

Attachment 3 - Exhibit A - Work Plan

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

Project Implementation, Phase 1

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EXHIBIT A - WORK PLAN

MONTEREY PENINSULA, CARMEL BAY, AND SOUTH MONTEREY BAY INTEGRATED REGIONAL WATER MANAGEMENT PLAN

PROJECT IMPLEMENTATION, PHASE 1

All Proposals must include a detailed description of the proposed implementation project(s) for which funding will be requested. The goals and objectives of the Proposal must be identified. Where requested funding is for a component of a larger project, this section must describe all of the components of the larger project and identify which elements of the project the IRWM grant is proposed to fund. Linkages to any other projects that must be completed first or that are essential to obtain the full benefits of the Proposal must be discussed.

Introduction

In 1777, Fray Junipero Serra (Father Serra) directed friars of the Capuchin order of Franciscan monks – with labor from the native Essalen and Ohlone people – to construct an irrigation system that took six years to build in order to water crops at the newly built mission located at the mouth of Rio Carmelo (Carmel River). This was the first recorded attempt to divert the Carmel River. During the 19th and 20th centuries, the Monterey Peninsula burgeoned from a small fishing village to a community known for its world-class auto race track, golf courses, and incredible undersea and land vistas.

Today, the Monterey Peninsula planning Region (Region) is still completely dependent on local water supplies for survival. Unsustainable diversions have decimated the steelhead run in the Carmel River over the past 40 years and over pumping of the only other water supply in the Region threatens the Seaside Groundwater Basin with the risk of seawater intrusion. Urban storm water discharges in the coastal area, including sanitary sewer overflows, regularly enter the Monterey Bay. As is typical of Mediterranean environments, episodic floods periodically wreak damage to homes, residences and infrastructure built too close to natural drainage ways. During past droughts, rainfall totals have dropped to as low as three inches for an entire water year.

The region exhibits many of the water resource problems currently facing California including: aquatic habitat degradation, threats to various aquatic and land-based species, ageing, obsolete, or unreliable infrastructure, chronic and episodic flood damage, unreliable water sources, reduced groundwater quantity and quality, and loss of surface storage. A bright spot in the Region is a long-standing commitment to environmental restoration, enhancement, and preservation. Also, more recently, with the initiation of the IRWM grant program and other major events, Regional communication and cooperation have increased significantly.

This Proposal consists of six regionally diverse Projects. Together, these Projects begin to address several priorities agreed to by the stakeholders who developed the Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management Plan (IRWM Plan). Most of this Proposal is self-contained, i.e., background and details necessary to understand linkages to the IRWM Plan are described below. However, there is a considerable amount of background information in the IRWM Plan and associated documents that details the planning Region, its needs, and the rationale, selection, and prioritization of these projects. The IRWM Plan, which is attached, can also be viewed or downloaded at:

http://www.mpwmd.dst.ca.us/Mbay_IRWM/Mbay_IRWM.htm

Summary: This Work Plan describes seven Projects involving several of the more than 40 stakeholders identified to date within the Region. The partners in these projects include private, non-profit, and public entities. The suite of projects is geographically diverse and will have benefits over a significant portion of the Region's area and population. Benefits include an increase in the reliability of the water supply, reduced impacts to threatened steelhead and California red-legged frogs from diversions of the Carmel River, improved aquatic habitat conditions in the Carmel River, improved water quality in the Seaside Groundwater Basin, a reduction in sewage overflows into the Pacific Grove Area of Special Biological Significance, reduced flood potential for 91?? residences in the lower Carmel River, and an increase in community involvement in water quality monitoring and low impact development technologies.

Project sponsors are requesting \$6 million in IRWM grant funds for a suite of projects that are estimated to cost approximately \$25 million. The local match consists of a mix of funds from established revenue streams, volunteer work, in-kind services of technical staff, and other State and Federal grant funds.

Most of the Projects contained in this Proposal are expected to be completed within three years of funding; however, the two largest projects with the greatest benefits may take longer (the Seaside Groundwater Basin Aquifer Storage and Recovery Project and the Lower Carmel River Floodplain Restoration Project). The suite of Projects were screened from a total of 17 Projects and selected for this Proposal based on a rigorous review and scoring process. The results of the selection process inform decision makers about those projects that meet regional priorities, include multiple objectives and water management strategies, are financially feasible, and can be implemented in the foreseeable future.

The suite of Projects will help to address four of the five regional priorities identified in the IRWM Plan. Most of the Projects have objectives that focus on solving existing problems such as recurring water shortages, flooding, habitat degradation, and failing infrastructure – all high priorities described in the IRWM Plan. However, one of the proposed projects is more forward looking and includes strategies to reduce water use, conserve energy, and involve the wider community in water resource management and stewardship (i.e., Carmel River Watershed Volunteer Program).

While there are no projects sponsored by or exclusively for disadvantaged communities (DACs) or Native Americans, the regional benefits of the Seaside Groundwater Basin (SGB) Aquifer Storage and Recovery Project do apply to all the census tract areas identified as DACs (downtown Monterey, Sand City, and a portion of Seaside). Benefits from this project include establishing a more reliable water supply, partially addressing a major conflict between water supply and environmental damage, improving groundwater quality in the SGB. In addition, two of the projects (Microbial source tracking and Sanitary Sewer Rehabilitation) will be carried out in the downtown Monterey DAC and address stormwater water quality within that DAC.

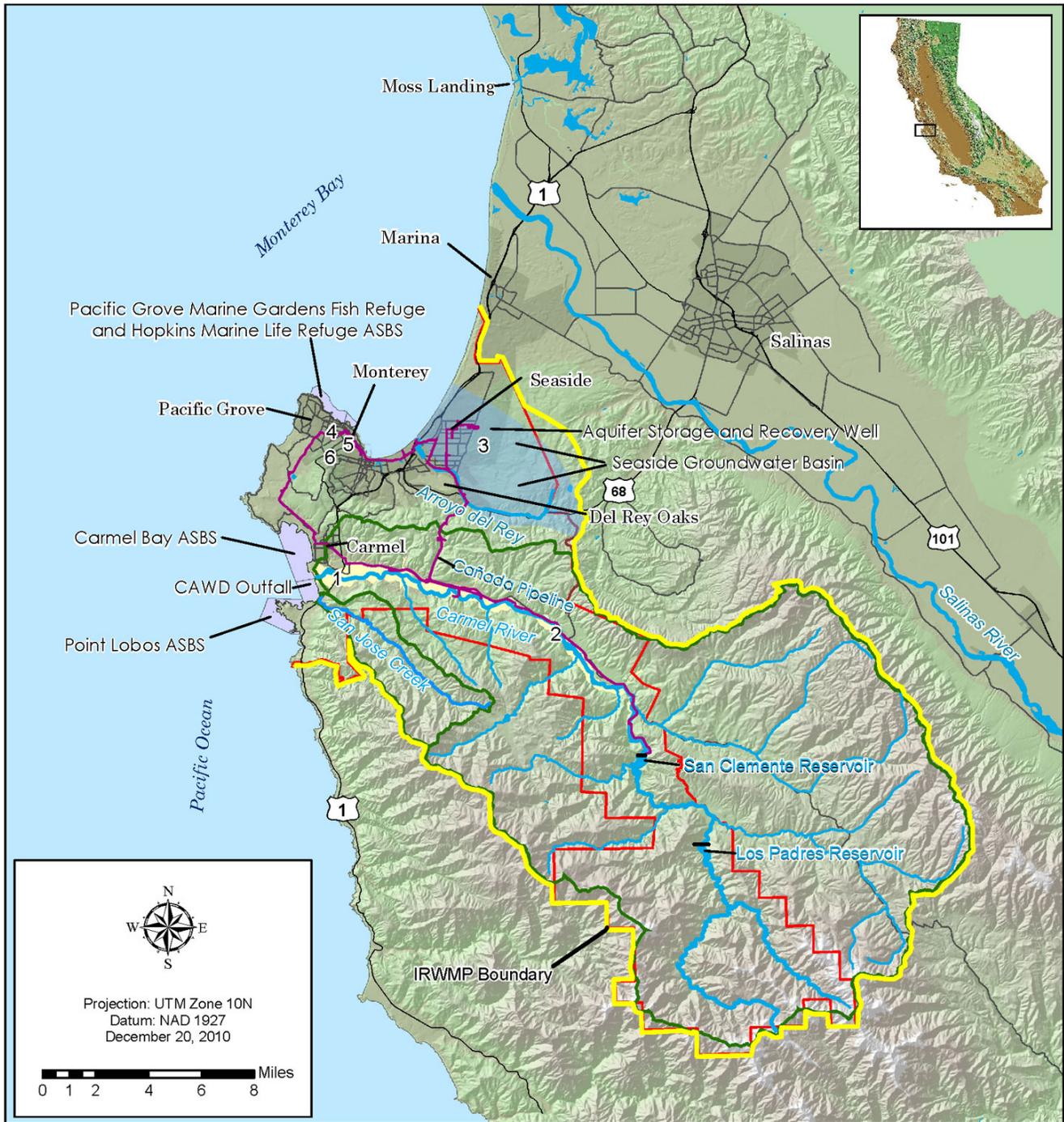
Project List:

- 1) Lower Carmel River Restoration and Floodplain Enhancement and 2) Carmel River Lagoon and Beach Studies – note – these are shown as location “1” in Figure 1 on the Regional Map
- 3) Seaside Groundwater Basin ASR
- 4) Sanitary Sewer System Repair
- 5) Implementation of Solid Waste Removal Technology
- 6) Carmel River Watershed Volunteer Program
- 7) Microbial Source Tracking in the Cities of Monterey and Pacific Grove

A short summary of each project is presented in the “Purpose and Need” section beginning on page 14.

Figure 1: Region Map of Monterey Peninsula, Carmel Bay, and South Monterey Bay

Integrated Regional Water Management Plan Project Implementation, Phase 1



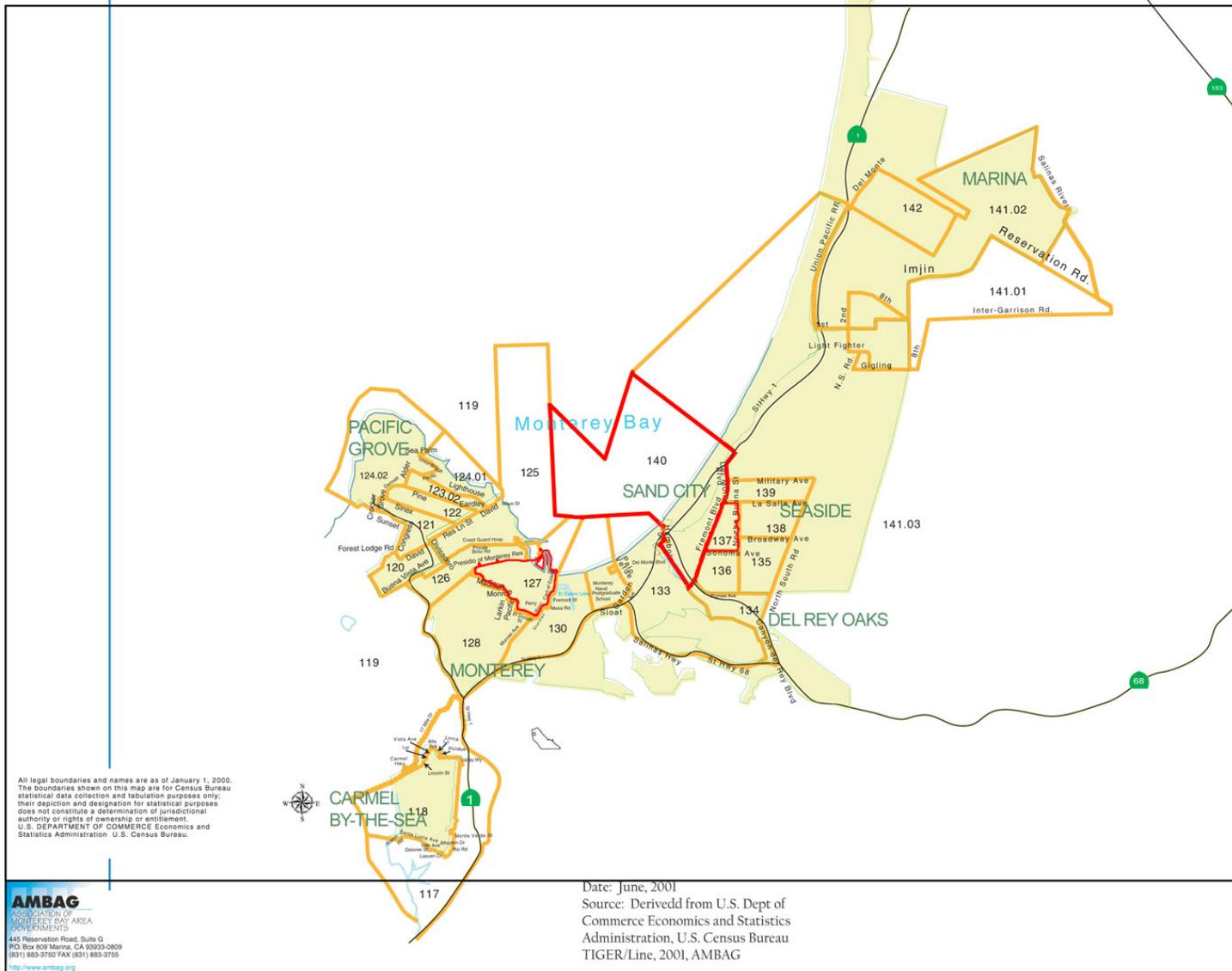
Project

1	Lower Carmel River Restoration and Floodplain Enhancement
2	Carmel River Watershed Volunteer Program
3	Seaside Groundwater Basin Aquifer Storage and Recovery (ASR)
4	Sanitary Sewer System Repair
5	Implementation of Solid Waste Removal Technology
6	Microbial Source Tracking in the Cities of Monterey and Pacific Grove

- IRWMP Area
- MPWMD Boundary
- Rivers
- Cal-Am Pipelines
- Roads
- Watershed Boundaries
- Seaside Groundwater Basin
- Carmel Valley Alluvial Aquifer
- Areas of Special Biological Significance
- City Limits

Figure 2: Disadvantaged Communities in the Region (Tracts 127, 137, 140)

MONTEREY COUNTY: CENSUS 2000 TRACT OUTLINE MAP



GOALS AND OBJECTIVES:

CONSISTENCY WITH REGIONAL PRIORITIES, OBJECTIVES AND STRATEGIES

Using the IRWM guidelines set out under Proposition 50, the Stakeholder Group in the Region developed and applied several criteria to refine Regional goals and objectives in order to select a Project Proposal. These criteria included a selection process that would result in a suite of projects that would:

- 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.

Regional goals are described in Table 1: Monterey Peninsula Regional Goals below. The goals for the IRWM Plan were based on improving existing water resource conditions in the Region at the time the IRWM Plan was developed (2007). 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. More detailed information about the development of these goals is described in the IRWM Plan, Section 4.1.

The IRWM Plan objectives were developed using an iterative, consensus-based approach, which resulted in a set of objectives 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 five categories were determined to be the Regional priorities. These Regional priorities were established to aid in 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

Summaries of these regional priorities are contained in Table 2: Water Supply and Water Quality Objectives and Table 3: Flood Protection and Erosion Prevention, Environmental Protection and Enhancement, and Regional Communication Objectives. Additional background documenting the rationale for selecting each of these priorities is contained in the IRWM Plan, Section 4.2, 4.3, and Chapter 6. For each category, multiple objectives were developed that include both quantitative and qualitative measures for evaluating the success of each project in a Project Proposal. An additional step in evaluating projects was to consider the water management strategies described for the IRWM program and determine which strategies each project employs. Table 4: Matching Projects with Strategies below shows the strategies that each Project includes and Tables 5 and 6 : Matching Projects with Objectives below show which objectives each project meets.

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. To evaluate the “readiness to proceed” for each project, a set of criteria were developed that included rating technical, financial, and progress aspects of each project. 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 IRWM Plan Chapter 4), objectives (Chapter 5), Regional priorities (Chapter 6), technical and financial feasibility, and readiness to proceed (also Chapter 6). 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 are shown in Table 8: Scoring Criteria.

Table 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.

Table 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 (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 3: 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.

Table 4: Matching Projects with Strategies

Projects	Sponsor	Water Management Strategy																		
		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
Lower Carmel River Restoration and Floodplain Enhancement	BSLT/MCWRA/MCPW	✓	✓		✓		✓	✓		✓		✓			✓			✓		
Carmel River Watershed Volunteer Program	CRWC/CWC	✓	✓				✓		✓							✓		✓		
Seaside Groundwater Basin Aquifer Storage and Recovery	MPWMD/CAW	✓	✓	✓		✓			✓			✓								
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	Monterey/PG					✓		✓	✓											

Table 5: Matching Projects with Objectives

Projects	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
Lower Carmel River Restoration and Floodplain Enhancement	BSLT/MCWRA/MCPW							✓	✓		✓	✓
Carmel River Watershed Volunteer Program	CRWC/CWC			✓		✓		✓	✓		✓	
Seaside Groundwater Basin Aquifer Storage and Recovery	MPWMD/CAW	✓	✓	✓			✓	✓	✓			
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								✓		✓	✓

Table 6: 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 preserving ecologic	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 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
Lower Carmel River Restoration and Floodplain Enhancement	BSLT/ MCWRA/ MCPW	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Carmel River Watershed Volunteer Program	CRWC/CWC					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Seaside Groundwater Basin Aquifer Storage and Recovery	MPWMD/ CAW							✓		✓	✓	✓	✓		
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	Monterey/PG	✓	✓			✓					✓	✓			

Table 7: 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.

Table 8: 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
	6	Promote the steelhead run
Statewide Priorities	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

A score of 100 represents a project package that is 100% feasible and meets the objectives for the region. However, “Regional Priorities” represents the only category that includes measurable targets (for water supply and flood protection). Within the Regional Priorities category, numeric targets for “Mitigate effects of storm water runoff throughout Region,” “Address storm water discharges to ASBS,” and “Promote the steelhead run” have not been established. TMDLs for stormwater in the Region have not been established, although the Tularcitos Creek sub-watershed in the Carmel River Basin must have TMDLs established by 2021.¹ Discharge requirements for ASBS are under development by the SWRCB. Federal and state goals for the steelhead run in the Region have not been established, although MPWMD did establish a possible range

¹ See Central Coast Regional Water Quality Control Board, Clean Water Act, Sections 305(b) and 303(d) Integrated Report for the Central Coast Region, June 2009.

http://www.swrcb.ca.gov/centralcoast/water_issues/programs/tmdl/303d/2008_0409_draft_integrated_report.pdf and http://www.swrcb.ca.gov/centralcoast/water_issues/programs/tmdl/303d/appendix_a.pdf

Tularcitos Creek drains approximately 55 square miles in the Region (about 20% of the Carmel River Basin); however, it is in the rain shadow of the Santa Lucia range and supplies less than 4% of the annual surface runoff from the Carmel River Basin.

that could be expected given certain levels of development². Once numeric targets are established, it is likely that the Regional Priorities in the IRWM Plan will be revised.

An explanation of the rationale for the method of prioritization is contained in the IRWM Plan, Section 6.3. The results of this prioritization process for the six projects in this Proposal are shown in Table 9 below.

Table 9: Prioritized Project List

Project List 2010 Implementation Grant Round 1	Sponsor	Strategies	Objectives	Regional Priorities	Feasibility	Total	IRWMP Ranking
Lower Carmel River Restoration and Floodplain Enhancement	BSLT/CRWC/MCWRA/ MPWMD/MCPW	4.00	5.01	6.67	3.19	18.88	1
Carmel River Watershed Volunteer Program	CRWC/CWC	2.40	5.31	2.37	3.19	13.27	2
Seaside Groundwater Basin Aquifer Storage and Recovery (ASR)	MPWMD/CAW	2.80	4.42	1.61	0.00	8.83	3
Sanitary Sewer System Repair	Monterey/P.G.	2.40	2.95	1.03	3.19	9.57	4
Implementation of Solid Waste Removal Technology	Monterey/P.G.	1.20	2.95	1.87	1.92	7.93	5
Microbial Source Tracking in the Cities of Monterey and Pacific Grove	Monterey/P.G.	1.20	2.36	0.20	2.51	6.27	6
Total Points, All Projects		14.0	23.0	13.7	14.0	64.7	
Maximum Possible Points for All Projects		17.0	25.0	33.0	25.0	100.0	

Today, the Region is completely dependent on local water supplies for survival. Unsustainable diversions decimated the steelhead run in the Carmel River over the past 40 years and over pumping of the only other water supply in the Region has put the Seaside Groundwater Basin at risk of seawater intrusion. Urban storm water discharges in the coastal area, including sanitary sewer overflows, regularly enter the Monterey Bay. As is typical of Mediterranean environments, episodic floods periodically wreak damage to homes, residences and infrastructure built too close to natural drainage ways. During past droughts, rainfall totals have dropped to as low as three inches for an entire water year. The estimated disappearances of historical populations of California red-legged frogs 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).

This Proposal consists of six regionally diverse Projects from six equally diverse Project sponsors. Together, these Projects begin to address several priorities agreed to by the stakeholders who developed the Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management Plan (IRWM Plan).

² In 2004, MPWMD estimated that the Carmel River Basin could support an annual adult run in the range of 2,600 to 4,200. A complicating factor in establishing a numeric target and monitoring for success is the difficulty of counting all adult fish entering or leaving the system. See Section 5.5.1.4 “Trend Analysis for Juvenile and Adult Steelhead,” Environmental and Biological Assessment of Portions of the Carmel River Watershed, Monterey Peninsula Water Management District.

PURPOSE AND NEED:

The following section describes how the proposed suite of Projects satisfies Regional priorities and includes a summary of project objectives and water management strategies employed.

Regional Priority: *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*

Where the Region may differ from other areas of the Central Coast and California is in a noteworthy combination of factors that has resulted in an incredibly complex and difficult setting in which to manage water supply problems. Rainfall/runoff is not reliable; surface storage in the region is both short-lived and structures to impound water have been found to be environmentally damaging over the long term; local aquifers are subject to seawater intrusion or are not large enough to provide long-term drought protection; the Region is not connected to the State Water project; and since the mid-1960s, the no large projects have been undertaken to replace or expand ageing or environmentally unsustainable water supplies.

Beginning in the 1960s, the region exceeded its surface storage supplies and the local water company (California American Water) increasingly turned to well water pumping to meet demand. As early as 1967, the damage to the environment from increased water extraction was noted. However, the community flip-flopped on proposals for major water supply projects in the 1980s and 1990s to increase the water supply and eventually turned them down. By the mid 2000s, approximately 100 alternatives to increase the water supply had been examined with no viable alternative chosen.

In the 2007 IRWM Plan, the total amount of new water supply projects needed in the Region to replace existing supplies and provide for some development during the next 20 years was estimated to equal about 95% of existing demand. This includes an immediate need (i.e., by 2016) to replace approximately 12,500 acre-feet annually(AFA) or about 70% of existing demand, which is currently produced from the two local water sources in the Region – the Carmel River Basin (CRB) and the Seaside Groundwater Basin (SGB). Once near-term replacement supply targets are met, there is an additional need of 4,545 AFA of new supplies to meet build-out demand in the Region.

Existing supplies – About 80% of water used within the MPWMD boundary 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 Monterey Peninsula Region (see [Figure 2: California American Water Service Boundaries](#)). The Carmel Valley alluvial groundwater basin provides approximately 65% of the water used in the Monterey Peninsula area. Groundwater pumping from this alluvial aquifer has resulted in depleted storage, reduced streamflow in the Carmel River, and impaired habitat conditions for steelhead trout and red-legged frogs. Typically, during the dry season between June and November, the lower seven miles of the Carmel River are dewatered (see [Figure 3: Dewatered Reach in the Carmel River at RM 3.5](#)). In 1998, the State Water Resources Control Board determined that the Carmel River was fully appropriated during the dry season. Recharge to the aquifer is derived mainly from river infiltration. During the rainy season when streamflow resumes, the alluvial aquifer fills in all years except during droughts. Annual streamflow in the lower reaches of the Carmel River is highly variable, ranging from zero af in 1977 to 367,00 af in 1983. Discharge to the ocean averages approximately 76,000 afy, with more than 96% of this total occurring between December and May.

Cal-Am owns and operates a series of production wells along the Carmel River (see [Figure 4: California American Water 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. Raw water is extracted from wells along the river and

processed through the Begonia Iron Removal Plant before being pumped into the municipal supply network (see Figures 5 and 6).

In 1995, SWRCB issued order WRO 95-10 to CAW to reduce Carmel River diversions by 70%. In 2009, SWRCB issued a Cease-and-Desist Order (CDO) (WRO 2009-60) that mandated the ramp down schedule in diversions from the CRB shown in Table 10: Proposed Reductions in Carmel River Diversions.

The Seaside Groundwater Basin, which supplied about 20% of municipal demand in 2005, 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. Table 11: Groundwater Conditions of Seaside Basin in 2006 summarizes the condition of the SGB in 2006 and the estimated sustainable yield amounts for each sub-basin. In part, the production level prior to adjudication was due to an order in 1995 from SWRCB (Order WRO 95-10) to increase production from the SGB to the maximum extent feasible in order to reduce impacts to the Carmel River from CRB diversions. Production is to be cut back from approximately 5,600 AFY to 3,000 AFY over an 11-year period beginning in 2007 (see Table 12: Schedule for Reductions in Seaside Groundwater Basin Production).

Both the CRB and SGB are under legal mandates to ramp down production or the community could face severe financial penalties for violating the ramp-down schedules in each basin. Cal-Am customers may be subject to water rationing, a moratorium on Water Permits for new construction and remodels, and fines if pumping limits are exceeded. The estimated cost to the community from meeting the ramp-down schedules solely by reducing water consumption has been estimated to range from \$17 to more than \$50 million annually.

Figure 2: California American Water Service Boundaries

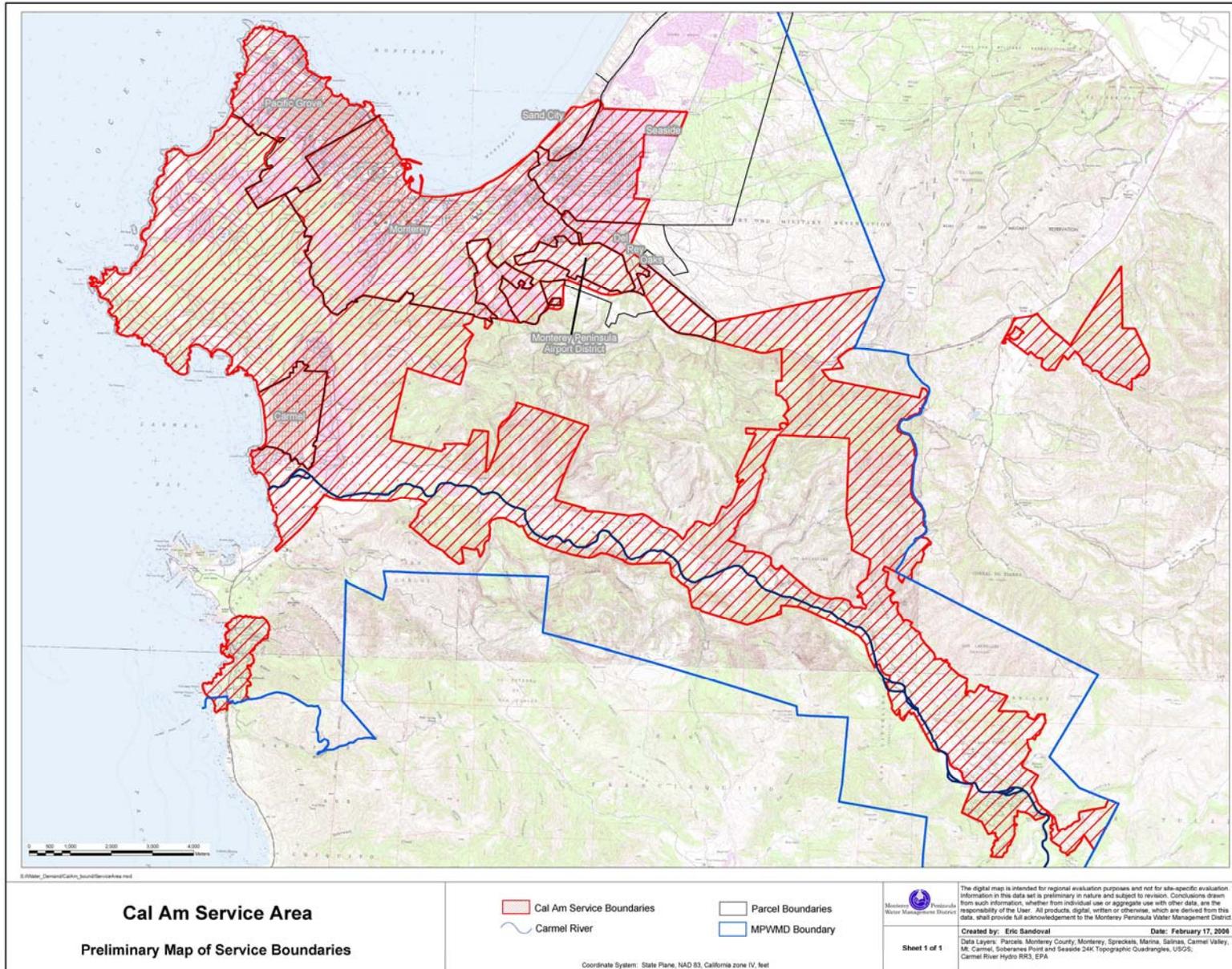


Figure 3: Dewatered Reach (Subunit 4) in the Carmel River at RM 3.5



Figure 4: California American Water Production Wells Along the Carmel River

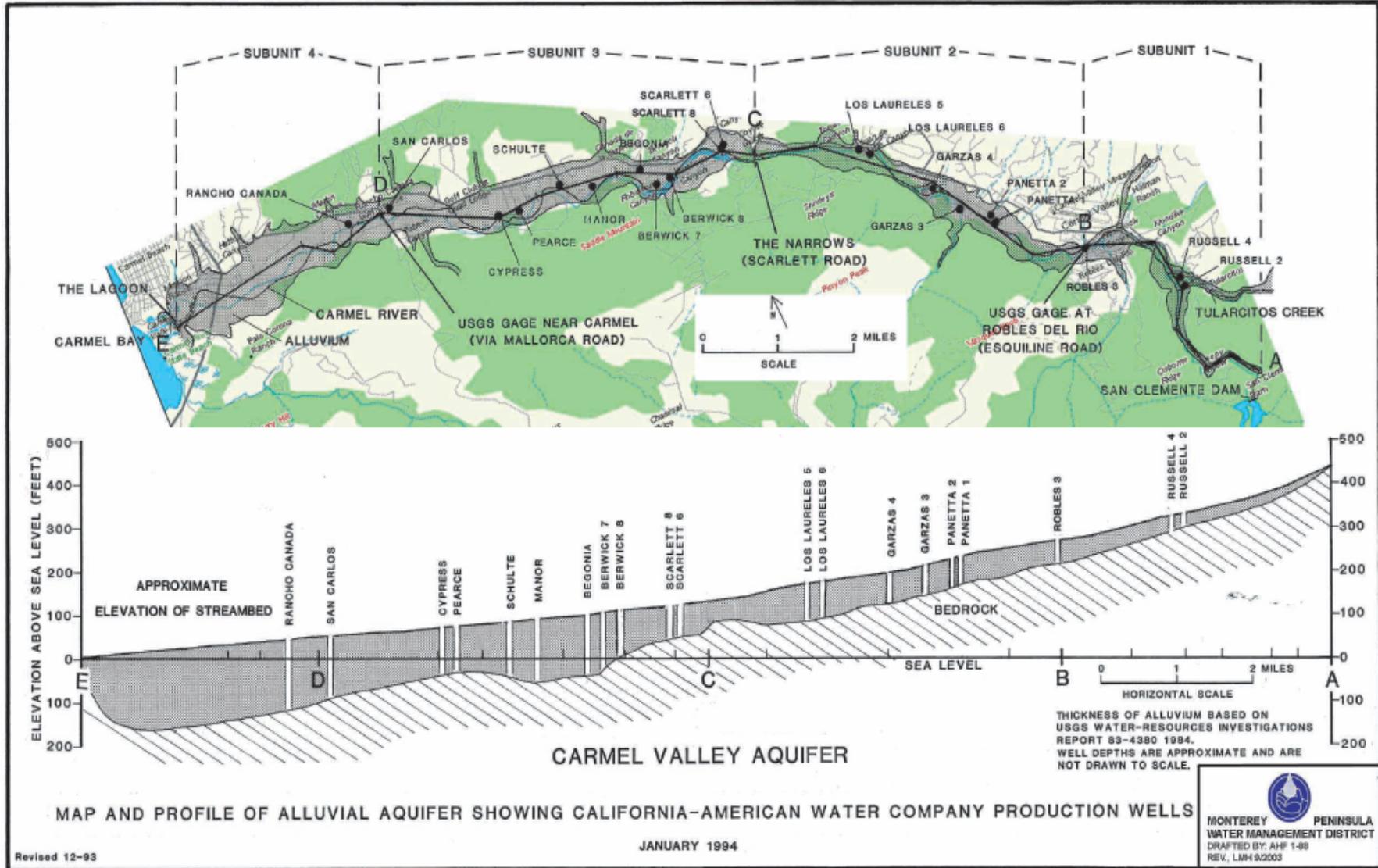


Table 10: Proposed Reductions in Carmel River Diversions

PROJECTED REDUCTIONS IN ILLEGAL DIVERSIONS FROM THE CARMEL RIVER									
(all amounts are in acre-feet)									
Water Year (Oct - Sept)	Base Amount¹	Mandatory Cumulative Annual Reduction²	Estimated ASR Project Operational Yield³	Estimated Sand City Desalinization Plant⁴	Estimated Small Project Output⁵	Estimated Coastal Water Project Output⁶	Total to Base Amount	Total Estimated Amount Diverted from Carmel River	Estimated Amount Diverted w/o Valid Basis of Right
2009-10	10,978	549	145	75	0	0	769	10,209	6,833
2010-11	10,978	549	145	290	0	0	984	9,994	6,618
2011-12	10,978	670	145	280	0	0	1,095	9,883	6,507
2012-13	10,978	791	145	270	0	0	1,206	9,772	6,396
2013-14	10,978	912	145	260	0	0	1,317	9,661	6,285
2014-15	10,978	1,033	145	250	0	0	1,428	9,550	6,174
2015-16	10,978	1,275	145	240	0	0	1,660	9,318	5,942
2016-17	10,978	1,517	145	230	0	11,730	1,892	3,376	0

- 1) Cal-Am diverts 3,376 afa under legal rights and, on average, 7,602 afa without a valid basis of right (60 afa of the 3,376 afa is assumed diverted under riparian right to riparian vegetation along Carmel River).
- 2) Reduction in 2009-2010 and 2010-2011 is initial amount of 5% (549 ac-ft). Starting October 1, 2011, add 121 af each year until October 1, 2015, when the annual reduction becomes 242 afa.
- 3) Average amount diverted for Phase 1 ASR project from water year 1994-1995 to 2006-2007 (R.T. Phase 1, Vol. I pp. 41-42). Amount may increase when Phase 2 of the ASR project becomes operational.
- 4) Number may vary based on actual production from desalinization plant. Assumes 3 months of operation in 2009-10.
- 5) Production from small projects cannot be estimated at this time.
- 6) Estimated production of Coastal Water Project (R.T. Phase 2, Vol. V, p. 1333).

Table 11: Groundwater Conditions of Seaside Basin in 2006

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

Figure 5 - West-East profile through the coastal area of the Seaside Groundwater Basin

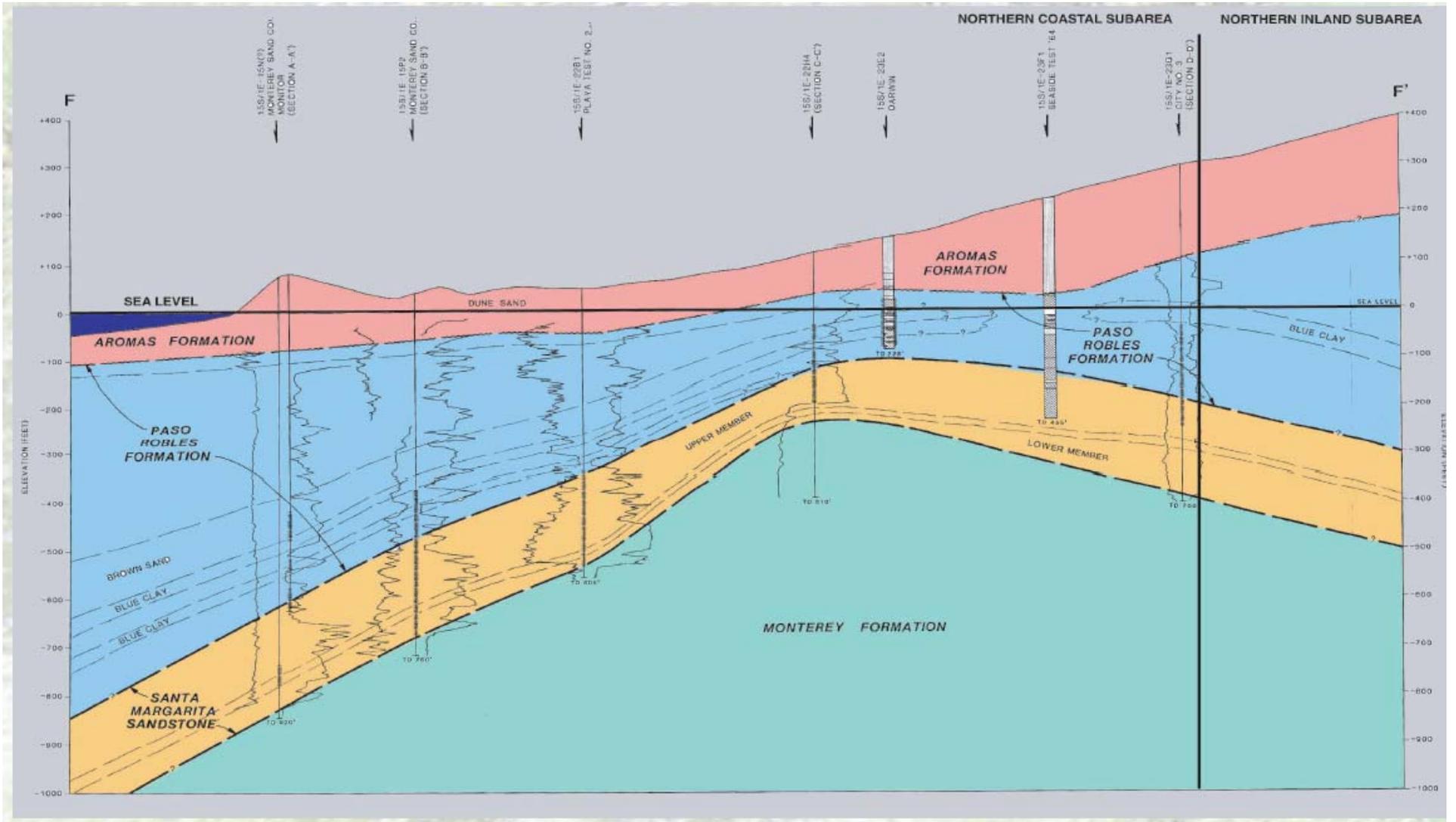


Figure 6 – Phase 1 Seaside Groundwater Basin Aquifer Storage and Retrieval Facilities Schematic



Table 12: Schedule for Reductions in Seaside Groundwater Basin Production

Monterey Peninsula Water Management District

Seaside Groundwater Basin Adjudication Allocations: Water Years 2006 - 2026									
Water Years	Coastal Subareas				Laguna Seca Subarea				Basin
	Operating Yield (afy)	Alternative Production Allocation (afy)	Standard Production Allocation (afy)	CAW Share (afy)	Operating Yield (afy)	Alternative Production Allocation (afy)	Standard Production Allocation (afy)	CAW Share (afy)	Operating Yield (afy)
2006-2008	4,611	743	3,868	3,504	989	644	345	345	5,600
2009	4,265	743	3,522	3,191	915	644	271	271	5,180
2010-2011	4,150	743	3,407	3,087	890	644	246	246	5,040
2012-2014	3,689	743	2,946	2,669	791	644	147	147	4,480
2015-2017	3,228	743	2,485	2,251	692	644	48	48	3,920
2018-2020	2,752	743	2,009	1,820	608	608	0	0	3,360
2021-2023	2,392	743	1,649	1,494	608	608	0	0	3,000
2024-2026	2,392	743	1,649	1,494	608	608	0	0	3,000

Source: *California American Water v. City of Seaside, et al.* (Case No. M66343, California Superior Court, Monterey County, March 27, 2006, as amended February 9, 2007)

Notes:

1. Values are based on the Court's decision at the January 12, 2007 hearing to switch to a Water Year-based accounting period (October 1 through September 30), the first "Administrative" Year began on October 1, 2006. However, consistent with the original decision, the first reduction in the Operating Yield will occur on January 1, 2009. Each reduction after January 1, 2009, will occur at the beginning of each triennial period, i.e., October 1, 2012, October 1, 2015, and so forth.
3. Cal-Am's share of the Standard Production Allocation for the Coastal Subareas is calculated as 90.60% of the total Standard Production Allocation. For the first triennial period, i.e., Water Years 2006 through 2008, Cal-Am's share is 3,504 afy. This calculation is consistent with the procedure described in the adjudication decision (pages 17 through 19) and Cal-Am's arguments in the *Joint Post-Judgment Motion to Request Clarification of the Court's Final Decision Relating to the Calculation of the Over-Production Replenishment Assessment* dated November 28, 2006 (pages 8 through 10).
4. For computation purposes, it is assumed that the 10% reduction in the Operating Yield is based on the initial Operating Yield specified by the Court, i.e., 5,600 afy. For example, at the beginning of Water Year 2010, the 10% reduction equals 560 afy ($5,600 \times 0.10 = 560$). Similarly, at the beginning of Water Year 2012, the 10% reduction also equals 560 afy ($5,600 \times 0.10 = 560$).
5. For computation purposes, it is assumed that the Natural Safe Yield for the basin is and remains at 3,000 afy, with 608 afy assigned to the Laguna Seca Subarea and the remainder, 2,392 afy, assigned to the Coastal Subareas within the basin.

/u/darby/excel/seaside/sgb_allocations_27mar06.xls

8/7/2007

Future Regional water supply needs – In 2006, the 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, MPWMD staff compiled the future water need estimates that are summarized in Table 12: Estimated Additional Water Demand. The general plans within the Cities and unincorporated areas anticipate a need for an increased water supply that is equivalent to about 25% of the existing total use in the Region in 2010.

Table 13: 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

It should be noted that the CDO against Cal-Am mandates that all new water supply projects in the MPWMD boundary satisfy the replacement water supply need before additional connections to the system can be made. CAW has requested and received PUC approval for a moratorium on all new connections to the CAW system.

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

This Project includes multiple objectives and water management strategies and will have several significant results. Objectives of this Project include:

- 1) provide 2,000 AFA toward the current replacement supply goal of 12,500 AFA;
- 2) help toward resolving a local conflict over water use by meeting the ramp-down schedule required under the Cease-and-Desist Order issued in 2009 by the State Water Resources Control Board concerning Carmel River Basin diversions;
- 3) improve water quality in the SGB with injected freshwater, where past overproduction has increased the potential for seawater intrusion;
- 4) improve dry season aquatic habitat in the Carmel River and Lagoon – especially for threatened steelhead – by reducing groundwater pumping in the CRB in the summer by CAW; and
- 5) use surface and groundwater conjunctively between the CRB and SGB to satisfy municipal demand.

While it has been determined that the SGB has a large capacity to store water (up to 50,000 AF), future expansions of ASR are dependent on CAW system upgrades to pipes and pumps and the installation of additional wells in Carmel Valley and in Seaside. The existing system has been designed to meet daily peak

demand; however, improvements must be made to meet daily peak demand while also pumping and storing significant volumes of water in the SGB.

The Project is to be completed in partnership between MPWMD and California American Water. The ASR Project involves using CAW facilities in the Region to divert and transfer excess Carmel River Basin winter flows to the SGB for injection. This project would complete Phase 1, which is designed to inject up to 1,000 AFA, and expand the project with facilities to store an additional 1,000 AFA for a total of 2,000 AFA after all construction is complete.

Water diverted in the winter (see [Figure 7 – Winter Flow Adjacent to CAW Cañada Well in the Lower Carmel River](#)) and injected into the SGB (see [Figure 8 - Injection well in the Santa Margarita formation in Seaside](#)) is recovered in the summer to meet municipal demand. This allows CAW to reduce production in the Carmel River Basin in the summer on a one-for-one basis. CAW owns most of the conveyance facilities and MPWMD owns the water rights and injection wells in the SGB. The estimated total cost of the Project is \$6.4 million, with a request of \$ \$1.7 million in grant funds. The local match for this project consists of a combination of in-kind services by MPWMD and funds from a user fee charged for use of water from the CAW system. The first phase of the Project is currently under construction and has already succeeded in diverting and storing more than 1,000 AF. Additional work to complete environmental compliance documents for Phase 2 of the Project is expected to be completed in the Spring of 2011. Construction of Phase 2 could begin by mid-year 2011 and would be expected to be completed in 2013.

[Figure 7 – Winter Flow Adjacent to CAW Cañada Well in the Lower Carmel River \(arrow shows approximate location of the well.\)](#)



Figure 8 - Injection well in the Santa Margarita formation in Seaside



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

The Carmel Valley, which is virtually all unincorporated, is the most flood-prone area within the Region and has the highest number of repetitive loss properties (94) in Monterey County (RLPs are properties with two or more claims of \$1,000 or more paid by the National Flood Insurance Program within any given 10-year period, since 1978). In 1995, it was estimated that approximately 1,700 properties were located in the 100-year floodplain of the Carmel River. These include single family and multi-family, commercial, public, and open space properties. Although temporary measures, such as sand-bagging along low-lying areas, around structures, can sometimes prevent flood damage, the March 10, 1995 flood, which had an estimated peak magnitude of 16,000 cubic feet per second or about a 70-year return flood level, damaged 700 residences and 68 businesses and caused the evacuation of most residences and businesses in the floodplain. Several bridges were damaged or destroyed during the 1995 flood. A center pier and two 80-foot spans of the Highway 1 bridge, which was built in 1933, were washed away. Emergency construction of a temporary one-lane bailey bridge was followed by a new permanent bridge across the river in June 1995. Currently, no temporary measures can stop flood and erosion damage due to extreme ocean surge at the Carmel River mouth.

Flood and erosion damage in the lower four miles of the river from high flows or ocean surge occurred in 1958, 1978, 1993, 1995, 1998, 2001, 2005, 2008, and 2009. [Figure 7: Panel 320, Monterey County Flood Insurance Rate Map](#) shows flood-prone zones in the lower Carmel River (note: the original page size is a PDF file that is 36 in. x 26 in. and can easily be zoomed up to view particular areas). Although there is no detailed, comprehensive plan to address flooding along the river or to restore natural river functions, what has emerged during the development of the IRWM Plan for the Region is a consensus-driven approach toward solutions that is based on a set of studies, plans, and policies that include the following:

- Nolte and Associates (1980) - proposal to elevate Highway 1 and construct a causeway raised to reduce the backwater effect from the roadway (also considered in the 1992 Lagoon Enhancement Plan)
- Monterey County (1983) - implemented the Carmel Valley Floodplain Ordinance that restricts development in the floodway and flood fringe and set elevation requirements for structures within the 100-year floodplain
- MPWMD (1984) Carmel River Management Plan – outlined bio-technical techniques to restore streamside vegetation, floodplain function and sediment transport continuity
- Williams (1992) - Carmel River Lagoon Enhancement Plan to restore aquatic habitat and reduce flood potential, including a proposal to install a barrier for flood protection
- Monterey County (1998) - MCWRA and Hacienda Carmel proposed a channel bypass project between RM 3 and 4 that would effectively carry all of the overbank flow that threatens flooding in that reach and would reduce the flood potential for more than 300 residential units.
- Williams and Associates (2002) - recommended improvements along the north side levee upstream of Highway 1 to reduce flood damage (between RM 1 and 2) in CSA 50
- BSLT (2006) - Carmel River Parkway Vision
- Carmel River Lagoon TAC (2007) – Outline of Studies for Long Term Management of the Carmel River Lagoon

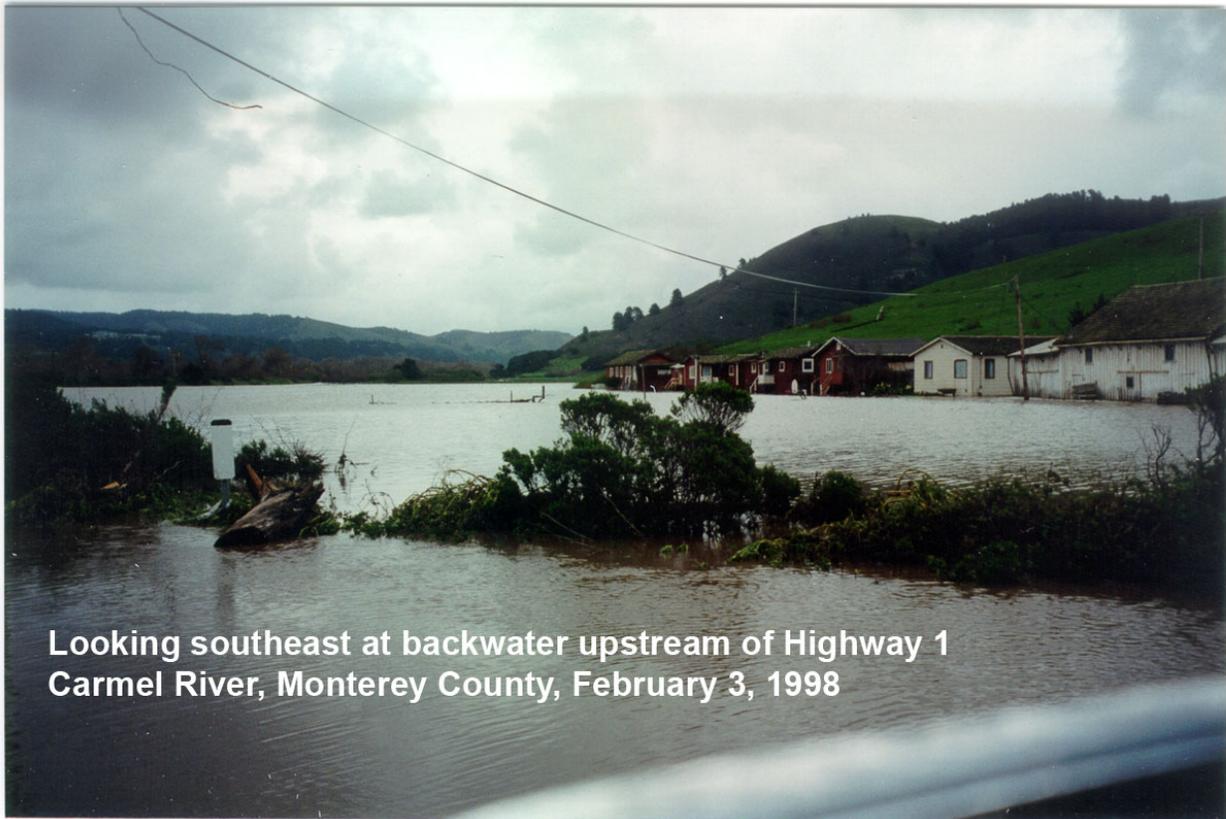
Each of these studies, rules, and proposals focus on a particular aspect of river management, but are ultimately linked by the goals of reducing flood damage, enhancing aquatic habitat, and restoring river functions.

In 1995, commercial, residential and agricultural properties, including residences and structures, along the river between RM 0.5 and RM 2 were inundated twice within two months, which resulted in the first set of levee modifications on the south side of the river to alleviate flood pressures. In 1997, CALTRANS began the phased removal of 1,500 feet of levee along the south side of the river, which allowed flood flows in 1998 to occupy the floodplain downstream of Highway 1 instead of flooding the Mission Fields area. That flood created naturally recruited riparian forest land adjacent to the river that has already matured in an area that had been farmed continuously since the Mission era.

In 2004, State Parks continued the restoration of the lagoon area downstream of Highway 1 by deepening and extending the south arm of the lagoon and restoring native riparian species to the remaining floodplain area south of the river.

In 2008, Rancho Canada (between RM 2 and 3) proposed to donate a portion of the golf course land adjacent to the Carmel River and make it into a permanent floodplain area as part of an overall development plan for the golf course areas. That project is currently being evaluated under CEQA.

Figure 9 – Overtopping of Highway 1 at Carmel River



**Looking southeast at backwater upstream of Highway 1
Carmel River, Monterey County, February 3, 1998**



**Looking south along Highway 1
Carmel River, Monterey County
at Odello artichoke fields, February 3, 1998**

Figure 10 – Highway 1 Bridge Over the Carmel River



**Highway 1 Bridge over the Carmel River
Above - March 10, 1995
Below - March 12, 1995**



Figure 11 – North Arm of Carmel River Lagoon

Flooding of local residences and infrastructure occurs at elevations above 10.7 (NGVD 1929).



Figure 12 – Carmel River State Beach and Lagoon with Mechanically Excavated Outlet



Lower Carmel River Floodplain Protection and Enhancement Project (LCR Project)

This Project, located in the lower Carmel River, has multiple objectives and benefits including reduction of flood impacts, retention of stormwater, restoration of riparian habitat, restoration of natural river functions, an enhancement of recreational opportunities, and public outreach. Proposed project work in the lower Carmel River includes grading of the floodplain adjacent to the river and installation of a causeway to lift Highway 1 over the river. This would reduce the flood potential for 65% of the repetitive loss properties (RLPs) in Monterey County by increasing conveyance under Highway 1. The Project would bring benefits to 69 RLPs. The Project would reestablish and reconnect 90 acres of riparian forest habitat along the Carmel River that has been in agricultural use for more than 50 years and was totally disconnected from the wetland area downstream by the construction of Highway 1 across the Carmel River in the early 1930s. The Project is being carried out in partnership between the Big Sur land Trust, the Carmel River Watershed Conservancy, Monterey County Water Resources Agency, Monterey County Public Works, Community Service Area 50, California State Parks, and MPWMD. The first phase of construction work (grading) is expected to begin in mid-2011. Environmental compliance work and construction for the second phase of the project (causeway construction) is expected to begin in mid-2011 and take two years to complete.

Carmel River Lagoon and Beach Studies

The second component of work in the lower Carmel River also has multiple objectives and benefits. Completion of several studies and initial design work would eventually lead to a Project to install a vinyl sheet barrier along the northern portion of the 100-acre Carmel River Lagoon.

Low-lying areas around the Lagoon at the mouth of the Carmel River are subject to flooding from ocean surge, high lagoon levels when the outlet through the barrier beach to the ocean is closed, and from periodic high flows in the Carmel River. These low-lying areas include infrastructure, residences, a school yard (River School) and one business (Mission Ranch) along the north edge of the Lagoon. Frequent flooding of this area (i.e., several times per year) due to high Lagoon levels is currently prevented by mechanically bulldozing the barrier beach across the mouth to lower the water level in the Lagoon. This practice has come under increasing scrutiny and criticism from a local environmental group and state and federal regulatory agencies.

The installation of the Ecosystem Protective Barrier would achieve three long-standing and over-arching goals in the Carmel River Lagoon all at the same time: 1) increasing the water quantity and quality and rearing habitat of threatened species steelhead and red-legged frogs in the Lagoon; 2) protecting residences adjacent to the Lagoon from periodic flooding; and 3) minimizing the necessity of mechanical breaching of the barrier beach that has caused harm and loss of habitat for steelhead.

The linkages and synergies among these three over-arching goals can be achieved by just a single project—the installation of the EPB. A barrier would allow the Lagoon elevation to rise up to an additional three feet. In late spring, this would double the volume of water in the lagoon and result initially in more aquatic habitat. Water quality in the dry season would degrade more slowly. In the fall/winter period, higher lagoon levels would improve habitat for outmigrating smolts, which spend a portion of their lives feeding and acclimating to saline water while in brackish lagoon water.

As its second goal, this Project will protect residences from flooding when the lagoon is high and reduce or eliminate the need to mechanically breach the barrier beach to reduce the potential for flooding. Currently, Monterey County Public Works mechanically manages the beach in the fall and winter to lower the water level in the lagoon and prevent flooding of low-lying structures. This results in impacts to steelhead, especially when mechanical breaching leads to an evacuation of the lagoon.

The third major goal is to reduce the potential for flooding of up to 24 residences, an elementary school yard (River School) and one business (Mission Ranch) along the north edge of the Lagoon. In addition to threat of floods from a slowly rising lagoon or from a coastal flood, low-lying areas near the lagoon can be inundated during periodic floods from high flows in the Carmel River.

The Project is being carried out in partnership between the Carmel River Watershed Conservancy, Homeowners for Effective Lagoon Management, the Monterey County Water Resources Agency, and Monterey County Public Works. The estimated total cost of installing a barrier is \$1.4 million; however, at this time, funding is being requested for initial feasibility and environmental compliance work only. This is estimated to cost \$300,500 with a grant fund request of \$210,500 (local match of \$90,000). Planning and initial design work can begin upon funding approval and would be expected to take approximately 15 months to complete..

Regional Priority: Mitigate effects of storm water runoff

The Region faces two different storm drainage issues – chronic discharges that degrade receiving water quality and episodic flood damage. Chronic discharge issues include those regulated under the NPDES program and storm water flows into areas of special biological significance (ASBS) adjacent to the Pebble Beach area and the Cities of Carmel-by-the-Sea, Pacific Grove, and Monterey. Episodic flooding occurs in the Carmel River valley, where a majority of the repeat flood properties in Monterey County are located.

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. 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 million³.

Three projects in this Proposal in the Cities of Pacific Grove and are focused on improving water quality in storm drain flows. The Sanitary Sewer System Repair Project in Monterey will reduce sewage system

³ 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.

overflows that result from catastrophic pipe failures or ruptures and can flow into storm drains. The Solid Waste Removal Project would curb solid waste emissions from two locations in the City of Monterey. The 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 Microbial Source Tacking Project will analyze water samples from the storm drain system for sources of bacteria. The results of this study will provide the Cities, Monterey County, Regional Water Quality Control Board, State Water Resources Control Board and the Monterey Bay National Marine 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. The projects can begin almost immediately upon funding approval, with only a Coastal Commission permit required for work on storm drains.

A fourth project focused on improving stormwater quality is the Carmel River Watershed Volunteer Program in the Carmel River Basin. Project objectives include a combination of public outreach, training, and the cultivation of stewardship values. This project is exempt under CEQA and can begin immediately upon funding.

[Sanitary Sewer System Repair Project](#)

This project along sewer line shared by the Cities of Monterey and Pacific Grove will repair ageing sewer mains and reduce sewage system overflows that result from catastrophic pipe failures or ruptures that can cause flow into storm drains and into the Pacific Grove Area of Special Biological Significance. Much of the clay pipe sewer system dates back to the early 1900s and have not been replaced. The portions proposed for repair are rated at service level “D” (explain rating) or “F” condition (explain rating). This project

[Solid Waste Removal Project](#)

This project would curb solid waste emissions from two locations in the City of Monterey. The sites were chosen based on their large upstream drainage areas and their known propensity for being collection points for wayward pieces of trash.

[Microbial Source Tracking Project](#)

This project will analyze water samples from a portion of the storm drain system in Monterey for the sources of bacteria and provide critical data for determining whether beach closures and postings in the Monterey Peninsula Region are required. The results of this study will provide the Cities, Monterey County, Regional Water Quality Control Board, State Water Resources Control Board and the Monterey Bay National Marine Sanctuary with the information they need to determine the human health risk at these study locations and possibly other similar watersheds throughout the MBNMS.

[Carmel River Volunteer Program](#)

This project will engage the surrounding community in various watershed and water quality programs in the Carmel River Basin that will include: water quality monitoring, flow and habitat monitoring; data compilation and analysis; public education and outreach programs, and opportunities for watershed stewardship.

[Regional Priority: Promote the steelhead run](#)

It has been estimated that the population of returning adult steelhead in the Carmel River Basin has dropped from a range of 12,000 to 20,000 annually (Snider 1983) to a few hundred today. The Carmel River Basin supports one of the stronger steelhead populations in the South-Central Coast distinctive population segment, which extends from the Pajaro River in Santa Cruz County south to streams north of the Santa Maria River in Ventura County. While the population in the Carmel River 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 and steelhead were listed as a threatened species by NMFS in 1996. Key objectives described in the IRWM Plan to reverse this trend include implementing strategies and projects that reverse the historical pattern of out-of-basin exports during periods of low flow from the Carmel Basin and implementation of watershed actions to improve the returns of steelhead (CRWC, 2004 and 2007).

Although no federal or state targets have been established for returning adults, the Carmel River Basin is estimated to support an annual adult run in the range of 2,600 to 4,200 (MPWMD, 2004). Currently, adult returns along the main stem are monitored at San Clemente Dam (RM 18.6) and at Los Padres Dam (RM 24.8). Data for the past five years show that the run is hovering between about 100 to 400 returning adults counted annually at the San Clemente Dam fish ladder.

Adults are known to spawn in the lower 18.6 miles of the main stem and in sub-watersheds downstream of San Clemente Dam. This reach of the river has undergone significant improvement in the quality and quantity of spawning habitat over the past 20 years, but there is no direct way to measure this improvement in terms of returning adults. A complicating factor in monitoring progress toward achieving a numeric target for returns is the difficulty of counting or estimating the number of adult fish entering or leaving the system. Efforts are underway to obtain funding to install a Didson sonar camera to count fish at a location downstream of tributary inflows. In lieu of a target for adult returns to the lower 18 miles, objectives such as increasing habitat area, volume, or quality, or taking population counts of juveniles must be used for projects along the lower 18 miles of the river as surrogates for estimating the progress toward increasing the number of returning adults.

[Aquifer Storage and Recovery in the Seaside Groundwater Basin](#)

This project will directly improve the quality and quantity of habitat for of rearing habitat for steelhead by reducing the level of summer diversions from the Carmel River and allowing municipal demand to be supplied from the SGB. The first phase of the ASR Project has previously “banked” more than 1,000 AF in the Seaside Groundwater Basin. The second phase of ASR is expected to significantly increase the ability to store and recover up to 2,000 AFA.

[Lower Carmel River Floodplain Enhancement Project](#)

Restoration of 90 acres of riparian forest along the Carmel River near Highway 1 and reconnection of the floodplain to the 100-acre Carmel River lagoon on the west side of Highway 1 will result in one of the largest and most diverse assemblages of riparian forest, seasonal, and perennial wetland habitats along the Central Coast.

INTEGRATED ELEMENTS OF PROJECTS:

Environmental protection and habitat enhancement: Aquatic habitat, especially for steelhead and CRLF in the lower Carmel River projects will be enhanced by implementation of the Seaside Groundwater Basin Aquifer Storage and Removal Project. As described above, the ASR Project will meet a regional priority to develop replacement supplies and reduce diversions of Carmel River Basin flows. This will result in an increase in surface and groundwater flows to the Carmel River lagoon and the lowest portion of the Carmel River Alluvial Aquifer. Currently, there is no model that integrates surface water flows, groundwater levels, and water supply production for the Carmel River watershed, so it is difficult to predict quantitative effects (the first phase of such a model will be developed with a planned update to the IRWM Plan). Past experiences with floodplain restoration along the Carmel River show that riparian restoration areas that are closely connected to the groundwater table (i.e., within the root zone of riparian vegetation) may not need extensive irrigation systems and tend to mature vigorously (within three to five years), whereas projects that require extensive irrigation during the dry season may take more than 10 years develop mature vegetation. The ASR Project will allow the river to flow through the project area for a longer period and will shorten the time needed to refill the aquifer after it is depleted during the dry season. This will directly benefit the floodplain restoration work proposed in the Lower Carmel River Floodplain Protection and Enhancement Project. Additional flow in the lower Carmel River due to the ASR Project will also improve the effectiveness of the Ecosystem Protective Barrier proposed at the Carmel river Lagoon.

Monitoring, Assessment, and Performance Measures: The activities, objectives and goals of the Carmel River Watershed Volunteer Program are linked to three of the five Regional Priorities stated in the IRWM Plan approved in 2007: 3) mitigate effects of storm water runoff throughout the planning Region, 4) Address storm water discharges into Areas of Special Biological Significance, 5) promote the steelhead run. This project will provide water quality monitoring results from the Lower Carmel River Restoration Project elements and will be integrated with water quantity monitoring for the ASR Project in order to assess project performance for each project.

Regional Communication and Cooperation: Projects within the City of Monterey and Pacific Grove to address storm water discharges to ASBS are complementary and also require close cooperation between the two entities. This will be achieved through signed agreements for implementing the projects. Cooperation and coordination between the remaining projects (ASR, Lower Carmel River Restoration, Carmel River Watershed Volunteer Program) concerning the collection and analysis of data will improve project performance analysis. It is expected that this cooperation will be fostered by using the web portal system proposed as an update to the IRWM Plan for the Region. An outline for the web portal system is contained in the Prop. 84 Planning Grant Work Plan submitted to DWR in September 2010. Essentially, the proposed update will result in recommended formats for reporting data and will give web-based tools to users to upload and assess monitoring data generally (e.g., in State databases) and for specific projects in the Region.

Replacement and future water supplies: A primary objective for the ASR Project is to reduce impacts to sensitive aquatic species from diversions in the Carmel River. Both elements in this Proposal for restoration in the lower Carmel River build on this objective and serve to enhance aquatic species in the lower Carmel River.

Public education, outreach programs, and opportunities for watershed stewardship: Each project in the Carmel River watershed will benefit directly from the efforts of the Carmel River Watershed Volunteer Program. This is because an educated and engaged population is a prerequisite for achieving the overall goals of the IRWM Plan and each individual project in the Proposal. Responsible leadership by Region stakeholders is critical but insufficient to realize true, sustainable improvements in the Region's water supply reliability, water quality, overall environmental health and flood protection. Awareness on the part of the residents of the Region, and furthermore, individual action towards progress, are necessary complements to the wise

leadership of the Regional stakeholder organizations.

As stated, the anticipated changes on the Carmel River will also require the establishment of baseline monitoring results in water quality, flow and habitat. Only with these baseline levels clearly established will the benefits of lagoon enhancement and overdrafting corrections and future projects, such as dam removal, be measurable. An engaged public taking ownership of the watershed's health is a critical component of these large scale infrastructure changes.

PROPOSITION 84 IRWM PLAN UPDATE

DWR has proposed to provide funds to the Region to update the IRWM Plan to Prop. 84 standards. A detailed Work Plan was submitted with the Planning Grant application. The projects in this proposal appear to be consistent with the provisions in Prop. 84. However, there are areas of focus in the update that current project sponsors may be able to take advantage of while implementing projects. These include DAC involvement, monitoring and assessment protocols, regional communication and the IRWM effects of Global Climate change on the rate of ocean rise and change in weather patterns. The latter change could affect projects at or near the coast, but is still not well understood. If the region is awarded an Implementation Grant, MPWMD provide quarterly reports from Planning Grant updates to the project sponsors within the Region.

FOR DETAILED PROJECT WORK TASKS – SEE INDIVIDUAL PROJECTS

References

Carmel River Watershed Conservancy, Inc., 2004. Watershed Assessment and Action Plan for the Carmel River Watershed, California.

Carmel River Watershed Conservancy, 2007. Carmel River Watershed Assessment & Action Plan 2007 Action Plan Matrix.

http://www.carmelriverwatershed.org/Carmel_River_Action_Plan_Matrix_6.30.07.pdf

Monterey Peninsula Water Management District, 2004. Section 5.5.1.4 "Trend Analysis for Juvenile and Adult Steelhead," Environmental and Biological Assessment of Portions of the Carmel River Watershed, Monterey Peninsula Water Management District. See

http://www.mpwmd.dst.ca.us/programs/river/watershed_assessment/watershed_assessment.htm

Snider, W. 1983. Reconnaissance of the steelhead resource of the Carmel River drainage, Monterey County. California Department of Fish and Game, Environmental Services Branch, Administrative Report No. 83-3, 41 pp.

ATTACHMENT 3. WORK PLAN – LOWER CARMEL RIVER FLOODPLAIN PROTECTION AND ENHANCEMENT

INTRODUCTION

Project Goals and Objectives

Goal: The Lower Carmel River Floodplain Protection and Enhancement Project (Project) is a multi-objective project that combines flood protection, habitat enhancement and wildlife corridors, agricultural land protection, storm water retention, and public recreation on a 131-acre site in the lower Carmel River.

Objectives:

- A. Reduce flood flows in urban areas: County Services Area 50 (CSA-50) is a developed area located along the north side of the lower Carmel River and includes the highest number of repetitive loss properties in Monterey County. Of the 147 acres of developed land in CSA-50, approximately 105 acres flood during the 50-year flood event and all 147 acres flood during the 100-year event. The Project will lower the floodplain on the south side of the River and remove levees resulting in a reconnection of the historic floodplain to the river channel, which will allow for a flood regime that moves water away from the developed areas of the floodplain. Reductions from current flood elevations are estimated to be 0.5-1.0 feet during the 100-year storm. See Flood Elevation Projections Attachment.
- B. Increase riparian and wetland habitat: The Project will restore approximately 90 acres of riparian and wetland habitat on the historic floodplain, providing important habitat for sensitive species including steelhead trout, California red-legged frog, and western pond turtle, as well as six additional state species of concern. The project will provide inundation of the newly graded floodplain at the 10-year interval. The project will provide increased quantity and quality of breeding and/or foraging habitat for 27 avian species that have been identified by one or more bird conservation plans as species of concern.
- C. Recharge groundwater and base flows to the Carmel River: The Project will address one of the watershed's most critical environmental problems - very low or no flow in the Lower Carmel River and Lagoon in the dry season - by enabling recharge of groundwater on the restored floodplain. Groundwater monitoring wells established on the project site in 2009 documented that groundwater recharge from the Carmel River establishes a base level in the aquifer underlying the parcel at the Projects site and sedimentary interbedding on the floodplain provide additional storage for infiltration and recharge to the aquifer above this base level. Due to these conditions, opportunities exist on the parcel to enhance groundwater recharge.
- D. Provide habitat connection across the floodplain: The Project includes a flood conveyance causeway under Highway One which will reconnect the east side of the floodplain to the west side of the floodplain and providing a corridor for wildlife species utilizing these habitat areas.
- E. Protect Agricultural Land from Flooding: The Project will establish a permanent 36-acre organic farm out of the 100-year floodplain.
- F. Improve water quality: The Project will provide additional filtration for sediment and nutrients through the creation of a functioning floodplain and associated riparian habitat and wetlands, resulting in increased water quality in the surface and groundwater flows entering the Carmel River Lagoon, the Carmel Bay (state-designated Area of Special Biological Significance, Marine Protected Area, and Critical Coastal Area) and the Monterey Bay National Marine Sanctuary. The hydrologic dynamics of the lagoon drive the functioning of the ecosystem. The amount and quality of water in the lagoon determine the available habitat for significant species.¹
- G. Public Trails and Recreation: The Project will include a public trail along the southern edge of the farm field and will link to over 4,000 acres of public land (Palo Corona Regional Park) immediately adjacent to the project site. The Project will link the new restored riparian and wetland habitats via the flood conveyance causeway.

¹ Carmel River Lagoon Enhancement Project: Water Quality and Aquatic Wildlife Monitoring, 2005-6 Joy Larson, Fred Watson, PhD, Joel Casagrande, Brian Pierce.

Publication No.: WI-2006-06, 24 July 2006, The Watershed Institute, Division of Science and Environmental Policy, California State University Monterey Bay.

Purpose and Need

The Lower Carmel River Floodplain Restoration and Enhancement Project will be completed on the 131-acre historic floodplain located just upstream of the Carmel River Lagoon and east of Highway One on land known as the Odello fields (or “Odello East”). See Figures 1-5 and Photos 1-5 at the end of this narrative. The land is part of the historic floodplain along the Carmel River but has not been available for a typical flooding regime for over 75-years due to agricultural production on the land. Prior to the 1930s, earthen levees were built on the south side of the river by the farmer-landowner to constrain the river and the entire expanse of wetlands and riparian forest surrounding the Carmel River Lagoon and Odello East was put into agricultural production for artichokes. Downstream of the present day Highway One, the levee and agricultural production narrowed the riparian forest and wetlands on the south side of the river for nearly ½-mile at their widest to a narrow strip along the river. Upstream of Highway One, the riparian forest on the south side of the main stem was reduced from a maximum of about 1400 feet wide to a narrow strip.

The levees kept flood events out of the fields except during larger flows (10-year storms and larger), which spread onto the floodplain and caused damages to residential and commercial properties. The existing levees are not adequate to hold the 1% annual chance flood.² The construction of Highway One in the early 1930s further diminished the ecological condition of the entire coastal ecosystem by placing a physical barrier between the Carmel River Lagoon and the larger floodplain thereby preventing hydrologic connectivity across the floodplain. Highway One created a north-south barrier to flood flows as well, resulting in flood waters flowing to the north side of the river, which affects areas such as Mission Fields, the Crossroads Shopping Center and Rio Road/Val Verde Road. Today the lower Carmel River is confined by levees on both sides, beginning near the river’s mouth and running 1.2 miles upstream.³ Recent major floods include January and March 1995 events and the February 1998 event. These events resulted in approximately \$10,520,000 in damages in 2009 dollars.

The project focuses on restoring a more frequent flooding regimen to 90-acres of the Odello East property and provides a flood conveyance causeway to both reconnect the west and east sides of the floodplain hydrologically and for habitat connectivity and wildlife movement. The remaining 36 acres of the property will remain as an agricultural preserve to allow for public access, as well as an organic farming operation and native plant nursery. A public trail will be located along the southern edge of the agricultural preserve and will be maintained by the Big Sur Land Trust as part of the Carmel River Parkway. The overall environmental goal is to restore connectivity and natural ecological function to a critical section of the Carmel River watershed—the lower floodplain/estuary system.

The project is a second phase in a series of habitat conservation and restoration activities occurring in the lower floodplain and lagoon since the 1990s including the Carmel River Lagoon Riparian Restoration Project completed in 2000 and the Carmel River Lagoon South Arm Restoration Project completed in 2004. Both of these projects were completed by California State Parks in partnership with the State Department of Transportation and the Big Sur Land Trust. Partners in this phase of restoring the floodplain and associated riparian and wetland habitats include California State Parks, Coastal Conservancy, Monterey County Water Resources Agency, Monterey County Public Works, Monterey Peninsula Water Management District and the Big Sur Land Trust.

The following studies and plans have been completed for the Lower Carmel River to articulate the vision for restoring the area for fish and wildlife habitat as well as address flood issues.

- Philip Williams and Associates and California Coastal Conservancy, Carmel River Lagoon Enhancement Plan, 1992. Prepared for Carmel River Steelhead Association.
- Philip Williams and Associates and California Coastal Conservancy, Carmel River Lagoon: Enhancement and Management Plan: Conceptual Design Report, 1999. Prepared for Monterey Peninsula Regional Park District, Coastal Conservancy, and California State Parks.
- Philip Williams and Associates and California Coastal Conservancy, Carmel River Reach 2: (Eastwood/Big Sur Land trust Property): Conceptual Enhancement Plan, 2000. Prepared for Big Sur Land Trust and California Coastal Conservancy.
- Big Sur Land Trust, Carmel River Parkway Vision Plan, 2005.

² Monterey County Water Resources Agency. Monterey County Flood Management Plan, pp. 20. Update 2008. Prepared for Monterey County.

³ Balance Hydrologics, Inc., 2007. Design Alternatives Analysis for Floodplain Restoration at the Odello Property.

- Balance Hydrologics, Inc., Design Alternatives Analysis for Floodplain Restoration at the Odello Property, 2007. Prepared for Big Sur Land Trust.
- Balance Hydrologics Inc., Supplemental Analysis for Floodplain Restoration at the Odello Property, 2008. Prepared for Big Sur Land Trust.
- Monterey County Water Resources Agency. Monterey County Flood Management Plan, Update 2008. Prepared for Monterey County.
- Whitson Engineers, Project Study Report to request Conceptual Approval, 2009. Prepared for Big Sur Land Trust, County of Monterey and Cal Trans.
- Balance Hydrologics, Inc., Groundwater Investigation and Initial Results of Monitoring at the Odello East Property, Carmel River Valley, June 2, 2010.
- Nikki Nedeff, Wetland Delineation for Odello East Property, 2010. Prepared for the Big Sur Land Trust.

The Lower Carmel River Floodplain Restoration and Enhancement Project at Odello East property has been planned through a series of technical studies initiated in 1992 and continuing to the current project description included in this proposal. The initial studies conducted by Philip Williams & Associates⁴ developed preliminary restoration plans for the west and east sides of the Odello property.⁵ These projects were designed to provide improved habitat and flood conveyance along two miles of the lower Carmel River. The 2000 work identified a much larger flood conveyance causeway that was cost prohibitive at the time of the technical studies. Work on the east side restoration was delayed due to these costs.

California State Parks completed the restoration of the west side of the Odello property in 2004, restoring a 100-acre agricultural parcel adjacent to the existing lagoon back to riparian and wetlands species and expanding the lagoon to provide a summer rearing habitat and winter refuge for steelhead. The companion restoration plan for Odello East (or Carmel River Reach 2 in the report title) is the focus of the current project, involving levee removal and site grading to reconnect the active river channel with the floodplain, as well as the enhancement of riparian and wetland habitat over the entirety of the floodplain.

Work Completed to Date and Proposed Phase for Prop 84 IRWM Funding

Since 2005 the Big Sur Land Trust and its partners have updated technical studies for the project including updated design plans, HEC-RAS modeling to identify the size and location for the flood conveyance structure, groundwater monitoring, and a wetland delineation.⁶ This work was completed with the current update of the FEMA Carmel River Flood Insurance Study (2008) and incorporates design based on new flood levels from that study. Big Sur Land Trust and its partners have also completed a Project Study Report with Cal Trans on the flood conveyance causeway to be built at Highway One. The Project has received conceptual approval by Cal Trans as of November 1, 2010.⁷

The project is currently supported by \$7,500,000 in confirmed funding with \$500,000 in design and feasibility work completed through 35% plans since September 30, 2008. Due to funding timelines for existing grants secured for the project and for practicality to gain access back to farming the land, the project will be built in two phases.

⁴ Philip Williams and Associates and California Coastal Conservancy, Carmel River Lagoon Enhancement Plan, 1992. Prepared for Carmel River Steelhead Association.

⁵ Philip Williams & Associates, Carmel River Lagoon: Enhancement and Management Plan: Conceptual Design Report; and Philip Williams & Associates, 2000. Carmel River: Reach 2 (Eastwood/Big Sur Land Trust Property) Conceptual Enhancement Plan.

⁶ Balance Hydrologics, Inc., Design Alternatives Analysis for Floodplain Restoration at the Odello Property, 2007. Prepared for Big Sur Land Trust.

⁷ Whitson Engineers, Project Study Report to request Conceptual Approval, Signed November 1, 2010. Prepared for Big Sur Land Trust, County of Monterey and Cal Trans.

Phase One: Agricultural Preserve Creation and Fill Pad Creation

Phase One will include the grading and creation of the 36-acre agricultural preserve out of the 100-year floodplain and the public trail. This phase will provide the “fill” site for the grading “cut” portions resulting in Phase Two, thus saving significant funds in not hauling off material from the levee removal. CEQA will be completed for the Agricultural Preserve phase of the project by February 2011. **Phase One will be completed from May 2011 – October 2011 and is not proposed to be funded through IRWM funds.** Preliminary planting for restoration and invasive species control will occur in some sites of the Phase One final grades.

Phase Two: Flood Conveyance Structure, Levee Removal, and Continued Habitat Restoration

Phase Two of the project will include the construction of the flood conveyance causeway, removal of the south bank levees, regrading of the east edge of the Odello property, and continued restoration plantings. This Phase will occur in from July 2011 – December 2013 and involves completing 100% design and engineering for the causeway and levee removal, completing CEQA/NEPA for the flood conveyance causeway, and constructing the causeway and removing the levees to the fill areas created during Phase One.

Integrated Elements of Projects:

This Project is not dependent on other IRWM Plan projects, but will benefit from some of the projects in the Proposal. Please see the discussion concerning this in the overall Proposal Work Plan under Integrated Elements of Projects.

IRWM funds are being sought for a portion of the environmental review and a portion of the construction of Phase Two.

The Work Plan tasks proposed for IRWM funding include the following:

Task 1: Project management including administering grant funds, managing subconsultants, administering a project review committee and technical advisory committee, and reporting to the public at meetings.

Task 2: Earthwork and Grading including:

- Remove approximately one half to 1400 feet of levee along the south side of the Carmel River to allow flood flows to access the floodplain and restoration area.
- Regrading a levee on the east edge of the property to allow flood flows to access the floodplain on the south side of the River.
- Create a new south overbank channel for the Carmel River to utilize during flood events and creation of shallow wetlands areas for restoration of approximately 90 acres of historic floodplain to riparian and wetland habitat.

Task 3: Construction of the approximate 500-foot flood conveyance causeway in Highway One linking lands on the east side of the Highway with land on the west side of the Highway.

Task 4: Restoration activities will involve grading to restore the land to a more naturally functioning floodplain, along with some native seeding and planting.

As noted, approximately 36 acres of land will be graded and retained as active agricultural land restricted to organic farming under a lease by the Big Sur Land Trust. This 36-acre agricultural preserve will be raised approximately 3 feet above the restored floodplain/riparian area immediately to the north in Phase One. Several off channel seasonal wetlands will be constructed at the east edge of the project site to accommodate sediment deposition during large flood events. The remaining portion of the floodplain will be graded to historic elevations with the assumption that off channel wetlands will re-establish with annual flood events. Riparian and wetland plantings will be used to encourage scour and floodplain depressions so that small wetlands can re-establish with hydrologic function.

Task	Schedule
1. Project Management (part of IRWM Grant)	At Grant Award Date
2. CEQA for Ag Field Grading (not in IRWM grant)	Complete by February 2011
3. Grade for Ag Field, Farm Road (not in IRWM grant)	May 2011 – Dec 2011
4. 100% designs for Causeway (not in IRWM grant)	July 2011 – March 2012
5. CEQA/NEPA for Causeway (part of IRWMP grant)	July 2001 – March 2012
6. Permitting (part of IRWM grant)	February 2011 – July 2011
7. Pre-project monitoring (not in IRWM grant)	January 2011 – March 2011
8. Causeway Construction and Habitat Restoration (part of IRWM Grant)	May 2012 – January 2013
9. Plantings and Invasives Control (part of IRWM Grant)	February 2013 – October 2013
10. Post-Project Monitoring (part of IRWM Grant)	February 2013 – December 2013

Required Permits

The proposed project will be subject to numerous federal, state, and local permits. BSLT will consult with the involved regulatory agencies and prepare permit applications and supporting documentation for review and approval. The following permits are anticipated to be needed for the project:

- U.S. Army Corps of Engineers, Clean Water Act Section 404 Permit
- National Marine Fisheries Service, Endangered Species Act (ESA) Section 7 Consultation
- USFWS ESA Section 7 Consultation
- California Department of Fish and Game, Streambed Alteration Agreement (1600 permit), and California Endangered Species Act Section 2081 Approval
- Central Coast Regional Water Quality Control Board, Clean Water Act Section 401 water quality permit
- California Coastal Commission, Coastal Development Permit
- County of Monterey
 - Land Use Approval (grading permit and possibly tree removal permit)
 - Federal Emergency Management Agency (FEMA) Floodplain Conditional Letter of Map Revision (CLOMR)
- Monterey Peninsula Water Management District, Carmel River Permit

Related Plans and Actions

There are several ongoing efforts to protect and preserve coastal habitats along the Carmel coast and lower Carmel River. These are summarized in the table below. The second table summarizes the natural resource plans that address the project area or affected coastal resources.

Current Coastal Acquisition, Restoration, Enhancement, and Management Actions

Related Action	Primary agency(ies) Involved	Relationship to Project
Carmel River Parkway Acquisitions	BSLT, Monterey Peninsula Regional Park District (MPRPD)	BSLT is pursuing a comprehensive program to acquire fee title or easements to property along the Carmel River in order to implement the vision for a Carmel River Parkway. These efforts will provide additional habitat for species using the project area. These efforts will also enhance public access to the area and create enhanced opportunities for interpretation of the Odello East project.

Related Action	Primary agency(ies) Involved	Relationship to Project
Regional water supply efforts	California American Water, State Water Resources Control Board	California American Water (CalAm), the water provider to the Monterey Peninsula, is under order from the State Water Resources Control Board (SWRCB) to stop withdrawing water from the Carmel River in excess of their water right. CalAm is developing an alternative source of water supply which will allow it to reduce its water withdrawals from the Carmel River by approximately 75%. Reducing CalAm's water withdrawals from the river will significantly improve aquatic and riparian habitat conditions, particularly for the anadromous steelhead.
Carmel River Lagoon management	California State Parks	In 2004, CSP completed a restoration project for the Carmel River Lagoon. CSP is undertaking ongoing management of the property in order to sustain and enhance the conservation value of the coastal wetland. The proposed project will provide additional connectivity to the CSP site. In addition, the Floodplain Restoration Project is a necessary precursor to the Highway 1 Conveyance project which would significantly improve scour of the south arm of the lagoon, and thus promote its sustainability.
MPWMD River Management	Monterey Peninsula Water Management District (MPWMD)	MPWMD has an ongoing program to assess and reduce the impacts of water withdrawals on the river. Their efforts include protection and restoration of the riparian corridor, protection of steelhead trout, and periodic bird use monitoring. The proposed project is consistent with MPWMD's river management program, and MPWMD staff will provide technical review and oversight for the Floodplain Restoration Project.

Comprehensive Natural Resource Plans for the Area

Natural Resource Plan	Description of the Plan	Relationship to project
California State Coastal Conservancy Strategic Plan (2007)	Describes Conservancy's current and historic resources allocation, public needs served, guiding policies and principles, and the intended and recommended future course.	Project is consistent with objectives to: 1) protect 25,400 acres of significant coastal and watershed resource properties; 2) restore and enhance biological diversity in coastal watersheds... including coastal wetlands... [and] stream corridors; and 3) preserve and restore coastal watersheds and create river parkways.
California Ocean Protection Council Strategic Plan (2006)	Identifies goals, objectives, and sets priority actions for the next several years.	Plan identifies restoration of riparian corridors as a priority action for restoring coastal and ocean ecosystems.

Natural Resource Plan	Description of the Plan	Relationship to project
Federal Recovery Outline for the Distinct Population Segment of South-Central California Coast Steelhead (2007)	Provides biological assessment and summary of threats for the DPS SCCC of steelhead. Provides interim guidance on recovery actions until final recovery plan is adopted.	Identifies the Carmel River as one of best systems in the region for potential recovery of steelhead. Project would further goals to restore natural hydrologic functions and restore riparian habitat.
The Monterey Peninsula, Carmel Bay and South Monterey Bay Integrated Regional Water Management Plan (IRWMP) (2007)	Collaborative effort of 34 public, private, and non-profit entities to facilitate coordination among organizations and set regional priorities for water management projects in the region. Priorities are goals associated with water supply, water quality, flood protection, environmental protection and enhancement, and regional communication and cooperation. The plan identifies specific objectives for each of the five overarching goals, as well as specific regional priorities identified by stakeholders.	The Odello East Floodplain Restoration Project was rated as the number one priority project for the region based on a set of criteria that included: 1) satisfaction of regional objectives and water management strategies; 2) alignment with regional priorities; and 3) technical feasibility and readiness to proceed.
Carmel River Parkway Vision Plan (2005)	BSLT completed the plan in 2005 with input from over 250 community members. The plan includes a vision for public trails, floodplain restoration, and public education via interpretation along the parkway corridor. The plan calls for restoring 264 acres of floodplain habitat.	The Parkway Plan recommends restoration of the floodplain at Odello East, including removal of the blister. The plan also recommends the Highway 1 Conveyance project to enhance the hydrologic connection and wildlife movement, and to reduce flooding north of the river.
Carmel River Watershed Assessment and Action Plan (2004)	In 2004, the Carmel River Watershed Conservancy prepared an assessment of the river based on available historic and current data, and limited field work. The action plan recommends key management measures and critical areas needing restoration work. In 2006, the CRWC revised and prioritized the recommended actions.	The Floodplain Restoration Project addresses several of the high priority actions identified in the CRWC plan including acquiring land to improve natural habitat and functions; reducing flood risk through multi-objectives projects including floodplain restoration; expand riparian restoration efforts; and implement the Carmel River Parkway.
The Water Quality Control Plan for the Central Coastal Basin (Basin Plan) (2005)	Adopted by the Central Coast Regional Water Quality Control Board, the Basin Plan designates beneficial use objectives for the Carmel River.	The proposed project will enhance several of the beneficial uses designated for the project area, in particular those related to support of aquatic and riparian habitat.
Carmel Area Land Use Plan (1999)	Monterey County's adopted Local Coastal Program (LCP) for the portion of the county in which the proposed project would be located.	Project will further LCP goals to 1) protect, enhance and restore wetland and riparian habitat; and 2) manage the floodplain in the lower Carmel River valley to preserve the river's natural values while providing flood protection.

Natural Resource Plan	Description of the Plan	Relationship to project
California's Wildlife Action Plan (2007)	A comprehensive wildlife conservation strategy for California that includes regional specific conservation actions necessary to restore and conserve ecosystems and wildlife populations. This proposal is in the Central Coast Region.	Project would further the plan's goal to protect and restore regionally significant river systems, including the Carmel River, and would specifically meet objectives to maintain a functional connection between river and floodplain, preserve riparian habitat, maintain sediment transfer capacity, and improve water quality. It is also consistent with the identified priority to protect and restore CRLF habitat.
California Water Plan Update (2009)	Provides a framework for water managers, legislators, and the public to consider options and make decisions regarding California's water future.	The plan calls for re-establishing contiguous natural riparian and floodplain habitat and its hydrologic connectivity between rivers/streams and their historical floodplains. The proposed project is also consistent with the goal to promote integrated flood management, in part through enhancement of floodplain ecosystems.

Maps and Photographs

- Figure 1: Project Location along Central Coast of California
- Figure 2: Project Vicinity Map
- Figure 3: Project Site – Property Boundaries and Agricultural Preserve
- Figure 4: Conceptual Project Plan
- Figure 5: Parcel Map of Project Site

- Photo 1: Aerial Photo of Project Vicinity
- Photo 2: Odello East Field Below Palo Corona Regional Park
- Photo 3: Odello East, looking west towards ocean
- Photo 4: Lower Carmel River in 1949
- Photo 5: South Arm of Carmel River Lagoon, immediately after restoration.

Figure 1: Project Location along Central Coast of California



Figure 2: Project Vicinity Map

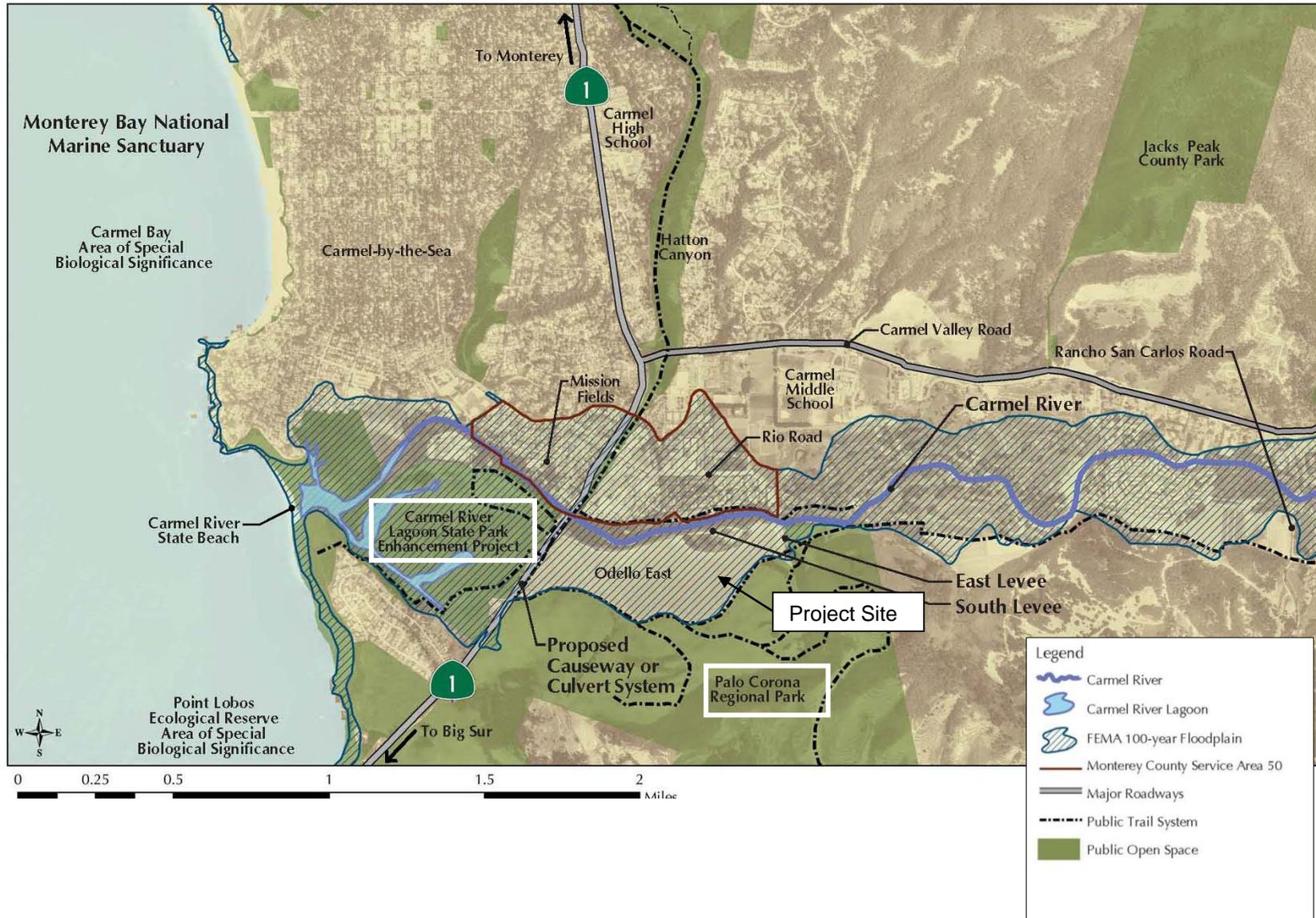


Figure 3: Project Site



- Property boundary
- Agricultural Preserve area

Note: Everything within the project boundary (outer blue line) that is *not* highlighted orange, is part of the 90-acre restoration area.

Figure 4: Conceptual Project Plan

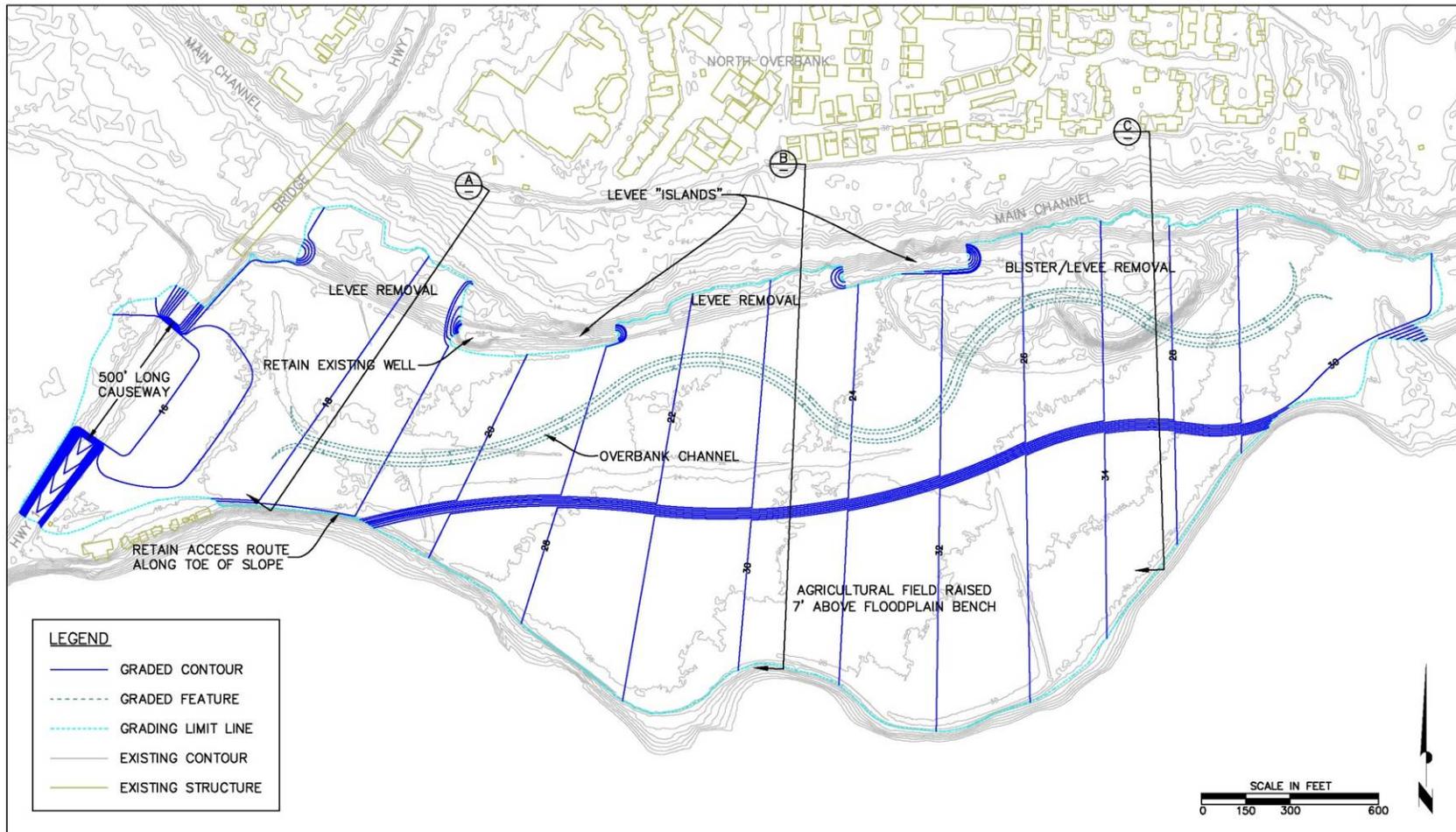


Figure 3. Conceptual floodplain restoration plan, Odello Property, lower Carmel River

Figure 5: Parcel Map of Project Site

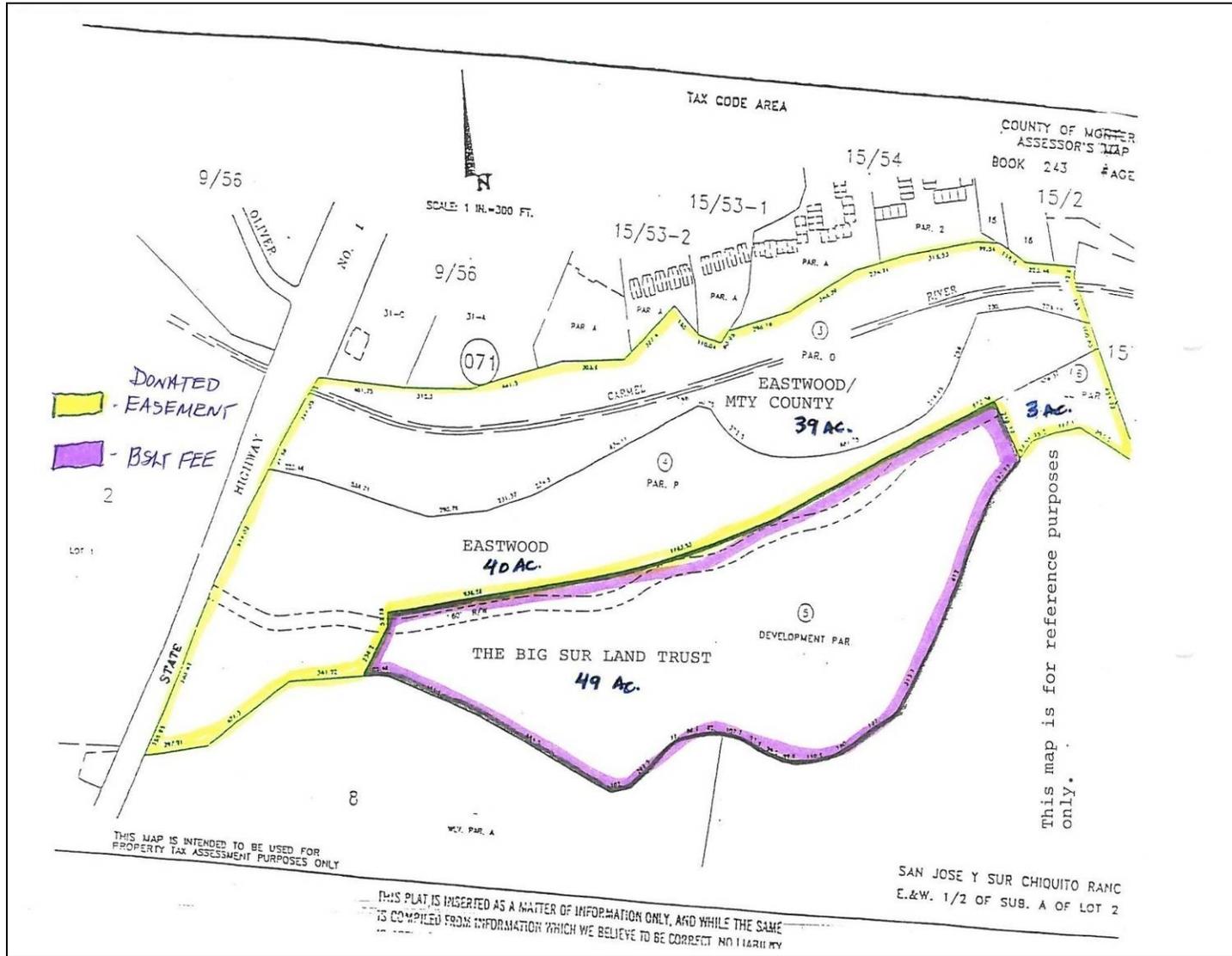


Photo 1: Aerial Photo of Project Vicinity



Photo 2: Odello East Field Below Palo Corona Regional Park



Photo 3: Odello East, looking west towards ocean



Photo 4: Lower Carmel River in 1949, note lack of floodplain habitat.



Photo 5: South Arm of Carmel River Lagoon, immediately after restoration.



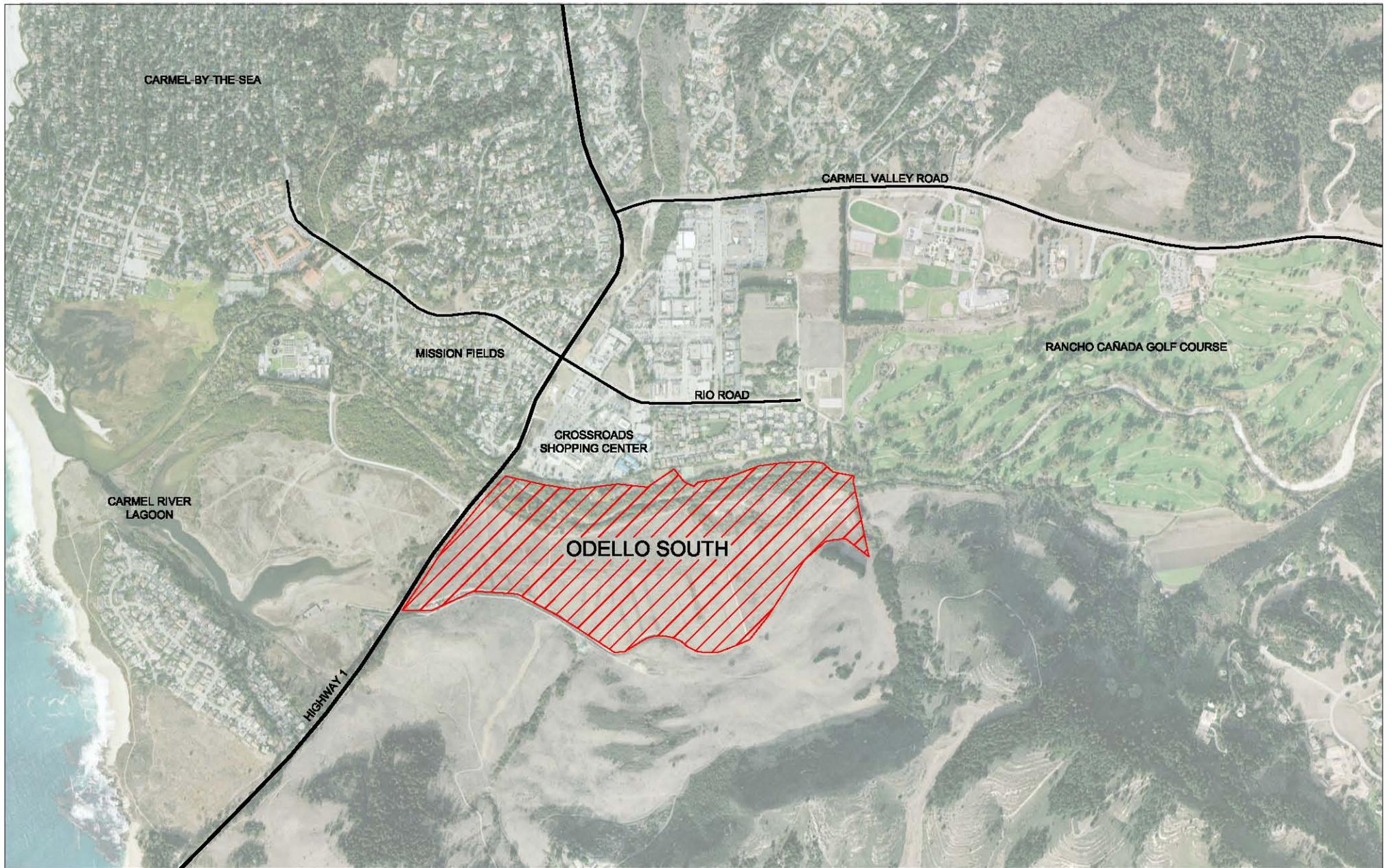


Figure 1. Location map, Odello South property, County of Monterey

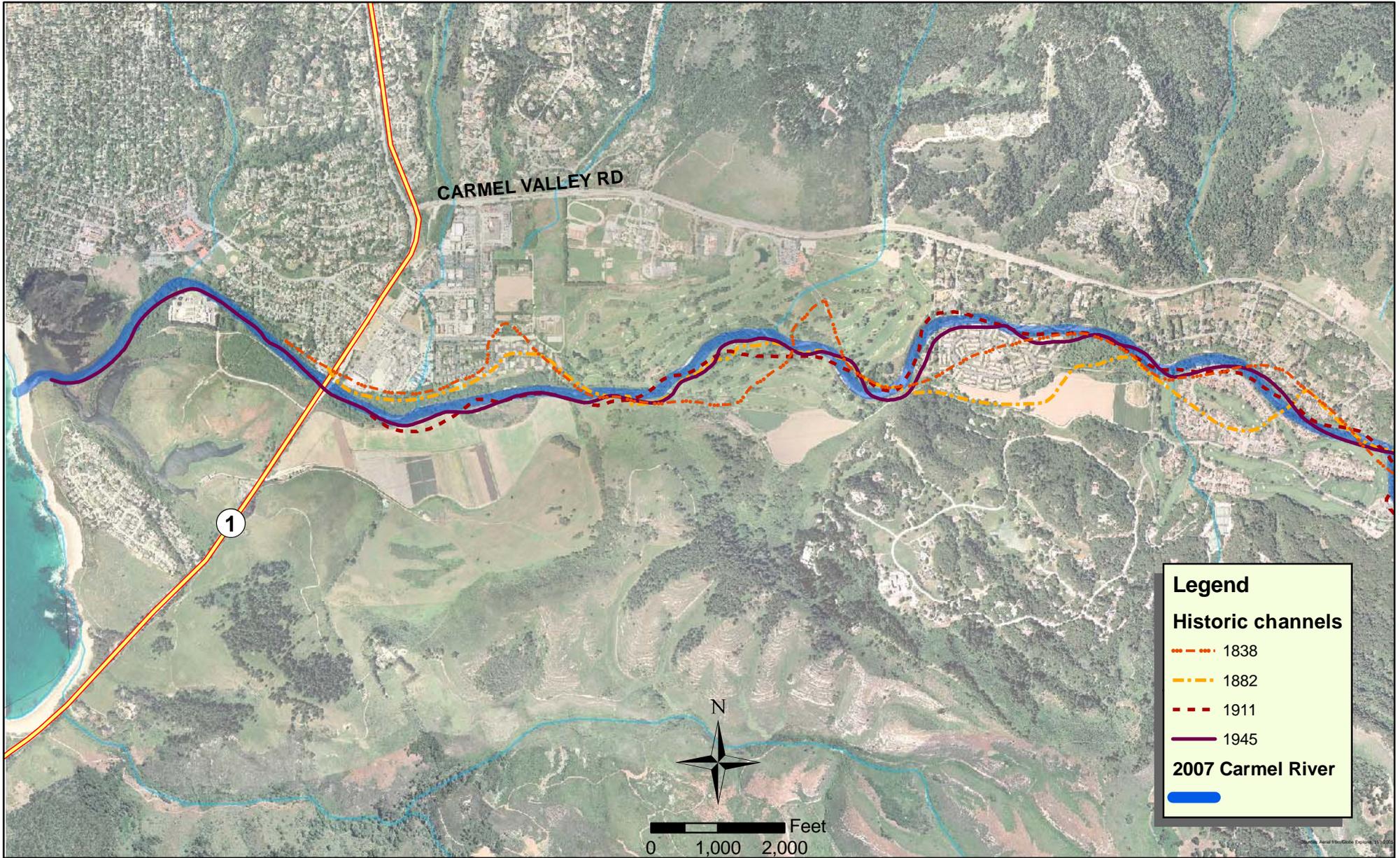


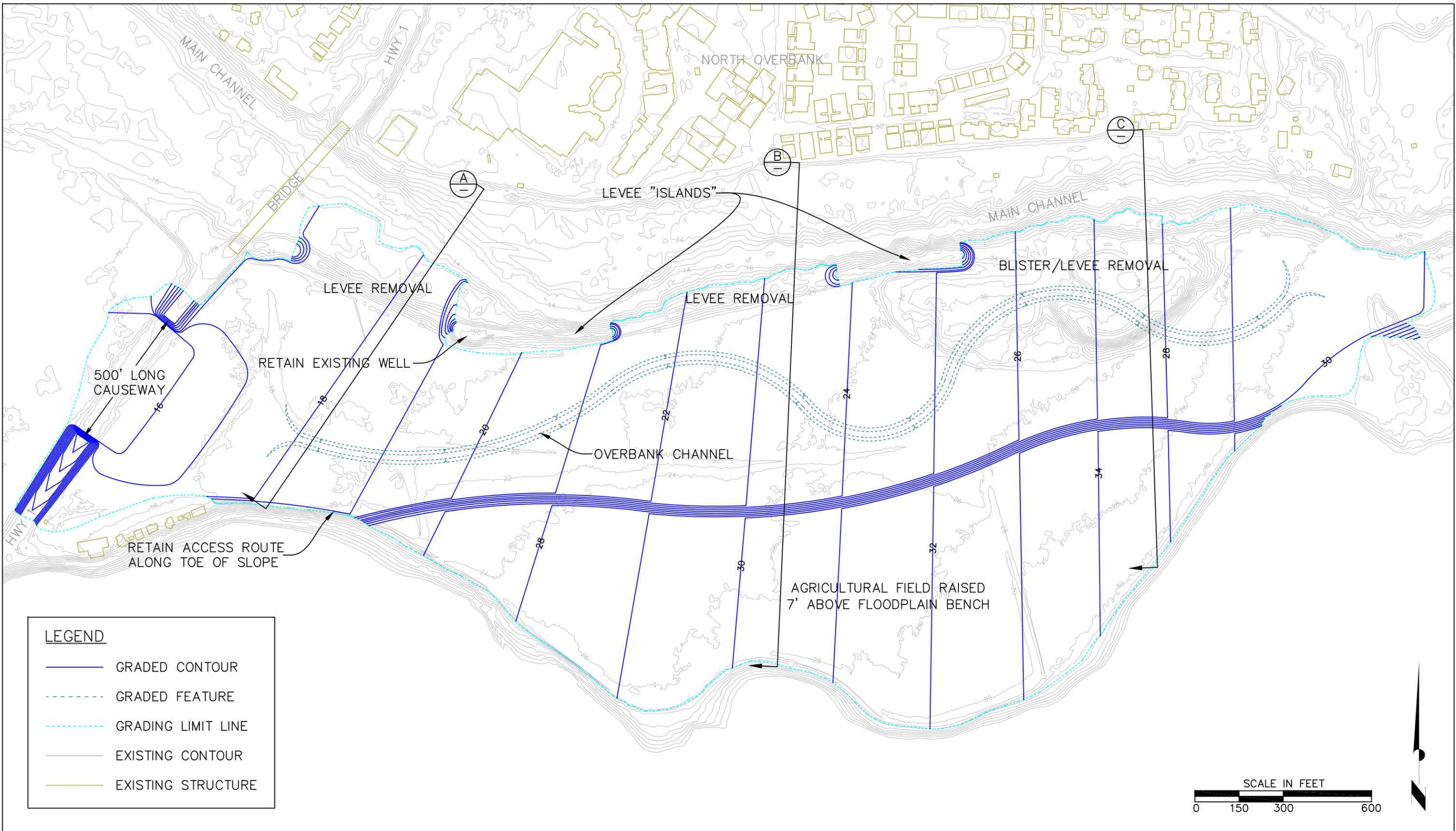
Figure 2. Former and present alignments of the Carmel River from Carmel Bay upstream to Valley Greens Drive

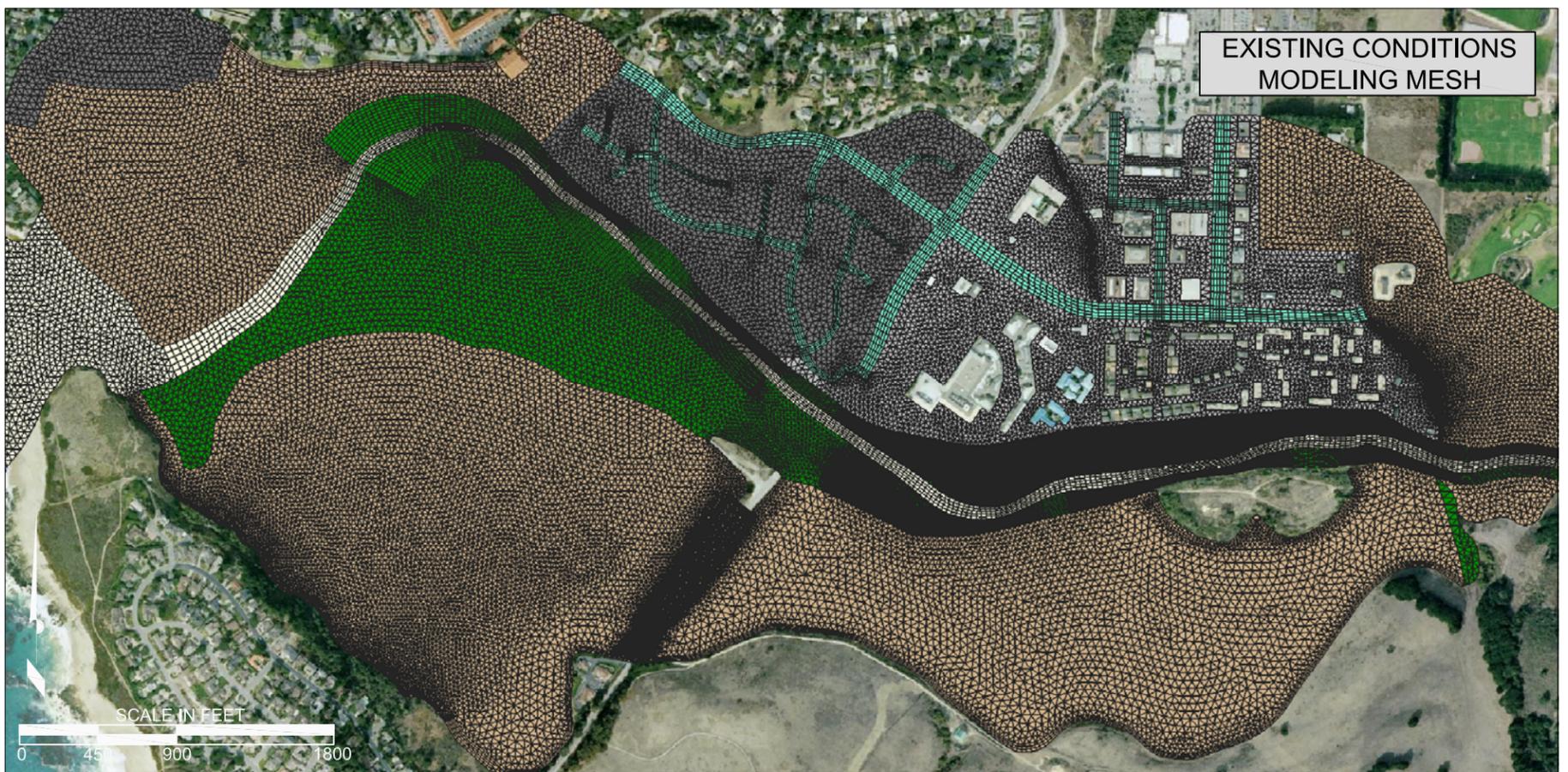
2007 alignment is the widest line (does not represent river width).
 Locations of previous alignments are approximate due to source materials (especially those of 1838 and 1882).
 Source Data: Kondolf 1982.



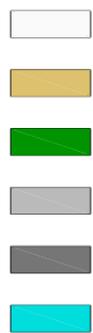
Balance Hydrologics, Inc.

206166 historic channel alignments.mxd





MATERIALS

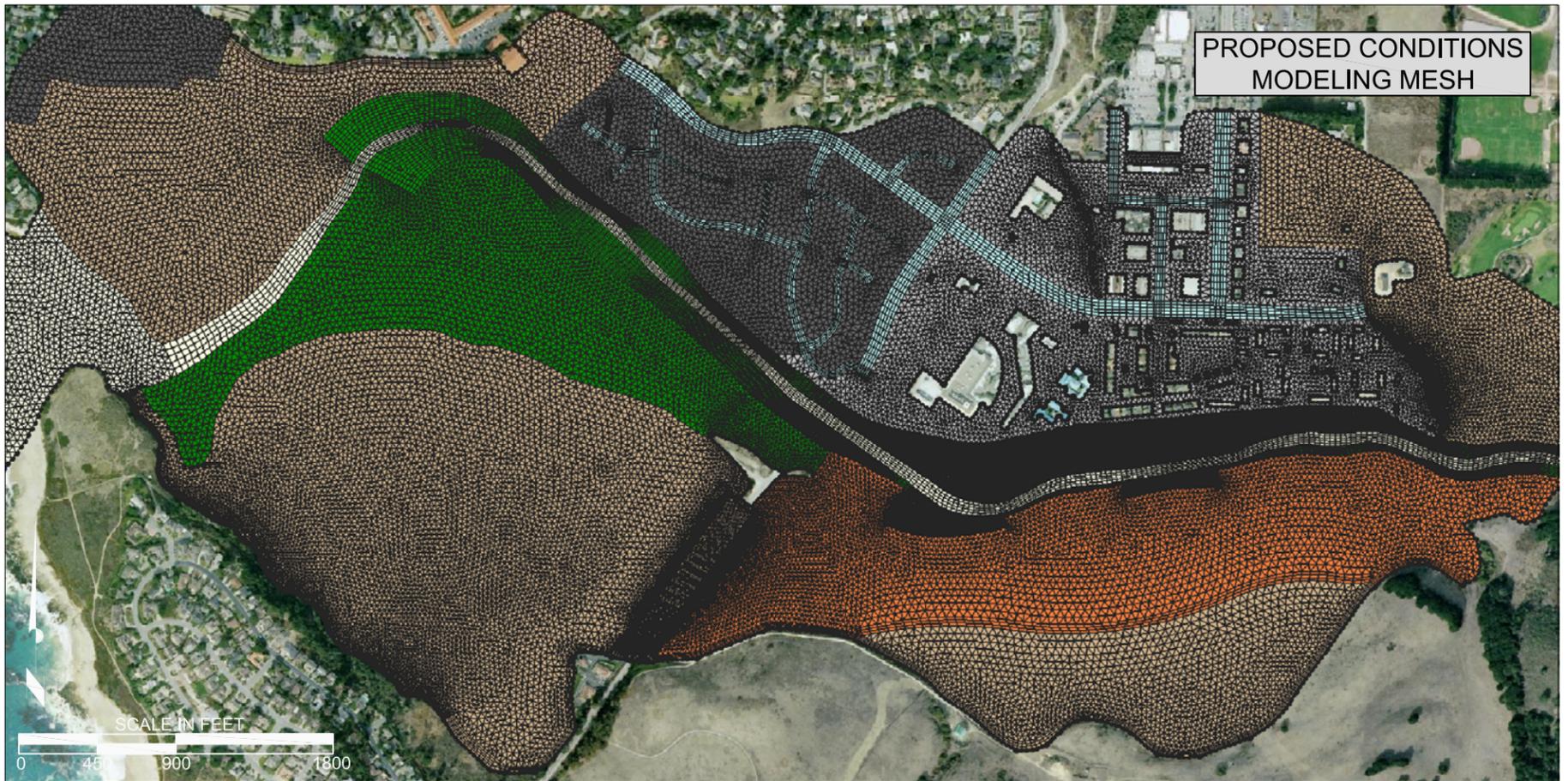


CHANNEL
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RESIDENTIAL
ROADWAY

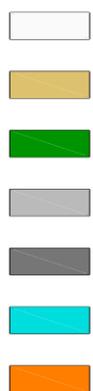
MANNING'S 'n'

0.03
0.05
0.10
0.10
0.20
0.03

MODELING ELEMENTS: 64,641
MODELING NODES: 147,787
100-YEAR FLOW: 29,100 cfs
10-YEAR FLOW: 11,000 cfs
100-YEAR TAILWATER: 10 feet
10-YEAR TAILWATER: 7 feet



MATERIALS

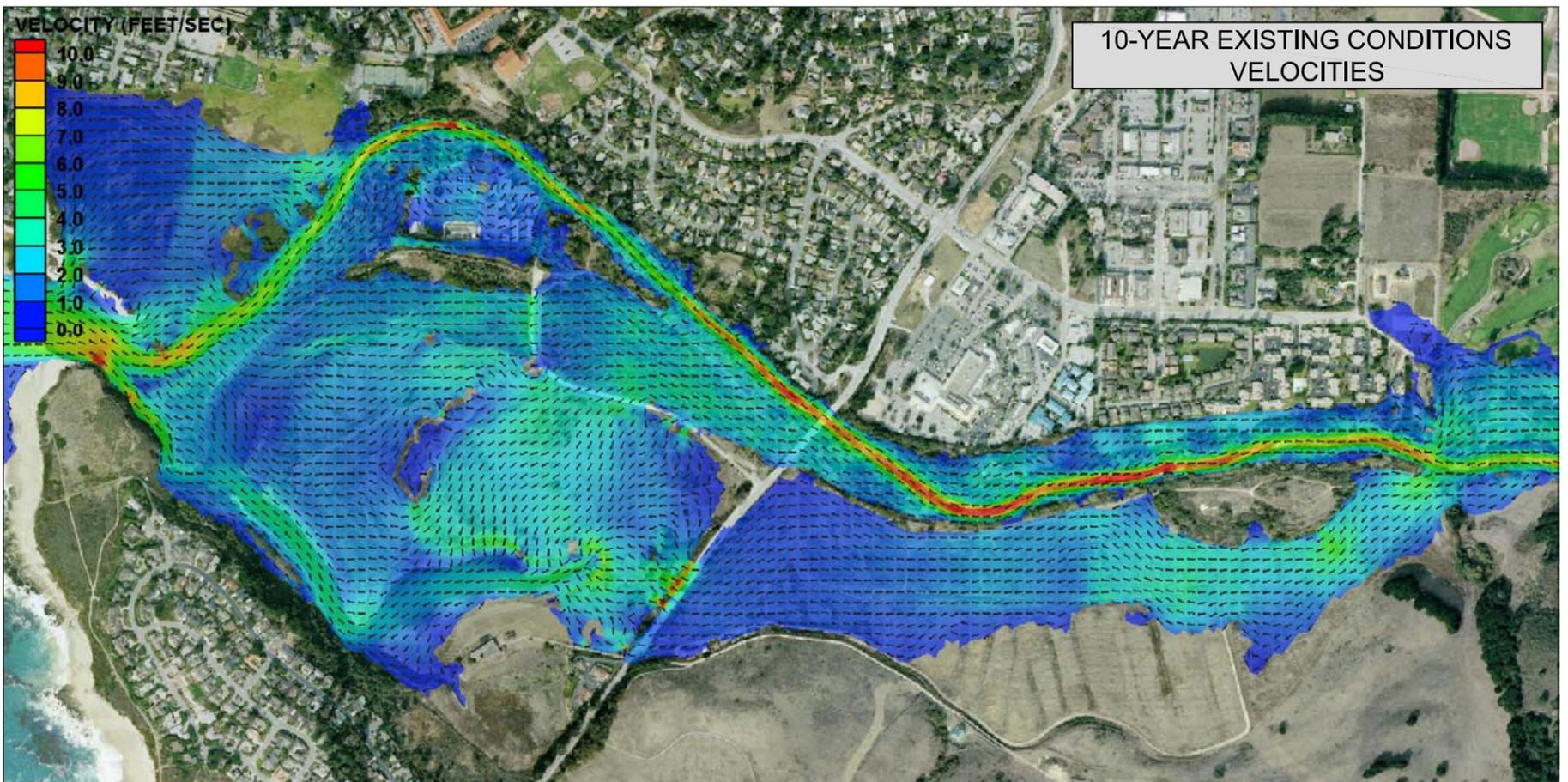
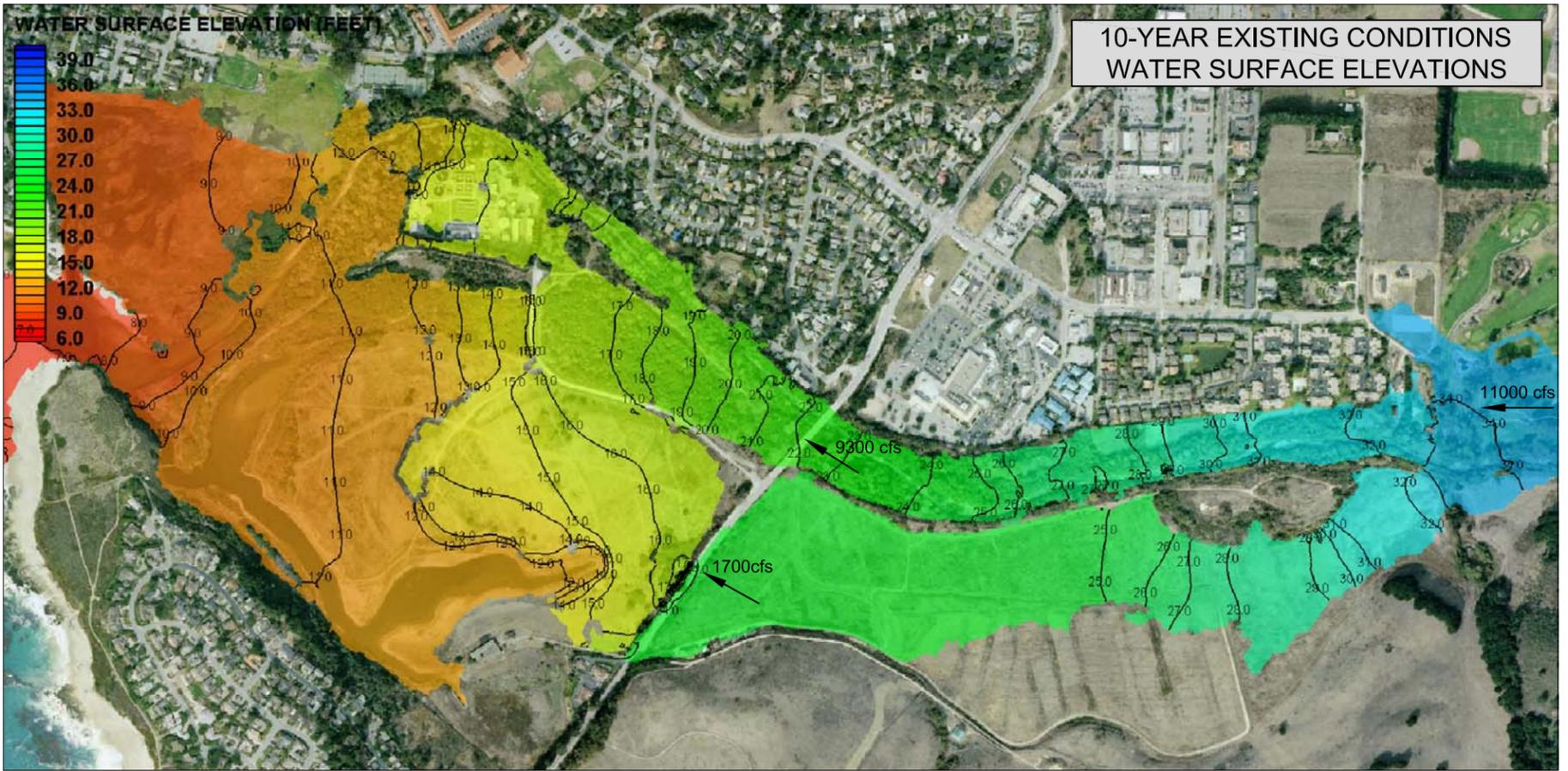


CHANNEL
FLOODPLAIN
RIPARIAN
COMMERCIAL
RESIDENTIAL
ROADWAY
RESTORATION

MANNING'S 'n'

0.03
0.05
0.10
0.10
0.20
0.03
0.08

MODELING ELEMENTS: 68,730
MODELING NODES: 155,077
100-YEAR FLOW: 29,100 cfs
10-YEAR FLOW: 11,000 cfs
100-YEAR TAILWATER: 10 feet
10-YEAR TAILWATER: 7 feet



5

FIGURE

JOB NUMBER
206116

ODELLO PROPERTY, CARMEL RIVER
**HYDRAULIC MODELING RESULTS
10-YEAR EXISTING CONDITIONS**
COUNTY OF MONTEREY, CALIFORNIA

DATE

02-15-2008

DRAWN BY

ER

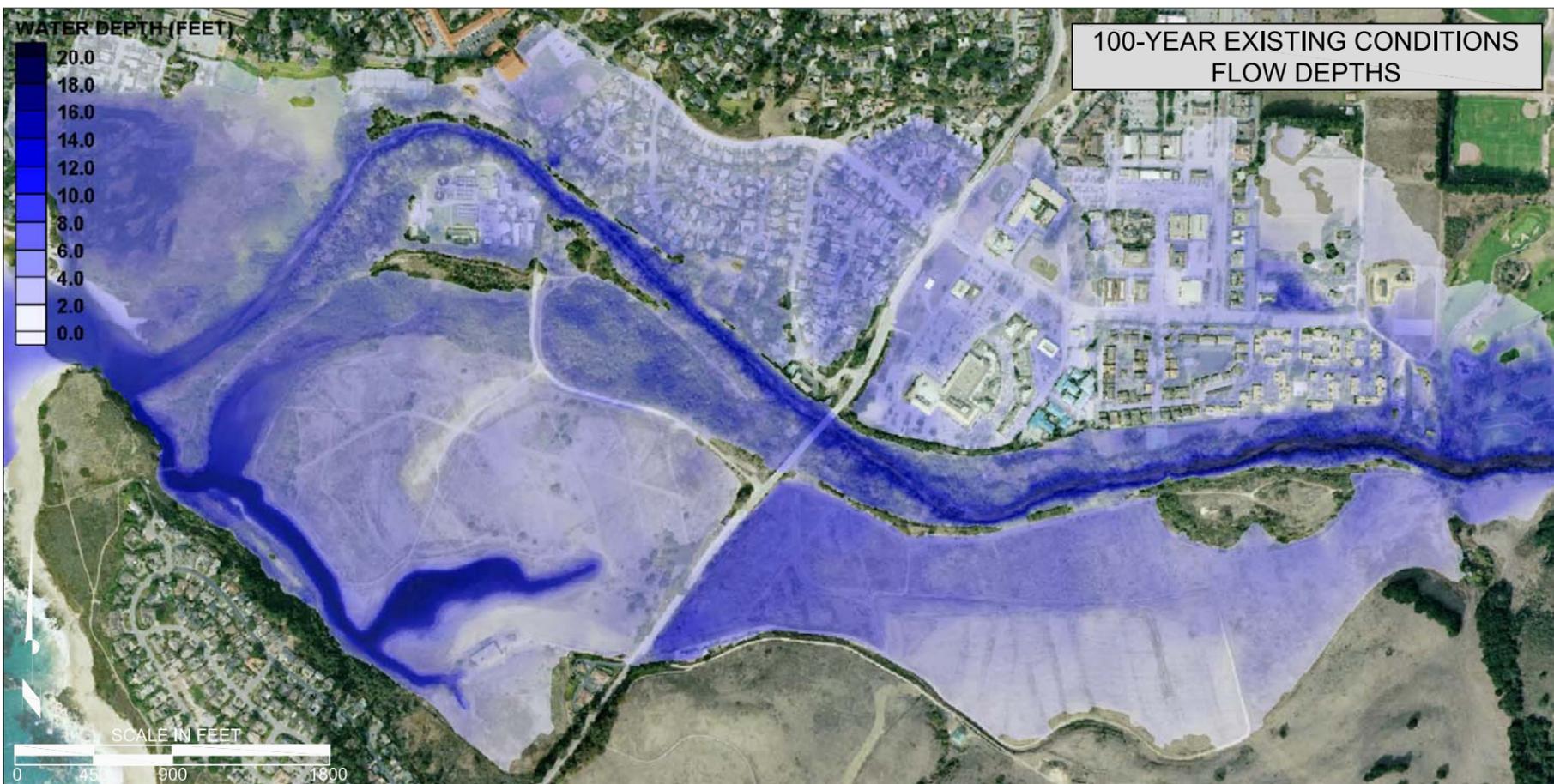
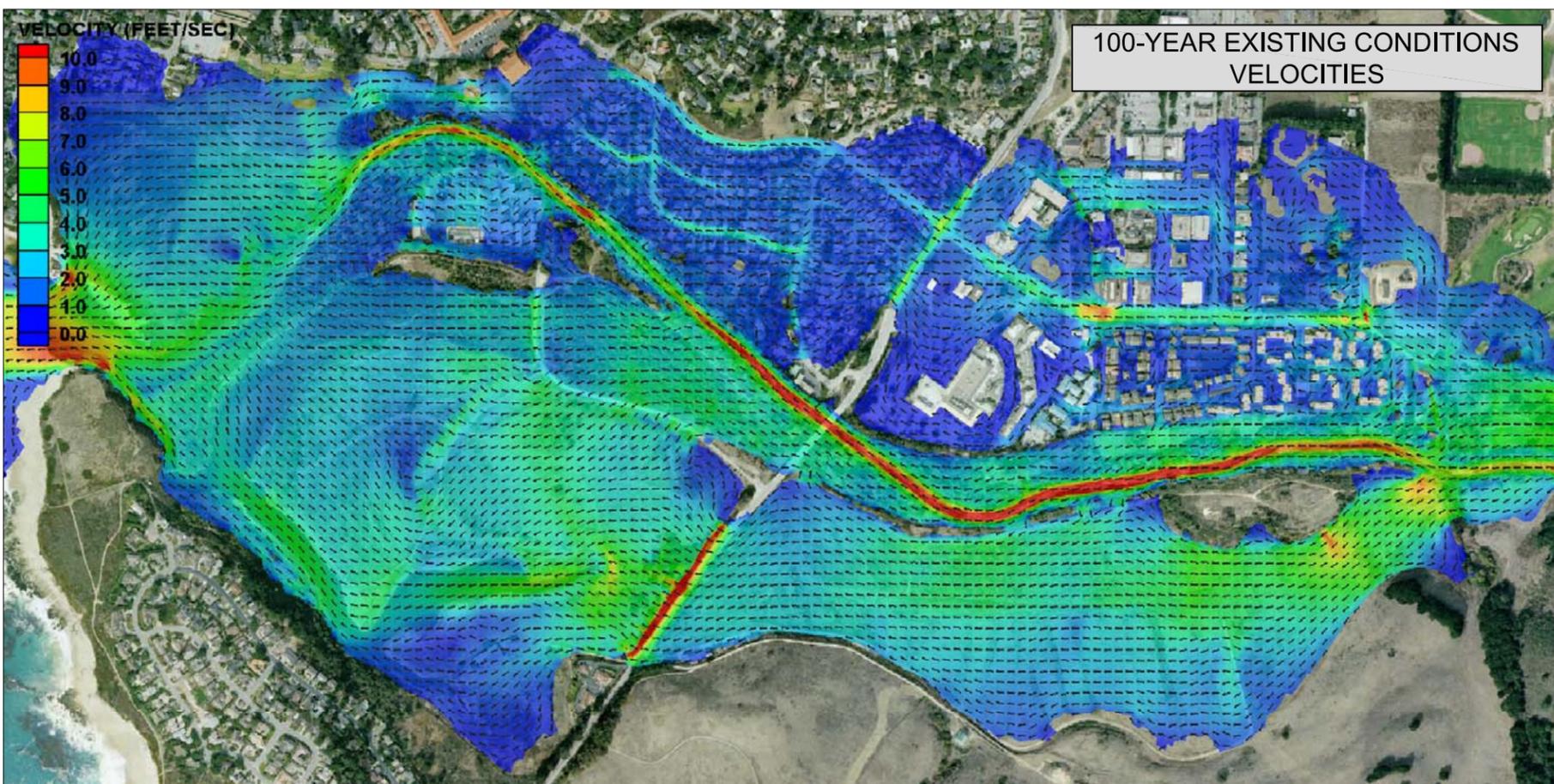
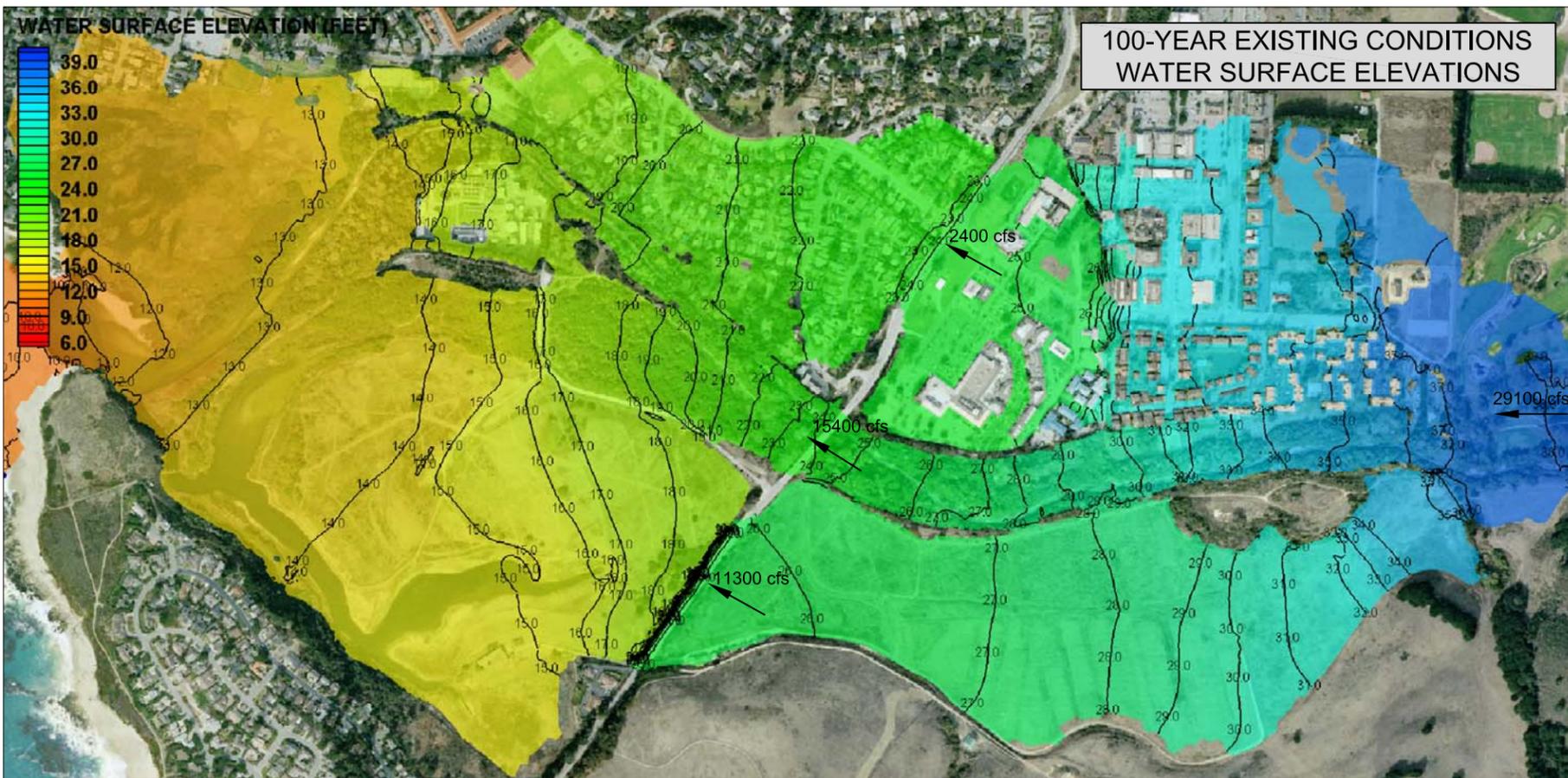
PROJ MGR

EB



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6

FIGURE

JOB NUMBER
206116

ODELLO PROPERTY, CARMEL RIVER
HYDRAULIC MODELING RESULTS
100-YEAR EXISTING CONDITIONS
COUNTY OF MONTEREY, CALIFORNIA

DATE
02-15-2008

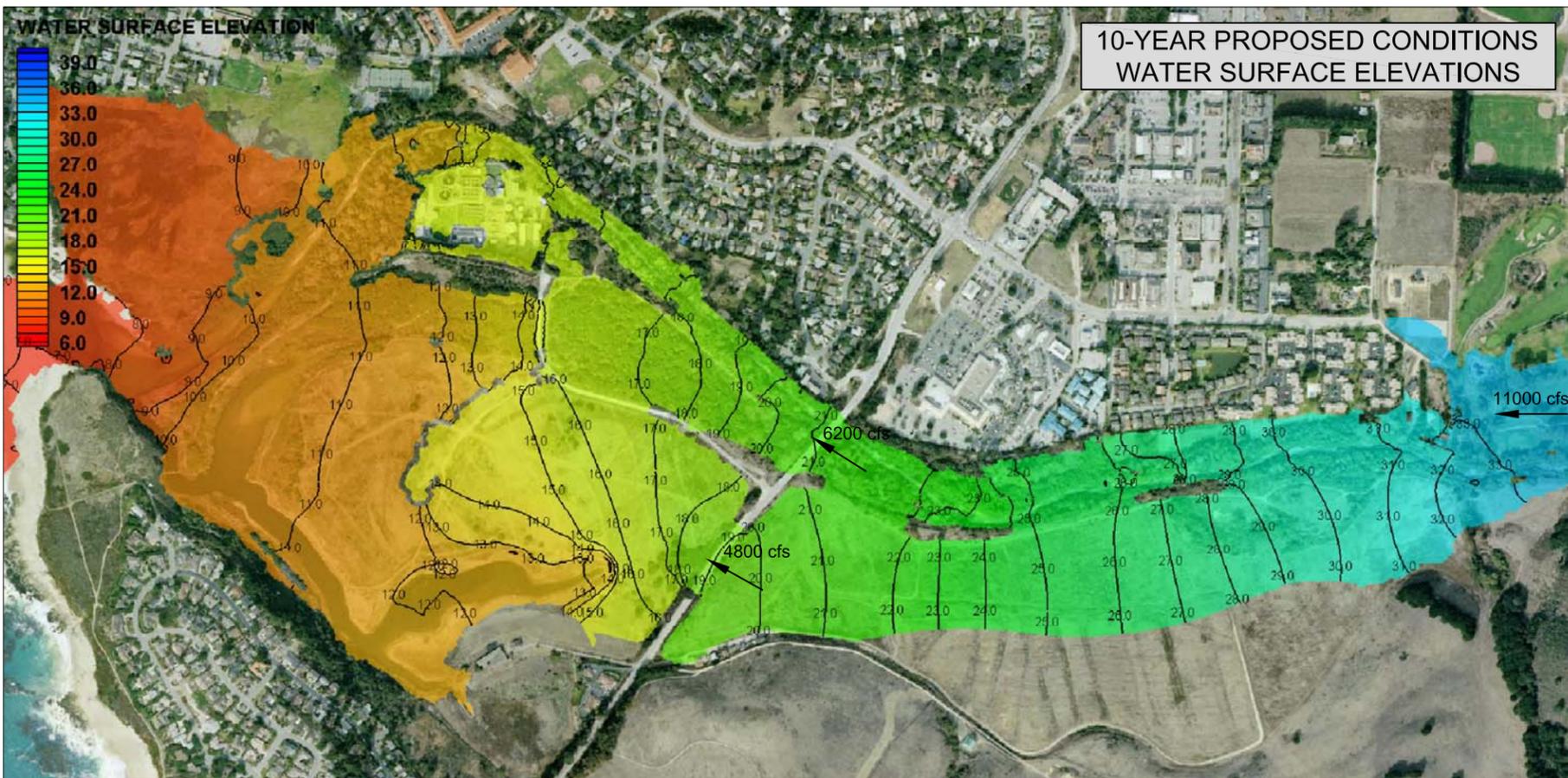
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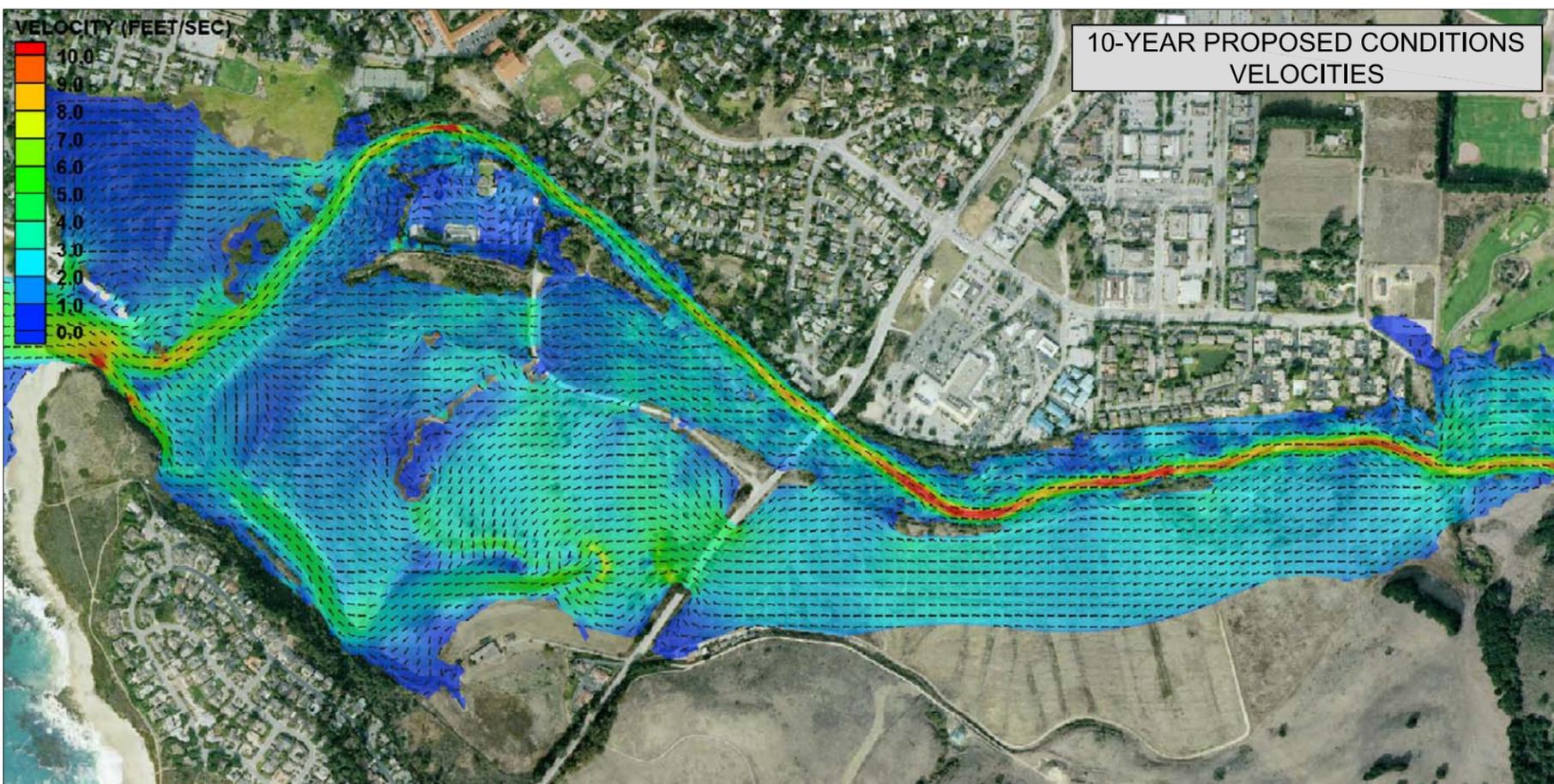


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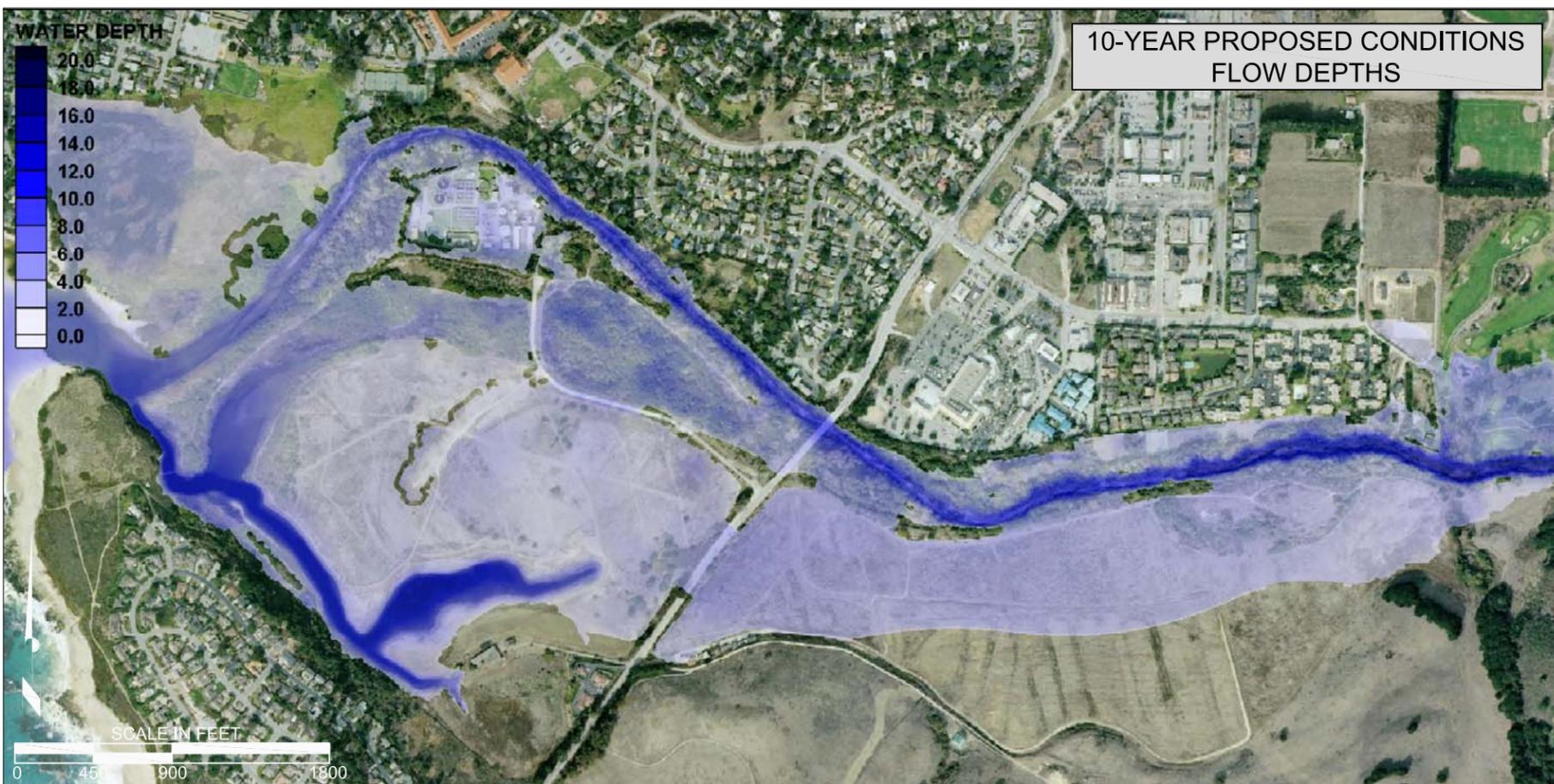
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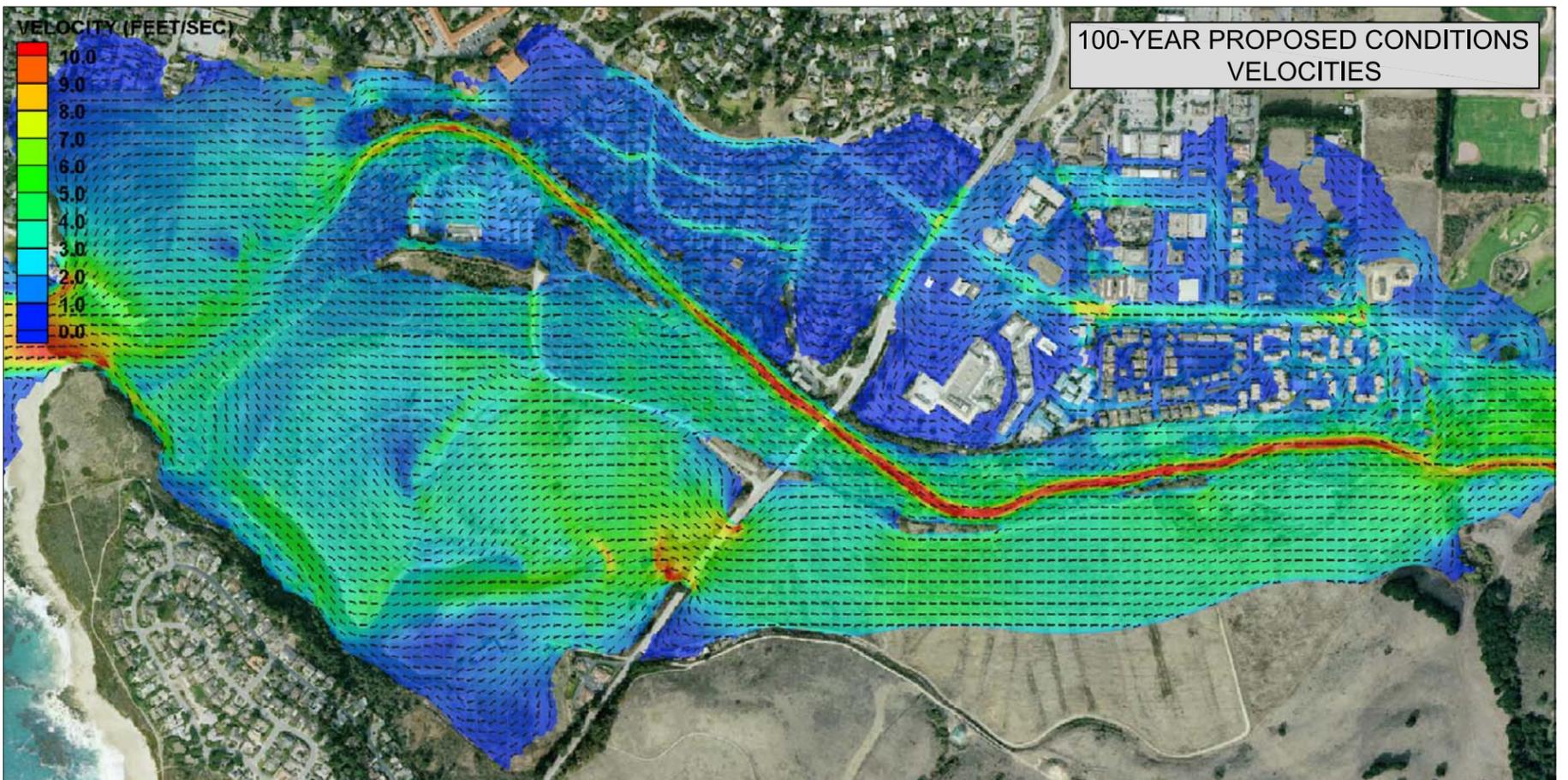
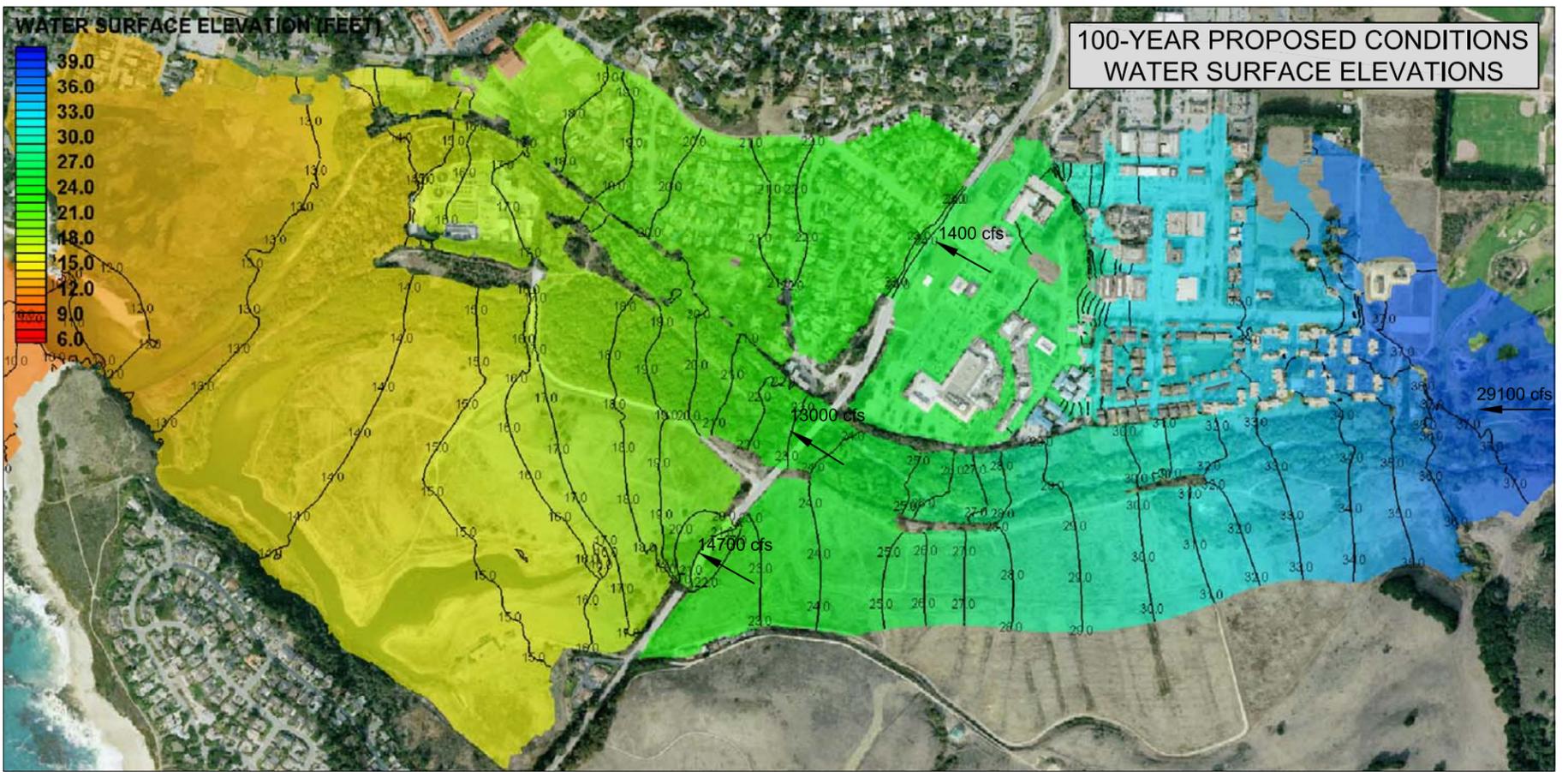
10-YEAR PROPOSED CONDITIONS
WATER SURFACE ELEVATIONS



10-YEAR PROPOSED CONDITIONS
VELOCITIES



10-YEAR PROPOSED CONDITIONS
FLOW DEPTHS



8

FIGURE

JOB NUMBER
206116

ODELLO PROPERTY, CARMEL RIVER
HYDRAULIC MODELING RESULTS
100-YEAR PROPOSED CONDITIONS
COUNTY OF MONTEREY, CALIFORNIA

DATE
02-15-2008

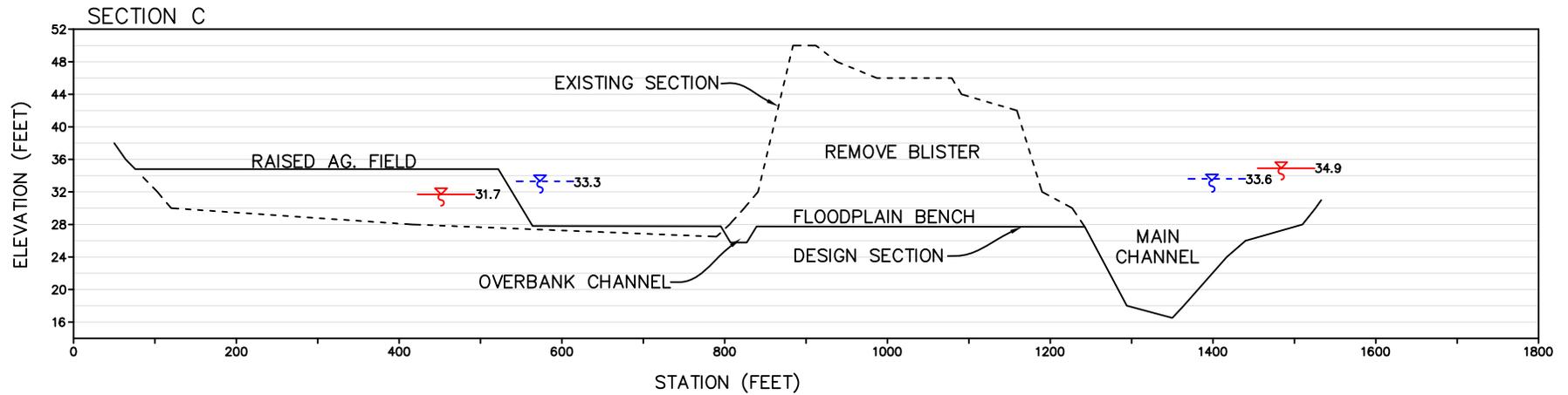
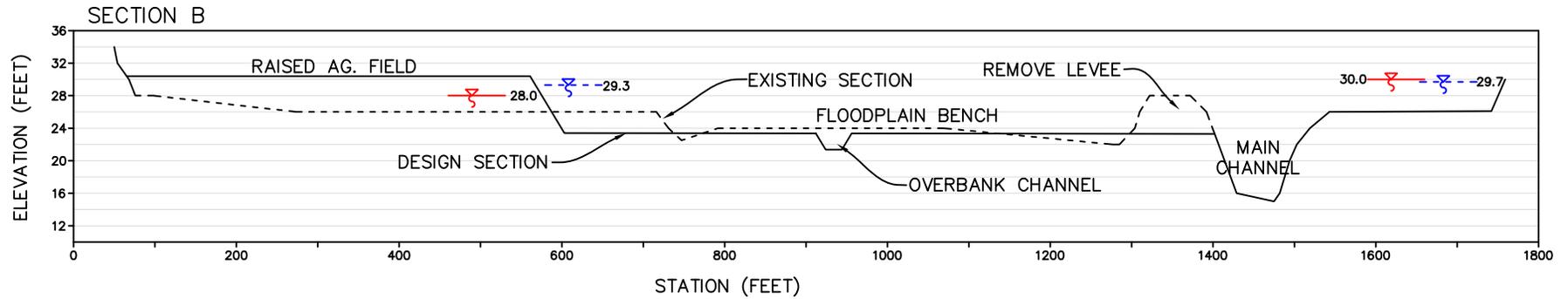
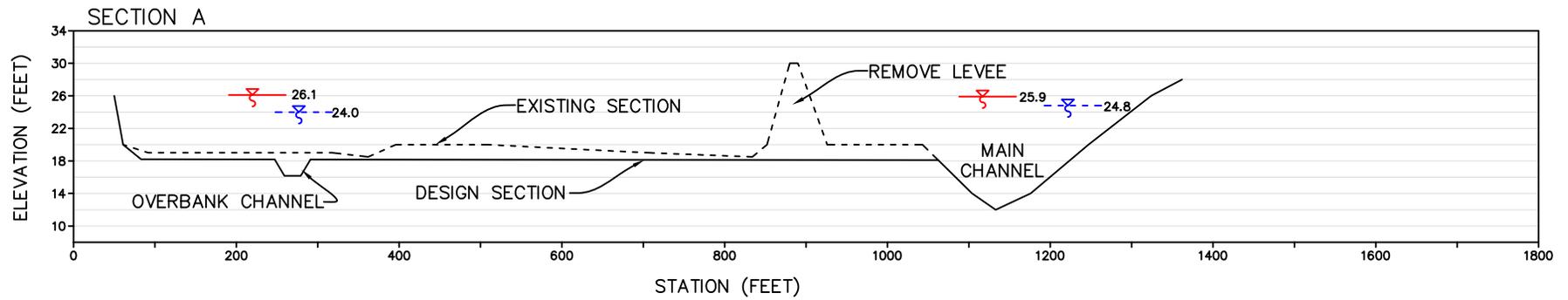
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EXISTING CONDITIONS 100-YEAR WATER SURFACE ELEVATION 

PROPOSED CONDITIONS 100-YEAR WATER SURFACE ELEVATION 

ATTACHMENT 3. WORK PLAN - CARMEL RIVER LAGOON AND BEACH STUDIES

Purpose and Need:

The Ecosystem Protective Barrier (EPB) Project is part of a comprehensive and linked set of projects that will reduce flood impacts and improve aquatic and riparian habitat in the lower four miles of the Carmel River. Its primary product is the installation of a barrier along the north side of the Carmel River Lagoon (hereinafter referred to as the “Lagoon”) to prevent up to 24 low-lying residences and infrastructure from flooding. The Project has multiple benefits, including reducing the potential for flood damage, an increase in water quantity and quality in the Lagoon, improved rearing habitat for threatened species Central Coast steelhead and California Red-Legged Frogs, more natural functioning of the opening and closing of the barrier beach at the mouth of the Carmel River, and avoidance of substantial operational costs associated with managing the barrier beach in a mechanical manner. Installation of the barrier would also likely resolve a conflict between Monterey County, the National Marine Fisheries Service (NMFS), the Coastal Commission, and the California Department of Fish and Game (CDFG) over whether regular beach management activities to reduce the potential for flooding can be considered emergency actions.

In most years, the beach across the mouth of the river builds up to a level during the dry season that is higher than the lowest residential units on the north side of the Lagoon. When the Lagoon fills in the fall and early winter from wave overwash and river inflows, Monterey County must breach the beach to lower the water level below flood stage. This action can result in a significant loss of aquatic habitat and cause harm to steelhead if the breaching action occurs prior to the time the steelhead are ready to go to the ocean. State Parks (the property owner), Monterey County and other agencies responsible for managing the Lagoon have sought a solution to this problem for nearly 20 years.

In addition, in most years upstream diversions by California American Water and others reduce surface and groundwater flows to the Lagoon in the spring, summer, and fall. This results in a decrease in the quantity and quality of the water in the Lagoon and associated aquatic habitat. Continuous water quality and quantity sampling show that increasing the Lagoon volume in late spring by mechanically raising the beach results in significantly more aquatic habitat (initially) and slows the decline of water quality during the dry season (e.g., temperature, dissolved oxygen, and salinity levels are acceptable for much of the summer). In late summer and fall there are temperature increases in the shallow parts of the Lagoon, and wave over wash often creates a saline layer at the Lagoon bottom. This latter condition has a two-fold effect on steelhead trout (*Oncorhynchus mykiss*, hereinafter “Steelhead”), which are listed as a threatened species. First, the saline layer absorbs more sunlight than freshwater and increases water temperature. Second, steelhead, which do not acclimate to saline conditions (smolt) until the onset of winter, are forced up in the water column, thereby increasing the potential for bird predation. Such wave over washes can occur at any time during the year, but generally increase in frequency during the fall, winter, and early spring.

Carmel River State Beach and Lagoon





Carmel River Lagoon – wave over wash (above), excavated channel through beach (below)



January 27, 2006, 10:20



The Carmel River State Beach, which forms a seasonally brackish Lagoon environment 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. Approximately 10 homes on the north side of the Lagoon were built below the level that the beach aggrades to just prior to winter flows and an additional 14 homes are subject to flooding during a 100-year flood. In addition, flooding of low-lying structures can occur from ocean surge into the Lagoon, which has occurred on several occasions, most recently in January 2008. Mechanical breaching of the Lagoon, besides being not fully permitted, has been found not to be a feasible solution in those instances when high waves preclude access to the beach for equipment.

Mechanical breaching of the beach to reduce the level in the Lagoon can 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, including California red-legged frogs (*Rana aurora draytonii*) (CRLF). This can result in a “take” of threatened species; a take is defined by the Endangered Species Act as “harming, wounding, or killing an endangered species.”

Non-mechanical breaches¹ are viewed as preferable by all environmental groups and regulatory agencies, including NMFS, CDFG, and the Coastal Commission. Mechanical breaches often occur early in the fall/winter season at a time when smolts may not be ready to go to the ocean and flow in the river may not be adequate for adult upstream migration, whereas, non-mechanical breaches would likely occur when conditions are more favorable for steelhead migration in and out of the Lagoon. However, all groups with an interest in the Carmel River and Lagoon are concerned that the low-lying residential structures are not flooded as a consequence of the cessation of mechanical breaching. An earlier study (cited in Williams 1992 page 6-9) sheds some light on how deep the Lagoon would have to be before natural breaching is likely to occur: “Curry (1984) has estimated that absent human intervention, the lagoon would commonly rise to over 11.5 feet (NGVD 1929) before breaking through the beach.” Subsequently, in January 2008, during an ocean swell event with 35-foot waves, the Lagoon rose to 12.66 ft. before it breached. (12.66 feet NGVD 1929 equals 15.41 feet NAVD 1988—see conversion chart in Addendum G).

The installation of a protective barrier adjacent to structures along the north side of the Lagoon would allow the water level to rise to as high as 15-16 feet NAVD 1988, lessening if not removing altogether the necessity of manual breaching to reduce the potential for flood damage.

Based on MPWMD calculations, the maximum Lagoon water volume could potentially double as a direct result of the installation of a barrier on the north side of the Lagoon.

The Carmel River Lagoon Technical Advisory Committee (hereinafter referred to as the “Lagoon TAC”), was formed in 2005 to address these problems, and the TAC issued a Final Report of its Study Plan for Long Term

¹ Here, “non-mechanical breach” is distinguished from a “natural” breach. Anthropomorphic influences have changed the beach dynamics. It is estimated that the total volume of sediment mined from or retained in the watershed between the 1920s and present exceeds six million cubic yards. A significant fraction of the total would have passed through the river to the beach.

Adaptive Management of the Carmel River State Beach and Lagoon in 2007. As stated in the Lagoon Technical Advisory Committee Long-Term Management Plan Final Report (2007, pp. 10-11):

“Habitat quantity is directly related to water elevation in the lagoon. At a water level of about two feet (NGVD 1929), the area of the lagoon is estimated to be about two acres. Whereas, at [the] nine-foot level, the area of the lagoon is estimated to be about 80 acres, a forty-fold increase. It is known that artificial breaching can have significant effects on life cycle stages of at least two of the species of concern at the Lagoon – steelhead and CRLF. Breaching of the barrier beach for flood control purposes frequently results in low lagoon elevations, elimination of most of the aquatic habitat of the lagoon, and a short and steep outflow path to the ocean. In recent years, the [Monterey] County has attempted to manage the location of the lagoon outflow channel across the barrier beach by simulating a natural channel meander pattern to minimize environmental impacts. However, fixing the river mouth at a specific location on the beach is difficult due to the complex interaction of waves, tidal fluctuation, river flow, and sand transport. Because more frequent and more expensive manipulations to maintain habitat have resulted, management of the barrier beach to minimize fish and wildlife impacts has been frustrating and failed to accomplish the desired results.”

The Final Report cited the construction of a barrier or levee as one possible solution (see page 25 section 4(a) and Study M2 on page 34). Other solutions include raising structures and flood-proofing infrastructure or buying out flood-prone properties. The former would likely be prohibitively expensive since it would require the rebuilding and relocation of several thousand feet of roads and utilities, importation of fill, lifting all structures, and re-landscaping a large neighborhood. Raising structures would also require a change in building restrictions at the lagoon. Buying properties would be both expensive (home prices are in the \$1-\$2 million range) and may not be feasible without exercising eminent domain powers. It should be noted that Monterey County has a policy that discourages the use of eminent domain. On July 1st, 2010, the Lagoon TAC met and reviewed the proposed EPB and decided to further investigate it along with other potential alternative solutions.

An earlier investigation (Williams 1992, page 9-21) also cited a barrier along the north side of the Lagoon as a potential solution to the problems associated with the barrier beach. The Lagoon TAC has on two occasions reviewed the project proposed in this document, and provided many supportive and constructive comments to enhance the project proposal. This project proposes to confirm that the installation of a barrier or levee is the optimal solution alternative cited by the Lagoon TAC. However, it will employ much longer-lasting material and less ecologically damaging than the previous solution proposal recommended using (concrete, metal, or wood).

Goals and Objectives:

Summary: The primary goal of this project is to improve habitat for the South Central California Coast Steelhead Distinct Population Segment (DPS) and for California Red-Legged Frogs. As its second goal, this Project will reduce or eliminate the need for mechanical breaching of the barrier beach. The third major goal is to reduce the chances of flooding of residences, a school yard (River School) and one business (Mission Ranch) along the north edge of the Lagoon.

This project proposes to confirm that the installation of a flood wall or levee is the optimal solution to the problems cited by the Lagoon TAC. However, it will employ much longer-lasting material and less ecologically damaging than the previous solution proposal recommended using (concrete, metal, or wood).

Detail of Goals and Objectives:

In this Project an Ecosystem Protective Barrier (EPB) composed of vinyl sheet piling will be installed at the Lagoon's western and northern borders on land owned by the California State Parks and Mission Ranch (see maps on page 9 & 11). At its eastern border the EPB will connect with the levee that protects the Mission Ranch property and the Mission Fields residential area (ref. CSA-50).

An increase in the depth of the Carmel River Lagoon near the Carmel River Wetlands Preserve is expected to be a primary outcome of this project, which is anticipated to expand the capacity of the Lagoon from a maximum of approximately 400 acre-feet (AF) to up to 800 AF and thereby improve the quality of the rearing ecosystem for the Steelhead (see chart in Addendum H). Several studies have demonstrated that steelhead reared in lagoon environments grow larger and are more likely to return to the river from the ocean than steelhead reared primarily in upper watersheds (ref. articles cited in the CA Department of Parks and Recreation Initial Study Mitigated Negative Declaration of July 2008, including those by Bond 2006, and Hayes, Bond, Hanson, and Freund 2008)). A recent report by the Center for Ecosystem Management and Restoration entitled Southern Steelhead Resources Evaluation (2010) states: "Based on surveys results, the Carmel River lagoon appears to offer significant rearing habitat, at least in some years. A 1983 DFG study of the *O. mykiss* standing crop concluded, "The lower Carmel River definitely has the capacity to sustain large populations of juvenile steelhead." (DFG 1983b). It is this rearing capacity that this project seeks to restore.

Dry season (late spring to early winter) water quality degrades in the absence of inflow as water in the Lagoon leaches out to the ocean through the barrier beach. Flow through the beach can be as high as 8 to 10 cfs (16-20 AF/day). Water quality changes include increased water temperature, reduced oxygen levels, and higher salinity levels. Effects to fish are heightened during dry years when there may be no freshwater inflow to the Lagoon for many months. This Project will improve the Lagoon as a key rearing habitat for the Steelhead in the Lagoon at the mouth of the Carmel River (to promote lagoon habitat adaptation, hydrologic/tidal reconnection, and coastal resiliency especially during the parr, juvenile, and smolt stages).

Goal 1: Improve the rearing habitat for the South Central California Coast Steelhead DPS and CA Red-Legged Frogs.

Objectives for Goal 1: Improve the rearing habitat for the threatened species in the Carmel River Lagoon, by first conducting feasibility studies to determine the site of the EPB and the effects of installing this barrier on nearby neighborhoods and upstream in the Carmel River.

Objective 1.1: Conduct geotechnical soil sampling to determine the composition of the soils along feasible EPB alignments (options include along the property lines, five feet beyond the property lines, and on a straight line across the Lagoon from the Carmel River State Beach parking lot to the levees near Mission Ranch). Take multiple soil samples along potential EPB alignments and at varying depths. Collect topographic data along the alignments.

Objective 1.2: Perform hydrologic analyses to determine the optimum height of the EPB and the optimum depth of the barrier under the ground floor of the Lagoon, as well as the optimum length (wrap around the State parks parking lot preferably so as to protect the parking lot and potentially the Scenic Road bluffs).

Objective 1.3: Perform hydrologic analyses on the potential upstream effects of installing the EPB on the levees near Mission Ranch and CSA-50 neighborhood (Mission Fields).

Objective 1.4: Perform hydrologic, engineering, and drainage analyses to determine the dry side effects of installing the EPB on the streets and homes in the neighborhoods adjacent to the site(s) of the EPB. This would include measurements of rain run-off as well as watering habits of the residents near where the EPB

would be installed.

Objective 1.5: Make a final determination of the optimum site, height, depth, and composition of the EPB, and secure estimates to complete the design and installation of this barrier.

Objective 1.6: Determine the nature and costs of the pumping systems necessary to ensure that dry side runoff water can be pumped into the Lagoon at times when the Lagoon stage is higher than the surrounding neighborhood and local runoff could threaten to flood the homes adjacent to the site of the EPB. Perform periodic water quality tests on runoff water to determine whether it will have any adverse effects on the water quality in the Lagoon.

Objective 1.7: Develop a budget for the cost of operating and maintaining the pumping systems and work with the Monterey County staff to determine a funding mechanism to pay for these costs.

Objective 1.8: Confirm that a literature research review and study of the topography, bathymetry, and historical changes in the volume, area, and water quality of the Carmel River Lagoon has been completed. If not, conduct these studies.

Objective 1.9: Confirm that a literature research review and study of the historical inflow and outflow to the Carmel River Lagoon have been completed.

Objective 1.10: Using volunteers, measure the water quality (salinity, temperature, and dissolved oxygen) in the central portion and north and south arms of the Lagoon before and after the installation of the EPB, and before and after the removal of the San Clemente Dam (that project may yield higher levels of sediment in the Carmel River and at the Lagoon). In addition the Sonde Profiler will be used to monitor water quality in the south arm of the Lagoon.

Goal 2: Reduce or eliminate the necessity of mechanical breaching of the barrier beach at the mouth of the Carmel River.

Objectives for Goal 2:

Objective 2.1: Analyze existing data on the height, width, and depth (including geomorphology of the underlying bedrock) of the Carmel River barrier beach, and the depth and volume of the Lagoon at high-flow events and at varying tide heights, and for events where the barrier beach breached naturally.

Objective 2.2: Use these data to estimate the NAVD'88 height of the Lagoon necessary to cause the barrier beach to breach naturally, at various heights and depths of the barrier beach.

Objective 2.3: Adjust the planned height of the EPB to ensure that the volume of water in the Lagoon will be sufficient to cause a natural breach of the barrier beach at any given tidal stage. The effect of a rising ocean level over the anticipated life of the structure may need to be evaluated.

The first and best known model relating shoreline retreat and beach change to an increase in local sea level is the Bruun model. This two-dimensional model assumes maintenance of an equilibrium nearshore profile in the cross-shore direction as sea level rises. This simple model states that the beach profile is a parabolic function whose parameters are entirely determined by the mean water level and the sand grain size. The analysis by Bruun assumes that with a rise in sea level, the equilibrium profile of the beach and shallow offshore moves upward and landward. However, the supply of sand to the beach is a critical determinant of the potential response to changes in sea level. A long-term sediment budget has not been established for the Carmel River State Beach and the precise role of changes in supply in influencing shore changes is not well

understood. Some authors have indicated that accelerated sea-level rise in coming decades makes general erosion of sandy shores more likely.

Objective 2.4: Estimate the cost to mechanically breach the barrier beach in the unlikely event that the height and width of the barrier beach are so great that the Lagoon fills up to a height that approaches the maximum height of the EPB. This situation should be extremely rare if the EPB is built to a height of at least 16 feet NAVD '88, as previous estimates of the maximum height of the Lagoon that will cause a natural breach of the barrier beach are at 11.5-12.5 feet NGVD '29 or 14.25-15.25 feet NAVD '88.

Objective 2.5: Work with local, state and federal agencies with authority over the Lagoon and barrier beach to develop a plan to allow emergency mechanical breaches of the barrier beach should the rare situation occur in terms of wave over wash of the barrier beach.

Goal 3: Reduce or prevent flooding of residences, a school yard, commercial buildings, and streets.

Objectives for Goal 3:

Objective 3.1: Meet with CA State Parks staff to determine their preferences for the optimum site for the EPB.

Objective 3.2: Meet with residents of homes that are in the 100-year flood plain along the north side of the Lagoon to explain the proposal for installation of a barrier and demonstrate the probable height and appearance of the EPB using a simulated wall. Seek their support, and if the wall is to be placed on property lines, obtain their consent.

Objective 3.3: Meet with representatives of Mission Ranch to determine their preference for the optimum site of the portion of the EPB that will cross in front of Mission Ranch and tie into the levee near their tennis courts.

Objective 3.4: Map the Lagoon in the vicinity of where the EPB is likely to be placed; use this map in the public meetings.

Objective 3.5: Analyze potential impacts of this barrier on the western edge of the project (the bluffs underlying Scenic Road west of the Carmel River State Park parking lot, and the parking lot itself), and prepare a contingency plan for those occasions when the River breaches naturally in a northerly direction or high wave action pushes the River channel against the bluffs.

Objective 3.6: Convene public meetings in the Carmel area to inform residents of the rationale and plans for the EPB and obtain their input or feedback.

Objective 3.7: If required, arrange for a land exchange to mitigate any reduction in wetlands caused by the installation of the EPB in the wetlands along the north side of the Lagoon.

Project List:

In this Project an Ecosystem Protective Barrier (EPB) composed of vinyl sheet piling (see photos of sample barriers in Addendum I) will be installed at the Lagoon's western and northern borders (see maps on page 9 & 11). At its eastern border the EPB will connect with the levee that protects the Mission Ranch property and the Mission Fields residential area (ref. CSA-50). At its western end the EPB will wrap around the State Parks parking lot.

A seasonal increase in the depth of the Carmel River Lagoon near the Carmel River Wetlands Preserve is expected to be a primary outcome of this project, which is anticipated to expand the capacity of the Lagoon

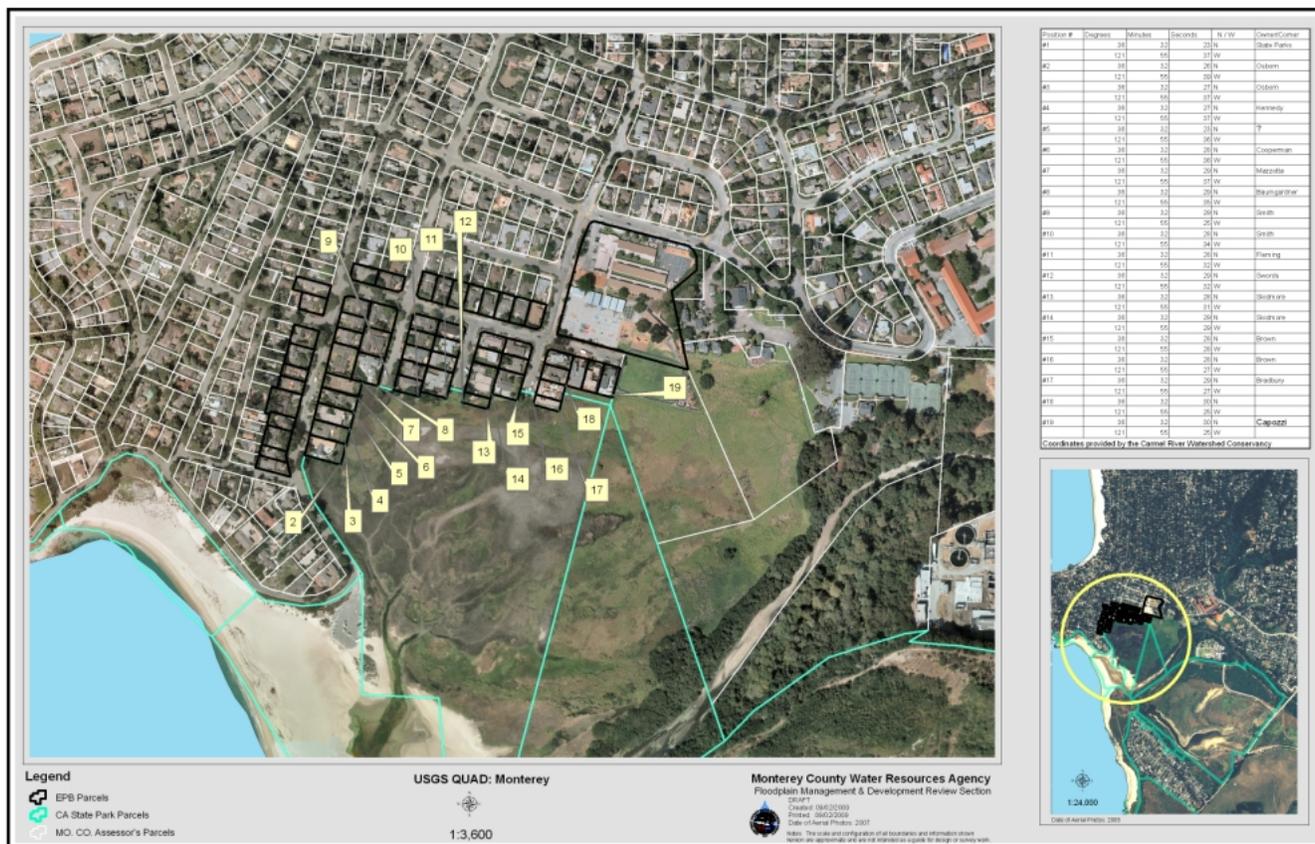
from a maximum of approximately 400 AF to 800 AF feet and thereby improve the quantity and quality of the rearing ecosystem for the Steelhead. Several studies have demonstrated that steelhead reared in lagoon environments grow larger and are more likely to return to the river from the ocean than steelhead reared primarily in upper watersheds (ref. articles cited in the CA Department of Parks and Recreation Initial Study Mitigated Negative Declaration of July 2008, including those by Bond 2006, and Hayes, Bond, Hanson, and Freund 2008)).

This barrier would be sympathetic to natural surroundings and habitat and will be minimally invasive to Lagoon ecosystem. The EPB would be of sufficient height to allow the Lagoon to breach naturally, at a water level of 15 to 6 feet NAVD '88. The barrier would have natural wetlands vegetation growing or planted in front and behind and thus would not adversely impact nearby property owners' Lagoon views. The EPB will be an industrial strength vinyl sheet piling that reduces the cost and is made from recycled material. Such sheet pilings are used extensively in civil and marine applications because of their inherent durability, corrosion and chemical resistance, and ease of installation. By reducing the number of interlocks there is less seepage allowing minimal usage of sealants or eliminating the need for sealant altogether. The material also reduces the carbon footprint in manufacturing, transportation and installation compared to traditional materials.

Integrated Elements of Projects:

The installation of the Ecosystem Protective Barrier would achieve three long-standing and over-arching goals in the Carmel River Lagoon all at the same time: increasing the water quantity and quality and rearing habitat of threatened species steelhead and red-legged frogs in the Lagoon, protecting residences adjacent to the Lagoon from periodic flooding, and minimizing the necessity of mechanical breaching of the barrier beach that has caused the deaths of thousands of juvenile steelhead that have been flushed into the ocean before they were ready to survive in that new environment. The linkages and synergies among these three over-arching goals can be achieved by just a single project—the installation of the EPB.

Site Map:



The EPB will most likely be installed either along or near the property lines that are shown above.

The Lagoon water quantity and quality will be affected positively by this wall primarily at seasonal high flows, which will fill the Lagoon to a volume sufficient to cause a natural breach of the barrier beach. As the Lagoon is filling, some seepage of fresh water into the ocean will occur especially at low tides, which will gradually decrease the height of the Lagoon in the absence of high flow events.

Proposed monitoring locations are at the end of each of the three roads that run into the Lagoon, at a distance of ten feet from the EPB; at the edge of the River School garden; in the wetlands next to the Mission Ranch; and in the south arm of the Lagoon. These locations will be noted on an enlarged version of the FEMA map above.

Completed Work:

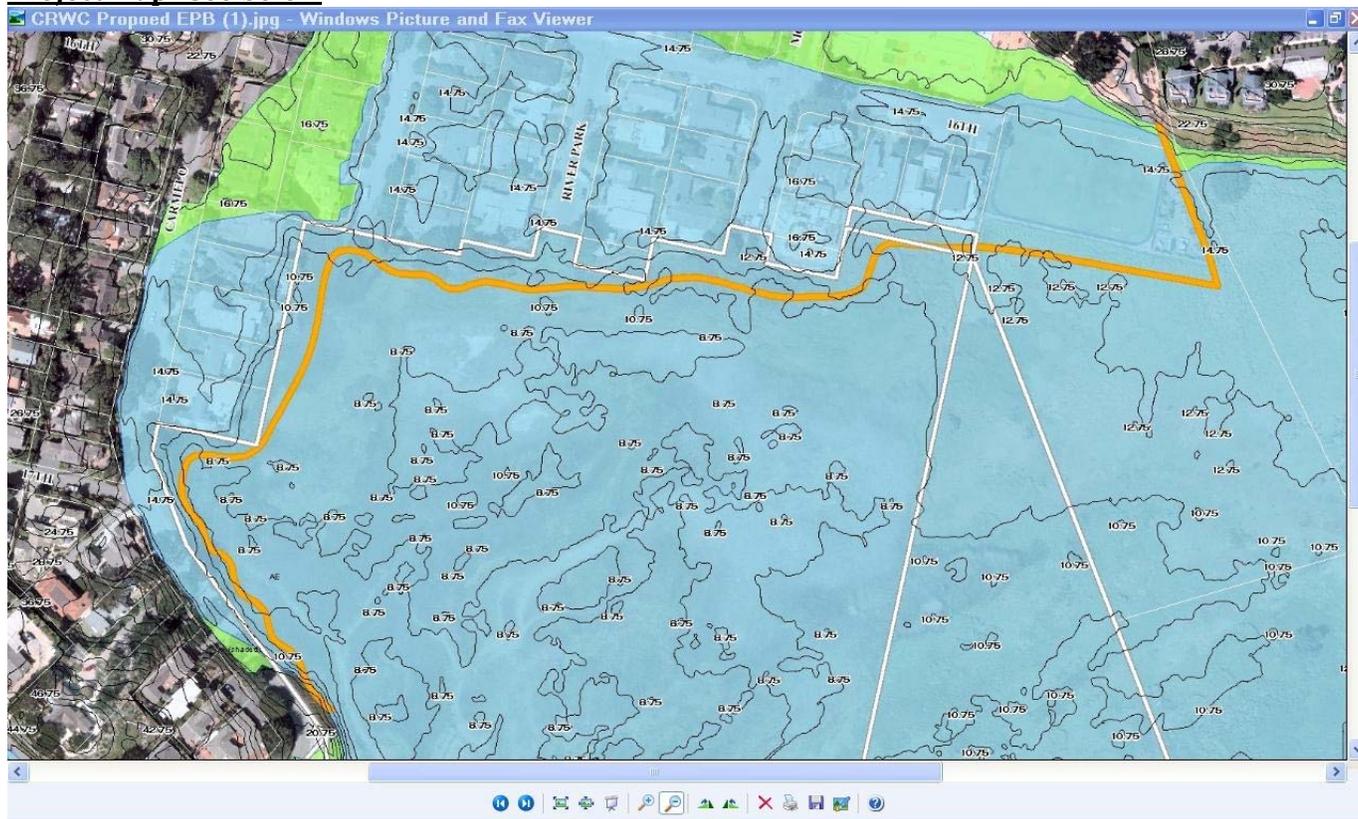
Initial planning has been completed that includes an estimation of the costs of the hydrologic and geotechnical analyses (see Objectives 1.1 through 1.6) as well as the design and installation of the Ecosystem Protective Barrier (Objective 1.5). This initial work will allow the project to commence at the beginning of the grant period. The estimates are shown in the budget for this sub-project.

Existing Data and Studies:

1. Williams (1992) Carmel River Lagoon Enhancement Plan, Philip Williams & Associates, Inc. Report to MPWMD

2. Bird, E.C.F., 1993. *Submerging Coasts. The Effects of a Rising Sea Level on Coastal Environments*. John Wiley and Sons, Chichester.
3. Curry, (1984). Hydrologic, historical, and soils report, Mission Ranch site, Carmel, California. Unpubl. Rept. to the City of Carmel
4. Dettman, D. H. (1984). The Carmel River Lagoon and its use by steelhead, Appendix A to the Carmel River Steelhead Resource: its relation to stream flow, and to water supply alternatives, unpub. Rept. To MPWMD
5. Curry, Stamm, and Lomax (1998) Flood Control Risks & Issues Symposium, CSUMB
6. Kraus, Patsch, Munger (2008) Barrier beach breaching from the lagoon side, with reference to Northern California, *Shore & Beach Spring 2008* p. 33
7. Carmel River Technical Advisory Committee (2007) Study Plan for the Long-Term Management of the Carmel River Barrier Beach, Final Report.
8. Converse (1982) Barrier beach features of California, Proc. 18th Coastal Eng. Conf. ASCE, 1008-1027
9. Kraus (2003) Analytical model of incipient breaching of coastal barriers. *Coastal Eng. Jnl.*, 45(4), 511-531
10. Smakthin (2004) Simulating the hydrology and mouth conditions of small temporarily closed/open estuaries. *Wetlands* 24(1), 123-132
11. Stretch & Parkinson (2006) The breaching of sand barriers at perched, temporary open/closed estuaries—a model study. *Coastal Eng. Jnl.*, 48(1) 13-30
12. Williams & Associates (2002) Lower Carmel River Flood Control Project, final Report. Report to MCWRA CSA-50
13. Casagrande (2006) Wetland Types of the Carmel River Lagoon, Report to the Watershed Institute, CSUMB
14. Hayes, Bond, Hanson & Freund (2008) Steelhead Growth in a Small Central California Watershed: Upstream and Estuarine Rearing Patterns. *Transactions of the American fisheries Society* 137:114-128
15. CA Department of Parks and Recreation (2008) Study Mitigated Negative Declaration for the Carmel River State Beach Lagoon Water Level Management Project.
16. Bond (2008) Importance of Estuarine Habitat to Central California Steelhead Growth and Marine Survival. Master's Thesis, Univ. of CA Santa Cruz
17. Hanson (2008) Influence of Lagoon Habitat on Steelhead Life History Variation.
18. Williams (1999) Carmel River Lagoon Enhancement and Management Plan: Conceptual Design Report. Report to MPRPD, CSCC, CADP

Project Map: see below



Project Timing and Phasing:

The proposed project would begin immediately upon approval of the IRWMP grant, but would be broken down into the following phases:

Phase I:

Topographical mapping and soil sampling: commence upon receipt of grant funds (see Objective 1.1)

Timeline: Complete within 3 months from grant funds receipt on June 1, 2011, or by September 1, 2011

Phase II:

Geotechnical and hydrologic analyses (see Objective 1.2-1.3) Timeline: Complete 5 months after Phase I completion, or by February 1, 2012.

Phase III: Perform hydrologic and drainage analyses on dry-side effects; develop design for pumping systems. (See Objectives 1.4, 1.6-1.9) Timeline: Complete within 7 months after Phase I completion, or by April 1, 2012

Phase IV: Obtain estimates for design and installation of wall. Timeline: Complete 9 months after Phase I completion, or by June 1, 2012

Phase V: Objectives 2.1-2.6 will be completed 12 months after Phase I completion, or by September 1, 2012.

Phase VI: Complete Objectives 3.1-3.6 within 15 months after Phase I completion, or by December 1, 2012.

Project Timing and Phasing Chart

Phase I	Phase II	Phase III	Phase IV	Phase V	Phase VI
3 mos.	5 mos.*	7 mos.*	9 mos.*	12 mos.*	15 mos.*

*following completion of Phase 1

Tasks

Phase I Tasks:

Task 1: Survey and topographically map the Carmel River Lagoon and determine exact NAVD'88 readings at several potential sites of the EPB.

Deliverables: topographical map with potential sites indicated.

Task 2: Collect soil samples at several potential sites where the wall might be installed; at the same time, gather any geotechnical reports from sites near the Lagoon.

Deliverables: core samples of Lagoon soils, collection of pertinent geotechnical reports.

Phase II Tasks:

Task 3: Gather all relevant technical reports on the hydrology of the CR Lagoon, and analyze them to determine the optimum site, height, and depth of the proposed EPB.

Note: for more task detail on Phases I and II, see Addendum B.

Deliverables: collection of technical reports, report that summarizes the findings.

Task 4: Survey and check the condition of the levees on the portion of the River upstream. Conduct a hydrologic simulation and analysis of the effects of the installation of the EPB on the upstream levees to ensure that they will not be compromised by the EPB height and location.

Deliverables: Report on the projected or estimated effects on the upstream levees and any actions required to protect them from negative effects.

Phase III Tasks:

Task 5: Collect data on water runoff from rain and residential watering into the Lagoon on the north side, and calculate the volume during high-flow periods.

Deliverables: Report showing calculations as to dry-side runoff volume.

Task 6: Research pumping systems that can handle the estimated runoff volume into the Lagoon, and determine the most cost-effective system and their locations. Obtain cost estimates for the pumping system, their installation, and their annual maintenance.

Deliverables: Budget for dry-side pumping systems.

Phase IV Tasks:

Task 7: Based on the results from Phases I, II, and III, determine the optimum height, depth (underground), composition and length of the EPB. Obtain preliminary designs, site maps and plans, and cost estimates from qualified suppliers. The major materials required can readily be assembled and the contractors have ascertained the specific work remaining as part of their pre-project preparations to finalize a scope of work, schedule, and cost. A discussion of the merits or advantages of the vinyl sheet wall is shown in Addendum A.

Deliverables: Preliminary site and wall design and cost estimate for EPB (materials and installation).

Phase V Tasks:

Task 8: Convene public meetings with community residents in the areas adjacent to the north side of the Lagoon as well as with members of the CSA-50, inform them of the project plans, and obtain their input and feedback on the project. If appropriate, and subject to the review and approval of the agencies with authority over the Lagoon, revise the project specifications in response to this feedback.

Deliverables: Meeting agendas and minutes, summary of input from residents, revisions to the project plans.

Task 9: Meet with representatives of Mission Ranch to review the project and determine the optimum site for the EPB that will run across their property. Obtain their consent to the site and height of the EPB.

Deliverables: Consent form signed by Mission Ranch owner or agent.

Task 10: Meet with federal, state, and local agency staff to review the design and plans for the EPB, obtain their input and feedback on the project, revise the project specifications, and determine the requirements for compliance with CEQA and NEPA and for submitting permit applications. The primary agencies that will be consulted include: California Department of Parks and Recreation, Monterey Peninsula Water Management District, Monterey County Water Resources Agency, Monterey County Public Works, Carmel Area Wastewater District, NOAA/NMFS, U.S. Fish & Wildlife Service, Big Sur Land Trust, Mission Fields' CSA-50, U.S. Army Corps of Engineers, the Coastal Commission, and the California Department of Fish and Game. It is anticipated that the Lagoon Technical Advisory Committee will assist in the expediting of permits, as most of these agencies are members and the TAC has already reviewed and provided input into this project.

Deliverables: Scope of work for CEQA/NEPA compliance, list of documents to submit with project applications.

Phase VI Tasks.

Task 11: Complete the meetings described in Objective 3.1 above.

Task 12: Estimate the probable NAVD'88 height of the Lagoon that will cause a natural breach in the barrier beach based on various heights and widths of the barrier beach.

Deliverables: Report on the results of this analysis indicating Lagoon heights.

Task 13: Determine the potential cost of mechanically closing the barrier beach when flows into the Lagoon are at their lowest.

Deliverables: Summary of the costs of each mechanical closure of the barrier beach.

Task 14: Coordinate with State Parks to ensure the continuation of mechanical closing of the barrier beach to increase its volume and water quality during the dry season(s).

Deliverables: Copies of communications and/or meeting notes.

Task 15: Develop and finalize the Safety Plan and Monitoring Plan. The Safety Manager will be licensed by the State of California and will be required to abide by the OSHA safety standards for workers and use of heavy equipment during the EPB installation. Monitors will be professionally trained using the CRAM method. A Monitoring Plan will be finalized with each of the local, state, and federal agencies and stakeholders as part of Task 15. Ongoing monitoring according to the schedule and protocol will provide data to evaluate the impact of the project on water quantity and quality in the Lagoon, applying the CRAM method. Performance measures will include water quantity (acreage covered and estimated volume in Lagoon), NAVD'88 height of Lagoon prior to natural breaching, water quality (temperature, salinity, dissolved oxygen) in Lagoon, counts of steelhead and CRLFs in Lagoon, number of emergency mechanical breaches required after EPB is completed, and number of mechanical closures of the barrier beach.

Deliverables: Final Safety and Monitoring Plans, and Performance Measures.

Task 16: Analyze the potential effects of the placement of the EPB barrier on the northwestern edge of the barrier beach as well as the Carmel River State Park parking lot.

Deliverables: Report on the potential effects and possible contingency plans for ameliorating any adverse effects.

Task 17: Evaluate alternative long-term solutions to fish passage in Lagoon.

Deliverables: report

Budget Category (a): Direct Project Administration Costs	
Task: Administration	Current Status: CRWC has existing staff.
Description of Work: Provide project management and administration of contract.	
Deliverables: Invoices, quarterly reports.	
Budget Category (b): Land Purchase/Easement	
Task 11: Meet with Land Owners	Current Status: Ongoing. CRWC have been meeting to discuss and plan project specifics and financing.
Description of Work: review the design and plans for the EPB	
Deliverables: copy of easement or agreement	
Budget Category (c): Planning/Design/Engineering/Environmental Documentation	
Tasks 1-9, 12-16	Current Status: Awaiting funding.
Description of Work: Geotechnical, hydraulic, and engineering studies.	
Deliverables: See individual task descriptions.	
Budget Category (d), (f): N/A - to be completed in a future phase	
Budget Category (e): Environmental Compliance/ Mitigation/Enhancement	
Task 10 - CEQA/NEPA and permit requirements	Current Status: Awaiting funding.
Description of Work: Determine the requirements for compliance with CEQA and NEPA and for submitting permit applications.	
Deliverables: Scope of work for CEQA/NEPA compliance, list of materials (documents) to submit with project applications.	
Budget Category (g): Other	
Task 17: Evaluate alternative long-term solutions to fish passage in Lagoon.	Current Status: Awaiting funding.
Deliverables: report	
Budget Category (h): Contingency	
For planning and design investigations (Tasks 1-16)	Current Status: Awaiting funding.

Addendum A: Vinyl Sheet Piling

Vinyl sheet piling is quickly becoming the most popular product to use in constructing your bulkheads and seawalls. Other materials have been used in the past, but they are virtually obsolete now. With the advent of vinyl sheet piling, homeowners with oceanfront or lakefront property can now rely on the newest manufacturing technology and know that they are getting the best product on the market today.

Why are so many people choosing vinyl sheet piling today?

- ☑ Cost efficiency – Vinyl is a better value. The real measure of this is not just the comparison of costs for the initial installation; you need to figure the costs over the long term. Since vinyl sheet piling lasts much longer than other more traditional materials (such as wood), the cost of repairs and replacement is delayed. In fact, should you ever decide to sell, your buyer can rest in the assurance that the seawall will last a very long time – that’s an added value to your property.
- ☑ Consistent appearance – It is well known that wood fades over time. Paint may cover that up, but the paint color will fade as well. There is really not a lot you can do about that except continue to paint in order to keep it looking nice. Vinyl, on the other hand, holds the same beautiful appearance for a very long time.
- ☑ UV resistance – Most materials react negatively to the harmful ultraviolet rays of the sun, and it doesn’t take very long for that to start happening. When the time period is stretched out over years, the sun can do some real damage. Vinyl sheet piling is designed to be resistant to this, so the effects of the sun are not as serious or as quick.
- ☑ Unaffected by marine borers – Marine borers are small mollusks or crustaceans that live in the ocean, and their primary source of sustenance is wood. If you use wood for your seawall construction, you will almost immediately have marine borers latching on and drilling into it. This degrades the integrity and stability of the seawall over time, which defeats the whole purpose; you want your seawall to be strong and able to withstand very harsh conditions. If a marine borer comes across a seawall constructed with vinyl, he just keeps moving. Vinyl provides no attraction at all for marine borers.
- ☐ Easy installation – Vinyl sheet piling provides for an easy installation, particularly compared to wood. Wood is subject to imperfections, warping, and various deformities. This can sometimes cause problems or delays at the time of the installation. Vinyl does not have that problem. Unlike wood, vinyl does not grow in nature; the components of a vinyl seawall are manufactured to some very strict and precise standards. There is virtually no room for error, so you are able to have a consistent product each time. This means an easy installation. For you as the homeowner, it means that the disruption on your property is finished quickly – a lot of homeowners really like that part.
- ☑ Better warranty – With all of the advantages listed above, it only makes sense that vinyl sheet piling comes with a full 50 year manufacturer’s warranty. This starts from the date of purchase.

We know vinyl will last a long time, so we back that up with a fantastic warranty. You can purchase our seawall products and have them installed by a certified dealer, and rest assured that your new seawall is covered by our lengthy warranty period.

As mentioned above, wood is now obviously obsolete. The same can now be said for aluminum, steel and concrete; each is now overshadowed by the many advantages of vinyl.

Addendum B

Task Detail:

Hydrologic analysis will comprise:

- 1) review existing site conditions, reports & maps to prepare a hydrologic study of the wetlands and upstream effects of the EPB; and
- 2) complete the Lagoon TAC-recommended study P3 (see next page)

Engineering design will comprise:

- 1) prepare a field surveyed topographic and boundary map of a 50' wide strip of the terrain centered on the proposed +2,300 l.f. seawall alignment (top of wall el. +17 ft) from the S.E. corner of Mission Ranch (connecting with existing levee) to Scenic Road near the entrance to the Carmel River State Beach parking lot, as delineated by the line on the aerial photo map in Appendix 7,
- 2) perform a geotechnical investigation of the alternative sites for the EPB, and recommend the optimal site,
- 3) design the protective wall or rip-rap wall to be installed at Carmel River State Beach parking lot at west end of the project;
- 4) attend project coordination meetings & public hearings,
- 5) designate a Lead Agency, conduct the CEQA evaluation and prepare a Negative Mitigated Declaration or EIS, and
- 6) prepare approved construction documents:
 - (a) 24" x 36" plans @ 1"=20' scale,
 - (b) technical specifications &
 - (c) construction estimate, including the following design drawings:
 - i) Title Sheet w/Vicinity & Dwg. Index Maps, Dwg. Index, Legend & General Notes
 - ii) Seawall Horizontal Control Plan & Profile (4 sheets)
 - iii) Erosion Protection & Sedimentation Control Plan (4 sheets)
 - iv) Typical Seawall Section & Site work Details (2 sheets)

STUDY SCOPE: P 3 - Monitoring beach and river mouth dynamics and correlating with physical processes

Problem Statement

Continued artificial breaching of the barrier beach may be contributing to beach sand losses in the already sediment limited setting. The delivery of sediment via river flows to, and up and down the beach is not understood. Nor is the impact of hydraulic interactions between river flows, variable ocean waves, and tidal fluctuations on sediment transport to and from the barrier beach well understood. Starting in the early 1990's, the County has always attempted to lower the barrier beach on the south or north end of the beach in an effort to minimize impacts to the lagoon ecosystem and protected species. However, due to river mouth migration caused by little understood physical processes, and/or unauthorized breaches by private citizens, the lagoon has ended up being breached throughout critical breeding and rearing periods of threatened and endangered wildlife species, severely compromising the habitat value for populations of these protected wildlife species.

Basic Approach

It is known that the mouth of the Carmel River migrates either north or south along the barrier beach. The direction of migration is thought to depend on ocean swells, littoral current direction and perhaps tidal fluctuations. However, why it migrates one way or the other, and under what ocean conditions is not understood. Monitoring the river mouth and beach dynamics real time, and correlating with the recorded ocean physical processes of swell size and direction, tidal fluctuation, and correlated littoral current direction is necessary to develop the knowledge and understanding which will be necessary to ensure the effectiveness any plan for management of the Carmel River Lagoon. Real time monitoring would use one or two stationary video cameras to take time lapse photography of the river mouth and beach dynamics and could help discourage illegal breaching activity.

Products:

The time stamped video would be correlated with recorded ocean conditions of swell height and direction, tidal fluctuation and littoral current direction along with river flow levels. Analysis and correlation of these variables would determine which direction the river mouth might migrate under variable river and ocean conditions. This information would be invaluable in planning management actions to protect property and ecosystem values of the lagoon. The video would also be available on a website in near real time for viewer observation and analysis.

Estimated Cost:

Preliminary discussion with Dr. Ed Thornton of the Monterey Naval Post Graduate School indicate he would be interested and willing to fold this study scope into similar ongoing research he is conducting at other sites along the Central Coast with funding from NOAA. The costs of additional equipment and personnel for web posting and analysis of results.-----\$60k. [Note: 2007 estimated cost.]

ATTACHMENT 3. WORK PLAN - SEASIDE GROUNDWATER BASIN AQUIFER STORAGE AND RECOVERY

Summary:

The Seaside Groundwater Basin Aquifer Storage and Recovery (ASR) Project is being developed to benefit the natural resources of the Carmel River Basin and improves the reliability of water resources and local water supplies for the Monterey Peninsula through “conjunctive use” management of surface and groundwater resources. The project entails diversion of groundwater from the Carmel Valley Alluvial Aquifer during times of “excess” Carmel River winter flow, as allowed by state and federal resource agencies, which is then treated and transmitted via the Cal-Am distribution system, to special injection/recovery wells in the Seaside Basin on the former Fort Ord Military Base. Available storage capacity in the coastal areas of the Seaside Basin serves as an underground reservoir for the diverted water, which is then extracted during dry periods. This conjunctive use more efficiently utilizes local water resources to improve the reliability of the community’s water supply while reducing the environmental impacts to the Carmel River and Seaside Basins. Water is diverted from the Carmel River System only when it is plentiful, and is used to recharge the over-pumped Seaside Basin in wet periods. Water is then pumped back out from the Seaside Basin in dry periods to help reduce the pumping impacts on the Carmel River environment. From the beginning of the ASR program in 1998 through 2010, more than 3,200 acre-feet of Carmel River System water have been diverted for injection and recharge into the Seaside Groundwater Basin (SGB). During the ASR testing program period from 1998 through 2007, the Monterey Peninsula Water Management District (MPWMD or District) established the effectiveness of ASR in the SGB, and successfully transitioned the testing program into a permanent project at the Phase 1 site in 2008.

The MPWMD has been developing the ASR Project as a phased project. This project phasing is necessitated by the timing of funding availability. The primary funding source to date has been the MPWMD’s Mitigation Program User Fee that is paid by users of the municipal water supply on the Monterey Peninsula, primarily provided by the Monterey District (main system) of California American Water (Cal-Am). Each project phase (i.e., site) has been designed to include two full-scale ASR wells plus all the ancillary facilities needed to operate the wells in both injection and extraction modes. Each site operates as a two-well couplet facility so the needed infrastructure can be shared, thereby reducing the costs associated with this infrastructure, compared to single-well ASR sites. As of December 2010, the first phase of the ASR Project (Phase 1), is approximately two-thirds complete. The bulk of the remaining work at the Phase 1 site is scheduled for completion by the end of Fiscal Year 2010-11 (June 30, 2011). The Phase 2 site is in the early stage of development and is the current focus of the MPWMD’s efforts on expansion of the ASR Project. The locations of the two ASR sites are shown on [Figure 1](#). The general site plan for the Phase 2 ASR site is shown on [Figure 2](#).

Goals and Objectives:

Enhance aquatic habitat in the Carmel River during the low-flow regime: By focusing on recovering stored ASR water in the summer months in lieu of pumping from the Carmel River, diversion during the critical summer months will be reduced.

The Carmel River supports populations of steelhead (*Oncorhynchus mykiss*), Pacific lamprey (*Entosphenus tridentatus*), river lamprey (*Lampetra ayresi*), Coast Range sculpin (*Cottus aleoticus*), prickly sculpin (*Cottus asper*), riffle sculpin (*Cottus gulosus*), Sacramento hitch (*Lavinia exilicauda*), threespine stickleback (*Gasterosteus aculeatus*), Sacramento blackfish (*Orthodon microlepidotus*), starry flounder (*Platichthys stellatus*), shiner perch (*Cymatogaster aggregata*), Pacific staghorn sculpin (*Leptocottus armatus*) (in the lagoon and lower river), brown trout (*Salmo trutta*), goldfish (*Carassius auratus*), green sunfish (*Lepomis cyanellus*), bluegill (*Lepomis macrochirus*), mosquitofish (*Gambusia affinis*), carp (*Cyprinus carpio*), black

bullhead (*Ictalurus melas*), and large-mouth bass (*Micropterus salmoides*). A single sighting of striped bass (*Morone saxatilis*) in the Carmel River Lagoon indicates that this species is an infrequent visitor. California state law and California Fish and Game Commission policies stipulate that healthy steelhead populations shall be protected or restored by controlling the harvest of adults, providing suitable spawning grounds, and maintaining rearing habitat for juvenile steelhead. The ongoing survival of the Carmel River population, however, is jeopardized by the historical development of water resources within the Carmel River Basin, the recent periods of drought, and other environmental problems. In 1986, the California Department of Fish and Game (CDFG) expressed concern that the steelhead population in the Carmel River was threatened with becoming a remnant run and adopted statewide policies and a management goal to maintain it as a self-sustaining resource and to restore it as much as possible to its historic level of productivity (Snider 1983; McEwan D. and T. A. Jackson 1986). For this goal to be accomplished, environmental problems that limit habitat and reduce opportunities for adult migration and juvenile emigration will have to be corrected.

Compared to No Project conditions, operation of the ASR Project would improve opportunities for upstream migration by slightly increasing the duration of attraction flows and lengthening the duration of the migration season. On average, the ASR Project would provide 38 days of attraction flows (the minimum flows, ranging from 75 cfs to 200 cfs depending on year type, that induce steelhead to enter the river from the ocean) and would provide at least two weeks (14 days) of attraction flows during the average dry, below-normal, above normal, and wet years. Although the average number of attraction days and the duration is increased by only one day, in dry years the attraction days are increased by two days and the duration of the migration season increases by three days. Although small, these differences are considered a significant beneficial impact because steelhead migrate over a short time period of three to six-weeks in dry years, so increases of a few days in years with naturally overwhelming constraints will increase the probability that a larger portion of the potential run will successfully migrate and spawn in the upper river. For this reason, the overall impact on upstream migration is considered a beneficial impact.

Compared to No-Project conditions, the ASR Project would slightly reduce flows for smolt habitats during wet, above normal, and below normal years, but improve flows during dry and critically-dry years. This is a direct consequence of changing Cal-Am's existing production system to inject surplus water into the Seaside Basin during wet periods and to restrain production from the Carmel River Basin during the spring of dry and critically-dry years. Opportunities for successful smolt emigration would be most improved during selected dry and critically-dry years, when flows into the Lagoon would be significantly increased as a direct result of Project operations. In addition to improving opportunities for smolt emigration, the ASR Project slightly reduces the risk of isolating and stranding steelhead smolts in the lower Carmel River. Overall, these changes are considered a beneficial impact.

Increase the reliability of the water supply: Banking water in the wetter years and recovering the banked water during drier water years will create a sustainable drought resistant source of water for the Monterey Peninsula. Approximately 2,000 acre-feet per year on average will be produced by this project. Because this water is diverted under a water right that is jointly held by MPWMD and Cal-Am, this is a new water source to the Cal-Am system. By recovering the water from this water bank in-lieu of pumping in the Carmel River, this new water source is augmenting the current sources as well as reducing water that is pumped from the Carmel River above Cal-Am's legal rights.

Reduce the cost of water resources to the Cal-Am rate payer: The ASR Project is an additional source of water that is more cost effective than water purchased from a regional desalination plant.

Resolve significant water-related conflicts: The ASR Project will facilitate a reduction in the volume of water pumped from the Carmel River System that is in excess of the water right held by Cal-Am.

Purpose and Need:

Note: additional information on the need for this project, including ramp-down requirements in water supply production is presented in the overall Work Plan for the Proposal.

Background: The MPWMD manages and regulates the use, reuse, and conservation of water within its boundaries on the Monterey Peninsula. About 80% of the water consumed within the District boundaries is produced and distributed by Cal-Am, a private company that serves approximately 95% of Monterey Peninsula residents and businesses.

Water supply for the Monterey Peninsula is derived from wells in the Carmel Valley Alluvial Aquifer and the Seaside Groundwater Basin. Approximately 70% of the water delivered by Cal-Am is extracted from the Carmel River Basin. Cal-Am owns two dams and 18 wells along the Carmel River Corridor. For many years it has been recognized that the existing levels of pumping from the Carmel River Basin have adverse effects on the Carmel River natural resources, particularly in dry years.

Regulatory and environmental water-use restrictions on the Monterey Peninsula's surface water and groundwater resources can be summarized as follows.

- **Carmel River** – Dams were used to capture surface water for delivery to the Peninsula starting in the late 1800's, but these reservoirs have filled with sediments and have significantly reduced their storage capacity. Water trapped behind the dams is released throughout the summer months to provide fish rearing flows for the federally listed Steelhead Trout. These flows are released in an effort to partially offset impacts associated with pumping the municipal wells along the river corridor in the summer months. Direct diversion from the river is strictly regulated, particularly during low-flow periods. Accordingly, no diversions of surface water for municipal use have occurred since 2002.
- **Carmel Valley Alluvial Aquifer** - As the main stem reservoirs filled with sediment and storage was lost, Cal-Am increased reliance on wells producing from the alluvial sediments beneath the river. Due to heavy seasonal pumping and periodic drought conditions, flows in the river were greatly reduced in the summer and riparian vegetation began to die. In response to complaints about the impact of Cal-Am's pumping of wells along the Carmel River Alluvial Aquifer on environmental resources including threatened steelhead fish, riparian vegetation and wildlife, the State Water Resources Control Board (SWRCB or State Water Board) imposed Order 95-10 in July 1995. Order 95-10 classified the groundwater in the Carmel River Alluvial Aquifer as water under the State's surface water jurisdiction and established regulatory control. This order declared that approximately 70% (10,730 acre-feet per year [AF/Y]) of the then-existing annual Cal-Am production was without valid water rights and was damaging the Carmel River environment, and imposed interim water-use restrictions until diversions could be permanently reduced. To meet the water demands of the Monterey Peninsula, Cal-Am began to shift some of its Carmel River Aquifer pumping to the Seaside Basin. In 2009, the SWRCB adopted Order 2009-0060 ("Cease and Desist Order" [CDO]), which imposed additional requirements and set an aggressive schedule for reducing Carmel Valley Aquifer diversions for compliance with the Order 95-10 allowed amount of 3,376 AF/Y.
- **Seaside Groundwater Basin** - To offset the required reduction in pumping from the Carmel River Basin as outlined in Order 95-10 and re-affirmed in the 2009 CDO, pumping of water from the Seaside Basin increased significantly, beginning in 1995. This increased pumping caused a long-term trend of lowering groundwater levels. Because the falling water levels were viewed as a threat to the

long-term viability of the Seaside Groundwater Basin as a reliable source of municipal water supply, in 2003 Cal-Am filed a legal claim that initiated an adjudication process to define groundwater rights. As a result of the adjudication process, the Seaside Basin has been declared in a state of overdraft and the annual extraction volumes from the basin are set to be reduced on a triennial schedule until the annual pumping matches the sustainable yield of the Seaside Basin.

As described above, the State Water Resources Control Board (SWRCB) is now the entity that exercises regulatory authority over water from the Carmel River Alluvial Aquifer, including the administration of appropriative water rights. Also in 1995, the SWRCB issued a decision (Decision 1632) that quantified water rights held (or permits that need to be obtained) by various entities in Carmel Valley. The decision determined that the Carmel River is fully appropriated in the drier season of the year (May 1 to December 31). MPWMD was issued water rights associated with a main stem reservoir on the Carmel River known as the New Los Padres Reservoir Project (SWRCB Permits 20808 and 7130B). As part of the MPWMD's ASR project testing in the Seaside Basin, the SWRCB issued annual temporary urgency permits to MPWMD to divert Carmel River water for injection well testing beginning in 1998. In October 2001, MPWMD submitted a petition for change based on the 1995 water rights permits associated with the New Los Padres Reservoir Project. The petition requests use of the Seaside Basin as a place of storage for some of the Carmel River water, rather than using a dam and reservoir on the Carmel River. The MPWMD petition was revised in September 2003.

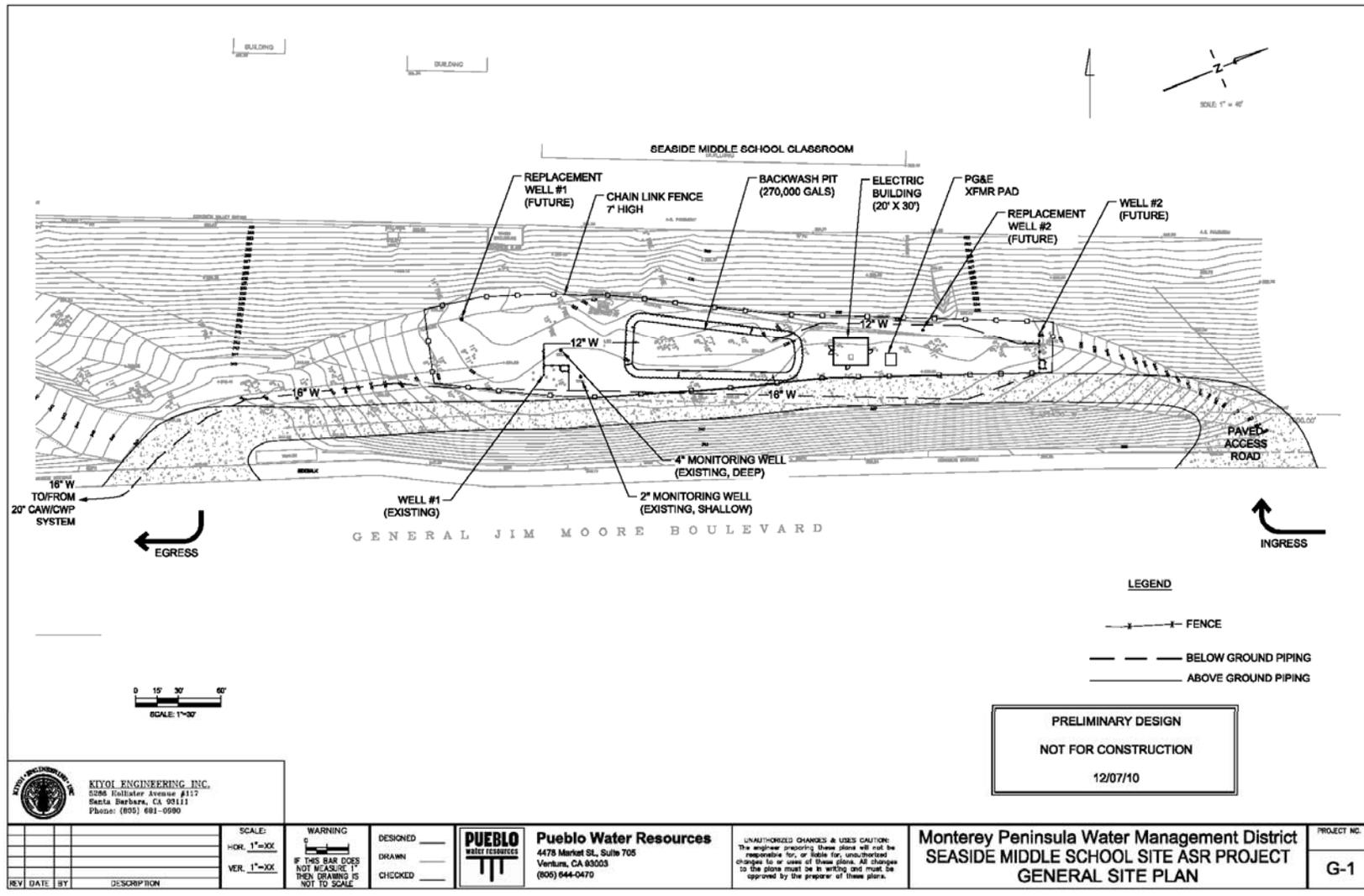
Figure 1 – Project Map



U:\j\ar\ASR Site 2\Temporary Easement Discharge.mxd

Locations are approximate based on MPWMD files.

Figure 2. Phase 2 ASR Project Preliminary Site Map



 **KIYOL ENGINEERING INC.**
 3286 Hollister Avenue #112
 Santa Barbara, CA 93111
 Phone: (805) 681-0990

SCALE:	WARNING
HOR. 1"=XX'	
VER. 1"=XX'	IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE
REV. DATE BY DESCRIPTION	

DESIGNED _____	
DRAWN _____	
CHECKED _____	

Pueblo Water Resources
 4478 Market St., Suite 705
 Ventura, CA 93003
 (805) 644-0470

UNAUTHORIZED CHANGES & USES CAUTION:
 The engineer preparing these plans will not be responsible for, or liable for, unauthorized changes to or uses of these plans. All changes to the plans must be in writing and must be approved by the preparer of these plans.

Monterey Peninsula Water Management District
SEASIDE MIDDLE SCHOOL SITE ASR PROJECT
GENERAL SITE PLAN

PROJECT NO.
G-1

Task List:

MPWMD is moving toward completion of the Phase 1 site (Santa Margarita Site) and is in the process of developing the Phase 2 site (Seaside Middle School Site). The Phase 1 ASR site is approximately two-thirds finished and is scheduled for completion by June 30, 2011 (i.e., end of Fiscal Year 2010-11). The task objectives remaining to bring the Phase 2 ASR site to full development are outlined below.

1. Complete Seaside Middle School (SMS)-1 Well Foundation
2. Conduct Backflush Pit Soils Investigation
3. Develop Facilities Design
4. Obtain Site Permits
 - a. City of Seaside Use and Building Permits
 - b. County of Monterey Environmental Health Well Permit (2nd ASR Well)
 - c. Regional Water Quality Control Board
 - d. State Water Resources Control Board
5. Install SMS-1 Pump & Motor
6. Complete Underground Piping from Gen. Jim Moore Blvd. (GJMB)
7. Install SMS-1 Downhole Flow Control Valve
8. Install SMS-1 Temporary Wellhead Piping
9. Complete Site Grading for Underground Utilities
10. Complete Site Grading for Access from GJMB
11. Install SMS-1 Well Permanent Equipment
12. Install Diversion Wall below site
13. Complete Backflush Pit Construction
14. Install Site Fencing, Paving
15. Construct Building to House Electrical Control Equipment
16. Finish Building Interior; Install Control Equipment
17. Drill and Construct SMS-2 Well
 - a. Drill pilot boring
 - b. Ream pilot boring
 - c. Install well screen and blank casing
 - d. Install gravel pack and cement seals
 - e. Install surface well foundation pad
18. Install SMS-2 Well Pump & Motor
19. Install SMS-2 Well Downhole Flow Control Valve
20. Install SMS-2 Well Permanent Wellhead Equipment

Completion of the above objectives will facilitate achieving the goals set forth in the enabling act of the District. Specifically the project would augment the water supply through integrated management of ground and surface water resources and foster the scenic values, environmental quality, native vegetation, fish and wildlife, and recreation on the Monterey Peninsula and in the Carmel River basin.

On average, operation of both of the ASR project sites will divert 2,000 Acre-Feet per year from the Carmel River for storage and recovery in the Seaside Groundwater Basin. This operation has a multi-faceted benefit that covers supplemental water supply to the Cal-Am system, greater compliance with regulatory production restrictions, and increased aquatic habitat in the Carmel River.

Phase 2 Site Permitting Status:

The Phase 1 Santa Margarita ASR Site has undergone complete CEQA and NEPA review and is fully

permitted. MPWMD will obtain an addendum to this document that will extend the permits to the Phase 2 Seaside Middle School Site. Initial meetings with permitting agencies indicate this will be acceptable because there are no new CEQA issues raised by the Seaside Middle School Site that are not covered in the Santa Margarita Site EIR. This work is to be completed before June 30, 2011.

District staff has been working with the City of Seaside planning staff since mid-2010 facilitate successful completion of the city use permit application for the Seaside Middle School Site. This work is to be completed before June 30, 2011.

The Water Rights permit application for the Phase 2 ASR Project was filed with the SWRCB in June 2008. Issuance of the permit is anticipated in the first quarter of Calendar Year 2011.

The Well Construction Permit for the SMS-2 Well at the Seaside Middle School Site will be acquired from the Monterey County Environmental Health Department. This process takes approximately 10 working days. This work will be completed prior to well construction in 2013.

The technical specifications for the Seaside Middle School Site are at 90%, so bulk of the engineering work has been completed.

District staff will obtain the required permits and perform contract administration. Staff that will be involved are listed below:

Joe Oliver, Water Resources Division Manager, will act as project lead for the District. His benefits compensated salary rate is \$107/hr and he will put a minimum of 16 full time weeks into the project to aid in design, permitting, and construction, for an estimated cost of \$68,400 (16 weeks x 40 hr/wk x \$107/hr = \$68,400). The District utilizes a 5 tier step salary advancement program and a yearly COLA adjustment. Joe is at the top of his step range but will be available for the COLA (which is tied to the San Francisco inflation index) every July.

Jonathan Lear, Senior Hydrogeologist, will act in a supporting role and provide technical assistance during all construction tasks at the Phase 2 site. Jonathan Lear has a benefits compensated rate of \$80/hour and will put in a minimum of 19 full time weeks into supporting the project lead , for an estimated cost of \$60,800 (19 weeks x 40 hr/wk x \$80/hr = \$60,800). The District utilizes a 5 tier step salary advancement program and a yearly COLA adjustment. Jonathan is at the bottom of his step range and will be eligible for 5% increases every November. He will also be available for the COLA (which is tied to the San Francisco inflation index) every July.

Both Joe and Jonathan are Registered Geologists and Certified Hydrogeologists with the state of California and will complete all work requiring these registrations for the District.

Phase 2 Site Development Schedule:

The schedule for full development of the Phase 2 Seaside Middle School Site is provided in [Attachment 5](#). This schedule has been developed so that all potential noise-generating work is completed during the summer months when the school is not in session. This schedule minimizes the potential for noise-related disruptions to school activities, at the request of the property owner, the Monterey Peninsula Unified School District. The requested grant funding for the ASR project in this application is for the drilling and installation of the second ASR well at this site (i.e., SMS-2 Well). In [Attachment 5](#), the drilling and construction of the SMS-2 Well is scheduled for the Summer of 2013. This schedule can be accelerated if funding becomes available to conduct this work at an earlier date.

Description of SMS-2 ASR Well Construction:

Well Construction – Construction of the second ASR well at the Seaside Middle School Site will require the following:

- Noise control/Sound Barrier – Assemble a noise barrier to meet construction permit requirements for noise control.
- 34 in dia. Carbon steel conductor casing – Conductor casing is used in well construction to stabilize the top 50 feet of the borehole while construction of the well is taking place. The casing will be American steel and purchased from American manufactures.
- 22" dia. Stainless steel blank casing – Blank casing is a component of the finished well and is installed in the borehole above the well screens. An estimated amount of 500 LF will be required to construct the wells. The casing will be American steel and purchased from American manufactures.
- 20" dia. Stainless steel wire wrapped screen – Screens allow water to flow into the well. An estimated amount of 200 LF will be required to construct the wells. The screens will be American steel and purchased from American manufactures (Johnson screens).
- 20" dia. Stainless steel blank casing – Blank casing used in well construction and to maintain structural integrity of the well.
- 20" dia. Stainless steel cellar and cap – Installed below the screened interval of the well to collect particles that would otherwise clog the well screens.
- 3" dia. Carbon steel gravel tremie pipe – Small pipe installed in the well bore and used to place the gravel pack and concrete seals in the bore during well construction.
- 3" dia. Stainless steel sounding pipe – Small pipe installed adjacent to the eductor pipe inside the outer casing to provide access to the well for the purpose of measuring water levels after the well construction is completed.
- 3" dia. SS chlorination access pipe – Pipe installed at well head that will provide access for chlorination of water during production prior to the water entering the Cal-Am distribution system.
- Gravel pack – Gravel installed in the borehole to allow water to pass from the formation to the well screens. Gravel is installed via tremie pipe during well construction.
- Cement grout – Grout is installed above the gravel pack in the well to seal the well and provide sanitary protection to the water source and protect the integrity of the well. Grout is installed via the tremie pipe during well construction.

Construction items that will be shared between the ASR facilities.

- Motor Control Center (MCC) and Variable Frequency Drive (VFD) assembly – The MCC and VFD units will allow operation of both ASR wells independently.
- Electrical control system – System to operate and control wells and automated valves. Control system will allow for variable speed operation of injection wells and will tie into the Pacific Gas and Electric 21 kva transformer to be located on site.. Control system will be linked to a SCADA system so

that it can be locally or remotely operated.

- Bollards – Protective traffic barrier to the wells and buildings housing chemical treatment and electrical controls.
- Water Pipe – Pipe used to inter-connect Phase 2 ASR wells to the the Cal-Am system. Each well will require a tie-in.
- Energy Dissipaters – Two energy dissipaters will be required at the backflush pit: one for each well. The dissipaters reduce the impact velocity of water entering backflush pits during backflush cycle of the injection wells. The dissipaters prevent erosion of the loosely consolidated sands onsite.
- Baserock – Baserock will be used as road base to each of the two new ASR wells. Baserock will also be used as underlayment for the paved ingress and egress road to the site.

Completed Work: As of December 2010, the Phase 1 Santa Margarita ASR site contains 2 wells, temporary power and chlorination facility. A permanent chemical and electrical building is currently under construction and should be completed in the first quarter of 2011. This site is connected to the Cal-Am system

The Phase 2 Seaside Middle School ASR site contains one well without a pump or power and it is not connected to the Cal-Am system. During the first quarter of 2011, permanent wellhead (pedestal) construction will be completed. Engineering design is 75% for the Seaside Middle School Site.

Water rights are secured for the Santa Margarita Site. Water rights for the Seaside Middle School Site are expected to be approved in early 2011.

Existing Data and Studies:

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Project Timing and Phasing (assuming receipt of funds to be June 1, 2011):

(See Schedule in Attachment 5)

ATTACHMENT 3. WORK PLAN - CITY OF MONTEREY – SEWER LINE REHABILITATION GRANT PROPOSAL

SUMMARY:

The Cities of Monterey and Pacific Grove have agreed to let Monterey take the lead in this partnership in coordinating a \$1.0 million sewer line rehabilitation project within the Pacific Grove ASBS area where moderate to severe deterioration has been observed and where failure is imminent. A MOU has been drafted outlining each party's responsibilities and obligations per this agreement. Partial funding for the renewal and repair of just the C to F rated pipes sewer mains within the ASBS drainage area is requested from Proposition 84 funding available through the Department of Water Resources (DWR), which the City of Monterey has agreed to manage the grant program. CEQA documentation will be filed as a single project with Monterey submitting the disclosure documentation.

Goals and Objectives:

The project will address a portion of the estimated \$13 million in needed sewer system repairs and replacement in the Cities of Monterey and Pacific Grove.

Recreation and public access – This project will seek to improve the reliability of the sewage systems of Monterey and Pacific Grove. Improved reliability will reduce the number of sewer system overflows (SSOs), as well as exfiltration from damaged pipes, leading to a reduction in beach closures and postings.

Water quality protection and improvement – Improving the cities sewer systems will reduce microbial contamination of surface and near-shore ocean waters. Additionally, emerging contaminants such as personal care products and other compounds associated with human waste will similarly be reduced.

NPS pollution control – This project will reduce NPS pollution from exfiltrating sewage lines.

Water and wastewater treatment – This project will improve wastewater treatment by reducing system failures and repairing deficiencies that reduce overall system

Purpose and Need:

The Monterey Peninsula is a unique interface between the land and sea that draws 5 million visitors each year to the county and generates 1.75 billion dollars of tourism revenue (2.46% of the California total, 2005). Residents and visitors alike are passionate about preserving the health of the marine environment.

The Monterey Peninsula's vitality is dependent on the health of the ocean that surrounds it. One of the greatest threats to the region's economic stability and environmental health is the adverse impact posed by poor water quality and by beach closures or postings. World class diving, kayaking, surfing and swimming lure thousands into waters that represent a growing health risk. The Peninsula is also home to the nation's largest kelp forests which are exceptionally rich in species diversity and provide key habitat for threatened populations of Southern sea otter. Human pathogens such as gastrointestinal parasites, have recently been documented in local sea otters and may be a factor in the slow recovery of the species. The Monterey Peninsula also has a significant aquaculture and kelp harvesting industry that is highly dependent upon unpolluted water.

Unfortunately, these uses can all be adversely impacted by beach closures and postings. Contributing factors to postings and closures include anthropogenic sources such as cracks, leaching and clogging in aging sanitary system infrastructure and illicit connections. These problems must be addressed by repairs and replacements at known locations of pipe failure as well as additional diagnostic work on the lines.

Both the City of Monterey and the City of Pacific Grove have evaluated their sewer systems and identified

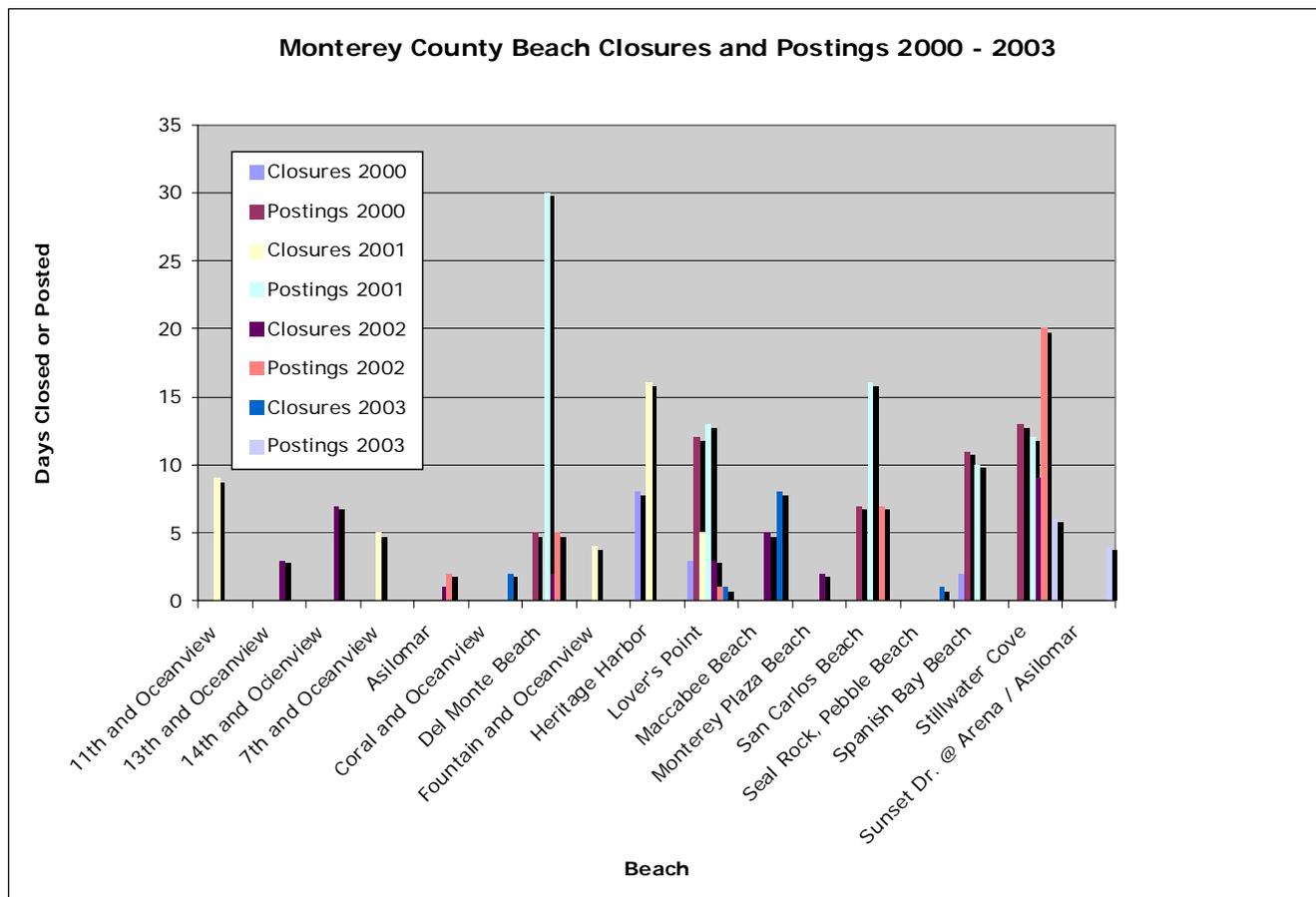
priority repair and replacement projects. Funding for the most critical projects (sewer lines graded C, D, or F; A for good condition through F for failing) is requested under this grant. Old or damaged sewer lines can lead to discharges of untreated waste through exfiltration to adjacent soil and ground water, or through sewage system overflows that result from catastrophic pipe failures or ruptures.

City of Pacific Grove

In May of 2004, the City of Pacific Grove accepted a Sewer System Asset Management Report 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).

City of Monterey

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 rated in the ‘C’, ‘D’, and ‘F’ categories. In September 2002, the first project was completed at a cost of approximately \$700,000.



Task List:

Task 1 – Planning

- Draft Professional Service Agreement (PSA) recognizing the City of Monterey as the Lead Agency, and the City of Pacific Grove a Cooperating Entity. Include indemnification agreement and each party's responsibilities.
- Prepare a single California Environmental Quality Act (CEQA) document for the entire project. Since the City of Monterey will be conducting work in the City of Pacific Grove, an agreement must first be made where Pacific Grove grants Monterey the authority to take the lead. A categorical exemption will then be filed under maintenance of existing utilities (15301).
- Complete planning and design for sewer line pipe bursting and open trench replacement.
- Complete plans and specifications for potential bidders to review.
- Establish a dedicated account with Finance Department to hold matching funds.
- Prepare and implement a Project Assessment and Evaluation Plan (PAEP) to detail the methods of measuring Project benefits and reporting them in accordance with a PAEP.
- Prepare Global Position Satellite (GPS) information for project site and monitoring locations.

Task 2 – Implementation

- Council to adopt a resolution approving Sewer line Rehabilitation Project. Secure matching funds into a dedicated account.
- City of Monterey to file Notice of Exemption (NOE) with the county clerk.
- Call for bids. Advertise project.
- Open bids. Award project.
- Submit work order for the City of Monterey Capitol Projects division or use the on-call Project Management/Inspection Services.

Task 3 - Construction

- Initiate Construction (Notice to Proceed)
 - Mobilization
 - Prep work
 - Call in Underground Service Alert (USA) to locate utilities
 - Traffic control plan

- Notify residences and businesses that may be affected
- Hydro jet line to remove debris and roots
- CCTV pre-inspection to confirm/locate defects and lateral connections
- Bypass pumping
- Remove protruding taps and perform spot repairs as needed
- Open trench replacement
 - Re-establish service connections
- Pipe burst
 - Re-establish service connections
- Post construction inspection

Task 4 – Monitoring – see in attachment 6

Task 5 – Project Reporting

- Progress Reports
- Annual Project Assessment and Evaluation Plan Report (PAEP)
- Annual Executive Summary Report
- Draft Project Report
- Final Project Report

Figure 1 – Project Map

Proposed Sewer Main Repairs Cities of Monterey and Pacific Grove



DESIGNED BY: _____
 DRAWN BY: _____ CITY OF MONTEREY
 CHECKED BY: APPROVED _____
 DATE: _____ SENIOR ENGINEER _____ REGIST. NO. _____ DATE _____

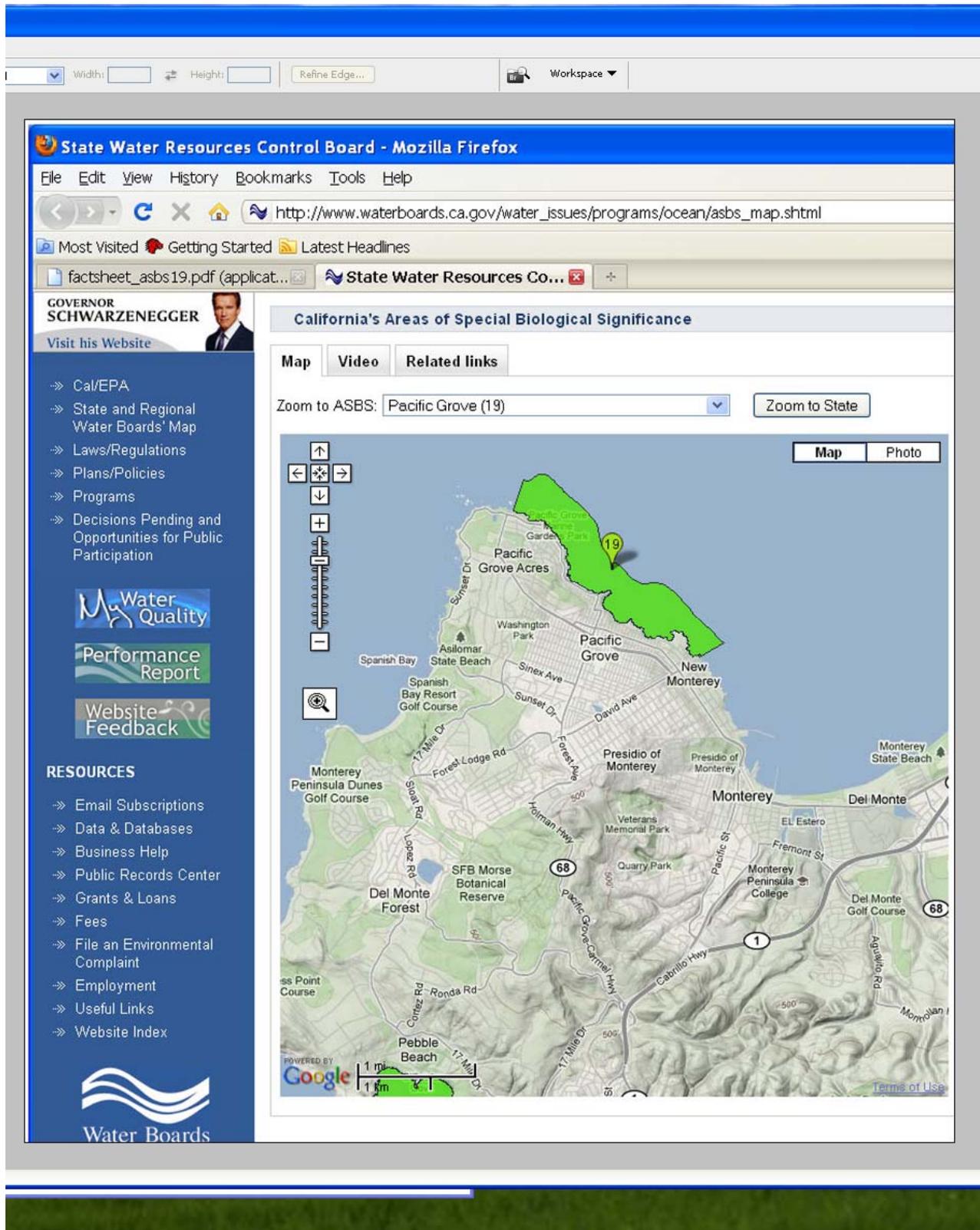
Cities of Monterey and Pacific Grove
 ASBS Project Locations

REVISIONS	DATE	SCALE
		1 inch = 200 feet
		DRAWING NAME
		PROJECT NAME

C1.0



Figure 2: Pacific Grove Area of Special Biological Significance



Completed Work:

City of Pacific Grove

In May of 2004, the City of Pacific Grove accepted a Sewer System Asset Management Report 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).

City of Monterey

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 rated in the 'C', 'D', and 'F' categories. In September 2002, the first project was completed at a cost of approximately \$700,000.

Existing Data and Studies:

1. HDR Engineering, Inc., (2004) City of Pacific Grove Sewer System Asset Management Plan

Project Timing and Phasing (assuming receipt of funds to be June 1, 2011):

Project is ready to go. Matching funds have been identified. No permits are expected to be needed.

ATTACHMENT 3. WORK PLAN - CITY OF MONTEREY – SOLID WASTE REMOVAL TECHNOLOGY (FROM STORM WATER)

SUMMARY:

This project would curb solid waste and sediment emissions from two locations in the City of Monterey. The two sites have been chosen based on their large upstream drainage areas and their propensity for collecting solid waste. 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. These storm drain diversion improvements would be constructed such that they can be modified in the future for dry weather diversion into adjacent sewer mains. During the dry weather months, volunteers visit the outfalls just downstream of these sites weekly to take water samples and to observe outfall conditions.

The City of Monterey and the Monterey Bay Sanctuary Citizen Watershed Monitoring Network have noticed the daily accumulation of trash and sediments in the storm drains near heavily visited areas along the coast. To help mitigate potential negative environmental impacts to the Sanctuary, the City of Monterey is currently cleaning affected storm drains by vacuuming out accumulated trash and sediments prior to the winter rains. This proposal is aimed at improving our remediation efficiency by removing trash and sediment from urban runoff continuously throughout the year. Since the majority of our storm flows are minimal (85th percentile) the majority of the storms would flow through each of the units continuously collecting debris and sediment.

The units can store these contaminants until the crews can clean them. See attached typical storm water treatment unit installed to the existing storm drain pipe. Testing samples of these outfalls in the past have shown heavy metals in the sediment, the inclusion of a fine particle separator will help in eliminating the heavy metals.

Goals and Objectives:

Recreation and public access – This project will remove trash from recreational beaches, improving the quality of the recreational experience.

Water quality protection and improvement – Trash is a common pollutant found in urban runoff; this project will reduce the amount of trash in several key areas in the planning region.

NPS pollution control – This project will reduce NPS pollution from urban runoff.

Purpose and Need:

The purpose of this project is to curb emissions of solid waste from two key areas in the City of Monterey. The lower third of the watershed draining to the Steinbeck Plaza/Prescott Avenue storm drain outfall is comprised of commercial properties including a large tourist area. The Olivier Street/Scott Street storm drain is a 60” diameter pipe collecting drainage from much of the Old Monterey residential neighborhood as well as the Calle Principal commercial district and an area of the Monterey State Historic Park around Custom House Plaza. The State Historic Park is host to many festivals and functions throughout the year which attract many visitors to this area.

Solid wastes, including styrofoam cups, plastic bags, styrofoam packaging material, and cigarette butts have been increasingly discharged to the MBNMS from these outfalls over the past several years. Though volunteers pick up refuse along the beach below these outfalls several times each week, this technology would be much more effective at reducing trash discharges.

Figure 1 – Project Map



Legend

- DRAINAGE BASIN
- CITY BOUNDARY
- STORM DRAIN

PROPOSED LOCATION:
SOLID WASTE REMOVAL
TECHNOLOGY (STORMWATER)

PROPOSED LOCATION:
SOLID WASTE REMOVAL
TECHNOLOGY (STORMWATER)



DESIGNED BY:	CITY OF MONTEREY		
DRAWN BY:			
CHECKED BY:	APPROVED:	_____ SIGNATURE	_____ DATE
DATE:			

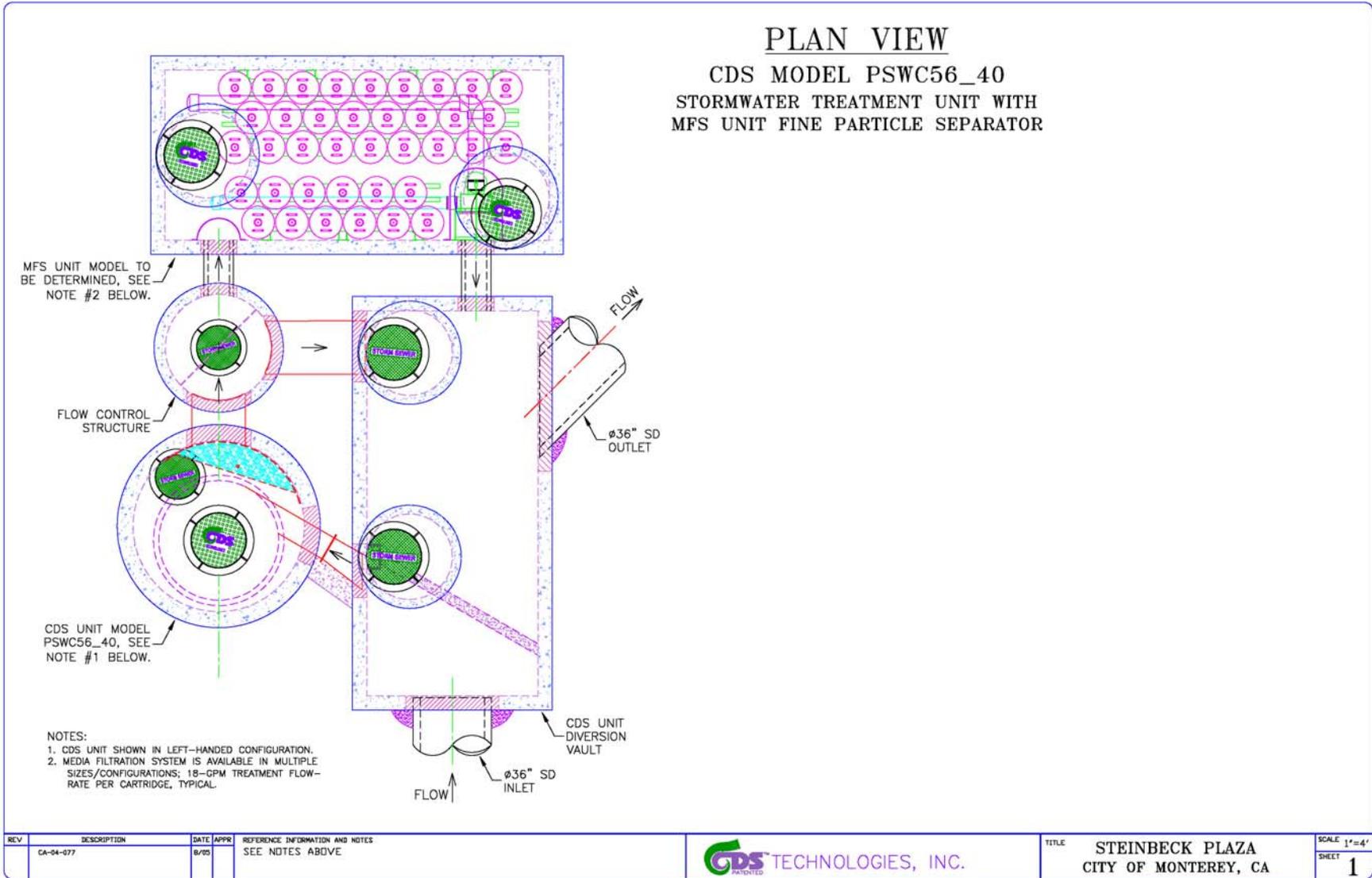
IRWMP SEWERLINE IMPROVEMENTS
MONTEREY AND PACIFIC GROVE
Stormdrain Drainage Basins

REVISIONS	DATE	NO	SCALE
			1" = 62.5' (AS SHOWN)

DRAWING NAME	C1.0
PROJECT NAME	



Figure 2



Tasks

Task 1 – Planning

- City to prepare staff report to council with recommendation to approve Implementation of Solid Waste Removal Technology (storm water) systems. Council to adopt a resolution approving project, dedicating matching funds to an account, and agreement to enter agreement with the state.
- Prepare a California Environmental Quality Act (CEQA) document for the entire project.
- 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.
- Update the 2006 preliminary design for Implementation of Solid Waste Removal Technology (storm water) installation.
- Complete project plans and specifications for potential bidders to review.
- Establish a dedicated account with Finance Department to hold matching funds.
- Prepare and implement a Project Assessment and Evaluation Plan (PAEP) to detail the methods of measuring Project benefits and reporting them in accordance with a PAEP.
- Prepare Global Position Satellite (GPS) information for project site and monitoring locations.

Task 2 – Implementation

- Council to adopt a resolution approving Implementation of Solid Waste Removal Technology (storm water) Project. Secure matching funds into a dedicated account.
- City of Monterey to file Notice of CEQA with the county clerk.
- Call for bids. Advertise project.
- Open bids.
- Submit and receive AOA approval of bid.
- Award project.
- Submit work order for the City of Monterey’s Capitol Projects division or use the on-call Project Management/Inspection Services.

Task 3 - Construction

- Initiate Construction (Notice to Proceed)

- Mobilization
- Prep work
 - Call in Underground Service Alert (USA) to locate utilities
 - Traffic control plan
 - Notify residences and businesses that may be affected
 - Hydrojet line to remove debris
 - CCTV pre-inspection to confirm/locate existing storm drain locations
- Install units and connect to existing storm drain system.
- Post construction inspection

Task 4 - Monitoring- see attachment 6

Task 5 - Project Reporting

- Progress Reports
- Annual Project Assessment and Evaluation Plan Report (PAEP)
- Annual Executive Summary Report
- Draft Project Report
- Final Project Report

Completed Work:

Existing Data and Studies:

Project Timing and Phasing (assuming receipt of funds to be June 1, 2011):

Project is ready to go. Matching funds have been identified, no permit delays are expected. The California Coastal Commission permit is the only permit that is needed. This is expected to be approved without controversy.

ATTACHMENT 3. WORK PLAN – CARMEL RIVER WATERSHED VOLUNTEER PROGRAM

Goals and Objectives: The overall goal of the CRWVP is to improve the health of the Carmel River watershed. To accomplish that overall goal, the proposed program includes following specific goals:

1. Develop a network of skilled volunteer monitors by training citizens to conduct flow, habitat and water quality monitoring, with professional oversight and quality control.
2. Assess water quality and habitat improvements deriving from IRWMP implementation through analysis of monitoring results, and help inform design of projects aiming to protect and restore the health of the watershed.
3. Improve the public's understanding of watershed issues through training and monitoring activities, as well as staff and volunteer activities focused on data analysis, public education and outreach.
4. Enhance citizen stewardship of the Carmel River watershed through implementation of small-scale best management practices (BMPs).

These goals and objectives are based on the four main components of the program, which are:

- ☑ Monitoring of water quality, river flow and habitat conditions,
- ☑ Data compilation and analysis,
- ☑ Public education and outreach programs, and
- ☑ Opportunities for watershed stewardship.

Specific objectives designed to achieve these goals are as follows:

Goal 1: Increase the amount and variety of monitoring data documenting the health of the Carmel River through scientifically-proven approaches to engage volunteers in watershed monitoring activities.

Objective 1.1: By May 31 of each year (2012, 2013 & 2014), all monitoring activities will be aligned with IRWM Plan. By December 31, 2011, existing scientific studies and other applicable literature will be collected for comparison to ongoing monitoring results. By December 31, 2011, a QA/QC Plan and Monitoring Plan to guide monitoring activities will be approved by CCRWCB/SWRCB staff. By May 31, 2012, the QA/QC Plan for watershed monitoring will be delivered to each MPIRWMP stakeholder.

Objective 1.2: By May 31 of each year (2012, 2013 & 2014), 34 monitoring events will have been conducted to assess water quality, flow and habitat conditions in the Carmel River watershed.

Goal 2: Habitat, water quality and flow monitoring results for the Carmel River are established as a publicly available resource for the community to learn about the health of the watershed.

Objective 2.1: Each monitoring event will have a QA/QC analysis of results within 90 days, in accordance with the USEPA- or SWRCB-approved QA/QC Plan. By May 31 of each year (2012, 2013 & 2014), monitoring results will be compared to historical results and applicable water quality objectives (WQO) in the CCRWQCB Basin Plan or CCAMP attention levels.

Objective 2.2: By May 31 of each year (2012, 2013 & 2014), 100% of the prior year's monitoring results will comply with CCRWQCB data formatting requirements. By May 31 of 2012, 2013 and 2014, 100% of the prior year's monitoring results will be published on the CCRWQCB data portal, CWC Data & Stewardship Portal, MBNMS SAM database, Monterey Bay Stormwater Management Program database, and California Environmental Data Exchange Network (CEDEN).

Objective 2.3: By May 31 of each year (2012, 2013 & 2014), 2 (6 total) public meetings will be held to communicate monitoring results and revisit MPIRWMP regional goals to individuals and community organizations. By May 31 of each year, promotional campaigns to drive community groups and individuals to

on-line databases of results will be developed and implemented. Objective 2.3 also relates to meeting Goal 3.

Goal 3: The public will understand more about the health of the Carmel River watershed, including impacts, threats and areas for improvement.

Objective 3.1: By May 31 of each year (2012, 2013 & 2014), 20 volunteers will have participated in classroom and/or field trainings on watershed monitoring protocol, per the QA/QC Plan. (60 trained volunteers over 3 years). By December 31 of each year, 2 college interns will be engaged to assist CWC staff in leading watershed monitoring and stewardship efforts. By May 31 of each year, 60% of trained volunteers will demonstrate a 40% improvement in their understanding of watershed issues and MPIRWMP regional goals.

Objective 3.2: By May 31 of each year (2012, 2013 & 2014):

- 4 presentations on Carmel River watershed issues, MPIRWMP goals and objectives and SWRCB/DWR statewide priorities, will be made to civic groups and local clubs (12 total);
- 3 Carmel River watershed-focused presentations will be made to water agencies/companies, city councils and/or county commissions/boards, including results of education, monitoring and stewardship efforts (9 total);
- 8 businesses will be identified to serve as watershed champions, raising awareness of Carmel River watershed issues and communicating the overall goals of the MPIRWMP projects and process (8-24 total);
- 6 presentations will be made to local elementary and middle schools, incorporating Carmel River watershed issues into existing CA State Science Standards (18 total);
- 4 lesson plans for classroom activities or field trips focusing on Carmel River watershed health will be shared with local school teachers (12 total);
- 1 presentation will be made to CSUMB Watershed Institute students to encourage research projects focusing on environmental and social science issues related to the Carmel River watershed (3 total).

Note: Objective 2.3 jointly serves Goals 2 & 3.

Goal 4: Monterey Peninsula residents will know about and engage in small-scale stewardship efforts to work towards improving the Carmel River watershed's overall health.

Objective 4.1: By May 31, 2012, 10 Carmel River Watershed Stewards will be recruited, selected and trained (8 sessions of 2+ hours each) to serve as champions of Goal 4 Stewardship efforts. The Watershed Stewardship leadership training course will include at least four of the following topics: watershed ecology, adaptive management principles, water quality and habitat monitoring protocol, community facilitation, conflict resolution and media outreach.

Objective 4.2: By December 31, 2011, 5 other local non-profits will be recruited by the Watershed Stewards to collectively serve as a "watershed hub" in charge of coordinating activities to pursue MPIRWMP goals.

Objective 4.3: By May 31 of each year (2012, 2013 & 2014), a Carmel River Watershed Yearly Community Action Plan will be revised, determining 6 priority stewardship actions to promote in the community for the year based on the Carmel River Watershed Assessment and Action Plan.

Objective 4.4: By May 31 of each year (2012, 2013 & 2014),

- 2 Carmel River clean-ups will be held (6 total);
- 2 invasive plant removal work days will be held (6 total);
- CWC's Watershed Citizen Toolkit will be downloaded from the internet 72 times (216 total downloads);
- 36 small-scale BMPs will be implemented and posted on CWC's Data & Stewardship Portal website

(72 total);

- 6 new BMPs will be added to CWC's Watershed Citizen Toolkit (18 total);
- 2 meetings will be held with MPIRWMP stakeholders as an opportunity for input to shape the education, stewardship and monitoring efforts of the hub and to report on progress (6 total).

Objective 4.5: By May 31 of each year (2012, 2013 & 2014), CWC will forward an independent evaluation report to MPIRWMP Stakeholders and DWR staff, including how the CRWVP might benefit other watersheds and scale up to other regions.

Purpose and Need:

As detailed in the CRWVP's goals and objectives, the purpose of the project is to encourage and create community ownership and involvement in the monitoring, stewardship and restoration of the Carmel River watershed. The CRWVP addresses most of the five statewide priorities as identified by DWR and SWRCB. It also represents progress towards the regional goals and objectives outlined in the MPIRWMP. For example, increasing levels of science literacy and understanding of hydrologic function and watershed ecology will benefit all efforts to address water supply, water quality and flood control issues. A more informed and aware citizenry is better able to dialog with the usual stakeholders leading integrated water resource efforts, such as water agencies, businesses and scientists. Further, by being active in education, stewardship and monitoring of the Carmel River, members of the public are taking productive steps to protect and preserve the natural resources their community relies on for a strong economy, quality of life, and public health and safety. As all residents in the watershed are beneficiaries of responsible use of these resources, the improved awareness and engagement resulting from CRWVP will help reduce conflicts when they arise, and help foster community-based and collegial solutions to the challenges this watershed and the region face.

Project List:

The CRWVP has four main components which are closely integrated with one another, and with the other projects in the IRWMP. The following project list follows these four components:

Project 1: Monitoring

CWC and regional partners will conduct water quality, flow and habitat monitoring throughout the Carmel River. Monitoring will follow USEPA and SWRCB protocols for safety, study design, field procedures, sample handling, and quality assurance/quality control. A quality assurance project plan (QAPP) will be prepared according to State of California (SWAMP) protocols. CWC has been conducting these rigorously-designed monitoring programs since 1995. CWC staff resources will be leveraged by using interns and trained volunteers to conduct monitoring activities under the direction of the CRWVP Project Manager. All monitoring efforts will have a two-fold goal of collecting scientifically valid data, while also educating the public and engaging the community to learn more about specific Carmel River watershed issues.

Project 2: Data compilation & analysis

Monitoring results will be compiled to present all field measurements and laboratory analyses into an accessible dataset. Guided by CWC's existing relationships with CCRWQCB staff, data formatting will follow the CCAMP format, which is SWAMP-compatible. Data will be posted to CWC's Data & Stewardship Portal to encourage public access and interpretation of results. Monitoring results will also be posted to other on-line databases, such as those managed by the CCRWQCB, MBNMS, CEDEN and USEPA. Existing data will be gathered to compare current results to historical and baseline values. Monitoring data will be evaluated in an effort to assess benefits to the watershed from IRWMP and other projects, as well as establish baseline conditions prior to major projects such as the San Clemente Dam removal and CAW plans to comply with SWRCB Order 95-10, which orders the company to cease unauthorized diversions from the Carmel River.

Project 3: Public education and outreach programs

CWC staff, interns and volunteers will partner with local organizations to plan, design and deliver workshops, presentations and discussions throughout the watershed during the three year project period.

Partners to be approached include an already robust group of civic groups and local clubs engaged in issues related to the River, as well as local schools, prominent businesses, researchers, city and county commissions and departments and appropriate staff at state and federal agencies. Many of these organizations have already worked together in developing the Carmel River Watershed Assessment and Action Plan.

Target audiences of the education and outreach efforts will include business owners, homeowners, members of disadvantaged communities, city and county leaders, water agencies, realtors, chambers of commerce, retired persons, sports club participants, and students at every level of school (K-12 & undergraduate and post-graduate school programs). Activities will include training for monitoring outings, river clean-ups, films, expert speaker series, open houses, presentations to clubs and water agencies, and informal education events to increase awareness about issues impacting the health of the Carmel River. Curriculum for education and outreach events will be based on CWC's existing NOAA-sponsored watershed school curriculum, which is specifically developed to inform audiences about Central Coast watershed issues, as well as components specific to the Carmel River.

Project 4: Watershed Stewardship

CWC will recruit 10 Watershed Stewards each year for three years. The Stewards will participate in a leadership training course which will prepare them as community mobilizers. Each year they will lead stewardship activities in the watershed, such as work days to replace invasive plant species, river clean-ups, public education workshops and monitoring events. A key set of activities for the Watershed Stewards will be to demonstrate to the community the variety of BMPs which individual landowners can implement to impact the Carmel River. They will creatively shape a suite of events to promote these BMPs throughout the watershed. Stewards will encourage residents to implement BMPs and to use CWC's on-line Stewardship Toolkit and Data & Stewardship Portal. The Toolkit provides resources to enable citizens to implement small-scale BMPs at their homes and businesses. The Portal allows members of the public to post photos and stories of BMPs they have implemented, and represents a unique approach to communicate a positive message to the community. The Portal is a unique effort to employ a social media-style approach to increase behavior change to affect watershed health. For residents who do not know what a BMP is, or which BMPs make sense for them, The Stewardship Toolkit offers ideas and instructions. The Toolkit and Portal are ongoing programs of CWC, and the Toolkit includes BMPs applicable to the Carmel River watershed. Once citizens have implemented BMPs at their homes or businesses, they can document their actions through the CWC Stewardship Portal, and the BMP implementation can be tracked and summarized to show progress in citizen-based water quality improvements over time.

Integrated Elements of Projects:

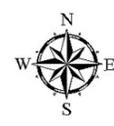
Each project in the Monterey Peninsula IRWMP (MPIRWMP) will benefit directly from the efforts of the CRWVP. This is because an educated and engaged population is a prerequisite for achieving the overall goals of the MPIRWMP and each individual project in the MPIRWMP group proposal. Responsible leadership by MPIRWMP stakeholders is critical but insufficient to realize true, sustainable improvements in the region's water supply reliability, water quality, overall environmental health and flood protection. Awareness on the part of the residents of the region, and furthermore, individual action towards progress, are necessary complements to the wise leadership of the MPIRWMP stakeholder organizations.

As stated, the anticipated changes on the Carmel River will also require the establishment of baseline monitoring results in water quality, flow and habitat. Only with these baseline levels clearly established will the benefits of dam removal, lagoon enhancement and overdrafting corrections be measurable. And an engaged public taking ownership of the watershed's health are critical complements to these large scale infrastructure changes.

The CRWVP is focused solely on the Carmel River watershed, but with success this model could be expanded to throughout the Region, offering benefits to each stakeholder project, other watersheds and to all beneficiaries in the Central Coast Funding Area. The model could be further scaled up to benefit other funding areas throughout the state as well.

Figure 1 - Regional Map



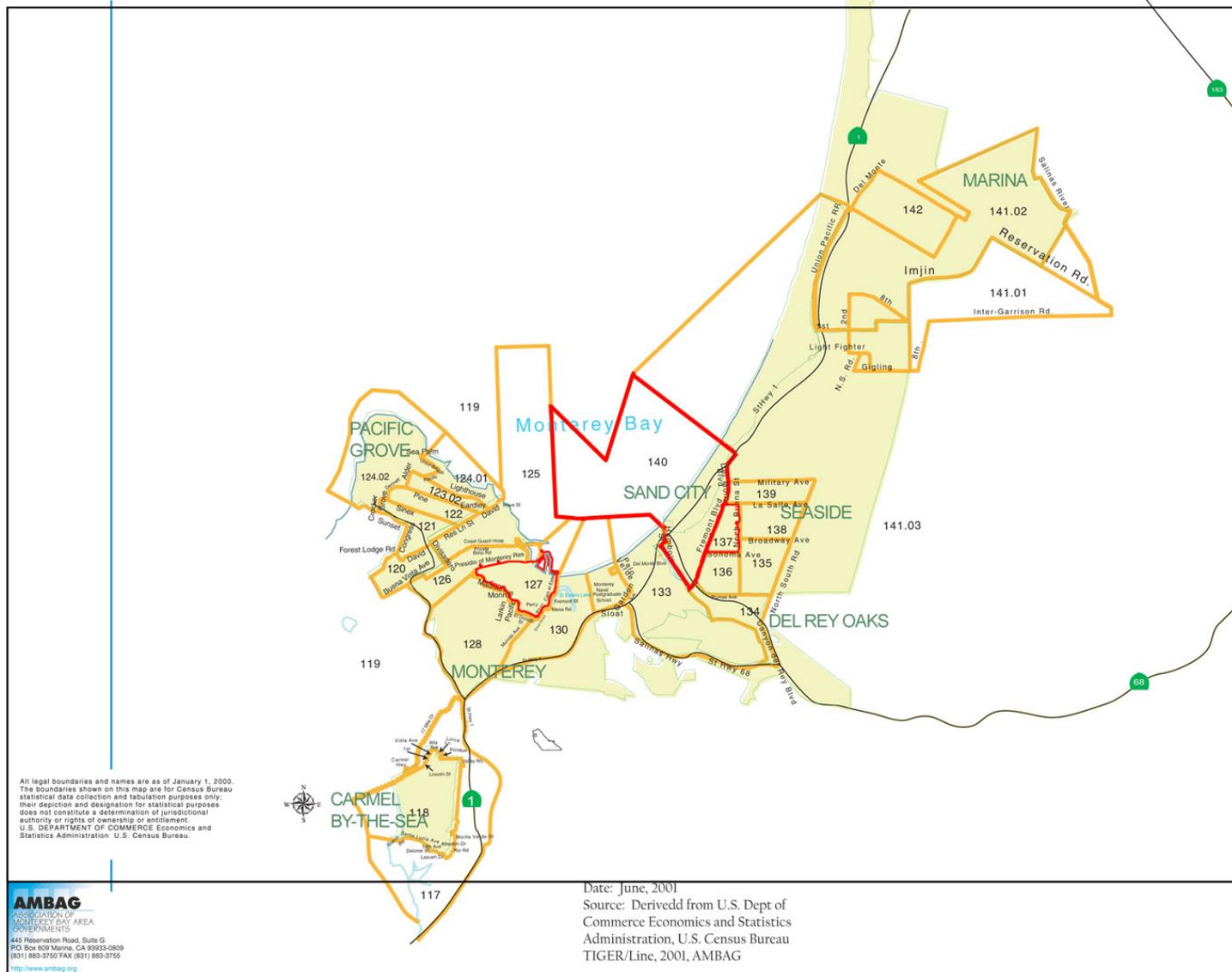

 Projection: UTM Zone 10N
 Datum: NAD 1927
 December 20, 2010


Project	
1	Lower Carmel River Restoration and Floodplain Enhancement
2	Carmel River Watershed Volunteer Program
3	Seaside Groundwater Basin Aquifer Storage and Recovery (ASR)
4	Sanitary Sewer System Repair
5	Implementation of Solid Waste Removal Technology
6	Microbial Source Tracking in the Cities of Monterey and Pacific Grove

- IRWMP Area
- MPWMD Boundary
- Rivers
- Cal-Am Pipelines
- Roads
- Watershed Boundaries
- Seaside Groundwater Basin
- Carmel Valley Alluvial Aquifer
- Areas of Special Biological Significance
- City Limits

Figure 2: Disadvantaged Communities in the Region (Tracts 127, 137, 140)

MONTEREY COUNTY: CENSUS 2000 TRACT OUTLINE MAP



Completed Work:

Significant amounts of work have been done to garner local support of watershed protection efforts. Experts have assisted these community efforts to assess local conditions, resulting in the Carmel River Watershed Assessment and Action Plan, which will guide CRWVP activities. Ongoing efforts by CWC and CRWC, which will continue up through receipt of grant funds, include working with local groups to shape the stewardship and education activities. CWC and CRWC are also working with CCRWQCB staff to ensure compliance with CCAMP data formatting for monitoring results. CEQA/NEPA compliance does not apply to the CRWVP.

Existing Data and Studies:

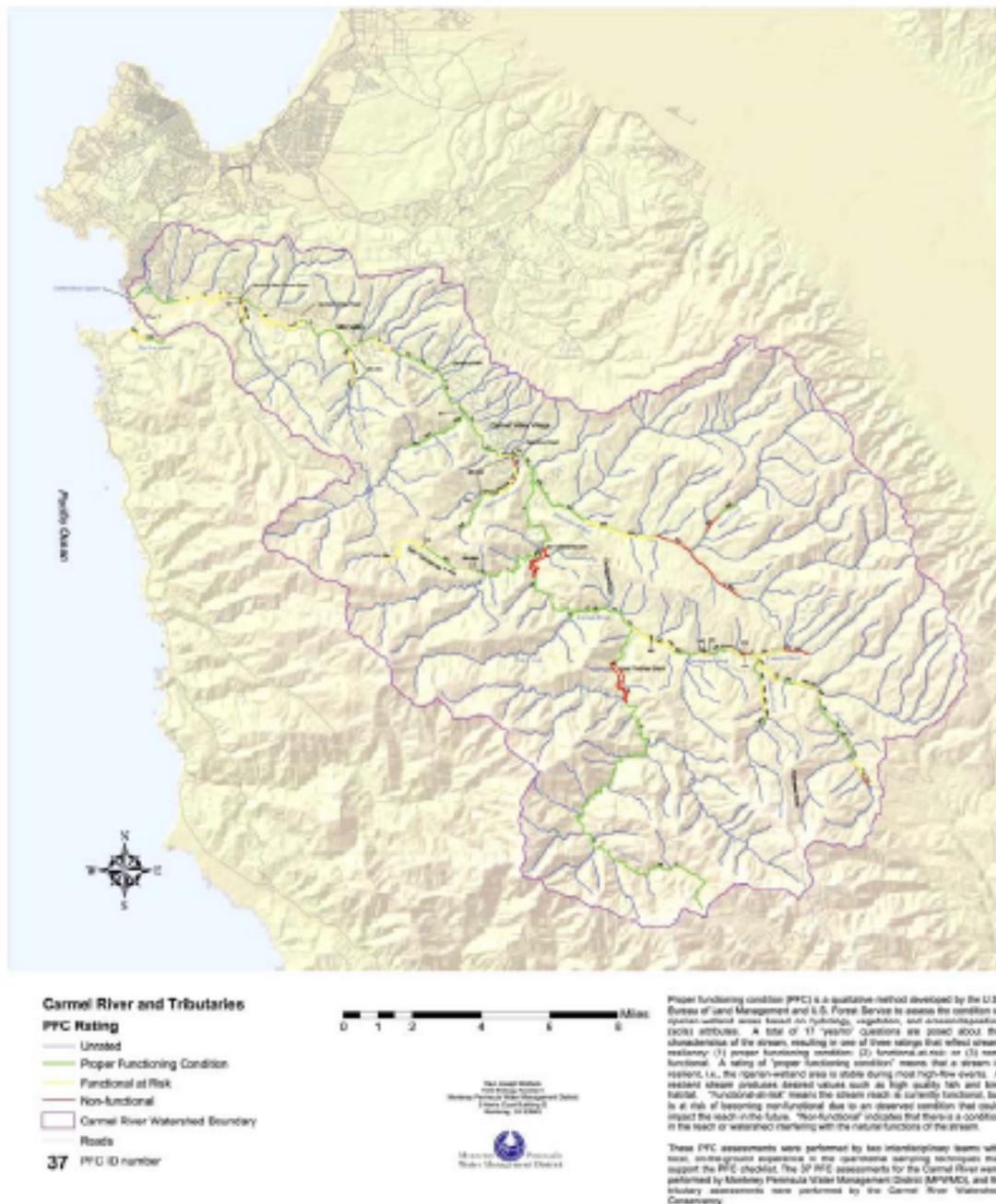
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Project Map:

Activities will take place throughout the Carmel River watershed, shown here:

**Proper Functioning Condition Assessment
of the Carmel River and Tributaries**



Project Timing and Phasing (assuming receipt of funds to be June 1, 2011):

Phase 1: Creation of Monitoring Plan and QA/QC Plan
6 months: June 1 – December 31, 2011.

Coordination with stakeholders and community groups to shape monitoring design. Monitoring study design and development and approval by USEPA or SWRCB of Quality Assurance & Quality Control (QA/QC) Plan (QAPP) (Objective 1.1).

Phase 2: Monitoring

2.5 years: January 1, 2011 – May 31, 2014

Staff to recruit and train volunteers and teams of staff and volunteers conduct monitoring activities throughout Carmel River watershed. (Objectives 1.2)

Phase 3: Public Outreach & Education

3 years: June 1, 2011 – May 31, 2014

Public outreach will be ongoing throughout the project, to include gathering input to inform monitoring activities, dissemination of monitoring results during multiple meetings, and on-going iterative re-design of monitoring and outreach activities based on results of data analysis and community input.

Phase 4: Stewardship Promotion

2.75 years: September 1, 2011 – May 31, 2014

Promotion of small-scale BMPs throughout the watershed, including posting to CWC Data & Stewardship Portal for tracking and measurement. Expansion of Stewardship Toolkit.

Phase 5: Data Analysis

2.5 years: December 1, 2011 – May 31, 2014

Review of historical field monitoring data and results of laboratory analysis of ongoing monitoring samples for comparison to historical values and water quality objectives.

Phase 6: Reporting

2.75 years: August 1, 2011 – May 31, 2014

DWR Quarterly & Annual Reporting. Posting of data and results of analysis to CWC Data & Stewardship Portal, CCRWQCB and other on-line databases for public review.

Tasks

Tasks follow project objectives listed in the Work Plan (Attachment 3). All monitoring activities will closely adhere to SWRCB and USEPA protocol for habitat, flow and water quality monitoring projects, including safety procedures. No rights-of-way or permits (e.g., NPEA, CEQA) will be required for any project activities. The status of all activities is in the planning phase. As described in each task, deliverables include quarterly and annual reports to DWR, reports and presentations to local agencies and partner organizations, and monitoring results in CCAMP- and SWAMP-compatible formats.

Tasks are listed here and included and described below in more detail, including, for each task: current status, description of work and deliverables.

Summary of Tasks:

Task 1: Administration
Task 2: Stakeholder & Partner Coordination
Task 3: Prepare QA/QC Plan & Monitoring Plan
Task 4: Assessment & Evaluation
Task 5: Volunteer & Intern Recruitment & Training
Task 6: Conduct Field Monitoring & Restoration
Task 7: Data Management & Analysis
Task 8: Reporting
Task 9: Public Education, Outreach & Stewardship Promotion

See attached table task details below.

Budget Category (a): Direct Project Administration Costs	
Task 1: Administration	Current Status: Ongoing. CWC has existing agreements with laboratories for similar monitoring projects.
Description of Work: Provide program management and administration of contract, including but not limited to contracting, laboratory arrangements and oversight, invoicing, technical oversight and staffing coordination for the programs.	
Deliverables: Invoices, laboratory cost schedules, staffing plans & budgets.	
Budget Category (c): Planning/Design/Engineering/Environmental Documentation	
Task 2: Stakeholder & Partner Coordination	Current Status: Ongoing. IRWM group, CWC, CRWC have been meeting to discuss and plan project specifics and
Description of Work: Coordinate with regional stakeholders to gather input on monitoring design; arrange and conduct kick-off meeting and follow-up planning meetings to review project goals and project timeline, and develop strategy and approach for monitoring programs. Identify storm drains to be monitored and Carmel River and tributary sites to be monitored. Determine monitoring regime, including frequency, time frame, and field and laboratory analytical constituents. Identify 5 other local non-profits to form a "watershed hub" in charge of coordinating activities to pursue MPRWMP goals for the Carmel River watershed. Host or participate in two meetings each year for three years with MPRWMP stakeholders to gain input into education, stewardship and monitoring efforts of the hub. Contract with Applied Survey Research (ASR) to develop performance measures and schedule for gathering useful data to measure progress towards objectives and goals.	
Deliverables: Updated CRWVP Project Objectives & Schedule of Activities; Memo documenting possible monitoring sites, constituents & frequency, with rationale; MOU of 7 Non-profits forming watershed hub; 6 Memoranda documenting stakeholder input for education, stewardship and monitoring efforts; Contract, performance measurements and schedule for data collection towards assessment/evaluation reports; Performance measurement reports.	
Task 3: Prepare QA/QC Plan & Monitoring Plan	Current Status: QA/QC Plan not yet begun. Preliminary discussions of monitoring sites & constituents have begun.
Description of Work: Prepare QA/QC Plan and Monitoring Plan to reflect final list of monitoring sites, analytical parameters, staffing assignments, and laboratories. Submit draft Plans to state/federal agency staff for review and copy DWR contract manager; address comments received and produce final versions of both documents. Distribute to stakeholders, staff and volunteers and review protocols with field personnel.	
Deliverables: Draft QA/QC Plan & Monitoring Plan; Final EPA-approved QA/QC Plan & Monitoring Plan; Roster of volunteers & partner organizations plans have been disseminated to.	
Task 4: Assessment & Evaluation	Current Status: No substantive progress yet.
Description of Work: Coordinate with Applied Survey Research (ASR) to report on project successes using performance measurement data; analysis to include scalability and applicability to additional watersheds and IRWM regions.	
Deliverables: ASR Evaluation Report to CWC; CWC Report to IRWM stakeholders & DWR regarding scalability of model to other watersheds & IRWM regions.	
Budget Category (d): Construction/Implementation	
Task 5: Volunteer & Intern Recruitment & Training	Current Status: Volunteer applications, waivers, training materials, internship job descriptions are prepared. Full curriculum of leadership training course for Watershed Stewards not yet developed.
Description of Work: Recruit 2 college interns each year to lead public outreach for stewardship & monitoring events; Conduct volunteer recruitment including preparation of press releases, newsletter articles, e-mail correspondence, and presentations to local community groups; Organize volunteer training sites, speakers and supplies; Coordinate and conduct volunteer classroom and in-field trainings; Provide monitoring plans, training materials, handouts and supplies. Process volunteer applications and obtain required waivers; Recruit 10 Carmel River Watershed Stewards each year to serve as champions of Stewardship efforts; Facilitate leadership training course activities, consisting of 8 or more sessions of two hours training each, including focus on at least four of the following topics: watershed ecology, adaptive management principles, water quality and habitat monitoring protocol, community facilitation, conflict resolution and media outreach.	
Deliverables: 6 CWC interns (2 per year); 60 volunteers to be trained over three-year period (20 per year); Classroom & field training materials; Volunteer applications & liability waivers; 30 Stewards recruited & trained (10 per year); Curriculum for leadership training course.	
Task 6: Conduct Field Monitoring & Restoration	Current Status: No substantive progress yet.
Description of Work: Conduct 102 monitoring events (34 per year), 6 Carmel River clean-ups (2 per year) and 6 invasive plant removal work days (2 per year).	
Deliverables: Documentation of river stretches addressed during clean-ups, and of plants removed/replaced with native plantings.	

Task 7: Data Management & Analysis	Current Status: QA/QC protocol for data review in place. No monitoring results yet. CWC Data & Stewardship Portal is live and active for other watersheds and regions.
Description of Work: Compile and analyze field measurements and laboratory analytical results. Produce Annual Summary Report of Monitoring. Evaluate performance measurement tracking and progress. Perform data management for monitoring results, including data checking and formatting, addition of site location information and photographs, and upload onto CWC's on-line Data & Stewardship Portal and other regional on-line portals per CCRWQCB data formatting requirements (CCAMP & SWAMP formatting). Perform a QA/QC analysis of results within 90 days, in accordance with the approved QA/QC Plan. Compare results to water quality objectives (WQO) in the CCRWQCB Basin Plan or CCAMP attention levels. Hold 2 public meetings each year to communicate monitoring results to individuals and community organizations. Respond to inquiries and provide information upon request.	
Deliverables: Annual Summary Report of Monitoring with data and analysis of results, including comparisons to WQO and Attention Levels; QA/QC-verified monitoring data, in Excel and on multiple on-line databases (CWC & State); Documentation of parties in receipt of and those requesting monitoring report & monitoring data.	
Task 8: Reporting	Current Status: No progress on reporting.
Description of Work: Create quarterly and annual reports to DWR.	
Deliverables: 12 quarterly reports and 3 annual reports, per DWR formatting requirements.	
Task 9: Public Education, Outreach & Stewardship Promotion	Current Status: CRWC active in community, hosting 1-2 events per year to raise awareness of watershed issues.
Description of Work: Conduct 72 public education and outreach events at community centers, schools, CSUMB classes, local businesses and city/county councils or water agencies (24 per year). Gather community and partner input for inclusion in Annual Watershed Action Plan. Communicate issues related to Carmel River watershed health and MPIRWMP regional goals. Maintain updated schedule of events on CWC website. Build Carmel River Watershed Stewards Group on Facebook. Update CWC Stewardship Toolkit each year with new BMPs. Deliver 12 lesson plans for classroom presentations or field trips to local teachers (4 per year).	
Deliverables: Report of individuals and groups CRWVP & MPIRMP goals and progress were shared with; 3 Annual Carmel River Annual Watershed Action Plans; Updated CWC website; Sustaining Carmel River Watershed Stewards Facebook page and group; 3 updated versions of CWC Stewardship Toolkit (1 per year); 12 elementary and middle school watershed-focused lesson plans (4 per year).	

ATTACHMENT 3. WORK PLAN - MICROBIAL SOURCE TRACKING

Summary:

The Cities of Monterey and Pacific Grove have agreed to let Monterey take the lead in this partnership in coordinating the \$252,000.00 Microbial Source Tracking project. A MOU has been drafted outlining each party's responsibilities and obligations per this agreement. Partial funding for determining the sources of contaminants is requested from Proposition 84 funding available through the Department of Water Resources (DWR), which the City of Monterey has agreed to manage the grant program.

Goals and Objectives:

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 advisory closures and postings in the Monterey Peninsula Region.

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). The three water sheds proposed are the Lovers Point, Greenwood Park, and Hartnell Gulch drainage basins, see attached area map.

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.

Recreation and public access – This project will ultimately lead to improvements in the reliability of the sewage systems of Monterey and Pacific Grove resulting in cleaner beaches and safer recreation opportunities.

Water quality protection and improvement – Improving our knowledge of sewage sources will lead to management measures that reduce microbial contamination of surface and near-shore ocean waters. Additionally, emerging contaminants such as Endocrine Disrupting Compounds (EDC's) and other compounds associated with human waste will similarly be reduced.

NPS pollution control – This project will identify sources of NPS pollution.

Water and wastewater treatment – This project will identify sources of bacterial contamination resulting in the ability to target treatment or elimination of those sources.

Integration with RWQCB 3 WMI Chapters

- Urban Runoff –Addressing beach closure issues, implementing Phase II of the NPDES Stormwater Program
- Monitoring – Maintaining the Central Coast Ambient Monitoring Program

Purpose and Need:

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 Monterey County Health Department tests Monterey Municipal Beach routinely for coliform contamination. The City of Monterey provides minimal source control implementation when notified, but contaminants still get into the storm drain system. The ability to source track and test multiple areas and tributaries, will enhance the source tracking for illegal discharges, as well as identify the type of coliform bacteria (human or animal). Source tracking of the Hartnell Gulch drainage basin, which includes downtown Monterey, an outfall to MBNMS, and the municipal beach, will help mitigate potential negative environmental impacts to the Sanctuary and ocean frontage due to beach closure postings.

The Monterey Peninsula is a unique interface between the land and sea that draws 5 million visitors a year to the county and generates 1.75 billion dollars of tourism revenue (2.46% of the California total). Residents and visitors alike are passionate about preserving the health of the marine environment.

The Monterey Peninsula's vitality is dependent on the health of the ocean that surrounds it. One of the greatest threats to the region's economic stability and environmental health is the adverse impact posed by poor water quality and by beach closures or postings. World class diving, kayaking, surfing and swimming lure thousands into waters that represent a health risk. The Peninsula is also home to the nation's largest kelp forests which are exceptionally rich in species diversity and provide key habitat for threatened populations of Southern sea otter. Human pathogens such as gastrointestinal parasites, have recently been documented in local sea otters and may be a factor in the slow recovery of the species. The Monterey Peninsula also has a significant aquaculture and kelp harvesting industry that is highly dependent upon unpolluted water.

However, the pathway by which these microorganisms are reaching the ocean is not clear. Contributing factors to postings and closures include anthropogenic sources such as sewage from overflows, cracks, leaching and clogging in aging sanitary system infrastructure and illicit connections. These problems must be addressed by repairs and replacements at known locations of pipe failure as well as additional diagnostic work on the lines. Other factors that contribute to coliform contamination include animals both wild and domestic as well as ubiquitous sources that are present in the soil. To date, the only monitoring that has been done prior to beach postings or closures is for total coliform. In addition, this testing is often conducted in the receiving water and not at the storm drain outfalls. While total coliform testing is useful, it doesn't tell us where the coliform originated and therefore, it's difficult to effectively reduce or eliminate the sources.

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 ribosomal RNA typing to determine sources of coliform contamination in three watersheds that flow into the Sanctuary.

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

Task List:

Task 1 – Planning

- Draft Professional Service Agreement (PSA) recognizing the City of Monterey as the Lead Agency, and the City of Pacific Grove a Cooperating Entity. Include indemnification agreement and each party's responsibilities.
- Extensive planning has already been conducted into how this program will be conducted including sampling regime, sampling entities, and testing procedures. The Cities have sporadically sourced tracked these drainage areas before, but where not adequately funded to encompass the entire drainage area and individual tributaries.
- Complete a request for proposal for potential qualified consultants to review. Receive and rate the proposals to determine the most qualified firm.
- Establish a dedicated account with Finance Department to hold matching funds.
- Prepare and implement a Project Assessment and Evaluation Plan (PAEP) to detail the methods of measuring Project benefits and reporting them in accordance with a PAEP.
- Prepare Global Position Satellite (GPS) information for project site and monitoring locations.

Task 2 – Implementation

- Send out a request for proposal, evaluate and rate response, choose a qualified firm.
- Council to adopt a resolution approving award of contract for Microbial Source Tracking. Secure matching funds into a dedicated account.
- Submit work order for the City of Monterey Engineering division or use the on-call Project Management/Inspection Services.
- Source track the three watersheds for Lovers Point, Green wood Park, and Hartnell Gulch Drainages.
- Data analysis
- Outreach and technical follow-up

Task 3 – Source Tracking

- Initiate testing (Notice to Proceed)
 - Mobilization
 - Prep work
 - Approve consultants standard operating procedures for sampling regime, sampling entities, and testing procedures

- Approve consultants proposed systematically approach for source tracking the three water shed's storm drain systems.
- Review tested site results for human or animal bacteria of initial key watershed locations. Based on results, continue source tracking to locate the source.

Task 4 – Monitoring – see attachment 6

Task 5 – Project Reporting

- Progress Reports which will include drainage (tributaries) basins tested for human or animal contaminates, and the location the discharge points into the drainage system.
- Annual Project Assessment and Evaluation Plan Report (PAEP)
- Annual Executive Summary Report
- Draft Project Report
- Final Project Report

Figure 1 – Project Map



DESIGNED BY:	CITY OF MONTEREY	
DRAWN BY:		
CHECKED BY:		
DATE:		
SENIOR ENGINEER	PROJECT NO.	DATE

IRWMP SEWERLINE IMPROVEMENTS MONTEREY AND PACIFIC GROVE
Stormdrain Drainage Basins

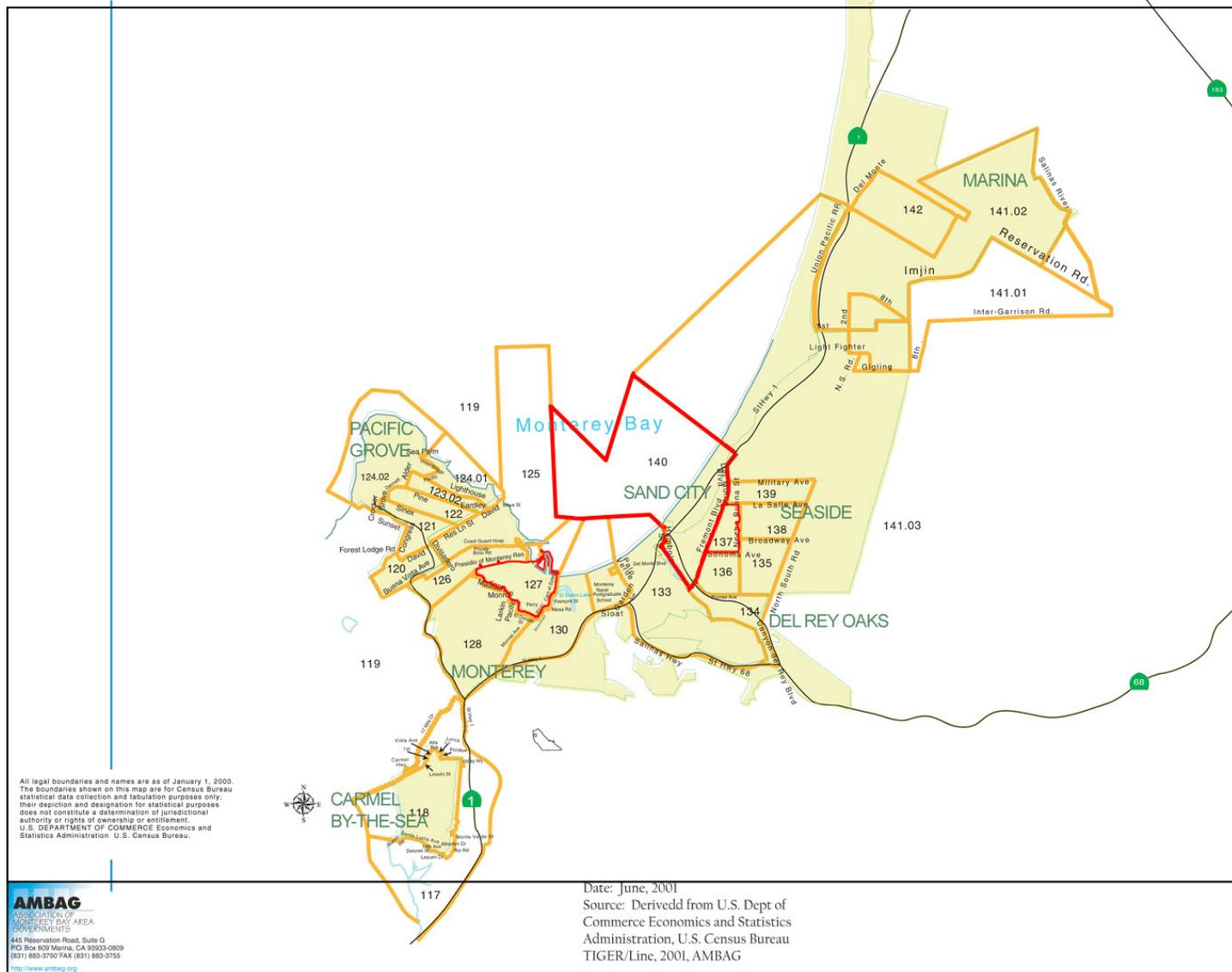
REVISIONS	DATE	NO.	SCALE
			1" = 2,494' (ASB)

DRAWING NAME	C1.0
PROJECT NAME	



Figure 2: Disadvantaged Communities in the Region (Tracts 127, 137, 140)

MONTEREY COUNTY: CENSUS 2000 TRACT OUTLINE MAP



Completed Work: None.

Existing Data and Studies:

1. HDR Engineering, Inc., (2004) City of Pacific Grove Sewer System Asset Management Plan
2. Monterey Regional Storm Water Management Program, Original Document, November 15, 2006

Project Timing and Phasing (assuming receipt of funds to be June 1, 2011):

Project is ready to go. Matching funds have been identified. No permits are expected to be needed.

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



November 2007

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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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Appendices

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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:

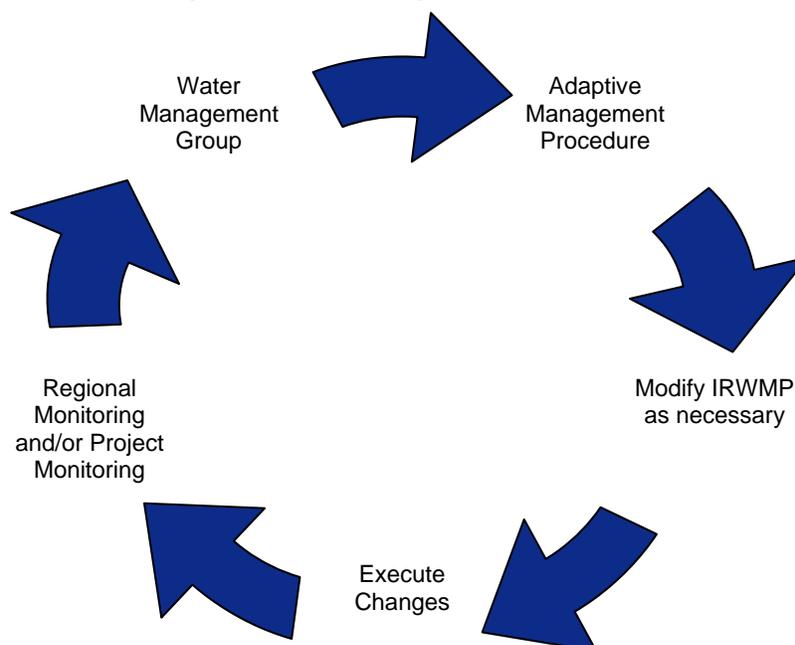
- Increased project costs to agencies and ratepayers.
- Delayed construction of planned facilities leading to delayed water supply and other benefits.
- Temporary impacts due to construction-related activities.

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



**GRIDDED AREAS INDICATE WATERSHEDS
PROPOSED FOR INCLUSION IN A COMPREHENSIVE
INTEGRATED REGIONAL WATER MANAGEMENT PLAN**

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.

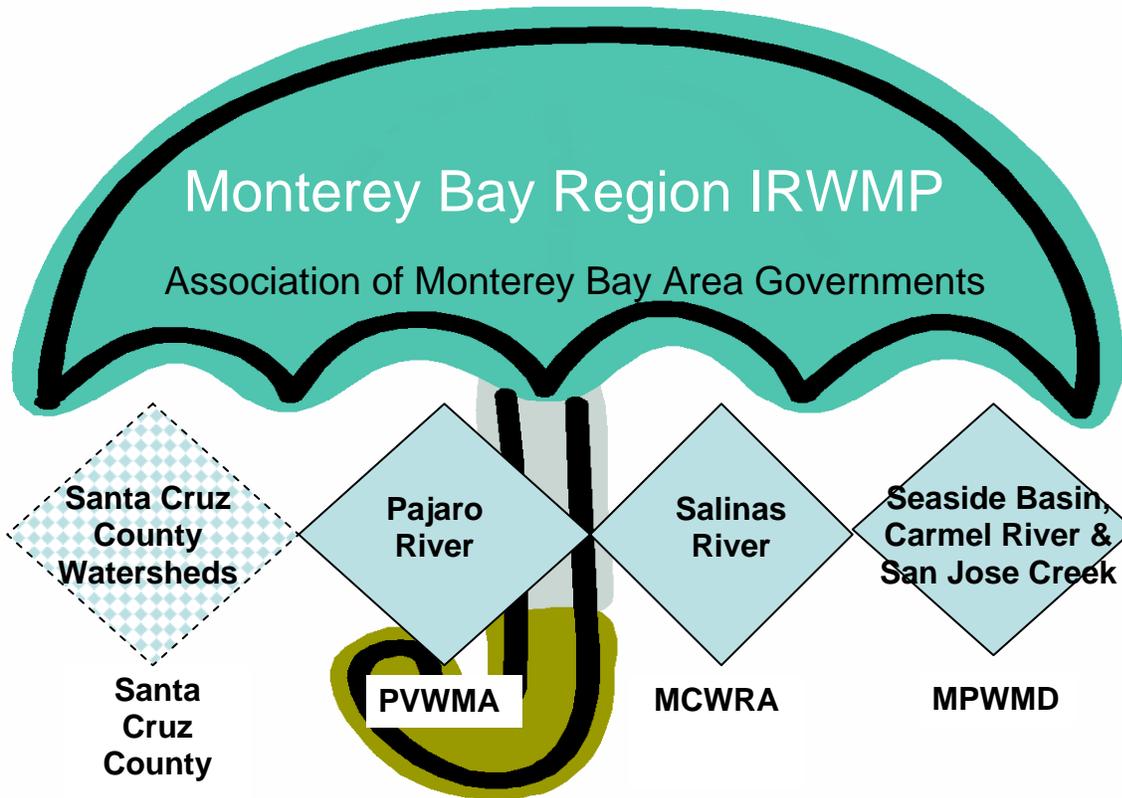
The six goals of the Greater Monterey Bay IRWM planning effort are:

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>

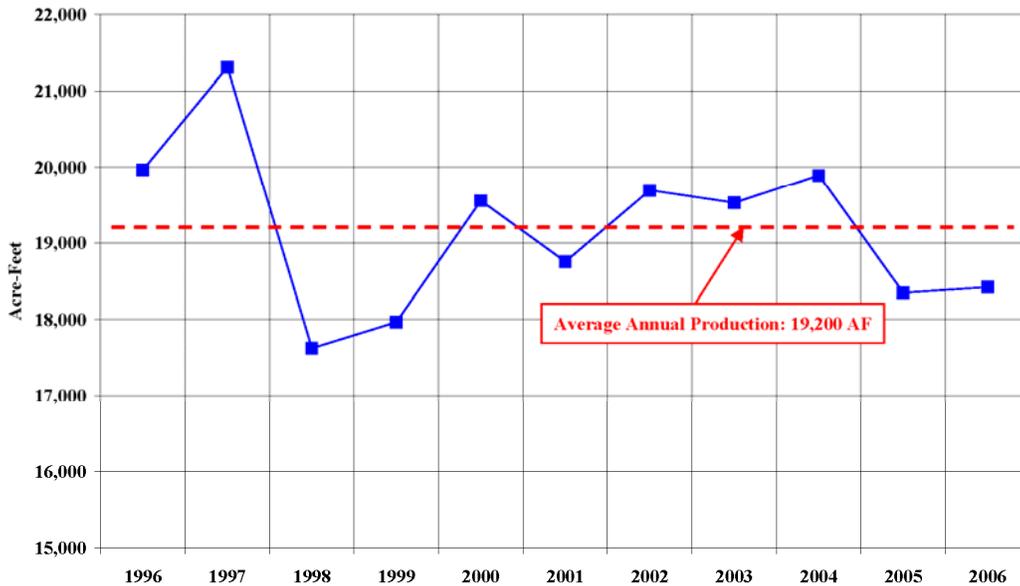
Figure 3-1: Map of Monterey Peninsula Integrated Regional Water Management Planning Region



No.	Project	Sponsor
1	Refine ASBS Alternatives	Monterey/PG
2	Lower Carmel River Restoration and Floodplain Enhancement	MCWRA/BSLT/MPWMD
3	Seaside Groundwater Basin Aquifer Storage and Recovery	MPWMD/CAW
4	Seaside Basin Groundwater Replenishment	MRWPCA
5	Seaside 90° Outfall Infiltration Component	City of Seaside
6	CSUMB Stormwater Percolation and Education	CSUMB
7	Carmel River Watershed Volunteer Monitoring Program	CRWC
8	Water Conservation Retrofit Program	MPWMD
9	Sanitary Sewer System Repair and Replacement	Monterey/PG
10	Microbial Source Tracking	Monterey/PG
11	Implementation of Solid Waste Removal Technology	Monterey/PG

- IRWMP Area
- Watershed Boundaries
- MPWMD Boundary
- Seaside Groundwater Basin
- Rivers
- Carmel Valley Alluvial Aquifer
- Cal-Am Pipelines
- Areas of Special Biological Significance
- Roads
- City Limits

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

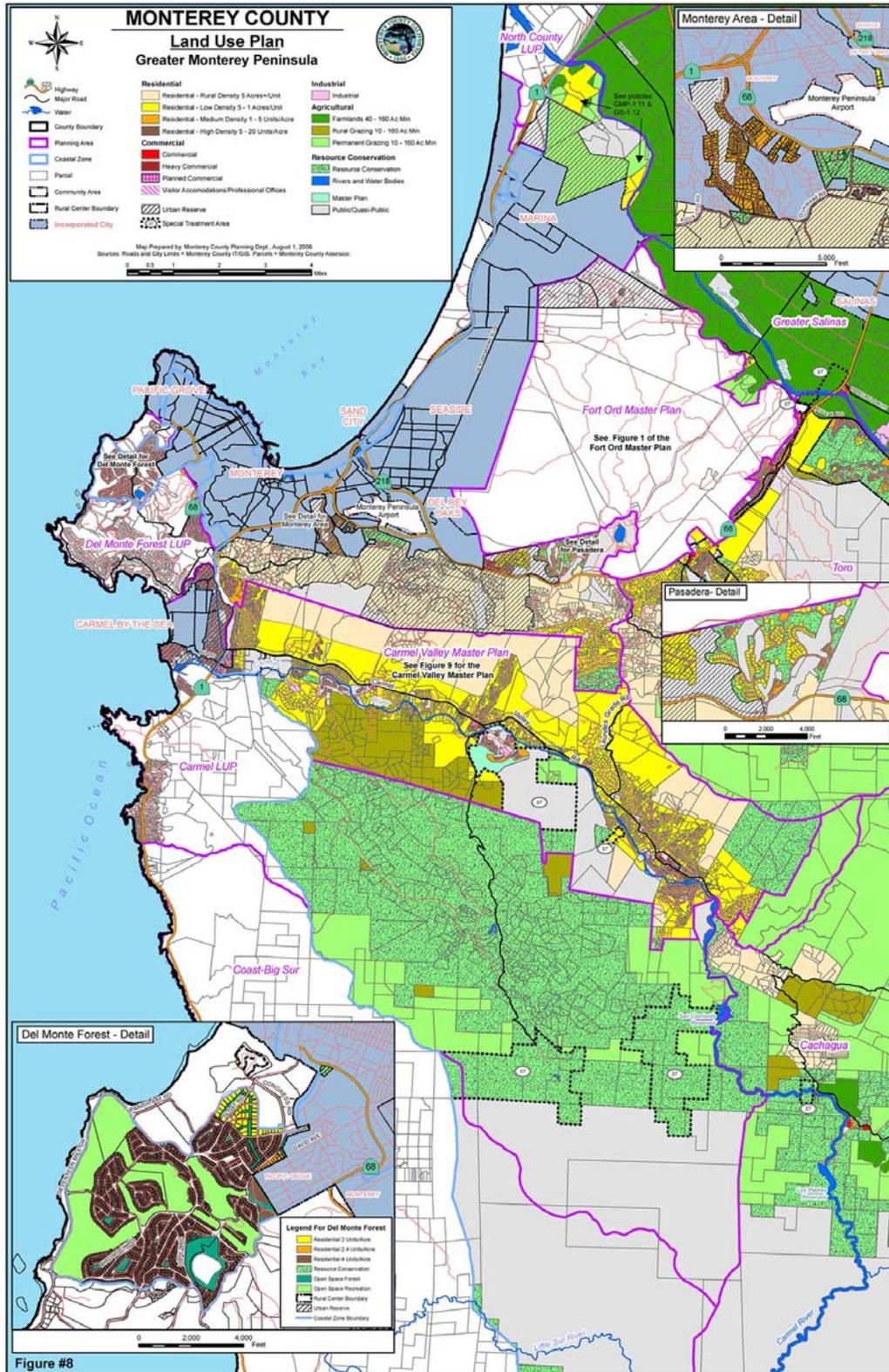
3.1.4 Major Land Uses

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

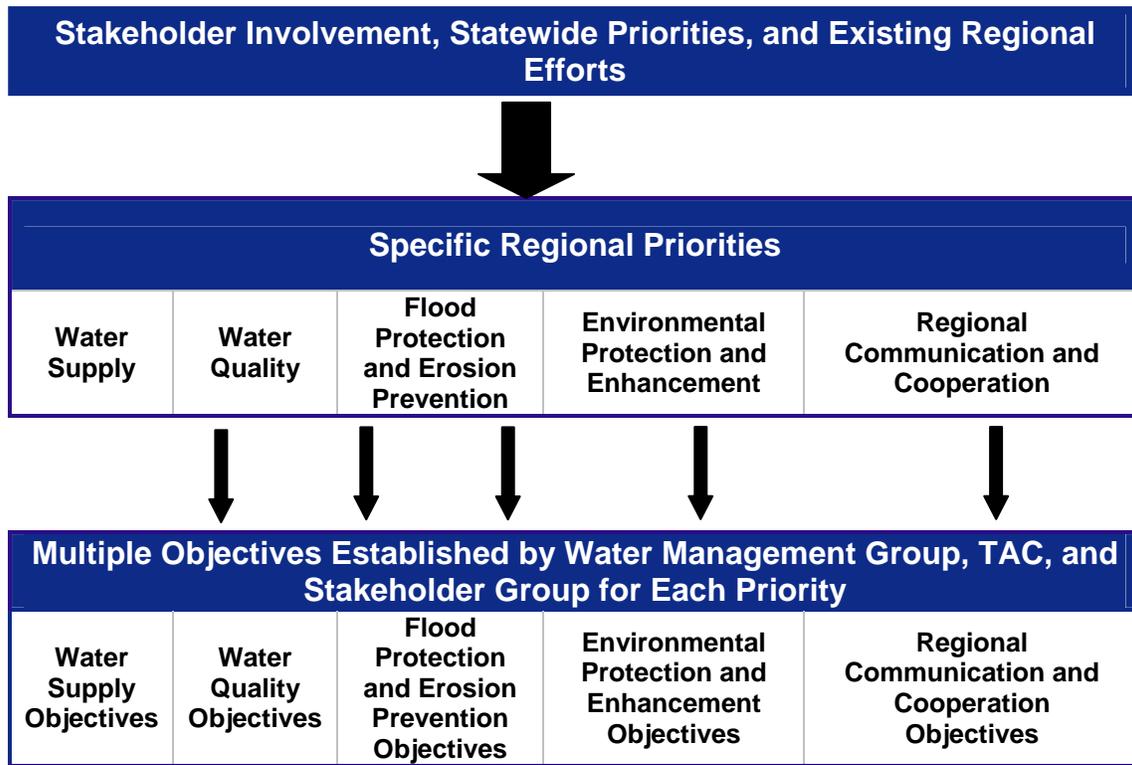


Table 4-1: Monterey Peninsula Regional Goals

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 preserving or restoring ecologic and stream function	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
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.

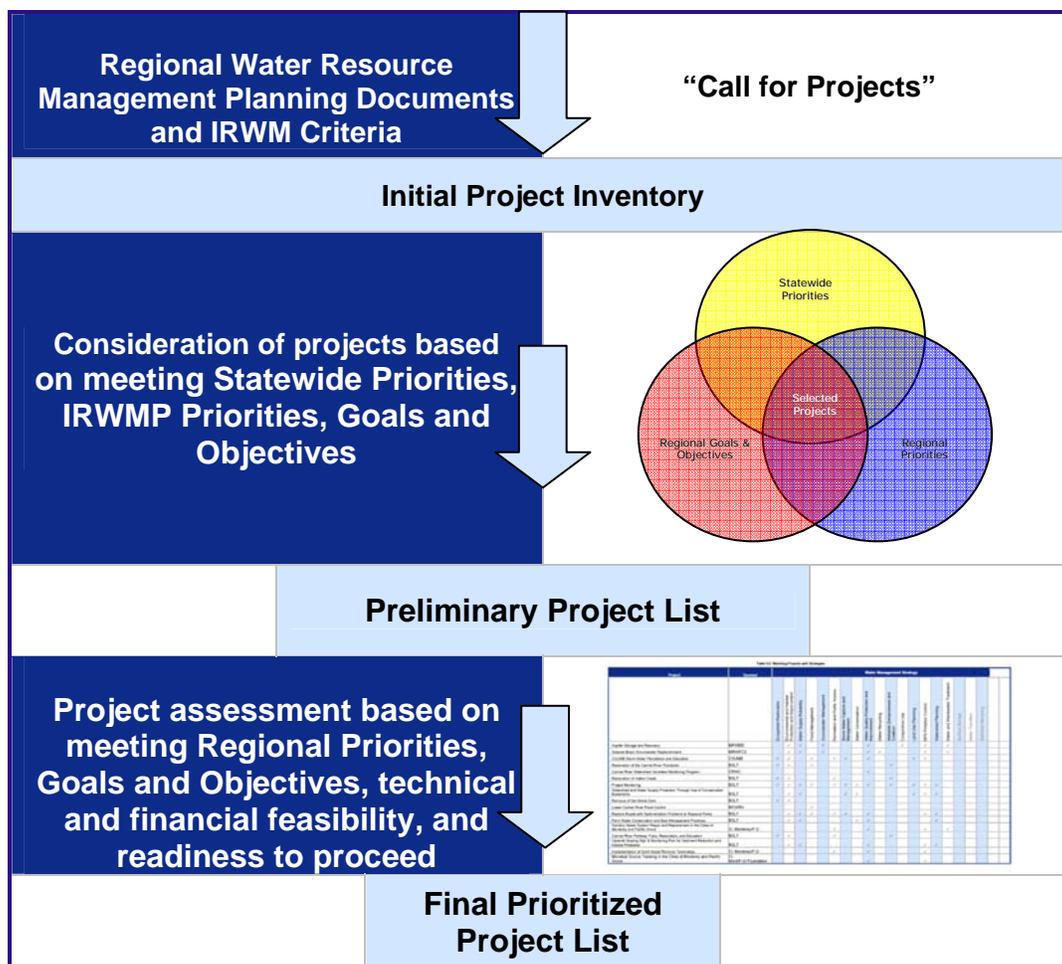
6.2 Compilation and Prioritization of Projects

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

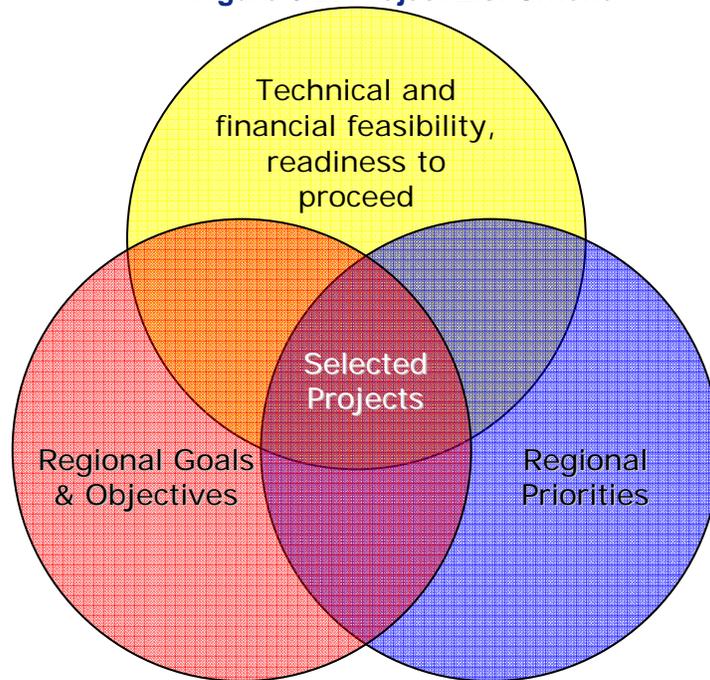


6.2.2 Project Assessment Process

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					
		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	Address environmental justice or DAC concerns
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.

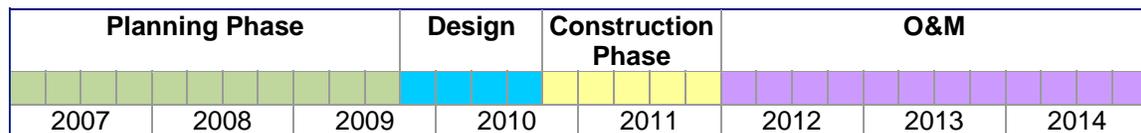
Financial Feasibility:

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.

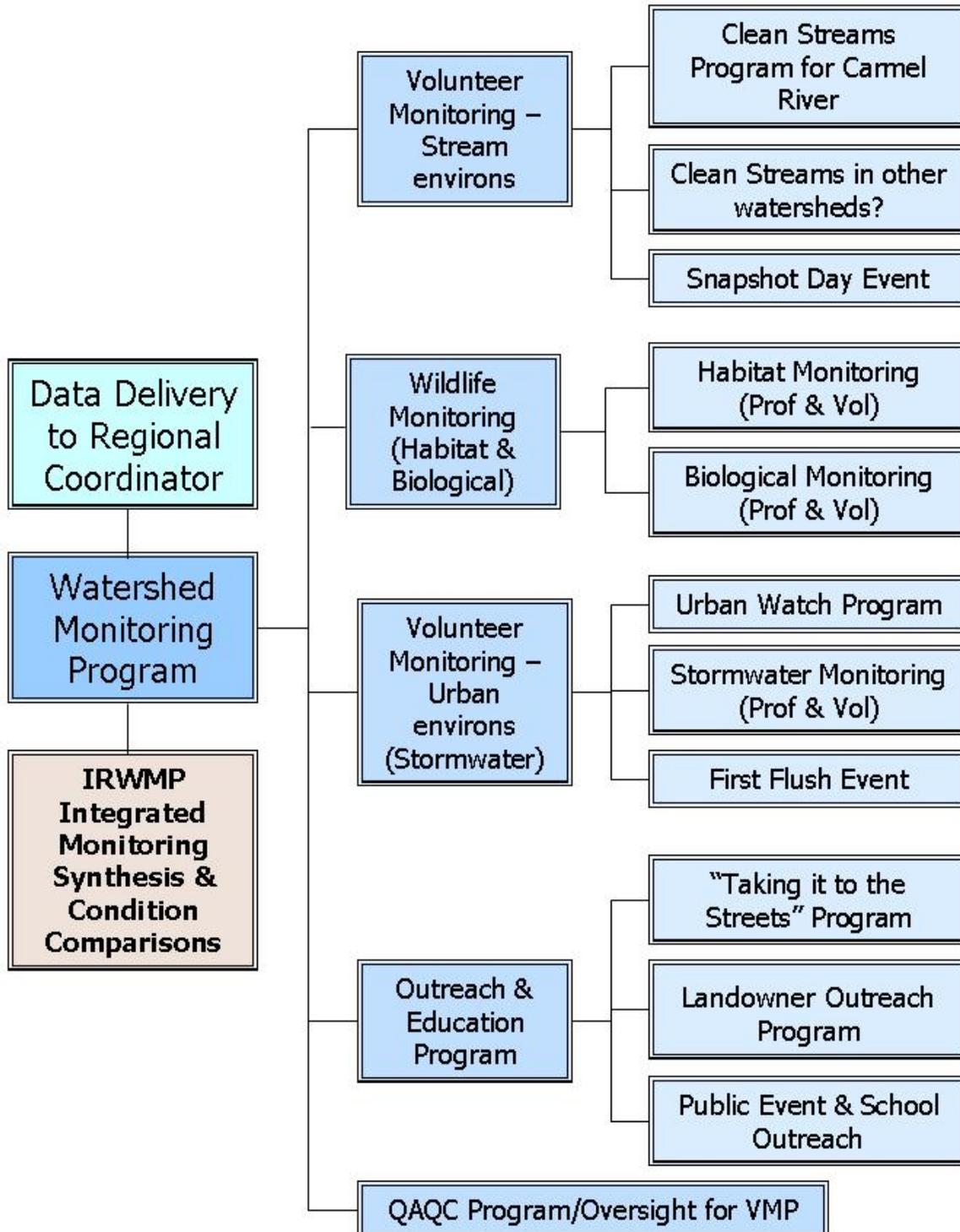
Program and financing strategy

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: #00b0e3;"></td> <td style="background-color: #ffff00;"></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.

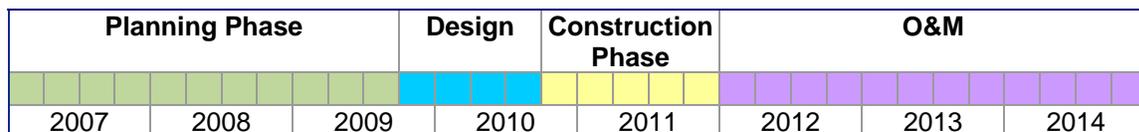
Financial Feasibility:

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:



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).

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.

Linkages/Interdependencies with Other Projects:

In conjunction with other NPS pollution prevention efforts included in the IRWMP, this project seeks to mitigate pollutant discharge to ASBS and the MBNMS.

Financial Feasibility:

Matching funds in the amount of \$940,750 have been identified. The total budget for this project is \$9,407,500.

Technical Feasibility:

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.

Project Timeline:



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 style="text-align: center;"> Planning Scope Development Execution </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.	
Linkages/Interdependencies with Other Projects: 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.	Financial Feasibility: \$36,000 of in-kind services from NOAA and Monterey and Pacific Grove Urban Watch. The total budget for this project is \$252,000. Technical Feasibility: There are no technical issues anticipated for this project.
Project Timeline: Project will be executed immediately following receipt of funding. The expected project duration is 24 months.	
Institutional Structure to Ensure Implementation: The Cities of Monterey and Pacific Grove will be responsible for project implementation.	

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.

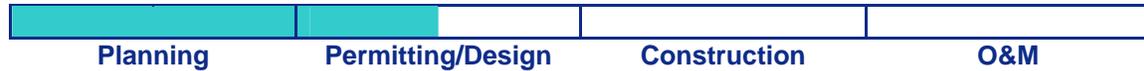
The area of CSUMB located between 7th Avenue and 8th Avenue currently discharges its runoff through a local storm drain system to an open space area to the north that is considered to be environmentally sensitive. CSUMB is having a storm water master plan prepared to modify their storm drain system to 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).

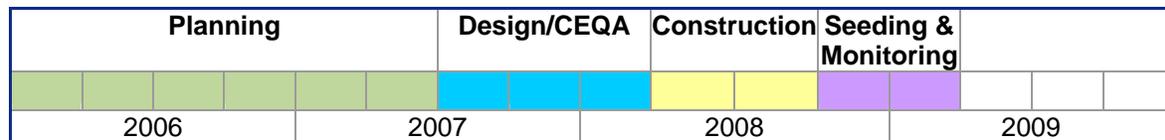
Financial Feasibility:

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.

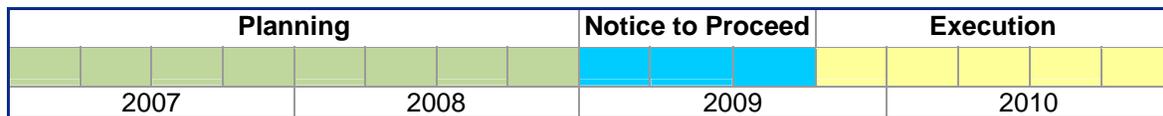
Financial Feasibility:

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:			
Planning	Scope Development	Execution	
Initial agency planning stage.			
<p>Linkages/Interdependencies with Other Projects:</p> <p>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.</p> <p>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).</p> <p>Seaside 90 Inch Outfall Infiltration Component Project will work with these related projects to:</p> <ul style="list-style-type: none"> • 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 	<p>Financial Feasibility:</p> <p>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.</p> <p>Technical Feasibility:</p> <p>This project will use proven technology (piping to draw storm water out of the storm drain system and into the Seaside Groundwater Basin).</p> <p>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.</p>		
Project Timeline (funding dependent):			
Planning		Notice to Proceed	Execution
2007	2008	2009	2010
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.

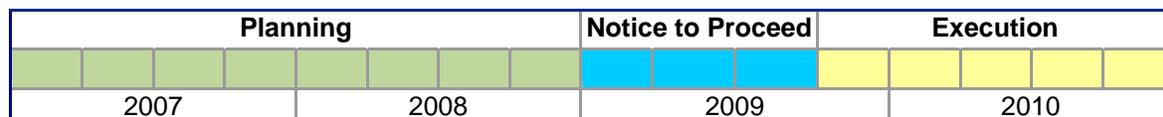
Considering the local water shortages, recycled water has value to many users because high-quality water can be diverted from some uses, such as agriculture and golf courses, to other domestic uses.

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

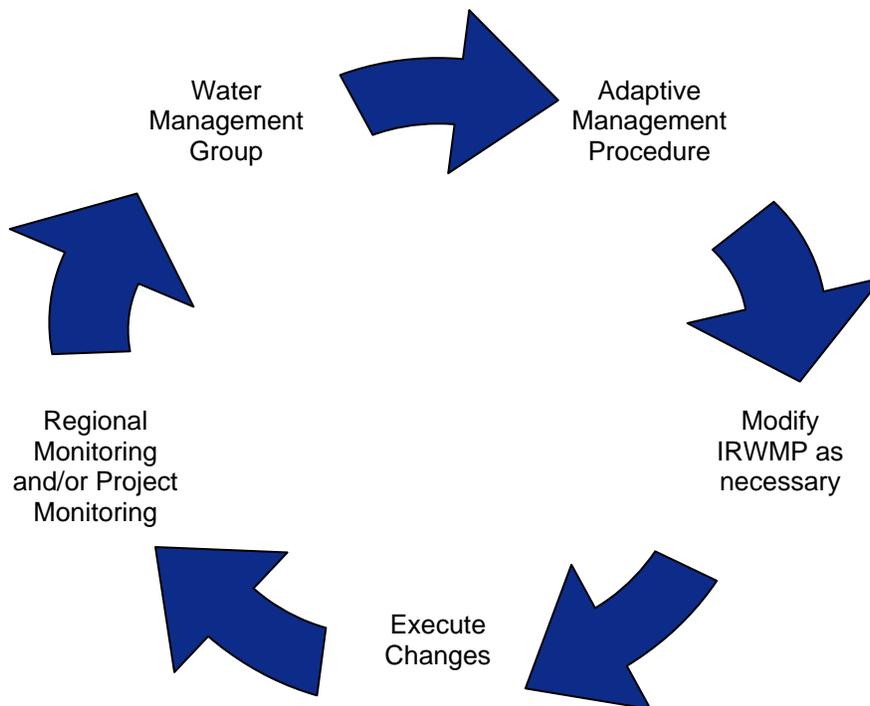
Project/Strategy	Reference Document	Technical Feasibility
Environmental Enhancement	<p>Watershed Assessment and Action Plan of the Carmel River Watershed by Carmel River Watershed Conservancy, 2004</p> <p>Carmel River Management Plan by MPWMD, 1984</p> <p>Supplemental Carmel River Action Plan by Carmel River Watershed Conservancy, 2006</p>	<p>Performance of similar projects, preliminary assessments, environmental studies, and the expert opinions of experienced stakeholders were used to assess technical feasibility.</p>
Recreation and Public Access	<p>BSLT Carmel River Parkway Plan</p>	<p>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.</p>
Water Supply	<p>Seaside Groundwater Basin: Update On Water Resource Conditions by MPWMD, 2005</p> <p>Cal-Am Urban Water Management Plan 2006-2010</p> <p>Seaside Groundwater Basin Monitoring and Management Plan, Seaside Watermaster, 2006</p> <p>Final Statement of Decision, Seaside Groundwater Basin Adjudication, 2006</p> <p>SWRCB Order No. WR 95-10, SWRCB 1995 and subsequent documents</p> <p>Carmel River Action Plan by Carmel River Watershed Conservancy, 2004</p>	<p>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.</p>
Flood Protection	<p>Monterey County Floodplain Management Plan, MCWRA, 2004</p> <p>Carmel River Action Plan by Carmel River Watershed Conservancy, 2004</p>	<p>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.</p>
Water Quality	<p>Monterey Regional Storm Water Management Program, 2006</p>	<p>Monitoring efforts and supporting documentation provided entities participating in the Monterey Regional Storm Water Management Program Group</p>

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 (CNDDDB). The CNDDDB 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 CNDDDB 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

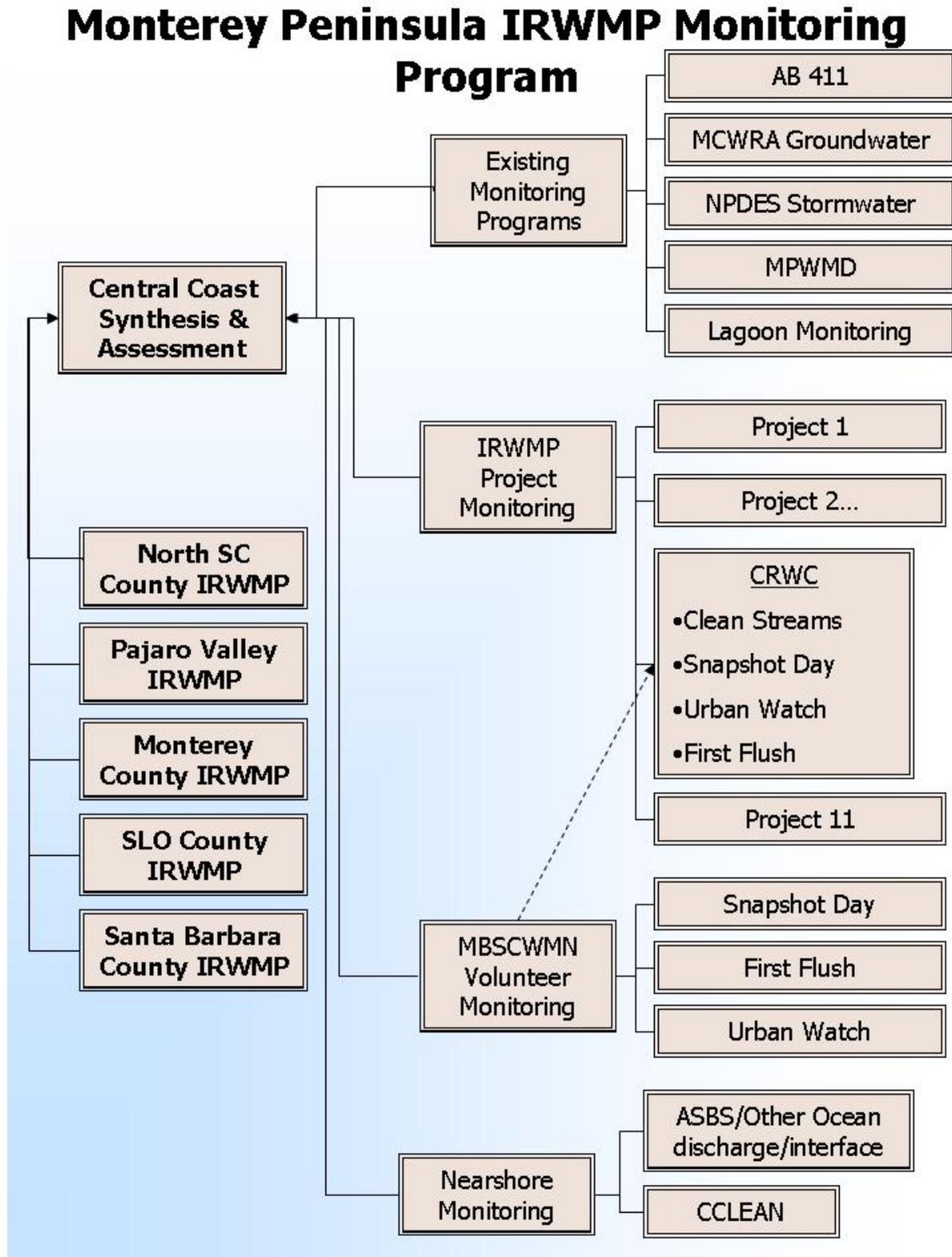
As part of the 2005 MPWMD *Geographical Information System (GIS) Implementation Plan*, a phased five-year implementation strategy was recommended. As part of this strategy, a web-based centrally located GIS platform was recommended to provide public access to the spatial information, maps and data available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

Memorandum of Understanding for Integrated Regional Water Management in the Monterey Peninsula, Carmel Bay, and South Monterey Bay Region

Memorandum of Understanding for Integrated Regional Water Management in the Monterey Peninsula, Carmel Bay, and South Monterey Bay Region

1. PURPOSE

The purpose of this Memorandum of Understanding (MOU) is to recognize a mutual understanding among entities in the greater Monterey Bay area regarding their joint efforts toward Integrated Regional Water Management (IRWM) planning. That understanding will continue to increase coordination, collaboration and communication for comprehensive management of water resources in the Monterey Peninsula, Carmel Bay, and South Monterey Bay Region (Region).

2. RECITALS

- A. The State of California desires to foster Integrated Regional Water Management (IRWM) planning and encourages local public, non-profit, and private (for profit) entities to define planning regions appropriate for managing water resources and to integrate strategies within these planning regions.
- B. Water resources management authority in the Region is currently distributed among various public agencies with a range of legal powers and regulatory responsibilities. These public agencies have definite jurisdictional boundaries, whereas sensible water resources planning and management frequently requires actions in multiple jurisdictions. Non-public entities within the Region have considerable interests in cooperating with public entities to protect, manage, and enhance water resources within the Region.
- C. Four public entities and one non-profit entity in the Region with responsibility and interests in management of water resources have agreed to form a Water Management Group for the purposes of developing and implementing projects consistent with the guidelines set by the State of California for IRWM. These entities are: 1.) the Big Sur Land Trust (BSLT), a 501 (c) 3 organization; 2.) the City of Monterey; 3.) Monterey Regional Water Pollution Control Agency (MRWPCA); 4.) the Monterey County Water Resources Agency (MCWRA); and 5.) the Monterey Peninsula Water Management District (MPWMD).
- D. The Water Management Group has defined an appropriate planning Region that takes into consideration jurisdictional limits, powers and responsibilities, and watershed and groundwater basin boundaries. The Water Management Group is taking the lead in overseeing and implementing a detailed IRWM Plan within the planning Region. The Region is generally described as encompassing approximately 347 square miles and consists of groundwater basins and coastal watershed areas contributing to the Carmel Bay and south Monterey Bay between Pt. Lobos on the south to Sand City on the north. The Region includes about 38 miles of the coast within the Monterey Bay National Marine Sanctuary, three Areas of Special Biological Significance (Pt. Lobos, Carmel Bay, and Pacific Grove), the Cities of Carmel-by-the Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, Seaside, and unincorporated portions of Monterey County including the Carmel Valley

watershed (255 square miles), Pebble Beach, the Carmel Highlands and portions of the Seaside Groundwater Basin adjacent to Highway 68 (also known as Canyon Del Rey).

- E. The entities signatory to this MOU desire to link and integrate efforts to jointly oversee the development and implementation of a comprehensive Integrated Regional Water Management Plan for the Region.

3. GOALS

The goals of the collaborative effort undertaken pursuant to this Memorandum of Understanding are:

- 3.1 To develop and adopt a comprehensive IRWMP for the Region that will consider the strategies that are required by the State under CWC 79562.5 and 79564 including at a minimum: 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, and wetlands enhancement and creation. Optional additional elements that may be considered include: conjunctive use, desalination, imported water, land use planning, nonpoint source pollution control, promotion of the steelhead run, surface storage, watershed planning, water and wastewater treatment, and water transfers.
- 3.2 To develop a comprehensive IRWMP for the Region that incorporates water supply, water quality, flood and erosion protection, and environmental protection and enhancement objectives.
- 3.3 To improve and maximize coordination of individual public, private, and non-profit agency plans, programs and projects for mutual benefit and optimal gain within the Region.
- 3.4 To help identify, develop, and implement collaborative plans, programs, and projects that may be beyond the scope or capability of individual entities, but which would be of mutual benefit if implemented in a cooperative manner..
- 3.5 To facilitate regional water management efforts that include multiple water supply, water quality, flood control, and environmental protection and enhancement objectives.
- 3.6 To foster coordination, collaboration and communication between stakeholders and other interested parties, to achieve greater efficiencies, enhance public services, and build public support for vital projects.
- 3.7. To realize regional water management objectives at the least cost possible through mutual cooperation, elimination of redundancy, and enhanced regional competitiveness for State and Federal grant funding.

4. DEFINITIONS

- 4.1 **Integrated Regional Water Management Plan (IRWMP or IRWM Plan).** The plan envisioned by state legislators and state resource agencies that integrates the strategies, objectives, and priorities for projects to manage water resources proposed by public entities, non-profit entities, and stakeholders within a defined Planning Region. The minimum plan standards are as shown 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,” as revised.

- 4.2 **Integration.** The combining of water management strategies and projects to be included in an IRWMP.
- 4.3.a **Lead Agency for IRWM Plan Development.** The Monterey Peninsula Water Management District is designated by the Water Management Group to lead the development or implementation of an Integrated Regional Water Management Plan for the Region.
- 4.3.b **Lead Agency for IRWM Grant Applications.** The Water Management Group may designate any entity in the Water Management Group to be the Lead Agency in making application to the State for grant funds.
- 4.4. **Non-profit Agency.** A 501 (c) (3) corporation, conservancy, group or other organization involved in water resources management in the Region.
- 4.5 **Private Agency.** A private or publicly held for-profit corporation or property owner involved in water resources management in the Region
- 4.6. **Project.** A specific project that addresses a service function.
- 4.7. **Public Agency.** A state-authorized water district, water agency, water management agency or other public entity, be it a special district, city or other governmental entity, responsible for providing one or more services in the areas of water supply, water quality, wastewater, recycled water, water conservation, stormwater/flood control, watershed planning and aquatic habitat protection and restoration.
- 4.8. **Region.** The area defined by the Water Management Group (WVG) consisting of watersheds, sub-watersheds and groundwater basins under the jurisdiction of one or more entities within the WVG.
- 4.9. **Service Function.** A water-related individual service function provided by a private, public, or non-profit entity, i.e. water supply, water quality, wastewater, recycled water, water conservation, stormwater/flood protection, watershed planning, recreational facilities, and habitat protection and restoration.
- 4.10 **Signatory Entity.** A public, private, or non-profit entity within the Region that is signatory to this MOU.
- 4.11 **Stakeholder.** A non-signatory public, private, or non-profit agency identified in the IRWM Plan with an interest in water resources management within the Region.
- 4.12 **Technical Advisory Committee.** The committee organized to advise the Water Management Group and Stakeholders concerning the IRWM Plan. The group is comprised of individuals with technical backgrounds in the fields of marine and freshwater biology, ecology, geology, engineering, hydrogeology, planning, resource conservation, riparian systems, water conservation, and water quality.
- 4.13 **Water Management Group.** The group of entities that takes the lead in overseeing the development and implementation of the Integrated Regional Water Management Plan within the Planning Region (the Monterey Regional Water Pollution Control Agency, the Monterey County Water Resources Agency, the Monterey Peninsula Water Management District, the City of Monterey, and the Big Sur Land Trust).
- 4.14. **Water Management Strategies.** Plans for and activities to be considered in an IRWMP include, but are not limited to, 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 improvement, water recycling, and wetlands enhancement and creation.

5. IRWMP PARTICIPANTS

- 5.1 **Adopting Entities.** The entities in the Region that participate in the development, adoption, and implementation of the Integrated Regional Water Management Plan for the Region. Each entity intending to carry out a project proposed in the IRWMP must formally adopt the IRWMP or provide written substantiation of acceptance by the governing authority of the entity. For a public agency, adoption of the IRWMP is by formal resolution of the governing body. For a non-profit or for-profit entity, proof of acceptance of the IRWMP by the equivalent of a public agency governing body is required (e.g., by a board of directors or other management entity).
- 5.2 **Stakeholders.** Entities, such as other public, private, and non-profit entities, business and environmental groups, that are considered valuable contributors to the understanding and management of the Region's water resources.
- 5.3 **Regulatory Agencies.** These agencies, including, but not limited to, the Central Coast Regional Water Quality Control Board, California Coastal Commission, U.S. Army Corps of Engineers, California Public Utilities Commission, National Marine Fisheries Service (NOAA Fisheries), U.S. Fish and Wildlife Service, and the California Department of Fish and Game, will be invited to participate in the development and implementation of the IRWMP.
- 5.4 **Water Management Group.** The group of entities that takes the lead in developing and implementing an Integrated Regional Water Management Plan within the Planning Region (the Monterey Regional Water Pollution Control Agency, the Monterey County Water Resources Agency, the Monterey Peninsula Water Management District, the City of Monterey, and the Big Sur Land Trust).

6. MUTUAL UNDERSTANDING

- 6.1 **Subject matter scope of the IRWMP.** The IRWMP for the Region will include, but is not limited to, water supply, water quality, wastewater, recycled water, water conservation, stormwater/flood control, watershed planning, erosion prevention, and habitat protection and restoration. It is acknowledged that the proposals contained in the IRWMP may be based, in part, on the land-use plans of the member entities local governments such as Cities, Monterey County, and special districts located within the Region. Therefore, the resultant IRWMP will by design have incorporated the land-use plans and assumptions intrinsic to the respective water-related service function.
- 6.2 **Geographical scope of the IRWMP.** The area for this Memorandum is generally defined as the watersheds and associated groundwater basins contributing to the south Monterey Bay and Carmel Bay as shown in Figure 3-1: Map of Monterey Peninsula Integrated Regional Water Management Planning Region in the IRWM Plan. However, the geographic scope of the IRWM Plan may be enlarged to include projects involving water resource management and entities outside of the defined Region.
- 6.3 **Approach to developing the IRWMP.** The Lead Agency will provide a draft IRWMP to the Water Management Group and other public, private, and non-profit entities for

review and comment. It will be the responsibility of each entity signatory to this Memorandum to provide the Lead Agency with information described in the draft IRWMP concerning project proposals or to identify the need for a water management strategy for each service function provided by a signatory entity.

In order to be part of a final IRWMP, all proposals for development of water management plans and water development project proposals related to the IRWMP must meet the standards identified in the draft IRWM Plan for the Region.

A technical advisory committee consisting of staff representatives from the Water Management Group, other Stakeholders and such other organizations as may become contributing entities, will review proposed management plans and project proposals for consistency with the draft IRWMP and recommend a prioritized list of projects to be carried out within the Region. The Water Management Group and Stakeholders will meet to review the recommendation made by the TAC.

- 6.4. **Approval of prioritized project list.** Approval of the prioritized project list should occur by consensus of the Water Management Group and Stakeholders and should be based on the prioritization process described in the IRWMP and the recommendations of the Technical Advisory Committee. However, if a consensus cannot be reached among the Stakeholders and Water Management Group, the Water Management Group may make a final determination of the prioritized project list.
- 6.5. **Adoption of the IRWMP.** Plan adoption will occur by approval of the governing board of each entity. It should be noted that the adopted Plan and project list may be amended from time to time as described below.
- 6.6. **Amendment of IRWMP or Prioritized Project list.** The IRWM Plan and prioritized project list may be amended from time to time. Any member of the Water Management Group or Stakeholders may request that the Lead Agency convene a meeting of the Water Management Group and Stakeholders for the purposes of amending the IRWM Plan or the prioritized project list. However, it is anticipated that the IRWMP or prioritized project list will be amended no more frequently than annually, unless more frequent amendments are required to meet State IRWM standards or grant application cycles. An amended IRWM Plan must be consistent with State IRWM standards as described in Definition 4.1 “Integrated Regional Water Management Plan” and any subsequent revisions by the State to IRWM guidelines.
- 6.7. **Project Implementation.** Project proponents will be responsible for completing proposed projects and providing project reports to the Lead Agency.
- 6.8. **Project Monitoring.** The Water Management Group will be responsible for monitoring the implementation of the IRWMP. The technical advisory committee will regularly report to the General Managers and Governing Boards of the Water Management Group regarding progress on the development and implementation of the IRWMP. The Lead Agency will be responsible for coordinating data collection and dissemination.
- 6.9. **Grant Applications.** The Water Management Group will designate a Lead Agency to apply for grant funds. The Lead Agency for each grant application should have a mission and expertise that is consistent with the purpose of the grant being applied for.

- 6.10 **Grant Awards and Agreement.** The Lead Agency will be the grantee and administer the grant on behalf of the Water Management Group and Stakeholders.
- 6.11 **Termination.** An entity signatory to this MOU may withdraw from participation upon 30 days advance notice to the other signatory entities, provided it agrees to be financially responsible for any previously committed, but unmet resource commitment.
- 6.12. **Personnel resources.** It is expected that the General Managers and/or other officials of each entity signatory to this MOU will periodically meet to insure that adequate staff resources are available to implement the IRWM Plan.
- 6.13. **Other on-going regional efforts.** Development of the IRWMP is separate from efforts of other organizations to develop water-related plans on a regional basis around Monterey Bay and the Central Coast. As the IRWMP is developed and implemented, work products may be shared to provide other entities and groups with current information.

7. INDEMNIFICATION

- 7.1 Each Party shall indemnify, defend and hold harmless the other parties, to the extent allowed by law and in proportion to fault, against any and all third-party liability for claims, demands, costs or judgments (direct, indirect, incidental or consequential) involving bodily injury, personal injury, death, property damage or other costs and expenses (including reasonable attorneys' fees, costs and expenses) arising or resulting from the acts or omissions of its own officers, agents, employees or representatives carried out pursuant to the obligations of this Agreement.
- 7.2 These indemnity provisions shall survive the termination or expiration of this Agreement. Further, each Party will be liable to the other Party for attorneys' fees, costs and expenses, and all other costs and expenses whatsoever, which are incurred by the other Party in enforcing these indemnity provisions.

7. SIGNATORIES TO THE MEMORANDUM OF UNDERSTANDING

We, the duly authorized undersigned representatives of our respective entities, acknowledge the above as our understanding of the intent and expected outcome in overseeing the development and implementation of an Integrated Regional Water Management Plan for the Monterey Peninsula, Carmel Bay, and South Monterey Bay Region.

WATER MANAGEMENT GROUP

Signature

Signature

Printed Name
Monterey County Water Resources Agency

Printed Name
Monterey Regional Water Pollution Control Agency

Date

Date

Signature

Signature

Printed Name
Big Sur Land Trust

Printed Name
City of Monterey

Date

Date

Signature

Printed Name
Monterey Peninsula Water Management District

Date

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Appendix B

Special Status Species

Notes:

FE=	Federally listed Endangered
FT=	Federally listed Threatened
FC=	Federal Candidate. Sufficient biological information to support a proposal to list the species as Endangered or Threatened.
MB=	Migratory Bird
SE=	State listed Endangered
ST=	State listed Threatened
SR=	State listed as Rare
SP=	State Protected Species
CSSC=	California Species of Special Concern
CNPS 1A=	Plants considered by the CNPS to be extinct in California
CNPS 1B=	Plants are rare, threatened, or endangered in California and elsewhere
CNPS 2=	Plant rare, threatened or endangered in California, but more numerous elsewhere
CNPS 3=	Needs more information
CNPS 4=	Limited distribution in California

Name	Status	Habitat	Local Occurrence
Fish			
Steelhead south/central California ESU (<i>Oncorhynchus mykiss</i>)	FT, CSSC	Coastal rivers and creeks with high quality water and sufficient spawning areas	Carmel River and majority of Carmel River Watershed tributaries and San Jose Creek
Reptiles and Amphibians			
California tiger salamander (<i>Ambystoma californiense</i>)	FT	Found mainly in annual grassland habitat but seasonal ponds and vernal pools are critical for breeding.	Fort Ord
Black legless lizard (<i>Anniella pulchra nigra</i>)	CSSC	Coastal and interior dunes	Fort Ord
Southwestern pond turtle (<i>Actinemys marmorata pallida</i>)	CSSC	Ponds, lakes, and streams with year around water	Carmel River Watershed
California horned lizard (<i>Phrynosoma coronatum Frontale</i>)	CSSC	Exposed gravel and sand areas with shrubs and clearings	San Clemente Dam Area
California Red-legged Frog (<i>Rana aurora draytoni</i>)	FT, SP, CSSC	Freshwater pools, streams and permanent or semi permanent ponds with emergent and overhanging vegetation. Requires pools of 1 m depth for breeding and hiding.	Carmel River Watershed
Coast Range newt (<i>Taricha torosa torosa</i>)	CSSC	Dead wood and leaves on forest floor	Upper Carmel River Watershed
Birds			
Cooper's hawk (<i>Accipiter cooperii</i>)	CSSC	Dense canopied evergreen and riparian forests zones	Breeds at Carmel River Watershed and Lagoon
Sharp-shinned hawk (<i>Accipiter striatus</i>)		Bushy riparian areas	Pacific Grove and Carmel River Watershed
Tricolored blackbird (<i>Agelaius tricolor</i>)	CSSC	Foothills of Coast Ranges	Fort Ord and Carmel Lagoon
Grasshopper sparrow (<i>Ammodramus savannarum</i>)	MB	Nests in open grasslands	Interior and coastal bluffs and Carmel Lagoon
Golden eagle (<i>Aquila chrysaetos</i>)	CSSC	Breeds on cliffs or in large trees or structures	Carmel River Watershed
Long-eared owl (<i>Asio otus</i>)	CSSC	Resident of riparian habitats.	Carmel River Watershed
Burrowing owl (<i>Athene cucularia</i>)	CSSC	Grassland habitat with ground squirrel burrows	Monterey and Carmel Lagoon
Marbled murrelet (<i>Brachyramphus marmoratus</i>)	FT, SE	Coastal marine feeding areas	Carmel Lagoon
Western snowy plover (<i>Charadrius alexandrinus nivosus</i>)	FT, CSSC	Sandy beaches on marine and estuarine shores. Salt pond levees.	Pacific Grove, Fort Ord Dunes and Carmel Lagoon
Northern harrier (<i>Circus cyaneus</i>)	CSSC	Open areas such as grasslands, steppes and wetlands	Carmel Lagoon
Black swift (<i>Cypseloides niger</i>)	CSSC	Nests in wet coastal bluff habitats. Forages	Point Lobos

Name	Status	Habitat	Local Occurrence
Yellow warbler <i>Dendroica petechia brewsteri</i> (nesting)	CSSC	aerially. Favors nesting in riparian woodland, especially dense willows and cottonwoods, and meadow edges.	Breeds at Carmel Lagoon
White-tailed kite (nesting sites only) <i>(Elanus leucurus)</i>	MB	Agricultural areas, grassland, and marshes	Carmel Lagoon and Carmel River Watershed
Pacific-slope flycatcher <i>(Empidonax difficilis)</i>	CSSC	Floodplain and riparian habitat	Breeds at Carmel Lagoon
California horned lark <i>(Eremophila alpestris actia)</i>	CSSC	Open habitats where trees and shrubs are absent	Unknown
Prairie falcon <i>(Falco mexicanus)</i>	CSSC	Dry country side grasslands and foothills	Carmel River Watershed
American peregrine falcon <i>(Falco peregrinus anatum)</i>	SE	River banks, trees, and man made structures	Carmel Lagoon
Common Loon <i>(Gavia immer)</i>	CSSC	Coastal waters in winter	Carmel Lagoon
California condor <i>(Gymnogyps californianus)</i>	FE, SE	Rugged foothills and mountains	Upper Carmel River Watershed
Bald Eagle <i>(Haliaeetus leucocephalus)</i>	FT, SE	Feeds on large fish from lakes and rivers	Vagrant at Carmel Lagoon
Barn swallow <i>(Hirundo rustica)</i>	MB	Open country and nests on man made structures	Breeds at Carmel Lagoon
Loggerhead shrike <i>(Lanius ludovicianus)</i>	CSSC	Short grassy areas with spiny shrubs	Unknown
California brown pelican <i>(Pelecanus occidentalis californicus)</i>	FT, ST	Coastal saltwater, beaches, bays, and marshes	Carmel Lagoon
Double-crested cormorant <i>(Phalacrocorax auritus)</i>	CSSC	Brackish and freshwater habitats	Carmel Lagoon
Black phoebe <i>(Sayornis nigricans)</i>	MB	Shady areas near water, streams, and ponds	Breeds at Carmel Lagoon
Rufous hummingbird <i>(Selasphorus rufus)</i>	MB	Forested and brushy areas near flowering plants	Carmel Lagoon
Allen's hummingbird <i>(Selasphorus sasin)</i>	MB	Forested and brushy areas near flowering plants	Breeds at Carmel Lagoon
California spotted owl <i>(Strix occidentalis occidentalis)</i>	CSSC	Dark old-growth or mixed mature coniferous forest	Carmel River Watershed

Name	Status	Habitat	Local Occurrence
Western meadowlark (<i>Sturnella neglecta</i>)	MB	Grassy areas ranging from sparse desert grassland to meadows in forests	Carmel River Watershed
Least bell's vireo (<i>Vireo bellii pusillus</i>)	FE, SE	Lowland riparian habitat	Carmel River Watershed
Plants			
Bristlecone fir (<i>Abies bracteata</i>)	CSSC	Lower montane coniferous forest, particularly in rocky areas, and chaparral.	Carmel River Watershed
Hickman's Onion (<i>Allium hickmanii</i>)	CSSC	Maritime chaparral, coastal prairie, coastal scrub, valley and foothill grassland habitats.	Fort Ord and Carmel River Watershed
Napa false indigo (<i>Amorpha californica</i> var. <i>napensis</i>)	CSSC	Chaparral and cismontane woodland.	Carmel River Watershed
Little Sur manzanita (<i>Arctostaphylos edmundsii</i>)	CSSC	Chaparral and coastal bluff scrub.	Garrapota Creek to Pfeiffer Point
Hooker's manzanita (<i>Arctostaphylos hookeri</i> ssp. <i>hookeri</i>)	CSSC, CNPS 1B	Sandy soils in coastal scrub, chaparral and cismontane woodland habitats.	Fort Ord
Contra Costa manzanita (<i>Arctostaphylos manzanita</i> ssp. <i>laevigata</i>)	CSSC	Rocky areas in chaparral.	Not in Monterey County; Santa Clara County
Monterey manzanita (<i>Arctostaphylos montereyensis</i>)	CSSC	Sandy soils in maritime chaparral, cismontane woodland and coastal scrub habitats.	Fort Ord
Pajaro manzanita (<i>Arctostaphylos pajaroensis</i>)	CSSC	Sandy soils in chaparral.	Fort Ord
Sandmat manzanita (<i>Arctostaphylos pumila</i>)	CSSC	Maritime chaparral, cismontane woodland, closed-cone coniferous forest and coastal scrub habitats, particularly in open areas with sandy soils.	Fort Ord
Coastal dunes milk-vetch (<i>Astragalus tener</i> var. <i>titi</i>)	FE, SE, CNPS 1B	Coastal bluff scrub, coastal dunes and coastal prairie, particularly in mesic areas with sandy soils.	Del Monte Forest
Brewers red maid (<i>Calandrinia breweri</i>)	CNPS 4	Chaparral, Coastal scrub, particularly in sandy or loamy soils at disturbed sites and burns	Fort Ord
Muir's tarplant (<i>Carlquistia muirii</i>)	CSSC, CNPS 1B	Upper and lower montane coniferous forest and chaparral.	Santa Lucia Mountains and Carmel River Watershed
Monterey Indian paintbrush (<i>Castilleja latifolia</i>)	CNPS 4	Closed-cone coniferous forest, coastal scrub, cismontane woodland	Fort Ord and Carmel River Watershed

Name	Status	Habitat	Local Occurrence
		and Coastal dune habitats, particularly in open areas with sandy soils.	
Monterey ceanothus (<i>Ceanothus cuneatus</i> var. <i>rigidus</i>)	CNPS 4	Closed-cone coniferous forest	Fort Ord
Central Dune Scrub			Coastal Areas
Central Maritime Chaparral			Fort Ord
Congdon's tarplant (<i>Centromadia parryi</i> ssp. <i>congdonii</i>)	CNPS 1B	Valley and foothill grassland habitats, particularly in areas with alkaline substrates.	Fort Ord
Douglas's spineflower (<i>Chorizanthe douglasii</i>)	CNPS 4	Sandy and gravelly areas in lower montane coniferous forest, chaparral, cismontane woodland and coastal scrub habitats.	Fort Ord
Monterey spineflower (<i>Chorizanthe pungens</i> var. <i>pungens</i>)	FT, CNPS 1B	Maritime chaparral, cismontane woodland, coastal dunes, coastal scrub, and sandy areas in valley and foothill grasslands.	Fort Ord
Straight-awned spineflower (<i>Chorizanthe rectispina</i>)	CNPS 1B	Chaparral, cismontane and coastal scrub habitats.	Carmel River Watershed
Robust spineflower (<i>Chorizanthe robusta</i> var. <i>robusta</i>)	FE, CNPS 1B	Coastal scrub, coastal dunes and open areas in cismontane woodland.	Fort Ord
Jolon clarkia (<i>Clarkia jolonensis</i>)	CNPS 1B	Chaparral, coastal scrub and cismontane woodland habitats.	Carmel Valley Watershed, Seaside and Laguna Seca
Lewis's clarkia (<i>Clarkia lewisii</i>)	CNPS 4	Chaparral, coastal scrub, closed-cone coniferous forest, cismontane woodland and broadleaved upland forest habitats.	Fort Ord and Carmel River Watershed
San Francisco collinsia (<i>Collinsia multicolor</i>)	CNPS 1B	Closed-cone coniferous forest and coastal scrub; sometimes found in areas with serpentinite soils.	Carmel river Watershed
Seaside bird's-beak (<i>Cordylanthus rigidus</i> ssp. <i>littoralis</i>)	SE	Sandy soils in coastal scrub, maritime chaparral, coastal dunes, closed-cone coniferous forest and cismontane woodland habitats; often found in disturbed areas.	Fort Ord
Branching beach aster (<i>Corethrogyne leucophylla</i>)	CNPS 3	Coastal dunes and closed-cone coniferous forest habitats.	Unknown
Gowen cypress (<i>Cupressus goveniana</i> ssp. <i>goveniana</i>)	FT	Maritime chaparral and closed-cone coniferous forest habitats.	Del Monte Forest and Point Lobos

Name	Status	Habitat	Local Occurrence
Monterey cypress (<i>Cupressus macrocarpa</i>)	CNPS 1B	Closed-cone coniferous forest habitat.	Point Lobos and Cypress Point
Hutchinson's larkspur (<i>Delphinium hutchinsoniae</i>)	CNPS 1B	Chaparral, coastal prairie, coastal scrub and broadleaved upland forest habitats.	Spreckels
Umbrella larkspur (<i>Delphinium umbraculorum</i>)	CNPS 1B	Cismontane woodland habitat.	East Santa Lucia Mountains and Carmel river Watershed
Virgate eriastrum (<i>Eriastrum virgatum</i>)	CNPS 4	Coastal bluff scrub, coastal dunes, coastal scrub and chaparral habitats.	Fort Ord
Eastwood's goldenbush (<i>Ericameria fasciculata</i>)	CNPS 1B	Maritime chaparral, coastal dunes, closed-cone coniferous forest and open areas with sandy soils in coastal scrub habitats.	Fort Ord
Pinnacles buckwheat (<i>Eriogonum nortonii</i>)	CNPS 1B	Sandy soils in chaparral and Valley and Foothill grassland habitats; often found on recent burn sites.	Carmel River Watershed; Rana Creek
Round-leaved filaree (<i>Erodium macrophyllum</i>)	CNPS 2	Cismontane woodland and valley and foothill grassland habitats.	Ventana Wilderness
Coast wallflower (<i>Erysimum ammophilum</i>)	CNPS 1B	Maritime Chaparral, Coastal dunes and open areas with sandy soils in coastal scrub habitats.	Fort Ord; Seaside Dunes
Menzies's wallflower (<i>Erysimum menziesii</i> ssp. <i>menziesii</i>)	FE, SE, CNPS 1B	Coastal dune habitat.	Pacific Grove and Monterey Coasts and Carmel Beach
Yadon's wallflower (<i>Erysimum menziesii</i> ssp. <i>yadonii</i>)	FE, SE, CNPS 1B	Coastal dune habitat.	North of Marina
Talus fritillary (<i>Fritillaria falcata</i>)	CNPS 1B	Chaparral, cismontane woodland and serpentinite soils in lower montane coniferous forest; often found in talus soils.	Ventana Wilderness
Fragrant fritillary (<i>Fritillaria liliacea</i>)	CNPS 1B	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland; often found in serpentinite soils.	Pfeiffer Point, Big Sur, Monterey, Pacific Grove and Lower Carmel River Watershed
Cone Peak bedstraw (<i>Galium californicum</i> ssp. <i>lucianense</i>)	CNPS 1B	Chaparral, cismontane woodland, lower montane coniferous forest and broadleaved upland forest habitats.	Ventana Wilderness
Santa Lucia bedstraw (<i>Galium clementis</i>)	CNPS 1B	Granitic, serpentinite or rocky soils in lower and upper montane coniferous forest habitat.	Upper Carmel Watershed and Ventana Wilderness
Sand gilia (<i>Gilia tenuiflora</i> ssp.)	FE, ST, CNPS 1B	Maritime chaparral, cismontane woodland,	Fort Ord

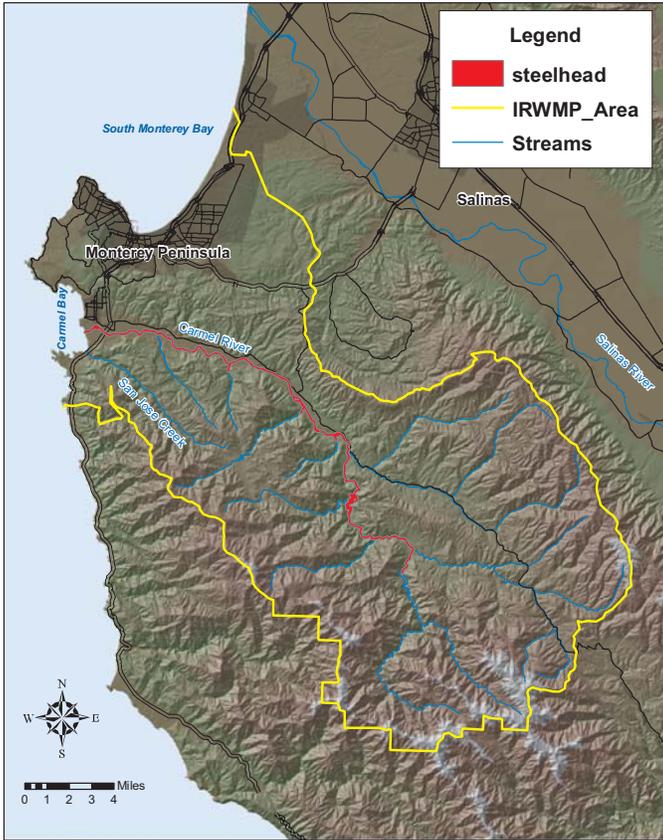
Name	Status	Habitat	Local Occurrence
<i>arenaria</i>)		coastal dunes and open areas with sandy soils in coastal scrub habitats.	
San Francisco gumplant (<i>Grindelia hirsutula</i> var. <i>maritime</i>)	CNPS 1B	Coastal bluff scrub, coastal scrub, valley and foothill grassland habitats particularly in sandy or serpentinite soils.	Seaside, Monterey and Pacific Grove Coasts
Santa Cruz tarplant (<i>Holocarpha macradenia</i>)	CNPS 1B	Coastal prairie, coastal scrub, clay and sandy soils in valley and foothill grassland habitats.	Unknown
Kellogg's horkelia (<i>Horkelia cuneata</i> ssp. <i>sericea</i>)	CNPS 1B.1	Maritime chaparral, closed-cone coniferous forest and sandy or gravelly openings in coastal scrub habitats.	Fort Ord
Beach layia (<i>Layia carnosa</i>)	FE, SE, CNPS 1B	Coastal dunes and sandy soils in coastal scrub habitats.	Coastal Monterey, Pacific Grove and Carmel
Contra Costa goldfields (<i>Lasthenia conjugens</i>)	CNPS 1B	Cismontane woodland, Valley and foothill grassland and Vernal pools	Fort Ord
Jones's layia (<i>Layia jonesii</i>)	CNPS 1B	Chaparral and clay or serpentinite soils in valley and foothill grassland habitats.	Not in Monterey County
Large-flowered linanthus (<i>Linanthus grandiflorus</i>)	CNPS 4	Coastal bluff scrub, Closed-cone coniferous forest Cismontane woodland, Coastal dunes, Coastal prairie, Coastal scrub, Valley and foothill grassland; usually in sandy soils.	Fort Ord
California linderiella (<i>Linderiella occidentalis</i>)			Not in CNPS rare plant inventory
Small-leaved lomatium (<i>Lomatium parvifolium</i>)	CNPS 4	Closed-cone coniferous forest, chaparral, coastal scrub and serpentinite soils in riparian woodland.	Fort Ord
Tidestrom's lupine (<i>Lupinus tidestromii</i>)	FE, SE, CNPS 1B	Coastal dune habitats.	Coastal Marina, Monterey, Pacific Grove and Carmel
Carmel Valley bush mallow (<i>Malacothamnus palmeri</i> var. <i>involucratus</i>)	CNPS 1B	Chaparral, cismontane woodland and coastal scrub habitats.	Carmel River Watershed
Santa Lucia bush mallow (<i>Malacothamnus palmeri</i> var. <i>palmeri</i>)	CNPS 1B	Rocky soils in chaparral.	Unknown
Carmel Valley malacothrix (<i>Malacothrix saxatilis</i> var. <i>arachnoidea</i>)	CNPS 1B	Rocky soils in chaparral.	Carmel River Watershed and Ventana Wilderness

Name	Status	Habitat	Local Occurrence
Marsh microseris <i>(Microseris paludosa)</i>	CNPS 1B	Closed-cone coniferous forest, cismontane woodland, coastal scrub and valley and foothill grassland habitats.	Carmel River Watershed
San Antonio Hill monardella (<i>Monardella antonina</i> ssp. <i>antonina</i>)		Chaparral and cismontane woodland habitats.	Ventana Wilderness and Carmel River Watershed
Curly-leaved monardella (<i>Monardella undulate</i>)	CNPS 4	Closed-cone coniferous forest, chaparral, coastal dunes, coastal prairie, coastal scrub and sandy soils in lower montane coniferous forest.	Fort Ord
Paso Robles navarretia (<i>Navarretia jaredii</i>)	CNPS 4	Cismontane woodland, Meadows and seeps, Valley and foothill grassland, Vernal pools; usually found in clay and serpentinite soils.	Fort Ord
Monterey Cypress Forest			Point Lobos
Monterey Pine Forest			Point Lobos
Monterey Pygmy Cypress Forest			
Northern Bishop Pine Forest			
California adder's tongue (<i>Ophioglossum californicum</i>)	CNPS 4	Chaparral, valley and foothill grassland and vernal pool habitats.	Unknown
Gairdner's yampah (<i>Perideridia gairdneri</i>)	CNPS 4	Broadleafed upland forest, chaparral, coastal prairie, valley and foothill grassland and vernal pool habitats.	Unknown
Monterey Pine (<i>Pinus radiata</i>)	CNPS 1	Closed-cone coniferous forest and cismontane woodland habitats.	Fort Ord, Monterey and Point Lobos
Michael's piperia (<i>Piperia michaelii</i>)	CNPS 4	Coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub and lower montane coniferous forest.	Fort Ord
Yadon's rein orchid (<i>Piperia yardonii</i>)	FE, CNPS 1B	Sandy soils in maritime chaparral, coastal bluff scrub and closed-cone coniferous forest.	Fort Ord
Hooked popcorn flower (<i>Plagiobothrys uncinatus</i>)	CNPS 1B	Sandy soils in chaparral, cismontane woodland, and valley and foothill grassland habitats.	Carmel River Watershed and Ventana Wilderness
Hickman's cinquefoil (<i>Potentilla hickmanii</i>)	FE, SE, CNPS 1B	Coastal bluff scrub, closed-cone coniferous forest, meadows, seeps, marshes and swamps, particularly in vernal mesic and freshwater	Lower Carmel River Watershed and Monterey, Pacific Grove and Carmel Coastal areas

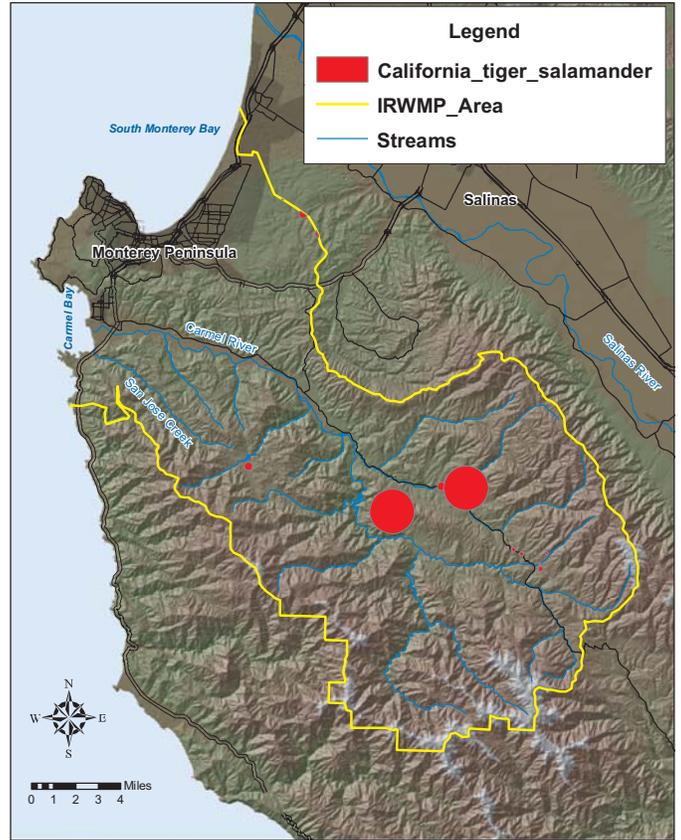
Name	Status	Habitat	Local Occurrence
		habitats.	
Pine rose <i>(Rosa pinetorum)</i>	CNPS 1B	Closed-cone coniferous forest habitats.	Monterey, Pacific Grove and Carmel
Maple-leaved checkerbloom <i>(Sidalcea malachroides)</i>	CNPS 1B	Coastal Scrub, coastal prairie, broadleafed upland forest, north coast coniferous forest; often in disturbed areas.	Carmel River Watershed and Big Sur
Santa Cruz microseris <i>(Stebbinsoseris decipiens)</i>	CNPS 1B	Broadleafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub and valley and foothill grassland, particularly in open areas with serpentinite soils.	Seaside and East of Monterey
Santa Cruz clover <i>(Trifolium buckwestiorum)</i>	CNPS 1B	Broadleafed upland forest, cismontane woodland and the margins of coastal prairie habitats.	Fort Ord
Pacific Grove clover <i>(Trifolium polyodon)</i>	SR, CNPS 1B	Closed-cone coniferous forest, coastal prairie, mesic areas in valley and foothill grasslands, meadows and seeps.	Monterey, Pacific Grove, Carmel and Seaside
Monterey clover <i>(Trifolium trichocalyx)</i>	FE, SE, CNPS 1B	Sandy soils in closed-cone coniferous forest; often found in openings in burned areas.	Monterey, Pacific Grove and Carmel
Valley Needlegrass Grassland			
Insects			
Globose dune beetle <i>(Coelus globosus)</i>	CSSC	Coastal dunes	Unknown
Smith's blue butterfly <i>(Euphilotes enoptes smithi)</i>	FE	Coastal dunes and cliff/chaparral	Seaside coastal dunes
Bay checkerspot butterfly <i>(Euphydryas editha bayensis)</i>	FT	Uses plant species growing in shallow, serpentine-derived soils	Unknown
Pinnacles optioserves riffle beetle <i>(Optioservus canus)</i>	CSSC	Gravelly or rocky streams in riffle areas	Unknown
Mammals			
Pallid bat <i>(Antrozous pallidus)</i>	CSSC	Roosts in rock crevices, tree hollows and mine shafts.	Carmel River Watershed; Hastings Reserve
Ringtail Cat <i>(Bassaricus astutus)</i>	CSSC	Prefers chaparral, rocky hillsides and riparian habitats.	Unknown
Townsend's big-eared bat <i>(Corynorhinus (Plecotus) townsendii)</i>	CSSC	Variety of habitats; most common in mesic sites.	Unknown
Greater western mastiff bat	CSSC	Coastal basins; favors rugged rocky areas with	North of Soledad

Name	Status	Habitat	Local Occurrence
<i>(Eumops perotis californicus)</i>		suitable crevices.	
Monterey dusky-footed woodrat (<i>Neotoma fuscipes luciana</i>)	CSSC	Chaparral, coastal sage scrub, clear cuttings and dense woods.	Fort Ord, Point Lobos
Pacific western big-eared bat (<i>Plecotus townsendii townsendii</i>)	CSSC	Coastal lowlands and cultivated valleys covered with mix vegetation.	Unknown
Monterey ornate shrew (<i>Sorex ornatus salaries</i>)	CSSC	Brackish or saline marshes near sea level.	Carmel River Watershed; Hastings Reserve
American badger (<i>Taxidea taxus</i>)	CSSC	Occupies a diversity of habitats; prefer grasslands, savannas, mountain meadows near timberline	Fort Ord, Point Lobos and Carmel River Watershed; Hastings Reserve

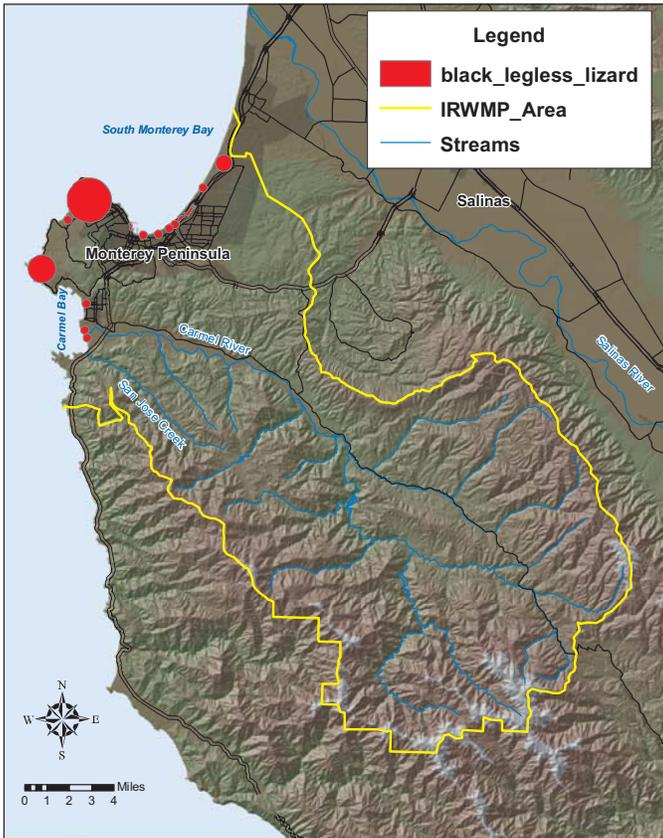
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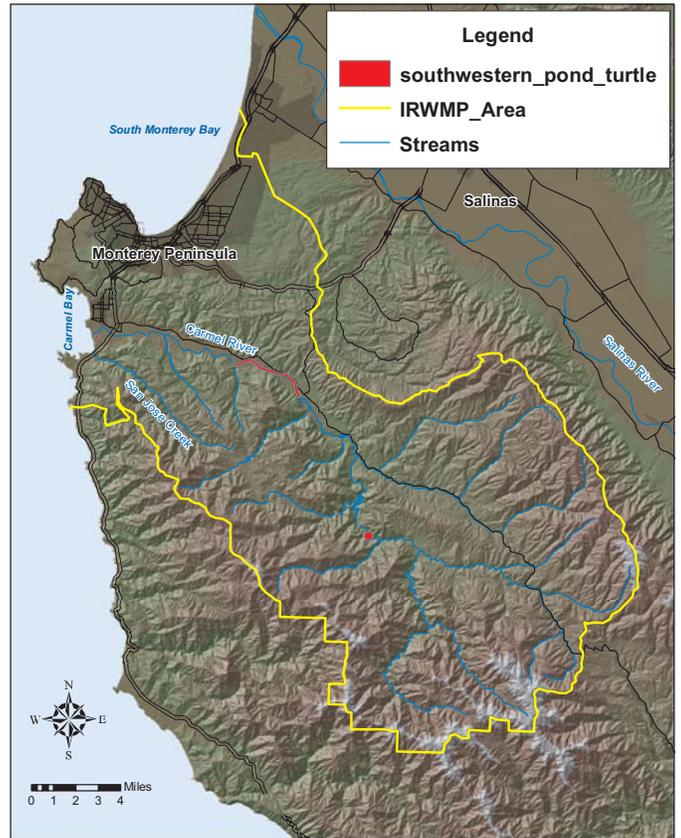
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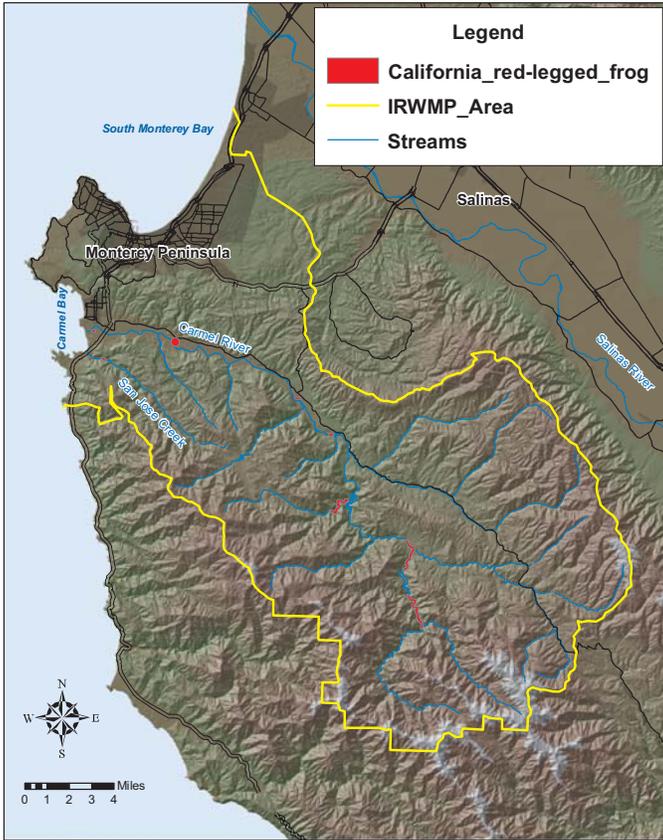
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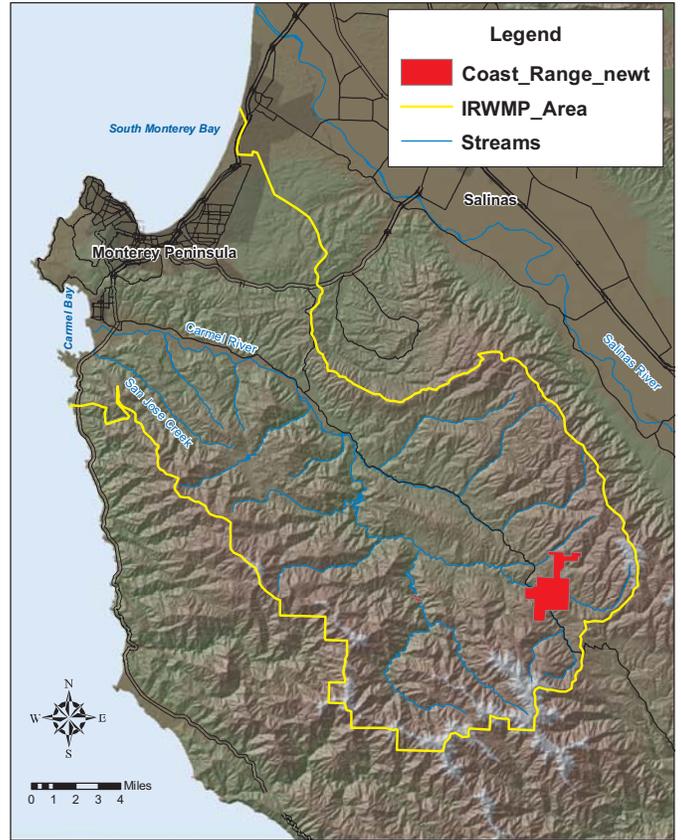
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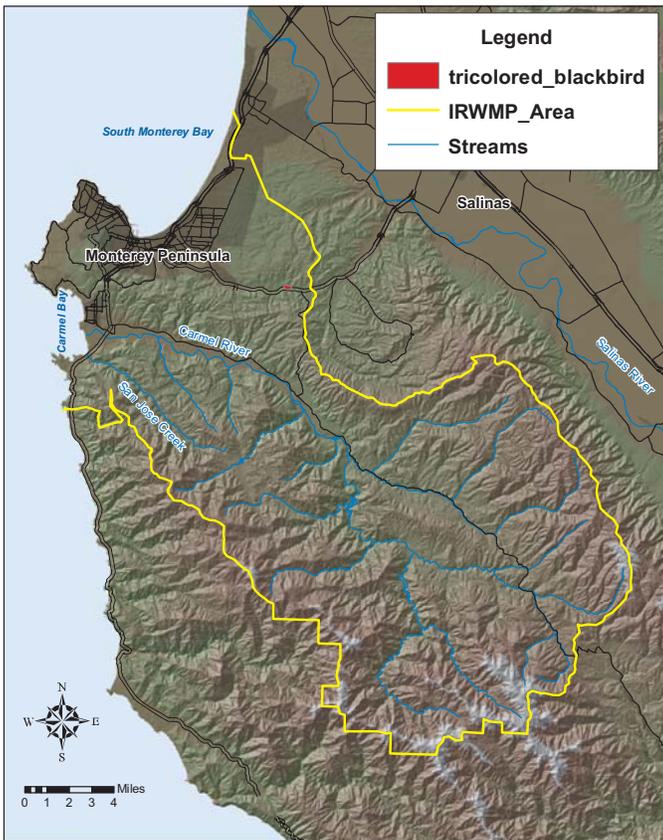
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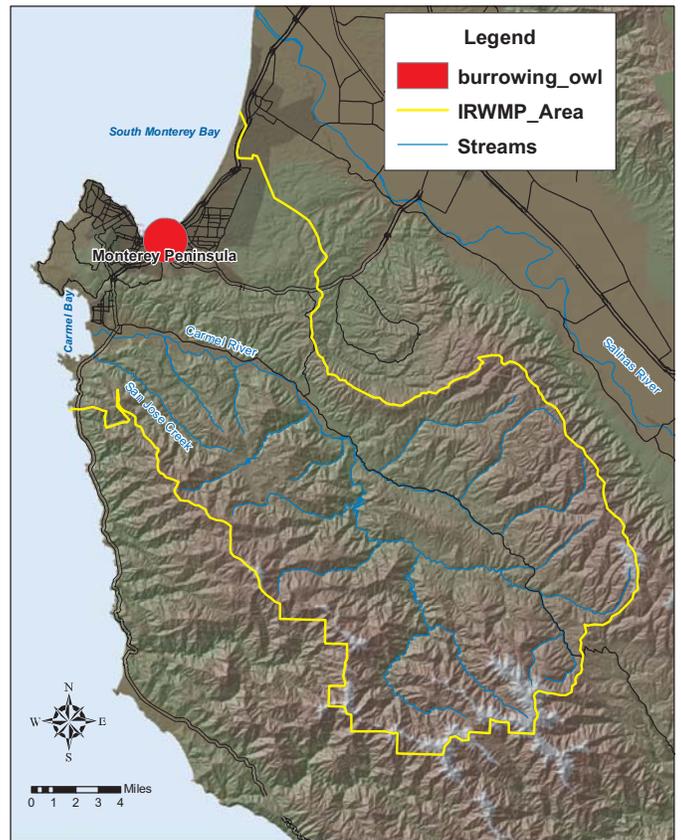
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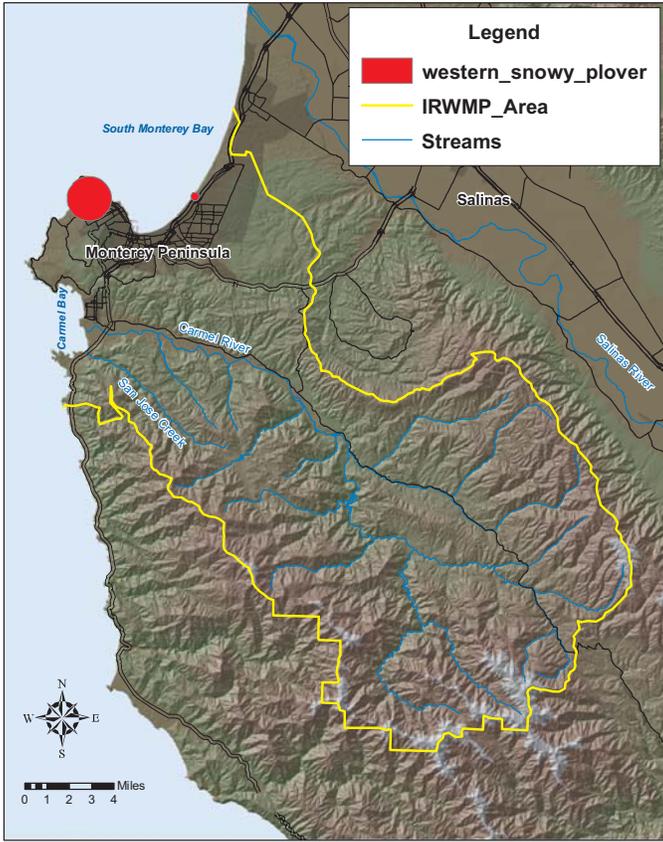
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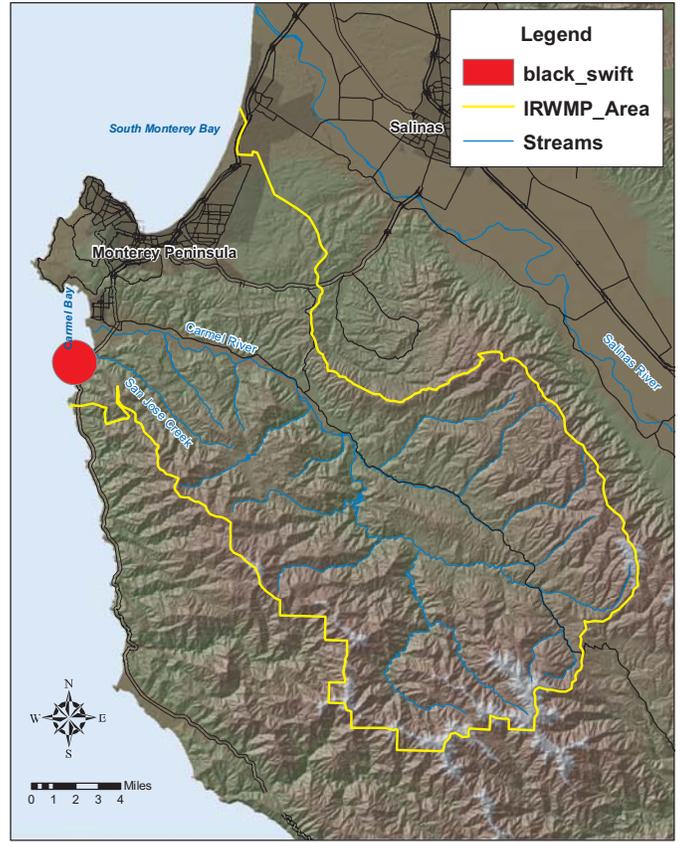
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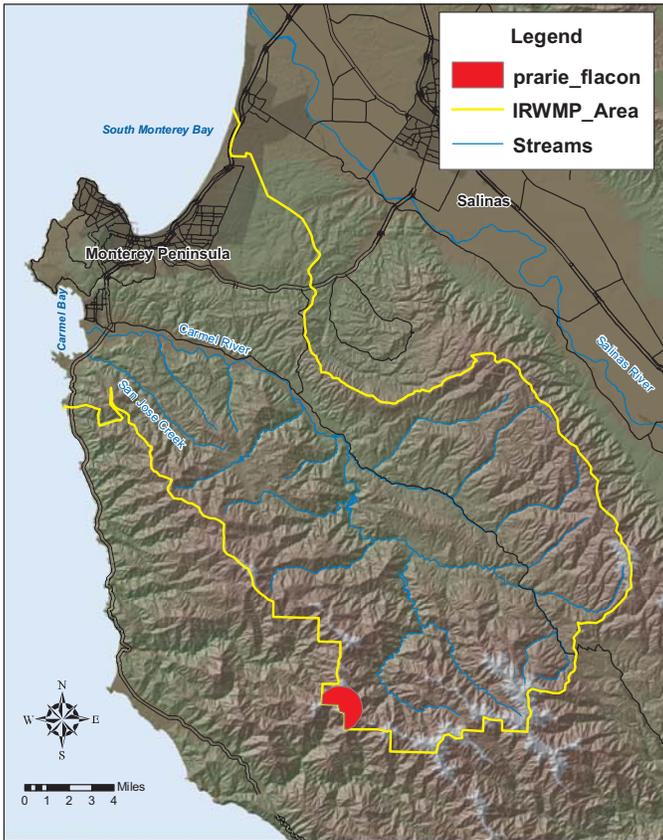
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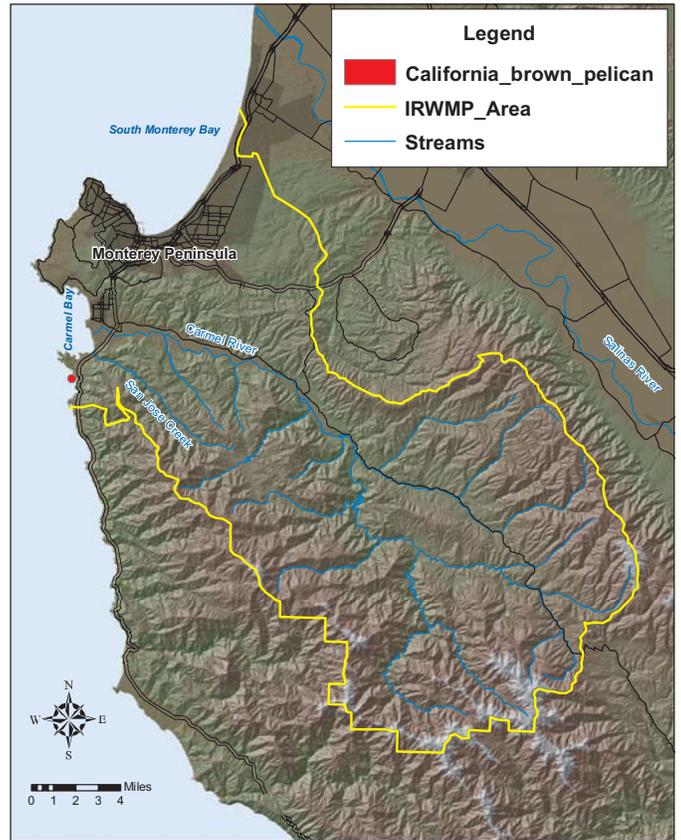
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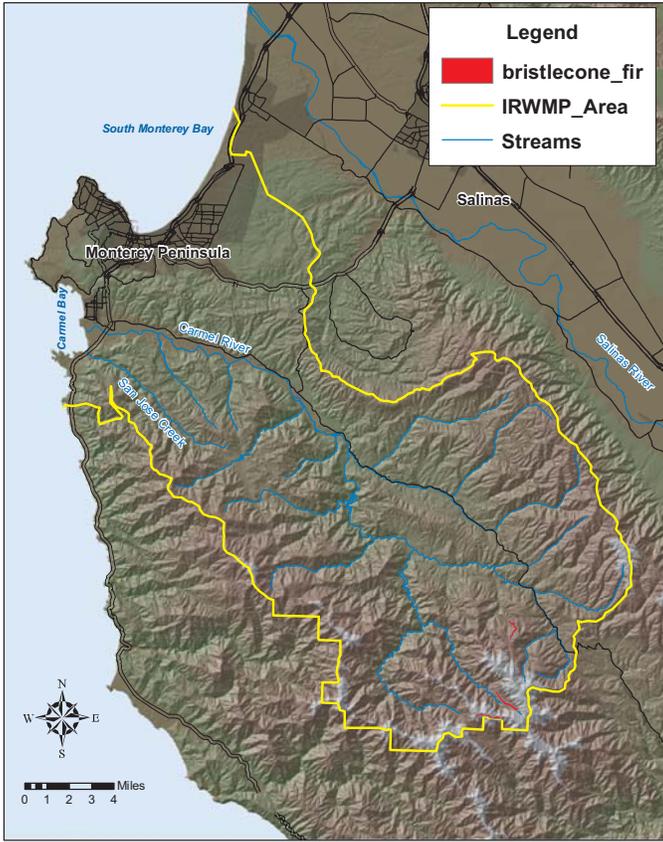
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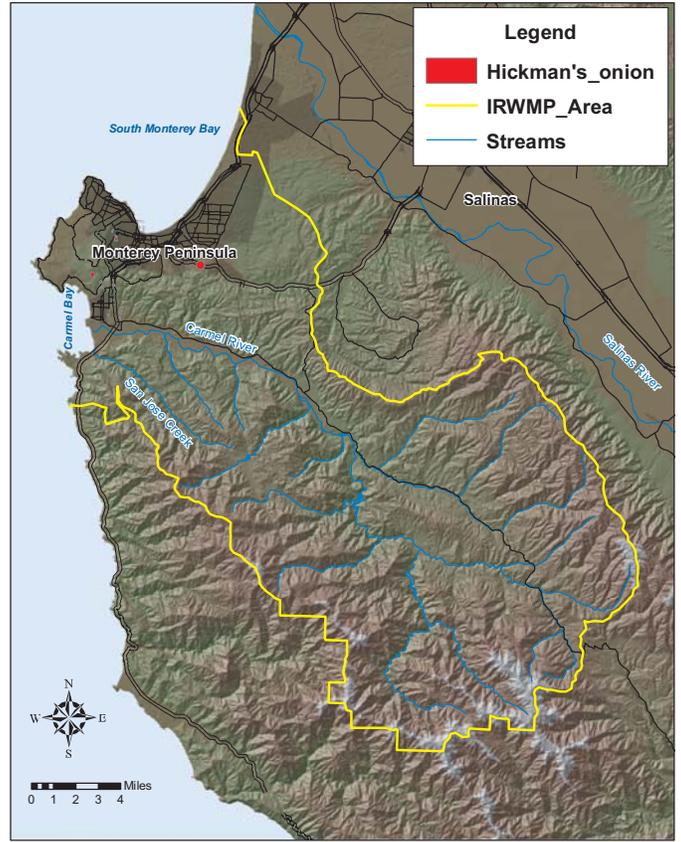
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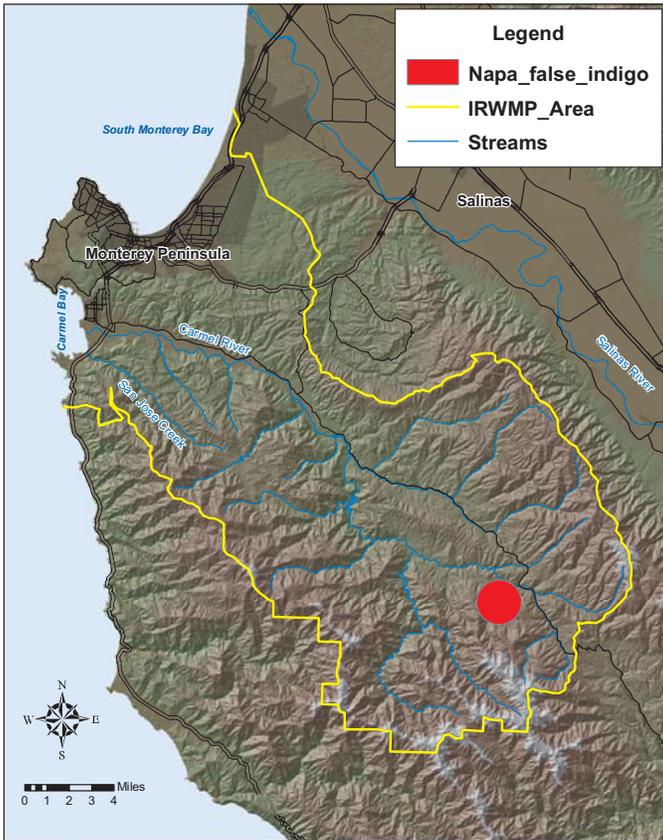
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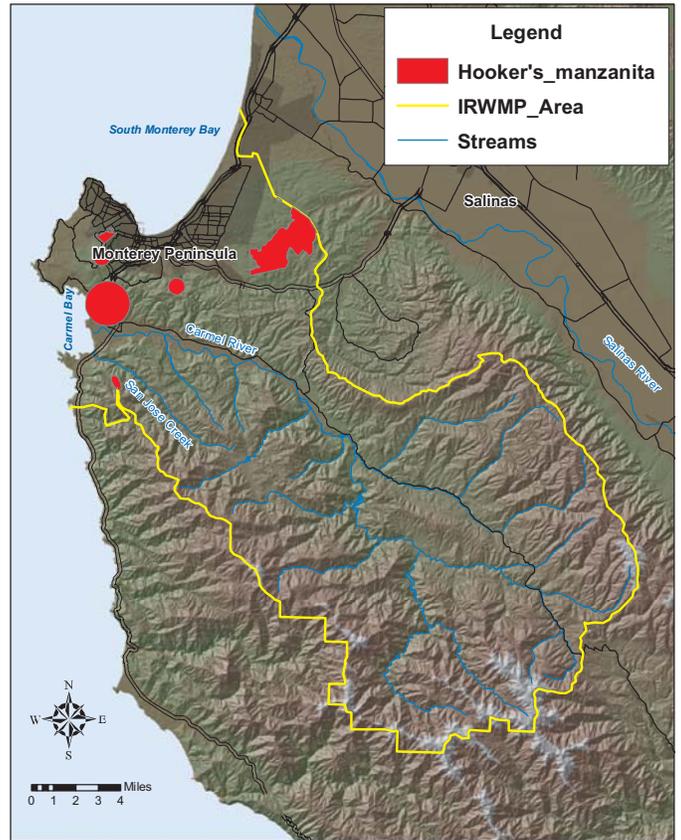
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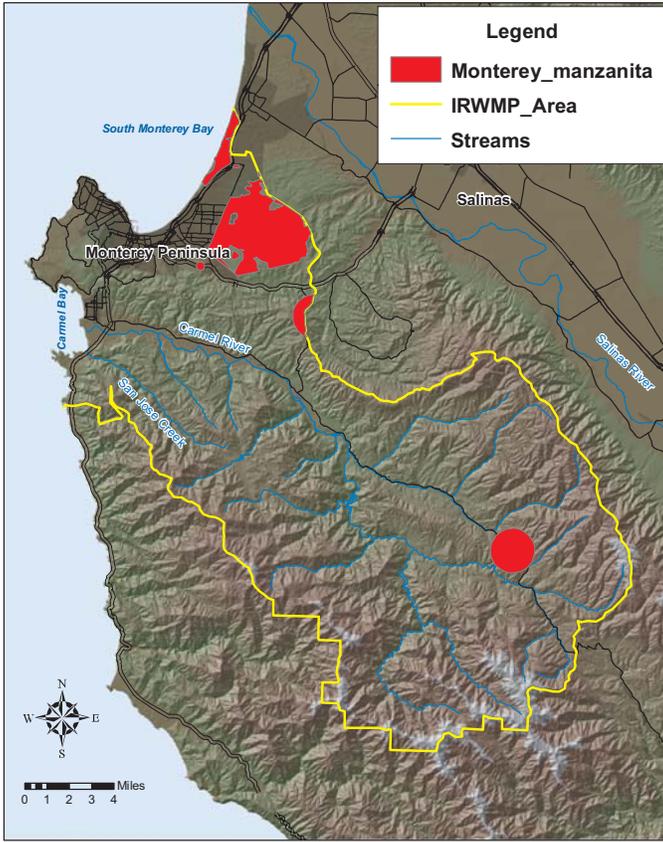
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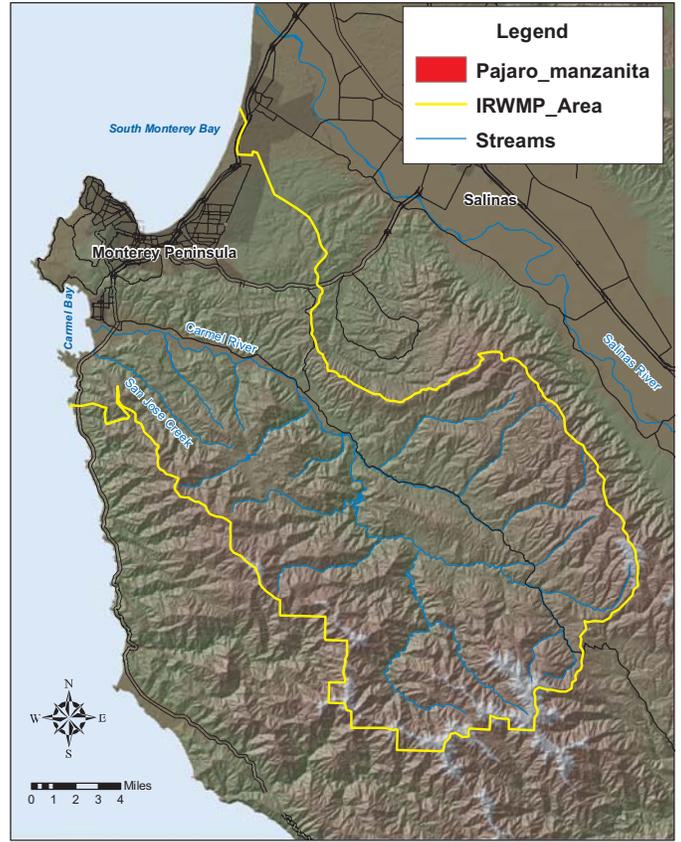
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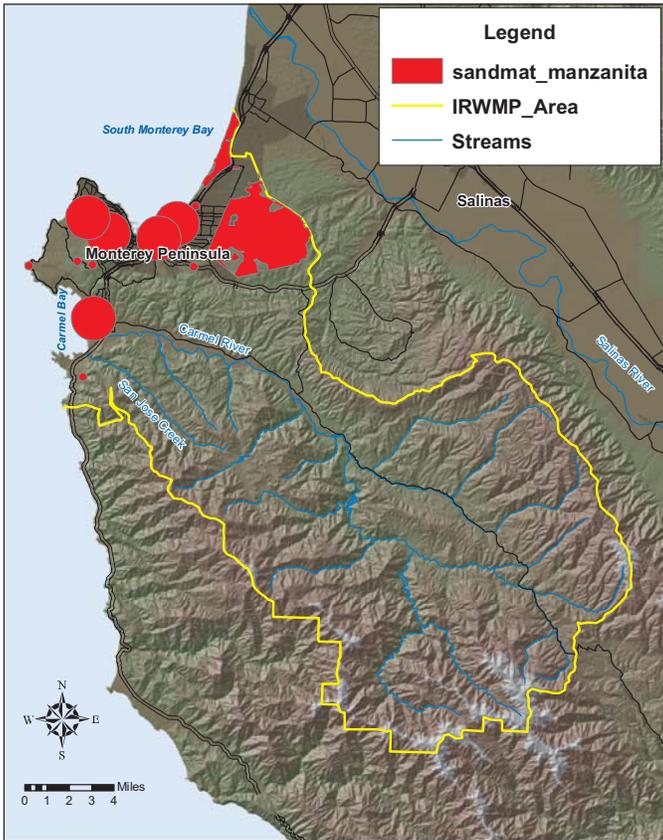
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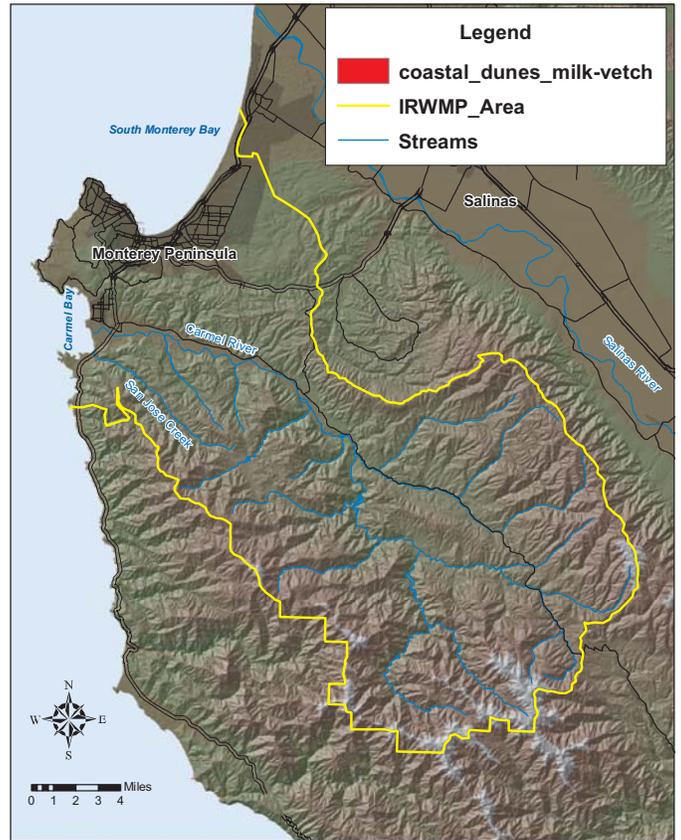
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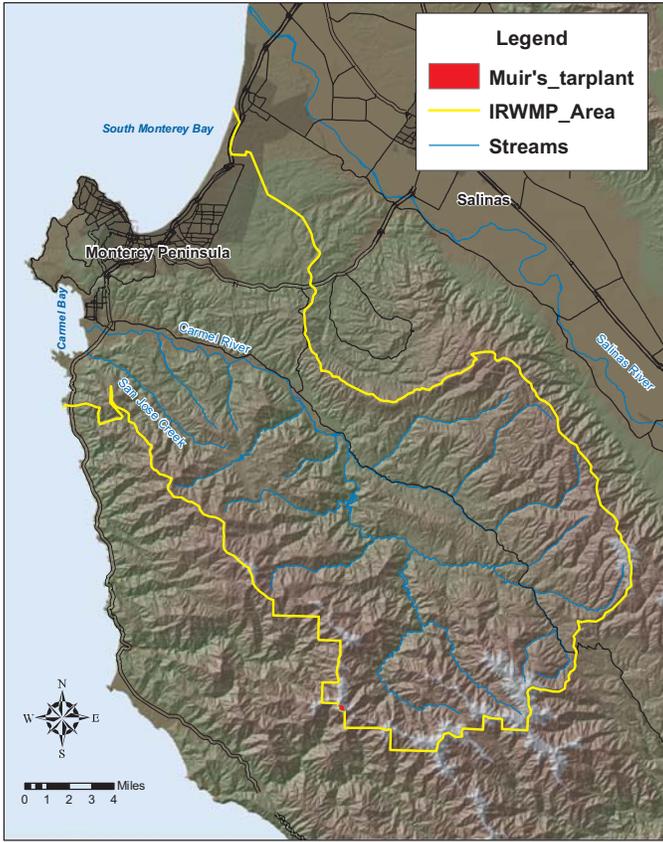
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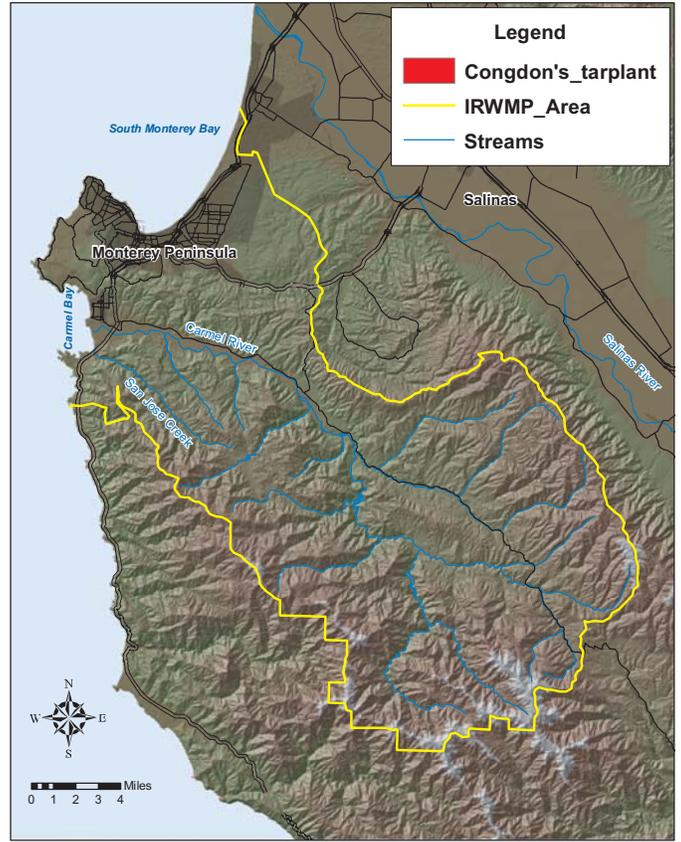
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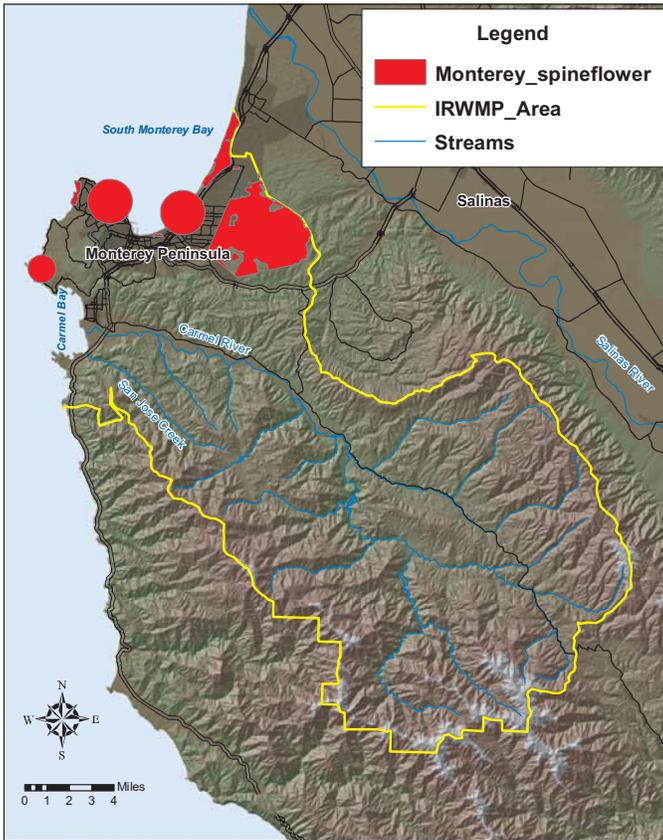
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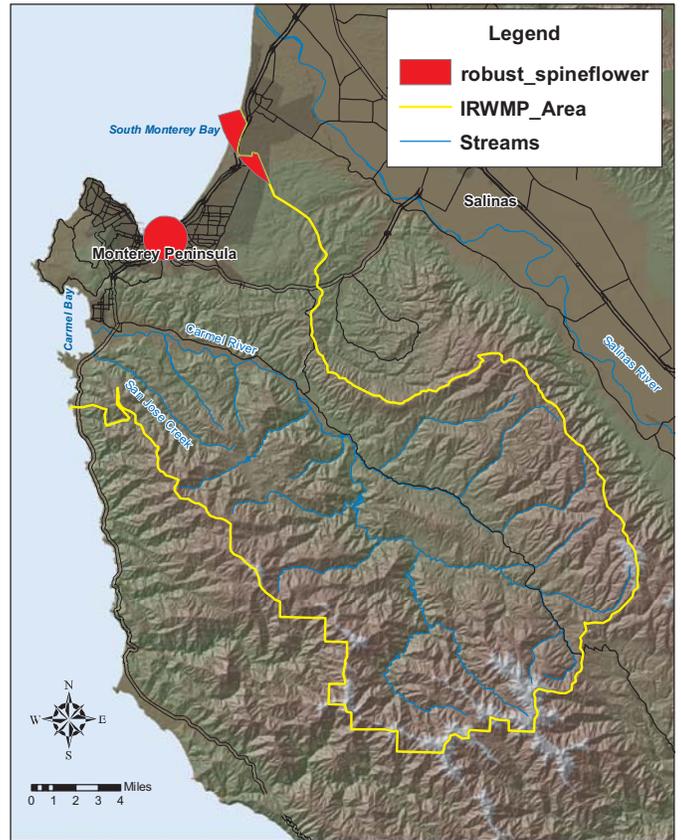
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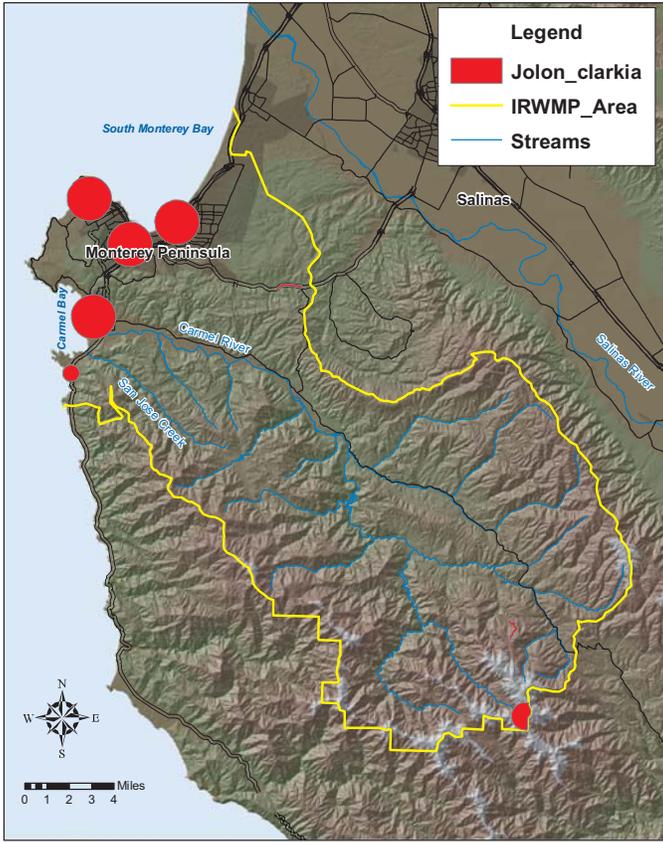
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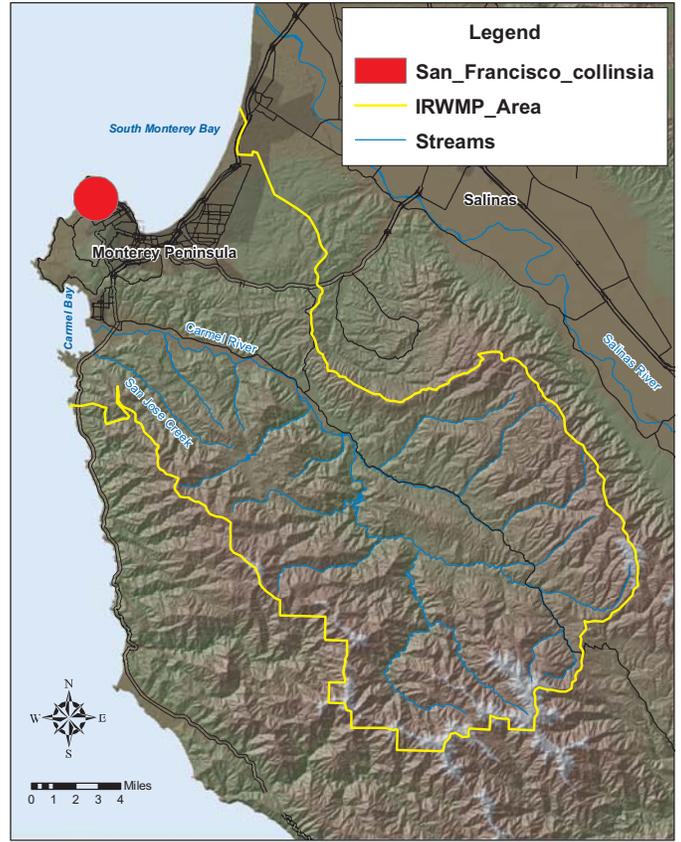
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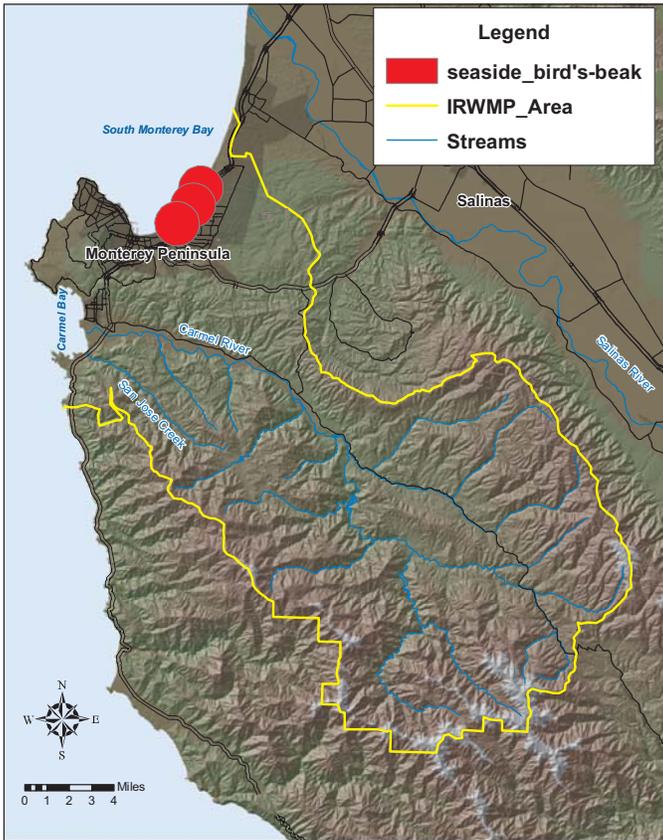
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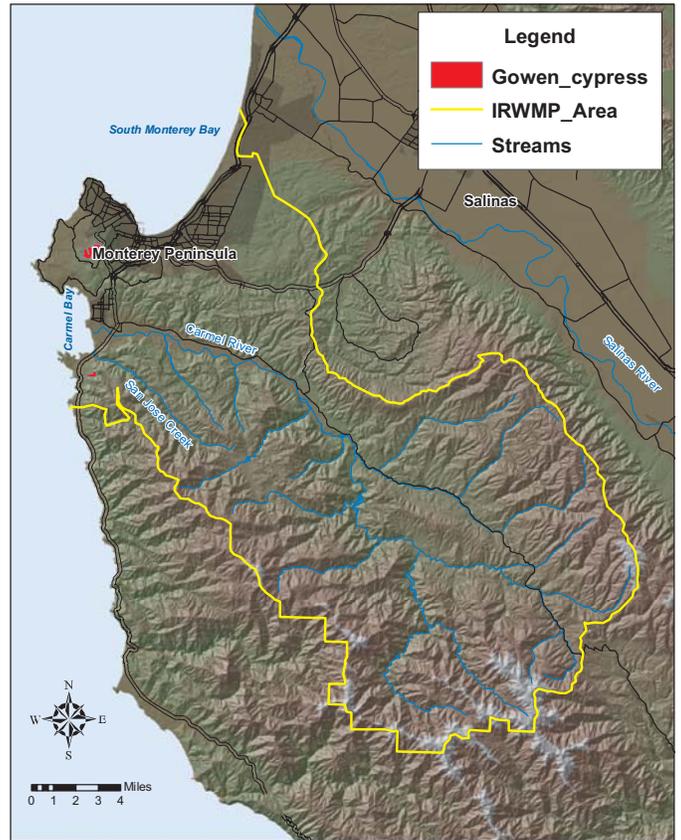
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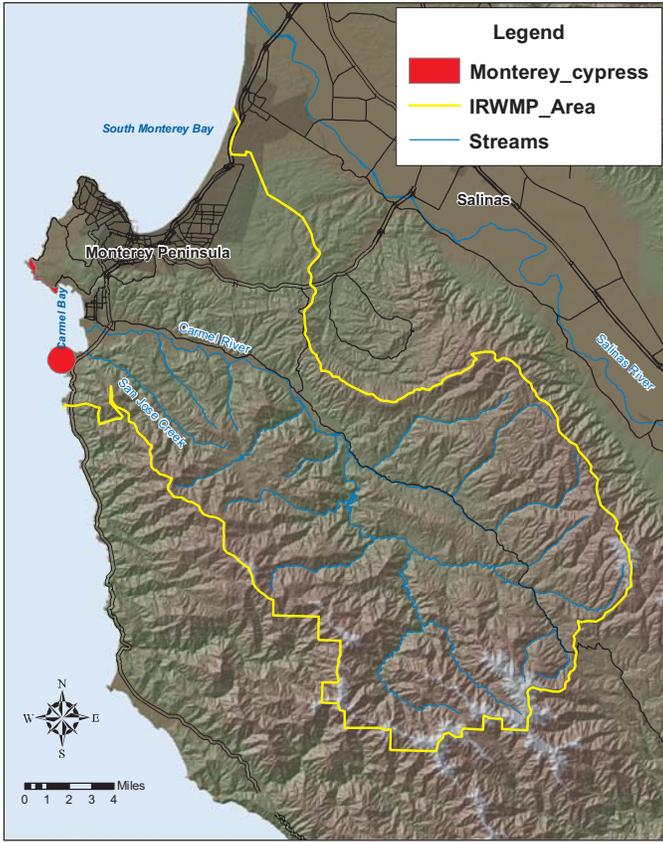
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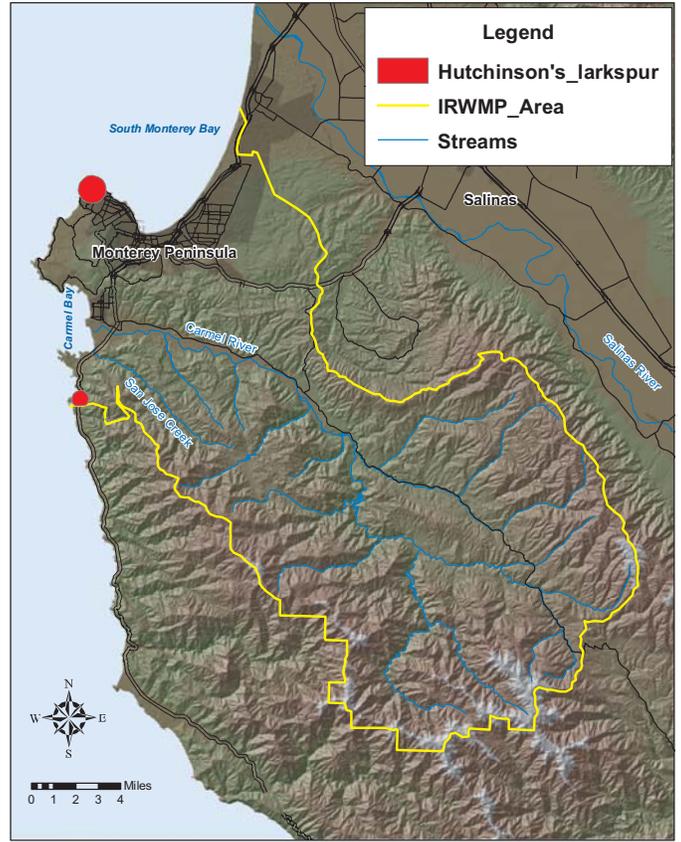
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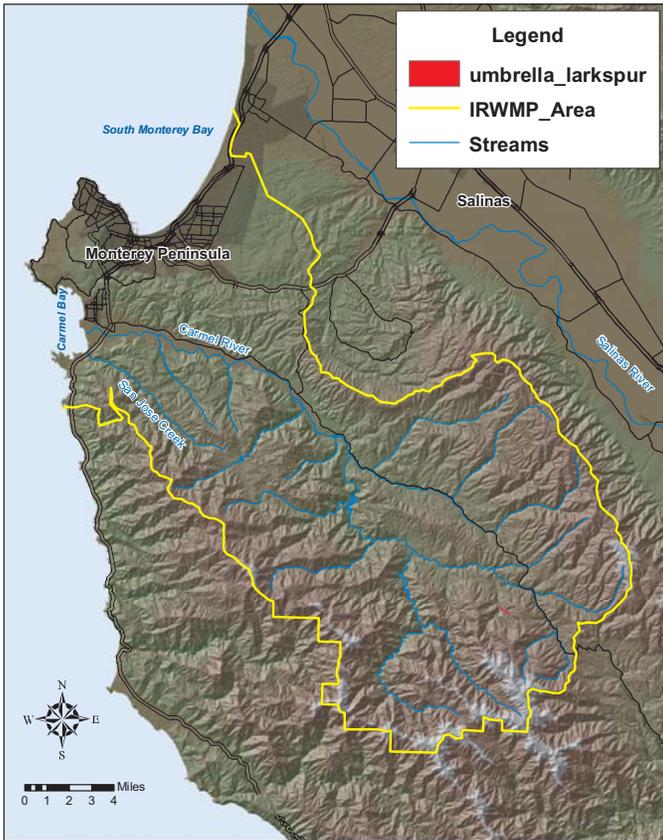
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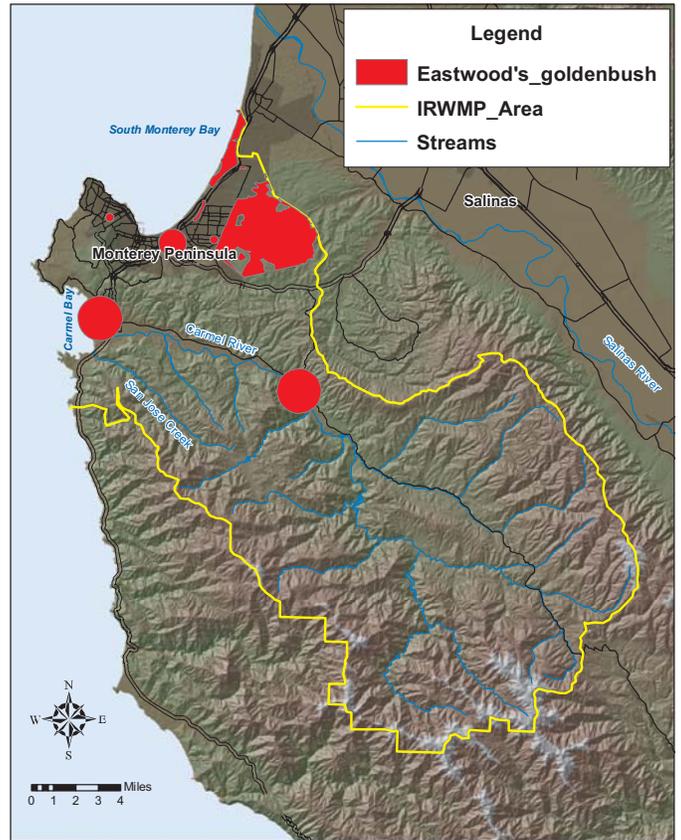
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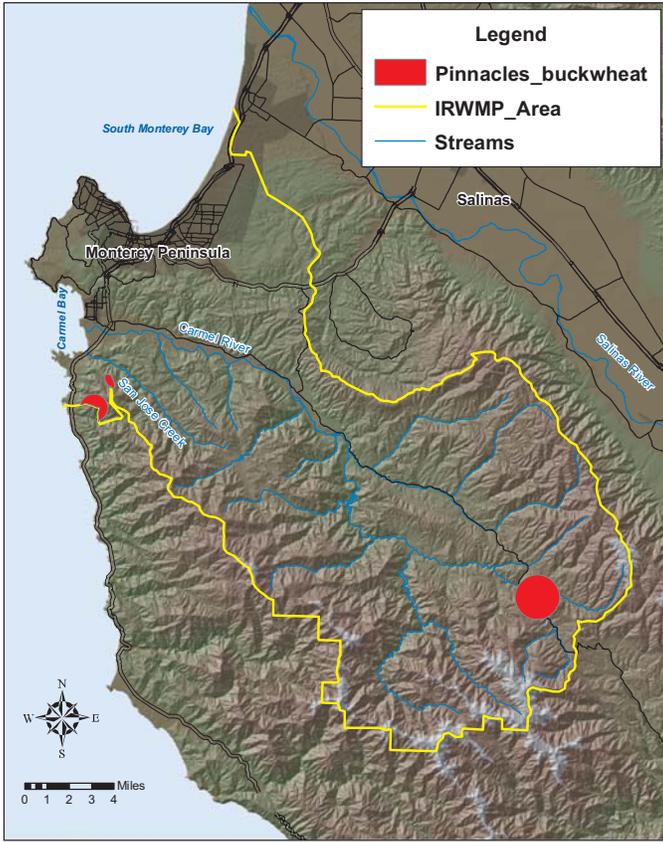
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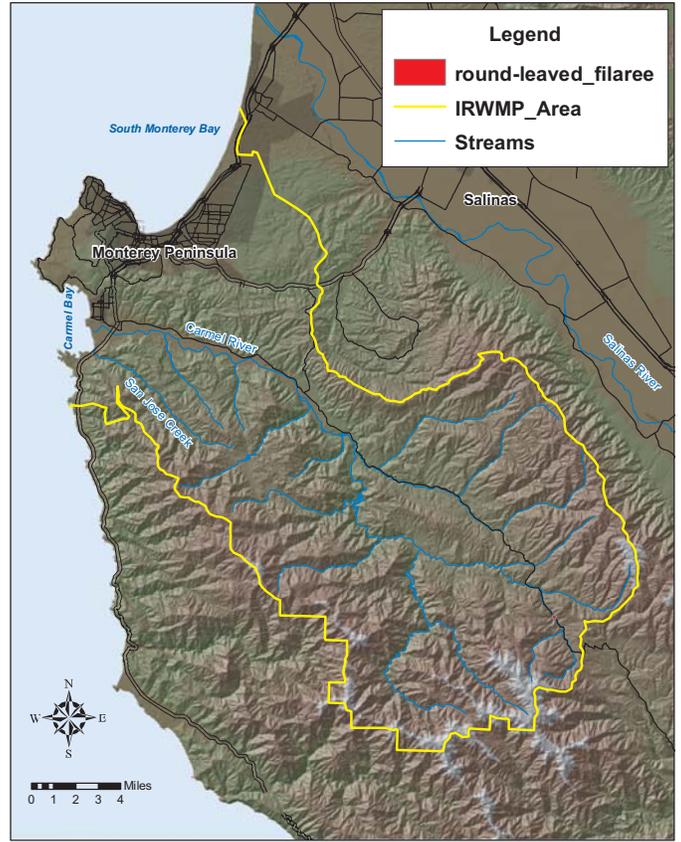
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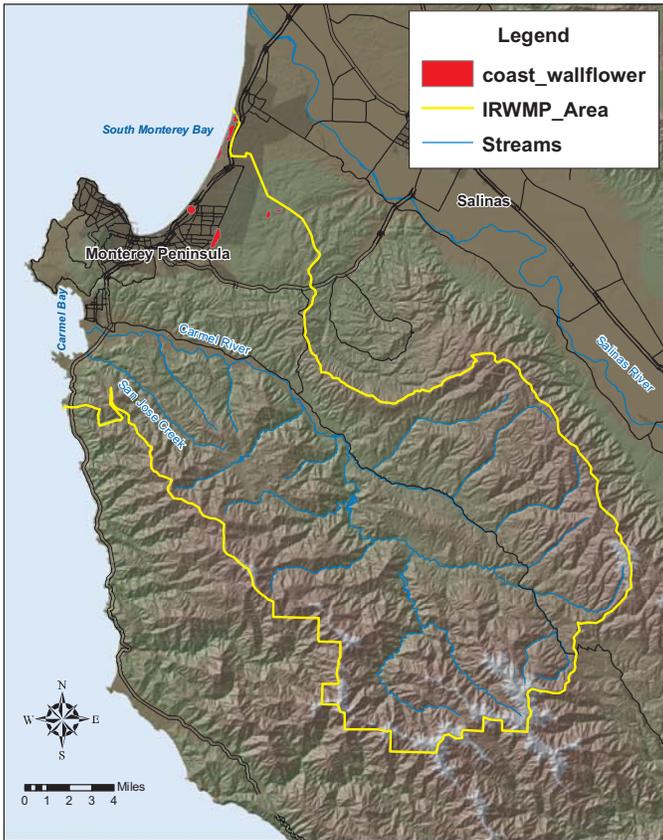
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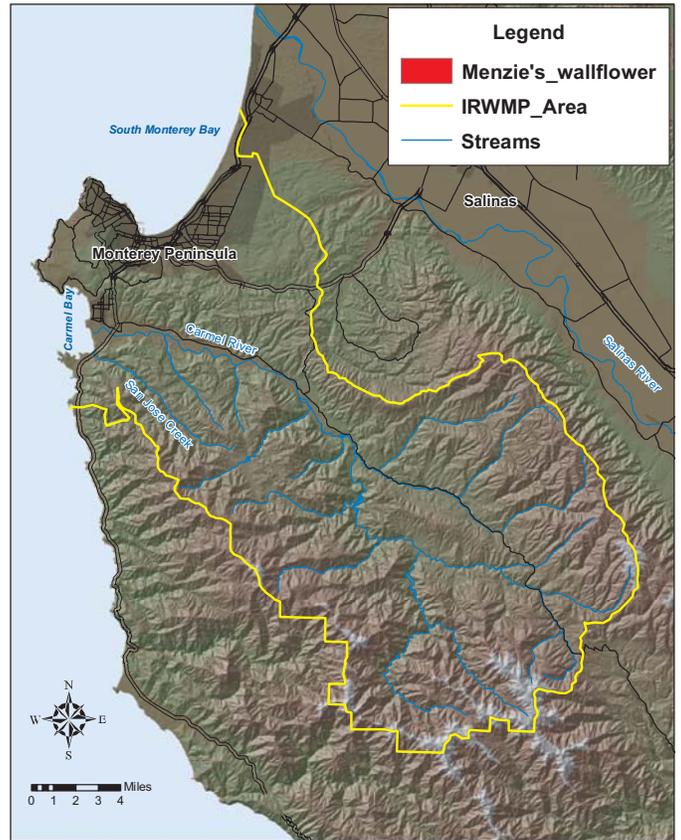
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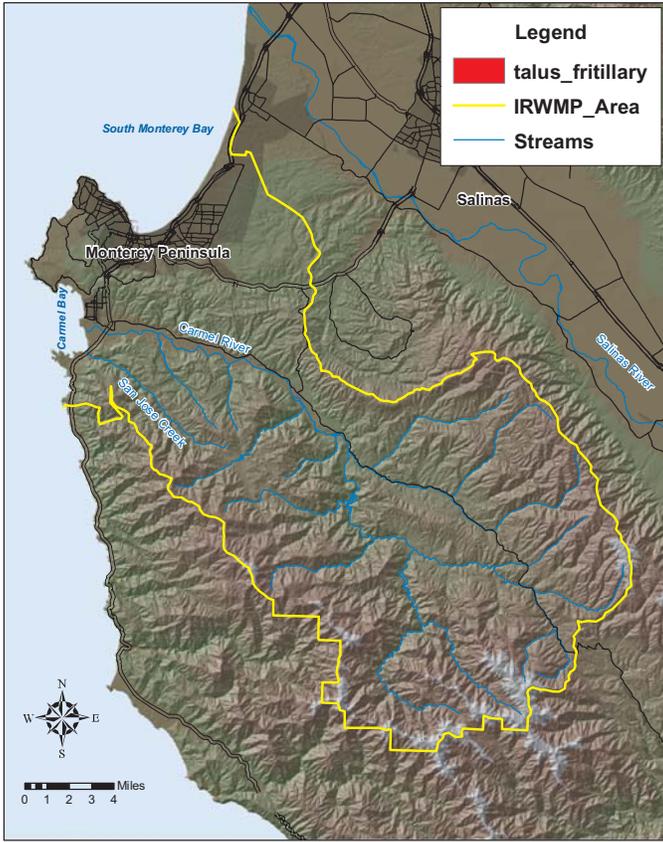
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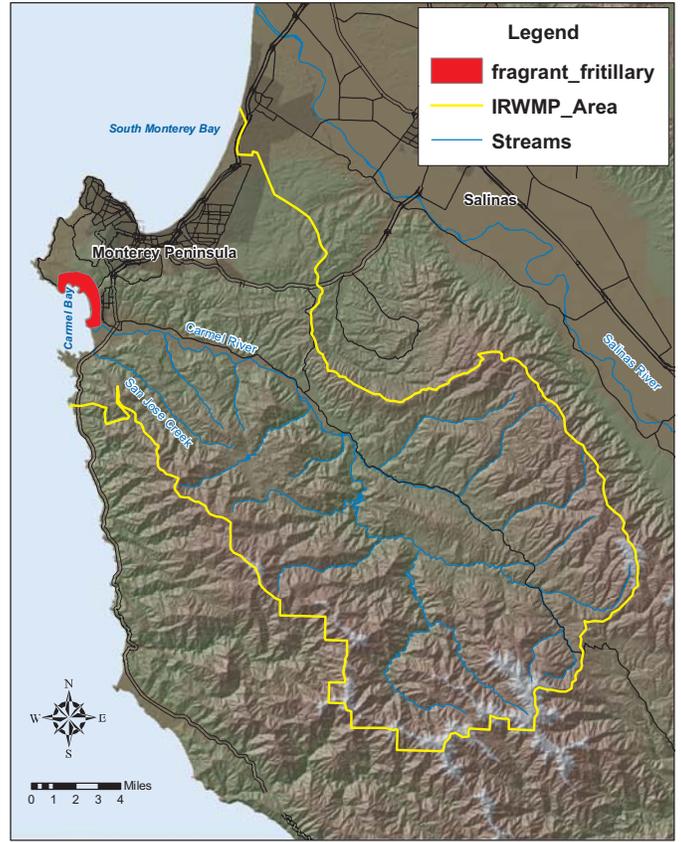
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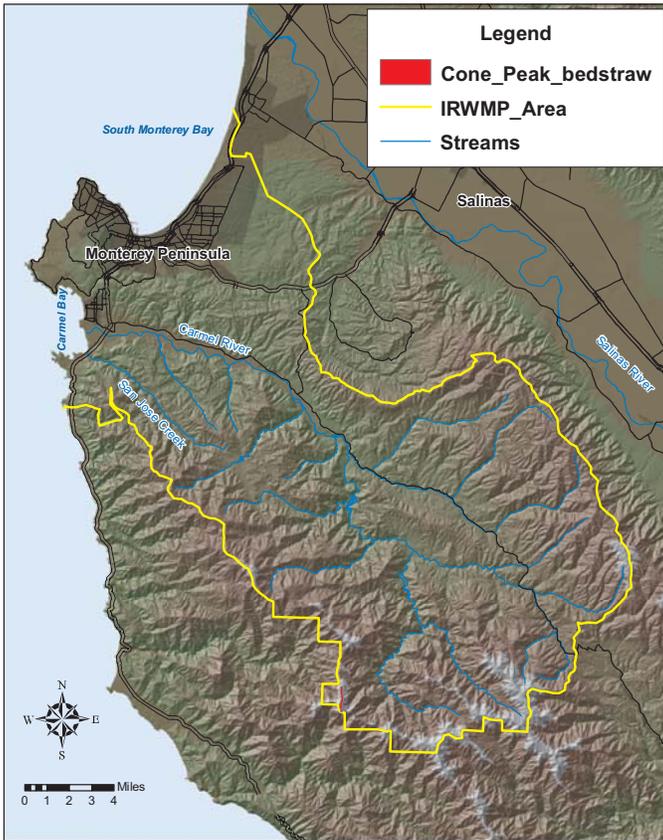
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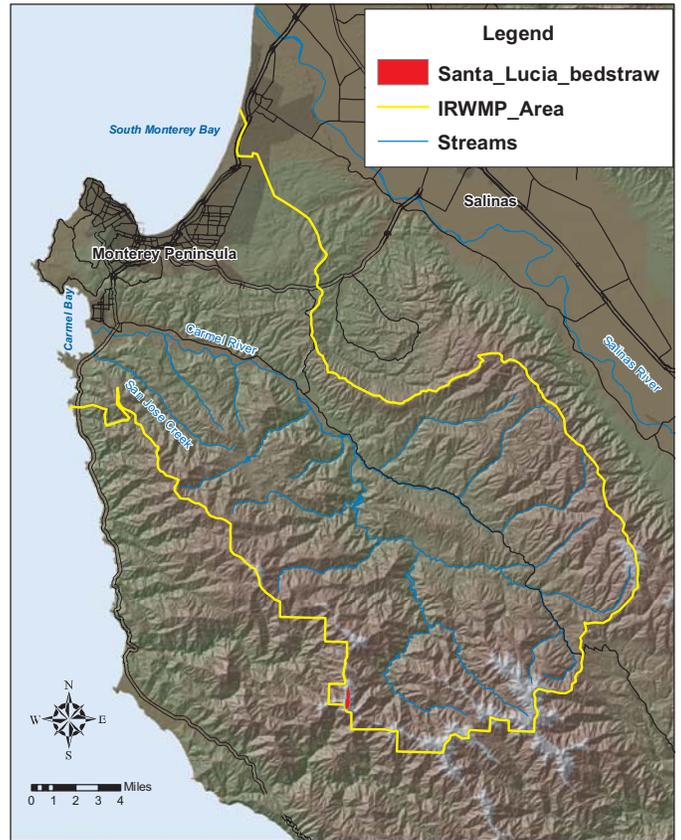
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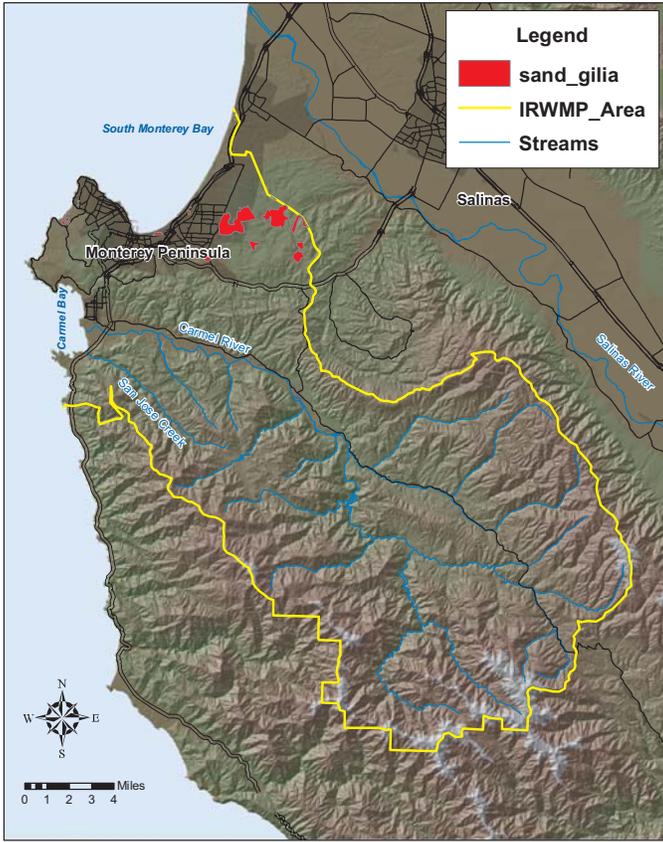
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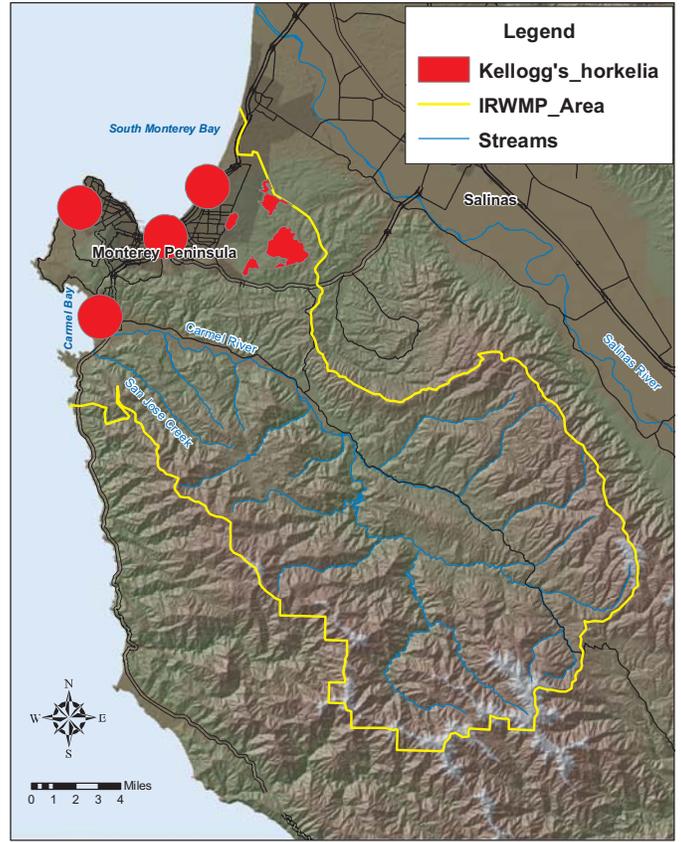
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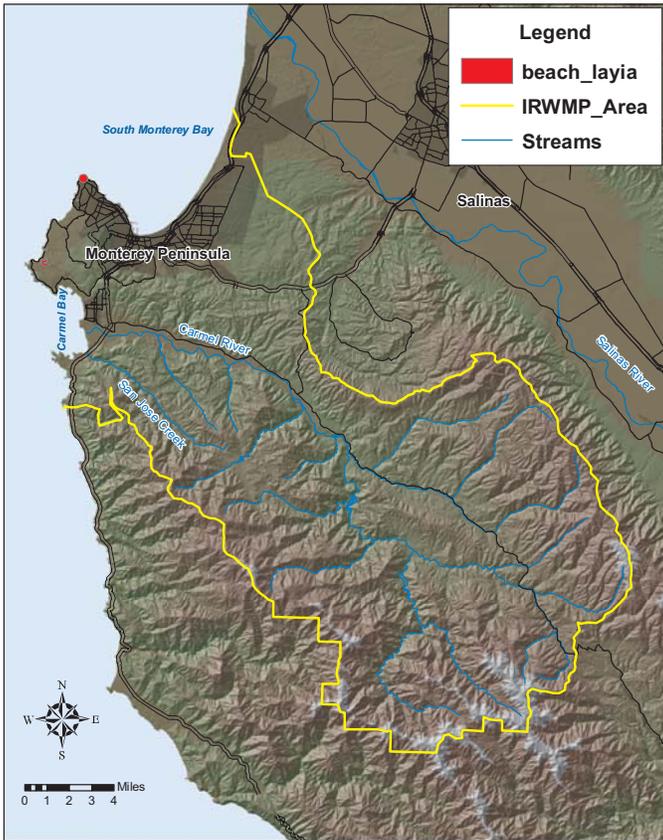
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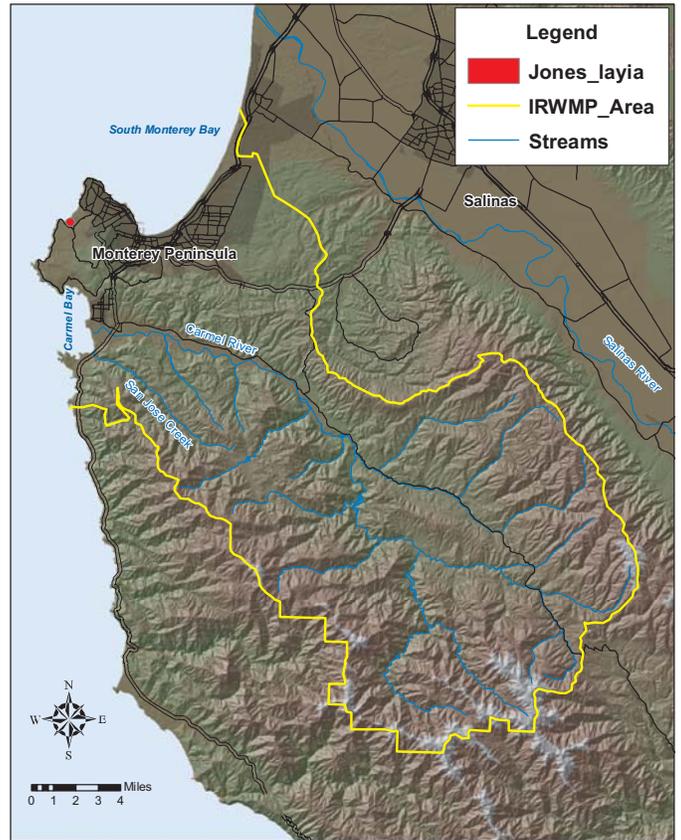
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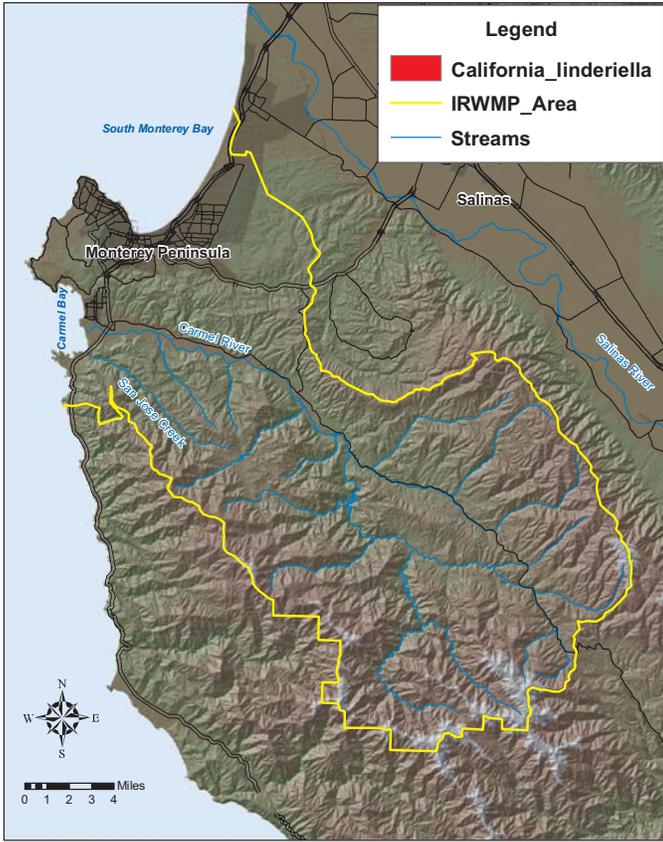
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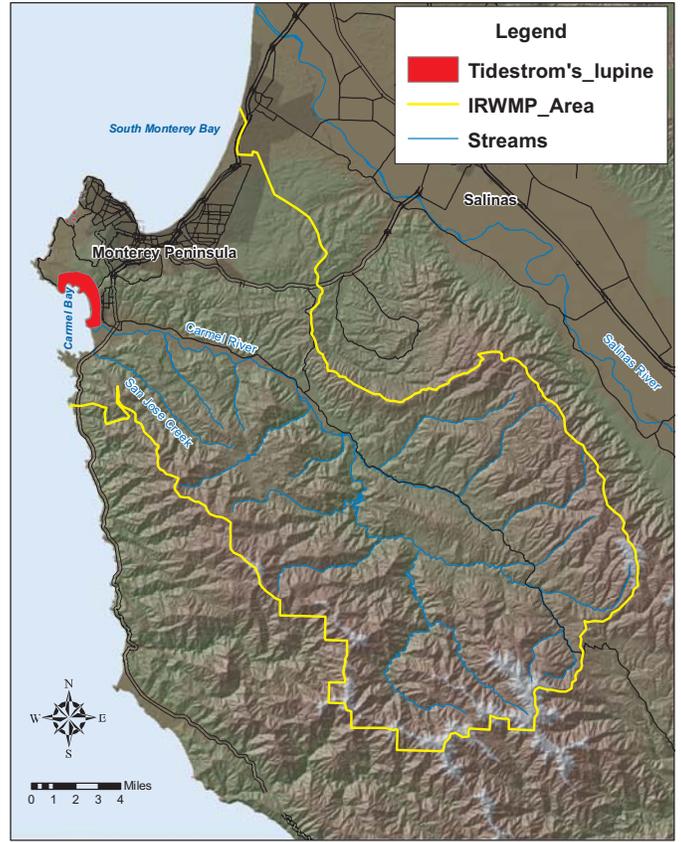
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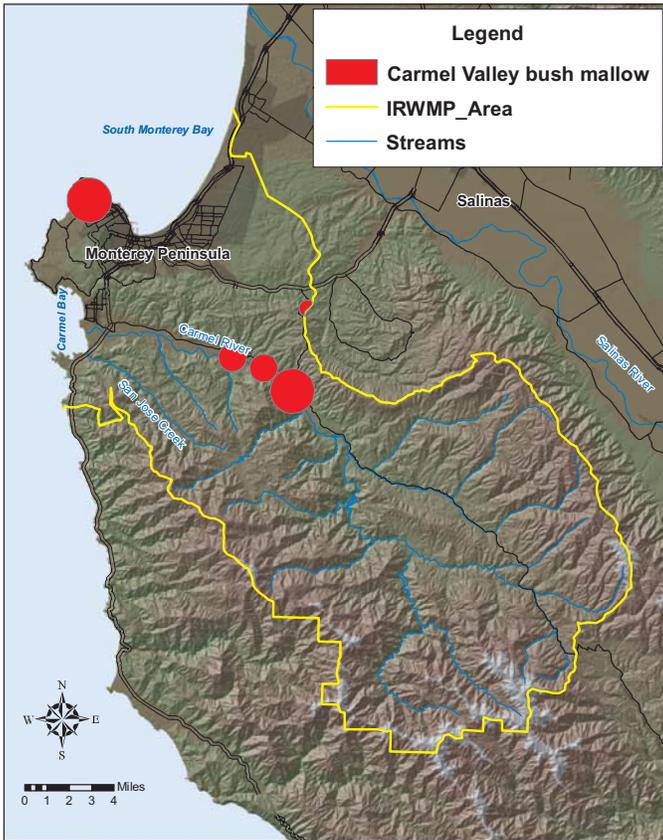
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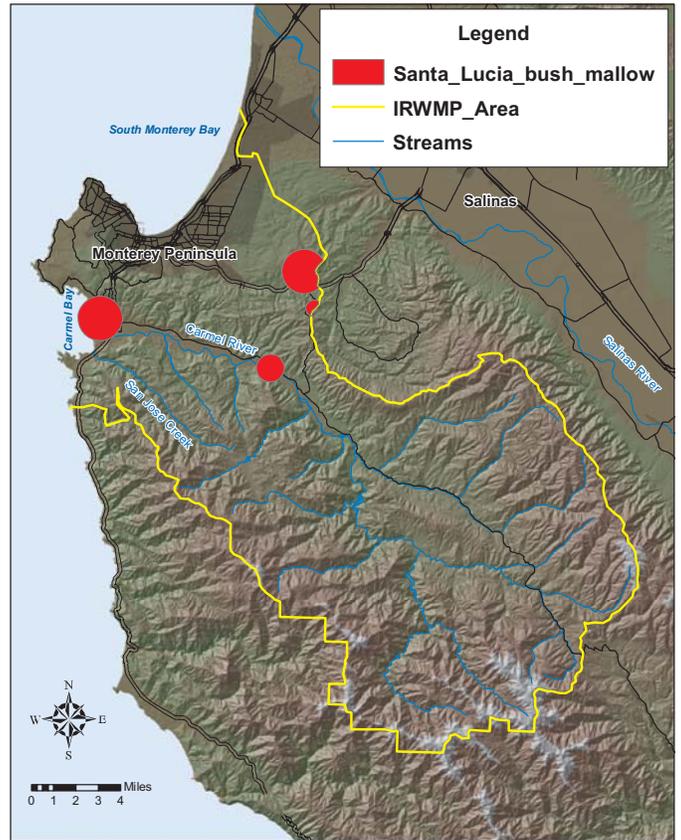
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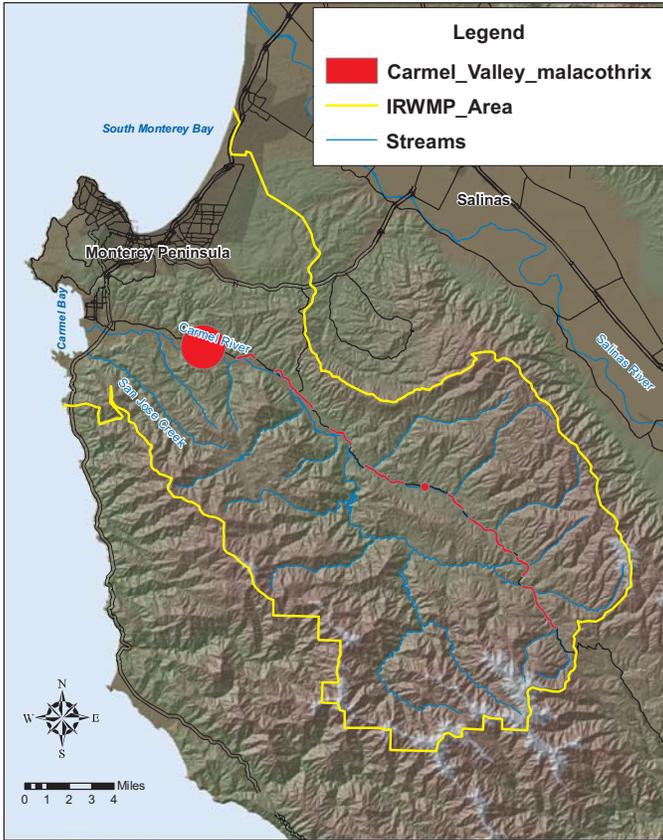
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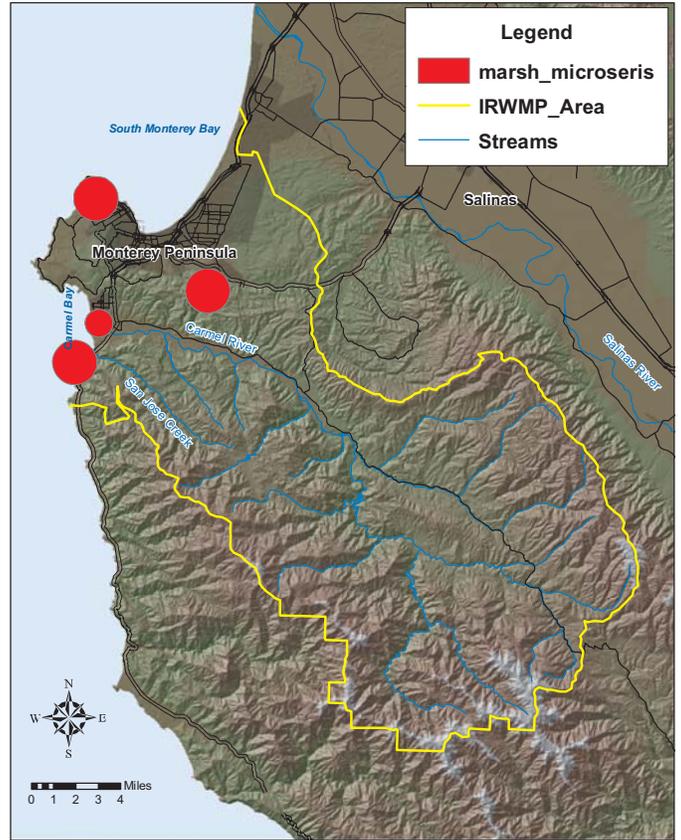
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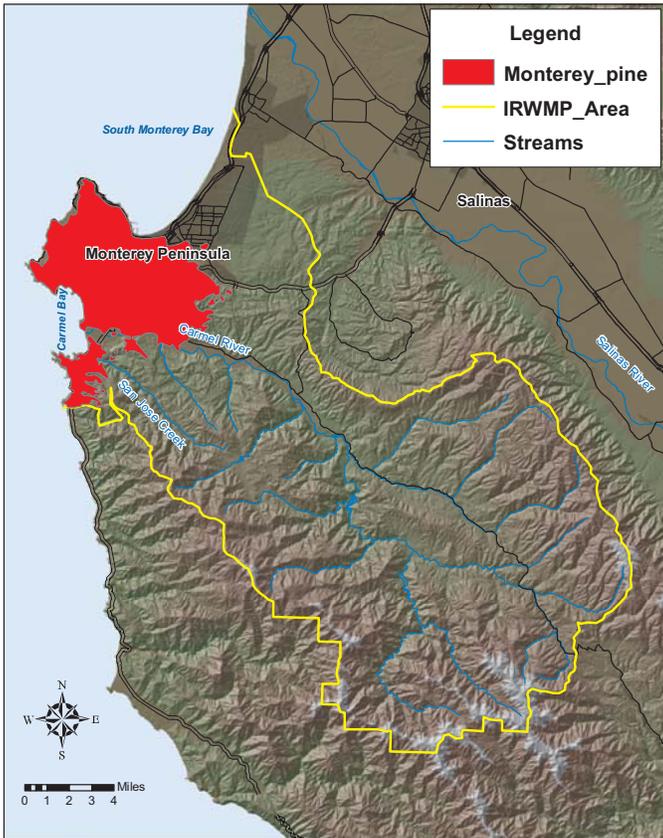
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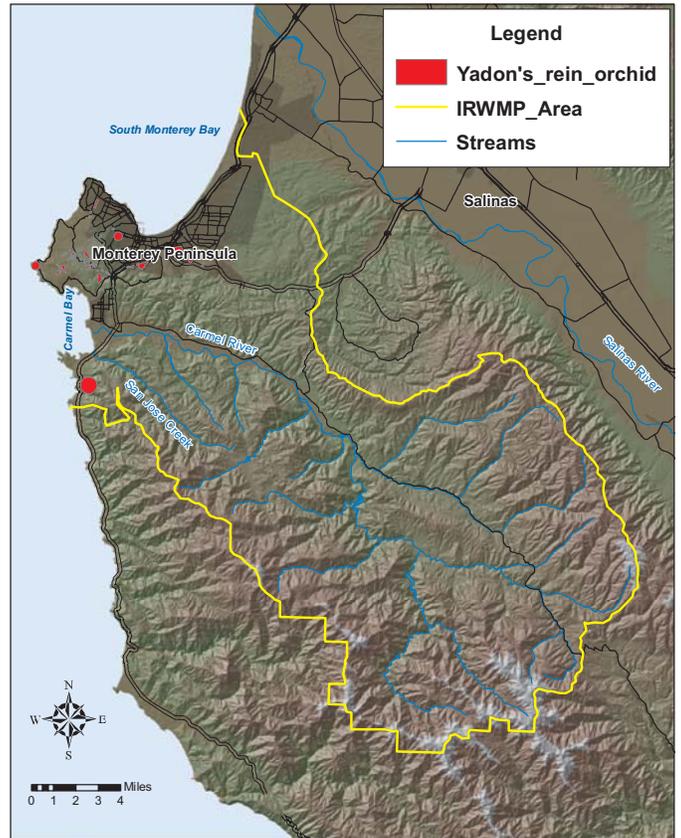
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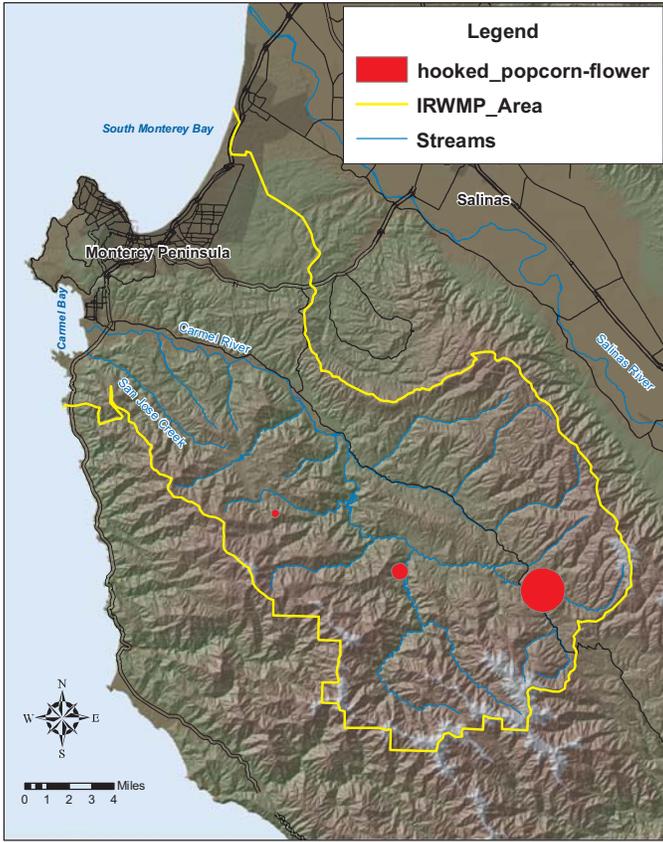
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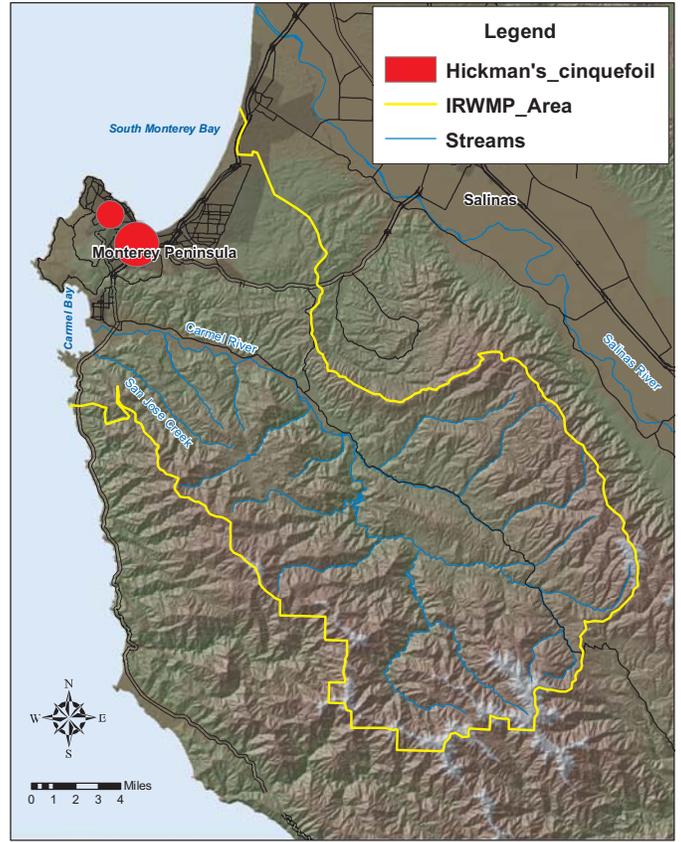
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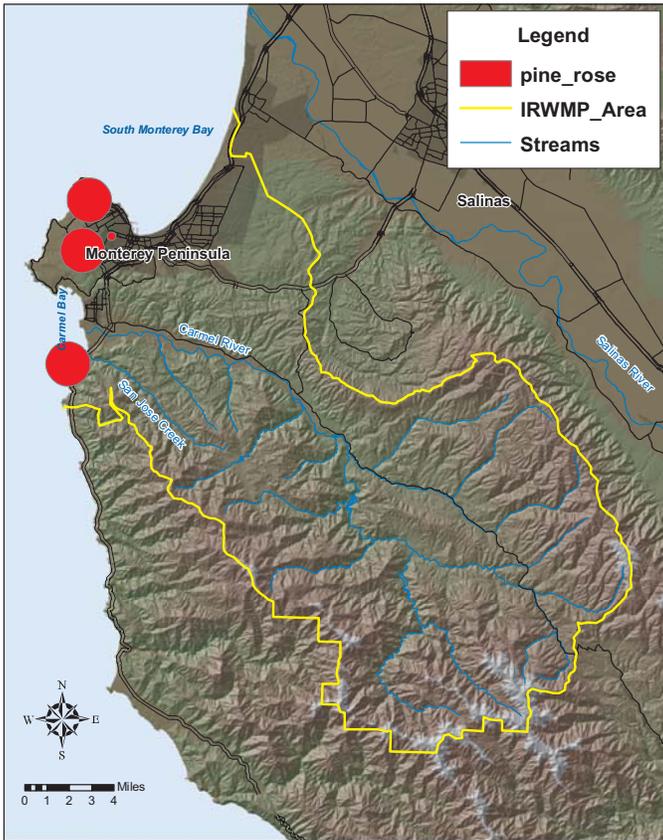
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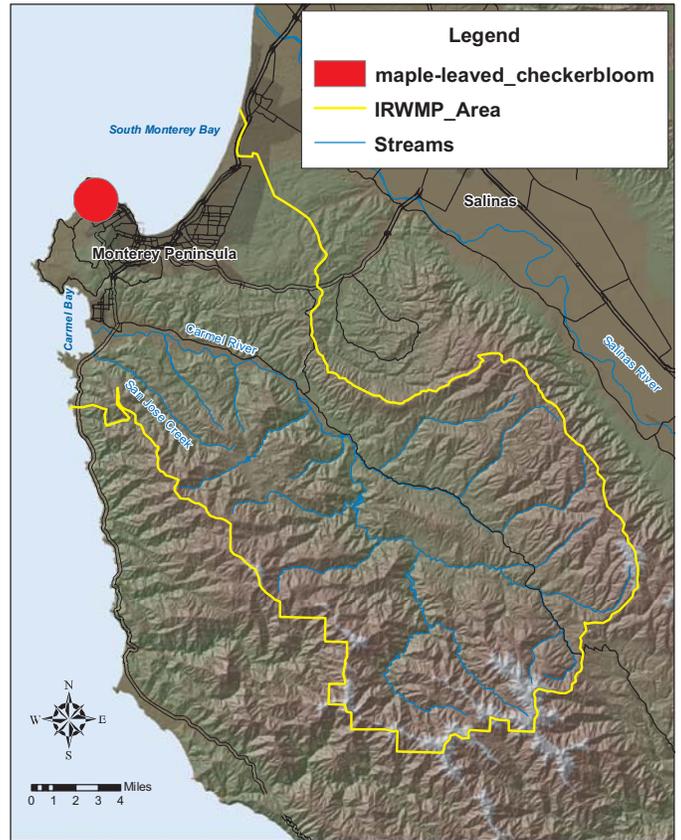
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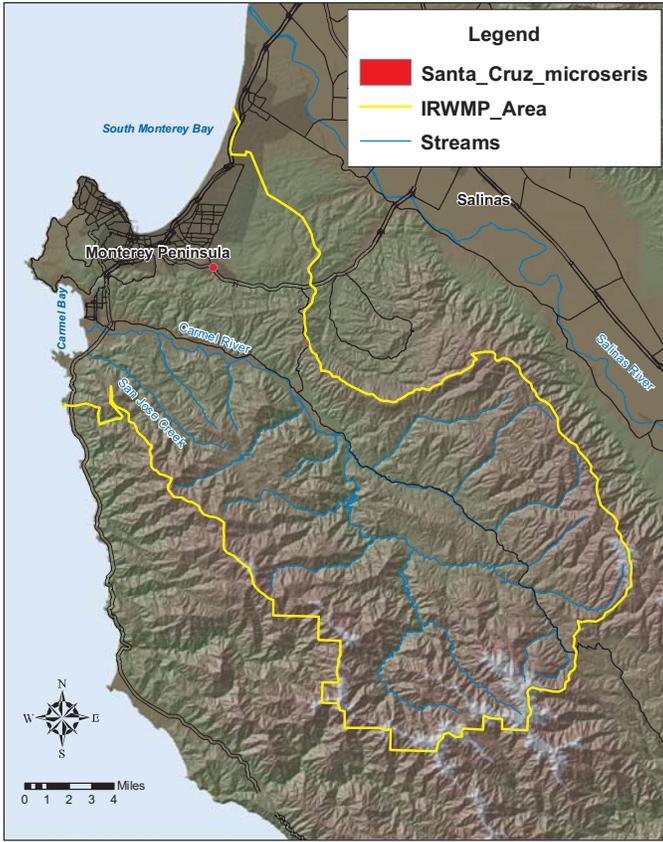
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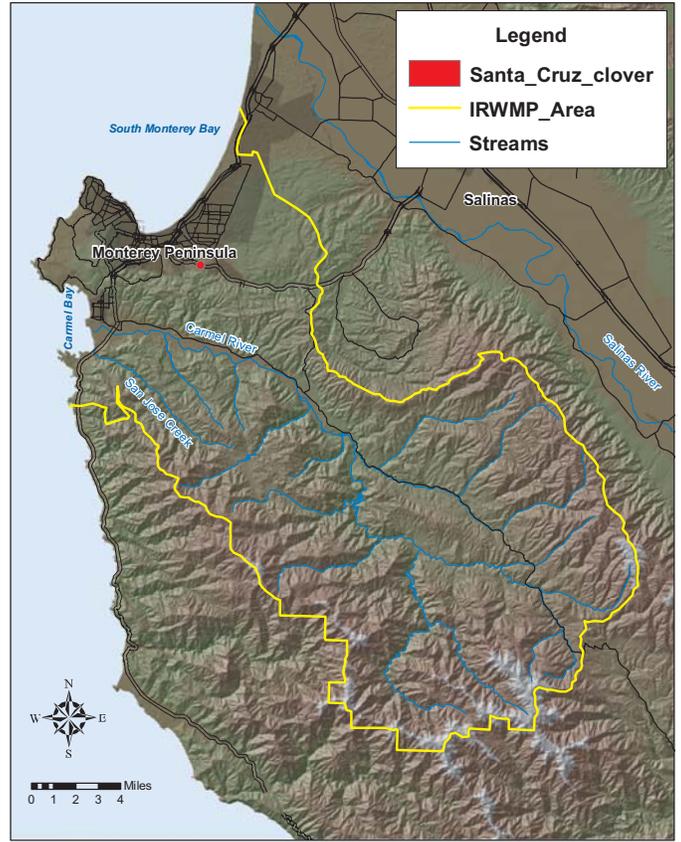
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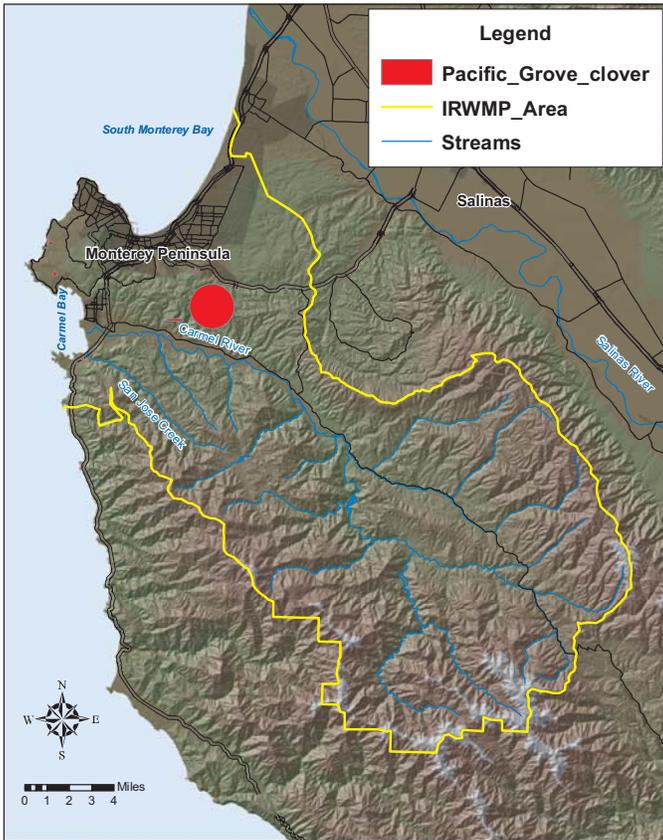
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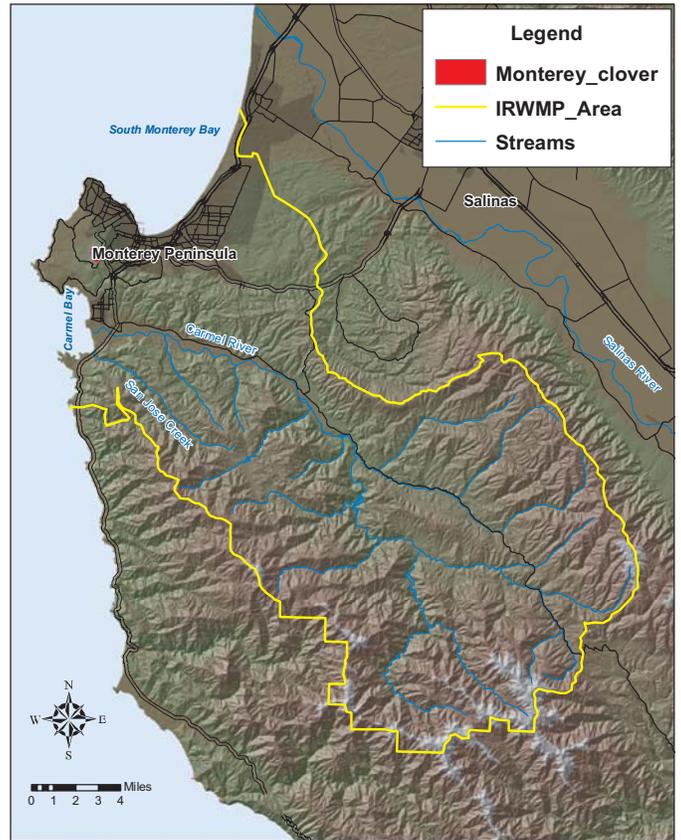
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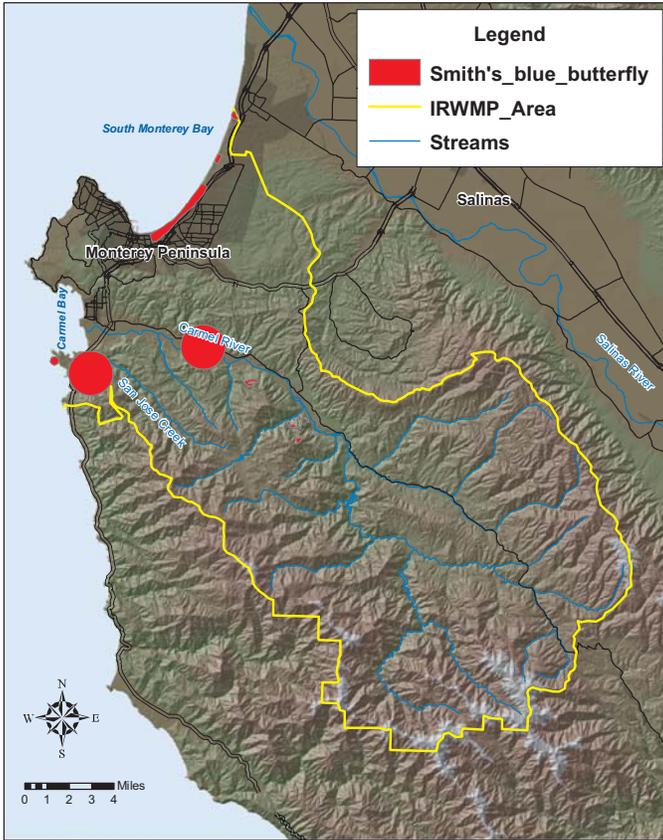
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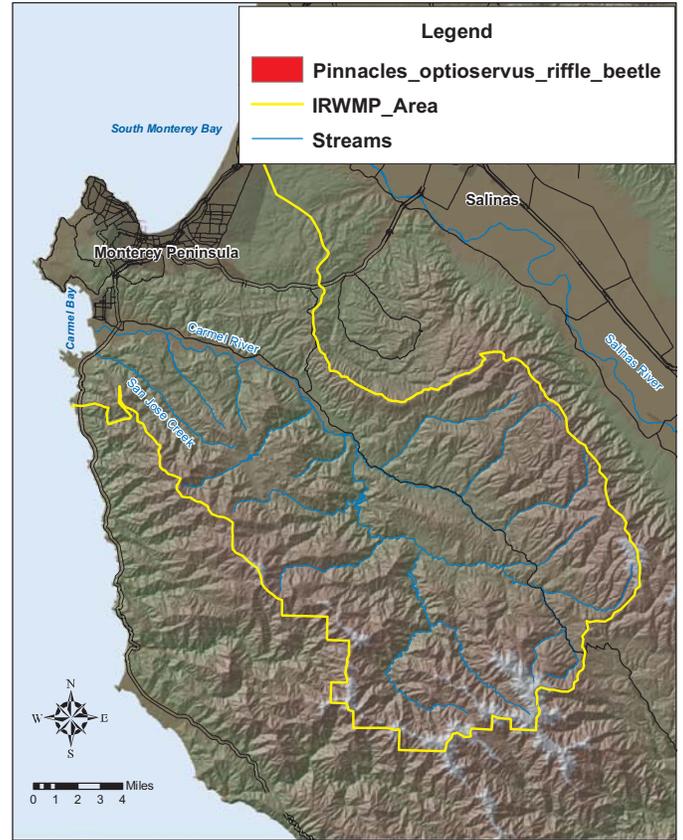
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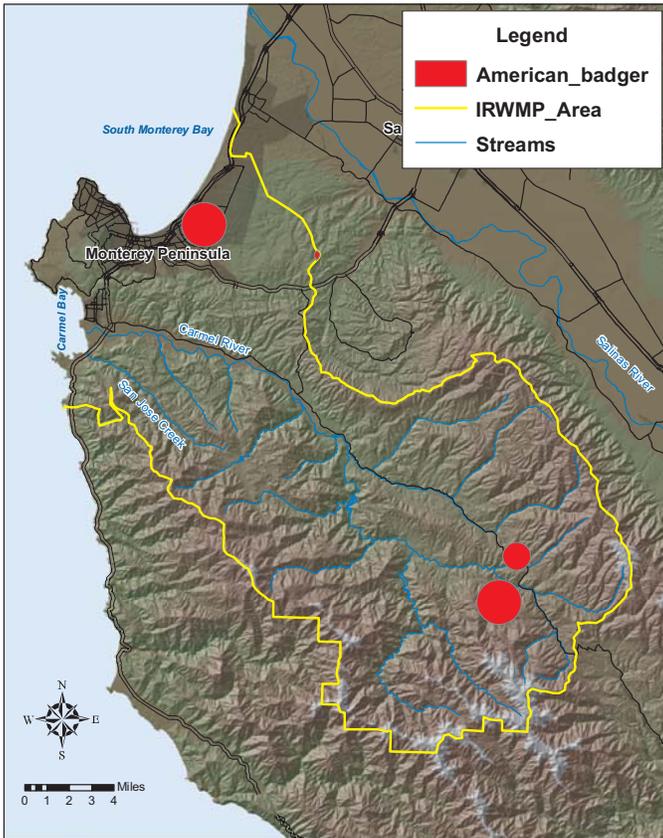
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Special Status Species Mapped in the California Natural Diversity Database for the Monterey Peninsula, Carmel Bay, and South Monterey Bay Region



Special Status Species Mapped in the California Natural Diversity Database for the Monterey Peninsula, Carmel Bay, and South Monterey Bay Region



Appendix C

Letters of Support



Carmel River Watershed Conservancy
P.O. Box 223833 Carmel, CA 93922-3833
Phone: 831-624-1064

Website: www.carmelriverwatershed.org E-mail: crwc@redshift.com

April 30th 2005

Mr. David A. Berger, General Manager
Monterey Peninsula Water Management District
P.O. Box 85, Monterey, California 93942

**Letter of Stakeholder Support/Grant Agreement- Prop 50 Planning
Grant Application**

Dear Mr. Berger,

The Carmel River Watershed Conservancy is pleased to be participating with the Monterey Peninsula Water Management District in the development of a planning grant application under Proposition 50. As you are aware the Watershed Assessment and Action Plan which was completed early this year calls for working partnerships with agencies and non-profit organizations on the peninsula.

We also heartily support the formation of an Integrated Regional Water Management Plan, (IRWMP). Bearing in mind the district's responsibilities for mitigation efforts required under CSWRCB order 95/10; a likely role in regulating one or more desalination plants and the future need for regulating groundwater extraction we believe that the time is ripe to seek an expansion of the districts jurisdiction to cover the entire watershed and sub-basins. Currently, MPWMD collects flow information from nine locations on the main tributaries of the Carmel River. If one supports the notion that groundwater in the upland areas is in most instances destined to reach the aquifers on the floor of the Carmel Valley, there can surely be no strong objection from the majority.

Yours truly,

Clive R. Sanders
Administrator

CITY HALL
BOX CC
CARMEL-BY-THE-SEA, CALIFORNIA 93921

RECEIVED

MAY - 5 2005

MPWMD

May 2, 2005

David A. Berger, General Manager
Monterey Peninsula Water Management District
P.O. Box 85
Monterey, California 93942

Subject: Proposition 50 Planning Grant Application for the Development of
an Integrated Regional Water Management Plan

Dear Mr. Berger:

The City of Carmel-by-the-Sea is in support of the Monterey Peninsula Water Management District's application for funding from the Integrated Regional Water Management Grant Program for the development of a regional water management plan, authorized under Proposition 50. The City is cooperating with MPWMD in the development of the application and the City intends to participate in the development and adoption of an Integrated Regional Water Management Plan (IRWMP) for the MPWMD region.

I look forward to continuing to work with you and your staff in developing this important regional plan. If you have any questions, please telephone me at 831-620-2000.

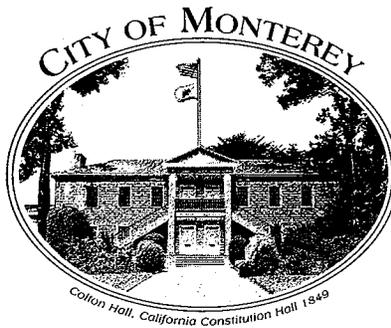
Sincerely,



Rich Guillen
City Administrator

data/RG/Storm Water Prop 50 Support Letter 5 2 2005.doc

c: Mayor and Members of the City Council



RECEIVED

MAY - 9 2005

MPWMD

May 4, 2005

Mayor:
DAN ALBERT

Councilmembers:
CHUCK DELLA SALA
LIBBY DOWNEY
JEFF HAFFERMAN
CLYDE ROBERSON

City Manager:
FRED MEURER

Mr. David A. Berger, General Manager
Monterey Peninsula Water Management District
P.O. Box 85
Monterey, CA 93940

Re: Support for Proposition 50 Planning Grant Submittal

Dear Mr. Berger:

On behalf of the City of Monterey, I would like to express our support for the development of an Integrated Regional Water Management Plan (IRWMP) for the Monterey Peninsula. The City recognizes the many benefits inherent in the collaborative development of a regional plan and is pleased to partner with the Monterey Peninsula Water Management District, the Monterey Bay National Marine Sanctuary, the Pebble Beach Company, and the cities of Pacific Grove and Carmel in this effort.

Further, I would like to express the City's strong support for this regional group's application to the California Department of Water Resources and the State Water Resources Control Board to obtain an Integrated Regional Water Management Planning Grant (part of the Proposition 50 – Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002) to help fund the development of the IRWMP.

The City of Monterey looks forward to working with the group in the development of this comprehensive plan and the resulting implementation projects, and ensuring the continued protection of our regional water systems.

Sincerely,

Dan Albert
Mayor

c: City Engineer
Associate Civil Engineer



RECEIVED

MAY - 4 2005

CITY OF PACIFIC GROVE

MPWMD

300 FOREST AVENUE
PACIFIC GROVE, CALIFORNIA 93950
TELEPHONE (831) 648-3100
FAX (831) 657-9361

May 10, 2005

David A. Berger, General Manager
Monterey Peninsula Water Management District
P.O. Box 85
Monterey, CA 93942

RE: Proposition 50 Planning Grant Application

Dear Mr. Berger:

The City of Pacific Grove would like to fully support the Monterey Peninsula Water Management District in their effort to secure a Proposition 50 Planning Grant to develop an Integrated Regional Water Management Plan (IRWMP) for this area. We look forward to participating in the process to develop and adopt an IRWMP.

If you should need any assistance in the near term, please do not hesitate to contact me.

Sincerely,

Jim Costello, Mayor

Cc: Councilmembers
City Manager
Public Works Director
Community Development Director



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

Monterey Bay National Marine Sanctuary
299 Foam Street
Monterey, California 93940

RECEIVED

MAY 16 2005

May 6, 2005

MPWMD

David A. Berger, General Manager
Monterey Peninsula Water Management District
P.O. Box 85
Monterey, California 93942

Subject: Support for Integrated Regional Water Management Plan

Dear Mr. Berger:

I am writing this letter to issue support for the development of an Integrated Regional Water Management Plan (IRWMP) in coastal Monterey County that will bring together similar plans and programs in order to encourage regional strategies for management of water resources. Ultimately, implementation of this plan will improve water quality in several watersheds that drain to the Monterey Bay National Marine Sanctuary (MBNMS).

A central element for both resource protection and economic sustainability is good water quality. Recognizing this fact, the MBNMS developed a Water Quality Protection Program (WQPP) concurrent with its designation in 1992. Today, the WQPP is a partnership of over twenty-five agencies and groups who have developed five issue-orientated action plans. These plans will become components of the overall IRWMP.

The MBNMS has developed strong partnerships with several of the local jurisdictions in this planning area to address water quality concerns. More recently, MBNMS staff have worked closely with the Monterey Peninsula cities and the MPWMD to develop components of the IRWMP and the planning grant proposal. The MBNMS will continue to work with all the participants in the development of the IRWMP.

The MBNMS looks forward to participation in the development of an IRWMP that meets all the objectives of water quality, water supply, groundwater management, and ecosystem restoration. Should have any questions or would like additional information, please contact Chris Coburn of my staff at (831) 420-1670.

Sincerely,

WILLIAM DOUROS
SUPERINTENDENT





Monterey Regional Water Pollution Control Agency

*"Dedicated to meeting the wastewater and recycled water needs
of our member agencies, while protecting the environment."*

Administration Office:
5 Harris Court, Bldg. D, Monterey, CA 93940-5756
(831) 372-3367 or 422-1001, FAX: (831) 372-6178
Website: www.mrwPCA.org

May 9, 2005

RECEIVED

MAY 12 2005

MPWMD

David A. Berger, General Manager
Monterey Peninsula Water Management District
P.O. Box 85
Monterey, California 93942

Dear Dave,

Subject: Letter of Support for Planning Grant Application

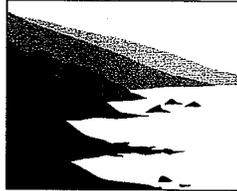
The Monterey Regional Water Pollution Control Agency strongly supports the Monterey Peninsula Water Management District's submittal of a Grant Application for Proposition 50 funding to develop an Integrated Regional Water Management Plan (IRWMP) for this area.

MRWPCA has been cooperating and coordinating closely with MPWMD in the development of the Grant Application, and will participate fully in the development and adoption of an IRWMP.

MRWPCA has several projects that could qualify for Implementation Grant funding, if they are included in your IRWMP. We therefore look forward to the opportunity to work closely with you and your staff throughout the grant process.

Sincerely,

Keith Israel
General Manager



BIG SUR
LAND TRUST

RECEIVED

MAY 17 2005

MPWMD

May 10, 2005

Mr. David A. Berger
General Manager
Monterey Peninsula Regional Water Management District
P.O. Box 85
Monterey, California 93942

Re: South Monterey Bay Integrated Regional Water Management Plan Grant
Proposal

Dear Mr. Berger:

I am writing to express my support for the development of the South Monterey Bay Integrated Regional Water Management Plan and associated planning grant proposal. Big Sur Land Trust appreciates the work being conducted to integrate efforts as our organization works to protect lands and waterways in Monterey County and neighboring areas that are significant natural habitat, open space, agricultural, watershed and recreational properties. Big Sur Land Trust recognizes the importance of collaborating with other local agencies to accomplish water management and habitat conservation goals.

We have identified, as part of our new 25 year vision plan, the need for greater integration of efforts and collaboration with regards to the conservation of the critical lands and waters in our area. The Carmel River and San Jose Creek watersheds are areas of special concern the Trust. We look forward to the opportunity to work with the Monterey Peninsula Water Management District and other participating parties to improve watershed lands and resources. IRWMP funding will leverage key investments already made by the Coastal Conservancy, Wildlife Conservation Board and several conservation NGO's in these areas.

We are eager to collaborate on projects which cumulative efforts will reduce non-point source inputs in Carmel River Watershed waterways and the Carmel Bay Area of Special Biological Significance.

Sincerely,

Bill Leahy
Big Sur Land Trust
Executive Director

MONTEREY COUNTY

WATER RESOURCES AGENCY RECEIVED

PO BOX 930
SALINAS, CA 93902
(831) 755-4860
FAX (831) 424-7935

CURTIS V. WEEKS
GENERAL MANAGER

JUL 7 2005

MPWMD



STREET ADDRESS
893 BLANCO CIRCLE
SALINAS, CA 93901-4455

July 5, 2005

David A. Berger, General Manager
Monterey Peninsula Water Management District
P.O. Box 85
Monterey, California 93942-0085

Dear Mr. Berger:

Subject: Combined Integrated Regional Water Management Plan and Integrated Coastal Watershed Management Plan for the Carmel Bay, Monterey Peninsula, and South Monterey Bay Region

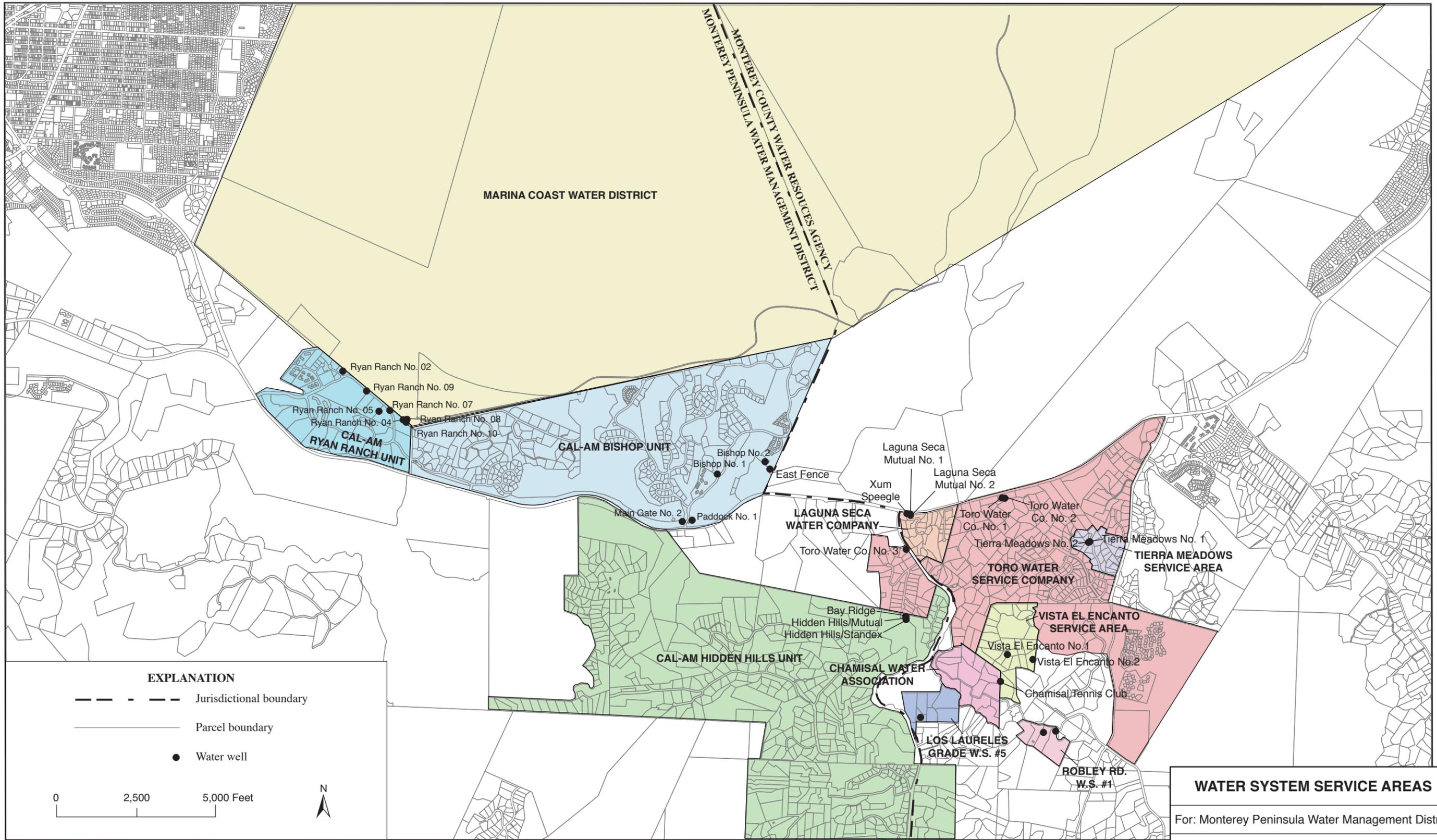
The Monterey County Water Resources Agency (MCWRA) has been cooperating and coordinating closely with the Monterey Peninsula Water Management District (MPWMD) to explore methods to integrate water resource management strategies and activities in the greater Monterey Bay area. MCWRA supports the development, adoption, and implementation of the combined Integrated Regional Water Management Plan/Integrated Coastal Watershed Management Plan for the Carmel Bay, Monterey Peninsula, and South Monterey Bay Region. We look forward to working with you and your staff throughout this process.

Sincerely,

Curtis Weeks
General Manager

Appendix D

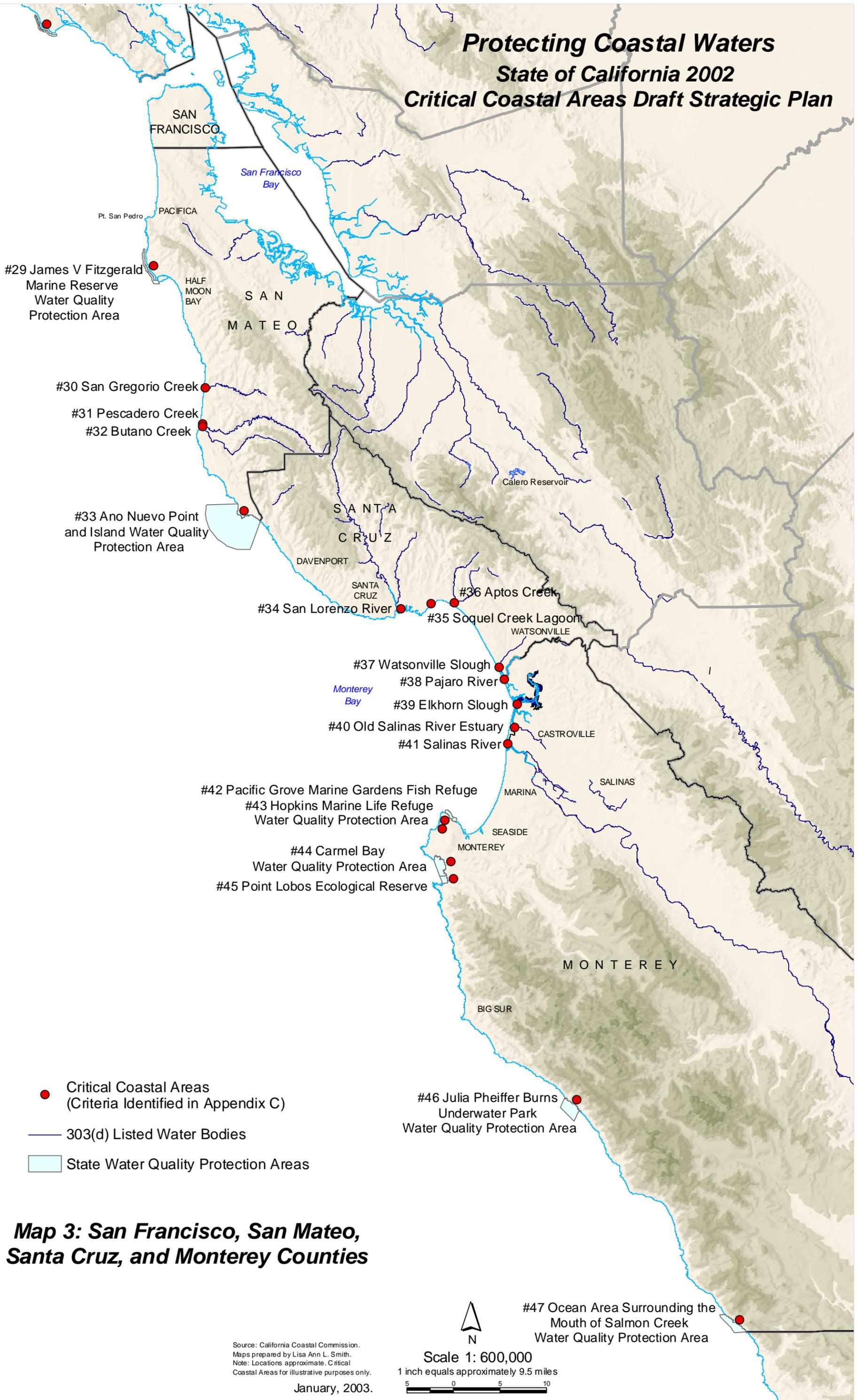
Additional Figures and Maps



Projection: State Plane, California Zone 4, 1983 NAD, feet
 Parcel boundaries from unpublished Monterey County GIS database (2001)
 Water system service areas from unpublished maps provided by California-American Water Company, Mark Dias (IDias Consulting), and J.W. Oliver (MPWMD).

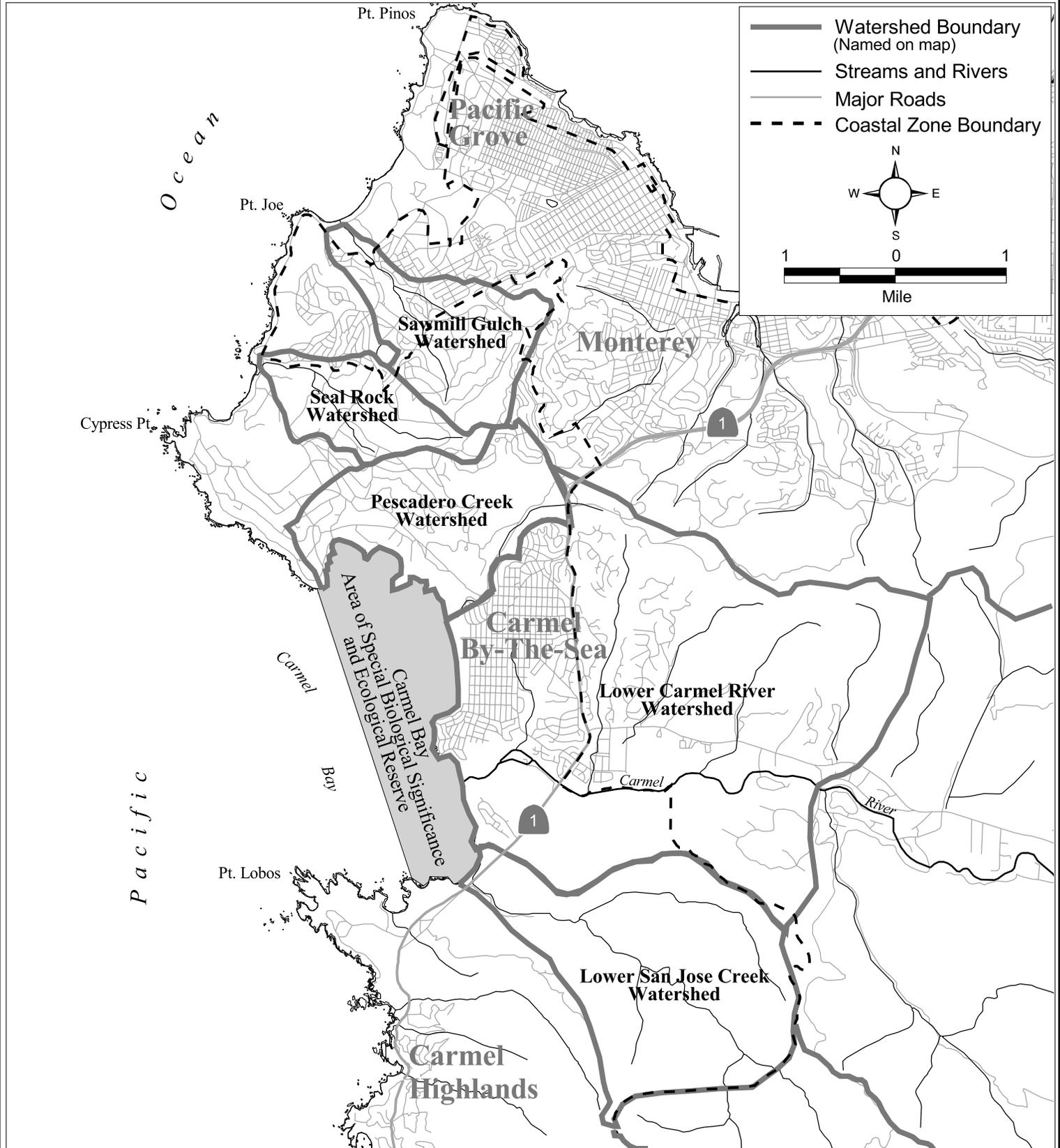
WATER SYSTEM SERVICE AREAS		
For: Monterey Peninsula Water Management District		
LAGUNA SECA SUBAREA PHASE III HYDROGEOLOGIC UPDATE		
November 2002	Gus Yates, CHG 740 Martin Feeney, CHG 145 Lew Rosenberg, CEG 1777	Figure 17

**Protecting Coastal Waters
State of California 2002
Critical Coastal Areas Draft Strategic Plan**

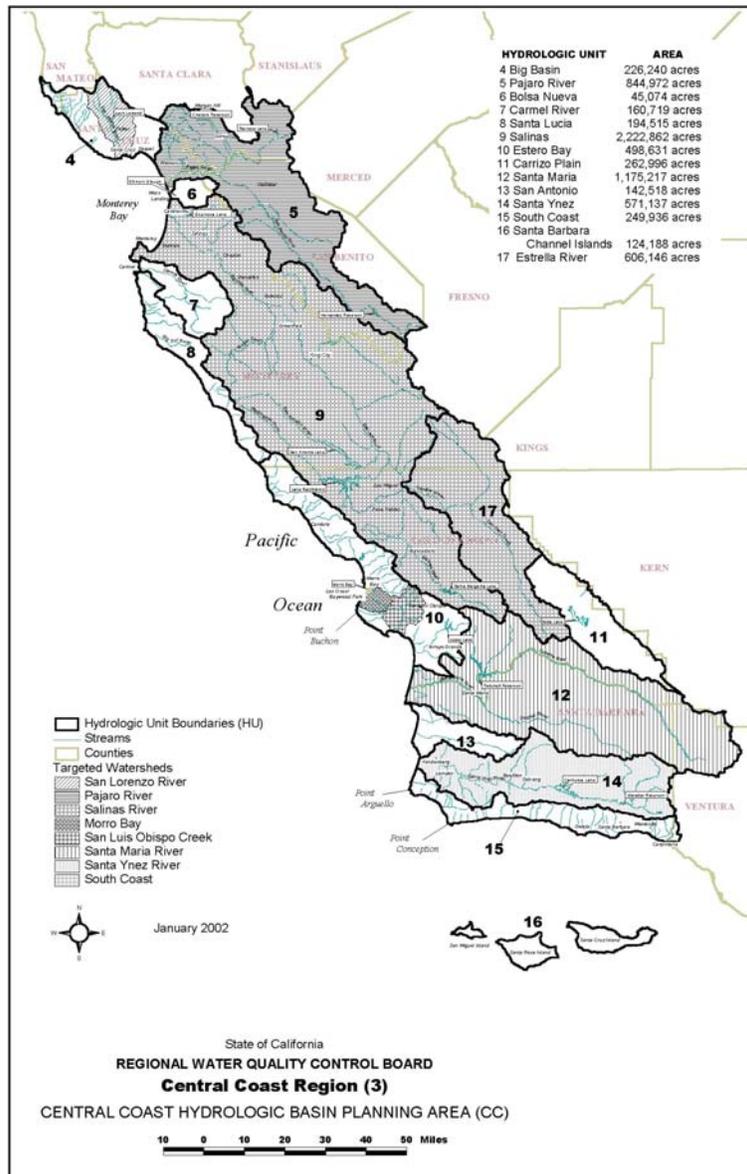


Carmel Bay Watersheds

Del Monte Forest and Carmel Planning Area



**Figure 1-1
Map of Targeted Watersheds**



Water Resource Issues in Targeted Watersheds

Table 1-1, briefly indicates the major water quality problems in Region 3’s targeted watersheds. Expanded descriptions of the conditions and problems in each watershed are contained in *Section Two, Watershed Activities* and shown in *Table D-1, Appendix Section D*.

Appendix E

Project Prioritization Spreadsheets

IRWM Project Scoring Summary

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	

*No cost estimate is available for this project, so it is not scored.

November 12, 2007

Water Management Strategies	Sponsor	Water Management Strategies																	Total Points by Project	Fraction assigned to Project		
		Ecosystem Restoration	Environmental and Habitat Protection and Improvement	Water Supply Reliability	Flood Management	Groundwater Management	Recreation and Public Access	Stormwater Capture and Management	Water Conservation	Water Quality Protection and Improvement	Wetlands Recycling	Wetlands Enhancement and Improvement	Conjunctive Use	Desalination	Imported Water	Land Use Planning	NPS Pollution Control	Surface Storage			Watershed Planning	Water and Wastewater Treatment
Project	Sponsor																					
Seaside Groundwater Basin Aquifer Storage and Recovery	MPWMD/CAW													N/A	N/A					0	0.00	
Seaside Basin Groundwater Replenishment	MRWPCA	1		1		1				1	1		1					1	7	1.65		
CSUMB Stormwater Percolation and Education	CSUMB	1	1			1	1		1		1	1			1		1	9	2.13			
Lower Carmel River Restoration and Floodplain Enhancement	BSLT	1	1		1		1	1		1		1			1	1		10	2.36			
Carmel River Watershed Volunteer Monitoring Program	CRWC	1	1			1			1						1		1	6	1.42			
Refine ASBS Alternatives	Monterey/PG	1	1	1		1	1	1		1	1		1		1	1	1	12	2.83			
Water Conservation Retrofit Program	MPWMD	1	1	1			1	1	1	1					1	1		8	1.89			
Sanitary Sewer System Repair and Replacement in the Cities of Monterey and Pacific Grove	Monterey/P.G.		1				1			1							1	4	0.94			
Implementation of Solid Waste Removal Technology	Monterey/P.G.		1			1				1								3	0.71			
Microbial Source Tracking in the Cities of Monterey and Pacific Grove	Mon/P.G./Foundation					1		1		1								3	0.71			
Seaside 90" Outfall Infiltration Component	City of Seaside		1	1	1	1	1	1		1		1	1			1		10	2.36			
All Projects Total		6	8	4	2	5	6	6	1	10	2	3	4	0	0	3	5	1	4	2	72	17
Points available for this package		1	1	1	1	1	1	1	1	1	1	1	1			1	1	1	1		17	
Maximum number of points available		1	1	1	1	1	1	1	1	1	1	1	1	n/a	n/a	1	1	1	1	1	17	

Rationale for points

Does a project incorporate as a strategy to meet the objectives and priorities described in the plan? If yes, a point is awarded for each strategy incorporated into a project.

Project	Sponsor/Goal	Water Supply						Water Quality				
		1	1	1	1	1	1	1	1	1	1	
Seaside Groundwater Basin Aquifer Storage and Recovery (ASR)	MPWMD/CAW											
Seaside Basin Groundwater Replenishment	MRWPCA	1	1		1			1	1	1		
CSUMB Stormwater Percolation and Education	CSUMB							1	1		1	1
Lower Carmel River Restoration and Floodplain Enhancement								1	1		1	1
Carmel River Watershed Volunteer Monitoring Program	CRWC			1				1	1		1	1
Refine ASBS Alternatives	Monterey/PG	1	1	1	1	1		1	1	1	1	1
Water Conservation Retrofit Program	MPWMD	1	1				1				1	1
Sanitary Sewer System Repair and Replacement in the Cities of Monterey and Pacific Grove	Monterey/P.G.							1	1		1	1
Implementation of Solid Waste Removal Technology	Monterey/P.G.								1		1	
Microbial Source Tracking in the Cities of Monterey and Pacific Grove	Mont/P.G./Foundation								1		1	
Seaside 90° Outfall Infiltration Component	Seaside	1				1		1	1		1	1
All Projects Total		4	3	2	2	2	1	7	9	2	9	7
Points available for this package		1	1	1	1	1	1	1	1	1	1	1
Maximum number of points available		1	1	1	1	1	1	1	1	1	1	1

Rationale
Does the proposed project address water related issues, priorities, and conflicts within the Region? If carried out, would the project partially or fully meet a particular objective?

Project	Sponsor/Goal	Flood Protection				Environmental Protection and Enhancement				
		Develop regional projects and plans necessary 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 or restoring ecologic and stream function	Provide community benefits beyond flood protection, such as public access, open space, recreation, agricultural preservation, and stream development	Identify opportunities to assess, protect, enhance, and/or restore natural resources, open space, water management strategies and projects	Protect and enhance sensitive species and 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 projects	Identify and integrate elements from appropriate Federal and State species protection and recovery plans
Seaside Groundwater Basin Aquifer Storage and Recovery (ASR)	MPWMD/CAW									
Seaside Basin Groundwater Replenishment	MRWPCA					1	1	1		1
CSUMB Stormwater Percolation and Education	CSUMB	1	1	1	1	1	1	1		1
Lower Carmel River Restoration and Floodplain Enhancement		1	1	1	1	1	1	1	1	1
Carmel River Watershed Volunteer Monitoring Program	CRWC					1	1	1	1	1
Refine ASBS Alternatives	Monterey/PG					1	1	1		1
Water Conservation Retrofit Program	MPWMD						1	1		1
Sanitary Sewer System Repair and Replacement in the Cities of Monterey and Pacific Grove	Monterey/P.G.	1	1	1			1	1		
Implementation of Solid Waste Removal Technology	Monterey/P.G.						1	1		
Microbial Source Tracking in the Cities of Monterey and Pacific Grove	Mont/P.G./Foundation	1	1			1				
Seaside 90° Outfall Infiltration Component	Seaside	1	1	1	1		1			1
All Projects Total		5	5	4	3	6	9	8	2	7
Points available for this package		1	1	1	1	1	1	1	1	1
Maximum number of points available		1	1	1	1	1	1	1	1	1

Rationale
Does the proposed project address water related issues, priorities, and conflicts within the

Project	Sponsor/Goal	Regional Communication and Cooperation					Total points	Fraction assigned to Project
		Meet or exceed State and Federal regulatory orders, provided that mandates are funded and environmental resources	Identify strategies for protecting both infrastructure and environmental resources	Foster collaboration between regional entities	Build relationships with State and Federal regulatory agencies and other water forums and resource management	Identify opportunities for public education on water		
Seaside Groundwater Basin Aquifer Storage and Recovery (ASR)	MPWMD/CAW						0	0.00
Seaside Basin Groundwater Replenishment	MRWPCA	1	1	1	1	1	15	2.72
CSUMB Stormwater Percolation and Education	CSUMB		1	1	1	1	16	2.90
Lower Carmel River Restoration and Floodplain Enhancement		1	1	1	1	1	18	3.26
Carmel River Watershed Volunteer Monitoring Program	CRWC	1	1	1	1	1	15	2.72
Refine ASBS Alternatives	Monterey/PG	1	1	1	1	1	19	3.44
Water Conservation Retrofit Program	MPWMD	1	1	1	1	1	13	2.36
Sanitary Sewer System Repair and Replacement in the Cities of Monterey and Pacific Grove	Monterey/P.G.	1	1	1		1	13	2.36
Implementation of Solid Waste Removal Technology	Monterey/P.G	1	1	1			7	1.27
Microbial Source Tracking in the Cities of Monterey and Pacific Grove	Mont/P.G./Foundation		1	1			7	1.27
Seaside 90° Outfall Infiltration Component	Seaside	1	1	1			15	2.72
All Projects Total		8	10	10	6	7	138	25.00
Points available for this package		1	1	1	1	1		25.00
Maximum number of points available		1	1	1	1	1		25.00

Rationale

Does the proposed project address water related issues, priorities, and conflicts within the

Regional Priorities		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 stormwater discharges into ASBS	Identify and remove fish barriers	Increase riparian streamside vegetation cover to 80% of streambanks	Reduce embeddedness to a range of 0.2 to 0.5	Meet Central Coast Basin Plan water quality targets for temperature, DO, pH, CO2	Increase flows available for all life stages	Conduct habitat and population assessments	Public Education and Outreach	Public Participation/Involvement	Mitig Discharge Detection and Elimination	Construction Site Runoff Control	Post-Construction Runoff Control	Pollution Prevention/Good Housekeeping	Sub-Total for MRSWMP MCM	Total Points - Regional Priorities
Project	Sponsor																	
Promote the steelhead run										Mitigate impacts of storm water discharges through implementation of MRSWMP Minimum Control Measures								
Seaside Groundwater Basin Aquifer Storage and Recovery (up to 3,234 AFA)	MPWMD/CAW									0.00							0.00	0.00
Seaside Basin Groundwater Replenishment (up 2,800 AFA)	MRWPCA	1.4			1		1	1		0.65							0.00	2.05
CSUMB Stormwater Percolation and Education	CSUMB									0.00	1	1			1	1	1.09	1.09
Lower Carmel River Restoration and Floodplain Enhancement	BSLT		5		1		1			0.40	1	1			1		0.59	5.99
Carmel River Watershed Volunteer Monitoring Program	CRWC									0.00	1	1	1			1	1.09	1.09
Refine ASBS Alternatives	Monterey/PG	need amount in AFA	3		1		1	1		0.65	1					1	0.34	3.99
Water Conservation Retrofit Program (up to 690 AFA)	MPWMD	0.34			1		1	1		0.65	1	1			1		0.59	1.58
Sanitary Sewer System Repair and Replacement in the Cities of Monterey and Pacific Grove	Monterey/P.G.									0.00			1			1	0.64	0.64
Implementation of Solid Waste Removal Technology	Monterey/P.G.									0.00							0.00	0.00
Microbial Source Tracking in the Cities of Monterey and Pacific Grove	Mont/P.G./Foundation									0.00							0.00	0.00
Seaside 90" Outfall Infiltration Component	City of Seaside				1		1	1		0.65					1	1	0.64	1.29
Subtotals				0	5	0	5	4	0		5	4	2	0	2	7		
Points awarded each MCM				0	0.2	0	0.2	0.25	0		0.2	0.25	0.5	0	0.5	0.1429		
Total Points for all Projects		1.74	5	3						3							5	17.74
Maximum Score Possible		8	7	6	1	1	1	1	1		1	1	1	1	1	1		33

Project Funding		Grant Request	Local Match	Total Cost	Local Match %	Points
Project	Sponsor	\$	\$	\$		
Seaside Groundwater Basin ASR	MPWMD/CAW	-	-		#DIV/0!	
Seaside Basin Groundwater Replenishment	MRWPCA	1,980,000	220,000	2,200,000	10.0%	2.00
CSUMB Stormwater Percolation and Education	CSUMB	3,173,400	352,600	3,526,000	10.0%	2.00
Lower Carmel River Restoration and Floodplain Enhancement	BSLT	1,507,500	167,500	1,675,000	10.0%	2.00
Carmel River Watershed Volunteer Monitoring Program	CRWC	750,000	-	750,000	0.0%	4.00
Refine ASBS Alternatives	Monterey/PG	405,000	45,000	450,000	10.0%	6.80
Water Conservation Retrofit Program	MPWMD	80,000	80,000.00	160,000	50.0%	8.40
Sanitary Sewer System Repair and Replacement in the Cities of Monterey and Pacific Grove	Monterey/P.G.	8,466,750	940,750	9,407,500	10.0%	2.00
Implementation of Solid Waste Removal Technology	Monterey/P.G	891,000	99,000	990,000	10.0%	3.70
Microbial Source Tracking in the Cities of Monterey and Pacific Grove	Mont/P.G/.Founda tion	216,000	36,000	252,000	14.3%	7.00
Seaside 90" Outfall Infiltration Component	City of Seaside	7,492,500	832,500.00	8,325,000	10.0%	2.00
All Projects Total		\$ 24,962,150	\$ 2,773,350	\$ 27,735,500	11.11%	n/a

		Local Match										
Total Project Cost (\$)		0%	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%
		Points										
0	100,000	7.5	7.75	8.00	8.25	8.50	8.75	9.00	9.25	9.50	9.75	10.00
100,000	500,000	6.00	6.04	6.80	7.20	7.60	8.00	8.40	8.80	9.20	9.60	10.00
500,000	1,000,000	2.00	3.20	3.60	4.40	5.20	6.00	6.80	7.60	8.40	9.20	10.00
1,000,000	1,500,000	-	-	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
1,500,000	2,000,000	-	-	2.00	2.88	3.75	4.63	5.50	6.38	7.25	8.13	9.00
2,000,000	3,000,000	-	-	2.00	2.75	3.50	4.25	5.00	5.75	6.50	7.25	8.00
3,000,000	4,000,000	-	-	2.00	2.63	3.25	3.88	4.50	5.13	5.75	6.38	7.00
4,000,000	5,000,000	-	-	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00
5,000,000	10,000,000	-	-	2.00	2.13	2.25	2.38	2.50	2.63	2.75	2.88	3.00
	>10,000,000	-	-	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Project Cost	Local Match											
100,000	-	5,000	10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000	
500,000	-	25,000	50,000	100,000	150,000	200,000	250,000	300,000	350,000	400,000	450,000	
1,000,000	-	50,000	100,000	200,000	300,000	400,000	500,000	600,000	700,000	800,000	900,000	
1,500,000	-	75,000	150,000	300,000	450,000	600,000	750,000	900,000	1,050,000	1,200,000	1,350,000	
2,000,000	-	100,000	200,000	400,000	600,000	800,000	1,000,000	1,200,000	1,400,000	1,600,000	1,800,000	
3,000,000	-	150,000	300,000	600,000	900,000	1,200,000	1,500,000	1,800,000	2,100,000	2,400,000	2,700,000	
4,000,000	-	200,000	400,000	800,000	1,200,000	1,600,000	2,000,000	2,400,000	2,800,000	3,200,000	3,600,000	
5,000,000	-	250,000	500,000	1,000,000	1,500,000	2,000,000	2,500,000	3,000,000	3,500,000	4,000,000	4,500,000	
10,000,000	-	500,000	1,000,000	2,000,000	3,000,000	4,000,000	5,000,000	6,000,000	7,000,000	8,000,000	9,000,000	

Feasibility		Technical Feasibility: 0 for obstacles or unknown technology; 7 for proven technology or methods (see Note 1)	Financial Feasibility (0 to 10)	Readiness to proceed: 0 for initial planning stage; 8 for projects with permits or no permits needed.	Total by Project	Fraction Assigned by Project
Project	Sponsor					
Seaside Groundwater Basin Aquifer Storage and Recovery	MPWMD/CAW	0	0.00	0	0	0.00
Seaside Basin Groundwater Replenishment	MRWPCA	2	2.00	2	6	0.56
CSUMB Stormwater Percolation and Education	CSUMB	7	2.00	4	13	1.21
Lower Carmel River Restoration and Floodplain Enhancement	BSLT	4	2.00	2	8	0.75
Carmel River Watershed Volunteer Monitoring Program	CRWC	7	4.00	2	13	1.21
Refine ASBS Alternatives	Monterey/PG	7	6.80	8	21.8	2.04
Water Conservation Retrofit Program	MPWMD	7	8.40	2	17.4	1.63
Sanitary Sewer System Repair and Replacement in the Cities of Monterey and Pacific Grove	Monterey/P.G.	7	2.00	8	17	1.59
Implementation of Solid Waste Removal Technology	Monterey/P.G	7	3.70	8	18.7	1.75
Microbial Source Tracking in the Cities of Monterey and Pacific Grove	Mont/P.G./Foundation	7	7.00	8	22	2.06
Seaside 90" Outfall Infiltration Component	City of Seaside	4	2.00	1	7	0.65
All Projects Total		59	39.9	45	143.9	13.44
Average Score (see Note 2)		5.363636364	3.99	4.09		
Maximum Possible Score this Package		5.363636364	3.99	4.09		13.44
Maximum Possible Project Package Score		7	10	8		25

1. 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.

2. Seaside Groundwater Basin Aquifer Storage and Recovery Project excluded from Financial Feasibility analysis.

Strategies (17%)	Projects are awarded one point for each of the strategies described in IRWM guidelines. Scoring consists of adding up all strategies. Each project is assigned a pro-rata share of the points available in this category.
Objectives (25%)	This category represents 25% of the project score. Projects are awarded one point for work that helps satisfy the Regional objectives described in the IRWM Plan. Scoring consists of adding up all objectives met or partially met. Each project is assigned a pro-rata share of the 25% assigned to this category.
Regional Priorities (33%)	Scoring is based on how much a project contributes to meeting a Regional Priority. For example, a project that can supply 8,500 acre-feet of water annually (or one half the goal set by stakeholders) would receive half of the points for that priority.
Feasibility (25%)	Projects receive points as explained in the Feasibility sheet. Each project is assigned a pro-rata share of the points available in this category.
Statewide Priorities	No quantitative scoring is awarded based on how much a project contributes to meeting a Statewide Priority. However, projects are evaluated qualitatively to assess which Statewide Priorities are met.

Regional Priority	Current status	Short-term goal	Point determination	Long-term goal
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.	Unauthorized use of 10,730 AFA from Carmel Valley. Operating yield in Seaside Basin set at 5,600 AFA and must be reduced to 3,000 AFA by 2010.	Replacement supply of 12,500 AFA	Approximately 1 point for each 2,000 AFA project (8 point total)	Additional future demand of 4,550 for General Plan Buildout
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 within the 100-year floodplain.	Flood damage reduction at RLP, protection of public infrastructure (roads, bridges, utilities)	Approximately 1 point for each 13 structures protected from annual flood (i.e., at the Lagoon) or 100-year flood (7 point total).	Protection of all properties up to 100-year flood return level
Address storm water discharges into ASBS	Dischargers must comply with State requirements for Carmel Bay ASBS and Pacific Grove ASBS	Define the maximum extent practicable (MEP) for reducing discharges to ASBS.	3 points for meeting short-term goal and 3 points for meeting long-term goal.	Reduce or eliminate to the maximum extent practicable the storm and non-storm water flows to the ASBS.
Promote the steelhead run -see Notes	Returning adult population between 300 and 800 annually.	See Notes	1.5 points for each short-term goal accomplished (6 point total).	Sustained returning adult population of 3,500-4,200 annually.
Mitigate impacts from storm water runoff throughout the region	Phase II, NPDES Program	Implementation of Six Minimum Control Measures	One full point for each short-term goal accomplished (6 point total).	Maintain compliance with NPDES General Permit

Notes:

Short-term goals for promotion of the steelhead run

1. Identify and remove fish barriers.
2. Increase riparian streamside vegetation cover to 80% of streambanks.
3. Reduce embeddedness to a range of 0.2 to 0.5.
4. Meet Central Coast Basin Plan water quality targets for temperature, DO, pH, CO₂.
5. Increase flows available for all life stages
6. Conduct habitat and population assessments.

Long Term Goal for Promoting the Steelhead Run

As of June 2007, the Federal species recovery plan was under development. The range for the IRWM Plan is from the ENVIRONMENTAL AND BIOLOGICAL ASSESSMENT OF PORTIONS OF THE CARMEL RIVER WATERSHED, December 2004, MPWMD.

Statewide Priorities - not used in quantitative evaluation		Statewide Priorities					
		Reduce conflict between water users or resolve water rights disputes	Implementation of TMDLs that are established or under development	Watershed Management Chapters, Plans, and Policies	Implement SWRCB's NPS Pollution	Implement recommendations of the floodplain management task force, desalination task force, recycling task force, or species recovery plan	Address environmental justice or DAC concerns
Project	Sponsor						
Seaside Groundwater Basin Aquifer Storage and Recovery	MPWMD/CAW	x	n/a	x		x	
Seaside Basin Groundwater Replenishment	MRWPCA	x	n/a	x		x	
CSUMB Stormwater Percolation and Education	CSUMB		n/a	x	x	x	
Lower Carmel River Restoration and Floodplain Enhancement	BSLT		n/a	x	x	x	
Carmel River Watershed Volunteer Monitoring Program	CRWC		n/a	x	x	x	
Refine ASBS Alternatives	Monterey/PG	x	n/a	x	x	x	
Water Conservation Retrofit Program	MPWMD	x	n/a	x	x	x	
Sanitary Sewer System Repair and Replacement	Monterey/P.G.		n/a	x	x		
Implementation of Solid Waste Removal Technology	Monterey/P.G		n/a	x			
Microbial Source Tracking	Mont/P.G./Fou ndation		n/a				
Seaside 90" Outfall Infiltration Component	Seaside	x	n/a	x	x	x	