STORM WATER RESOURCE PLAN

FOR THE GREATER MONTEREY COUNTY INTEGRATED REGIONAL WATER MANAGEMENT REGION

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Prepared by:
Coastal Conservation and Research, Inc.
on behalf of the
Greater Monterey County Integrated Regional Water Management Region

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ACRYONYMS AND KEY WORDS

AMBAG	Association of Monterey Bay Area Governments
ASBS	Areas of Special Biological Significance
BMP	best management practice
CCA	Critical Coastal Areas
CCC	California Coastal Commission
CCGC	Central Coast Groundwater Coalition
CEDEN	California Environmental Data Exchange Network
CEQA	California Environmental Quality Act
CRAM	California Rapid Assessment Methodology
CSIP	Castroville Seawater Intrusion Project
CWA	Clean Water Act
DAC	disadvantaged community
DMS	data management system
DWR	California Department of Water Resources
DWS	drinking water standard
GAMA	Groundwater Ambient Monitoring and Assessment Program
GHG	greenhouse gas
GMC	Greater Monterey County
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
IRWM Plan	Integrated Regional Water Management Plan
LCP	Local Coastal Program
LPA	Local Primacy Agency
MBNMS	Monterey Bay National Marine Sanctuary
MCL	Maximum Contaminant Level
MCRMA	Monterey County Resource Management Agency
MCWRA	Monterey County Water Resources Agency
MEP	maximum extent practicable
MPA	Marine Protected Area
MRSWMP	Monterey Regional Stormwater Management Program
MS4	Municipal Separate Storm Sewer System
MTBE	Methyl tert-butyl ether
NEPA	National Environmental Policy Act
NGO	non-governmental organization
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
Plan	Storm Water Resource Plan
Prop 1	Proposition 1 Water Quality, Supply, and Infrastructure Improvement Act
Regional Board	Regional Water Quality Control Board
RWMG	Regional Water Management Group
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SMCA	State Marine Conservation Area
SMR	State Marine Reserve
State Water Board	State Water Resources Control Board

SWAMP	Surface Water Ambient Monitoring Program
SWMP	Storm Water Management Plan
SWMPU	Storm Water Management Plan Update
SWRCB	State Water Resources Control Board
SWRP	Storm Water Resource Plan
TAC	Technical Advisory Committee
TMDL	total maximum daily load
US EPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WDR	Waste Discharge Requirement
WMI	Watershed Management Initiative

CHAPTER 1. Introduction

This Storm Water Resource Plan has been developed for the Greater Monterey County Integrated Regional Water Management (IRWM) region. The geographic coverage area includes the entirety of the Greater Monterey County IRWM region, plus the portion of the Pajaro River Watershed IRWM region that lies within Monterey County.

The Greater Monterey County IRWM region is characterized largely by intensively farmed agricultural land, rural communities, and a small number of urban areas, the largest of which is the City of Salinas (population approximately 156,000[1]). Groundwater is the primary source of water supply in the region. The Greater Monterey County region receives no imported water, and therefore maintaining the region's water supply is absolutely critical for ensuring the health, prosperity, and long-term sustainability of local communities. The Salinas Valley Groundwater Basin is severely impacted by nitrate contamination, primarily from fertilizer inputs, and by seawater intrusion, due to over pumping. Water quality is a major issue for surface waters as well. The surface waterbodies in the lower Salinas Valley have some of the worst pollutant impairments on the Central Coast, impacted largely by intensive agriculture and nonpoint source pollutants from urban uses.

These water resource issues, along with critical flooding and environmental concerns, have prompted the IRWM Regional Water Management Group (RWMG) and stakeholders in the Greater Monterey County IRWM region to come together for the purposes of storm water resource planning under Proposition 1. The Proposition 1 SWRP planning process has enabled the RWMG and stakeholders to explore new opportunities for storm water and dry weather runoff projects, as well as opportunities for integrating projects, in order to achieve multiple benefits on a regional scale.

This chapter provides the legislative background for developing this Storm Water Resource Plan (SWRP, or Plan), briefly identifies the SWRP planning area, describes the purpose of the Plan along with the approach for Plan development, describes the process for incorporating this Plan into the IRWM Plan and the relationship of this Plan to other SWRPs in the vicinity, addresses certain Standard Provisions of the Storm Water Resource Plan Guidelines including how monitoring will be addressed, and provides a summary of how the Plan is organized.

1.1 Legislative Background and Development of this Plan

Water Code section 10563, subdivision (c)(1), requires a SWRP as a condition of receiving funds for storm water and dry weather runoff capture projects from any bond approved by voters after January 1, 2014.[2] This requirement applies to Proposition 1, the Water Quality, Supply, and Infrastructure Improvement Act of 2014, approved by voters in November 2014. Proposition 1 authorized $200 million in grants for multi-benefit storm water management projects.

[1] 2016 American Community Survey five-year (2012-2016) population estimate.

[2] This requirement does not apply to disadvantaged communities with a population of 20,000 or less, and that is not a co-permittee for an MS4 National Pollutant Discharge Elimination System permit issued to a municipality with a population greater than 20,000 (Water Code section 10563(c) et seq.).

The State Water Resources Control Board (State Water Board) administers the Storm Water Grant Program under Proposition 1. The State Water Board developed Storm Water Resource Plan Guidelines (2015) to assist applicants with the development of their SWRP. A SWRP must comply with the relevant Water Code provisions enacted by Senate Bill 985 in order for individual storm water and dry weather runoff capture projects in the Plan to be eligible for bond funds. This SWRP was developed in accordance with the SWRP Guidelines and complies with all relevant Water Code provisions (see Checklist and Self-Certification in Appendix A).

The SWRP for the Greater Monterey County Integrated Regional Water Management (IRWM) region was developed by Coastal Conservation and Research, Inc., a non-profit organization and fiscal agent for the Central Coast Wetlands Group at Moss Landing Marine Laboratories. The Plan was developed with funding from State Water Board Proposition 1 Storm Water Planning Grant funds (Grant Agreement No. D1612608). Monterey County Resource Management Agency acted as lead public agency for this project.

1.2 Purpose of this Plan and General Approach

The purpose of this SWRP is to promote storm water management implementation projects that provide regionally optimized benefits of increased water supply, improved water quality, better flood protection, enhanced environmental quality, and greater community opportunity. The SWRP achieves that purpose by: characterizing current storm water dynamics in terms of sources, volume, flow, timing, quality, and rights; and identifying geographically and temporally specific opportunities to divert, capture, store, treat, recharge, and reuse this resource to guide the development of implementation projects that optimize regionally integrated benefits.

While traditional approaches to storm water management consider storm water and dry weather runoff as a problem to be addressed, this Plan considers storm water and dry weather runoff as a potential resource. Projects that utilize storm water and dry weather runoff as a resource can result in the following multiple benefits (Water Code sections 10561(g), 10561(h), and 10562(b)(2)):

- creation and restoration of wetlands
- creation and restoration of riverside [riparian] habitats
- maintenance of instream flows
- increases in park and recreation lands
- increases in urban green space
- augmentation of recreation opportunities for communities
- increased tree canopy
- reduced heat island effect
- improved air quality
- improved water quality
- increased water supply
- improved flood management
- increased environmental benefits
- other community benefits

The SWRP uses a watershed-based approach to identify regionally integrated opportunities to beneficially reuse storm water within the Greater Monterey County region. The plan focuses especially

on the Salinas, Alisal-Elkhorn Sloughs, and Pajaro watershed areas. Using modeling and other tools, the Plan also identifies priority infiltration and recharge opportunity areas, urban bio-retention areas, and areas for potential floodplain and open space enhancement. Projects in the Plan are prioritized by evaluating project benefits with respect to watershed-based storm water management goals.

This Plan is considered a living document. By identifying both design projects (i.e., defined and ready to go) and concept projects (i.e., opportunities for future project development), the Plan provides a useful and comprehensive long-term planning tool for storm water resource management in the Greater Monterey County region.

Key Definitions (from Storm Water Resource Plan Guidelines):

Storm Water: Temporary surface water runoff and drainage generated by immediately preceding storms.

Rain Water: Precipitation on any public or private parcel that has not entered an offsite storm drain system or channel, a flood control channel, or any other stream channel, and has not previously been placed to a beneficial use.

Dry Weather Runoff: Surface water runoff and flow in storm drains, flood control channels, or other means of runoff conveyance produced by non-storm water resulting from irrigation, residential, commercial, and industrial activities.

Storm Water and Dry Weather Runoff Capture: To intercept, store, manage, and use storm water and dry weather runoff, thereby reducing the volume of runoff exiting a site.

1.3 Incorporation of SWRP into IRWM Plan

1.3.1 Submission of SWRP to IRWM Group

The Greater Monterey County SWRP planning area encompasses the entirety of Greater Monterey County IRWM region, plus the portion of the Pajaro River Watershed IRWM region that lies within Monterey County.

The Greater Monterey County Regional Water Management Group is the entity responsible for decisions related to IRWM planning in the Greater Monterey County IRWM region. The RWMG has served as the Technical Advisory Committee (TAC) for this SWRP, and as such has participated in the decision-making at every major decision point and milestone during the Plan's development. Upon completion of the SWRP, the Plan was formally submitted to the RWMG per the Water Code provisions (section 10562, subd. (b)(7)). On July 17, 2019, at a regularly scheduled RWMG meeting that was open to the public, the RWMG voted to approve the SWRP and to incorporate the SWRP into the Greater Monterey County IRWM Plan. The SWRP is incorporated into the IRWM Plan as Appendix O. Note that since the planning boundaries for this SWRP include a small portion of the Pajaro River Watershed IRWM region, this SWRP will also be presented to the Pajaro River Watershed RWMG for incorporation into their IRWM Plan.

1.3.2 Comparison of Water Resource Management Goals between the SWRP and IRWM Plan

The objectives and projects of the SWRP fit naturally into the broader water management goals of the IRWM Plan. The IRWM Plan is a watershed-based water resource plan that emphasizes integrated projects with multiple water resource and community benefits. The IRWM Plan contains the following seven goals:

- **Water Supply:** Improve water supply reliability and protect groundwater and surface water supplies.
- **Water Quality:** Protect and improve surface, groundwater, estuarine, and coastal water quality, and ensure the provision of high-quality, potable, affordable drinking water for all communities in the region.
- **Flood Protection and Floodplain Management:** Develop, fund, and implement integrated watershed approaches to flood management through collaborative and community supported processes.
- **Environment:** Protect, enhance, and restore the region's ecological resources while respecting the rights of private property owners.
- **Regional Communication and Cooperation:** Promote regional communication, cooperation, and education regarding water resource management.
- **Disadvantaged Communities:** Ensure the provision of high-quality, potable, affordable water and healthy conditions for disadvantaged communities.
- **Climate Change:** Adapt the region's water management approach to deal with impacts of climate change using science-based approaches, and minimize regional causal effects.

The SWRP goals are similar to those of the IRWM Plan, though they focus more specifically on storm water. The SWRP contains the following five goals:

- **Water Supply:** Manage storm water to increase water supply for urban, agricultural, and environmental uses.
- **Water Quality:** Improve water quality so that waters in the planning area are suitable for human and environmental uses.
- **Flood Management:** Manage storm water systems to reduce surface water peak flows and flood risk.
- **Environment:** Protect, preserve, restore and/or enhance watershed features and processes through storm water management.
- **Community:** Enhance economic prosperity and quality of life through improved urban spaces, availability of clean water, and related job creation and training.

Many of the SWRP objectives precisely overlap with those of the IRWM Plan, and all of the SWRP objectives are entirely consistent with the overall intent of the IRWM Plan. (For a more detailed discussion of the SWRP goals and objectives, see Chapter 5, Plan Objectives.) Furthermore, like the IRWM Plan, the SWRP recognizes the added benefit to integration of multiple water management strategies – in this case, storm water management strategies – as compared to stand-alone, single

benefit projects. It is therefore natural for the Greater Monterey County SWRP planning effort to have been conducted within the context of the Greater Monterey County IRWM program.

1.3.3 Other Local Plans that may Affect or be Affected by the SWRP

There are numerous plans within the watershed boundaries that directly or indirectly address storm water resource management, including storm water management plans, storm drain master plans, urban water management plans, watershed management plans, general plans, and other local plans. These local plans may affect or be affected by the SWRP in various ways; for example, many of these documents have been used in the development of the SWRP, and the results of modeling and other outcomes of the SWRP may be used to inform future updates of these other plans.

Following is a list of local plans relevant to storm water resource planning and management. See Chapter 4, Organization, Coordination, and Collaboration, for a more complete description of the relationship of the SWRP to these local plans.

- Storm water management plans and guidance documents:
  - City of Salinas Stormwater Management Plan (2013)
  - King City NPDES Phase II Stormwater Management Plan (2009)
  - City of Soledad Stormwater Management Plan (2010)
  - Monterey Regional Stormwater Management Program (2006)
  - City of Marina NPDES Phase II Small MS4 General Permit Guidance Document (June 2013)
  - City of Gonzales NPDES Phase II Small MS4 General Permit Guidance Document (July 2013)

- Storm water and storm drain masterplans:
  - City of Salinas Storm Water Master Plan (2004)
  - Community of Castroville Storm Drain Master Plan (2001)

- Plans that specifically address dry weather runoff:
  - Monterey Bay National Marine Sanctuary: Implementing Solutions to Urban Runoff (1992)

- Plans that specifically address flood management:
  - Monterey County Floodplain Management Plan (2008)
  - Monterey County Multi-Jurisdictional Hazard Mitigation Plan (2014)

- Groundwater management plans:
  - Monterey County Groundwater Management Plan (2006)
  - Salinas Valley Basin Groundwater Sustainability Plan (currently under development)

- Urban water management plans:
  - City of Greenfield (2015, Draft)
  - King City (2015)
  - Marina Coast Water District (2015)
  - California Water Service Company-Salinas District (2015)
  - City of Soledad (2015)

- Watershed management plans that specifically address storm water resource management:
  - San Antonio and Nacimiento Rivers Watershed Management Plan (2008)

  - Elkhorn Slough Watershed Conservation Plan (1999)
  - Elkhorn Slough at the Crossroads: Natural Resources and Conservation Strategies for the Elkhorn Slough Watershed (2002)
  - Moro Cojo Slough Management and Enhancement Plan (1996)
  - Northern Salinas Valley Watershed Restoration Plan (1997)
  - Reclamation Ditch Watershed Assessment and Management Strategy (2005)

- General plans: All of the general plans in the project area include policies (in public service and/or land use elements) that apply to water conservation, storm drainage facilities, or storm water management. Relevant general plans and community plans include:
  - Monterey County General Plan (2010)
  - City of Marina General Plan (2000, with updates through 2010)
  - City of Gonzales General Plan (2010)
  - City of Greenfield General Plan (2005)
  - City of Salinas General Plan (2002)
  - City of Soledad General Plan (2005)
  - City of Soledad Downtown Specific Plan (2012)
  - King City General Plan (1998)
  - Castroville Community Plan Update 2010

1.4 Consistency with Applicable Laws, Policies, and Permits

The Storm Water Resource Plan Guidelines require that SWRPs address, or provide formal reference addressing, certain "standard provisions," including those listed below. This SWRP and its projects and activities have been vetted to ensure consistency with all applicable laws, policies, permits, and water rights, as follows:

- **California Environmental Quality Act (CEQA):** Implementation of activities and individual projects in the SWRP will not occur unless they are in compliance with CEQA.

- **Water Quality Control Plans:** This SWRP is consistent with, and will assist in compliance with, applicable federal and state regulations and policies, and permits implementing federal and state regulations and policies, including, but not limited to:
  - Clean Water Act and the Safe Drinking Water Act;
  - Water rights permits/licenses;
  - State Water Board plans and policies;
  - State and Regional Water Board water quality control plans and policies, including the Central Coast Basin Plan (2016), Watershed Management Initiative Chapter (2002), and total maximum daily loads adopted by the Central Coast Regional Water Board;
  - Any other federal and/or state laws, regulations, and permits.

- **Other Applicable State Permits:** The SWRP will be implemented in accordance with applicable National Pollutant Discharge Elimination System (NPDES) permits, Waste Discharge Requirements (WDRs), Areas of Special Biological Significance Compliance Plans (State Water Board Resolution 2012-0012), and/or conditional waivers issued by the State and/or Regional Water Boards. Chapter 2 Water Quality Compliance describes how the SWRP is consistent with NPDES permits, WDRs, and conditional waivers issued by the Central Coast Regional Board.

- **California Health and Safety Code – Pest and Mosquito Abatement:** All projects included in this SWRP are subject to the Mosquito Abatement and Vector Control District Law, which requires property owners, including municipalities, to prevent public nuisances caused by property or activity that has been artificially altered from its natural condition so that it does not: support the development, attraction, or harborage of vectors such as mosquitoes and rats; or facilitate the introduction or spread of vectors. Upon its completion, the SWRP will be submitted to local mosquito and vector control districts (including the Northern Salinas Valley Mosquito Abatement District and the Monterey County Department of Health).
- **Modification of a River or Stream Channel:** As required by Clean Water Act sections 401 and 404 and other federal and state laws, regulations, and permits, projects included in this SWRP that include substantial change or use of any material from a river, stream, or lake will be required to avoid and minimize erosion, sediment transport, and hydromodification, and fully mitigate environmental impacts resulting from the projects. These projects may require additional permitting for compliance with Clean Water Act Sections 404 and 401 as well as California Department of Fish and Wildlife regulations.

1.5 Monitoring

To assess the effectiveness of Plan implementation on a watershed basis, SWRPs are required to include a monitoring component to collect statistically meaningful data. This SWRP will support, and will be consistent with, all monitoring requirements associated with applicable Municipal Separate Storm Sewer System (MS4) permits. Each proposed project will be reviewed for the extent to which it collects statistically meaningful data and follows monitoring requirements associated with applicable MS4 permit(s).

For individual projects within a watershed that may impact or have a potential to impact water quality, proposed monitoring will be evaluated to ensure integration of existing local, regional, or statewide monitoring efforts. All projects must adhere to certain State guidelines for monitoring. These include:

- Projects that involve surface water quality must meet the criteria for and be compatible with the Surface Water Ambient Monitoring Program (SWAMP): http://www.waterboards.ca.gov/water_issues/programs/swamp/tools.shtml).
- All projects that involve groundwater quality must meet the criteria for and be compatible with Groundwater Ambient Monitoring and Assessment (GAMA): http://www.waterboards.ca.gov/gama/).
- All projects that involve wetland restoration must meet the criteria for and be compatible with the State Wetland and Riparian Area Monitoring Plan (WRAMP): http://www.waterboards.ca.gov/mywaterquality/monitoring_council/wetland_workgroup/docs/2010/tenetsprogram.pdf

All monitoring data will be stored in centralized local, regional, or statewide water quality data collection systems, including the State Water Board's California Environmental Data Exchange Network (CEDEN), SWAMP, and GAMA. See Chapter 8, Information and Data Management, for further discussion on monitoring and data management.

1.6 Organization of this Plan

This SWRP adheres to the State's Storm Water Resource Plan Guidelines, and is organized as follows:

- **Chapter 1. Introduction**: Describes the purpose of the Plan, development of the Plan, and addresses Standard Provisions.
- **Chapter 2. Water Quality Compliance**: Identifies water quality issues within the major watersheds, and includes discussion of the SWRP in relation to applicable TMDL Implementation Plans and MS4 Permits.
- **Chapter 3. Watershed Identification**: Identifies the SWRP boundary and watersheds within the planning area.
- **Chapter 4. Organization, Coordination, and Collaboration**: Describes the RWMG, discusses public engagement efforts, and describes coordination with agencies and organizations with regard to storm water and dry weather runoff management.
- **Chapter 5. Storm Water Management Objectives**: Identifies the storm water goals and objectives of this Plan.
- **Chapter 6. Quantitative Methods for Identification and Prioritization of Storm Water and Dry Weather Runoff Capture Projects**: Describes the narrative and quantitative goals for the five multiple benefits in each of the four main sub-watersheds in the planning area, and the methods used to derive them.
- **Chapter 7. Evaluation and Prioritization of Projects**: Includes a prioritized project list, and describes the quantitative analyses employed to identify opportunities and the use of that information to identify, evaluate, and prioritize the storm water management projects.
- **Chapter 8. Information and Data Management**: Describes the data management system including types of data gathered, data formats for transfer to regional and statewide systems, data storage and retrieval, back-up systems, and security.
- **Chapter 9. Implementation Strategy and Schedule**: Describes an overall coordinated strategy to facilitate the successful implementation of projects listed in this Plan.
- **Chapter 10. Education, Outreach, and Public Participation**: Describes the community engagement process that occurred during Plan development.
- **Chapter 11. References**

Disclosure Statement:

Funding has been provided in full or in part through an agreement with the State Water Resources Control Board using funds from Proposition 1. The contents of this document do not necessarily reflect the views and policies of the foregoing, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

CHAPTER 2. Water Quality Compliance

The quality of surface waters and groundwater basins in the Greater Monterey County region is greatly influenced by land use practices. The primary land use in Monterey County is agriculture, representing about 56 percent of the total land area and occupying more than 1.4 million acres of land. Only 5 percent of the county has been developed with residential, industrial, and commercial uses. Intensive agriculture in the Greater Monterey County IRWM planning area is a primary contributor of pollutants to surface waters and groundwater. Discharges from agricultural lands include surface discharges (irrigation return flows or tailwater), subsurface drainage generated by installing drainage systems to lower the water table below irrigated lands (tile drains), discharges to groundwater through percolation, and storm water runoff flowing from irrigated lands.

In the Salinas Valley, surface waters are impacted largely by intensive agricultural use as well as by nonpoint source pollutants from urban uses. Salinas Valley surface waters are especially impaired by nitrate, pesticides, toxicity, and pathogens. Nitrate contamination in the groundwater basin, resulting mainly from the use of synthetic fertilizers for irrigated agriculture, is a major problem for the region's drinking water supply, affecting rural communities throughout the Salinas Valley. Addressing nitrate-polluted drinking water in the Salinas Valley is one of the Central Coast Regional Water Quality Control Board's (Central Coast Regional Board, or RWQCB) top concerns.

Erosion and sedimentation and septic systems are also major causes of pollutants to surface waters. Erosion is a widespread problem in Monterey County, due in part to the erosive nature of local soils as well as from land use practices (including farming on steep slopes, unmaintained or improperly designed dirt roads, altered water channels that increase water velocities and alter the natural sediment balance, and areas that have been denuded of vegetation by fire, overgrazing, or clearing).

This chapter identifies water quality issues in the region and describes how the SWRP and its projects are consistent with, and assist in compliance with, applicable federal and state regulations and policies and with permits that implement those regulations and policies.

2.1 Water Quality Issues

2.1.1 Groundwater Quality

Two major water quality problems affecting the Salinas Valley Groundwater Basin are: 1) seawater intrusion, due to over pumping, and 2) nitrate contamination, primarily from fertilizer inputs. The Salinas Valley Groundwater Basin has been designated as a high priority basin under SGMA, with the 180/400-Foot Aquifer being further designated as critically overdrafted. The entire Salinas Valley Groundwater Basin was listed as impaired in the Central Coast Regional Board's Water Management Initiative and as only partially supporting beneficial uses due to nitrate contamination and seawater intrusion (RWQCB 2002, p. 29).

Seawater intrusion has advanced approximately 7.5 miles inland in the 180-Foot Aquifer, and 4.5 miles inland in the 400-Foot Aquifer. According to the 2015 Urban Water Management Plan for the Salinas District (Cal Water 2016a), the annual non-drought overdraft of the Salinas Valley Groundwater Basin is estimated to be approximately 45,300 AFY. Because of the hydrologic continuity between the ocean and

the 180-Foot and 400-Foot Aquifers of the Pressure Subarea, seawater has been intruding into these aquifers at a rate of approximately 28,800 AFY. During droughts, the annual overdraft can escalate to between 150,000 to 300,000 AFY. The East Side and Pressure Subareas of the Salinas Valley Groundwater Basin are the most impacted by lack of recharge. As a result of seawater intrusion, urban and agricultural supply wells have been abandoned, destroyed, and relocated. Figures 2.1 and 2.2 illustrate the extent of seawater intrusion in the Salinas Valley.

Figure 2.1 Seawater Intrusion in the Salinas Valley Groundwater Basin: Pressure 180-Foot Aquifer

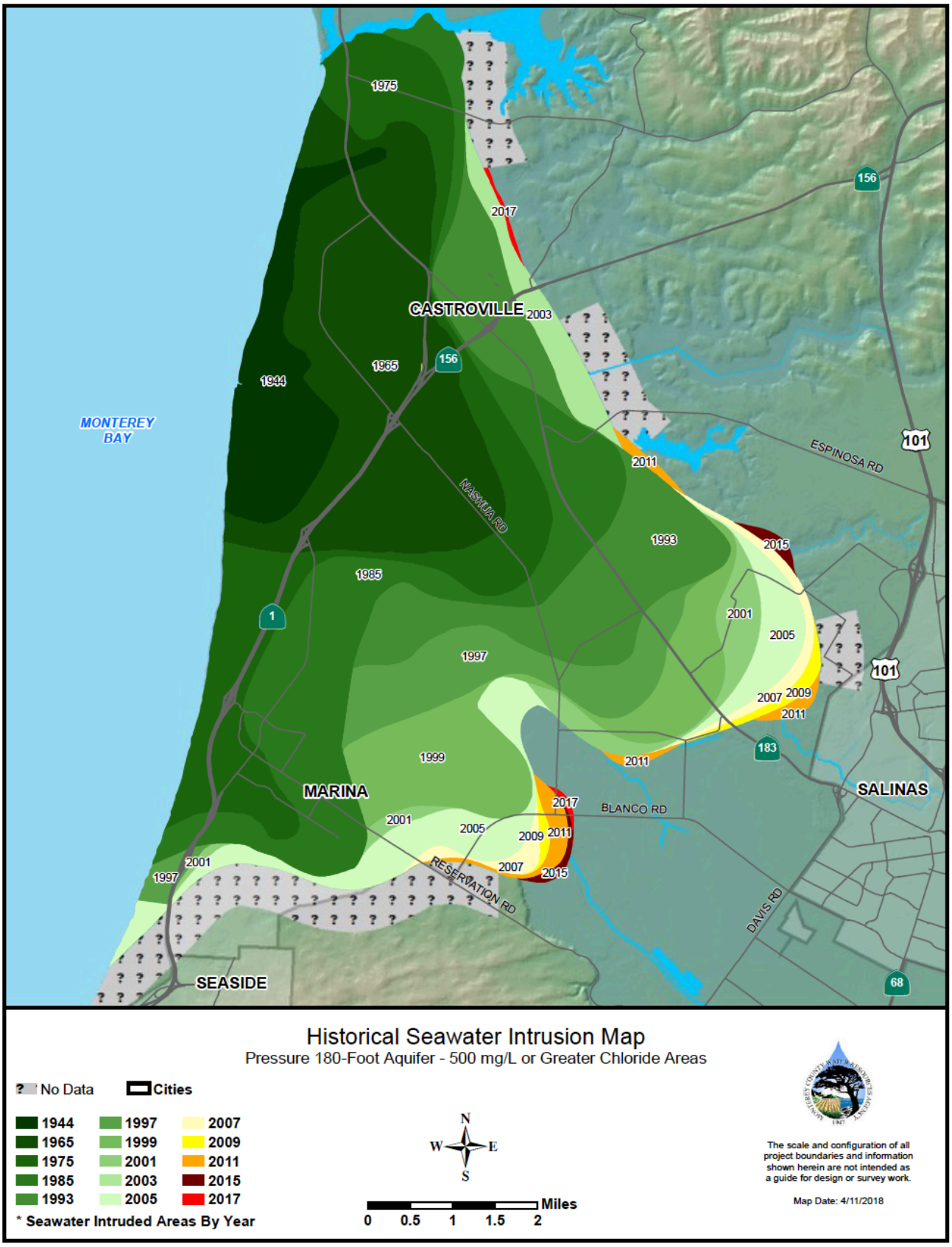
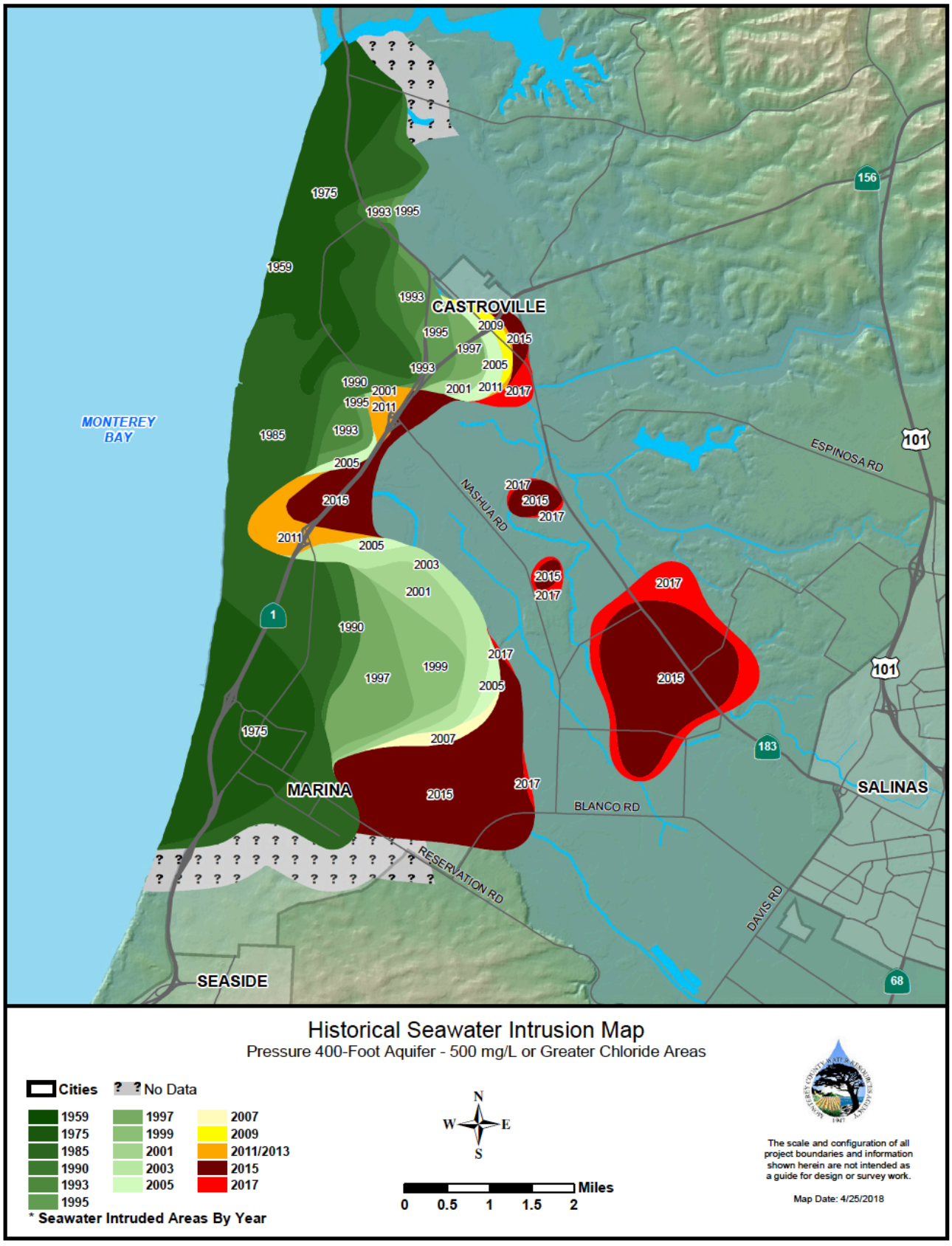


Figure 2.2 Seawater Intrusion in the Salinas Valley Groundwater Basin: Pressure 400-Foot Aquifer



Nitrate contamination in the Salinas Valley was first documented in a report published by the Association of Monterey Bay Area Governments (AMBAG) in 1978. In 1988, a report by the State Water Board documented that nitrate levels in the Salinas Valley groundwater had impaired its beneficial use as a drinking water supply. In a July 1995 staff report, the State Water Board ranked the Salinas Valley as their number one water quality concern due to the severity of nitrate contamination. All of the Salinas Valley cities have had to replace domestic water wells due to high nitrate levels that exceed the drinking water standard.

The State of California Maximum Contaminant Level (MCL) for nitrate is established at 10 mg/L NO_3-N. Data collected by the Central Coast Regional Board between April 2010 and April 2014 per Agricultural Order monitoring requirements showed that 45 percent of on-farm domestic wells in Monterey County exceeded the drinking water standard. In the East Side Aquifer subbasin, 64 percent of on-farm domestic wells sampled exceeded the drinking water standard. The highest measured nitrate concentration for the sampled on-farm wells was 137.2 mg/L NO3-N (almost 14 times the drinking water standard), also detected in the East Side Aquifer subbasin (RWQCB 2017a, p. 1).

Between October 2013 and August 2014, the Central Coast Groundwater Coalition (CCGC), a third-party cooperative groundwater monitoring program that was established for agricultural landowners and operators in the Central Coast region, collected a total of 229 samples from domestic and irrigation wells in the Salinas Valley. CCGC used GeoTracker GAMA data[1] (which includes data from the California Department of Public Health, GAMA-SWRCB data collection efforts and Regulated Sites), USGS National Water Information System data,[2] and data extracted from the GAMA special study carried out by Lawrence Livermore National Laboratory (Moran et al. 2011). In its Groundwater Characterization Report dated June 2015, CCGC made the following conclusions regarding nitrate in the Salinas Valley (CCGC 2015a; see also CCGC 2015b):

- 41 percent of wells with nitrate concentrations (or 309 of 758 total wells sampled) had maximum concentrations over the US EPA and State-defined maximum contaminant level (MCL).
- 34 percent of the land area within the Salinas Valley has nitrate concentrations over the MCL.
- 55 percent of domestic wells or 121 of 221 total sampled on CCGC-member properties had concentrations exceeding the MCL.

Based on results such as these, a 2014 Regional Water Board staff report concluded, "The data clearly show that groundwater pollution due to nitrate is severe and widespread in the Central Coast Region, affecting public water supply systems, domestic wells, and small unregulated water systems... Of particular concern are the high percentages of domestic wells that are polluted with nitrate at concentrations far exceeding the drinking water standard in many Central Coast counties and groundwater basins. …. Tens of thousands of Central Coast residents are at risk" (CCGC 2015a).

Nitrate is not the only contaminant affecting drinking water supplies; there are several other contaminants of concern. The Monterey County Drinking Water Protection Services, Environmental Health Bureau (EHB) administers Local Primacy Agency (LPA, having 15 – 199 water connections), state small (5 – 14 connections), and local small (2 – 4 connections) water systems, including 276 LPA systems,

[1] Source: http://geotracker.waterboards.ca.gov/gama/, accessed by Central Coast Groundwater Coalition on February 6, 2014.
[2] Source: http://waterdata.usgs.gov/nwis, accessed by Central Coast Groundwater Coalition on April 4, 2013.

276 state small systems, and 694 local small systems.[3] The EHB has been tracking contamination found in drinking water systems by nitrate, arsenic, and hexavalent chromium (chromium-6). Based on recent EHB data (October 2017), Table 2.1 summarizes the number of LPA, state small, and local small water systems that are out of compliance for nitrate and/or arsenic, or that exceeded the former MCL for chromium-6[4] in Monterey County. The highest level of nitrate detected was 96.3 mg/L NO_3-N. The highest level of arsenic detected was 118 µ/L. The highest level of chromium-6 detected was 49 µ/L.

Table 2.1 Number of LPA (15-199 Connections) and Small Water Systems (2-14 Connections) in Monterey County Exceeding Arsenic, Nitrate, or Chromium-6 Standards

	Arsenic	Nitrate	Chromium-6
LPAs (15-199 connections)	10 (4%)	19 (7%)	10-15[a]
State Smalls (5-14 connections)	29 (11%)	39 (14%)	59 (21%)
Local Smalls (2-4 connections)	52 (7%)	123 (18%)	106 (15%)

Source: Monterey County Environmental Health Bureau, data dated October 2017.

a: EHB staff reported that 10-15 systems exceed the former chromium-6 MCL standard (10 µ/L);[5] however, these systems were not specifically included in the data provided by EHB, given the recent change in the State standard for chromium-6.

2.1.2 Surface Water Quality

Section 303(d) of the federal Clean Water Act requires each State to maintain a list of impaired waterbodies and to develop Total Maximum Daily Loads (TMDLs) for all impaired waterbodies. A TMDL estimates the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. Once a TMDL is established, an implementation plan must be developed to describe how that waterbody will meet the water quality standards.

The Central Coast Regional Board is the State agency responsible for identifying impaired waterbodies within the Central Coast Region. In April 2018, the United States Environmental Protection Agency (US EPA) approved California's 2014-2016 303(d) List. A summary 303(d)-listed waterbodies in the Greater Monterey County IRWM planning region is shown in Table 2.2.[6] Table 2.3 shows the impaired

[3] See Monterey County Health Department website (http://www.mtyhd.org/index.php/services/environmental-health/small-water-system-program/) and Central Coast Regional Water Quality Control Board website (http://www.swrcb.ca.gov/centralcoast/water_issues/programs/gap/index.shtml).

[4] On May 31, 2017, the Superior Court of Sacramento County issued a judgment invalidating the hexavalent chromium MCL of 10 µ/L that was adopted as a regulatory standard for drinking water on July 1, 2014. The court ordered the State Water Board to take the necessary actions to delete the chromium-6 MCL standard from the California Code of Regulations. As of September 11, 2017, the MCL for chromium-6 is no longer in effect. The court's primary reason for invalidating the MCL is that the California Department of Public Health "failed to properly consider the economic feasibility of complying with the MCL" when adopting the MCL. The court did not make any finding about whether the MCL adequately protected public health. The State Water Board will be establishing a new MCL for chromium-6, which will be between the chromium-6 public health goal (PHG) of 0.02 µ/L and the total chromium MCL of 50 µ/L.

[5] Email communication to IRWM Program Director from Cheryl Sandoval, Supervisor for the Drinking Water Protection Program, March 30, 2018.

[6] The Section 303(d) List of waterbodies for all of California is available on the Central Coast Regional Board's website: https://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2012.shtml.

waterbodies with potential sources of impairment, highlighting those that are likely impaired at least in part by polluted storm water or dry weather runoff.

Within the Greater Monterey County IRWM region, 31 waterbodies have been determined by the Central Coast Regional Board to be impaired under Section 303(d) of the Clean Water Act. These waterbodies are illustrated in Figure 2.3. Impairments are found to occur within the Salinas, Gabilan, and Bolsa Nueva watersheds, with very minor impairments listed for two waterbodies in the Big Sur coastal watershed (which is not a focus area for storm water planning). The region has 332 miles of impaired rivers (20 rivers/creeks, including over 100 miles of the Salinas River), 2,339 acres of impaired estuaries, 79 acres of impaired harbor (Moss Landing Harbor), and 5,580 acres of impaired lakes/reservoirs. The entire Salinas Valley Groundwater Basin, which includes four sub-basins, is listed in the Regional Board's Watershed Management Initiative Chapter as impaired and as only partially supporting beneficial uses due to nitrate contamination and seawater intrusion (RWQCB 2002, p. 29).

The waterbodies in the lower Salinas Valley have some of the worst pollutant impairments on the Central Coast. The Lower Salinas River (from the estuary to Gonzales Road) has the most impairments identified on the 303(d) List of any other waterbody on the Central Coast, with 19 impairments. Tying for second place are the Salinas Reclamation Ditch and Tembladero Slough, each with 14 pollutant impairments. Quail Creek is listed with 13 impairments, and Old Salinas River Channel is listed with 10.[7] More important than the number of pollutant impairments identified are the magnitude of the problems. Each of these water segments is impaired for toxicity and high levels of pesticides, nutrients, and indicator bacteria. Moss Landing Harbor, which lies at the receiving end of the Salinas Reclamation Ditch (Gabilan) watershed, is listed for 12 pollutant impairments, including pesticides, toxicity, pathogens, and sediment.

Activities that can generate or contribute to the pollution of storm water or dry weather runoff in particular, or that can impair beneficial use of storm water or dry weather runoff, include, but are not limited to:

- agricultural land use practices, including use of pesticides, herbicides, and fertilizers
- confined animal operations
- urban land uses
- road construction
- roads, streets, and highways operations and maintenance
- plaza, sidewalk, and parking lot maintenance and cleaning
- fountains, pools, lakes, and lagoons maintenance
- landscape maintenance
- drainage system operation and maintenance
- waste handling and disposal
- water and sewer utility operation and maintenance
- natural sources such as effects of fire, flood, and landslide
- grassland management
- logging and other harvest activities
- mining

[7] To see the fact sheets for each of these water segments, go to the following link: http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/category5_report.shtml

Sections 303(d) and 303(e) of the Clean Water Act require that approved TMDLs be incorporated into water quality control plans. The water quality control plan for the Central Coast Region is the Central Coast Basin Plan. The section below describes how the SWRP and its projects are consistent with the Central Coast Basin Plan and the Central Coast Region's Watershed Management Initiative.

Table 2.2 2014-2016 California 303(D) List of Water Quality Limited Segments in the Greater Monterey County IRWM Region

		PESTICIDES												NUTRIENTS					OTHER ORGANICS		SEDIMENT			TOXICITY	PATHOGENS					SALINITY				METALS/METALLOIDS					MISC	
HUC	Water Body	pesticides	chlorpyrifos	diazinon	chlordane	DDD	DDE	DDT	dieldrin	dimethoate	malathion	permethrin, total	toxaphene	nitrate	chlorophyll-a	ammonia	nutrients	Low dissolved O2	priority organics	PCBs	sediment/ siltation	turbidity	benthic community effects	toxicity	fecal coliform	total coliform	e coli	indicator bacteria	enterococcus	sodium	chloride	specific conductivity	TDS	arsenic	nickel	boron	copper	mercury	temp	pH
306: Bolsa Nueva	Bennett Slough														x			x				x																	x
	Carneros Creek													x	x	x		x				x			x														x
	Elkhorn Slough	x												x				x			x					x													x
	Moss Landing Harbor		x	x				x	x									x		x	x			x				x						x	x				x
309: Gabilan	Alisal Creek													x	x	x						x		x	x					x										
	Alisal Slough			x										x		x						x		x																
	Quail Creek		x	x						x	x	x		x		x		x				x		x	x		x											x	
	Santa Rita Creek													x		x		x				x			x		x			x								x	
	Gabilan Creek													x		x						x		x	x															x
	Merrit Ditch			x										x		x		x				x		x																x
	Natividad Creek			x										x		x		x				x		x			x												x	
	Espinosa Lake		x	x																																			
	Espinosa Slough	x		x							x			x		x			x			x		x																x
	Salinas Reclamation Canal		x	x							x	x		x		x		x	x			x		x	x		x											x	x
	Tembladero Slough		x	x							x			x	x			x				x		x	x	x	x		x						x				x
309: Lower Salinas	Blanco Drain		x	x		x	x							x								x		x															
	Old Salinas River		x	x										x	x			x				x		x	x		x												x
	Salinas River, lower		x	x	x		x	x	x				x	x						x		x	x	x	x		x		x	x	x		x						x
	Salinas River Lagoon		x				x										x							x														x	x
	Salinas River Refuge Lagoon																					x																	x
(306 on TMDL list)	Moro Cojo Slough	x												x		x		x			x	x		x		x	x												x
(306 on TMDL list)	Old Salinas River Estuary	x															x																						
309: Upper/ Middle Salinas	Arroyo Seco River																								x													x	
	Chualar Creek		x	x						x	x			x		x		x				x		x	x		x												x
	Chular Creek, South Branch													x		x						x																x	x
	Salinas River, middle																					x		x	x													x	x
	San Antonio Reservoir																																				x		
	San Antonio River (below res)																								x		x												
	San Lorenzo Creek																								x		x			x	x	x				x			x
(317 on TMDL list)	Cholame Creek																	x							x		x			x	x	x				x			
308: Big Sur Coast	Big Creek																																						x
	Willow Creek																																						x

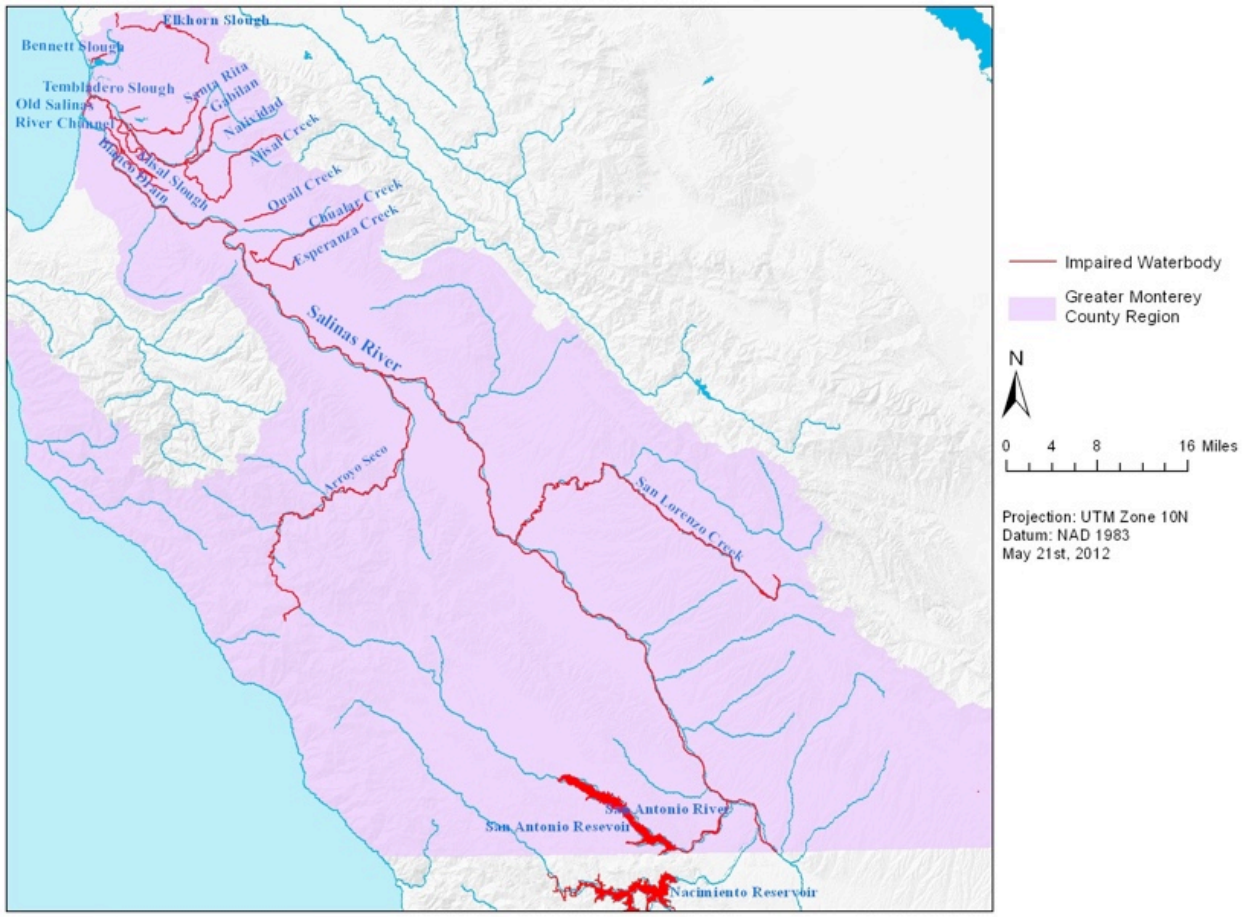
Table 2.3 Potential Sources of Impairment for 303(d)-listed Waterbodies in Greater Monterey County Region

Waterbody	Pollutant Categories	Potential Sources of Impairment	Associated with Storm Water or Dry Weather Runoff
Bennett Slough	Nutrients, Sediment	Source Unknown	
Carneros Creek	Nutrients, Fecal Indicator Bacteria, Sediment, Miscellaneous	Source Unknown	
Elkhorn Slough	Pesticides, Nutrients, Sediment, Fecal Indicator Bacteria, Miscellaneous	Source Unknown	
Moss Landing Harbor	Pesticides, Toxicity, Nutrients, Sediment, Fecal Indicator Bacteria, Metals/Metalloids, Other Organics, Miscellaneous	Agriculture, Source Unknown	
Alisal Creek	Fecal Indicator Bacteria, Salinity, Nutrients, Toxicity, Sediment	Urban Runoff/Storm Sewers, Agriculture, Grazing-Related Sources, Illegal dumping, Transient encampments, Natural Sources, Source Unknown	Yes
Alisal Slough	Nutrients, Pesticides, Toxicity, Sediment	Agriculture, Grazing-Related Sources, Domestic Animals/Livestock, Natural Sources, Source Unknown	
Quail Creek	Nutrients, Pesticides, Toxicity, Sediment, Fecal Indicator Bacteria, Miscellaneous	Agriculture, Domestic Animals/Livestock, Illegal dumping, Natural Sources, Source Unknown	
Santa Rita Creek	Nutrients, Fecal Indicator Bacteria, Salinity, Sediment	Agriculture, Domestic Animals/Livestock, Urban Runoff/Storm Sewers, Collection System Failure, Illegal dumping, Natural Sources, Source Unknown	Yes
Gabilan Creek	Nutrients, Sediment	Urban Runoff/Storm Sewers, Agriculture, Domestic Animals/Livestock, Natural Sources, Source Unknown	Yes
Merritt Ditch	Nutrients, Pesticides, Toxicity, Sediment, Miscellaneous	Agriculture, Domestic Animals/Livestock, Natural Sources, Source Unknown	
Natividad Creek	Nutrients, Pesticides, Fecal Indicator Bacteria, Sediment, Toxicity, Miscellaneous	Urban Runoff/Storm Sewers, Collection System Failure, Agriculture, Domestic Animals/Livestock, Illegal dumping, Transient encampments, Natural Sources, Source Unknown	Yes
Espinosa Lake	Pesticides	Agriculture	
Espinosa Slough	Pesticides, Nutrients, Sediment, Toxicity, Other Organics, Miscellaneous	Agriculture, Domestic Animals/Livestock, Natural Sources, Source Unknown	
Salinas Reclamation Canal	Pesticides, Nutrients, Toxicity, Other Organics, Sediment, Metals/Metalloids, Fecal Indicator Bacteria, Miscellaneous	Agriculture, Urban Runoff/Storm Sewers, Collection System Failure, Domestic Animals/Livestock, Illegal dumping, Transient encampments, Natural Sources, Source Unknown	Yes

Tembladero Slough	Pesticides, Toxicity, Nutrients, Sediment, Fecal Indicator Bacteria, Metals/Metalloids, Miscellaneous	Agriculture, Urban Runoff/Storm Sewers, Domestic Animals/Livestock, Illegal dumping, Natural Sources, Source Unknown	Yes
Blanco Drain	Pesticides, Nutrients, Sediment, Toxicity	Agriculture, Domestic Animals/Livestock, Natural Sources, Source Unknown	
Old Salinas River	Pesticides, Nutrients, Toxicity, Sediment, Fecal Indicator Bacteria, Miscellaneous	Agriculture, Urban Runoff/Storm Sewers, Domestic Animals/Livestock, Domestic Pet Waste, Illegal dumping, Natural Sources, Source Unknown	Yes
Salinas River, lower	Pesticides, Nutrients, Toxicity, Sediment, Other Organics, Salinity, Fecal Indicator Bacteria, Miscellaneous	Urban Runoff/Storm Sewers, Agriculture, Domestic Animals/Livestock, Illegal dumping, Channelization, Flow Alteration/Regulation/Modification, Hydromodification, Natural Sources, Source Unknown	Yes
Salinas River Lagoon	Pesticides, Nutrients, Toxicity, Miscellaneous	Agriculture, Source Unknown	Yes
Salinas River Refuge Lagoon	Sediment, Miscellaneous	Source Unknown	Yes
Moro Cojo Slough	Pesticides, Nutrients, Sediment, Toxicity, Fecal Indicator Bacteria, Miscellaneous	Agriculture, Domestic Animals/Livestock, Natural Sources, Source Unknown	
Old Salinas River Estuary	Pesticides, Nutrients	Source Unknown	Yes
Arroyo Seco River	Fecal Indicator Bacteria, Miscellaneous	Source Unknown	
Chualar Creek	Nutrients, Pesticides, Toxicity, Fecal Indicator Bacteria, Sediment, Miscellaneous	Agriculture, Domestic Animals/Livestock, Illegal dumping, Natural Sources, Source Unknown	
Chualar Creek, South Branch	Sediment, Nutrients, Miscellaneous	Agriculture, Domestic Animals/Livestock, Natural Sources, Source Unknown	
Salinas River, middle	Toxicity, Sediment, Fecal Indicator Bacteria, Miscellaneous	Source Unknown	
San Antonio Reservoir	Metals/Metalloids	Source Unknown	
San Antonio River (below res)	Fecal Indicator Bacteria	Domestic Animals/Livestock, Natural Sources	
San Lorenzo Creek	Fecal Indicator Bacteria, Metals/Metalloids, Salinity, Miscellaneous	Domestic Animals/Livestock, Grazing-Related Sources, Natural Sources, Source Unknown	
Cholame Creek	Nutrients, Fecal Indicator Bacteria, Metals/Metalloids, Salinity	Grazing-Related Sources, Natural Sources, Source Unknown	
Big Creek	Miscellaneous	Natural Sources	
Willow Creek	Miscellaneous	Source Unknown	

Source: US EPA-approved 2014-2016 Clean Water Act Section 303(d) List

Figure 2.3 Impaired Surface Waters in the Greater Monterey County IRWM Region



2.2 Consistency with Applicable Water Quality Control Plans and Policies

2.2.1 Central Coast Basin Plan

California's Porter-Cologne Water Quality Control Act (1969) establishes the responsibilities and authorities of the State's nine Regional Water Quality Control Boards and the State Water Resources Control Board. The Porter-Cologne Act names the Regional 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 a water quality control plan for all areas within its region. The Central Coastal Basin Plan is the water quality control plan formulated and adopted by the Regional Board for the Central Coast Region. The Basin Plan was last updated in March 2016 (see RWQCB 2016).

The objective of the Central Coastal Basin Plan is to show how the quality of the surface and ground waters in the Central Coast Region should be managed to provide the highest water quality reasonably possible. The Basin Plan lists various water uses (Beneficial Uses), then describes the water quality which must be maintained to allow those uses (Water Quality Objectives). The Implementation Plan then describes the programs, projects, and other actions necessary to achieve the standards established in the plan. The Central Coast Regional Board implements the Basin Plan by issuing and enforcing waste discharge requirements to individuals, communities, or businesses whose waste discharges can affect

water quality. These requirements can be either State Waste Discharge Requirements (WDRs) for discharges to land, or federally delegated National Pollutant Discharge Elimination System (NPDES) permits for discharges to surface water.

The Central Coast Regional Board has established the following planning goals for water quality in the Central Coast Region (p. IV-2):

1. Protect and enhance all basin waters, surface and underground, fresh and saline, for present and anticipated beneficial uses, including aquatic environmental values.
2. The quality of all surface waters shall allow unrestricted recreational use.
3. Manage municipal and industrial wastewater disposal as part of an integrated system of fresh water supplies to achieve maximum benefit of fresh water resources for present and future beneficial uses and to achieve harmony with the natural environment.
4. Achieve maximum effective use of fresh waters through reclamation and recycling.
5. Continually improve waste treatment systems and processes to assure consistent high quality effluent based on best economically achievable technology.
6. 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 SWRP goals are consistent with those of the Basin Plan, and include specific objectives to: protect surface waters and groundwater basins from contamination and the threat of contamination; capture storm water and dry weather runoff and recycle it for beneficial reuse; improve septic systems, sewer system infrastructure, and wastewater treatment systems to prevent water quality contamination; minimize unintended impacts of projects including erosion and sediment transport; and manage storm water and dry weather runoff so as to protect, preserve, restore, or enhance habitat and open space. Projects and activities included in the SWRP support these (and other) objectives, and are therefore also consistent with Basin Plan goals.

2.2.2 Watershed Management Initiative

Each of the nine Regional Boards in the state is responsible for developing a Watershed Management Initiative (WMI) Chapter as part of the State's five-year Strategic Plan for water resource protection. The WMI for the Central Coast Region outlines water quality priorities, identifies priority watersheds and water quality issues, and describes watershed management strategies.

As part of the WMI planning process, the Regional Board identified nine priority watersheds. Two watersheds within the Greater Monterey County IRWM region are included on that list: the Salinas River watershed and the Elkhorn Slough, with the Salinas River watershed being targeted as a "highest priority watershed." Pollutants of concern in the Salinas River watershed include seawater intrusion, nitrate and minerals in groundwater, nutrients, pesticides, heavy metals, and sedimentation. Water quality problems include over-pumping of groundwater, agricultural activities, urban development and runoff, past mineral mining, and gravel mining. The primary water quality concerns in the Elkhorn Slough watershed include erosion, pesticides, bacteria, and scour.

This SWRP focuses its planning effort in two of the WMI high priority watersheds – the Salinas River and Elkhorn Slough watersheds. By aiming to reduce pollutant loading in surface waters and groundwater

and to enhance watershed processes through storm water and dry weather runoff management practices, the SWRP helps to support WMI goals.

2.3 Consistency with NPDES Permits, WDRs, and Agricultural Conditional Waiver

2.3.1 NPDES Permits and WDRs

As noted above, Clean Water Act sections 303(d) and 303(e) require that approved TMDLs be incorporated into water quality control plans. TMDLs for the Central Coast Region are incorporated into the Central Coast Basin Plan. The Central Coast Regional Board implements the Basin Plan by issuing and enforcing NPDES permits and Waste Discharge Requirements (WDRs). NPDES permits are issued to regulate discharges of waste from point sources to "waters of the United States" including discharges of storm water from urban separate storm sewer systems (MS4s) and certain categories of industrial activity. WDRs are issued to regulate discharges to land, with an aim to protect the beneficial uses of ground and surface water.

Phase I of the US EPA's storm water program was promulgated in 1990 under the Clean Water Act. Phase I relies on NPDES permit coverage to address storm water runoff from: (1) "medium" and "large" MS4s generally serving populations of 100,000 or greater, (2) construction activity disturbing five acres of land or greater, and (3) ten categories of industrial activity. On December 8, 1999, EPA promulgated regulations known as the Storm Water Phase II Final Rule. The Phase II program expanded the Phase I program to include all municipalities within designated urbanized areas, as well as designated small municipalities outside of urbanized areas (generally those with a population of at least 10,000 and/or a population density of at least 1,000 persons per square mile), and operators of small construction sites that disturb between 1-5 acres.

The City of Salinas is the only Phase I MS4 in the Central Coast Region and is covered by an individual NPDES Phase I permit (Order No. R3-2012-0005, NPDES Permit No. CA0049981). Four municipalities in the SWRP planning area – Marina, Soledad, Gonzales, and King City – plus Monterey County are enrolled under the Phase II Small MS4 General Permit (Order No. 2013-0001-DWQ, NPDES Permit No. CAS000004). Figure 2.4 shows the boundaries of NPDES regulated entities in the planning area. The City of Greenfield is exempt from MS4 requirements. Other permits that apply within the watershed boundaries are the NPDES Construction and Industrial General Permits, and Caltrans Municipal MS4 Permit, administered by the State Water Board.

The City of Salinas's NPDES Phase I permit was renewed in May 2012, with requirements for increased emphasis on identifying and protecting watershed processes. The City's Storm Water Management Plan Update (SWMPU, 2013) reflects this new watershed-based approach. Storm water runoff in the city of Salinas is generated from various land uses, including urban and agricultural uses, and discharges into the Salinas Reclamation Ditch and the Salinas River. The City's NPDES permit requires the City to reduce the storm water of pollutant discharges to the maximum extent practicable (MEP) and protect water quality and beneficial uses. The Order also contains: effectiveness assessment measures, including water quality monitoring, detailed best management practices (BMP) assessment requirements, and water quality action levels, designed to provide information about the effectiveness of efforts to reduce pollutant discharges and protect water quality and beneficial uses (RWQCB 2012a and 2012b).

The Phase II NPDES Program is 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. The County of Monterey, with the Monterey Peninsula cities of Carmel by the Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside, is a participating member of the Monterey Regional Storm Water Management Program (MRSWMP). The MRSWMP covers the unincorporated areas of Monterey County that have been designated by the U.S. Census Bureau as being "Urbanized Areas" and that are within the County's legal jurisdictional boundary. The purpose of the MRSWMP is to implement and enforce a series of BMPs designed to reduce the discharge of pollutants from the MS4s to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act. Participating members collaborate on projects and other permit-related activities to satisfy a number of their individual Phase II Small MS4 General Permit requirements, including public education and public participation, such as volunteer monitoring.

There are currently 101 WDR permits within the IRWM region, including general permits for Fertilizer and Pesticides, Fruit and Vegetable Processing, Wineries, Small Domestic Wastewater Systems, and Land Discharge. According to the California Code of Regulations, Title 27 section 20090, there are nine categories of discharges that are regulated by the WDR Program: sewage, wastewater, underground injection, Regional Water Board cleanup actions, gas condensate, soil amendments, drilling waste, reuse, and waste treatment in fully enclosed units.

Table 2.4 summarizes the number of permits issued within the Greater Monterey County IRWM planning area under NPDES Phase I and Phase II, Construction, Industrial, and Caltrans General Permits, and WDRs.

Table 2.4 NPDES Permits and WDRs Issued by the Central Coast Regional Board in the Greater Monterey County IRWM Region

Type of Permit	Total Issued
NPDES Phase I	1
NPDES Phase II Small MS4 General Permit	5
Industrial Storm Water General Permit	133
Construction Storm Water General Permit	82
Caltrans Storm Water General Permit	12
WDRs	101

Source: State Water Board California Integrated Water Quality System (CIWQS) Project. Accessed on July 10, 2018 from: https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet

SWRP projects and activities are consistent with, and support, NPDES permits and WDRs. The SWRP planning team has worked closely with County and municipal staffs to ensure that the SWRP reflects their storm water management program objectives and that it addresses, to the extent possible, their WDR and NPDES permit requirements.

2.3.2 New Development and Redevelopment

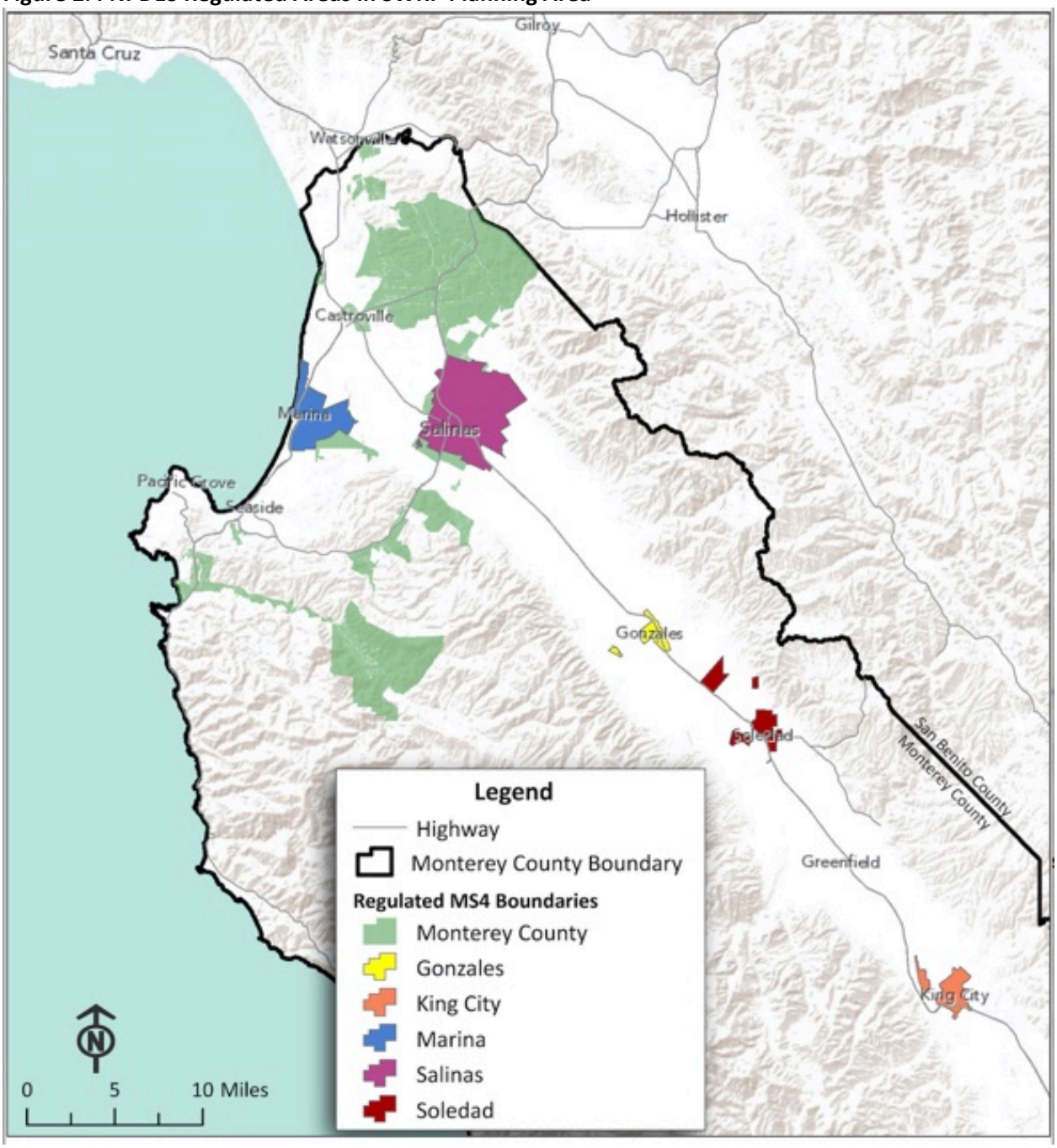
While this SWRP does not contain any new development or redevelopment projects, such projects submitted to the SWRP in the future will be required to be consistent with NPDES permits and WDRs. The County of Monterey and the City of Salinas promulgate storm water ordinances and regulations for

new development and redevelopment, and provide best management practice guidance, to ensure consistency with their respective NPDES permits.

Chapter 16.14 Urban Stormwater Quality Management and Discharge of the Monterey County Code is intended to control the entry of urban pollutants into storm water runoff, to reduce the presence of pollutants in storm water to the maximum extent practicable, and effectively prohibit non-storm water discharges into the County storm drain system. Monterey County Code also contains Chapter 16.08 Grading and Chapter 16.12 Erosion Control. The County provides additional resources to contractors and property owners, including the Construction Best Management Practices Handbook (July 2015) developed by the Monterey Regional Stormwater Management Program (MRSWMP). The handbook provides technical guidance for both temporary and permanent erosion prevention, sediment control, and management of other activities that can cause pollution during construction.

New development and redevelopment projects in the City of Salinas are required to comply with the City's Stormwater Standard Plans, which are intended to be used in conjunction with the Stormwater Development Standards and the Standard Specifications, Design Standards, and Standard Plans (2008, updated March 2017). The purpose of the Stormwater Development Standards is to assist project applicants for new and redevelopment projects in complying with storm water management requirements set forth by both the City of Salinas and the Central Coast Regional Water Quality Control Board. New and redeveloped projects are required to implement Low Impact Development (LID) principles. The Stormwater Development Standards document contains both storm water design requirements and LID design guidance. The City also provides numerous resources on its website for storm water best management practices (https://www.cityofsalinas.org/our-city-services/public-works/water-waste-energy/stormwater-program/stormwater-regulations).

Figure 2.4 NPDES Regulated Areas in SWRP Planning Area



2.3.3 Central Coast Irrigated Lands Agricultural Order

The Storm Water Resource Plan Guidelines require that SWRPs also show how they are consistent with conditional waivers issued by the State and/or Regional Water Boards. On March 8, 2017, the Central Coast Regional Board issued the Central Coast's third "Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands" (Order R3-2017-0002). The new Agricultural Order is

the third order adopted in the Central Coast Region, and is therefore referred to as Ag Order 3.0. Ag Order 3.0 is a three-year order that must be replaced by March 7, 2020.

The Ag Order regulates discharges of waste from irrigated lands to ensure that such discharges do not cause or contribute to the exceedance of any regional, State, or federal numeric or narrative water quality standard in waters of the State and of the United States. Ag Order 3.0 prioritizes conditions to control nitrate loading to groundwater and impacts to public water systems (RWQCB 2017, p. 3).

The Ag Order mandates all growers within the Regional Board's jurisdiction who discharge runoff from irrigated agricultural lands to comply with the conditions of the Order. Dischargers are required to implement, and where appropriate update or improve, management practices, which may include local or regional control or treatment practices and changes in farming practices to effectively control discharges, meet water quality standards, and achieve compliance with the Order. Dischargers must also comply with other conditions of the Ag Order, including monitoring and reporting requirements. For farms that pose the greatest risk to water quality, growers are required to develop certified Irrigation and Nutrient Management Plans, Water Quality Buffer Plans if they are adjacent to the most critical creeks, and to monitor their individual discharge.

Ag Order 3.0 includes a groundwater monitoring requirement. Growers must sample: 1) the primary irrigation well located on each ranch, and 2) all domestic wells located on the assessor parcel numbers where the ranch is located. Ag Order 3.0 also expands the Total Nitrogen Applied reporting requirement to include all Tier 2 and Tier 3 ranches that grow any crop with a high potential of loading nitrogen to groundwater.

This SWRP is consistent with the overarching goal of the Ag Order, which is to protect the quality of surface water and groundwater basins from degradation due to the discharge of waste from irrigated lands. The following SWRP objectives directly support Ag Order goals:

- Reduce the quantity and improve the quantity of urban and agricultural runoff that would otherwise enter state waters untreated.
- Promote source control of pollutants.
- Protect surface waters and groundwater basins from contamination and the threat of contamination.

While Ag Order requirements focus primarily on source control, projects in this SWRP focus on capturing, cleaning, and reusing storm water runoff flowing from irrigated lands; the end goal, nonetheless, is the same. Note that this SWRP has been incorporated into the Greater Monterey County IRWM Plan and is being implemented by the Greater Monterey County Regional Water Management Group, which acted as the Technical Advisory Committee for this SWRP, in coordination with the IRWM Plan. Several projects in the IRWM Plan directly address source control for both pollution and dry weather runoff. These include:

Ecology Action – Monterey Bay Friendly Landscaping (MBFL): This project supports Monterey Bay-area landscape contractors, public agencies, and water utilities in retrofitting existing landscapes to comply with state and local water efficient landscape ordinances and storm water post-construction requirements. The goals of the MBFL program are to reduce landscape irrigation demand from local water supplies, reduce storm water run-off and non-point source pollution, and create green urban environments resilient to drought and climate change. MBFL maintenance standards require the

application of mulch, integrated pest management and prevent application of petroleum-based, high nitrogen fertilizers to reduce sediment, pesticides and nutrients in storm water run-off.

Resource Conservation District of Monterey County – Monterey County Farm Nutrient Management and Water Quality Assistance Program: This project provides comprehensive bilingual on-farm erosion, irrigation and nutrient management assistance for Monterey County farmers. The service 1) evaluates erosion potential, irrigation system and application efficiency, and nutrient budgeting; 2) develops recommendations as needed for field configuration, soil stabilization, and refined water and nutrient applications; and 3) assists growers' voluntary implementation of those recommendations to help reduce excess soil, water and nutrient movement off area farms while optimizing farm productivity.

Resource Conservation District of Monterey County – Livestock and Land: Rangeland and Livestock Facility Water Quality, Vegetation Management and Wildlife Enhancement Program: The purpose of this program is to achieve immediate and lasting reductions in nutrient, sediment and pathogen pollution to surface and ground waters and enhance wildlife habitat through implementation of best management practices on livestock facilities and rangelands in the Greater Monterey County IRWM region. The program utilizes an incentives-based approach to achieve the cultural change needed for livestock facilities to voluntarily adopt management measures that improve the healthy functioning of watersheds. Projects are implemented in high priority areas identified by TMDLs and other regional and local plans.

Resource Conservation District of Monterey County – Rural Roads Erosion Assistance Program for Monterey County: Roads have been identified in the Monterey Bay National Marine Sanctuary's *Action Plan IV: Agriculture and Rural Lands* as a significant source of sediment input into storm drains, streams, and rivers draining to the Monterey Bay. This project provides education and training on rural roads drainage techniques, on-site technical assistance, and funding for road erosion assessments, project design and permitting, and road drainage project implementation.

2.4 Other Efforts to Address Water Quality Issues

In addition to the regulatory approaches being taken to address water quality issues, described above, there are numerous non-regulatory efforts currently underway. A few key efforts are described below.

Castroville Seawater Intrusion Project and Salinas Valley Water Project: The Monterey County Water Resources Agency (MCWRA) has undertaken two major efforts to combat seawater intrusion in coastal groundwater basins. The Castroville Seawater Intrusion Project (CSIP), aimed at providing recycled water to agricultural growers within the seawater intrusion front area, was constructed in the mid-1990s. Wastewater from the Monterey Peninsula, Salinas, Marina, Moss Landing and the Ord Community is conveyed to the Monterey County Water Recycling Plant for processing by Monterey One Water. The plant has the capacity to generate approximately 21,600 AFY of recycled water. Tertiary treated recycled water is delivered directly to the Castroville area for agricultural irrigation during the irrigation season. Since 1998, recycled water deliveries from CSIP have ranged from approximately 7,500-14,000 AFY, providing reclaimed wastewater to approximately 12,000 acres of agricultural land near Castroville. A number of projects in this SWRP are designed to integrate with the CSIP to enhance the quantity of water available for recycling. These SWRP projects include:

- Blanco Drain Treatment Wetland Areas
- Salinas Water Quality and Agricultural Reuse Efficiency Project

- Salinas Area Flood Enhancements and Reuse Project

In addition, the Salinas Valley Water Project, also constructed by MCWRA and completed in 2010, transfers water from MCWRA's reservoirs in the southern part of Salinas Valley to the northern (seawater-intruded) portion of the groundwater basin. An average of 9,700 AFY of Salinas River is diverted and delivered to the CSIP system, reducing groundwater pumping by the same amount.

Monterey Bay Sanctuary's Water Quality Protection Program: The Monterey Bay National Marine Sanctuary is vulnerable to pollution from the watersheds that drain into it, including (and especially) the Salinas River watershed. In 1992, a Memorandum of Agreement was signed (and updated in 2015) by eight federal, state and local agencies agreeing to work together to develop a Water Quality Protection Program (WQPP) for the Sanctuary. The WQPP Committee has produced seven Action Plans to address watershed pollution (including *Urban Runoff*; *Agriculture and Rural Land*; and *Regional Monitoring*), and is actively working with stakeholders throughout the Greater Monterey County region to implement the plan strategies. The following projects in this SWRP are designed to restore wetland habitat and improve water quality in tributary watersheds to the Sanctuary:

- Elkhorn Slough Ridgeline to Tideline
- Blanco Drain Treatment Wetland
- Espinosa Lake Flood Retention
- Old Salinas River Treatment Wetland
- Davis Road Bridge Replacement
- Castroville and Moss Landing Storm Water
- Acosta Plaza LID
- Lincoln Street LID
- Moss Landing South Harbor Water Quality
- Salinas to the Sea
- Gabilan Floodplain
- Carr Lake
- Monterey One Water Ocean Outfall

Pure Water Monterey: Pure Water Monterey is a regional effort, led by Monterey One Water, to provide a sustainable source of water through advanced treatment and injection of approximately 3.5 MGD of water into the Seaside groundwater basin. The project aims to provide both purified potable water for domestic use and water for irrigation in the Salinas Valley. The project will utilize not just wastewater, but storm water, food industry processing water, and impaired surface waters. The three SWRP projects listed above as part of the CSIP program can also be directed to the Seaside groundwater basin.

Programs Addressing Contaminated Drinking Water: Several programs are underway to ensure safe drinking water for communities that suffer from a contaminated groundwater supply.

In 2015, the Greater Monterey County RWMG received grant funds from the State Water Board to develop an "Integrated Drinking Water and Wastewater Plan for Disadvantaged Communities in the Salinas Valley." The plan, completed in December 2017, identifies and recommends solutions for disadvantaged communities that suffer from nitrate-contaminated drinking water. In 2018 the RWMG received State grant funds (through Proposition 1 IRWM Disadvantaged Community Involvement Grant Program) to continue its efforts toward implementing drinking water solutions for small disadvantaged communities in unincorporated areas of the county.

In March 2017, the State Water Board and Central Coast Regional Board signed an agreement – referred to as the Interim Replacement Water Settlement Agreement – with a coalition of Salinas Valley growers, landowners, and shippers that temporarily exempts members of the coalition from certain enforcement actions in exchange for providing replacement drinking water to residents with nitrate-contaminated drinking water wells within areas of the Salinas Valley. The Salinas Basin Agricultural Stewardship Group has agreed to supply bottled water for up to two years to customers of qualifying LPA water systems, small water systems, and private domestic wells.

In 2018, the Central Coast Regional Board initiated a private well water quality testing program in Monterey County. The program focuses on private individual household and local/state small drinking water systems, and is a free and voluntary program that provides testing for nitrate, arsenic, chromium-6, 1,2,3-trichloropropane, perchlorate and general minerals. Priorities of the program are: 1) to provide information to well owners about the safety of their drinking water; 2) to improve the Regional Board's understanding of water quality with respect to beneficial uses in the region.

CHAPTER 3. Watershed Identification

This chapter:

- identifies the watershed boundaries for the SWRP planning area and describes why those boundaries are appropriate for SWRP planning;
- identifies natural watershed processes and discusses how those processes have been disrupted by land use activities;
- describes internal boundaries;
- identifies water suppliers in the region and an estimation of the volume of water provided;
- describes groundwater and surface water resources, including water quality priorities; and
- identifies native habitats, land use, and open space areas.

3.1 Watershed Boundaries

3.1.1 Identification of Watershed Boundaries

The boundaries of the Greater Monterey County SWRP planning area encompass the entirety of the Greater Monterey County IRWM region, plus the portion of the Pajaro River Watershed IRWM region that lies within Monterey County. A decision was made to include the Pajaro River watershed area because storm water projects were proposed for that area but there was no SWRP coverage.

The Greater Monterey County IRWM region is about 3,199 square miles (about 2 million acres) and includes the following major watersheds or portions thereof (with Calwater 2.2.1 HUC8 identification numbers):

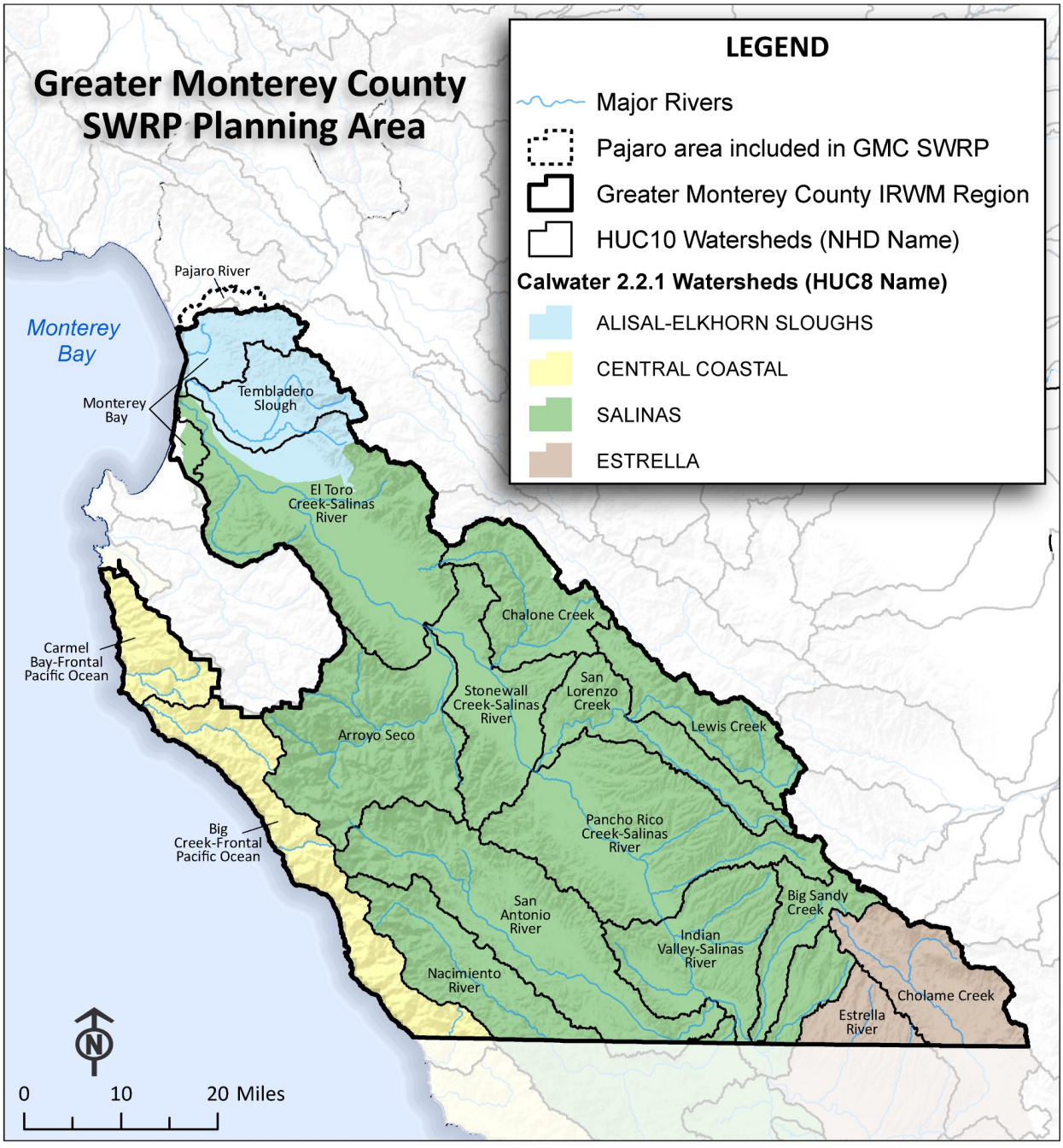
- Salinas watershed, HUC 18060005, encompassing 2,439 square miles
- Alisal-Elkhorn Sloughs watershed, HUC 18060011, totaling 237 square miles; this watershed includes Santa Rita, Gabilan, Natividad, and Alisal Creeks
- Central Coastal watershed, HUC 18060006, encompassing 297 square miles, comprised of the numerous coastal watersheds along the Big Sur coast
- A small portion of the Estrella River, USGS HUC 18060004, encompassing 221 square miles

The SWRP boundaries also include the portion of the Pajaaro River watershed that lies within Monterey County:

- Pajaro River watershed, HUC 18060002, encompassing 17.35 square miles

For the purposes of storm water planning, this SWRP focuses specifically on the Salinas, Alisal-Elkhorn Sloughs, and Pajaro River watersheds. The coastal watersheds of Big Sur were not targeted as a focus of this SWRP planning effort because of the limited opportunities for projects in that sparsely populated, mountainous coastal region. Any storm water projects proposed for the Big Sur region, however, would be eligible for inclusion in this plan. Figure 3.1 illustrates the watersheds and sub-watersheds included in the Greater Monterey County SWRP planning area.

Figure 3.1 Watersheds and Sub-watersheds of the Greater Monterey County SWRP



3.1.2 Why the Watersheds are Considered Appropriate for Storm Water Management

Given the broad geographic scope of the IRWM region, the active participation of water resource agencies, nonprofit organizations, disadvantaged communities, and other organizations on the Regional Water Management Group (RWMG), and a well-established process for stakeholder outreach, the Greater Monterey County IRWM region was deemed an appropriate planning area for development of a SWRP. The RWMG's interest in developing a SWRP is not only to identify storm water capture

opportunities to increase the region's water supply, but to do so within a watershed-based framework to achieve the multiple benefits of water supply, water quality, flood control, environmental, and community benefits – thereby addressing the goals and objectives of the IRWM Plan. The watersheds targeted for SWRP planning – namely, the Salinas, Alisal-Elkhorn Sloughs, and Pajaro River watersheds – are large geographic areas that offer numerous opportunities for storm water capture, reuse, recharge, and treatment to achieve these multiple benefits.

3.1.3 Relationship of this SWRP to Other SWRPs

Two other SWRPs have been developed in Monterey County: the Greater Salinas Area SWRP (February 2017), and the Monterey Peninsula Region SWRP (December 20, 2018).

Greater Salinas Area SWRP: Prior to the development of this SWRP, a SWRP was produced for a sub-watershed area located within the geographic boundaries of the Greater Monterey County IRWM region. The Greater Salinas Area SWRP was developed with Proposition 1 Storm Water Planning Grant funds by Kennedy/Jenks Consultants on behalf of Monterey One Water and the City of Salinas. Monterey One Water and the City of Salinas are both members of the RWMG as well as partners in Monterey One Water's regional water program, Pure Water Monterey. Pure Water Monterey will use storm water as one of the water resources to address water supply and associated seawater intrusion issues in a critically overdrafted aquifer, the Seaside Area sub-basin of the Salinas Valley Groundwater Basin. The Greater Salinas Area SWRP was developed with the express purpose of using storm water to help address seawater intrusion in the Salinas sub-watersheds and downstream.

The planning area for the Greater Salinas Area SWRP includes the Gabilan sub-watershed, the majority of which lies in the City of Salinas limits, as well as portions of the lower Salinas watershed downstream of the City of Salinas (Figure 3.2). The total coverage area is about 237 square miles (151,000 acres).

Development of the Greater Salinas Area SWRP was based largely on the 2013 Greater Monterey County IRWM Plan, utilizing the IRWM Plan goals and objectives to define the storm water management strategies in order to meet SWRP objectives, and largely pulling storm water projects from the IRWM Plan for its project list. The Greater Salinas SWRP planning process was also conducted in the context of the ongoing Greater Monterey County IRWM program. The Greater Monterey County RWMG provided input into the Greater Salinas SWRP at every major milestone, and upon its completion, the SWRP was submitted to the RWMG in accordance with the Water Code provisions (section 10562, subd. (b)(7)). The SWRP was incorporated into the IRWM Plan as Appendix O, by vote of the RWMG at a regularly scheduled RWMG meeting that was open to the public, on February 15, 2017.

Many aspects of the Greater Salinas Area SWRP have been incorporated into this SWRP. While the Greater Salinas Plan was used as a general foundation for this Plan, the planning area for the Greater Monterey County SWRP has been significantly expanded to include the Alisal-Elkhorn Sloughs watershed and the entire portion of the Salinas watershed within the Greater Monterey County IRWM limits. An entirely new project list was created for the Greater Monterey County SWRP, including opportunities for new projects based on the results of watershed modeling and analysis. While overlap exists between the Greater Monterey County and Greater Salinas Area SWRPs, they are independent, stand-alone plans. The Greater Salinas Area SWRP can be found at the following link: https://www.cityofsalinas.org/sites/default/files/final_swrp_mrwpca-salinas_feb2017_signed_checklist.pdf

Monterey Peninsula SWRP: A SWRP was also developed for the Monterey Peninsula, Carmel Bay, and South Monterey Bay IRWM region. The Monterey Peninsula Region SWRP boundary coincides with that of the Monterey Peninsula IRWM region, and includes the Carmel River Basin watershed, most of the Canyon Del Rey/Frontal Monterey Bay watershed, a small portion of Big Sur/Frontal Pacific Ocean watershed, and a small portion of El Toro Creek/Salinas River watershed. The Monterey Peninsula Region SWRP was completed and submitted to the Monterey Peninsula, Carmel Bay, and South Monterey Bay RWMG on November 1, 2018 for incorporation into that region's IRWM Plan.

Figure 3.2 Greater Salinas Area SWRP Planning Area Boundaries

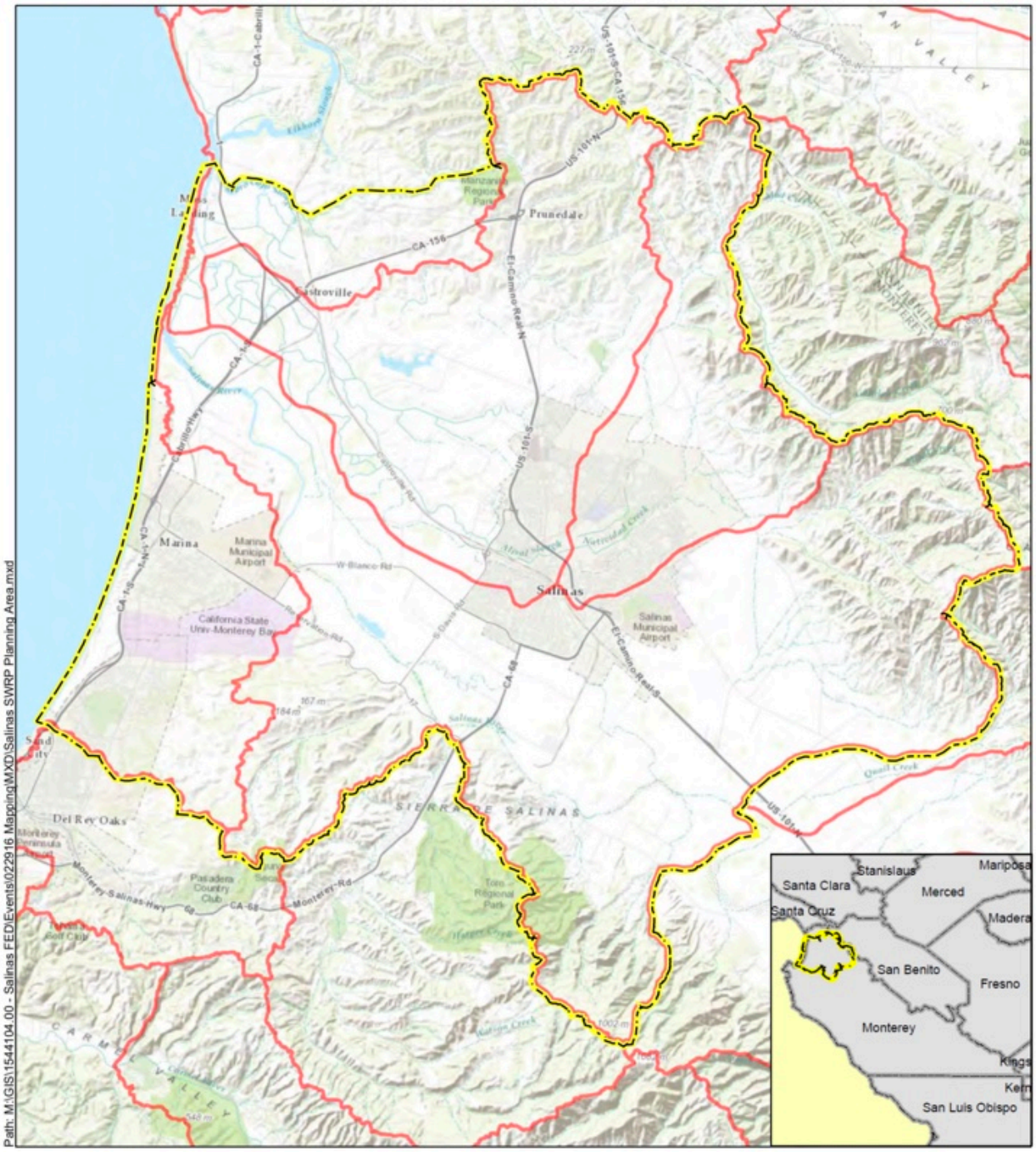
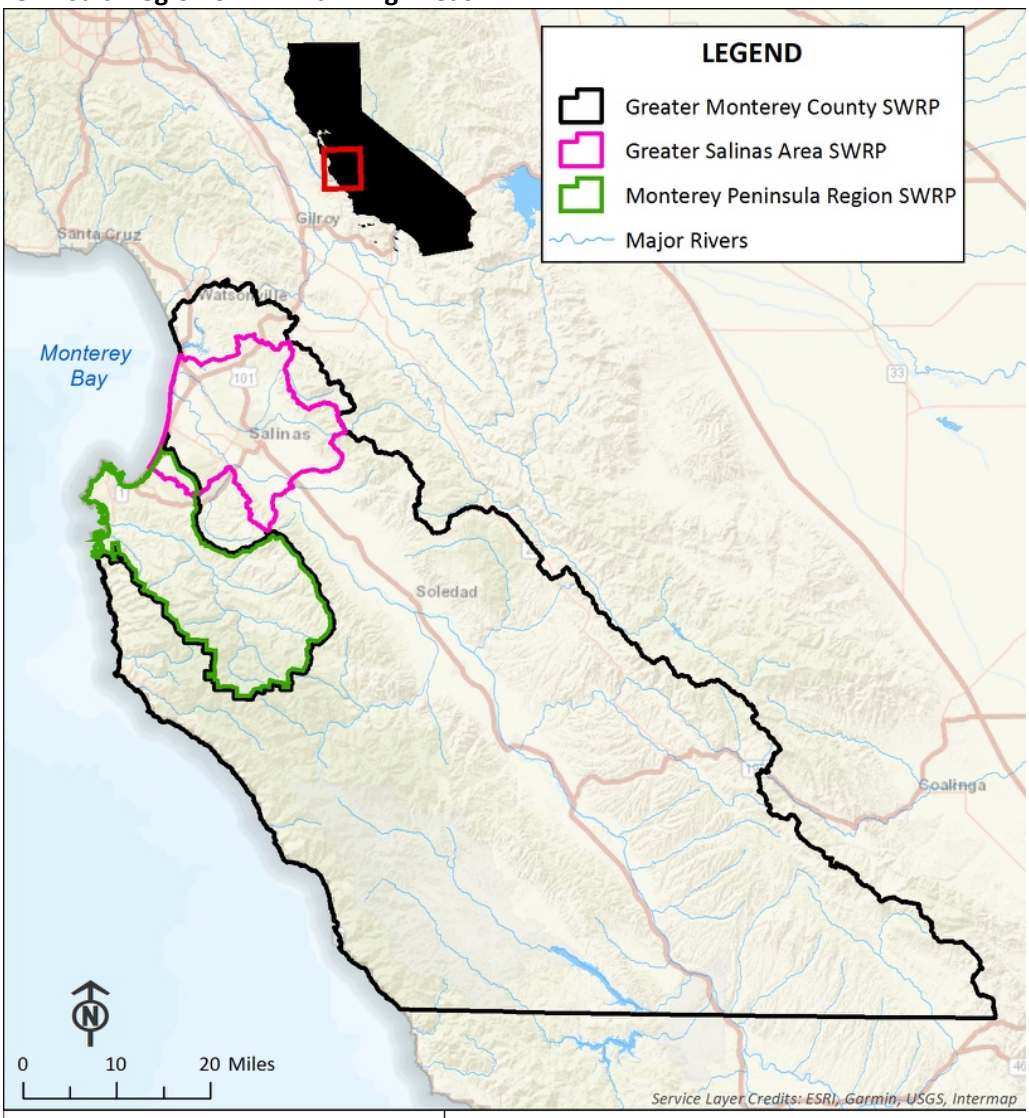


Figure 3.3 shows the boundaries of the Greater Monterey County SWRP planning region in relation to the Greater Salinas Area SWRP and the Monterey Peninsula IRWM/SWRP planning areas. It should be noted that the Greater Monterey County and the Monterey Peninsula, Carmel Bay, and South Monterey Bay IRWM RWMGs considered developing a single SWRP that would cover both IRWM regions. However, given the different watershed systems, different and independent water supply sources, and differing water resource issues within each of the regions, the RWMGs opted to develop separate SWRPs (i.e., for all the same reasons it made sense to create separate IRWM regions). The RWMGs are committed to coordinating the two SWRPs in areas of overlapping interests, including a storm water diversion and groundwater recharge project (called "Pure Water Monterey") that would span both regions.

Figure 3.3 Greater Monterey County SWRP in Context with Greater Salinas Area SWRP and Monterey Peninsula Region SWRP Planning Areas



3.2 Watershed Processes

3.2.1 Watershed Processes: Studies Conducted

A watershed is defined by natural topographic boundaries and might encompass complex natural ecosystems, highly urbanized landscapes, or elements of both. Watershed processes can be broken down into specific functions and characteristics, including: soil processes and erosion, nutrient cycling, pollution transport, riparian habitat and stream buffers, stream morphology and channel characteristics, hydrology, and water quality. Numerous studies have been conducted over the years to understand and quantify these watershed processes in the Greater Monterey County SWRP area, particularly as they impact water supply. Studies include, among others:

- Reclamation Ditch Watershed Assessment and Management Strategy (2005, prepared by Central Coast Watershed Studies, Watershed Institute, California State University Monterey Bay, for MCWRA)
- Salinas River Watershed Area Salt Modeling (2015, prepared by Tetra Tech for the Central Coast Regional Water Quality Control Board and US EPA Region IX)
- Salinas Valley Watershed Model and Integrated Hydrologic Model (USGS and MCWRA)
- Salinas and Carmel Rivers Basin Study (2017, US Bureau of Reclamation)
- Northern Salinas Valley Watershed Restoration Plan: Final Report of AMBAG's Water Quality Planning Project Entitled "Nonpoint Source Pollution in Coastal Harbors & Sloughs of the Monterey Bay Region: Problem Assessment & Best Management Practices. (1997) 296 pp.
- California Integrated Assessment of Watershed Health (November 2013), EPA 841-R-14-003; prepared by The Cadmus Group, Inc. for U.S. Environmental Protection Agency

The dynamics between watershed processes in the Greater Monterey County SWRP area are complex, and are best understood by consulting original studies such as these. This chapter, along with Chapter 2, generally describes some of these watershed characteristics and functions, including hydrology, land use, and water quality.

3.2.2 How Natural Watershed Processes have been Disrupted

Watersheds do not commonly follow corporate or municipal/county boundaries. Water that falls in one jurisdiction may flow through several more jurisdictions and numerous environmental systems before it reaches its final destination. Water that begins its journey in the relatively undisturbed Gabilan or Santa Lucia Mountains, for example, intermingles with runoff from farmlands, cities, and other developed areas before entering the Salinas River or Reclamation Ditch, ultimately draining to the Monterey Bay. On its journey, water flows through several different land use areas and often through several different jurisdictions. This hydrologic connection between upstream and downstream stakeholders is the main reason to address storm water and dry weather runoff management through a regional evaluation of projects submitted under this SWRP.

The upland areas of the Greater Monterey County region consist of annual grasslands and woodlands frequently used for grazing or as public open space. These areas are largely undeveloped, though grazing, logging and poorly designed dirt roads contribute to enhanced erosion. Lowland areas are largely agricultural, urban or rural residential, and here the natural watershed processes have been significantly disrupted. Roadways, parking lots, sidewalks, rooftops, and other impervious surfaces

inhibit the natural infiltration of rainwater, which leads to increased storm water runoff. The average annual storm water flow from the City of Salinas, for example, is estimated to be 4,938 AFY (TELR 2018). Increased storm water runoff leads to higher peak flows that cause increased flooding downstream. This has promoted stream channel modifications to control the floodwaters. Precipitation runoff, particularly in the early wet season, can mobilize and transport pollutants such as heavy metals, pesticides, hydrocarbons, pathogens and sediment into streams. These pollutants impact the health of receiving streams as well as the coastal waters into which these streams flow. Chapter 2 describes the water quality issues of particular concern in the Greater Monterey County region. Surface water impairments described in that chapter and listed in Table 2.2 (California 303(d) List) are primarily caused by agricultural and urban runoff.

Human activity has also introduced non-native vegetation. Invasive species affect terrestrial, freshwater, estuarine, and marine systems throughout the region and pose a major challenge to private landowners, farmers, ranchers, and resource managers. The non-native plant *Arundo donax* is especially problematic in the Greater Monterey County region. *Arundo donax* is an aggressive perennial grass that has overtaken approximately 2,500 acres of the Salinas River, forming enormous monocultures with virtually no food or habitat value for native wildlife. *Arundo* is a "thirsty" plant that outcompetes native species, interferes with flood control efforts, is extremely flammable increasing the likelihood and intensity of fires, forms thick mats, and prevents the natural supply of sediment from reaching receiving waters.[1] The *Arundo* infestation in the Salinas River represents the second-largest invasion in California of this nonnative invasive species.

The alteration of watershed processes in the planning region has also led to a substantial decline in fisheries. Critical habitat has been designated for South-Central California Coast steelhead along the entire Big Sur coast and within the Salinas River basin, which includes the Salinas River, the Salinas River Lagoon, Gabilan Creek, Arroyo Seco River, Nacimiento River, the San Antonio River, and their tributaries. The National Marine Fisheries Service has identified seven principal threats that have contributed to the destruction, modification, or curtailment of the habitat or range of the South-Central California Coast steelhead. These include:

1. alteration of natural stream flow patterns;
2. physical impediments to fish passage;
3. alteration of floodplains and channels, including the degradation or elimination of riparian areas;
4. sedimentation;
5. urban and rural waste discharges;
6. spread and propagation of exotic species (including *Arundo donax* and *Tamarix*); and
7. loss of estuarine habitat.

Erosion is another widespread problem in Monterey County, due in part to the erosive nature of local soils as well as from land use practices. These land use practices include farming on steep slopes, unmaintained or improperly designed dirt roads, altered water channels that increase water velocities and alter the natural sediment balance, and areas that have been denuded of vegetation by fire, overgrazing, or clearing. Erosion from roads, agriculture, and unstable stream banks may carry pollutants and can be detrimental to aquatic habitat and organisms.

[1] US Fish and Wildlife Service 2017.

Many of the important biological resources and natural watershed processes in the planning region may become increasingly vulnerable over time due to impacts of climate change. Climate change is expected to put a number of stressors on ecosystems, with potentially catastrophic effects on biodiversity. In 2018, the Greater Monterey County RWMG, led by the Central Coast Wetlands Group and a Climate Task Force comprised of regional scientists, water managers, and coastal policy professionals, conducted an analysis to assess priority climate change vulnerabilities and impacts to the region. Highest priority climate change impacts that are most relevant to regional storm water planning are shown in Table 3.1.

Table 3.1 Priority Climate Change Vulnerabilities and Impacts

Priority Level	Climate Change Consequences
Water Supply	
Extreme	Agricultural water use is expected to increase to offset higher temperatures and evapotranspiration
Extreme	Local rainfall changes are estimated to be reduced by 3-10 inches
Extreme	Sea level rise and higher groundwater extraction will lead to increased rates of saltwater intrusion
Extreme	Droughts will be more frequent and severe
High	Rangelands are expected to be drier
High	Domestic landscaping water needs will be higher
Water Quality	
Extreme	Sea level rise will impact current estuary brackish water interface towards more marine systems
High	Lower seasonal surface flows can lead to higher pollutant concentrations
High	Changes in storm intensity will increase sediment loading in many systems
Flooding	
Extreme	Coastal levees and control structures will be undersized to manage the combined influences of higher flow events and sea level rise
High	Regional levees will provide less protection during higher storm flow events
High	Natural creeks throughout the region and managed conveyance within the Salinas Valley will see higher flow rates leading to increased erosion and flooding
Ecosystem Vulnerabilities	
Extreme	Sea level rise will impact current estuary brackish water interface towards more marine systems
Extreme	Coastal wetland systems are especially vulnerable to the combined influences of climate change
High	Migration patterns and species distribution will change
High	Some locally unique species such as coastal redwoods and giant kelp are susceptible to changes in certain locally favorable climate variables (fog duration, coastal upwelling)

The following sections of this chapter describe the internal boundaries of the SWRP planning region, land use, native habitats, parks and open space areas, surface and groundwater resources, and water quality priorities.

3.3 Internal Boundaries

3.3.1 Municipalities, Communities, and Military Areas

The Greater Monterey County SWRP planning region includes six incorporated cities, which comprise 69 percent of the region's population (and 56 percent of the county population as a whole). These cities include: Salinas, Soledad, Marina, Greenfield, King City, and Gonzales. Also included within the region are several unincorporated communities, including: Prunedale (the largest community with a population of 19,628), Castroville (population 6,978), and the significantly smaller communities of Moss Landing,

Las Lomas, Spreckels, Chualar, San Lucas, San Ardo, Lockwood, and Bradley. Population for the cities and communities of the region are shown in Table 3.2 below (American Community Survey 2012-2016 five-year estimates).

Table 3.2 Estimated Population for Cities/Communities in Region

Community	Population
Big Sur CCD	1,710
Boronda CDP	1,381
Bradley CDP	134
Castroville CDP	6,978
Chualar CDP	1,238
Elkhorn CDP	1,091
Gonzales city	8,401
Greenfield city	16,994
King City city	13,532
Las Lomas CDP	3,047
Lockwood CDP	443
Marina city	20,816
Moss Landing CDP	118
Pine Canyon CDP	1,799
Prunedale CDP	19,628
Salinas city	155,889
San Ardo CDP	821
San Lucas CDP	362
Soledad city	25,616
Spreckels CDP	745
Toro Park CCD	10,680
Monterey County	*430,201*

Source: 2016 American Community Survey (ACS) of the US Census, five-year estimates (2012 – 2016). "CCD" = "Census County Division." "CDP" = "Census-designated Place." Population estimates for Big Sur CCD and Toro Park CCD are from 2010 US Census (these CCDs were not included in 2016 ACS).

Military areas in the region include Fort Hunter Liggett, a United States Army Reserve command post encompassing 165,000 acres on the eastern side of the Santa Lucia Mountains, and Camp Roberts, a National Guard training base located in southern Monterey County and northern San Luis Obispo County, encompassing approximately 17,000 acres within Monterey County. Figure 3.4 illustrates political boundaries within the Greater Monterey County IRWM region.

3.3.2 Service Areas of Land Use Agencies

Land use agencies in the region include the six incorporated cities noted above, plus the County of Monterey, which is responsible for land use planning in the unincorporated areas of the county. In addition, the U.S. Forest Service makes land use decisions for the federal lands within the Los Padres National Forest, the Bureau of Land Management (BLM) is responsible for land use decisions on its land holdings (including lands in South Monterey County and about 15,000 acres of property on the former Fort Ord), and California State Parks is responsible for land use planning in its six State Park units within the region. The U.S. Army is responsible for land use planning on Fort Hunter Liggett, Camp Roberts, and its residential holdings on the former Fort Ord. Various other federal and state agencies hold small properties throughout the County, which are outside local land use authority.

In addition, as stipulated in the Coastal Act, the California Coastal Commission (CCC) has authority to certify land use policy in the coastal zone. CCC retains land use authority in areas of original jurisdiction and for all work below the mean high tide level, and has limited appeal authority over coastal permit applications in certain circumstances. Pursuant to the California Coastal Act, Monterey County amended its General Plan in the 1980s to adopt a Local Coastal Program (LCP) made up of land use plans (policy) and coastal implementation plans (regulatory) that govern land use within the coastal zone.

Figure 3.4 Counties, Cities, Census Designated Places, and Military Areas

3.3.3 Boundaries of Water and Wastewater Agencies

Water Management Agencies and Districts

The Monterey County Water Resources Agency (MCWRA), formed in 1947, is the primary water management agency for Monterey County. A small portion of the Greater Monterey County IRWM region – in the northeastern part of the region where the Salinas River watershed falls within San Benito County – lies within the jurisdictional boundaries of the San Benito County Water District (SBCWD). In addition, a small portion of the SWRP planning area lies within the jurisdictional boundaries of the Pajaro Valley Water Management Agency (PVWMA). Figure 3.5 illustrates the jurisdictional boundaries of MCWRA, SBCWD, and PVWMA, along with boundaries for water purveyors (described in Section 3.3.4 below) in the Greater Monterey County SWRP planning region.

Wastewater Treatment Agencies

Wastewater is managed by various entities in the SWRP planning area. In the northern part of Monterey County, the primary wastewater agency is Monterey One Water (formerly, Monterey Regional Water Pollution Control Agency). Monterey One Water currently serves a population of approximately 250,000 people and treats 18.5 million gallons each day. The Regional Treatment Plant is located two miles north of the City of Marina. The plant has the capacity to generate approximately 21,600 AFY of recycled water. Of that amount, 13,300 AFY of tertiary treated recycled water is delivered by the MCWRA to farmers in the Castroville region for irrigation during the irrigation season, and plans are currently underway to construct advanced water purification facilities to allow for groundwater injection as well as seasonal storage facilities that would enable the remaining 8,300 AFY of available capacity to be generated during the non-irrigation season.

For other areas of the planning region, wastewater treatment is provided by the municipalities, water districts, or private water utilities that service those areas. Municipalities in the region that provide wastewater service include Gonzales, Greenfield, King City, and Soledad. While the Monterey One Water provides residential wastewater service for the Salinas service area, the City of Salinas owns and operates an Industrial Wastewater Treatment Plant, currently receiving 2 MGD from industrial customers in Salinas. Many residents in rural areas of the Greater Monterey County region are on individual septic systems, which are regulated by Monterey County Environmental Health Bureau. Figure 3.6 illustrates the service areas of Monterey One Water and other wastewater treatment providers (described further in Section 3.3.4) in the Greater Monterey County SWRP planning region.

Groundwater Sustainability Agencies

The Sustainable Groundwater Management Act (SGMA), enacted in 2014, has allowed for the creation of new water management agencies in the state of California with regulatory authority over groundwater use. Several Groundwater Sustainability Agencies (GSAs) have been formed for the purpose of sustainable groundwater management within the Greater Monterey County SWRP planning region: Salinas Valley Basin GSA, Marina Coast Water District GSA, City of Marina GSA, Arroyo Seco GSA, and Pajaro Valley Water Management Agency.

According to Bulletin 118, the Salinas Valley Basin GSA is the exclusive GSA for the Langley Area (sub-basin number 3-004.09), East Side Aquifer (3-004.02), Upper Valley Aquifer (3-004.05), and Paso Robles Area (3-004.06). The Salinas Valley Basin GSA has overlapping jurisdiction with the City of Marina GSA

and Marina Coast Water District GSA for the 180/400 Foot Aquifer (3-004.01), and has overlapping jurisdiction with Marina Coast Water District GSA for the Monterey Aquifer (3-004.10). The Marina Coast Water District GSA has exclusive jurisdiction over the Marina portion of the 180/400 Foot Aquifer (3-004.01). For the Forebay Aquifer (3-004.04), the Salinas Valley Basin GSA has overlapping jurisdiction with the Arroyo Seco GSA. To the north, the Pajaro Valley Water Management Agency is the exclusive GSA over the Corralitos - Pajaro Valley Basin (3-002.01). Figure 3.7 illustrates the jurisdictional boundaries of these GSAs.

3.3.4 Water Purveyors and Wastewater Treatment Providers

Major water purveyors in the region include California Water Service Company, Alco Water Service Company, California American Water Company, Marina Coast Water District, Castroville Community Services District, and the municipalities of Gonzales, Greenfield, and Soledad. Some of these water suppliers also provide wastewater services, as noted. The U.S. Army and California State Parks supply water for use on their properties. The following provides a brief description of the major water purveyors and estimated volumes of water provided.

Alco Water Service: Alisal Water Corporation, dba Alco Water Service (Alco), is an investor-owned public utility water company that has provided water service to the Alisal community, eventually incorporated into the City of Salinas, since 1932. Current demand within the Alco service area, based on reporting to the State Water Board, was 1,139 million gallons for the 2016 water year.

California American Water Company: California American Water Company (CalAm) is a California Public Utilities Commission (CPUC) regulated utility. Within the Greater Monterey County IRWM Plan area, the company provides service to approximately 3,000 water and wastewater connections. Communities served include Toro, Ambler Park, Las Palmas, and Spreckels in the Salinas Valley; Ralph Lane and Indian Springs in Salinas; Oak Hills in northern Monterey County; and Chualar in southern Monterey County. According to CalAm's 2015 Urban Water Management Plan (2015 UWMP) for the Monterey District, 2015 demand was about 1,136 million gallons within the Greater Monterey County planning area.

California Water Service Company: California Water Service Company (Cal Water) is an investor-owned CPUC-regulated company. Cal Water serves approximately 130,000 residents (70 percent of the urban users) in the City of Salinas and some of the surrounding areas, including the unincorporated communities of Bolsa Knolls, Las Lomas, Oak Hills, Country Meadows, Salinas Hills, and Buena Vista. Alco Water Company serves the remaining portion of the City of Salinas. According to the Cal Water Salinas District 2015 UWMP, 4,777 million gallons of groundwater was supplied within the Salinas service area and surrounding areas in 2015. Cal Water also serves approximately 14,850 residents in King City, providing on average 2.5 million gallons of water per day to more than 2,500 service connections. Total system demand in 2015 was 1,441 AF (Cal Water 2015b).

Castroville Community Services District: The Castroville Community Services District (CCSD) serves a population of about 7,300 in the communities of Castroville and Moss Landing. Services provided include water, sewer, storm water, street lighting, and recreational facilities. CCSD currently delivers approximately 800 AFY of water through approximately 2,000 connections (LAFCO 2014).

City of Gonzales: The City of Gonzales provides potable water and wastewater treatment to a population of about 8,400. According to recent data,[2] the City delivered 1,450 AF (472 million gallons) of potable water to its citizens and businesses. The municipal wastewater treatment plant operates at 1.30 MGD and serves all residential, commercial and industrial customers in the City (LAFCO 2010a).

City of Greenfield: The City of Greenfield Public Works Department is responsible for water supply and delivery in the City of Greenfield. In 2015, the City supplied 501 million gallons of water (1,539 AF) to a population of nearly 18,000 residents for personal, commercial use and fire protection (City of Greenfield 2015). The City of Greenfield also provides wastewater treatment services to city limit customers, consisting of primary treatment. The City's Wastewater Treatment Plant (WWTP) has a capacity to receive a flow of 2.0 MGD. The City's WWTP treated a total of 951 AF in 2015.

City of Soledad: The City of Soledad provides domestic water to residential, commercial, industrial and institutional customers within the City limits. In 2015, metered water deliveries totaled 1,731 AF to an estimated population of 16,455 (City of Soledad 2015). The City of Soledad also provides wastewater treatment services for the city and the Prison. The City of Soledad recently completed an upgrade of the City Plant which, in addition to increasing plant treatment capacity to 5.5 MGD, treats wastewater to meet tertiary requirements for recycled water use. The plant will provide tertiary treated water for agricultural and urban and landscape irrigation.

Marina Coast Water District: The Marina Coast Water District (MCWD) provides potable water delivery and wastewater conveyance services to residents in the City of Marina and to the Ord Community. According to the Marina Coast Water District 2015 UWMP, the District delivered approximately 3,194 AF of potable water to 7,873 connections, including 1,657 AF to Central Marina and 1,332 to the Ord Community.

Pajaro/Sunny Mesa Community Services District: Pajaro/Sunny Mesa Community Services District (PSMCSD) provides potable water, sanitary sewer, and other services to residents in North Monterey County. PSMCSD owns and operates multiple water systems, including one serving Pajaro and another water system serving the Sunny Mesa area. Water demand for water systems located within the Greater Monterey County region and served by PSMCSD is currently about 66.4 million gallons.[3]

Table 3.3 summarizes the water suppliers and service areas for connections greater than 200, and wastewater treatment providers in the Greater Monterey County IRWM region. Figure 3.5 shows the service areas of water purveyors, and Figure 3.6 shows the service areas of wastewater treatment providers.

[2] City of Gonzales website accessed July 13, 2018: http://www.ci.gonzales.ca.us/public-work.php.
[3] Based on communication between PSMCSD General Manager and Karen Nilsen (Nilsen & Associates), July 24, 2018.

Table 3.3 Water Supply (Connections >200) and Wastewater Treatment Providers

Service Supplier	Service Area (within Greater Monterey County IRWM Region)	Population Served	Water Supply	Wastewater Treatment
Alco Water Service Company	Service areas within the City of Salinas – north and east sides	29,152	x	
California American Water Company	Toro Water Company	408	x	
	Ambler Park	396	x	
	Chualar	186	x	
	Las Palmas	1,046		x
	Indian Springs	180		x
	Oak Hills	460		x
	Spreckels	270		x
	Ralph Lane	28	x	
California State Parks	Julia Pfeiffer Burns State Park		x	
	Andrew Molera State Park		x	
	Pfeiffer Big Sur State Park		x	x
	Fremont Peak State Park		x	
California Utilities	Toro Area	1,100 connections + -		x
California Water Service Company	King City	14,850	x	
	Salinas District (including 70% of the City of Salinas, plus Bolsa Knolls, Las Lomas, Oak Hills, Country Meadows, Salinas Hills, and Buena Vista)	130,000	x	
Camp Roberts	National guard base	5,986	X	X
Castroville Community Services District	Community of Castroville	7,300	X	
Chualar Community Services Area	Community of Chualar	1,238		X
City of Gonzales	City of Gonzales	9,114	X	X
City of Greenfield	City of Greenfield	17,898	X	X
City of Soledad	City of Soledad	16,455	X	X
	Salinas Valley State Prison and Corrections Training Facility/Soledad Prison	11,200		X
Fort Hunter Liggett	Army base	5,500	X	X
King City	King City	13,532		X
Little Bear Water Company	Area southwest of King City	2,314	X	X
Marina Coast Water District	City of Marina and Ord Community	30,480	X	
Monte Del Lago Park	Monte Del Lago Mobile Home Community	750	X	
Monterey County Parks	Lake San Antonio		X	X
Monterey One Water	City of Salinas, Marina, unincorporated areas within the County (plus Monterey Peninsula cities which are outside the GMC	250,000 (includes areas outside the		X

Service Supplier	Service Area (within Greater Monterey County IRWM Region)	Population Served	Water Supply	Wastewater Treatment
	IRWM region)	IRWM region)		
Pajaro Sanitation District operated by Monterey County Public Works	Las Lomas Area	3,047		X
Pajaro/Sunny Mesa Community Services District	Pajaro area (lies outside of IRWM region), Elkhorn, Prunedale area, plus Sunny Mesa and Hillcrest subdivisions	7,225	X	
Salinas Valley State Prison	Facility grounds in Soledad	5,719	X	
San Ardo Water District	Community of San Ardo	821	X	X
San Lucas County Water District	Community of San Lucas	362	X	X
Soledad Prison/Corrections Training Facility	Facility grounds in Soledad	7,175	X	
Spreckels Water Company	Community of Spreckels and Tanimura Antle Plant	745	X	

Source: 2007 Data from State of California, Department of Finance, compiled by Association of Monterey Bay Area Governments, except for the following:

- Alco population estimate based on email communication with Alco President, December 13, 2011.
- California American Water Company population from email communication with CalAm, December 13, 2011.
- California Water population estimates from King City 2015 UWMP and Salinas District 2015 UWMP.
- Castroville CSD population estimate from CCSD website accessed December 2018.
- Chualar CSD population estimate based on 2016 American Community Survey data.
- City of Gonzales population estimate based on 2016 American Community Survey data.
- City of Greenfield population estimate from City of Greenfield 2015 UWMP.
- King City population estimate for wastewater services based on 2016 American Community Survey data.
- Las Lomas population estimate (for Pajaro Sanitation District) based on 2016 American Community Survey data.
- Marina Coast Water District population estimate from MCWD 2015 UWMP, based on 2010 US Census.
- Pajaro/Sunny Mesa CSD population estimate from LAFCO 2006 MSR for the North County Area of Monterey County.
- San Ardo population estimate based on 2016 American Community Survey data.
- San Lucas population estimate based on 2016 American Community Survey data.
- City of Soledad population estimate from the Soledad 2015 UWMP.
- Spreckels population estimate based on 2016 American Community Survey data.

Figure 3.5 Boundaries of Water Agencies and Water Purveyors

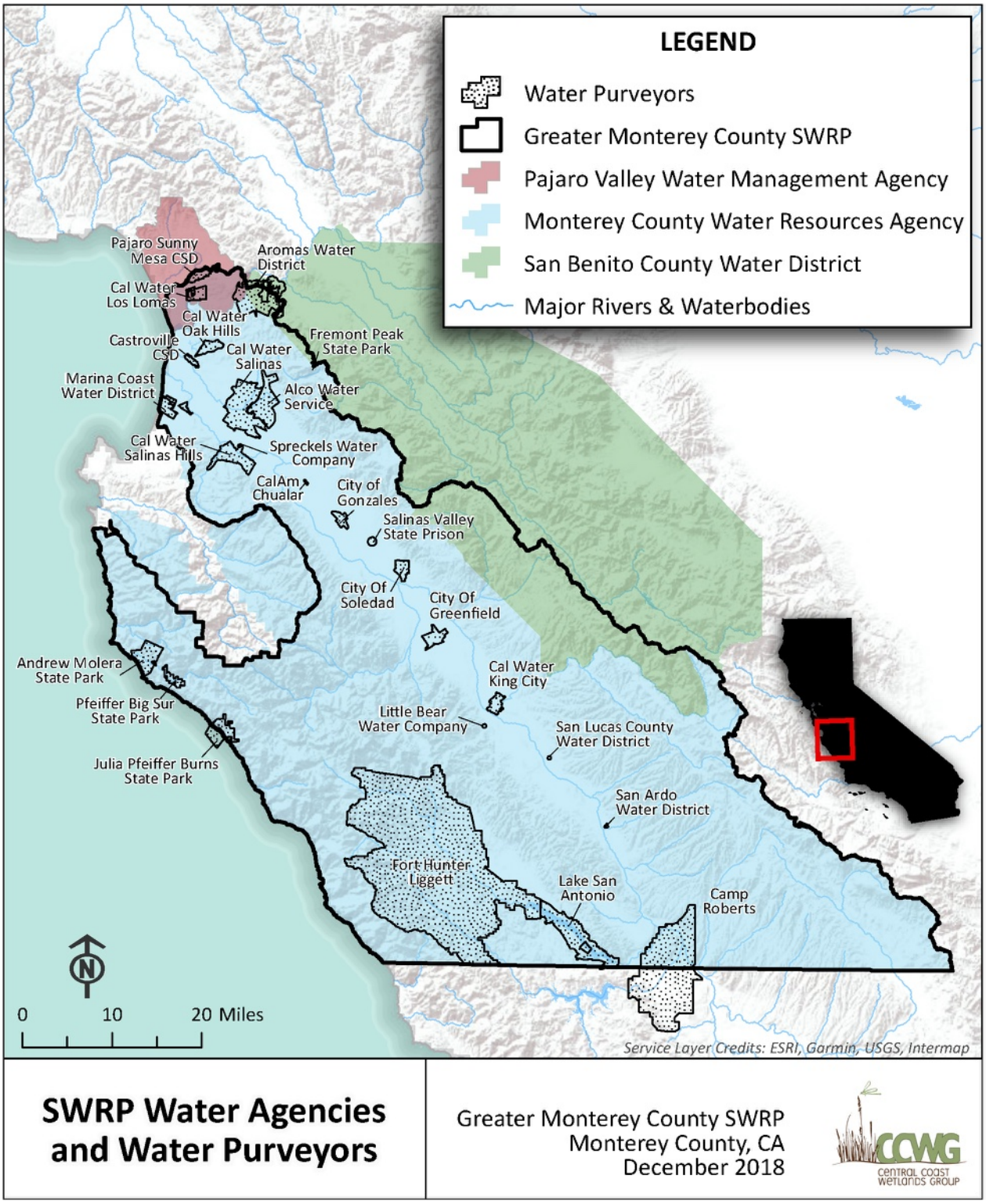


Figure 3.6 Boundaries of Wastewater Treatment Providers

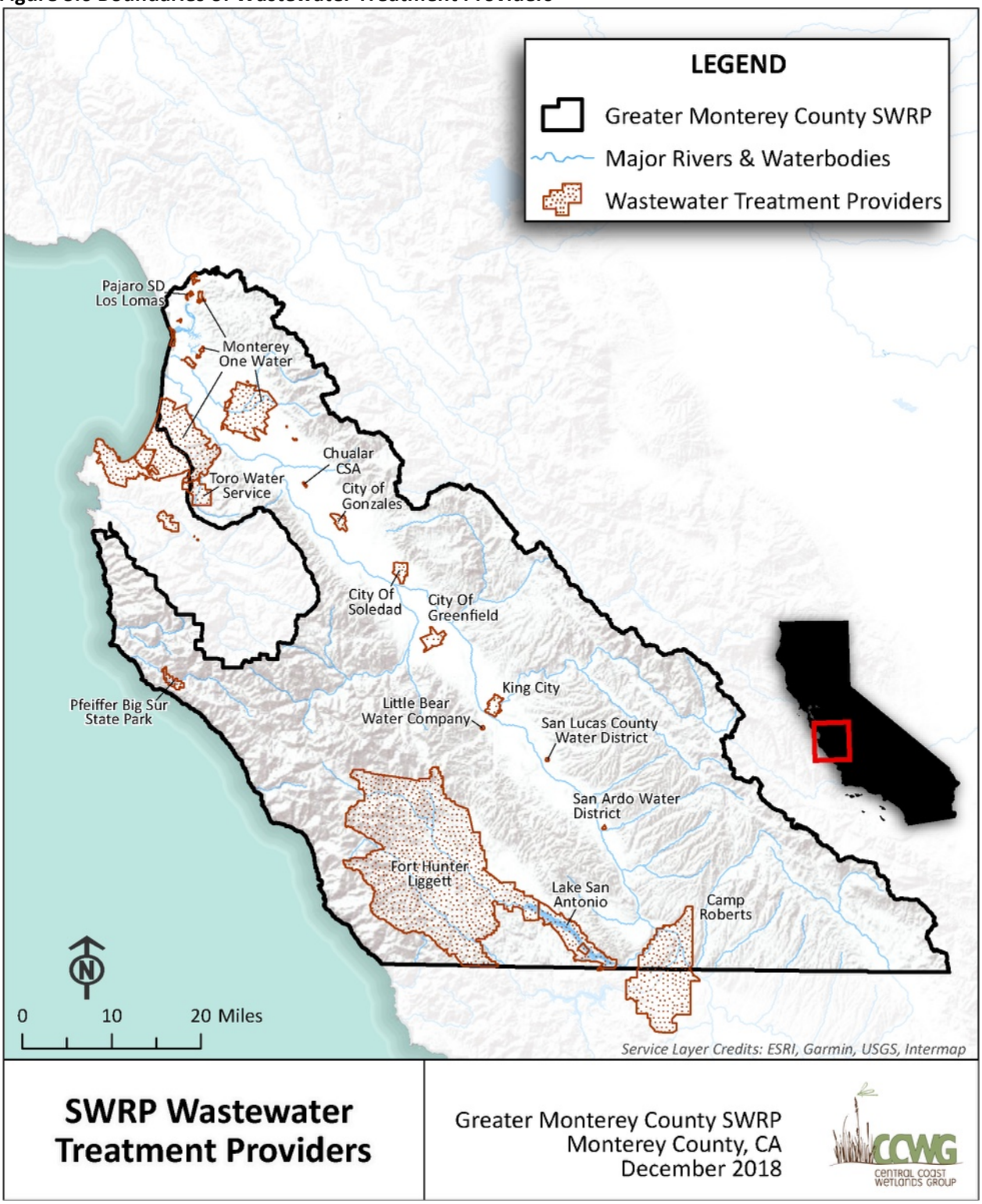
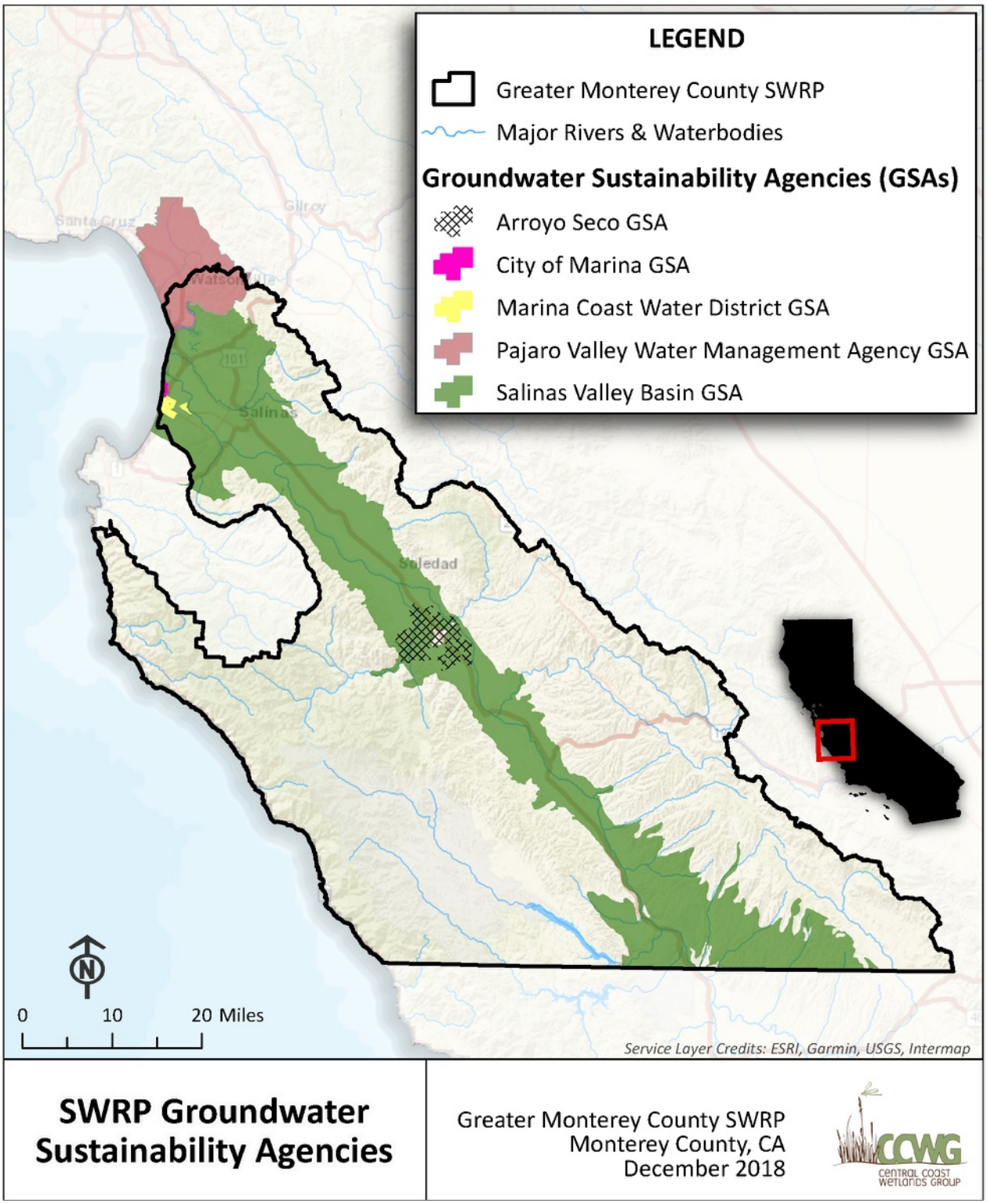


Figure 3.7 Boundaries of Groundwater Sustainability Agencies



3.3.5 Non-potable Water Supply

Agriculture is by far the largest consumer of water in the Greater Monterey County region. Over the ten-year period 2006 - 2015, agriculture accounted for an average of 91 percent of groundwater use while urban water uses accounted for just 9 percent. There are no agricultural water suppliers in the Greater Monterey County region; growers supply their own water needs with groundwater extracted from their own wells.

MCWRA has been collecting groundwater extraction data from well operators for agricultural and urban water uses since 1992. Agricultural water use consists of water used for irrigation, while urban water use includes all household consumption as well as commercial and industrial water use. The groundwater extraction data, provided by over 300 well operators, is compiled in the Ground Water Extraction Management System portion of MCWRA Information Management System, a relational database maintained by the MCWRA and summarized in annual Ground Water Extraction Summary Reports (GWESR).

Table 3.4 below summarizes GWESR data from 2006 to 2015. In 2015, agricultural pumping accounted for about 93 percent of groundwater extraction in the Salinas Valley Groundwater Basin, with urban pumping accounting for the remaining 7 percent. A second source of agricultural water use not reflected in this table includes the 13,300 AFY of tertiary treated recycled water from the Monterey One Water plant, delivered to approximately 12,000 acres of agricultural users near Castroville.

Table 3.4 Agricultural and Urban Water Use in the Salinas Valley 2006-2015

Year	% Wells Reporting	Agricultural Pumping (AFY)	Urban Pumping Reported (AFY)	Total Pumping (AFY)
2006	96%	421,634	49,606	471,240
2007	97%	475,155	50,440	525,595
2008	97%	477,124	50,047	527,171
2009	97%	465,707	45,517	511,224
2010	97%	416,421	44,022	460,443
2011	97%	404,110	44,474	448,584
2012	97%	446,620	42,621	489,241
2013	97%	462,873	45,332	508,205
2014	98%	480,160	44,327	524,487
2015	98%	478,113	36,601	514,714

Source: MCWRA GWESR from website: http://www.mcwra.co.monterey.ca.us/.

3.4 Land Use

3.4.1 Land Use and Native Vegetation

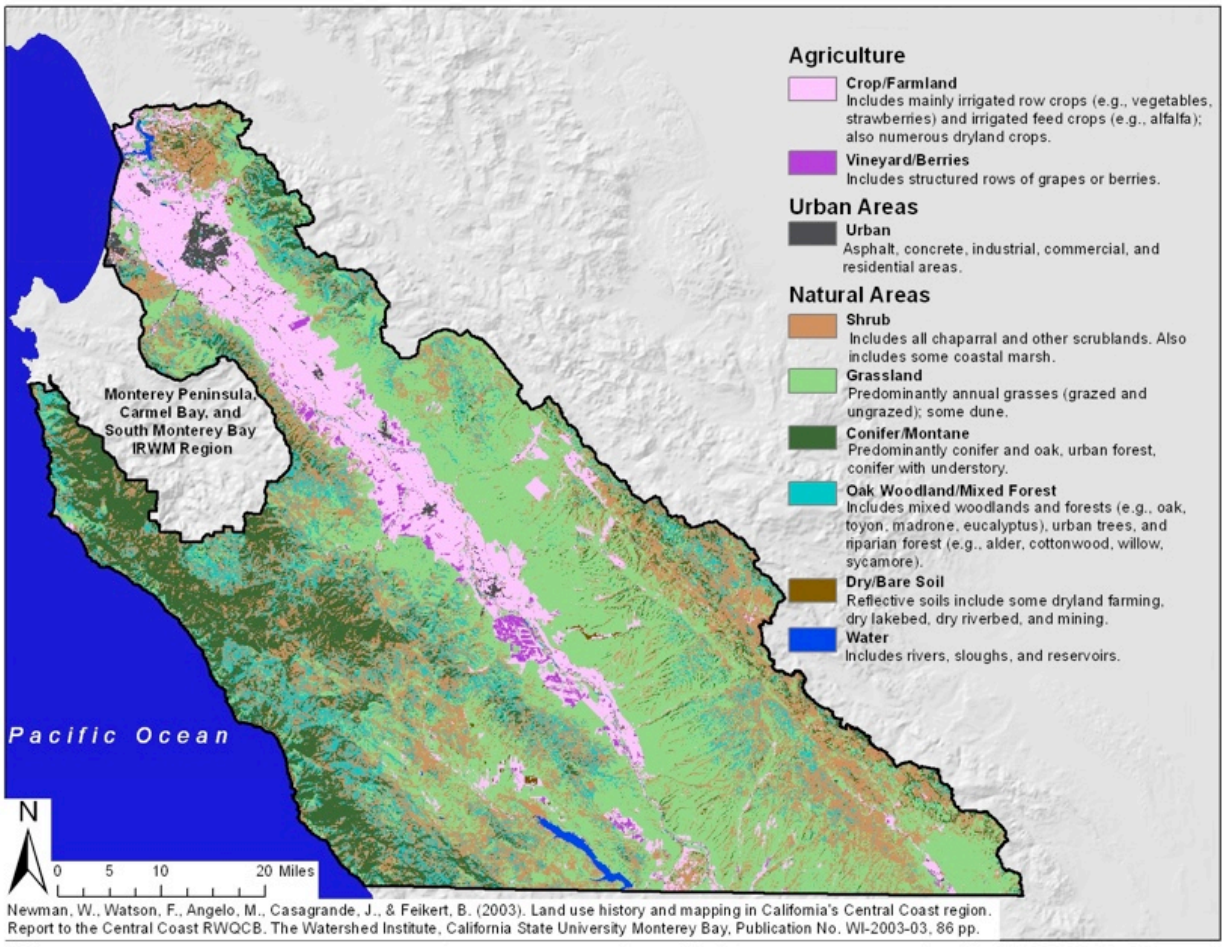
The dominant land use in Monterey County (and the planning area) is agriculture, representing about 56 percent of the total land area and occupying about 1.2 million acres of land. The second largest land use consists of public and quasi-public uses (such as parks, recreational, community, and military facilities), comprising about 23 percent of the total land area (about 471,000 acres). Approximately 16 percent of the land area (about 328,000 acres) in the county is devoted to resource conservation and other uses.

The remaining 5 percent of the county (about 102,000 acres) has been developed with residential, industrial, and commercial uses.

Natural vegetation throughout the county is typical of that occurring in the coastal ranges and interior valleys of central California. The Salinas Valley is dominated by agriculture and, in the southern county, by significant stands of oak woodlands. The Gabilan Range to the east is dominated by annual and native grassland, and by mixed oak forests. In the northern coastal section of the region are beach dunes near the former Fort Ord and marshlands around the Elkhorn Slough as well as rare maritime chaparral species. The coastal Big Sur coastal range is dominated by redwood, oak woodland, coastal chaparral, and annual grassland.

The region includes many vegetation types or plant communities that are considered to be "sensitive natural communities" under the California Environmental Quality Act (CEQA). These include: freshwater marsh, riparian/wetland, native grassland/valley needlegrass grassland, coastal prairie/coastal terrace prairie, maritime chaparral, oak woodland, blue oak woodland, oak savannah, mixed conifer, redwood forest, dune and dune scrub, saltwater marsh and tidal mudflats. Other plant communities occurring in the region include coastal scrub, interior scrub and chaparral (baccharis chaparral, baccharis scrub, Gabilan scrub, and mixed chaparral), eucalyptus groves, and annual grassland. Figure 3.8 shows general land uses and natural vegetation in the Greater Monterey County IRWM and SWRP planning area.

Figure 3.8 Land Uses and Natural Vegetation in the Greater Monterey County IRWM Region



3.4.2 Parks, Protected Areas, and Open Space

The Greater Monterey County region includes approximately 500,000 acres[4] of land dedicated to wilderness, conservation areas, and open space. Federal open space areas include the Los Padres National Forest (U.S. Forest Service, encompassing 1.75 million acres), Pinnacles National Park (U.S. National Park Service, encompassing 26,000 acres), Salinas River National Wildlife Refuge (US Fish and Wildlife Service, 367 acres), and Fort Ord National Monument (US Bureau of Land Management, encompassing 14,651 acres).

The California Department of Parks and Recreation operates six state parks in the Big Sur region: Garrapata State Park (2,879 acres), Andrew Molera State Park (4,766 acres), Pfeiffer Big Sur State Park (1,006 acres), Julia Pfeiffer Burns State Park (3,762 acres), Limekiln State Park (716 acres), and the Point Sur Historic Park. Other state parks include Fort Ord Dunes State Park (979 acres) and Fremont Peak State Park, located in the Gabilan Range. State beaches in the Greater Monterey County region include Marina State Beach, a 170-acre protected beach; Salinas River State Beach; and Moss Landing State Beach. Moss Landing Wildlife Area (728 acres) is a California State wildlife preserve administered by the California Department of Fish and Wildlife (CDFW) and located on the shore of Elkhorn Slough.

One of Central Coast California's most significant undeveloped open spaces is the 10,000-acre Palo Corona Regional Park, owned and managed by the CDFW and the Monterey Peninsula Regional Park District. Toro County Park, owned by Monterey County Parks, is a 4,756-acre recreational park located six miles from downtown Salinas. Another significant protected area in the Greater Monterey County region is Landels-Hill Big Creek Reserve located along the Big Sur coast. This 3,848-acre reserve is owned by the University of California Natural Reserve System and the University of California at Santa Cruz. Joshua Creek Canyon Ecological Preserve is also in Big Sur, owned by CDFW and comprising approximately 6,140 acres.

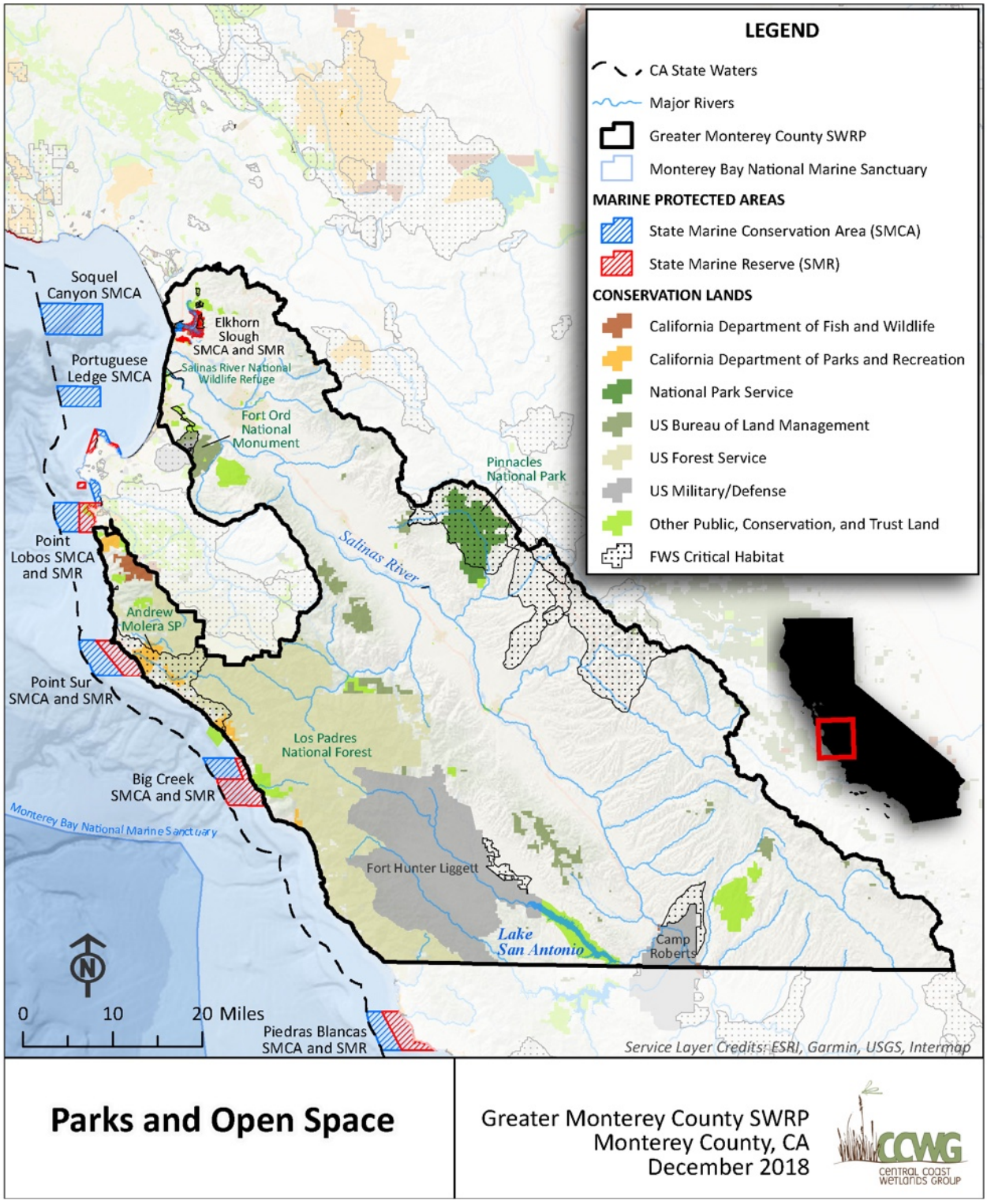
Several nationally important estuarine, coastal, and ocean protected areas are located in or adjacent to the SWRP planning area. The Greater Monterey County region is situated adjacent to the Monterey Bay National Marine Sanctuary (MBNMS), a federally protected marine sanctuary administered by the National Oceanic and Atmospheric Administration (NOAA). MBNMS encompasses 276 miles of shoreline and 6,094 square statute miles of ocean, including four Critical Coastal Areas (CCA), two Areas of Special Biological Significance (ASBS), and five Marine Protected Areas (MPA).[5] The 1700-acre Elkhorn Slough National Estuarine Research Reserve, part of the MBNMS, provides some of the most important freshwater marsh and brackish marsh habitat for wildlife in California. The Reserve is administered by NOAA and managed by the CDFW. Big Creek State Marine Reserve and Big Creek State Marine Conservation Area are two adjoining marine protected areas that lie offshore of Big Sur, totaling 22.5 square miles. Moro Cojo Estuary State Marine Reserve is a marine protected area located inland from Monterey Bay, directly south of the Elkhorn Slough, and covering 0.5 square miles.

[4] Estimated by the Big Sur Land Trust staff, personal communication between BSLT staff and IRWM Program Director, January 18, 2012.

[5] Protected areas include: Elkhorn Slough (CCA and MPA), Moro Cojo Estuary (MPA), Old Salinas River Estuary (CCA), Salinas River (CCA), Julia Pfeiffer Burns Underwater Park (CCA and ASBS), Point Lobos (MPA), Point Sur (MPA), Big Creek (MPA), and the ocean area surrounding the mouth of Salmon Creek (ASBS).

Critical habitat areas preserved as a part of local, state, or national parks, or as part of other conservation lands in the SWRP planning region, along with estuarine, coastal, and ocean protected areas, are presented in Figure 3.9.

Figure 3.9 Wilderness, Conservation Areas, Parks, Open Space, and Coastal/Ocean Protected Areas



3.5 Groundwater and Surface Water Resources

3.5.1 Groundwater Resources

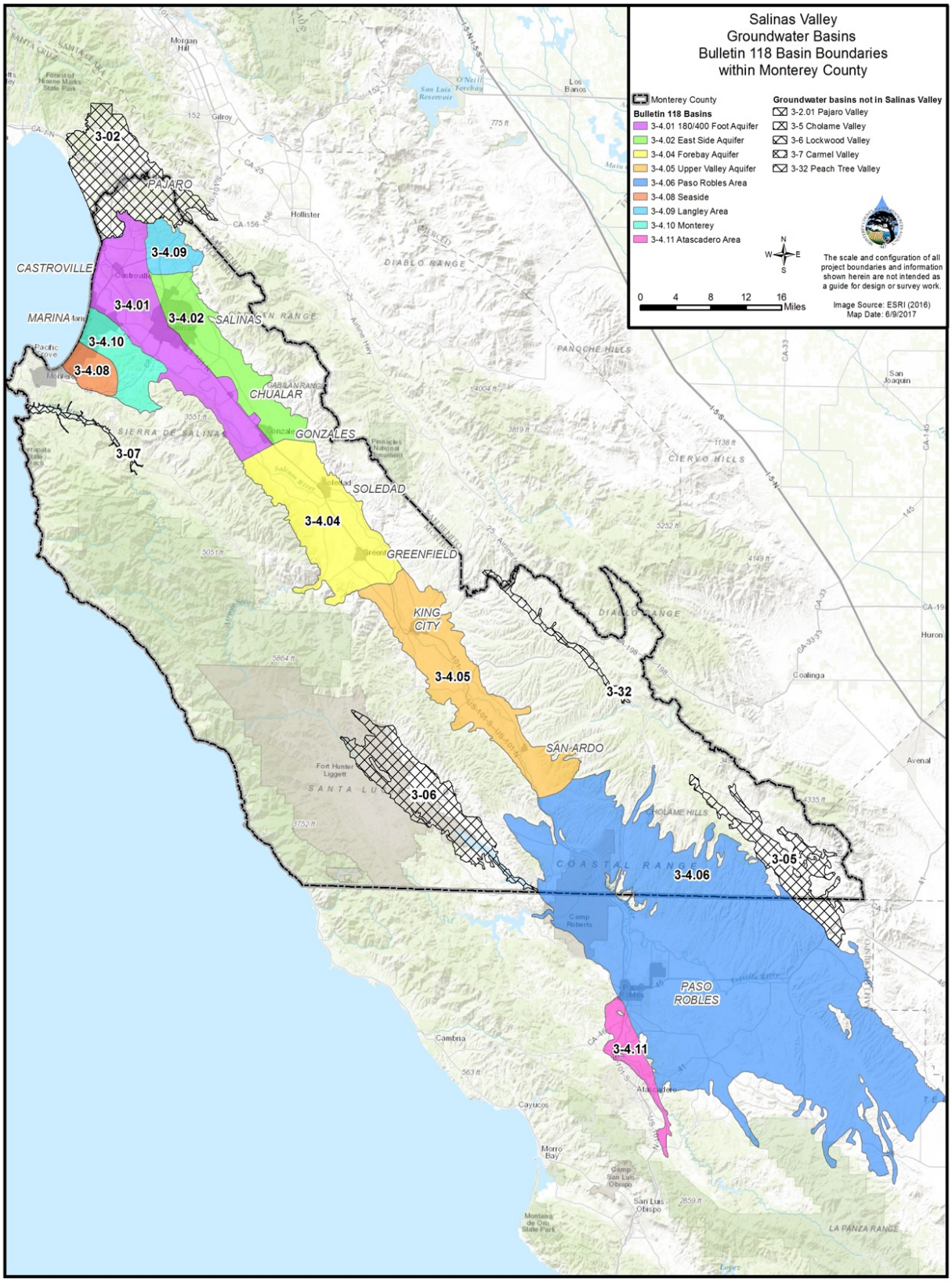
Groundwater is the main source of water supply in the Greater Monterey County IRWM region, with the exception of residents along the Big Sur coast, who depend entirely on surface water and shallow wells for their water supply, and of residents near Greenfield, who have a diversion from the Arroyo Seco River. The Greater Monterey County region receives no imported water.

The largest groundwater basin in the planning region is the Salinas Valley Groundwater Basin. The Salinas Valley Groundwater Basin is made up of eight sub-basins: 180/400 Foot Aquifer, East Side Aquifer, Forebay Aquifer, Upper Valley Aquifer, Paso Robles Aquifer, Monterey, Seaside Basin, and Atascadero Area (Figure 3.10). The Seaside Basin and Atascadero Area sub-basins are located outside of the Greater Monterey County planning area. The Paso Robles sub-basin extends into San Luis Obispo County (also outside of the IRWM region). The subareas have different hydrogeologic and recharge characteristics, though they are not separated by barriers to horizontal flow and water can move between them. The Upper Valley and Forebay subareas are unconfined and in direct hydraulic connection with the Salinas River.

Other considerably smaller groundwater basins in the Greater Monterey County IRWM planning region include Lockwood Valley, Cholame Valley, and Peach Tree Valley basins at the southern end of the county, and a portion of the Pajaro Valley Groundwater Basin at the northern end of the county.

Groundwater recharge in the Salinas Valley is principally from infiltration from the Salinas River, Arroyo Seco and, to a much lesser extent, other tributaries to the Salinas River; and from deep percolation of rainfall. Both natural runoff and conservation releases from Nacimiento and San Antonio Reservoirs contribute to the flow in the Salinas River. It is estimated that stream recharge accounts for approximately half of the total basin recharge. Deep percolation of applied irrigation water is the second largest component of the groundwater budget, but because it represents recirculation of existing groundwater rather than an inflow of “new” water, it is not considered a source of recharge.

Figure 3.10 Major Groundwater Basins in the Greater Monterey County Region



Source: Monterey County Water Resources Agency, June 2017

3.5.2 Surface Water Resources

The significant surface water resources of the Greater Monterey County IRWM region include the Salinas River in the Salinas Valley and its tributaries; the San Antonio and Nacimiento Reservoirs, which control water flows to the Salinas River and thus impact recharge of the Salinas Valley Groundwater Basin; the numerous rivers originating in the Santa Lucia Mountains along the Big Sur coast, which provide the main source of water for water users in that portion of the region; the Elkhorn Slough and Moro Cojo Slough; the Monterey Bay, and the coastal waters of the Monterey Bay National Marine Sanctuary. Elkhorn Slough, Moro Cojo Slough and the surrounding areas that drain to Moss Landing Harbor provide some of the most important estuarine habitat for wildlife in California, including extensive areas of salt marsh, brackish marsh, freshwater marsh, intertidal mudflats and open water. Figure 3.11 illustrates the important surface water resources in the Greater Monterey County SWRP planning area.

The Salinas River is the eighth longest river in the state of California and the largest water system in Monterey County, extending about 120 miles from its headwaters at the Santa Margarita Reservoir in San Luis Obispo County to its mouth at the Monterey Bay. The Salinas River drains approximately 4,043 square miles of land. Several tributaries enter the river along the length, including Pancho Rico Creek, Santa Rita Creek, Estrella Creek, Chalone Creek, San Lorenzo Creek, El Toro Creek, Prunedale Creek, Arroyo Seco River, Nacimiento River, and San Antonio River.

The Arroyo Seco River is the largest undammed tributary to the Salinas River and is an important source of groundwater recharge to the Salinas Valley Groundwater Basin. The river is 40 miles long and drains 275 square miles of watershed, most of which lies in the rugged coastal range areas southwest of Greenfield and Soledad. The Arroyo Seco River sustains a small population of steelhead trout.

The San Antonio and Nacimiento Rivers are the largest tributaries to the Salinas River, with watersheds of about 330 and 328 square miles, respectively. Dams owned and operated by the MCWRA control both of these rivers. The San Antonio River has its headwaters in the Santa Lucia Mountains and has a total length of 58 miles. The Nacimiento River, located about five miles southwest of the San Antonio River, also originates in the Santa Lucia Mountains and has a total length of 54 miles. Nacimiento and San Antonio Rivers contribute approximately 200,000 AFY and 70,000 AFY, respectively, to the Salinas River.

The Nacimiento and San Antonio Dams—built in 1957 and 1967, respectively—were constructed to control floodwaters and to release water into the Salinas River for percolation to underground aquifers throughout the summer. At maximum pool, the Nacimiento Reservoir's storage capacity is 377,900 AF with a surface elevation of 800 feet. The Nacimiento Reservoir yields on average about 62 percent of the total water in the Salinas River system. At full pool, the San Antonio Reservoir has a storage capacity of 335,000 AF with a surface elevation of 780 feet. The San Antonio Reservoir yields on average about 13 percent of the total water in the Salinas River system.

Average annual flows to the ocean from the Salinas River are around 360,400 AFY,[6] most of which occurs during the period of November through March. During the spring and summer months, the

[6] Source: Annual data report on United States Geological Survey (USGS) website: http://wdr.water.usgs.gov/wy2010/pdfs/11152500.2010.pdf

reservoirs on the Nacimiento and San Antonio Rivers regulate flow to maximize groundwater recharge via the Salinas River channel.

To the northeast of the Salinas River watershed is the smaller Gabilan Creek sub-watershed, which contains five waterways—Gabilan Creek, Alisal Creek, Natividad Creek, Santa Rita Creek, and Tembladero Slough—along with the historic Carr Lake, a 450-acre former wetland and seasonal lake in the City of Salinas now primarily under agricultural production. The Big Sur Land Trust recently (2017) purchased a 73-acre parcel within Carr Lake with the intent of developing the property into a local recreational park and open space area, with multiple benefits of storm water capture, flood control, and environmental enhancement.

Figure 3.11 Important Surface Water Resources in the Greater Monterey County SWRP Area

3.5.3 Water Quality Priorities

Chapter 2 describes the water quality issues related to groundwater and surface water resources in the Greater Monterey County region. Water quality priorities for the SWRP planning effort focus on addressing the major issues outlined in that chapter. For groundwater, that includes identifying and implementing projects to address seawater intrusion, nitrate contamination, and other pollutants such as arsenic and chromium-6. For surface water, priorities include addressing sources of contamination for impaired water bodies listed on the 303(d) List, and helping municipalities and other entities implement their NPDES and WDR permit requirements. These priorities are expressed generally through the water quality goal and objectives of this SWRP:

Water Quality Goal: Improve water quality so that waters in the planning area are suitable for human and environmental uses.

Water Quality Objectives: Support projects that:

1. Reduce the quantity and improve the quality of urban and agricultural runoff that would otherwise enter state waters untreated.
2. Promote source control of pollutants.
3. Reestablish natural water drainage systems that treat and infiltrate storm water, or mimic these natural system functions to the maximum extent feasible.
4. Protect surface waters and groundwater basins from contamination and the threat of contamination.
5. Improve septic systems, sewer system infrastructure, wastewater treatment systems, and manure management programs to prevent water quality contamination.
6. Promote regional monitoring, modeling and analysis to better understand regional processes related to causes of adverse biological effects, sources and transport of pollutants, status and trends in pollutant concentrations and loads, and the effectiveness of management practices to reduce impacts of pollutant in storm water and dry weather flows.

CHAPTER 4. Organization, Coordination, and Collaboration

Storm water management on a watershed basis involves collaboration among local governments, utilities, non-profit organizations, and other stakeholder groups to analyze the hydrology, storm drain/runoff conveyance systems, opportunity sites, and habitat or community needs within sub-watersheds. The Storm Water Management Planning Act implemented through Water Code section 10563 substantively focuses on diverting runoff from existing storm drains, channels, or conveyance structures to sites (particularly publicly owned sites) that can clean, store, infiltrate and/or use the runoff. Coordinated storm water management, monitoring, and evaluation on a watershed basis maximizes resources and funding, helps minimize monitoring costs, and assists entities responsible for storm water management in meeting their regulatory requirements while achieving multiple benefits.

This chapter of the Storm Water Resource Plan (SWRP) describes the organization and roles of the entities that participated in SWRP development, the community engagement process, and the plan for ongoing collaboration and coordination during SWRP implementation.

4.1 Involvement of Agencies, Organizations, and Other Stakeholders in SWRP Development

The SWRP planning effort involved numerous entities, including local, regional, and state government agencies, NPDES-regulated entities, utilities, nonprofit organizations, and other potentially affected stakeholders.

The Principal Investigator for development of this SWRP was the Central Coast Wetlands Group, an affiliate research group at Moss Landing Marine Laboratories. Coastal Conservation and Research, Inc., the non-profit fiscal agent for the Central Coast Wetlands Group, acted as Lead Applicant for purposes of the Proposition 1 Storm Water Planning Grant. Monterey County Resource Management Agency was the Lead Public Agency. Monterey County Resource Management Agency administers the Phase II General Permit for unincorporated urban areas of the county, and was chosen as the Lead Public Agency because they have jurisdiction over a broader geographic area than do the other regulated public agencies in the Greater Monterey County Integrated Regional Water Management (IRWM) region. Monterey Bay National Marine Sanctuary led the stakeholder outreach effort for SWRP development. The Greater Monterey County IRWM Regional Water Management Group acted as the Technical Advisory Committee (TAC) for the SWRP and was actively involved in all aspects of plan development.

Other agencies and organizations contributed to the development of this SWRP through technical support (e.g., providing modeling and other analytical tools), project development, and contribution of matching funds. Table 4.1 summarizes the entities that directly participated in, or contributed to, the development of this SWRP.

Table 4.1 Agencies and Organizations Participating in Development of the SWRP

				Management Authority over, Responsibility for, or Active Involvement in:								
Entity	**Additional Roles and Responsibilities**	**RWMG Member**	**TAC Member**	**Storm Water Mgmt**	**Water Supply**	**Water Quality**	**Wastewater Treatment**	**Flood Management**	**Environmental**	**Land Use Planning**	**Disadvantaged Community / Env Justice**	**Agricultural Interests**
Coastal Conservation and Research, Inc.	**Lead Applicant** for Prop 1 SWRP Planning Grant					X			X			
Monterey County Resource Management Agency	**Lead Public Agency**, Project Proponent	X	X	X	X	X	X	X	X	X		
Central Coast Wetlands Group at Moss Landing Marine Labs	**Project Lead**, Project Proponent	X	X			X		X	X			
Monterey Bay National Marine Sanctuary	Project Team Member – Stakeholder Outreach	X	X			X			X			
Big Sur Land Trust	Project Proponent	X	X			X			X			
California State University Monterey Bay		X	X			X			X			
California Water Service Company		X	X		X	X						
Castroville Community Services District		X	X	X	X	X	X				X	
City of Salinas	Matching Funds, Project Proponent	X	X	X		X	X	X		X		
City of Soledad	Project Proponent	X	X	X	X	X	X	X		X	X	
Elkhorn Slough National Estuarine Research Reserve / Elkhorn Slough Foundation	Project Proponent	X	X			X		X	X			X
Environmental Justice Coalition for Water		X	X			X					X	
Marina Coast Water District		X	X		X	X						
Monterey County Agricultural Commissioner's Office		X	X			X						X
Monterey County Water Resources Agency	Matching Funds	X	X		X	X		X	X			
Monterey One Water	Matching Funds, Project Proponent	X	X		X	X	X					X
Resource Conservation District of Monterey County	Project Proponent	X	X			X			X			X
Rural Community Assistance Corporation		X	X			X	X				X	
San Jerardo Cooperative, Inc.		X	X		X	X	X	X			X	
Central Coast Regional Water Quality Control Board			X	X	X	X	X		X		X	X
Environmental Science Associates (ESA)	Project Team Technical Support					X		X	X			

2NDNATURE Consulting	Project Team Technical Support					X						
Monterey Regional Stormwater Management Program	Cooperating Entity – Project Lead on Monterey Peninsula SWRP			X		X						
Moss Landing Harbor District	Project Proponent					X						
Resource Conservation District of Santa Cruz County	Project Proponent					X		X	X			X

The following sections describe how the SWRP development process allowed for collaborative and coordinated planning between public agencies, nonprofit organizations, privately owned water utilities and other affected stakeholders in the planning region, and how it provided for community participation in order to achieve mutually beneficial goals and multiple watershed objectives. Chapter 10, Education, Outreach, and Public Participation, describes the stakeholder outreach effort in more detail.

4.1.1 Regional Water Management Group

Greater Monterey County Regional Water Management Group

The primary Regional Water Management Group (RWMG) implementing an existing Integrated Regional Water Management (IRWM) Plan in the Storm Water Resource Plan (SWRP) planning area is the Greater Monterey County RWMG. The geographic boundaries for the Greater Monterey County SWRP include the entire Greater Monterey County IRWM region plus the portion of the Pajaro River Watershed IRWM region that lies within Monterey County.

The Greater Monterey County RWMG is comprised of 18 entities including government agencies, nonprofit organizations, educational organizations, water service districts, private water companies, and organizations representing agricultural, environmental, and community interests:

- Big Sur Land Trust
- California State University Monterey Bay
- California Water Service Company
- Castroville Community Services District
- Central Coast Wetlands Group at Moss Landing Marine Laboratories
- City of Salinas
- City of Soledad
- Elkhorn Slough National Estuarine Research Reserve
- Environmental Justice Coalition for Water
- Marina Coast Water District
- Monterey Bay National Marine Sanctuary
- Monterey County Agricultural Commissioner's Office
- Monterey County Resource Management Agency
- Monterey County Water Resources Agency
- Monterey One Water
- Resource Conservation District of Monterey County
- Rural Community Assistance Corporation
- San Jerardo Cooperative, Inc.

These 18 entities were invited to join the RWMG based on the intention to create a diverse and inclusive RWMG with adequate and balanced representation of water resource management issues and

geographic areas in the Greater Monterey County IRWM region. Nine of the 18 RWMG entities have statutory authority over water supply and/or water management within the Greater Monterey County region: Castroville Community Services District, City of Salinas, City of Soledad, Elkhorn Slough National Estuarine Research Reserve, Marina Coast Water District, Monterey Bay National Marine Sanctuary, Monterey County Resource Management Agency, Monterey County Water Resources Agency, and Monterey One Water. Of those agencies, the following are specifically responsible for, have oversight authority, or are otherwise involved in storm water management: Castroville Community Services District, City of Salinas, City of Soledad, Elkhorn Slough National Estuarine Research Reserve, Monterey County Resource Management Agency, Monterey Bay National Marine Sanctuary, and Monterey One Water.

Regional Water Management Group as Technical Advisory Committee

The Greater Monterey County RWMG acted as the Technical Advisory Committee (TAC) for development of this SWRP, and participated in decision-making at every major milestone of the planning process. In addition to the RWMG members, a representative from the Central Coast Regional Water Quality Control Board served as a member of the TAC.

The TAC provided input on SWRP development through five meetings conducted over the course of the project, as well as through review of the Draft SWRP. The TAC meetings coincided with regularly scheduled RWMG meetings, which were announced to the broader SWRP stakeholder list and open to the public. The TAC meetings covered the following topics:

1. March 15, 2017: Kickoff TAC meeting and review of SWRP objectives.
2. August 16, 2017: Review of gathered information and models, including annotated bibliography.
3. February 21, 2018: Approaches for quantitative methods for analysis and prioritization of storm water implementation projects for the SWRP.
4. September 19, 2018: Present prioritization criteria for SWRP projects and prioritized project list.
5. February 20, 2019: Present Final Draft SWRP.

Upon completion of this SWRP, the SWRP was formally approved by vote of the RWMG on July 17, 2019 and incorporated into the IRWM Plan as an appendix to that plan.

Pajaro River Watershed Regional Water Management Group

As noted above, the boundaries of this SWRP include a small portion of the Pajaro River Watershed IRWM region, namely, that portion that lies within Monterey County. The Pajaro River Watershed RWMG consists of the following three water agencies:

- Santa Clara Valley Water District
- San Benito County Water District
- Pajaro Valley Water Management Agency

Upon completion of this SWRP, the SWRP will be submitted to the Pajaro River Watershed RWMG for incorporation into the Pajaro River Watershed IRWM Plan.

Monterey Peninsula Regional Water Management Group

The implementation of this SWRP potentially affects interests of members of an additional RWMG in the

region: the Monterey Peninsula, Carmel Bay, and South Monterey Bay RWMG. Several member entities of the Greater Monterey County RWMG are also participating members of the Monterey Peninsula RWMG. The Monterey Peninsula, Carmel Bay, and South Monterey Bay RWMG consists of the following agencies and organizations:

- Big Sur Land Trust
- California State University Monterey Bay
- Carmel Area Wastewater District
- Carmel River Watershed Conservancy
- Carmel Valley Association
- City of Carmel-by-the-Sea
- City of Del Rey Oaks
- City of Monterey
- City of Sand City
- City of Seaside
- Marina Coast Water District
- Monterey County Resource Management Agency
- Monterey County Water Resources Agency
- Monterey One Water
- Monterey Peninsula Water Management District
- Resource Conservation District of Monterey County

A SWRP was completed for the Monterey Peninsula, Carmel Bay, and South Monterey Bay IRWM region in December 2018. The Greater Monterey County SWRP Project Team and RWMG worked collaboratively with the Monterey Regional SWRP planning team and the Monterey Peninsula RWMG to ensure consistency between the two plans and to explore possibilities for coordination and partnerships. The Monterey Peninsula Region SWRP can be accessed at the following website: http://montereysea.org/stormwater-resource-plan/.

4.1.2 Coordination with Agencies with Authority and Responsibility for Storm Water and/or Dry Weather Runoff Management

Federal, state, and local agencies have been engaged and actively involved in the development of this Greater Monterey County SWRP, including those that need to exercise their own authorities and mandates in order to address the storm water and dry weather runoff management objectives of the Plan.

The state agency with regulatory authority over storm water management is the State Water Resources Control Board. Storm water regulations are carried out by the Regional Water Quality Control Boards according to California Water Code. The Central Coast Regional Board administers the Central Coast Storm Water Program – a National Pollutant Discharge Elimination System (NPDES) Program – to protect, maintain, and improve watershed processes affected by storm water runoff. The program regulates storm water discharges from municipalities and construction and industrial activities. Central Coast Regional Board staff was actively involved in the Greater Monterey County SWRP development process by means of participation on the TAC.

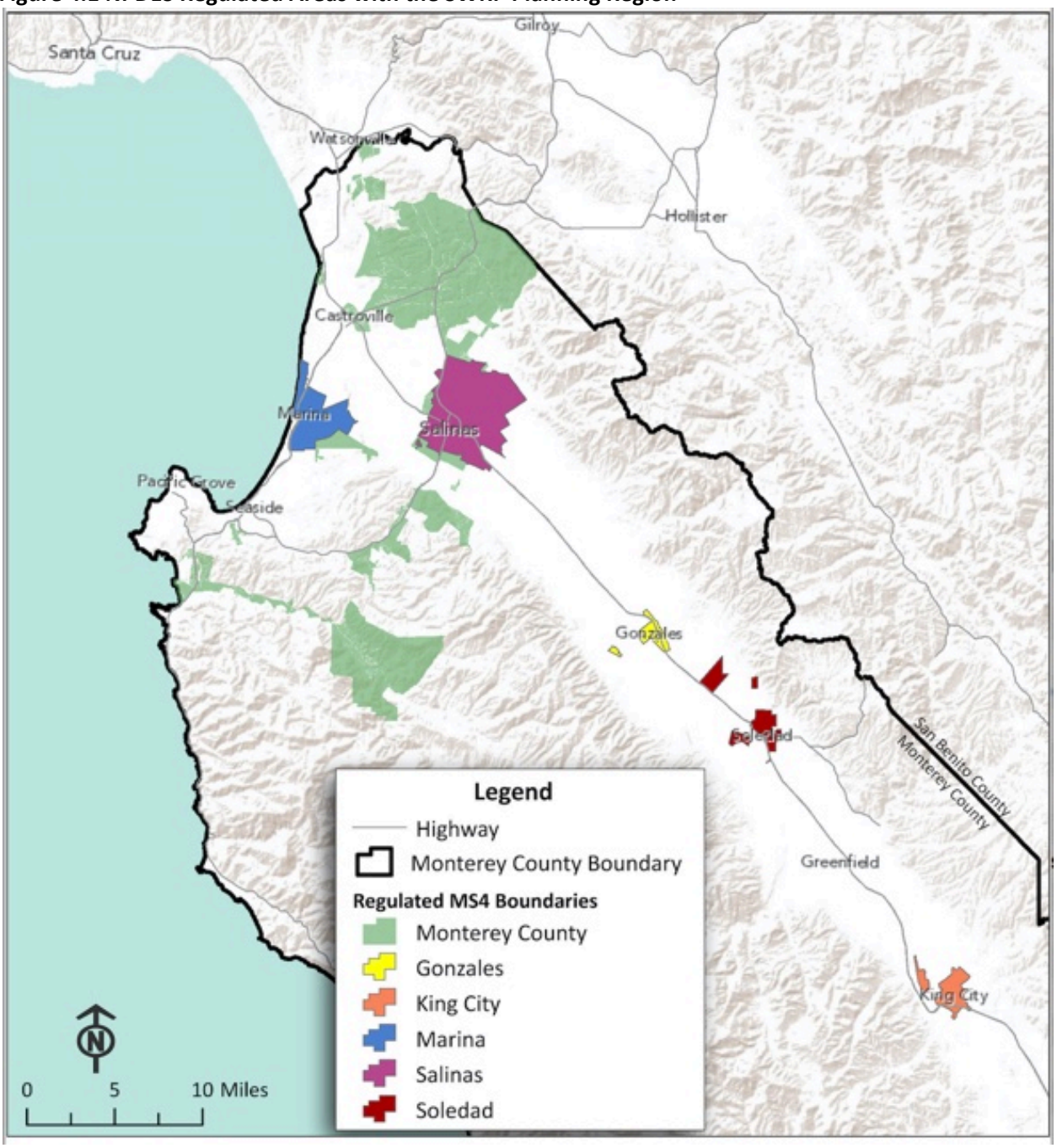
The RWMG/TAC includes two federal agencies with authority over and/or involvement in storm water management. Elkhorn Slough National Estuarine Research Reserve manages nearly 4,000 acres in the Elkhorn Slough watershed, with a mandate to conserve and restore the natural resources and receiving

waters of Elkhorn Slough. The National Oceanic and Atmospheric Administration (NOAA) is responsible for protecting the multiple resources of the Monterey Bay National Marine Sanctuary. The sanctuary stretches along 276 miles of coast and is vulnerable to runoff from the 11 watersheds, encompassing 7,000 square miles, which drain into it. In 1992, a Memorandum of Agreement was signed by eight federal, state, and local agencies to work together to develop a Water Quality Protection Program for the Sanctuary. In partnership with the Coastal Commission, the program developed the Model Urban Runoff Program, essentially a "how to" guide for local governments to develop programs to control urban runoff, which ultimately informed the MBNMS *Solutions to Urban Runoff Action Plan*.

The Greater Monterey County region includes one NPDES Phase I entity – the City of Salinas – and five Phase II Small Municipal Separate Storm Sewer System (MS4) regulated entities: the cities of Marina, Soledad, Gonzales, and King City, and the County of Monterey. Monterey County Resource Management Agency administers the Phase II General Permit for unincorporated urban areas of the county. The SWRP Project Team worked closely with the County and regulated cities to ensure that the SWRP reflects their storm water management program objectives and that it addresses, to the extent possible, their NPDES permit requirements. Figure 4.1 shows the boundaries of NPDES regulated entities in the planning area. The SWRP Project Team also reached out to other local agencies, including Castroville Community Services District, Moss Landing Harbor District, and the City of Greenfield, that are not subject to NPDES requirements but that are responsible for storm water management within their districts.

Two other agencies with responsibility for storm water and/or dry weather runoff management, and that have been actively engaged in the SWRP development process as RWMG and TAC members, are the Monterey County Water Resources Agency (MCWRA) and Monterey One Water. Monterey One Water is a regulatory Joint Powers Authority that provides wastewater treatment for portions of the county, including storm water treatment through diversions to their collection system from the City of Pacific Grove and soon from the City of Salinas. MCWRA regulates water supply for the county, and is responsible for operations and maintenance of the Reclamation Ditch #1665 (Rec Ditch). The Reclamation Ditch watershed comprises approximately 157 square miles, draining a series of natural lakes that are linked by a system of lateral ditches and pumping facilities. The Rec Ditch is one of the most polluted water bodies on the Central Coast, listed for 14 impairments on the State's 2014-2016 303(d) List.

Figure 4.1 NPDES Regulated Areas with the SWRP Planning Region



4.1.3 Nonprofit Organizations working on Storm Water and/or Dry Weather Resource Planning/Management

Nonprofit organizations working on storm water and/or dry weather resource planning or management in the watershed were identified and invited to participate in the SWRP planning process. While announcements regarding the SWRP planning process were emailed to nearly 40 nonprofit organizations on the Greater Monterey County IRWM stakeholder list, only a handful of nonprofit organizations have direct interests in storm water or dry weather runoff management. Several of those organizations, including the Central Coast Wetlands Group, Big Sur Land Trust, San Jerardo Cooperative, Inc., Environmental Justice Coalition for Water, and Rural Community Assistance Corporation, are members of the RWMG and were active participants on the SWRP TAC.

The Central Coast Wetlands Group, the Project Lead for this SWRP planning effort, has ongoing research interests in storm water management as it relates to environmental health. The Central Coast Wetlands Group is collaborating with Monterey One Water, the City of Salinas, MCWRA, Castroville Community Services District, and Moss Landing Harbor District on a number of projects in this SWRP related to treatment wetlands, flood retention, floodplain enhancement, and other storm water management projects to achieve multiple environmental and community benefits.

The Big Sur Land Trust is a landowner in the Greater Monterey County IRWM region with a mandate to conserve and protect natural resources. In 2017, the Big Sur Land Trust acquired a 73-acre parcel of Carr Lake, a 480-acre seasonally dry lakebed in the heart of the City of Salinas. The land trust has interests in acquiring additional parcels and developing the Carr Lake property (in coordination with the City of Salinas) for multiple uses, including parkland, wetlands, and storm water capture.

San Jerardo Cooperative, Inc. is a cooperative housing complex for low-income farm working families and a nonprofit mutual benefit corporation located in the Salinas Valley. San Jerardo represents a disadvantaged community, and has specific interests in implementing storm water improvements on its property to prevent seasonal flooding. San Jerardo Cooperative, along with the Environmental Justice Coalition for Water and Rural Community Assistance Corporation, also participated in the SWRP planning process with an eye to protecting the interests of disadvantaged communities within the Greater Monterey County IRWM region.

Another nonprofit, Ecology Action, contributed to this SWRP through its LID Bioretention Opportunity GIS Tool. The Bioretention Opportunity Analysis tool, developed by Fall Creek Engineering, estimates infiltration and recharge based on characteristics such as soil type, surface slope, and opportunity to recharge over-drafted water supply aquifers. Opportunity maps were produced for the City of Salinas. The SWRP Project Team expanded the LID Bioretention Opportunity GIS Tool to the Salinas River and Alisal-Elkhorn Sloughs watersheds to identify infiltration/recharge areas utilizing area-specific storm water infrastructure locations. Ecology Action is also partnering with the City of Salinas in conducting Our Water, Our World (OWOW), a program that targets two of the most commonly used residential pesticides often found in local runoff and wastewater treatment plant discharges. Ecology Action implements LID-oriented projects within the Greater Monterey County IRWM region, including LID retrofits and their popular Green Gardener Program.

4.1.4 Public Engagement Efforts and Community Participation in Plan Development

The SWRP planning effort engaged the general public, affected communities, and other interested stakeholders through a concerted outreach effort. The stakeholder outreach effort is described fully in Chapter 10. Below is a brief summary of the public outreach components:

Email Announcements: Email announcements with SWRP-related news and events were sent numerous times over the course of SWRP development to stakeholders in the Greater Monterey County IRWM region. Emails were sent to the IRWM general stakeholder list, comprising over 250 email addresses, as well as to a targeted storm water listserv created specifically for this project, comprising 45 email addresses.

SWRP Website: A dedicated SWRP webpage was created on the Greater Monterey County IRWM Program website (http://www.greatermontereyirwmp.org/current/planning/). The webpage includes SWRP information and frequently updated news and announcements.

Public Workshops: Three public stakeholder workshops were held over the planning period. On April 25th, 2017, a public workshop was held to introduce the SWRP requirements, timeline, and objectives; discuss modeling and information gathering; and request information for potential projects and data for the modeling and analysis. The second public workshop was held August 30, 2017 to discuss SWRP project solicitation and review, introduce the project application short form, and review the timing and full application process for the SWRP. The third public stakeholder workshop was held on April 25, 2019 to solicit public comments on the draft SWRP.

TAC Meetings: All TAC meetings were open to the public and were announced via the IRWM general stakeholder listserv and the targeted storm water stakeholder listserv.

Project Development: Emails announcing a project solicitation for the SWRP were sent to both listservs, inviting interested stakeholders to participate in project development and project implementation. The Project Team also reached out to potential project proponents individually to discuss potential project ideas and to encourage their participation.

Stakeholders were given the opportunity to discuss and review the content of the SWRP and to review and comment on the draft versions.

4.2 Involvement of Agencies in SWRP Implementation

4.2.1 Regulatory Agency Decision-making Required for Plan Implementation

Local regulatory agencies involved in the SWRP development process include Monterey County and cities, which have regulatory authority over planning and project permitting, as well as Monterey One Water and MCWRA, which regulate wastewater and water supply in the region, respectively. MCWRA is also responsible for flood protection and for the control of flood and storm waters within Monterey County for the purpose of water supply management. Decisions relating to plan implementation that must be made by these regulatory agencies include project design review, permit review and approval, and any other procedures ordinarily required for project implementation within the respective district boundaries. Storm water projects where service areas must be extended or require a joint powers

agency would require LAFCO approval. All of these agencies have had opportunities to provide input into the SWRP as it was being developed.

Projects implemented through this SWRP must be consistent with NPDES Phase I and Phase II permit requirements, including monitoring requirements. The Central Coast Regional Board is the regulatory agency that evaluates NPDES permit compliance. The Central Coast Regional Board may also be involved in facilitating project review and approval for other permits, such as Clean Water Act Section 401 certifications.

There are four Groundwater Sustainability Agencies (GSAs) with authority over groundwater management within the SWRP region: Salinas Valley Basin GSA, Marina Coast Water District GSA, City of Marina GSA, and the Arroyo Seco GSA. Groundwater Sustainability Plans (GSPs) are currently under development for the 180/400-Foot Subbasin, East Side Subbasin, Langley Area Subbasin, Forebay Aquifer Subbasin, and the Monterey Subbasin. All projects submitted for Proposition 1 IRWM Implementation Grant funds that affect groundwater must have the approval of the local GSA. To the extent that these projects also involve storm water management, the local GSA will become involved in review and approval of those projects. The Project Team has worked collaboratively with the Salinas Valley Basin GSA to ensure consistency between the goals of this SWRP and those of the GSP for the 180/400-Foot Subbasin, currently under development.

Other agency stakeholders that have influence, policy control, and/or regulatory authority, and that may need to make decisions regarding SWRP implementation or regional monitoring, include: County of Monterey Environmental Health Department, Association of Monterey Bay Area Governments, National Oceanic Atmospheric Administration (with decisions related to storm water and dry weather runoff into the Monterey Bay National Marine Sanctuary), California Coastal Commission (for projects located within the coastal zone), and US Army Corps of Engineers (for review of Clean Water Act Section 404 permits). Other federal, state, or local regulatory agencies may get involved through NEPA or CEQA processes. Water demand and existing supplies associated with development projects are coordinated between the city government agencies within the Greater Monterey County planning area and local and regional water agencies. Monterey County Resource Management Agency consults with MCWRA on water supply and flood/drainage matters in all parts of Monterey County and with the Monterey County Environmental Health Bureau regarding water quality issues.

4.2.2 Coordination of Local Governmental Agencies to Support Plan Implementation

Several local governmental agencies have been coordinating on project development for improved storm water and dry weather runoff management in the region. For example, the City of Salinas has been collaborating extensively with Monterey One Water to divert and beneficially reuse storm water and dry weather runoff under the Pure Water Monterey program, and on other projects including the Salinas Area Flood Enhancements and Reuse (SAFER) project. The Resource Conservation District (RCD) of Monterey County is collaborating with the RCD of Santa Cruz County on improved storm water management and infiltration on public and private lands.

Local governmental agencies are also collaborating with nonprofit organizations. For example, the City of Salinas has been collaborating with the Big Sur Land Trust on the multi-benefit Carr Lake land purchase and restoration project. The Central Coast Wetlands Group has been collaborating with the City of Salinas and Monterey One Water on projects such as the Salinas Water Quality and Agricultural

Reuse Efficiency project and Espinosa Lake Flood Retention, and with the MCWRA on the Gabilan Floodplain Enhancement Project.

No new or altered governance structures are necessary to support collaboration between these local agencies.

4.2.3 Why Individual Agency Participation in Various Isolated Efforts is Appropriate

While the IRWM and SWRP planning processes encourage collaboration and coordination between agencies toward achieving mutually beneficial goals and multi-benefit projects, there may be instances where it is more appropriate for an agency to pursue a project on its own. This SWRP allows for that possibility. An example is the Soledad Regional Recharge Project. The City of Soledad is a small city located in southern Monterey County, approximately 25 south of the City of Salinas. The communities in southern Monterey County, such as Soledad, are isolated in the sense that they are located far from the hub of the Monterey Peninsula cities and the City of Salinas. The Soledad Regional Recharge Project is only very indirectly connected hydrologically to projects elsewhere in the planning area. It makes sense that storm water or dry weather urban runoff projects in rural South County may be pursued independently of the more collaborative efforts taking place in the northern part of the county, where the vast majority of agencies and organizations in the SWRP planning area do their work.

4.3 Relation of SWRP to Other Local Plans, Ordinances, and Programs

There are numerous plans and programs within the watershed boundaries that directly or indirectly address storm water resource management, including storm water management plans and programs, storm drain master plans, and watershed management plans. Other existing plans that may be impacted by this SWRP include urban water management plans, groundwater management plans, groundwater sustainability plans, flood management plans, hazard mitigation plans, and other resource management plans. By helping to increase water supplies and improve water quality, flood control, natural hydrological functioning and watershed conditions, this SWRP is generally consistent with the objectives of other local water resource and other relevant plans in the Greater Monterey County region and is meant to supplement and support these existing plans.

Following is a list of local plans and programs that were used to support the development of this SWRP, or that may directly or indirectly affect or be affected by the implementation of this SWRP.

4.3.1 Storm Water Management Programs and Plans

The primary objective of storm water management plans is to reduce the discharge of pollutants from storm drain systems to the maximum extent practicable in order to reduce adverse impacts to downstream receiving waters and enhance watershed health. The SWRP Project Team has worked closely with each of the NPDES regulated entities and their engineers to explore storm water capture opportunities and to develop potential projects. This collaborative process has ensured that the SWRP is consistent with the storm water management programs within the region, while helping the County and municipalities fulfill their NPDES permit requirements. The following storm water management programs and plans have been implemented within the Greater Monterey County region:

- **County of Monterey:** *Monterey County Guidance Document* (September 2014). The County of Monterey Resource Management Agency administers the Phase II Municipal General Permit for

urbanized portions of unincorporated Monterey County. The County is also a participating member of the Monterey Regional Storm Water Management Program (MRSWMP).

- **City of Salinas:** *Storm Water Management Plan* (2013), and *Storm Water Master Plan* (2004).
- **King City:** *City of King NPDES Phase II Storm Water Management Program* (2009). *King City Guidance Document* (2015).
- **City of Soledad:** *Storm Water Management Plan* (2010). *City of Soledad Guidance Document* (2015). *Storm Drain Master Plan* (2015).
- **City of Marina:** *City of Marina Guidance Document* (2013).
- **City of Gonzales:** *City of Gonzales Guidance Document* (2013).
- **Castroville:** Castroville is an unincorporated "urbanized area" covered by the County of Monterey MS4 General Permit. The *Storm Drain Master Plan for CSA-14* was developed for Castroville in 2001. In addition, the *Castroville Community Plan Update 2010* outlines opportunities for drainage improvements and design standards for flood control and drainage systems, including storm water runoff treatment control best management practices (BMPs).
- **Caltrans:** *Statewide Storm Water Management Plan* (2012).

4.3.2 Watershed and Other Resource Management Plans

The watershed management plans listed below include sections that specifically address storm water resource management:

- *San Antonio and Nacimiento Rivers Watershed Management Plan* (2008): This plan was developed by the Nacimiento and San Antonio (Nacitone) Watersheds Steering Committee and Central Coast Salmon Enhancement, Inc. for MCWRA and the State Water Resources Control Board in October 2008. The plan includes a section, Preventing Pollution from Point and Nonpoint Sources.
- *Elkhorn Slough Watershed Conservation Plan* (1999): The Conservation Plan was developed to identify critical resources within the Elkhorn Slough watershed, to identify and address threats, and to maintain the long-term viability of Elkhorn Slough and its related upland communities as a significant coastal system.
- *Elkhorn Slough at the Crossroads: Natural Resources and Conservation Strategies for the Elkhorn Slough Watershed* (2002): In 2002, a second report was produced based on the Elkhorn Slough Watershed Conservation Plan. This report identifies key natural resources of the slough and suggests strategies for conserving them, including recommendations for 100-meter buffer areas and agricultural runoff and storm water control measures to protect aquatic habitat.
- *Moro Cojo Slough Management and Enhancement Plan* (1996): This plan was developed by The Habitat Restoration Group for the Monterey County Planning and Building Inspection Department and the State Coastal Conservancy. The plan includes several water quality and nonpoint pollution objectives.
- *Northern Salinas Valley Watershed Restoration Plan* (1997): This plan was the Final Report of a study entitled, "Nonpoint Pollution in Coastal Harbors and Sloughs of the Monterey Bay Region" prepared by Moss Landing Marine Laboratories and the Watershed Institute for the Association of Monterey Bay Area Governments (AMBAG). The plan encompasses all of the water courses

that flow from the Gabilan Mountains east of Salinas into Moss Landing Harbor. The plan promotes the restoration of former wetland and riparian areas ("wet corridors") throughout the watershed as the primary means for water quality restoration, with wetlands and riparian areas acting as natural sediment and pollution filters.

- *Reclamation Ditch Watershed Assessment and Management Strategy* (2005): This study for the MCWRA, completed in 2005 by the Central Coast Watershed Studies (CCoWS) team of the Watershed Institute at California State University Monterey Bay, focuses on the same geographic area as the Northern Salinas Valley Watershed Restoration Plan – a 157 square-mile watershed with its headwaters in the Gabilan Range and its terminus at a set of tide gates at the entrance to Moss Landing Harbor. Management goals listed in the plan relate to water quality, flood control, parklands, determining fish passage and steelhead presence/absence, special status species protection, mosquito abatement, food safety and agricultural pest control, harbor sedimentation, sustainable water supply, and economic viability.

Monterey Bay National Marine Sanctuary Management Plan: The Monterey Bay National Marine Sanctuary Management Plan was developed in 2008, and includes 23 Action Plans to guide the Sanctuary in protecting resources. The Action Plans most pertinent to the SWRP include: Implementing Solutions to Urban Runoff; Regional Monitoring, Data Access, and Interagency Coordination; and Agriculture and Rural Lands.

4.3.3 Plans Related to Water Supply and Groundwater Management

Urban Water Management Plans: Urban water management plans (UWMPs) serve as long-range planning documents for urban water suppliers, and include water supply planning, source data for development of a regional water plan, and a source document for cities and counties as they prepare their General Plans. UWMPs have been developed for the following water districts within the Greater Monterey County IRWM region:

- City of Greenfield (2015, Draft)
- King City (2015)
- Marina Coast Water District (2015)
- California Water Service Company-Salinas District (2015)
- City of Soledad (2015)

Groundwater Sustainability Plans: According to the Sustainable Groundwater Management Act (SGMA) of 2014, local and regional authorities in a groundwater basin listed by the California Department of Water Resources (DWR) as medium or high priority are required to prepare and implement a Groundwater Sustainability Plan (GSP) for their basin by January 2022, or for critically overdrafted basins, by January 2020. As noted above, GSPs are currently under development for the following subbasins located within the Greater Monterey County IRWM region: 180/400-Foot Subbasin, East Side Subbasin, Langley Area Subbasin, Forebay Aquifer Subbasin, and the Monterey Subbasin. Given its goal to achieve basin sustainability, these plans will very likely consider opportunities for storm water and dry weather urban runoff capture, groundwater recharge, and other storm water and dry weather urban runoff management strategies.

Monterey County Groundwater Management Plan: The Monterey County Groundwater Management Plan (GWMP) was prepared by MCWRA in 2006 in accordance with the California Groundwater Management Act. The document provides the framework for the management of groundwater

resources in the Salinas Valley Groundwater Basin (exclusive of the Seaside and Paso Robles subareas) and acts as a guidance document for future groundwater projects. The GSPs, when completed, will supersede the GWMP as the guiding document for groundwater management in the region.

4.3.4 Plans Related to Flood Management and Hazard Mitigation

Monterey County Floodplain Management Plan (2002, updated in 2008): The MCWRA developed the Monterey County Floodplain Management Plan in 2002 with the goal of creating a plan to minimize the loss of life and property in areas where repetitive losses have occurred, and to ensure that the natural and beneficial functions of the County's floodplains are protected. Updated in 2008, the Plan describes the County's flood control system (infrastructure), identifies flood zones defined by the Federal Emergency Management Agency (FEMA), including maps depicting Repetitive Loss Properties (RLPs) and 100-year floodplains, provides a general hazard assessment, assesses the flood hazards of specific waterways in the County in terms of repetitive losses, and provides an implementation plan for flood mitigation and for mitigation of RLPs.

Monterey County Multi-Jurisdictional Hazard Mitigation Plan (2014): The Hazard Mitigation Plan for Monterey County was developed for the Monterey County Office of Emergency Services in 2007 and updated in 2014, and was adopted by County of Monterey and the cities of Carmel-by-the-Sea, Del Rey Oaks, Gonzales, Greenfield, King City, Marina, Monterey, Pacific Grove, Salinas, Sand City, Seaside, and Soledad. Emergency response and disaster planning naturally involves water resource planners both in the preparation and mitigation phases. This includes identifying and implementing minor flood and storm water management projects to reduce damage due to local flooding or inadequate drainage, including the modification of existing culverts and bridges, upgrading capacity of storm drains, stabilization of streambanks, and creation of debris or flood/storm water retention basins in small watersheds.

4.3.5 Plans Related to Community Development and Disadvantaged Communities

LAFCO Municipal Services Reviews: The Local Agency Formation Commission of Monterey County (LAFCO) produces Municipal Service and Sphere and Influence Reviews (MSR) for urban areas and other planning districts within the County. The MSRs contain information pertinent to understanding the water management and water management needs in the Greater Monterey County IRWM region, including: growth and population projections; present and planned land uses in the area, including agricultural and open space lands; description of present and planned public facilities, including water supply, wastewater, storm water, and flood management infrastructure; and adequacy of public services, including infrastructure deficiencies and needs. The following MSRs have been used to support the development of this SWRP:

- City of Gonzales (2010)
- City of Greenfield (2010)
- King City (2010)
- City of Marina (2011)
- City of Salinas (2010)
- City of Soledad (2010)
- North County (2006)
- South/Central County (2015)
- Castroville Community Services District (2014)

Monterey County Parks Department Strategic Plan: This strategic plan sets forth a vision for County parks, the mission of the Parks Department, principles for guiding decisions, six broad multi-year goals, and strategies for achieving each of the goals. It is intended to serve as a roadmap for the department.

Monterey County Health Department Strategic Plan (2018): A plan to improve health and quality of life in Monterey County through County supported policies, programs, and services; promoting access to equitable opportunities for healthy choices and healthy environments in collaboration with communities.

Integrated Drinking Water and Wastewater Plan for Disadvantaged Communities in the Salinas Valley (2017): The primary intent of this plan, developed by the Greater Monterey County Regional Water Management Group, was to determine solutions for disadvantaged communities impacted by nitrate contamination in their drinking water. The planning effort identifies disadvantaged communities in the Greater Monterey County IRWM region, describes their drinking water and wastewater problems, and offers potential solutions for seven of the "high priority" communities.

4.3.6 General Plans, Ordinances, and Laws

General Plans: Every county and city in California is required by State law to have a general plan. General plans must address, at minimum, seven elements: Land Use, Circulation, Housing, Natural Resource Conservation, Open Space, Noise, and Safety. General plans have been developed for the following localities within the Greater Monterey County IRWM region:

- Monterey County General Plan 2010, including Specific Plans
- City of Gonzales Draft General Plan 2010
- City of Greenfield General Plan 2005-2025
- City of Marina General Plan 2000, with updates through 2010
- City of Salinas General Plan 2002
- City of Soledad General Plan 2005
- King City General Plan 1998

The SWRP is broadly consistent with the policies of these general plans. Policies from the Monterey County General Plan, for example, aim to: ensure an adequate and safe water supply to meet the County's current and long-term needs, including measures to increase runoff retention, protect water quality, enhance groundwater recharge, maximize the use of recycled water, and maximize urban and agricultural water conservation; protect and enhance surface water and groundwater resources; and encourage the provision of open space lands.

Ordinances: A review of all county and city ordinances in the SWRP planning region has uncovered no ordinances that would appear to prevent or hinder the implementation of SWRP projects. All of the ordinances relevant to construction, grading, runoff control, erosion control, water efficiency, water conservation, landscaping, and storm water management support the general objectives of SWRP planning and would pose no barriers. Ordinances potentially relevant to SWRP implementation are summarized in Table 4.2.

Table 4.2 Ordinances Relevant to SWRP Project Implementation

	Runoff /Erosion Control	Water Efficiency/Conservation	Storm Water Management
Monterey County	Ch 16.12.060 Erosion Control; Ch 16.12.070 Runoff Control		Ch 16.14 Urban Storm Water Quality Management and Discharge Control
Salinas		Ch 36A Article III Water Efficient Landscape	Ch 29 Storm Water Management and Discharge Control
King City	Ch 12.04.080	Ch 15.5 Water Efficient Landscape	Ch 13.09 Nonpoint Source Pollution
Gonzales	Ch 10.28.140	Ch 10.08 Mandatory Water Conservation; Ch 10.24 Water Efficient Landscape Design	Ch 10.28 Storm Water Quality Management and Discharge Control
Marina	Ch 8.46.130		Ch 8.46 Urban Storm Water Quality Management and Discharge Control
Soledad	Ch 13.52.D.2.a	Ch 15.10.070	Ch 13.52 Storm Water Quality
Greenfield	Ch 15.04.010		

Regional Water Board Irrigated Lands Regulatory Program: In July 2004, the Central Coast Regional Water Quality Control Board (RWQCB) adopted an order known as the "Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands." The Central Coast RWQCB has extended the 2004 Agricultural Order multiple times. The 2012 Irrigated Lands Agricultural Order prioritized conditions to control pollutant loading in areas where water quality impairment was documented in the Clean Water Act section 303(d) List of Impaired Waterbodies, specifically addressing the growing problem of nitrate contamination in the region's drinking water. Dischargers are required to implement, and where appropriate update or improve, management practices to reduce agricultural runoff to streams and impaired water bodies. For farms that pose the greatest risk to water quality, growers are required to develop certified Irrigation and Nutrient Management Plans, Water Quality Buffer Plans if they are adjacent to the most critical creeks, and monitor their individual discharge. The Central Coast Water Board approved a new Agricultural Order on March 8, 2017. The 2017 Ag Order (known as Ag Order 3.0) also requires groundwater monitoring. This SWRP references known or potential opportunities for capture and reuse of agricultural runoff from farm operations.

CHAPTER 5. Storm Water Management Objectives

The project area, as described in Chapter 3, is subject to water quality impairments, groundwater overdraft, insufficient water supply in dry years and seasons, damaging flood events, historical wetland and riparian loss, and low acreages of parks, open space and non-vehicular transportation corridors relative to California and U.S. median values. The goals and objectives described below, including quantitative objectives, are watershed-based targets for proper watershed function and adequate supply of ecosystem services related to water resources. These objectives cannot be achieved by storm water management alone, but the storm water projects described in this SWRP will be important contributors to regional solutions. The goals and objectives listed below are incorporated into the project evaluation and prioritization described in Chapter 7.

5.1 Overarching Management Goal

The overarching goal is to promote storm water management implementation projects that provide regionally optimized benefits of increased water supply, improved water quality, better flood protection, enhanced environmental quality, and greater community opportunity.

5.2 Water Quality

5.2.1 Water Quality Goal

The management goal for water quality is: *Improve water quality so that waters in the planning area are suitable for human and environmental uses.*

5.2.2 Water Quality: Qualitative Objectives

Support projects that:

a. Reduce the quantity and improve the quality of urban and agricultural runoff that would otherwise enter state waters untreated.
b. Promote source control of pollutants.
c. Reestablish natural water drainage systems that treat and infiltrate storm water, or mimic these natural system functions to the maximum extent feasible.
d. Protect surface waters and groundwater basins from contamination and the threat of contamination.
e. Improve septic systems, sewer system infrastructure, wastewater treatment systems, and manure management programs to prevent water quality contamination.
f. Promote regional monitoring, modeling and analysis to better understand regional processes related to causes of adverse biological effects, sources and transport of pollutants, status and trends in pollutant concentrations and loads, and the effectiveness of management practices to reduce impacts of pollutants in storm water and dry weather flows.

5.2.3 Water Quality: Quantitative Objective

Achieve and maintain pollutant concentrations and toxicity below water quality standards.

This quantitative management objective applies to all pollutants. Additional specificity is provided for nitrate because it is widely found at concentrations above standards in surface waterbodies of the region and its allowable concentrations have been set by the Regional Water Quality Control Board at varying levels depending on season and watershed. The nitrate quantitative management objective for this SWRP is the total allowable annual load shown in the far right column of Table 5.1.

Table 5.1 SWRP Quantitative Management Objectives for Nitrate (as N)

Watershed Area	Stream Reach	Allowable Concentration mg/l (May 1-Oct 31) *	Allowable concentration mg/l (Nov 1-April 30) *	Allowable loads (kg/y) **	Allowable Loads (kg/y) **	Total Allowable Annual Load (kg/y) **
		Wet	Dry	Wet	Dry	Wet + Dry
Wetland	Tembladero	8	6.4	8,667	1,240	9,908
Espinosa	Espinosa	8	6.4	1,691	254	1,945
San Jon Basin	Reclamation Canal	8	6.4	3,946	564	4,510
Boronda	Reclamation Canal	8	6.4	5,884	338	6,222
Natividad	Gabilan	8	2	0.0	0.0	0.0
Old Stage	Natividad creek	8	2	881	18	899
Old Stage South	Alisal	8	2	1,128	53	1,180
Old Stage Lower	Alisal	8	2	458	17.6	476
Castro Pond	Tembladero	8	6.4	10,641	1,522	12,163
Carr Lake	Gab/Natividad/Alisal	8	2	28,364	573	28,936
Airport	Alisal	8	2	9,408	458	9,866

* Source for allowable concentrations: Water Quality Control Plan for the Central Coastal Basin, 2017.
** Allowable loads calculated as allowable concentration times modeled flow estimate (Chapter 6).

5.3 Water Supply

5.3.1 Water Supply Goal

The management goal for water supply is: *Manage storm water to increase water supply for urban, agricultural and environmental uses.*

5.3.2 Water Supply: Qualitative Objectives

Promote projects that:

a. Capture storm water and/or dry weather runoff or divert water from existing storm drains, channels, or conveyance structures for transport to sites (particularly publicly owned sites) that can clean, store, infiltrate and/or reuse the runoff.
b. Increase groundwater recharge and protect groundwater recharge areas.
c. Adapt to changes in the amount, intensity, timing, quality, and variability of runoff and recharge due to climate change.

d. Augment local water supply through increased storage of storm water and dry weather runoff while ensuring sufficient surface supply for all human and environmental uses.
e. Increase and optimize water storage and conveyance capacity through construction, repair, replacement, and augmentation of infrastructure.
f. Promote and maximize water conservation.

5.3.3 Water Supply: Quantitative Objective

Implement storm water, conservation and other projects to provide water sufficient to replace the volume by which groundwater is currently over-drafted in the Greater Monterey County IRWM region, while additionally maintaining sufficient instream flows to support healthy wetland, riparian, and aquatic ecosystems. Initial estimates from the US Geological Survey Salinas Valley Integrated Hydrologic Model indicate this value to be 13,270 acre feet per year (W. Hanson, USGS, personal communication, 2017). This volume cannot reasonably be provided by storm water alone. For this SWRP, a storm water capture, reuse, and/or infiltration goal has been established at 4,000 acre feet/year, which is 30% of the total goal. See Chapter 7 for details on storm water capture estimates.

5.4 Flood Management

5.4.1 Flood Management Goal

The management goal for flood protection benefits is: *Manage storm water systems to reduce surface water peak flows and flood risk.*

5.4.2 Flood Management: Qualitative Objectives

a. Develop and implement storm water projects to protect, restore, and enhance the natural ecological and hydrological functions of watersheds.
b. Improve flood management systems and operational techniques/strategies by reducing peak runoff rates and/or volumes to reduce flood risk.
c. Promote projects to reduce sanitary sewer overflows.
d. Implement flood management projects that provide multiple benefits such as public safety, property protection, habitat protection, agricultural productivity, recreation, and economic stability and resilience.

5.4.3 Flood Management: Quantitative Objective

Within the 10- and 100-year flood risk areas of the Gabilan watershed, reduce by 50% the amount of farm land acreage that is flooded in 10- and 100-year storm events. (The Gabilan watershed is defined as the HEC-RAS model focus area described in Chapter 6.)

5.5 Environmental Benefits

5.5.1 Environment Goal

The management goal for environmental benefits is: *Protect, preserve, restore, and/or enhance watershed features and processes through storm water management.*

5.5.2 Environment: Qualitative Objectives

Promote projects that:

a. Manage storm water and dry weather runoff to protect, preserve, restore, or enhance habitat and open space, including wetlands, streams, riverside habitats, parkways, parks, and urban green space.
b. Protect and enhance state and federally listed species and their habitats.
c. Minimize unintended impacts of projects, including erosion, sediment transport, hydromodification, and habitat degradation.
d. Enhance and restore fish-friendly streams and river corridors.
e. Reduce energy use and greenhouse gas emissions.
f. Help reduce the rate of climate change through mitigation and carbon capture, and decrease the potential impacts of climate change through adaptation and development of resilient landscapes and infrastructure.

5.5.3 Environment: Quantitative Objectives

Habitat Extent: Double the current acreage of riparian and wetland habitat by restoring historic wetlands in current high-risk flood areas, as defined in Section 5.4.3, above. The current extent of wetland habitat in the Gabilan watershed is approximately 950 acres (CCWG Draft Gabilan Watershed Habitat Assessment 2018), therefore the goal of this SWRP is to add an additional 950 acres of wetland via storm water management projects. Quantitative goals for the remainder of the Greater Monterey County IRWM region have not yet been set.

Habitat Quality: Improve all wetland and riparian habitats in the Greater Monterey County IRWM region to attain California Rapid Assessment Method (CRAM) scores above 50 (the lower threshold for "fair" condition; CCWG Draft Gabilan Watershed Habitat Assessment 2018).

5.6 Community Benefits

5.6.1 Community Goal

The management goal for community benefits is: *Enhance economic prosperity and quality of life through improved urban spaces, availability of clean water, and related job creation and training.*

5.6.2 Community: Qualitative Objectives

Promote projects that:

a. Purchase fee title or conservation easements on lands from willing sellers to provide opportunities for groundwater recharge and integrated water resource management benefits. Ensure adequate funding and infrastructure to manage properties and/or monitor easements.
b. Create or restore habitat, green open space, parks, and recreation, particularly in disadvantaged communities.
c. Promote public education and opportunities for community involvement, including outreach to disadvantaged communities.

d. Encourage opportunities for employment and training related to management of water resources.
e. Increase community prosperity by enhancing open spaces.

5.6.3 Community: Quantitative Objectives

Implement storm water-related projects in and adjacent to Salinas Valley cities and towns to increase the per capita acreage of parks and open space to at least the median for all U.S. cities: 13.1 acres per 1,000 residents (The Trust for Public Land, 2017). The city of Salinas currently has just 2.9 park acres per resident (The James Irvine Foundation 2015). For the city of Salinas alone this would require an increase of more than 1,500 acres of parks and open space. The storm water projects in this SWRP propose creating approximately 500 acres of open space, paths, trails and accessible wetland habitat, primarily within 10 miles of the city of Salinas.

CHAPTER 6. Quantitative Methods for Identification and Prioritization of Storm Water and Dry Weather Runoff Capture Projects

6.1 Types of Storm Water Projects and their Quantitative Methods

Projects evaluated in this Storm Water Resource Plan (SWRP) can be divided into three types: engineered infrastructure projects, low impact development (LID) projects and landscape-based watershed function projects. The three types of projects were developed and evaluated in different ways.

6.1.1 Engineered Infrastructure Projects

There are four engineered infrastructure projects in this SWRP:

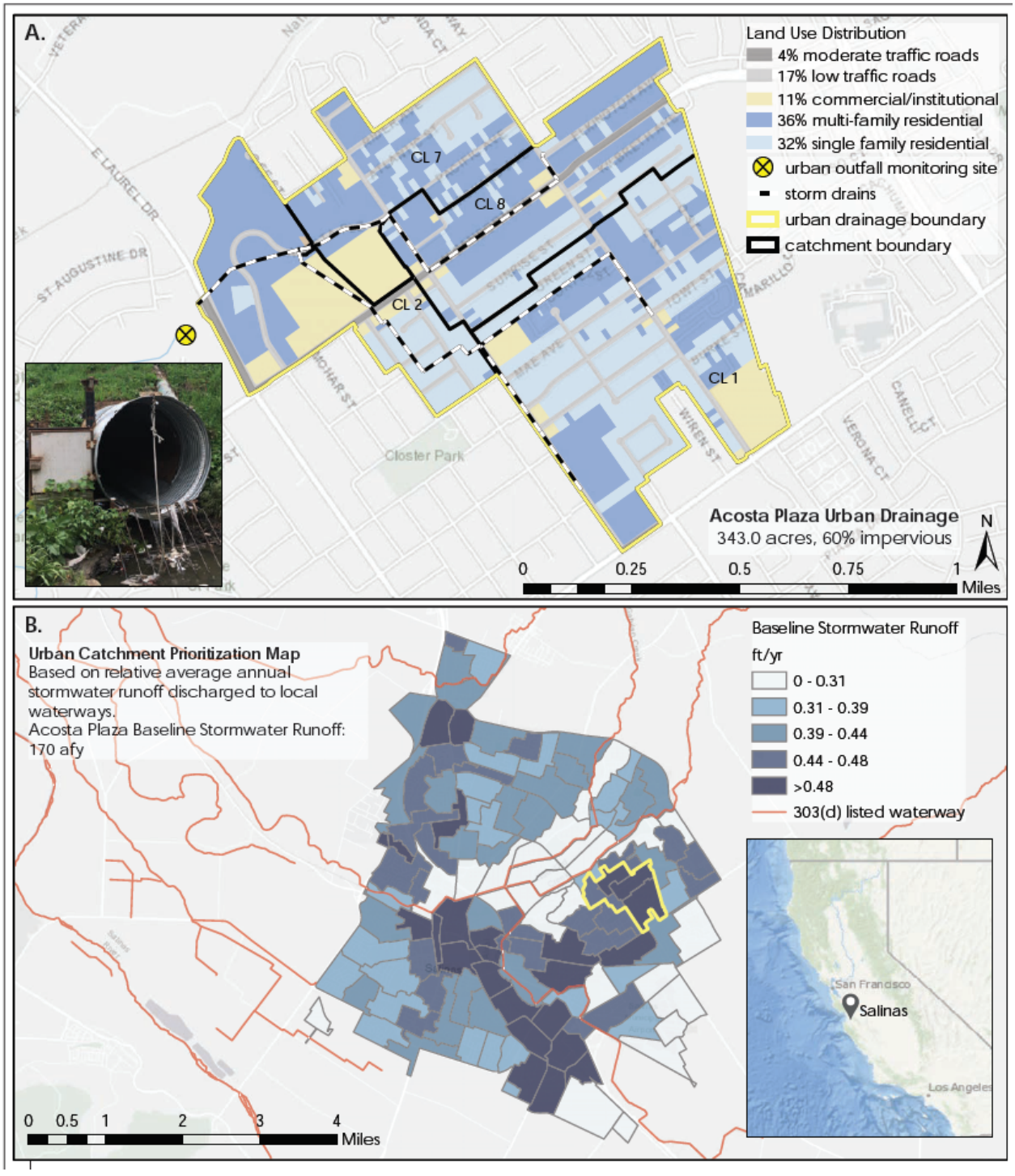
1) The City of Soledad's Regional Recharge Project,
2) The City of Salinas and Monterey One Water's Salinas Area Flood Enhancements and Reuse (SAFER) Project,
3) The City of Salinas, Monterey One Water and Central Coast Wetlands Group's (CCWG) Salinas Water Quality and Agricultural Reuse Efficiency Project, and
4) Monterey One Water's Ocean Outfall Beach Junction Structure Managed Retreat Project.

The fourth of these projects (Ocean Outfall) is a concept project that has not yet been formally engineered. The other three have been independently engineered and were submitted for this SWRP with extensive design detail, including the quantitative estimation of project benefits. It was beyond the scope of this SWRP to conduct a separate evaluation of the quantitative methods used to develop these engineering plans and benefit estimates. The proposal details were reviewed, and the project proponents are well qualified and have successfully completed similar recent projects. This chapter does not attempt to evaluate the quantitative methods involved in engineering these projects.

6.1.2 Low Impact Development Projects

Two projects in the City of Salinas involved installation of LID features to infiltrate storm water and reduce runoff. These are the *Acosta Plaza Urban Drainage Restoration Project* and the *Lincoln Green/Complete Street Project*. Both were evaluated by 2NDNATURE, LLC, using the Tool to Estimate Load Reductions (TELR). This tool has been developed in collaboration with the Central Coast Low Impact Development Initiative (LIDI) with funding from the Central Coast Regional Water Quality Control Board. An example TELR analytical product for the Acosta Plaza project shows a number of the features used to quantitatively evaluate the project and estimate storm water runoff patterns (Figure 6.1). These LID projects are concept projects that have not yet been sufficiently developed to provide quantitative estimates of project benefits. The SWRP team did no further evaluation of these two LID concept projects, and there is no further quantitative analysis of these projects in this chapter.

Figure 6.1 Representative TELR Output for the Design of the Acosta Plaza Concept Project



6.1.3 Landscape-Based Watershed Function Projects

The remaining eleven projects in this SWRP involve the evaluation of landscape features and processes that can be managed to direct storm water for storage, treatment, infiltration, habitat restoration and

recreational opportunities. The following sections of this chapter describe quantitative methods employed to evaluate watershed-based opportunities and to design natural feature-focused storm water projects for this SWRP. These quantitative methods include:

- Measurement and data analysis of benefits derived from similar previous projects;
- Geographic Information System (GIS) analysis of natural features such as topographic depressions, stream channels, engineered conveyances, wetlands, riparian areas, land cover, hydrography, soil types, geology and hydrologic connectivity;
- Hydrologic modeling using a water balance model of the entire Greater Monterey County IRWM region to evaluate interactions between proposed projects; and
- Flood modeling using Hydrologic Engineering Center's River Analysis System (HEC-RAS).

The quantitative methods and results of these analyses are described in sections 6.2 to 6.5. Details of the GIS analyses and base map are given in Appendix C. Details of hydrologic modeling are given in Appendix D.

6.1.4 Assessment of Cumulative Benefits to Satisfy Management Objectives

The following sections describe the analysis of opportunities and project benefits to produce quantitative estimates of the degree to which the integrated effects of all projects cumulatively meet the management objectives described in Chapter 5. The next sections describe, in order:

- The use of monitoring data from existing projects to estimate the quantitative benefits of proposed projects;
- The current water quality, supply, flood, habitat and community conditions in the study area, which provide a baseline for comparison to the desired conditions in order to determine improvements needed by new projects;
- The quantitative methods, including GIS and hydrologic modeling, used to identify new storm water management opportunities and to design projects to use these opportunities to meet management goals; and
- A quantitative comparison of the cumulative benefits of all projects with the numeric management goals listed in Chapter 5.

6.2 Information on Storm Water Benefits from Existing Projects

Detailed monitoring has provided data and information from existing treatment wetland, bioreactor, retention basin and recharge projects, and these data can be used to estimate the benefits expected from similar proposed projects.

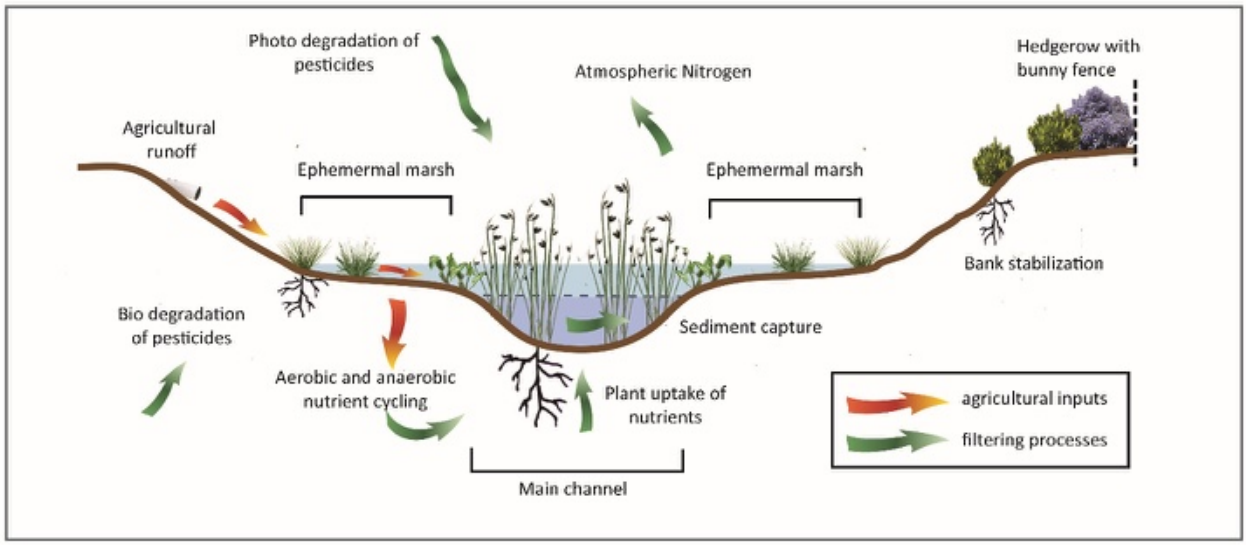
6.2.1 Projects to Improve Water Quality

Water quality can be enhanced by keeping pollutants out of storm water conveyance systems and by treating polluted storm water once it has entered storm drains, channels, streams and other waterways. Initial pollutant reduction at the source is managed through compliance with regulations such as grading permits, the Agricultural Order, and NPDES Municipal Separate Storm Sewer System (MS4) permits. This SWRP analysis describes projects that can improve storm water quality after it enters conveyances.

6.2.1.1 Water Quality Benefits of Existing Treatment Wetlands

Vegetated treatment wetlands (Figure 6.2) have been installed in the Moro Cojo, Elkhorn Slough and Salinas Valley watersheds (Vymazal 2010, Habitat Restoration Group 1996, ABA Consultants 1989, AMBAG 2005). Pollutant removal efficiency of wetlands is determined by project vegetation, flow, retention time, soils, bacterial assemblage and wetland design (Figure 6.2) (García-Lledó et al. 2011, Beutel et al. 2009, Daniels et al. 2005, Poe et al. 2003, Vymazal 2010, Vymazal 2007).

Figure 6.2. The Chemical and Biological Processes that Improve Water Quality in Treatment Wetlands



6.2.1.2 Water Quality Benefits of Existing Nutrient Bio-reactors

Woodchip bio-reactors provide a similar anoxic condition to those found in wetland soils and have been shown to be effective at reducing nitrates from surface water, usually with a much smaller spatial footprint.

6.2.1.3 Data from Local Examples: Castroville Treatment Wetland and Bioreactor

The Castroville treatment wetland covers 12 acres of land and drains approximately 1000 acres of farmland in the Moro Cojo watershed. The treatment capacity is estimated at 140,000 gallons/day, the average hydraulic retention time is 3 days (Figure 6.3a).

Figure 6.3 Castroville Treatment Wetland and Bioreactor

The Castroville experimental bioreactor is a twelve-chamber system that provides pretreatment of agricultural runoff from the Castroville ditch (3b). Data on nitrate reduction by this system are shown in Table 6.1.

Table 6.1 Nitrate Load Reduction for Two Treatment Systems

Treatment	Percent	mg/L	g/day	Load Reduction (g/day) per 100 m^2 of Treatment Area	Concentration Reduction (mg/L) per 100 m^2 of Treatment Area
Bioreactor (Cool Wood Chips)	45%	14.9	225	563	37
Treatment Wetland (Estimate)	35%	11.4	164	273	19

6.2.2 Existing Projects to Improve Water Supply

6.2.2.1 Infiltration and Retention Basins to Support Groundwater Sustainability (Pajaro Valley)

Managed aquifer recharge (MAR) is the intentional recharge and storage of water, including rainfall and storm water runoff, in a suitable aquifer to achieve water supply and water quality benefits. The Harkins Slough Managed Aquifer Recharge and Recovery facility in Watsonville diverts up to 2,000 acre-feet per year from Harkins Slough between November and May each year. Diverted water is filtered and pumped to the recharge basin where it infiltrates into subsurface soils for short-term storage. Extraction wells located around the perimeter of the recharge basin recover water when needed for irrigation. To date, PV Water estimates that over 8,700 acre-feet of water have been recharged in the Harkins Slough MAR.

6.2.3 Existing Projects to Improve Aquatic Habitat

A number of aquatic habitat enhancement projects have been successfully completed in the study area. Listed here are some examples with quantitative characteristics that indicate the potential for benefits that can be provided by the projects evaluated in this SWRP. The water quality benefits of these wetlands are characterized in section 6.2.1.

6.2.3.1 Catellus Wetland

Inn 2004 a total of 30 acres of pond habitat were created on the Catellus parcel in the lower Moro Cojo Slough through the construction of shallow water ponds and diversion of agricultural runoff to these ponds. Over 10,000 native plants were established and weed controlled to maintain the wetland.

6.2.3.2 Sea Mist Wetland

Also begun in 2004, the Sea Mist project included the enhancement, restoration, and protection of 350 acres of wetlands, floodplains, and adjacent upland habitats. The project demonstrated the use of practices to reduce nutrient inputs and restore natural habitats. Three ponds and connecting channels totaling more than 21 acres were created on the Sea Mist parcel, with an additional 20 acres of seasonally flooded wetland. Wetland and upland habitat were planted or drill seeded with native plant species to provide habitat and reduce erosion.

6.2.3.3 Moro Cojo Wetlands

In 2008 a total of 50 acres of wetland and upland habitat at twelve sites throughout the Moro Cojo watershed were restored and enhanced. The restoration has helped to mitigate anthropogenic impacts on wetland resources, particularly those that affect water quality, sedimentation, and loss of habitat.

6.2.4 Existing Projects to Improve Flood Management

A number of local flood reduction efforts have been undertaken by the Monterey County Water Resources Agency (MCWRA). Projects include nuisance vegetation removal in the Salinas River Stream Maintenance Program, the Potrero Tide Gate Replacement Project and efforts to remove debris and silt from Reclamation Ditch to increase channel capacity and conveyance. Data on reductions in peak flow and inundated acreage were not available at the time of this evaluation and flood benefits of proposed storm water projects have been estimated using HEC-RAS modeling (Appendix C).

6.2.5 Existing Projects that Provide Community Benefits

Natividad Creek Park is an example of a storm water-fed creek that enhances East Salinas' largest recreational area. This 64-acre park is adjacent to both a low-income housing project and a middle-income subdivision. One hallmark of the new park is to link the local community with natural habitat and recreational areas. The Return of the Natives Environmental Restoration and Education Program has involved Salinas' schools in the restoration 17 acres of the park with local flora, and added interpretive environmental elements into the park redesign. There are now over 20,000 native California plants in the park. The condition of this creek and wetland park received a CRAM score of 56-62, significantly greater that adjacent portions of the creek scoring 39.

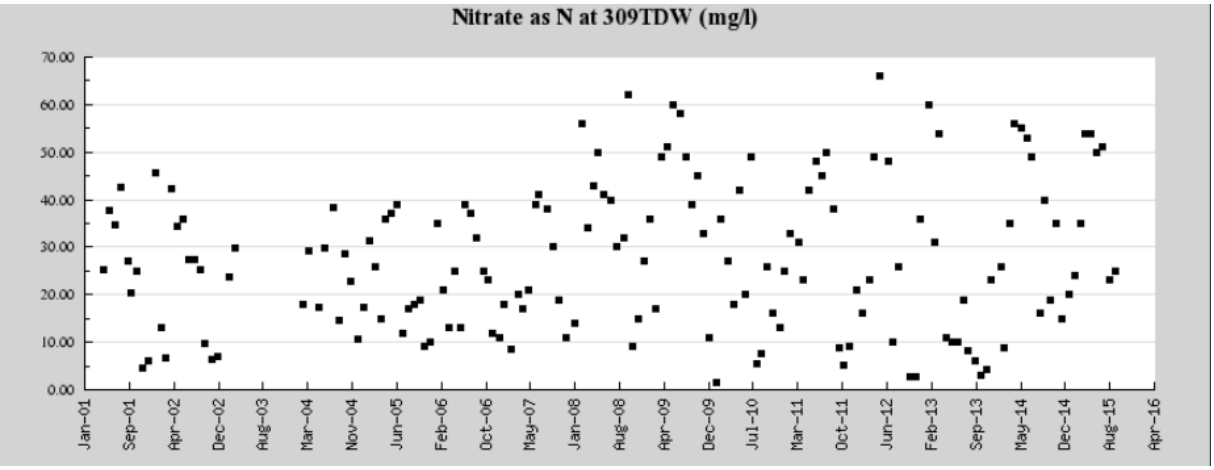
6.3 Current Conditions related to Storm Water Management Goals

A number of data sources and local reports were referenced to estimate where storm water management goals were not being met/achieved within the Salinas Valley. The goals for each category are described in Chapter 5. Data are presented provide a general baseline against which to evaluate the need for storm water management projects.

6.3.1 Current Condition for Water Quality

As described in Chapter 2 there are thirty-one 303d listed waterbodies in the GMC IRWM study area. Data collected within receiving waters have shown fluctuations in nitrate concentrations through time, likely the combine effects of changes in precipitation and seasonal farming practices including fertilizer application, irrigation scheduling and crop type (Figure 6.4). Despite the variability, overall concentrations at many sites, including this highly polluted site near the mouth of the Tembladero Slough, exceed nitrate water quality standards much of the time. Estimated annual loads are presented in section 6.4.1, along with comparisons to potential reductions from projects in this SWRP.

Figure 6.4 Nitrate Concentrations at the Confluence of the Reclamation Ditch and Old Salinas River 2000-2016. (Data and graphic from ccamp.org)



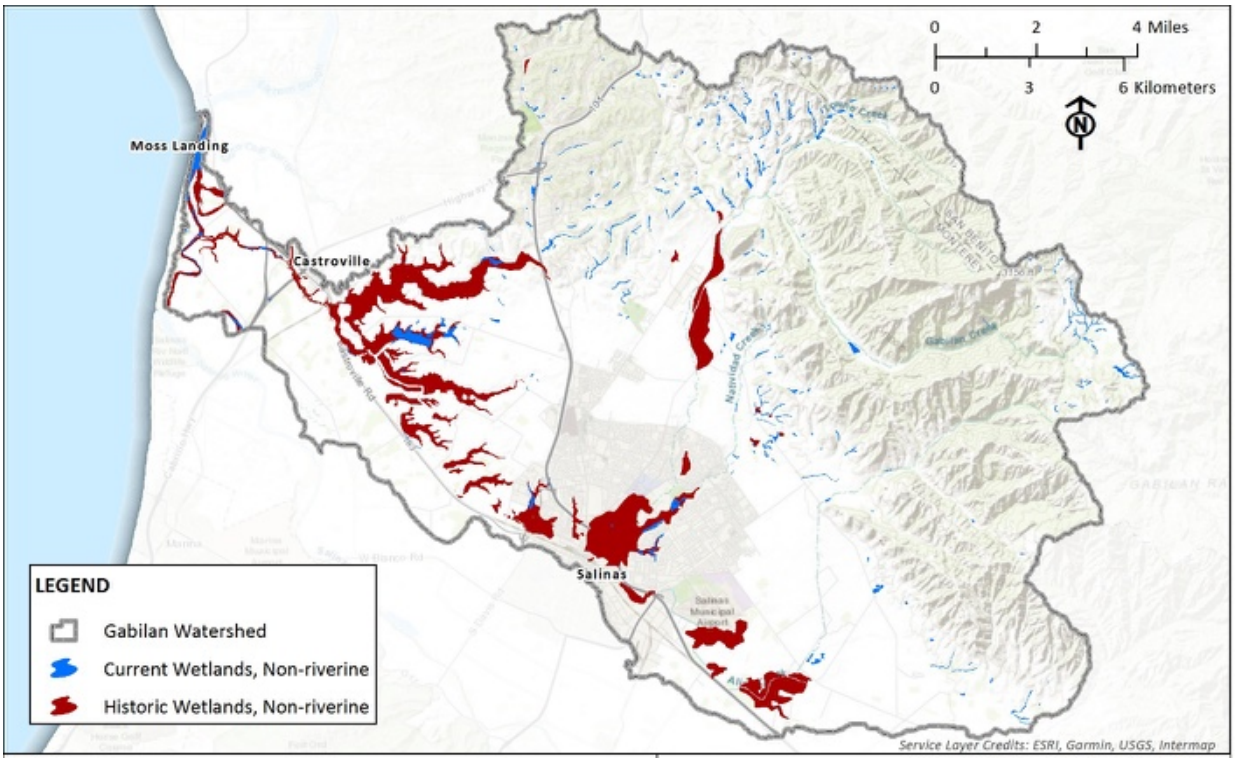
6.3.2 Current Condition for Water Supply

Water supply conditions in the target watersheds are described in Chapter 3. It is worth noting here that recent model outputs from USGS estimate that the Average Annual Change of Groundwater Storage in the Salinas Valley is an annual deficit of 13,270 af/y. This gives an indication that the current water supply in the study area is insufficient and unsustainable. Projects evaluated in this SWRP are intended to help alleviate the supply shortage that exacerbates groundwater overdraft.

6.3.3 Current Condition of Wetland and Riparian Habitat

As described previously, a network of drainage channels and the central Reclamation Ditch has transitioned the network of seven historical lakes of the lower Salinas Valley into a productive agriculture region with the resulting environmental challenges that come with a significant reduction in wetland and riverine resource condition and acreage (Figure 6.5).

Figure 6.5 Areas of the Gabilan Watershed that have experienced Wetland Reclamation



A GIS analysis of historical wetland habitats mapped before 1900 compared with current wetland acreages (National Wetlands Inventory) notes an 84% loss of wetland habitat within the Gabilan Watershed (Table 6.2). Some areas that were reclaimed a century ago are routinely too wet to farm or too vulnerable from flooding to build. Combined acreage of unused lands along the Reclamation Ditch has been estimated to far exceed 200 acres and could be repurposed for water quality, habitat and storm water management needs.

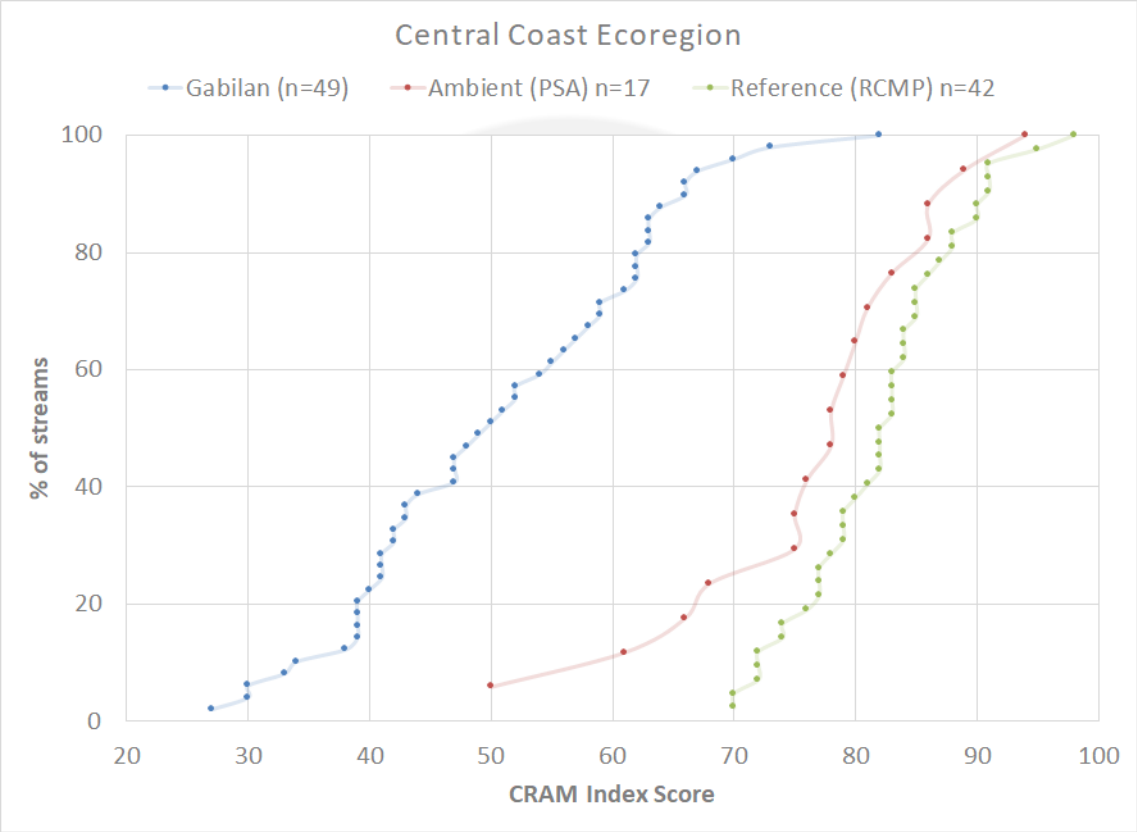
Table 6.2 Analysis of Historical Wetland Habitats Mapped before 1900 Compared with Current Wetland Acreages

Non-Riverine or Palustrine Wetland Habitat	Habitat Acreage	Percentage of Historical Acreage
Historical	5,907	100%
Current	950	16%
Total Loss	4,958	84%

In addition to a documented historical loss in wetland area, the condition of existing wetland and creek habitat has been compromised by adjacent land uses, upstream watershed impacts and channelization and armoring of drainage ways. Storm water projects that enhance flow conditions and reduce flooding can also be designed to enhance aquatic habitat condition.

The California Rapid Assessment Method for Wetlands (CRAM) is a standardized rapid habitat condition assessment tool for wetland monitoring, developed with support from EPA. Creek and river habitat within the Gabilan Watershed is in fair to poor condition (Figure 6.6).

Figure 6.6 Distribution of CRAM Scores for Gabilan Watershed Wetlands Compared to Wetlands of the Greater Central Coast and California Reference Sites



PSA = Data from the Perennial Stream Assessment of the California Surface Water Ambient Monitoring Program (SWAMP). RCMP = Data from the SWAMP Reference Condition Monitoring Program.

6.3.4 Current Flooding Condition

Historical Flooding

The Salinas Valley has experienced repeated flooding over the past 112 years since the initial storm water infrastructure was constructed (Table 6.3). The valley now experiences higher peak flows than seen historically for similar size rain events.

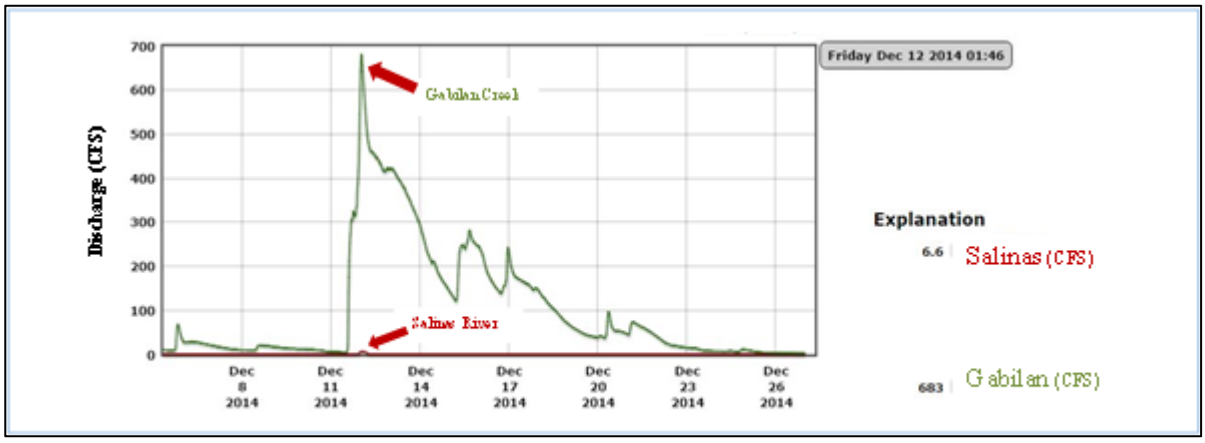
(See http://www.co.monterey.ca.us/government/government-links/water-resourcesagency/programs/floodplain-management/historical-flooding#wra).

Table 6.3 Major Floods in Moss Landing and Northern Monterey County, 1911 to Present

Date	Description of Damage
March 1911	More than 2,000 acres of farmland destroyed along Salinas River, electric light plant, pumping plant, oil tanks half submerged, buildings along river underwater, debris
January 1914	Bridge damage, some bridges carried away, torrential rains
February 1938	Salinas River flooded, damaged bridges, crops, and roads
Winter 1940-41	Closed roads, washed out piers and foundations, flooded streets, most rainfall for any season since 1890
February 1945	Lots of rain over 36 hours during an extreme dry spell, little damage
January 1966	32,000 acres of farmland inundated along the Salinas River, estimated $6,572,000 in damage
January & February 1969	Two successive floods of the Salinas River, substantial damage throughout the county
March 1995	Damage all over the county, mass evacuations throughout, including Moss Landing
February 1998	El Niño winter storms hit, rain and saturated ground, land and mudslides
March 2011	Tsunami, maximum amplitude of 2 meters in the area, Moss Landing damages: $1,020,000
December 2014	Flooding in lower Salinas Valley due to localized rain and flooding in the Gabilan Watershed. Costs to the agriculture industry estimated at more than $1,500,000
Winter 2017	Numerous winter storms hit, dune erosion, rain, saturated ground and flooding, land and mudslides

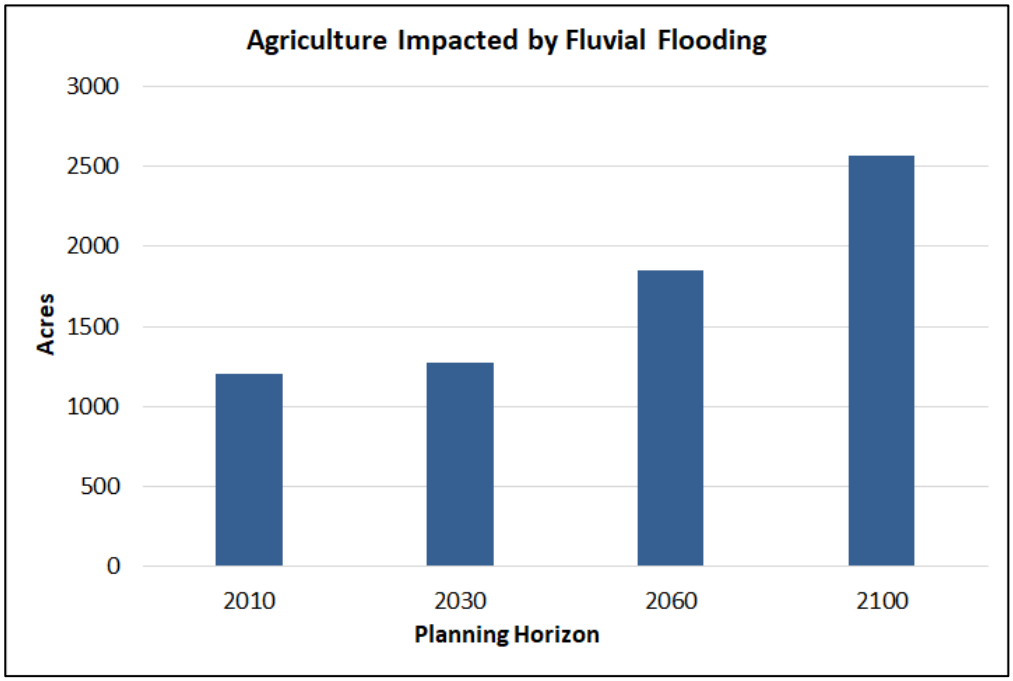
The 1995 March floods resulted in county-wide flooding of private property, resulting in damage to 1,500 homes and 110 businesses. In Castroville 312 residences and 38 businesses were damaged and 1,320 residents were evacuated. A 1998 flood closed or restricted 50 roads and highways in the county. In 2014 localized rainfall within the Gabilan hills caused discharges of almost 700 cfs within the Reclamation Ditch while during that same period the Salinas River flow did not surpass 10 cfs (Figure 6.7). This indicates the localized nature of flooding in the study area and the frequency with which flooding occurs. The Monterey County Hazard Mitigation Plan suggests that, “Based on previous occurrences, Monterey County can generally expect a serious flood event to occur every 4 years.”

Figure 6.7 River Discharge from Gabilan Creek and the Salinas River, December 11, 2014



Flooding like that predicted within the FEMA 100-year hazard maps is expected to become more frequent (e.g., 10-year interval) due to changing rainfall patterns associated with climate, and this will have an increased impact on agriculture (Figure 6.8; CCWG 2017).

Figure 6.8 Climate-Driven Changes in Flooding and Flood Impact on Agriculture



6.3.5 Current Community Needs Related to Storm Water Management

Previous watershed and resource planning efforts have documented community needs regarding water resource management in the study area (e.g., the IRWM planning effort, Environmental Justice Coalition for Water (EJCW) inventory, and the CCWG Castroville meetings). Specifically, the Gabilan Watershed Blueprint is an early planning effort conducted by the Greater Monterey County Regional Water

Management Group (RWMG) aimed at addressing and resolving water-related conflicts in the region, while promoting stakeholder collaboration and project integration. This resulted in the Water Resource Project Coordination (WRPC) effort in one sub-watershed area of the Greater Monterey County IRWM region, the Gabilan Watershed, from early 2011 to early 2014. This effort produced the Gabilan Watershed Blueprint. Specific conclusions described within the Blueprint effort that reflect storm water community planning include:

- Residents of Salinas should enjoy and have convenient access to green places, and ample outdoor education and activities that engage children and other community members to maintain local environmental quality.
- Within city boundaries, urban runoff management practices and facilities should minimize the impact of urban impervious surfaces on storm flows to regional waterways.
- Area farms should host a variety of farm runoff water quality management techniques reflective of individual approaches and needs and innovations, resulting in cleaner waterways amidst a thriving agricultural economy.
- The Reclamation Ditch/creek system should be able to safely and effectively convey storm flows while protecting or enhancing water quality as flows are conveyed to Moss Landing Harbor. Where possible, wetlands and other wildlife habitat should be incorporated into the system's function.
- Pedestrian and bike-friendly paths connecting Salinas to regional path systems should be developed along acceptable routes.

In March of 2014, Castroville community leaders and the public engaged in discussions about water related needs. Community leaders included members from the School District, the Public Library, the North Monterey County Parks and Recreation District, the Castroville Community Services District, the County Planning Department, and the Castroville Rotary Club. Identified community needs included: improved access to the coast, waterways, and open space; water quality improvement; flood reduction; walking and running trails; playing fields; small parks and environmental education programs. The discussions were captured in a wordle (Figure 6.9).

Figure 6.9 Wordle Results of IRWMP Outreach Efforts

6.4 Quantitative Methods to Identify New Storm Water Management Opportunities

Types of Projects for Consideration

Water Quality Treatment Systems:

- *Treatment wetlands and riparian corridors*
- *Engineered treatment systems (bioreactors, etc.)*
- *Urban LID and water quality treatment systems*

Water Supply:

- *Storm water capture*
- *Infiltration*
- *Reuse* projects

Flood Attenuation and Capture Projects:

- *Floodplain restoration projects*
- *Floodwater capture, retention and/or reuse*

Environmental Enhancement Projects:

- *Wetland/riparian restoration*
- *Treatment wetlands*

Community Enhancement Projects:

- *Floodplain open space*
- *Recreational trails between community centers*

This analysis uses data from existing projects pollutant load information, hydrologic modeling and GIS interpretation to identify locations and specifications for projects to improve storm water management.

GIS analyses used a GIS base map to compile and overlaid landscape, hydrologic, geologic and social services layers to identify opportunities for storm water capture, treatment, transport, recharge and reuse. We used the water balance model for the greater Salinas Valley to estimate inter-relationships and cumulative benefits of projects. A HEC-RAS flood model for the Gabilan watershed was modified to estimate seasonal flow conditions under current conditions, to identify areas where current conditions did not meet defined storm water management goals and then to evaluate the cumulative change in condition achieved by the projects in this SWRP. A nutrient box model was used to estimate current nitrate loads and potential load reductions by the projects in this SWRP.

Details of the GIS analyses and base map are given in Appendix C. Details of the hydrologic modeling are given in Appendix D. The following sub-sections describe the results of the GIS analyses.

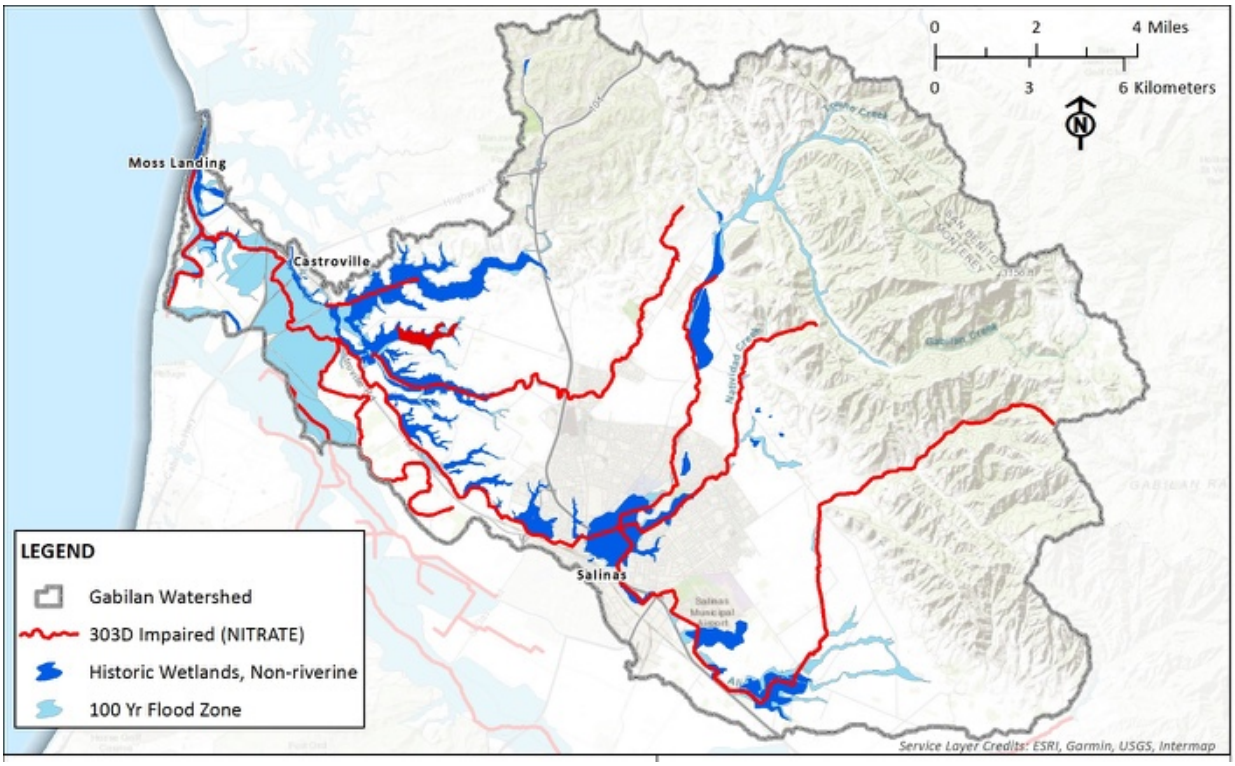
6.4.1 Opportunities to Improve Water Quality

Constructed systems to improve water quality (conveyances to water treatment plants, treatment wetlands, bioreactors) are best located near pollutant sources or along main drainages where treatment of entire sub-drainages can be achieved. Treatment wetlands are best located within areas that historically supported wetland habitat, do not currently meet water quality objectives, and where possible can be designed to provide secondary benefits that improve other storm water environmental objectives (Figure 6.10).

Water quality treatment wetland and bioreactor opportunity areas were defined where local drainage areas overlay with:

- Water quality impairment, as with inclusion on the CWA 303d list
- Areas selected as priority load reduction sub-watersheds
- Large floodplain areas (100 year flood map)
- Historical wetland areas
- Low productivity agriculture due to annual flooding or high ground water

Figure 6.10 GIS Layer of Geomorphic Depressions and Historical Wetlands Adjacent to Impaired Waterways



The Nitrate Load Box Model was used to estimate the size of treatment projects needed based of GIS analysis of project location and current pollutant levels. The model used drainage basin land use information (total acres in cultivation) and dry and wet weather discharge averages from the Mod/Flow

model to estimate average nitrate load and concentration within 11 sub-basins of the Gabilan Watershed (Table 6.4, Figure 6.11). Total nitrate load and concentration estimates for each sub-drainage were compared with seasonal water quality objectives to estimate how much the current (modeled) load exceeded the allowable load. Load exceedance values (both positive and negative) provide an estimate of the level of treatment needed to meet water quality objectives.

Table 6.4 Nitrate Annual Load and Load Exceedances in 10 Sub-Watershed Basins in the Gabilan Watershed

Sub Water-shed Basin	Watershed treatment basin	TMDL category	Allowable concentration mg/l Wet (Nov 1 - April 30)	Allowable concentration mg/l Dry (May 1 - Oct 31)	Total allowable annual load (kg/yr)	Total Load (kg/yr)	Load Exceeded (kg/yr)
1	Espinosa Wetland	Tembladero	8	6.4	9,908	21,124	11,216
2	Espinosa Lake	Espinosa	8	6.4	1,945	15,104	13,159
3	SanJon Detention	Rec Canal	8	6.4	4,510	33,163	28,653
4	Boronda	Rec Canal	8	6.4	6,222	5,321	-901
5	Natividad Rd.	Gabilan	8	2	0	30,787	30,787
6	Old Stage	Natividad Creek	8	2	898	545	-353
7	Old Stage South	Alisal	8	2	1,180	2,715	1,535
8	Old Stage Lower	Alisal	8	2	476	3,012	2,536
9	Castroville Pond	Tembladero	8	6.4	12,163	39,734	27,571
10	Carr Lake	G/N/A	8	2	28,936	158,876	129,940
11	Airport	Alisal	8	2	9,866	75,709	65,843

Figure 6.11a. The Ten Gabilan Sub-Watershed Basins in the Nitrate Box Model (# 1 – 8)

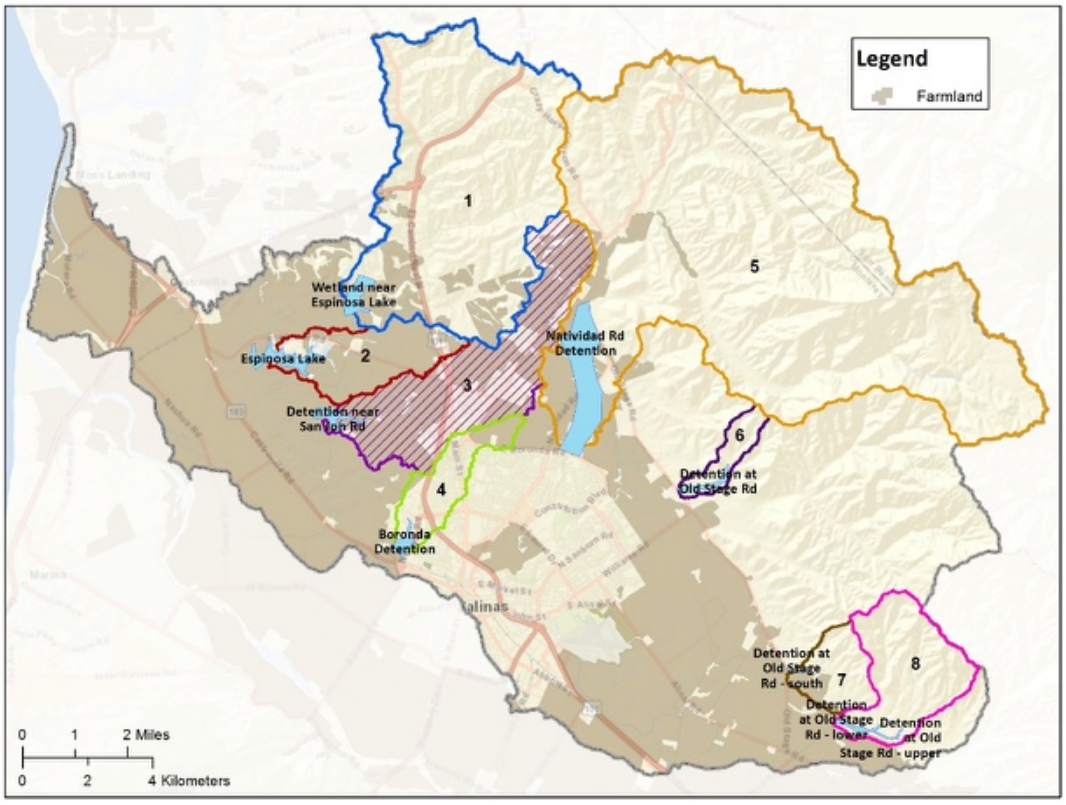
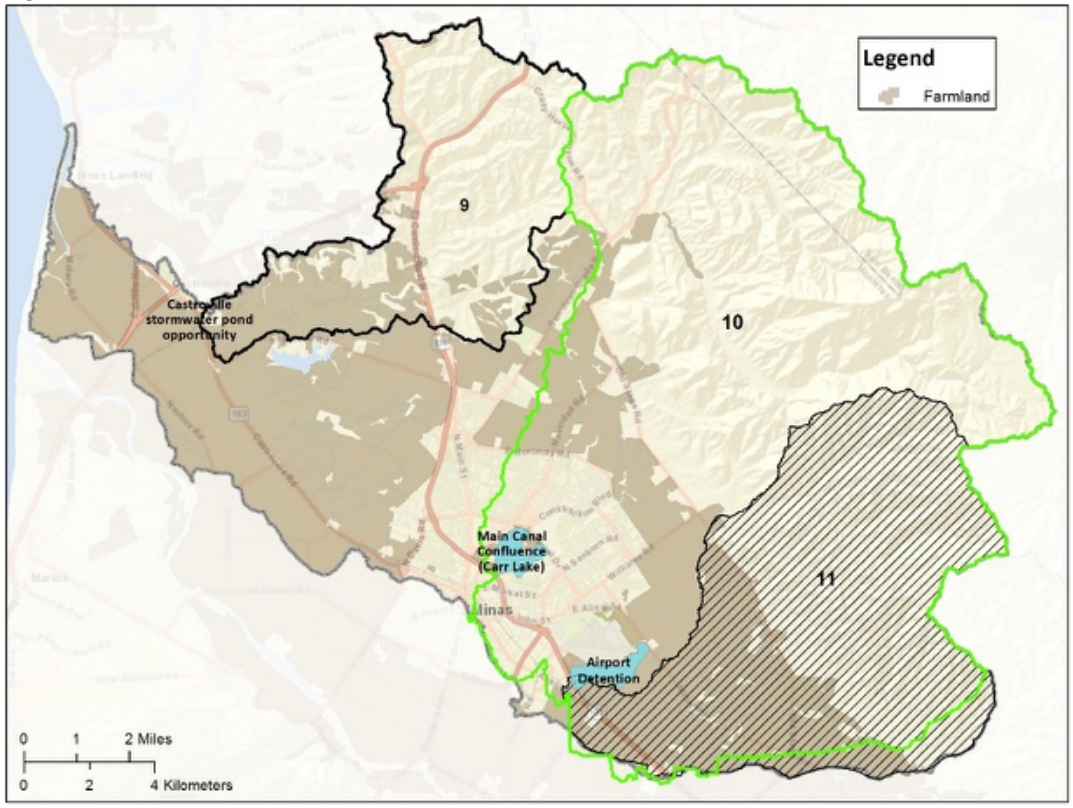


Figure 6.11b. The Ten Gabilan Sub-Watershed Basins in the Nitrate Box Model (# 9 – 11)



Given the estimated annual load above that which would meet water quality standards (Load Exceeded column in Table 6.5, data from existing treatment wetlands and bioreactors were used to determine the size of similar projects needed to reduce loads to meet standards or to approach zero (Table 6.5). The cumulative total for all projects is shown in the final row.

Table 6.5 Sub-drainage Loading and Needed Treatment Areas to Meet Water Quality Objectives

Sub water-shed Basin	Watershed treatment basin	Load exceeded (kg/yr) N	Size of treatment (acres) needed to meet WQO		Size of treatment (acres) to achieve 0 mg/l N	
			Wetland	Bioreactor	Wetland	Bioreactor
1	Espinosa Wetland	15,512	5.5	1.7	9.0	2.9
2	Espinosa Lake	15,882	5.6	1.8	6.3	2.0
3	SanJon Detention	31,535	11.1	3.5	12.7	4.1
4	Boronda	-734	-0.3	-0.1	2.0	0.6
5	Natividad Rd.	36,606	12.9	4.1	16.8	5.3
6	Old Stage	63	0.0	0.0	0.3	0.1
7	Old Stage South	2,732	1.0	0.3	1.4	0.4
8	Old Stage Lower	6,628	2.3	0.7	2.5	0.8
9	Castroville Pond	33,466	11.8	3.8	16.2	5.1
10	Carr Lake	176,098	62.2	19.8	72.5	23.1
11	Airport	87,108	30.7	9.8	34.3	10.9
			142.9	**45.5**	**174.0**	**55.4**

6.4.2 Opportunities to Improve Water Supply

In terms of landscape-based storm water management projects, GIS was used to identify areas for storm water retention and infiltration, with the following characteristics:

Retention

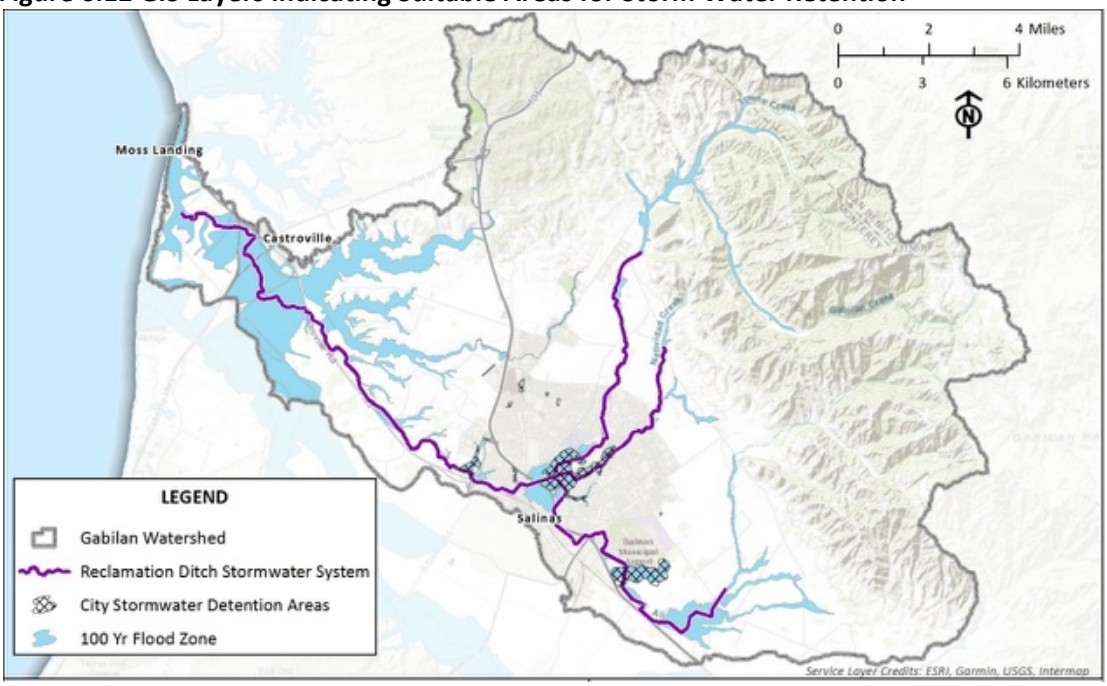
- Large floodplain areas (FEMA 100)
- Designated flood management areas
- Areas contributing to downstream flooding
- Areas near or up stream of collection and reuse infrastructure
- Historical depressions and wetlands

Infiltration

- Large floodplain and riparian upland areas
- Areas with permeable soils and subsurface geology where infiltration into groundwater is feasible

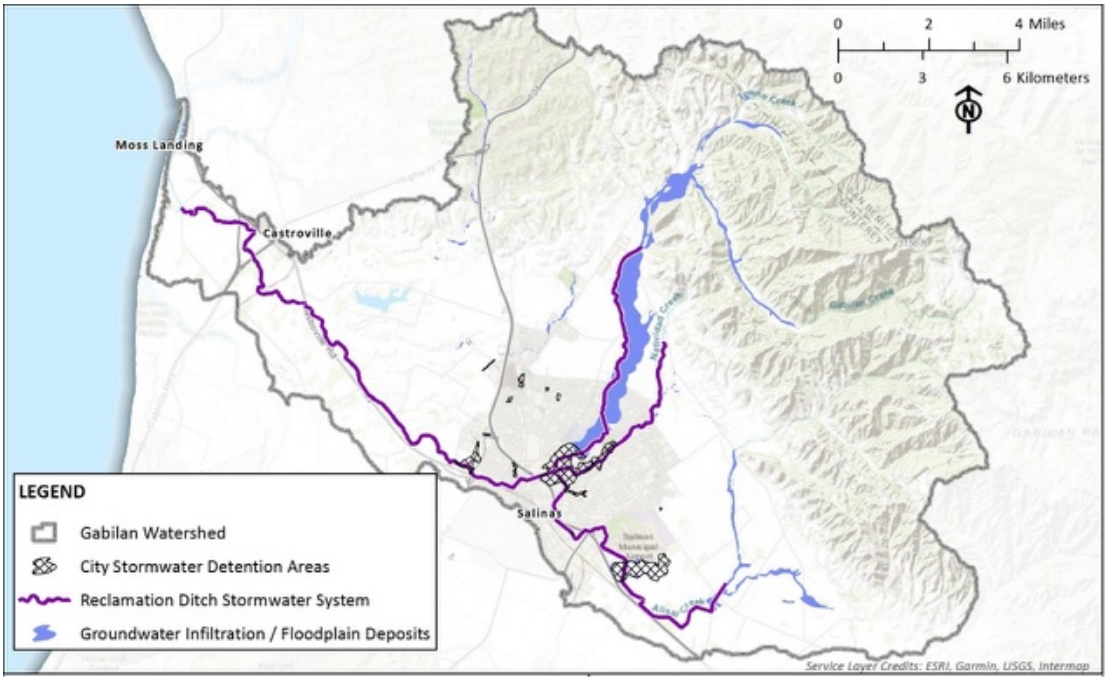
GIS layers were developed to identify flood plains, geomorphic depressions and other areas suitable for storm water retention (Figure 6.12).

Figure 6.12 GIS Layers Indicating Suitable Areas for Storm Water Retention



A number of groundwater management reports document areas within the watershed that support recharge of the 180 and 400 Foot Aquifers (MCWRA 2006, Brown and Caldwell 2015). Monterey County has created a GIS layer of infiltration areas within the watershed (Figure 6.13). Most recharge opportunities are located within the Gabilan Mountain range (specifically the Prunedale area and Gabilan Creek main stem) and at the base of the foothills where water historically spread into wider flood plain areas (base of Gabilan Creek foothills).

Figure 6.13 GIS Layers Indicating Suitable Areas for Storm Water Infiltration



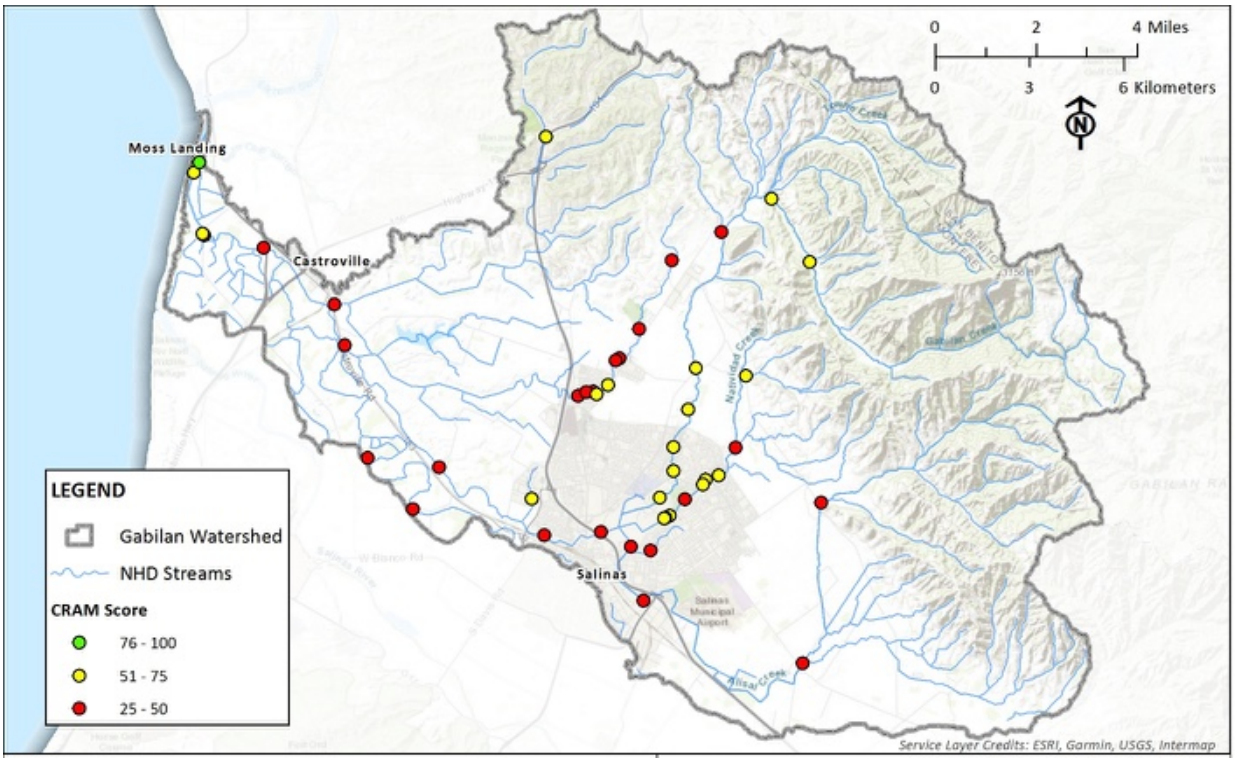
6.4.3 Opportunities to Improve Aquatic Habitat

GIS layers used to identify locations to use storm water for wetland and riparian habitat include:

- Historical wetland areas
- Large floodplain areas
- Area is adjacent to communities with limited parks and open space
- Wetland areas with low environmental condition (e.g., HAB scores)
- Low productivity agriculture due to annual flooding or high ground water
- Range lands with historically reduced riparian width or condition

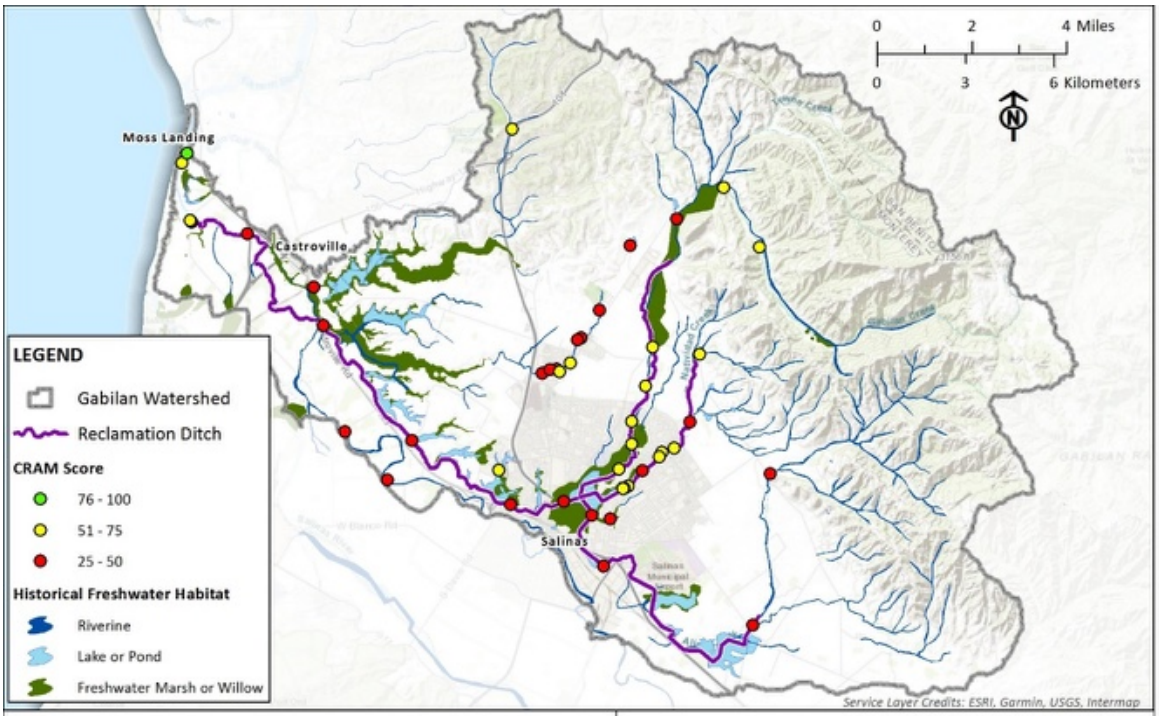
In addition to landscape features, opportunities to use storm water for wetland habitat enhancement occur where current wetland condition is degraded. Locations with red dots (Figure 6.14) show where wetland habitat is in poorest condition.

Figure 6.14 Ranges of CRAM Scores Indicating Condition of Existing Wetland Areas



An overlay of geomorphic and habitat condition layers highlights opportunity areas for wetland enhancement projects to manage storm water (Figure 6.15).

Figure 6.15 GIS Layers Indicating Suitable Areas for Habitat and Treatment Wetlands



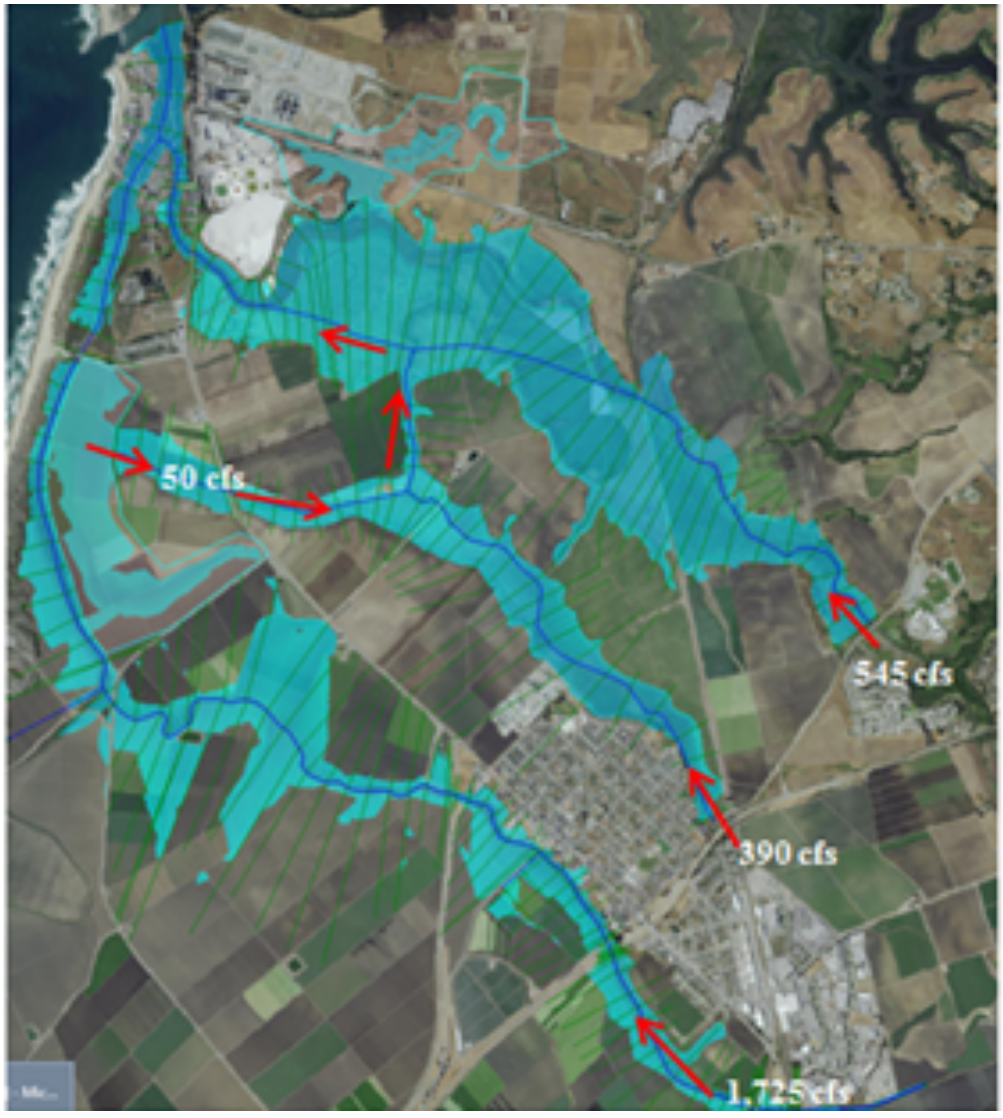
6.4.4 Opportunities to Improve Flood Management

6.4.4.1 Hydrologic Modeling Approach to Flood Management Opportunities Analysis

Two models were used to characterize current conditions and estimate project flood management benefits within the study area. One is a ModFlow water balance model, which simulates rainfall-runoff and routing processes over the full Salinas River watershed. The other is and a HEC-RAS flood model, which simulates channel and floodplain hydraulics, and estimates water level and flood inundation extents for parts of the Gabilan Creek watershed.

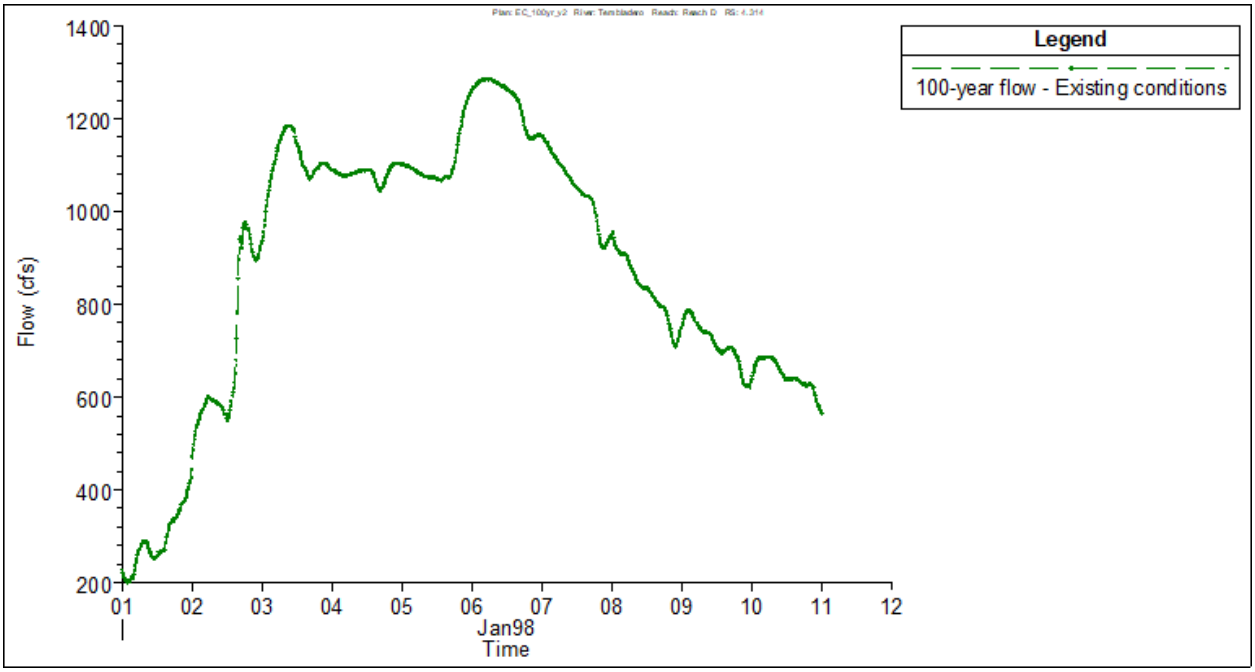
A hydraulic model of channels in the Gabilan Creek watershed was updated from a prior analysis completed by ESA (2016). This model was used to evaluate the downstream peak flow, water surface, and inundation extent benefit of individual projects for a 10-year and 100-year design flow event. The model coverage is shown in Figure 6.16.

Figure 6.16 Inundated Areas in a 100-Year Flood Event in the Gabilan Watershed Hydraulic Model Domain



Two events were analyzed: the 10-year (10% annual chance) event and the 100-year (1% annual chance) event. These were selected as a moderate and high-risk condition to cover a range of potentially extreme events likely to occur in the study area. An example 100-year hydrograph for existing conditions and cumulative project conditions at Preston Road in Castroville is shown in Figure 6.17.

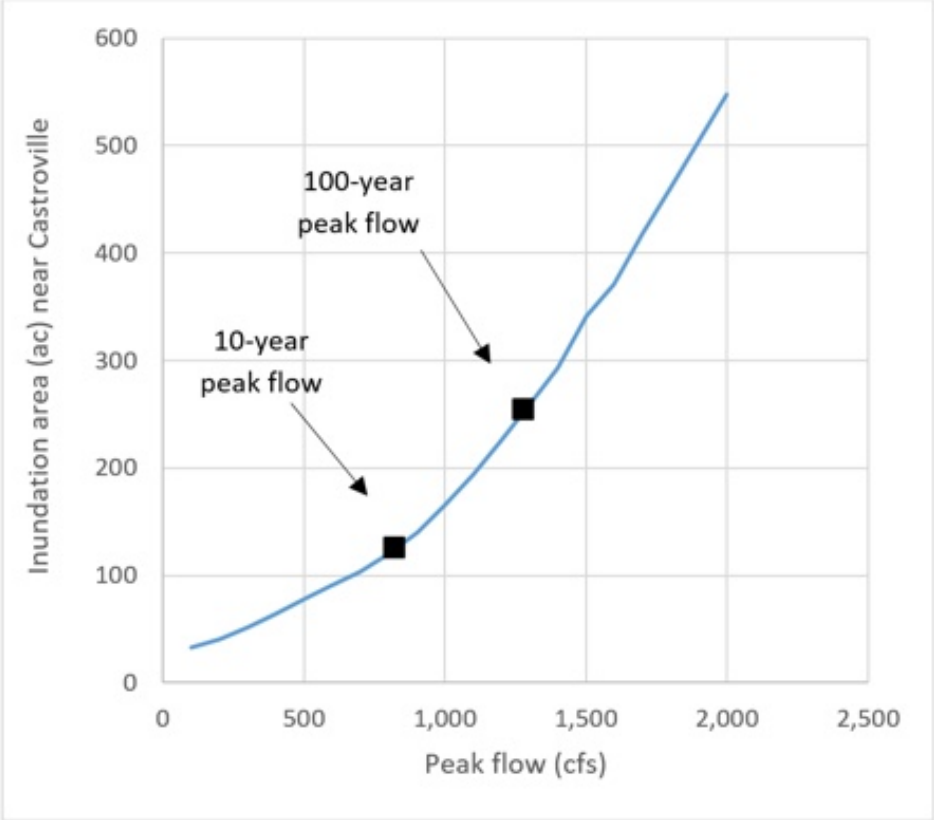
Figure 6.17 Hydrograph 100-Year Storm Event under Existing Conditions for an 85% Storm Event at Preston Road in Castroville



A cumulative project run was also evaluated for a rainfall event equivalent to the 85th percentile rainfall in the region. Based on data compiled by the California Coastal Commission for its water quality program, the 85th percentile 24-hour rainfall is 1.1 inches for Monterey (CCC, 2015). By distributing this rainfall evenly over the watershed the resulting peak flow rate was evaluated for existing and cumulative project conditions at the Reclamation Ditch monitoring location at Preston Road near Castroville. The model results show an estimated flow of 338 cfs for the 85th percentile rainfall event.

A supplementary analysis was conducted to evaluate the farmland inundation extent for a range of flows downstream of Castroville Road. Flow capacity varies through this reach but it was estimated from the hydraulic model that the left bank of the Reclamation Ditch channel overtops at approximately 700 to 1,200 cfs, while the right bank overtops at approximately 700 to 1,000 cfs. The relationship between peak flow and inundation area is shown in Figure 6.18. Peak flow for the 10- and 100-year events at this location is 825 and 1,287 cfs, respectively. This relationship provides a way to contextualize the reduction in flood area for each increment of peak flow reduction realized by implementing a given project.

Figure 6.18 Relationship between Peak Flow and Inundation Area under 10- and 100-Year Storm Events for the Reclamation Ditch near Castroville



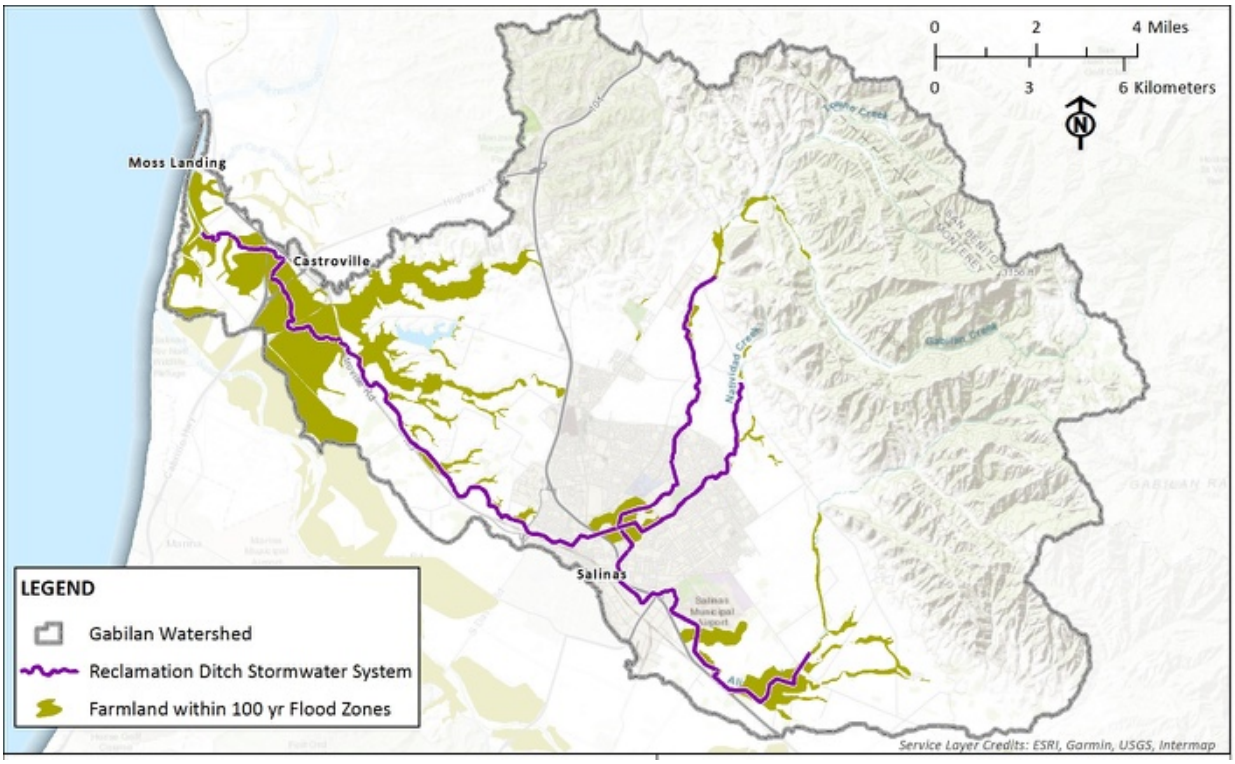
6.4.4.2 GIS Approach to Flood Management Opportunities Analysis

GIS layers used to identify locations for potential flood management projects included:

- Upper watershed riparian floodplain areas
- Large floodplain areas that threaten agriculture
- Areas where agriculture is impacted by periodically flooding or high ground water
- Areas near or up stream of collection and reuse infrastructure
- Historical wetland areas
- Drainages attributed as a cause of downstream flooding

GIS overlays show the opportunity areas for flood management based on consideration of the above features (Figure 6.19).

Figure 6.19 GIS Layers Indicating Opportunity Areas for Flood Management



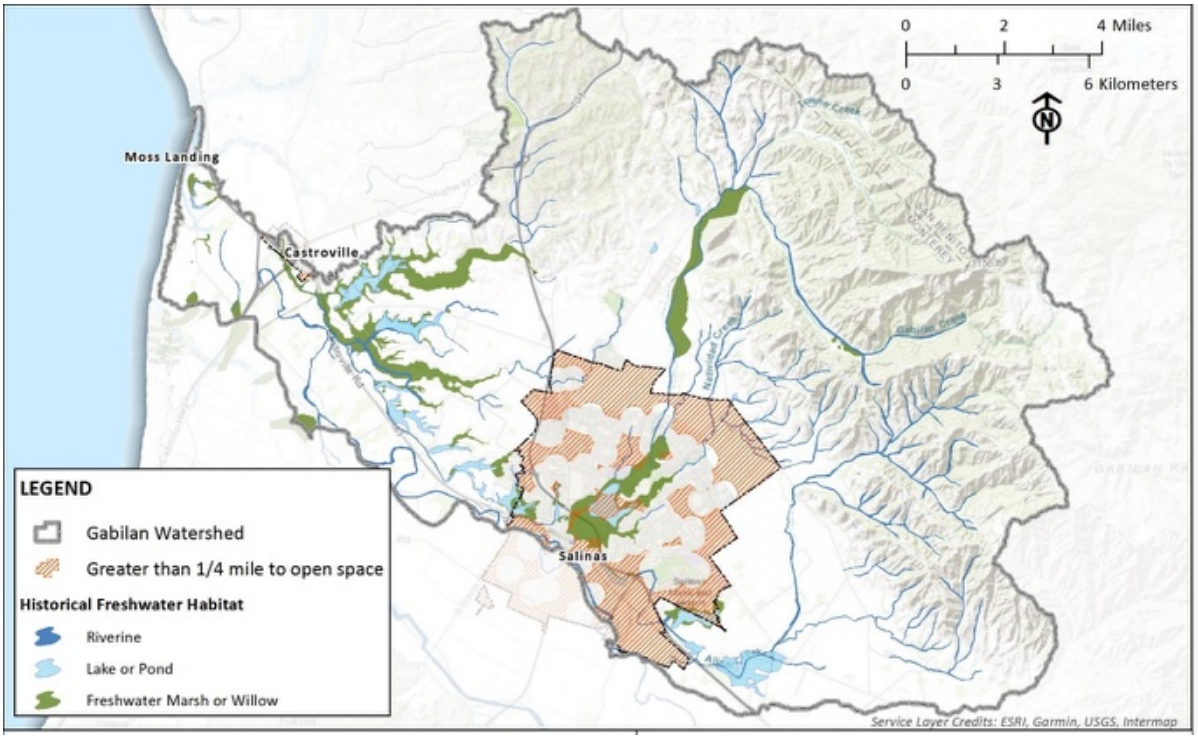
6.4.5 Opportunities to Provide Community Benefits

GIS layers used to identify locations for storm water projects to enhance recreation, aesthetics, non-vehicular transportation, and public connection to nature areas include:

- Drainages within or adjacent to residential communities
- Large urban floodplain areas
- Historical wetland areas
- Flood prone urban areas
- Near neighborhoods located more than one-quarter mile from community open space
- Areas identified as needing walking and bike paths
- Areas that link community destinations
- Areas where linear land acquisition adjacent to waterways is feasible
- Areas where needing ball fields and other recreation

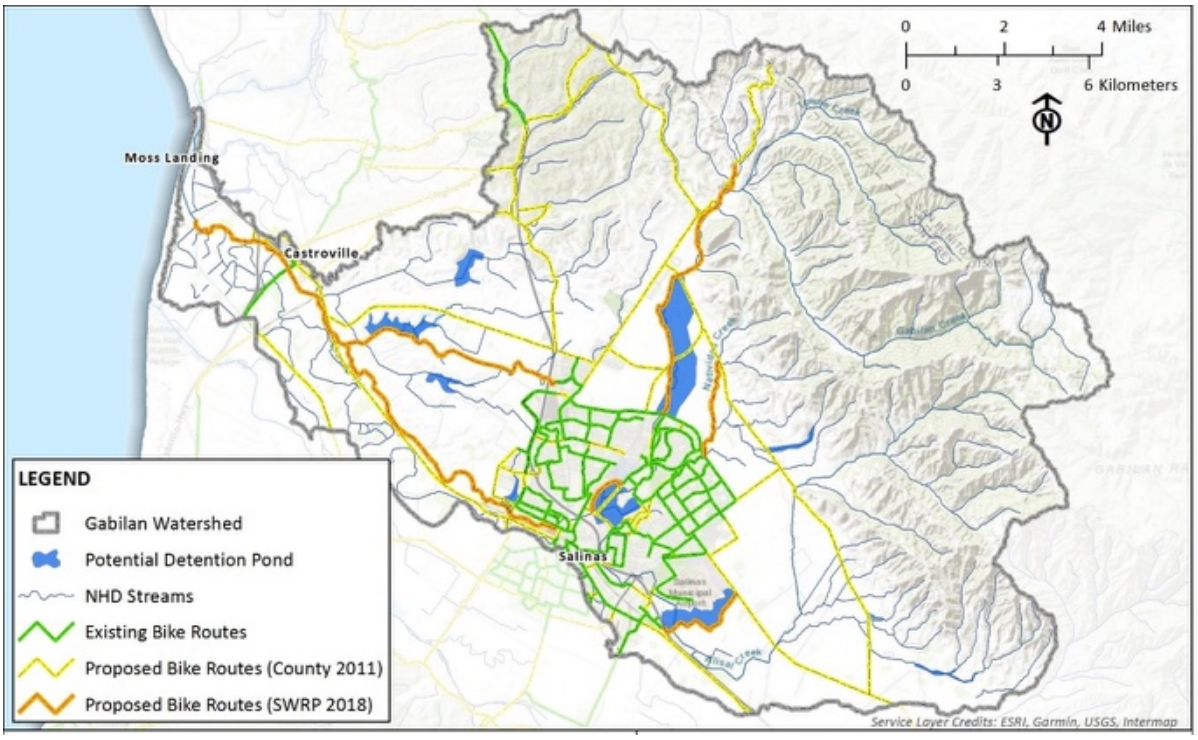
The GIS analysis using available parks and open space maps identified a number of neighborhoods in the City of Salinas that were further than one quarter mile from community open space (Figure 6.20).

Figure 6.20 Neighborhoods in the City of Salinas that were Further than One Quarter Mile from Community Open Space



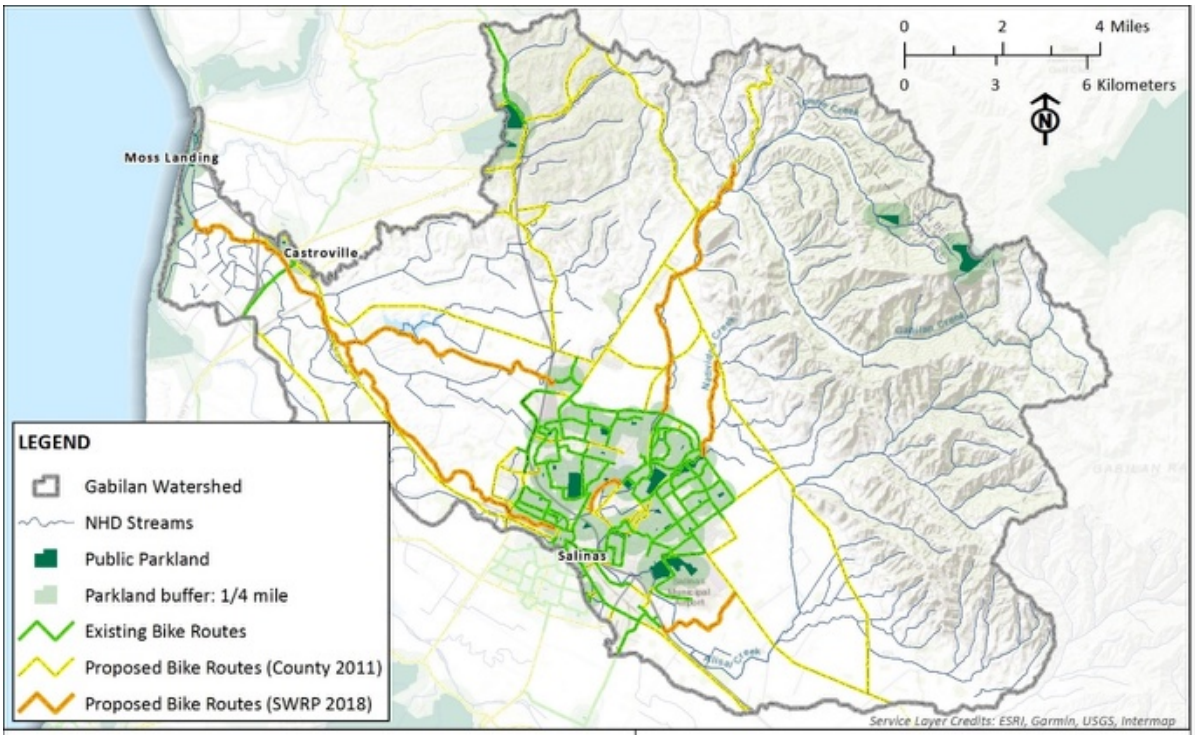
Areas where existing bike and pedestrian infrastructure did not provide movement between urban population centers in the lower Salinas Valley were identified using GIS layers from AMBAG and Monterey County. Proposed infrastructure upgrades within the County Bike Plan were highlighted (Figure 6.21). Linear pathways that parallel storm and creek drainage pathways were noted as optimal areas for multi-benefit project development and implementation.

Figure 6.21 GIS Overlay of Bike Routes, Streams, and Potential Storm Water Detention Areas



Combining layers for neighborhoods, parks, open space and needed bike corridors further highlights areas for multi-benefit storm water projects (Figure 6.22).

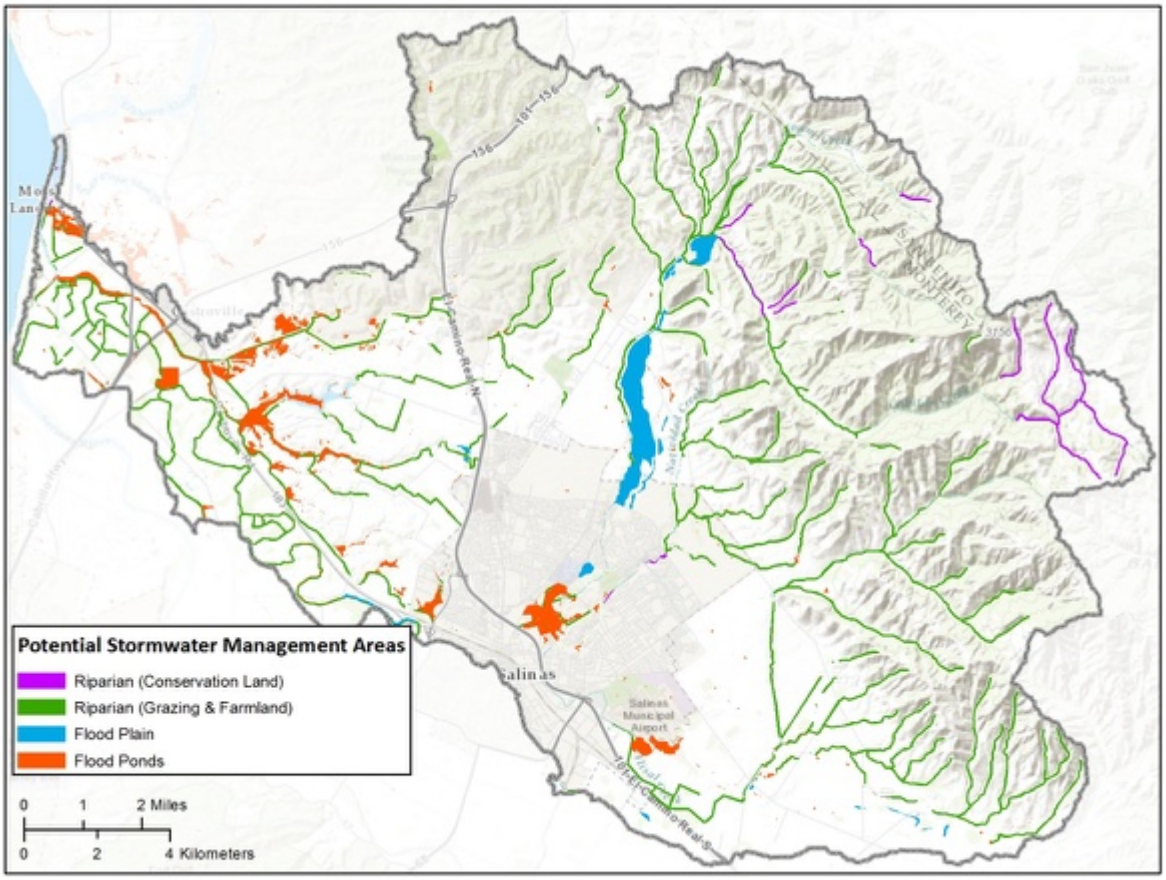
Figure 6.22 Overlay of Parkland, Streams, and Existing or Potential Bike Path Corridors



6.5 Cumulative Benefits of Multiple Storm Water Management Projects: Quantitative Methods and Results

In the overall quantitative analysis for this SWRP, priority was given to identifying storm water management opportunities that provided both multiple benefits and operational coordination to enhance the overall cumulative benefits of all projects implemented. Figure 6.23 shows the overlay of GIS layers described above and highlights areas within the watershed where storage, treatment, flood reduction, infiltration, habitat restoration and community open space creation are most likely to co-occur and maximize the cumulative watershed-wide benefits of all projects.

Figure 6.23 Gabilan Watershed Storm Water Priority Areas for Multi-benefit Projects



6.5.1 Benefits Addressed by Approved and Proposed Projects

The cumulative benefits for five metrics, one for each benefit category, are shown in Table 6.6. These include benefits for one funded project from the Greater Salinas SWRP, eight concept projects and nine design projects in this SWRP. There is substantial potential for cumulative benefits to address the management goals stated in Chapter 5. These are addressed by benefit type in the following sections.

Table 6.6 Benefits of the One Funded and Six Proposed Implementation Projects

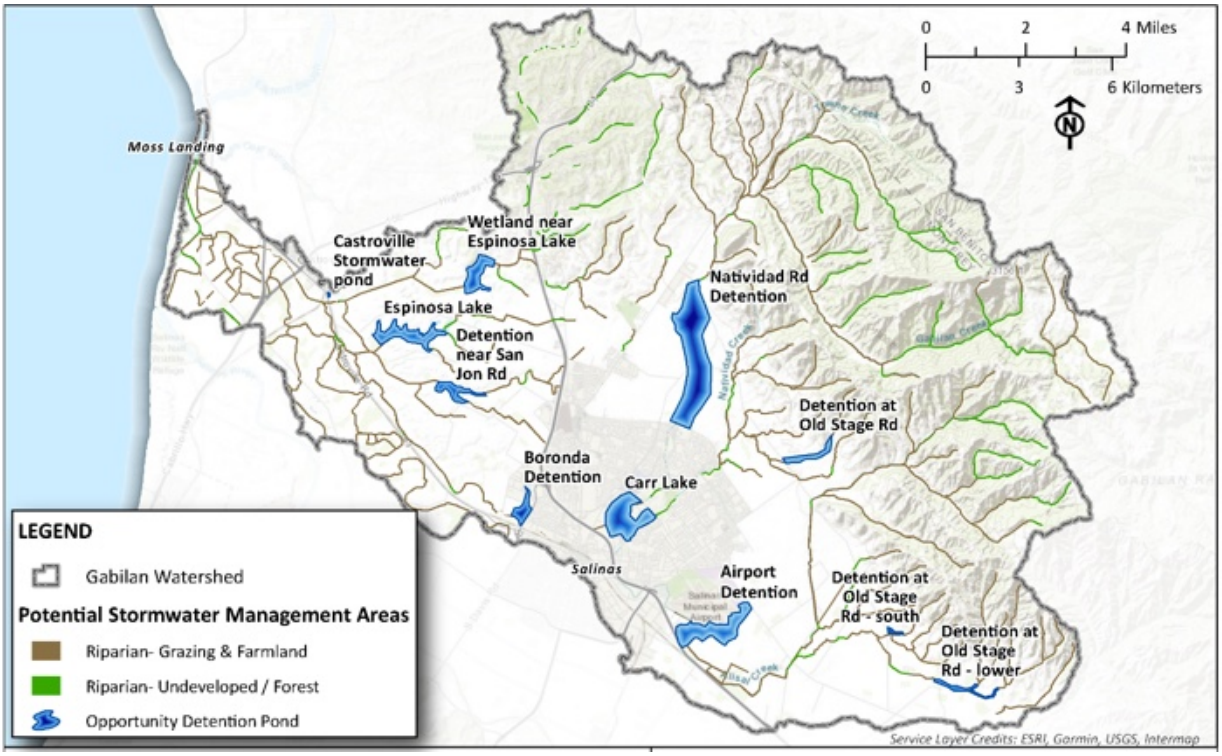
Project Applicant	Project Title	Water Quality	Water Supply	Flood Benefits	Environmental Benefits	Community Benefits
		NO3 - N load reduction (kg/y)	Storm Water Captured for Reuse (af/y)	Decreased in Inundated Area (acre)	Wetland Habitat Created (acre)	New Park and Open Space (acre)
Greater Salinas SWRP Project Funded in Round 1						
Monterey One Water	Storm Water Reuse	18,400	1,400	ND	ND	ND
Concept Proposals, This SWRP						
Big Sur Land Trust	Carr Lake	ND	419	88	73	73
Central Coast Wetlands Group	Gabilan Floodplain	ND	ND	ND	84	ND
Central Coast Wetlands Group	Salinas to the Sea	10,562	ND	ND	500	100
City of Salinas	Acosta Plaza LID	ND	ND	ND	ND	ND
City of Salinas	Lincoln Avenue LID	ND	ND	ND	ND	ND
Monterey One Water	Ocean Outfall	ND	ND	ND	ND	ND
Moss Landing Harbor District	Harbor Water Quality	ND	ND	ND	14	ND
Resource Conservation Districts	Managed Recharge	ND	195	MD	ND	ND
Design Proposals, This SWRP						
Central Coast Wetlands Group	Blanco Drain Treatment	ND	ND	ND	11	ND
Central Coast Wetlands Group	Castroville and ML	ND	66	67	7	1
Central Coast Wetlands Group	Espinosa Lake	7,552	12	29	185	185
Central Coast Wetlands Group	Old Salinas River	ND	ND	ND	5	ND
Salinas and Monterey 1 Water	SAFER	ND	300	ND	ND	ND
City of Soledad	Regional Recharge	ND	272	7	ND	4
County of Monterey	Bridge Bioswales	ND	1	ND	ND	ND
Elkhorn Slough Foundation	Ridgeline to Tideline	ND	180	ND	150	ND
M1W/CCWG/Salinas	Agricultural Reuse	ND	300	ND	35	ND
Total		**36,514**	**3,145**	**191**	**1,064**	**363**

ND = No Data

6.5.2 Potential Watershed-wide Benefits

The analyses described in Section 6.4 identified opportunities, some of which were subsequently submitted as concept projects for this SWRP. These concept projects need further refinement to determine possibilities to work with land owners, regulatory challenges, adjacent land use consideration, agency/land owner commitment to long term management and other factors that must be addressed before concept projects can be developed for implementation funding. Concept project locations are shown in Figure 6.24.

Figure 6.24 Estimated Location of Concept Projects Developed from GIS and Model Analysis of Multi-Benefit Watershed-Based Opportunities for Storm Water Management



Specific dimensions for concept projects have not yet been determined, but general size of potential projects is shown in Table 6.7.

Table 6.7 General Design Specifications of Concept Projects

Project	Project Size/Type
Castroville to the Sea	21,500 ft of channel expansion (60ft wide)
Espinosa Lake	630 af of detention (3-5ft depth)
Carr Lake	1,000 af of detention (3-5ft depth)
Airport detention	980 af of detention (3-5ft depth)
Gabilan floodplain expansion	255 af of floodplain detention (3-5ft depth, 80 acre portion of area)
Boronda detention	210 af of detention (3-5ft depth)
San Jon detention	270 af of detention (3-5ft depth)
Castroville ponds	15 af of detention (3-5ft depth)

6.5.2.1 Cumulative Water Quality Benefits of Concept Projects

Using nitrate load reduction rates measured at the Castroville Slough treatment wetland (3,600 kg/acre treatment wetland per year), we estimated potential load reduction that could be accomplished by proposed projects in ten sub watersheds (Table 6.8). Detentions basins can be less efficient than wetlands, so basin treatment rates were calculated at one-fifth to one-half the efficiency of the Castroville wetland, depending on detention basin depth. Shallower basins provide more efficient load reduction. Concept project size and load reduction potential were compared with the modeled existing nitrate loads within sub-watersheds and the projected load reduction capacity of the projects was reported as percent of that needed to meet water quality standards. Only two of the concept projects (as evaluated here) were found to be undersized for the load reduction needed for those subwatersheds. These model estimates are generalized and based on a number of assumptions that can be refined, but many of the projects far exceeded the size needed to achieve water quality objectives, indicating that implementation of these projects could eliminate nitrate impairments in many study area watersheds.

Table 6.8 Project Potential to Eliminate Impairment due to Nitrate Loading

Sub water-shed Basin	Watershed treatment basin	Load exceeded	Size of treatment (acres) needed to meet limits	Size of treatment (acres) to get to 0 mg/l	Conceptual treatment size for drainage	% of treatment needed to meet WQO
1	Wetland	15,512	5.5	9.0	3.6	66%
2	Espinosa	15,882	5.6	6.3	10.0	178%
3	SanJon Detention	31,535	11.1	12.7	9.1	82%
4	Boronda	-734	-0.3	2.0	35.5	na
5	Natividad	36,606	12.9	16.8	40.0	310%
6	Old Stage	63	0.0	0.3	1.1	5162%
7	Old Stage South	2,732	1.0	1.4	7.1	735%
8	Old Stage Lower	6,628	2.3	2.5	18.1	772%
9	Castro Pond	33,466	11.8	16.2	4.6	39%
10	Carr Lake	176,098	62.2	72.5	33.4	54%
11	Airport	87,108	30.7	34.3	32.7	106%
		Total	**142.9**	**174.0**	**195.1**	**137%**

6.5.2.2 Cumulative Water Capture

The flood model analyzed 10-year (10% annual chance) events and 100-year (1% annual chance) events. The results for these metrics for each of the projects evaluated are summarized in Table 6.9, including the cumulative amount of flood protection provided if all projects were implemented. Some of the projects function in sequence while others are in parallel so the cumulative benefit is not a simple summation of the individual benefits.

Table 6.9 SWRP Water Supply and Flood Metrics from Water Balance Model for Individual Projects

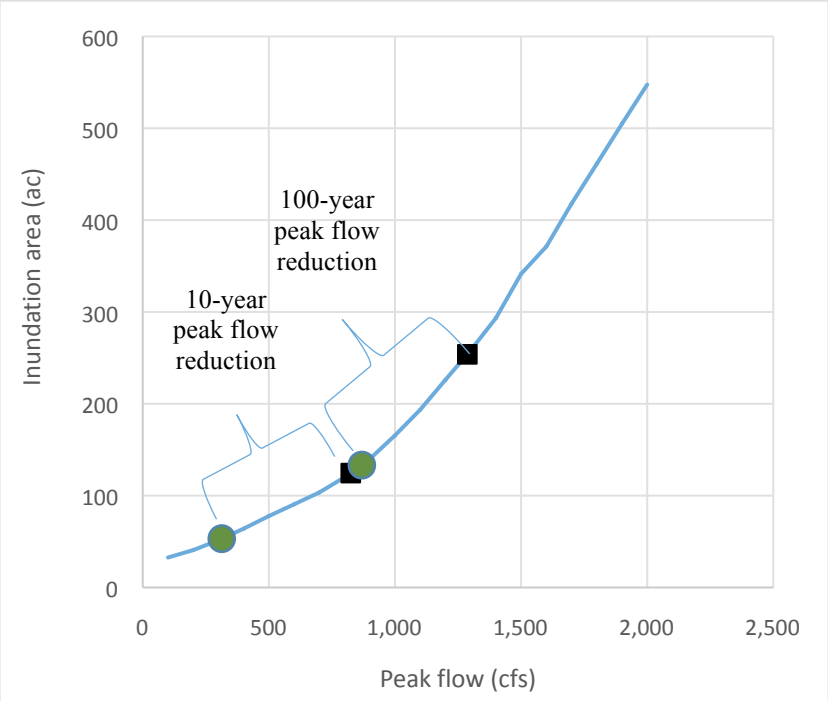
Project	Project Size/Type	Metric				
		Water supply metric			Flood metric	
		Upstream drainage area (ac)	Volume stored (af/y)		Reduction in peak flow for 1998 event *	
			Dry weather	Wet weather	D/S of project (cfs)	D/S of project (%)
Espinosa Lake	630 af of detention	2,254	109	3	39	7%
Carr Lake	1,000 af of detention[1]	36,692	387	32	139	22%
Airport detention	980 af of detention	23,415	551	22	91	27%
Gabilan expanded floodplain	255 af of floodplain inundation (80 acres)	25,697	25	0	194	30%
Boronda detention	210 af of detention	1,419	373	33	23	9%
Wetland near Espinosa	440 af of detention	11,582	414	14	72	13%
San Jon Detention	270 af of detention	5,251	190	7	33	6%
Old Stage 1	210 af of detention	648	54	5	17	3%
Old Stage 2	150 af of detention	2,816	49	2	30	9%
Old Stage 3	35 af of detention	1,181	10	0	10	3%
Castroville ponds	15 af of detention	14,221	63	3	87	15%
Chualar	30 af of detention	830	7	0	3	1%
Gonzalez	40 af of detention	15,201	96	5	18	7%
Soledad	40 af of detention	646	5	0	6	0%
Cumulative projects	4,050 of detention, 255 af of floodplain creation	141,853	4,068	386	1,050	65%

*Largest event modeled in 20-year water balance model, EC Peak flow = 1,750 cfs

[1] As is likely with all conceptual projects, the Carr Lake area is being planned as a multi-benfit community improvement project. Therefore, it is possible that less storm water will be stored than the estimated 1,000 acre feet in order that other park and open space amenities can be increased. If accurate flood reduction or infiltration and capture estimates are needed, hydraulic models can be rerun as individual concept projects move to design and implementation.

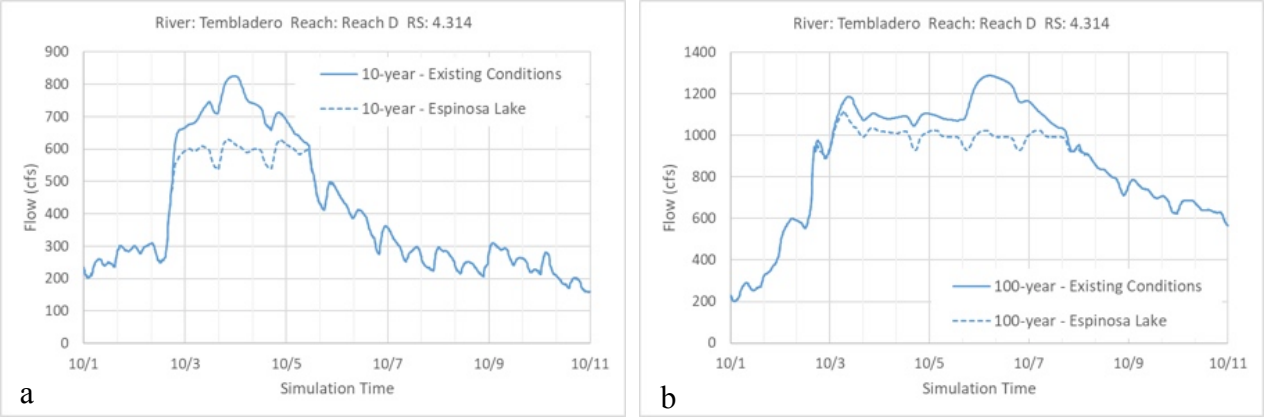
The flood management benefits above are given in units of flow (cfs). These benefits were also estimated in terms of reduction in acres inundated by flooding, using the HEC-RAS model. The inundation extent for a range of flows was calculated in the vicinity of Castroville and plotted in Figure 6.25. Each concept project was modeled to estimate a reduction in flow (cfs) and associated reduction in downstream flooded areas. Flood impact reduction at the Old Salinas River can be interpolated from this figure.

Figure 6.25 Peak Flow and Inundation Area Relationship for Reclamation Ditch between OSR and Castroville Road with (Green) and without (Black) Implementation of Concept Storm Water Projects



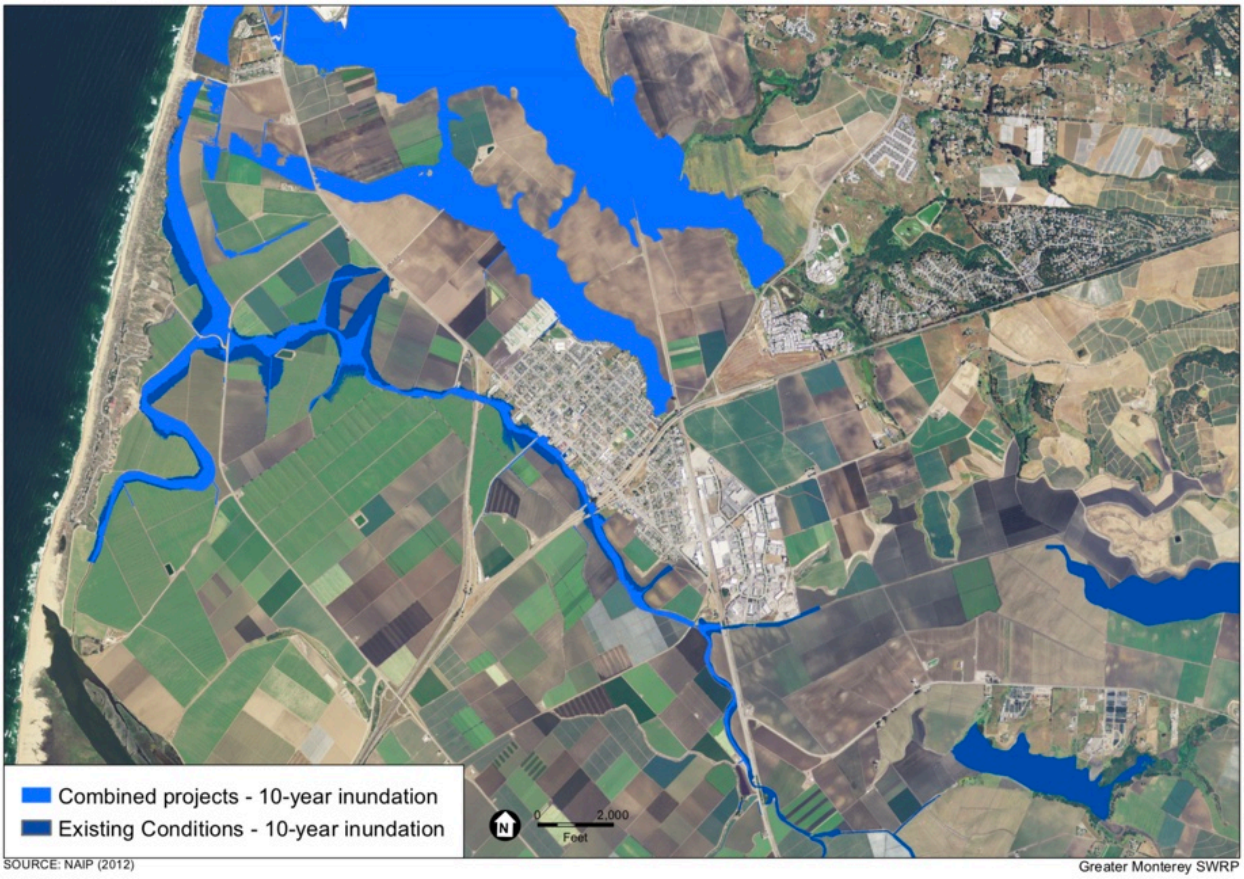
Most of the flood reduction potential is found in agricultural areas along the Reclamation Ditch adjacent to the community of Castroville. An example of a concept project integrating flood control with other benefits is the Espinosa Lake project. This project would increase lake extent by an additional 10 acres, land that is currently in agriculture. The project, however, is predicted to reduce 10-year storm flooding on more than 30 acres of farmland downstream (Figure 6.26 and 6.27). The project would also reduce nitrate loads by an estimated 36,000 kg/y and capture 100 acre feet of storm water for reuse.

Figure 6.26 (a) 10-year Hydrograph at Preston Road for Existing and Espinosa Lake Project Conditions. (b) 100-year Hydrograph at Preston Road for Existing and Espinosa Lake Project Conditions



Flow reduction estimates were modeled for each of the concept projects to understand the scale of project needed to reduce downstream flooding significantly. The modeling results indicate that Carr Lake, the largest detention storage project analyzed, and the expanded Airport Detention concept projects provide the largest reduction in peak flow for the 20-year period modeled (Table 6.9).

Figure 6.27 Flood Reduction Areas (Dark Blue) by the Cumulative Projects upstream

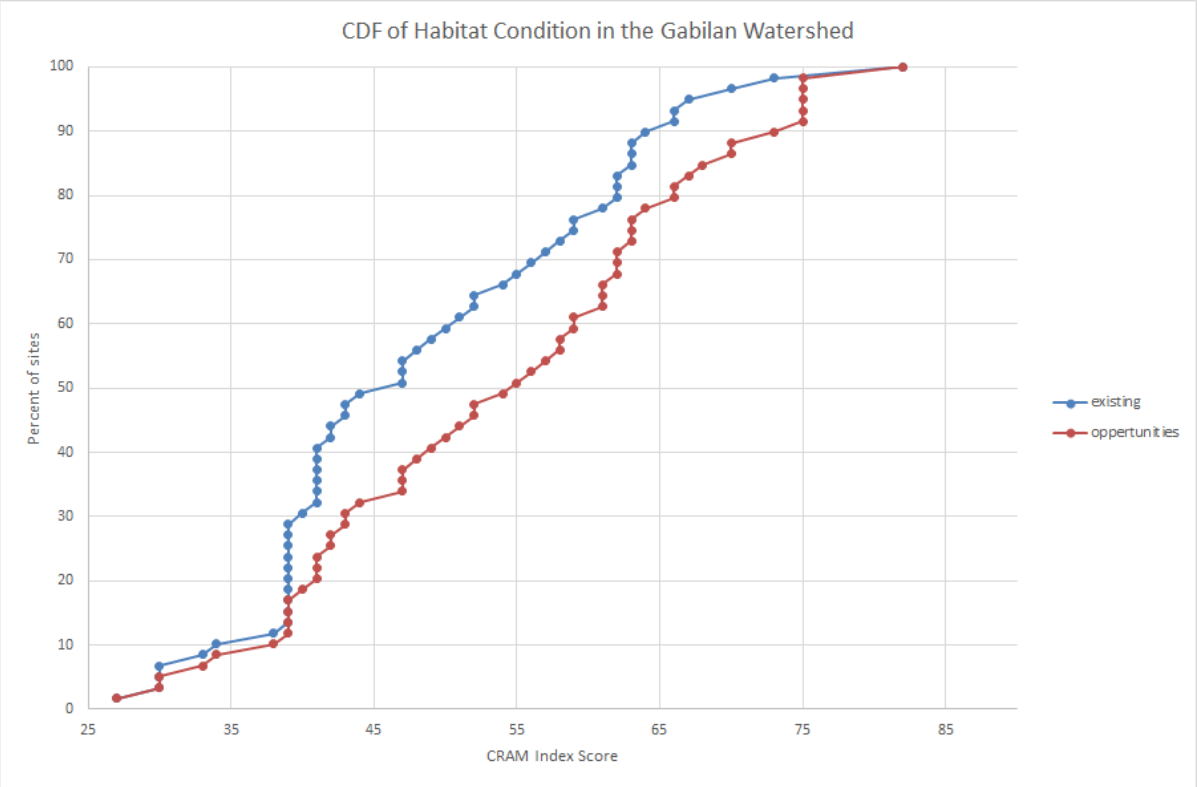


6.5.2.3 Cumulative Environmental Benefits of Concept Projects

Many of the projects identified and evaluated within this plan focus on the reestablishment of natural drainage systems (Figure 6.24), restoration of wetland and riverside habitats (Table 6.6) and creation of parkways and parks (Figure 6.22). As each concept project proceeds towards design and implementation, the project teams will continue to integrate habitat and natural system functions into the designs.

To estimate the possible habitat and natural system benefits of the concept projects, example projects that have been completed with similar objectives and descriptions were used to estimate environmental benefits that will accrue when the proposed projects are implemented. The environmental benefits of concept projects were estimated using California Rapid Assessment Method (CRAM) condition score improvements realized by previously implemented projects within the watershed. Condition scores for previous projects on average increased by 20-35 points (out of 100) after similar restoration projects. The estimated improvements in wetland condition (CRAM scores) from the proposed projects in this SWRP are shown in Figure 6.28. Results of this community wide condition response analysis suggest that the conceptual projects will improve the overall condition of the watershed while reducing the percent of the watershed that is in poor condition (CRAM score of 45 or below) from 50% of the watershed to approximately 30%.

Figure 6.28 Estimated Cumulative Wetland Condition Benefit from Proposed Projects



6.5.2.4 Community Benefits of Concept Projects

The cumulative community benefits of proposed projects are not subject to modeling or quantitative analysis other than simply summing the acres of parks, open space, bike paths and natural areas. Table 6.6 shows that 363 acres of parks and open space would be created by the projects evaluated. The Salinas to the Sea project would provide non-roadway bike paths for 15 miles to allow residents of the city to bike to coastal recreation areas.

CHAPTER 7. Evaluation and Prioritization of Projects

7.1 Quantitative Methods

The detailed quantitative methods, including hydrologic modeling and geographic information system (GIS) analyses, that were used to identify opportunities and evaluate projects have been described in Chapter 6. This chapter covers the evaluation of projects and the use of quantitative metrics to prioritize the projects.

7.2 Overview of Prioritization Process

Many local government agencies and non-profit organizations are engaged in planning and implementation of projects to manage storm water in the Greater Monterey County planning area. As part of Storm Water Resource Plan (SWRP) outreach, the Project Team solicited projects during Technical Advisory Committee meetings, stakeholder meetings, and through direct contact with individuals and organizations involved in regional storm water management. As a result, 17 project descriptions were submitted for inclusion and evaluation in the SWRP.

The first step in evaluating projects was to classify them based on the level of detail and completion of design. Eight of the 17 projects were classified as "concept" projects and nine were classified as "design" projects, the distinction being that design projects included sufficient quantitative information to evaluate benefit magnitudes for at least most of the five major benefits: water quality, water supply, flood management, environmental, and community benefits. Concept projects provided quantitative estimates for some of the major benefits. All projects were then quantitatively prioritized using the following scoring process.

7.3 Concept Project Scoring

Concept projects were evaluated based on scores from two categories: Category 1: Project Funding and Public Land Availability, and Category 2: Multiple Benefits Analysis. In Category 1, 25 points were given if the project had permanent funding to achieve the benefit and 25 points were given if the project was located on public land. The maximum score possible for Category 1 was 50 points.

In the Category 2 Multiple Benefits Analysis, each of the main benefits and additional benefits identified in the SWRCB Storm Water Resource Plan Guidelines (2015) were checked if they were addressed by the project. There are eight main benefits (each worth four points) and nine additional benefits (each worth two points). The maximum score possible for Category 2 was also 50 points.

7.4 Design Project Scoring

Design projects were scored in the same way as concept projects for Categories 1 and 2, but design projects also provided sufficient information to score them in a third category: Category 3 Quantitative Benefit Metrics Analysis, which considered the magnitude of the intended benefits. To allow the most direct comparisons possible, one metric was used to represent each of four major benefit categories. Water quality benefits were scored by the percent reduction in storm water pollutants. Water supply

benefits were scored by the acre feet of water per year captured for reuse. Flood management was not scored because of insufficient information available for seven of the nine design projects. Environmental benefits were scored by the acres of wetland or riparian habitat created, and community benefits were scored by the acres of recreational or open space provided. Multiple benefits beyond this subset were scored in Category 2.

The Category 3 score was calculated by averaging the rank scores for each type of benefit. The range of values for each benefit (e.g., acre feet per year for water supply benefit) was divided into five even intervals. The project values were then assigned ranks from 0 to 5 (Table 7.1). The final Category 3 score was the average of the four benefit ranks, with each average normalized to 100. The maximum score possible for Category 3 was 100 points, equal to Categories 1 and 2 combined.

Table 7.1 Assignment of Rank Scores to Ranges of Quantitative Metrics Values

Benefit:	**Water Quality**	**Water Supply**	**Flood**	**Environment**	**Community**
	Pollutant Reduction (%)	Storm Water Captured (AF/Y)	(Insufficient Information Provided)	Wetland Habitat Created (acres)	Recreational and Open Space Created (acres)
Range:	0 to 100	0 to 478	N/A	0 to 185	0 to 11
Interval:	20	95.6		37	2.2
Rank Scores:					
5	81 – 100	383 – 478	N/A	149 – 185	8.9 – 11
4	61 – 80	288 – 382	N/A	112 – 148	6.7 – 8.8
3	41 – 60	192 – 287	N/A	75 – 111	4.5 – 6.6
2	21 – 40	98 – 191	N/A	38 – 74	2.3 – 4.4
1	1 – 20	1 – 97	N/A	1 – 37	1 – 2.2
0	0	0	N/A	0	0

7.5 Modifications to the Prioritization Process following the Technical Advisory Committee Meeting

The description above and the tables below reflect changes made to the prioritization process after review by the Technical Advisory Committee (TAC) on September 19, 2018:

1. The maximum possible points for Category 1 was reduced from 40 + 40 = 80 to 25 + 25 = 50. This was because there was some uncertainty about future funding availability and because the benefits accrued were thought to be more important criteria at this point in project development than were the fiscal constraints.

2. The maximum possible points for Category 3 was reduced from 120 to 100 so that Category 3 was worth twice the points of either Category 1 or 2. There was agreement that the magnitude of the benefits (Category 3) was most important, but the differences in the types of metrics reported made direct comparison difficult, so a decision was made not to weigh this category too heavily.

3. Prior to the TAC meeting the projects for Elkhorn Slough, Castroville/Moss Landing and Davis Road were assigned zeroes for water quality because no specific estimates were provided. The TAC explained that water quality benefits could be estimated from the acre feet treated and the type of treatment, and that these non-negligible water quality benefits should be included in the scoring. The water quality

scores for those projects were changed to Elkhorn Slough = 2, Castroville/Moss Landing = 1, and Davis Road = 1.

4. The Blanco Drain project was previously thought to be on public land and was given 25 points for that in Category 1 scoring. The project is being developed for private land so that score was changed to zero.

Following are brief descriptions of the concept projects and design projects included in this SWRP.

7.6 Concept Project Summaries

7.6.1 Carr Lake Project

Concept Project

Project Applicant:
Big Sur Land Trust

Main Benefits Met:

- Increased infiltration and/or treatment of runoff
- Decreased flood risk by reducing runoff rate and/or volume
- Environmental and habitat protection and improvement
- Increased urban green space
- Public education

Project Cost Estimate:
$ 4,870,000

Benefit Metrics Value(s):

- 73 acre floodplain restored
- 387 afy storm water stored in wet weather
- 32 afy storm water stored in dry weather
- 87.28 acre 10-yr inundation extent reduction
- 0.6 acre 100-year inundation extent reduction

Project Summary:
The goal of this project is to transform a portion of Carr Lake in Salinas, California, to an urban park and green space for the local community, while providing multiple natural resource benefits. The Carr Lake Project provides an opportunity both to enhance floodplain performance and to improve water quality through restoration of the creeks that flow through the project area. The Carr Lake Project will also provide much needed parks and open space within the City of Salinas, which is a park-poor and economically distressed community.

The City of Salinas has long imagined transforming Carr Lake into a multi-benefit green space, serving as a "central park" in the heart of Salinas. Objectives include:

- Increased green space for outdoor recreation;
- Flood management benefits;
- Water quality improvements;
- Habitat enhancement; and
- Climate change adaptation.

The transformation of The Big Sur Land Trust's 73-acre property within the larger basin will include wetland enhancements and restoration to function as floodwater detention areas. These areas will be restored with diverse perennial vegetation to reduce soil erosion, encourage uptake of excess nutrients, and reduce sediment flowing downstream. With the prospect of more intense storms that could occur more frequently as a result of climate change, restoration of Carr Lake will provide strategies for adaptation.

7.6.2 Gabilan Floodplain Enhancement Project

Concept Project

Project Applicant:
Central Coast Wetlands Group

Main Benefits Met:

- Increased infiltration and/or treatment of runoff
- Water supply reliability
- Conjunctive use
- Decreased flood volume risk by reducing runoff rate and volume
- Environmental and habitat protection and improvement
- Increased urban green space

Requested Amount:
$270,000

Match Funds:
$180,000 with additional anticipated

Benefit Metrics Value(s):

- Approximately 84 acres of floodplain restored to freshwater habitat
- 326 cfs reduction (43%) in 20-year maximum flow at next downstream location

Project Summary:
Gabilan Creek originates in the Gabilan Mountain range and then flows into a broad flood plain before entering the Salinas Valley and the city of Salinas. The creek then flows into Carr Lake, the Tembladero Slough, and the water eventually empties into Monterey Bay.

Storm runoff from the Gabilan Mountains presents one of the greatest flood risks to Salinas. As runoff passes through agricultural fields it picks up sediment, nutrients, pesticides and other pollutants that are further concentrated as flow continues downstream to Carr Lake and onward to Moss Landing Harbor and Monterey Bay. This project proposes to negotiate the seasonal lease or land sale of up to 80 acres of floodplain lands above the City of Salinas. Floodplain infiltration and natural corridor enhancement will be integrated into future development plans for Salinas. We will also work with Monterey County Water Resources Agency and the Salinas Valley Groundwater Sustainability Agency to increase flood attenuation and groundwater infiltration within this corridor and investigate groundwater recharge valuation. Finally, in-stream treatment wetlands will be installed to improve water quality before infiltration.

7.6.3 Salinas to the Sea Storm Water Management, Community Development and Habitat Enhancement Project

Concept Project

Project Applicant:
Central Coast Wetlands Group

Main Benefits Met:
- Increased infiltration and/or treatment of runoff
- Conjunctive use
- Decreased flood volume risk by reducing runoff rate and volume
- Environmental and habitat protection and improvement
- Increased urban green space
- Employment opportunities provided
- Public education

Requested Amount:
$5,725,000

Match Funds:
$6,870,000

Benefit Metrics Value(s):
- More than 13 miles/500 acres of restored active riverine channel habitat
- Increased flow and flood attenuation
- 100 acres of trails and paths created
- 50% reduction in nitrate
- Increase in dissolved oxygen
- Improved fish habitat

Project Summary:
This project alters the Reclamation Ditch/Gabilan Watershed drainage system to increase flow capacity while also enhancing wetland habitat and water quality by creating a linear restoration project along the Reclamation Ditch between the City of Salinas and Moss Landing Beach (Salinas to the Sea). The project will help the County and farmers meet their water quality obligations and support flood control and environmental goals while also providing a recreational opportunity to North Monterey County residents. Specifically, the project is designed to:

1. Expand the width of the current drainage system to a maintained channel, aquatic habitat, bike/maintenance path and upland transition/buffer.
2. Include a pedestrian/bicycle path, fencing and property boundary vegetation along the channel between the City of Salinas and Moss Landing Beach.
3. Include larger areas of wetland habitat/open space along the drainage.
4. Provide erosion control.
5. Greatly improve water quality of the Tembladero/Rec Ditch drainage.
6. Integrate a wetland treatment system.
7. Increase low flow retention time and water quality filtration through vegetation of the expanded flood plain.

7.6.4 Acosta Plaza Urban Drainage Restoration

Concept Project

Project Applicant:
City of Salinas

Main Benefits Met:

- Increased infiltration and/or treatment of runoff
- Water supply reliability
- Decreased flood risk by reducing runoff rate and volume
- Increased urban green space
- Public education

Project Cost Estimate:
$ 1,500,000

Benefit Metrics Value(s):

- Project will be designed to capture the volume from an 85-percentile 24-hour storm event
- Volume infiltrated and pollutant removal will be quantified

Project Summary:
The Salinas Reclamation Canal to which Acosta Plaza drains is listed on the EPA 303(d) list. Acosta Plaza is a high-density low-income residential neighborhood with three schools and a high priority opportunity to reduce excess storm water volumes, urban pollutant loads and trash delivery to the local receiving waters.

The drainage restoration will integrate cost-effective best management practices (BMPs) that include:

- More effective street sweeping with parking controls, efficient sweepers, coordination with waste recovery, community outreach and education, community litter clean ups, improved road integrity and design.
- Neighborhood, businesses and school education, outreach and incentives to reduce local litter.
- Downtown Street Team litter clean-up sites.
- Design implementation and maintenance of distributed decentralized structural BMPs, green infrastructure and green streets and parcel runoff control practices.
- Design implementation and maintenance of centralized structural BMPs.

Throughout the restoration efforts, effectiveness of all structural and non-structural controls will be assessed. We will quantify the volume, pollutant and litter reduction progress achieved, among other benefits.

7.6.5 Lincoln Green/Complete Street

Concept Project

Project Applicant:
City of Salinas

Main Benefits Met:

- Increased infiltration and/or treatment of runoff
- Water supply reliability
- Decreased flood risk by reducing runoff rate and volume
- Increased urban green space
- Public education

Project Cost Estimate:
$ 1,430,000

Benefit Metrics Value(s):

- Project will be designed to capture the volume from an 85-percentile 24-hour storm event
- Volume infiltrated and pollutant removal will be quantified
- Square footage of urban greening will be created

Project Summary:
Development of a green/complete street design is currently in process for an approximate 1/3-mile length of Lincoln Street, Salinas, between Alisal and Markets Streets. The project design will include multiple community, water resource and other environmental benefits. Concept design includes retrofit of the existing street condition to integrate green infrastructure elements such as bioretention/ biofiltration and permeable pavement.

The project will be designed to address storm water management targets for pollutant removal and volume management consistent with statewide and regional storm water NPDES program. The green street design elements will mimic natural watershed processes to support health watersheds and receiving waters such as evapotranspiration, groundwater recharge, lateral subsurface flows, organic and inorganic particulate delivery and chemical/biological processes. The project will improve community livability through increased green space, reduction of heat island effects and improved air quality. Use of storm water to irrigate vegetation along the street corridor will reduce consumptive use of the water supply.

7.6.6 Ocean Outfall Beach Junction Structure Managed Retreat Project

Concept Project

Project Applicant:
Monterey One Water

Main Benefits Met:

- Environmental and habitat protection and improvement
- Outfall used in support of Pure Water Monterey's main benefits of water supply, water quality, flood management, environmental and community

Requested Amount:
$5,500,000

Match Funds:
$6,000,000

Benefit Metrics Value(s):

- Support of Pure Water Monterey's production of up to 1,000 acre feet of advanced purified water to establish a "drought reserve" for water supply

Project Summary:
Monterey One Water's land/ocean outfall pipeline conveys secondary treated effluent from its treatment plant 2.1 miles out into the Monterey Bay. As a result of erosion-induced exposure of the outfall pipeline on the beach adjacent to the CEMEX sand mining operation in Marina, Monterey One Water staff installed temporary protection measures on the outfall pipeline upstream of the ocean outfall beach junction structure.

The temporary protection measures are planned to remain in place until Monterey One Water implements a permanent solution, most likely involving a managed retreat strategy to relocate this critical junction structure further inland. In addition to extending the longevity of the ocean outfall, such inland migration will prevent the junction structure from hindering full public access and highest beneficial use of the beach by reducing the risk of future pipe exposure. Relocating the junction structure inland will protect sensitive coastal dune habitat and threatened/ endangered species by reducing the probability of future emergency actions and maintenance, which would necessitate ground-disturbing activities.

Monterey One Water seeks external funding for planning/environmental, engineering, right of way acquisition, and construction services to adapt to climate change and continue the Monterey One Water mission of sustainable and ecologically sound water management.

7.6.7 South Moss Landing Harbor Water Quality Project

Concept Project

Project Applicant:
Moss Landing Harbor District

Main Benefits Met:
- Increased infiltration and/or treatment of runoff
- Environmental and habitat protection and improvement
- Increased urban green space
- Public education

Requested Amount:
$700,000

Match Funds:
$700,000

Benefit Metrics Value(s):
- Reduction in tidal scour in South Moss Landing Harbor
- Up to 14 acres of tidal marsh restored in South Moss Landing Harbor

Project Summary:
Fifty percent of the tidal salt marsh in the Moss Landing and Elkhorn Slough areas has been lost in the past 70 years. This project is designed to plan for the restoration of up to 14 acres of lost marsh. Use of sediment geotubes as a sill across the boundary to the south salt marsh and addition of sediment to this former marsh through beneficial reuse of dredge sediments that have been transported into the south harbor area from the south marsh will return the land to the elevation necessary for marsh plants to thrive. Healthy plants will cap contaminated sediments, and capture clean sediment in the future, jumpstarting the process that sustains healthy tidal marsh habitats as sea level rises. The sediment addition will also reduce the south Moss Landing wetland areas tidal prism, which today is larger than it was historically, and the additional flowing water has eroded banks and soft mud habitats.

The goals of the project are to:

- Protect and improve surface water quality by reducing tidal scour in the south Moss Landing salt marsh area
- Increase the extent of tidal marsh in south Moss Landing salt marsh area
- Provide resilience to climate change to estuarine ecosystems in the south Moss Landing salt marsh areas
- Increase understanding of how best to create salt marsh

7.6.8 Storm Water Management, Collection, and Infiltration on Private and Public Lands

Concept Project

Project Applicant:
Resource Conservation District of Santa Cruz County (in partnership with the Resource Conservation District of Monterey County)

Main Benefits Met:
- Increased infiltration and/or treatment of runoff
- Water supply reliability
- Decreased flood risk by reducing runoff rate and volume
- Public education

Requested Amount:
$ 1,000,000

Match Funds:
$ 1,000,000

Benefit Metrics Value(s):
- Estimated 100 acre-feet per year storm water captured per project
- Estimated 195 acre-feet per year of infiltration by storm water if 6 projects are completed

Project Summary:
The Central Coast of California supports a multi-billion dollar agriculture industry. This region is largely self-reliant on local water supplies, most of which come from groundwater basins not subject to water rights regulation or trading. Many of these basins suffer from persistent groundwater overdraft and seawater intrusion, which threatens the long-term viability and competitiveness of agriculture, tourism and the ecological integrity in the region. Climate change will also bring more frequent extreme precipitation events and an associated increase in runoff and a reduction in infiltration, placing even greater stress on limited groundwater resources.

The Resource Conservation District of Santa Cruz County and local experts from the University of California Santa Cruz have identified opportunities for implementation of managed aquifer recharge (MAR) projects by conducting a regional analysis of MAR suitability. This project would identify potential sites with willing landowners, conduct necessary geologic investigations, develop designs, permits and agreements, and construct and monitor recharge facilities capturing runoff from approximately 100 – 300 acre catchments into facilities generally less than 5 acres. The project would also provide technical assistance to growers to improve storm water management on farms through practices to improve soil health and infiltration.

7.7 Design Project Summaries

7.7.1 Blanco Drain Treatment Wetland

Design Project

Project Applicant:
Central Coast Wetlands Group

Main Benefits Met:

- Increased infiltration and/or treatment of runoff
- Water supply reliability
- Conjunctive use
- Environmental and habitat protection and improvement

Requested Amount:
$950,000

Match Funds:
$425,000 with additional anticipated

Benefit Metrics Value(s):

- 50% reduction in nitrates in Blanco Drain waters, to 2958.5 g/m^2-yr
- Up to 4380 af/yr of storm water and agricultural runoff treated
- 11 acres of freshwater habitat created

Project Summary:
The Blanco Drain is an ideal location for the construction of a linear treatment wetland. It provides a wide floodplain, farm roads on both sides of the drainage that can provide a buffer between drainage and farm operations, and slopes that will benefit from erosion control and weed management. The Blanco Drain drains approximately 6400 acres of surrounding farmland and is classified as category 5 impaired water body listing pursuant to Section 303(d) of the Clean Water Act for pesticides, low dissolved oxygen, nitrates, turbidity, chlorpyrifos, and diazinon.

The treatment wetland design uses a sinuous flow path to maximize reduction of nutrients and suspended sediment within the main drainage channel. A hedgerow of native plants planted on the channel bank will reduce erosion and create a buffer between the treatment wetland and the adjacent agricultural fields. Hedgerows help to reduce dust and provide habitat for pollinators, enhancing production in agricultural operations. Short fencing adjacent to the hedgerows can be used to control rodents, reptiles, and amphibians if necessary. Raptor perches will encourage raptors to prey on rodents that might cross into agricultural fields.

7.7.2 Castroville and Moss Landing Storm Water Enhancement Project

Design Project

Project Applicant:
Central Coast Wetlands Group

Main Benefits Met:

- Increased infiltration and/or treatment of runoff
- Decreased flood volume risk by reducing runoff rate and volume
- Environmental and habitat protection and improvement
- Increased urban green space
- Employment opportunities provided
- Public education

Requested Amount:
$1,200,000

Match Funds:
$600,000 with additional anticipated

Benefit Metrics Value(s):

- Approximately 1 mile of trail improvement
- Almost 7 acres of freshwater habitat enhanced
- 63 afy storm water captured in wet season (3 afy in dry)
- 38.28 acre reduction in 10 year inundation extent
- 66.6 acre reduction in 100 year inundation extent

Project Summary:
The communities of Moss Landing and Castroville are located adjacent to the Reclamation Ditch and encircled by fresh and brackish water habitats of the lower Salinas Valley. The proposed project will be a partnership between the Central Coast Wetlands Group, Moss Landing Marine Labs and the Castroville Community Services District to improve storm water drainage infrastructure to increase flood attenuation and improve water quality. Current detention basins within Castroville will be enhanced to improve water quality (through native planting and enhanced designs that provide better water filtration and pollutant reduction including sediment, nutrients, and pesticides) prior to discharge to the Castroville and Tembladero sloughs. A one-mile long stretch of Moss Landing Road will be improved to include a walking strip and depressional drainage swale (LID management practices) and natural ponds which will attenuate flooding along Moss Landing Road. Both locations will increase freshwater habitat within an urban setting and provide greater public safety and coastal access, improve flood management, filter pollutants and be a public example of using natural infrastructure to manage urban storm water.

7.7.3 Espinosa Lake Flood Retention Project

Design Project

Project Applicant:
Central Coast Wetlands Group

Main Benefits Met:
- Increased infiltration and/or treatment of runoff
- Water supply reliability
- Conjunctive use
- Decreased flood volume risk by reducing runoff rate and volume
- Environmental and habitat protection and improvement
- Public education

Requested Amount:
$1,250,000

Match Funds:
$500,000 with additional anticipated

Benefit Metrics Value(s):
- 109 acre-feet per year of storm water stored in wet weather
- 3 acre-feet per year of storm water stored in dry weather
- 185 acre freshwater habitat enhanced
- 185 acre freshwater habitat available for recreation and education
- 50% reduction in nitrates
- 17.94 acre reduction in 10 year inundation extent
- 29.45 acre reduction in 100 year inundation extent

Project Summary:
The proposed project at Espinosa Lake, between Salinas and Castroville, offers an opportunity for water supply, flood management, water quality, environmental and community benefits. The project consists of a three-pronged approach to upgrade storm water impoundment capacity, create freshwater impoundments, and to treat lake water quality for reuse of water through a sinuous treatment wetland drainage system.

The first objective of the project is to negotiate a land agreement on 10 acres of land adjacent to North Espinosa Lake to allow seasonal flooding. This 10-acre addition will help optimize winter flood attenuation and spring water supply. The second objective is to flood Espinosa Lake with 5 ft of seasonal storm water (approximately 850 acre feet). The third objective is to construct a sinuous drainage system to treat lake waters for beneficial reuse. This will be accomplished by the construction of containment berms, flood conveyance and water treatment channels. The drainage system will be a treatment wetland planted with California native plants that will improve surface water quality through a 50% reduction in nitrate and a decrease in suspended sediment and organic matter. There are also possible recreational opportunities including a walking trail and/or nature viewing locations in the newly improved freshwater habitat.

7.7.4 Old Salinas River Treatment Wetland

Design Project

Project Applicant:
Central Coast Wetlands Group

Main Benefits Met:

- Increased infiltration and/or treatment of runoff
- Environmental and habitat protection and improvement

Requested Amount:
$740,000

Match Funds:
$380,000 with additional anticipated

Benefit Metrics Value(s):

- 4.8 acres of freshwater treatment wetland created
- Reduction in pollutant load
- Increase in dissolved oxygen
- Improved fish habitat

Project Summary:
This project will construct 4.8 acres of treatment wetlands along the Old Salinas River adjacent to the 3-acre Molera Road Treatment Wetland. This Project represents a significant step towards addressing nutrient contributions from farms along the Old Salinas River and will stand as a highly visible partnership between farmers and resource managers to treat nutrient loading of surface waters. The new site and existing Molera Road project will constitute one of the largest treatment wetland projects in the lower Tembladero/Old Salinas River (OSR) drainage.

The project will redirect surface water flowing down the OSR into an Active Linear Treatment System by modifying the discharge location of one of the two culverts (the low flow culvert) that pass under Monterey Dunes Way. Water will be directed through a constructed channel for approximately 500 meters between the active bank of the OSR and the adjacent farm road before water merges with the main channel. Water will flow through a sinuous channel with vegetated banks necessary for the effective nutrient reduction. Filtered water will be discharged back into the OSR.

7.7.5 Salinas Area Flood Enhancements and Reuse Project

Design Project

Project Applicants:
City of Salinas
Monterey One Water

Main Benefits Met:
- Increased infiltration and/or treatment of runoff
- Water supply reliability
- Conjunctive use
- Decreased flood risk by reducing runoff rate and/or volume
- Environmental and habitat protection and improvement

Requested Amount:
$2,950,000

Match Funds:
$2,950,000

Benefit Metrics Value(s):
- 200-300 afy storm water treated to reduce pollutant load
- 200-300 afy storm water captured
- 10% reduction in energy consumption by the Salinas Industrial Wastewater Treatment Facility

Project Summary:
This project is a series of improvements to the City of Salinas's existing Industrial Wastewater Treatment Facility (IWTF) and storm water infrastructure with the ultimate goal of increasing the functionality of these facilities for increasing storm water capture and reuse, in addition to other water resource and environmental benefits. The Blanco Retention Basin, located adjacent to Monterey One Water's Salinas Pump Station, requires upgrades to its subsurface perforated pipe collection drains, pump, and piping to increase flood protection of nearby farmland by enabling the City of Salinas to control the basin with greater reliability and for improved water quality and water reuse yields. The project also includes storm water flood-proofing measures to the IWTF's electrical cabinet and pump station. Additionally, if the IWTF influent pump station capacity is enhanced, the facility can better accommodate the full flows of storm water available for capture and beneficial reuse by the region.

Finally, the City of Salinas and Monterey One Water propose to conduct a condition assessment and subsequent rehabilitation of a 33-inch pipeline to allow more diverse functionality by enabling capture and storage of additional storm water for reuse and optimized treatment of industrial waste water.

7.7.6 Soledad Regional Recharge Project

Design Project

Project Applicant:
City of Soledad

Main Benefits Met:

- Increased infiltration and/or treatment of runoff
- Water supply reliability
- Decreased flood risk by reducing runoff rate and volume
- Increased urban green space
- Public education

Requested Amount:
$500,000

Match Funds:
$54,500,000

Benefit Metrics Value(s):

- Storm water and dry weather runoff captured from 478 acres of the city
- Approximately 272 acre-feet per year of storm water captured
- Elimination of flooding hazard of approximately 7 acres of residential development
- Approximately 3.6 acres added to city's open space

Project Summary:
The City of Soledad is proposing a multi-objective storm water project that will provide multiple benefits for this small disadvantaged community in the Salinas Valley. The Soledad Regional Recharge Project consists of rerouting runoff from an upstream storm water basin to a larger downstream infiltration facility, and re-functioning the existing storm water basin to community open space.

The expanded storm water basin will allow for storm water capture and infiltration of urban runoff into the groundwater basin, providing natural treatment and preventing polluted urban runoff from potentially flowing to the Salinas River.

The proposed project will increase the city's water supply via increased recharge to the aquifer. This will help the city's water infrastructure system adapt to climate change by creating a more sustainable water supply source. In addition, the storm drain system improvements will increase the conveyance capacity, which will limit the flooding from high intensity storms associated with climate change. Increasing recharge to the shallow aquifer will provide a more reliable water supply for agricultural use and will reduce potential demand on the deep aquifer, which will improve water self-reliance both for the City of Soledad and for the broader region.

7.7.7 Bioswales for Davis Road Bridge Replacement and Road Widening Project

Design Project

Project Applicant:
Monterey County Public Works and Facilities (Resource Management Agency)

Main Benefits Met:
- Increased infiltration and/or treatment of runoff
- Decreased flood risk by reducing runoff rate and volume
- Environmental and habitat protection and improvement
- Increased urban green space

Requested Amount:
$500,000

Match Funds:
$54,500,000

Benefit Metrics Value(s):
- 0.3 acre feet of storm water captured in bioswales*
- 1.43 acre feet of storm water captured for infiltration into groundwater*
- Filtration of storm water in bioswales will reduce pollutants and contribute cleaner waters to the Salinas River

Project Updates (2018):
- 65% completion of plans and specs
- EIR adopted in 2016

* Volumes provided by Project Manager during project update

Project Summary:
The project consists of replacing the low-water crossing of the Salinas River on Davis Road with a 1700-foot long bridge that spans the floodway. The project includes widening the existing two-lane road to four lanes with class II bike lanes from Blanco Road to Reservation Road. As part of the project the intersections of Davis Road with Reservation Road, Foster Road, Hitchcock Road and Blanco Road will be widened to accommodate the additional lanes. To improve the drainage of the four-lane road, the project will also add roadside ditches that will collect and channel the water off the road and toward the Salinas River. The roadside ditches, or bioswales, will act as areas for the water to percolate and allow for sediment to settle out of the runoff prior discharging into the river.

The bridge component of the project is mostly funded by Federal Highway Administration (FHWA) Highway Bridge Program funds and road widening is proposed to be funded by FORA development fees. The project estimate is $55 million and has a $5 million shortfall. The funds from this grant will fund the construction and roadside bioswales.

The CEQA and NEPA documents for the project have been certified and the project is currently in the final design phase. The project schedule is targeting to have the final design and right-of-way phase complete by December 2019.

7.7.8 Ridgeline to Tideline

Design Project

Project Applicant:
Elkhorn Slough Foundation

Main Benefits Met:

- Increased filtration and/or treatment of runoff
- Water supply reliability
- Decreased flood risk by reducing runoff rate and/or volume
- Environmental and habitat protection and improvement
- Increased urban green space
- Water temperature improvements
- Employment opportunities provided
- Public education

Requested Amount:
$6,178,438

Match Funds:
$2,050,694 with additional anticipated

Benefit Metrics Value(s):

Acres of watershed filtered:	2,113
Acres of filtering marsh:	150
Pesticide input reduction (kg)	TBD
Water volume captured (afy)	180
Impervious replaced (acres)	60
Project size (acres)	150
People benefited	TBD

Project Summary:
Ridgeline to Tideline is a comprehensive approach to addressing water resource issues in an estuarine watershed. The project area encompasses 60 acres threatened by development and a 150 acres wetland, 210 acres of Elkhorn Slough, and uplands set in a 2,113-acre watershed amongst a 4,000-acre block of protected lands

The three phases of this work include:

1) Restoring ecosystem function in part of the Slough with consistently poor water quality, coupled with restoration of an adjacent upland buffer;

2) Acquiring two adjacent farmland properties that are chronic sources of Slough degradation; and

3) Re-contouring and stabilizing their steep eroding slopes and restoring native vegetation.

Reduced groundwater extraction on these lands will improve water balance in the basin, resist seawater intrusion, prevent nitrate pollution and promote freshwater spring re-emergence.

7.7.9 Salinas Water Quality and Agricultural Reuse Efficiency Project

Design Project

Project Applicants:
Monterey One Water,
Central Coast Wetlands Group,
City of Salinas

Main Benefits Met:
- Increased infiltration and/or treatment of runoff
- Water supply reliability
- Conjunctive use
- Decreased flood risk by reducing runoff rate and/or volume
- Environmental and habitat protection and improvement
- Employment opportunities provided

Requested Amount:
$805,000

Match Funds:
$805,000

Benefit Metrics Value(s):
- Up to 500,000 gpd storm water and urban runoff treated
- Up to 200-300 afy of storm water discharge percolated or reused within the Castroville Seawater Intrusion Project
- 35 acres restored to wetland habitat
- 10% reduction in energy consumption by the Salinas Industrial Wastewater Treatment Facility

Project Summary:
This project is proposed to occur at the Salinas Industrial Wastewater Treatment Facility (IWTF), a treatment and associated conveyance system that serves approximately 25 agricultural processing and related businesses, owned and operated by the City of Salinas. The project includes components designed to:
- Define water quality constraints and assess alternative treatment technologies to maximize beneficial reuse of industrial wastewater and storm water;
- Assess the feasibility and effectiveness of natural wetlands and sustainable media filtration bioreactors for passive treatment of industrial waste water;
- Achieve energy efficiencies and increased dry season yield of storm water capture and reuse;
- Assist the City in meeting total maximum daily load (TMDL) requirements;
- Improve downstream habitat for special-status species in the Salinas River lagoon and in the Monterey Bay National Marine Sanctuary;
- Enhance groundwater resources in the Salinas Valley Groundwater Basin; and
- Augment treatment plan (TP) influent flows in the summer for beneficial reuse for one or both of the following recycled water programs: (1) Salinas Valley Reclamation Project and Castroville Seawater Intrusion Project and/or (2) Pure Water Monterey.

7.8 Prioritization Tables

Tables 7.2 to 7.10 on the following pages show the information used, the scores assigned, and the prioritized project lists.

Table 7.2 Category 1 Scores for Concept Projects

Project Applicant	**Project Title**	**Permanent Funding to Achieve Benefit?** (25 points)**:**	**Project Located on Lands with Public Ownership?** (25 points)**:**	**Category 1 Score** (80 points max)	**Match Provided**
City of Salinas	Acosta Plaza	Y	Y	50	Unknown at this time
Big Sur Land Trust	Carr Lake	N	N	0	Unknown at this time
Central Coast Wetlands Group	Gabilan Floodplain	N	N	0	$180,000
City of Salinas	Lincoln Street	Y	Y	50	Unknown at this time
RCDs of Santa Cruz & Monterey Counties	Storm water MAR	Y	Y/2	38	Unknown at this time
Central Coast Wetlands Group	Salinas to the Sea	N	N	0	Unknown at this time
Moss Landing Harbor District	South Harbor Water Quality	N	Y	25	Unknown at this time
Monterey One Water	Ocean Outfall	Y/N?	Y/N?	25	$6,000,000

Table 7.3 Concept Project Category 2 Checkbox Table for Benefits Addressed
Main benefit columns are shaded.

		Water Quality			**Water Supply**			**Flood Mgmt**		**Environmental**					**Community**						
Project Applicant	**Project Title**	Increased infiltration and/or treatment of runoff	Nonpoint source pollution control	Reestablish natural water drainage and treatment	Water supply reliability	Conjunctive use	Water conservation	Decreased flood risk by reducing runoff rate and volume	Reduced sanitary sewer overflows	Environmental and habitat protection and improvement	Reduced energy use, GHG emissions, or provides a carbon sink	Reestablishment of the natural hydrograph	Increased urban green space	Water temperature improvements	Employment opportunities provided	Public education	Community involvement	Enhance and/or create recreational and public use areas	# of SWRP Main Benefits Met (8 max) (4 points for each benefit):	# of SWRP Secondary Benefits Met (9 max) (2 points for each benefit):	**Category 2 Score (50 max)**
City of Salinas	Acosta Plaza	X	X		X		X	X			X	X	X			X	X	X	5	6	**32**
Big Sur Land Trust	Carr Lake	X		X				X		X	X		X			X	X	X	5	4	**28**
Central Coast Wetlands Group	Gabilan Floodplain	X	X	X	X	X		X		X		X	X					X	6	4	**32**
City of Salinas	Lincoln Street	X	X		X		X	X			X	X	X			X	X	X	5	6	**32**
RCDs of SC & Mo Counties	Storm Water MAR	X	X		X		X	X			X					X	X		4	4	**24**
Central Coast Wetlands Group	Salinas to the Sea	X	X	X		X		X		X	X	X	X	X	X	X	X	X	7	7	**42**
Moss Landing Harbor District	So Harbor Water Quality	X	X	X						X	X	X	X			X		X	4	5	**26**
Monterey One Water	Ocean Outfall																		0	0	**0**

Table 7.4 Category 2 Scores for Concept Projects (based on 4 points assigned to each main benefit and 2 points assigned to each additional benefit in Table 3)

Project Applicant	**Project Title**	**No. of SWRP Main Benefits Met** (8 max) (4 points for each benefit)	**No. of SWRP Secondary Benefits Met** (9 max) (2 points for each benefit)	**Category 2 Score** (50 max)
City of Salinas	Acosta Plaza	5	6	**32**
Big Sur Land Trust	Carr Lake	5	4	**28**
Central Coast Wetlands Group	Gabilan Floodplain	6	4	**32**
City of Salinas	Lincoln Street	5	6	**32**
RCDs of SC & Mo Counties	Storm Water MAR	4	4	**24**
Central Coast Wetlands Group	Salinas to the Sea	7	7	**42**
Moss Landing Harbor District	South Harbor Water Quality	4	5	**26**
Monterey One Water	Ocean Outfall	0	0	**0**

Table 7.5 Concept Project Final Prioritization as the Sum of Scores for Categories 1 and 2

Project Applicant	**Project Title**	**Category 1 Score Funding and Land** (50 points max)	**Category 2 Score # of Benefits** (50 points max)	**TOTAL SCORE**
City of Salinas	Acosta Plaza	50	32	**82**
City of Salinas	Lincoln Street	50	32	**82**
RCDs of SC and Monterey Counties	Storm Water MAR	38	24	**62**
Moss Landing Harbor District	South Harbor Water Quality	25	26	**51**
Central Coast Wetlands Group	Salinas to the Sea	0	42	**42**
Central Coast Wetlands Group	Gabilan Floodplain	0	32	**32**
Big Sur Land Trust	Carr Lake	0	28	**28**
Monterey One Water	Ocean Outfall	25	0	**25**

Table 7.6 Category 1 Scores for Design Projects

Project Applicant	**Project Title**	**Permanent Funding to Achieve Benefit?** (25 points)**:**	**Project Located on Lands with Public Ownership?** (25 points)**:**	**Category 1 Score** (50 points max)	**Match Provided**
Central Coast Wetlands Group	Blanco Drain Treatment Wetland Areas	Y	N	25	$425,000
Central Coast Wetlands Group	Castroville and Moss Landing Stormwater Enhancement Project	N	N	0	$600,000
Central Coast Wetlands Group	Espinosa Lake Flood Retention Project	N	N	0	$500,000
Central Coast Wetlands Group	Old Salinas River Treatment Wetland	N	N	0	$380,000
City of Soledad	Soledad Regional Recharge Project	Y	Y	50	$491,878
Elkhorn Slough Foundation	Ridgeline to Tideline	N	Y	25	$2,050,694
Monterey County Public Works (RMA)	Davis Road Bridge Replacement and Road Widening Project	Y	Y	50	$50,000,000
Monterey One Water, Central Coast Wetlands Group, City of Salinas	Salinas Water Quality and Agricultural Reuse Efficiency Project	Y	Y	50	$805,000
Salinas, Monterey One Water	Salinas Area Flood Enhancements and Reuse (SAFER)	N?	Y	25	$2,950,000

Table 7.7 Design Project Category 2 Checkbox Table for Benefits Addressed (main benefit columns are shaded)

		Water Quality			Water Supply			Flood		Environment					Community			
Project Applicant	**Project Title**	Increased infiltration and/or treatment of runoff	Nonpoint source pollution control	Reestablish natural water drainage and treatment	Water supply reliability	Conjunctive use	Water conservation	Decreased flood risk by reducing runoff rate and volume	Reduced sanitary sewer overflows	Environmental and habitat protection and improvement	Reduced energy use, GHG emissions, or provides a carbon sink	Reestablishment of the natural hydrograph	Increased urban green space	Water temperature improvements	Employment opportunities provided	Public education	Community involvement	Enhance and/or create recreational and public use areas
Central Coast Wetlands Group	Blanco Drain Treatment Wetland	X	X	X	X	X	X			X	X							
Central Coast Wetlands Group	Castroville and Moss Landing Stormwater Enhancement	X	X	X				X		X		X	X		X	X	X	X
Monterey County Public Works (RMA)	Davis Road Bridge Replacement	X	X	X				X		X			X					
Central Coast Wetlands Group	Espinosa Lake Flood Retention Project	X	X	X	X	X	X	X		X		X				X		
Central Coast Wetlands Group	Old Salinas River Treatment Wetland	X	X	X						X	X	X		X				
Monterey One Water, Central Coast Wetlands Group, City of Salinas	Salinas Water Quality and Agricultural Reuse Efficiency Project	X	X	X	X	X	X	X		X	X	X			X			
Elkhorn Slough Foundation	Ridgeline to Tideline	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X
City of Salinas, Monterey One Water	Salinas Area Flood Enhancements and Reuse (SAFER)	X	X		X	X	X	X		X	X							X
City of Soledad	Soledad Regional Recharge Project	X	X	X	X		X	X					X			X		X

Table 7.8 Category 2 Scores for Design Projects (based on 4 points assigned to each main benefit and 2 points assigned to each additional benefit in Table 7)

Project Applicant	**Project Title**	**No. of SWRP Main Benefits Met** (8 max) (4 points for each benefit)	**No. of SWRP Secondary Benefits Met** (9 max) (2 points for each benefit)	**Category 2 Score** (50 max)
Central Coast Wetlands Group	Blanco Drain Treatment Wetland Areas	4	4	**24**
Central Coast Wetlands Group	Castroville and Moss Landing Storm Water Project	6	5	**34**
Central Coast Wetlands Group	Espinosa Lake Flood Retention Project	6	4	**32**
Central Coast Wetlands Group	Old Salinas River Treatment Wetland	2	5	**18**
City of Soledad	Soledad Regional Recharge	5	4	**28**
Elkhorn Slough Foundation	Ridgeline to Tideline	7	8	**44**
Monterey County RMA	Davis Road Bridge	4	2	**20**
Monterey One Water, Central Coast Wetlands Group, City of Salinas	Salinas Water Quality and Ag Reuse	6	5	**34**
City of Salinas, Monterey One Water	Salinas Area Flood and Reuse (SAFER)	5	4	**28**

Table 7.9 Category 3 Rank-based Scores for Quantitative Benefit Metrics Analysis

This analysis considered the magnitude of the intended benefits.

Applicant	Project Title	Water Quality: Pollutant reduction (%)	Water Supply: Volume captured (af/y)	Flood: Data Available (not scored)	Environment: Increase in wetland habitat (acres)	Community: Increase in public open space (acres)	Total	Average	Average scaled to 100
Central Coast Wetlands Group	Blanco Drain Treatment Wetland	3	0		1	5	9	2.25	**90**
Central Coast Wetlands Group	Castroville and Moss Landing Stormwater	1	1	yes	0	3	5	1.25	**50**
Central Coast Wetlands Group	Espinosa Lake Retention	3	2	yes	5	0	10	2.5	**100**
Central Coast Wetlands Group	Old Salinas River Treatment Wetland	1	0		1	0	2	0.5	**90**
City of Soledad	Soledad Regional Recharge Project	0	5		0	2	7	1.75	**70**
Elkhorn Slough Foundation	Ridgeline to Tideline	2	2		5	0	9	2.25	**90**
Monterey County RMA	Davis Road Bridge Project	1	1		0	0	2	0.5	**20**
Monterey One Water, CCWG, Salinas	Salinas Water Quality and Ag Reuse	5	4		1	0	10	2.5	**100**
City of Salinas, Monterey One Water	Salinas Area Flood Enhancements and Reuse	5	4		0	0	9	2.25	**90**

Table 7.10 Prioritization of Design Projects Based on the Sum of Scores from Categories 1, 2 and 3

Applicant	Project Title	Category 1 (50 max)	Category 2 (50 max)	Category 3 (100 max)	TOTAL SCORE
Monterey One Water, CCWG, City of Salinas	Salinas Water Quality and Ag Reuse	50	34	100	**184**
Elkhorn Slough Foundation	Ridgeline to Tideline	25	44	90	**159**
City of Soledad	Soledad Recharge	50	28	70	**148**
Salinas, Monterey One Water	Salinas Flood & Reuse (SAFER)	25	28	90	**143**
Central Coast Wetlands Group	Blanco Drain Treatment Wetland	25	24	90	**139**
Central Coast Wetlands Group	Espinosa Lake Flood Retention	0	32	100	**132**
Central Coast Wetlands Group	Old Salinas River Treatment Wetland	0	18	90	**108**
Monterey County RMA	Davis Road Bridge	50	20	20	**90**
Central Coast Wetlands Group	Castroville and Moss Landing Storm Water	0	34	50	**84**

7.9 Project Consistency with NPDES Permits

Most of the projects included in this Storm Water Resource Plan are located within NPDES permit boundaries, including the Phase I NPDES permit for the City of Salinas and the Phase II NPDES permits for the City of Soledad, City of Marina, and Monterey County. Figure 7.1 below illustrates project locations relative to NPDES permit boundaries. Sections 7.6 and 7.7 of this chapter summarize the quantitative benefits that each of these projects will provide, and Table. 7.11 below summarizes how each project complies with or is consistent with the applicable NPDES permits. Chapter 6, Quantitative Methods for Identification and Prioritization of Storm Water and Dry Weather Runoff Capture Projects, describes the analysis of opportunities and project benefits to estimate the degree to which the projects cumulatively meet the Plan's management objectives.

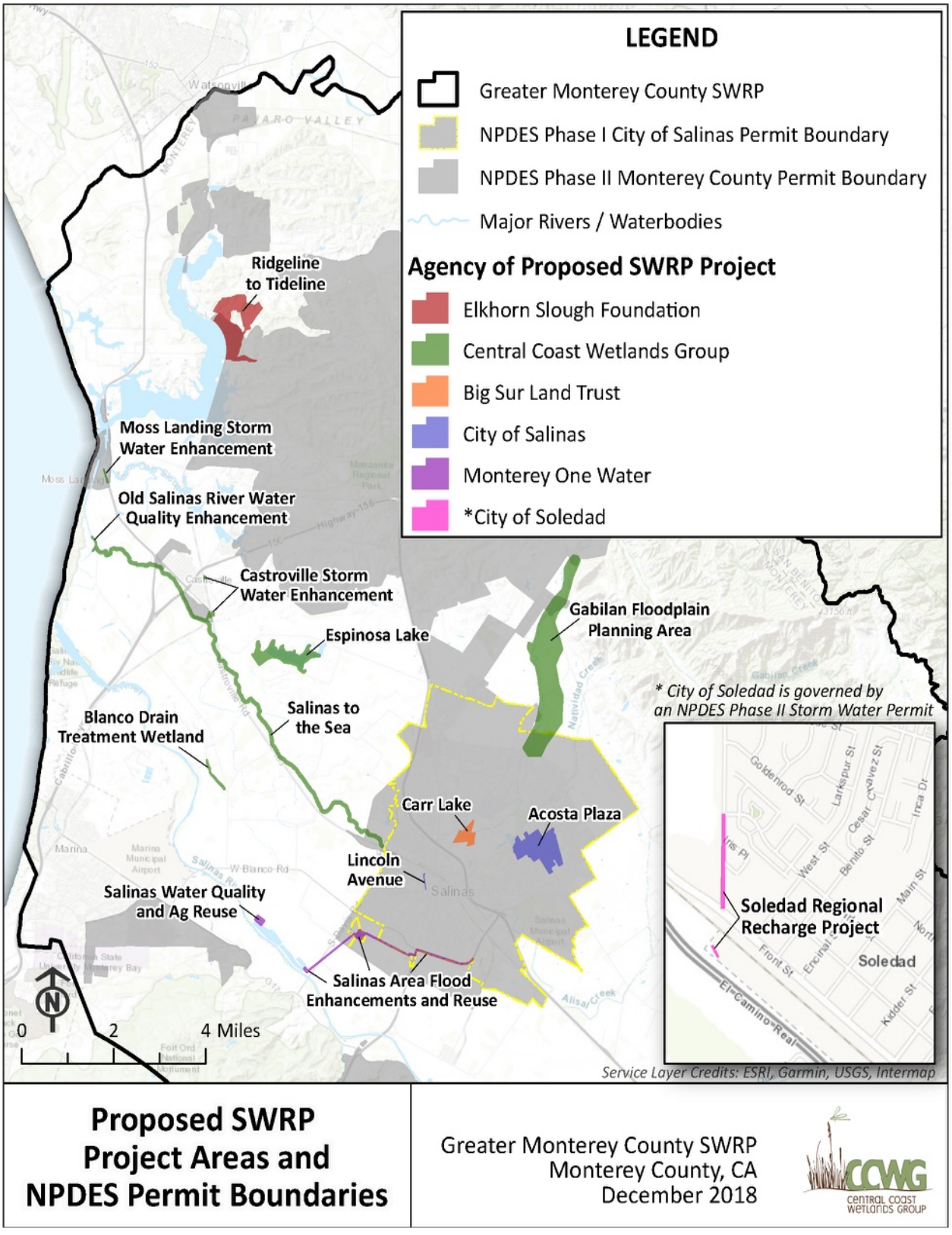
Table 7.11 How Projects Comply or are Consistent with NPDES Permits

Project Proponent	Project Title	Relevant Permit	How the Project Complies with or is Consistent with NPDES Permit
Big Sur Land Trust	Carr Lake Restoration	Salinas	Project provides watershed restoration, constituent and peak flow reduction, water quality improvement, and storm water infiltration in support of the City's NPDES permit. Also provides increased green space.
Central Coast Wetlands Group	Gabilan Floodplain Enhancement	Salinas	For the areas that fall within the City limits, this project provides City NPDES support by reducing storm water runoff rate/volume, increasing habitat protection, and increasing filtration and treatment of storm water runoff (via reduction of constituent loads).
Central Coast Wetlands Group	Salinas to the Sea	Portions lie within Monterey County coverage area	The Reclamation Ditch provides significant storm water discharge for the Salinas Valley. This project will support Monterey County NPDES permit efforts to enhance this watercourse by protecting water quality in the waters within its jurisdiction, reducing the presence of pollutants in storm water to the maximum extent practicable.
City of Salinas	Acosta Plaza LID	Salinas	This project helps the City comply with TMDLs, decreases constituent loading to receiving waters, helps support trash TMDL compliance, and increases storm water infiltration. It also helps the City meet NPDES Education and Outreach requirements to schools and communities.
City of Salinas	Lincoln Avenue Green Street LID	Salinas	This project provides greater infiltration and treatment of storm water runoff (constituent load and runoff volume reductions). Also helps the City meet LID community outreach and education requirements through signage and

Project Proponent	Project Title	Relevant Permit	How the Project Complies with or is Consistent with NPDES Permit
			community meetings.
Monterey One Water	Ocean Outfall Beach Junction Structure Managed Retreat	Marina	While this project does not directly support compliance with the City's NPDES Phase II permit, the project will protect sensitive coastal dune habitat and threatened/endangered species by reducing the probability of future emergency actions and maintenance, which would necessitate ground-disturbing activities.
Moss Landing Harbor District	South Moss Landing Harbor Water Quality	Monterey County	This project will support the County's NPDES permit requirements by capturing and "capping" contaminated sediment in storm water and, once healthy marsh is established, capturing clean sediment, jumpstarting the process that sustains healthy tidal marsh habitats as sea level rises.
Resource Conservation Districts	Stormwater Management, Collection and Infiltration	Monterey County	This project will help the County comply with NPDES permit requirements by capturing and infiltrating storm water, thereby reducing flood risk and increasing water supply resources.
Central Coast Wetlands Group	Blanco Drain Treatment Wetland	Monterey County	The Blanco Drain is managed by the Monterey County Water Resources Agency through pumping of irrigation and storm water into the Salinas River. This project will support Monterey County NPDES permit efforts to enhance this watercourse by protecting water quality in the waters within its jurisdiction, reducing the presence of pollutants in storm water to the maximum extent practicable, and effectively prohibiting non-storm water discharges into the County storm drain system.
Central Coast Wetlands Group	Castroville and Moss Landing Stormwater Enhancement	Monterey County	This project will support Monterey County NPDES permit efforts within the unincorporated Urbanized Areas by protecting water quality in the waters within the County's jurisdiction, reducing the presence of pollutants in storm water to the maximum extent practicable, and effectively prohibiting non-storm water discharges into the County storm drain system.
Central Coast Wetlands Group	Espinosa Lake Flood Retention	Outside of permit boundaries	While the project itself is located outside NPDES permit boundaries, this project supports NPDES permit compliance via

Project Proponent	Project Title	Relevant Permit	How the Project Complies with or is Consistent with NPDES Permit
			pollutant load reductions, meeting lower Salinas Valley TMDLs, improving habitat, and reducing runoff volume through storm water capture and reuse.
Central Coast Wetlands Group	Old Salinas River Treatment Wetland	Monterey County	This project supports NPDES compliance via pollutant load reductions, meeting Lower Salinas Valley TMDLs, and improving habitat.
City of Soledad	Soledad Regional Recharge	Soledad	The project captures runoff from existing land uses, treats and retains runoff up to the 25-yr storm.
County of Monterey	Davis Road Bridge Bioswales	Outside of permit boundaries	N/A
Elkhorn Slough Foundation	Ridgeline to Tideline	Monterey County	This project will support the County's NPDES permit compliance by filtering runoff, replacing impervious surfaces, and stabilizing eroding slopes, thereby reducing sediment in runoff. The project also helps the County meet NPDES Education and Outreach requirements.
Monterey One Water/CCWG/City of Salinas	Salinas Water Quality and Agricultural Reuse Efficiency	Salinas	This project supports the City's NPDES compliance via reducing constituent loads, addressing Salinas River TMDLs, improving habitat, and reducing runoff volume through storm water capture and reuse.
City of Salinas and Monterey One Water	Salinas Area Flood Enhancements and Reuse (SAFER)	Salinas	This project provides upgrades to the City's IWTF facility which is utilized to capture and reuse storm water, transferring the storm water to M1W for treatment and reuse. This project will help repurpose the IWTF as a storm water and urban runoff seasonal storage site. This project reduces storm water runoff volume and constituent loads, which are compliance goals of the City's NPDES permit.

Figure 7.1 SWRP Project Locations and NDPES Permit Boundaries



CHAPTER 8. Information and Data Management

8.1 Decision Support Tools, Monitoring, and Information Management

8.1.1 Decision Support Tools

A number of analytical and forecasting tools have been developed in the region to assist with decision making and adaptive management. The Tool to Estimate Load Reductions (TELR) has been developed by 2NDNATURE, LLC, in collaboration with the Central Coast Low Impact Development Initiative (LIDI) with funding from the Central Coast Regional Water Quality Control Board. TELR has been used in the initial analysis of the Lincoln Street and Acosta Plaza projects in the city of Salinas and is available for other urban catchments in the region.

The Central Coast Wetlands Group (CCWG) and the Moss Landing Marine Laboratories are using nutrient reduction rates quantified at local treatment wetlands and bioreactors to generate a treatment system nutrient reduction estimation tool. This tool is designed to assist project proponents in determining expected project-specific nutrient reduction rates. Project proponents will be able to enter standard data variables (flow rate, initial nutrient concentrations, size, retention time, ambient water temperature) to generate estimates of nutrient load reductions and discharged nutrient concentrations. These load reductions can be compared with sub-watershed load estimates provided in Chapter 6 to quantify the estimated reductions and the cumulative benefits to water quality of multiple projects located in unique sub-watersheds.

Sophisticated and extensive hydrologic models have been developed for the Greater Monterey County SWRP area. These include the USGS Salinas Valley Integrated Hydrologic Model, which is designed to support decisions regarding sustainable surface-water delivery volumes, streamflow depletion, seawater intrusion, saline-irrigation practices and potential habitat degradation. Model scenarios can be run to optimize water reuse and recycling, flood control, overall water use and dry-season water management.

A region-wide water balance model was developed as part of this SWRP project and is available to estimate the combined effects of multiple projects on water quality and reuse. The flood management model and nitrate loading model (SWAT) used in this project are available for decision support as projects are implemented. GIS layers and routines used in developing this SWRP are also available for decision support. These are described in Chapter 6 and Appendices C and D.

8.1.2 Monitoring and Information Management

Progress toward meeting SWRP objectives is directly tied to the successful implementation of projects. The implementation of projects, along with associated monitoring data, will be tracked using a Data Management System (DMS) that takes advantage of database systems developed by statewide, regional and partner efforts. Because neither the SWRP nor the Greater Monterey County Integrated Regional Water Management (IRWM) Plan have ongoing, secure funding sources for data management, the Regional Water Management Group has opted to utilize existing State database frameworks. These include the California Surface Water Ambient Monitoring Program (SWAMP) and its Regional Data Center at Moss Landing Marine Labs, and the California Environmental Data Exchange Network (CEDEN). Wetland and riparian habitat conditions will be measured and documented using the California Rapid

Assessment Methods (CRAM), and applicable groundwater data will reside in GeoTracker using the Groundwater Ambient Monitoring and Assessment (GAMA) database.

The DMS for the Greater Monterey County IRWM region includes data validation and quality assurance for the set of standardized key metadata fields. The data system provides a portal to data sets (measurements) hosted by the data generating organizations or those that have been integrated to regional, statewide, or national databases, including Wetland Tracker, CalDUCs, and CEDEN. The Regional Water Management Group and the Regional Data Center are responsible for ensuring that data get uploaded to the appropriate State database.

If a project requires monitoring, the project proponent is responsible for both development of the project-specific monitoring plan and for all monitoring activities. The project-specific monitoring plan requirements will vary based on the type of project being implemented. All projects must adhere to State guidelines for monitoring in order to be implemented through the IRWM Plan, and by extension, the SWRP. These include:

- Projects that involve surface water quality must meet the criteria for and be compatible with SWAMP (http://www.waterboards.ca.gov/water_issues/programs/swamp/tools.shtml).
- All projects that involve groundwater quality must meet the criteria for and be compatible with GAMA (http://www.waterboards.ca.gov/gama/).
- All projects that involve wetland restoration must meet the criteria for and be compatible with the State Wetland and Riparian Area Monitoring Plan (WRAMP), http://www.waterboards.ca.gov/mywaterquality/monitoring_council/wetland_workgroup/docs/2010/tenetsprogram.pdf).

Any projects that do not fall into one of the above categories must, at minimum, address the following:

1. Clearly and concisely (in a table format) describe what is being monitored for each project. Examples include photo monitoring, water depth, flood frequency, and effects the project may have on habitat or particular species (before and after implementation), etc.
2. Measures to remedy or react to problems encountered during monitoring. An example would be to coordinate with the Department of Fish and Wildlife if a species or its habitat is potentially impacted during or after implementation of a project.
3. Location of monitoring sites (with a map).
4. Monitoring frequency.
5. Monitoring protocols/methodologies, including who will perform the monitoring.
6. Procedures to ensure the monitoring schedule is maintained and that adequate resources (staff and budget) are available to maintain monitoring of the project throughout the scheduled monitoring timeframe.

8.1.3 Identifying Data Gaps

Through project-specific monitoring efforts, the Conservation Action Tracker, regional monitoring and measurable objectives, the Regional Water Management Group intends to demonstrate over time that the Greater Monterey County IRWM Plan and SWRP are meeting their goals and objectives, and to

identify where more data are needed. Through the Conservation Action Tracker, projects can be matched with water management issues to determine where critical data are needed. The Regional Water Board maintains the Central Coast Ambient Monitoring Program (CCAMP), mandates the agricultural Cooperative Monitoring Program, and reviews storm water permit data. Wetland monitoring and modeling by the Central Coast Wetlands Group and others helps to estimate where wetland conditions may be degraded and in need of further monitoring or project implementation. Data from all of these programs are publicly available and can be used to identify locations, parameters, analyses and data management needed to identify data gaps and opportunities for storm water projects.

8.2 Mechanisms to Share Performance Data

Data collected on project performance generally fall into categories that are managed by regional and statewide data portals, and project data will be submitted to these portals for public access. These data management systems include:

- Central Coast Action Tracker: The Central Coast Action Tracker is an effort between the Greater Monterey County Regional Water Management Group and the Central Coast Resource Conservation Districts. The Action Tracker is an online tool that allows project proponents to register and update information on conservation projects across the region in order to track efforts and improve stakeholders' ability to evaluate collective impacts and effectiveness. The website which provides detailed information on various conservation and water quality related projects throughout the Central Coast, including those from the IRWM Plan and the SWRP. Website: https://www.ccactiontracker.org/

- GAMA: All projects that involve groundwater quality must meet the criteria for and be compatible with GAMA.
  Website: http://www.waterboards.ca.gov/gama/geotracker_gama.shtml

- SWAMP: Projects that involve surface water quality must meet the criteria for and be compatible with SWAMP.
  Website: http://www.waterboards.ca.gov/water_issues/programs/swamp/tools.shtml

- CEDEN: CEDEN was created by the State Water Resources Control Board with support from SWAMP to include all available statewide data (such as that produced by research and volunteer organizations). Website: http://www.ceden.org/

- Wetland Tracker: Projects that involve wetland restoration must be uploaded to the California Wetland Tracker. Website: http://www.californiawetlands.net/tracker/

- CalEEMod: CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with both construction and operations from a variety of land use projects. All IRWM Plan projects have been required to do the CalEEMod assessment, summaries of which can be entered in the Action Tracker. Website: http://www.caleemod.com/

All of these databases are accessible by the general public. In addition, Central Coast water quality monitoring data can be viewed in the Regional Water Board's Central Coast Ambient Monitoring Program (CCAMP) Data Navigator and Report Card system. This CCAMP system is a web-based user interface that provides exceptional graphical and map-based access to data. Underlying the interface are a detailed set of web-based tools that compare measured values to regulatory and other thresholds, provide color-coded report card grades of surface water condition, and provide comprehensive analytics such as trend statistics, Bayesian change point analysis, data distributions and quality assurance information. The CCAMP tools and interface are available to the public at http://www.ccamp.org/.

8.3 Frequency at which Data will be Updated

Many of the projects evaluated in this SWRP affect the flow of water and contaminants to waterbodies monitored by the CCAMP program. These waterbodies include:

- Alisal Creek
- Alisal Slough
- Blanco Drain
- Elkhorn Slough
- Espinosa Slough
- Gabilan Creek
- Merritt Ditch
- Moro Cojo Slough
- Moss Landing Harbor
- Old Salinas River
- Pajaro River
- Salinas Reclamation Canal
- Salinas River
- Santa Rita Creek
- Tembladero Slough

Water quality data for sites in these waterbodies are updated on a five-year rotation, with the data entered into CCAMP and CEDEN for public access.

In addition, there are Coastal Confluence sites near the discharge points of the following waterbodies affected by these storm water projects:

- Pajaro River
- Elkhorn Slough
- Moro Cojo Slough
- Moss Landing Harbor
- Tembladero Slough
- Old Salinas River
- Salinas River

These sites are measured monthly for key conventional contaminants, including suspended sediment and nitrate, both of which are target constituents of storm water projects. These data are also entered into CCAMP and CEDEN on a regular basis for public access.

Additional monitoring will depend on future funding of monitoring and assessment projects in the region and the implementation projects listed in this SWRP.

CHAPTER 9. Implementation Strategy and Schedule

This chapter describes the overall coordinated strategy to facilitate the successful implementation of projects evaluated in this plan.

9.1 Resources for Plan Implementation

Projects in this SWRP will be eligible for grant funds to support storm water and dry weather runoff capture projects from California bond measures approved by voters after January 2014. These include approximately $90 million available in Round 2 Implementation Grants from Proposition 1, with the solicitation period beginning in summer 2019. Bond fund grants may not be available for all projects evaluated in this SWRP, and bond fund programs have recently required up to 50% matching funds from non-State sources. Tables 9.1 and 9.2 show the grant request estimates and identified matching funds for concept proposals and design proposals evaluated in this SWRP. The total grant funding that may be requested by all projects is estimated to be greater than $30 million.

Table 9.1 Estimated Grant and Matching Funds for Concept Proposals

Project Applicant	Project Title	Estimated Grant Request	Identified Matching Funds
Big Sur Land Trust	Carr Lake Restoration	NA	NA
Central Coast Wetlands Group	Gabilan Floodplain Enhancement	$270,000	$180,000
Central Coast Wetlands Group	Salinas to the Sea	$5,725,000	$6,870,000
City of Salinas	Acosta Plaza LID	NA	NA
City of Salinas	Lincoln Avenue Green Street LID	NA	NA
Monterey One Water	Ocean Outfall Beach Junction Structure Managed Retreat	$5,500,000	$6,00,000
Moss Landing Harbor District	South Moss Landing Harbor Water Quality	NA	NA
Resource Conservation Districts	Stormwater Management, Collection and Infiltration	NA	NA
Total		**$11,495,000 +**	**$7,050,000 +**

Table 9.2 Estimated Grant and Matching Funds for Design Proposals

Project Applicant	Project Title	Estimated Grant Request	Identified Matching Funds
Central Coast Wetlands Group	Blanco Drain Treatment Wetland	$950,000	$425,000
Central Coast Wetlands Group	Castroville and Moss Landing Stormwater Enhancement	$1,200,000	$600,000
Central Coast Wetlands Group	Espinosa Lake Flood Retention	$1,250,000	$500,000
Central Coast Wetlands Group	Old Salinas River Treatment Wetland	$740,000	$380,000
City of Salinas and Monterey One Water	Salinas Area Flood Enhancements and Reuse (SAFER)	$2,950,000	$2,950,000
City of Soledad	Soledad Regional Recharge	$4,172,505	$491,878
County of Monterey	Davis Road Bridge Bioswales	$500,000	$54,500,000
Elkhorn Slough Foundation	Ridgeline to Tideline	$6,178,438	$2,050,694
Monterey One Water/CCWG/City of Salinas	Salinas Water Quality and Agricultural Reuse Efficiency	$805,000	$805,000
Total		**$18,745,943**	**$62,702,572**

Efforts to obtain grant and matching funds will be coordinated by the Regional Water Management Group (RWMG) for the Greater Monterey County Integrated Regional Water Management (IRWM) Region, as described in the next section.

Planning, engineering, construction and maintenance resources are available at the agencies and organizations that have submitted proposals to the SWRP. All project proponents have successfully completed similar projects in the region, as is documented on their websites:

- Big Sur Land Trust: https://bigsurlandtrust.org/carr-lake-salinas/
- Central Coast Wetlands Group: https://www.mlml.calstate.edu/ccwg/habitat-restoration/
- City of Salinas: https://www.cityofsalinas.org/our-city-services/public-works/water-waste-energy/stormwater-program/news/harnessing-technology-create-data-driven-city-salinas-stormwater-program
- City of Soledad: https://cityofsoledad.com/our-city/city-departments/facilities/engineering-services/
- County of Monterey: http://www.co.monterey.ca.us/government/departments-i-z/resource-management-agency-rma/public-works-facilities
- Elkhorn Slough Foundation: https://www.elkhornslough.org/tidal-wetland-program/hester-marsh-restoration/
- Monterey One Water: http://purewatermonterey.org/2018/04/18/pure-water-monterey-wins-watereuse-ca-award/
- Moss Landing Harbor District: http://www.mosslandingharbor.dst.ca.us/about/history.htm
- Resource Conservation District: http://www.rcdsantacruz.org/mar

In addition, SWRP project proponents and other SWRP stakeholders have been actively engaged in attempting to develop a strategy for funding and implementing not only storm water projects in the SWRP, but water and natural resource-related projects in other regional/local plans in Monterey County, including the Greater Monterey County, Monterey Peninsula, and Pajaro River Watershed IRWM Plans, Groundwater Sustainability Plans, Salinas River Long Term Management Plan, and others. Stakeholder meetings were held on January 15, 2019 and February 20, 2019 to discuss potential funding and financing options for such a regional, county-wide implementation strategy. Topics of discussion included project partner authorities and capabilities, potential funding and financing options, and organizational capacity, with regard to what an organizational structure might look like for cooperative project funding, administration and implementation. This discussion is continuing through the IRWM process.

9.2 Submittal of the SWRP to the Existing IRWM Plan

This SWRP has been submitted to the RWMG for the Greater Monterey County IRWM Region for incorporation into the IRWM Plan. Adoption of the SWRP by the RWMG is expected in late spring 2019. The RWMG has convened a standing Funding Committee to identify sources of funding for the IRWM Plan projects and programs, which include SWRP projects. These funding sources include private foundation grants; State IRWM and storm water grant funds; state and federal water quality grant funds; monetary contributions from RWMG entities; and in-kind staff time contributed by members of the RWMG. The Funding Committee is also investigating other potential means of long-term support. These include collaboration with agencies and organizations external to the RWMG who share similar goals. Such agencies may contribute financial or other resources toward the implementation of SWRP projects.

Continuing Funding Committee planning and project support for the IRWM Plan and SWRP include:

- Approximately 6 to 10 RWMG meetings a year, which focus on ongoing water resource issues in the region, opportunities for collaboration between RWMG members, opportunities for integration of projects, ongoing outreach and assistance to disadvantaged communities, and alternative sources of funding for IRWM Plan and SWRP projects and programs.
- Project solicitations, which will occur in response to State IRWM and Storm Water Implementation Grant funding rounds (anticipated approximately every two years).
- Committee work associated with the project solicitations (e.g., project ranking and project review).
- Project monitoring and Plan performance evaluation.

In addition to seeking financial support for the ongoing IRWM planning process, the Funding Committee is tasked with identifying alternative sources of grant funds and other means to help implement projects and programs in the IRWM Plan. Potential funding sources include:

- Federal grant programs such as U.S. Fish and Wildlife Service grants, National Fish and Wildlife Federation grants, Economic Development Administration grants, U.S. Bureau of Reclamation Title XVI funds, and U.S. Department of Agriculture grant funds including the Natural Resources Conservation Service Environmental Quality Incentives Program grants
- State grant programs such as Department of Fish and Wildlife Fisheries Restoration Grant Program funds; State Coastal Conservancy funds; State Water Resources Control Board Cleanup and Abatement Account grants, Supplemental Environmental Protection grants, and other water quality grants; and State Department of Water Resources grants
- Local funds such as Transportation Agency for Monterey County grants
- Private grants such as California State Parks Foundation, Elkhorn Slough Foundation, Monterey Bay Sanctuary Foundation, Monterey County Agricultural and Historical Land Trust, and corporate gifts
- Ratepayer fees
- Special taxes, assessments, and fees
- Loans from sources such as the Clean Water State Revolving Fund

9.3 Implementation Projects and Programs

This SWRP is developed by entities with experience in developing projects and utilizing practices to ensure effective implementation of planning efforts. The following projects and programs submitted to the SWRP achieve multiple benefits and will ensure effective implementation by achieving Plan storm water objectives:

1. Carr Lake Project: The Big Sur Land Trust and partners propose a transformation of Carr Lake, in the center of the City of Salinas, from seasonally flooded farm land to restored wetland habitat, community parks and other uses. (Concept Proposal)

2. Salinas to the Sea: The Central Coast Wetlands Group proposes restoring wetland habitat, bicycle and walking trails, water storage and treatment along 25 miles of highly modified stream channel. (Concept Proposal)

3. Blanco Drain Treatment Wetland Areas: The Central Coast Wetlands Group and partners propose restoring wetland habitat in this highly modified stream channel to provide storm water storage and treatment. (Design Proposal)

4. Castroville and Moss Landing Storm Water Enhancement Project: The Central Coast Wetlands Group and partners propose creating storm water storage and treatment in seasonally flooded farm lands that historically were wetland habitat. (Design Proposal)

5. Espinosa Lake Flood Retention Project: The Central Coast Wetlands Group and partners propose creating storm water storage and treatment in seasonally flooded farmlands that historically were wetland habitat. (Design Proposal)

6. Old Salinas River Treatment Wetland: The Central Coast Wetlands Group and partners propose creating storm water storage and treatment in seasonally flooded farmlands that historically were wetland habitat. (Design Proposal)

7. Gabilan Floodplain: The Central Coast Wetlands Group and partners propose re-establishing watershed processes to allow a highly modified channel to reconnect to areas of its floodplain to restore wetland habitat, attenuate flood peak flows and promote aquifer recharge. (Concept Proposal)

8. Acosta Plaza: The City of Salinas proposes low impact development installations to promote groundwater recharge and reduce storm water pollution and flooding. (Concept Proposal)

9. Lincoln Street: The City of Salinas proposes low impact development installations to promote groundwater recharge and reduce storm water pollution and flooding. (Concept Proposal)

10. Soledad Regional Recharge Project: The City of Soledad proposes diverting storm water to a larger storage pond to reduce flooding and provide parks and open space for a disadvantaged community. (Design Proposal)

11. Ridgeline to Tideline: The Elkhorn Slough Foundation proposes upland and wetland restoration to eliminate sediment mass wasting events and suspended sediment pollution in a National Estuarine Research Reserve. (Design Proposal)

12. Davis Road Bridge Replacement and Road Widening Project: The Monterey County Resource Management Agency Public Works and Facilities proposes installing bioswales along a highway repair and bridge construction project to retain and treat storm water before it enters the Salinas River. (Design Proposal)

13. Ocean Outfall: Monterey One Water proposes re-engineering and reconstructing a damaged wastewater outfall that conveys storm water and wastewater to the ocean. (Concept Proposal)

14. Salinas Water Quality and Agricultural Reuse Efficiency Project: Monterey One Water, Central Coast Wetlands Group and the City of Salinas propose engineered infrastructure and new treatment wetlands to store and treat storm water and industrial wash water. (Design Proposal)

15. South Moss Landing Harbor Water Quality: The Moss Landing Harbor District proposes beneficial reuse of dredged harbor sediment to create wetland habitat to capture and treat sediment, nutrients and other pollutants before they enter the Monterey Bay National Marine Sanctuary. (Concept Proposal)

16. Storm Water Managed Aquifer Recharge: The Resource Conservation Districts of Monterey and Santa Cruz Counties propose diverting agricultural storm water to ponds and treatment wetlands to facilitate groundwater recharge. (Concept Proposal)

17. Salinas Area Flood Enhancements and Reuse (SAFER): The City of Salinas and Monterey One Water propose engineering and infrastructure improvements to ponds that store and treat storm water runoff from the city. (Design Proposal)

More detailed project descriptions are provided in Chapter 7. Table 9.3 provides the status and anticipated timeline for each project.

Table 9.3 Project Status and Anticipated Timeline

Project Applicant	Project Title	Project Status	Anticipated Schedule following Funding Procurement
Big Sur Land Trust	Carr Lake Restoration	Preliminary vision (non-engineering) concept design complete (December 2018).	TBD
Central Coast Wetlands Group	Gabilan Floodplain Enhancement	Concept Proposal	Year 1 (planning): Landowner agreements, Boundary delineations, percolation study, 30% Design/ CEQA Checklist Complete. Year 2: Complete CEQA, 100% Design, grading permits. Year 3: begin and complete construction, begin monitoring. Year 4: Monitoring, reporting and groundwater benefit documentation.
Central Coast Wetlands Group	Salinas to the Sea	Concept Proposal	TBD
Central Coast Wetlands Group	Blanco Drain Treatment Wetland	Landowner agreement in negotiations	Year 1: Land agreement, design, permit submittal. Year 2: Permit completion, earth moving, erosion control planting. Year 3: Native planting, monitoring & reporting
Central Coast Wetlands Group	Castroville and Moss Landing Storm Water Enhancement	Concept Proposal	Year 1: Design and Permit. Year 2: Construction and initial planting. Year 3 complete landscaping and planting implementation.
Central Coast Wetlands Group	Espinosa Lake Flood Retention	Concept Proposal	Year 1&2: Landowner agreements and design. Year 3: permits and construction. Year 4: planting, monitoring and operations.
Central Coast	Old Salinas River	30% designs complete	Year 1: Land owner agreement,

Wetlands Group	Treatment Wetland		design completion, permit submittal. Year 2: Construction and initial planting. Year 3: complete planting, monitoring and reporting.
City of Salinas	Acosta Plaza LID	Concept Proposal	Year 1: Develop integrated street sweeping/parking control program, perform community outreach, and develop Request For Information (RFI) for Public-Private Partnership (P3) project opportunities. Year 2: Revise street sweeping program, if necessary, after evaluation of water quality monitoring results.
City of Salinas	Lincoln Avenue Green Street LID	Concept Proposal	Year 1: Incorporate concept proposal into engineering design for Salinas' Downtown Complete Streets project. Year 2: Obtain permits and initiate construction/planting.
City of Salinas and Monterey One Water	Salinas Area Flood Enhancements and Reuse (SAFER)	Environmental review: complete with the exception of the treatment wetlands component, which qualifies for CEQA exemption. Design: 30%	Year 1: Planning, design, environmental (June 2020-December 2020). Year 2: Construction/ Implementation (January 2021-June 2022).
City of Soledad	Soledad Regional Recharge	1) Construct 72" SD and regrade existing Retention Pond - Project is complete as of 2/1/2019. 2) Install 36" SD in Gabilan Drive – Anticipated completion 9/1/2019. 3) Convert Retention Pond to Community Park – Pending funding.	Convert Retention Pond to Community Park: 3 months for design; 1.5 months to bid; 6 months to construct.
County of Monterey	Davis Road Bridge Bioswales	Plans and specification are 95% complete. Currently in process of acquiring right-of-way to widen Davis Rd.	Once right-of-way is acquired, approx 12 months to secure construction permits and finalize project plans & specifications
Elkhorn Slough Foundation	Ridgeline to Tideline	In the planning stage for marsh restoration. Land acquisition plan is underway; 100 acres have been acquired and restoration started.	Year 1: Complete acquisition, CEQA, 100% Design, (etc.), begin construction. Year 2: Complete construction, begin monitoring. Year 3: Monitoring.
Monterey One Water	Ocean Outfall Beach Junction Structure Managed Retreat	Concept Proposal	Currently this project is only conceptual and would need further design and environmental review before becoming an implementation project. The

			project is not expected to receive funding until FY 2024/2025.
Monterey One Water/CCWG/City of Salinas	Salinas Water Quality and Agricultural Reuse Efficiency	Select project components have already been designed and assessed environmentally. The project could be ready to bid.	Year 1: design, permitting, pilot project R&D. Year 2: construction and monitoring. Year 3 project implementation, operations and monitoring.
Moss Landing Harbor District	South Moss Landing Harbor Water Quality	Concept Proposal	TBD
Resource Conservation Districts	Stormwater Management, Collection and Infiltration	Concept Proposal	Awaiting funding. Anticipated start date is FY 2019/2020. Year 1: Design and permitting. Year 2: Construction.

9.4 Adaptive Management – Maintaining a Living Document

By incorporating this SWRP into the IRWM Plan and ongoing RWMG process, the projects, implementation strategy, and adaptation of water management strategies will be revisited and revised at every funding cycle, approximately every two years. Ongoing adaptations to the SWRP may include: re-characterization of water quality priorities; source assessment re-evaluation; effectiveness assessment of projects; updated metrics-based quantitative analysis; adding or removing projects; documentation of completed projects and identification of necessary next steps.

9.5 Responsibilities

The RWMG will be a central forum for coordination among project managers. Member agencies and other partner agencies will be responsible for the coordinated, watershed-based implementation of storm water projects in this SWRP. The following entities will be the key partners in strategically implementing storm water management projects in the region.

Table 9.4 Storm Water Quality and Habitat Improvement Project Key Partners

Team Members	Land Acquisition	Design and Permitting	Construction	Operations	Monitoring
City of Salinas		X		X	X
Monterey County Water Resources Agency		X		X	
Central Coast Wetlands Group	X	X	X	X	X
Big Sur Land Trust	X	X	X	X	
Monterey County RCD	X	X	X	X	
Monterey County Parks Dept	X		X	X	
Local Landowners	X		X		
Monterey County Grower Shippers				X	
Central Coast Regional Water Board					
Preservation Inc.					X

Table 9.5 Low Impact Development Project Key Partners

Team Members	Land Acquisition	Design and Permitting	Construction	Operations	Monitoring
City of Salinas	X	X	X	X	X
Monterey County Water Resources Agency				X	
Monterey County Planning Dept	X	X			
Local Landowners and Developers	X	X	X	X	X
Ecology Action		X	X		
Central Coast Regional Water Board		X			X

Table 9.6 Water Supply Enhancement Project Key Partners

Team Members	Land Acquisition	Design and Permitting	Construction	Operations	Monitoring
City of Salinas	X	X	X	X	X
Monterey County Water Resources Agency		X	X	X	
Salinas Valley Groundwater Sustainability Agency	X	X	X	X	X
Central Coast Wetlands Group	X	X	X		X
Monterey One Water	X	X	X	X	X
Farmers	X	X	X	X	X
Monterey County Grower Shippers	X	X		X	
Central Coast Regional Water Board		X			X

Table 9.7 Storm Water Flood Management Key Partners

Team Members	Land Acquisition	Design and Permitting	Construction	Operations	Monitoring
City of Salinas		X		X	X
Monterey County Water Resources Agency		X		X	
Central Coast Wetlands Group	X	X	X	X	X
Big Sur Land Trust	X	X	X	X	
Monterey County RCD	X	X	X	X	
Monterey County Parks Dept	X		X	X	
Local Landowners	X		X		
Monterey County Grower Shippers				X	
Central Coast Regional Water Board					
Preservation Inc.					X

Table 9.8 Aquatic Environment Enhancement Projects Key Partners

Team Members	Land Acquisition	Design and Permitting	Construction	Operations	Monitoring
City of Salinas		X		X	X
Monterey County Water Resources Agency		X		X	
Central Coast Wetlands Group	X	X	X	X	X
Big Sur Land Trust	X	X	X	X	
Monterey County RCD	X	X	X	X	
Monterey County Parks Dept	X		X	X	
Local Landowners	X		X		
Monterey County Grower Shippers				X	
Central Coast Regional Water Board					
Preservation Inc.					X

Table 9.9 Community Enhancement Projects Key Partners

Team Members	Land Acquisition	Design and Permitting	Construction	Operations	Monitoring
City of Salinas		X		X	X
Monterey County Water Resources Agency		X		X	
Central Coast Wetlands Group	X	X	X	X	X
Big Sur Land Trust	X	X	X	X	
Monterey County RCD	X	X	X	X	
Monterey County Parks Dept	X		X	X	
Local Landowners	X		X		
Environmental Justice Coalition for Water	X	X		X	X

9.6 Community Participation

Development and implementation of this SWRP included input from the RWMG through regular RWMG meetings, Technical Advisory Committee meetings that were open to and attended by the public, and additional stakeholder meetings that were held to inform and receive feedback from stakeholders and the public. These meetings are described in greater detail in Chapter 10. Ongoing community participation for SWRP implementation will continue through the IRWM process, as described in Section 9.2.

In addition, individual project proponents have developed their own stakeholder and community outreach programs, and will continue to conduct outreach accordingly. For example, The Big Sur Land Trust has been hosting a series of community events for the Carr Lake Project (https://www.montereycountygives.com/nonprofit/big-sur-land-trust/).

9.7 Implementation Status Tracking

Plan performance tracking of this SWRP will be conducted every two years or as appropriate as part of the IRWM Plan Performance Review. The review will evaluate progress made toward achieving IRWM Plan and SWRP objectives. Progress toward meeting IRWM and SWRP objectives is directly tied to the implementation of projects, which will be tracked using the Data Management System described in Chapter 8. Two tables will be generated with each Plan Performance Review to show: 1) that the RWMG is implementing projects listed in the IRWM Plan/SWRP, and 2) that the RWMG is efficiently making progress towards meeting the objectives of the IRWM Plan/SWRP. As appropriate, project implementation will be tracked using the "Conservation Action Tracker" database, which is a data system for tracking land-use management improvements in the Central Coast region: https://www.ccactiontracker.org/

9.8 Timeline

The final SWRP document will be submitted by June 30, 2019. That coincides with the release of the grant funding solicitation for Round 2 Storm Water Implementation Grants from Proposition 1. Projects described in this SWRP will be eligible to apply for these and other funds to implement the projects. Timing of implementation for the individual projects included in this plan will be determined as funding becomes available.

9.9 Federal, State, and Local Permits

There are a number of permits and permissions that must be obtained to implement the SWRP and its projects, including but not limited to:

- Federal
  - National Environmental Policy Act (NEPA)
  - Section 401 and 404 of the Clean Water Act
- State
  - California Environmental Quality Act (CEQA)
  - California Department of Fish and Wildlife Lake/Streambed Alteration Permits
  - General Permit for Discharges of Storm Water Associated with Construction Activity
  - Regional Water Quality Control Board NPDES permits and/or WDR
- Local
  - City/County development and encroachment permits
  - Municipal storm water compliance
  - Local pretreatment programs

As part of the Greater Monterey County IRWM Plan, the RWMG works to build relationships with federal, state, and local regulatory agencies and other water agencies to facilitate the permitting, planning, and implementation of water-related projects. Members of the RWMG meet with federal,

state, and local regulatory agencies, water agencies, and other project proponents to facilitate the permitting, planning, and implementation of water-related projects, as needed. It is anticipated that such meetings will be held during project planning and construction phases for storm water projects included in this Plan.

9.10 Implementation Performance Measures

The projects and programs listed in Section 9.3 have been evaluated to ensure that effective implementation of the SWRP will achieve multiple benefits for the Greater Monterey County area. Table 9.9 shows the number of projects submitted to the Greater Monterey County SWRP that will address each benefit objective.

Table 9.10 Summary of Benefits Addressed by Greater Monterey County SWRP Projects

	Number of Projects (out of 17)	
	Main Benefit	**Secondary Benefit**
Water Quality	15	15
Water Supply	10	8
Flood Management	13	0
Environmental	12	10
Community	10	10

The table indicates that the benefit category most frequently addressed by projects submitted for the SWRP is water quality, though all five benefit categories are addressed by a number of projects. All of the projects address multiple benefits.

The implementation of the SWRP is expected to result in the following outcomes, which define the performance measures for projects in the Greater Monterey County Area. Each design project was evaluated quantitatively to estimate the magnitude of each project benefit in terms of attainment of water quality standards, volume of water diverted and treated for reuse, reduction in peak flood flows, acres and quality of habitat restored, acres of recreational and open space restored or created, and public access to non-vehicular transportation corridors.

Project Benefits Categories for Implementation Performance Measures:

1. Water Quality:
    a. Increased filtration and/or treatment of runoff
    b. Greater non-point source pollution control
    c. Reestablishment of natural water drainage and treatment

2. Water Supply:
    a. Increased water supply reliability
    b. Increased conjunctive use of groundwater and surface water (storm water)
    c. Water conservation

3. Flood Management:
    a. Decreased flood risk by attenuation of peak flows during storm events, thus reducing acreage flooded

4. Environment:
    a. Restoration of wetland and riparian habitat
    b. Reduced energy use, reduced greenhouse gas emissions, and/or additional locations for carbon sinks
    c. Reestablishment of natural hydrographs
    d. Treatment wetlands to improve water quality

5. Community:
    a. Increased parkland and open space
    b. increased availability of non-carbon transportation (pedestrian and bike paths)
    c. Increased employment opportunities
    d. Increased public education
    e. Increased community involvement

With every SWRP review and update, the objectives and performance will be reviewed to assess the extent to which they are being achieved. As the SWRP and IRWM Plan processes continue, new projects will be developed, either as concept proposals or as fully designed projects, to address the gaps in achieving the goals and objectives of the SWRP and IRWM Plan.

Each project proposed for implementation has specified its anticipated benefits and performance measures. These performance measures are listed below.

Implementation Performance Measures

Water Quality:
- Pollutant load reduction (mass per unit time)
- Pollutant concentration reduction in receiving waters (mass per volume)
- Reductions in biological effects (toxicity, eutrophication, invertebrate community metrics, fish tissue concentrations)
- Reduction of storm water flows to receiving waters (volume)

Water Supply
- Water captured for reuse (volume)
- Water percolated to groundwater (volume or flow)
- Water to aquifer recharge (volume or flow)
- Reductions in groundwater pumping (volume)

Flood Management
- Reduction in peak flood flows (flow per rate of precipitation)
- Reduction in area flooded (area)

Environmental

- Wetland or riparian habitat restored or enhanced (area)
- Improved condition of wetland or riparian habitat (California Rapid Assessment Method, CRAM scores)

Community

- Increased parkland and open spaces (area)
- Increased transportation opportunities (length of walking trails and bike paths)
- Employment (persons hired to build or maintain water related facilities)
- Public engagement (participation in meetings and community action)

The SWRP team partners and the project proponents have extensive experience in designing and conducting monitoring and assessment programs to track outcomes and effectiveness of implementation projects.

9.11 Mechanisms to Adapt Project Operations and Plan Implementation

Through project-specific monitoring efforts, the Conservation Action Tracker, and measurable objectives, the RWMG will track project operations and plan implementation to ensure that SWRP goals and objectives are being met. Implementing project monitoring and review will enable the RWMG to respond to lessons learned from the project monitoring efforts and to utilize new information, particularly as new data regarding climate change impacts and vulnerabilities for the Greater Monterey County region become available. With this information, the RWMG may choose to modify SWRP objectives, the measurability of those objectives, or the project review process; and these decisions will, in turn, dictate the types of projects that will be prioritized and implemented in the future.

CHAPTER 10. Education, Outreach and Public Participation

Storm water management on a watershed basis involves collaboration among local governments, utilities, and other stakeholder groups to analyze the hydrology, storm drain/runoff conveyance systems, opportunity sites, habitat and community needs within sub-watersheds. The Storm Water Management Planning Act implemented through Water Code section 10563 substantively focuses on diverting runoff from existing storm drains, channels, or conveyance structures to sites (particularly publicly owned sites) that can clean, store, infiltrate and/or use the runoff. The benefits of coordinated storm water management on a watershed basis include reduced monitoring costs and maximized results across programs intended to protect beneficial uses.

An added incentive for local governments, nonprofit organizations, utilities, and other stakeholder groups to participate in coordinated storm water planning is the potential for grant funding. Water Code section 10563, subdivision (c)(1), requires a Storm Water Resource Plan (SWRP) as a condition of receiving funds for storm water and dry weather runoff capture projects from any bond approved by voters after January 1, 2014.[1] Therefore, participation in the Greater Monterey County SWRP planning process has provided an opportunity for stakeholders wishing to fund storm water or dry weather runoff capture projects to include their projects in a SWRP and thereby obtain eligibility for certain State grant funds.

This chapter describes the public education, outreach, and participation process for development and implementation of the Greater Monterey County SWRP.

10.1 General Strategy for Public Outreach

The Greater Monterey County SWRP was developed and adopted with broad participation from the public and interested stakeholders. The public engagement effort was conducted through the Greater Monterey County IRWM program, which has an ongoing and robust stakeholder outreach process. The Greater Monterey County Regional Water Management Group itself is a diverse consortium of 18 entities, composed of public agencies, water companies, nonprofit organizations, academic institutions, and community groups, including three organizations that specifically represent disadvantaged community interests.

The public outreach strategy consisted of a general process for stakeholder communication, plus a series of stakeholder meetings to inform stakeholders and the general public about the SWRP process and to obtain their input on technical aspects of the plan, project development, and the overall planning process.

Public outreach included broad outreach to all entities included on the Greater Monterey County IRWM stakeholder list (including over 150 different entities representing diverse interests), as well as identification and inclusion of specific audiences potentially affected by, or with potential interest in, the SWRP. Targeted audiences included communities potentially affected by storm water projects,

[1] This requirement does not apply to disadvantaged communities with a population of 20,000 or less, and that is not a co-permittee for an MS4 National Pollutant Discharge Elimination System permit issued to a municipality with a population greater than 20,000 (Water Code section 10563(c) et seq.).

disadvantaged communities, locally regulated commercial and industrial stakeholders, certain nongovernmental and nonprofit organizations with interests in storm water planning (such as Ecology Action and The Nature Conservancy), water management agencies, water suppliers, waste treatment operators, ratepayers, and others with operations within the SWRP watershed boundaries. Stakeholders had the opportunity to participate and comment at all major decision points and milestones of the SWRP, as described below.

10.2 Process for Stakeholder Communication

The strategy for ongoing communication with stakeholders included the following elements:

- **Webpage:** A dedicated SWRP webpage has been created on the Greater Monterey County IRWM website. The website describes the SWRP and the SWRP planning process, provides news updates, and provides contact information. The website can be accessed at: http://www.greatermontereyirwmp.org/current/planning/
- **Email Listserv:** As noted above, a targeted stakeholder email list (separate from the general Greater Monterey County IRWM stakeholder list) was created for stakeholders potentially affected by, or with potential interests in, SWRP development. Stakeholders who attended the SWRP public workshops were added to that list. Emails were sent to this listserv to notify stakeholders of all SWRP-related meetings, to alert them to the project solicitation, and to invite their comments on certain milestones in the development of the SWRP and on the draft SWRP.
- **Announcements and Presentations:** SWRP information and funding opportunities were also communicated through presentations and announcements at various meetings and public events.

10.3 Stakeholder Outreach Meetings

In addition to ongoing stakeholder communication, and in addition to meetings of the Technical Advisory Committee, three stakeholder outreach meetings were convened to inform stakeholders and the general public about the SWRP process and milestones, and to obtain their input. These meetings occurred on the following dates:

- **April 25, 2017:** Initial meeting to recruit and inform stakeholder representatives interested in the development of the Greater Monterey County SWRP. Stakeholders were informed of the requirement for projects to be included in a SWRP for Proposition 1 Implementation Grants. The Project Team explained the SWRP development timeline and objectives, and introduced and discussed modeling and information gathering. The Project Team also requested preliminary information for potential projects and data for SWRP modeling and analysis.
- **August 30, 2017:** The purpose of this meeting was to begin the solicitation of projects and project ideas in order to share information about potential implementation projects with the Project Team for purposes of analysis and modeling.
- **February 20, 2019:** Meeting to present the Administrative Draft Greater Monterey County SWRP and to obtain comments from the Technical Advisory Committee and stakeholders.
- **April 25, 2019:** Stakeholder meeting to present the Public Draft SWRP and obtain comments.

10.4 Stakeholder Engagement in Project Design and Implementation

Project Design: A two-phase project solicitation was part of the SWRP planning process: A preliminary project solicitation was announced in order to give stakeholders an opportunity to share and discuss project ideas with the Project Team, which in turn helped to inform inputs for modeling as part of SWRP development. Emails were sent on August 18, 2017 to the IRWM and SWRP stakeholder lists to announce the August 30, 2017 stakeholder meeting and explain the purpose of the preliminary project solicitation.

On May 17, 2018, emails were sent to the IRWM and SWRP stakeholder lists to announce the official project solicitation for the SWRP. Project applications were due on July 13, 2018. The Project Team reached out specifically to County staff and to municipalities in the Greater Monterey County region in order to encourage and discuss potential projects. The team also reached out individually to project proponents with projects in the Greater Salinas Area SWRP to discuss any potential updates that may have warranted inclusion of their projects in the Greater Monterey County SWRP as well.

Project Implementation: Community participation will occur during individual project implementation, which will focus on the community where the project is located. Each project will include its own public participation process to address the concerns of affected residents and businesses and adjust project designs as appropriate and feasible. SWRP projects will provide an ideal opportunity to showcase the many benefits of green infrastructure, particularly regarding storm water capture, reduced local flooding, urban greening, and other features and functionality that will serve the community. With proper educational tools such as interpretive signage, the public can also gain a better understanding of how the project provides opportunities to capture, treat, and conserve water. As a result, constructed projects will provide a mechanism for community participation and education that will help garner support for additional projects implemented over time.

Project proponents and other SWRP stakeholders have also been actively engaged in developing a strategy for funding and implementing storm water projects in the SWRP more generally, and related infrastructure development. Stakeholder meetings were held on January 15, 2019 and February 20, 2019 to discuss potential funding and financing options for a regional, county-wide implementation strategy for projects included in the SWRP as well as other local water and natural resource-related plans, including the IRWM Plan, Groundwater Sustainability Plans, Salinas River Long Term Management Plan, and others. Topics of discussion included project partner authorities and capabilities, potential funding and financing options, and organizational capacity, with regard to what an organizational structure might look like for cooperative project funding, administration and implementation. This discussion is continuing through the IRWM process.

10.5 Disadvantaged Communities and Environmental Justice

The planning area established in this SWRP includes a large number of disadvantaged communities. Disadvantaged communities are defined as communities with annual median household incomes (MHI) that are less than 80 percent of the statewide MHI. The statewide annual MHI in 2016, according to 2016 American Community Survey (ACS) data of the US Census, was $63,783; the disadvantaged community “threshold” was $51,026. According to this data, approximately 34 percent of the Greater Monterey County population qualified as disadvantaged. Figure 10.1 illustrates the geographic extent of disadvantaged communities within the Greater Monterey County region.

Table 10.1 summarizes the disadvantaged community census "places" in the Greater Monterey County. In addition to census "places," there are numerous disadvantaged communities located within census tracts and block groups within the region. As indicated in the table, many disadvantaged communities in the Greater Monterey County region are largely Hispanic. Many individuals in these communities are first-generation and monolingual in Spanish. Other languages may be represented as well. For example, the City of Greenfield has a large number of households from the Oaxaca region of Mexico, where the primary language is an indigenous dialect unrelated to Spanish.

Table 10.1 Disadvantaged Community "Places" in the Greater Monterey County Region

	Population	Estimated MHI	Hispanic Population
Boronda CDP	1,381	33,712	70%
King City city	13,532	38,766	90%
San Ardo CDP	821	43,281	86%
San Lucas CDP	362	46,250	89%
Greenfield city	16,994	46,506	90%
Castroville CDP	6,978	50,949	90%
Lockwood CDP	443	38,269	34%

Source: 2012-2016 American Community Survey

Figure 10.1 Geographic Extent of Disadvantaged Communities in the Greater Monterey County Region

Disadvantaged communities and environmental justice communities have been well represented in SWRP planning efforts. The Greater Monterey County Regional Water Management Group, which acted as the Technical Advisory Committee for this SWRP, includes disadvantaged communities, assistance providers, and water purveyors that serve disadvantaged communities, namely: Environmental Justice Coalition for Water (assistance provider), Rural Community Assistance Corporation (assistance provider), San Jerardo Cooperative, Inc. (disadvantaged community), Castroville Community Services District, City of Soledad (a disadvantaged community according to 2014 ACS data), California Water Service Company (serves disadvantaged communities), and Monterey County Resource Management Agency (assists disadvantaged communities through public works projects).

Environmental justice concerns exist where water resource problems disproportionately impact communities that lack the capacity to address those problems themselves, due to financial, language, or other constraints. Many disadvantaged communities in the Greater Monterey County SWRP planning region are impacted by contaminated drinking water due largely to agricultural practices in the Salinas Valley and North County. The costs associated with addressing contaminated drinking water wells can be extremely high, out of reach for many low-income communities, and the capacity to address technical or regulatory issues can be significantly hampered by language barriers.

Environmental justice is also relevant where water resource projects meant to convey "general" public benefit do not in fact benefit poor or otherwise disadvantaged communities proportionately. For example, many disadvantaged communities in Monterey County lack water-based recreational and open space opportunities. While Monterey has a wealth of beautiful coastline, many low-income communities are located in the Salinas Valley or North County areas, where rivers and streams have been diverted and/or covered up to accommodate agricultural and urban growth.

Integrated storm water resource planning can help create parks and open space in overcrowded urban areas. The City of Salinas, for example, which has numerous low-income neighborhoods and a large Hispanic population, has one of the lowest ratios of parkland per resident in California—just 2.9 acres per 1,000 residents, compared to 16.6 acres per 1,000 people in San Jose. The national average is about 10 acres per 1,000 people (The James Irvine Foundation 2015). The Carr Lake project in this SWRP proposes to capture urban runoff, recharge the groundwater basin, and improve water quality flowing to Monterey Bay, while creating a new park and open space area for residents in downtown Salinas.

The SWRP planning area also includes climate-vulnerable communities such as those located near coastal regions affected by issues including sea level rise and seawater intrusion in the groundwater. Seawater intrusion is already a serious problem impacting coastal aquifers in the region (as described in Chapter 2). Climate change is expected to make this problem worse. Projections currently being used by the State of California suggest a possible sea level rise of approximately 14 inches (36 cm) by 2050 and up to approximately 55 inches (140 cm) by 2100.[2] Sea level rise will significantly increase the pressure of saltwater on the coastal Salinas Valley Groundwater Basin aquifers, causing increased seawater intrusion in critical groundwater supplies. Disadvantaged communities are likely to be disproportionately affected by the impacts of sea level rise and other impacts associated with climate change, as they have less capacity to adapt (e.g., move inland).

The Central Coast Wetlands Group, the Principal Investigator for development of this SWRP and a member of the Regional Water Management Group, has conducted sea level vulnerability studies for

[2] Projections are based on estimates by Cayan et al. 2008 and by Rahmstorf 2007.

several communities along the Monterey Bay, including Moss Landing and Castroville (both of which are disadvantaged communities according to recent ACS data). The Moss Landing Coastal Climate Change Vulnerability Report (CCWG 2017) documented that Moss Landing, Castroville, and nearby farmlands are vulnerable to both river and ocean flooding. The report includes valuable adaptation recommendations. Storm water projects for these areas are included in this SWRP.

Other recent efforts include The Nature Conservancy's Coastal Resiliency Mapping Tool (2015). The Nature Conservancy developed this publicly accessible interactive mapping tool to view projected sea level rise hazards for various geographies across the world, on both local and global scales. Users can explore the extent of flooding and erosion along selected coastlines—specifically in the Americas or on a global scale—for multiple time horizons or amounts of sea level rise, and can overlay ecological, social, or economic layers to view vulnerabilities.

As part of the SWRP planning process, the Project Team made a special effort to reach out to disadvantaged and climate-vulnerable communities, including Castroville, Moss Landing, Soledad, and San Jerardo Cooperative, to discuss project development and special needs.

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