4.4 BIOLOGICAL RESOURCES: FISHERIES

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4.4.1 Introduction

This section addresses the freshwater and anadromous fishery biological resources located in the vicinity of the Proposed Project sites; identifies applicable federal, state and local regulations pertaining to fishery resources; and evaluates potential impacts from construction and operation of the Proposed Project facilities. Fishery biological resources refer to aquatic life present in the affected surface waterways utilized or potentially affected by the Proposed Project. **Section 4.5** of this EIR, **Biological Resources: Terrestrial**, addresses terrestrial vegetation, wildlife, and wetland resources.

This section is based on the fisheries analyses prepared as part of this EIR by HDR Engineering and Hagar Environmental Science, which are summarized in this section and included in **Appendices F and G.** The analyses in these reports rely upon hydrological flow conditions developed by Schaaf & Wheeler (See **Appendices O, P and Q**). Schaaf & Wheeler provided baseline and simulated river flows as a result of proposed diversions, which were used in the assessment of potential impacts to fish species in the Salinas River and Reclamation Ditch. The technical studies include:

- HDR Engineering, January 2015. *Salinas River Steelhead Habitat and Passage Effects Assessment Technical Memorandum*. Prepared for Denise Duffy & Associates. (See **Appendix F**).
- Hagar Environmental Science. February 28, 2015. Pure Groundwater Replenishment (GWR) Project – Reclamation Ditch and Tembladero Slough Source Water Diversion Fisheries Effects Analysis. Technical Memorandum, prepared for Denise Duffy & Associates." (See **Appendix G-1**).

- Hagar Environmental Science. February 27, 2015. *Estimation of Minimum Flows for Migration of Steelhead in the Reclamation Ditch*. Technical Memorandum, prepared for Denise Duffy & Associates. (See **Appendix G-2**).
- Schaaf & Wheeler studies regarding source water yields and impacts:
    - December 2014. "Blanco Drain Yield Study" (see **Appendix Q**).
    - December 2014. "Reclamation Ditch Yield Study" (see **Appendix P**).
    - February 2015. "Salinas River Inflow Impacts" (including the impacts of changes in percolation at the Salinas Industrial Wastewater Treatment Facility on Groundwater and the Salinas River (see **Appendix O**).

Public and agency comments related to fishery resources were received during the public scoping period in response to the Notice of Preparation and are summarized in **Appendix A, Scoping Report.** Comments received with regard to fisheries impacts are summarized below:

- Consult with the U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS) to determine whether the project will have any direct or indirect effects on federally listed threatened, endangered, or candidate species at project sites and surrounding areas and identity measures to reduce such effects. Consultation with the California Department of Fish and Wildlife (CDFW) also is recommended.
- Evaluate noise and vibration impacts on fish and include mitigation measures for these impacts.

4.4.2 Environmental Setting

The following Proposed Project component sites are located in proximity to aquatic resources that may support fishery resources:

- The Salinas Pump Station Source Water Diversion
- Salinas Treatment Facility Storage and Recovery
- Blanco Drain Diversion
- Reclamation Ditch Diversion
- Tembladero Slough Diversion
- Lake El Estero Source Water Diversion and Storage Site

The potential area affected by these sites includes the immediate vicinity of the site and upstream and downstream areas that could be influenced by diversion actions associated with the Proposed Project. The potentially affected water bodies are the Salinas River and the Salinas River Lagoon. Fish habitat areas upstream of the immediate project vicinity that could be influenced by Proposed Project diversion actions are the Arroyo Seco, San Antonio, and Nacimiento Rivers. In addition, this section considers the Reclamation Ditch Diversion, which connects to Tembladero Slough and ultimately the Old Salinas River, and upstream Reclamation Ditch tributaries including Gabilan Creek. This section also considers Lake El Estero in Monterey and upstream tributaries within the El Estero watershed.

4.4.2.1 Overview of Fish Species in Vicinity of Proposed Project Components

The following subsections describe the hydrological conditions of: the Salinas River Basin, including the Salinas River Lagoon; the Reclamation Ditch and Tembladero Slough; and the Lake El Estero watershed. The subsections provide information on the drainage/watershed basins associated with these water bodies and discuss existing fishery species and habitats in the vicinity of these areas. Pertinent information on channel conditions and flows also are summarized.

Salinas River Basin

Salinas River

The Salinas River flows approximately 172 miles north/northwest through the Salinas Valley from its headwaters in the Santa Lucia and La Panza Mountain Ranges in San Luis Obispo County, and reaches the Monterey Bay near Castroville. With a drainage area of approximately 4,240 square miles, the Salinas River watershed is the largest in the central California coast area. Major tributaries include the Nacimiento, San Antonio, and Arroyo Seco Rivers. See **Figure 2.5, Salinas River Basin** in **Section 2, Project Description**. **Figure 4.4-1, Salinas River Watershed In Project Vicinity** shows the Salinas River watershed in the vicinity of the Proposed Project sites.

The Salinas River is roughly divided into two reaches based on the channel morphology. The lower 21 miles of river generally has a narrower channel top width, typically about 500 to 1,000 feet than the 73 miles of river upstream. The Salinas River channel bed and banks are sand-dominated along both reaches; the bed-form is usually relatively flat with little vertical oscillation in the bed topography. Channel banks are usually well-vegetated, with widely varying amounts of vegetation growing on bars and the channel bottom.

The Salinas River is a managed river system, influenced by flow regulation from upstream dams, levees and adjacent land uses. Construction of Nacimiento and San Antonio dams in 1957 and 1965, respectively, altered the natural hydrology of the Salinas River to provide flood protection and aquifer recharge (and recreation, although this was not a primary purpose of the dams). Additionally, the upper 110 miles of the Salinas River are controlled by the Santa Margarita Dam, which was constructed in 1942 in San Luis Obispo County and impounds approximately 24,000 acre-feet that forms Santa Margarita Lake (Monterey County Water Resources Agency, May 2014). (Further description of Nacimiento and San Antonio Reservoirs is provided below.) The Santa Margarita Dam is operated so that a “live stream” is maintained in the lower river from the dam to the confluence with the Nacimiento River, which is about 46 miles downstream (FISHBIO, February 2013).

The Salinas River Diversion Facility (SRDF) is located at River Mile (RM) 4.8 on the Salinas River, approximately 5 river miles upstream of the mouth of the Salinas River near the City of Marina. The SRDF is part of the Salinas Valley Water Project (SVWP) completed by the Monterey County Water Resources Agency (MCWRA) in 2010. The Salinas Valley Water Project goals are to halt seawater intrusion, provide water for current and future needs, and improve the hydrologic balance of groundwater within the Salinas River Basin. Groundwater is the source for most urban and agricultural water needs in the Salinas River Valley (National Marine Fisheries Service, 2007), and a long-known and continual imbalance between groundwater withdrawal and recharge has caused overdraft conditions and seawater intrusion into the aquifer. The Salinas Valley Water Project is a combination of

structural and operational changes to provide surface water deliveries and aquifer replenishment. The Salinas River Diversion Facility consists of a bladder dam to impound spring, summer and early-fall reservoir releases, and a pump station to deliver surface water and reduce the need for groundwater pumping. The Salinas Valley Water Project also includes re-operation of the San Antonio and Nacimiento dams, including releases that provide a source of surface water to the agricultural land uses in the area served by the Castroville Saltwater Intrusion Project (CSIP). The Salinas Valley Water Project does not provide new water sources for the basin, rather more water is released from the San Antonio and Nacimiento dams in the spring, summer, and early-fall for diversion by the Salinas River Diversion Facility to offset groundwater pumping (National Marine Fisheries Service, 2007).

The existing Salinas River Diversion Facility generally operates from April 1 to October 31 via operation of an existing bladder dam that spans the width of the Salinas River. When in operation, the dam maintains the upstream water surface elevation impoundment, and a total operational storage volume of the impoundment is 108 acre-feet (AF). The SRDF includes a fish passage system with intake screens and fish ladders that comply with National Marine Fisheries Service and California Department Fish and Wildlife (CDFW) criteria (National Marine Fisheries Service, 2007).

Fishery Habitat Overview

Table 4.4-1, Native Fish Species Known to Occur in the Salinas River Watershed summarizes native fish species known to occur in the Salinas River watershed. Species include steelhead (*Oncorhynchus mykiss*), Pacific lamprey (*Lampetra tridentata*), threespine stickleback (*Gasterosteus aculeatus*), hitch (*Lavinia exilicauda*), Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento sucker (*Catostomus occidentalis*), and Monterey roach (*Lavinia symmetricus subditus*. This fish assemblage, Sucker-Stickleback-Pikeminnow Assemblage, occurs in the low-elevation reaches of the western and north Salinas River watershed, including the Salinas River main-stem, the lower reaches of the Arroyo Seco River and the lower Gabilan Creek (Monterey County Water Resources Agency, April 2013). The Roach assemblage is found in small tributary streams with low to moderate gradients and rocky substrate, and the Rainbow Trout-Speckled Dace Assemblage occurs in spring-fed, cool headwater streams. Common carp, hitch, Sacramento blackfish, starry flounder, and threespine stickleback were observed in the Salinas River during 2010 (Monterey County Water Resources Agency, 2011). The most abundant species captured in 2011 were Sacramento sucker, speckled dace, and threespine stickleback (FISHBIO, 2011).

Federally-listed species that occur or may occur within the Salinas River include the South-Central California Coastal (SCCC) steelhead Distinct Population Segment (DPS). Steelhead are an anadromous species with adults spawning in freshwater and juveniles rearing in freshwater before migrating to the ocean to grow and mature prior to returning as adults to reproduce in freshwater. See **Section 4.4.2.2** below for further description of steelhead characteristics and habitat. Habitat conditions in the lower Salinas River are generally not suitable for steelhead spawning or rearing. The substrate is primarily sand, and gravel is only a minor component, primarily upstream of King City. The lower 150 miles of the main-stem Salinas River is a low gradient sand-bedded stream with channel depths that rarely exceed 2.5 feet, and is primarily viewed as a steelhead migration corridor (Monterey County Water Resources Agency, May 2014).

Before Nacimiento and San Antonio Reservoirs were constructed, the Salinas River had little or no flow during most years (National Marine Fisheries Service, 2007). Even with present operations and release of water from the reservoirs throughout the summer, water

temperature is reportedly too high for rearing juveniles (Monterey County Water Resources Agency, 2001). Steelhead populations spawning in the Arroyo Seco or in other tributaries to the Salinas River use the lower Salinas River as a migration corridor only. Low stream flow in the Salinas River may result in areas that are too shallow for fish to pass. An assessment of the Arroyo Seco River reported that it had the potential to support an estimated run of a few thousand steelhead (National Marine Fisheries Service, 2007). Further description of special status fish species is provided below.

It is also noted that non-native species have been spreading pervasively in the Salinas River Watershed. The watershed has an infestation of Arundo donax (Giant reed) which provides little shading in the stream, and can lead to increased water temperatures and reduced habitat quality for aquatic wildlife (Monterey County Water Resources Agency, March 2013).

Table 4.4-1
Native Fish Species Known to Occur in the Salinas River Watershed

Scientific Name	Common Name	Special Status	Main Occurrence
Lavinia exilicauda	Hitch	None	Mainstem Salinas Salinas River Lagoon
Lavinia symmetricus subditus	Monterey roach	California Species of Special Concern	Mainstem Salinas Tributaries
Clupea pallasi	Pacific herring	None	Salinas River Lagoon
Lampetra tridentata	Pacific lamprey	None	Mainstem Salinas, tributaries
Cottus asper	Prickly sculpin	None	Mainstem Salinas, Tributaries Salinas River Lagoon
Orthodon microlepidotus	Sacramento blackfish	None	Mainstem Salinas Salinas River Lagoon
Ptychocheilus grandis	Sacramento pikeminnow	None	Mainstem Salinas Salinas River Lagoon
Catostomus occidentalis	Sacramento sucker	None	Mainstem Salinas/Reservoir Salinas River Lagoon
Cymatogaster aggregata	Shiner surfperch	None	Salinas River Lagoon
Rhinichthys osculus	Speckled dace	None	Upper tributaries
Leptocottus armatus	Staghorn sculpin	None	Salinas River Lagoon
Platichthys stellatus	Starry flounder	None	Salinas River Lagoon
Oncorhynchus mykiss	South Central California Coast Steelhead	Federally-listed Threatened	Mainstem Salinas
Gasterosteus aculeatus	Threespine stickleback	None	Mainstem Salinas Tributaries Salinas River Lagoon
Eucyclogobius newberryi	Tidewater Goby	Federally Endangered	Salinas River Lagoon
Atherinops affinis	Topsmelt	None	Salinas River Lagoon
SOURCE: Monterey County Water Resources Agency, March 2013, Hagar Environmental Science, January 2014			

Flow Considerations

Within the Salinas River watershed, the wet season is considered to be November-May while the dry season is defined as June through October. The Monterey County Water Resources Agency (MCWRA) estimated fish passage flow requirements using field measurements of channel and flow characteristics, including water depth transects at critical passage sites, and the application of criteria for conditions suitable for upstream steelhead migration (Monterey County Water Resources Agency, 2001). The flow requirements were developed as part of the MCWRA's Salinas Valley Water Project.

The minimum flow identified by the Monterey County Water Resources Agency for steelhead migration occurs when, at the shallowest cross-sections, there is a depth of at least 0.6 feet across 25% of the channel width and there is a continuous section at this depth across at least 10% of the channel width. A flow of about 72 cubic feet per second

(cfs) would meet the minimum migration needs for steelhead in the lower Salinas River downstream of Spreckels, and a flow of 154 cfs would meet the minimum migration criteria upstream of Spreckels. Less flow is required downstream of Spreckels since the channel is narrower and more confined in this reach (Monterey County Water Resources Agency, 2001). Under some situations, the 0.6 foot depth over 25% channel width criteria was considered to be overly restrictive, and using a less restrictive width criterion, MCWRA estimated that passage flows for adult steelhead in the Salinas River would be 94 cfs upstream of Spreckels and 60 cfs downstream of Spreckels (Monterey County Water Resources Agency, 2001). **Table 4.4-2, SCCC Steelhead Life Stage Flow Thresholds for Migratory Passage in the Salinas River** summarizes flows for maintenance of steelhead migration in Salinas River at different life stages identified in various studies.

Flow criteria for downstream migration of post-spawning adults and immature fish have not been widely developed. However, it was assumed by MCWRA that that post-spawning adult steelhead and emigrating juvenile steelhead can migrate downstream over riffle areas at shallower depths than those needed by adults migrating upstream (Monterey County Water Resources Agency, 2001). If a depth criterion of 0.4 feet is substituted in the analysis of passage transects in the Salinas River, the resulting minimum passage flow estimates for downstream migration of post-spawning adults and smolts would be 112 cfs upstream of Spreckels and 56 cfs downstream of Spreckels (Monterey County Water Resources Agency, 2001). If it is also assumed that the 0.4 foot depth criteria were achieved over a continuous 8-foot channel width rather than 10% of the channel width, the minimum passage flow estimate would be further reduced to 59 cfs upstream of Spreckels and 50 cfs downstream of Spreckels (Monterey County Water Resources Agency, 2001).

As part of the Salinas Valley Water Project goals to minimize impacts to federally threatened steelhead and its critical habitat, MCWRA developed flow prescriptions to facilitate and enhance adult steelhead upstream migration, downstream migration of juveniles, smolts, and kelts (post-spawn adult steelhead), and spawning and rearing habitat within the San Antonio and Nacimiento rivers below the dams (Monterey County Water Resources Agency, 2005). The MCWRA's flow prescriptions and timing are tied to the SCCC steelhead life cycle within the Salinas River (Monterey County Water Resources Agency, 2005). The flow prescriptions rely on triggers based on a combination of reservoir flows and stream flows regarding steelhead upstream and downstream migration as permit conditions associated with operating the SRDF. The flow prescriptions were reviewed by the National Marine Fisheries Service (NMFS) and incorporated in NMFS' Biological Opinion for the SRDF project (National Marine Fisheries Service, 2007). Additionally, MCWRA releases Salinas River Lagoon maintenance flows in conjunction with lagoon opening and closure, juvenile passage flows released from the San Antonio and Nacimiento dams, and passage conditions within the Arroyo Seco River (Monterey County Water Resources Agency, 2005). The flow prescriptions and timing are tied to the SCCC steelhead life cycle within the Salinas River (Monterey County Water Resources Agency, 2005).

Adult steelhead upstream migration triggers are in effect from February 1 through March 31. When flow triggers occur, flows of 260 cfs at the USGS gage near Chualar must be provided to facilitate upstream migration of adult steelhead. To insure this minimum flow and duration, MCWRA must provide reservoir releases when necessary to augment natural flows. The number of passage days targeted for dry-normal, normal-normal, and wet-normal years are 16, 47, and 73 days, respectively (National Marine Fisheries Service, 2007).

Table 4.4-2
SCCC Steelhead Life Stage Flow Thresholds for Migratory Passage in the Salinas River

Life stage	Time Period*	Flow (in cfs) Required Downstream of Spreckels Gage for Migratory Passage	Source Document	Notes**
Smolt Outmigration	March through June	N/A	NMFS 2007, Page 23	In California, the outmigration of steelhead smolts typically begins in March and ends in late May or June (Titus et al. 2002).
	April through June	N/A	NMFS 2007, Page 23	Snider (1983) states that in the Carmel River, most juvenile steelhead migrate to the ocean between April and June.
	March through June	N/A	NMFS 2007, Page 74	We have assumed that properly functioning habitat conditions for this phase of the steelhead life history include substantial sustained flows for several weeks during the period of migration (late March through early June).
	Year-Round with peak emigration from April through June	56	MCWRA 2001, Section 5.6	If a depth criteria of 0.4 feet is substituted in the analysis of passage transects in the Salinas River the resulting minimum passage flow estimates for downstream migration of post-spawning adults and smolts would be 112 cfs upstream of Spreckels and 56 cfs downstream of Spreckels.
		50		If it is also assumed that the 0.4 foot depth criteria were achieved over a continuous 8 foot channel width rather than 10% of the channel width, the minimum passage flow estimate would be further reduced to 59 cfs upstream of Spreckels and 50 cfs downstream of Spreckels.
	January through June	N/A	MCWRA 2013b, Page 3-118	Steelhead smolts may immigrate to the ocean from January through June on the receding limb of the winter hydrograph.
	December 15 through March 31	N/A	MCWRA 2013b, Page 3-119	Seaward migration of juveniles may end earlier as compared to the other coastal drainages, because a greater amount of flow is required to provide safe passage conditions in the broad, sandy Salinas riverbed and the migration from rearing habitat in the tributaries is greater than 50 miles. NMFS (2003, p. 24) noted December 15 to March 31 as the juvenile steelhead migration season, which likely considers the above factors.
	March through June	N/A	MCWRA 2013b, Page 3-128-129	Steelhead smolt migration typically begins in March and ends in late-May or June, depending on flow and passage conditions.
	Jan 15 through May	N/A	MCWRA 2013b, Page 3-134	Downstream juvenile/kelt migration (mid-January through the end of May).
Adult Immigration	December 1 through April 15	72	MCWRA 2001, Section 5.6	Based on the Thompson criteria, a flow of about 72 cfs would meet the minimum migration needs for steelhead in the Lower Salinas downstream of Spreckels and a flow of 154 cfs would meet the minimum migration criteria upstream of Spreckels. Less flow is required downstream of Spreckels since the channel is narrower and more confined in this reach.
		60		Using the less restrictive width criterion of 8 feet instead of 25%, minimum passage flow estimates for adult steelhead in the Salinas River would be 94 cfs upstream of Spreckels and 60 cfs downstream of Spreckels.
	January through May	N/A	Moyle 2008, Page 80	Adult steelhead return from the ocean to enter watersheds to spawn in SCC stream between January and May (Boughton et al. 2006)
	December through April	N/A	MCWRA 2013b, Page 3-118	NMFS indicates that adult steelhead in this region migrate upstream primarily from December to April (NMFS 2007)
	November through June	N/A	NMFS 2007, Page 23	Adult steelhead migrate to fresh water between November and June, peaking in March.
	December through April	N/A	NMFS 2007, Page 69 - 70	Although the exact timing of adult upstream migration in the Salinas River is not known, data from other Central California coastal streams indicate that adult steelhead in this area migrate upstream primarily from December through April (Figure 11)

* Time periods provided represent the widest range indicated by the source document. For example, if a source document indicates a time period beginning sometime in March and ending in late May or June, the time period selected includes March through June

** Time periods are selected based on source documents evaluated (e.g., NMFS 2007, MCWRA 2013b), although the source documents may cite additional sources.

To facilitate the downstream migration of smolts and rearing juvenile steelhead in the Salinas River during normal category water years, MCWRA provides reservoir releases (referred to as "block flows") beginning March 15th when the specified flow triggers are met. If block flows are triggered between March 15 and March 31, 700 cfs will be provided at the Salinas River near Soledad for 5 days, and then thereafter 300 cfs will be maintained in the Salinas River near Spreckels until April 20. If the block flow triggers occur in April, 700 cfs will be provided at the Salinas River near Soledad for 5 days, and then thereafter 300 cfs will be provided at Spreckels for an additional 15 days. After a block flow is completed, if outmigration of steelhead smolts from the Arroyo Seco to the Salinas River could occur, flow to the ocean will be maintained for 10 days after smolt outmigration flow at the Reliz Creek gage drops below 1 cfs (National Marine Fisheries Service, 2007). In some years, flow releases for smolt migration may not occur because triggers for those releases are not met. However, in those years National Marine Fisheries Service required MCWRA to provide reservoir releases and SRDF bypass flows to enhance migration opportunities for juvenile steelhead and post-spawn adult steelhead (kelts) (National Marine Fisheries Service, 2007).

The MCWRA began operation of the Salinas River Diversion Facility in April 2010, which involves release of water from Nacimiento and San Antonio Reservoirs to the Salinas River throughout the irrigation season with impoundment and diversion at the SRDF located near the upper part of the Salinas River Lagoon. The Salinas River Diversion Facility operates seasonally between April 1 and October 31.

Beginning April 1, MCWRA provides bypass flows to the Salinas River Lagoon. For dry year-types, MCWRA provides 2 cfs to the lagoon when the Salinas River Diversion Facility is operating or during aquifer conservation releases. For non-dry year-types, and if the combined reservoir storage is 220,000 AF or more, MCWRA provides additional supplemental bypass flows (Monterey County Water Resources Agency, July 2011). If the lagoon is open to the ocean, then MCWRA provides 45 cfs to the lagoon for 10 days or until the lagoon closes to the ocean, whichever occurs first, then 15 cfs to the lagoon through June 30th, then 2 cfs as long as the Salinas River Diversion Facility is operating or during aquifer conservation releases (Monterey County Water Resources Agency, July 2011). If the lagoon is not open to the ocean, then MCWRA will provide 15 cfs to the lagoon through June 30th, then 2 cfs as long as the Salinas River Diversion Facility is operating or during aquifer conservation releases. These bypass flows influence water quality conditions in the lagoon during the dry season. Before implementation of the Salinas Valley Water Project there was no requirement for provision of flow to the lagoon and there was generally no flow to the lagoon after storm flows ceased in the spring. This was likely consistent with natural river flow patterns before development of the Salinas Valley for agriculture (Monterey County Water Resources Agency, July 2011).

Temperature Considerations

Water temperature is measured at two locations in the Salinas River: at the Blanco Road Bridge, three miles upstream of the Salinas River Diversion Facility, and at the Salinas River Diversion Facility. Data collected during 2011 show that the general trend within the monitoring period showed increasing water temperatures from spring to summer and decreasing temperatures from summer to fall. For the protection of steelhead, the maximum weekly average temperatures are 67.8ºF (19.6ºC). Temperatures recorded at the Spreckels gage range from 50ºF to 82ºF (10 ºC to 27.9ºC), with an average of 63ºF (17.4ºC) (California Regional Water Quality Control Board, 2008).

Water temperatures in this stream are highly variable and dependent on reservoir releases, air temperature, and reservoir storage. In general, water released through the reservoir

outlet is at a relatively constant temperature of 52°F to 54°F (11.1°C to 12.2 ° C). The water warms rapidly as it moves downstream, generally in proportion to fluctuation in daily air temperature. At minimum release levels (25 to 30 cfs), water temperature can increase to as much as 73°F (22.8° C) within 5 miles of the Nacimiento dam, and 75°F (23.9° C) within 10 miles of the dam. During the summer conservation release period (with flows of 300 cfs or more), water temperature is generally maintained at less than 64°F (17.8°C) within 5 miles of the dam, and 68°F (20° C) or less within 10 miles of the dam (Monterey County Water Resources Agency, 2001).

In addition, diurnal water temperature fluctuations are common. Data collected at the Chualar gage indicate an average difference of 4.5°F and a maximum difference of 8°F between maximum and minimum daily temperature in April (Monterey County Water Resources Agency, 2001). In May there is as much as a 22°F daily swing in temperature and the average change is 16°F (Monterey County Water Resources Agency, 2001).

Water Quality

The Central Coast Regional Water Quality Control Board (RWQCB) Water Quality Control Plan for the Central Coast Basin (Basin Plan) designates beneficial uses of the Salinas River below Spreckels as including municipal and domestic supply, agricultural supply, non-contact water recreation, wildlife habitat, warm and cold water fish habitat, freshwater replenishment (of the Salinas Lagoon) and commercial or sport fishing. The Salinas River is listed as an impaired water body pursuant to Section 303(d) of the Clean Water Act for chlorides, pesticides, Escherichia coli (E. coli), fecal coliform, nitrate, total dissolved solids, turbidity and other factors.

City of Salinas Industrial Wastewater Facility and Urban Stormwater Runoff Discharges into Salinas River

The City of Salinas urban stormwater runoff from the southwest portion of the city is currently discharged into the Salinas River near Davis Road via a 66-inch outfall line. Additionally, three miles southwest of the City of Salinas, the Salinas Industrial Wastewater Treatment Facility (Salinas Treatment Facility) is located on the bank of the Salinas River. The City of Salinas owns and operates the facility to treat and dispose of industrial water, most of which has been used to wash and prepare vegetable crops at 24 industrial food processing facilities in Salinas. The Salinas Treatment Facility consists of an aeration pond for treatment of incoming water and three large percolation ponds that dispose of water by percolation and evaporation. Additional disposal capacity is provided by drying beds north of the ponds and by temporary Rapid Infiltration Basins (RIBs) between the main ponds and the adjacent Salinas River channel.

Water that percolates from the ponds either flows a short distance through the subsurface and emerges as seepage into the Salinas River or accrues to the regionally extensive shallow aquifer. The shallow aquifer is not used directly as a source of water supply, but downward percolation from the shallow aquifer is a source of recharge to the 180-Foot aquifer, which is used for water supply in the agricultural area surrounding the Salinas Treatment Facility. (**See Section 4.4-10**: **Hydrology and Water Quality: Groundwater** for further discussion of groundwater aquifers.)

Salinas River Lagoon

The mouth of the Salinas River is a seasonal lagoon controlled by the presence of a sandbar that forms in response to changes in outflow and tidal cycles. Lagoons form in response to seasonal rainfall and water patterns, and tidal influences, with sandbar closure

during dry periods (spring and summer) and breaching during wet periods (fall and winter). During wet months, high energy waves erode and breach sandbars, while high stream flows widen and deepen the estuary mouth (Monterey County Water Resources Agency, March 2013). In dry months, low energy waves deposit sand and build up sandbars. After sandbar formation, water surface elevation rises as the impounded lagoon fills with freshwater streamflow. The fresh water interacts with already present salt water, occasional surf wash, and salt water that has percolated through the sandbar to create a brackish environment or even a freshwater environment if inflow is sufficient (Monterey County Water Resources Agency, March 2013). Sandbars generally breach at the onset of fall and winter storms, converting the estuaries to freshwater during high river flows. A brackish estuary environment occurs during low river flows if there is still a substantial area of impounded water even if all or most of the sandbar is not present. In the Salinas River flooding of agricultural lands can precede the natural breaching (Monterey County Water Resources Agency, March 2013).

The Salinas River Lagoon is approximately two miles long and is located in low-lying, open agriculture setting. The banks are defined, leading to a stable surface area during the summer months. The northern bank is vegetated with riparian and phreatophytic vegetation with large woody debris scattered around the lagoon. The Salinas River Lagoon is utilized as a migration corridor by adult and juvenile steelhead (Monterey County Water Resources Agency, March 2013).

The lagoon is brackish in the fall due to the freshwater from the inflowing river and salt water from the high ocean waves (Casagrande et al. 2003). During major runoff events, water elevations in the lagoon rises and breaching events occur. During breaching events, both natural and artificial, anadromous fish such as steelhead and Pacific lamprey are able to migrate. The MCWRA intervenes in the Salinas Lagoon each year by using equipment to either cause or assist the breach, and also manages the lagoon water levels as part of flood control activities (Monterey County Water Resources Agency, 2011).

Fishery Habitat Overview

In general, estuaries provide important habitat for juvenile steelhead and are used for rearing/feeding, freshwater to saltwater acclimation, and migration. Similarly, lagoons located at the interface of river mouths and the ocean may be a valuable habitat component for juvenile steelhead, providing abundant feeding opportunities for rearing fish and saltwater transition zones for outmigrating smolts. Preferred rearing conditions in lagoons exist when sandbars cut off ocean access which reduces salinity and promotes mixing of the lagoon water, which prevents water stratification and high temperatures, thus supporting food production and appropriate dissolved oxygen concentrations.

The Salinas River Lagoon supports a mixed assemblage of marine, freshwater, and estuarine species generally typical of lagoons along the Central California Coast. The mix of species in any year is influenced by freshwater inflows, opening and closing of the sandbar at the mouth of the Lagoon, and the resulting conditions of water quality and productivity (Hagar Environmental Science, February 2015).

The Salinas River Lagoon fishery has been sampled at intervals since the early 1900s and most recently in the early 1990s (Gilchrist et al. 1997) and in annual surveys by MCWRA from 2002 to 2014 (Hagar Environmental Science, February 2014). The lagoon supports a mixture of marine and freshwater fishes. Over 24 species were observed during lagoon fishery surveys conducted during the past 12 years (2002-2013) as summarized in **Table 4.4-3, Fish Species Observed in Salinas River Lagoon (2002-2013)**.

Table 4.4-3
Fish Species Observed in Salinas River Lagoon (2002-2013)

Species	Scientific name	Season observed		
		Spring	Summer	Fall
Arrow goby	Clevelandia ios	No	No	Yes
Carp	Cyprinus carpio	No	Yes	Yes
Chinook Salmon	Oncorhynchus tshawytscha	No	No	Yes
Hitch	Lavinia exilicauda	No	Yes	x
Largemouth bass	Micropterus salmoides	No	Yes	Yes
Mosquitofish	Gambusia affinis	No	Yes	Yes
Pacific herring	Clupea pallasii	No	Yes	Yes
Pacific lamprey	Lampetra tridentata	Yes	No	Yes
Pacific sardine	Sardinops sagax	No	Yes	No
Pacific staghorn sculpin	Leptocottus armatus	Yes	Yes	Yes
Prickly sculpin	Cottus asper	Yes	Yes	Yes
Rockfish	Sebastoides spps	No	Yes	No
Sacramento blackfish	Orthodon microlepidotus	Yes	Yes	Yes
Sacramento pikeminnow	Ptychocheilus grandis	Yes	Yes	Yes
Sacramento sucker	Catostomus occidentalis	Yes	Yes	Yes
Shiner surfperch	Cymatogaster aggregata	Yes	Yes	Yes
Starry flounder	Platichthys stellatus	Yes	Yes	Yes
Steelhead	Oncorhynchus mykiss	Yes	Yes	Yes
Striped bass	Morone saxatilis	Yes	Yes	Yes
Threadfin shad	Dorosoma patenense	Yes	No	Yes
Threespine stickleback	Gasterosteus aculeatus	Yes	Yes	Yes
Tidewater goby	Eucyclogobius newberryi	No	No	Yes
Topsmelt	Atherinops affinis	No	Yes	Yes
Yellowfin goby	Acanthogobius flavimanus	Yes	Yes	No
Species observed during lagoon fishery surveys conducted during spring, summer and fall (2002-2013).				

Some species appear to occur in the lagoon year round while others are seasonally present (Hagar Environmental Science, February 2015, Monterey County Water Resources Agency, 2013a). Native freshwater species using the Salinas River Lagoon include Sacramento blackfish (*Orthodon microlepidotus*), hitch (*Lavinia exilicauda*), Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento sucker (*Catostomus occidentalis*), prickly sculpin (Cottus asper), and threespine stickleback (*Gasterosteus aculeatus*). Several other freshwater species have been collected historically in the Lagoon but are no longer found there, including speckled dace (*Rhinichthys osculus*) and thicktail chub (*Gila crassicauda*), an extinct large minnow. Introduced freshwater species include carp and white bass. The single white bass taken in 1990 probably came from the population in Nacimiento Reservoir and is likely a transient species in the Lagoon. Other reservoir species, such as threadfin shad, may be expected to reach the Lagoon during wet years when large flood control releases are made. In years with low freshwater inflow and saline conditions in the Lagoon, freshwater species may be restricted to the upper reaches of the Lagoon or to freshwater areas upstream of the Lagoon (Gilchrist et al. 1997).

Steelhead and tidewater goby have been rarely observed in the lagoon surveys. Only three steelhead were observed: two in 2011 and one in 2013. Tidewater goby were observed for the first time during the 12 years of the lagoon survey and for the first time since 1951, when two gobies were observed during fall 2013 surveys. The tidewater goby was presumed lost from the lagoon due to levee construction and channelization (USFWS 2013 as cited in HDR Engineering, January 2015). It is likely that the gobies observed in 2013 had dispersed from nearby Bennett Slough or Moro Cojo Slough (MCWRA 2013b as cited in HDR Engineering, January 2015).

Several marine species use the Lagoon for reproduction or juvenile rearing. Starry flounders spawn in the ocean but juveniles enter the Lagoon and can rear there for two or more years. As they grow older they become less tolerant of fresh water and leave the Lagoon. Staghorn sculpin also enter the Lagoon as juveniles but usually only remain for a year. Other marine species found include Pacific herring, topsmelt, surf smelt, northern anchovy, jacksmelt, striped bass, and English sole. The green sturgeon reported by CDFW in 1975 is probably atypical since they usually use larger rivers further north (Hagar Environmental Science, February 2015).

The MCWRA intermittently evaluates water quality of the Lagoon and analyzes fish population and response to the changing conditions. In 2013, sampling for fish and habitat conditions were conducted in the spring, summer and fall. The great distance and intermittent flow conditions between the spawning/rearing areas and lagoon may severely limit the importance of the lagoon as a steelhead rearing habitat in the Salinas River Basin (Monterey County Water Resources Agency, April 2013).

Flow Considerations

Water levels in the lagoon are monitored at the Old Salinas River outlet gate, which is located in the northwestern corner of the Salinas Lagoon. During non-event periods, the majority of fresh or brackish water entering the lagoon comes from the Blanco Drain, located approximately five miles upstream from the lagoon, which is an agricultural runoff canal. There are also a number of small agricultural tile drainage systems discharging directly into the lagoon. The flow rate of the Salinas River upstream of the Lagoon at which the Salinas River Lagoon will remain open to the ocean is expected to generally range from 80 to 150 cfs (Monterey County Water Resources Agency, 2005).

Salinas River Major Tributary Rivers

The Arroyo Seco River drains a watershed area of 303 square miles, and it extends approximately 37 miles from its headwaters within forest and wilderness areas to its confluence with the Salinas River. The river is unregulated, with surface flow interrupted during dry summer months as it flows across the Salinas Valley en route to the Salinas River. The Arroyo Seco River contains a majority of the steelhead spawning habitat and half the steelhead rearing habitat within the Salinas River basin. It is the closest major tributary to the Pacific Ocean, which increases steelhead utilization over upstream tributaries (Monterey County Water Resources Agency, March 2013).

The San Antonio River drains 344 square miles, and flows 58 miles from its headwaters in the Los Padres National Forest to the Salinas River. The San Antonio River is regulated by the San Antonio Dam, which impounds 350,000 acre-feet. The dam was constructed in 1965 and is used for flood protection, aquifer recharge, and recreation. Prior to construction of San Antonio Dam, the San Antonio River normally did not reach the Salinas River in late summer (Monterey County Water Resources Agency, 2001). Flow prescriptions are used to maintain steelhead rearing habitat on the San Antonio River below the dam. Aquatic habitat below the dam consists primarily of shallow-run habitat, and lesser amounts of pool and riffle habitat. The channel substrate is primarily composed of equal parts of sand and gravel with lesser amounts of cobble and silt.

The Nacimiento River drains 362 square miles and flows 53 miles from its headwaters in the Santa Lucia Mountains within the Los Padres National Forest to the confluence with the Salinas River. Under natural conditions, flow in the river is intermittent, drying during the summer months. The river is regulated by the Nacimiento Dam, located 10 miles upstream from the confluence with the Salinas River. The dam, constructed in 1957, impounds 350,000 acre-feet, and provides flood protection and aquifer recharge to the Salinas Valley (Monterey County Water Resources Agency, 2001). Before Nacimiento Reservoir was constructed, the Nacimiento River regularly experienced levels of little or no flow in the reach currently inundated by the reservoir and in the section of river downstream of the dam (Monterey County Water Resources Agency, 2001). The dam blocks passage of steelhead to the upper portion of the river basin. Dam operation and flow releases on the Nacimiento River are managed for the following purposes: (1) to facilitate and enhance passage for upstream migrating adult steelhead on the Salinas River; (2) to facilitate and enhance passage for downstream migrating steelhead smolts and juveniles on the Salinas River; (3) to maintain the Salinas River Lagoon; (4) to provide water for the Salinas River Diversion Facility; and (5) to maintain steelhead rearing habitat below the dam. Below the dam, the Nacimiento River is characterized by a low gradient and long, wide sections with sparse riparian vegetation. Typical substrate consists of gravel with lesser amounts of sand and cobble (Monterey County Water Resources Agency, March 2013).

Reclamation Ditch, Tembladero Slough and the Old Salinas River

The Reclamation Ditch was built between 1917 and 1920 to collect and drain surface runoff generated in its watershed, which is approximately 157 square miles with headwaters in the Gabilan Range above Salinas. The Gabilan watershed originates in the northern corner of the Gabilan Mountain Range northeast of the City of Salinas and discharges into Carr Lake, a seasonal lake in the center of Salinas which is drained by the Reclamation Ditch. The Reclamation Ditch empties into the Tembladero Slough (an extended brackish, sub-tidal slough just south of Castroville) then to the Old Salinas River just upstream from Moss

Landing Harbor. Downstream of the Highway 183 crossing, the Reclamation Ditch becomes known as Tembladero Slough. See **Figure 4.4-2, Reclamation Ditch Watershed.**

The Reclamation Ditch watershed has five main tributaries including Gabilan, Natividad, Alisal and Santa Rita Creeks (see **Figure 4.4-3, Reclamation Ditch Tributaries**) and the Merritt Lake drainage. Gabilan, Natividad, and Alisal Creeks converge at Carr Lake. The outlet from Carr Lake forms the head of the Reclamation Ditch. The majority of runoff in the Reclamation Ditch basin was historically generated in the Gabilan and Alisal Creek subwatersheds (Hagar Environmental Science, February 2015). The lower Reclamation Ditch watershed areas were formerly low-lying areas with seasonal lakes, swamps, and wetlands. Much of the middle and lower watershed channels have been altered for drainage and conveyance of flood flows. Much of the historic lakes, swamps and wetlands are now farmland and urban development.

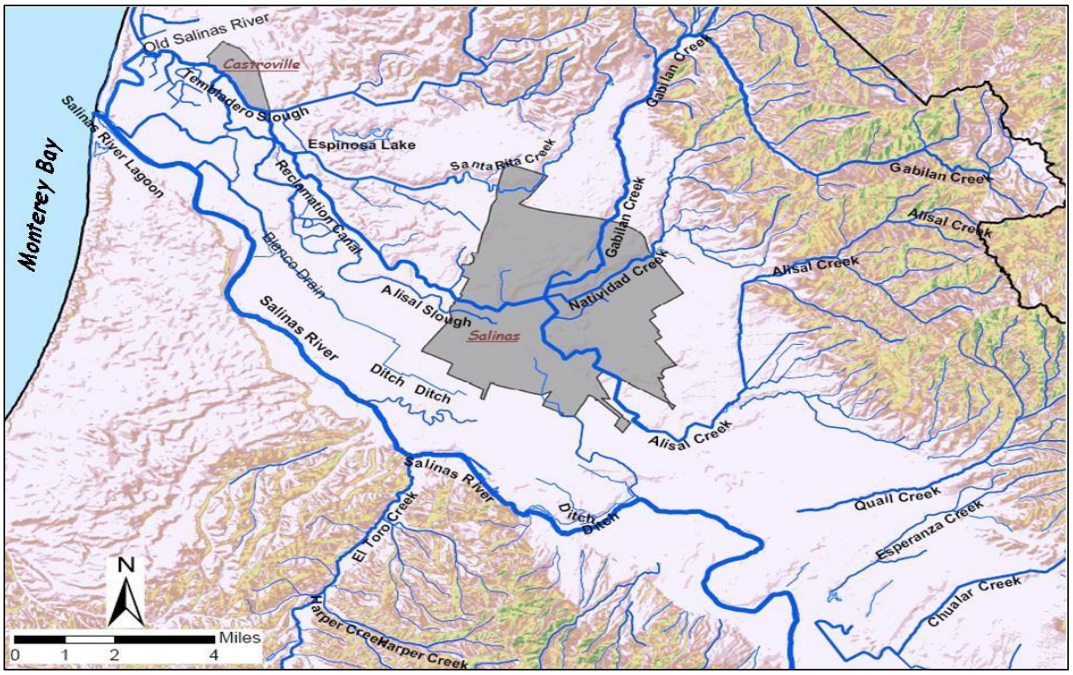

Figure 4.4-3: Reclamation Ditch Tributaries

The watershed area that drains into the Reclamation Ditch also contains the City of Salinas and portions of Castroville and Prunedale. Summer flows are predominantly agricultural tile drainage. Winter flows include storm runoff from throughout the basin (Schaaf & Wheeler, 2014). The drainage area includes the outlet of Carr Lake and a network of channels draining much of the City of Salinas as well as many of the former lakes and sloughs. Urban runoff from the City of Salinas drains into various channels of the Reclamation Ditch system via approximately 54 stormwater outfalls (Hagar Environmental Science, February 2015).

The Reclamation Ditch system drained an extensive system of interconnected sub-tidal lakes and swamps that formerly existed between Salinas and Castroville, including Merritt Lake, Espinosa Lake, Santa Rita Slough, Vierra Lake, Fontes Lake, Boronda Lake, Markley Swamp, and Mill Lake. The lakes naturally had poor drainage and were only connected during periods of high runoff. Under current conditions, the Carr Lake bed and most of the lakes are used for agricultural production during the growing season, but still flood regularly during winter storm events and are used for detention flood storage. Surface water pump

stations have been installed and operated to allow continued agricultural use of these areas (Hagar Environmental Science, February 2015).

Channel conditions vary widely in the Reclamation Ditch watershed. The streams of the Gabilan subwatershed are non-perennial in the upper-most sections, perennial or near-perennial in certain reaches mid-way down the range, and then again non-perennial in the lowest parts of the subwatershed as the streams begin to flow over old alluvium at the foot of the range (Casagrande and Watson, 2006a). At the highest elevations in the Gabilan Range the streams are mostly ephemeral with narrow channels; channel substrate is predominantly gravel and cobble. The dominant streamside vegetation is primarily oak savanna with grazed riparian woodland with mixed oak, gray and coulter pines at the highest elevations. In the steep mountain canyons of the Gabilan Range, streams are typically narrow and of steep gradient; channel substrate is primarily cobble/boulder. In the mid to lower elevations of Gabilan Range, streams generally flow year-round, especially in the mid to lower elevations of this zone. Riparian vegetation is dense, usually consisting of big-leaf maples, tan oaks, white alder, and sycamore trees, which helps keep the water temperatures cold throughout the year (Hagar Environmental Science, February 2015). In the foothills and alluvial fans of the Gabilan Range, streams are usually ephemeral in some locations with moderate slopes and smaller average substrate sizes. Riparian vegetation is still commonly found throughout much of the foothill stream reaches, although some reaches have lost a substantial portion of their streamside vegetation (Hagar Environmental Science, February 2015).

Between the foothill zone and the City of Salinas, the stream channels are modified by human development to a greater degree. Some of these still support native riparian vegetation but have been channelized, thus eliminating the streams ability to fully access the adjacent floodplain during high runoff events. These stream reaches have a gentle slope, predominantly sand substrate, and in most areas lack summer flow. Some of these stream reaches support native warmwater fish and amphibians. Other stream reaches in this zone have steep banks that are either unvegetated or support only introduced annual weeds. Such conditions are generally of low habitat quality for riparian-associated organisms, due to the lack of overhead cover, in-channel complexity, and sources of or woody/plant debris. The steep unvegetated banks are also more susceptible to erosion, particularly during high flows. Such bank erosion is a source of sediment that later accumulates in stream channels further downstream (Hagar Environmental Science, February 2015).

Most of the stream channels of lower valley bottom have been converted into ditches or drainage canals that generally have steep side slopes without native riparian vegetation, a substrate of primarily fine-grained sediment (mostly silts and clays), and an undefined low-flow channel. The lack of pools and in-stream complexity limits the amount of shelter or overwintering habitat for fish and amphibian species. Sections of the ditch system are occasionally lined with riprap to protect against erosion (Hagar Environmental Science, February 2015). Their dry-season flow is artificially perennial from local urban and agricultural runoff sources (Casagrande and Watson, 2006a), and the channels are generally maintained without tree canopy.

Within the City of Salinas, the Reclamation Ditch is an urban watercourse with steep sides and numerous pipe culverts or bridges with lined inverts (Schaaf & Wheeler 2014). The Reclamation Ditch generally has low gradient though at some locations, particularly bridges, there is a local increase in gradient that presents potential issues for fish migration downstream (Hagar Environmental Science, February 2015).

Downstream of the Highway 183 crossing, the Reclamation Ditch becomes Tembladero Slough, which is a broad, gentle sloped channel with slow-moving, perennial flows and fresh water with salinity levels generally lower than 1.5 parts per thousand (ppt). Riparian vegetation, which is managed by use of herbicides, is sparse, occurring in clusters. Where vegetation is present, it is usually annual weeds along with an occasional clump of willows, tules and/or watercress (Casagrande and Watson, 2006a).

Tembladero Slough is tidally influenced from the Old Salinas River up to Highway 183 in Castroville (Schaaf & Wheeler, 2014). Tembladero Slough joins with the Old Salinas River, which carries the controlled outflow from the Salinas River Lagoon, and together they form a back-beach swale that runs behind the dunes toward Moss Landing Harbor. This reach has a gentle slope and meandering channel but is tidally influenced and has brackish water and salt concentration fluctuations due to the tidal cycle (Casagrande and Watson, 2006a). The banks support vegetation tolerant of saltwater, such as pickleweed and/or salt grass. Channel substrate is fine silts and clays.

The Potrero Road tide gates are installed on the Old Salinas River just upstream of Moss Landing Harbor. The tide gates consist of ten box culverts each with a flap gate on the downstream side. During periods of high stream flow and low tide, the gates are opened by the differential water pressure. When the tide is high, the gates close, impeding the flow of the tide up the Old Salinas River. Under conditions of simultaneous high outflows and high spring tides, the gates can impede outflows and increase water level stage in Tembladero Slough.

Fishery Habitat Overview

There are no known fish surveys of the Reclamation Ditch watershed, although anecdotal information (Casagrande and Watson, 2006a) and surveys in nearby water bodies are indicative of species that are likely to be found there, which are summarized in **Table 4.4-4, Fish Species Occurring in the Reclamation Ditch Watershed and Vicinity** and depicted on **Figure 4.4-4, Photos of Reclamation Ditch**. Based on habitat characteristics, it is likely that the headwater perennial streams in the Reclamation Ditch watershed support riffle sculpin (*Cottus gulosus*), speckled dace (*Rhinichthys osculus*), trout (*Oncorhynchus mykiss*), and possibly Sacramento sucker (*Catostomus occidentalis*). Two occurrences of trout have been observed in Gabilan Creek, including one young trout along the downstream side of the Old Stage Road Crossing in June 2004 and an adult female steelhead found dead in Gabilan Creek along Little River Drive in March 2004 (CCoWS, 2006). The exact cause of death was not determined but was possibly the lack of suitable flow combined with a possible migration barrier (CCoWS, 2006).

The Reclamation Ditch watershed has the potential to support steelhead trout (*Oncorhynchus mykiss*). Potential salmonid habitat exists upstream of the project site, although the extent and quality of such habitat has not been well quantified. Although trout historically have been stocked by landowners in the watershed (CCoWS, 2006), the presence of suitable habitat in Gabilan Creek that is occupied by *O. mykiss* (likely resident form) and the adult steelhead found in 2004 indicate that the Reclamation Ditch watershed can be considered as potential steelhead habitat. Suitable habitat conditions for rainbow trout/steelhead are also likely to exist in the upper reaches of Alisal, Towne, and Mud Creeks (CCoWS, 2006).

Table 4.4-4
Fish Species Occurring in the Reclamation Ditch Watershed and Vicinity

Common Name	Scientific Name	**Rec Ditch Watershed** (Casagrande and Watson, 2006a)[1]	**Old Salinas River** HES 2001	**Salinas Lagoon** HES 2014	**Snyder** (1913), **Hubbs** (1947)[2]
NATIVE FRESHWATER SPECIES					
Pacific lamprey	*Lampetra tridentata*	X		X	X
California roach	*Hesperoleucus symmetricus*	X			X
Hitch	*Lavinia exilicauda*	X	X	X	X
Sacramento blackfish	*Orthodon microlepidotus*	X		X	X
Sacramento pikeminnow	*Ptychocheilus grandis*	X	X	X	X
Speckled dace	*Rhinichthys osculus*				X
Sacramento sucker	*Catostomus occidentalis*	X	X	X	X
Steelhead/rainbow trout	*Oncorhynchus mykiss*			X	
Chinook salmon	*Oncorhynchus tshawytscha*			X	
Threespine stickleback	*Gasterosteus aculeatus*	X	X	X	X
Prickly sculpin	*Cottus asper*	X		X	X
Coastrange sculpin	*Cottus aleuticus*				X
Riffle sculpin	*Cottus gulosus*				X
Sacramento perch	*Archoplites interruptus*				X
Tule perch	*Hysterocarpus traski*				X
ESTAURINE SPECIES					
Pacific herring	*Clupea pallasii*		X	X	X
Topsmelt	*Atherinops affinis*			X	
Pacific staghorn sculpin	*Leptocottus armatus*		X	X	X
Striped bass	*Morone saxatilis*			X	
Shiner surfperch	*Cymatogaster aggregata*			X	X
Yellowfin goby	*Acanthogobius flavimanus*			X	
Arrow goby	*Clevelandia ios*			X	
Tidewater goby	*Eucyclogobius newberryi*			X	X
Starry flounder	*Platichthys stellatus*			X	X
INTRODUCED WARMWATER SPECIES					
Threadfin shad	*Dorosoma patenense*			X	
Goldfish	*Carassius auratus*	X			
Carp	*Cyprinus carpio*	X	X	X	X
Golden shiner	*Notemigonus chrysoleucas*	X			
Fathead minnow	*Pimephales promelas*	X			
Bullhead	*Ameiurus sp.*	X			
Mosquitofish	*Gambusia affinis*	X	X	X	
Sunfish	*Lepomis sp.*	X			
Bluegill	*Lepomis macrochirus*	X			
Largemouth bass	*Micropterus salmoides*	X			
Black crappie	*Pomoxis nigromaculatus*		X		

[1]Fish kill in Tembladero Slough reported by CDFW (2002) and various observations by J. Casagrande and J. Hagar.

[2]Snyder collections near Salinas, Spreckels, and "Blanco"; Hubbs collections in Salinas River Lagoon.

Spawning habitat is only found within the upper foothill and mountainous reaches of the Gabilan Range where suitable substrate (gravel/cobble) is dominant and stream flow is still abundant (CCoWS, 2006). The duration of adequate flow in the middle reaches of the Reclamation Ditch Watershed is brief in average years, and the migration window is very short (Casagrande and Watson, 2006a). Although the duration of adequate flow in the middle reaches of the Reclamation Ditch watershed is brief in most years, the distance between Moss Landing Harbor and the upper reaches of Gabilan Creek is not excessive for migrating steelhead (Hagar Environmental Science, February 2015). The middle reaches of the Reclamation Ditch also are characterized by degraded water quality and maintained drainage channels devoid of vegetation that do not provide cover for fish. Water quality and wildlife habitat are impaired in the lower watershed (Casagrande and Watson, 2006a).

In order to reach the spawning habitat upstream, steelhead would have to navigate through a series of man-made obstructions that hinder fish passage. Most are passable during periods of prolonged stream flow to achieve suitable flow depth and duration for passage (CCoWS, 2006). However, there are passage obstacles at the San Jon stream gage site, which has a trapezoidal channel section and gaging weir. (See photo on **Figure 4.4-5, Photos Gabilan Creek Fish Passage Obstacles**.) The concrete lip at the lower edge of the apron presents a jumping obstacle at low flows without a pool at the base. The apron also creates uniformly very shallow flow. The concrete lip is likely not a problem for upstream migrating adults when there is sufficient flow for passage over the apron. The lip is also not considered problematic for downstream migrating smolts or adults. The Boronda Road gage site has rock rip-rap fill in the channel downstream of the road bridge creating a critical passage riffle (Hagar, February 27, 2015).

The middle reaches of the watershed (between the Gabilan Mountains and the City of Salinas) are ephemeral and thus do not support fish. Some intermittent reaches support California roach (*Hesperoleucus symmetricus*) and threespine stickleback (*Gasterosteus aculeatus*), which are both tolerant of high temperature and low dissolved oxygen (Casagrande and Watson, 2006a). Some fish passage obstacles on Gabilan Creek are shown on photos on **Figure 4.4-5a**; location of the photos are shown on **Figure 4.4-5b**.

The downstream habitats of the watershed support warmwater fish communities (i.e., minnows, suckers, and introduced fishes). The slow, warmwater habitats of lower Natividad Creek/Laurel Pond, the lower Santa Rita Creek drainage, the Reclamation Ditch, Tembladero Slough, and the Old Salinas River support most of the original native warmwater fish species as well as introduced warmwater species. Species include the native Sacramento sucker, Sacramento blackfish, Sacramento pikeminnow, hitch, California roach, threespine stickleback and a variety of introduced fish like carp, fathead minnow and mosquito fish.

Flow Considerations

The flow regime varies significantly in different parts of the watershed. The middle to lower sections of the watershed have less standing water in the dry season, and more runoff in the wet season. The entire system is highly episodic, with little or no flow for most of the time, interrupted occasionally by large runoff events during the wet season (Casagrande and Watson, 2006a). Sources contributing to the stream flow vary seasonally, and include urban runoff, agricultural tile drain water, and permitted discharge in the dry season and stormwater/urban runoff in the wet season (CCOWS, December 2014).

The Reclamation Ditch is perennial downstream of agricultural and urban development. The USGS streamflow gage at San Jon Road (Station 11152650, Reclamation Ditch near

Salinas) is located just downstream of the proposed Reclamation Ditch diversion site at Davis Road. The period of record is 28 years and is split into October 1970 to February 1986 and June 2002 to the present. Measured daily mean discharge at the San Jon Road location ranges from 0 cfs to over 500 cfs and is highest in December through April (Hagar Environmental Science, February 2015).

According to USGS records, flow west of Salinas at the San Jon Road gage only ceased on three days between 1971 and 1985, and on those days, standing water was probably still present throughout most of the Reclamation Ditch. The presence of standing water is reflective of historical conditions, since the area was a system of lakes, while the presence of dry-season flow is a consequence of dry-season urban and agricultural discharges. Average annual runoff at the San Jon Road gage has declined by almost a third in recent years as water conservation practices have reduced the amount of agricultural irrigation water used (Schaaf & Wheeler, 2014).

There are no instream flow requirements for fisheries or aquatic life in the Reclamation Ditch watershed. There are no known studies that have methodically documented passage obstacles or barriers in the watershed, and no studies of instream flow needs for fish species, including steelhead, have been conducted (Hagar Environmental Science, February 2015). An assessment was conducted by Hagar Environmental Science for this EIR to identify fish passage obstacles between the proposed Reclamation Ditch Diversion site at Davis Road and the Tembladero Slough Diversion site to determine the minimum amount of flow necessary for steelhead migration through the reach, which is further described in **Section 4.4.4.1** below. Fish passage in Tembladero Slough is not expected to be influenced by a diversion near Castroville since Tembladero Slough is tidally influenced up to this area and backwatering of the channel prevents formation of critical riffles or other shallow locations.

Water Quality

The water quality in the Reclamation Ditch is generally poor, containing high levels of nitrates and pesticides and low levels of dissolved oxygen. The Reclamation Ditch (also known as Salinas Reclamation Canal) and all of its tributary streams are on the California Listing of Water Quality Limited Stream Segments, as reported under Section 303(d) of the Federal Clean Water Act (California Regional Water Quality Control Board [RWQCB], 2011). The RWQCB's *Water Quality Control Plan for the Central Coast Basin* (Basin Plan) designates beneficial uses of the Reclamation Ditch as warm water fish habitat and commercial or sport fishing. Tembladero Slough is designated as having additional beneficial uses of estuarine habitat, rare/threatened/endangered species, and spawning/reproduction/early development habitat.

Reclamation Ditch and Tembladero Slough are both listed as impaired water bodies pursuant to Section 303(d) of the Clean Water Act for ammonia, fecal coliform, pesticides, nitrate, toxicity, dissolved oxygen, and other parameters. Water quality has been sampled and monitored for the past 15 years under various programs, and many of these parameters can be at levels that result in toxicity to aquatic life (CCRWQCB Order No. R3-2012-0011 Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands).

Lake El Estero Watershed

Lake El Estero is one of four major watersheds within the City of Monterey. Under natural conditions, Lake El Estero was seasonally either a marine estuary or a brackish water lake. Lake El Estero was dammed in 1872 when tracks for the Southern Pacific Railroad were

built along with a sand ridge separating it from the bay. The lake was further modified over time, including enlarging it and turning it into a fresh water lake.

The watershed tributary to Lake El Estero covers over 2,400 acres and has a range of land uses. The majority of the watershed area, 2014 acres, is pervious, and 404 acres are covered with non-pervious surfaces. The surface area of Lake El Estero is 18.6 acres. The surface flow from Aguajito and Iris Canyons is less than the water used for irrigation at the Lake El Estero Park Complex grounds, which have an estimated average demand of 40 acre-feet per year. The groundwater contribution to Lake El Estero has been estimated at 0.335 acre-feet per day, or 122 acre-feet per year. Water is pumped directly from the lake into the El Estero complex irrigation system, treated only with chlorine. Stormwater detention is provided by the lake, before being drained and pumped to the Monterey Bay, prior to and during large storm events to prevent flooding.

Fishery resources of the Lake El Estero watershed are limited to the modified estuary systems. Due to insufficient flows and both natural and human caused barriers, no anadromous salmonids or tidewater gobies are known to currently exist in the Lake El Estero watershed. Lake El Estero is currently stocked with various species of freshwater fish for recreational purposes (City of Monterey, 2004).

4.4.2.2 Special Status Species

Table 4.4-5, Special Status Species with the Potential to Occur in the Salinas River and Salinas Lagoon lists the special status species with the potential to occur in the Salinas River and Salinas Lagoon. These include the South-Central California Coast (SCCC) steelhead Distinct Population Segment (DPS) and its critical habitat and tidewater goby. As previously indicated, the Reclamation Ditch and Tembladero Slough also have potential to be steelhead habitat. Monterey roach is a special status species identified by CDFW as a Species of Special Concern. These listed species are described below.

Table 4.4-5
Special Status Species with the Potential to Occur in the Salinas River and Salinas Lagoon

Scientific Name	Common Name	Listing Status
Eucyclogobius newberryi	Tidewater Goby	Federally Endangered
Oncorhynchus mykiss	South-Central California steelhead	Federally Threatened
Lavinia symmetricus subditus	Monterey roach	California Species of Special Concern

In 2011, pink salmon (*O. gorbuscha*) was reported in the Salinas River. Although pink salmon were historically distributed in coastal streams, the Puget Sound region is regarded as the southernmost extent of recent spawning habitat. Pink salmon have been known to occur within California and have even been reported south of the San Francisco Bay in the San Lorenzo River; the pink salmon observations do not suggest a population within Salinas River (HDR Engineering, January 2015). Therefore, the species is not considered further in this analysis.

The SCCC steelhead species is federally listed as a threatened species. The SCCC steelhead includes all naturally spawned anadromous populations of *O. mykiss* in coastal river basins from the Pajaro River in Monterey County southward to but not including the Santa Maria River in San Luis Obispo County. Although *O. mykiss* exhibits both resident and anadromous life history characteristics, the SCCC steelhead includes only the anadromous life form of *O. mykiss*.

The Federal Endangered Species Act (ESA) requires that the National Marine Fisheries Service review the status of listed species under its authority at least every five years and determine whether any species should be removed from the list or have its listing status changed. In September 2012, NMFS completed a 5-year status review of the SCCC steelhead. Based upon a review of available information, NMFS recommended that the SCCC steelhead DPS remain classified as a threatened species.

Tidewater goby (*Eucyclogobius newberryi*), a federally listed endangered species, is known to inhabit coastal brackish water ranging from Tillas Slough near the Oregon border south to San Diego County (Monterey County Water Resources Agency, March 2013). The species is adapted to live in lagoon habitat and is generally not found in the freshwater portions of streams flowing into lagoons. Tidewater gobies were observed only once from the Salinas River Lagoon in 1946; monitoring efforts in the lagoon conducted from 2002 to 2013 indicated that no tidewater gobies were collected (Monterey County Water Resources Agency, March 2013). However, two tidewater gobies (*Eucyclogobius newberryi*) were captured during monitoring conducted in 2013 (Hagar Environmental Science, February 2014). In 2014, the tidewater goby was proposed to be reclassified as threatened as discussed further below.

Monterey Roach (*Lavinia symmetricus subditus*) is designated as a California Species of Special Concern, which is a designation conferred by the CDFW for those species which are considered to be indicators of regional habitat changes or are considered to be potential future protected species. Species of special concern are not necessarily afforded protection under the Fish and Game Code unless they are also identified in the code as California Fully Protected Species; the Monterey roach is not a California Fully Protected Species. The Species of Special Concern designation is intended by the CDFW for use as a management tool to take these species into special consideration when decisions are made concerning the development of natural lands.

South-Central California Coastal Steelhead Distinct Population Segment

Critical Habitat Designation

Critical Habitat for SCCC steelhead was designated in February 2000 and was reaffirmed in 2005. Section 3 of the ESA defines critical habitat as (i) the specific areas within the geographical area occupied by the species, at the time it is listed on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed." The freshwater

primary constituent elements of critical habitat include: 1) spawning habitat, including spawning substrate, and adequate water quantity and quality; 2) freshwater rearing habitat including floodplain connectivity, and natural escape and velocity cover; and 3) freshwater migration corridors free of obstructions, with water quantity and quality conditions that allow movement (Monterey County Water Resources Agency, March 2013).

Critical Habitat within the Salinas River watershed is designated along the Salinas River from the Salinas River mouth upstream to 7.5 miles below the Santa Margarita Lake, Arroyo Seco River, Nacimiento River (below the dam), San Antonio River (below the dam), and the upper Salinas River tributaries (NMFS, 2007, Monterey County Water Resources Agency, March 2013). The Critical Habitat designation includes also Gabilan Creek, the Reclamation Ditch, Tembladero Slough, the Old Salinas River and Salinas River Lagoon, and Lower Salinas River.

Taxonomy and Population Trends

Based on genetic and distributional information, 41 historically independent populations of SCCC steelhead have been recognized in the DPS, including three populations in the Salinas River (Moyle et al, 2008). Three populations are recognized in the Salinas River due to its large size, which likely allows sufficient geographic isolation to maintain multiple populations. These 41 populations are divided into four biogeographical regions including (from north to south): Interior coast range, Carmel Basin, Big Sur Coast, and San Luis Obispo Terrace (Moyle et al, 2008). The Salinas River occurs within the Interior Coast Range Biogeographic Population Group (Monterey County Water Resources Agency, 2013).

The limited documentation on current abundance suggests the overall population in the SCCC steelhead is extremely small (HDR Engineering, January 2015). Estimating the magnitude of the departure of the population from historical conditions is hampered because the run size for most watersheds continues to be poorly characterized and major impacts leading to subsequent declines occurred prior to most modern fish investigations in the SCCC steelhead DPS. The sporadic presence of steelhead in many watersheds in the SCCC steelhead DPS further confounds assessment efforts. Nonetheless, investigations conducted since 1996 indicate that of the 39 watersheds that historically supported anadromous runs, virtually all continue to be occupied by native *O. mykiss*, though most of the populations are at historically low levels (National Marine Fisheries Service, December 2013.

Life History Overview

Steelhead are a form of rainbow trout that migrate to the ocean as juveniles and return to inland waters as adults to spawn. All steelhead within the SCCC steelhead DPS are considered “winter steelhead” based on their migratory timing and behavior; ascending streams during the winter when winter rainfall results in suitable flow and temperature (Moyle, 2002). SCCC steelhead require pools with low velocities in association with instream and near stream cover such as large woody debris, undercut banks, or submerged or overhanging vegetation, can provide desirable resting areas for migrating adult steelhead. The migration of adult SCCC steelhead is strongly associated with high winter and spring flows that provide a continuous hydrological connection between the ocean and upstream habitat (National Marine Fisheries Service, 2013). Adult upstream migration times vary according to life history type (e.g., winter run versus spring-run) and climatic conditions (i.e., the timing of higher winter and spring flows) (Monterey County Water Resources Agency, March 2013).

Winter steelhead fish are reported to enter freshwater to spawn between November 1 and April 30, with peak numbers occurring in January and February (Moyle, 2002). NMFS states that SCCC steelhead primarily migrate December through April in the Salinas Region (National Marine Fisheries Service, 2007). Steelhead spawn in cool, clear, well-oxygenated streams with suitable depth, current velocity, and gravel size, and typically select spawning areas at the downstream end of pools, in gravels ranging from approximately 0.5 to 4.5 inches in diameter. Eggs incubate for 25–30 days, depending on water temperatures, then hatch into alevins (larval stage). The alevins remain in the gravel for an additional 2–5 weeks after hatching, depending on temperature, before emerging in spring or early summer as steelhead juveniles (fry). Following emergence, fry feed in shallow, low-velocity areas such as stream margins and low-gradient riffles, and then move to faster, deeper water as they increase in size. In the summer and late-fall, as flows lessen and riffle area decreases, juvenile steelhead may move into pools. During winter as water temperatures decrease and flows increase, juveniles seek hydraulic refuge within pools, interstitial spaces in cobble and boulder substrates, or near large woody debris (Monterey County Water Resources Agency, March 2013).

As fry grow they develop marks on their sides and become known as “parr,” which is the juvenile life stage (Moyle, 2002). After 1 to 3 years of rearing in freshwater, most juvenile steelhead begin the process of smoltification and proceed to migrate downstream toward the ocean. Young steelhead feed on a wide variety of aquatic and terrestrial insects, and emerging fry are sometimes preyed upon by older juveniles (National Marine Fisheries Service, 2007). Steelhead smolts may immigrate to the ocean from January through June. NMFS (2013) states that outmigration usually occurs in the late winter and spring. These fish may reside in the ocean for between 2 and 4 years (Moyle, 2002) prior to returning to spawn.

Habitat needs in the Salinas River, Reclamation Ditch, and Tembladero Slough for emigrating steelhead (smolts) likely are similar to those for rearing juvenile steelhead. Migrating smolts are particularly vulnerable to predation, and physical structure and cover (refugia) are important for survival of this life stage. Similar to rearing juveniles, outmigrants rely on the presence of adequate food and suitable resting pools. Lagoons and estuaries at the river mouth are often very important for the rearing of larger juveniles and may provide essential feeding opportunities for smolts prior to entering the ocean (Monterey County Water Resources Agency, March 2013).

Steelhead Habitat in the Salinas River

The mainstem Salinas River is a migration corridor for adult steelhead migrating from the ocean to spawn in tributaries (National Marine Fisheries Service, 2007). Kelts, smolts, and juveniles use the river to migrate downstream to the ocean or lagoon. The lower Salinas River has a sandy substrate with a broad channel with no spawning or rearing habitat present. Most spawning and rearing that does occur in the Salinas River Basin occurs in tributary streams (National Marine Fisheries Service, 2007). The Salinas River between the confluence with the Pacific Ocean and below the upstream dams is characteristic of a depositional environment. Specifically, the substrate is primarily sand throughout, and coarser gravel is only a minor component, primarily upstream of King City. Before Nacimiento and San Antonio Reservoirs were constructed, the Salinas River had little or no summertime flow in most years due to groundwater pumping. Even with present operations and release of cooler water from the reservoirs throughout the summer, water temperatures are too high for rearing juveniles. As such, steelhead use of upper Salinas River tributaries depends upon maintaining a migration corridor in the mainstem Salinas River. The current

migration corridor of the lower Salinas River is limited by the availability of adequate flows to provide passage over long distances to suitable spawning and rearing habitat (National Marine Fisheries Service, 2007). Adequate migration flows are annually highly variable. Groundwater pumping has also affected these flows, and levees, channel maintenance, road crossings, and removal of riparian vegetation have reduced the availability and quality, of migration habitat for steelhead (National Marine Fisheries Service, 2007, Monterey County Water Resources Agency, 2013b).

Steelhead Habitat in the Salinas River Lagoon

Habitat conditions in the Salinas River Lagoon are generally not suitable for steelhead spawning or egg incubation, but could potentially support rearing. When the river mouth is open, the lagoon is tidally influenced and sustains saltwater conditions. When the river mouth is closed, the lagoon is typically fresh with good water quality conditions, specifically when Salinas River inflow is adequate and no saltwater intrusions occur. The transition period between saltwater and freshwater conditions may result in salinity stratification that can contribute to elevated temperatures and low dissolved oxygen levels, conditions not suitable for rearing juveniles. Thus, the lagoon is believed to be utilized primarily as a migration corridor by adult and juvenile steelhead.

Steelhead Habitat in the Reclamation Ditch

As indicated above, the Reclamation Ditch watershed has the potential to support steelhead trout (*Oncorhynchus mykiss*). Potential salmonid habitat exists upstream of the Reclamation Ditch, although the extent and quality of such habitat has not been well quantified. However, the presence of suitable habitat in Gabilan Creek along with past observations of one individual steelhead trout in Gabilan Creek indicate that the Reclamation Ditch watershed should be considered as potential steelhead habitat (Hagar Environmental Science, February 2015). Spawning habitat is only found within the upper foothill and mountainous reaches of the Gabilan Range where suitable substrate (gravel/cobble) is dominant and stream flow is still abundant (CCoWS, 2006). As previously indicated, channel and flow conditions vary widely in the Reclamation Ditch watershed. The streams of the Gabilan subwatershed are non-perennial in the uppermost sections, perennial or near-perennial in certain reaches mid-way down the range, and non-perennial in the lowest parts of the subwatershed. Additionally, the middle reaches of the Reclamation Ditch are characterized by degraded water quality and maintained drainage channels devoid of vegetation that do not provide cover for fish. In order to reach the spawning habitat upstream, steelhead would have to navigate through a series of man-made obstacles. Suitable habitat conditions for rainbow trout/steelhead are also likely to exist in the upper reaches of Alisal, Towne, and Mud Creeks (Casagrande and Watson, 2006a).

Channel conditions vary widely in the Reclamation Ditch watershed. The streams of the Gabilan subwatershed are non-perennial in the upper-most sections, perennial or near-perennial in certain reaches mid-way down the range, and then again non-perennial in the lowest parts of the subwatershed as the streams begin to flow over old alluvium at the foot of the range (Casagrande and Watson, 2006a).

The flow regime varies significantly in different parts of the watershed. The middle to lower sections of the watershed have less standing water in the dry season, and more runoff in the wet season. The entire system is highly episodic, with little or no flow for most of the time, interrupted occasionally by large runoff events during the wet season (Casagrande and Watson, 2006a).

Results of Fishery Studies in the Salinas River Watershed

MCWRA has conducted fisheries studies on the Salinas River Watershed in the Nacimiento, Arroyo Seco, and Salinas Rivers and the Salinas River Lagoon. These studies focused primarily on the tributaries to the Salinas River because the tributaries historically provided the best spawning and rearing habitats in the watershed. Additionally, MCWRA measured conductivity, dissolved oxygen, and water temperature on the Salinas River and Lagoon and conducted an impoundment survey at the SRDF.

In 2010 MCWRA developed and implemented a Juvenile Outmigration Monitoring Program to: (1) determine the abundance of downstream migrating steelhead smolts in the Salinas River Basin; (2) determine the relative contribution of the tributaries on smolt abundances to the overall Salinas River Basin abundance; (3) characterize the migration timing of steelhead smolts; and (4) evaluate potential relationships to environmental factors. Sampling was conducted from March 12 through May 28 during 2010 at three locations: Salinas River, Arroyo Seco River and Nacimiento River (Monterey County Water Resources Agency, April 2011) and during the same time period in 2011 (Monterey County Water Resources Agency, April 2012).

During the November 2010 impoundment survey, no *O. mykiss* were observed (Monterey County Water Resources Agency, April 2011). However, electrofishing and seining surveys conducted on the Nacimiento and Arroyo Seco Rivers during 2010 resulted in capture of *O. mykiss* on the Arroyo Seco River (Monterey County Water Resources Agency, April 2011). During the 2010 juvenile outmigration survey period, a total of 140 *O. mykiss* were captured in the Arroyo Seco River, which led to an abundance estimate of 480 juvenile *O. mykiss*. No *O. mykiss* were captured in the Nacimiento River and only two *O. mykiss* were captured on the Salinas River, so no abundance estimates could be generated (Monterey County Water Resources Agency, April 2011).

The impoundment survey was also conducted during 2011, but was not completed due to unforeseen environmental conditions not allowing efficient sampling to occur. Electrofishing and seining was also conducted during 2011 in the Nacimiento and Arroyo Seco rivers. Twenty eight *O. mykiss* were captured in the Arroyo Seco River and no *O. mykiss* were captured in the Nacimiento River. The Salinas Basin Juvenile *O. mykiss* Outmigration Monitoring report published in September 2011 documented the second year of outmigration monitoring in the Salinas River watershed. A total of 64 *O. mykiss* were captured in the Arroyo Seco River, resulting in an abundance estimate of 332 *O. mykiss* for the sampling season (Monterey County Water Resources Agency, April2012). No *O. mykiss* were captured in the Nacimiento River and only two *O. mykiss* were captured on the Salinas River, so no abundance estimates could be generated (Monterey County Water Resources Agency, April 2012). Non-salmonid species captured during the 2010 and 2011 surveys conducted by MCWRA (2011, 2012) are presented in those reports.

The 2011 study concluded that similar to 2010 there were no apparent overall relationships between downstream migration timing, water temperature and dissolved oxygen (MCWRA, 2012). The report further suggested that that migration timing may be affected by turbidity, with small peaks in migration occurring during small changes in turbidity. However, because turbidity and flow vary in correlation to each other, it is difficult to identify the influences of turbidity and flow independently (Monterey County Water Resources Agency, 2012).

The Monterey County Water Resources Agency conducts sandbar management at the mouth of the Salinas River as part of its flood control activity. The Lagoon Monitoring Program, conducted by MCWRA since 2002, was altered in 2010 to be consistent with the

NMFS 2009 Biological Opinion for sandbar management at the mouth of the Salinas River. The Biological Opinion calls for fish population sampling in the Salinas River Lagoon during spring (April and May), summer (June through August), and fall (October or early November). Sampling is focused on capturing rearing juvenile steelhead that may be present in the lagoon with the objective to determine whether steelhead are present, and evaluate steelhead distribution, relative abundance (catch per unit effort), and condition (Monterey County Water Resources Agency as cited in HDR Engineering, January 2015).

The 2011 lagoon monitoring began in April of that year with high flows from the Salinas River and an open lagoon. The lagoon was closed for the October sampling. For the first time since 2002, juvenile steelhead were captured during each of the three sampling periods. However, only one individual was captured during each of the three surveys. The winter conditions of 2010-2011 led to good migration conditions and the flow at Spreckels remaining high through late-May, led to conditions at Arroyo Seco that would support adult steelhead migration, which is in agreement with the smolt trapping conducted during 2011 that documented migration of juvenile steelhead from the Arroyo Seco River, with the majority of migrating juveniles being smolts and silvery parr. Smolts would pass quickly through the estuary while parr and young-of-year may spend time rearing in the estuary. The low number of parr and young-of-year migrating from the Arroyo Seco River is consistent with the lack of observed steelhead rearing in the Salinas River lagoon (Monterey County Water Resources Agency as cited in HDR Engineering, January 2015).

The water conditions in 2012 were dry and resulted in low flows during migration periods for adult steelhead in the Salinas River system, but adequate flows for migrating smolts. The late season rain in March and April led to high flows likely beneficial for smolts. With a full impoundment behind the inflatable dam, a minimum of 2 cfs was bypassed to the Salinas River Lagoon for 27 days (October 20th thru November 15th). During the irrigation season flows were bypassed through the fish ladder and the regulating weir at the Salinas River Diversion Facility and averaged 10-22 cfs throughout the season (Monterey County Water Resources Agency as cited in HDR Engineering, January 2015).

The 2007 NMFS Biological Opinion stated that one of the terms and conditions of the Biological Opinion requested that adult steelhead escapement monitoring be conducted for a minimum of 10 years, unless NMFS and MCWRA agree to an alternative timeframe. In 2011 an adult steelhead escapement monitoring program was set up, but subsequently the weir system became inoperable. Due to multiple factors, monitoring was not conducted during the entire timeframe outlined in the Biological Opinion (December 1 to March 31). Between January 19, 2011 and February 17, 2011, 23 steelhead passage events were detected by the system at the Salinas River Weir, 18 upstream passages, and 5 downstream passages, with a total of 13 adult steelhead documented. Although steelhead cannot be distinguishable from salmon with silhouettes alone, based on passage timings and the fact that the Salinas River is not known to support any salmon species, the assumption was made that silhouettes observed were steelhead (Monterey County Water Resources Agency as cited in HDR Engineering, January 2015).

During the 2012 period, monitoring protocols were amended regarding the weir and flow events From November 30, 2011 through April 2, 2012, the system recorded a net upstream passage of 17 adult steelhead (19 recorded passing upstream and 2 recorded passing downstream), which was an increase of four adult steelhead upstream passages over the previous monitoring season. No apparent relationships between migration timing, flow, water temperature, turbidity, and dissolved oxygen were identified during the 2012 migratory period for steelhead. However, failure to detect such trends and relationship is (at least

partially) attributable to a very small population size of steelhead in the Salinas River basin (Monterey County Water Resources Agency as cited in HDR Engineering, January 2015). Furthermore, the 2011/2012 winter was relatively "dry" that resulted in only two very small peaks in flow. Future monitoring efforts may yield additional information and elucidate relationships between upstream migration of steelhead and environmental variables.

Tidewater Goby

Status and Distribution

The tidewater goby (*Eucyclogobius newberryi*) are a small, short-lived California endemic species that inhabits coastal brackish water habitats entirely within California, ranging from Tillas Slough (mouth of the Smith River, Del Norte County) near the Oregon border south to Agua Hedionda Lagoon (northern San Diego County). This species was federally listed as endangered in 1994, and is considered to be a species with moderate threats and a high potential for recovery (U.S. Fish and Wildlife Service, 2005). Tidewater goby has had fully protected status from the State of California since 1987.

The 2013 final rule on the Designation of Critical Habitat for Tidewater Goby revised the 2000 (65 FR 69693) and 2008 (73 FR 5920) critical habitat ruling. Salinas Lagoon is not designated as Critical Habitat for the species.

The USFWS 5-year review conducted in 2007 recommended down-listing to threatened status (U.S. Fish and Wildlife Service, 2007). The USFWS has determined that north of Orange County, there are more populations than were known at the time of the listing, that the threats to those populations are less severe than previously believed, and that the tidewater goby has a greater ability than was known in 1994 to re-colonize habitats from which it is temporarily absent. The USFWS has determined that reclassifying the tidewater goby as threatened is warranted, and, proposed reclassification in 2014 (Federal Register: March 13, 2014; Volume 79, Number 49).

Tidewater goby were reported in low to moderate abundance at three locations in the Salinas River Lagoon in August 1946, and as indicated above, tidewater gobies were recently collected again there in 2013 (Hagar Environmental Science, February 2015). Tidewater goby have also been found in Bennett Slough (northern end of Elkhorn Slough) (USFWS 2005). The critical habitat designation for tidewater goby includes Bennett Slough (north of the project area) and the Salinas River (U.S. Fish and Wildlife Service, 2013 as cited in Hagar Environmental Science, February 2015).

The USFWS characterizes tidewater goby populations (i.e., localities) along the California coast as metapopulations (a group of distinct populations that are genetically interconnected through occasional exchange of animals) (U.S. Fish and Wildlife Service, 2007). While individual populations may be periodically extirpated under natural conditions, a metapopulation is likely to persist through colonization or re-colonization events that establish new populations (USFWS 2007). Local populations of tidewater gobies occupy coastal lagoons and estuaries that in most cases are separated from each other by the open ocean. Some tidewater goby populations persist on a consistent basis (potential sources of individuals for re-colonization), while other tidewater goby populations appear to experience intermittent extirpations. Some localities where tidewater gobies have been extirpated apparently have been re-colonized when extant populations were present within a relatively short distance of the extirpated population (i.e., less than 6 miles (10 kilometers)). More recently, another tidewater goby researcher has suggested that re-colonizations have typically been between populations separated by no more than 10 miles (Swift 2007 cited in USFWS 2007). Flooding during winter rains can contribute to re-colonization of estuarine

habitats where tidewater goby populations have previously been extirpated. The closest known populations that could recolonize the Salinas River Lagoon are in the Pajaro River and Elkhorn Slough (USFWS 2005, Kukowski 1972, Swift et al. 1989 as cited in Hagar Environmental Science, February 2015). The mouth of Elkhorn Slough is connected to the Salinas River Lagoon through the Old Salinas River. The mouth of the Pajaro River is about 3 miles north of the mouth of Elkhorn Slough and about 7 miles north of the Salinas River Lagoon.

Life History

Tidewater goby are uniquely adapted to coastal lagoons and the uppermost brackish zone of larger estuaries, rarely invading marine or freshwater habitats (U.S. Fish and Wildlife Service, 2005). Tidewater gobies are small fish (rarely exceeding two inches in length) that generally live for only 1 year, with few individuals living longer than a year. Reproduction occurs at all times of the year; the peak of spawning activity occurs during the spring and then again in the late-summer. Fluctuations in reproduction are probably due to death of breeding adults in early summer and colder temperatures or hydrological disruptions in winter. Reproduction takes place in water between 48°F and 77°F (9°C and 25°C) and at salinities of 2 to 27 parts per thousand (USFWS, 2005).

Male tidewater gobies begin digging breeding burrows in relatively unconsolidated, clean, coarse sand (averaging 0.5 millimeter [0.02 inch] in diameter), in April or May after lagoons close to the ocean (USFWS 2005). After hatching, the larval tidewater gobies emerge from the burrow and swim upward to join the plankton. Tidewater gobies are known to be preyed upon by native species such as small steelhead, prickly sculpin, and staghorn sculpin (USFWS, 2005).

Tidewater goby abundance fluctuates spatially and seasonally, due in part to their predominantly annual life cycle (Swenson 1999 as cited in Hagar Environmental Science, February 2015). Tidewater goby populations also vary greatly with the varying environmental conditions (e.g., drought, El Niño) among years (USFWS, 2007). Their short life span and restricted habitat make individual populations vulnerable to unique catastrophic events (floods, toxic events, introduction of predator species, drought, or habitat alteration). Nevertheless, available information indicates that *Eucyclobius* is tolerant of a very wide range of salinity, temperature, and other water quality conditions.

Habitat Characteristics

The tidewater goby favors the calm conditions that prevail when the lagoons are cut off from the ocean by beach sandbars. They are bottom dwellers and are typically found at water depths of less than three feet. Tidewater gobies typically inhabit areas of slow-moving water, avoiding strong wave action or currents. Particularly important to the persistence of the species in lagoons is the presence of backwater, marshy habitats, which provide refuge habitat during winter flood flows. Optimal lagoon habitats are shallow, sandy-bottomed areas, surrounded by beds of emergent vegetation. Open areas are critical for breeding, while vegetation is critical for overwintering survival (providing refuge from high flows) and probably for feeding as well (Moyle 2002 as cited in Hagar Environmental Science, February 2015).

All sizes of *E. newberryi* usually occur at the upper end of lagoons at salinities of 10 ppt or less. Of 60 collections, 65% were at 0-10 ppt, 20% were at 10-20 ppt, 17% at 20-30 ppt, and 2% at 42 ppt (Swift, 1989 as cited in Hagar Environmental Science, February 2015). The collection at 42 ppt was made at Bennett Slough, a tributary of Elkhorn Slough in Monterey County. In lab tests conducted by the CDFW, tidewater gobies were maintained in

freshwater at 10-15 ppt, 20 ppt, and normal seawater (33 ppt) with reproduction taking place under all four conditions (Worcester and Lea 1996 as cited in Hagar Environmental Science, February 2015). Differences in reproductive success, if any, were not reported. Worcester and Lea also held tidewater gobies in hypersaline water (45-54 ppt) for 6 months with no mortality. In salinity tolerance tests reported by Swift et al. (1989), tidewater gobies in salinities above 41 ppt experienced high mortality. In an experiment where salinity increased slowly due to evaporation, over half the gobies survived hypersaline conditions up to 1.75 times that of seawater.

Criteria for lagoon conditions that favor tidewater gobies include: little or no channelization; allowing closure to the ocean for much of the year so that tidal fluctuation is absent or minimal; fresh unconsolidated sand is optimal for reproduction; high quality of inflowing water to increase habitable area of a lagoon in summer. Nutrient enrichment can stimulate algal blooms, deplete oxygen, and lead to hydrogen sulfide formation. Most fish species are intolerant of low dissolved oxygen and high hydrogen sulfide concentrations. Non-native predatory fish should be excluded. Centrarchid fish (sunfish and bass) and tidewater gobies are not usually found together and may not be able to coexist (Swift et al. 1989 as cited in Hagar Environmental Science, February 2015).

Gobies may move upstream during winter rains and high flows of inlet streams (Swift et al. 1989) as well as during the summer when algal blooms and hydrogen sulfide forms in the substrate and enters the water column. During this period most fish are at the upper end of lagoons where freshwater inflow occurs or at the seaward end where occasional waves wash into the Lagoon (Swift et al. 1989 as cited in Hagar Environmental Science, February 2015).

Currently, the majority of the most stable and largest tidewater goby populations consist of lagoons and estuaries of intermediate sizes (5 to 125 acres) that have remained relatively unaffected by human activities (USFWS, 2005). Many of the localities where tidewater gobies are regularly present may be “source” populations for localities that intermittently lose their tidewater goby populations. Large wetlands are likely to have lower rates of extirpation than small wetlands. In addition, populations at small sites were sensitive to drought, presumably because droughts can eliminate suitable habitat at small wetlands (USFWS, 2007).

Monterey Roach

Monterey Roach (*Lavinia symmetricus subditus*) is designated as a California Species of Special Concern (CSC) as explained above. The Monterey form of California Roach formerly were widely distributed throughout streams in the Monterey Bay drainage, however, they are currently less widely distributed due to habitat loss and interspecific competition (Monterey County Water Resources Agency, March 2013). They tend to be most abundant when found by themselves or with just one or two other species. In the absence of fish predators, roach will utilize the open waters of pools; otherwise they often stay within pool margins and amongst shallow water areas. Roach are omnivorous, mainly feeding on the bottom, but they can also feed on drift organisms such as terrestrial insects (Monterey County Water Resources Agency, March 2013.

Little is known regarding the current status and distribution of Monterey roach in the Salinas River and nearby watersheds. Monterey roach were collected on the Salinas River at River Mile 109 during recent rotary screw trap surveys (Monterey County Water Resources Agency as cited in HDR Engineering, January 2015). However, roach have not been reported to occur in the lower Salinas River, downstream of the Proposed Project. Monterey

roach have been reported to occur in the warmwater reaches of neighboring watersheds, including lower Natividad Creek/Laurel Pond, the lower Santa Rita Creek drainage, the Reclamation Ditch, Tembladero Slough, and the Old Salinas River (HDR Engineering, January 2015).

4.4.3 Regulatory Framework

4.4.3.1 Federal

Federal Endangered Species Act (ESA)

Provisions of the ESA of 1973 (16 USC 1532 et seq., as amended) protect federally listed threatened or endangered species and their habitats from unlawful take. Listed species include those for which proposed and final rules have been published in the Federal Register. The ESA is administered by the Service or National Oceanic and Atmospheric Administration Marine Fisheries Service (NOAA Fisheries). In general, NOAA Fisheries is responsible for the protection of ESA-listed marine species and anadromous fish, whereas other listed species are under Service jurisdiction.

Section 9 of ESA prohibits the take of any fish or wildlife species listed under ESA as endangered or threatened. Take, as defined by ESA, is "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." Harm is defined as "any act that kills or injures the fish or wildlife…including significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife." In addition, Section 9 prohibits removing, digging up, and maliciously damaging or destroying federally listed plants on sites under federal jurisdiction. Section 9 does not prohibit take of federally listed plants on sites not under federal jurisdiction. If there is the potential for incidental take of a federally listed fish or wildlife species, take of listed species can be authorized through either the Section 7 consultation process for federal actions or a Section 10 incidental take permit process for non-federal actions. Federal agency actions include activities that are on federal land, conducted by a federal agency, funded by a federal agency, or authorized by a federal agency (including issuance of federal permits).

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (16 USC 651 Et Seq.) requires all federal agencies to consult with and give strong consideration to the views of the USFWS, NOAA Fisheries, and state wildlife agencies regarding the fish and wildlife impacts of projects that propose to impound, divert, channel, or otherwise alter a body of water.

The Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) establishes a management system for national marine and estuarine fishery resources. This legislation requires all federal agencies to consult with NMFS regarding all actions or proposed actions permitted, funded, or undertaken that might adversely affect essential fish habitat (EFH). EFH is defined as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The legislation states that migratory routes to and from anadromous fish spawning grounds should also be considered EFH. The phrase "adversely affect" refers to the creation of any impact that reduces the quality or quantity of essential fish habitat. The Magnuson-Stevens Act states that consultation regarding EFH

should be consolidated, where appropriate, with the interagency consultation, coordination, and environmental review procedures required by other federal statutes, such as NEPA, the Fish and Wildlife Coordination Act, the federal Clean Water Act, and ESA. In most cases, the environmental compliance required for federal activities will satisfy consultation requirements under the Magnuson-Stevens Act.

Clean Water Act 404 Permit

The U.S. Army Corps of Engineers administers compliance with Section 404 of the Clean Water Act. Section 404 regulates activities that involve dredging and/or filling of waters deemed under federal jurisdiction, or as "Waters of the United States." The two types of permits issued by the Corps under Section 404 are Nationwide Permits and Individual Permits. If impacts to wetlands are relatively small and a project falls into a specific category of uses already permitted, project proponents may apply for a Nationwide Permit, which is easier to obtain than an Individual Permit.

4.4.3.2 State

California Endangered Species Act (CESA)

The CESA was enacted in 1984. The California Code of Regulations (Title 14, §670.5) lists animal species considered endangered or threatened by the state. Section 2090 of CESA requires state agencies to comply with endangered species protection and recovery and to promote conservation of these species. Section 2080 of the Fish and Game Code prohibits "take" of any species that the commission determines to be an endangered species or a threatened species. A Section 2081 Incidental Take Permit from the CDFW may be obtained to authorize "take" of state listed species.

California Fish and Game Code Sections 1600-1616

Sections 1600-1607 of the DFG Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify the CDFW before beginning construction. If the CDFW determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. The CDFW jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider.

Central Coast Regional Water Quality Control Board and State Water Resources Control Board

The State Water Resources Control Board (SWRCB) and the Central Coast Regional Water Quality Control Board (RWQCB) establish policies and procedures that are designed to ensure the protection of surface water and groundwater from degradation. The Central Coast RWQCB establishes beneficial uses of surface and groundwater resources, as contained in its Water Quality Control Plan for the Central Coast Central Coast RWQCB. The RWQCB administers the National Pollutant Discharge Elimination System permitting and Section 401 water quality certification processes.

Under the authority of CWA Section 303(d), the RWQCB and SWRCB list water bodies as impaired when not in compliance with designated water quality objectives and standards. Section 303(d) also requires preparation of a management program for waters identified by the state as impaired. As stated above, the Salinas River, Reclamation Ditch and

Tembladero Slough are listed as impaired waterbodies under section 303(d) of the Clean Water Act.

4.4.3.3 Local Plans and Regulations

In addition to the general requirements of CEQA and California laws and regulations, fishery resource issues may be addressed in local General Plans and municipal codes of local jurisdictions within the Proposed Project area. Fishery resources potentially affected by the Proposed Project are all located within the unincorporated area of Monterey County. As indicated above in **Section 4.4.2.1**, there are no anadromous salmonids or tidewater gobies in Lake El Estero in the City of Monterey. **Table 4.4-6, Applicable State, Regional, and Local Land Use Plans and Policies Relevant to Biological Resources: Fisheries** summarizes County plans, policies and regulations pertaining to fish biological resources that are relevant to the Proposed Project and that were adopted for the purpose of avoiding or mitigating an environmental effect. **Table 4.4-6** provides a review of project consistency and/or conflicts with such plans, policies, and regulations. Where the analysis concludes the project would not conflict with the applicable plan, policy, or regulation, the finding and rationale is noted. In some cases, a potential inconsistency or conflict would be avoided with implementation of mitigation measures included in this EIR, which is explained.

Table 4.4-6
Applicable State, Regional, and Local Land Use Plans and Policies Relevant to Biological Resources: Fisheries

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component	Specific Policy, or Program	Project Consistency with Policies, and Programs
Monterey County	Monterey County General Plan	Safety	Salinas Pump Station Diversion Salinas Treatment Facility Storage and Recovery Reclamation Ditch Diversion Tembladero Slough Diversion Blanco Drain Diversion	**OS-4.1**: Federal and State listed native marine and fresh water species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant shall be protected. Species designated in Area Plans shall also be protected.	**Consistent with Mitigation**: Construction and operation of the Proposed Project would protect federal and state-listed fish species. (See Impacts BF-1 and BF-2.)
Monterey County	Monterey County General Plan	Safety	Salinas Pump Station Diversion Salinas Treatment Facility Storage and Recovery Reclamation Ditch Diversion Tembladero Slough Diversion Blanco Drain Diversion	**OS-5.16**: A biological study shall be required for any development project requiring a discretionary permit and having the potential to substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or substantially reduce the number or restrict the range of an endangered, rare, or threatened species.	**Consistent**: Biological reports have been prepared regarding fish resources, and construction and operation of the Proposed Project would not reduce habitat of a fish species, cause a fish population to drop below self-sustaining levels, threaten to eliminate a fish community, or substantially reduce the number or restrict the range of an endangered or threatened fish species. (See Impact BF-3.)
Monterey County	North County Land Use Plan	Resource Management	Tembladero Slough Diversion	**Policy 2.3.3.B2:** All development, including dredging, filling, and grading within stream corridors, shall be limited to activities necessary for flood control purposes, water supply projects, improvement of fish and wildlife habitat, or laying of pipelines when no alternative route is feasible, and continued and future use of utility lines and appurtenant facilities. These activities shall be carried out in such a manner as to minimize impacts from increased runoff, sedimentation, biochemical degradation, or thermal pollution. When such activities require removal of riparian plant species, re-vegetation with native plants shall be required.	**Consistent with mitigation**: Construction of the proposed diversion would be for a water supply project and impacts would be minimized. There would be no removal of riparian or other vegetation (See Impacts BF-1 and BF-2.)
Monterey County	North County Land Use Plan	Resource Management	Tembladero Slough Diversion	**Policy 2.3.3.B6:** Dredging or other major construction activities shall be conducted so as to avoid breeding seasons and other critical phases in the life cycles of commercial species of fish and shellfish and other rare, endangered, and threatened indigenous species.	**Consistent with mitigation**: In-water construction activities would be scheduled to avoid steelhead migration periods. (See Impacts BF-1.)

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4.4.4 Impacts and Mitigation Measures

4.4.4.1 Significance Criteria

Based on Appendix G of the CEQA Guidelines, a project would result in significant impacts related to fishery resources if it would:

a. Have a substantial adverse effect, either directly or through habitat modifications, on any fish species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
b. Interfere substantially with the movement of any native resident or migratory fish species or impede the use of native wildlife nursery sites;
c. Substantially reduce the habitat of a fish species, cause a fish population to drop below self-sustaining levels, threaten to eliminate a fishery community, or reduce the number or restrict the range of a rare or endangered species;
d. Conflict with any local policies or ordinances protecting fishery resources; or
e. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan.

No additional significance criteria are needed to comply with the CEQA-Plus[1] considerations required by the State Revolving Fund Loan Program administered by the State Water Resources Control Board.

In order to apply the significance criteria, specific, measurable indicators have been identified to compare baseline (without project) conditions with conditions with the Proposed Project operations. The Proposed Project operations would potentially alter fish habitat conditions by changing flow patterns, as flows would be diverted at certain locations and times of the year in varying amounts in the Salinas River and Reclamation Ditch. Therefore, impact indicators for this assessment are primarily related to changes in flow and resulting potential effects that a reduction of flows would have on steelhead migration and passage, including adult immigration (upstream) and juvenile and smolt outmigration (downstream). Relative changes in modeled flow and predicted changes in frequency of the occurrence of migratory conditions based on flow-based passage criteria, were used as quantitative indicators of potential effects to steelhead as a result of the Proposed Project. The Proposed Project includes construction of facilities to divert flows that may result in construction-related impacts.

Based on review of relevant flow indicators by the EIR consultants (HDR Engineering and Hagar Environmental Science), the following would be indicators of potential significant impacts:

- *Stream Flow Changes* - 10% or greater. A 10% decrease in flow relative to existing conditions was defined as an impact indicator based on previous studies conducted by the U.S. Fish and Wildlife Service, in which reductions in flow of 10% or greater were identified as changes that could be sufficient to reduce habitat quantity or quality to an extent that could significantly affect fish (Trinity River Mainstem Fishery

[1] To comply with applicable federal statutes and authorities, EPA established specific "CEQA-Plus" requirements in the Operating Agreement with SWRCB for administering the State Revolving Fund (SRF) Loan Program.

Restoration Draft EIS/EIR, USFWS et al. 1999 as cited in HDR Engineering, January 2015). The Trinity River EIS/EIR further states, "…[t]his assumption [is] very conservative…[i]t is likely that reductions in streamflows much greater than 10% would be necessary to significantly (and quantifiably) reduce habitat quality and quantity to an extent detrimental to fishery resources." In addition, the San Joaquin River Agreement EIS/EIR (USDOI et al., 1999 as cited in HDR Engineering, January 2015) also used these criteria thresholds that were derived based on the ability to accurately measure stream flow discharges to ±10%. The San Joaquin River Agreement EIS/EIR considered flow changes of less than ±10% to be insignificant. As indicated in the Freeport Regional Water Project Draft EIS/EIR (JSA, 2003 as cited in HDR Engineering, January 2015):

> "Relative to the base case, a meaningful change in habitat is assumed to occur when the change in flow equals or exceeds approximately 10%. The 10% criterion is based on the assumption that changes in flow less than 10% are generally not within the accuracy of flow measurements, and will not result in measurable changes to fish habitat area."

The impact assessment for this EIR relies on previously established information and, therefore, evaluates changes in monthly flow based on differences in frequency of daily flow changes of 10% or greater. Specifically, a change of 10% or greater in long-term flow, as expressed by flow exceedance probabilities, is considered an indicator of potential impact on SCCC steelhead.

It is noted that using an analysis of flow exceedance is complicated by the runoff patterns in coastal streams like the Salinas River. Coastal, rain-dominated streams display substantial variation in flows during most months, as further explained in **Appendix F**. Therefore, substantial flow reductions, as indicated by reductions of 10% or more, occur more frequently at lower flows because small reductions in flow represent a large percentage of the total flow. As such, evaluating only the percentage of time when flow reductions of 10% or more occur may be misleading when considered as an indicator of impacts on biological resources and their habitats because a 10% reduction in flow would not necessarily result in a substantial loss of migratory habitat or a substantial reduction in passage potential, as further discussed below. In such cases, best professional judgment is used to determine whether impacts associated with these reductions would be considered significant.

- *Temporal Considerations* – A change in flow that occurs 10% of the time. Duration and timing are important components of a flow regime, and therefore, evaluating quantitative changes in flow magnitude during an analytical period (i.e., migration periods) could artificially overstate or understate impacts. However, a paucity of information exists regarding site-specific effects of changes in flow over specific durations. Thus, utilizing a change in flow that occurs 10% of the time during an analytical evaluation period was used as an indicator of a duration and timing of flow change that could result in an impact on migrating steelhead.
- *Passage Thresholds* - Changes in minimum flow thresholds needed for steelhead migration. The potential for changes in flows resulting from implementation of the Proposed Project to impact SCCC steelhead in the Salinas River, Reclamation Ditch, and Tembladero Slough is dependent on the ability of the species to use the affected reaches as a migratory corridor. Flow levels that provide suitable conditions for upstream and downstream passage in the Salinas River were established based on available literature and onsite evaluation at potential passage impediments. Migration flows for the Reclamation Ditch were estimated as part the studies conducted for this EIR. These flow values are treated as thresholds, below which passage is impaired, and

serve as indicators of potential impact to passage for upstream migrating adults and downstream migrating juveniles and smolts.

Salinas River. Comparisons of modeled flows for the Proposed Project, relative to the baseline scenario (the Existing Condition scenario), were conducted for the life stages and life history periods for steelhead that are listed below. These time periods were selected to evaluate the bulk of the upstream migration and downstream emigration periods and are intended to encompass the majority of steelhead migration in the affected water bodies, including the peak migration periods, without overestimating impacts.

a. Adult Immigration (December through April)
b. Juvenile and Smolt Emigration (March through June)

For the Salinas River, passage flow indicator values were evaluated based on past studies, including thresholds developed by the Monterey County Water Resources as part of the Salinas Valley Water Project Master EIR, discussed above in **Section 4.4.2.1**. Identified flows for different life stages are summarized on **Table 4.4-2**. Based on this review, **Table 4.4-7, Threshold Flows for Maintenance of Steelhead Migration the Lower Salinas River, Downstream of Spreckels** summarizes the passage flow indicator values considered in evaluating impact significance for maintenance of steelhead migration in Salinas River.

Table 4.4-7
Threshold Flows for Maintenance of Steelhead Migration the Lower Salinas River, Downstream of Spreckels

Life stage	Required Flow Depth	Channel Width	Threshold Flow
Adult Immigration	0.6 feet	25% of channel	72 cfs
Adult immigration	0.6 feet	8 feet (min)	60 cfs
Juvenile and Smolt Emigration	0.4 feet	25% of channel	56 cfs
Juvenile and Smolt Emigration	0.4 feet	8 feet (min)	50 cfs

Reclamation Ditch. The Reclamation Ditch stream channel conditions were found to be primarily ditches or drainage canals that generally have steep side slopes without native riparian vegetation (**Appendix G-1**). Minimum flows for migration of both adult steelhead moving upstream to spawn and smolts moving downstream to the ocean were estimated by Hagar Environmental Science (February 27, 2015, Passage Memo). The estimates were developed based on using channel geometry measurements and the Manning equation to make an approximation of minimum passage flow needs. This method gives an "order-of-magnitude" approximation, but there is a potential for error of +/-30%. The methodology and results are explained in **Appendix G-2**.

Minimum passage flow thresholds were estimated at two critical passage sites: the USGS stream gage weir at San Jon Road and at a site near Boronda Road, both of which are downstream from the proposed Reclamation Ditch Diversion site. For the Reclamation Ditch, migration seasons were defined to encompass the major period for each life stage typical of the Salinas River basin: December through April for adults and March through May for smolts. Passage in Tembladero Slough is not expected to be influenced by a diversion near Castroville since Tembladero Slough is tidal up to this area and backwatering of the channel prevents formation of critical riffles or other shallow locations. **Table 4.4-8, Minimum Passage Flow Estimates (in cfs) for Steelhead Migration in Reclamation Ditch Downstream of Davis Road** summarizes the passage flow indicator values considered in evaluating impact significance and estimates minimum flows for potential steelhead migration in the Reclamation Ditch.

Table 4.4-8
Minimum Passage Flow Estimates (in cfs) for Steelhead Migration in Reclamation Ditch Downstream of Davis Road

Location	Adult	Smolt
San Jon Road (USGS gage weir)	78 cfs	31 cfs
Boronda Road critical riffle	32 cfs	11 cfs
Source: Hagar Environmental Science, Passage Memo (February 27, 2015)		

In summary, a change in stream flow of 10% or more may be considered significant depending on the species and life stages likely to be present, habitat requirements and behavior of those species or life stages, and potential for the given flow change to influence key habitat features. For the purposes of this analysis, the effect of the project would be considered less than significant if it would result in: a change in flow of less than 10%, relative to specific flow thresholds during steelhead adult or smolt migration periods; or changes in flow that occur less than 10% of the time during the analytical period. Furthermore, for an impact to be considered less than significant, implementation of the project must not cause creation of an obstacle or hazard to migrating steelhead (adults or smolts).

The following impact analyses also include qualitative assessment of unquantified components of the flow regime that can be used to characterize the entire range of flows and specific hydrologic phenomena (e.g., floods and low flows) that are vital to the integrity of river ecosystems, thus fish species. These components of the flow regime include: (1) magnitude; (2) frequency; (3) duration; (4) timing; and (5) rate of change of hydrologic conditions. Therefore, while modeled flows are evaluated using specific values as impact indicators (changes in flow of 10% or more, specific flow thresholds), other flow conditions are considered qualitatively in conjunction with quantitative evaluations.

Additionally, the Salinas River, Reclamation Ditch and Tembladero Slough are listed as impaired water bodies pursuant to Section 303(d) of the Clean Water Act for chlorides, pesticides, E. coli, fecal coliform, nitrate, total dissolved solids, turbidity and other factors. Diversion related impacts that could further degrade water quality conditions and impair associated beneficial uses also would be considered an impact indicator.

4.4.4.2 Impact Analysis Overview

Approach to Analysis

The impact assessment addresses impacts on SCCC steelhead, tidewater goby and Monterey roach in the Salinas River, Reclamation Ditch and Tembladero Slough and other water bodies affected by the Proposed Project where these species may be found. The quantitative assessment of potential flow-related impacts included evaluation of: (1) changes in monthly long-term flows (exceedance probability distributions based on hydrologic record of 82 years) using occurrence (>10% of the time) of a 10% or more reduction in simulated diversion scenario flow conditions, relative to a baseline condition as indicators of impact; and (2) differences in occurrence of suitable fish passage conditions using percent reduction in current daily flows from suitable to unsuitable relative to meeting specified SCCC steelhead passage thresholds as summarized on **Table 4.4-7**. Qualitative interpretation of flow changes, relative to general habitat conditions and water quality is also considered in the analysis.

As discussed in **Section 2.7.1.2, Source Water Operation: Diversion, Treatment and Use**, water rights permits from the SWRCB would be required for surface water diversions from the Reclamation Ditch, Blanco Drain, and Tembladero Slough. It is anticipated that the water rights permits for the proposed diversions would be as follows: diversion rate for the Tembladero Slough of up to 3 cfs and diversion rates for the Reclamation Ditch and Blanco Drain of up to 6 cfs.

Three diversion scenarios (A, B and C-Salinas River) were modeled to assess impacts within the Salinas River (HDR Engineering, January 2015), and four diversion scenarios (Cases 1, 2, 3 and 4-Reclamation Ditch) were analyzed for the Reclamation Ditch in addition to the base flow condition (Hagar Environmental Science, February 2015). Diversion scenarios C and Case 2 correspond to the potential worst case conditions that could occur under the Proposed Project; therefore, the modeling results for those scenarios are presented below. Diversion scenarios A and B and Cases 1, 3 and 4 correspond to reduced project alternatives; therefore, the modeling results for those scenarios are presented in the Alternatives chapter of this EIR. The proposed diversions are summarized below. Detailed assumptions associated with each of these scenarios are provided by Schaaf and Wheeler (2014).

- *Salinas River.* The Proposed Project includes: diverting Salinas stormwater prior to discharge into the Salinas River and diverting Salinas Treatment Facility outflow, in addition to up to 6 cfs (but typically only up to 4.6 cfs) from Blanco Drain. The Proposed Project is evaluated relative to the Baseline (Existing) Conditions, which is defined as historic flow in the Salinas River near Spreckels plus the Salinas Industrial Wastewater Treatment Facility (Salinas Treatment Facility) outflow plus Salinas stormwater outfall.
- *Reclamation Ditch*. The Proposed Project includes: diversion of up to 6.0 cfs of available flow from Reclamation Ditch at Davis Road with an in-stream (by-pass) flow requirement of 0.69 cfs in the months of June to November, and 2.0 cfs during the months of December to May for fish migration, and diversion of up to 3.0 cfs of available flow from Tembladero Slough at Castroville with an in-stream (by-pass) flow requirement of 1.0 cfs year-round in Tembladero Slough.

Baseline conditions are based on historic flow data that was obtained from the USGS Spreckels gage (Station 11152500) and from data collected at the Salinas Industrial Wastewater Treatment Facility outflow to the percolation ponds and at the Salinas stormwater outfall. Baseline conditions used in the analysis of the Reclamation Ditch and Tembladero Slough are based on historic flow data obtained at the USGS San Jon Road gage (Station 11152650).

Analytical Methods

The SCCC steelhead impact assessment for the Salinas River relies on historic hydrologic data obtained from the Spreckels gage with assumptions regarding stormwater outfall and Salinas Treatment Facility outflow. By adjusting the data based on these assumptions, the historical data effectively became a baseline hydrologic modeling output against which potential alterations in flow associated with implementation the Proposed Project could be compared. Specifically, the diversion assumptions are applied to the estimated (modeled) baseline flows to obtain a specific set of estimated (modeled) flows associated with each of the diversion scenarios. These “modeled flows” provide a quantitative basis from which to assess the potential impacts of the Proposed Project on SCCC steelhead passage in the Salinas River at the Spreckels gage. Detailed discussion of development of the modeled flows is presented in Schaaf and Wheeler (2014).

Raw model output included estimated daily flow for an 82-year period of record, which were conditioned to aggregate data in meaningful ways for the SCCC steelhead evaluation. Daily estimated flow data were used to develop exceedance probability distributions (exceedance curves) by month. These exceedance probability distributions were developed from ranked and sorted data, and show the percentage of time (probability) that a given value is exceeded. These curves show the general long-term differences in flow between an evaluated diversion associated with the Proposed Project and the baseline conditions.

The assessment for the Reclamation Ditch and Tembladero Slough relies on historic hydrologic data from the San Jon Road gage and modeled flow results. All of the assumptions (e.g., hydrologic conditions, climatic conditions, upstream storage conditions, etc.) are the same for both the with-project and without-project flow estimates, except assumptions associated with each modeled diversion scenario. The period of record is 28 years and is split into October 1970 to February 1986 and June 2002 to the present. Average annual runoff at the San Jon Road gage has declined by almost a third in recent years as water conservation practices have reduced the amount of agricultural irrigation (Schaaf & Wheeler 2014), and therefore, only the 2002-2013 data were used in this analysis.

Areas of No Impact

Construction and operation of the following Proposed Project components would not be located adjacent to water bodies and would have no effect on fish resources: the Product Water Conveyance pipelines and Booster Stations, Injection Well Facilities and CalAm Distribution System pipelines. While construction and operation of the Lake El Estero Diversion is adjacent to Lake El Estero, there are no special status or native species known to occur in the lake. The Treatment Facilities at the Regional Treatment Plant would result in reverse osmosis concentrate discharge; potential impacts to anadromous fish in the marine environment due to reverse osmosis concentrate discharge are discussed in the **Section 4.14**, **Marine Resources**. The Treatment Facilities would not result in impacts to fish resources evaluated in this **Section 4.4**.

The Proposed Project would not result in impacts related to the some of the significance criteria, as explained below.

> *(d) Conflict with Local Policies Protecting Fishery Resources.* (No impact during construction or operations). As shown in **Table 4.4-6,** construction and operations of the Proposed Project would not result in conflicts with local policies addressing protection of fishery resources.
>
> *(e) Conflict with Habitat Conservation Plan or Natural Conservation Community Plan.* There are no adopted Habitat Conservation Plans or Natural Conservation Community Plans within the area of the Proposed Project components that address fishery resources. The "Installation-Wide Multispecies Habitat Conservation Plan at Former Fort Ord" does not include fishery resources and does not include the geographic area of potential impact of the Proposed Project.

Summary of Impacts

Table 4.4-9, Summary of Impacts – Biological Resources: Fisheries provides a summary of potential impacts to terrestrial fishery resources and significance determinations at each Proposed Project component site.

Table 4.4-9
Summary of Impacts – Biological Resources: Fisheries

Impact Title	Source Water Diversion and Storage Site						Treatment Facilities at Regional Treatment Plant	Product Water Conveyance		Injection Well Facilities	CalAm Distribution System		Project Overall
	Salinas Pump Station	Salinas Treatment Facility Storage and Recovery	Reclamation Ditch	Tembladero Slough	Blanco Drain (Pump Station and Pipeline)	Lake El Estero		RUWAP Alignment Option	Coastal Alignment Option		Transfer Pipeline	Monterey Pipeline	
BF-1: Habitat Modification Due to Construction of Diversion Facilities	NI	NI	LSM	LSM	LS	NI	NI	NI	NI	NI	NI	NI	LSM
BF-2: Interference with Fish Migration Due to Project Operations	LS	LS	LSM	LS	LS	NI	NI	NI	NI	NI	NI	NI	LSM
BF-3: Reduction in Fish Habitat or Fish Populations Due to Project Operations	LS	LS	LS	LS	LS	NI	NI	NI	NI	NI	NI	NI	LS
Cumulative Impacts	LS: There would be no significant construction or operational cumulative impacts to biological resources: fisheries.												

NI – No Impact
LS – Less than Significant
LSM – Less than Significant with Mitigation
SU – Significant Unavoidable
BI – Beneficial Impact

4.4.4.3 Construction Impacts and Mitigation Measures

Impact BF-1: <u>Habitat Modification Due to Construction of Diversion Facilities</u>. Construction of the proposed Reclamation Ditch and Tembladero Slough diversions could indirectly result in habitat modifications for endangered or threatened fish species as a result of construction activities and dewatering the construction sites. (Criterion a) (Less than Significant with Mitigation)

Construction of diversion structures at the following sites could result in indirect temporary modifications to potential steelhead fish habitat in the Reclamation Ditch/Tembladero Slough, as discussed below. As previously indicated, the Reclamation Ditch watershed has the potential to

support steelhead trout as potential salmonid habitat exists upstream of the proposed diversion sites. Tidewater goby are not expected to be present in the Reclamation Ditch at the Davis Road site due to its degraded condition and distance upstream from estuarine habitat. However, there is a potential for tidewater goby to be present at the Tembladero Slough diversion site.

Construction at the Blanco Drain Diversion site is addressed below. Construction at the Lake El Estero Diversion site would not be within the water body, and no native or special status fish species have been identified at this location. There would be no construction impacts at the other Proposed Project sites as none are located adjacent to water bodies, and there would be no improvements constructed within an aquatic habitat at those sites.

Source Water Diversion and Storage Sites

Reclamation Ditch

Construction of the Reclamation Ditch Diversion site would include minor grading, installation of a wet well/diversion structure, modification of an existing sanitary sewer manhole and a short pipeline from the existing manhole to the new pump station. The work would disturb approximately 0.15 acres of land, including the Reclamation Ditch banks and channel bottom. The channel carries flows year-round, so a temporary coffer dam would be required above and below the site, with a small diversion pump to convey existing channel flows past the project construction area. The temporary coffer dams would consist of waterproof tarps or membranes wrapped around gravel fill material, which would be removed when the work is completed.

The new pump station wet well, intake structure and pipelines would be constructed using open-trench excavation. The construction excavation may be as large as 40-feet long by 10-feet wide. The below-grade components may use pre-cast concrete structures, so that the underground work could take less than a week to complete. Once the excavations are closed, the channel protection (concrete or riprap) would be installed and the temporary cofferdams and by-pass pumping system removed.

Dewatering the channel by the coffer dam would represent a short-term temporary impact to aquatic habitat and aquatic species within the construction area, including potential steelhead migration habitat. This would be a potentially significant impact if dewatering occurred during steelhead migration periods. Tidewater goby are not expected to be present at the Davis Road construction site due to the degraded condition of the Reclamation Ditch in this location and distance upstream from estuarine habitat. Potential construction-related impacts would be avoided and reduced to less-than-significant levels by implementation of Mitigation Measures BF-1a and BF-1b that would limit construction to periods when migratory steelhead would not be present and implement best management practices (BMPs).

Tembladero Slough

Construction of the Tembladero Slough diversion would include minor grading, installation of a new wet well/diversion structure, modification of the existing wet well at the Castroville Pump Station and construction of a short pipeline from the wet well to the new pump station. The work would disturb approximately 0.25 acres of land, including the Tembladero Slough banks and channel bottom. The channel carries flow year-round, so a temporary coffer dam would be required around the site, with a small channel left open to allow flows past the project construction site. The temporary coffer dams may consist of geomembrane tubes filled with water or driven sheet piles, depending upon the site conditions. Any cofferdam installed would be removed when the work is completed.

The new pump station wet well, intake structure and pipelines would be constructed using open-trench excavation. The construction excavation may be as large as 100-feet long by 10-feet

wide. The below-grade components may use pre-cast concrete structures, so that the underground work could take less than a week to complete. Once the excavations are closed, the channel protection (concrete or riprap) would be installed and the temporary cofferdams and dewatering pumping system removed. Modification of the existing pump station wet well may require by-pass pumping of the existing wastewater flows within the pump station. The new pipeline connecting the new pump station to the existing wet well would be installed using open trench methods.

Dewatering the channel to complete construction of the in-channel structures would represent a short-term temporary impact to aquatic habitat and aquatic species within the construction area. This would be a potentially significant impact if dewatering occurred during steelhead migration periods. In addition to potential steelhead migration habitat, there is a potential for tidewater goby to be present at the Tembladero Slough diversion site. Effects could be avoided and minimized to less than significant levels by implementation of Mitigation Measures BF-1a and BF1-b.

Blanco Drain

Construction of the Blanco Drain Diversion would include minor grading, installation of a new wet well/diversion structure, installation of a new force main and gravity pipelines by open trench and by trenchless methods. The work would temporarily disturb approximately 0.15 acres of land at the existing pump station site, including the Blanco Drain banks and channel bottom. The channel carries flow year-round, so a temporary coffer dam would be required above the site, with a small diversion pump to convey existing channel flows past the project construction site and the existing slide gate downstream of the adjacent Monterey County Water Resources Agency pump station.

The new pump station wet well, intake structure and on-site pipelines would be constructed using open-trench excavation. Once the excavations are closed, the channel protection (concrete or riprap) would be installed and the temporary cofferdam and by-pass pumping system removed. Pipeline construction would not occur in an aquatic environment, and no dewatering would be required.

No special status fish species have been identified in Blanco Drain. Therefore, no impact on aquatic habitat and aquatic species, including special status species, would result from the construction of the Blanco Drain Diversion site improvements.

Impact Conclusion

The Proposed Project construction would result in a potentially significant impact to potential aquatic habitat for the federally threatened SCCC steelhead DPS species, if present, in the Reclamation Ditch and Tembladero Slough due to channel dewatering and construction of the proposed diversion structures at these sites. Additionally, the federally endangered tidewater goby may be present at the Tembladero Slough Diversion site. No special status species have been identified in Blanco Drain.

Generally, dewatering the channel to complete construction of the in-channel structures would represent a short-term temporary modification to aquatic habitat through alteration of the channel and/or flows during construction, with potential harm to individual fish that may be present within the construction area. Construction activities may also result in temporary degradation of water quality due to erosion or other materials entering the water course, which is addressed in **Section 4.11, Hydrology/Water Quality: Surface Water**. With implementation of Mitigation Measure BF-1a: Construction during Low Flow Season**,** potential impacts to migrating steelhead would be avoided. Implementation of

Mitigation Measure BF-1b: Removal of Aquatic Species during Construction, would reduce impacts to a less-than-significant level for other aquatic fish species that may be present at any of the sites, including conducting pre-construction surveys for tidewater goby at the Tembladero Slough Diversion site. If present, appropriate measures would be implemented in consultation with the regulatory agencies, and the impact would be reduced to a less-than-significant level.

Mitigation Measures

Mitigation Measure BF-1a: Construction during Low Flow Season. (Applies to Reclamation Ditch and Tembladero Slough Diversions)

Conduct construction of diversion facilities during periods of low flow outside of the SCCC steelhead migration periods, i.e. between June and November, which would be outside of the adult migration period from December through April and outside of the smolt migration period from March through May.

Mitigation Measure BF-1b: Relocation of Aquatic Species during Construction. (Applies to Reclamation Ditch and Tembladero Slough Diversions)
Conduct pre-construction surveys to determine whether tidewater gobies or other fish species are present, and if so, implement appropriate measures in consultation with applicable regulatory agencies, which may include a program for capture and relocation of tidewater gobies to suitable habitat outside of work area during construction.

4.4.4.4 Operational Impacts and Mitigation Measures

Impact BF-2: Interference with Fish Migration. Operation of the Proposed Project would result in changes in stream flows that may interfere with fish migration in the Salinas River and Reclamation Ditch. (Criterion b) (Less than Significant with Mitigation)

The following Proposed Project components would affect flows in the Salinas River by changing existing flows and/or adding new diversions: Salinas Pump Station, Salinas Treatment Facility, and Blanco Drain Diversion. The proposed Reclamation Ditch Diversion would affect flows in the Reclamation Ditch. Impacts are addressed below by watershed. None of the other Proposed Project facilities would result in operations that would affect stream flows.

Salinas River

The Salinas Pump Station and Blanco Drain Diversions, as well as changes to flows at the Salinas Treatment Facility site would affect the amount of flow in the Salinas River. While flows in the Salinas River would change under the Proposed Project, the change would not result in significant impacts to fish migration flows as explained below. See **Appendix F** (Scenario C) for a full discussion.

Operation of the Proposed Project would reduce flow in the Salinas River by diverting City of Salinas stormwater (at River Mile 11.2), Salinas Treatment Facility inflow (RM 9.2-10.7) and 6.0 cfs from Blanco Drain (RM 5.1). Overall, operation of the Proposed Project would divert less than 2% of the baseline mean annual flow in the Salinas River (Schaaf and Wheeler 2014). Due to the flashy nature of runoff in the Salinas River, the majority of flow occurs during a very brief period. During the rest of the time, flows in the Salinas River are relatively low. Because flows in the River are below 90 cfs much of the time, reductions in flow of 10% or more would occur

during all months of the SCCC steelhead adult immigration and juvenile outmigration periods under the Proposed Project.

Given that a reduction in 10% of river flows would occur for more than 10% of the time, additional analysis was needed to determine whether a significant impact would occur. Reduction in suitable fish passage conditions under the Proposed Project was evaluated based on the identified passage flow indicator values as shown on **Table 4.4-7**. The number and percentage of days in each month (over the entire 82-year period of record) were identified when the Proposed Project would result in flows below a migratory flow threshold. The model results show that under the Proposed Project, suitable adult migration flows would be reduced below each of the passage flow indicator values less than 2.0% of the time and juvenile migration flows would be reduced below each of the passage flow indicator values less than 3.0% of the time, both relative to existing conditions, as summarized on **Table 4.4-10, Predicted Changes to Steelhead Passage Flow Thresholds in the Salinas River**. Although the percent of flow reductions would vary by month for all indicator flows, changes within any month all would be less than 6.7% with the highest change in December. Thus, the change in flows under the Proposed Project would not result in significant impacts to steelhead migration in the Salinas River.

Reclamation Ditch and Tembladero Slough

The Reclamation Ditch flows west into the Tembladero Slough; therefore the aquatic habitat and species of these waterbodies are interconnected. The Reclamation Ditch Diversion and the Tembladero Slough Diversion have been analyzed together because of this relationship. The analysis evaluates impacts to adult and smolt migration resulting from the alteration of flows due to these two diversions, consisting of diversion of up to 6.0 cfs of available flow from Reclamation Ditch at Davis Road with an in-stream (by-pass) flow requirement of 0.69 cfs in the months of June to November and 2.0 cfs during the months of December to May for fish migration, and diversion of up to 3.0 cfs of available flow from Tembladero Slough at Castroville with an in-stream (by-pass) flow requirement of 1.0 cfs year-round in Tembladero Slough. The most difficult passage (migration) conditions would be at the San Jon Road stream gage located downstream of the Reclamation Ditch Diversion site.

The Tembladero Slough diversion would result in flow reductions in Tembladero Slough downstream of the diversion site. However, migration flows for both adult and smolt steelhead would be more of an issue in the Reclamation Ditch upstream of Tembladero Slough; the diversion at Tembladero Slough would have less effect on steelhead migration than the diversion at the Reclamation Ditch site since Tembladero Slough has a very low gradient downstream of the Tembladero Slough Diversion and there are no critical passage sections such as the riprap and gaging weir at San Jon Road upstream. Additionally, Tembladero Slough is tidally influenced from the Old Salinas River up to Highway 183 in Castroville, and the backwater condition caused by the tide gates would prevent measurable reductions in water levels throughout that reach (Schaaf & Wheeler 2014). Therefore, diversion at Tembladero Slough would not adversely affect downstream areas with regards to steelhead migration.

During the smolt migration period, flows at the Reclamation Ditch Diversion site are generally lower than during the adult migration period and a proportional reduction in flow from the diversion would be greater. Although smolts need less flow to migrate in the Reclamation Ditch than adults, the channel is severely lacking in cover and smolts are exposed to potential predation from birds. Minimum migration flow for smolts is estimated at between 11 cfs and 31 cfs, depending on location as shown on **Table 4.4-8,** with the most difficult passage at the San Jon Road stream gage. Proportional reductions in flow can be quite large in this range.

Table 4.4-10
Predicted Changes to Steelhead Passage Flow Thresholds in the Salinas River (Scenario C)

Life stage/ Period	Number of days meeting threshold		Percent of potential migration period meeting threshold		Change in percentage of potential migration period meeting threshold (%)	Reduction in number of days meeting threshold relative to baseline	Reduction in threshold occurrence relative to baseline (%)
	Baseline	Scenario C	Baseline	Scenario C			
Adult Upstream Migration							
60 cfs threshold							
Dec	508	474	19.7	18.4	1.3	34	6.7
Jan	1,160	1,130	45.6	44.5	1.2	30	2.6
Feb	1,430	1,402	61.7	60.5	1.2	28	2.0
Mar	1,524	1,511	60.0	59.4	0.5	13	0.9
Apr	1,151	1,137	46.8	46.2	0.6	14	1.2
All	5,773	5,654	46.4	45.5	1.0	119	2.1
72 cfs threshold							
Dec	467	441	18.2	17.1	1.0	26	5.6
Jan	1,111	1,083	43.7	42.6	1.1	28	2.5
Feb	1,397	1,373	60.3	59.3	1.0	24	1.7
Mar	1,498	1,484	58.9	58.4	0.6	14	0.9
Apr	1,125	1,107	45.7	45.0	0.7	18	1.6
All	5,598	5,488	45.0	44.1	0.9	110	2.0
Juvenile Downstream Migration							
50 cfs threshold							
Mar	1,555	1,530	61.2	60.2	1.0	25	1.6
Apr	1,179	1,158	47.9	47.0	0.9	21	1.8
May	762	716	30.0	28.2	1.8	46	6.0
Jun	284	272	11.5	11.0	0.5	12	4.2
All	3,780	3,676	37.8	36.8	1.0	104	2.8
56 cfs threshold							
Mar	1,539	1,515	60.5	59.6	0.9	24	1.6
Apr	1,166	1,145	47.4	46.5	0.9	21	1.8
May	720	687	28.3	27.0	1.3	33	4.6
Jun	275	257	11.2	10.5	0.7	18	6.5
All	3,700	3,604	37.0	36.0	1.0	96	2.6

Project-related flow reductions during the dry season (June-September) would exceed 10% of flows simulated at the Reclamation Ditch and Tembladero Slough Diversion sites. However, special status species are not expected to be present in the Reclamation Ditch downstream of the Reclamation Ditch Diversion site during the dry season. Steelhead use these reaches only for migration during the winter and spring, and potential dry season rearing habitat exists only in headwater reaches. There is a limited potential for tidewater goby near or downstream of the Tembladero Slough Diversion site. Since goby prefer quiescent conditions, and since the channel is tidally backwatered in this reach, flow reductions in the range simulated would not be expected to have a detrimental effect on them, should they be present. Native and introduced warmwater species likely to be present are not migrating during this period. The proposed 1 cfs minimum flow would maintain base habitat conditions for species likely to be present. Therefore, flow changes as a result of operation of the Proposed Project during the dry season would result in a less than significant impact on fish migration in this area.

The largest proportional flow reductions during adult migration would occur in the range of 1 to 60 cfs. Flow reductions for the existing condition of 60 cfs or less would be 10% or more for the Reclamation Ditch. The combined Reclamation Ditch Diversion and diversion at Tembladero Slough would result in larger flow reductions in Tembladero Slough and downstream reaches to Monterey Bay with flow reductions of 10%.

Assuming a minimum passage flow of 78 cfs at the San Jon Road stream gage site, it is estimated that there would be reductions of 0% to 22% (average 13%) in the number of days annually meeting the minimum migration threshold for adult steelhead as shown on **Table 4.4-11, Stimulated Number of Days Reclamation Ditch Flows Meet Steelhead Migration Criteria at San Jon Road**. The number of potential migration days would be reduced in 10 years out of the 11 modeled and in 8 years the reduction would be 10% or more. Although the actual number of days involved generally would be small (1 to 4 fewer days meeting migration criteria), the migration windows are also relatively short. Given the species status as threatened, a change in flow of this magnitude (10% or more reduction in migration periods in 73% of years) is potentially significant for migrating adult steelhead.

Based on a minimum passage flow for smolts of 31 cfs at the San Jon Road site, the number of days with flows meeting minimum smolt passage criteria is reduced by 0% to 15% annually or 9% on average as shown on **Table 4.4-11**. The reduction is 10% or more in 2 of the 11 years simulated. Flow alterations of this magnitude during the smolt migration period, particularly given the sensitivity of smolts migrating through this degraded habitat, would be potentially significant downstream of the Reclamation Ditch Diversion site.

Table 4.4-11
Stimulated Number of Days Reclamation Ditch Flows Meet Steelhead Migration Criteria at San Jon Road

Year	Number of Days Meeting Adult Migration Criteria (78 cfs) (And percent reduction from Existing Conditions) Migration Period: Dec. 1st through Apr. 30th		Number of Days Meeting Smolt Migration Criteria (31 cfs) (And percent reduction from Existing Conditions) Migration Period: Mar. 1st through May 3lst	
	Existing Conditions	Proposed Project	Existing Conditions	Proposed Project
2003	8	7 (-13%)	4	4 (0%)
2004	11	10 (-9%)	2	2 (0%)
2005	31	28 (-10%)	19	18 (-5%)
2006	22	18 (-18%)	41	35 (-15%)
2007	1	1 (0%)	0	0 (0%)
2008	10	9 (-10%)	0	0 (0%)
2009	8	7 (-13%)	5	5 (0%)
2010	17	16 (-6%)	17	16 (-6%)
2011	22	19 (-14%)	15	13 (-13%)
2012	5	4 (-20%)	9	9 (0%)
2013	9	7 (-22%)	0	0 (0%)
Total	144	126 (-13%)	112	102 (-9%)

Impact Conclusion

The Proposed Project diversions would result in a reduction of flows in the Salinas River and Reclamation Ditch. Reduction of flows in the Salinas River due to diversions of City of Salinas stormwater and Salinas Treatment Facility flows with diversions at Blanco Drain would result in reduction of flows during the SCCC steelhead adult immigration period by 1.0 to 2.8% and during the juvenile outmigration period by about 1.3 to 2.8%, relative to existing conditions, which is below the significance criteria for flow reduction related to migration flows. Therefore, in consideration of the timing, frequency, magnitude, and duration of flow changes, these changes would not result in substantial impacts on SCCC steelhead within the Salinas River, and would not result in a significant impact on fish migration.

However, flow reductions in the Reclamation Ditch would result in potentially significant impacts to both adult and juvenile steelhead migration due to flow reductions that exceed 10% and significant reductions in the days in which fish passage could occur. Implementation of Mitigation Measure BF-2a: Maintain Migration Flows or Mitigation Measure BF-2b: Redesign San Jon Weir to Improve Fish Passage would reduce impacts to steelhead migration in the Reclamation Ditch to a less-than-significant level.

Mitigation Measures

Mitigation Measure BF-2a: Maintain Migration Flows. (Applies to the Reclamation Ditch Diversion)

Operate diversions to maintain steelhead migration flows in the Reclamation Ditch based on two criteria – one for upstream adult passage in Jan-Feb-Mar and one for downstream juvenile passage in Apr-May. For juvenile passage, the downstream

passage shall have a flow trigger in both Gabilan Creek and at the Reclamation Ditch, so that if there is flow in Gabilan Creek that would allow outmigration, then the bypass flow requirements, as measured at the San Jon Gage of the Reclamation Ditch, shall be applied (Hagar Environmental Science. February 27, 2015, Technical Memorandum: Estimation of Minimum Flows for Migration of Steelhead in the Reclamation Ditch (Appendix G-2). If there is no flow in Gabilan Creek, then only the low flow (minimum bypass flow requirement as proposed in the project description) shall be applied, and these flows for the dry season at Reclamation Ditch as measured at the San Jon USGS gage shall be met.

Alternately, as the San Jon weir located at the USGS gage is considered a barrier to steelhead migration and the bypass flow requirements have been developed to allow adult and smolt steelhead migration to have adequate flow to travel past this obstacle, if the weir were to be modified to allow steelhead passage, the mitigation above would not have to be met. Therefore, alternate Mitigation Measure BF-2a has been developed, as follows:

Mitigation Measure Alternate BF-2a: Modify San Jon Weir. (Applies to the Reclamation Ditch Diversion)

Construct modifications to the existing San Jon weir to provide for steelhead passage. Modifications could include downstream pool, modifications to the structural configuration of the weir to allow passage or other construction, and improvements to remove the impediment to steelhead passage defined above.

The construction impacts of Mitigation Measure Alternate BF-2a, if chosen, could result in a potentially significant impact to potential aquatic habitat for the federally threatened SCCC steelhead DPS species, if present, in the Reclamation Ditch due to channel dewatering and construction of the modifications to the existing San Jon weir to provide for steelhead passage. Application of Mitigation Measure BF-1a: Construction during Low Flow Season and Mitigation Measure BF-1b: Removal of Aquatic Species during Construction, would be applicable and the impacts would be reduced to a less-than-significant level.

It is also noted that the primary objective of the project is to produce replacement water to California American Water Company (CalAm) thereby enabling CalAm to reduce its diversions from the Carmel River system by this same amount. Reduction of diversions in the Carmel River would have a beneficial impact on river flows and fishery habitat. The Proposed Project would have net beneficial effects on special-status species in the Carmel River system and a less than significant impact on the special-status fisheries species in the Salinas River system.

Impact BF-3: Reduction in Fish Habitat or Fish Populations Due to Project Operations. Operation of the Proposed Project diversions would not reduce the habitat of a fish species or substantially affect fish populations. (Criterion c) (Less than Significant)

Project operation would not result in reduction of fish habitat. As discussed above under Impact BF-2, the Proposed Project would result in changes to flows in the Salinas River and Reclamation Ditch with operation of the following project components: Salinas Pump Station, Salinas Treatment Plant, and Reclamation Ditch, Blanco Drain and Tembladero Slough Diversions. However, this reduction would not reduce fish habitat, and changes to steelhead migration flows would be less than significant in the Salinas River and less than significant with implementation of recommended mitigation measures in the Reclamation Ditch.

For each of the analyzed scenarios for the Salinas River, there is a limited potential for tidewater goby and Monterey roach to occur in the Salinas River downstream of the project component sites. Since these species prefer quiescent conditions, flow reductions would not be expected to have a detrimental effect on them, should they be present (HDR Engineering, January 2015).

There is a limited potential for tidewater goby near or downstream of the Tembladero Slough Diversion site. Since goby prefer quiescent conditions, and since the channel is tidally backwatered in this reach, flow reductions in the range simulated would not be expected to have a detrimental effect on them, should they be present. Native and introduced warmwater species likely to be present are not migrating during this period. The minimum flows that will be provided will maintain base habitat conditions for species likely to be present.

Additionally, diversion of stormwater and industrial water would not result in a significant impact on water quality in the Salinas River under any of the scenarios analyzed. Schaaf and Wheeler (2014) reported that the stormwater runoff is generally of equal or better quality than the Salinas River, and that stormwater runoff meets the Central Coast RWQCB Basin Plan objectives in most categories. In the categories of turbidity and orthophosphate, it exceeds the Basin Plan objectives but is below the average concentration in the receiving stream. Although the stormwater runoff may slightly improve the quality of the water in the river during storm events, the Salinas River basin is so large and the flows during storm events are so high (100 to ten thousand cubic feet per second) diverting urban stormwater runoff to the Proposed Project would not have an adverse impact on water quality within the Salinas River (Schaaf & Wheeler, 2015a). Diverting stormwater runoff to the Proposed Project would also not adversely degrade fish or aquatic habitat within the Salinas River (HDR Engineering, January 2015).

Effluent from the industrial treatment facility is also generally of equal or better quality than the Salinas River. The exception in this case is Total Dissolved Solids (TDS), which exceeds both the Basin Plan objective and the existing quality of the Salinas River. Diversion of industrial wastewater to the Proposed Project may result in reduced TDS levels in the river, particularly in summer months during low flow periods and outside the steelhead migration periods. Under the current condition described in detail in **Section 4.11.2** with increased flows released from the reservoirs to the Salinas River Diversion Facility during the summer months, the industrial facility inflows represent a smaller percentage of the total streamflow and the water quality changes due to their elimination as influent to the river would be less than if flow were not managed (Schaaf & Wheeler, 2015a). Thus, removing stormwater runoff and effluent from the industrial treatment facility should have no appreciable effect on water quality within the Salinas River (HDR Engineering, January 2015).

The diversion inlet at the Reclamation Ditch, Tembladero Slough and Blanco Drain Diversion sites would be screened to minimize entrainment of fish (Schaaf & Wheeler 2014). The screening system would be in compliance with Statewide Fish Screening Policy and Fish Screening Criteria developed by CDFW for structure placement, approach velocity, sweeping velocity, screen openings, and screen construction. The Statewide Fish Screening Policy is structured to comply with existing fish screening statutes, the Federal Endangered Species Act (ESA), the California Endangered Species Act (CESA), and court decisions in place at the time of its adoption. Compliance with these policies and criteria would reduce potential effects of the diversion structure to less than significant levels. Due to the possibility of migrating steelhead in the Reclamation Ditch, this diversion facility would also be in compliance with NMFS Anadromous Salmonid Passage Facility Design criteria and specifications (NMFS 2008). Compliance with these policies and criteria would insure that potential effects of the Reclamation Ditch Diversion structure will be less than significant.

As a result, the Proposed Project would not reduce fish habitat or cause fish populations to drop below self-sustaining levels, or threaten to eliminate a fish community or reduce or restrict the range of a fish species. Therefore, this is a less-than-significant impact, and no mitigation measures are required.

4.4.4.5 Cumulative Impacts

The geographic scope for cumulative impact analysis on fishery biological resources consists of those projects that may affect steelhead, tidewater goby or other fishery species in the Salinas River or Reclamation Ditch. Based on the list of cumulative projects provided in **Table 4.1-2, Project Considered for Cumulative Analysis** (see **section 4.1, Introduction**), the only cumulative project that would result in diversions and/or construction adjacent to these water bodies is the Salinas Valley Water Project Phase 2 (**#2** as identified on **Table 4.1-2**). Cumulative project locations are shown on **Figure 4.1.1, Cumulative Projects Location Map**. The Proposed Project construction currently is estimated to be from mid-summer 2016 through 2017. None of the identified cumulative projects are known to have overlapping construction schedules, except for the Monterey Peninsula Water Supply Project (MPWSP), the City of Salinas Solar Project, and the Dunes on Monterey Bay.

The discussion of cumulative impacts is organized to address the combined impacts of the Proposed Project plus the MPWSP (with the 6.4 mgd desalination plant) and then to address the overall combined impacts of the Proposed Project and all relevant projects identified on **Table 4.1-2** for the cumulative analysis:

- *Combined Impacts of Proposed Project Plus MPWSP* (with 6.4 mgd Desalination Plant) (referred to as the MPWSP Variant):[2] The CalAm Monterey Peninsula Water Supply Project includes: a seawater intake system; a source water pipeline; a desalination plant and appurtenant facilities; desalinated water conveyance facilities, including pipelines, pump stations, and a terminal reservoir; and an expanded ASR system, including two additional injection/extraction wells (ASR-5 and ASR-6 Wells), a new ASR Pump Station, and conveyance pipelines to convey between the well. The CalAm Distribution Pipelines (Transfer and Monterey) would be constructed for either the MPWSP or GWR project. The cumulative impact analysis in this EIR anticipates that the Proposed Project could be combined with a version of the MPWSP that includes a 6.4 mgd desalination plant. Similarly, the MPWSP EIR is evaluating a "Variant" project that includes the proposed CalAm Facilities (with the 6.4 mgd desalination plant) and the Proposed Project. The impacts of the Variant are considered to be cumulative impacts in this EIR. The CalAm and GWR Facilities that comprise the MPWSP Variant are shown in **Appendix Y**.
- *Overall Cumulative Projects*: This impact analysis is based on the list of cumulative projects provided on **Table 4.1-2,** (see **Section 4.1, Introduction**). The overall cumulative impacts analysis considers the degree to which all relevant past, present and probable future projects (including the MPWSP with the 6.4 mgd desalination plant) could result in impacts that combine with the impacts of the Proposed Project.

Combined Impacts of Proposed Project Plus MPWSP (with 6.4 mgd Desalination Plant). Both the MPWSP Desalination Plant and the Proposed Project Treatment Facilities at the Regional

[2] The October 2012 Notice of Preparation of an EIR for the MPWSP describes an alternative to the MPWSP that would include a smaller desalination plant combined with the Proposed GWR Project (CPUC, 2012). Based on ongoing coordination with the CPUC's EIR consultants, this alternative is referenced as the "Variant" and includes a 6.4 mgd desalination plant that was proposed by CalAm in amended application materials, submitted in 2013 to the CPUC (CPUC, 2013).

Treatment Plant would be located in the unincorporated area of Monterey County within a distance of approximately 0.5 miles. The Transmission Pipeline component of the MPWSP would be in the similar location as a segment of the Proposed Project Product Water Conveyance Coastal Alignment pipeline along the Transportation Agency's rail line corridor. Both the MPWSP and GWR projects include installation of new wells in the Seaside area. However, the well locations would be located approximately 0.5 miles from each other. The estimated construction schedules for the two projects could overlap for approximately 18 months, from mid-summer 2016 to the end of 2017.

Table 4.4-9 provides a summary of potential impacts to terrestrial fishery resources and significance determinations at each GWR Proposed Project component site.

The proposed Monterey Peninsula Water Supply Project (desalination facility) would not result in the placement of structures within creeks, rivers, or other waterways, nor would it affect inland fish or migration. Therefore, the proposed MPWSP Desalination Plant would not impact fisheries resources.

Overall Cumulative Impacts. Cumulative projects are shown on **Table 4.1-2** (see **Section 4.1**), and cumulative project locations are shown on **Figure 4.1.1 Cumulative Projects Location Map.** The cumulative projects are cross-referenced (in parentheses) to the project number on **Table 4.1-2**. The overall cumulative impact analysis considers impacts of the proposed project along with the potential impacts of "related projects" or other projects that are reasonably foreseeable to take place near the Proposed Project. As indicated above, the only cumulative project that would result in diversions and/or construction adjacent to the Salinas River or Reclamation Ditch is the Salinas Valley Water Project Phase 2. The Salinas Valley Water Project, Phase II proposes to use the water right of Monterey County Water Resources Agency (assigned in Water Right Permit 11043) by further developing surface water resources that will be used to offset groundwater pumping. This project, which is expected to be operational in the year 2026, would allow MCWRA to facilitate further offsets of groundwater pumping by delivering additional surface water to the Pressure and East Side subareas. The project would divert up to 135,000 acre-feet per year of water from the Salinas River for municipal, industrial, and/or agricultural uses in the Pressure and East Side subareas. Continued alleviation of groundwater pumping through use of the diverted surface water would help combat seawater intrusion in Monterey County. The project proposes two surface water diversion points and their appurtenant facilities for capture, conveyance, and delivery of the water. The capture and diversion facilities would consist of either a surface water diversion facility, similar to the existing Salinas River Diversion Facility, or subsurface collectors, such as radial arm wells, which has not been determined (MCWRA, 2015).

The environmental review process for the Salinas Valley Water Project Phase 2 has been initiated, but a public review Draft EIR has not been released. It is not known at this time what impacts the Salinas Valley Water Project Phase may have on fishery resources. As part of the Salinas Valley Water Project goals to minimize impacts to federally threatened steelhead and its critical habitat, MCWRA developed flow prescriptions to facilitate and enhance steelhead migration (Monterey County Water Resources Agency, 2005). The flow prescriptions were reviewed by the National Marine Fisheries Service (NMFS) and incorporated in NMFS' Biological Opinion for the Salinas River Diversion Facility Project (National Marine Fisheries Service, 2007).

The flow prescriptions rely on triggers based on a combination of reservoir flows and stream flows regarding steelhead upstream and downstream migration as permit conditions associated with operating the Salinas River Diversion Facility. Prior to permit and operation, the Salinas Valley Water Project Phase 2 would be required to consult with the U. S. Fish and Wildlife

Service (USFWS) and/or National Marine Fisheries Service (NMFS) to determine whether the project will have any direct or indirect effects on federally listed threatened, endangered, or candidate species at project sites and surrounding areas and identity measures to reduce such effects. Due to requirements of the federal and state Endangered Species Acts, prescriptions and requirements will be imposed on the Salinas Valley Water Project Phase 2 and MCWRA to maintain river flows to support steelhead migration habitat, similar to the MCWRA's current flow prescriptions and timing which are tied to the steelhead life cycle within the Salinas River (Monterey County Water Resources Agency, 2005).

None of the other cumulative projects listed in **Table 4.1-2** involve increases in surface water diversions. The Proposed GWR Project would not result in significant adverse effects to fishery resources in the Salinas River and, as explained above, the MCWRA would be required to maintain flows protective of special status fish species in connection with implementation of the Salinas Valley Water Project Phase 2, if that project is approved. Therefore, no significant cumulative impacts to fishery resources in the Salinas River are anticipated.

Cumulative Impact Conclusion

The Proposed Project and one of the cumulative projects listed in **Table 4.1-2** could result in combined impacts on Salinas River flows. The Proposed Project and the Salinas Valley Water Project Phase 2 both would involve changes to surface flows that would occur in the Salinas River. As discussed above under **Impact BF-2**, the Proposed Project would result in minor changes to flows in the Salinas River. However, this reduction would not reduce fish habitat, and changes to steelhead migration flows would be less than significant in the Salinas River.

New projects involving diversions from the Salinas River will be subject to obtaining water rights and appropriate permits from the State Water Resources Control Board as well as environmental restrictions to maintain adequate flow for steelhead passage tied to the steelhead life cycle. New projects would be required to maintain and monitor river flows to support steelhead migration habitat, similar to the MCWRA's flow prescriptions and MCWRA's existing monitoring program. Flow prescriptions will be carefully reviewed and adjusted as necessary based on project–level environmental mitigation and permit conditions. This may include additional monitoring and/or metering of surface water diversions as well as effects on flows in downstream water bodies. Permit conditions imposed and required by SWRCB water rights permits and consultation under the Endangered Species Act will also prescribe surface water management measures that would reduce impacts. With the requirements for mitigation and maintenance of adequate flows for fish migration, the Proposed Project and the Salinas Valley Water Project Phase 2 would not be expected to result in a significant cumulative impact to fish species and fish habitat.

4.4.5 References

California Public Utilities Commission (CPUC), 2012. Notice of Preparation of an Environmental Impact Report for the CalAm Monterey Peninsula Water Supply Project. October 2012.

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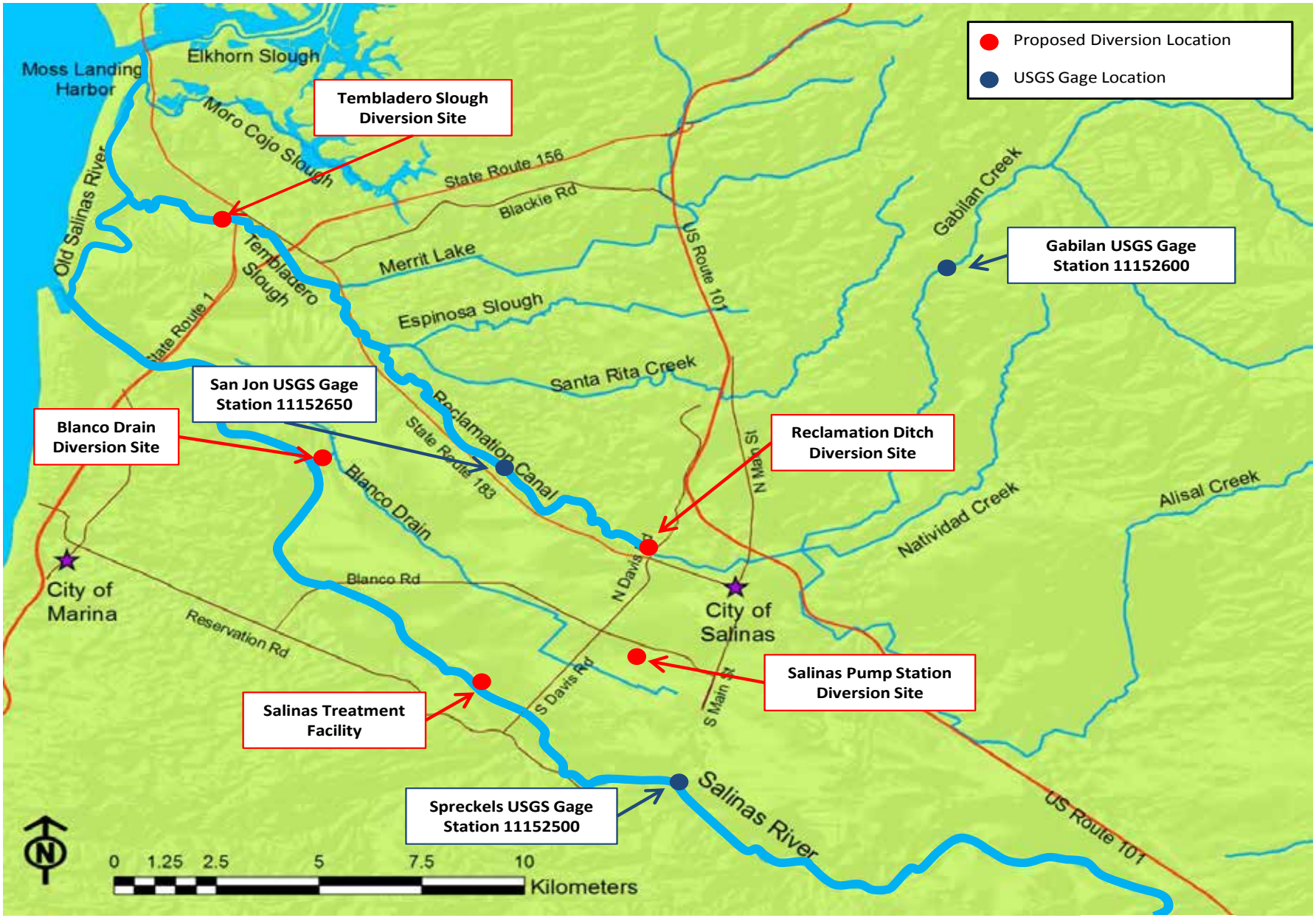

Central Coast Watershed Studies, 2011

Salinas River Watershed In Project Vicinity

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure
4.4-1

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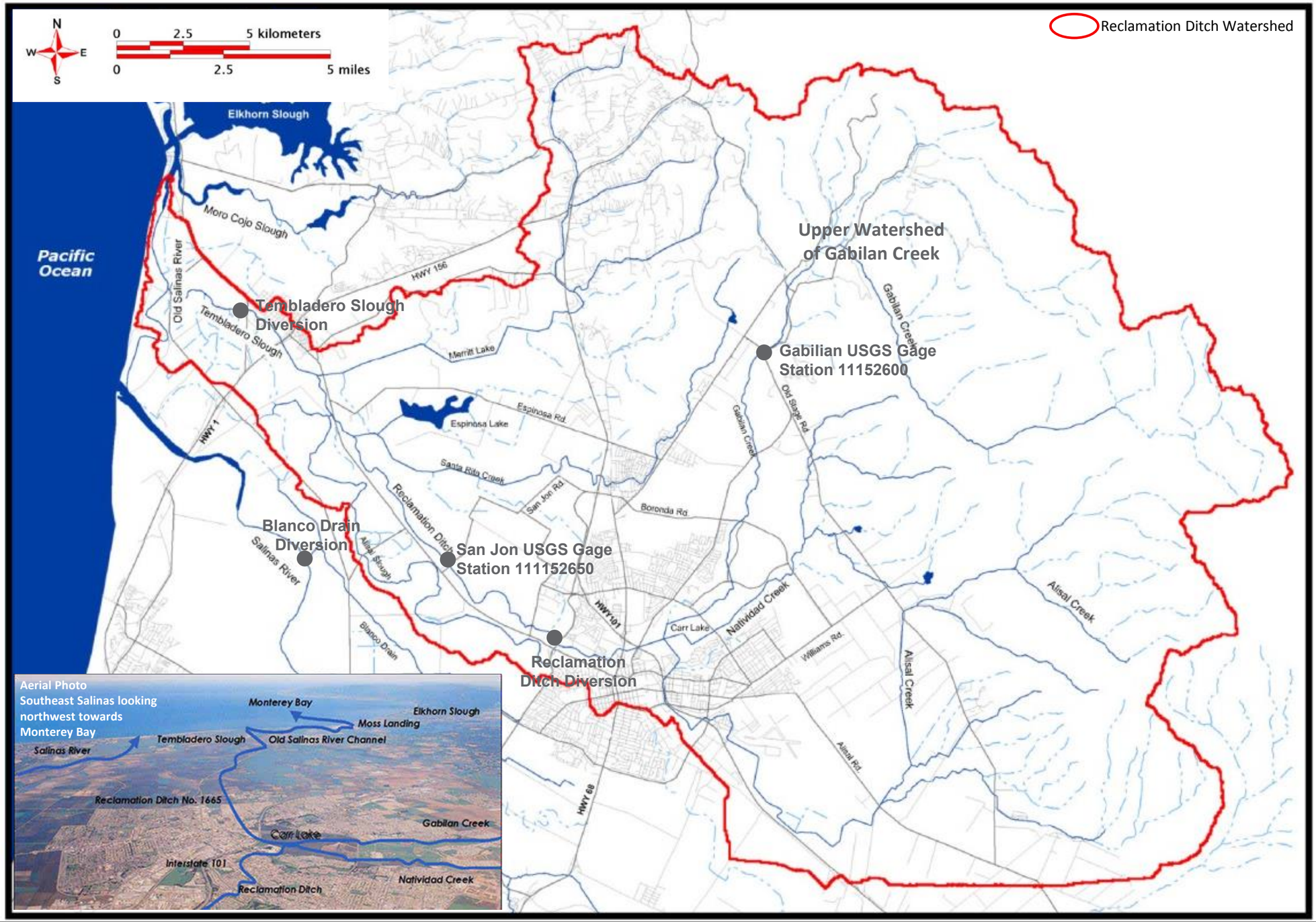

Source: CCoWS, 2014

DD&A

Reclamation Ditch Watershed

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure
4.4-2

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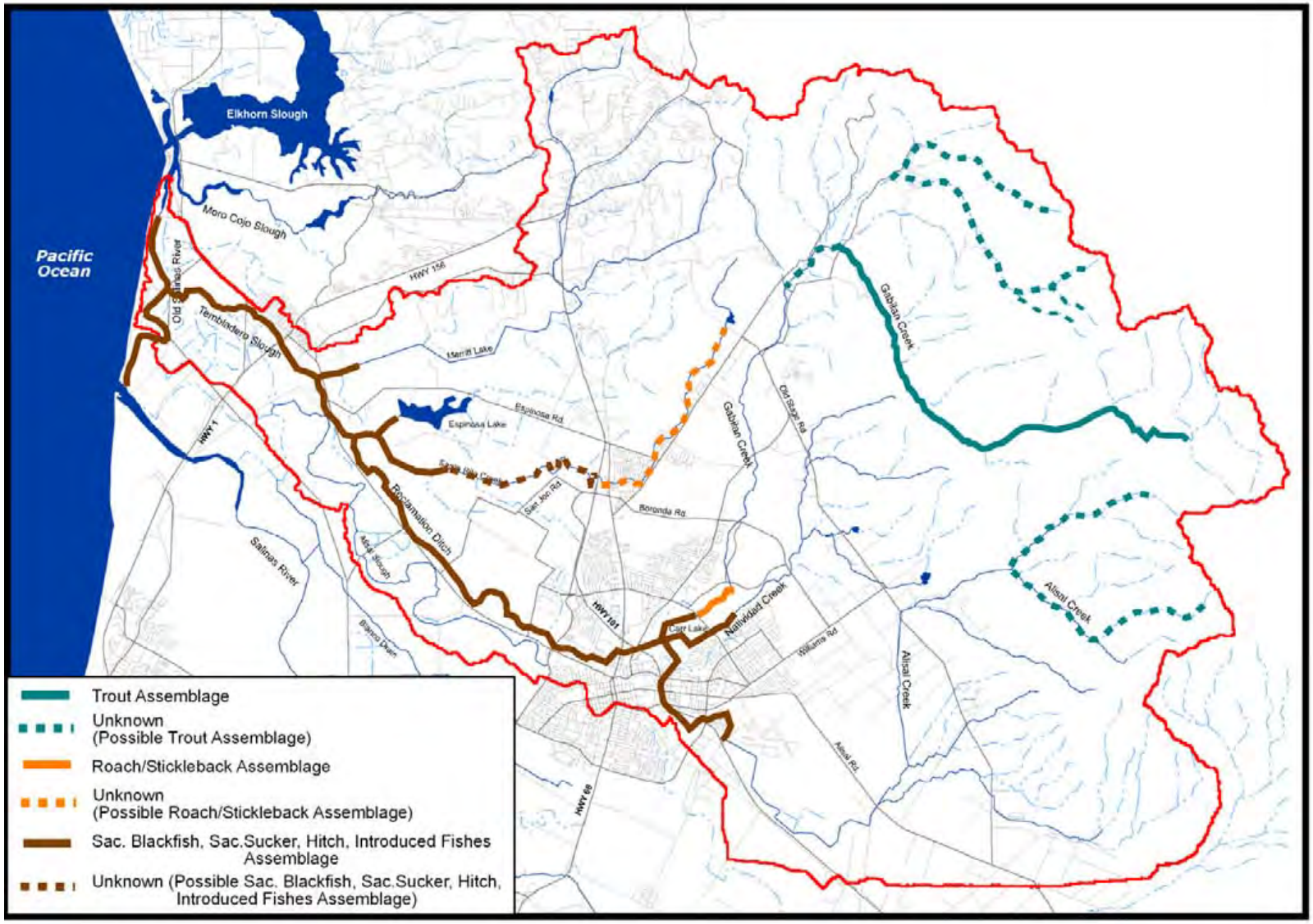

Reclamation Ditch Fish Assemblages

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure
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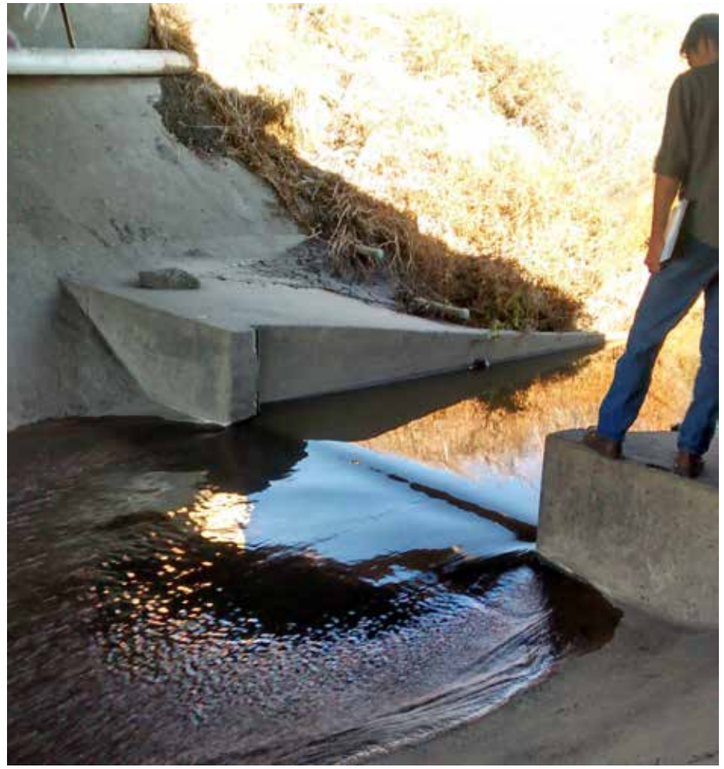
Molera Road Bridge

Near Tembladero Slough Intake Site

Boronda Street Crossing

Haro Road Bridge

The San Jon Road Undercrossing



Near Reclamation Ditch Intake Site

See Figure 4.4-5b for location of photos

Source: Inman J, Malik A, Missaghian J, Neill C, Noble S, Duffy D, 2014

Photos of Reclamation Ditch and Tembladero Slough

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure
4.4-5a

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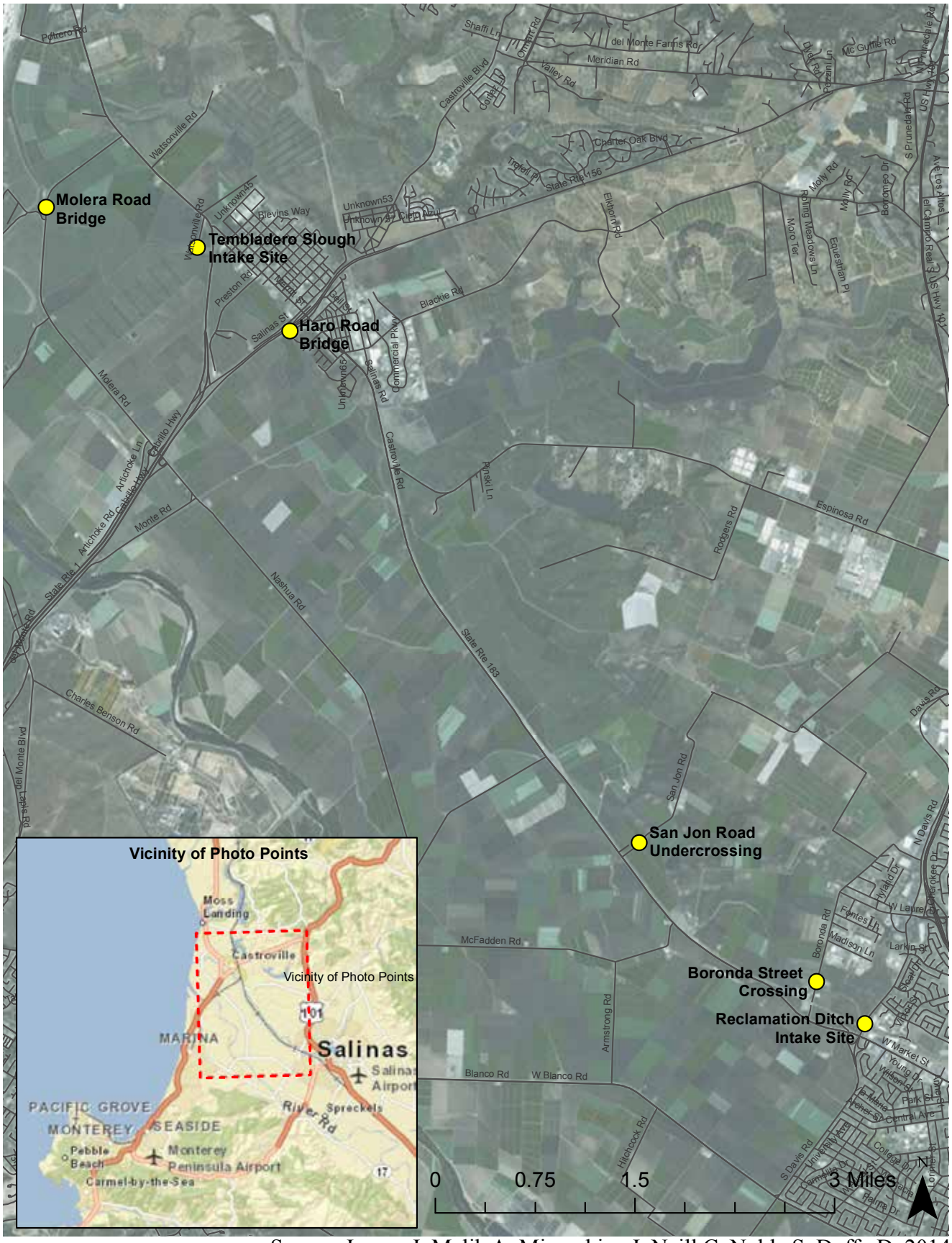

Source: Inman J, Malik A, Missaghian J, Neill C, Noble S, Duffy D, 2014

Photos of Reclamation Ditch and Tembladero Slough

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure
4.4-5b

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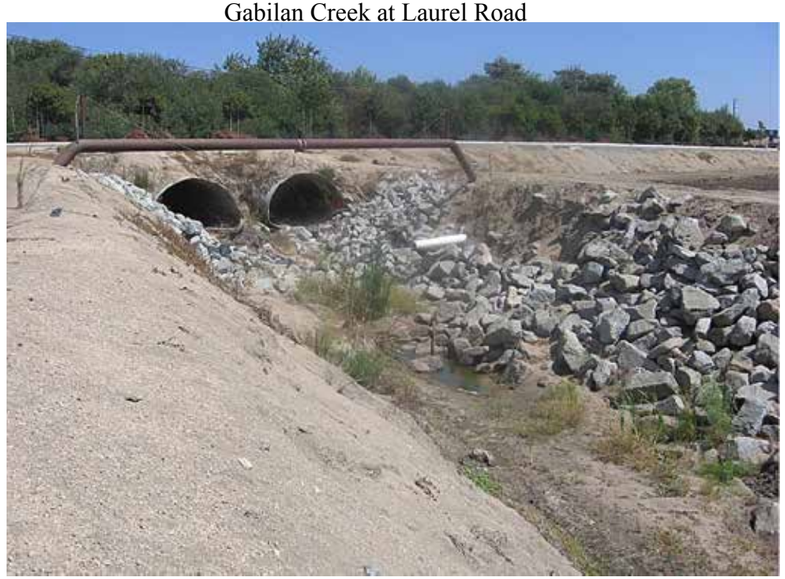
Gabilan Creek at Laurel Road



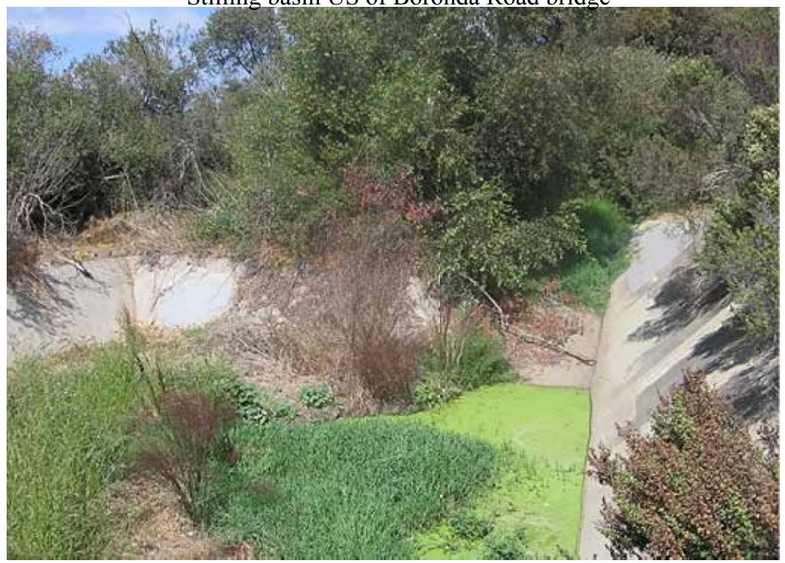
Gabilan Creek between Constitution and Lexington

Boronda Road Bridge

Gabilan Creek between Constitution and Lexington

Gabilan Creek upstream of Lexington

Stilling basin US of Boronda Road bridge



See Figure 4.4-6b for location of photos

Source: Schaaf and Wheeler, 2015

DD&A

Photos of Gabilan Creek Passage Obstacles

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure
4.4-6a

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Source: Schaaf and Wheeler, 2015

Photos of Gabilan Creek Passage Obstacles

April 2015

Pure Water Monterey GWR Project
Draft EIR

Figure
4.4-6b

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