Chapter 2
Background

This chapter describes the Monterey County Water Resources Agency's (MCWRA's) jurisdiction and authorities, water management responsibilities, projects and programs, and related planning activities to provide context for the *Salinas River Long-Term Management Plan* (LTMP).

MCWRA is a flood control and water agency whose mission and approach to water management balances water supply, flood protection, and environmental sensitivity. MCWRA owns and operates a range of flood control, water supply, groundwater augmentation, and hydroelectric facilities. The agency manages flood and stormwater through its operations at the Nacimiento and San Antonio Dams, conserves such waters through percolation and storage, monitors groundwater extraction, and supports groundwater recharge of the Salinas Valley. Under the Monterey County Water Resources Agency Act (Agency Act), MCWRA has jurisdiction over matters pertaining to water and water supply within the Salinas Valley and is authorized to work as a conjunctive-use agency, utilizing both aboveground and belowground storage facilities to ensure water supply reliability (Section 2.2, *Jurisdiction and Funding Mechanisms*).

One of MCWRA's highest priorities is water conservation operations, primarily by maximizing the amount of groundwater recharge into the Salinas Valley aquifers, largely achieved through timely reservoir releases and a reduction in groundwater pumping through the operation of the Salinas River Diversion Facility (SRDF) (Section 2.3.1.1, *Reservoirs*). As described in Section 2.3.1.2, *Groundwater Recharge*, management of Nacimiento and San Antonio Dams is now focused primarily on the regulated release of water from those reservoirs to maintain Salinas River streamflow to maximize groundwater recharge from the streambed, operate the SRDF, and provide flows for steelhead. MCWRA also operates both Nacimiento and San Antonio Dams to enhance the recreation benefits of the reservoirs to the extent compatible with release requirements and constraints. When making reservoir releases, however, MCWRA must consider established agreements and permits with other agencies, while still meeting the primary goals of groundwater recharge, SRDF operation, and flows for steelhead.

In addition to water supply operations, MCWRA also operates its two dams to provide for safe conditions for downstream communities (Section 2.3.2, *Flood Management*). This involves managing reservoir storage to ensure that there is adequate capacity to contain high levels of projected inflow during storm events. MCWRA coordinates maintenance activities along the Salinas River and its tributaries in partnership with and on behalf of landowners through a program known as the Salinas River Stream Maintenance Program (SMP).

MCWRA is implementing or involved in multiple projects and programs that may be relevant to short- and long-term management needs of the Salinas River in the LTMP study area, as described in Section 2.4, *MCWRA Projects and Programs*. In addition, there are several current research and planning efforts that are expected to have some bearing on how the Salinas River is managed in the long-term, which are described in Section 2.5, *Other Applicable Planning Efforts*.

2.1 Monterey County Water Resources Agency Mission

The mission of MCWRA is to manage, protect, store and conserve water resources in Monterey County for beneficial and environmental use, while minimizing damage from flooding to create a safe and sustainable water supply for present and future generations. This mission reflects MCWRA's current approach to water management that balances water supply, flood protection, and environmental sensitivity. MCWRA developed and implements several long-term programs to achieve its mission, including the Salinas River SMP and the Salinas Valley Water Project (SVWP).

2.2 Jurisdiction and Funding Mechanisms

MCWRA was formed in 1947 as the Monterey County Flood Control and Water Conservation District. In 1990, MCWRA's name was changed under the Agency Act. The Agency Act established MCWRA as a flood control and water agency and defines the authorities of MCWRA. These authorities include the following as necessary and proper to carry out the Agency Act.

- Establish zones within which MCWRA may institute projects with specific benefits for the zone.
- Amend zones, including elimination of zones, pending certain circumstances.
- Acquire, use, exchange, transport, or sell property of every kind, including water.
- Construct, repair, remove, or otherwise improve any work as authorized by the Agency Act.
- Store water in surface or underground reservoirs.
- Appropriate, conserve, or reclaim water.
- Act on behalf of landowners regarding water or water rights.
- Prevent unlawful exportation of water.
- Prevent degradation of water quality.
- Control flood and stormwater.
- Incur indebtedness and issue bonds.
- Levy taxes or assessments.
- Construct, maintain, improve, and operate public recreational facilities on reservoirs managed by MCWRA.
- Require the installation of flow meters on groundwater extraction facilities and water distribution system service connections in Monterey County for the purpose of collecting data or facilitating development of water management plans.

While MCWRA has broad authority under the Agency Act, it has not historically utilized all of its authorities.

MCWRA owns and/or operates a range of flood control, water supply, groundwater augmentation, and hydroelectric facilities. These include the Nacimiento and San Antonio Dams and Reservoirs, the Nacimiento Dam hydroelectric plant, the SRDF, the Castroville Seawater Intrusion Project (CSIP) and

the Salinas Valley Recycling Project. Descriptions of these and other projects and programs operated by MCWRA are provided in Section 2.4, *MCWRA Projects and Programs*, unless otherwise noted.

MCWRA is authorized to incur indebtedness, issue bonds, and levy and collect taxes or assessments in order to pay any obligations and carry out the purposes of its authorizing legislation. Revenues of MCWRA are comprised of multiple sources, which currently include the following sources.

1. Property assessments.
2. Ad valorem property taxes.
3. Water delivery service charges.
4. Hydroelectric sales.
5. Miscellaneous fees and income.
6. Grants from governmental and non-governmental entities.

The first five of these revenue sources represent relatively certain and long-term sources of revenue for MCWRA. Grants provide a much less certain and temporary source of revenue for MCWRA that may significantly fluctuate year to year.

Property assessments are the main source of revenue for MCWRA and, based on its proposed fiscal year (FY) 2018–19 budget, are projected to comprise 61% of MCWRA revenues this fiscal year (Raftelis Financial Consultants 2017). Grants are currently MCWRA's second largest source of revenue, constituting approximately 20% of projected MCWRA revenue in FY 2018–19. This is in part the result of the award of a $10 million grant for the Interlake Tunnel Project from the California Department of Water Resources (DWR) under Proposition 84. Historically, grant revenue has composed a much smaller share of MCWRA's total revenue. The remaining revenue sources are each less than 10% of the total, as shown in Table 2-1.

Table 2-1. FY 2018–19 MCWRA Revenue by Source

Revenue Source	Amount ($M)	% of Total
Long-Term Sources		
Property Assessments	15.2	61
Ad Valorem Property Taxes	1.9	8
Water Delivery Service Charges	1.1	5
Miscellaneous Fees & Income	1.1	4
Hydroelectric Sales	0.6	2
Temporary Sources		
Grants	5.1	20
Total	**25.0**	**100**

Source: Raftelis Financial Consultants 2017.

Property assessment revenue, MCWRA's principal source of income, is dedicated to the repayment of costs of specific projects or services that confer special benefits to the assessed properties. Each area in which groups of properties are assessed based on a given MCWRA project or service is called a *zone of benefit*. This revenue source must be used by MCWRA for the provision of identified special benefits and is therefore not general purpose revenue available to MCWRA for discretionary

purposes.[1] The majority of property assessment revenue (58%) is dedicated to the payment of operating and debt service costs for the Salinas Valley Recycling Projects, which are co-operated with Monterey County's regional wastewater agency, Monterey Regional Water Pollution Control Agency (now known as Monterey One Water). Approximately 34% of property assessment revenue is dedicated to the payment of flood control project costs. The remaining 8% is dedicated to repayment of construction and debt service costs of the SVWP.

MCWRA's property assessments are subject to Proposition 218, passed by California voters in 1996. Proposition 218 amended the California Constitution to require that all new or increased property assessments (as well as taxes and fees) follow prescribed assessment calculation and election requirements. As noted previously, property assessments can only be used for projects or services that confer special benefits to the properties assessed (i.e., zones of benefit). They cannot be used to pay for projects or services (or the subcomponents of these projects) that provide general public benefits. Additionally, Proposition 218 requires that the assessments be set so that they are proportional to the special benefits received by each property owner. Lastly, new or increased property assessments are subject to the approval of assessed property owners. The assessment may be imposed only if 50% or more of the ballots, weighted by assessed value, support the assessment.

Prior to Proposition 218, the burden of proof in a court proceeding to demonstrate that a fee or assessment was illegal rested with the plaintiff. Proposition 218 changed this so that the burden of proof now rests with the local government that imposed the fee or assessment. Proposition 218 also gives local residents the power to repeal or reduce any local tax, assessment, or fee through the initiative process.

The overall consequence of Proposition 218 has made adopting new assessments and increasing existing assessments by MCWRA far more difficult, expensive, and uncertain. It has also sharply restricted the discretionary use of assessment revenue by MCWRA and made it harder to accommodate unanticipated project costs.

This is especially pertinent to MCWRA in relation to the SVWP. Voters approved assessments to fund the SVWP in 2003. However, since the time these assessments were approved, MCWRA has incurred significant and unanticipated environmental monitoring and compliance costs and dam maintenance costs related to the project that are above and beyond the costs covered by the original assessments.[2]

Overall, MCWRA is currently operating with a structural budget deficit, meaning that its ongoing expenditures exceed its ongoing revenues. Historically, MCWRA has filled these funding gaps by drawing on its reserves or seeking supplemental funding through grants.[3] The goal of MCWRA is to eliminate its structural budget deficit through a combination of cost control and revenue enhancement. In the near term, MCWRA is reducing staffing levels and deferring maintenance and

[1] As defined by Article XIIID (Proposition 218) of the California Constitution, a special benefit is a particular benefit accruing to land and buildings, not a general benefit to the public or a general increase in property values. If a project or service would not provide such a special benefit, Proposition 218 states that it may not be financed by an assessment.

[2] Capital replacement and maintenance costs identified for the Nacimiento Dam total more than $6.2 million, of which $4.3 million are improvements that have been ordered by the Federal Energy Regulatory Commission or the Division of Safety of Dams. Capital replacement and maintenance costs identified for the San Antonio Dam total more than $8.3 million, of which $7.0 million are improvements that have been ordered by the Division of Safety of Dams.

[3] Statutorily, MCWRA is required to balance its budget, which it has traditionally done through use of reserves.

capital improvement projects. For example, MCWRA staff has been reduced by 16% in the last 4 years (FY 2013–14 to 2016–17). In another example, MCWRA's FY 2018–19 budget assumes the deferral of approximately $6 million in maintenance and capital improvements for the Salinas Valley Recycling Projects. These financial challenges and limited sources of predictable revenue illustrate some of the limitations facing MCWRA in leading comprehensive management of the Salinas River. In the longer term, MCWRA will need to develop new revenue sources in order to fund ongoing operations and maintenance, environmental compliance, and capital replacement costs. MCWRA will also need to secure a consistent funding source to implement the habitat conservation plan it anticipates developing following this LTMP.

2.3 Water Resource Management

MCWRA manages flood and stormwater through its operations at the Nacimiento and San Antonio Dams, conserves such waters through percolation and storage, monitors groundwater extraction, supports groundwater recharge of the Salinas Valley, and provides water to the agricultural and industrial communities of the Salinas Valley. Details on how MCWRA currently manages water resources in its jurisdiction are outlined in the following sections.

2.3.1 Water Supply Operations

MCWRA has jurisdiction over matters pertaining to water and water supply within Salinas Valley, including the northern and central sections of the Salinas River watershed and portions of the Gabilan/Tembladero and Moro Cojo watersheds. MCWRA is authorized to conserve water in any manner; to buy, sell, and purvey water; and to prevent the waste or diminution of the water extractions that are determined to be harmful to the groundwater basin (i.e., subsurface flows). Through this authorization, MCWRA works as a conjunctive-use agency utilizing both aboveground (reservoirs and diversions) and belowground (aquifer) storage facilities to ensure water supply reliability. Conjunctive use typically entails reservoir releases to groundwater recharge areas—which are either on-channel (i.e., in a natural streambed) or off-channel—where water percolates into the aquifer and is stored for later extraction. This conjunctive use strategy involves managing the available water resources and supply distribution system to meet ongoing demand for water from a variety of local and regional agricultural users (including water availability for irrigation during the growing season), as well as filling the reservoirs during the wet season.

One of MCWRA's highest priorities is water conservation operations, primarily by maximizing the amount of groundwater recharge into the Salinas Valley aquifers. MCWRA accomplishes this through timely reservoir releases and the operation of the SRDF (Monterey County Water Resources Agency 2018a). By storing winter inflow to Nacimiento and San Antonio Reservoirs, water is available for release during the irrigation season (April to October). Water is released from the dams into the Salinas River, where it flows downstream or is recharged into the aquifer from the river bed and its immediate floodplain. Groundwater is the main source of irrigation for the surrounding agricultural fields. As water flows northwest along the valley floor, MCWRA monitors river flow levels using several U.S. Geological Survey streamflow gages located along the mainstem of the Salinas River from Bradley to Spreckels (Figures 2-1a and 2-1b). These real-time data allow MCWRA to manage reservoir releases as well as operations at the SRDF throughout the year. The SRDF can only be operated between April 1 and October 31 to impound Salinas River flow and mix it with tertiary-treated recycled water at the regional wastewater treatment plant for distribution to growers in lieu of groundwater pumping in the CSIP area.

Figure 2-1a. Water Management Facilities on the Lower Salinas River

Figure 2-1b. Water Management Facilities on the Upper Salinas River

When making reservoir releases, MCWRA must consider established agreements and permits, while still meeting the primary goals of groundwater recharge and SRDF operation. For example, MCWRA developed a flow prescription to improve habitat for steelhead trout in the Salinas River as component of its federal Endangered Species Act permit issued by National Marine Fisheries Service (NMFS). When specific conditions are met, MCWRA provides releases from the reservoirs to enhance upstream or downstream passage conditions for migrating steelhead as well as maintain prescribed flows for spawning and rearing habitat in the Nacimiento River downstream of Nacimiento Dam.

2.3.1.1 Reservoirs

Water Releases

The highest priority of MCWRA's water conservation operations is to maximize the amount of groundwater recharge in the Salinas Valley aquifers through reservoir water releases and the operation of the SRDF. This is accomplished by storing winter inflow to Nacimiento and San Antonio Reservoirs so that water is available for release during the irrigation season. It is intended that reservoir releases be made in accordance with existing regulations and agreements in a manner that reduces impacts on both fish and recreation, while still meeting the primary goals of groundwater recharge and SRDF operation (Monterey County Water Resources Agency 2018a).

The average annual inflow into Nacimiento Reservoir between water years 1959 and 2015 was approximately 198,000 acre-feet (AF) per water year, which is approximately three times the average inflow to nearby San Antonio Reservoir. Total Nacimiento Reservoir releases for all purposes between water years 1959 and 2015 averaged approximately 191,000 AF per water year, of which an average of approximately 119,000 per water year was released for groundwater recharge and SRDF operations. Reservoir release averages between water years 1959 and 2015 were influenced by periods of different operational strategies that may not reflect current or future operations (Monterey County Water Resources Agency 2018a).

Releases may be made following the cessation of natural flow or to supplement natural flow for groundwater recharge (conservation releases) or SRDF operations. Impoundment of water at the SRDF can begin as early as April 1 and continue through October 31. As required by the NMFS biological opinion and detailed in MCWRA's flow prescription, the MCWRA will maintain flow to the Salinas River Lagoon during conservation releases or when the SRDF is operating (Monterey County Water Resources Agency 2005).

Recreation

Recreational use of the two reservoirs includes boating, swimming, fishing, and camping. These uses are managed by the Monterey County Resource Management Agency at both Nacimiento and San Antonio Reservoirs. MCWRA operates both dams to enhance the recreation benefits of the reservoirs to the extent compatible with release requirements and constraints. For example, to minimize the impact of reservoir releases on reservoir levels during peak recreational periods, MCWRA will, to the extent possible, adjust reservoir releases to equalize the rate of decline in elevation between both reservoirs during periods of highest recreational uses (e.g., Memorial Day weekend, 4th of July, and Labor Day weekend)(Monterey County Water Resources Agency 2018a).

2.3.1.2 Groundwater Recharge

An estimated 95% of all water used in Monterey County is derived from groundwater wells. With nearly 200,000 acres of land under cultivation in the Salinas Valley, agricultural pumping exceeds 495,000 AF per year. Combined with urban and other uses, total water pumped in the Salinas Valley is approximately 520,000 AF per year (Monterey County Water Resources Agency 2018b). Ensuring that there are sufficient quantities of good quality groundwater is the most important aspect of managing water resources in Monterey County today.

Prior to 1957, groundwater recharge in the valley occurred from a combination of precipitation, streamflow, and irrigation. After construction of Nacimiento Dam (in 1957) and San Antonio Dam (in 1967), MCWRA had the ability to actively manage groundwater recharge. Management of Nacimiento and San Antonio Dams is now focused primarily on the regulated release of water to maintain Salinas River streamflow to maximize groundwater recharge from the streambed. Since 1998, MCWRA and Monterey One Water have cooperated to implement the Salinas Valley Recycling Projects. These projects provide advanced treatment of municipal wastewater and deliver it to augment groundwater supplies for agricultural irrigation on approximately 12,000 acres near Castroville (Monterey County Water Resources Agency 2006).

2.3.2 Flood Management

In addition to water supply operations, MCWRA also operates its two dams to provide for safe conditions for downstream communities (Figures 2-1a and 2-1b). This involves managing reservoir storage to ensure that there is adequate capacity to contain high levels of projected inflow during storm events. Both Nacimiento and San Antonio Reservoirs are equipped to capture flows from the upper watershed (surface waters of the Nacimiento and San Antonio Rivers, respectively) and protect downstream reaches from flooding. MCWRA developed probability flood data which are used to determine how much flood storage is required prior to large storm events (Monterey County Water Resources Agency 2018a). When a large storm is predicted, reservoir storage is drawn down to a level that allows room to capture upstream flood flows, if necessary.

In addition, MCWRA coordinates maintenance activities along the Salinas River and its tributaries in partnership with and on behalf of landowners and interested parties through the Salinas River SMP (more detailed provided in Section 2.4.2.1, *Salinas River Stream Maintenance Program*). Routine maintenance consists of the construction of secondary channels through vegetation removal and sediment management measures to maximize flood flow capacity to ensure the system is in suitable condition throughout the year while maintaining or enhancing natural habitat and hydrological processes. This routine maintenance is especially important during the wet season when there are higher probabilities for flood events (Monterey County Water Resources Agency 2014).

In addition to the structural flood control provided by MCWRA-owned dams, reservoirs, and pump stations, MCWRA also provides flood warning services to Monterey County residents. MCWRA staff monitors countywide hydrologic conditions during every storm event. A real-time flood warning system allows MCWRA staff to provide hydrologic data as well as expertise to emergency managers and local law enforcement any hour of the day or night as needed for the protection of life and property in Monterey County (Monterey County Water Resources Agency 2018a).

2.3.3 Facilities

In addition to Nacimiento and San Antonio Dams and the SRDF, MCWRA operates and maintains drainage facilities (earthen channels) in 14 drainage maintenance zones and districts located throughout Monterey County. These drainages maintenance zones consist of approximately 57 miles of improved drainageway, eight pump stations, 9 miles of river levees, and numerous culverts, tide gates, and concrete structures. Figures 2-1a and 2-1b show these associated facilities in the management area.

2.3.3.1 Reservoirs

MCWRA owns and operates two dams and their associated reservoirs, Nacimiento and San Antonio (Figure 2-1b). Nacimiento and San Antonio Dams are managed for the combined goals of water conservation through groundwater recharge, flood protection, and recreation, with flood safety always being the primary consideration. MCWRA has water rights for the Nacimiento River to store 350,000 AF from October 1 of each year to July 1 of the succeeding year and to use 180,000 AF per year for irrigation, domestic municipal, industrial, and recreational uses. MCWRA also has water rights for the San Antonio River to store 220,000 AF and use 210,000 AF per year for similar annual uses. The operation of the reservoirs is guided by the Reservoir Operations Advisory Committee that provides recommendations to the MCWRA's Board of Directors (Monterey County Water Resources Agency 2018a). The Reservoir Operations Advisory Committee consists of three Board members, the Board Chair, and non-Director members. The Chair appoints non-Director members to the Reservoir Operations Advisory Committee as follows.

- One representative each of the Pressure, East Side, Forebay, and Upper Valley groundwater subareas.
- Three members of the public.
- One representative of the San Luis Obispo County Public Works Department.
- One representative of the Monterey County Parks Department.
- One representative of the lakes resort concessionaire.
- One representative of Nacimiento Regional Water Management Advisory Committee.
- One representative of the Salinas River Channel Coalition.

Nacimiento Dam and Reservoir

Nacimiento Dam and Reservoir are located in northern San Luis Obispo County, about 20 miles from the coast. Nacimiento Dam was completed in 1957. The dam crest elevation is 825 feet above mean sea level (amsl) with a spillway elevation of 787.75 feet that can be raised to an elevation of 800 feet by using an inflatable Obermeyer spillway gate. Specifications for Nacimiento Dam and Reservoir are provided in Table 2-2 and Figure 2-2.

Table 2-2. Nacimiento and San Antonio Reservoir and Dam Specifications

Specifications	Nacimiento Reservoir	San Antonio Reservoir
Reservoir length (maximum capacity)	18 mi	16 mi
Shoreline (maximum capacity)	165 mi	100 mi
Dam crest length	1,650 ft	1,433 ft
Dam height above streambed	215 ft	201 ft
Dam crest elevation	825 ft amsl	802 ft amsl
Spillway elevation	800 ft amsl	780 ft amsl
Maximum storage capacity	377,900 AF	335,000 AF
Dead pool elevation	670 ft amsl	645 ft amsl
Dead pool storage capacity	10,300 AF	10,000 AF
Operational minimum pool elevation	687.8 ft amsl	666 ft amsl
Operational minimum pool storage capacity	12,000 AF	13,000 AF
Conservation pool elevation	787.75 ft amsl	774.5 ft amsl
Conservation pool storage capacity	289,013 AF	282,000 AF
Flood pool elevation	801 ft amsl	780 ft amsl
Flood pool storage capacity	66,587 AF	30,000 AF

Source: Monterey County Water Resources Agency 2018a and 2018c.
mi = mile; ft = feet; amsl = above mean sea level; AF = acre-feet

Several operational pools were constructed to aid in the management of water being stored in the reservoir. The operational minimum pool retains water reserved for fish and wildlife habitat as well as a water entitlement belonging to the County of San Luis Obispo. The conservation pool, which extends from the minimum pool to the concrete spillway, is the operational pool used to store water for later release to the Salinas River for groundwater recharge, fish passage, and SVWP operations.

San Antonio Dam and Reservoir

The San Antonio Dam and Reservoir are located in southern Monterey County, about 16 miles northwest of Paso Robles. San Antonio Dam was completed in 1967. This earth-filled dam has a crest elevation of 802 feet amsl and a capacity of 335,000 AF. Specifications for San Antonio Dam and Reservoir are provided in Table 2-2 and presented in Figure 2-2.

Operational pools have been created to aid in the management of water being stored in the reservoir. The physical minimum pool or dead pool is at an elevation of 645 feet and has 10,000 AF of storage. Water below an elevation of 666 feet is reserved for fish and wildlife habitat. The conservation pool that extends from minimum pool is the operational pool used to store water for later release to the Salinas River for groundwater recharge, fish passage, and the operation of the SVWP.

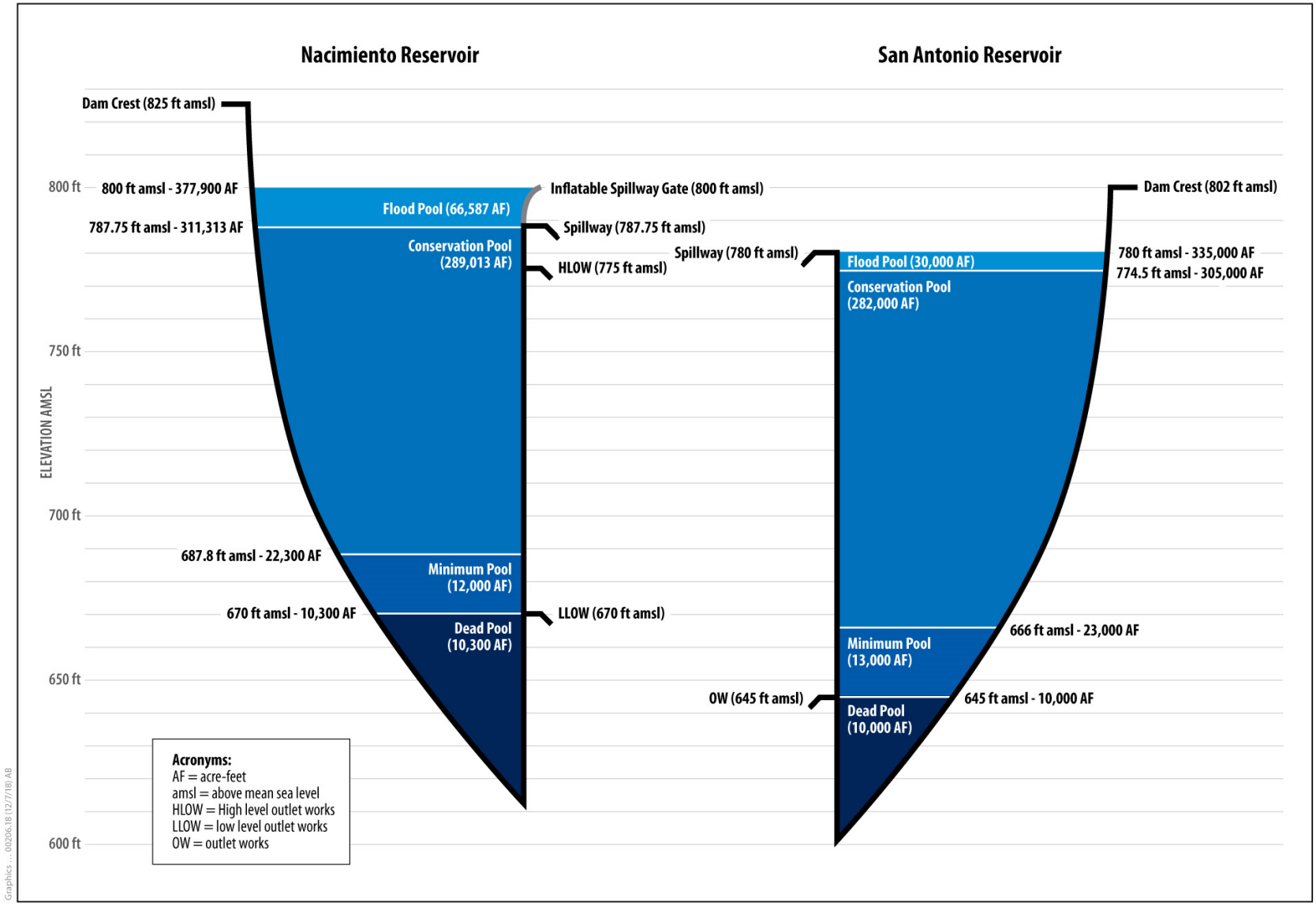


Figure 2-2. Nacimiento and San Antonio Reservoir and Dam Specifications

2.3.3.2 Salinas River Diversion Facility

The SRDF was constructed in 2010 as part of SVWP. Located near Marina (approximately 4.8 miles from the mouth of the Salinas River), this facility was built to impound water to provide additional irrigation water to nearby farms in the lower reaches of the river valley after being treated (filtered and chlorinated) and mixed with recycled wastewater. The facility includes an Obermeyer inflatable dam, which is approximately 9 feet high by 230 feet long and consists of a metal spillway gate and an inflatable air bladder. The facility also includes a screened intake and a pump station that transfers impounded water to the Salinas Valley Reclamation Project where it is filtered and disinfected prior to being blended with recycled water produced at the Salinas Valley Reclamation Project. The blended water then flows into the distribution piping for conveyance to the customers within the CSIP service area.

2.3.3.3 Other Facilities

Additional facilities owned or managed by MCWRA that play an integral part in the flood control and water supply operations in the management area are summarized below.

- **CSIP Irrigation Pipeline.** The CSIP irrigation pipeline is a 48-mile pipeline distribution system to supply irrigation water to areas most threatened by seawater intrusion. CSIP delivers a blend of groundwater, river water, and recycled water to growers within a 12,000-acre service area surrounding Castroville.
- **Blanco Drain Pump Station.** The Blanco Drain is a reclamation ditch that drains approximately 6,400 acres of agricultural lands near Salinas. The watershed is between the Salinas River and Alisal Slough. Blanco Drain discharges to the Salinas River at River Mile 5, upstream of the SRDF. A headwall and flap gate at the downstream end prevents seasonal high flows in the Salinas River from migrating up the Blanco Drain channel. In 2009–2010 as part of the SRDF construction, a pump station was installed at the downstream end to control backwater from the Salinas River impoundment area from entering the Blanco Drain. MCWRA maintains this pump station that lifts Blanco Drain flows past a slidegate and into the gravity portion of the channel.
- **Old Salinas River Slidegate.** MCWRA maintains and operates a slidegate where the Salinas River Lagoon discharges into the Old Salinas River (OSR). This slidegate is located in the northern portion of the lagoon and is operated to regulate lagoon water levels when the sandbar at the mouth of the river is closed. This slidegate controls flow from the Salinas River to the Pacific Ocean through the OSR channel. More details on this facility and its operations are provided in Section 2.4.1.2, *Salinas River Lagoon Management and Enhancement Plan*.
- **Potrero Road Tide Gates.** MCWRA maintains and operates the Potrero Road tide gates, which are located on the OSR downstream of the confluence with the Tembladero Slough on the access road to the Salinas River State Beach. The tide gates are box culverts with steel tide gates that are designed to prevent tidal waters from moving upstream and inundating farm land. This design restricts OSR discharge, including during storm events. The current structure was installed in the early 1980s.
- **Moss Landing Road Tide Gates.** MCWRA also manages the Moss Landing Road tide gates located on Moss Landing Road along the Moro Cojo Slough at the confluence with Moss Landing Harbor. The tide gates are cylindrical culverts with tide gates that prevent tidal waters from

moving upstream and inundating nearby residential and commercial lands. This design restricts Moro Cojo Slough discharge during storm events.

- **Reclamation Ditch System Pump Stations.** MCWRA is responsible for operations and maintenance of pump stations throughout the Reclamation Ditch system. The Reclamation Ditch (commonly referred to as the *Rec Ditch*) watershed consists of an area of approximately 157 square miles within Monterey County and a very small portion of San Benito County. The Rec Ditch flows southeast to northwest, draining a series of generally dry lake beds (e.g., Carr Lake and Merritt Lake) that are farmed when not flooded and are linked by a system of lateral ditches (tributaries) and pumping facilities. At the upstream end of this system is Smith Lake, southeast of Salinas. From Smith Lake, the Rec Ditch drains through Carr Lake and flows northwest towards Castroville. These lakes provide stormwater runoff detention before entering the Rec Ditch and are primarily farmed during the dry season. Near Castroville, the Rec Ditch flows into Tembladero Slough, which drains Merritt Lake. Tembladero Slough flows past Castroville into the OSR. The OSR discharges through tide gates at Potrero Road into Moss Landing Harbor and, ultimately, Monterey Bay.

2.4 MCWRA Projects and Programs

This section is a summary of current MCWRA projects and programs that may be relevant to short- and long-term management needs of the Salinas River in the study area. They are presented in chronological order of when projects were constructed and first operated.

2.4.1 MCWRA-Led Projects and Programs

2.4.1.1 Castroville Seawater Intrusion Project

Due to the growing threat to the region's water supply and the gradual increase of seawater intrusion into groundwater in northernmost portion of the Salinas Valley due to groundwater pumping, MCWRA enacted Ordinance No. 3635 in 1992 approving the CSIP. The CSIP is characterized as the distribution component of the Salinas Valley Reclamation Project, a wastewater reclamation facility built by Monterey One Water and maintained at the Monterey Regional Treatment Plant. After the reclamation facility was completed in 1994, MCWRA constructed a 48-mile pipeline distribution system to supply irrigation water treated from the Salinas Valley Reclamation Project to areas highly affected by seawater intrusion. The CSIP began construction in 1995, funded by assessment collections in zones of benefit 2A, 2B, and 2Y, and started delivering a blend of recycled (tertiary-treated) water and groundwater to agricultural fields within a 12,000-acre service area surrounding Castroville by 1998 (Monterey County Water Resources Agency 2018d).

By using recycled water pumped from Monterey One Water, farmers can safely irrigate their crops and reduce groundwater use. Each water user in the CSIP system has a delivery turnout with control and isolation valves and meters that allow the user to regulate flow and MCWRA to monitor total water use at each site. Total water deliveries to the CSIP system have varied between 16,663 and 21,982 AF per year from 1999 to 2007. The average water use over this monitoring period was 18,942 AF per year (RMC Water and Environment 2007).

Since its implementation, the CSIP system has contributed to halting the recent rates of seawater intrusion in portions of the region and groundwater levels from three of the four aquifers affected

are beginning to trend toward their historical levels (Monterey County Water Resources Agency 2018d). The results of the CSIP led to the next project to help slow and ultimately reverse seawater intrusion—the SVWP. Through the SVWP's installation of a rubber spillway gate at Nacimiento Dam and another rubber dam in 2010 on the Salinas River near Marina (the SRDF), seasonally stored river water can be pumped into the CSIP's pipelines for delivery as irrigation water, thus further reducing the need to pump groundwater. See more details on the SVWP in Section 2.4.1.3, *Salinas Valley Water Project*.

2.4.1.2 Salinas River Lagoon Management and Enhancement Plan

The *Salinas River Lagoon Management and Enhancement Plan* was adopted in 1997 to address issues and concerns relating to flood risk and ecological impacts on the Salinas River Lagoon (Monterey County Water Resources Agency 1997). The plan recommends several measures to restore and manage the existing hydrology, vegetation, wildlife, aquatic resources, and water quality of the lagoon. The plan was developed through consultation with the Salinas River Lagoon Task Force, which was composed of federal, state, and local agencies, along with local agricultural representatives.

The lagoon project area includes the lower end of the Salinas River starting at State Highway 1 at River Mile 2 downstream to the coastal sandbar that separates the river from the Monterey Bay. Over the last two decades, MCWRA, U.S. Fish and Wildlife Service (USFWS), and California State Parks have implemented many of the 27 recommended management measures stated in the plan, resulting in an increase of riparian and wetland vegetation recovery, water quality improvements, and steelhead passage. The 27 measures are listed in Table 2-3.

Table 2-3. Recommended Measures from Salinas River Lagoon Management and Enhancement Plan

Recommended Measures		Implementing Entity	Status
1	Accommodate higher winter lagoon water elevations, between 4 and 5 feet	MCWRA, Landowners, CCC	Ongoing
2	Install and operate the new Old Salinas River Slidegate system in accordance with breaching plan	MCWRA	Complete
3	Install a water level monitoring gage	MCWRA	Complete
4	Minimize short duration breaches by using OSR Channel when dredged	MCWRA	OSR was dredged once; short-duration breaches still undertaken
5	Encourage riparian enhancement measures by Highway 1 bridge	CCC, RCDMC, Lagoon Task Force	Unknown
6	Encourage program to enhance riparian habitat within the plan area	CCC, Lagoon Task Force, Landowners	Unknown
7	Implement enhancement and management measures within fore dunes and dune scrub	CCC, CDPR, USFWS	Ongoing
8	Maintain permitted facilities where necessary on north bank of slopes	MCWRA	Unknown
9	Monitor the sand gilia[4] population on public property	CDPR	Unknown

[4] Synonymous with *Monterey slender-flowered gilia* as referenced in the *Salinas River Lagoon Management and Enhancement Plan*.

Recommended Measures		Implementing Entity	Status
10	Implement habitat enhancement on a portion of the USFWS refuge	USFWS	Ongoing
11	Reduce hunting activity within sensitive areas on USFWS property	USFWS	Complete
12	Maintain the quality of Smith's blue butterfly habitat on public property	USFWS	Ongoing
13	Control public recreational use to avoid impacting wildlife	USFWS	Ongoing
14	Manage the pond on the USFWS refuge to maintain wildlife values	USFWS	Ongoing
15	Encourage management of boating activities to protect sensitive species	USFWS	Ongoing
16	Control red fox populations	USFWS, CDPR	Ongoing
17	Protect snowy plover habitat on public property in the study area	USFWS	Ongoing
18	Install bird nest boxes and bat roost boxes on public properties	USFWS	Measure replaced
19	Establish baseline salinity levels in the OSR to operate double weir and enhance freshwater fisheries habitat in the lagoon	MCWRA	Unknown
20	Evaluate the potential to reintroduce native freshwater species, enhance Sacramento blackfish/perch community	CDFW, USFWS	Unknown
21	Evaluate the potential to reintroduce tidewater goby into the lagoon	CDFW, USFWS	Complete
22	Establish a sediment and water quality monitoring program	MCWRA, Regional Water Board, Lagoon Task Force, AMBAG	Water quality monitoring ongoing; sediment monitoring unknown
23	Encourage participation in the Water Quality Protection Plan by Sanctuary	MCWRA, Regional Water Board, Lagoon Task Force, Sanctuary	Unknown
24	Develop a public use and access plan on public properties	Lagoon Task Force	Unknown
25	Recognize the ability of property owners to make necessary and permitted improvements	CDFW	Unknown
26	Operation of culvert shall not increase flooding or excess salinity along the OSR	MCWRA	Unknown
27	Form Interagency/Property Owners' Management Committee	MCWRA, CCC, CDPR, Lagoon Task Force, Landowners, USFWS	Unknown

Source: Monterey County Water Resources Agency 1997.

AMBAG = Association of Monterey Bay Area Governments; CCC = California Coastal Conservancy; CDPR = California Department of Parks and Recreation; CDFW = California Department of Fish and Wildlife; MCWRA = Monterey County Water Resources Agency; Sanctuary = Monterey Bay National Marine Sanctuary; OSR = Old Salinas River; RCDMC = Resource Conservation District of Monterey County; Regional Water Board = Central Coast Regional Water Quality Control Board; USFWS = U.S. Fish and Wildlife Service

As noted in Table 2-3, several assigned measures have been implemented over the last 20 years. The Old Salinas River Slidegate Project and the Salinas River Lagoon Sandbar Management Program, born from Measures 1 and 2, respectively, are in effect today and help manage river flows reducing the likelihood of flood events in the nearby adjacent agricultural lands and residential areas. In addition, a water monitoring gage was installed in 1996 to collect real-time precipitation and streamflow data, and a Lagoon Monitoring Program has been implemented since 2001 to comply with the plan (Measures 3 and 4). Each year, MCWRA assesses aquatic conditions in the lagoon by measuring water depth and clarity, temperature, dissolved oxygen, conductivity, and salinity (Hagar Environmental Science 2010). The intent of this data collection and annual monitoring is to provide more information on lagoon function and improved management to reduce flood risks and improve habitat quality (Monterey County Water Resources Agency 1997).

Old Salinas River Slidegate Project

One way MCWRA manages water levels in the Salinas River Lagoon is by releasing flows through an outlet gate to the OSR channel. The outlet gate is located at the base of Mulligan Hill and is known as the Old Salinas River Slidegate. The OSR channel, an earthen channel approximately 4.5 miles long and 8–200 feet wide, connects the Salinas River Lagoon to the mouth of Elkhorn Slough and the Moss Landing Harbor. MCWRA constructed a new slidegate at the mouth of the OSR channel in 1996 to replace a degraded slidegate and culvert built in 1990. The existing slidegate, equipped with a 60-inch box culvert, is typically closed when the sandbar at the lagoon mouth is open. The slidegate is typically open when the sandbar is in place to regulate lagoon water levels so that adjacent farmland and upstream areas are not flooded. Approximately 100 cubic feet per second is the maximum volume that can pass through the slidegate. Flow through the slidegate is limited by the capacity of the outlet structure and by capacity in the OSR channel. The OSR channel is tidally influenced (by the Potrero Road tide gates) and high inflows from other sources (primarily from Tembladero Slough) during winter storms severely restrict the amount of water that can drain through the slidegate, thus backing up the lagoon. Effective management of the slidegate continues to be a key issue for MCWRA.

Salinas River Lagoon Sandbar Management Program

MCWRA developed a sandbar management program[5] as a means of flood control in the Salinas River Lagoon (Monterey County Water Resources Agency 1997). This breaching plan defines criteria for managing the sandbar elevation to allow direct outflow to the ocean when water levels in the lagoon are high and flooding in the nearby uplands is imminent. Sandbar management activities involve either lowering the existing sandbar to an elevation that would likely promote natural breaching or excavating a drainage channel across the sandbar to drain the lagoon once it reaches a critical elevation. The latter approach is implemented when runoff from the Salinas River is expected to raise lagoon levels above 6 feet National Geodetic Vertical Datum. Natural breaching, if it occurs at all, typically occurs in conjunction with winter storms in November, December, or January. Mechanical opening undertaken by MCWRA can occur anytime between October and June. River flows typically recede in late spring to low levels between storms and, depending on tide and wave conditions, the mouth typically closes again by summer.

[5] Referred to as the *Salinas River Mouth Breaching Plan* in Appendix C of the *Salinas River Lagoon Management and Enhancement Plan*.

MCWRA has funded a lagoon monitoring program in the Salinas River Lagoon since 2001 (Hagar Environmental Science 2010) to support the sandbar management program. Monitoring over the years has included general habitat condition observations throughout the lagoon (i.e., water surface elevation, depth characteristics, salinity stratification, temperature, dissolved oxygen concentration, water clarity), river flows into the lagoon preceding and following sandbar opening, and closure and re-opening history following sandbar opening.

In December 2009, NMFS completed its consultation and issued a biological opinion for the U.S. Army Corps of Engineers permit for sandbar breaching at the mouth of the Salinas River (Hagar Environmental Science 2015). Following this consultation, the Lagoon Monitoring Program was altered in 2010 to be consistent with the monitoring measures in the biological opinion (National Marine Fisheries Service 2009). The monitoring of the lagoon now includes pertinent data on steelhead populations and their habitat conditions in the spring and summer, in addition to the fall samples that have been conducted previously for water quality monitoring (more details are provided in Section 3.5, *Environmental Pressures and Stresses*).

2.4.1.3 Salinas Valley Water Project

In 2003, MCWRA enacted Ordinance No. 4203, approving the SVWP to address the water resources management issues straining the Salinas Valley groundwater basin. The project is funded by collections of property tax assessments in zone of benefit 2C. The SVWP provides for the long-term management and protection of groundwater resources in the Salinas River groundwater basin.

The specific goals of the SVWP are to accomplish the following.

- Halt seawater intrusion.
- Continue conservation of winter flows for recharge of the basin through summer releases.
- Provide flood protection.
- Improve long-term hydrologic balance between recharge and withdrawal.
- Provide a sufficient water supply to meet water needs through the year 2030 (RMC Water and Environment 2007).

MCWRA is implementing the SVWP in two phases. Phase I, which was completed in 2010, included modifications to Nacimiento Reservoir spillway and construction of the SRDF to improve dam safety, enhance flood control, and recharge the watershed aquifers. The Nacimiento Reservoir spillway was enlarged and equipped with a new rubber spillway gate to preclude the dam from overtopping during a high flood event. By increasing the capacity of the spillway, more water can be stored during the winter and spring annually, while still providing for passage of potential high flood events, thus making more water available for release later in the year. The additional water can be used to supplement and/or replace groundwater use through a surface diversion and/or groundwater recharge (Monterey County Water Resources Agency 2018e).

The SRDF was constructed to provide irrigation water for farms in the lower reaches of the river valley after being treated (filtered and chlorinated). Diverted water is used to irrigate approximately 12,000 acres of agricultural lands, significantly reducing the need to pump groundwater (RMC Water and Environment 2003). Without these additions to the existing infrastructure, seawater intrusion would continue to advance and there would be an ongoing need for groundwater extraction to meet irrigation demands of the CSIP area. Currently, the SVWP supplies water the

quality of which equals, if not exceeds, the recycled water that has been distributed to the local agricultural industry for more than 20 years (Monterey County Water Resources Agency 2018e).

MCWRA has proposed Phase II of the SVWP to address additional water supply issues in the Salinas River groundwater basin. Phase II would put to beneficial use the water right allocated to MCWRA (by Water Right Permit 11043) to further develop surface water resources that would be used to offset groundwater pumping. Reduced groundwater extractions would, in turn, help to slow and ultimately halt seawater intrusion in the Salinas River groundwater basin. Phase II would also allow for further offsets of groundwater pumping by delivering additional surface water to the several subareas of the Salinas River groundwater basin. Up to 135,000 AF per year of water would be diverted from the Salinas River and supplied for municipal, industrial, and/or agricultural uses in these subareas (Geoscience 2013).

Phase II would encompass two surface water diversion points, most likely similar to the existing SRDF, for capture, conveyance, and delivery of the water: one located near Soledad, known as the East Side Canal Intake, and the other located south of Salinas, called the Castroville Canal Intake. The conveyance facilities would be either aboveground or belowground pipelines and pump stations. Delivery facilities may consist of injection wells (as part of an aquifer storage and recovery system), percolation ponds, or turnouts for direct use of the water. The delivery facilities may incorporate treatment of the water or, alternatively, MCWRA may deliver raw water to be treated by the end-user in a manner suitable for the intended application (for example, agricultural versus urban). Phase II is currently on hold; however, it will be evaluated in an environmental impact report (EIR), and a suitable alternative will be selected as result of the review process.

2.4.1.4 Interlake Tunnel and Spillway Modification Project

The Interlake Tunnel and Spillway Modification Project (referred to herein as *Interlake Tunnel Project*) proposes to divert water from the Nacimiento Reservoir to San Antonio Reservoir through an approximately 2-mile-long gravity flow tunnel with an intake structure in Nacimiento Reservoir and an exit outlet structure in San Antonio Reservoir (Monterey County Water Resources Agency 2016). A key component of the Interlake Tunnel Project is the spillway modification which, as proposed and currently under review for feasibility, would raise the current 780-foot-tall crest of the San Antonio Dam spillway approximately 7 feet to increase its capacity by approximately 60,000 AF (18%). The Nacimiento River watershed produces nearly three times the average annual inflow as compared to the San Antonio River watershed; accordingly, capturing and diverting high Nacimiento River flows to San Antonio Reservoir would increase the overall storage capacity within the two watersheds. Once implemented, the project will help conserve water for use during future drought years (Monterey County Water Resources Agency 2018f).

The project has been under consideration since the late 1970s and was included in MCWRA's 1991 *Water Capital Facilities Plan* as an approach to better manage flood and conservation flows in the Salinas River watershed. More recently, the project was included in the 2013 *Greater Monterey County Integrated Regional Water Management Plan*. In 2014, a group of Salinas Valley growers revitalized the urgency for the project due to the ongoing multi-year drought.

The Interlake Tunnel Project is divided into three phases: (1) project feasibility tasks, including preliminary engineering and water rights requirements analysis; (2) pre-construction tasks, including environmental review, permit applications, geotechnical and final design, right-of-way acquisition, and financing arrangements; and (3) construction. The project is currently in the first

phase of development. Depending upon several factors in the second phase, including the degree of environmental documentation required, the project construction could be completed by the end of 2021 (Monterey County Water Resources Agency 2016).

2.4.1.5 Operations and Maintenance Activities

MCWRA is responsible for inspection, operations and maintenance, and repair and replacement of facilities on properties within an approved zone of benefit, on properties it owns, or on properties for which it holds an easement. Facilities include Nacimiento and San Antonio Dams, SRDF, CSIP irrigation pipeline, Old Salinas River Slidegate, as well as other various pump stations, canals, drainageways, and reclamation channels that make up the Salinas River water supply and flood control system. To keep water moving to destinations throughout its jurisdiction and protect surrounding uplands, MCWRA conducts the following routine maintenance activities.

- Facility maintenance such as trash removal; fence installation; accumulated sediment removal; trail, road, and culvert repair or replacement; and minor bridge repair.
- Storm system maintenance including clearing outlets to restore stormwater flow. Work may entail trimming vegetation and/or clearing sediment around drain outlets.
- Storm damage repair and flood prevention projects including drainage improvements.
- Natural resource protection such as small bank stabilization projects (less than 100 feet), restoration to reduce erosion, and removal of debris deposited during flooding.
- Small-scale erosion control projects or storm damage prevention projects that do not create new permanent hardscape on the creek bank or channel including sandbag installation.
- Operation and maintenance of flood protection facilities such as armored channels, bypass channels, levees, access roads, and detention ponds.
- Vegetation management for exotic species removal, such as removal of giant reed.
- Vegetation management for public safety hazards including fire management and mosquito control activities.
- Precipitation and stream gage station maintenance.
- Operations and maintenance of water utility/water supply facilities including inflatable dams, diversion structures, groundwater recharge ponds, gages, pipelines, pumps, turnouts, slidegates, fish ladders, etc.

2.4.2 MCWRA Partnership Projects and Programs

This section is a summary of three interrelated projects and programs led by federal, state, or other local agencies in which MCWRA is a partner and that are relevant to short- and long-term management needs of the Salinas River in the study area.

2.4.2.1 Salinas River Stream Maintenance Program

In 2010, MCWRA developed the Salinas River SMP in collaboration with the Resource Conservation District of Monterey County (RCDMC), the Salinas River Channel Coalition, the Grower-Shipper Association of Central California, The Nature Conservancy, Conservation Collaborative, and other local entities and contractors. The Salinas River SMP is intended to help protect landowners and

farms along the Salinas River against flooding during and after moderate storm events while enhancing the habitat value of the Salinas River (Monterey County Water Resources Agency 2014). The Salinas River SMP, an adaptation from the Salinas River Channel Maintenance Program, facilitates vegetation and sediment management activities conducted voluntarily by individual property owners, growers, and municipalities. To effectively implement this program, these entities collectively formed a non-profit organization called the Salinas River Stream Maintenance Program River Management Unit Association.

The Salinas River SMP addresses management needs along the banks of the Salinas River mainstem from nearly the mouth to San Ardo (River Miles 2–94). The Salinas River SMP also addressed vegetation management needs in three tributaries: Gonzales Slough, Bryant Canyon Channel, and San Lorenzo Creek. With its collaborative and science-based approaches, the Salinas River SMP outlines measures to manage and remove vegetation and sediment in specific maintenance areas within the watershed to maximize flood flow capacity, minimize bank erosion, and minimize environmental effects (Monterey County Water Resources Agency 2018g). The RCDMC helps MCWRA administer the Salinas River SMP. The RCDMC also holds the Routine Maintenance Agreement permit from the California Department of Fish and Wildlife (CDFW) under the Lake or Streambed Alteration Program, and oversees the required biological monitoring for the program.

The Salinas River mainstem and the three select tributaries are collectively referred to as the Salinas River *SMP Program Area*. The Salinas River SMP Program Area is further divided into seven river management units (Figure 1-2). Approximately 129 designated maintenance areas within the seven river management units were identified and mapped based on available data such as topography, flood flows, and vegetation communities. Most work activities planned by Salinas River SMP participants are restricted to these designated maintenance areas and outside of the low-flow channel (Monterey County Water Resources Agency 2018g). Implementation of the Salinas River SMP occurs primarily through landowner and lessee participation in the Salinas River Stream Maintenance Program River Management Unit Association.

Work activities planned by Salinas River SMP participants include vegetation and sediment management. Vegetation management is focused on the following activities.

- Cutting and removal of flow-constricting vegetation (both native and nonnative) within the secondary channels to maintain flow conveyance capacity.
- Controlling invasive vegetation, mainly *Arundo donax* (Arundo) and *Tamarix parviflora* (tamarisk).
- Promoting a canopy of native riparian trees through restoration measures.

Vegetation removal activities are relatively consistent from year to year and involve mowing, disking, and herbicide applications through the prep-and-spray method (Monterey County Water Resources Agency 2018g). Sediment management is directed towards removing sediment accumulation in areas outside of the low-flow channel to increase stream capacity and minimize bank erosion. Sediment removal is accomplished using heavy equipment such as a large track excavator or bulldozer. Sediment removed from the maintenance area is moved outside the stream channel and either relocated on the adjacent property or hauled offsite using dump trucks (Monterey County Water Resources Agency 2018g). The typical timeframe in which most stream maintenance activities are conducted is September 1 to November 15.

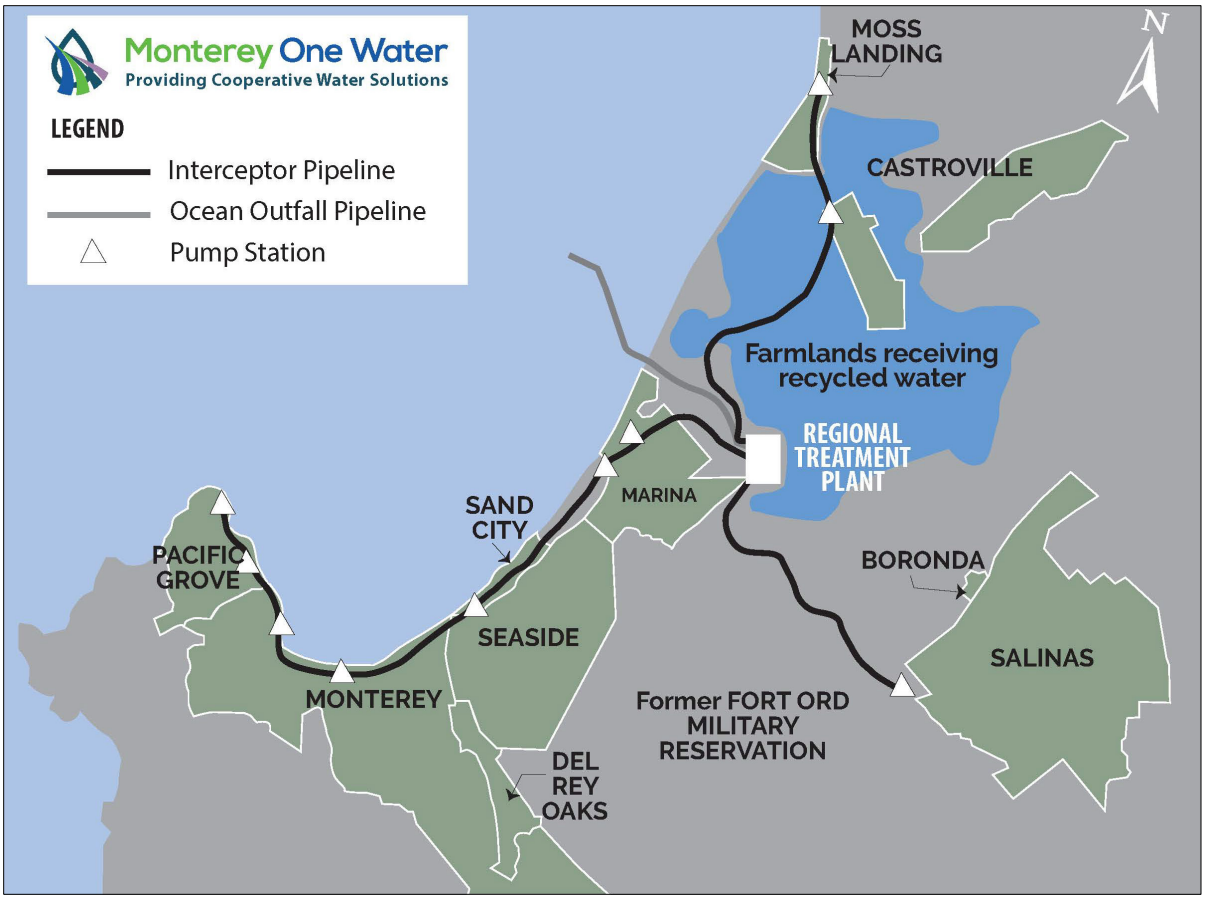
MCWRA oversees the Salinas River SMP Monitoring Program, tracking compliance of activities allowed by the programmatic EIR and associated permits, evaluating stream maintenance activities, and monitoring changes to the low-flow channel. The objectives of the Salinas River SMP Monitoring Program are to provide compliance monitoring to ensure that the proposed work is being performed as allowed under the EIR and permits and to provide physical process monitoring to evaluate the extent to which the stream maintenance activities are achieving the objectives of the Salinas River SMP for flood control capacity protection and habitat enhancement.

2.4.2.2 Pure Water Monterey

Pure Water Monterey is a water recycling and groundwater replenishment project developed by two public agencies: Monterey Peninsula Water Management District and Monterey One Water. The project, adopted by the two agencies in 2012, proposes to reduce water use from the Carmel River and the Seaside Basin and, in doing so, will restore reliability of surface water and groundwater in the region. The project plans to utilize existing infrastructure and construct new facilities to treat agricultural wash water, stormwater runoff, agricultural return water, and treated wastewater. The advanced purification process includes membrane filtration, reverse osmosis, oxidation with hydrogen peroxide, and ultraviolet light followed by natural percolation into the groundwater basin through injection wells. Operation and maintenance of these facilities will be funded by users and will primarily originate from property taxes in zones of benefit.

Treated water from this project will have many uses, including potable water, irrigation supply, and groundwater recharge (Denise Duffy & Associates 2016). MCWRA may participate in the Pure Water Monterey project by utilizing new source waters from the project for irrigation supply through the CSIP. Figure 2-3 shows the alignment of the recycled water pipeline. MCWRA participation, in turn, will reduce groundwater pumping by an estimated 2,000 AF per year in the Salinas Valley Basin, build and maintain a drought reserve for future use, and reduce costs for future capital improvement projects (Pure Water Monterey 2018).

Additional regional benefits of the project include increased water supply in the winter, reduction of stormwater runoff into the ocean, treatment of impaired agricultural surface waters, distribution of water rights acquisition costs among participating agencies, and overall improvement of water quality in the Salinas Valley. The project is currently under construction, with activities focused on constructing diversion facilities in the Rec Ditch and Blanco Drain, injection wells in the Seaside groundwater basin, and an advanced water purification facility at the Monterey Regional Treatment Plant. The project is expected to be fully operational by 2020 (Pure Water Monterey 2018).



Source: California State University Monterey Bay 2018.

Figure 2-3. Monterey Regional Treatment Plant and Recycled Water Irrigation Pipe Alignment

2.4.2.3 Groundwater Sustainability Plans

In 2014, California established the Sustainable Groundwater Management Act (SGMA). Within the study area, four groundwater sustainability plans (GSPs) are currently under development: the Salinas Valley Basin GSP, the Marina Coast Water District (MCWD) GSP, City of Marina GSP, and the Arroyo Seco GSP. Because the hydrology and geology of these four plans are somewhat intertwined due to proximity and subsurface characteristics, the groundwater sustainability agencies (GSAs) leading development of the four GSPs are working to coordinate their efforts, particularly in establishing a common water budget that will inform the projects proposed by each plan.

Salinas Valley Basin Groundwater Sustainability Plan

In December 2016, a joint powers agreement formed the Salinas Valley Basin GSA. The Salinas Valley Basin GSA has an 11-member board representing the beneficial users of groundwater in the basin, including Monterey County, cities, agriculture, private municipal water suppliers, small water systems, residential well owners, disadvantaged communities, and environmental uses. An advisory committee was formed in 2017 to provide input and recommendations to the Salinas Valley Basin GSA on a range of topics. The consensus-seeking advisory committee represents a broad range of interests within the Salinas Valley (Salinas Valley Basin Groundwater Sustainability Agency 2018).

SGMA requires that GSPs be developed to address each of six subbasins (all Salinas Valley Basin subbasins excluding the Seaside subbasin). Of the six subbasins, only the 180/400 Foot Aquifer subbasin has been identified as being in critical overdraft. This status triggers a requirement that the 180/400 Foot Aquifer subbasin GSP be submitted to DWR by January 1, 2020. To meet this requirement, and because groundwater management is a valley-wide challenge, the Salinas Valley Basin GSA has elected to initiate development of a Valley-Wide Integrated GSP to address the management of the Salinas Valley Basin in its entirety. The 180/400 Foot Aquifer subbasin will be addressed as a chapter within the Valley-Wide Integrated GSP. After the 2020 submittal of the Valley-Wide Integrated GSP, the Salinas Valley Basin GSA will continue development of the remaining five subbasin-specific plans, which are not due until January 1, 2022. As these additional subbasins' GSPs are developed, the Valley-Wide Integrated GSP will be updated for consistency. DWR has 2 years to review each submitted GSP.

The first quantitative analysis proposed by the Salinas Valley Basin GSA is to develop a water budget for the Salinas Valley. The Salinas Valley Basin GSA plans to use the forthcoming Salinas Valley Integrated Hydrological Model that is being developed by the U.S. Bureau of Reclamation, U.S. Geological Survey, and MCWRA.

Groundwater elevation data from the California Statewide Groundwater Elevation Monitoring Program (CASGEM) will be an integral part of monitoring under the GSP. Since 2010, MCWRA has been the designated monitoring entity for three high-priority and four medium-priority groundwater subbasins in the Salinas Valley Basin. High priority subbasins include the 180/400 Foot Aquifer, Eastside Aquifer, and Paso Robles Area subbasins (Figure 2-4). The medium-priority subbasins are Forebay Aquifer, Upper Valley Aquifer, Langley Area, and Corral de Tierra Area subbasins. In addition to these, MCWRA will monitor three low- or very-low priority groundwater subbasins in Monterey County at a later date: Cholame Valley, Lockwood Valley, and Peach Tree Valley subbasins. MCWRA developed a monitoring plan to meet the requirements of the CASGEM program, which details how participants will collect groundwater elevation data in those groundwater basins for which MCWRA is the designated monitoring entity. The subareas monitored comprise 48 wells, some of which are owned by MCWRA and others that are privately owned but whose owners have volunteered the well for inclusion in the CASGEM program (Monterey County Water Resources Agency 2015).

Marina Coast Water District Groundwater Sustainability Plan

The MCWD is the GSA for the MCWD GSP. MCWD's Central Marina and Ord Community water service areas overlie portions of the Monterey subbasin, the 180/400 Foot Aquifer subbasin, and part of the Seaside Adjudicated basin. Three of the district wells are located in Central Marina, and five wells are in the Ord Community.

DWR granted MCWD exclusive GSA status within its jurisdictional boundaries in the Monterey subbasin and the 180/400 Foot Aquifer subbasin. MCWD will be engaged in the development of GSPs for the entirety of these two subbasins, in coordination with other GSAs within these subbasins (Marina Coast Water District and Marina Coast Water District Groundwater Sustainability Agency 2018).

The 180/400 Foot Aquifer subbasin GSP will be prepared by January 31, 2020, and the Monterey subbasin GSP will be prepared by January 31, 2022.

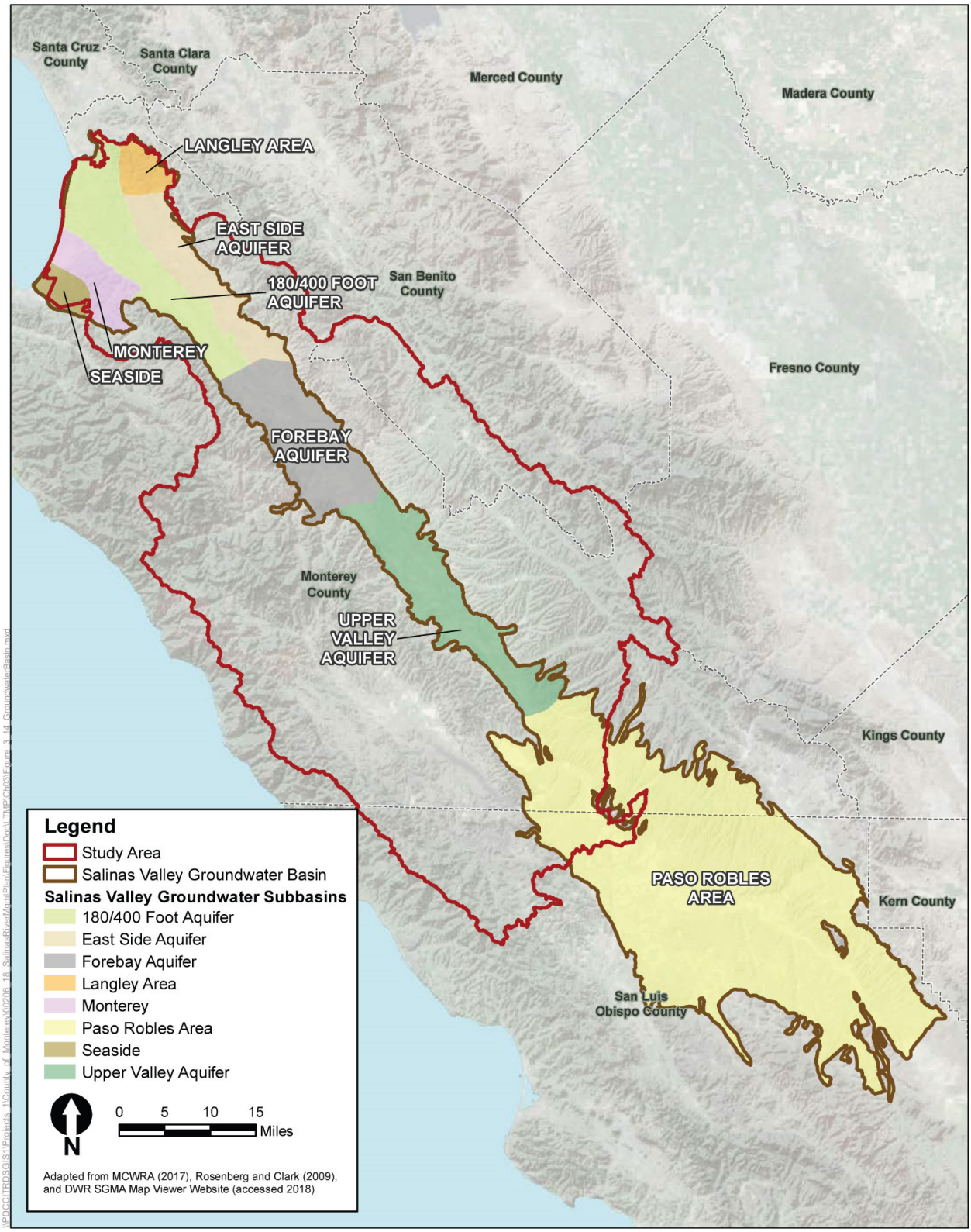


Figure 2-4. Salinas Valley Groundwater Basin

City of Marina Groundwater Sustainability Plan

The City of Marina is the GSA for the City of Marina GSP. The boundary of the City of Marina GSA overlies a small portion of the 180/400 Foot Aquifer subbasin located within city limits but outside of the MCWD service area. The 180/400 Foot Aquifer subbasin GSP will be prepared by January 31, 2020.

Arroyo Seco Groundwater Sustainability Plan

The Arroyo Seco GSA was founded in 2017. The Arroyo Seco GSA's mission is to develop a comprehensive GSP by 2022 and successfully implement the plan over SGMA's planning and implementation horizon of 50 years to demonstrate long-term groundwater basin sustainability. The Arroyo Seco GSA is governed by a five-member board representing diverse interests from the Arroyo Seco region. The Arroyo Seco GSA board is advised by a nine-member advisory committee comprised of individuals representing a cross section of varied social, environmental, and economic interests in the Arroyo Seco region (City of Greenfield 2018).

The Arroyo Seco GSA addresses the area geographically bound by Greenfield. The Arroyo Seco GSA is also seeking approval from DWR to include in its jurisdiction adjacent unincorporated lands that are the lower watershed of the Arroyo Seco. Both the city limits of Greenfield and the requested unincorporated areas overlaps with the Forebay Aquifer subbasin. Because the City of Greenfield has jurisdiction over a portion of the Forebay Aquifer subbasin and its interests are primarily tied to the lower Arroyo Seco (an area known as the *Arroyo Seco cone*), the City of Greenfield is seeking to develop a GSP specific to its jurisdiction and area of interest. The Arroyo Seco GSP, which is currently proposed as a standalone GSP from the Forebay Aquifer GSP, will be prepared by January 31, 2022.

2.4.2.4 WaterSMART Basin Study

The WaterSMART Basin Study for the Salinas River Basin (Basin Study) is a comprehensive water resources assessment of the Salinas River Valley funded by U.S. Bureau of Reclamation, MCWRA, Monterey Peninsula Water Management District, San Luis Obispo County Public Works, and Monterey One Water. The study, developed in 2017, is part of U.S. Bureau of Reclamation's Sustain and Manage America's Resources for Tomorrow (WaterSMART)[6] program that funds and oversees watershed basin studies nationwide.

The Basin Study will assess the general health of the Salinas River and Carmel River watersheds and groundwater basins and their abilities to provide sustainable water supplies into the future with respect to climate change over the next century. The study authors will downscale global models specifically to the Central Coast to predict what the hydrology of the Salinas River might look like in the future with a changing climate (U.S. Bureau of Reclamation 2017).

The Basin Study will be developed in coordination with the Monterey Peninsula Water Management District, which is simultaneously developing the *Monterey Peninsula Drought Contingency Plan*. Developed together and sharing hydrology, climate data and other common elements, these two studies will provide a robust view of how potential future climate conditions may impact water supplies and demands. Ultimately, these studies will be used to represent how imbalances between

[6] U.S. Bureau of Reclamation WaterSMART Program, available at https://www.usbr.gov/watersmart/.

future water supplies and demands may be mitigated or reduced by implementing various actions and adaptation strategies (U.S. Bureau of Reclamation 2017).

The objectives of the Basin Study are as follows.

1. Improve regional collaboration in the development of a comprehensive assessment of supplies and demands in each river basin and subbasins.
2. Identify a set of potential future climate conditions to year 2100 and assess the impacts of these future conditions to existing and projected future supplies and demands.
3. Identify solutions and adaptation strategies which respond to the imbalances projected between supplies and demands.

These objectives will help water managers make informed decisions on water use, plan for future water supplies, and propose adaptive strategies to mitigate for effects of climate change. The total funding needed for the Basin Study is projected to be $1.66 million. The U.S. Bureau of Reclamation will provide funding as the federal share, and the non-federal costs will be shared by the partners with in-kind services contributions.

The Basin Study encompasses the entire watersheds of the Salinas and Carmel River basins, including the Monterey Peninsula. Together, the two basins encompass an area of approximately 4,500 square miles (U.S. Bureau of Reclamation 2017).

2.4.2.5 Greater Monterey County Integrated Regional Water Management Plan

Integrated regional water management (IRWM) is an approach to water management that is being strongly promoted by state water managers and legislators as a way to increase regional self-sufficiency. IRWM encourages local water resource managers to take a proactive leadership role in solving water management problems on a local level through collaborative regional planning. This regional approach is considered necessary in order for water managers to cope with the impending water management challenges ahead. The IRWM Plan is congruent with local plans and includes current, relevant elements of local water planning and water management issues common to multiple local entities in the region (Figure 2-5). IRWM planning does not replace or supersede local planning; rather, local planning elements are used as the foundation for the regional planning effort.

The Greater Monterey County Regional Water Management Group (RWMG) is the entity tasked with developing and implementing the IRWM Plan, reviewing projects submitted to the plan, and choosing which projects to put forward for funding. The Greater Monterey County RWMG has no special legal authority or regulatory power; it is simply a group of local agencies and organizations that have volunteered to identify water resource management projects in the Greater Monterey County region and to submit grant applications to the state on behalf of the region.

The Greater Monterey County IRWM Plan was formally adopted by vote of the RWMG on April 17, 2013. Between 2017 and 2018, the plan was updated to comply with 2016 IRWM program guidelines. On September 19, 2018, at a regularly scheduled RWMG meeting that was open to the public, RWMG voted to approve the updated IRWM Plan.

Source: Regional Water Management Group 2018.

Figure 2-5. Greater Monterey County Integrated Regional Water Management Plan Region

The RWMG for the Greater Monterey County IRWM region includes government agencies, nonprofit organizations, educational organizations, water service districts, private water companies, and organizations representing agricultural, environmental, and community interests. The RWMG members were chosen to ensure balanced representation of the various resource areas, interests, and geographic areas throughout the Greater Monterey County region, and consist of the following 18 entities.

- Big Sur Land Trust
- California State University Monterey Bay
- California Water Service Company
- Castroville Community Services District
- Central Coast Wetlands Group (CCWG) at Moss Landing Marine Laboratories
- City of Salinas
- City of Soledad
- Elkhorn Slough National Estuarine Research Reserve
- Environmental Justice Coalition for Water
- MCWD
- Monterey Bay National Marine Sanctuary (Sanctuary)
- Monterey County Agricultural Commissioner's Office
- Monterey County Resource Management Agency
- MCWRA
- Monterey Regional Water Pollution Control Agency
- RCDMC
- Rural Community Assistance Corporation
- San Jerardo Co-Operative, Inc.

The Greater Monterey County IRWM region lies entirely within the Central Coast Regional Water Quality Control Board (Regional Water Board) district and is part of the IRWM Central Coast Funding Area. Adjacent IRWM regions are the Pajaro River Watershed IRWM region; Monterey Peninsula, Carmel Bay, and South Monterey Bay IRWM region; and San Luis Obispo County IRWM region. Together these four regions, plus the Northern Santa Cruz County and the Santa Barbara County IRWM regions, form the Central Coast IRWM Funding Area.

The Greater Monterey County IRWM region includes the entirety of Monterey County exclusive of the Pajaro River Watershed IRWM region and the Monterey Peninsula, Carmel Bay, and South Monterey Bay IRWM region established under Proposition 50. The Greater Monterey County IRWM region also includes a small portion of San Benito County where the Salinas River watershed extends outside of Monterey County. Generally, the region includes the entire Salinas River watershed north of the San Luis Obispo County line, all of the Gabilan/Tembladero and Bolsa Nueva watersheds in the northern part of the county, and all of the coastal watersheds of the Big Sur coastal region within Monterey County.

The IRWM Plan goals and objectives are at the very foundation of the IRWM planning process. The goals and objectives are the response to what the RWMG perceives to be the major water resource issues in the region and as such, reflect the RWMG's water resource management values and overall priorities for the region. The objectives give focus to the plan, provide the basis for determining which resource management strategies are appropriate for use in the region, guide project development, and are used to evaluate project benefits.

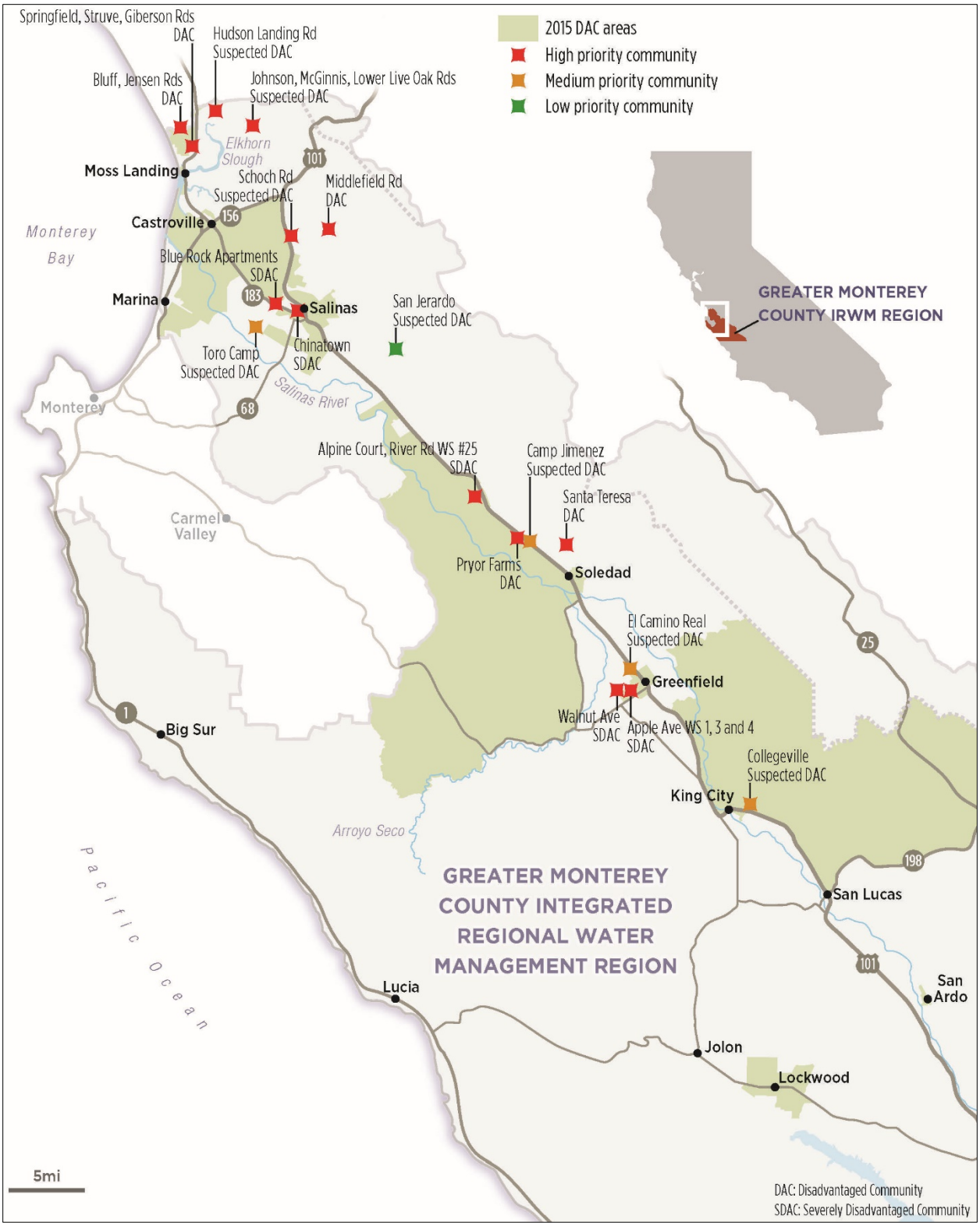
The goals for the Greater Monterey County IRWM planning region are as follows.

- **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.
- **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. On November 8, 2017, the Greater Monterey County RWMG voted to approve the *Integrated Plan to Address Drinking Water and Wastewater Needs of Disadvantaged Communities in the Salinas Valley and Greater Monterey County IRWM Region*. This plan focuses on small disadvantaged communities, and communities suspected to be disadvantaged, in unincorporated areas that are served by state small water systems (5–14 connections), local small water systems (2–4 connections), and private domestic wells.

A new viewing platform, the Greater Monterey County Community Water Tool, has been created to show the locations of disadvantaged communities and suspected disadvantaged communities (Figure 2-6), geographic areas with water quality contamination (including nitrate, arsenic, and hexavalent chromium contamination), and the boundaries of nearby water districts.

2.4.2.6 Greater Monterey County Storm Water Resources Plan

The *Greater Monterey County Storm Water Resources Plan* (SWRP) is being drafted in accordance with the SWRP Guidelines and complies with all relevant Water Code provisions. The draft is anticipated to be finalized in June 2019. The geographic coverage area of Greater Monterey County SWRP is coterminous with the boundaries of the Greater Monterey County IRWM region, with a special focus for the purposes of stormwater planning in the Salinas River, Gabilan/Tembladero, Moro Cojo, Elkhorn, and McClusky watersheds (Figure 2-7).



Source: Regional Water Management Group 2018.

Figure 2-6. Disadvantaged and Suspected Disadvantaged Communities in the Greater Monterey County Integrated Regional Water Management Region

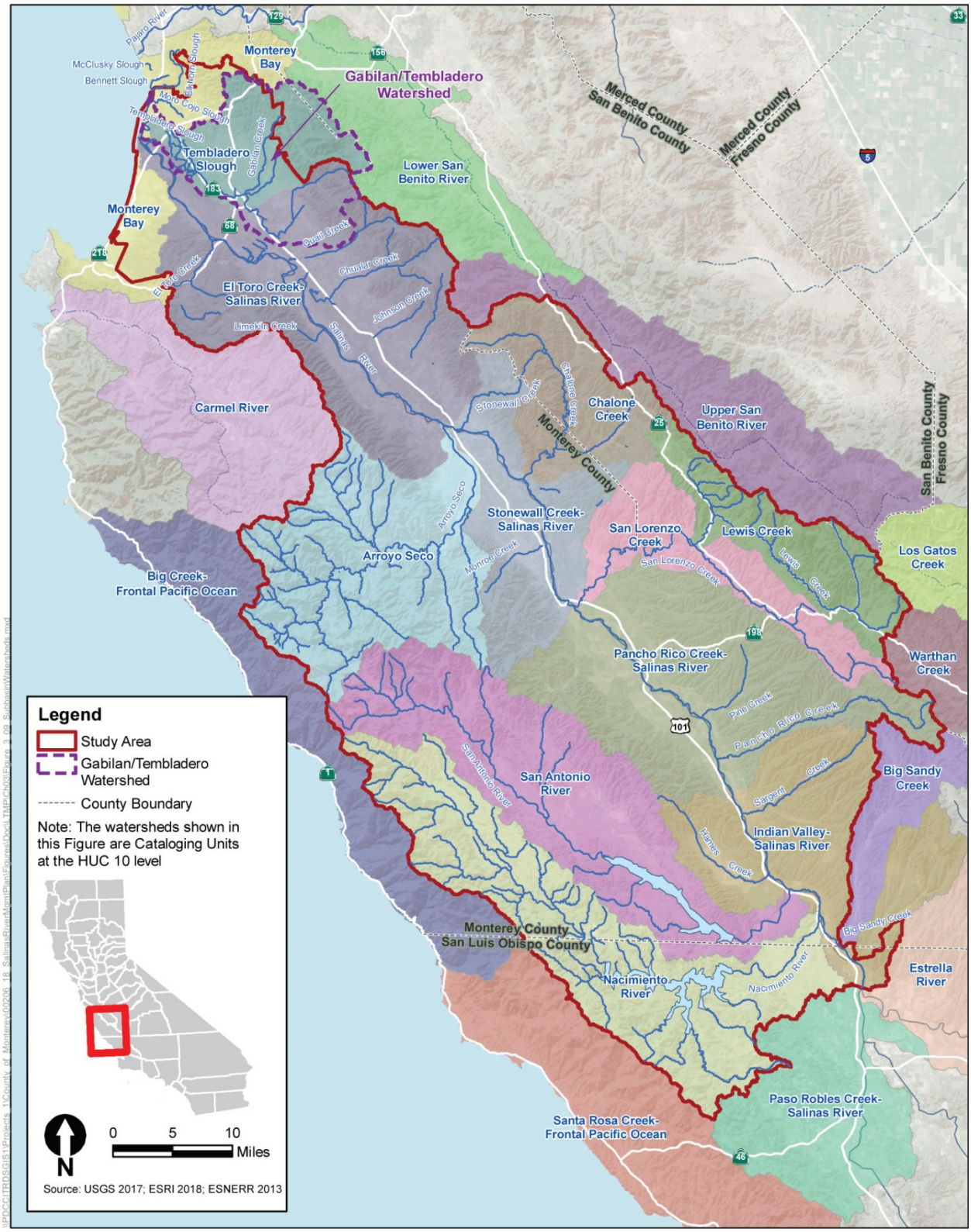


Figure 2-7. Watersheds in the Study Area

The purpose of the SWRP is to promote stormwater 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 (1) characterizing current stormwater dynamics in terms of sources, volume, flow, timing, quality, and rights and (2) 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 stormwater management consider stormwater and dry weather runoff as a problem to be addressed, this plan considers it as a potential resource. Projects that utilize stormwater and dry weather runoff as a resource can result in the following multiple benefits (Water Code §§ 10561(g), 10561(h), and 10562(b)(2)).

- Creation and restoration of wetlands.
- Enhanced riparian habitats.
- Increased instream flows.
- Increased park and recreation lands.
- Increased urban green space.
- Augmented 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.

The SWRP uses a watershed-based approach to identify regionally integrated opportunities to beneficially reuse stormwater within the Greater Monterey County region, focusing on the Salinas River, Gabilan/Tembladero, Moro Cojo, Elkhorn, and McClusky 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 stormwater management goals.

The SWRP contains the following five goals.

- **Water Supply**. Manage stormwater 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 stormwater systems to reduce surface water peak flows and flood risk.

- **Environment.** Protect, preserve, restore, and/or enhance watershed features and processes through stormwater management.
- **Community.** Enhance economic prosperity and quality of life through improved urban spaces, availability of clean water, and related job creation and training.

This plan will be considered a living document. By identifying both implementation projects and concept projects, the plan will provide a useful and comprehensive long-term planning tool for stormwater resource management in the Greater Monterey County region.

The Greater Monterey County RWMG 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 for this SWRP and, as such, has participated in the decision-making during the plan's development. Upon completion of the SWRP in June 2019, the plan will be formally submitted to the RWMG per the Water Code provisions (Water Code § 10562, (b)(7)). Monterey Bay National Marine Sanctuary Water Quality Protection Partnership

The Sanctuary is a federally protected marine preserve established in 1992 by the National Oceanic and Atmospheric Administration under the authority of the National Marine Sanctuaries Act. It comprises Central California coastal waters, from Marin County to San Luis Obispo County, encompassing a shoreline length of 276 miles and 4,601 square miles of the Pacific Ocean. Containing extensive kelp forests and one of North America's largest underwater canyons, the Sanctuary supports an incredible array of marine life including 36 species of marine mammals, over 180 species of seabirds and shorebirds, over 525 species of fishes, and a bounty of invertebrates and algae (National Oceanic and Atmospheric Administration 2018).

Due to its proximity to the coastline, the Sanctuary is vulnerable to pollution from approximately 7,000 square miles of surface waters from the surrounding watersheds that distribute contaminants such as sediments, nutrients, fecal bacteria, pesticides, oil, grease, metals, and detergents. To ensure water quality protections for the Sanctuary, a memorandum of agreement was signed in 1992 and updated in 2006 by eight federal, state and local agencies to develop a water quality protection program. By using a collaborative approach involving key stakeholders for specific issues, the program committee has completed action plans for the following categories.

- Agriculture and rural land.
- Beach closure and microbial contamination.
- Citizen watershed monitoring network.
- Marinas and boating.
- Regional monitoring.
- Wetlands and riparian corridors.
- Urban runoff.

As part of the Urban Runoff Action Plan, MCWRA and the County of Monterey are collaborating with the Cities of Monterey, Pacific Grove, Seaside, Carmel, Marina, Del Rey Oaks, and Sand City to implement the Monterey Regional Storm Water Management Program (MRSWMP) for the Monterey Peninsula. The goal of the MRSWMP is to meet water quality standards for urban runoff required by the Clean Water Act to protect and enhance public health and natural water resources including watersheds, beaches, and the coastal waters of the Sanctuary. The MRSWMP identifies stormwater

capture projects within the jurisdiction of the partnering entities to collect, store, and treat stormwater runoff including dry weather flows from excess irrigation runoff (Monterey Regional Stormwater and Education Alliance 2018).

2.5 Other Applicable Planning Efforts

The following summarizes current research and planning efforts that are expected to have some bearing on how the Salinas River is managed in the long term.

2.5.1 Central Coast Wetlands Group

The CCWG is an affiliate research group at Moss Landing Marine Laboratories focused on the study, preservation, and restoration of Central Coast wetlands. The group was started in response to federal and state interests in coordinating wetland activities throughout California. The state and federal governments have adopted a *no net loss* policy for wetlands but currently have few mechanisms to track the implementation or success meant to achieve this policy. The CCWG has begun to build the necessary infrastructure, working closely with regional partners (U.S. Environmental Protection Agency, the Sanctuary, California State University Monterey Bay, Central Coast Regional Water Board, the RCDMC, MCWRA) who have active programs throughout the Central Coast. Four CCWG projects located within the Salinas River watershed are described below.

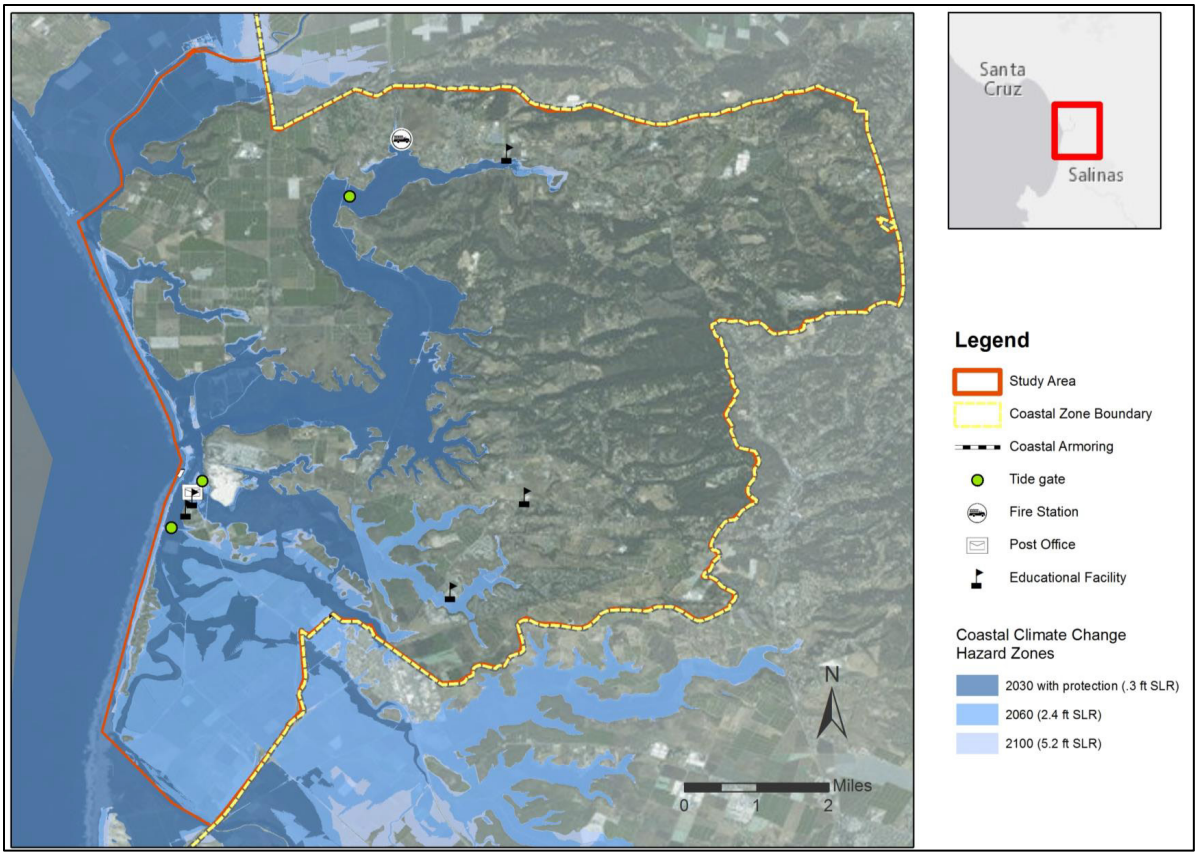
2.5.1.1 Moss Landing and Lower Salinas Valley Sea Level Rise Vulnerability Analysis

To benefit local coastal planning and foster discussions with state regulatory and funding agencies, the Moss Landing and Lower Salinas Valley sea level rise vulnerability report provides a predictive chronology of risks associated with future sea level rise and coastal climate change in the lower Salinas Valley. Estimates of the extent of assets at risk of various climate hazards were made using best available regional data. This approach allows planners to understand the full range of possible impacts and to understand the overall risk posed by sea level rise in this region (Central Coast Wetlands Group 2017).

The report's hazard maps show projected hazard zones for various climate scenarios for three planning horizons, and the report's hazard analysis focuses on a subset of those scenarios. Figure 2-8 illustrates the combined hazard areas for future sea level rise and coastal climate change.

The analysis achieved three key objectives to further regional planning for the inevitable impacts associated with sea level rise and its confounding effects on fluvial processes within the Moss Landing community and surrounding region (Central Coast Wetlands Group 2017). The analysis specifically determined the following.

- What critical coastal infrastructure may be compromised and when.
- How fluvial processes may increase flooding risk to coastal communities.
- Appropriate response strategies for these risks to discuss with regional partners the programmatic and policy options that can be adopted within community plans and updates to hazard mitigation plans.



Source: Central Coast Wetlands Group 2017.

Figure 2-8. Coastal Climate Change Hazard Zones in Northwestern Monterey County

2.5.1.2 Water Balance and Flood Modeling for the Greater Monterey County Storm Water Resources Plan

The CCWG and Environmental Science Associates developed modeling tools to enable quantitative assessment of project opportunities in the Greater Monterey County IRWM region. The models were developed to support a new stormwater resources plan (i.e., the SWRP) for this region. Environmental Science Associates developed two primary models to characterize current conditions and project benefits within the planning region. These include a water balance model, which simulates simple rainfall-runoff and routing processes within the entire Salinas River watershed, and a flood model which simulates channel and floodplain hydraulics capturing water level and flood inundation extents for parts of the Gabilan/Tembladero watershed (Environmental Science Associates and Central Coast Wetlands Group 2018).

2.5.1.3 Old Salinas River Enhancement Project

Enhancement of the OSR has been a long-term objective discussed within numerous watershed plans in the region. Enhancement goals for this drainage include flood attenuation and adjacent agriculture flood protection, water quality enhancements, lagoon flood management and habitat connectivity, fish migration, habitat enhancement, and coastal access. A key challenge to making progress on any of these objectives is that the lands adjacent to (and including the channel itself) are privately owned by local farmers. Other than working toward flood protection goals, the adjacent

landowners have not prioritized meeting these other environmental objectives for the OSR (Central Coast Watershed Studies 2006).

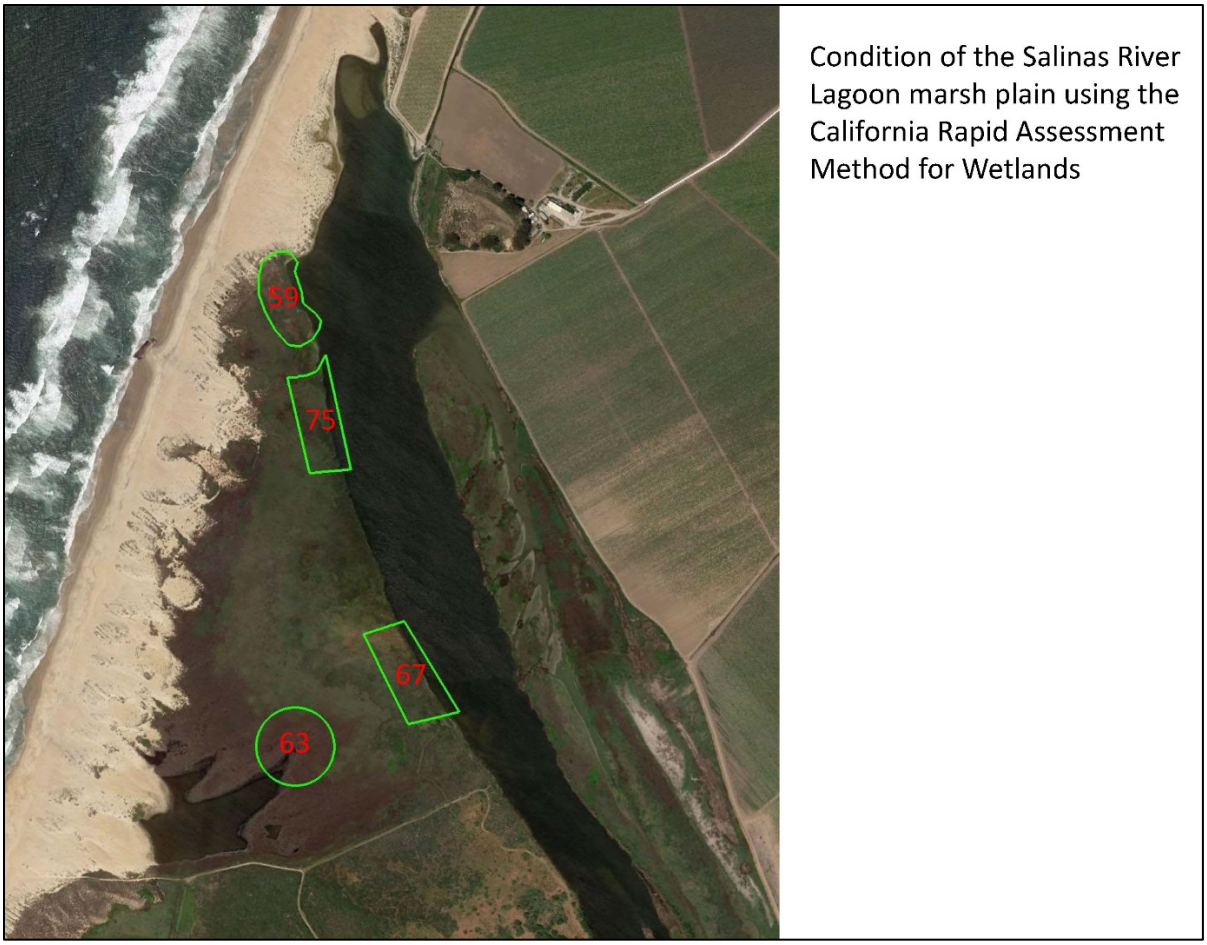
Recently, however, CCWG has worked with landowners on both sides of the OSR to integrate water quality and other environmental objectives into their farming operations, leading to the implementation of water quality enhancement projects on and adjacent to these farmers' lands. Positive water quality results of those projects have been documented and submitted to regulatory agencies for review and consideration. Current discussions with the Central Coast Regional Water Board regarding how to incentivize landowners to take further actions are underway, and landowners have identified other lands for water quality and possibly habitat enhancement efforts if regulatory incentives are established.

To demonstrate potential benefits of landowner collaboration to solve environmental goals, Scattini and Sons farms agreed to have initial habitat and water quality enhancement plans drafted for their portions of the OSR. The draft habitat enhancement designs are intended to improve water quality, increase flow and decrease flooding, and benefit fish habitat and fish passage objectives. The designs use local tidal action (documented at two locations within the OSR) to direct flows through linear treatment wetland areas, flowing back into the main channel downstream during subsequent low tides. Initial nitrate load reductions for this system are estimated to range between 500 and 4,000 kilograms per year.

2.5.1.4 California Rapid Assessment Method for Wetlands of the Salinas River Lagoon

Central Coast Wetlands Group assessed the condition of the Salinas River Lagoon marsh plain in 2012 and 2015. The California Rapid Assessment Method for Wetlands (CRAM) was used to conduct the assessments of existing vegetation and habitat at four sites on the marsh plain. CRAM measures quantity and quality of vegetation conditions of four main habitat attributes of the veg and habitat: Hydrology, Physical Structure, Biotic Structure and Buffer/Landscape Context. CRAM Index scores are divided into four categories: Excellent (82–100); Good (63–81); Fair (44–62); and Poor (25–43). During the analysis, CRAM Index scores ranged from 59 on the channel edge near the mouth to 75 farther east along the channel in a more established area of the marsh (Figure 2-9). The average score for the system is 66 (good). This puts the lagoon in the 33rd percentile of 94 similar bar-built estuaries assessed along the entire California coastline (Central Coast Wetlands Group 2015).

Several stressors were identified on the site during the assessments. While not factored into the CRAM scores, stressors can provide more detailed insight about what may be adversely affecting the ecological condition of the river, stream, or creek. Stressors that were consistently observed on the site include non-point sources from agricultural areas, nutrients and pesticides, and dikes and levees along the river (Central Coast Wetlands Group 2015).



Source: Central Coast Wetlands Group 2015.

Figure 2-9. Assessment Locations and Scores from the California Rapid Assessment Method for Wetlands

2.5.2 Resource Conservation District of Monterey County

As of 2008, the RCDMC is implementing the Salinas Watershed Invasive Nonnative Plant Control and Restoration Program, a large-scale invasive plant removal program across the Salinas River watershed, with a goal of eradicating Arundo and other invasive species along 90 infested river miles in 20 years (Resource Conservation District of Monterey County 2011). The program involves grant and mitigation funding to the RCDMC and its partners for the restoration of riparian habitat in the Salinas River watershed through the control of invasive nonnative plants (mainly Arundo) and the planting of native species. Current partners include Monterey County Agriculture Commissioner, and private landowners.

The project area encompasses the Salinas River and its tributaries within Monterey County and is predominately private land. No work occurs without a right-of-entry agreement signed by both the landowner and the RCDMC. Lands owned by the federal government are excluded from the program area (Resource Conservation District of Monterey County 2011).

The program's activities include intensive abatement including herbicide treatments and biomass reduction measures, such as aggressive mowing with heavy equipment and weeding by hand. The

program uses a systematic approach of starting upstream and working downstream to preclude any further dispersal of Arundo by clonal material (i.e., root balls) floating downstream. The herbicide treatment cycle typically involves foliar application of herbicide (aquatic approved herbicide formulations of glyphosate, imazapyr, or triclopyr). Treatments are applied from July to November. To avoid impacts on non-target plants, stands are prepped for spraying. The prepping creates a physical space between target and non-target plants. Arundo is pushed away from native shrubs and trees, and the natives may be trimmed (<6-inch diameter). Arundo is typically not cut, as this reduces treatment efficacy. A marking dye is added to the herbicide mix to allow applicators to see and minimize chemical drift and ensure thorough coverage of target plants. Crews apply targeted herbicide using hand-held sprayers (foliar application method). No broadcast applications are made from booms, aircraft, or other mechanical devices. Only target plants are treated with herbicide (Resource Conservation District of Monterey County 2011).

Active re-vegetation is another key component of the program for most project areas that have biomass reduction (i.e., mowing of invasive plants). Effective control of target plants is required prior to re-vegetation to avoid situations where re-treatments would harm a significant number of plantings. For areas that are treated first and then followed by biomass reduction, planting typically occurs immediately if conditions are suitable. Areas that have biomass reduction first and then have re-growth treated in multiple cycles will typically not be planted with natives until after the second year of treatment. Native seedlings derived from the Salinas River watershed are grown, planted, and monitored as part of the re-vegetation effort (Resource Conservation District of Monterey County 2011). In the first phase of the program between 2008 and 2009, Arundo, tamarisk, and tree tobacco were sprayed between the Monterey/San Luis Obispo County line to King City. The next phase of the program began in 2014, beginning near Greenfield and working downstream. As of August 2018, the program has implemented removal measures from Greenfield to Soledad (Zefferman pers. comm.).

The RCDMC's roles in administering the program are as follows.

- Fundraising.
- Securing required permits.
- Recruiting landowners into the program.
- Overseeing the implementation of weed control activities on private lands.
- Providing biological monitoring of treated areas.
- Ensuring regulatory compliance.
- Coordinating financial and technical assistance for private landowners interested in performing their own control efforts.

As a result of the program, over 450 acres of Arundo have been eradicated or are severely supressed (and being repeatedly treated). The RCDMC continues to seek funding and landowner cooperation to advance the program downstream.

Funding sources include grants from CDFW, Wildlife Conservation Board, California Department of Transportation, California Department of Food and Agriculture, USFWS, Natural Resources Conservation Service, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Forest Service, Monterey County, and the State Water Resources Control Board. Other sources include donations and in-lieu-fee type mitigation programs (Resource Conservation District of Monterey County 2018).

2.5.3 Transportation Agency of Monterey County

The Transportation Agency of Monterey County has initiated the development of a regional conservation investment strategy (RCIS) for Monterey County. The RCIS will identify areas of conservation priority for implementation of conservation actions and habitat enhancement actions by Transportation Agency of Monterey County to facilitate appropriate mitigation actions for its proposed transportation projects throughout Monterey County. The RCIS will assess the vulnerability of species and habitat to climate change–related stressors (e.g., drought, wildfire, and landslides); develop conservation strategies to improve resiliency from the identified stressors; and define a framework to finance the implementation of these conservation strategies as compensatory mitigation from new transportation improvements. The types of conservation strategies that are eligible to be included in an RCIS will both directly and indirectly contribute to the climate resiliency of Monterey County's transportation infrastructure, including wildlife crossings, wetlands restoration, and habitat acquisition and conservation, supporting several state initiatives and priorities. Some examples of potential conservation strategies that could be identified through the RCIS process are as follows.

- Wildlife crossings under or over state highways and highly travelled regional corridors, such as the Scenic State Route 68 between Monterey and Salinas, to preserve and improve habitat connectivity while reducing animal–vehicle conflict points.
- Wetlands protection and restoration that protects transportation infrastructure from the effects of flooding and stormwater impacts, such as State Route 156 in north Monterey County.
- Land acquisition for species and habitat restoration and conservation that results in more drought-tolerant and healthy habitat that in turn protects nearby infrastructure from climate-related events such as wildfires and landslides.

2.5.4 Upper Salinas–Las Tablas Resource Conservation District

Central Coast Salmon Enhancement (CCSE), in cooperation with the Upper Salinas–Las Tablas Resource Conservation District, is preparing several components of a future watershed management plan for the Salinas River that is intended to create a path to resilience in the watershed's communities and for its natural resources. These components will illuminate critical issues for watershed protection and management and identify knowledge gaps. One of these components is the Watershed Resources Inventory—an encyclopedic list of documents from projects, plans, guidance documents, and regulatory products paired with an annotated bibliography to act as a quick reference for individuals to learn about the current or historical status of the Salinas River watershed's most important features. The current status of the Salinas River watershed will also be reported in an existing conditions document, which will rely on many of the documents in the Watershed Resources Inventory, as well as information exchanged with CCSE partners (e.g., MCWRA) on current developments. The consolidation of this information will aid in future determinations of resource management priorities and actions, such as those involving steelhead trout in the Salinas River watershed (Wald pers. comm.).

CCSE is collaborating with Stillwater Sciences to create a conceptual model for steelhead in the Salinas River watershed based on historical information, data and observations of fish counts, river hydrology, fish passage barriers, and other physical parameters relevant to the survival and life

cycle of steelhead trout. The aim of these works is to bridge the jurisdictional divide between the upper and lower Salinas two-county decision-making paradigm and better coordinate upstream and downstream plans and actions for the watershed's protection and management. CCSE believes that this is an important step toward making the Salinas River and the communities that depend on it more resilient to change and improving the accuracy and speed of responses to change (Wald pers. comm.).