GENERAL PLAN 2050

WATSONVILLE, CAL.

CITY OF WATSONVILLE
WATER SUPPLY ASSESSMENT FOR THE WATSONVILLE 2050 GENERAL PLAN UPDATE

February 2026

Watsonville CALIFORNIA

Harris & Associates

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APPENDICES

Appendix A: Growth Projections and Associated Water Demand
Appendix B: Pajaro River Watershed Integrated Regional Water Management Plan

ACRONYMS AND ABBREVIATIONS

AFY	acre-feet per year
CCSM4	Community Climate System Model 4
CDS	Coastal Distribution System
CFP	Corralitos Filter Plant
City	City of Watsonville
DWR	California Department of Water Resources
DWSP	Downtown Watsonville Specific Plan
GPU	Watsonville 2050 General Plan Update
GSP	Groundwater Sustainability Plan
GSU22	Pajaro Valley Basin Groundwater Sustainability Update 2022
MFR	multi-family residential
PV Water	Pajaro Valley Water Management Agency
Pajaro Valley Sub-Basin	Pajaro Valley Groundwater Sub-Basin 3-002.01
RWF	recycled water treatment facility
SB	Senate Bill
SFR	single-family residential
USGS	U.S. Geological Survey
UWMP	Urban Water Management Plan
WSA	Water Supply Assessment
WSCP	Water Shortage Contingency Plan

1 INTRODUCTION

Pursuant to California Water Code, Section 10910 et seq., and based on the analysis detailed in this Water Supply Assessment (WSA) and the representations by the plan proponents, the City of Watsonville (City) has determined that its currently projected water supplies will be sufficient to meet the projected annual water demands associated with the Watsonville 2050 General Plan Update (GPU) during normal, single, and multiple dry-years, provided that the City and its constituents continue to proactively protect and augment water supply and manage water demand through the City's demand management measures and its Water Shortage Contingency Plan (WSCP).

The City primarily uses groundwater and, to a much lesser extent, surface water to meet demand. The City has water supply rights of 21,900 acre-feet per year (AFY), but groundwater quality and quantity may not support this level of withdrawal.

City water demand in an average precipitation year is 6,788 AFY. Of this demand, 202 AFY is sourced from surface water and 6,586 AFY from groundwater. The GPU projects a 346 AFY increase in water demand. This WSA finds that there is sufficient water supply to support the GPU.

1.1 REGULATORY FRAMEWORK

Several bills enacted in 2001 address the integration of land use and water supply planning. Key among these were Senate Bill (SB) 610, which amended California Water Code, Section 10910 et seq., and SB 221, which added California Government Code, Section 66473.7. Both bills, which took effect on January 1, 2002, require that cities and counties consider and present specific information about water availability in connection with certain large projects.

1.1.1 SENATE BILL 610

SB 610 requires that any city or county that determines that a project is subject to the California Environmental Quality Act under California Public Resources Code, Section 21080, shall prepare a WSA to determine the sufficiency of water supply to meet water demand during normal, single, and multiple dry-years over a 20-year projection period. The GPU is a mixed-use plan that includes more than 500 dwelling units; thus, the City has determined that the GPU is subject to the act.

1.1.2 SENATE BILL 221

SB 221 requires that proposed subdivisions adding more than 500 dwelling units must also receive written verification of the available water supply from the project's water supplier. The GPU does not involve the creation of a subdivision or a subdivision tract map. Therefore, no written verification is required to be provided to a developer.

The public water system that serves the area described by the GPU is the City's Public Water System CA4410011.

This document serves as the WSA for the GPU to meet the previously described California Water and Government Code requirements.

1.2 DATA SOURCES

The following data sources were used in developing this WSA:

- 2020 City of Watsonville Urban Water Management Plan (UWMP), prepared by Harris & Associates, July 2021
- City of Watsonville Water System Master Plan, Technical Memorandum 2, Future System Evaluation, Carollo, January 2020
- Infill and New Growth Projections ("Growth Projections WSA_06-24-2025.xlxs"), Sargent Town Planning, June 24, 2025
- Parcel data for parcels included in Buena Vista, Area B, Area C, and Highway 1 Gateway ("Watsonville_AG_Parcels_250530.xlsx"), Sargent Town Planning, May 30, 2025
- Pajaro River Watershed Integrated Regional Water Management Plan
- Pajaro Valley Water Management Agency and Montgomery & Associates, Pajaro Valley Basin Management Plan: Groundwater Sustainability Update 2022 (GSU22), November 17, 2021
- Pajaro Valley Water Management Agency, groundwater production data and recycled water treatment facility (RWF) data
- Santa Cruz County Assessor, number of parcels by property type
- Sargent Town Planning, 2025 GPU drafts

1.3 PROJECT OVERVIEW

The City is preparing the Watsonville 2050 GPU, a comprehensive GPU of the Watsonville 2005 General Plan, in response to changes in conditions in the City and new state laws enacted since the preparation of the existing General Plan. Overall, the General Plan 2050 growth strategy is grounded in an "infill first" approach, with the majority of planned growth focused within the City's existing boundaries, particularly in Downtown and along key commercial corridors. Approximately 75 percent of total residential growth is projected to occur within the current City limits as infill development, while approximately 75 percent of non-residential growth is anticipated to occur in planned annexation areas outside the City limits. Within the City, most residential infill growth is concentrated in Downtown (approximately 85 percent), with smaller amounts along major corridors (approximately 12 percent) and within existing neighborhoods (approximately 3 percent). Infill opportunities are primarily located in Downtown—guided by the Downtown Watsonville Specific Plan (DWSP)—and along the Freedom Boulevard and East Lake Avenue corridors. Infill is expected to consist largely of accessory dwelling units, townhomes, and multi-family or

mixed-use development, including transit-oriented development near the planned Downtown passenger rail station. New growth areas outside the City limits are intended to accommodate land uses and development types that cannot be feasibly accommodated through infill alone, including single-family detached housing, larger employment-generating uses, regional retail, visitor-serving uses, and new parks and public facilities, consistent with community input and the City's long-term vision.

The GPU includes goals, policies, and implementation actions—developed with extensive community input—to advance the City's vision and community priorities. Specifics include revitalizing Downtown Watsonville; introducing a range of new housing choices, both single-family and multi-family; attracting new employment and revenue-generating uses; maintaining the existing character of the City's residential neighborhoods; preserving the City's natural open spaces, especially the sloughs; improving the City's existing parks and community facilities and introducing new ones; accommodating planned passenger rail service, including a station in Downtown Watsonville; implementing complete streets improvements; and rerouting truck routes around town.

Figure 1 illustrates how the community vision and priorities relate to each of Watsonville's geographical areas in terms of where the City anticipates these changes in the infill and new growth areas. New growth beyond existing City limits is planned in the Buena Vista, Atkinson Lane/Area C, and Highway 1 Gateway areas (Figure 2–Figure 4). Growth in Buena Vista and Atkinson Lane/Area C would consist of single-family and multi-family housing and small mixed-use neighborhood centers, and may offer a significant number of new homeownership opportunities. Growth in the Highway 1 Gateway would consist of regional retail, community recreation, and visitor-serving uses.

New development in Buena Vista and Atkinson Lane/Area C requires annexation into the City. New development in the planning area beyond the City's current urban limit line—the parcels adjacent to Buena Vista, portions of Area C, and within the majority of the Highway 1 Gateway—would require approval through a Citywide referendum and subsequent annexation.

FIGURE 1: COMMUNITY VISION

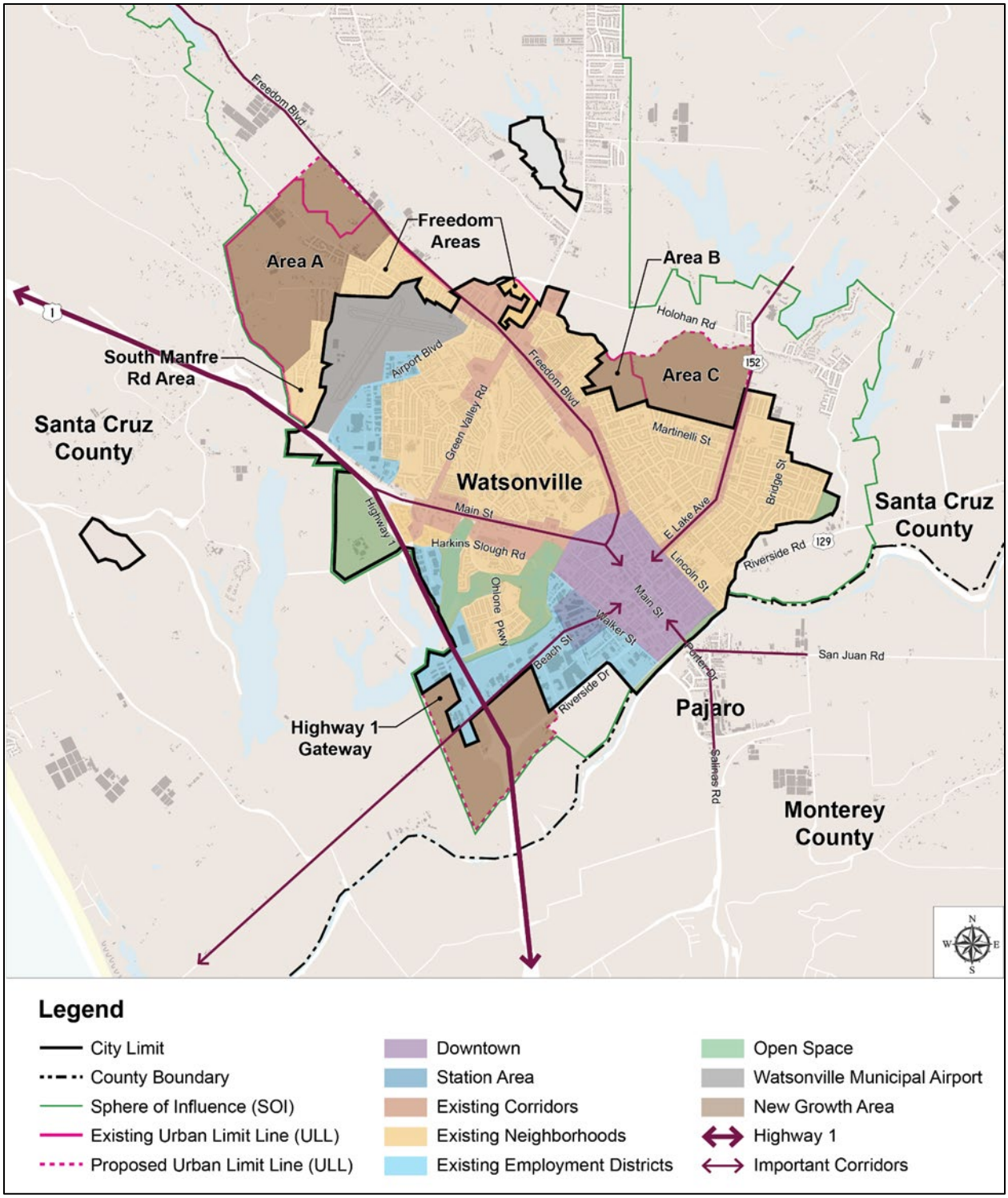


FIGURE 2: GPU MAP – BUENA VISTA

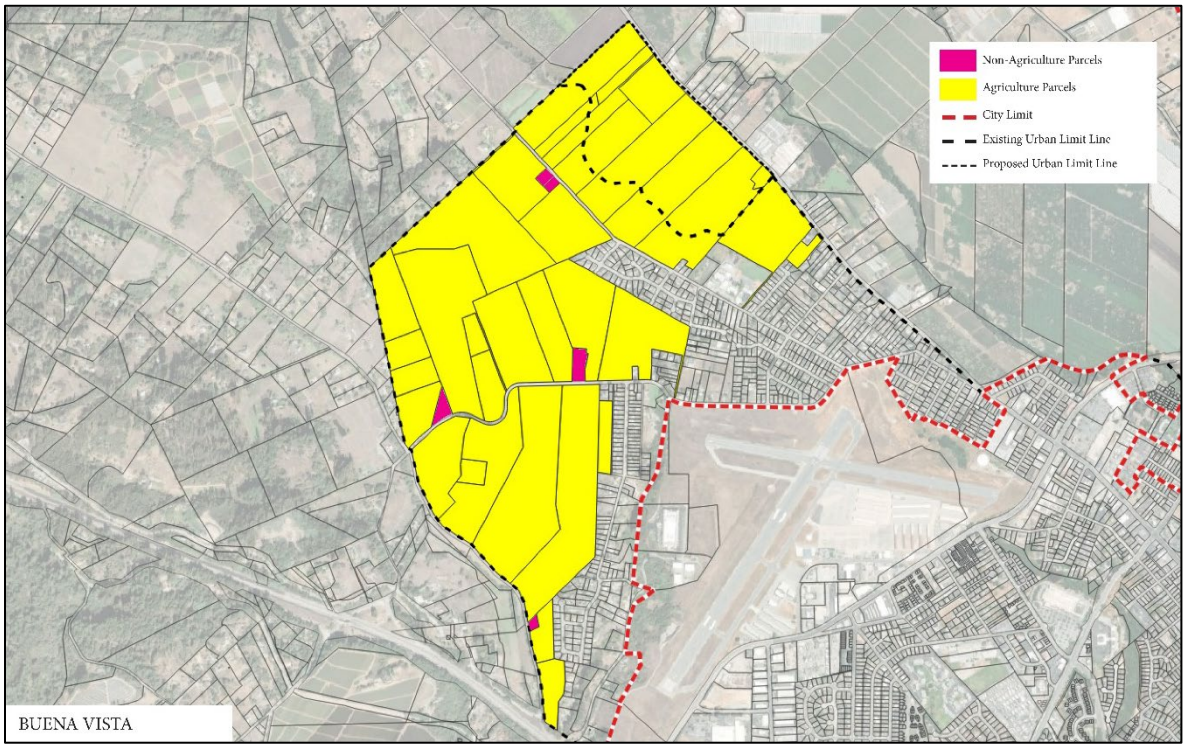


FIGURE 3: GPU MAP – ATKINSON LANE/AREA C

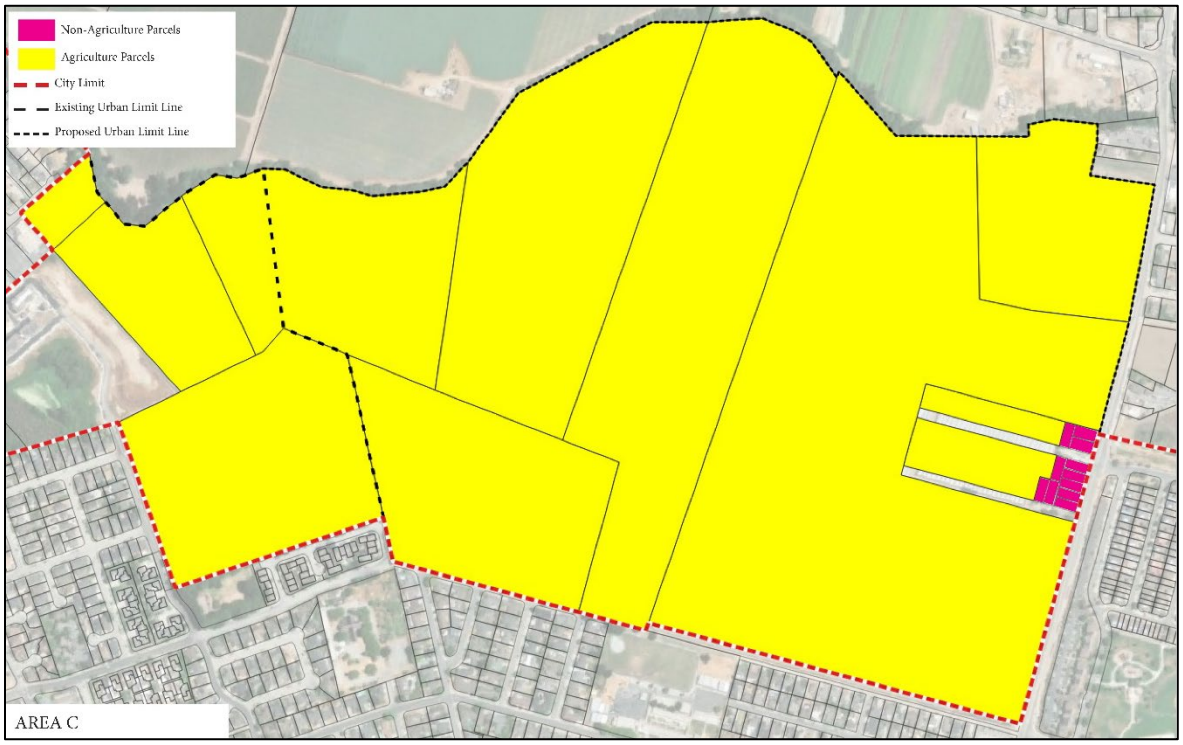
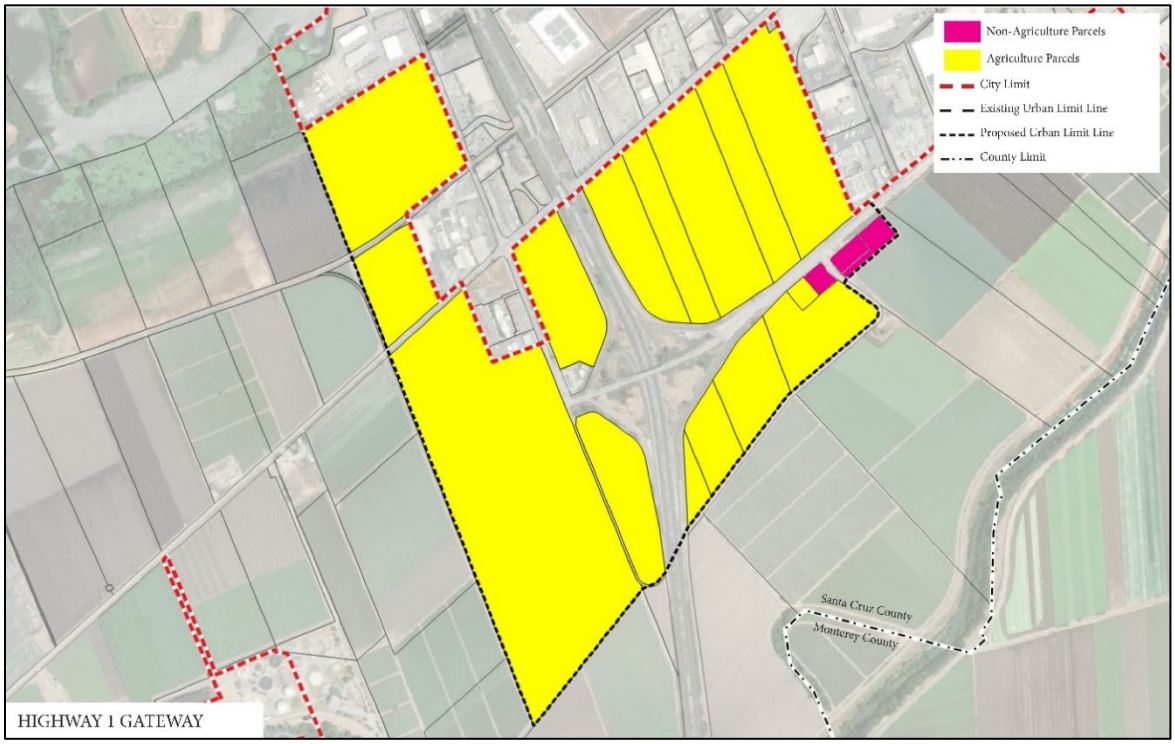


FIGURE 4: GPU MAP – HIGHWAY 1 GATEWAY



1.3.1 ASSUMPTIONS

For the purposes of this WSA, all parcels referenced in the GPU are included, regardless of their status of annexation or City referendum. While a WSA was prepared in 2022 for the DWSP, the GPU includes updated estimates for Downtown development and supersedes the DWSP. Therefore, this WSA includes all infill development, including that within the DWSP boundaries.

The GPU indicates a maximum development capacity of 5,981 residential units and 5,371,613 square feet for commercial, industrial, and recreational space. Additional details on the GPU are shown in Table 1 and in Appendix A.

TABLE 1: DEVELOPMENT CAPACITY

Total Infill and New Development	Dwelling Units (#)	Square Feet
Residential SFR, Detached and Attached	1,188	
Residential MFR	4,793	
Commercial		
Dining		138,441
Retail		1,094,104
Office		589,542
Hotels		100,000
Industrial		749,526
Recreational Fields		2,700,000
Total	**5,981**	**5,371,613**

Notes: SFR = single-family residential; MFR = multi-family residential

1.4 CITY OF WATSONVILLE PUBLIC WATER SYSTEM

The City is located along the Monterey Bay between the Cities of Santa Cruz and Monterey in Santa Cruz County. The City lies in the heart of the Pajaro Valley, surrounded by prime agricultural land and wetlands. Water is an integral component throughout the region's environs. Five small lakes are near the City's northern and eastern boundaries.

The City is bounded by Corralitos Creek to the north, Salsipuedes Creek to the east, and the Pajaro River to the south. The Pajaro River forms the boundary between Santa Cruz and Monterey Counties. Several small creeks and sloughs meander through the City and extend south and west of Highway 1, forming what is referred to as the Watsonville Slough System. Figure 4 and Figure 5 show the City's location and current limits.

FIGURE 5: WATSONVILLE LOCATION

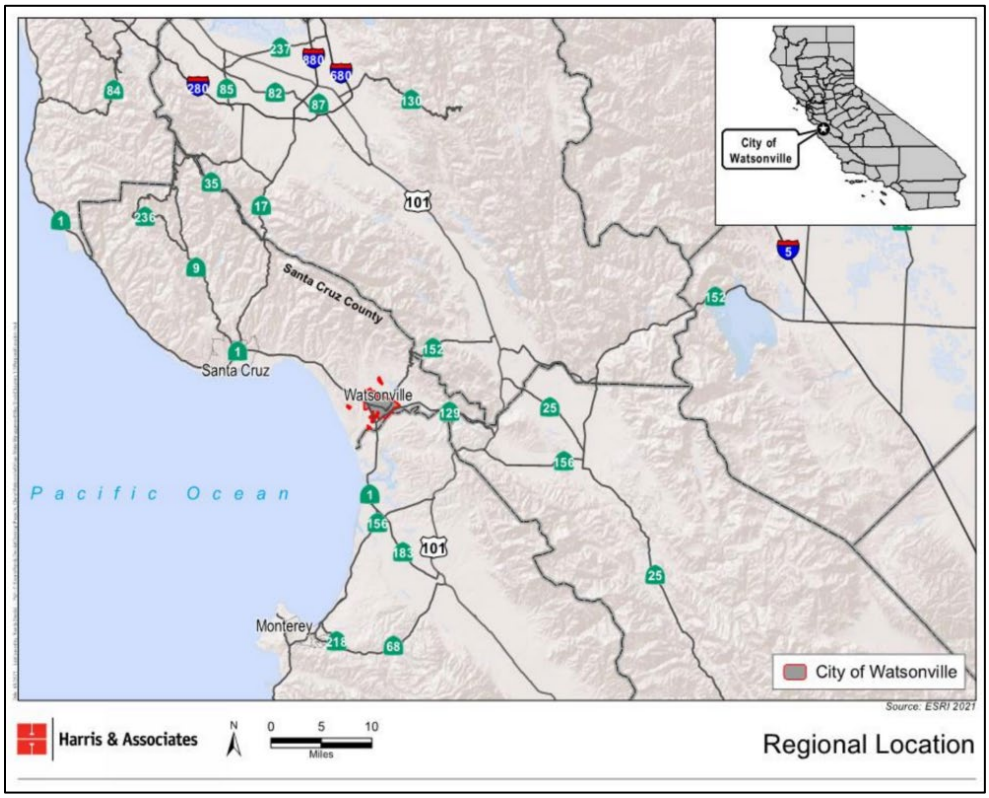
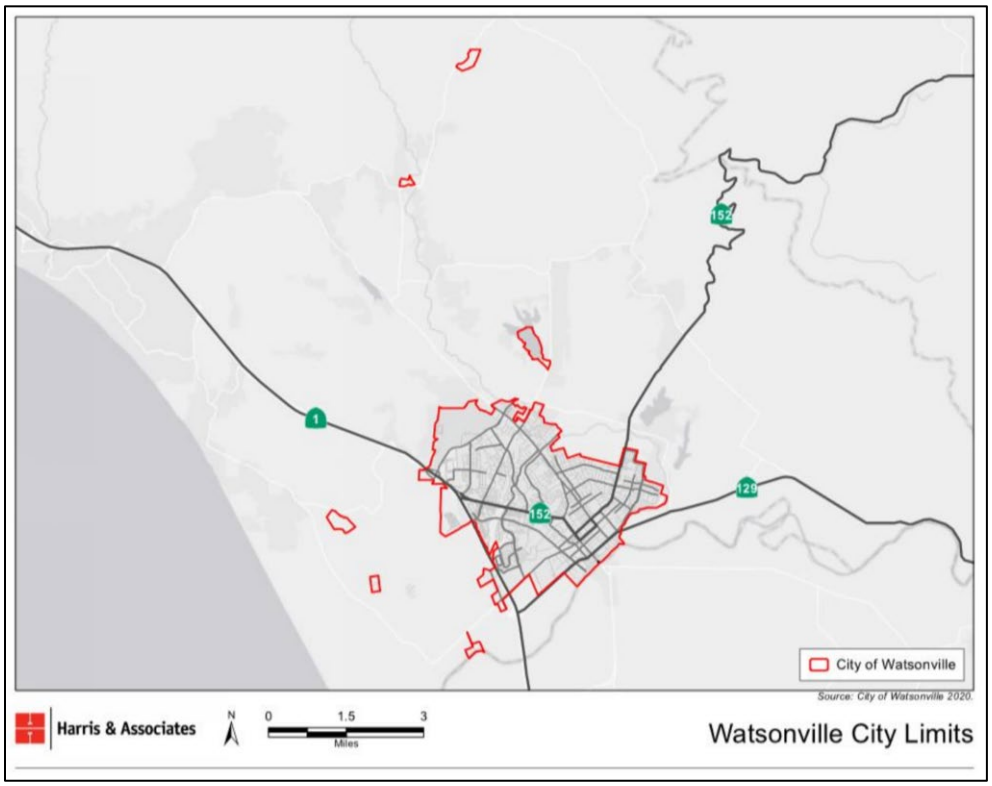


FIGURE 6: WATSONVILLE CITY LIMITS



The City owns and operates a regional public water supply system that includes nine hydraulic pressure zones, 14 wells, eight reservoirs and water storage facilities, nine booster stations, over 190 miles of pipelines, and a slow sand filtration plant (Corralitos Filter Plant [CFP]). The system provides water to a service area that is larger than the City limits, extending into the unincorporated areas of Santa Cruz County (Figure 6). In 2020, this regional water system served an estimated population of 65,231 customers.

The City owns and operates a wastewater treatment facility. In addition, the City collaborated with the Pajaro Valley Water Management Agency (PV Water) to develop and build an associated RWF, which provides recycled water for crop irrigation in the coastal areas of South Santa Cruz and North Monterey Counties. The RWF protects groundwater supplies by providing an alternative to well extraction.

1.5 2020 WATSONVILLE URBAN WATER MANAGEMENT PLAN

The City updates its UWMP every 5 years. The latest plan is the 2020 City of Watsonville UWMP.

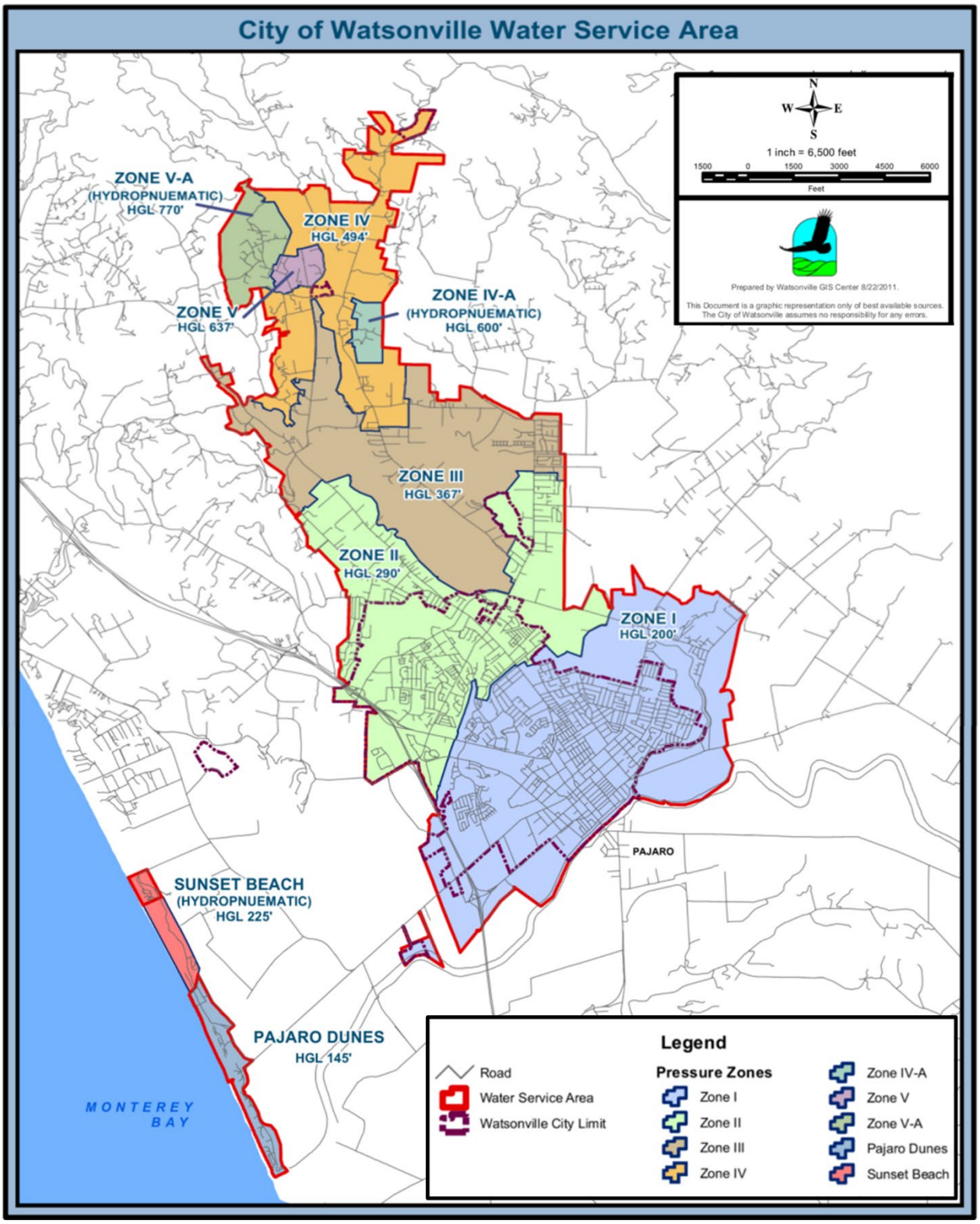
The UWMP provides information on present and future water demand and supplies and assesses the City's water resource reliability over the next 25 years. It also acts as a guide to maintain efficient use of urban water supplies, promote conservation programs and policies, and proactively plan and update the City's strategies to address potential water shortages and drought conditions.

The UWMP addresses water-planning fundamentals by:

- Preparing a detailed look at current and future water use, including assessing baseline data and examining other long-term planning documents for the region.
- Analyzing potable and non-potable water supplies, reviewing water rights and contracts, ascertaining restrictions on water availability under certain regulatory and hydrological conditions, and assessing seismic risk to various water system facilities.
- Reviewing the range of potential impacts of climate change on water demand and supply.
- Analyzing water supply reliability by integrating the water use analyses with the water supply analyses to provide a water service reliability picture under normal conditions, single dry-year conditions, and 5 consecutive dry-years through the year 2045.
- Preparing a Drought Risk Assessment by including integrated water supplies and projected water use in a hypothetical 5-year drought condition.
- Developing a WSCP that specifies opportunities to reduce demand and augment supplies under numerous water shortage conditions.

The UWMP includes general growth rates for commercial, industrial, and public water connections. However, these growth rates do not correspond to the GPU. This WSA uses average year demand as calculated for the WSA for base demand and maximum growth estimates based on the GPU.

FIGURE 7: WATSONVILLE WATER SERVICE AREA



2 WATER DEMAND

The City recognizes the importance of water conservation and is committed to promoting and practicing the sustainable use of water resources. The City demonstrates this commitment through the adoption of water efficiency and waste prevention ordinances, English/Spanish bilingual outreach and educational programs, financial incentive programs, implementation of water conservation at City properties, distribution system loss prevention, and numerous other water conservation measures. Details on these measures are provided in the UWMP.

The City also has a WSCP to address drought or catastrophic water emergencies. The WSCP establishes six levels of drought and water conservation actions associated with each level. In addition, the City prepares an annual Water Supply and Demand Assessment that includes information on customer demand.

The City's efforts have been hugely successful. From 2001 to 2010, the City's service area used an average of 101 gallons per capita per day (GPCD). In 2020, that number declined to 87 GPCD. Demand estimates throughout this WSA assume that the City and its constituents continue their proactive water demand management.

2.1 HISTORICAL MUNICIPAL WATER DEMAND

In 2024, the City delivered 6,138 AF of water to its service area. Table 2 depicts historical water demand by type of user over the last 5 years. Water demand numbers are predominantly based on water meter readings.

TABLE 2: HISTORICAL WATER DEMAND BY TYPE (AFY)

User Type	2020	2021	2022	2023	2024
SFR	3,329	3,075	2,974	2,784	2,828
MFR	839	809	789	776	787
Commercial	1,136	1,092	989	948	961
Industrial	535	614	693	582	542
Landscape	471	419	360	292	331
Agricultural Irrigation	729	699	558	588	652
Other	43	42	45	1	37
Total	**7,082**	**6,750**	**6,408**	**5,971**	**6,138**

Notes: AFY = acre-feet per year; MFR = multi-family residential; SFR = single-family residential

Total municipal water demand from 2007 to 2024 is shown in Table 3. "Water year type" is based on PV Water definitions (see Figure 7).

Annual precipitation levels have a strong impact on water demand. Based on the City's UWMP, water demand in the City initially increases during a drought—likely due to increased irrigation—and then eventually declines as water conservation measures are adopted. A summary of average water demand by water year type is shown in Table 4. This table uses data from Table 3 but only includes years 2011–2024, as water use has decreased

over time due to improved demand management and conservation. Table 4 provides averages; for instance, municipal water demand in the single wet-year is an average of 2016, 2019, and 2024 (2011 is not considered because 2010 was also a wet-year).

Table 5 presents water demand in a normal (average), single, and multiple dry-years, again using only 2011–2024 data. There is no data on a "third dry-year" or "fourth dry-year." The average of 2012–2014 (2 consecutive dry-years followed by a very dry-year) was used for the third dry-year. The average for a "single very dry-year" was used for the "fourth dry-year."

The UWMP estimates that water demand in a fourth dry-year is 92 percent of average year demand, which equates to 6,245 AFY in this analysis.

TABLE 3: HISTORICAL MUNICIPAL WATER DEMAND (2007–2024)

Calendar Year	PV Water Water Year Type	Precipitation (inches)[1]	Watsonville Water Demand (AFY)
2007	Dry	13.6	8,631
2008	Dry	15.8	8,805
2009	Dry	15.9	7,761
2010	Wet	27.6	7,460
2011	Wet	29.5	7,301
2012	Dry	15.0	7,770
2013	Dry	14.0	8,318
2014	Very Dry	9.9	7,506
2015	Average	18.1	6,874
2016	Wet	27.4	6,349
2017	Very Wet	39.8	6,734
2018	Dry	15.1	6,948
2019	Wet	26.5	6,908
2020	Average	20.2	7,082
2021	Very Dry	12.9	6,750
2022	Average	21.4	6,408
2023	Very Wet	42.0	5,971
2024	Wet	27.2	6,138

Note: AFY = acre-feet per year

[1] **Source:** National Oceanographic and Atmospheric Administration, National Centers for Environmental Information

TABLE 4: MUNICIPAL WATER DEMAND (2011–2024)

Year Type	Average AFY	% of Average
Single Very Wet-Year	6,352	94%
Single Wet-Year	6,465	95%
2 Consecutive Wet-Years	N/A	N/A
Average Year	**6,788**	**100%**
Single Dry-Year	7,359	108%
2 Consecutive Dry-Years	8,318	123%
3 Consecutive Dry-Years	N/A	N/A
Single Very Dry-Year	7,128	105%

Note: AFY = acre-feet per year

TABLE 5: MUNICIPAL WATER DEMAND IN NORMAL, SINGLE, AND MULTIPLE DRY-YEARS (2011–2024)

Year Type	Average AFY
Normal (Average) Year	6,788
Single Dry-Year	7,359
Second Dry-Year	8,318
Third Dry-Year	7,865
Fourth Dry-Year	7,128

Note: AFY = acre-feet per year

2.2 PROJECTED NEW WATER DEMAND

Future water demand associated with the GPU is estimated separately for each type of user: single-family residential (SFR), multi-family residential (MFR), commercial, industrial, recreational, and agricultural.

Table 6 presents water usage estimates for each type of user. These results assume an "average" water year type. Demand by user type is discussed in more detail in the following sections.

TABLE 6: WATER USAGE FACTORS

User Type	Gallons/Person/Day	Gallons/Square Foot/Day	Source[1]
SFR	71.8	N/A	Estimated (refer to Section 2.2.1)
MFR	31.7	N/A	Estimated (refer to Section 2.2.1)
Commercial-Dining	N/A	0.740	WMP
Commercial-Retail	N/A	0.096	WMP
Commercial-Office	N/A	0.100	WMP
Hotels	N/A	0.230	WMP
Industrial	N/A	0.140	WMP
Recreational Fields	N/A	0.028	Estimated (refer to Section 2.2.3)

Note: WMP = Water Master Plan

[1] City of Watsonville's Water Master Plan, January 2020.

2.2.1 SINGLE-FAMILY RESIDENTIAL AND MULTI-FAMILY RESIDENTIAL

Water usage varies greatly between SFR and MFR, with MFR using less water than SFR. Water department data includes the volume sold and number of connections for both SFR and MFR. However, the number of MFR connections is misleading. Typically, there is only one water meter/connection for an entire apartment building or condominium association.

The following data was used to estimate water usage for SFR and MFR:

- Santa Cruz County Assessor data, showing 1,023 multi-family residences in the Watsonville existing and GPU growth areas. This WSA estimates eight units per MFR.
- GPU estimates of 2.89 persons per MFR and 3.45 persons per SFR unit.
- Total 2020 population in the City's water service area of 65,231, per the UWMP. It was assumed that the service area population remained constant because the City's population remained fairly constant since 2020.
- Water volume sold to SFR and MFR customers in 2020.

Using the above data, SFR usage was estimated to be 71.8 GPCD in 2020, which was an average rainfall year. MFR usage was estimated to be 31.5 GPCD in 2020. This resulted in an average usage for both SFR and MFR of 57 GPCD, which matches the estimate in the 2020 UWMP.

New home construction requires water-saving devices and water-efficient landscaping. Typically, this results in a lower GPCD for new development. However, the City's water use is already very low due to the City's progressive and effective water conservation measures. While new development and state-wide water conservation measures are likely to further reduce GPCD, it is difficult to quantify those reductions given the City's extremely low water usage compared to other cities. For conservatism, the City's current SFR and MFR GPCD were used for future water use calculations.

2.2.2 COMMERCIAL AND INDUSTRIAL

Water usage per square foot for commercial-dining, commercial-retail, commercial-office, commercial-hotels, and industrial was based on the City's 2020 Water System Master Plan.

2.2.3 RECREATIONAL

For recreational space, the GPU envisions a large soccer complex. Estimates for water usage for the soccer complex assume the following:

- 750,000 gallons per year per soccer field. The Sports Field Irrigation and Sprinkler System Cost and Funding Guide estimates that 500,000 to 1,000,000 gallons of water are used per year per soccer field, depending on the climate and grass type. Other sources estimate 600,000 to 1.5 million gallons per year. With the City's mild climate

and strong water conservation ethic, 750,000 gallons per soccer field was deemed a conservative estimate.
- Average soccer field size of 110 yards by 75 yards.
- 75 percent of acreage identified in the GPU as recreational dedicated to soccer fields, with the remainder unused or parking.

The above assumptions yielded 0.028 gallons per square foot per day for recreational land use.

2.3 AGRICULTURAL LAND CONVERSION

The GPU includes the potential conversion of agricultural land to alternative uses. The California Department of Water Resources (DWR) estimates that, in an average year, approximately 9.6 million acres are irrigated with roughly 34 million acre-feet of water.[1] This equates to 3.54 acre-feet of water per acre per year. Converting agriculture to other uses is likely to result in a significant decrease in water use.

Not all agricultural land is in use within the urban limit line, and due to the temperate locale of Watsonville, irrigation per acre is likely to be lower than the California average. To approximate decreased water use related to the conversion of agricultural land, 19 years of actual groundwater withdrawals for the affected parcels were analyzed (Table 7). Figure 8 charts annual precipitation amounts and agricultural water demand over this 19-year period. Note that water years start on October 1 of each year. “Water year type” is based on PV Water definitions (Figure 7).

Over the last two decades, farmers have implemented high-efficiency irrigation practices, significantly reducing water use. Agricultural use in different water year types is summarized in Table 8, using water years 2011–2024 to better reflect these current practices.

Agricultural water demand in an average year was 883 AFY. This represents the expected decrease in agricultural water usage at full buildout of the GPU.

[1] California Department of Water Resources, Agricultural Water Use Efficiency, accessed 7/15/2025.

FIGURE 8: AGRICULTURAL WATER DEMAND (2006-2024)

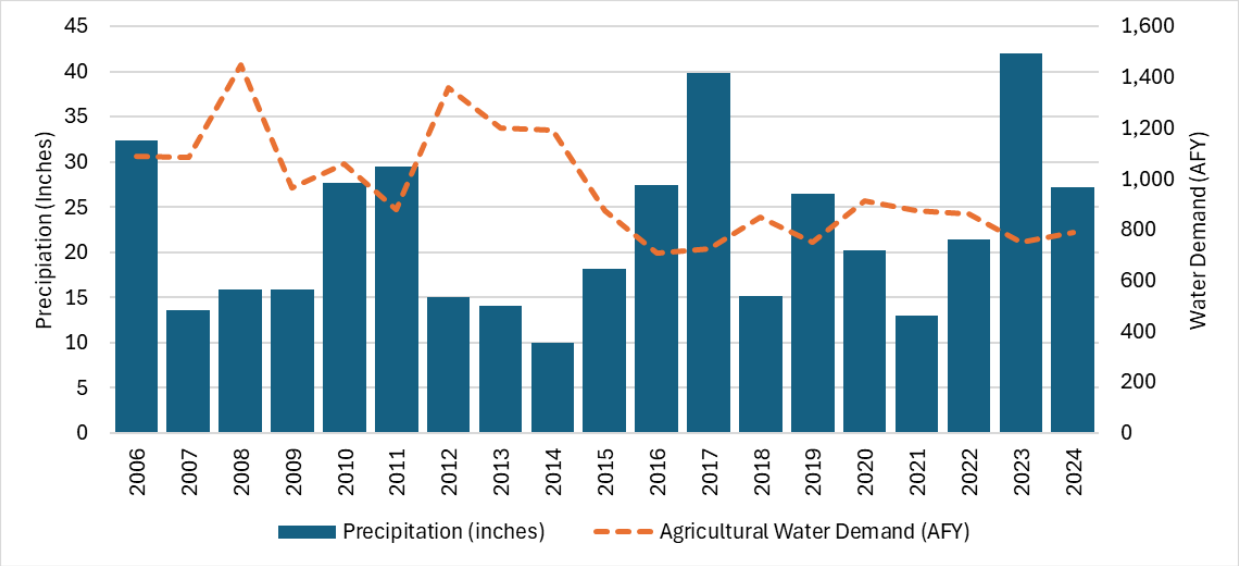


TABLE 7: AGRICULTURAL WATER DEMAND (2006–2024)

PV Water Water Year	PV Water Water Year Type	Precipitation (inches)	Agricultural Water Demand (AFY)
2006	Wet	32.4	1,090
2007	Dry	13.6	1,083
2008	Dry	15.8	1,446
2009	Dry	15.9	966
2010	Wet	27.6	1,060
2011	Wet	29.5	879
2012	Dry	15.0	1,359
2013	Dry	14.0	1,198
2014	Very Dry	9.9	1,190
2015	Average	18.1	873
2016	Wet	27.4	709
2017	Very Wet	39.8	722
2018	Dry	15.1	847
2019	Wet	26.5	749
2020	Average	20.2	913
2021	Very Dry	12.9	875
2022	Average	21.4	862
2023	Very Wet	42.0	750
2024	Wet	27.2	787

Note: AFY = acre-feet per year

FIGURE 9: PV WATER YEAR DEFINITIONS

	Annual Precip (in/yr)				
Year Type	Lower (in/yr)	Upper (in/yr)	Average Recurrence Interval[14] (years)	Average Exceedance Probability (%)	Number of Years
Very Dry		12.92	<1.1	>91	13
Dry	12.93	17.54	1.1-1.5	91-67	34
Average	17.55	24.43	>1.5-3	67-33	50
Wet	24.44	34.07	>3-10	33-10	33
Very Wet	34.08		>10	<10	14
Long Term Average Annual Precipitation = 21.93 in/yr					
Water Year Record = 1880-2024					

TABLE 8: AGRICULTURAL WATER DEMAND IN AFFECTED PARCELS BY WATER YEAR TYPE (2011–2024)

Year Type	Average AFY	% of Average
Single Very Wet-Year	736	83%
Single Wet-Year	748	85%
2 Consecutive Wet-Years	N/A	N/A
Average Year	**883**	**100%**
Single Dry-Year	1,134	128%
2 Consecutive Dry-Years	1,198	136%
3 Consecutive Dry-Years	N/A	N/A
Single Very Dry-Year	1,033	117%

Note: AFY = acre-feet per year

Some agricultural users in the coastal zone purchase recycled water from the RWF rather than pumping groundwater. The RWF is designed to treat and deliver 4,000 AFY. However, its production and sales are limited by the amount of wastewater available; maintenance requirements; demand for agricultural water, which varies by month and water year type; and a myriad other factors. Note that the RWF blends recycled water with potable water from the City and other sources to meet demand and improve water quality.

As water demand increases, there is more wastewater available to treat and potentially more production capacity to deliver agricultural water to the coastal zone.

Table 9 shows recycled water (produced by the RWF), City potable water blended with the recycled water, and the combined total of recycled water and City potable water. The table also includes a system total, which represents the total water delivered to agricultural users. Note that system total water includes additions from other sources that are not shown in the table.

Over the 2016–2024 period, the combined total of recycled water plus City blended water represented 52 percent of the total City water demand. Stated another way, 52 percent of future increases in City water demand could potentially generate additional wastewater available for recycling, up to the current RWF design capacity of 4,000 AFY. However, the RWF used significantly less potable water in 2024, and there are efforts to continue to reduce potable water use. Recycled water as a percent of total City water sold in 2024 was 27 percent. While

2023 was a very wet-year and 2024 was a wet-year, the myriad of complications of recycled water production and sales makes the 27 percent figure a more reasonable and conservative estimate of the increase in recycled water due to increased demand.

TABLE 9: RECYCLED WATER STATISTICS

Year	Recycled Water (AF)	City Potable Water (AF)	Recycled Water + City Water Total (AF)	System Total (AF)	City Water Demand (AFY Sold)	Recycled Water + City Water as % of City Water Demand	Recycled Water as % of Total City Water Sold
2016	2,766	620	3,386	3,936	6,348	53%	44%
2017	2,815	761	3,576	4,328	6,734	53%	42%
2018	3,042	779	3,821	4,620	6,948	55%	44%
2019	3,177	923	4,100	5,339	6,908	59%	46%
2020	3,287	794	4,081	5,632	7,082	58%	46%
2021	2,785	614	3,399	5,007	6,749	50%	41%
2022	2,440	508	2,949	3,932	6,408	46%	38%
2023	2,561	630	3,191	4,025	5,970	53%	43%
2024	1,671	451	2,122	3,061	6,138	35%	**27%**
Total	**24,545**	**6,081**	**30,626**	**39,880**	**59,287**	**52%**	**41%**

Note: AF = acre-feet

2.4 INCREMENTAL WATER DEMAND

The estimated water demand associated with the proposed GPU buildout would result in a net increase of 346 AFY. The incremental water demand was calculated using the following estimates and is presented in Table 10:

- The proposed GPU water demand is estimated at 1,357 AFY.
- Water demand savings from the conversion of agricultural land are estimated at the average year use of 883 AFY, as evaluated in Section 2.3.
- An additional demand offset of 128 AFY is included to represent the additional supply from the RWF to agricultural users. This represents approximately 27 percent of the new demand, as discussed in Section 2.3.

TABLE 10: INCREMENTAL WATER DEMAND

Water Demand	Annual Water Usage (AFY)
GPU Demand Estimate	
GPU Water Demand (Summarized By Infill Versus New Development)	
Infill Development	609
New Development	748
Total	**1,357**
GPU Water Demand (By Customer Type)	
Residential SFR, Detached and Attached	358
Residential MFR	492
Commercial	
Dining	115
Retail	118
Office	66
Hotels	26
Industrial	118
Recreational Fields	64
Total	**1,357**
Existing Agricultural Land Demand	
Credit from Conversion of Agricultural Use (Existing Use)	**–883**
Incremental Change (Subtotal)	
Subtotal	**474**
Additional Supply Credit (Subtotal)	
Additional Supply from RWF to Agricultural Users	**–128**
Incremental Water Demand	
Net New Water Demand	**346**

Notes: AFY = acre-feet per year; GPU = General Plan Update; MFR = multi-family residential ; SFR = single-family residential

Table 11 depicts projected water use in average water year types for 2025–2045. The table shows water use associated with the full buildout of the GPU by 2030 because there is no scheduled estimate for development. In reality, full buildout is unlikely to occur even after the 20-year horizon. Thus, this WSA gives a very conservative estimate of water usage associated with the GPU.

TABLE 11: WATSONVILLE SERVICE AREA PROJECTED WATER DEMAND IN AVERAGE WATER YEAR WITH FULL BUILDOUT OF GPU (AFY)

AFY	2025	2030	2035	2040	2045
Current Water Demand (Average Year)	6,788	6,788	6,788	6,788	6,788
GPU Incremental Demand (Average Year)	0	346	346	346	346
Total Water Demand	**6,788**	**7,134**	**7,134**	**7,134**	**7,134**

3 WATER SUPPLY

The City's water supply consists mainly of groundwater (97.1 percent), with periodic augmentation from surface water (2.9 percent), as shown in Figure 8. When possible, the City will use a combination of surface water and groundwater supply sources; in other years, the City relies entirely on groundwater supply.

Table 12 shows the City's water rights by source. The City has groundwater rights of 21,000 AFY. In addition, the City's CFP treats up to 900 AFY. Table 13 provides actual water extractions by source for the past 10 years. Over this time period, 2.9 percent of the City's water supply was from surface water, and 97.1 percent was from groundwater. The CFP's average production was 202 AFY.

FIGURE 10: WATER SUPPLY BY SOURCE

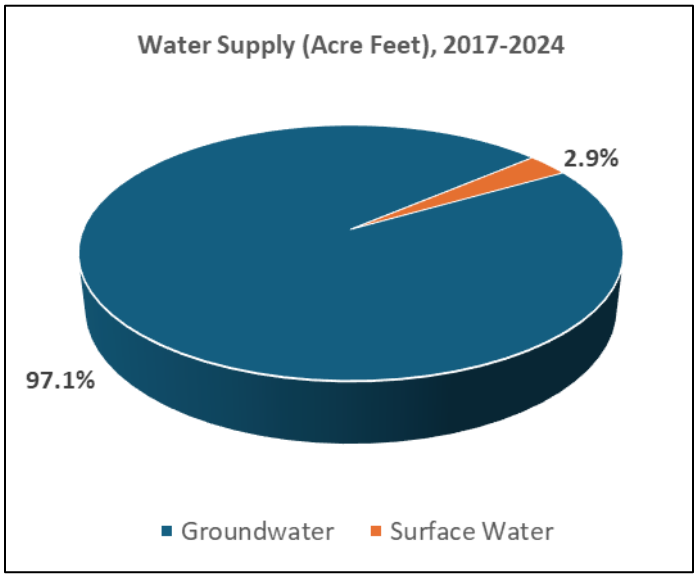


TABLE 12: WATER RIGHTS BY SOURCE

Water Source	Water Rights
Groundwater	21,000
Surface Water	900
Total Water Demand	**21,900**

TABLE 13: GROUNDWATER AND SURFACE WATER EXTRACTIONS

Water Source	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Avg.
Groundwater	6,870	6,461	6,316	6,688	6,586	7,101	7,027	6,768	6,456	6,381	6,665
Surface Water	0	186	684	397	473	0	0	0	37	243	202
Total	**6,870**	**6,647**	**7,000**	**7,085**	**7,059**	**7,101**	**7,027**	**6,768**	**6,493**	**6,624**	**6,867**

3.1 SURFACE WATER

The City enjoys pre-1914 water rights (S010141 and S010142) on the Corralitos and Browns Creeks, which are north of the City limits. The surface water diversions flow to the CFP and are treated via slow sand filtration and disinfection. The CFP operates seasonally, typically starting in late spring and continuing through fall. During the rainy season, the CFP is taken out of service due to the high turbidity of the creek at the intake(s). High turbidity is not conducive to the efficiency of a slow sand filtration plant. When operational, the CFP treats up to 900 AFY and has a maximum design capacity of 2 million gallons per day.

3.2 GROUNDWATER

The City pumps groundwater from 14 active wells, which can provide up to 21,000 AFY of water. The wells pump from Pajaro Valley Groundwater Sub-Basin 3-002.01 (Pajaro Valley Sub-Basin).

The Aromas Red Sands Formation is considered the primary water-bearing geologic unit of the Pajaro Valley Sub-Basin. Other layers with water deposits include the Purisima Formation, Terrace and Pleistocene Eolian deposits, Quaternary alluvium, and dune deposits. The basal gravel unit also has good hydraulic continuity with the underlying Aromas Red Sands Formation and is a major source of water for shallow wells in the Pajaro River floodplain.

3.2.1 PAJARO VALLEY SUB-BASIN MANAGEMENT

Groundwater resources in the Pajaro Valley Sub-Basin have been managed by PV Water since the agency's formation in 1984. PV Water is a state-chartered water management district formed to manage existing and supplemental water supplies to prevent further increase in long-term overdraft, land subsidence, and water quality degradation. PV Water works to provide and ensure sufficient water supplies for present and future anticipated needs within its boundaries, generally the greater coastal Pajaro Valley.

Under the Sustainable Groundwater Management Act, the DWR assessed and prioritized basins throughout California. The Pajaro Valley Sub-Basin received the maximum possible level of priority points (40), making it a high-priority sub-basin that was critically overdrafted. As such, the act required that a Groundwater Sustainability Plan (GSP) or an Alternative to a GSP be developed for the sub-basin. In December 2016, PV Water submitted the 2014 Basin Management Plan (BMP) as an Alternative to a GSP to comply with the act. This was updated in 2019 to the Pajaro River Watershed Integrated Regional Water Management Plan (Appendix B). In 2019, the DWR approved the 2014 BMP and associated

documents[2] as functionally equal to a GSP, meaning it satisfied the objectives of the act. The Pajaro Valley Sub-Basin is not adjudicated.

The DWR's Bulletin 118[3] designates the Pajaro Valley Sub-Basin as subject to conditions of critical overdraft. The 2014 BMP identifies seawater intrusion as the primary adverse effect of the overdraft and identifies projects to improve groundwater levels (quantity) and water quality. The Pajaro Valley Sub-Basin must achieve its sustainability goal by 2040 and maintain sustainability through 2070 or risk state intervention in groundwater management of the sub-basin. State intervention in management would involve pumping restrictions imposed by the State Water Resources Control Board. In its approval, the DWR provided recommended actions for PV Water to address in its 5-year update, the GSU22. The GSU22 is discussed further below.

3.2.2 MANAGEMENT AND PROTECTION

Since its inception in 1984, PV Water has been working to address groundwater supply challenges. While the City's water supplies are not currently under immediate threat by seawater intrusion, the City has collaborated with PV Water to develop projects that artificially recharge groundwater or reduce agricultural reliance on groundwater. Artificial recharge captures and retains water in surface impoundments (dams, dikes, and infiltration areas) to allow water to percolate into the underlying sub-basin.

Significant water supply projects and studies completed by PV Water, often in collaboration with the City, include the following:

- **RWF –** The City collaborated with PV Water to develop and build the RWF to provide water for agricultural irrigation. The City operates and provides treated wastewater to the RWF.
- **Increased Water Storage at City's Wastewater Treatment Plant –** Agricultural demand for recycled water is highest during the day; however, recycled water is also produced during nighttime hours. This project added 1.5 million gallons of storage capacity, raising the total RWF storage capacity to over 2 million gallons and allowing an additional estimated 750 AFY of water supply to meet daytime agricultural water demand.
- **Harkins Slough Managed Aquifer Recharge and Recovery Facility –** This facility allows PV Water to divert, filter, store, and use water from Harkins Slough that would otherwise flow to the Monterey Bay.

[2] The GSP Alternative is composed of the 2014 BMP Update, the GSU22, the Pajaro Valley Hydrologic Model report, the Agency Act, the Salt and Nutrient Management Plan and other miscellaneous documents.

[3] DWR (California Department of Wate Resources). 2016. Bulleting 118: Interim Update 2016. Accessed September 2025. https://cawaterlibrary.net/wp-content/uploads/2017/05/Bulletin_118_Interim_Update_2016.pdf.

- **Coastal Distribution System (CDS) –** This system consists of over 21 miles of pipeline capable of providing a blend of recycled water, Harkins Slough water, and inland groundwater to over 6,100 acres of agricultural land.
- **Blend Wells –** PV Water operates two production wells that augment the supplemental water supply and improve water quality.
- **Modeling –** PV Water collaborates with the U.S. Geological Survey (USGS) to perform modeling to assess the impact of climate change, water demand, conservation projects, and other factors on water supplies in the Pajaro Valley. Additionally, PV Water maintains groundwater and surface water monitoring programs that collect and store data pertaining to surface and groundwater quality and quantity. These programs track and analyze changes through time and inform water management and planning efforts.
- **College Lake Integrated Resources Management Project –** This project includes a weir structure and intake pump station; a treatment plant; and a 6-mile, 30-inch water main to convey water to the CDS to supply an average of 1,800–2,300 AFY to agricultural users.
- **Watsonville Slough System Managed Aquifer Recharge and Recovery Projects –** These projects consist of upgrading the existing Harkins Slough, developing Struve Slough as a water supply source, and constructing a recharge basin. The projects are scheduled for completion in 2028.

3.2.3 PROJECTED GROUNDWATER SUPPLY

PV Water continues to implement the projects identified in the 2014 BMP and is monitoring and reporting on groundwater quantity and quality. Historically chronic reductions in groundwater levels have led to seawater intrusion from the Pacific Ocean, resulting in increased salinization of the groundwater in the coastal zone (Figure 9). Over time, brackish water can negatively impact crops, soil, and infrastructure. Thus, a significant sustainability strategy for the Pajaro Valley Sub-Basin is to maintain groundwater elevations that inhibit saltwater intrusion "at levels that have supported groundwater supply over the last twenty years."[4]

Groundwater quality is evaluated based on approved water quality sustainability management criteria for chloride, nitrates, and total dissolved solids. These criteria have been established for an inland and a coastal zone, with a heavy emphasis on the coastal zone. The urban limit line falls entirely in the inland zone; however, the two zones are in the same groundwater sub-basin and closely linked.

[4] Pajaro Valley Water Management Agency. 2025. "GSU22 Overview Fact Sheet." 7–28. Accessed September 2025. https://www.pvwater.org/images/about-pvwma/assets/SGM/PVWater_GSU22-Overview-FactSheet.pdf.

FIGURE 11: GSU22 INLAND AND COASTAL ZONE MAP (SOURCE: GSU22)

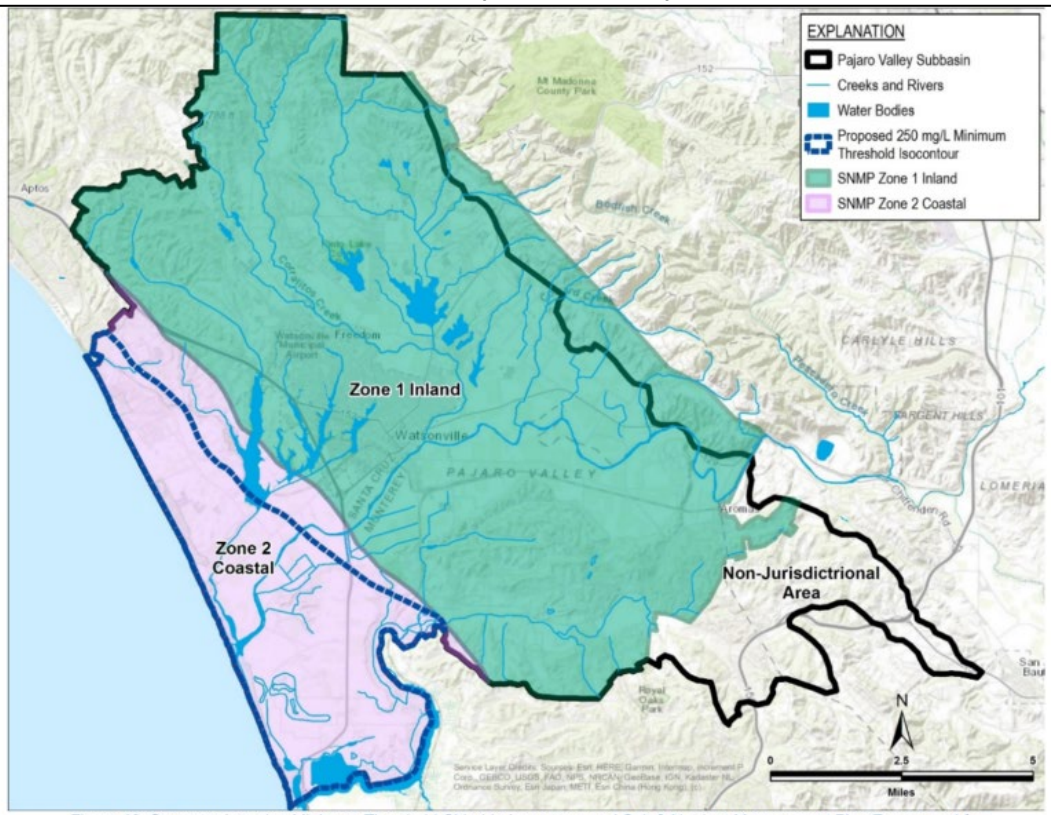


Figure 10. Seawater Intrusion Minimum Threshold Chloride Isocontour and Salt & Nutrient Management Plan Zones used for Groundwater Quality Sustainable Management Criteria

Pajaro Valley Basin Groundwater Sustainability Update 2022 (GSU22) 2-22
December 2021

The DWR recommended that PV Water develop a projected water budget that demonstrates the anticipated response to BMP implementation. The groundwater budget is an inventory of estimates of past, current, and future groundwater inflows and outflows to and from the Pajaro Valley Sub-Basin. To aid in the development of the estimates, PV Water hired the USGS. The USGS developed a conceptual groundwater model to reproduce the most important natural and human components of the hydrologic system and related climatic factors. The Pajaro Valley Hydrologic Model was most recently updated in 2020. Results are presented in GSU22.

Model simulations provided estimates of historical, current, and future water budgets, incorporating projected climate change, sea-level rise, and human uses; simulations of projects described in the 2014 BMP; and linkages to other basins. Based on the model results, the GSU22 committee found that “the projected water budget results from the Pajaro Valley Hydrologic Model (PVHM), updated in 2021, demonstrate that the Basin Management Plan Update (2014) projects and management actions are likely to achieve

their intended effects, increasing groundwater in storage and reducing the rate of seawater intrusion, through 2040."

While the model simulations are projected estimates, they provide highly useful tools for managing water resources and determining the future benefits of potential water supply projects. Table 14 presents the model results. When the model was developed, municipal pumping, highlighted in pink, was assumed to grow at an annual rate of approximately 0.47 percent. This resulted in an average of 7,220 AFY for 2025–2039 and 7,850 AFY for 2040–2069. Municipal pumping represents the City's groundwater withdrawals to meet water demand in its service area.

The areas highlighted in yellow represent (1) net annual change of physical groundwater in storage and (2) net annual change of groundwater in storage net of offshore flows. In the 2025–2039 time period, groundwater storage and groundwater storage net of seawater intrusion improve significantly over the historical time period. This trend reverses in the 2040–2069 time period.

Table 15 presents averages for water year types across the entire time frame of 2025–2069.

Figure 10 depicts a graphical presentation of the results over time. Here, the modeled results indicate that the net change in storage remains positive throughout the 2025–2069 period, reaching nearly zero in 2069.

Seawater intrusion occurs in the coastal area depicted on Figure 9. Note, however, that the model only predicts an average of groundwater levels and seawater intrusion across both the coastal and inland areas.

TABLE 14: GSU22 PROJECTED GROUNDWATER BUDGET SUMMARY (TABLE 18 FROM GSU22)

	Component	Historical/Current Average (WY 1976-2018)	WY 2025-2039 Average	WY 2025-2039 Percent% Change from Historical/Current	WY 2040-2069 Average	WY 2040-2069 Percent Change from Historical/Current
Inflows	From Areas Outside Mapped Basins	920	1,140	24%	1,100	20%
	Flow From Offshore	7,640	5,730	-25%	6,680	-13%
	Flow From mid-County	7,970	7,290	-9%	7,810	-2%
	Flow From Salinas	4,440	4,290	-3%	4,390	-1%
	Flow From Purisima Highlands	1,360	1,370	1%	1,340	-1%
	Net Streambed Recharge	13,110	15,290	17%	14,840	13%
	Deep Percolation	24,310	24,360	<1%	22,670	-7%
Outflows	Flow to Offshore	1,050	2,020	93%	1,840	75%
	Rural Residential Pumping	1,780	890	-50%	890	-50%
	Flow To mid-County	1,250	1,230	-2%	1,180	-6%
	Flow To Salinas	2,280	3,340	46%	3,050	34%
	Flow To Purisima Highlands	330	330	<1%	320	-3%
	Drain Return Flow	7,520	9,400	25%	8,530	13%
	ET From Groundwater	2,770	3,840	38%	3,900	41%
	Municipal Pumping	6,410	7,220	13%	7,850	22%
	Ag pumping	35,480	27,840	-22%	30,650	-14%
	ASR Pumping	410	1,060	157%	1,160	183%
Storage	Net Change of Physical Groundwater in Storage	660	2,280	246%	-570	-186%
	Net Change of Groundwater in Storage Excluding Net Offshore Inflows (To Approximate Usable Groundwater in Storage)	-5,930	-1,430	-74%	-5,410	-3%

TABLE 15: GSU22 PROJECTED GROUNDWATER BUDGET SUMMARY BY WATER YEAR TYPE (TABLE 19 FROM GSU22)

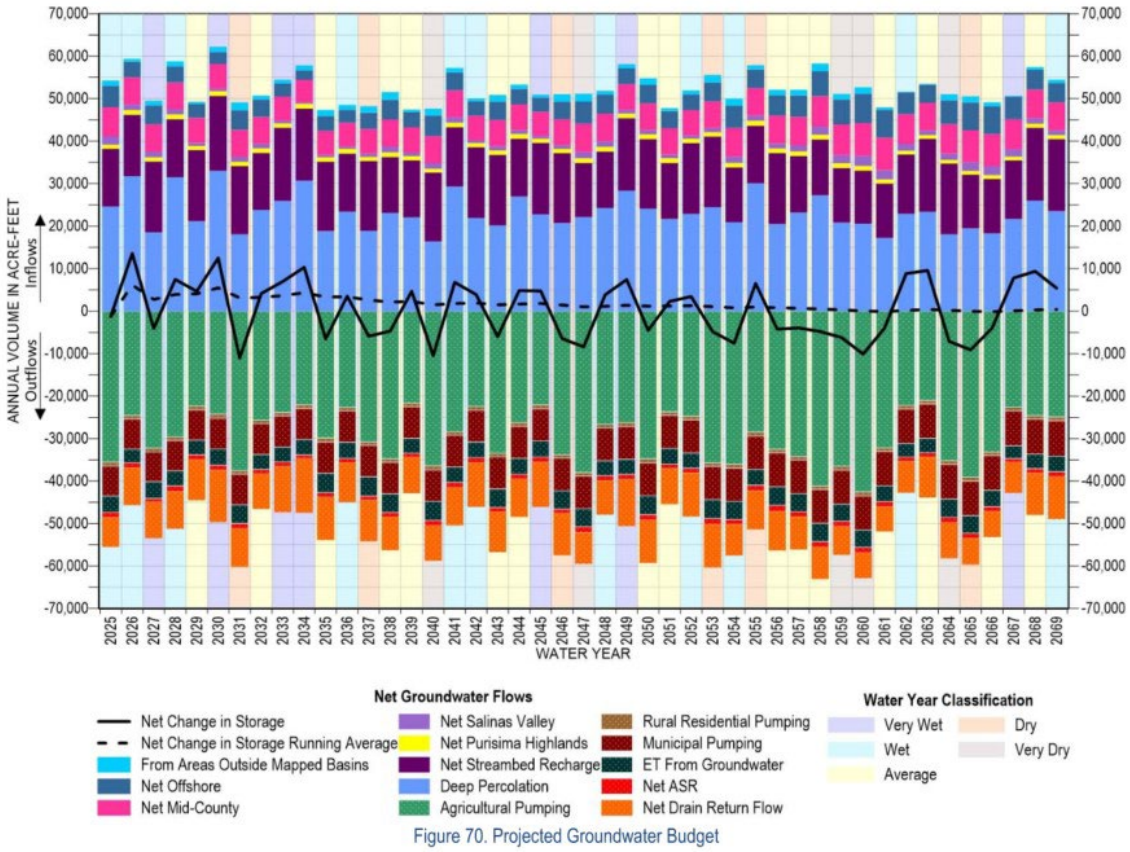
	Component	Average in Very Dry Years	Average in Dry Years	Average in Average Years	Average in Wet Years	Average in Very Wet Years
Inflows	Flow From Areas Outside Mapped Basins	2,270	1,200	1,670	1,530	1,520
	Flow From Offshore	6,550	6,680	6,170	5,970	5,540
	Flow From mid-County	7,730	7,810	7,580	7,510	7,270
	Flow From Salinas	4,470	4,430	4,440	4,400	4,350
	Flow From Purisima Highlands	1,710	1,620	1,680	1,740	1,770
	Net Streambed Recharge	15,940	12,160	13,720	13,860	14,530
	Deep Percolation	21,970	16,970	23,730	27,030	31,110
Outflows[1]	Flow to Offshore	2,010	1,840	2,050	2,080	2,200
	Rural Residential Pumping	880	850	900	900	880
	Flow To mid-County	1,460	1,330	1,410	1,400	1,410
	Flow To Salinas	3,510	3,170	3,420	3,440	3,620
	Flow To Purisima Highlands	410	400	410	420	430
	Drain Return Flow	10,000	6,990	8,990	9,400	10,810
	ET From Groundwater	4,850	4,190	4,270	4,130	4,070
	Municipal Pumping	7,920	7,780	7,630	7,600	7,660
	Ag pumping	39,190	29,380	32,870	30,480	28,300
	ASR Pumping	1,350	930	1,100	1,140	1,110
Storage[2]	Net Change of Groundwater in Storage	-10,990	-6,010	-4,100	1,010	5,520
	Net Change of Groundwater in Storage Excluding Net Flows from Offshore (To Approximate Usable Groundwater in Storage)	-15,530	-10,850	-8,220	-2,880	2,180

*All values are in acre-feet per year (AFY), rounded to the nearest 10 AFY. Small discrepancies between inflow minus outflow and change in storage may occur due to rounding.

[1] Outflows shown as positive flows in tables for flows exiting the Basin. In figures that show both inflows and outflows, inflows are shown as positive, and outflows are shown as negative.

[2] Net change of groundwater in storage is positive for an increase of groundwater in storage (Inflows>Outflows) and negative for a decrease of groundwater in storage (Outflows<Inflows). This sign convention is also used in figures.

FIGURE 12: GSU22 PROJECTED GROUNDWATER BUDGET OVER TIME (FIGURE 70 FROM GSU22)



3.3 CLIMATE CHANGE AND SEA-LEVEL RISE

There is scientific evidence that global climate conditions are changing and will continue to change as a result of the continued buildup of greenhouse gases in Earth's atmosphere. Changes in climate can affect water supply and water quality through modifications in the timing, amount, and form of precipitation. Increased temperatures influence water supplies through evapotranspiration and increased water demands—particularly for agriculture. Climate change is also expected to affect storm intensity, flooding, riparian and aquatic habitat and ecosystems, and seawater intrusion.

In coastal aquifers, such as the Pajaro Valley Sub-Basin, as groundwater levels decrease, the pressure gradient between saltwater and freshwater also changes. The lower the groundwater level becomes, the less pressure there is from freshwater within the aquifer to resist the intruding seawater. Reduced precipitation and stream runoff associated with drought events inhibit groundwater recharge. Natural recharge has not been sufficient to maintain groundwater levels in the Pajaro Valley Sub-Basin; therefore, seawater intrusion has been an issue, particularly for farmers in the coastal area west of the City.

The USGS model incorporated projected climate change and sea-level rise based on the Community Climate System Model 4 (CCSM4). The CCSM4 has been used to study several

paleoclimate epochs, the climate of the more recent past, and to make projections of possible future climate change. The use of the CCSM4 is consistent with DWR guidance for evaluating climate change.[5]

[5] California DWR, 2018b, Guidance for Climate Change Data Use During Groundwater Sustainability Plan Development, Guidance Document for Sustainable Management of Groundwater, July.

4 CONCLUSION – WATER RELIABILITY

As discussed previously, the City has water rights to 21,000 AFY of groundwater. However, modeling indicates that it cannot withdraw this level of water without a possible negative influence on groundwater quality and quantity.

To review the potential impact of the GPU on groundwater quality and quantity, this WSA compares demand to the GSU22 water modeling. Full buildout based on the GPU would increase demand by 346 AFY, for a total of 7,134 AFY. A portion of the demand will be met through surface water rather than groundwater, as shown in Table 16. The impact on groundwater is projected to be 7,134 AFY, which is significantly below the GSU22-modeled levels of 7,220 AFY through the year 2039 and 7,850 AFY for 2040–2069.

TABLE 16: GROUNDWATER VERSUS SURFACE WATER SUPPLY IN AN AVERAGE YEAR

Water Source	Total Water Demand at Full Buildout (AFY)
Groundwater	6,932
Surface Water	202
Total	**7,134**

Note: AFY = acre-feet per year

Table 17 presents water reliability in normal, single, and multiple dry-years. Water supply is based on municipal demand modeled in GSU22 (Table 15) plus 202 AFY for surface water. While Table 17 indicates negative numbers in some years, these are offset by positive impacts. Wet and very wet-years will further provide positive impacts on supply. Therefore, the projected groundwater supply will meet projected water demand.

TABLE 17: WATER RELIABILITY IN NORMAL, SINGLE, AND MULTIPLE DRY-YEARS (AFY)

Year Type	Supply and Demand	2025	2030	2035	2040	2045
Normal Year	Supply Total	7,832	7,832	7,832	7,832	7,832
	Demand Total	6,788	7,134	7,134	7,134	7,134
	Difference	**1,044**	**698**	**698**	**698**	**698**
Single Dry-Year	Supply Total	7,982	7,982	7,982	7,982	7,982
	Demand Total	7,359	7,734	7,734	7,734	7,734
	Difference	**623**	**248**	**248**	**248**	**248**
Second Dry-Year	Supply Total	7,982	7,982	7,982	7,982	7,982
	Demand Total	8,318	8,742	8,742	8,742	8,742
	Difference	**−336**	**−760**	**−760**	**−760**	**−760**
Third Dry-Year	Supply Total	8,122	8,122	8,122	8,122	8,122
	Demand Total	7,865	8,266	8,266	8,266	8,266
	Difference	**257**	**−144**	**−144**	**−144**	**−144**
Fourth Dry-Year	Supply Total	8,122	8,122	8,122	8,122	8,122
	Demand Total	7,128	7,491	7,491	7,491	7,491
	Difference	**994**	**631**	**631**	**631**	**631**

Notes: AFY = acre-feet per year

APPENDIX A: GROWTH PROJECTIONS AND ASSOCIATED WATER DEMAND

	Dwelling Units	Persons per Unit	Duty Factor (gal/person /day)	Square Feet	Duty Factor (gal/sq ft/day)	Annual Water Usage (gal/yr)	Annual Water Usage (AFY)
Infill							
Corridor Infill							
Residential SFH, Detached and Attached	49	3.75	72			4,815,536	15
Residential MFH	532	2.89	32			17,789,412	55
Commercial							
Dining				31,595	0.740	8,533,810	26
Retail				63,190	0.096	2,214,178	7
Office				31,594	0.100	1,153,181	4
Total Corridor Infill	**581**			**126,379**		**34,506,117**	**106**
DWSP Infill							
Residential MFH	3,883	2.89	32			129,842,647	398
Commercial							
Dining				28,932	0.740	7,814,533	24
Retail				57,864	0.096	2,027,555	6
Office				28,932	0.100	1,056,018	3
Total DWSP Infill	**3,883**			**115,728**		**140,740,753**	**432**
Neighborhood Infill							
Residential SFH, Detached and Attached	96	3.75	72			9,434,520	29
Total Neighborhood Infill	**96**					**9,434,520**	**29**
Employment Infill							
Industrial				270,511	0.140	13,823,112	42
Total Employment Infill				**270,511**		**13,823,112**	**42**
TOTAL INFILL	**4,560**			**512,618**		**198,504,501**	**609**

	Dwelling Units	Persons per Unit	Duty Factor (gal/person /day)	Square Feet	Duty Factor (gal/sq ft/day)	Annual Water Usage (gal/yr)	Annual Water Usage (AFY)
New							
Buena Vista							
Residential SFH, Detached and Attached	470	3.75	72			46,189,838	142
Residential MFH	246	2.89	32			8,225,931	25
Commercial							
Dining				10,018	0.740	2,705,862	8
Retail				10,018	0.096	351,031	1
Office					0.100		
Total Buena Vista	**716**			**20,036**		**57,472,661**	**176**
Area B							
Residential SFH, Detached and Attached	164	3.75	72			16,117,305	49
Residential MFH	94	2.89	32			3,143,242	10
Total Area B	**258**					**19,260,547**	**59**
Area C Subarea 1 (East side of Areac C, along East Lake Avenue)							
Residential SFH, Detached and Attached	247	3.75	72			24,274,234	74
Residential MFH	38	2.89	32			1,270,672	4
Commercial							-
Dining				5,000	0.740	1,350,500	4
Retail				5,000	0.096	175,200	1
Office					0.100		
Total Area C Subarea 1	**285**			**10,000**		**27,070,606**	**83**
Area C Subarea 2 (West side of Area C, next to Area B)							
Residential SFH, Detached and Attached	162	3.75	72			15,920,753	49
Residential MFH		2.89	32				
Total Area C Subarea 2	**162**					**15,920,753**	**49**
Highway 1 Gateway (Development)							
Commercial							
Dining				62,896	0.740	16,988,210	53
Retail				958,032	0.096	33,569,441	103
Office				529,016	0.100	19,309,084	59
Industrial				479,015	0.140	24,477,667	76
Hotels				100,000	0.230	8,395,000	26
Total Highway 1 Gateway (Development)				**2,128,959**		**102,739,401**	**317**
Recreational Fields				2,700,000	0.028	20,695,500	64
Total Highway 1 Gateway				**4,828,959**		**123,434,901**	**381**
TOTAL NEW	**1,421**			**4,858,995**		**243,159,468**	**748**

TOTAL INFILL AND NEW WATER DEMAND	Dwelling Units	Persons per Unit	Duty Factor (gal/ person /day)	Square Feet	Duty Factor (gal/sq ft/day)	Annual Water Usage (gal/yr)	Annual Water Usage (AFY)
Residential SFH, Detached and Attached	1,188	3.75	72			116,752,185	358.00
Residential MFH	4,793	2.89	32			160,271,905	492.00
Commercial							
Dining				138,441	0.740	37,392,914	115.00
Retail				1,094,104	0.096	38,337,404	118.00
Office				589,542	0.100	21,518,283	66.00
Hotels				100,000	0.230	8,395,000	26.00
Industrial				749,526	0.140	38,300,779	118.00
Recreational Fields				2,700,000	0.028	20,695,500	64.00
TOTAL	**5,981**			**5,371,613**		**441,663,970**	**1,357**

APPENDIX B: PAJARO RIVER WATERSHED INTEGRATED REGIONAL WATER MANAGEMENT PLAN

Pajaro River Watershed Integrated Regional Water Management Plan

October 2019

PAJARO RIVER
watershed
Integrated Regional Water Management

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1 Governance

This chapter meets the following Integrated Regional Water Management (IRWM) Plan Standard from the 2016 Integrated Regional Water Management Program Guidelines (DWR, 2016).

> The IRWM Plan must document a governance structure that ensures the IRWM Plan will be updated and implemented beyond existing State grant programs. The IRWM Plan must include:
>
> - The name [and description] of the RWMG responsible for development and implementation of the Plan…and how the makeup of the RWMG meets CWC §10539 and is sufficient of membership and participation to develop and implement the IRWM Plan.
> - The RWMG and individual project proponents who adopted the Plan
> - A description of the IRWM governance structure
> - A description of how the chosen form of governance addresses and ensures [outreach and involvement, decision making, access to the IRWM process, communication, Plan implementation, coordination with neighboring IRWM efforts and State and federal agencies, collaborative processes, how changes to the IRWM Plan will be performed, and updating or amending the IRWM Plan].

1.1 Background

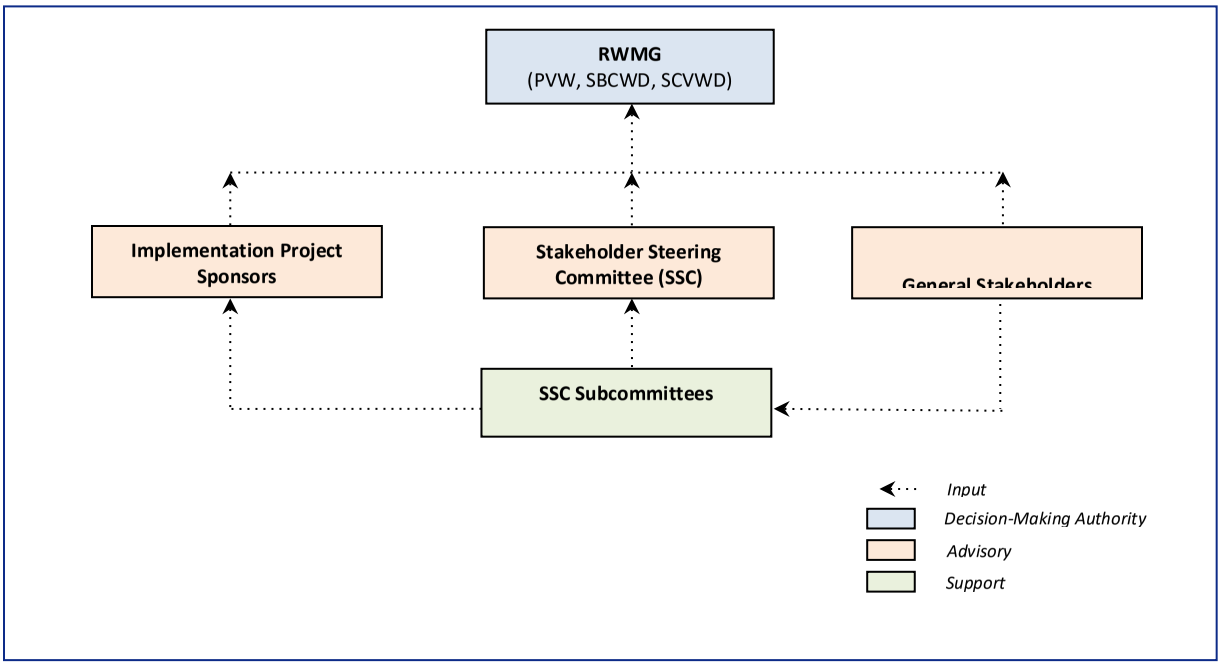
In October 2004, Pajaro Valley Water Management Agency (PV Water), San Benito County Water District (SBCWD), and Santa Clara Valley Water District (Valley Water) entered into a Memorandum of Understanding (MOU) for the purpose of coordinating water resources planning and implementation activities watershed-wide (see Appendix A). The three agencies, collectively known as the Pajaro River Watershed Collaborative (Collaborative), led the development and implementation of the 2007 Pajaro River Watershed Integrated Regional Water Management (IRWM) Plan. The Collaborative was recognized as the Regional Water Management Group (RWMG) for the Pajaro River Watershed IRWM effort during the California Department of Water Resources' (DWR's) Plan Review Process in 2009. As part of their RWMG role, the Collaborative has met and will continue to meet regularly in order to formulate and carry out the mission, goals, objectives, and strategies of the IRWM Plan and to solicit and encourage participation from other agencies and stakeholders in the watershed. The on-going nature of the IRWM process and stakeholder collaboration will facilitate conflict identification and resolution of issues within the watershed. The collaborative approach will also provide a forum for identifying and evaluating water supply, water quality, groundwater and surface water management, ecosystem restoration, flood management, and other watershed issues.

1.2 Governance Structure

This chapter describes the Regional Water Management Group, Stakeholder Steering Committee, Implementation Project Sponsors, and Pajaro River Watershed stakeholders, which together provide sufficient breadth of membership and participation to develop and implement the Pajaro River Watershed IRWM Plan.

The Pajaro River Watershed IRWM Program decision-making authority consists of the RWMG, which solicits input from 3 advisory entities - a Stakeholder Steering Committee (SSC) and its associated subcommittees, the Implementation Project Sponsors, and general stakeholders. The governance structure is illustrated in Figure 1-1. Specific roles and responsibilities are described in subsequent sections.

Figure 1-1: Organizational Structure



1.2.1 Regional Water Management Group

The Pajaro River Watershed RWMG consists of PV Water, SBCWD, and Valley Water. The RWMG relies on input and participation from a broad range of stakeholders in IRWM Plan development and implementation. Through this collaborative approach with stakeholders, especially collaboration with the SSC on planning matters and with implementation project sponsors on implementation matters, the RWMG is able to lead an IRWM program that has addressed many of the critical issues in the watershed. The RWMG responsibilities include:

1. Providing information on the State IRWM program requirements and opportunities.
    a. Participating in State led workshops regarding IRWM planning standards and requirements;
    b. Participating in the IRWM Roundtable of Regions regarding IRWM planning approaches and recommendations; and
    c. Conveying the information from these coordination efforts to the SSC for their consideration and use when supporting the Pajaro River Watershed IRWM planning.
2. Updating the IRWM Plan.
    a. Securing and managing the IRWM consultant agreements;
    b. Leading the development and distribution of plan chapters for SSC and public review; and
    c. Leading the development and supporting the adoption of the IRWM Plan Update by SSC and other agencies and organizations.
    d. Adopting and incorporating by reference the Stormwater Resource Plans developed within the region

   e. Updating the project list in the IRWM Plan

3. Conducting public workshops and other outreach activities related to the IRWM program.
   a. Scheduling and publicizing public workshops and other outreach activities as needed to solicit public participation in the IRWM program;
   b. Preparing public workshop and outreach materials to support public participation in the IRWM program; and
   c. Coordinating outreach activities and workshops with the SSC.
   d. Coordinating tribal and disadvantaged community outreach activities
4. Coordinating with other IRWM regions in the Central Coast Funding Area.
   a. Participating in Central Coast Funding Area coordination activities;
   b. Soliciting support from the SSC members that also participate in other IRWM regions, when appropriate; and
   c. Conveying the information from these coordination efforts to the SSC for their consideration and use when supporting the Pajaro River Watershed IRWM planning.
5. Leading the IRWM Plan implementation in collaboration with other agencies and organizations.
   a. Collaborating with the SSC to monitor regional conditions and project implementation to identify potential IRWM plan modification or update needs;
   b. Facilitating the coordination of agencies and organizations when integrated or regional project opportunities exist;
   c. Coordinating and supporting the submittal of grant applications; and communicating with SSC and other stakeholders regarding funding opportunities for plan implementation.

The RWMG uses a consensus-based approach to make IRWM decisions. The RWMG incorporates the SSC, Project Sponsor, and general stakeholder advice and recommendations into the IRWM program to the maximum extent possible. If the RWMG is unable to incorporate SSC and other stakeholders' advice and recommendations, the RWMG provides an explanation to the SCC and the RWMG's policy-makers.

The RWMG supports the SSC in helping to identify a SSC chairperson, identifying facilitation needs, developing the SSC decision-making process, establishing ground rules, determining the SSC meeting frequency, and maintaining meeting records.

Legal actions such as contracting and submitting grant funding applications are carried out by individual RWMG members on behalf of the RWMG or project sponsors if a RWMG member is not participating in the funding proposal, and cost sharing agreements are developed on a case-by-case basis as necessary. Costs associated with administrative functions of the RWMG, IRWM Plan development, and Plan implementation are covered in a variety of ways, including grants, multi-agency contributions, funds from individual project proponents, and in-kind contributions of staff time from the participating entities.

The RWMG members and their responsibilities for water resources management are described below.

1.2.1.1 Pajaro Valley Water Management Agency

PV Water is a state-chartered special purpose district formed under State Law pursuant to the Pajaro Valley Water Management Agency Act. PV Water was formed to efficiently and economically manage existing

and supplemental water supplies to prevent further increase in, and to accomplish continuing reduction of, long-term overdraft and to provide and ensure sufficient water supplies for present and anticipated needs within its boundaries. PV Water has the authority to adopt ordinances to conserve local groundwater supplies that all public and private water purveyors within the Agency's boundaries must adhere to. The PV Water service area is comprised of portions of three counties, which are Santa Cruz, Monterey, and San Benito Counties. PV Water is the Groundwater Sustainability Agency (GSA) for the Pajaro Valley Groundwater Subbasin and received approval for their alternative management plan under the Sustainable Groundwater Management Act (SGMA).

1.2.1.2 San Benito County Water District

SBCWD is a special purpose district formed under State Law pursuant to the San Benito County Water District Act. As a water conservation and flood control district, the SBCWD mission is to preserve the economic and environmental health and well-being of San Benito County through the control, management and conservation of waters and the provision of water services in a practical, cost-effective and responsible manner. The SBCWD is a CVP contractor and receives water from the San Felipe Division facilities through the Pacheco and Hollister Conduits. SBCWD is also a member of the Pajaro River Watershed Flood Prevention Authority. SBCWD is the GSA for the Bolsa, Hollister, San Juan Bautista, and Tres Pinos groundwater basins (and is cooperating with Santa Clara Valley Water District, which is the GSA for small portions of the Hollister and San Juan Bautista basins within Santa Clara County).

1.2.1.3 Santa Clara Valley Water District

Valley Water is a special purpose district formed under State Law pursuant to the Santa Clara Valley Water District Act. Valley Water provides wholesale water supply, stream and watershed stewardship, and flood protection for Santa Clara County. In addition, Valley Water manages the County's groundwater subbasins. The mission of the Valley Water is a healthy, safe, and enhanced quality of living in Santa Clara County through watershed stewardship and comprehensive management of water resources in a practical, cost-effective, and environmentally-sensitive manner. Valley Water is a CVP and State Water Project (SWP) contractor and receives water from the San Felipe Division facilities through the Pacheco and Santa Clara Conduits. Valley Water is also a member of the Pajaro River Watershed Flood Prevention Authority. Valley Water is the GSA for the Llagas and Santa Clara subbasins and for the section of the Northern San Benito County subbasin that is in Santa Clara County. Valley Water received approval for their alternative management plan under the SGMA.

1.2.2 Stakeholder Steering Committee

Since formally launching the Pajaro River Watershed IRWM Plan effort in early 2005, the RWMG has been proactive and focused on ensuring stakeholders are aware of, informed about, and participating in IRWM planning and implementation. This included formation of a Stakeholder Steering Committee (SSC) in 2005. This committee provided a forum for on-going discussion and stakeholder input, and provided review and stakeholder oversight throughout the initial IRWM Plan development process.

The SSC has historically been responsive and reactive to changing regional needs, requirements and conditions, which demonstrates the active adaptive management of the Plan. In 2009, for example, the SSC was convened to address continued IRWM planning and implementation tasks including:

- Review stakeholder engagement plan,
- Review approach and schedule for responding to new Proposition 84 IRWM guidelines,
- Provide input on the level of interest in applying for implementation grants,

- Provide input on the planning grant application, and
- Continue soliciting implementation projects.

In 2011, the Pajaro River Watershed IRWM Region was awarded a planning grant. The planning grant work plan included a task to formalize the SSC. Therefore, the RWMG went through a planning process to formalize communications and develop better and more strategic approach to identify and enjoin stakeholders in the IRWM process. As a result, a new SSC was established.

The new SSC represents the interests necessary to address the objectives and resource management strategies of the Pajaro River Watershed IRWM Plan in both the upper and lower watershed. Furthermore, consistent with California Water Code Section 10541(g), the SSC is designed to provide a balance of water management interests and geography. The RWMG invited interested watershed stakeholders to participate in the SSC and reviewed the list of interested participants to ensure adequate representation and identify potential gaps in coverage, either in resource area or geography. As gaps were identified, additional participants were solicited to ensure balanced representation in the SSC. The SSC membership list is in Table 1-1.

Table 1-1: Stakeholder Steering Committee

Committee Member	Organization	Upper Watershed	Lower Watershed
Lynn Overtree Stewardship Manager	Land Trust of Santa Cruz County		.
Matt Freeman Assistance General Manager	Santa Clara County Open Space Authority	.	
Jennifer Scheer Executive Director	Santa Clara County Farm Bureau	.	
Lisa Lurie Executive Director	Resource Conservation District of Santa Cruz County		.
Susan Meyer Executive Director	Loma Prieta Resource Conservation District	.	
Don Ridenhour General Manager	Sunnyslope County Water District	.	
Ray Creech General Manager	Tres Pinos Water District	.	
Rob Johnson General Manager	Aromas Water District	.	.
Mark Strudley Flood Control Program Manager	County of Santa Cruz		.
John Ricker Water Resources Division Director	County of Santa Cruz		.
Steve Palmisano Public Works Director	City of Watsonville		.
Matt Keeling	Central Coast Regional Water Quality Control Board	.	.
Valentin Lopez Tribal Chairperson	Amah Mutsun Tribal Band	.	.
Kenn Reiller	Sierra Club, Ventana Chapter	.	.
Marlene Freeland	Bolado Park Golf Course	.	

The SSC, as described above, provides advice from diverse perspectives to the RWMG. The purpose of the SSC is to reflect the concerns and issues of various stakeholders and the general public, serve as a link to the community, serve as a "sounding board" for the Partners, and comment on IRWM Plan documents. The Partners will work with the SSC to ensure that SSC and public concerns and ideas are understood and considered in Partner decisions.

The SSC comprises 15 members, designed to provide a balance of water management interests and geography. The ability of the SSC to be effectual relies on the roles, responsibilities and communication

among the SSC and with the RWMG. The role of the SSC is to serve as an advisory body in reviewing and providing recommendations on work items completed by RWMG staff and consultants as well as to:

1. Assist with ongoing Public Participation in the IRWM Program.
    a. Assist in receiving public input;
    b. Coordinate with other entities for areas of represented expertise;
    c. Encourage outreach/educational activities to promote the IRWM program within agencies and constituencies (i.e., website recognition, events); and
    d. Assist in outreach to disadvantaged communities (DACs) within agencies and constituencies.
    e. Assist in outreach to tribal communities whose traditional territories are located within the Pajaro River watershed IRWM region.
2. Provide input on the project prioritization process and criteria.
    a. Provide input on the planning goals and objectives;
    b. Provide input on project screening criteria to measure a project's benefit in meeting the planning goals and objectives; and
    c. Provide input on the weighting or ranking of the criteria that emphasizes the region's priorities.
3. Assist in Preparation and Submittal of Final IRWM Plan Updates.
    a. Provide recommendations on chapters of Draft IRWM Plan;
    b. Assist in the development of Resolutions of Support; and
    c. Provide SSC recommendation to RWMG policymakers on IRWM Plan adoption.
4. Review and Provide Recommendations on Funding Applications.
    a. Assist in coordinating and consolidating implementation projects;
    b. Provide input on criteria for selecting recommended implementation projects based on the Proposal Solicitation Package funding priorities; and
    c. Provide SSC recommendation to RWMG policymakers on funding applications.
5. Coordinate with Adjacent Planning Regions.
    a. Assist in coordinating with adjacent planning regions; and
    b. Review and recommend on a process for selecting cross-regional projects with adjacent planning regions.

SSC membership expectations include:

- Attending SSC meetings regularly;
- Articulating their interests, concerns and perspectives on the issues being addressed;
- Maintaining an open mind regarding other views;
- Focusing on the "big picture" of the IRWM Plan; and

- Constructively managing conflict between SSC members.

The SSC may also form subcommittees to address major programs in the Pajaro IRWM Plan, such as water supply, salt management, agricultural water quality, and Pajaro River flood protection. The role of the subcommittees is to further evaluate the projects within their respective programs, make program recommendations and lead implementation efforts for the projects included in their recommendations. The potential responsibilities of the subcommittees include:

- Outline program implementation schedule
- Develop program financing plan
- Lead project implementation efforts
- Develop project evaluation processes including degree of benefit assessment
- Enhance project definitions in terms of regional program objectives
- Define the subcommittee's stakeholder involvement process (including disadvantaged communities) and actively engage their stakeholders, as the subcommittees serve as the primary means of stakeholder participation

The SSC members will also help provide a link with other major stakeholder engagement efforts in the region. The RWMG will monitor SSC participation and, if needed, recommend changes to the membership to ensure the committee continues to represent the interests necessary to address the objectives and resource management strategies of the Pajaro River Watershed IRWM Plan and effort.

1.2.3 Project Sponsors

Implementation Project Sponsors are those agencies and organizations that are implementing plans or projects in the IRWM Plan. The current list of Implementation Project Sponsors can be found on the Pajaro IRWM website: pajaroirwmp.org

The Project Sponsors will be responsible for stakeholder outreach and engagement on their specific projects, providing the RWMG with information on their implementation efforts, and participating in appropriate SSC Subcommittees.

1.2.4 General Stakeholders

From the information gathered through the outreach efforts, a list of stakeholders was generated, as seen in Table 1-2. The stakeholder list includes organizations dealing with all aspects of water resource management, including water supply, water quality, flood protection and environmental protection and enhancement. The stakeholder list is expected to evolve over time; therefore, additional stakeholders are expected to be identified and contacted for their on-going participation in IRWM planning and project generation. Individuals may request to be added to the stakeholder list by e-mailing the RWMG representatives at the following addresses:

RWMG Representative	Agency	E-Mail Address
Samantha Greene	Valley Water	sgreene@valleywater.org
Brian Lockwood	PV Water	lockwood@pvwater.org
Jeff Cattaneo	SBCWD	jcattaneo@sbcwd.com

Stakeholders and the general public who are interested in the development and implementation of IRWM Plan but are unable to participate at a more significant level (such as being a member of the SSC or a subcommittee), would be able to provide their comments through multiple outreach activities conducted by the RWMG, SSC, and Implementation Project Sponsors and shape the development and implementation of the IRWM Plan.

Table 1-2: Stakeholders in the Pajaro River Watershed IRWM Plan

Stakeholder	Description of Authority/Interests
Amah Mutsun Tribal Band	The Amah Mutsun Tribal Band (AMTB) is comprised of the living descendants of the Mutsun and Awaswas speaking peoples whose ancestral homeland encompasses the lands and waters of Santa Cruz, San Benito, and parts of San Mateo and Santa Clara counties—the territory known to the Tribe as Popeloutchom. A goal of the Amah Mutsun is to restore lands and waterways within the Pajaro Watershed using the knowledge and approaches of their ancestors. In 2013, the AMTB established the Amah Mutsun Land Trust (AMLT)—a Native-led 501(c)(3) non-profit organization—to serve as a vehicle for the Tribe's re-engagement with its ancestral territory and stewardship role.
Aromas Water District	Aromas Water District is located on the westerly edge of the PV Water service area. This special district provides water treatment and supply service for approximately 950 customers.
Association of Monterey Bay Area Governments (AMBAG)	AMBAG was organized for the permanent establishment of a forum for planning, discussion and study of regional problems of mutual interest and concern to the counties and cities in Monterey, San Benito, and Santa Cruz Counties; and for the development of studies, plans, policies and action recommendations.
California Coastal Conservancy	The California Coastal Conservancy works with other groups to protect, conserve, restore, and enhance environmental and human-based resources of the California coast and ocean for environmentally sustainable and prudent use by current and future generations.
Central Coast Agricultural Water Quality Coalition	This coalition is a partnership of Central Coast growers organized through their respective county Farm Bureaus. Established by the California Farm Bureau, six Central Coast counties receive grant monies to fund research and monitoring of agricultural water quality effects. The Coalition is working to identify local water quality threats and learn about economically viable water quality protection practices. The various county Farm Bureau program coordinators assist watershed groups to implement these practices.

Central Coast Regional Water Quality Control Board (RWQCB) – Region 3	The Central Coast RWQCB is a regulatory extension of the State Water Resources Control Board. The Central Coast RWQCB coordinates and controls the quality of water in its region through the protection of beneficial uses, the development of water quality objectives to protect the beneficial uses, and implementation planning to accommodate the water quality objectives. This entity was established by the Porter-Cologne Water Quality Control Act (1969), which became Division Seven ("Water Quality") of the State Water Code. The State Water Code establishes the responsibilities and authorities of the nine RWQCBs (previously called Water Pollution Control Boards) and the State Water Resources Control Board (SWRCB). The federal Clean Water Act (Public Law 92-500, as amended) provides for the delegation of certain responsibilities in water quality control and water quality planning to the states. Where the Environmental Protection Agency (EPA) and the SWRCB have agreed to such delegation, the Regional Boards implement portions of the Clean Water Act, such as the National Pollutant Discharge Elimination System (NPDES) program and toxic substance control programs
Central Coast Resource Conservation & Development Council	The Central Coast Resource Conservation & Development Council serves South Santa Clara, San Benito, Santa Cruz, Monterey, San Luis Obispo, and Santa Barbara Counties. The council's activities focus on agritourism, steelhead habitat enhancement, water quality education, coordinated resource management and planning (CRMP) coordination and permit streamlining.
City of Gilroy	Located in South Santa Clara County, the City of Gilroy provides water service to residences and businesses. Gilroy is a South County Regional Wastewater Authority (SCRWA) Partner which provides wastewater service for the Cities of Gilroy and Morgan Hill.
City of Hollister	The City of Hollister is a major urban service area in San Benito County. The City of Hollister provides various municipal and industrial (M&I) services that includes wastewater collection and treatment and water supply service.
City of Morgan Hill	Located in South Santa Clara County, the City of Morgan Hill provides water service to residences and businesses. Morgan Hill is a SCRWA Partner that provides wastewater service for the Cities of Morgan Hill and Gilroy.
City of San Juan Bautista	Located in San Benito County, the City of San Juan Bautista provides wastewater and water services. San Juan Bautista is a member of the Water Resources Association of San Benito County.
City of Watsonville	The City of Watsonville is a major urban service area within PV Water. The City provides various M&I services including wastewater collection and treatment and water supply service.

County of Monterey	The County of Monterey is a government agency with land use jurisdiction within its boundaries. The County also manages water and sanitation systems in unincorporated County Service Areas. The southern portion of the PV Water service area is in Monterey County.
County of San Benito	The County of San Benito is a government agency with land use jurisdiction within its boundaries. A significant portion of the upper Pajaro River watershed (including the San Benito River) is within San Benito County.
County of Santa Clara	The County of Santa Clara is a government agency with land use jurisdiction within its boundaries. A portion of the upper Pajaro River watershed is within Santa Clara County.
County of Santa Cruz	The County of Santa Cruz is a government agency with land use jurisdiction within its boundaries. The County of Santa Cruz also has jurisdiction over stormwater, drainage, watershed management, water resources management and water quality protection for the unincorporated areas of Santa Cruz County. The northern portion of the PV Water service area is in Santa Cruz County.
Farm Bureaus (Monterey County, San Benito County, Santa Clara County, and Santa Cruz County)	Farm Bureaus are organized on a county, state, and national level with the county Farm Bureaus serving as the core of the organization. Santa Cruz, Monterey, San Benito and Santa Clara Counties each have their own Farm Bureau. The Farm Bureau is a voluntary, nongovernmental, nonpartisan organization of farm and ranch families seeking solutions to the problems that affect their lives, both socially and economically. The Central Coast Agricultural Water Quality Coalition is the local Farm Bureau partnership that works with growers within the Pajaro River watershed.
Land Trust of Santa Cruz County	The land trust is a community-based nonprofit organization that works cooperatively with land owners, government entities, and other organizations to protect and manage lands of significant value. Their primary focuses are protecting prime agricultural lands, protecting lands with significant habitat value, and providing effective stewardship of lands already protected.
Monterey Bay National Marine Sanctuary (MBNMS)	The MBNMS mission is to understand and protect the coastal ecosystem of Central California. The MBNMS is an extension of the National Oceanic and Atmospheric Administration (NOAA) National Marine Sanctuary Program (NMSP). The NMSP mission is to serve as the trustee for the nation's system of marine protected areas, to conserve, protect, and enhance their biodiversity, ecological integrity and cultural legacy. Its goals are appropriate to the unique diversity contained within individual sites. They may include restoring and rebuilding marine habitats or ecosystems to their natural condition or monitoring and maintaining already healthy areas.

Monterey County Water Resources Agency (MCWRA)	MCWRA is a special district formed to manage, protect, and enhance the quantity and quality of water and provide specified flood control services for Monterey County, and to be a leader in efficient, innovative, and equitable water resources management for the County. As a County water agency and stakeholder, MCWRA has an interest in flood prevention and water supply management of the lower Pajaro River that falls within its jurisdiction.
Pajaro River Watershed Flood Prevention Authority (PRWFPA)	PRWFPA was established in 2000 by the State of California Assembly Bill 807 to identify, evaluate, fund, and implement flood prevention and control strategies in the Pajaro River watershed, on an intergovernmental basis. Since the Pajaro River watershed covers an area within four counties (Santa Clara, San Benito, Santa Cruz, and Monterey) and four water districts (Santa Clara Valley Water District; San Benito County Water District; Santa Cruz County Flood Control and Water Conservation District, Zone 7; and Monterey County Water Resources Agency), the PRWFPA is comprised of one representative from each of the eight interested agencies. The PRWFPA is a governing body through which each member organization can participate and contribute to finding a method to provide flood protection in the watershed and promote general watershed interests. A further goal is to identify and prioritize strategies and projects that will provide multiple benefits, such as water supply, groundwater recharge, or environmental restoration and protection benefits.
Pajaro/Sunny Mesa Community Services District	Pajaro/Sunny Mesa Community Services District is a water supplier for smaller communities in the Pajaro Valley and has consolidated water delivery service for a number of mutual water companies in northern Monterey County.
Pajaro Valley Chamber of Commerce	The Pajaro Valley Chamber of Commerce promotes Watsonville and surrounding community areas and is dedicated to advancing the business success of its members.
Planning and Conservation League Foundation	The Planning and Conservation League Foundation mission is to ensure that California continues to be an attractive, livable, and equitable state by engaging in cutting-edge environmental public policy research, and educating and empowering local communities to understand and participate in local and state environmental decision making processes. The Planning and Conservation League Foundation also produces publications that educate the public about environmental challenges in the areas of planning, natural resource conservation, environmental protection, clean air, clean water, sustainable energy policies, and environmental justice.

Resource Conservation Districts (RCDs)	California RCDs are special districts organized under the state Public Resources Code, Division 9. The RCDs in the Pajaro Watershed are the RCD of Santa Cruz County, Monterey County RCD, San Benito RCD and Loma Prieta RCD. Each district has a locally elected or appointed volunteer board of directors made up of landowners in that district. Interests of the RCDs which relate to water management include water quality, wildlife habitat restoration, soil erosion control, and conservation education. RCDs are a source of technical assistance and can provide a critical link between the goals and objectives of the IRWM Plan and the land owners and managers that are integral to implementing actions.
San Benito County Agricultural Land Trust	This land trust is devoted to providing financial options to landowners in order to protect the agricultural heritage of San Benito County. The land trust can protect land permanently and directly by accepting donations of conservation easements designed to meet the individual needs of landowners. As a non-profit, tax-exempt organization, the Trust is funded through membership, donations and grants.
San Benito County Chamber of Commerce	The San Benito County Chamber of Commerce is organized for the purpose of creating, promoting, and celebrating economic vitality within San Benito County by providing resources to businesses and individuals.
San Martin Neighborhood Alliance	This community alliance encompasses local topics and issues.
Santa Clara County Open Space Authority	The immediate high priorities of the Open Space Authority are preservation of open spaces and creation of greenbelts between communities, lands on the valley floor, hillsides, viewsheds and watersheds, baylands and riparian corridors. The Open Space Authority promotes land preservation to maintain the quality of life in the County and to encourage outdoor recreation and continuing agricultural activities. It promotes development and implementation of land management policies that provide proper care of open space lands and allow public access appropriate to the nature of the land for recreation.
Santa Cruz County Flood Control and Water Conservation District, Zone 7 (SCCFC&WCD)	This district is governed by the Santa Cruz County Board of Supervisors, City of Watsonville, and PV Water. It provides flood control services to Santa Cruz County except the cities of Santa Cruz, Scotts Valley and Capitola. As a County agency and stakeholder, SCCFC&WCD has an interest in flood prevention of the lower Pajaro River that falls within its jurisdiction.
Sierra Club, Loma Prieta Chapter	This local chapter of the Sierra Club is committed to participating in the South Santa Clara County Habitat Conservation Plan/Natural Communities Conservation Plan. The planning area includes the Uvas-Llagas watershed, which is a tributary to the Pajaro River.

Sierra Club, Ventana Chapter	This local chapter of the Sierra Club is interested in preserving the Pajaro River and its watershed through environmental activism.
Silicon Valley Land Conservancy	The Silicon Valley Land Conservancy is a nonprofit entity formed to preserve and protect the remaining open space in Silicon Valley.
Soquel Creek Water District	This government agency provides water resource management for communities in mid-Santa Cruz County.
South County Regional Wastewater Authority	South County Regional Wastewater Authority is the regional wastewater authority for South Santa Clara County, primarily serving the Cities of Gilroy and Morgan Hill. SCRWA has partnered with the Santa Clara Valley Water District to expand water recycling in southern Santa Clara County.
South Valley Streams for Tomorrow	This organization is concerned with streams in South Santa Clara County and tributaries of the Pajaro River in Santa Clara and San Benito Counties.
Sunnyslope County Water District	Sunnyslope County Water District is a water and wastewater management district for a portion of the City of Hollister and the Ridgemark Development in San Benito County.
The Nature Conservancy (TNC)	TNC is a leading international, nonprofit organization dedicated to preserving the diversity of life on Earth. Their mission is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. TNC is currently working on projects within the Pajaro River watershed that promotes private lands conservation and other conservation practices. They work with landowners, communities, cooperatives and businesses to establish local groups that can protect land.
U.S. Army Corps of Engineers (Corps)	The Corps provides engineering and environmental services throughout the nation. The Corps is currently conducting a flood risk management study on the lower Pajaro River and tributaries.
Water Resources Association of San Benito County	The Water Resource Association is comprised of the SBCWD, San Benito County Government, Sunnyslope County Water District, City of Hollister, and City of San Juan Bautista.
Watsonville Wetlands Watch	The Watsonville Wetlands Watch is a nonprofit community based organization dedicated to the protection, restoration and appreciation of the wetlands of the Pajaro Valley.
Wildlands, Inc.	Wildlands, Inc. is a habitat development and land management company with projects throughout California and the western United States. Wildlands is one of the nation's first private organizations to establish mitigation banks and conservation banks that protect wildlife habitat in perpetuity.

1.3 Benefits of IRWM Governance Structure

The following sections describe how the governance structure addresses and ensures public outreach and involvement processes, effective decision making, balanced access and opportunity for participation in the

IRWM process, effective communication within and outside the IRWM region, long-term implementation of the IRWM Plan, coordination with neighboring IRWM efforts and State and federal agencies, and collaborative processes to establish plan objectives.

1.3.1 Public Outreach and Involvement Processes

A broad stakeholder outreach process is crucial to ensure that the IRWM Plan identifies local issues, reflects local needs, promotes the formation of partnerships, and encourages coordination with state and federal agencies. One of the benefits of a regional planning process is that it brings together a broad array of groups into a forum to discuss and better understand shared needs and opportunities.

The IRWM Plan process invites active public participation of all interested stakeholders. The main forums for IRWM planning and implementation are the SSC, the SSC subcommittees, and general stakeholder meetings. In addition to SSC and SSC subcommittee meetings, the RWMG conducts general stakeholder meetings or updates around major milestones such as updates to the IRWM Plan goals and objectives, project solicitation and review, and project selection for grant applications. All opportunities for input to key decisions related to the IRWM development and implementation, as well as those decisions, are communicated to stakeholders via email.

The public involvement process is built upon the success of the collaborative efforts within the region and with the surrounding IRWM Plan regions. Stakeholders were identified through their involvement or interest in water, environment, and similar projects in the past. These entities were contacted and invited to participate in the IRWM effort. By this process, a varied and broad group was encouraged to become stakeholder participants, including entities that were not necessarily involved with any past efforts.

1.3.2 Balanced Access and Opportunity for IRWM Process Participation

The primary method for participation in the IRWM process is through the SSC. As noted above, the RWMG ensured that the SSC includes a broad and balanced representation of community sectors and environmental and water resources interests. Other opportunities for participation in the IRWM process include being a Project Sponsor, signing up for the general stakeholder list, and participating in SSC subcommittees. No one is denied the opportunity to participate in the IRWM process; rather, the RWMG encourages interested parties to participate in the SSC and/or other stakeholder groups.

1.3.3 Effective Communication

The RWMG's communication plan establishes how communication flows and is managed throughout IRWM planning and implementation and provides a framework for continued engagement and communication flow. The purpose of the plan is to build a solid, inclusive and representative agency, stakeholder and DAC base that is supportive of the aims of the IRWM Plan.

This Communication Plan identifies the procedures used to manage communication. The plan focuses on formal communication elements. Other communication channels exist on informal levels and enhance those discussed within this Plan. This Plan is not intended to limit, but to enhance communication. Open, ongoing communication actively engaging stakeholders is critical to the success of the Plan and projects, ultimately the Region. The outreach strategy engages a balance of the interest groups in the IRWM process regardless of their ability to contribute financially to the IRWM Plan's development or implementation. Stakeholders are necessary to address the objectives and resource management strategies of the IRWM Plan. Furthermore, a robust and broad stakeholder and public outreach lays a solid foundation for regional (and sub-regional) involvement as well as build overall regional (and sub-regional) capacity. It sets forth a framework to provide guidance for implementing projects and carrying on the goals of IRWM effort throughout future years. The Communication Plan outlines a process to knit together a core group of active and engaged regional and sub-regional representatives who are motivated and equipped to meet the

formidable challenges involved in planning for increased water quality, groundwater protection, stormwater management, water reliability, flood management, water quality, water supply, and equitable environmental benefits. In summary, the objectives of the communication effort are to:

- Marshal many points of view
- Understand the interests and needs of the watershed
- Develop constructive relationships
- Create an understanding among collaborators about the benefits and purposes of the IRWM program and individual IRWM projects
- Maintain credibility with regulators and funding agencies
- Demonstrate responsiveness to stakeholder issues or concerns

1.3.3.1 Community Outreach Approach

As part of the Communication Plan, the RWMG, Project Sponsors, and the Stakeholder Steering Committee conduct three tiers of focused outreach activities to provide different venues for the stakeholders and the general public to voice their comments and concerns throughout the IRWM planning and implementation process. The community outreach activities are summarized in Table 1-3, and described in the subsequent sections.

Table 1-3: Community Outreach Approach

	Tier One	Tier Two	Tier Three
Goals:	**Planning-Level Outreach**	**Project-Specific Outreach**	**IRWM Plan General Outreach**
Organizers:	Stakeholder Steering Committee (SSC) and Subcommittee	Implementation Project Sponsors	RWMG
Objectives:	Identify needs of the watershed, develop recommendations on project priorities/rankings	Coordinate and collaborate on project implementation, solicit community input and concerns regarding the implementation of projects	Provide oversight. Report on progress, updates, and decisions related to the IRWM Plan
Target Audience:	All interested parties, including stakeholders, other watershed stakeholders, other IRWM regional stakeholders	Project-specific stakeholders, residents, project beneficiaries, and agencies	Stakeholders and agencies, and all interested parties
Outreach Venues:	Stakeholder workshops/meetings, conferences, board meetings, subcommittee meetings	Workshops/meetings	Public workshops/ meetings SSC meetings
Minimum Frequency:	Quarterly or as-needed, at locations throughout the region	As-needed, at locations near the projects	Quarterly or as-needed, at locations throughout the region

1.3.3.2 Planning-Level Outreach (Tier One)

The Stakeholder Steering Committee provides a forum for coordinating input from the subcommittees and making recommendations to the RWMG. The outreach activities provide the general stakeholders a forum to:

- Share their ideas and concerns regarding the IRWM Plan
- Identify the needs of the watershed, and potential projects that align with the goals and objectives of the respective regional water management programs
- Identify, discuss, and resolve regional conflicts associated with potential projects
- Work with other stakeholders and the general public to make recommendations on project prioritization and rankings, transfer the information to the Partners to make decisions.
- Coordinate with other activities in the Pajaro river watershed and coordinate with other IRWM regional stakeholders

1.3.3.3 Project-Specific Outreach (Tier Two)

Each of the Implementation Project Sponsors conducts project-specific outreach to interested parties related to their respective project. The outreach activities provide the general stakeholders a forum:

- To provide information to the community regarding specific projects that are being implemented. Identify, discuss, and resolve concerns from stakeholders and the general public who might be impacted by the project
- For stakeholders and general public to communicate throughout the implementation period to resolve potential conflicts

1.3.3.4 IRWM Plan General Outreach (Tier Three)

The RWMG conducts general IRWM Plan outreach to all interested parties to report on the progress, updates, and decisions made related to the IRWM Plan. The outreach activates provide the stakeholders and the general public a forum to:

- Discuss IRWM Plan progress, review key deliverables, provide comments, and gain consensus
- Continue stakeholder process allowing for IRWM Plan updates to reflect changes in local water management needs and priorities. Changes were also necessary to respond to updates to City and County General Plans, or other newly completed local planning documents.

1.3.3.5 Outreach Venues and Strategies

It is the intent of the RWMG is to continue to hold outreach workshops/meetings to ensure that all interested stakeholders have an opportunity to participate in the IRWM program through the life of the Plan. Meetings would be held at different locations throughout the watershed so that stakeholders from different regions would be able to attend and held at times that facilitate the best attendance.

Notification occurs at least two weeks prior to workshops/meetings via a variety of methods, including print media, letters, emails, and, potentially, agency websites. The purpose of the meetings is to inform stakeholders of IRWM efforts, solicit feedback on key IRWM deliverables, and solicit projects to be considered in the IRWM Plan as well as to update the project list and be responsive to solicitations and/or other topics and issues related to IRWM. Following each workshop, the Partners prepare and distribute a brief summary of stakeholder input and how the Partners plan to address the input.

The Partners will also continue to engage the community through related workshops, board meetings, and other venues that include audiences with potential interest in the Pajaro River Watershed IRWM effort. These venues have previously included the Pajaro River Watershed Council, South County Regional Wastewater Authority TAC, Water Resources Association of San Benito County Board, Santa Clara Valley Water District Board Advisory Committees, Santa Cruz County Board of Supervisors, and current Groundwater Sustainability Planning efforts. The Partners will also continue to conduct outreach with their own Boards.

1.3.4 Coordination with Neighboring IRWM Efforts and Agencies

The Pajaro River Watershed is one of six regions in the Central Coast Hydrologic Region and one of four regions that drain to Monterey Bay. As stated above in Section 1.2.1, the RWMG is responsible for coordinating with other IRWM regions in the Central Coast. Most coordination occurs through periodic Central Coast Coordination conference calls. Other coordination efforts have included development of joint letters to DWR, including transmittal of the Monterey Bay National Marine Sanctuary document entitled “Comparison of the Six Central Coast Integrated Regional Water Management Plans and

Recommendations for Collaborative Programs" in June 2008 and comments on DWR's Draft 2014 Drought Solicitation Proposal Solicitation Package in May 2014.

The Pajaro River Watershed IRWM region and the Santa Cruz County IRWM region share an overlap area in the Watsonville Sloughs. Within this area, the Pajaro River Watershed IRWM effort addresses water supply; water quality related to groundwater, drinking water, and recycled water; and flood management. The Santa Cruz County IRWM effort addresses surface water quality and environmental enhancement.

The Pajaro River Watershed region also shares a boundary with the San Francisco Bay Area IRWM region. Coordination with the Bay Area region occurs through Valley Water, which is a member of both RWMGs.

State and Federal agencies are involved in region's governance structure through a variety of mechanisms. These include:

- DWR participation in SSC and general stakeholder meetings,
- Central Coast Regional Water Quality Control Board membership on the SSC,
- Monterey Bay National Marine Sanctuary participation in Central Coast Coordination activities,
- U.S. Army Corp of Engineers participation in flood management projects, and
- Natural Resources Conservation Service participation in water quality and environmental projects.

1.3.5 Effective Decision Making

The RWMG's strives to reach consensus on all decisions. The decisions are informed by input from the SSC, Project Sponsors, general stakeholders, and the RWMG's Boards' policies. By considering all the sources of input, the RWMG's decisions reflect the interests and priorities of the entire Pajaro River Watershed. Making decisions on a consensus basis ensures all decisions are completely considered by the RWMG.

1.3.6 Long-Term Implementation of the IRWM Plan

The Pajaro River Watershed IRWM governance structure ensures long-term implementation of the IRWM Plan. The RWMG Partners have a long history of working together on water resources issues, dating back to the 1960s when the San Felipe Committee was formed to negotiate contracts for Central Valley Project supplies. Valley Water and SBCWD share a groundwater basin and the Pajaro Valley Groundwater Basin is influenced by actions in the upper watershed. The Partners also share interests in water quality and have worked together on salinity and nutrient management issues. The 2004 MOU formalized the Partners' commitment to continue working together on water resource management issues. The RWMG is an established and cohesive group to lead the IRWM effort. The RWMG will continue to be responsible for IRWM planning and implementation and will meet on a regular basis to:

- Review the IRWM Plan and ensure DWR standards are met
- Receive updates on regional efforts relevant to IRWM Plan implementation
- Oversee the evaluation and prioritization of projects for plan updates and future grant rounds
- Communicate with others including DWR, other IRWM Regions, DACs and tribes, other water resource management programs of interest (e.g., US EPA and other federal and state programs)

The SSC also contributes to long-term implementation of the IRWM Plan. Unlike the RWMG, membership in the SSC can vary over time as organizations' interests change and issues in the watershed evolve. Periodically reviewing and updating SSC membership in response to conditions in the watershed ensure the SSC will be able to provide the RWMG with timely and pertinent input on IRWM Plan implementation and needs for updates over the long-term.

At a minimum, the RWMG and all grant funded project sponsors intend to adopt the plan consistent with IRWM guidelines and requirements. Following adoption, the Plan will be implemented through execution of projects by the Project Sponsors. The RWMG will periodically review progress toward attaining the regional goals and objectives and additional work will be completed on the IRWM Plan as needed through an adaptive management framework.

1.4 IRWM Plan Adoption and Maintenance

Upon the completion of the IRWM Plan, the RWMG will publish a notice of intent to adopt the Plan in accordance with §6066 of the Government Code and shall adopt the Plan at a public meeting of the RWMG. The governing bodies of each agency that is part of the RWMG will formally adopt the IRWM Plan. Additionally, each Project Sponsor seeking IRWM funding will be required to adopt the IRWM Plan to be eligible.

The planning horizon for the IRWM Plan is 20 years. Formal plan review will occur at least every five years. Significant changes to the governance structure, region description, IRWM goals and objectives, and resource management strategies will require re-adoption of the Plan by the RWMG and Project Sponsors. Formal IRWM Plan updates could occur more frequently based on:

- Significant changes in conditions as defined by the RWMG with input from the stakeholders
- Achievement of an objective which necessitates setting a revised or replacement regional objective
- The need, as determined by the RWMG with input from the stakeholders, to set new regional objectives
- Availability of new information, which may be particularly relevant with respect to the Climate Change Chapter or the integration of a Stormwater Resource Plan.

Informal changes to IRWM Plan include adding information on the results of special studies such as salt and nutrient management plans or groundwater sustainability plans, updating the project list, utilization of improved data management tools and techniques, additional financing options, and changes to the SSC membership list. These information changes will be approved by the RWMG without formal adoption.

1.5 Collaborative Process Used to Establish Plan Objectives

A consensus-based approach was used to develop the Pajaro River Watershed IRWM goals and objectives for the 2007 IRWM Plan. During the development of the 2007 goals and objectives, the RWMG considered both the needs and issues identified for the region and the statewide priorities. The goals and objectives were presented to stakeholders and then refined based on stakeholder input and consensus. The same process was used to update the goals and objectives for the 2014 IRWM Plan, with the addition of consideration of Basin Plan Objectives, 20x2020 water efficiency goals, and requirements of California Water Code §10540(c). Specifically, the RWMG reviewed the goals and objectives, presented proposed revised goals and objectives to the SSC, met with the SSC to obtain input on the goals and objectives, reviewed SSC input, and incorporated all the SSC input into the goals and objectives in Chapter 2.

2 Region Description

This chapter meets the following Integrated Regional Water Management (IRWM) Plan Standard from the 2016 Integrated Regional Water Management Program Guidelines (DWR, 2016).

> **Region Description** – An IRWM Plan must include a description of the region being managed by the RWMG. This description should include a comprehensive inclusion of the watersheds and the water systems, internal boundaries, water supplies and demands, social and cultural makeup, major water related objectives and conflicts, the IRWM regional boundary, and identification of the neighboring and/or overlapping IRWM efforts.

The Pajaro River Watershed IRWM regional boundary is the Pajaro River Watershed boundary, as illustrated in Figure 2-1. The Watershed is an appropriate area for integrated regional water management because of the mutual needs and shared resources that link the region. The Pajaro River is the largest coastal stream between San Francisco Bay and the Salinas River Watershed in the County of Monterey. The watershed is approximately 1,300 square miles and it includes portions of Santa Cruz, Santa Clara, San Benito, and Monterey Counties. Its large size contributes to the number of diverse environments, physical features, and land uses within the watershed. Tributaries to the Pajaro River, the largest of which is the San Benito River, serve as the major routes for surface flow and drainage throughout the watershed.

The Pajaro River coastal area has been identified by the California Coastal Commission as a Critical Coastal Area (CCA). Additionally, the Pajaro River is tributary to Monterey Bay, a federally protected National Marine Sanctuary administered by the National Oceanic and Atmospheric Administration (NOAA). Therefore, the Pajaro River's water quality is critical to the protection and sustainability of this offshore environment.

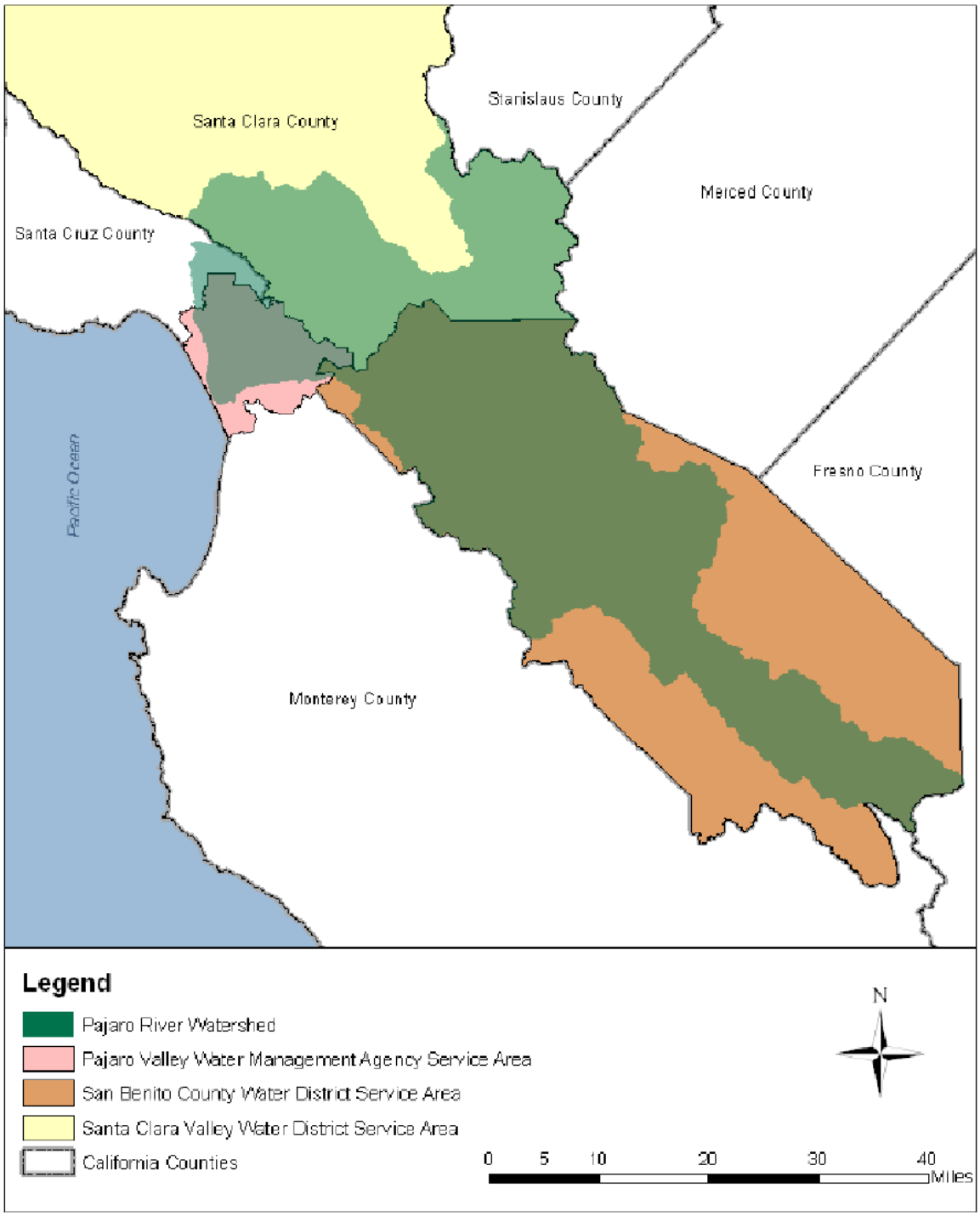
This chapter summarizes the Pajaro River watershed setting and describes issues and concerns in the watershed.

2.1 Pajaro River Watershed Relevance as an IRWM Plan

The Pajaro River Watershed is an appropriate area for integrated regional water management because of the mutual needs and shared resources that link the region. Many of the water supply, water quality, flood management, and environmental enhancement challenges within the watershed are best addressed through cooperation of the agencies and stakeholders found within its boundaries. The Region provides the setting for maximizing opportunities for integration of water management activities through coordination on shared resource issues by the diverse group of IRWM planning participants. The RWMG includes the three major water resource agencies within the Pajaro River Watershed IRWM effort – PV Water, SBCWD and Valley Water. Figure 2-1 illustrates the agencies' jurisdictions in relation to the Pajaro River watershed. SBCWD and Valley Water service areas encompass the major tributaries to the Pajaro River and form the upper portion of the watershed. The PV Water service area, which lies at the mouth of the watershed, forms the lower portion of the watershed.

The major water related objectives and conflicts within the region are discussed below.

Figure 2-1: Pajaro River Watershed IRWM Regional Boundary



2.1.1 Water Supply

Ensuring an adequate water supply is a critical need for the watershed. The ability to meet future demands is impacted by the heavy reliance on groundwater throughout the watershed, which has led to overdraft in some areas, as well as by the varying reliability of imported Central Valley Project (CVP) water. Successfully meeting future water supply challenges will require the coordination of the agencies within

the watershed that share these issues and that can work together to develop solutions that could not be implemented on an individual agency basis.

The primary impetus for initiating the Pajaro River Watershed IRWM Plan was to determine how to better manage the shared water resources within the watershed. The three partner agencies are the GSAs for the major groundwater sub-basins within the watershed. Each agency manages the groundwater supply and groundwater-surface water connections to support holistic water resources management.

Natural linkages exist where surface waters and groundwater bodies cross agency boundaries. As an example, in the upper watershed, Valley Water and SBCWD share a connection to the Gilroy-Hollister Groundwater Basin. This groundwater basin connection is a linkage between the two agencies in regards to groundwater management activities. The Pajaro Valley Groundwater Basin, which PV Water relies upon, is bound by the San Andreas Fault to the east, separating PV Water from the Valley Water and SBCWD. However, the Pajaro Valley Groundwater Basin is influenced by the Pajaro River, which drains South Valley Water and SBCWD service areas. Therefore, drainage activities within the Valley Water and SBCWD service areas influence groundwater in the PV Water service area. The Santa Cruz Purisima Formation Highlands Groundwater Basin, which underlies a portion of the Corralitos Creek watershed, also drains to the Pajaro Valley Groundwater Basin.

In the Partners' MOU for coordination of water resources planning, they identified water conservation, water recycling, desalination, groundwater basin management, water banking, conjunctive use, transfer agreements and storage development as common issues that could be addressed through joint long-term water supply planning.

2.1.2 Water Quality

Water quality needs within the watershed are influenced strongly by the highly agricultural nature of the area. The most significant surface water quality pollutants are sediment and nutrients which are generated through agricultural and urban activities near rivers and creeks that run through the watershed. These pollutants are eventually carried downstream and degrade water quality throughout the watershed drainage area. Improving surface water quality requires the cooperation of stakeholders and agencies throughout the watershed.

Additionally, the quality of groundwater is an issue throughout the region. Common challenges throughout the watershed with respect to groundwater quality include salinity and nitrate management. Because the entire region relies heavily upon its groundwater resources, the various agencies have a common interest in protecting and improving the quality of the groundwater basins. Section XX describes water quality concerns in more detail.

2.1.3 Flood Management

Although flooding is of the highest concern in the lower portion of the Pajaro River, effective flood management solutions must consider the entire river and its drainage area, as there are opportunities to influence downstream outcomes through upstream modifications. Because of this, the watershed is a natural boundary for flood protection efforts. This is evident upon examining the composition of the Pajaro River Flood Prevention Authority (PRWFPA), which is a joint powers authority active in the watershed that includes representatives from the following agencies:

- Monterey County Water Resources Agency (MCWRA)
- SBCWD
- Valley Water

- Santa Cruz County Flood Control and Water Conservation District, Zone 7
- Monterey County
- San Benito County
- Santa Clara County
- Santa Cruz County

All of these agencies are working together towards solving flood management issues in conjunction with providing other watershed benefits including water supply, groundwater recharge, water quality and wildlife and riparian habitat. The Corps is a federal agency which is also involved in flood risk management for the region.

2.1.4 Environmental Enhancement

There are significant opportunities for working to address riparian habitat, open space and recreation needs in the process of meeting the other water management needs of the watershed. Stakeholders have voiced the desire to make proactive lasting policies and decisions that will sensitize and educate the public about the importance of the Pajaro River watershed and enhance the public's role as custodians of the riparian environment.

Water management policies and decisions can incorporate elements that provide for the protection, preservation and restoration of native plants, wetlands, open space, terrestrial and aquatic wildlife habitat, and riparian forest. This will require agencies involved in water supply, water quality and flood management issues in the watershed to take proactive steps to work with environmentally-focused agencies and municipalities to incorporate environmental benefits to the maximum extent possible when implementing water management projects.

2.1.5 Relationship of Other IRWM Plan Efforts

Valley Water is also participating in the San Francisco Bay Area IRWM effort. The Valley Water service area can be divided into two regions – South County and North County, which drain to Monterey Bay and San Francisco Bay, respectively. In addition to falling within different watersheds, South County and North County have fairly distinct land uses and social, cultural and economic compositions. Because South County is more aligned with the make-up of PV Water and SBCWD and is in the same watershed, Valley Water determined that coordination with these agencies provided the best opportunity to address water management issues within its South County region, while the Bay Area IRWM effort could best address issues within the Santa Clara North County region.

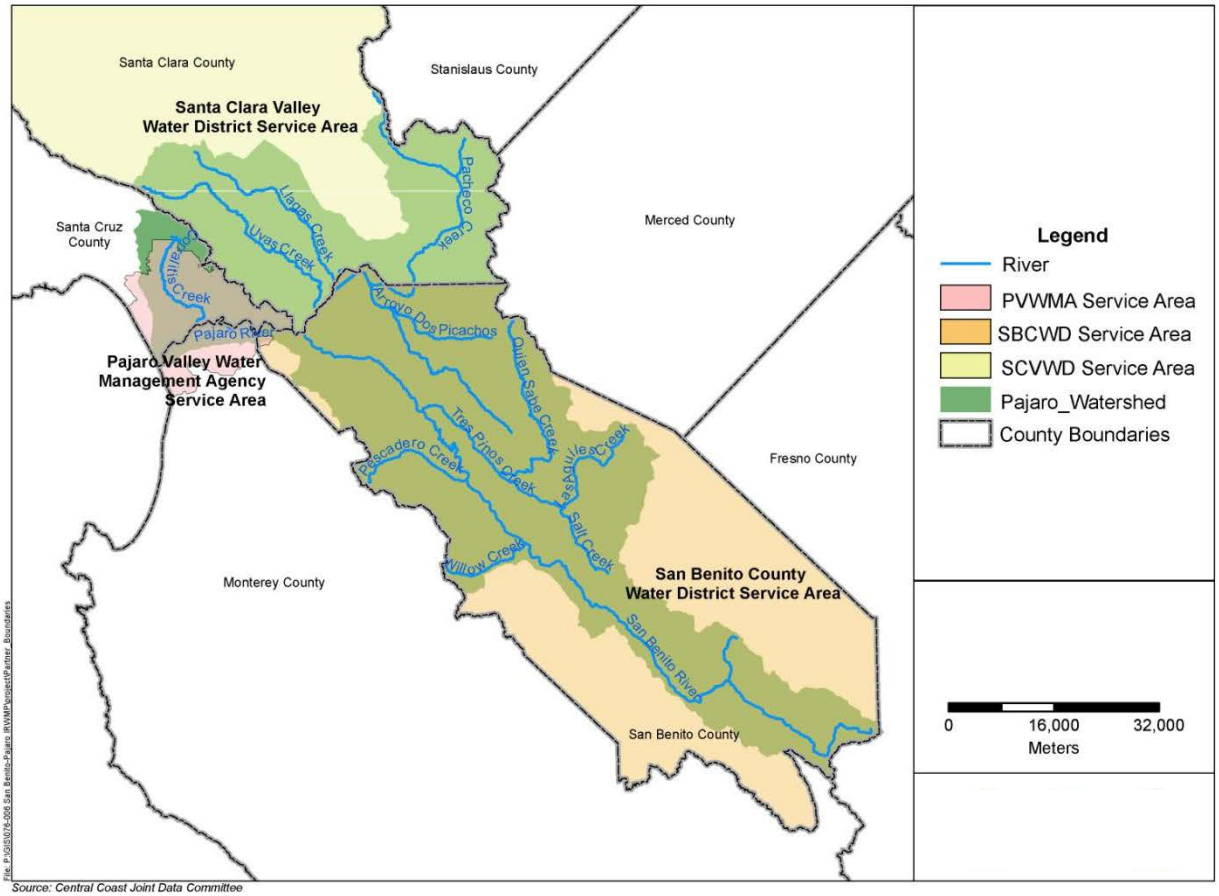
The Pajaro River Watershed IRWM region and the Santa Cruz County IRWM region share an overlap area in the Watsonville Sloughs. Within this area, the Pajaro River Watershed IRWM effort addresses water supply; water quality related to groundwater, drinking water, and recycled water; and flood management. The Santa Cruz County IRWM effort addresses surface water quality and environmental enhancement.

The six IRWM planning regions in the Central Coast Hydrologic Region – Santa Cruz County, Pajaro River Watershed, Greater Monterey, Monterey Peninsula, San Luis Obispo, and Santa Barbara – have been coordinating with each since 2007. Coordination activities include regular meetings, support for other regions' projects, supporting development of report documenting the cooperatives integrated efforts on the Central Coast, preparing joint comment letters to DWR, entering into a Memorandum of Agreement regarding Prop 1 IRWM funding, and Disadvantaged Community Involvement Program activities.

2.2 Internal Boundaries

The Pajaro River Watershed IRWM Region contains numerous internal boundaries that are associated with counties, cities and special districts. The various boundaries delineate jurisdiction and responsibility for land use planning, various municipal services and water resource management. This section summarizes the major internal boundaries within the watershed, shown in Figure 2-2.

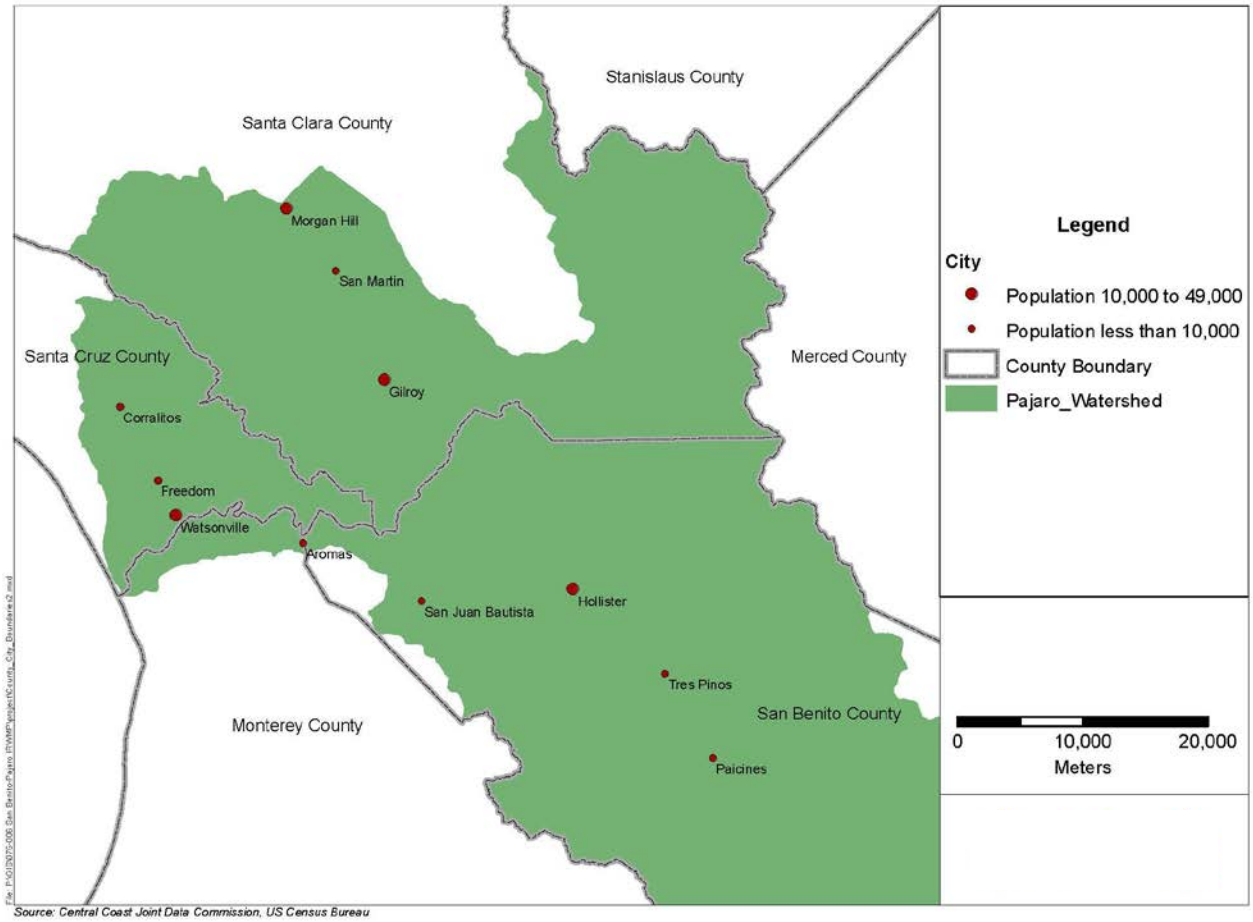
Figure 2-2: Watershed Setting



2.2.1 Counties

The Pajaro River watershed includes areas within the counties of Santa Clara, Santa Cruz, Monterey, and San Benito. County jurisdiction generally includes land use planning, development, tax assessment, elections, health and well being, and other services. Counties can also be responsible for water and wastewater service in unincorporated areas (outside city boundaries). County boundaries in relation to the watershed are shown in Figure 2-3.

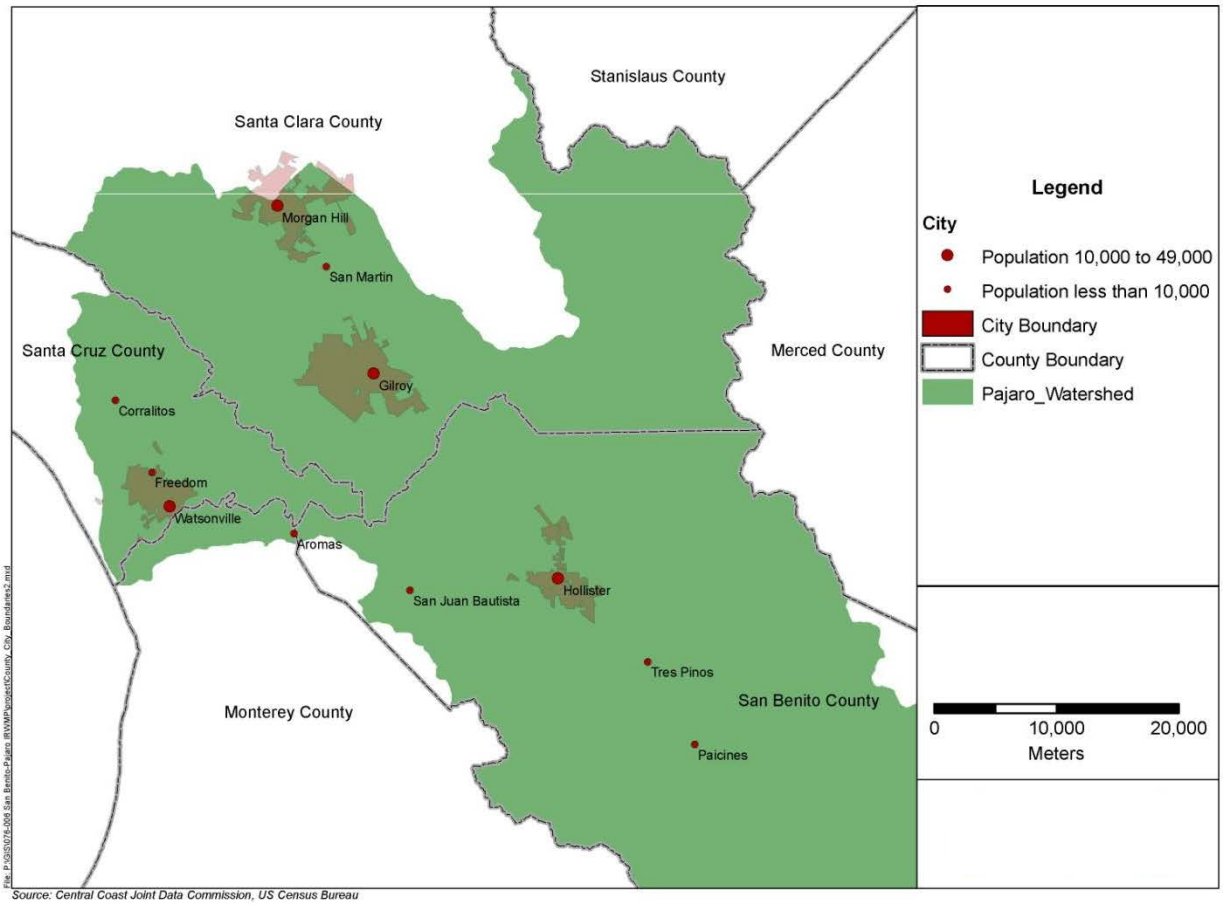
Figure 2-3: County Boundaries within the Pajaro Watershed



2.2.2 Cities

The major cities in the watershed are Watsonville, Hollister, Gilroy, and Morgan Hill. Figure 2-4 shows boundaries for these major cities and shows locations for other small cities throughout the watershed. Cities are typically responsible for municipal services including water and wastewater service, street and traffic maintenance, and land use planning within their service area. In some cases, special districts have been formed to provide some of these municipal services. Municipal services can also extend beyond the City boundary to serve a designated urban service boundary or other areas.

Figure 2-4: Major City Boundaries within the Pajaro River Watershed



2.2.3 Special Districts

Special districts are local agencies that provide specific public services, such as water supply or flood management, within defined boundaries. Numerous special districts exist within the Pajaro River watershed. The ones with connections to water management are discussed here.

Special districts may provide water or wastewater services rather than County- or City-provided municipal services. The Sunnyslope County Water District (SSCWD), Tres Pinos County Water District, Pacheco Pass Water District, San Martin County Water District, Aromas Water District (AWD), and Pajaro/Sunny Mesa Community Services District are six such districts within the watershed. The SSCWD is a municipal water supplier and wastewater management agency for portions of the Hollister area, serving roughly 5,000 water customers and 1,000 wastewater customers. Tres Pinos County Water District provides water and wastewater services to customers in Tres Pinos. Pacheco Pass Water District is responsible for operating Pacheco Reservoir, mainly to promote groundwater recharge within the District's service area. San Martin County Water District is a community water district that serves the unincorporated area of San Martin in Santa Clara County. The AWD is a multi-county special district which provides municipal water service to approximately 950 connections in Monterey County and San Benito County. Pajaro/Sunny Mesa Community Services District provides water service to nearly 700 residential and commercial users and provides wastewater collection services for the community of Pajaro.

Resource Conservation Districts (RCDs) are another type of special district with interests in water resource management. In California, RCDs are designated as special districts under the state Public Resources Code. Each RCD is comprised of a locally elected or appointed Board of Directors, whose members are also landowners within that RCD, and typically serve as liaisons between landowners and government agencies. They are involved with the conservation of many natural resources including water, air, soil and wildlife habitat, and they play a very important educational role within watersheds. The Pajaro River Watershed encompasses four different RCDs –RCD of Santa Cruz County, San Benito RCD, Loma Prieta RCD and Monterey County RCD. RCDs are a source of technical assistance and can provide a critical link between the goals and objectives of the IRWM Plan and the land owners and managers that are integral to implementing actions. The RCD of Santa Cruz County has been an especially active participant in the Pajaro IRWM effort since its inception through participation in the Stakeholder Steering Committee and through project implementation.

The Santa Clara County Open Space Authority is a special district concerned with land preservation, including areas of wetlands, baylands, riparian corridors and other unique habitats in Santa Clara County.

In addition to these entities, special districts of importance include those agencies that have authority to manage water supplies within the watershed. For the Pajaro River watershed these agencies are PV Water, SBCWD, Valley Water and MCWRA. PV Water, SBCWD and Valley Water were previously described in Chapter 1. MCWRA was formed under State Law pursuant to the Monterey County Water Resources Agency Act as a flood control and water agency. MCWRA authority extends throughout Monterey County, which encompasses the southern portion of the lower Pajaro River watershed. In discussions among the sponsors of the four IRWM Plan efforts in the Monterey Bay region, it was agreed that the water management issues faced by MCWRA were best addressed through the Greater Monterey County IRWM Plan (formerly the Salinas Valley IRWM Plan). Although MCWRA is not participating in the Pajaro River Watershed IRWM Plan as a Collaborative partner, MCWRA is interested in this IRWM Plan and has and will continue to participate as an active stakeholder.

Similar to MCWRA, the Santa Cruz County Flood Control and Water Conservation District Zone 7 (SCCFC&WCD) is a special district whose jurisdiction overlaps two of the IRWM Plan efforts ongoing in the Monterey Bay region. Because of its interest in flood management issues with the Santa Cruz County portion of the Pajaro River Watershed region, the SSCFC&WCD has participated and will continue to participate as an active stakeholder in the Pajaro River Watershed Region in addition to the Santa Cruz County IRWM Plan.

SBCWD, Valley Water, MCWRA, and SCCFC&WCD all have the responsibility of addressing flood control and drainage issues in their respective jurisdictions. Such responsibilities may include flood prevention, flood control project planning, drainage services, and maintenance and operations of existing flood control and drainage infrastructure. The Pajaro River Watershed Flood Prevention Authority (PRWFPA), introduced earlier, is a special district formed by the State of California to identify, evaluate, fund, and implement flood prevention and control strategies in the Pajaro River watershed, on an intergovernmental basis. PRWFPA is completing a watershed study through a phased approach that has identified a recommended flood program that is in the process of being implemented. Phase 1 of the Study included modeling of hydrologic and sediment regimes of the watershed. Phase 2 identified flood protection projects for the watershed, and Phase 3 consists of project selection and associated CEQA analysis. Phase 4 is flood protection implementation.

2.3 Land Use

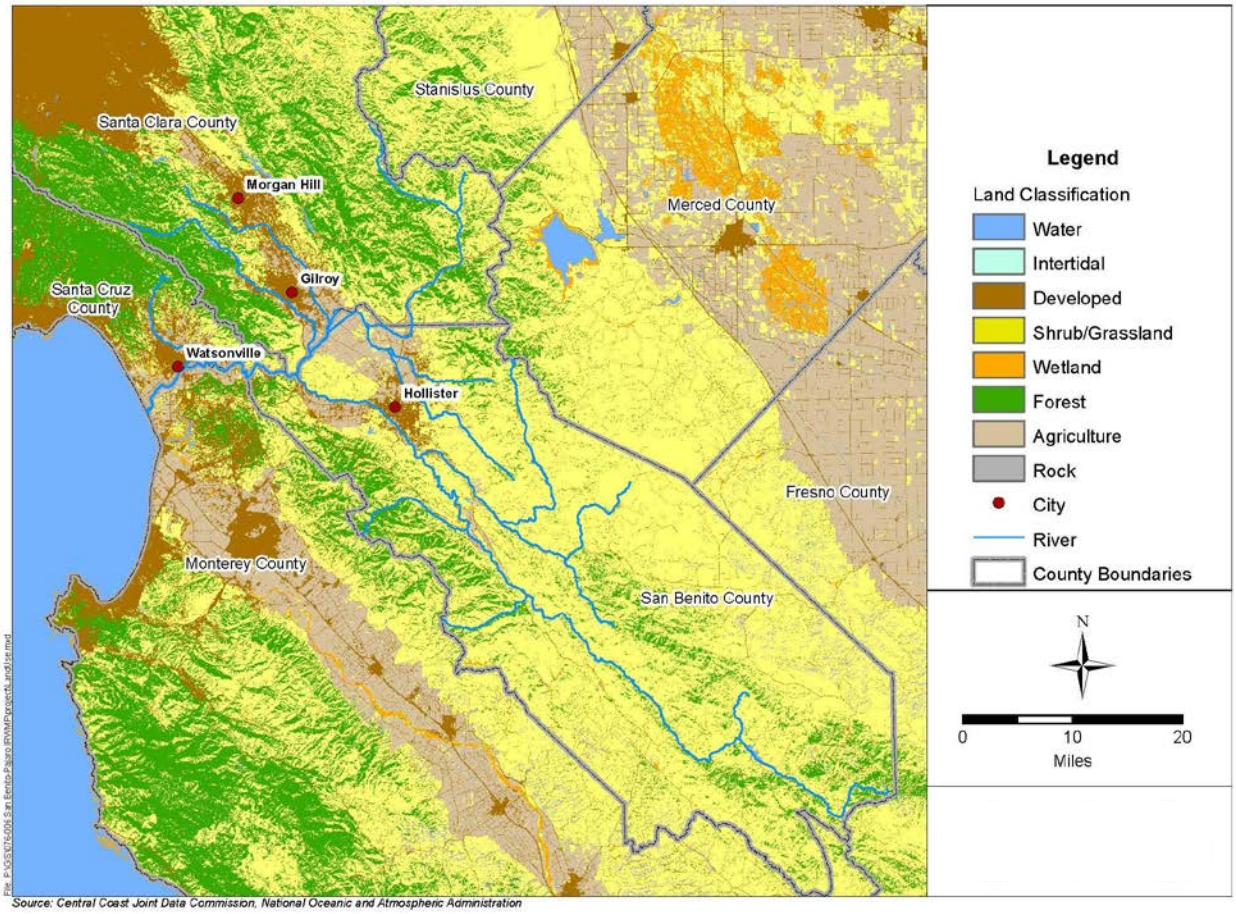
Land use data are critical for identifying and evaluating a multitude of water resources management characteristics including water use, wastewater production, storm water runoff, environmental habitats, and other natural resources.

Land use data are available from DWR, USGS, and local government agencies. Figure 2-5 illustrates the major land use divisions for the watershed. Development within the watershed, both urban and rural, is clustered around the major cities. Agriculture and grazing are the dominant rural land uses in these areas but represent a small portion of the total watershed land use, which consists of primarily forest, shrub, and grassland. Other industries outside of the urban setting include mining and timber harvesting.

General land use trends in the watershed include significant development of rural and agricultural areas associated with increases in population in the four major cities of the watershed, those being Watsonville, Hollister, Gilroy, and Morgan Hill. A second land use trend is a shift in the types of crop grown in the watershed. The shift is generally towards higher value crops. Both trends need to be addressed through regional water management planning.

More specific regional land use data for PV Water, San Benito County and the Valley Water South County is included in the following sections.

Figure 2-5: Major Land Use Divisions



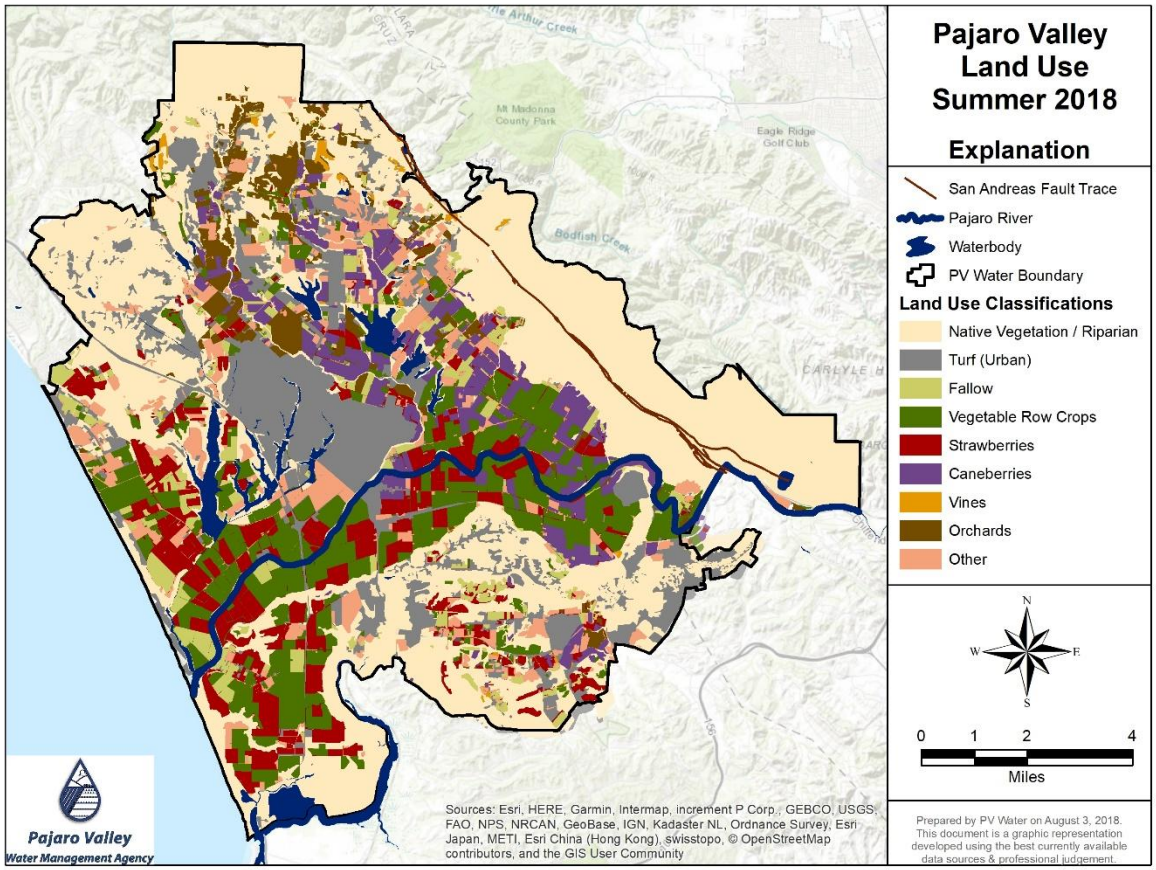
Source: Central Coast Joint Data Commission, National Oceanic and Atmospheric Administration

2.3.1 PV Water Land Use

The primary land uses within the lower Pajaro River watershed are agricultural, native vegetation, native riparian and urban land uses such as commercial, industrial, and residential. About one-half of all land within PV Water boundaries is in some type of irrigated agriculture. Native vegetation and agricultural land are the major designations throughout the Pajaro Valley, while urban use is primarily located within or adjacent to the City of Watsonville.

DWR land use surveys were collected for Monterey and Santa Cruz Counties for 1966, 1975, 1982, 1989, and 1997. Urban land use increases have generally resulted from the conversion of native vegetation land, not agricultural land. Urban land use has increased consistently from only 4,800 acres in 1966 to nearly 12,900 acres in 1997. This increase reflects general population growth trends throughout the State of California over the last several decades. The total agricultural land area has remained relatively constant from 1989 onward. Between 28,000-30,000 acres of irrigated agricultural land are within the PV Water service area. Figure 2-6 shows the 2018 breakdown for the land uses within the PV Water service area.

Figure 2-6: Land Use in the PV Water Service Area



For the purposes of land use projections, it is assumed that agricultural land use will remain constant. Total active agricultural acreage and crop makeup in the Pajaro Valley based on recent annual surveys remain relatively consistent year to year however the spatial distribution of strawberry and vegetable row crops shift yearly due to typical crop rotation patterns.

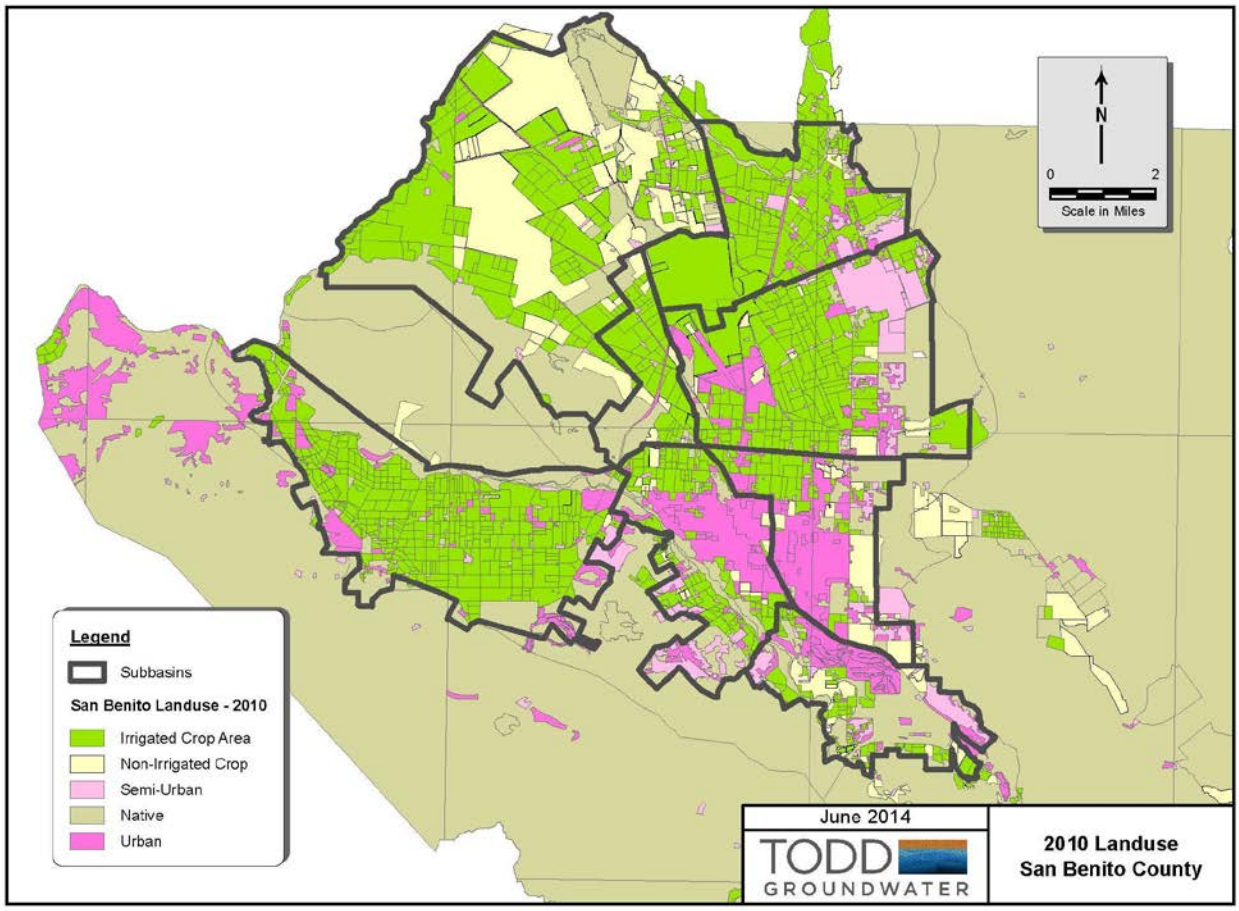
2.3.2 San Benito County Land Use

Figure 2-7 shows the major land use categories from the DWR 2002 land use survey. The DWR land use data includes crop type and acreage that can be used in conjunction with other factors to estimate crop water use. Based on the 2010 update to the San Benito County land use map, irrigated agriculture in SBC encompassed approximately 31,077 acres. Some of the prime agricultural areas are gradually being converted to urban areas as the population is expanding. Urban land uses are primarily around Hollister

and San Juan Bautista in the northern area of the County. Unincorporated residential developments exist primarily around the golf courses and on the edges of alluvial fans and foothills. Industrial areas in the unincorporated portions of SBC include various agricultural uses, sand and gravel mines, and munitions manufacturing facilities.

Hollister is the largest urban area in San Benito County, representing approximately 65% of the population. Areas within the City range from light to densely populated residential zones. Commercial uses are present along major roadways especially in the downtown area. Light industrial and agricultural land uses exist in the northwestern area of the City.

Figure 2-7: Major Land Use in San Benito County

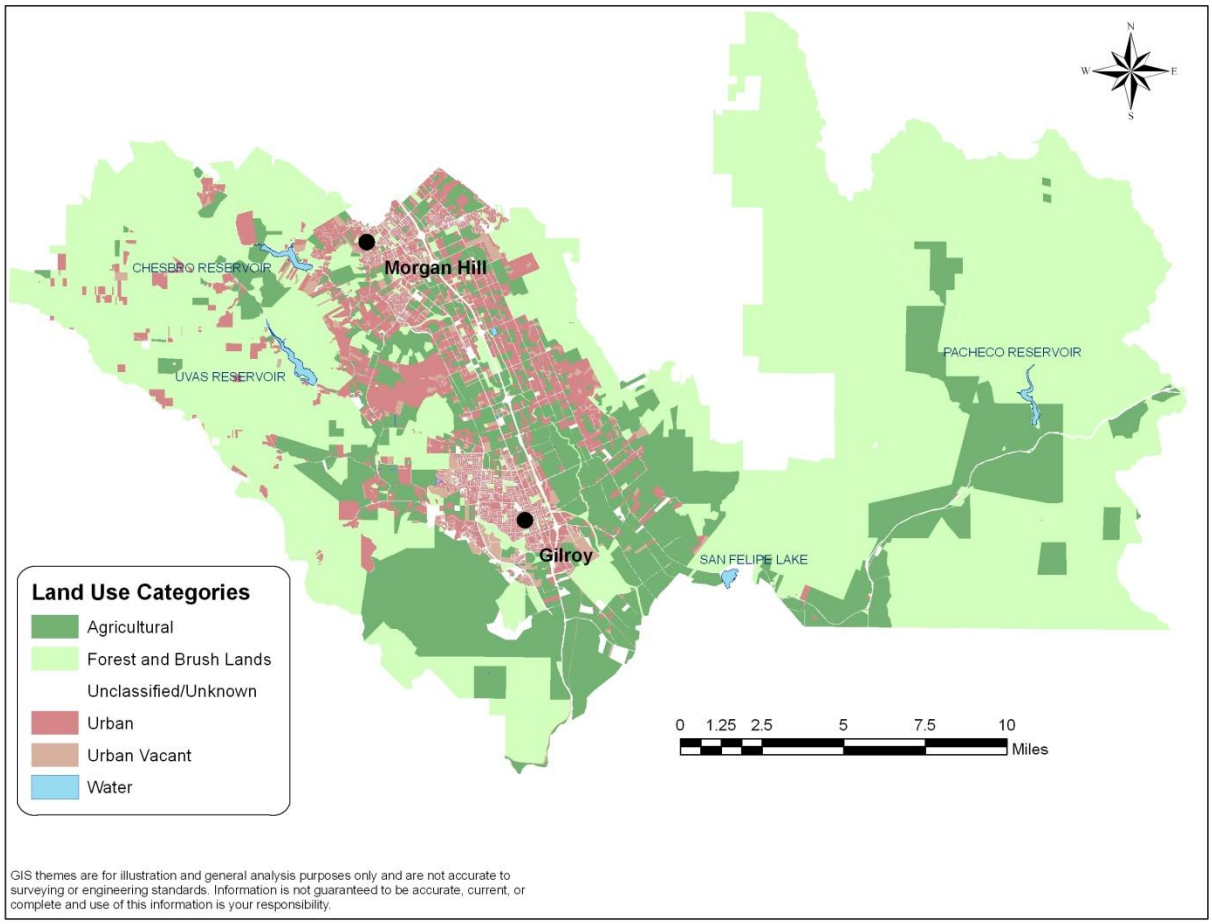


2.3.3 Valley Water South County Land Use

Land use data were available from the Santa Clara County assessor. Gilroy and Morgan Hill are the major urban areas within Valley Water South County. Gilroy, the larger of these two cities, encompasses approximately 14,610 acres. Urban areas within Gilroy range from low-density to high-density residential zones with regions of commercial and industrial use. Gilroy and Morgan Hill are both expected to grow in the future, but unlike North County where urbanization due to the strong growth in the manufacturing and service sectors has eliminated most of the agriculture, South County is expected to maintain its agricultural roots. Like PV Water and SBCWD, the majority of land use in South County will remain agricultural and rural residential.

Figure 2-8 shows the major land use categories for South County based on Santa Clara County assessors' data.

Figure 2-8: Land Use in Valley Water South County



2.4 Water Demand

Projected water demands were collected from various planning efforts by SBCWD, PV Water and Valley Water. Major water uses in the watershed are comprised of agriculture irrigation and municipal and industrial (M&I) use. Projections from planning efforts were established based on considerations of land development, population projections, and other considerations. Table 2-1 summarizes the projected water demand for the watershed over the 20-year planning horizon.

Table 2-1: Projected Water Demand through 2040

Year	PV Water (AFY)[a]	SBCWD (AFY)[b]	Valley Water (AFY)[c]	Pajaro River Watershed Total (AFY)
2020	53,000	71,600	49,800	**174,400**
2025	52,000	72,900	52,200	**177,100**
2030	51,000	74,300	53,000	**178,300**
2035	50,000	75,900	53,800	**179,700**
2040	50,000	75,900	54,600	**180,500**

Footnotes:

a. Source: Basin Management Plan (Carollo, 2014); Acre-feet per year (AFY). Projections for 2040 are not available, so demand is kept constant.

b. Source: Hollister Urban Area 2015 Urban Water Management Plan (Todd Groundwater, 2016); San Benito County General Plan Update 2035; Draft Water Supply Assessment, The Vintage Specific Plan (Todd Groundwater, 2019) (projections are based on dry year demands)

c. Source: Valley Water WEAP Model Water Supply Master Plan Demand Scenario.

As shown in the table, demands are projected to increase slightly between 2020 and 2040. The minimal increase is likely owing to the assumption that the water use within the watershed will remain primarily agricultural.

2.5 Water Quality and Quantity

The region's water supplies consist of groundwater, local surface water, imported surface water from the CVP, and recycled water. Major water supply and quality issues in the watershed include:

- Pajaro Valley Groundwater Basin overdraft and seawater intrusion;
- San Felipe Division water supply reliability;
- Salinity and hardness in the Gilroy-Hollister groundwater basin;
- Localized areas of contaminated or poor groundwater quality throughout the watershed;
- Hexavalent chromium in the Watsonville area
- Sediment and nutrients in surface water throughout the watershed;
- Iron and manganese in the Aromas Water District groundwater;
- Perchlorate in the Morgan Hill area;
- Nitrate throughout the watershed; and
- Seawater intrusion and nitrate contamination in the Pajaro/Sunny Mesa Community Service District service area.

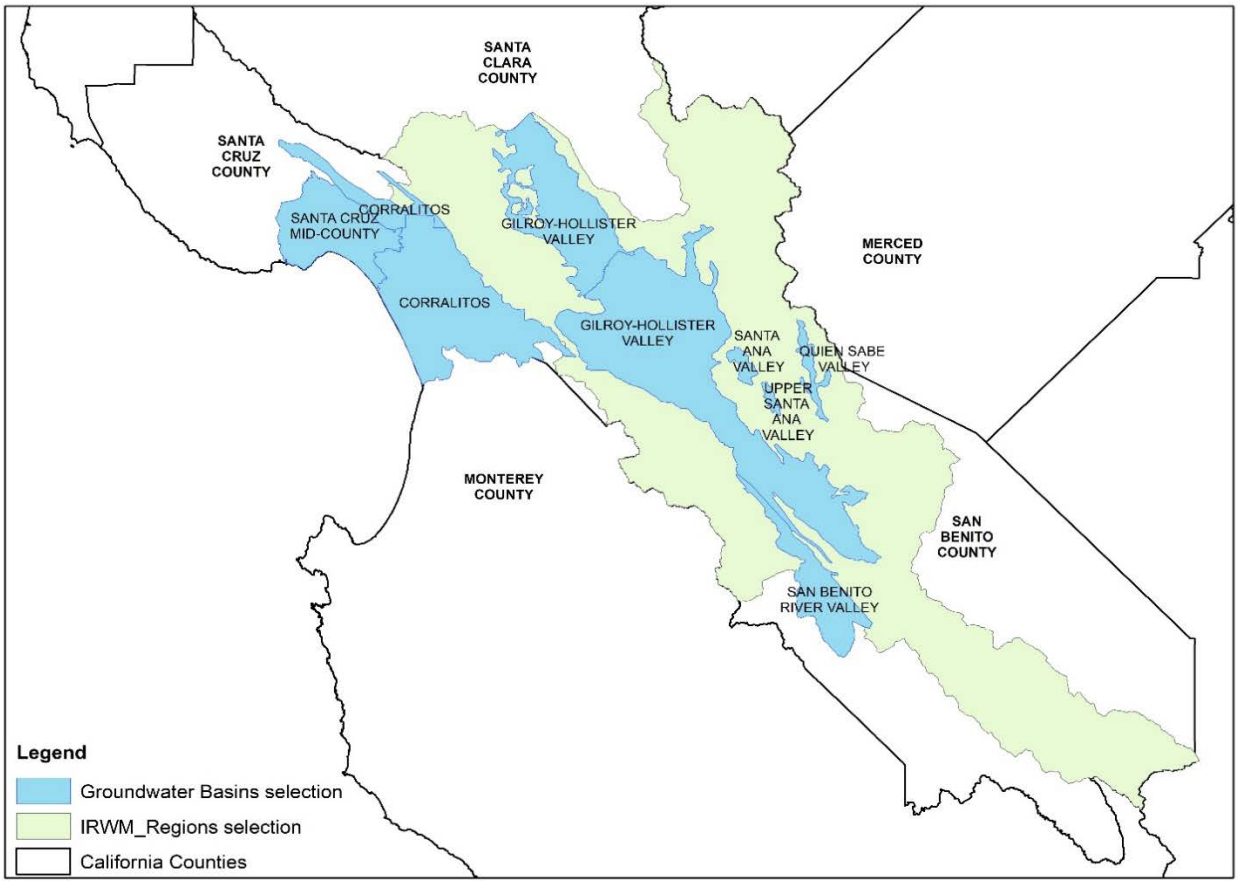
Additional water supply and quality issues are described in the following sections along with a summary description of the various supplies.

2.5.1 Groundwater Supply

Groundwater is the major water supply in the Pajaro River watershed. PV Water, SBCWD, and Valley Water are the GSAs responsible for managing the groundwater basins in the Pajaro River watershed (Figure 2-9). Groundwater basin characteristics of importance include water quality, supply sustainability, land

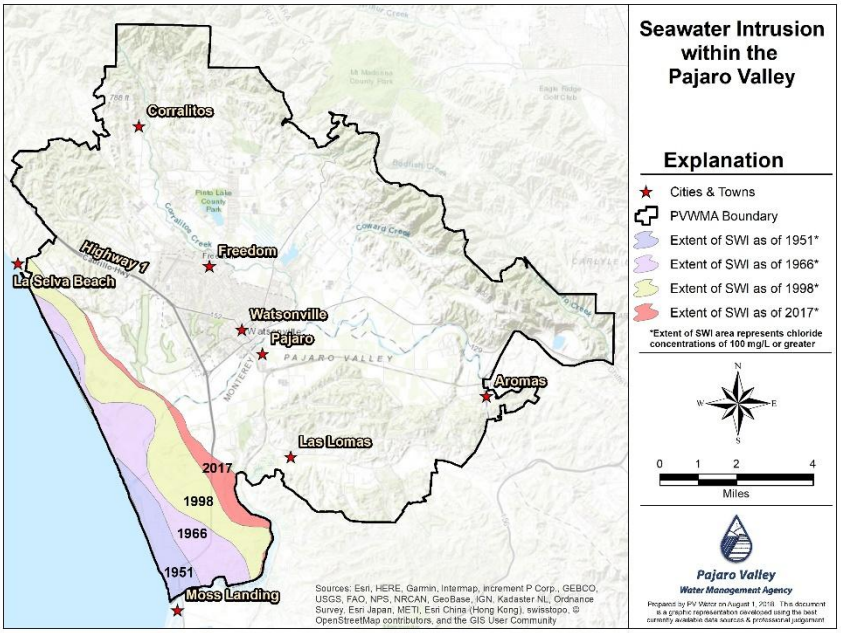
subsidence, and liquefaction. The quality and sustainability of groundwater varies throughout the watershed and is dependent on management activities and local practices. Land subsidence and liquefaction issues are associated with groundwater level management and can be related to sustainable yield and groundwater basin operation.

Figure 2-9: Groundwater Basins within the Pajaro River Watershed Region



The Pajaro Valley Groundwater Basin, which is separated from the rest of the watershed's groundwater basins by the San Andreas Fault, is affected by overdraft and seawater intrusion that are impacting the quality of groundwater. Approximately 80% of total water demand is from agriculture and 11,000 acres of land near the coast are impacted by seawater intrusion. Other Pajaro Valley groundwater quality concerns include nutrients (i.e., nitrates), salinity, manganese, Methyl Tertiary Butyl Ether (MTBE, from underground gasoline storage tank leaks), hexavalent chromium, and other contaminants. As previously described, the Pajaro Valley Groundwater Basin is influenced by the Pajaro River, which drains the upper portion of the watershed including the Valley Water and SBCWD jurisdictional areas. Therefore, collaboration by the stakeholders in the region is critical for managing the groundwater basin. Figure 2-10 shows the extent of seawater intrusion through time in the lower watershed.

Figure 2-10: Coastal Seawater Intrusion



As part of the IRWM Plan Update 2014, a focused study of the water resource issues and needs in the Pajaro Sunny Mesa Community Services District service area was completed. PSMCSD serves a Disadvantaged Community (DAC) and the study was conducted as part of the focused outreach and technical support to DACs in the Pajaro River Watershed IRWM region. The study documented the existing systems owned and/or operated by PSMCSD, identified critical water supply issues facing the PSMCSD systems, and recommended projects that will begin to resolve these issues.

As documented in the study, the PSMCSD service area is distributed across portions of the southernmost Pajaro Valley Groundwater Basin and portions of the northernmost Salinas Valley Groundwater Basin. Current monitoring and reporting on groundwater conditions is provided by PV Water and MCWRA. Both agencies report seawater intrusion in the PSMCSD area. To the north of Elkhorn Slough, PV Water has reported the gradual encroachment of seawater intrusion (≥100 mg/L chloride) from 1951 to 2017. The Springfield MWC service area of PSMCSD is within the intruded zone. To the south of Elkhorn Slough, MCWRA has reported seawater intrusion in the 180-foot aquifer (500 mg/L chloride) from 1944 to 2011. The Moss Landing Harbor service area of PSMCSD is within the intruded zone.

The major groundwater basin that underlies the Valley Water and SBCWD portions of the watershed is the Gilroy-Hollister Valley Groundwater Basin, which can be further subdivided into the Llagas, Bolsa, San Juan Bautista and Hollister sub-basins (the sub-basins were consolidated into the North San Benito Subbasin thorugh a basin boundary modification approved by DWR in 2016). Portions of the Gilroy-Hollister Valley Groundwater Basin are subject to high groundwater levels; over the past few years, the groundwater table has approached or reached the land surface at several locations creating nuisance problems for existing land uses. Portions of this basin are also affected by high salinity levels, nutrients, MTBE, perchlorate, and other contaminants, which can impact the beneficial use of groundwater. Figure 2-10 shows the groundwater basins in the watershed in relation to county boundaries and fault lines.

Groundwater recharge occurs through natural, passive percolation and through managed percolation methods. Currently, natural methods such as infiltration of rainfall, seepage of stream flow, and percolation of irrigation water are the primary sources of recharge in the Pajaro Valley Groundwater Basin. The

variation in precipitation and stream flow influences how and when the Pajaro Valley Groundwater Basin is recharged. However, PV Water is also augmenting natural recharge with a pilot stormwater capture and recharge program on agricultural fields within their service area. Within the SBCWD portion of the Gilroy-Hollister Valley Groundwater Basin, recharge occurs through a combination of natural and artificial methods including infiltration of rainfall, direct runoff, CVP water percolation, percolation of surface water from reservoirs, and deep percolation of irrigation water and treated wastewater effluent. Percolation of imported CVP has served as a significant source of recharge in the Hollister and San Juan Bautista sub-basins; the Bolsa sub-basin does not receive CVP water. Groundwater recharge is also promoted through releases from the Hernandez and Paicines Reservoirs which store runoff during the wet months and release during the dry season. Both artificial and natural recharge are important for sustaining the groundwater supplies in the Llagas sub-basin of the Gilroy-Hollister Valley groundwater basin and can be an effective tool for conjunctive management of surface and groundwater supplies. To balance groundwater extraction and to ensure that groundwater supplies are sustained, Valley Water actively manages in stream recharge and operates four percolation pond systems within the Llagas sub-basin. These artificial recharge operations employ water from local reservoirs and imported water. The limiting factor in Valley Water's groundwater recharge operations is the condition and extent of its infrastructure.

The quantity of groundwater available for use in the region is based on the groundwater sustainable yields and the groundwater quality. Table 2-2 presents the groundwater quantities that are assumed for the region and Table 2-3 summarizes groundwater quality concentration ranges for various sub-basins within the Pajaro River watershed.

Table 2-2: Groundwater Sustainable Yields

Service Area Basin	Sustainable Yield (AFY)
PV Water	24,000[a]
SBCWD	54,000[b]
Valley Water	22,000[c]
Total	**99,500**

Footnote:

a. The sustainable yield with current pumping practices is only 24,000 AFY; however with modified practices it may increase to 48,000 AFY. (RMC, PV Water Revised Basin Management Plan, February 2002)

b. While the sustainable yield is 54,000 AFY, the assumed beneficial yield is only 39,000 AFY due to water quality issues. (Kennedy Jenks, 2004); the SGMA-compliant Groundwater Sustainability Plan will include updated sustainable yield estimates

c. The 2016 Groundwater Management Plan does not quantify sustainable yield but lists the 10-year average natural recharge of Llagas Sub-basin as 22,500 AFY (Valley Water, 2012 GWMP).

Table 2-3: Groundwater Quality Concentration Ranges for Pajaro River Watershed Sub-basins

Parameter	Pajaro Valley[a]	San Benito Basin Wide[b]	Llagas[c]
Chloride (mg/L)	3-14,100	2.5-1,610	11-135
Sulfate (mg/L)	<1-1,990	0.2-1,400	12.6-142
Nitrate (mg/L)	<0.05-118	0.1-513	<0.05-56.5
TDS (mg/L)	120-27,000	8.0-6,321	208-772
SAR	0.4-48	94-240	0.39-2.8
Electrical Conductance (uS/cm at 25°C)	235-38,500	--	352-1,240
Aluminum (µg/L)	111-2,200	0.1-13,000	<20-360
Arsenic (µg/L)	0-30	0-540	<2-4
Barium (µg/L)	0-527	0.1-1,400	11-430
Boron (µg/L)	<100-2,400	46-65,000	<50-2,000
Cadmium (µg/L)	1-175	0.5-10	<1
Chromium 6 (µg/L)	1-140	0-87	<1-7.2
Copper (µg/L)	8-1,600	0-1,240	<1-16.6
Fluoride (mg/L)	<0.1-17.5	0-0.51	<0.05-0.28
Iron (µg/L)	0.55-28,500	0-24,000	<20-620
Lead (µg/L)	1-80	0-35	<5
Manganese (µg/L)	0.36-4,800	0-2,640	<1-130
Mercury (µg/L)	0.1-5.8	0-30	<1
Nickel (µg/L)	0-25	0.5-520	<1-11.2
Selenium (µg/L)	1-5	0.6-61	<5
Silver (µg/L)	0-5	7-80	<10
Zinc (µg/L)	2-6,000	0.1-3,000	<10-130
Perchlorate (µg/L)			<4-4.62

Footnotes:

a. Source: Data from PV Water.
b. Source: Todd Engineers, *Development of a Water Quality Monitoring Program - Hollister Groundwater Basin*, June 2004.
c. Source: Santa Clara Valley Water District 2017 Annual Groundwater Report, July 2018. Values represent the lowest detected value and maximum value for the shallow and principal aquifer zones.

Specific groundwater quality issues of concern include seawater intrusion along the coast, perchlorate plumes in San Martin and Hollister, long-term groundwater salinity build up in the upper watershed, and nitrates. To better understand and manage the salt and nutrient issues, three Salt and Nutrient Management Plans were completed as part of the Pajaro River Watershed IRWM Plan Update 2014. The plans were completed for the three critical groundwater subbasins: the Llagas Subbasin managed by Valley Water; the Bolsa, Hollister and San Juan Bautista Area Subbasins managed by SBCWD; and the Pajaro Valley Groundwater Basin managed by PV Water. A summary of the conclusions for each subbasin is provided below and updated with progress that has occurred to present.

Groundwater quality within the Llagas Subbasin is generally good and is acceptable for potable, irrigation, and livestock uses. However, anthropogenic activities have resulted in elevated nitrate concentrations in many production wells. The current analysis indicates that average Total Dissolved Solids (TDS) and

nitrate-NO_3 concentrations in the Llagas Subbasin are below their respective Water Quality Objectives (WQOs). Accordingly, there is available assimilative capacity when compared with the WQOs. While average nitrate-NO_3 concentrations are below the Maximum Contaminant Level (MCL), nitrate-NO_3 is present above the MCL in many wells in the Llagas Subbasin and elevated nitrate has been a recognized water quality concern for many years. In response to this condition, Valley Water and stakeholders have conducted studies and developed programs to mitigate nitrogen releases and water quality impacts. Predictions indicate that the WQOs (secondary MCL for TDS and the MCL for nitrate-NO_3) will not be exceeded in the future planning period. Sources that add salt and nutrient (S/N) load and degrade groundwater quality as well as those that improve groundwater quality are similar in the future planning period as in the baseline period in the Salt and Nutrient Management Plan.

Major current sources of TDS loading to the Llagas Subbasin include agricultural irrigation return flows, municipal and domestic irrigation return flows, wastewater treatment and recycling facility percolation ponds, and septic systems. Note that all recharge sources (with any measurable S/N concentration) add S/N load to the Llagas Subbasin; however, recharge sources that have TDS and nitrate-NO_3 concentrations lower than the ambient average groundwater concentrations will improve groundwater quality relative to background. Managed Aquifer Recharge (MAR) contributes a significant portion of the TDS load in the northern Subbasin, where most recharge occurs, but this recharge improves groundwater quality because the recharge water is very low in TDS and nitrate-NO_3 compared to the groundwater. Major current sources of nitrate-NO_3 loading to the Subbasin include agricultural irrigation return flows, septic system, and domestic and municipal irrigation return flows. The District has had a voluntary, comprehensive groundwater quality monitoring and reporting program for many years to ensure that water quality concerns are identified and actively managed.

The Llagas Subbasin also has a perchlorate plume in the Morgan Hill area that originated from a former flare manufacturing facility. Currently, the responsible party, Olin Corporation is conducting pump and treat cleanup and monitoring natural attenuation of the plume. The managed recharge of low-nitrate water by Valley Water is also helping cleanup.

Groundwater quantities in the Hollister and San Juan Bautista Area Subbasins are at or near historic highs in most of the subbasin area due to imported water, managed percolation, and decreased groundwater use. The Bolsa Subbasin however, which does not receive CVP imported water and relies on solely groundwater for water supply has shown some depression due to groundwater pumping. All subbasins have existing assimilative capacity for TDS and nitrate, although very limited assimilative capacity exists in the San Juan Bautista North area.

TDS and nitrate levels are generally well below the respective WQOs and other pertinent criteria. In reviewing time concentration data, TDS trends are somewhat mixed; however, more wells show decreasing trends than increasing trends, mainly due to large outflows. In the Bolsa Subbasin, due to the lack of groundwater outflows, TDS concentrations are expected to increase slightly. Nitrate trends in concentration were projected to be virtually unchanged; increases in nitrate concentration are projected to be small, well below 10 mg/L nitrate by the end of 2021. At this time, no additional measures, beyond those that have already been implemented, are recommended. The SNMP process will, however, enable continued evaluation of the efficacy of implementation measures.

The groundwater budget for the Pajaro Valley Groundwater Basin (PVGB) suggests an average deficit of 12,100 AFY during a simulation period of 1964-2009. Based on the modeling results, PV Water established a target of reducing groundwater production in the PVGB by approximately 12,100 AFY. An update to the PV Water Basin Management Plan (2014 BMP Update) was developed by an Ad Hoc Basin Management Plan committee, established by the Board of Directors in 2010. The 2014 BMP Update is composed of three components to meet this goal: 1) conservation programs (targeting savings of 5,000 AFY), 2)

optimizing use of existing water supply facilities, including increased recycled water deliveries (estimated addition of 3,000 AFY), and 3) construction of new water supplies capable of producing 4,100 AFY.

Groundwater quality varies significantly both spatially and vertically throughout the PVGB. For example, TDS concentrations range from a minimum of 120 mg/L to a maximum value over 27,000 mg/L. Locations in the PVGB where TDS concentrations are highest include the western boundary, consistent with the mapped seawater intrusion front. Eastern areas are elevated including Murphy Crossing and the East Area where stream flow infiltration of high TDS water originating in the upper reaches of the Pajaro River Watershed occurs. Seawater intrusion is the greatest source of salts to the aquifer system, with approximately 20% of the groundwater within the basin observed to have chloride concentrations more than 100 mg/L. Elevated groundwater concentrations of nitrate-NO3 are found in the sand dunes of the San Andreas and Springfield Terraces as well as in the eastern area between Highways 129 and 152. The main source of nitrates in the basin is direct infiltration via agricultural land uses, followed by streamflow infiltration. Given that no WQOs are explicitly stated for the PV Water area in the current Water Quality Control Plan for the Central Coastal Basin (Basin Plan, 2011), the threshold concentrations for each constituent of concern were selected based on the thresholds defined for neighboring basins. The analysis suggests a significant amount of assimilative capacity with respect to TDS remains in the PV Water groundwater basin with over 90% of the area to have concentrations below 1,000 mg/L TDS. For nitrates, the analysis suggests some level of remaining assimilative capacity for over 80% of the Basin. However, nearly 20% of the Basin has average nitrate concentrations that exceed the selected threshold of 45 mg/L.

Watsonville may need to address a new hexavalent chromium regulation in the future that could require mitigation of naturally occurring hexavalent chromium in their water supply wells. Approximately 90% of the City of Watsonville drinking water demands are supplied by twelve groundwater wells extracting from the Pajaro Valley basin. The need for mitigation will be determined once a new hexavalent chromium contaminant limit is determined by the WQCB. All twelve wells are impacted by hexavalent chromium and six of which would exceed a new 10 ppb MCL regulatory limit. 50% of the City's water supply will be in violation of the new MCL. Until treatment is implemented, the impacted wells will not meet primary drinking water standards leaving the City vulnerable to drinking water MCL violations. The City is asking the state for a review of economic impacts to communities and for financial assistance to comply with the regulation.

There are two sites in the Pajaro Valley Groundwater Basin contaminated by arsenic located in Watsonville. One site is an old Pacific Gas and Electric manufactured gas plant that has been converted to a general construction yard. Clean up is voluntary and no clean up actions currently exist per the SWRCB GeoTracker. The second site is a warehouse property that is being assessed for necessary actions. The potential arsenic contamination would be of groundwater not used for drinking accordingly to the SWRCB GeoTracker.

PV Water has targeted additional projects to increase water supply and quality. PV Water completed construction of a new 1.5 million gallon storage tank and improvements to the Distribution Pump Station in 2017 as part of a three phased Recycled Water Facility Improvements Project that will help PV Water produce and deliver more recycled water. The two remaining phases include construction of two additional disk filter banks, a new chemical storage tank, and an additional 0.5 million gallon storage tank.

PV Water's 2014 BMP update describes two proposed managed aquifer recharge and recovery projects collectively named the Watsonville Slough System Managed Aquifer Recharge and Recovery Projects. The first project plans to optimize the existing Harkins Slough Facility by improving conditions at the point of diversion, improving sediment removal, recovering a greater percent of the recharged water and developing additional recharge basins. The second project, the Struve Slough Project, would divert flows from Struve Slough and send the water to recharge basins located on the San Andreas Terrace for short-term subsurface storage. A network of extraction wells would later recover the recharged water and pump

it into the Coastal Distribution System where it would augment the supplemental water supply and offset groundwater pumping. Recent progress includes completion of a Recharge Basin Hydrogeologic Study field investigation and analytical report; completion of preliminary design drawings for the three potential recharge basin sites associated with the projects; near completion of the slough hydrologic modeling to support a water right application and inform project capacity; issuance of a notice of preparation for an environmental impact report; and continued stakeholder engagement.

PV Water is also working on a proposed College Lake Integrated Resources Management Project that would increase the Agency's supplemental water supply by an average of 2,400 AFY. Water would be treated and then conveyed through a pipeline to the CDS where it would be used as an irrigation supply to further reduce groundwater pumping in the coastal area impacted by seawater intrusion. Recent progress includes the completion of a draft feasibility study for state and federal grant funding eligibility; completion of the preliminary design drawings of the proposed weir, intake, pumpstation, treatment plant, and pipeline for evaluation in the environmental impact report (EIR); completion of hydrologic and hydraulic modeling, a cultural resources survey report, and wetland delineation; and issuance of the draft EIR. PV Water is preparing responses to comments received on the draft EIR with potential certification of the EIR in October of 2019.

In 2014 the PV Water Board of Directors approved the implementation of a Pilot BMP Conservation Program. In August of 2015, the Board adopted the BMP Conservation Program. The program focuses on agricultural water conservation but also provides conservation services for domestic water users ("home and garden"). The conservation program leverages numerous partners and their programs including the Resource Conservation District of Santa Cruz County (RCDSCC), the National Resources Conservation Service (NRCS), the Monterey County Resource Conservation District (RCDMC), UC Cooperative Extension, Water Conservation Coalition of Santa Cruz County, Community Water Dialogue, and private consultants. PV Water and the conservation program partners continue to engage water users in all aspects of the conservation program. PV Water sponsors or hosts multiple workshops and trainings for agricultural growers focusing on providing technical support. Outreach efforts conducted through direct communication, newsletters, and mass media are utilized to encourage conservation program participation and provide water saving information. Compared to the program baseline period average (2006-2010), the most recent rolling 5-year average (2014 – 2018) of agricultural water use in the Pajaro Valley reflected a reduction of approximately 1,400 acre-feet per year.

2.5.2 Local Surface Water

Local surface waters provide a variety of important functions and benefits in the watershed. These functions and benefits include drainage, flood protection, groundwater recharge, ecological habitats, recreation, and water supply. Important surface water characteristics include water quality, flood conveyance, and interaction with groundwater. Figure 2-11 shows the major surface waters in the watershed including reservoirs, creeks, and rivers.

Table 2-4 provides descriptions of the major reservoirs owned by agencies within the Pajaro River watershed. San Luis Reservoir, which lies outside of the watershed, will be discussed in greater detail in Section 2.5.3.

Figure 2-11: Major Surface Waters

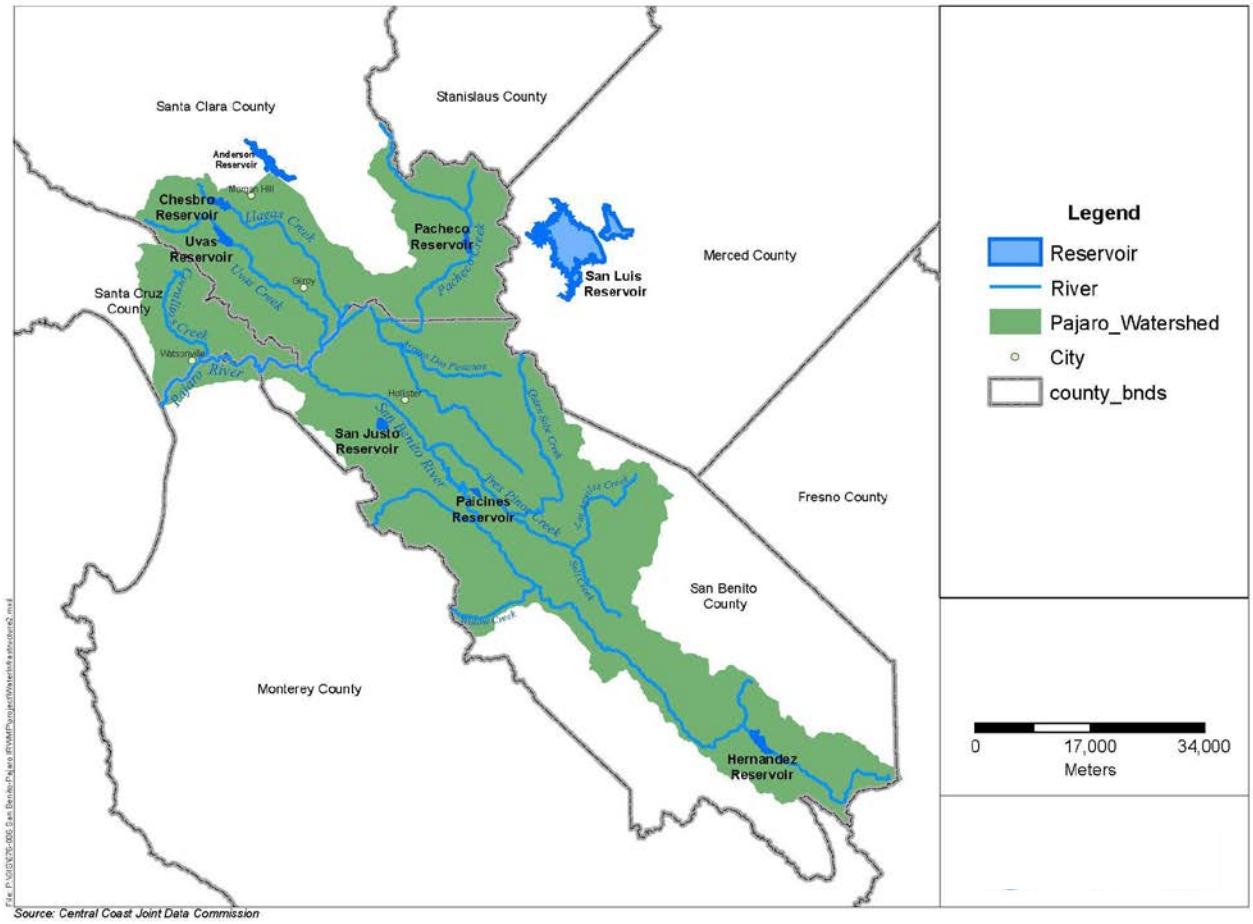


Table 2-4: Existing Major Local Surface Supply Reservoirs

Agency/Reservoir Name	Capacity (AF)	Notes
Valley Water		
Chesbro Reservoir	7,945	Chesbro Reservoir discharges to Llagas Creek, which ties into Pajaro River. The reservoir is operated primarily for flood protection, but also facilitates groundwater recharge in the Gilroy-Hollister Groundwater Basin, provides environmental benefits, and supports recreation activities.
Uvas Reservoir	9,835	Uvas Reservoir discharges to Uvas Creek, which ties into Pajaro River. The reservoir is operated to facilitate groundwater recharge in the Gilroy-Hollister Groundwater Basin. It also provides flood protection, environmental, and recreational benefits.
Anderson Reservoir	90,373	Anderson Reservoir discharges to Coyote Creek, which flows to the San Francisco Bay. The reservoir is operated to facilitate groundwater recharge in the Santa Clara Valley Groundwater Basin and provide an emergency source of supply to Valley Water water treatment plants. The reservoir also provides flood protection, environmental, and recreation benefits. Though located outside the Pajaro River Watershed, historically, the reservoir was connected to the Gilroy-Hollister Groundwater Basin via a pipeline.
SBCWD		
Hernandez Reservoir	18,300	Hernandez Reservoir stores runoff from the upper San Benito River and has a tributary watershed of about 85 square miles. The reservoir covers about 610 acres. The reservoir is operated to facilitate groundwater recharge in the Gilroy-Hollister Groundwater Basin and provide flood protection.
Paicines Reservoir	2,870	The Paicines Reservoir is an off-stream reservoir located between the San Benito River and Tres Pinos Creek and is filled by water diverted from the San Benito River, with some water coming from water stored and released from Hernandez Reservoir.
San Justo Reservoir	10,000	San Justo Reservoir (owned by the USBR) is located 3 miles southwest of Hollister. San Justo Reservoir provides elevated operational storage and flexibility for the SBCWD CVP system.
Pacheco Pass Water District		
Pacheco Reservoir	6,000	Pacheco Reservoir discharges to North Pacheco Creek which ties into the Pajaro River. This reservoir facilitates local groundwater recharge. The reservoir is owned and operated by Pacheco Pass Water District although data collection and management is performed by Valley Water.

College Lake, a potential new surface storage reservoir, is located approximately one mile northeast of the Watsonville city limits. It is a naturally occurring seasonal lake that receives water inflows from the Green Valley, Casserly, and Hughes Creek subwatersheds. These streams drain approximately 11,000 acres of range, rural residential and crop lands. Outflows from the lake naturally flow downstream to Salsipuedes Creek in the winter months. Downstream from College Lake, Corralitos Creek converges with Salsipuedes Creek, which flows into the Pajaro River and ultimately into the Monterey Bay. Winter runoff causes inundation of approximately 260 acres of the basin. In the spring, the lake basin is typically pumped dry to allow farming to take place on the lakebed during the summer months. This practice continues today and most the lakebed is used for vegetable row crops and a small portion of raspberries.

As part of the Pajaro River Watershed IRWM Plan 2014, the Santa Cruz County RCD led a study to improve understanding of the hydrology of College Lake. The study included the selection of a preferred alternative which will balance water supply, water quality, habitat, agriculture, and community needs. The completed study can be found at https://www.rcdsantacruz.org/college-lake-study. This effort supported collaboration between private landowners and public agencies in development of a management alternative to maximize benefits for water supply while simultaneously improving water quality and habitat within the lake. The anticipated College Lake project yield is approximately 1,800 - 2,300 AFY.

2.5.2.1 Watershed Flooding

Flooding along the Pajaro River is a major point of conflict in the watershed. In 2000, the Pajaro River Watershed Flood Prevention Authority (FPA) was formed by the State legislature to work with both upper and lower watershed stakeholders to investigate and develop a regional recommendation to address flooding along the Pajaro River. A watershed study has been completed with a recommended integrated set of flood projects in the lower and upper watershed to address flooding. Major elements of the Pajaro River Flood Protection Program include the Soap Lake Floodplain Preservation Project, Lower Pajaro River Bench Excavation, and the Corps' Lower Pajaro River Flood Risk Reduction Project.

The Pajaro River is a perennial stream that flows between four counties. In the upper watershed, the river is the dividing line between Santa Clara and San Benito counties. In the lower watershed, the river is the dividing line between Monterey and Santa Cruz counties. The downstream portion of the River is channelized with a levee that runs 11.3 miles to the ocean through Santa Cruz and Monterey Counties. The levee was deemed inadequate by the Corps when it first flooded in 1955. Another major flood occurred in 1995 that has resulted in a renewed urgency to increase the levee's level of flood protection. Monterey and Santa Cruz counties provide annual maintenance of the levee system. On-going vegetation and sediment maintenance activities are done to provide as much flood conveyance capacity as possible within the existing levee system. The levee system suffers from restricted flood carrying capacity caused by accumulated sediment deposition.

The City of Watsonville, the unincorporated town of Pajaro, and surrounding agricultural areas in Monterey and Santa Cruz Counties, are subject to flooding from the Pajaro River. In addition, the City of Watsonville and surrounding

agricultural areas in Santa Cruz County are also subject to separate and independent flooding from Salsipuedes and Corralitos Creeks.

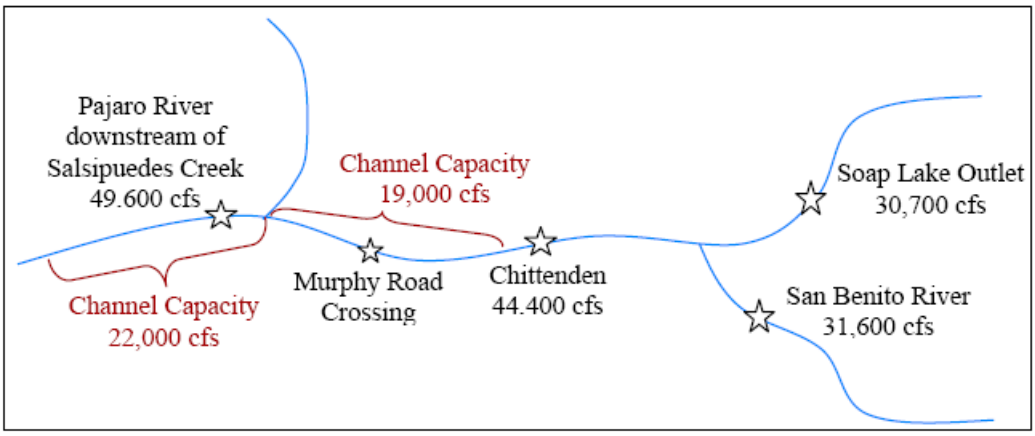
Significant flooding and associated urban and agricultural damages in Monterey County resulted from the March 1995 flood on the Pajaro River. Agricultural crop damages were estimated at $67 million for the 3,280 acres that were flooded, and urban damages in the unincorporated town of Pajaro were estimated at $28 million. In February 1998, significant flooding occurred in Santa Cruz County downstream of the urban areas of Watsonville, with an estimated $1.7 million in agricultural crop damages and $0.4 million in non-crop damages. This relatively low damage estimate is due to the fact that 800 out of 1,100 acres of land flooded were in the preparation phase and without established plantings.

The existing channel capacity in the lower reaches of Pajaro River is approximately 22,000 cubic feet per second (cfs), which is well below the expected 100-year flood event of 44,400 cfs. The following figures and data are excerpted from the *Pajaro River Watershed Study Phase 2 Report, RMC, April 2003* that was produced for the PRWFPA (RMC, 2003).

Table 2-5: Hydrologic Model Peak Flows Based on General Plan Buildout Conditions

Watershed Location	Peak Model Flow Rate (cfs)		
	25-year Event	50-year Event	100-year Event
San Benito River	18,800	26,200	31,600
Soap Lake Outlet on Pajaro River	21,600	27,400	30,700
Chittenden Gage on Pajaro River	29,300	38,400	44,400
Pajaro River Downstream of Salsipuedes Creek	32,700	43,100	49,600

Figure 2-12: 100-Year Return Period Peak Design Flows on the Lower Pajaro River



Two recent legal decisions, the Arreola Decision and the Paterno Decision, have shaped flood management policy and prompted warnings to State and local government about California's flood management crisis. The Arreola Decision stems from damages in the 1995 Pajaro River flood. A white paper was prepared at the direction of the legislature after the Paterno Decision that held the State liable for flood damages caused by levee failure on the Yuba River.

In 2012 and 2013, SCCFC&WCD and MCWRA implemented the Pajaro River Bench Excavation Project. The Pajaro River Bench Excavation Project is specifically designed to relieve the magnitude and severity of potential future flooding of the Pajaro River levees until the Corps Levee Reconstruction Project is built. The current flood conveyance capacity is equivalent to an 8-year flood. Model results indicate that the 100-year flood stage will be reduced by a maximum of 1.2 feet and the project will increase capacity by approximately 2,000 cfs or approximately 10% once the benches are constructed. The project creates a 2.5 year floodplain to re-establish flow levels at bank-full capacity. The project improves channel form and function by enhancing the potential for increased sinuosity within the newly created floodplain area. The increased meander lengths for the stream lessen the stream gradient and also are expected to reduce flow velocities.

This is expected to be a more self-maintaining scenario for the River, returning it to its natural ability to more effectively move sediment out of the river channel system to the ocean by natural geomorphic processes. This project creates more lateral room for the river to meander over a wider floodplain area within the levee channel. The benches also allow more efficient and less intrusive sediment management techniques. Model results indicate that benches allow sediment to be collected outside of the main channel and closer to the banks. Reducing the need for channel maintenance will lead to reduced annual costs and less environmental impact. Sediment removal equipment will also not necessarily need to be operated deep in the waterway since the benches will move the removal areas closer to the levees.

In an effort to better understand how sediment is eroded, transported and deposited in the Pajaro River, the FPA completed the San Benito River Watershed Study as part of the Pajaro River Watershed IRWM Plan Update. The San Benito River is the main tributary to the Pajaro River, with a watershed area of 607-square miles upstream of Hollister, California. The San Benito River watershed has relatively high relief, and lies parallel with, and slightly north of, the San Andreas Rift Zone for a length of approximately 60 miles. Land use within the watershed is largely rural, dominated by agriculture and ranching. Whether the San Benito or the upper Pajaro River is the main source of sediment to the lower Pajaro River is uncertain; the San Benito River watershed is larger (659 square miles compared with 513 square miles for the upper Pajaro River at the confluence of the two channels), has steeper overall relief and has fewer depositional areas that would trap sediment from the upper watershed. By contrast the upper Pajaro River watershed is slightly smaller but generates more runoff due to higher annual rainfall. Determining the relative sediment contribution of the two tributaries and the rate at which sediment is transported to the downstream flood management reaches was the primary objective of the study.

Study results show that the lower reaches of the San Benito River have generally remained stable to depositional, while the upper half has experienced persistent incision, with the highest observed rates near the upstream extent of the study area. It appears that multiple knickzones have migrated upstream at varying rates, thus propagating incision in a headward direction. Over the past decade, the upper part of the study reach has exhibited incision rates on the order of 0.3 to 0.6 feet per year. It is likely that these rates of incision will persist into the near future, generating excess sediment that is stored in the lower reach of the San Benito River and transported downstream into the Pajaro River. The highest rates of future fluvial bed incision are expected to occur upstream roughly from the old Highway 156 crossing to approximately one-quarter mile upstream of Nash Road. It is unclear to what degree the observed incision and possible knickzone migration is attributable to anthropogenic causes versus natural processes.

In contrast to the upper San Benito River, the upper Pajaro River (from the San Benito confluence upstream to Highway 101) has shown substantial aggradation since 1992 (between 1.9 and 5.1 feet). It does not appear that systemic incision on this reach of the Pajaro River is a notable source of sediment to the lower Pajaro River. It also appears unlikely that the flood detention function provided by Soap Lake would be threatened by incision along the Pajaro River at this time, as has sometimes been postulated.

Though the relative contributions between the two systems appears highly variable from year to year,

sediment transport model results show that the San Benito River is a significant source of sediment for the lower Pajaro River, contributing a total cumulative load of 299,515 tons during a 100-year event, and 111,256 tons being delivered over the course of a 10-year event. Because the finest sediment largely passes through the lower Pajaro River and is transported to the ocean, the analysis separated out the total load from the sand and gravel load that are more likely to be deposited in the channel and to reduce flood conveyance around Watsonville. Sand and gravel comprise approximately 22 to 23 percent of the cumulative, event-based sediment load from the San Benito River. A fraction of the sediment load delivered from the San Benito River is stored within the lower Pajaro River upstream of the Chittenden Pass and is likely remobilized during subsequent flood events. The remaining material is transported to the lower Pajaro where much is deposited in the flood prone reaches.

Predicted peak sediment transport rates, compared to observed sediment transport rates on the Pajaro River, indicate that the majority of the sediment deposited in the lower Pajaro River is contributed by the San Benito River. Event-based modeling results suggest that during extreme floods (i.e., from the 25-year and 100-year events) 50 to 64 percent of the lower Pajaro River's sediment load comes from the San Benito River, and during smaller, more frequent flood events (i.e., from the 10-year event down) the San Benito River's contribution gets progressively larger, increasing from approximately 80 to 100 percent.

Based on the model results, approximately 1,686,597 total tons of sediment would be delivered to the lower Pajaro River from the San Benito over a period of time reflected by the WY 1989-2010 hydrograph, 592,823 tons (or 35 percent) of which would be sand and gravel (and therefore most likely to be deposited in the area of greatest flood risk). Volumetrically, this represents approximately 1,716,971 cubic yards of total material and 471,709 cubic yards of sand and gravel. By comparison the Lower Pajaro River Bench Excavation Project has removed approximately 322,000 cubic yards of sand and gravel from the lower Pajaro River, representing about 15 years of cumulative coarse sediment delivery from the San Benito River (assuming all sediment was delivered from the mouth of the San Benito River to the bench excavation project area). Cumulatively, it is estimated that the San Benito River accounts for approximately 48 to 56 percent of the total sediment load and up to 86 percent of the sand and gravel load that would be delivered to the lower Pajaro River over an equivalent hydrograph.

Based on the study results, it was recommended that an opportunities and constraints assessment for erosion reduction be carried out on the San Benito River (between Hollister and the confluence with the Pajaro River). Ideally, this would include an assessment of natural versus anthropogenic causes of erosion and sources of sediment, and should focus on arresting potential knickzones that may migrate upstream and on stabilizing the banks and bed of the San Benito River.

The Upper Llagas Creek has flooded communities from San Martin to Morgan Hill since 1939. The current effort to mitigate flood damage began in 1982 when the Natural Resource Conservation Service and the Valley Water completed a comprehensive restudy of the Llagas Creek floodplain. At the time, an estimated 1,123 residential buildings, 64 mobile homes, 463 commercial establishments, and 24 industrial buildings were located in the flood-prone area; damages from a 100-year flood were estimated to be $8.5 million. Recurring floods have damaged homes and businesses. Most recently, on February 20, 2017, many residential and commercial areas of Morgan Hill experienced flooding depths ranging from a half foot up to two feet. As part of Valley Water's Safe, Clean Water Program (approved by voters in November 2012), the Upper Llagas Creek Flood Protection Project will provide flood protection to communities along the East Little Llagas Creek, West Little Llagas Creek and Llagas Creek in San Martin and Morgan Hill. In addition, the project design is being updated to protect 1,100 homes, 500 businesses and over 1,300 acres of agricultural land and to preserve and enhance the creek's habitat, fish and wildlife.

The project extends approximately 13.9 miles from about Buena Vista Avenue to just beyond Llagas Road. The project aimes to provide 100-year level flood protection in the urban areas of Morgan Hill, as well as an approximately 10-year level flood protection and no induced flooding in the agricultural areas

of Gilroy and Morgan Hill. Measures to minimize flooding potential include widening and deepening the channel, installing a diversion channel and a high flow diversion tunnel, riparian revegetation, and building a maintenance road on the top of bank on each side of the channel. Construction will be completed in two phases, with phase 1 occurring November 1, 2018-December 31, 2020 and phase 2 occurring May 1, 2019-December 31, 2021.

2.5.2.2 Water Quality

The State Water Resources Control Board (SWRCB) has identified a number of water bodies in the Pajaro River watershed that suffer significant water quality impairments from a variety of pollutants that prevent their beneficial use as defined in the Regional Water Quality Control Board (RWQCB) Basin Plan. The beneficial uses affected include municipal, agricultural, and industrial water supply, groundwater recharge, support of rare, threatened or endangered species, migration and spawning of aquatic organisms, and preservation of wildlife habitat, biological habitats of special significance, cold and warm freshwater habitat, as well as estuarine ecosystems.

The impaired water bodies are listed on the RWQCB Clean Water Act (CWA) Section 303(d) list of impaired water bodies for nutrient, sediment, fecal coliform and other pathogens, mercury, chloride, pH, low dissolved oxygen, salinity, and pesticide pollutants/stressors. Table 2-6 summarizes the CWA Section 303(d) listed water bodies and the identified pollutant/stressors, based on the U.S. EPA 2010 Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report). In total, 160.2 miles of river and creek reaches and 626 acres of reservoirs are impaired. Each water body-pollutant combination must be addressed through the development of a Total Maximum Daily Load (TMDL), which determines the total pollutant load that a water body can receive without affecting beneficial use. Each TMDL includes a determination of target load allocations for each source and identifies parties that will be responsible for attaining the TMDL allocations through reductions in pollutant loading. Once a TMDL is established, it must be implemented over a time period specified in the TMDL. The status of the TMDL associated with each water body-pollutant combination is included in Table 2-7.

Table 2-6: Pajaro River Watershed CWA Section 303(d) Listed Water Bodies (2014-2016 Update)[1]

Water Body Name (Length/Area Impaired)	Pollutant/Stressor	Potential Sources
Beach Road Ditch (3.4 miles)	Dissolved Oxygen	Source Unknown
	Turbidity	Source Unknown
	Nitrate	Source Unknown
	pH	Source Unknown
Carnadero Creek (3.2 miles)	Fecal Coliform	Collection system failure, domestic animals/livestock, urban runoff/storm sewers
	Dissolved Oxygen	Source Unknown
	E. Coli	Collection system failure, domestic animals/livestock, urban runoff/storm sewers
	Turbidity	Source Unknown
	Nitrate	Source Unknown

[1] U.S. EPA 2014-2016 Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report)

Water Body Name (Length/Area Impaired)	Pollutant/Stressor	Potential Sources
Chesbro Reservoir (235.2 acres)	Mercury	Source Unknown
Corralitos Creek (13.6 miles)	Fecal Coliform	Agriculture-animal, domestic pet water, municipal point sources, natural sources, onsite wastewater systems (septic tanks), transient encampments.
	E. Coli	Agriculture-animal, domestic pet water, municipal point sources, natural sources, onsite wastewater systems (septic tanks), transient encampments.
	Turbidity	Source Unknown
	pH	Source Unknown
Furlong Creek (8.5 miles)		
	E. Coli	Source Unknown
	Fecal Coliform (Completed TMDL)	Collection system failure, domestic animals/livestock, urban runoff/storm sewers
	Nitrate	Source Unknown
	Turbidity	Source Unknown
Gallighan Slough (3.0 miles)	Indicator Bacteria	Source Unknown
Hanson Slough (1.2 miles)	Indicator Bacteria	Source Unknown
Harkins Slough (7.3 miles)	Low Dissolved Oxygen	Source Unknown
	Chlorophyll-a	Source Unknown
	Indicator Bacteria	Source Unknown
Hernandez Reservoir (623.4 acres)	Mercury	Surface Mining
Llagas Creek above Chesbro Reservoir (9.4 miles)	Temperature	Source unknown
	pH	Source unknown
Llagas Creek below Chesbro Reservoir (16.4 miles)	Chloride	Source Unknown
	Chlorpyrifos	Agriculture
	Electrical Conductivity	Source Unknown
	E. Coli	Collection system failure, domestic animals/livestock, urban runoff/storm sewers
	Fecal Coliform	Collection system failure, domestic animals/livestock,

Water Body Name (Length/Area Impaired)	Pollutant/Stressor	Potential Sources
		urban runoff/storm sewers
	Low Dissolved Oxygen	Agriculture, domestic animals/livestock, natural sources, urban runoff/storm sewers
	Nutrients	Municipal Point Sources Agriculture Irrigated Crop Production Pasture Grazing-Riparian and/or Upland Agriculture-Storm runoff Agriculture-Irrigation Tailwater Agriculture-Return Flows Urban Runoff/Storm Sewers Habitat Modification Non-point Source Unknown Point Source
	Sedimentation /Siltation	Agriculture-grazing, Habitat Modification, Hydromodification, irrigated crop production, land development, resource extraction, silviculture
	Sodium	Nonpoint Source, Source Unknown
	TDS	Source Unknown
	Turbidity	Source Unknown
McGowan Ditch (2.5 miles)	Nitrate	Source Unknown
	DDD	Source Unknown
	DDE	Source Unknown
	Toxicity	Source Unknown
	Malathion	Source Unknown
Millers Canal (2.1 miles)	Chlorophyll-a	Agriculture, domestic animals/livestock, natural sources
	Toxicity	Source Unknown
	E. Coli	Source Unknown
	Fecal Coliform	Collection system failure, domestic animals/livestock, urban runoff/storm sewers
	Low Dissolved Oxygen	Agriculture, domestic animals/livestock, natural sources
	Temperature	Source Unknown
	Turbidity	Source Unknown
	pH	Source Unknown

Water Body Name (Length/Area Impaired)	Pollutant/Stressor	Potential Sources
Pacheco Creek (25.9 miles)	Fecal Coliform	Collection system failure, domestic animals/livestock, urban runoff/storm sewers
	Low Dissolved Oxygen	Source Unknown
	Turbidity	Source Unknown
Pajaro River (31.9 miles)	Boron	Source Unknown
	Chlordane	Source unknown
	Chloride	Source Unknown
	Chlorpyrifos	Agriculture
	Chromium	Source Unknown
	DDD	Source unknown
	DDE	Source Unknown
	DDT	Source Unknown
	Diazinon	Agriculture
	Dieldrin	Source unknown
	E. Coli	Source Unknown
	Fecal Coliform	Collection system failure, domestic animals/livestock, urban runoff/storm sewers
	Low Dissolved Oxygen	Source Unknown
	Nitrate	Agriculture, domestic animals/livestock, natural sources
	PCBs	Source unknown
	Sedimentation/ Siltation	Agriculture, domestic animals/livestock, grazing-related sources, habitat modification, land development, logging road construction/maintenance, urban runoff/storm sewers
	Sodium	Source Unknown
	Turbidity	Source Unknown
	Toxicity	Source Unknown
	pH	Source unknown
Pajaro River Estuary (24 acres)	Diazinon	Agriculture
	Low Dissolved Oxygen	Source Unknown

Water Body Name (Length/Area Impaired)	Pollutant/Stressor	Potential Sources
	pH	Source Unknown
	Water temperature	Source Unknown
	Toxicity	Source Unknown
	Malathion	Source Unknown
	DDE	Source Unknown
Pinto Lake (104.5 acres)	Chlorophyll-a	Source Unknown
	Cyanobacteria Hepatotoxic Microcystins	Source Unknown
	Low Dissolved Oxygen	Source Unknown
	Scum/Foam Unnatural	Source Unknown
	Ammonia	Source Unknown
	DDT	Source Unknown
	pH	Source Unknown
Rider Creek (1.8 miles)	Sedimentation/Siltation	Erosion/siltation, high/road/bridge construction, logging road construction/maintenance
Salsipuedes Creek (Santa Cruz County) (2.6 miles)	E. Coli	Source Unknown
	Fecal Coliform	Collection system failure, domestic animals/livestock, natural sources, onsite wastewater systems (septic tanks), transient encampments, urban runoff/storm sewers
	Low Dissolved Oxygen	Source Unknown
	Turbidity	Source Unknown
	Toxicity	Source Unknown
	Nitrate	Source Unknown
	pH	Source Unknown
San Benito River (86.8 miles)	Boron	Source Unknown
	Electrical Conductivity	Agriculture, grazing-related sources, natural sources, other urban runoff, resource extraction, source unknown
	E. Coli	Agriculture, grazing-related sources, natural sources, other urban runoff
	Fecal Coliform	Collection system failure, domestic animals/livestock, urban runoff/storm sewers
	Sedimentation/ Siltation	Agriculture, grazing-related sources, harvesting, restoraiton, residue management, high/road/bridge

Water Body Name (Length/Area Impaired)	Pollutant/Stressor	Potential Sources
		runoff, hydromodification, road construction, surface mining, urban runoff/storm sewers
	pH	Source Unknown
San Juan Creek (7.3 miles)	Fecal Coliform	Collection system failure, domestic animals/livestock, urban runoff/storm sewers
	Low Dissolved Oxygen	Source Unknown
	E. Coli	Source Unknown
	Turbidity	Source Unknown
	Toxicity	Source Unknown
Struve Slough (2.8 miles)	Low Dissolved Oxygen	Source Unknown
	pH	Source Unknown
	Toxicity	Source Unknown
	Chlorophyll-a	Source Unknown
	Turbidity	Source Unknown
	E. Coli	Source Unknown
	Fecal Coliform	Source Unknown
Tequisquita Slough (7.3 miles)	Fecal Coliform	Collection system failure, domestic animals/livestock, urban runoff/storm sewers
	Low Dissolved Oxygen	Source Unknown
	Turbidity	Source Unknown
	Toxicity	Source Unknown
	Ammonia	Source Unknown
	pH	Source Unknown
Tres Pinos Creek (30.5 miles)	E. Coli	Source Unknown
	Fecal Coliform	Collection system failure, domestic animals/livestock, urban runoff/storm sewers
	pH	Natural sources, source unknown
Uvas Creek (above Uvas Reservoir) (8.2 miles)	pH	Source Unknown
	Water temperature	Source Unknown
Uvas Creek (below Uvas Reservoir) (14.1 miles)	Turbidity	Agriculture, grazing-related sources, groundwater loadings, removal of riparian vegetation
	Low Dissolved Oxygen	Agriculture, grazing-related sources, groundwater loadings, removal of riparian vegetation

Water Body Name (Length/Area Impaired)	Pollutant/Stressor	Potential Sources
Uvas Reservoir (271.9 acres)	Mercury	Source Unknown
Watsonville Slough (6.2 miles)	Low Dissolved Oxygen	Agriculture, domestic animals/livestock, natural sources, urban runoff/storm sewers
	DDE	Source Unknown
	Nitrate	Agriculture, domestic animals/livestock, natural sources, urban runoff/storm sewers
	Malathion	Source Unknown
	Fecal Coliform	Source Unknown
	E. Coli	Source Unknown
	Toxicity	Source Unknown
	Turbidity	Source Unknown

Table 2-7: Status of Pajaro River Watershed TMDLs

TMDL Project Name	Status	Water Body(ies)
Clear Creek and Hernandez Reservoir Mercury TMDL	Completed in 2004	Clear Creek and Hernandez Reservoir
Corralitos Creek Pathogen TMDL	Completed in 2012	Corralitos and Salsipuedes Creeks
Pajaro River Watershed Chlorpyrifos and Diazinon	Completed in 2013	Pajaro River, Pajaro River Estuary, Llagas Creek, and tributaries
Pajaro River Watershed Fecal Coliform	Completed 2009	Pajaro River, San Benito River, Llagas Creek, Tesquiquita Slough, San Juan Creek, Carnadero/Uvas Creek, Bird Creek, Pescadero Creek, Tres Pinos Creek, Furlong (Jones) Creek, Santa Ana Creek, and Pacheco Creek
Pajaro River Watershed Nitrate TMDL, superceded by Pajaro River nutrients TMDL	Nitrate TMDL completed in 2005, Nutrients TMDL completed in 2016	Pajaro River and Llagas Creek
Pajaro River Watershed Sediment TMDL	Completed in 2006	Pajaro River, Llagas Creek, Rider Creek, and San Benito River
Pinto Lake Watershed TMDLs for cyanobacterial blooms	In Progress	Pinto Lake and Tributaries
Watsonville Slough Pathogens TMDL	Completed in 2006	Watsonville Slough

The nitrate and sediment TMDLs will have the most widespread impact on stakeholders and agencies in the watershed. These two TMDLs have identified irrigated agriculture as a significant anthropogenic source of both nitrate and sediment loading. Additional sources of sediment loading that have been identified are silviculture, urban/residential areas, streambank erosion, sand and gravel mining, rangeland/grazing, roads and landslides/natural erosion. Nitrate and sediment pose one of the most significant challenges to water quality. For instance, tributary streams to the Pajaro River feed surface water concentrations in excess of 40 (up to 80) ppm nitrate-N during the drought season. The TMDL for Nitrates is scheduled to be implemented over a 20 year period and will use the Central Coast Regional Water Quality Control Board's existing Conditional Waiver for Discharges from Irrigated Agricultural Land to implement the TMDL. The TMDL for Sediment has a timeframe of 45 years and focuses on the implementation of Farm and Range Water Quality Plans, renewal of existing Waste Discharge Requirements for sand and gravel mining operations and a land disturbance prohibition for pasture and rangelands, roads, animal and livestock facilities and hydromodification-related activities. As described below, a number of efforts have evolved that will help address these TMDLs. These efforts involve the participation of a diverse group of stakeholders and agencies throughout the watershed.

The Central Coast RWQCB adopted Order No. R3-2012-0011 (Conditional Waiver of Waste Discharge for Discharges from Irrigated Lands). This order regulates discharges of "waste" as defined in the Water Code section 13050 and "pollutants" as defined in the Clean Water Act from irrigated lands by requiring individuals subject to the order to comply with conditions to ensure that such discharges do not cause or contribute to the exceedance of Regional, State, or Federal numeric or narrative water quality standard in the waters of the State and of the United States.

The Order requires compliance with water quality standards. Dischargers must implement, and where appropriate, update or improve management practices, which may include local or regional control or treatment practices and changes in farming practices to effectively control discharges, meet water quality standards and achieve compliance with this Order. Consistent with the Water Board's Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program (SWRCB, 2004), dischargers comply by implementing and improving management practices and complying with the other conditions, including monitoring and reporting requirements. The Order requires the discharger to address impacts to water quality by evaluating the effectiveness of management practices (e.g., waste discharge treatment and control measures), and taking action to improve management practices to reduce discharges. If the discharger fails to address impacts to water quality by taking the actions required by the Order, including evaluating the effectiveness of their management practices and improving as needed, the discharger may then be subject to progressive enforcement and possible monetary liability. The Discharger can present their case to the Central Coast Water Board before any monetary liability may be assessed (RWQCB Order R3-2012-0011).

The Central Coast RWQCB is currently developing the TMDL for nutrients and algal toxins in the Pinto Lake Watershed. Pinto Lake is listed on the 303(d) list due to impairments by toxic algal blooms and nutrients. This type of water quality impairment is a biological response to excessive loading of nutrients to the lake, such as phosphorus. Episodic algal blooms in Pinto Lake, which result from nutrient-driven biostimulation, constitute a potential health risk and public nuisance to humans, their pets, and to livestock and wildlife. Pinto Lake is considered one of the most toxic lakes ever recorded in the scientific literature.

The City of Watsonville was awarded a 319(h) planning grant to evaluate treatment alternatives and then a 319(h) implementation grant to implement the recommended treatment approach. Currently being implemented, the Pinto Lake Restoration Project will be based on the findings of the planning study and the extensive research completed as part of the planning study. The main objectives of the Pinto Lake - CLEAN THE GREEN project are as follows:

- Treat internal nutrient loadings that drive cyanobacteria blooms using environmentally safe and proven technologies including polymers/coagulants.
- Treat nutrient loadings from the tributaries (which flow seasonally into the lake) with a flow-based polymer/coagulant (such as alum) dosing system and through implementation of nutrient best management practices (BMPs) within the watershed.
- Coordinate with watershed stakeholders to gain participation in implementation efforts that reduce loadings to Pinto Lake.
- Collect and analyze water quality data verifying reduction of nutrients in-lake and from the watershed as a result of treatment efforts.

The Santa Cruz County RCD completed the *Lower Pajaro River Enhancement Plan* (December 2002) to assess erosion and sedimentation problems in several tributary watersheds in the Lower Pajaro River Watershed. The plan was supported by a grant jointly funded by the California Coastal Conservancy and the Central Coast RWQCB. A key goal of this enhancement plan was to work in cooperation with landowners, land managers, and agency staff to assess historical and existing conditions in order to determine principal physical factors causing significant erosion and sedimentation problems in the areas

studied. The baseline study identified enhancement strategies to address and reduce drainage and erosion problems in the study area. The Plan was reviewed by a steering committee of Lower Pajaro landowner and interest groups and by a Technical Advisory Committee (TAC) of agencies and resource professionals.

A variety of alternative on-farm and bank stabilization BMPs were presented that are used to stabilize sediment (source control) and to reduce erosion and the delivery of sediment from upland areas and waterways. All of the practices described are cost-effective methods designed to stabilize soil by primarily slowing runoff from the fields and by stabilizing stream and waterway banks that are experiencing excessive bank erosion. Sheet and rill erosion from bare fields and bank erosion from unstable drainage ditches and waterways are resulting in erosion and sedimentation problems in the Pajaro Valley region. Several of the recommended BMPs also provide additional benefits to the land by conserving soil, improving water infiltration and groundwater recharge, improving soil fertility, reducing costs for ongoing maintenance of infrastructure (access roads and drainage systems), reducing land loss, enhancing habitat and improving water quality. Practices described are well established techniques, recommended by local, state and federal resource conservation agencies, including the Santa Cruz County RCD and the Natural Resource Conservation Service.

The Monterey Bay National Marine Sanctuary (MBNMS) *Action Plan IV: Agriculture and Rural Lands* focuses on strategies to protect water quality from potential adverse impacts of agricultural land management, while recognizing the importance of maintaining agricultural use of the lands for the long-term health of the watersheds. The Plan was developed and adopted with participation from over twenty stakeholders. This is because effectively managed agricultural lands can act to slow and capture storm water runoff, provide sites for recharge, water storage and wildlife habitat, and reduce the impact of flood events.

The aspects of agriculture that potentially impact water quality include erosion and sedimentation, offsite transport of chemical fertilizers and pesticides, and microbial contamination. Storm water, flooding, irrigation, and leaching can all mobilize substances that are beneficial while on-site, but become pollutants as they concentrate in neighboring groundwater, streams, rivers, wetlands, and nearshore waters. Though each individual farm or ranch may contribute a relatively small amount of pollutants, the cumulative effects through the length of a watershed can be damaging. At the same time, the offsite movement of sediments, pesticides and nutrients can represent a long-term economic loss to the grower.

Many farmers, ranchers and forest landowners have already adopted a variety of management measures to reduce polluted runoff. Expanding and strengthening the conservation practices already begun by the industry, in the main goal of this program, and can help protect our natural resources and sustain the long-term economic viability of agriculture.

Some management practices that address these issues may have long-term economic benefits for the grower or rancher, as well as improving habitat for fish and wildlife and reducing offsite damage to public trust resources. Costs for other practices may exceed any economic benefit to the agricultural landowner or operator, though the benefit to the public may be considerable. The Action Plan encourages increased support for the development and implementation of economically feasible management improvements, and the development of incentives which allow implementation of marginally economic practices where substantial benefits to natural resources may justify public investment.

2.5.3 Imported Water Supply

Import water supply from the CVP is delivered to the region through the San Felipe Division Facilities, which supply water from San Luis Reservoir. The reservoir is a joint project by the United States Bureau of Reclamation (USBR) and the State of California, and provides storage for both CVP and SWP supplies. Major infrastructure for the San Felipe Unit also includes the Pacheco Pumping Plant, Pacheco Conduit, Santa Clara Conduit, and Hollister Conduit. The SBCWD operates San Justo Reservoir (owned by the

USBR), which is used as operational storage for the San Benito CVP water system. SBCWD is currently working on eradication of the invasive zebra mussel in the reservoir.

As previously described, the Valley Water, SBCWD, and PV Water all have CVP water contracts or contract reservations. However, only Valley Water and SBCWD have existing conduits allowing for use of CVP water. The San Felipe Division currently provides supply for agricultural and M&I designations in Valley Water and SBCWD service areas. Table 2-8 summarizes the contract entitlements and projected average deliveries for each agency from the CVP.

CVP water is a hydrologically dependent supply and is subject to delivery reductions by the USBR. is a representation of deliveries that can be expected over 80 years (based on CalSim II Model - 2030 Level of Development [LOD] in the San Joaquin Valley and 2020 LOD in the Sacramento Valley and implementation of the draft CVP M&I Shortage Policy). CalSim II model data indicates a 50% probability that CVP is expected to have allocations less than 15% of the agriculture contract amount and 65% of the M&I contract amount any given year. Table 2-8 summarizes the contract amounts and the projected average annual supply available for the Valley Water, SBCWD, and PV Water. The CVP annual supply availability has decreased significantly since the 2007 IRWM Plan, when average CVP supply availability was 34,100 AFY for agriculture and 114,800 AFY for M&I, because of Biological Opinions that constrained CVP operations and consideration of moderate sea level rise.

Table 2-8: CVP Contracts and Long-Term Average Supplies

Agency	CVP Agricultural Contract Amount (AFY)	Average Available Agricultural Supply (AFY)	CVP M&I Contract Amount (AFY)	Average Available M&I Supply (AFY)
Valley Water[a]	33,100	6,620	119,400 - 130,000	84,914
SBCWD	35,500	17,100	8,250	5,700
PV Water	6,260	3,000	NA	NA
Total	**64,260**	**31,000**	**127,650 – 138,250**	**95,800**

Notes:

1. NA – Not applicable.
2. The Valley Water CVP water is used throughout Santa Clara County. Assumes no additional supplies are secured through transfers, spot market, or options.
3. Valley Water's maximum total (Agriculture plus M&I) contract amount is 152,500 AFY. Depending on Agricultural allocations and use, Valley Water can be allocated between 119,400 and 130,000 AFY of M&I supply for a total contract amount of 152,500 AFY.
4. PV Water does not have a connection to the CVP system. The 6,260 AFY derives from a three-way contract between Westlands Water District and Valley Water. PV Water has not exercised its right to that water and the contract expires at the end of 2019.

Within the watershed, CVP water allocations are served directly for agricultural irrigation, treated and served for M&I use, and used for groundwater recharge and conjunctive use programs. Table 2-9 summarizes the average CVP water quality from the San Felipe Division.

Table 2-9: CVP San Felipe Unit Water Quality

Parameter	Quality
Conductivity	
Range (uS/cm)	360-770
Expected (uS/cm)	540
TDS	
Range (mg/l)	160-368
Average (mg/l)	278
Chloride	
Range (mg/l)	6-107
Expected (mg/l)	70
Sodium	
Range (mg/l)	20-80
Average (mg/l)	55
pH	
Minimum	7.0
Maximum	9.0
Boron	
Range (ug/l)	110-216
Average (ug/l)	162
Nitrogen	
Ammonia (mg/l)	0.1-6.3
Nitrate (mg/l as NO_3)	3.0
Bicarbonate	
Maximum (mg/l)	79
Turbidity	
Range (NTU)	1.0-12.0
Expected (NTU)	2

Notes:
1. Data collected from 2000 to 2012 from the Pacheco Pump Plant Trash Racks at San Luis Reservoir.

The reliability of imported water supply and the region's reliance on Delta-conveyed imported water supplies is a significant issue in the Pajaro River Watershed. As discussed below, the water management agencies are developing recycled water supplies to reduce reliance on imported water supplies. The agencies are also implementing programs to increase and/or optimize the use of existing local groundwater and/or local imported water supplies. In addition, water suppliers throughout the watershed are implementing aggressive water conservation programs. Together, these efforts will reduce the region's

reliance on Delta-conveyed imported supplies. Nonetheless, imported water will continue to be a critical source of supply for the region.

2.5.4 Recycled Water

Recycled water is currently being produced by the South County Regional Wastewater Authority (SCRWA) for use in southern Santa Clara County for landscape irrigation, crop irrigation, and industrial use. In 1999, the SCRWA, Valley Water, the City of Morgan Hill, and the City of Gilroy entered into a partnership agreement to expand recycled water use in southern Santa Clara County. SCRWA was designated as the producer, Valley Water as the wholesaler, and the cities of Gilroy and Morgan Hill as the recycled water retailers. Currently, recycled water is only delivered to the Gilroy area. The South County Recycled Water Master Plan was completed in October 2004 and updated in 2015; it outlines near-term, short-term, and long-term project recommendations. The near-term phase of the 2004 Master Plan was jointly implemented by SCRWA and Valley Water in 2005-2006 allowing for an additional 800 AFY of recycled water delivery. The agencies partially funded the expansion with an implementation grant. Approximately $1.7 million of a Federal stimulus grant was also received for Phase 1A of the short-term projects. Phase 1A of the short-term project was completed in 2012 and included 3,000 feet of 36-inch pipeline and associated facilities. Phase 1B is scheduled for completion in 2021 and will include 14,000 feet of 30-inch pipeline and additional recycled water turnouts. Phase 2 will be completed by 2019 and includes an additional 11,600 feet of 30-inch pipeline. Construction of the long-term component of the 2004 South County Recycled Water Master Plan has not been scheduled or funded. Completion of the short-term Master Plan projects is expected increase recycled water use from about 1,900 AF in 2017 to about 3,700 AF by 2021.

Another recycled water project that exists in the watershed is the Watsonville Area Water Recycling Project (WAWRP). The WAWRP is operated jointly by PV Water and the City of Watsonville as part of PV Water's long-term plan to eliminate basin overdraft and halt seawater intrusion. The project began water deliveries in April 2009 and has produced approximately 25,600 acre-feet of recycled water through 2018 for use as irrigation water in-lieu of groundwater pumping. The recycled water facility is currently capable of producing approximately 4,000 AFY of recycled water to be blended with 2,000 AFY of "blend" water from other sources, for a total capacity of 6,000 AFY of water for agricultural customers along the Pajaro Valley coast. PV Water completed construction of a new 1.5-million-gallon storage tank and improvements to the Distribution Pump Station in 2017 as part of a three phased Recycled Water Facility Improvements Project that will help PV Water produce and deliver more recycled water. The two remaining phases include construction of two additional disk filter banks, a new chemical storage tank, and an additional 0.5-million-gallon storage tank. Increased recycled water deliveries is an essential component of PV Water's Basin Management Plan to achieve a balanced basin.

The Final Program Environmental Impact Report for the Hollister Urban Area Water and Wastewater Master Plan and Coordinated Water Supply Treatment Plan was completed in January 2011. The plan consists of a number of projects for water, wastewater, and recycled water. SBCWD and its project partners have initiated a phased implementation of the master plan. The Program is scheduled to be completed by 2023 and is phased to provide flexibility in responding to changing conditions. The plan calls to develop at least 1,170 AFY of recycled water use.

Table 2-10: Existing and Expected Recycled Water Quality

Wastewater Parameter	SCRWA[a]	Hollister Domestic WWTP[b]	Watsonville[c]
pH	7.5	7.6	7.2
Chloride (mg/L)	169	285	131
Sodium (mg/L)	115	283	116
Boron (mg/l)	0.33	--	0.33
Sulfate (mg/L)	62	213	172
TDS (mg/L)	640	1,130	713
Ammonia	0.51	28.7	22
Nitrate (mg/L)	2.76	9.3	2.02
Kjeldahl N (mg/L)	1.32	31.4	23
Total Nitrogen (mg/L)	2.91	2.7	33.1

Footnotes:

a. Average SCRWA effluent for 2011. (SWRCB website)
b. The data listed are recorded in the year 2003 (January to June); WWTP, wastewater treatment plant.
c. Data from the average recycled water quality in calendar year 2018

2.5.5 Water Conservation

Water conservation is key in reducing dependence on CVP supplies, ensuring water use efficiency, helping to respond to drought conditions, and in achieving SBx7-7 requirements. SBx7-7, or the Water Conservation Bill of 2009, seeks to achieve a 20% statewide reduction in urban per capita water use by December 31, 2020. The bill requires each urban water supplier to develop urban water use targets for 2015 and 2020 to help meet the 20% reduction goal by 2020. DWR established compliance options for urban water suppliers to develop urban water use targets which were to be included in the suppliers' 2010 UWMPs. The 2015 UWMPs are to include demonstration that the supplier is on track for meeting its 2015 and 2020 targets. The urban water suppliers in the Pajaro IRWM region have developed targets, which were included in their 2010 UWMPs and are implementing conservation measures (or BMPs) to achieve the water use reduction targets.

In addition, the RWMG partners, Project Sponsors, and other stakeholders are implementing agricultural water conservation programs to manage agricultural water demands. Agricultural irrigation is the highest water use sector in the Pajaro River Watershed.

2.5.6 Desalted Water

The Hollister Urban Area Water Project is implementing the 2008 Hollister Urban Area Water and Wastewater Master Plan (Master Plan) and the 2010 Coordinated Water Supply and Treatment Plan (Coordinated Plan). The overall purpose of the project is to:

- Improve the quality of municipal drinking water, industrial supply, and recycled water for urban and agricultural irrigation users,
- Provide a reliable and sustainable water supply to meet the current and future demands of the Hollister Urban Area (HUA), and

- Implement goals for the Hollister Water Reclamation Facility to be the primary wastewater treatment plant for incorporated and unincorporated lands in the HUA to protect groundwater quality and public health.

One element of project is phased groundwater demineralization.

2.5.7 Future Water Supply Versus Demand

Table 2-11 shows the supplies currently available for PV Water, SBCWD and Valley Water in the Pajaro River Watershed in comparison to the forecasted demand in 2035. There is an average supply gap of about 10,000 AFY. This down from projected supply gap of about 70,000 AFY in the 2007 IRWM Plan. However, additional demand management and/or supply development will be required to completely close the supply gap. Future solutions may involve increasing recharge opportunities to increase the safe yield and diversifying the portfolio with recycled water, additional surface water supplies, water transfers, and other water supply sources.

Table 2-11: Water Supply and Demand Projections

Source of Supply	2020	2025	2030	2035	2040
Groundwater (AFY)	99,500	99,500	99,500	99,500	99,500
Surface Water (AFY)	17,370	20,920	21,020	21,020	21,020
CVP (AFY)	48,244	48,244	48,244	48,244	48,244
Recycled Water (AFY)	8,170	8,170	8,170	8,170	8,170
Total Supplies (AFY)	173,284	176,834	176,934	176,934	176,934
Total Demands (AFY)	174,400	177,100	178,300	179,700	180,500

Notes:
1. Groundwater from Table 2-2
2. Surface water from agency projections
3. CVP from Table 2-8; assumes 18% of Valley Water total CVP deliveries are used in the Llagas Subbasin
4. Recycled water from Section 2.5.4
5. Demands from Table 2-1

2.6 Ecological Processes/Environmental Resources

The Pajaro River Watershed is tributary to Monterey Bay, a federally protected National Marine Sanctuary administered by the National Oceanic and Atmospheric Administration (NOAA). The Monterey Bay National Marine Sanctuary (MBNMS) is one of the world's most diverse marine ecosystems. It is home to numerous mammals, seabirds, fishes, invertebrates and plants. It is also a remarkably productive coastal environment. MBNMS was established for the purpose of resource protection, research, education, and public use of this national treasure. As a contributing water and sediment source, the Pajaro River plays an integral role in MBNMS health.

The Pajaro River Watershed supports a multitude of the environmental resources including biotic habitats, special status plant and animal species, paleontological resources, cultural resources, and visual resources. The California Natural Diversity Database (CNDDB) is a program developed by the California Department of Fish and Wildlife that inventories the status and location of plants and animals in California. The special-status species within the Pajaro IRWM region and the associated federal and California categories are provided in Table 2-12. It should be noted that the IRWM Plan is a planning study that would not result in the disturbance of any environmental resource. These activities are exempt from the CEQA pursuant to CEQA Guidelines §15262 and §15306. As such, programmatic environmental analysis under CEQA is not required.

Table 2-12: Special-Status Species within the Pajaro IRWM Region

Common Name	Scientific Name	Federal List Category	California List Category
Bald Eagle	Haliaeetus leucocephalus	Delisted	Endangered
Bank Swallow	Riparia riparia	None	Threatened
Bay checkerspot butterfly	Euphydryas editha bayensis	Threatened	None
California condor	Gymnogyps californianus	Endangered	Endangered
California red-legged frog	Rana draytonii	Threatened	None
California tiger salamander	Ambystoma californiense	Threatened	Threatened
Coyote ceanothus	Ceanothus ferrisiae	Endangered	None
Coyote ceanothus	Ceanothus ferrisiae	Endangered	None
Least Bell's vireo	Vireo bellii pusillus	Endangered	Endangered
Metcalf Canyon jewel-flower	Streptanthus albidus ssp. albidus	Endangered	None
Monterey spineflower	Chorizanthe pungens var. pungens	Threatened	None
Nelson's antelope squirrel	Ammospermophilus nelsoni	None	Threatened
San Benito evening-primrose	Camissonia benitensis	Threatened	None
San Joaquin kit fox	Vulpes macrotis mutica	Endangered	Threatened
Santa Clara Valley dudleya	Dudleya abramsii ssp. setchellii	Endangered	None
Santa Cruz long-toed salamander	Ambystoma macrodactylum croceum	Endangered	Endangered
Santa Cruz tarplant	Holocarpha macradenia	Threatened	Endangered
Steelhead - south/central California coast DPS	Oncorhynchus mykiss irideus	Threatened	None
Tidewater goby	Eucyclogobius newberryi	Endangered	None
Vernal pool fairy shrimp	Branchinecta lynchi	Threatened	None
Western snowy plover	Charadrius alexandrinus nivosus	Threatened	None
Western yellow-billed cuckoo	Coccyzus americanus occidentalis	Candidate	Endangered

Source: CNDDB, 2012

Several creeks and rivers support riparian habitat, including the Pajaro River, Llagas Creek, Uvas/Carnadero Creek, San Benito River, Miller Canal, Corralitos Creek, and other associated tributaries. Riparian and wetland areas along these water features and along various drainage ditches provide habitat and movement corridors for wildlife. Some of the wetland areas contain suitable habitat for two sensitive species known to occur in the project vicinity: the California red-legged frog and the California tiger salamander. On August 23, 2005 the U.S. Fish and Wildlife Service (USFWS) approved the “Designation of Critical Habitat for the California Tiger Salamander, Central Population; Final Rule.” This rule designated approximately 382,666 acres of critical habitat, which includes the Soap Lake floodplain area, located in the upper watershed.

San Felipe Lake, which is the central feature of the "Bolsa de San Felipe", is designated as a "California Important Bird Area" by the National Audubon Society. The Bolsa is a crossroads for birds migrating between San Francisco Bay to the north, Monterey Bay to the west and the Central Valley to the east. The Bolsa is also identified by the National Audubon Society as a "bird vagrant trap", a site where bird species far outside of their normal range appear. The fields surrounding San Felipe Lake are saturated with water during the winter months and it is possible that vernal pools could be located here. If vernal pools do exist around the lake, they could serve as potential habitat for fairy shrimp and the larval stage of California tiger salamander (Valley Water, 2003).

The Pajaro River serves as a migration pathway for adult steelhead (*Oncorhynchus mykiss*) migrating to spawning and nursery habitat in the upper watershed and for steelhead smolts (1-2 year old juveniles) migrating from that habitat to the ocean. However, because of low, warm summer streamflows and substrate dominated by sand or silt, the Pajaro River provides almost no potential rearing habitat for steelhead (Smith, 2002). Uvas, Llagas, and Corralitos Creeks provide potential spawning and rearing habitat, and Uvas provides access, spawning and rearing in all but extreme drought years. Use of Llagas Creek by steelhead is less frequent and less extensive (HRG, 1997). The entire Pajaro River watershed provides potential habitat for several fish species and comprised one of the major drainages of the south-central California Evolutionarily Significant Unit (ESU) for the steelhead. Although once present in the Pajaro River, Coho salmon have not been present in the river since at least the late 1960s.

In December 2013, the National Marine Fisheries Service of the National Ocean and Atmospheric Administration released the South-Central California Coast Steelhead (SCCCS) Recovery Plan. The planning area extends from the Pajaro River in Santa Cruz/Monterey County south to, but not including, the Santa Maria River at the San Luis Obispo/Santa Barbara County line. The Recovery Plan is a guideline document for achieving recovery goals that include specific biological objectives and viability criteria for populations of *O. mykiss* and the distinct population segment (DPS) as a whole. Reduced access to historic spawning and rearing habitat is considered a principle cause for the decline of the SCCC steelhead. Critical recovery actions identified for the Pajaro River Watershed include:

- Develop and implement operating criteria to ensure the pattern and magnitude of groundwater extractions and water releases from Uvas Dam and Pacheco Dam to provide the essential habitat functions to support the life history and habitat requirements of adult and juvenile steelhead.
- Physically modify fish passage impediments to allow steelhead natural rates of migration to upstream spawning and rearing habitats, and passage of smolts and kelts downstream to the estuary and ocean and restoration of spawning gravel recruitment to the lower mainstem.
- Manage instream mining to minimize impacts to migration, spawning and rearing habitat in major tributaries, including Uvas, Corralitos, Llagas, and Pacheco Creeks, and the San Benito River.
- Identify, protect, and where necessary, restore estuarine rearing habitat, including management of artificial sandbar breeching at the river's mouth.

The overall goal of the South-Central California Steelhead Recovery Plan is to prevent the extinction of anadromous steelhead by ensuring the long-term persistence of viable, self-sustaining, wild populations of steelhead across the DPS.

Paleontological resources include fossilized remains of animals and plants, typically found in sedimentary rock units that provide information about the evolution of life on earth over the past 500 million years or more. No single repository exists for information on fossil locations within California. Exact locations of fossils are not usually published in order to protect the resource from unauthorized collecting and subsequent loss of scientific information. Paleontological resources have been identified near Gilroy within the Soap Lake area; however, since the exact location of these resources cannot be published, it is unknown whether these resources are directly within the Soap Lake floodplain.

2.7 Cultural Resources

The Pajaro River watershed is rich with cultural resources including various Native American and historical cultural sites, buildings, and landmarks, as well as ethnobiologically significant natural resources and culturally significant landscape features. Many of these resources remain important to the cultural practices of area residents today and have potential to yield information on the prehistory and history of the region. Generally, areas in proximity to rivers, creeks, and other sources of freshwater have a high potential for archeological sensitivity.

Cultural resources that have been identified throughout the Pajaro River watershed include:

- Prehistoric archeological sites – Places where Native Americans lived or carried out activities during the prehistoric period before 1769 AD;
- Historical archaeological sites – Places where human activities were carried out during the historical period between 1769 AD and 50 years ago;
- Traditional cultural properties and features – Places and natural features associated with the cultural practices or beliefs of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community;
- Historical structures – Houses, outbuildings, stores, offices, factories, barns, corrals, mines, dams, bridges, roads, and other facilities that served residential, commercial, industrial, agricultural, transportation, and other functions during the historical periods (more than 50 years ago); and
- Ethnobiologically significant natural resources – Plants and animals associated with the cultural practices or beliefs of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community.

The information herein should not be considered comprehensive of the entire Pajaro River watershed, as it originates from previous environmental documentation for specific projects and their associated project areas within the watershed. Within the scope of the IRWMP, further research to compile and document the cultural resources within the Pajaro Watershed will be performed in conjunction with environmental evaluations on a project-specific basis. Due to the sensitivity of cultural resources, specific details about the location and nature of identified cultural resources are kept confidential.

2.7.1 Cultural Resources in Soap Lake

The Soap Lake project area encompasses about 8,000 acres of floodplain lands upstream of the Pajaro River at Highway 101 and is split between the counties of Santa Clara and San Benito near Hollister. Research indicated that 26 Native American and historic-period cultural sites have been identified within the Soap Lake area – 18 within Santa Clara County and 8 within San Benito County.

Native American archaeological sites located in the southern Santa Clara Valley tend to be located along creek banks, along the margin of former marshland, and near the mouths of canyons where they open into the Valley. At the time of Euro American contact, Native people that lived in the area belonged to the Ohlone ethnolinguistic group, which was comprised of dozens of autonomous semi-permanent village units affixed to particular territories. Given the environmental setting of Soap Lake and the presence of recorded prehistoric archaeological sites in the vicinity, there is a high potential for Native American sites in the Soap Lake area.

Other cultural resources include, but are not limited to the following:

- The Bautista de Anza National Historic Trial, a National Historic Trail crossing the Soap Lake area;
- Miller Canal, an unlined historic canal between San Felipe Lake and the Pajaro River; and
- Prehistoric lithic scatters within sparse to moderate density chert debitage, flaked stone and ground stone.

No single repository exists for information on fossil locations within California. Exact locations of fossils are not usually published in order to protect the resource from unauthorized collecting and subsequent loss of scientific information. Paleontological resources have been identified near Gilroy within the Soap Lake area; however, since the exact location of these resources cannot be published, it is unknown whether these resources are directly within the Soap Lake floodplain.

Human remains were identified in three sites within the Soap Lake project vicinity. In addition, one unrecorded site is a possible Native American burial/cremation site. At the very least, these findings strongly suggest the presence of Native American habitation areas positing the resources as potentially eligible for the National Register.

2.7.2 Cultural Resources in Valley Water and PV Water Service Area

The archeological, ethnographic, and historical context for the PV Water service area consists of information about, and sites located within, the southern Santa Clara Valley and the Monterey Bay region. This information was gathered from a literature review of the October 2001 PV Water Revised BMP Draft EIR.

The southern Santa Clara Valley region was initially settled 4,000 to 7,000 years ago. Review of a prehistoric archeological site database and recent research suggests that the habitation characteristic of the inhabitants followed an early period of high mobility, proceeded by a middle period of more sedentary settlement with indication of year-round occupation and reliance on a subsistence economy which lasted until 850-1,500 years ago, and ended with a late or protohistoric period which showed an adaptive shift to more mobile settlement patterns with a reduction in territorial base, and more usage of local resources.

For the Monterey Bay region of PV Water, it has been proposed that two archeological population patterns existed. The Sur Pattern which appeared more than 3,000 years ago is thought to correspond with Hokan ancestors of the Esselen and represents an early “forager” subsistence strategy. The Monterey Pattern which appeared about 2,450 years ago, corresponds with Penutian ancestors of historic Ohlone and represents a “collector” subsistence strategy. In an archeological sense, the two populations represent a distinct shift in settlement, subsistence, and use of the region through time.

The ethnographically documented aboriginal inhabitants of the PV Water were part of the Ohlone language group, which extended from the San Francisco Bay area south to the southern Monterey Bay and lower Salinas River areas. Information regarding these people was obtained from records of early Spanish explorers, documents maintained at missions, the works of ethnographers and linguists, and from Native American descendants.

Four groups of original inhabitants are noted within the PV Water project area: Tiuvta, Unijaima, Motsun, and Ausaima. The Tiuvta occupied the Pajaro River, Elkhorn Slough, and lower Salinas River areas. The Unijaima lived in the mountains and plains of the southwestern Santa Clara Valley, north of the Pajaro River, while the Motsun lived in the San Juan Valley and in the mountains southwest of the valley. The Ausaima lived in the eastern portion of the San Felipe Sink and the hills on the west side of Pacheco Pass. Today, these original inhabitants are represented by the Amah Mutsun Tribal Band.

Following the early inhabitants of the region, the southern Santa Clara Valley region and Monterey Bay experienced periods of Spanish arrival and colonization, Mexican independence and the ranchos, and Anglo-American expansion.

2.8 Social/Cultural/Economic State

The Pajaro River Watershed social setting is rooted in communities that can generally be classified as suburban and rural in character. The economic setting in the Pajaro River watershed can generally be characterized as agriculturally based. Agricultural production and processing are the major industries throughout the watershed.

San Benito County agriculture is a $255 million industry (San Benito County 2010 Annual Crop Report). The County's farming and grazing lands are extremely productive and support a significant acreage and variety of crops. Some of the most common vegetable crops grown in the County include lettuce, bell peppers, onions, celery, and broccoli. Common orchard crops are walnuts, grapes, apricots, and apples. The City of Hollister is the major urban area in the County and is generally considered a suburban type community. The economy is based on agricultural production and processing.

Agriculture is the cornerstone of the Pajaro Valley economy and is a $800 million plus industry. Crops grown in the Pajaro Valley include strawberries, raspberries, vegetable row crops, blueberries, and apples. Without development of a sustainable water supply, an estimated 25,660 acres of agricultural land potentially would need to be fallowed to reduce groundwater pumping to eliminate seawater intrusion and the groundwater overdraft. The lost agricultural production has an estimated annual value of $400 million and would result in loss of approximately 11,530 jobs (PV Water, 2013). Property values would also likely plummet as land would likely be converted to range land. The City of Watsonville is the major urban area in the Pajaro Valley and can be generally classified as a suburban community. The City qualifies as a disadvantage community with an average median household income (MHI) below 80% of the State MHI (See Section 12.7 for additional details). The City's economy is linked to the agricultural production of the region and would be impacted by losses in agricultural production.

South Santa Clara County has historically been based on agricultural production and processing. The total gross value of Santa Clara County's agricultural production was $261 million in 2012 (Santa Clara County Agricultural Crop Report 2012). Santa Clara County agricultural producers grow nursery and cut flower crops, vegetable, fruit, and wine grape crops, conduct milk and egg production, and livestock grazing and sales.

Major urban areas in southern Santa Clara County include the City of Gilroy, City of Morgan Hill, and unincorporated San Martin. These urban areas can be generally classified as suburban and rural in nature. Gilroy is known as the "Garlic Capital of World" and the local economy has generally been based on the agricultural production of garlic, prunes, tomatoes, flowers, and onions. The Outlets at Gilroy also provide an economic base for the communities. The proximity of southern Santa Clara County to the San Francisco Bay Area also facilitates commuters from Gilroy, Morgan Hill, and San Martin. There has also been an increased interest in southern Santa Clara County for expansion of the technology industry.

2.9 Disadvantaged Communities

A disadvantaged community (DAC) is defined in the California Public Resource Code as a community with an annual MHI that is less than 80% of the statewide MHI [PRC §75005 (g)]. DWR collected and compiled the U.S. Census American Community Survey MHI data for 2010 to 2014 (i.e. 2014 Census Data). The State MHI was $61,489; therefore, communities with an average MHI of $49,191 are considered disadvantaged communities. The RWMG is currently reviewing the DWR DAC information and

performing community surveys to refine their DAC assessment. Table 2-13 demonstrates 2010 census data and MHI statistics from major cities located in the Pajaro watershed.

Table 2-13: 2010 Census Data and MHI Statistics in Pajaro Watershed

Community[1]	Population	Median Household Income	Average Household Size
Pajaro	**3,070**	**$36,094**	**4.8**
Watsonville	**51,199**	**$46,675**	**3.75**
Amesti	**3,478**	**$47,483**	**3.53**
Freedom	**3,070**	**$48,688**	**3.95**
Hollister	34,928	$63,289	3.53
Gilroy	48,821	$71,340	3.39
Corralitos	2,326	$79,454	2.8
Morgan Hill	37,882	$92,771	3.05
California	37,253,956	$60,883	3.88
80% of the State MHI	-	$48,706	-

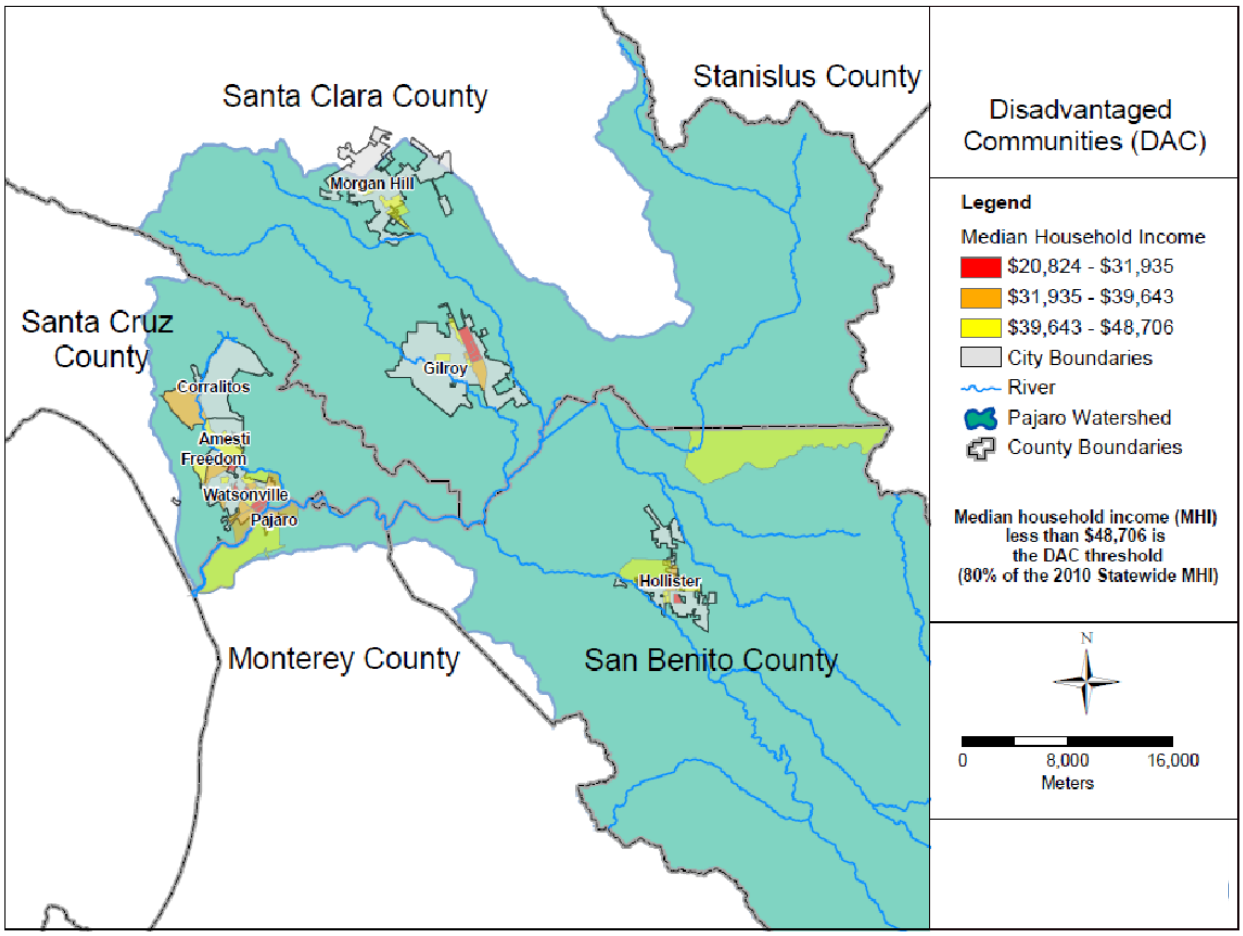
Note:
1. DACs are indicated in bold.

As indicated in Table 2-13, there are four communities in the Pajaro River watershed with MHIs less than 80% of the State MHI. The communities of Pajaro, Wastonville, Amesti and Freedom include significant portions of DACs, shown in Figure 2-13. In addition to the relatively low per capita income as compared to the statewide average, the cost of living in these areas is relatively high compared to the Statewide average, resulting in an increase in the average household sizes in these cities above the state average. In addition to the four cities previously mentioned, four other cities in the Region include DAC areas within their city boundaries. For comparison purposes, socioeconomic statistics for all eight communities with DACs are listed in Table 2-14. In general, the median age in the Region is lower than the state median age of 35.3 years, except for the community of Corralitos. Residents of this Region are more likely to own their houses in larger cities with higher median household income.

Table 2-14: Additional 2010 Socioeconomic Statistics in Pajaro Watershed

City	Median Age	Housing Units	% Owner Occupied	% Rental Units
Pajaro	25.6	655	23%	77%
Watsonville	29.2	14089	44%	56%
Amesti	31.3	1015	62%	39%
Freedom	30.2	806	66%	34%
Hollister	30.8	10401	60%	40%
Gilroy	32.4	14854	61%	39%
Corralitos	45.1	888	74%	26%
Morgan Hill	36.8	12859	71%	29%

Figure 2-13: DACs in the Pajaro River Watershed



2.10 Climate Change

Climate change may potentially have significant impacts on California's water resources, due to rising sea levels, decreased snowpack, and increased water temperatures. In addition, extreme conditions, including droughts and floods, are expected to become more severe. Climate change is expected to impact water supply, flooding, water demand, and habitat within the Pajaro River Watershed. The specific climate change impacts to the Pajaro region and vulnerabilities are discussed in detail in Chapter 14 and summarized here.

Imported water supplies will likely decrease as snow decreases and rain increases. It is more difficult to operate the CVP reservoirs for a rain-dominated system and reoperation studies considering climate change show a resultant decrease in water supply. In addition, the CVP supplies will likely have increased environmental flow restrictions as increased temperatures increase the reservoir water temperature and the temperature of the water released for fisheries habitat. Sea level rise may also require increased outflow of CVP supplies to the San Francisco Bay to prevent salt water intrusion.

Locally, increased storm intensity and drought severity will result in reduced water supply and increased demand. Water supply will be reduced because it is difficult to collect and store water in local reservoirs from individual large storms. Local reservoirs operate best with frequent, low intensity rains. Moreover, flows that cannot be stored in the local reservoirs may cause flooding in communities downstream of the

reservoirs. In addition, increased storm intensities and droughts will increase pollutant concentrations and sedimentation in surface water supplies.

Increased temperatures and decreased local and imported surface water supplies may result in increased groundwater pumping if other new supplies are not established, such as recycled water. Increased groundwater pumping can increase the risk of subsidence and salt or brackish water contaminating groundwater supplies (e.g., saltwater intrusion).

For a detailed assessment of climate change impacts, vulnerabilities, and potential mitigation and adaptation measures for the Pajaro IRWM region, see Chapter 14.

3 IRWM Plan Objectives

This chapter meets the following IRWM Plan Standard from the 2016 Integrated Regional Water Management Grant Program Guidelines.

> **Objectives –** The IRWM Plan must clearly present plan objectives and describe the process used to develop the objectives. Plan objectives must address major water-related issues and conflicts of the region. RWMGs must consider the objectives in the appropriate basin plan or plans and strategies to meet applicable water quality standards (Water Code Section 10541.(e)(2)). In addition, objectives must be measurable by some practical means so achievement of objectives can be monitored. The objectives may be prioritized for the region. The IRWM Plan must contain an explanation of the prioritization or reason why the objectives are not prioritized.
>
> The Plan Objectives must address the following climate change adaptation and mitigation requirements:
>
> - Address adapting to changes in the amount, intensity, timing, quality and variability of runoff and recharge.
> - Consider the effects of sea level rise (SLR) on water supply conditions and identify suitable adaptation measures.
> - Reduce energy consumption, especially the energy embedded in water use, and ultimately reducing GHG emissions.
> - Consider, where practical, the strategies adopted by the California Air Resources Board (CARB) in its AB 32 Scoping Plan, when evaluating different ways to meeting IRWM plan objectives.
> - Consider options for carbon sequestration and using renewable energy where such options are integrally tied to supporting IRWM Plan objectives.

In the IRWM Plan process, development of objectives is a key step, as objectives provide a basis for decision making, guide work efforts, and can be used to evaluate project benefits. In the Pajaro River Watershed IRWM Plan process, a mission statement, goals and objectives were developed. The planning objectives are targeted outcomes which benefit the region now and in a changed climate. When implementing regional projects, the Regional Water Management Group (RWMG) and project sponsors will strive to meet as many objectives as possible.

3.1 Mission, Goals and Objectives

A consensus-based approach was used in the development of a mission statement for the Pajaro River Watershed RWMG and associated goals and objectives for the region that were presented in the 2007 IRWM Plan. During the development of the 2007 mission, goals and objectives, the RWMG considered both the needs and issues identified for the region and the statewide priorities. The goals and objectives were presented to stakeholders and then refined based on stakeholder input and consensus. The same process was used to update the goals and objectives for the 2014 IRWM Plan, with the addition of consideration of Basin Plan Objectives, 20x2020 water efficiency goals, and requirements of California Water Code §10540(c). This 2018 IRWM Plan clarifies the region's intentions related to climate change adaptation and mitigation. The results of this collaborative effort are the mission, goals, and objectives list below, with the goals and objectives listed in order of priority.

The goals were updated in 2018 to explicitly recognize that climate change is integral to how we manage water resources. The objectives do not include separate climate change objectives; most of the existing objectives are designed to adapt to and help mitigate climate change. For example, the objective to implement water conservation programs to reduce water use will help adapt to increasing temperatures and changed demand patterns and will reduce energy consumption and associated greenhouse gas (GHG)

emissions. Similarly, maintaining flood attenuations properties in the watershed will help adapt to changes in the amount and intensity of runoff. Planning efforts have and will continue to focus on addressing extreme conditions, including potentially more extreme conditions associated with climate change.

MISSION: The mission of the Pajaro River Watershed Regional Water Management Group is to preserve the economic and environmental wealth and well-being for the Pajaro River watershed through watershed stewardship and comprehensive management of water resources in a practical, cost effective and responsible manner.

Water Supply Goal: Protect and improve regional water supply reliability, protect groundwater resources from overdraft, reduce dependence on imported water, and protect watershed communities from drought now and in a changed climate.

Objectives:

1. Meet 100% of M&I and agriculture demands (both current and future conditions) in wet to dry years including the first year of a drought
2. Meet 85% M&I and 75% agriculture demands (both current and future conditions) in second and subsequent years of a drought
3. Identify and address water supply needs of disadvantaged communities in the Pajaro River Watershed
4. Implement water conservation programs to reduce M&I and agricultural water uses consistent with SB 606 and AB 1668
5. Maximize the use of recycled water during the irrigation season and expand other uses of recycled water
6. Optimize the use of groundwater and aquifer storage
7. Maximize conjunctive use opportunities including interagency conjunctive use.
8. Optimize use of existing import surface water entitlements from the San Felipe Division
9. Maximize the beneficial use of existing local water supplies while protecting existing surface water rights.

Water Quality Goal: Protect and improve water quality for beneficial uses now and in a changed climate consistent with regional community interests and the RWQCB basin plan objectives through planning and implementation in cooperation with local and state agencies and regional stakeholders.

Objectives:

1. Meet or exceed all applicable groundwater, surface water, wastewater, and recycled water quality regulatory standards
2. Identify and address the drinking water quality of disadvantaged communities in the Pajaro River Watershed.
3. Protect groundwater resources from contamination including salts, seawater intrusion, and nutrients.
4. Address impacts from surface water runoff through implementation of Best Management Practices or other surface water management strategies
5. Meet or exceed delivered water quality targets established by recycled water users.

Flood Management Goal: Ensure flood management strategies are developed and implemented through a collaborative and watershed-wide approach and are designed to maximize opportunities for comprehensive management of water resources and adapt to climate change.

Objectives:

1. Implement flood management strategies throughout the watershed that provide multiple benefits
2. Reach consensus on the Pajaro River Risk Reduction Project necessary to protect existing urban areas and infrastructure from flooding and erosion from the 100-year event and to maximize opportunities to protect agricultural land uses
3. Work with stakeholders to preserve existing flood attenuation by implementing land management and conservation strategies throughout the watershed
4. Develop approaches for adaptive management to minimize maintenance requirements and protect quality and availability of water while preserving ecologic and stream functions, and enhancing when appropriate
5. Provide community benefits beyond flood protection such as public access, open space, recreation, agriculture preservation and economic development

Environmental Protection and Enhancement Goal: Preserve the environmental wealth and well-being of the Pajaro River watershed now and under a changed climate by identifying opportunities to sustain, restore and enhance natural resources of streams, watersheds, wetlands, and the Monterey Bay when developing and implementing water management strategies.

Objectives:

1. Address opportunities to enhance the local environment and protect and/or restore natural resources, in cooperation with landowners, when developing water management strategies
2. Improve biological and cultural resources, including riparian habitats, habitats supporting sensitive plant or animal species and archaeological/historic sites when implementing strategies and projects
3. Address opportunities to protect, enhance, or restore habitat to support Monterey Bay National Marine Sanctuary marine life in conjunction with water management strategies
4. Address opportunities for open spaces, trails, parks along creeks and other recreational projects in the watershed that can be incorporated with water management strategies, consistent with public use and property rights

3.1.1 Water Supply Objectives

The following paragraphs provide additional explanation of the objectives developed to support the water supply goal. These objectives recognize the importance of managing for drought, securing and optimizing existing supplies and infrastructure, and increasing water conservation and reuse to meet future needs.

1. The RWMG established the objective of meeting “100% of M&I and agriculture demands in wet to dry years” to reflect the importance of a reliable water supply now and in a changed climate. As with all the objectives, this objective may not be met every year, but it serves as targets for the RWMG to strive towards as they implement projects.

2. In recognition of the increased obstacles faced in meeting demands during drought years, the RWMG established the objective of meeting "85% of M&I and 75% of agriculture demands in second and subsequent years of a drought". Because surface water supplies generally cannot be relied upon during dry years and climate change will affect the amount, intensity, timing, and variability of runoff and recharge, this objective is geared towards developing supplies that are not dependent on yearly precipitation such as recycled water and managing demands.

3. The objective to "identify and address water supply needs of disadvantaged communities in the Pajaro River Watershed" reflects an unmet need for the City of Watsonville and, more significantly, the Town of Pajaro. The RWMG applies the objectives related to meeting demands to the entire region but recognizes that the unmet needs of the disadvantaged communities warrant additional focus.

4. The objective to "implement water conservation programs to reduce water use…" recognizes that water conservation is one of the most effective ways to manage demands and that demand management will be critical with a changing climate, including increased water demands due to increased temperatures and changed demand patterns. Furthermore, water conservation reduces energy consumption and associated GHG emissions. The RWMG is committed to continuing conservation measures and encouraging water use efficiency, including onsite capture and reuse, throughout the region.

5. Recycled water is valued as a local, drought-proof water supply that will help the region adapt to climate change. By establishing the objective to "maximize recycled water use during the irrigation season and expand other uses of recycled water," the RWMG is promoting the continued development of this reliable supply.

6. The objective to "optimize the use of groundwater and aquifer storage" encourages the RWMG to consider the use of groundwater from a regional perspective as both a supply source and a storage area. Optimizing the use of groundwater and aquifer storage involves capturing the potential synergies offered from coordinated management and use of the groundwater basins.

7. "Maximize conjunctive use opportunities, including interagency conjunctive use" captures the intent of the RWMG to coordinate groundwater and surface water management activities locally and regionally. Management of these supplies on a regional basis can aid in addressing the current imbalance between areas of the watershed which are hindered by high groundwater conditions and areas of the watershed facing overdraft conditions. Conjunctive management is, and will continue to be in a changing climate, critical for meeting needs during droughts and other water supply shortages.

8. "Optimizing and sustaining the use of existing import surface water entitlements from the San Felipe Division" is included as an objective because the RWMG each hold CVP entitlements and their shared connection to the CVP system through the San Felipe Division presents significant opportunities for optimizing the use of CVP import water in the region. Sustaining the use of CVP water is important given the current deficit in water supplies for the region. This objective is designed to encourage coordination among the RWMG in use of CVP import water to maximize the benefit that can be gained from each of the agency's contract options. This objective is not to invest in infrastructure or contracts that would increase import water supplies since import water supplies are vulnerable to climate change.

9. The objective to "maximize the beneficial use of existing local water supplies while protecting existing surface water rights" is aimed at maintaining rights to local surface waters. While these surface water supplies are not the largest source of supply in the region, they are a critical portion of the region's supply and provide flexibility in water supply planning and operations. This

objective does not aim to invest in additional surface storage for surface supplies, since increased temperatures will increase evaporation and increased variability will reduce the effectiveness of surface storage. However, this objective does consider investing in groundwater storage as a resilient approach to maximizing beneficial use of water under future climate conditions.

3.1.2 Water Quality Objectives

The following paragraphs provide additional explanation of the objectives developed to support the water quality goal.

1. The objective to "meet or exceed all applicable groundwater, surface water, wastewater and recycled water quality regulatory standards" is included in recognition of the importance of providing people and the environment with clean, safe water. The water quality focus should be meeting and, when possible, exceeding applicable water quality objectives.
2. "Identify and address the drinking water quality of disadvantaged communities in the Pajaro River Watershed" is a high priority for the region especially given the serious water quality issues and health threats in the Town of Pajaro and City of Watsonville.
3. It is important to "protect groundwater resources from contamination including salts, seawater intrusion, and nutrients" because groundwater is the primary water supply for the region. Sea level rise is increasing the threat of seawater intrusion into coastal aquifers.
4. The objective to "address impacts from surface water runoff through implementation of Best Management Practices or other surface water management strategies" is intended to protect the region's water bodies from pollutant loading and aid in meeting TMDLs. These strategies should also be designed to minimize water quality threats associated with climate change. Increased wildfire activity, more intense runoff events, and increased temperature will exacerbate water quality challenges.
5. The objective to "meet or exceed delivered water quality targets established by recycled water users" recognizes the importance of providing water supplies that meet users' water quality requirements, even those that go beyond regulatory requirements. This objective is especially important for expanding the use of recycled, where user water quality requirements are frequently more stringent than some regulatory standards.

3.1.3 Flood Management Objectives

The following paragraphs provide additional explanation of the objectives developed to support the flood management goal.

1. The RWMG's commitment to protecting communities and managing flood risks throughout the watershed from floodwaters is expressed in the objective to "implement flood management strategies throughout the watershed that provide multiple benefits." The importance of developing and implementing flood management strategies for the watershed is recognized by the RWMG. The region has a history of flooding and it is anticipated that flood risk will increase with climate change and sea level rise. Specifying multiple beneficial projects reflects the RWMG's desire to move away from the single-purpose flood control projects of the past and move towards the implementation of flood management strategies that can also incorporate water supply, water quality and environmental protection elements and be resilient to changes in the amount, intensity, timing, and variability of runoff.

2. The objective to "reach consensus on the Pajaro River Flood Risk Reduction Project to protect existing urban areas and infrastructure from flooding and erosion and to maximize opportunities to protect agricultural land uses" is worded specifically to stress the importance of achieving consensus in implementing a flood management project for the Pajaro River. Developing a solution to the flooding issue of the Lower Pajaro River is a watershed-wide issue. In addition, we need to protect communities and infrastructure from increased severity of coastal flooding that results from SLR.

3. Maintaining flood attenuation properties of the watershed is necessary to preventing further increases in storm flows and adapting to a changing climate. The objective to "work with stakeholders to preserve existing flood attenuation by implementing land management and conservation strategies throughout the watershed" addresses this need, and it also emphasizes the necessity of working with stakeholders to make land use decisions that are appropriate for the region.

4. The objective to "develop approaches for adaptive management to minimize maintenance requirements and protect quality and availability of water while preserving ecologic and stream functions and enhancing where appropriate" reflects the importance of pursuing adaptive management approached that adjust to changing conditions, including climate change, and improved understanding of flood issues.

5. The objective to "provide community benefits beyond flood protection such as public access, open space, recreation, agriculture preservation and economic development" addresses multi-objective flood protection projects not covered by the first objective.

3.1.4 Environmental Protection and Enhancement Objectives

The following paragraphs provide additional explanation of the objectives developed to support the environmental protection and enhancement goal.

1. The objective to "address opportunities to enhance the local environment, and protect and/or restore natural resources, in cooperation with landowners, when developing water management strategies" encourages the development of environmental enhancements to projects through partnerships. Cooperation with land owners is important to avoid potential conflicts between the broad base of stakeholders. This objective also recognizes the importance of land and water management for sustaining ecosystem services such as water supply, flood protection, and carbon sequestration.

2. The next objective, "Improve biological and cultural resources, including riparian habitats, habitats supporting sensitive plant or animal species, and archaeological/historic sites when implementing strategies and projects," reflects the RWMG' commitment to support and, where appropriate, participate in the preservation of the region's environmental and cultural well-being. This objective is also met through environmental documentation required for project implementation.

3. The Pajaro River drains to Monterey Bay, which is a federally protected marine area that supports a diverse marine ecosystem. To continue protection of this critical resource, the RWMG developed the objective "to identify opportunities to protect, enhance or restore habitat to support Monterey Bay National Marine Sanctuary marine life in conjunction with other water management strategies."

4. Because recreational elements can often be well paired with water resource management projects, the RWMG included the objective "to identify opportunities for open spaces, trails, parks along creeks and other recreational projects in the watershed that can be incorporated with water

management strategies, consistent with public use and property rights." As with the first objective, cooperation with landowners was specified to avoid potential conflicts between stakeholders.

3.1.5 Focused Studies Objectives

The following focused studies were completed as part of the IRWM Plan Update 2014:

- San Benito River Watershed Study
- Salt and Nutrient Management Planning
- College Lake Improvement and Watershed Management

Each of these studies involved the development of goals and objectives and the integration of the goals and objectives into the IRWM Plan. These studies provided information on known issues for the study area, such as water quality and water supply, and provided information on opportunities and resources available to address the issues.

3.2 Prioritization of the Goals and Objectives

The RWMG came to agreement on the priorities of the region in 2007 by first looking at the priorities for their own service areas. This exercise allowed the RWMG to identify those areas where they shared the strongest connections and to engage in discussions with stakeholders on how the regional priorities should be shaped. The RWMG reviewed and updated the priority of the objectives for this 2014 IRWM Plan and obtained concurrence from the Stakeholder Steering Committee. The priority of the objectives in this 2018 IRWM Plan are the same as the 2014 IRWM Plan.

All the goals and objectives are important to the region. Thus, the prioritization is relative rather than an absolute determination of importance.

The goals and objectives, as they were presented in Section 3.1, are listed in order of priority.

3.2.1 Water Supply Prioritization

The water supply goal was given the highest priority of the four goals because an adequate supply of water is most critical to protecting human health, economic health, and the environmental well-being of the Pajaro River Watershed. The first two objectives that fall under this goal (i.e. meeting 100% of M&I and agricultural demands in wet to dry years and meeting 85% of M&I and 75% of agricultural demands) were ranked as the first and second priorities, respectively, because having a reliable and of adequate water supply is critical to meeting the region's needs. Meeting the water supply needs of disadvantaged communities was ranked third because, even though the first two objectives apply to the entire watershed, the needs of disadvantaged communities warrant additional attention. Water conservation was ranked above the remaining water supply objectives in recognition of the State's priority for water use efficiency and because managing demands will be critical for adapting to climate change. Recycled water ranked next at fifth because recycled water is a local, drought proof supply that will be critical for meeting future water demands and adapting to climate change. Conservation and recycled water ranked higher than other supplies since they relieve demands on potable supplies and are relatively drought-proof. Groundwater and conjunctive use ranked sixth and seventh, respectively. Groundwater will continue to be the foundation of the region's water supply and conjunctive use will continue to be invaluable in managing supplies under different hydrologic conditions. Optimizing and sustaining the use of imported CVP water ranked above local surface water supplies based on the higher volume of CVP supply in the watershed. Maximizing the beneficial use of local surface water is an important component of the region's water supply.

3.2.2 Water Quality Prioritization

The water quality goal was given the second highest priority for the region, just behind the water supply goal, because water quality is an integral part of water supply reliability and the region faces water quality issues that affect water management strategies. Of the water quality objectives, meeting or exceeding all applicable regulatory standards was ranked first. This ranking reflects the importance of water quality in meeting water demands; at a minimum, the appropriate regulations for a given water resource must be met if it is to be used as a water supply source and support the wealth and well-being of the watershed. The RWMG also are interested in going beyond simply meeting or exceeding regulatory standards. Addressing the drinking water quality needs of disadvantaged communities was ranked second to reflect the important and ongoing needs of these communities. The third water quality objective is to protect groundwater quality because groundwater is the majority of the drinking water supply in the region, is typically untreated, and does not meet water quality standards throughout the region. The objective to address surface water runoff impacts is ranked below groundwater protection since surface water is treated prior to drinking water use and is used less often than groundwater as a source of drinking water supply. Addressing surface water impacts aids in meeting TMDLs established for the Pajaro River Watershed and supports achieving water quality objectives for multiple beneficial uses. Recycled water quality was ranked fifth because, while it is critical to meeting water supply objectives, it is not currently a source of supply for drinking water or the environment.

3.2.3 Flood Management Prioritization

The flood management goal was ranked third among the regional goals. Flood management is an important issue for the watershed, but the RWMG prioritized having an adequate supply of safe clean water. The general flood protection objective, which covers flood protection projects throughout the watershed, was ranked as the first priority. The more specific Pajaro River Risk Reduction Project was given second priority. The high priority of the objective to reach consensus on the Pajaro River Risk Reduction Project reflects an understanding that a regional, watershed-wide approach will be necessary to implement a project that protects existing urban areas and infrastructure and land uses from a 100-year event. Working with stakeholders to preserve existing flood attenuation by implementing land management strategies was ranked third in recognition of the importance flood attenuation plays in the Pajaro River Risk Reduction Project, as well as mitigating some development impacts. Developing approaches for adaptive management was ranked fourth since this objective works to maintain the flood protection properties of implemented projects; maintaining the benefits of implemented projects prevents the need for additional projects. The flood protection aspects are of greater importance than providing additional community benefits, which was ranked fifth.

3.2.4 Environmental Protection and Enhancement Prioritization

The environmental protection and enhancement goal, which is ranked fourth, represents the RWMG's commitment to look for opportunities to incorporate environmental elements into water management projects. Of the four objectives under this goal, the two which speak to protection of environmental resources throughout the watershed are ranked first and second. The objective to identify opportunities to enhance the local environment and protect, enhance and/or restore natural resources reflects the desire of the RWMG and their stakeholders to provide environmental benefits throughout the watershed, and this objective was given the highest priority among the environmental objectives. In some cases, enhancement and restoration will not be possible, and the best that can be done is protection through minimization of adverse effects; the objective covering this situation was given second highest priority. Protection of the Monterey Bay National Marine Sanctuary marine life specifically was ranked third after the general protection of natural resources throughout the watershed. Finally, identifying opportunities for recreational

elements was ranked fourth out of the four objectives. The RWMG would like to create opportunities for open spaces, trails, parks and other recreational projects but this work is considered secondary to the objectives that work towards preserving habitats and biological resources.

3.3 Objective Measures

Table 3-1 identifies measures that the region will use to assess whether the IRWM Plan objectives are being achieved. For objectives with multiple measures, not all measures will necessarily be used. Additional measures may be identified and added to this table during IRWM Plan implementation.

Table 3-1: Objective Measures

Goals and Objectives	Measure(s)
Water Supply Goal – Protect and improve regional water supply reliability, protect groundwater resources from overdraft, reduce dependence on imported water, and protect watershed communities from drought, now and in a changed climate	
1. Meet 100% of M&I and agricultural demands (both current and future conditions) in wet to dry years including the first year of a drought.	• Current and projected annual acre-feet of total supply by water year type
2. Meet 85% of M&I and 75% agricultural demands (both current and future conditions) in second and subsequent years of drought.	• Current and projected annual acre-feet of total supply by water year type • Percent of drought-resilient supply
3. Identify and address water supply needs of disadvantaged communities in the Pajaro River Watershed	• Reliability of disadvantaged community supplies
4. Implement water conservation programs to reduce M&I and agricultural water use consistent with SBx7-7 and CVPIA	• Estimated annual water conservation savings • Estimated annual stormwater capture and onsite reuse
5. Maximize the use of recycled water during the irrigation season and expand other uses of recycled water	• Annual recycled water use
6. Optimize the use of groundwater and aquifer storage	• Sustainable yields • Operational storage
7. Maximize conjunctive use opportunities including interagency conjunctive use	• Groundwater levels
8. Optimize and sustain the use of existing import surface water entitlements from the San Felipe Unit	• Long-term average CVP deliveries
9. Maximize the beneficial use of existing local water supplies while protecting existing surface water rights	• Long-term average local surface water use
Water Quality Goal – Protect and improve water quality for beneficial uses consistent with regional community interests and the RWQCB basin plan objectives through planning and implementation in cooperation with local and state agencies and regional stakeholders	
1. Meet or exceed all applicable groundwater, surface water, wastewater, and recycled water regulatory standards	• Concentrations of constituents of concern (i.e., nitrate, chloride, pathogens, turbidity, toxins, etc)

2. Identify and address the drinking water quality of disadvantaged communities in the Pajaro River Watershed	● Drinking water quality exceedance standards
3. Protect groundwater resources from contamination including salts, seawater intrusion, and nutrients	● Effectiveness of groundwater protection programs ● Acres of protected recharge areas ● Cleanup and abatement of groundwater contamination plumes ● Implementation of Salt and Nutrient Management Plans ● Extent of seawater intrusion
4. Address impacts from surface water runoff through implementation of Best Management Practices or other surface water management strategies	● Acre-feet of stormwater capture ● Number of LID projects ● Acreage managed with approved Best Management Practice (BMP) techniques.
5. Meet or exceed delivered water quality targets established by recycled water users	● Concentrations of salts in recycled water
Flood Management Goal – Ensure flood management strategies are developed and implemented through a collaborative and watershed-wide approach and are designed to maximize opportunities for comprehensive management of water resources and adapt to climate change	
1. Implement flood management strategies throughout the watershed hat provide multiple benefits	● Level of flood protection ● Effectiveness of flood risk reduction programs
2. Reach consensus on the Pajaro River Risk Reduction Project necessary to protect existing urban areas and infrastructure from flooding and erosion the 100-year event and to maximize opportunities to protect agricultural land uses	● Level of community and agency support ● Acreage of coastal areas restored to reduce flood extent
3. Work with stakeholders to preserve existing flood attenuation by implementing land management and conservation strategies throughout the watershed	● Acres of floodplain preserved
4. Develop approaches for adaptive management to minimize maintenance requirements and protect quality and availability of water while preserving ecologic and stream functions, and enhancing when appropriate	● Sediment load ● Invasive species
5. Provide community benefits beyond flood protection such as public access, open space, recreation, agriculture preservation and economic development	● Level of additional recreational opportunities ● Number of agricultural acres preserved ● Per capita income ● Value of agricultural production

Environmental Protection and Enhancement Goal – Preserve the environmental wealth and well-being of the Pajaro River watershed by identifying opportunities to sustain, restore, and enhance natural resources of stream, watersheds, wetlands, and the Monterey Bay when developing and implementing water management strategies.	
1. Address opportunities to enhance the local environment and protect and/or restore natural resources, in cooperation with landowners, when developing water management strategies	● Number of fish passage barriers ● Miles of streams restored and/or rehabilitated ● Acres of wetlands protected and/or restored ● Acres of riparian buffers ● Amount of carbon sequestered
2. Improve biological and cultural resources, including riparian habitats, habitats supporting sensitive plant or animal species and archaeological/historic sites when implementing strategies and projects	● Sensitive species occurrence ● Stream flow ● Sediment loading ● Acres of culturally valuable area and/or resource acquired or preserved through conservation easements or other means
3. Address opportunities to protect, enhance, or restore habitat to support Monterey Bay National Marine Sanctuary marine life in conjunction with water management strategies	● Sediment loading ● Progress toward meeting Total Maximum Daily Loads (TMDLs)
4. Address opportunities for open spaces, trails, parks along creeks or other recreational projects in the watershed that can be incorporated with water management strategies, consistent with public use and property rights	● Level of additional recreational opportunities ● Miles of trails ● Acres of parklands and/or access ● Number of amenities ● Number of visitor days ● Miles of upgrades to trails ● Acres of upgrades to parklands

4 Resource Management Strategies

This chapter meets the following IRWM Plan Standard from the 2016 IRWM Program Guidelines (DWR, 2016).

> **Resource Management Strategies** – The IRWM Plan must document the range of resource management strategies (RMS) considered to meet the IRWM objectives and identify which RMS were incorporated in the IRWM Plan. The effects of climate change on the IRWM region must factor into consideration of the RMS. RMS to be considered must at least include the RMS listed in Table [4-1] below and discussed in detailed in Volume 3 of the CWP Update 2013.
>
> The IRWM Plan must use vulnerability assessments and tools such as those provided in the Climate Change Handbook to identify and implement RMS and adaptation strategies that address region-specific climate change impacts, including:
>
> - Demonstrate how the effects of climate change on its region are factored into its RMS.
> - Reducing energy consumption, especially the energy embedded in water use, and ultimately reducing GHG emissions.
> - An evaluation of RMS and other adaptation strategies and ability of such strategies to eliminate or minimize those vulnerabilities, especially those impacting water infrastructure systems.

The Regional Water Management Group (RWMG) considered the resource management strategies (RMS) described in Volume 3 of the California Water Plan Update 2013 (CWP) and listed in Table 4-1, The 32 RMS in the CWP are a diverse set of projects, programs, and policies that can help regions meet their objectives and help mitigate and adapt to climate change. These strategies can be mixed and matched to provide multiple water and resource benefits, diversify the local water portfolio, and help the Region become more self-sufficient. The RMS and the RWMG's evaluation of how they can help achieve the region's goals and objectives are described in this chapter.

Table 4-1: Resource Management Strategies from CWP Updates 2009 and 2013

Reduce Water Demand	
• Agricultural Water Use Efficiency	• Urban Water Use Efficiency
Improve Operational Efficiency and Transfers of Water	
• Conveyance – Delta • Conveyance – Regional/Local	• System Reoperation • Water Transfers
Increase Water Supply	
• Conjunctive Management & Groundwater Storage • Desalination • Precipitation Enhancement	• Recycled Municipal Water • Surface Storage – CALFED • Surface Storage – Regional/Local
Improve Water Quality	
• Drinking Water Treatment and Distribution • Groundwater/Aquifer Remediation • Matching Quality to Use	• Pollution Prevention • Salt and Salinity Management • Urban Runoff Management
Practice Resource Stewardship	
• Agricultural Lands Stewardship • Economic Incentives • Ecosystem Restoration • Forest Management	• Land Use Planning and Management • Recharge Area Protection • Water-Dependent Recreation • Watershed Management • Sediment Management
Improve Flood Management	
• Flood Risk Management	
Other Strategies	
• Crop Idling for Water Transfers • Dewvaporation • Fog Collection • Irrigated Land Retirement	• Rainfed Agriculture • Waterbag Transport/Storage Technology • Outreach and Education • Water and Culture

4.1 Agricultural Water Use Efficiency

Agricultural water use efficiency can achieve reductions in the amount of water used for agricultural irrigation. Strategies recommended by the CWP to achieve agricultural water savings and benefits include:

- improving irrigation system technology and management of water, both on-farm and at the district level to minimize water losses;
- adjusting irrigation schedules to decrease the amount of water applied;
- installing remote monitoring and/or improving water management and controls; and
- developing community educational conservation activities to foster water use efficiency.

This strategy could increase the Pajaro region's water savings by decreasing demands, improve water quality by reducing surface runoff of irrigation water, provide environmental benefits, and reduce energy usage by reducing water demand. This RMS supports the region's water supply, water quality, and environmental goals and is incorporated into the IRWM Plan.

4.2 Urban Water Use Efficiency

Urban water use efficiency strategies can assist in managing increasing water needs of growing populations in the region. Urban water use efficiency strategies can reduce water demand through technological and behavioral improvements by decreasing indoor and outdoor residential, commercial, institutional, and industrial water use. Approaches recommended by the CWP to increase urban water use efficiency include:

- implementing programs such as Best Management Practices (BMPs);
- installing water efficient landscapes;
- encouraging gray water and rain water capture to increase water conservation and improve water quality;
- increasing public outreach and encouraging community involvement; and
- funding incentive programs for small districts and economically DACs.

Potential benefits of urban water use efficiency include drought preparedness, reduced demands, reduced runoff from landscapes, and reduced energy use. This RMS supports the region's water supply, water quality, and environmental goals and is incorporated into the IRWM Plan.

4.3 Crop Idling for Water Transfers

Crop idling is the removal of lands from irrigation with the aim of returning the lands to irrigation at some latter time and is done to make water available for transfer. Agriculture is the foundation of the Pajaro River Watershed's society and economy and crop idling could have significant socioeconomic impacts. Further, there are limited water transfer opportunities within the Pajaro River Watershed. This RMS has been screened from further evaluation.

4.4 Irrigated Land Retirement

Irrigated land retirement involves removing farmland from active use to increase water availability for other uses. Agricultural is a significant land use in the Pajaro River Watershed and retiring land from agriculture would significantly change the socioeconomics of the region. As such, this RMS has been screened from further evaluation.

4.5 Conveyance – Delta

"Conveyance provides for the movement of water. Conveyance infrastructure includes natural watercourses as well as constructed facilities. Conveyance through the Delta, located at the confluence of the Sacramento and San Joaquin rivers, includes interconnected natural streams, and constructed canals. Delta conveyance moves water westward from the upstream water drainage basins to the bays connected to the Pacific Ocean. Conveyance in the Delta also supports in-Delta diversions and SWP and CVP exports from pumps at the south end of the Delta. Regulatory actions to protect threatened and endangered fish species limited through-Delta conveyance and have made water supplies increasingly variable. Sea level rise and other results of climate change will increase threats to species and water supply reliability. California WaterFix would be a new conveyance system that will route water through two tunnels from north of the Delta to the SWP and CVP pumps, with the intention of providing a more reliable supply of water while maintaining flows for species of concern.

The Pajaro River Watershed depends on conveyance through the Delta for its Central Valley Project (CVP) supplies. The potential benefits of Delta conveyance to the Pajaro River Watershed include

maintaining or increasing water supply reliability, protecting water quality, and providing operational flexibility. This RMS supports the region's water supply and water quality goals and is incorporated into the IRWM Plan.

4.6 Conveyance – Regional/Local

The region's CVP supplies are conveyed from the Delta in the Delta-Mendota Canal to San Luis Reservoir and then through Pacheco Pumping Plant and Conduit to the Santa Clara and Hollister Conduits for local use. Imported and locally developed water is conveyed to recharge facilities, treatment plants, and end users. Regional/local conveyance strategies can include improving aging infrastructure, increasing existing capacities, constructing alternative conveyance and system interties, and and/or constructing new conveyance facilities.

The potential benefits of regional/local conveyance include maintaining and increasing water supply reliability for the urban, agricultural and environmental water-use sectors; protecting water quality; augmenting current water supplies; operational flexibility; conjunctive management; and flood management. This RMS supports the region's water supply, water quality, flood management, and environmental goals and is incorporated into the IRWM Plan.

4.7 System Reoperation

System reoperation means changing existing operation and management procedures for existing reservoirs and conveyance facilities to increase water related benefits from these facilities. System reoperation may address specific needs (e.g., cold water releases), improve efficiency and water supply reliability (e.g., carrying over supplies from one year to the next), and/or anticipate future conditions (e.g., runoff patterns resulting from climate change). Reoperation is generally regarded as an alternative to construction of major new water facilities, but physical modifications to existing facilities may be needed in some cases to expand the reoperation capability.

Some of the potential benefits of system reoperation strategies include increased water supply reliability, flood management, environmental water enhancement, and water quality management. This RMS supports all of the region's goals – water supply, water quality, flood management, and environmental protection and enhancement – and is incorporated into the IRWM Plan.

4.8 Water Transfers

Water transfers are a voluntary change in the way water is distributed among water users. California Water Codes defines a water transfer as a temporary or long-term change in the point of diversion, place of use, or purpose of use due to transfer or exchange of water or water rights. Water is generally made available for transfers by transferring water from storage, pumping groundwater in lieu of using surface water and transferring the surface water rights, transferring banked groundwater, and reducing water use in one area to make water available to another area, and reducing irrecoverable losses. Water transfers are often linked with system reoperation, storage, conjunctive management, conveyance, water quality, and/or crop idling.

Potential benefits of water transfers include additional water supplies during droughts, operational flexibility, and compensation that can fund beneficial projects/activities. This RMS supports the region's water supply goal and is incorporated into the IRWM Plan.

4.9 Flood Risk Management

The Pajaro has a history of significant flood impacts. Flood risk management is intended to enhance flood protection and includes projects and programs that assist individuals and communities manage flood flows

and to prepare for, respond to, and recover from a flood. This strategy is part of a comprehensive approach that considers land and water resources on a watershed scale and employees both structural and non-structural measures to address flood risks. Several flood risk management strategies identified by the CWP include:

- Setting back levees
- High flow diversions into adjacent lands to temporarily store flows
- Maintaining facilities to secure the long-term preservation of flood management facilities
- Floodplain function restoration to preserve and/or restore the natural ability of undeveloped floodplains to absorb, hold, and release floodwaters
- Floodplain regulation
- Development and redevelopment policies
- Housing and building codes
- Disaster Preparedness, Response, and Recovery for flood risk management.

The benefits of flood risk management include improved drought preparedness, improved water quality, reduced flood impacts, environmental benefits, energy benefits, and reduced groundwater overdraft. This RMS supports all of the region's goals – water supply, water quality, flood management, and environmental protection and enhancement – and is incorporated into the IRWM Plan.

4.10 Agricultural Lands Stewardship

Agricultural lands stewardship involves conserving and improving land for conservation purposes as well as protecting open spaces and rural communities. This can assist in protecting environmentally sensitive lands, recharging groundwater, improving water quality, providing water for wetland protection and restoration, and increasing carbon sequestration within soil. Agricultural land stewardship strategies include:

- stabilizing streambanks to slow bank erosion and filter drainage water from the fields;
- installing windbreaks (i.e. trees and/or shrubs) along field boundaries to help control soil erosion, conserve soil moisture, improve crop protection among many other benefits;
- performing conservation tillage to increase water infiltration and soil water conservation and reduce erosion and water runoff;
- encouraging irrigation tailwater recovery to help capture and reuse irrigation runoff water to benefit water conservation and off-site water quality; and
- encouraging stormwater capture infrastructure on agricultural lands to provide groundwater recharge, such as Flood-Managed Aquifer Recharge (Flood-MAR).

The benefits of agricultural lands stewardship include improved drought preparedness, improved water quality, operational flexibility and efficiency, reduced flood impacts, environmental benefits, energy benefits, recreational opportunities, and reduced groundwater overdraft. This RMS supports all of the region's goals – water supply, water quality, flood management, and environmental protection and enhancement – and is incorporated into the IRWM Plan.

4.11 Economic Incentives (Loans, Grants and Water Pricing)

Economic incentives including low interest loans, grants, and water rates and rate structures can influence water management, amount of water use, time of use, wastewater volume, and source of supply. Several urban runoff management strategies identified by the CWP include:

- instituting loans and grant programs that support better regional water management;
- adopting policies that promote long-run water use efficiency;
- developing modeling tools for economic analyses of economic incentives as well as guidelines and ranking criteria for grant and loan awards; and
- exploring innovative financial incentives.

Economic incentives can help to improve drought preparedness, improve water quality, provide operational flexibility and efficiency, provide environmental benefits, and reduce groundwater overdraft. This RMS supports the region's water supply, water quality, and environmental protection and enhancement goals and is incorporated into the IRWM Plan.

4.12 Ecosystem Restoration

Ecosystem restoration strategies are key to enhancing the region's rich natural resources. Ecosystem restoration strategies identified by the CWP include:

- increasing the use of setback levees and floodwater bypasses;
- creating programs that support and funds the identification of stream flow needs;
- establishing biological reserve areas that connect or reconnect habitat patches;
- expanding riparian habitat;
- devising climate change adaptation plans that benefit ecosystems, water, and flood management;
- reproducing natural flows in streams and rivers;
- controlling non-native invasive plant and animal species; and
- filtering of pollutants and recharging aquifers.

Potential benefits of ecosystem restoration include improved drought preparedness, improved water quality, operational flexibility and efficiency, reduced flood impacts, ecosystem benefits, and reduced groundwater overdraft. This RMS supports all of the region's goals – water supply, water quality, flood management, and environmental protection and enhancement – and is incorporated into the IRWM Plan.

4.13 Forest Management

Forest management strategies focus on improving the availability and quality of water for downstream users on both publicly and privately owned forest lands. Forest management strategies identified by the CWP include:

- establishing long-term monitoring to understand hydrologic changes resulting from possible climate change effects through the installation of stream gages, precipitation stations, water-quality and sediment monitoring stations, and long-term monitoring wells;

- increasing research efforts into identifying effective BMPs for forest management and the effects of wildfires;
- assessing sediment sources and erosion processes in managed and unmanaged forested watersheds;
- increasing multi-party coordination of forest management;
- improving communication between downstream and upstream water users; and
- developing public education campaigns for water users.

Potential benefits of forest management strategies include interception of rainfall, reduction of urban runoff, increased energy-efficient shade during hot weather, reduced flooding and increased dry-season base flows, and protection from surface erosion and filtering pollutants. This RMS supports all of the region's goals – water supply, water quality, flood management, and environmental protection and enhancement – and is incorporated into the IRWM Plan.

4.14 Recharge Area Protection

Recharge area protection protects recharge areas from pollution, which protects and maintains the water quality of groundwater supplies. In additional, recharge area protection that incorporates flood plain management can help manage flood impacts. Several recharge area protection strategies identified by the CWP include:

- expanding research into surface spreading and the fate of chemicals and microbes in recharge water;
- increasing funding for the identification and protection of recharge areas;
- creating education and media campaigns to increase public awareness and knowledge on the importance of recharge areas and relevancy to groundwater;
- requiring source water protection plans; and
- developing methods for analyzing the economic benefits and costs of recharge areas.

Recharge area protection improves drought preparedness, improves water quality, provide operational flexibility and efficiency, reduces flood impacts, and reduces groundwater overdraft. This RMS supports the region's water supply, water quality, and flood management goals and is incorporated into the IRWM Plan.

4.15 Sediment Management

Sediment, like fresh water, is limited in supply and is a valuable natural resource. However, it can be both desirable and unwanted depending on the quantity, location, and type. Sediment contributes to many positive purposes including renewal of wetlands, streams, and coastal habitats; maintaining and restoring good quality native riparian vegetation; fertile farmland; levee maintenance; construction; and beach restoration. However, excess fine-grained sediments cloud water, degrade wildlife, reduce storage capacity in reservoirs, and reduce the hydraulic capacity of stream and flood channels. In addition, toxic pollutants may be absorbed onto sediments and affect aquatic life, bioaccumulate, and impair beneficial uses of water bodies. Sediment management is achieved through source management, sediment transport management, sediment deposition management.

The benefits of sediment management include reduced flood risk, improved habitat for aquatic species, improved water quality, increased reservoir storage capacity, and improved access to shorelines. This

RMS supports all of the region's goals – water supply, water quality, flood management, and environmental protection and enhancement – and is incorporated into the IRWM Plan.

4.16 Outreach and Education

Outreach and education increases awareness, influences behavior, builds support, and affects public and stakeholder actions related to water management. Outreach and education efforts may range from providing information and educating to empowering people to make decisions. The benefits of outreach and education include more informed decision making, improved relationships, increased support for water management projects and programs, and increased participation in water management activities. Outreach and education is integral to all water management strategies. In other words, the potential benefits of other water management strategies cannot be fully achieved without outreach and education. For example, most water use efficiency measures are implemented by water users, so outreach and education to those users is a necessary component of the strategy. This RMS supports all of the region's goals – water supply, water quality, flood management, and environmental protection and enhancement – and is incorporated into the IRWM Plan.

4.17 Conjunctive Management and Groundwater Storage

Conjunctive management refers to the coordinated and planned use and management of both surface water and groundwater resources to maximize the availability and reliability of water supplies in a region to meet various management objectives. Groundwater is stored in the groundwater basin for later use and surface water is used to recharge the basin when excess water supply is available. Water is put into the groundwater by direct (e.g., use of recharge ponds, stormwater capture and recharge) and in-lieu recharge (e.g., use of surface water or recycled water in-lieu of groundwater).

Potential benefits of conjunctive management are improved water supply reliability and drought protection, reduced groundwater overdraft and land subsidence, protection from salt water intrusion, water quality protection and improvement, improved flood management, and improved environmental conditions. This RMS supports all the region's goals – water supply, water quality, flood management, and environmental protection and enhancement – and is incorporated into the IRWM Plan.

4.18 Desalination

According to the CWP, "Desalination comprises various water treatment processes for the removal of salt from water for beneficial use. Desalination is used to treat seawater as well as brackish water (water with a salinity that exceeds normally acceptable standards for municipal, domestic, and irrigation uses, but less than that of seawater). Desalination technologies are also used to treat polluted and impaired waters and as an advanced treatment of wastewater to produce high quality recycled water. In California, the principal method for desalination is reverse osmosis (RO). This process can be used to remove salt as well as specific contaminants in water such as trihalomethane precursors, volatile organic carbons, nitrates and pathogens."

Potential benefits of desalination include increased water supply, increased supply reliability during droughts, reduced reliance on imported sources, diversification of water supply sources and increased operational flexibility, improved potable water quality, and increased recycled water use. This RMS supports the region's water supply and water quality goals and is incorporated into the IRWM Plan.

4.19 Precipitation Enhancement

Precipitation enhancement artificially stimulates clouds to produce more rainfall or snowfall than would naturally occur, increasing water supply. According to the CWP, precipitation enhancement (or cloud seeding) should not be viewed as a remedy for drought as opportunities are generally fewer in dry years. It works better in combination with surface or groundwater storage to increase average supplies. In the very wet years, when sponsors already have enough water, cloud seeding operations are usually suspended. The Santa Clara Valley Water District investigated cloud seeding from 1955 to 1965 and observed positive results on rainfall during some types of rainfall events. However, additional investigation is needed into the efficacy and precision of cloud seeding in the watershed, especially under current environmental conditions, as well as an analysis of potential adverse impacts.

Although cloud seeding has the potential to increase rainfall and water supply for the region, it is still evolving as a water management strategy in California and its utility for the Pajaro River Watershed is unclear. This RMS is not incorporated into the IRWM Plan.

4.20 Recycled Municipal Water

Recycled municipal water originates as wastewater from municipal treated plants, is treated to a level suitable for beneficial use. Non-potable recycled water uses include irrigation, industrial applications, and toilet flushing. Advanced water treatment technologies can produce recycled water that is suitable for potable reuse, either indirectly through groundwater recharge or injection or through reservoir augmentation, or directly without going through groundwater or surface water body.

Potential benefits of water recycling are a drought-resistant local water source that off-sets potable water use, reduced wastewater discharges with benefits to water quality and the environment, reduced reliance on the Delta, and reduced greenhouse gas emissions. This RMS supports the region's water supply, water quality, and environmental goals and is incorporated into the IRWM Plan.

4.21 Surface Storage – CALFED

CALFED surface storage includes five potential surface water reservoirs or reservoir expansion projects. The projects are being investigated by the U.S. Bureau of Reclamation, the California Department of Water Resources, and local water interests. The five projects are spread out across the state and include north-of-Delta, in-Delta, and south-of-Delta storage options. These projects are to be designed to provide multiple benefits, including environmental and water quality benefits. The Santa Clara Valley Water District is a partner in the planning for the Los Vaqueros Reservoir Expansion and the new Sites Reservoir.

The potential benefits of CALFED surface storage in the Pajaro River Watershed are improved water supply reliability, water quality, and operational flexibility. This RMS supports the region's water supply and water quality goals and is incorporated into the IRWM Plan.

4.22 Surface Storage – Regional/Local

This RMS focuses on regional and local surface storage alternatives to expand surface storage capacity to collect water for later release and use. Surface storage can play an role in managing natural hydrologic variations, especially when combined with other RMS such as water transfers and conjunctive management. Additional surface storage capacity can be developed by constructing new dams and by enlarging, reoperating, or modifying existing reservoirs and their outlet structures. The Santa Clara Valley Water District and the San Benito County Water District are investigating the benefits of building a new 140,000 acre-foot reservoir on North Fork Pacheco Creek.

Benefits of expanding regional/local surface storage include improved flood management, ecosystem management, water quality management, hydroelectric power generation, emergency water supply,

recreation, capture of surface water runoff for water supply augmentation, and water supply reliability. This RMS supports all of the region's goals – water supply, water quality, flood management, and environmental protection and enhancement – and is incorporated into the IRWM Plan.

4.23 Drinking Water Treatment and Distribution

Providing a reliable supply of safe drinking water is critical to public health and safety. To meet or exceed drinking water standard, public water supplies must develop and maintain adequate water treatment and distribution facilities and protect the quality of their source waters. Most groundwater wells used for drinking water are constructed in such a manner that they capture only high quality water that does not require treatment to remove contaminants. Surface water supplies in the region do require treatment to meeting drinking water standards. Distribution systems must be operated to maintain water quality as supplies are distributed to customers. Securing funding to maintain and operate drinking water facilities can be challenging, especially for small and disadvantaged communities.

Potential benefits of this RMS are a safe supply of drinking water. This RMS supports the region's water quality goal and is incorporated into the IRWM Plan.

4.24 Groundwater and Aquifer Remediation

Contaminant concentrations above drinking water standards have been detected in portions of aquifers in the Pajaro River Watershed. In some cases, groundwater contains levels of natural constituents such as hexavalent chromium or manganese that do not support beneficial uses. In other cases, groundwater has been contaminated by human activities resulting in concentrations of contaminants such as nitrate and perchlorate above drinking water standards. Passive groundwater remediation allows contaminants to biologically or chemically degrade or disperse in situ over time. Active groundwater remediation can involve pumping the groundwater and treating it or injecting chemicals into the contamination plume to treat the contamination. Sometimes groundwater is treated at the wellhead and used directly for potable, irrigation, or industrial uses.

Potential benefits of groundwater and aquifer remediation are additional water supply that would otherwise not be available and use of a remediated aquifer for conjunctive management. This RMS supports the region's water supply and water quality goals and is incorporated into the IRWM Plan.

4.25 Land Use Planning and Management

More efficient and effective land use patterns promote integrated regional water management. As the California Water Plan 2009 explains, integrated land use and water management consists of planning for the development needs of a growing population while providing for the efficient use of water, water quality, energy, and other resources. Land use decisions affect water supply and quality, flood management, and other water issues. Compact and sustainable development, often referred to as low-impact development (LID), can help manage the impacts of development on water resources and help communities adapt to impacts of climate change. In addition, land use planning that minimizes stormwater runoff and maximizing stormwater capture and recharge will help improve water quality, reduce flooding, and increase water supply.

Land use planning and management can improvement drought preparedness, improve water quality reduce flood impacts, provide ecosystem benefits, provide energy benefits, and provide recreational benefits. This RMS supports all the region's goals – water supply, water quality, flood management, and environmental protection and enhancement – and is incorporated into the IRWM Plan.

4.26 Matching Quality to Use

Not all water uses require the same quality of water, so a common measure of water quality is its suitability for its intended use. In other words, a water quality constituent is only a contaminant if it adversely affects the intended use of the water. High quality water sources can be used for drinking water and industrial purposes because these uses benefit from higher quality water. Recycled water can be treated to a wide range of purities that can be matched to different uses and offset the use potable supplies. Stormwater and treated wastewater could be used to augment streamflows to improve aquatic ecosystems and provide recreational opportunities, if they are of appropriate quality. Matching water quality to water use is important because several water uses do not require water treatment or do not need to be treated for potable uses.

Potential benefits of matching water quality to use include improved drinking water quality, reduced costs for treatment or replacing damaged fixtures, instream and ecosystem benefits, opportunities for blending sources, improved water supply reliability, and reduced greenhouse gas emissions. This RMS supports the region's water supply, water quality, and environmental goals and is incorporated into the IRWM Plan.

4.27 Pollution Prevention

Pollution prevention assists in maintaining and improving source water quality. Climate change may increase the amount of pollutants entering source water because the severe droughts allow pollutants to build up in soils and the large floods can more effectively transport sediments into creeks. Pollution prevention activities can include:

- developing proper land management practices that prevent sediment and pollutants from entering source waters;
- establishing drinking water source and wellhead protection programs to protect drinking water sources and groundwater recharge areas from contamination;
- identifying communities relying on groundwater contaminated by anthropogenic sources for drinking water and take appropriate regulatory action; and
- addressing improperly destroyed, sealed and abandoned wells that can serve as potential pathways for groundwater contaminants.

Potential benefits of pollution prevention include reduced water treatment requirements, enhanced habitat and natural resource conditions, protecting water quality for recreation activities, greenhouse gas reduction through better land management practices, and improved water supply reliability resulting from decreased water quality variability. This RMS supports the region's water supply, water quality, climate change, and environmental goals and is incorporated into the IRWM Plan.

4.28 Salt and Salinity Management

Salt is present to some degree in all natural water supplies because soluble salts in rocks and soil begin to dissolve as soon as water reaches them. Salts are added to soil or water as fertilizers or soil amendments, or to assist in some industrial, domestic, or other process such as food processing or water softening. Salts can also enter the Pajaro River Watershed as a result of groundwater overdraft, which can result in saltwater intrusion in coastal aquifers. Climate change and the predicted sea level rise will worsen this problem. In addition, as water is consumed through use for irrigation, domestic, or municipal and industrial supply, most of the salt load remains behind. Salt can also enter the watershed via the importation of water supplies. Salt and salinity management includes over-irrigating to flush salts out of the root zone, dilution with lower salinity water, treatment to remove salts from water supplies, and brine management and disposal.

The benefits of salt management include improved water quality, operational flexibility and efficiency, environmental benefits, and energy savings. This RMS supports the region's water supply, water quality, and environmental goals and is incorporated into the IRWM Plan.

4.29 Urban Runoff Management

Urban runoff management strategies seek to manage both stormwater and dry weather runoff to minimize soil erosion and sedimentation problems, reduce surface water pollution, protect natural resources, protect and augment groundwater supplies, and improve flood protection. Climate change may increase flood severity in the watershed, so managing urban runoff would improve the region's ability to adapt to the effects of climate change. Urban runoff management strategies include:

- coordinating efforts with agencies, stakeholders, and the public to decide how urban runoff management should be integrated into work plans;
- encouraging public outreach and education concerning funding and implementation of urban runoff measures;
- designing recharge basins to minimize physical, chemical, or biological clogging;
- capturing and recharging stormwater on existing open space (i.e., Flood-MAR)
- working with communities to identify opportunities to address urban runoff management;
- providing incentives for the installation of low impact development features on new and existing developments; and
- emphasizing source control measures and strong public education/outreach efforts as being the most effective way to manage urban runoff in this highly arid region.

The benefits of Urban Runoff Management include improved water quality, operational flexibility, reduce flood impacts, environmental benefits, climate change adaptation, energy benefits, recreational opportunities, and reduced groundwater overdraft. This RMS supports all the region's goals – water supply, water quality, flood management, climate change, and environmental protection and enhancement – and is incorporated into the IRWM Plan.

4.30 Water-Dependent Recreation

This strategy provides for adequate access to water-related recreation activities. Water-dependent strategies identified by the *California Water Plan Update 2013* include:

- partnering with schools to provide drowning prevention programs primarily aiming at youth from urban and low income families;
- developing a procedure to incorporate climate change assessments within all infrastructure planning, budgeting, and project development;
- researching, identifying, and mitigating impacts of stream flows that prevent Native Americans from participating in their traditional cultural activities; and
- developing invasive species preventative measures.

Water-based recreation holds significant value to the residents and stakeholders in the Pajaro region. The benefits of water-based recreation include reduced flood impacts, environmental benefits, and recreational

opportunities. This RMS supports the region's flood protection and environmental protection and enhancement goals and is incorporated into the IRWM Plan.

4.31 Watershed Management

Watershed management involves coordinating and integrating the management of numerous physical, chemical, and biological processes at the watershed level to generate multiple benefits. Watershed management strategies identified by the *California Water Plan Update 2013* include:

- creating a scientifically valid tracking and reporting method to document changes in the watershed;
- assessing the performance of projects and programs;
- providing watershed information to better inform local land use decision makers on how to maintain and improve watershed functions; and
- using watershed approaches in which all RMS strategies are coordinated.

Watershed management has been - and will continue to be – an important framework for managing the water resources in the Pajaro River Watershed. This RMS improves regional drought preparedness, improves water quality, provides operational flexibility and efficiency, reduces flood impacts, provides environmental and energy benefits, provides recreational benefits, and reduces groundwater overdraft. For example, projects that capture and recharge stormwater on open space (i.e., Flood MAR) use watershed information to develop a watershed approach that provides benefits to water supply, water quality, and flood management. This RMS supports all the region's goals – water supply, water quality, flood management, and environmental protection and enhancement – and is incorporated into the IRWM Plan.

4.32 Water and Culture

The draft California Water Plan Update 2013 explains,

> "Water and culture are connected in a myriad of ways, with subtle and complex implications for water management in California. Some cultural relationships to water are so pervasive, they may be easy to overlook. Other cultural considerations are less apparent and may be difficult to recognize. Increasing the awareness of how cultural values, uses, and practices are affected by water management, and how these have an effect on water management…, will help inform policies and decisions."

Potential benefits of this RMS include using traditional knowledge to better sustain and integrate water management and better understanding perspectives that influence water management strategies. Like the Outreach and Education RMS, understanding how culture affects water management is integral to all water management strategies. This RMS supports all the region's goals – water supply, water quality, flood management, and environmental protection and enhancement – and is incorporated into the IRWM Plan.

4.33 Strategies Selected

Table 4-2 presents the selected RMS and how they contribute to meeting each of the IRWM Plan regional goals and objectives. The RMS can be integrated to form successful projects that fulfill multiple regional goals.

Table 4-2: Comparison of Goals, Objectives and RMS

Goals and Objectives / Resource Management Strategies	Water Supply									Water Quality					Flood Management					Environmental			
	Meet 100% of demands in normal years	Meet 85% M&I and 75% agriculture demands in drought years	Address DAC water supply needs	Imple-ment water conse-rvation	Maxim-ize recycled water	Optimize the use of ground-water and aquifer storage	Max-imize conj-unctive use	Optimize imported supplies	Maxi-mize local surface water supplies	Meet water quality stand-ards	Address DAC drink-ing water quality needs	Protect ground-water quality	Manage surface water quality	Meet recycled water targets	Imple-ment flood manag-ement	Conse-nsus on the Pajaro River Risk Reduct-ion project	Pres-erve flood atten-uation	Develop adaptive manage-ment	Provide comm-unity benefits	Enhance the local environ-ment	Improve resources	Protect Monterey Bay National Marine Sanctuary	Address opportunities for recreational projects
Agricultural Water Use Efficiency	X	X	X	X			X			X		X	X									X	
Urban Water Use Efficiency	X	X	X	X			X			X		X	X									X	
Conveyance-Delta	X	X					X	X															X
Conveyance – Regional/Local	X	X	X			X	X	X	X														
System Reoperation	X	X	X			X	X	X	X	X	X	X	X										
Water Transfers	X	X	X				X	X															
Conjunctive Management	X	X	X			X	X	X	X														
Desalination	X	X	X				X			X	X			X									
Recycled Municipal Water	X	X	X		X		X			X				X									
Surface Storage-CALFED	X	X						X		X													
Surface Storage – Regional/Local	X	X	X				X		X	X	X				X								X
Drinking Water Treatment and Distribution							X	X	X	X	X												

Goals and Objectives / Resource Management Strategies	Water Supply									Water Quality					Flood Management					Environmental			
	Meet 100% of demands in normal years	Meet 85% M&I and 75% agriculture demands in drought years	Address DAC water supply needs	Imple-ment water conse-rvation	Maxim-ize recycled water	Optimize the use of ground-water and aquifer storage	Max-imize conj-unctive use	Optimize imported supplies	Maxi-mize local surface water supplies	Meet water quality stand-ards	Address DAC drink-ing water quality needs	Protect ground-water quality	Manage surface water quality	Meet recycled water targets	Imple-ment flood manag-ement	Conse-nsus on the Pajaro River Risk Reduct-ion project	Pres-erve flood atten-uation	Develop adaptive manage-ment	Provide comm-unity benefits	Enhance the local environ-ment	Improve resources	Protect Monterey Bay National Marine Sanctuary	Address opportunities for recreational projects
Groundwater/ Aquifer Remediation	X	X	X			X	X			X	X												
Matching Quality to Use	X	X			X		X	X	X	X	X	X								X	X	X	
Pollution Prevention							X			X		X	X	X	X		X			X	X	X	X
Salt and Salinity Management	X	X	X		X	X	X	X		X	X	X		X						X	X		
Urban Runoff Management							X			X	X	X	X		X	X	X	X	X	X	X	X	
Agricultural Lands Stewardship	X	X	X	X		X	X			X	X	X	X		X	X	X		X	X	X	X	
Economic Incentives	X	X	X	X	X		X										X						
Ecosystem Restoration	X	X	X				X		X	X	X	X	X		X	X	X	X	X	X	X	X	
Forest Management	X	X	X			X			X	X	X		X		X		X		X		X		
Land Use Planning and Management	X	X	X	X	X					X	X	X	X		X	X	X	X	X	X	X	X	X
Recharge Area Protection	X	X	X		X	X	X			X	X				X	X	X		X	X	X	X	
Water-Dependent Recreation															X	X			X	X			X
Watershed Management	X	X	X			X	X		X	X	X	X	X		X	X	X		X	X	X	X	X
Sediment Management	X	X				X	X		X	X	X		X	X	X	X		X	X	X		X	X
Flood Risk Management	X	X	X				X		X						X	X	X	X	X				
Outreach and Education	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Water and Culture	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

4.34 Implementation of Resource Management Strategies to Adapt to and Mitigate Climate Change

Table 4-3 identifies whether each RMS included in the Pajaro River Watershed IRWM Plan may help mitigate climate change or help adapt to climate change impacts in accordance with Plan objectives..

Table 4-3: RMS Relation to Climate Change Mitigation and Adaptation

Resource Management Strategy	Adapts to or mitigates negative effects from changes in precipitation or surface runoff	Protects or reduces impacts of sea level rise (coastal flooding, salt water intrusion)	Reduces embedded energy consumption, increases renewable energy use and/or carbon sequestration	Adapts to or mitigates climate change-related increases in water demands
Reduce Water Demand				
Agricultural Water Use Efficiency	✓		✓	✓
Urban Water Use Efficiency	✓		✓	✓
Improve Operational Efficiency and Transfers				
Conveyance – Delta				
Conveyance — Regional / Local				
System Reoperation	✓			
Water Transfers	✓	✓		
Increase Water Supply				
Conjunctive Management and GW Storage	✓	✓		
Desalination	✓			
Recycled Municipal Water	✓			✓
Surface Storage – CALFED	✓			
Surface Storage — Regional/Local	✓	✓		
Improve Water Quality				
Drinking Water Treatment and Distribution				
Groundwater and Aquifer Remediation		✓		
Matching Water Quality to Use	✓		✓	✓
Pollution Prevention	✓			
Salt and Salinity Management		✓		
Urban Runoff Management	✓	✓		
Practice Resource Stewardship				
Agricultural Lands Stewardship	✓	✓	✓	✓
Ecosystem Restoration	✓	✓	✓	

Resource Management Strategy	Adapts to or mitigates negative effects from changes in precipitation or surface runoff	Protects or reduces impacts of sea level rise (coastal flooding, salt water intrusion)	Reduces embedded energy consumption, increases renewable energy use and/or carbon sequestration	Adapts to or mitigates climate change-related increases in water demands
Forest Management	✓	✓	✓	
Land Use Planning and Management	✓	✓	✓	✓
Recharge Areas Protection	✓	✓		
Sediment Management	✓		✓	
Watershed Management	✓	✓	✓	
Improve Flood Management				
Flood Risk Management	✓	✓		
People and Water				
Economic Incentives				✓
Outreach and Education				✓
Water and Culture				✓
Water-dependent Recreation				

5 Project Review Process and Integration

This chapter meets the following 2016 IRWM Plan Standards:

1) **Project Review Process** – The IRWM Plan must contain a process or processes to select projects for inclusion in the IRWM Plan. The selection process(es) must include the following components:

   - Procedures for submitting a project to the RWMG
   - Procedures for review of projects considered for inclusion into the IRWM Plan.
   - Procedures for displaying the list(s) of selected projects

   Review factors must be evaluated for each project and compared for all projects in a systematic manner. The results should be used to promote and prioritize projects in the selection process while keeping in consideration the unique goals and objectives of the IRWM region. Review factors must also consider climate change

2) **Integration –** An IRWM Plan must contain structures and processes that provide opportunities to develop and foster integration.

5.1 Background

The 2018 Pajaro River Watershed IRWM Plan project review process, which was approved by the Stakeholder Steering Committee (SSC), consists of a three-step process that includes the following:

- Step 1 – project sponsors submit projects to the RWMG using provided form (Appendix B)
- Step 2 – score project using the Pajaro River Watershed's scoring metrics (Table 5-2)
- Step 3 – develop high, medium and low project priorities

The RWMG simplified the project review process in this 2018 IRWM Plan by deleting Step 1 of the 2014 process where plan goals and objectives are prioritized using weighting factors. The goals and objectives are prioritized in Chapter 3 and the project review process includes scoring metrics that address the IRWM Plan Guidelines review factors (Table 5-1).

The RWMG also elaborated on the climate change review factors to include the following considerations consistent with the 2016 IRWM Plan Standards:

- Consider if adaptations to the water management system are necessary to adapt to the potential effects of climate change on the region
- Consider the contribution of the project to adapting to identified system vulnerabilities to climate change effects on the region
- Consider changes in the amount, intensity, timing, quality, and variability of runoff and recharge
- Consider the effects of sea level rise on water supply conditions and identify suitable adaptation measures
- Consider the contribution of the project in reducing GHG emissions as compared to project alternatives
- Consider a project's ability to help the IRWM region reduce GHG emissions as new projects are implemented over the 20-year planning horizon
- Reduce energy consumption, especially energy embedded in water use, and ultimately reducing GHG emissions

Other updates to the project review factors are:

- Simplification of the review factors related to integration and coordination;
- Replacement of the "Positive B/C Ratio" factor with a factor that considers cost effectiveness, which can be assessed in terms of water supply, water quality, and other physical benefits;
- Addition of a factor specific to reduce reliance on the Delta; and
- Addition of a factor about IRWM Plan adoption.

In addition to the changes to the project review process, the plan includes a documented process for submitting a project and displaying the list of selected projects.

5.2 Project Review Process: Submittal

To be considered for inclusion in the Pajaro River Watershed IRWM Plan, project sponsors are required to submit a completed Pajaro River Watershed IRWM Project Form (Appendix B). The form requires inputting project information that addresses the IRWM Program Guidelines review factors (listed in Table 5-1), basic project and sponsor information, and Pajaro River Watershed scoring metrics. To ensure a comprehensive list of projects, sponsors are encouraged to submit the form regardless of project status or readiness. All project forms are reviewed, regardless of completeness.

The RWMG issues calls for projects during IRWM Plan updates and reviews, as well as when grant funding applications are being considered. Projects are also welcome outside these processes. The Project Form is available at: and can be submitted to sgreene@valleywater.org. In addition, the RWMG emails the form to the stakeholder list along with calls for projects. The most recent call for projects was in March 2019.

Table 5-1: Comparison of 2016 Project Review Factors and the Pajaro River Watershed's scoring metrics

Category	DWR Review Factor	Pajaro River Watershed Scoring Metric
General Information	Whether project proponent has adopted or will adopt the IRWM plan	Has project sponsor adopted the IRWM plan or indicated their intent to do so?
Goals and Objectives	How the project contributes to IRWM Plan objectives	Which objectives does the project help accomplish?
	How the project or program will help reduce dependence on the Sacramento-San Joaquin Delta for water supply	Does the project include investment in water use efficiency, water recycling, advanced water technologies, and/or development of local supplies?
Integration	How the project is related to resource management strategies selected for use in the IRWM Plan	Which RMS does the project implement to help diversify the water management portfolio?
	Strategic considerations for IRWM Plan implementation	How can the project be integrated with other projects to leverage resources, increase benefits, and better achieve regional goals and objectives?
Social	Specific benefits to DAC water issues, including whether a project helps address critical water supply or water quality needs of a DAC	What is the level of benefits related to water supply or water quality needs of a DAC?
	Specific benefits to critical water issues for Native American Tribal communities	What is the level of benefits to critical water issues for Native American Tribal communities?
	Environmental Justice (EJ) considerations	How does the project address environmental justice considerations?
Financial/Economic	Project costs and financing	Can the project sponsor secure sufficient funding for matching and operations costs? How certain is the project sponsor's financing?
		How certain are the cost estimates?
	Technical feasibility of the project	Is there sufficient documentation that the project can achieve the claimed benefits?
	Economic feasibility, including water quality and water supply benefits and other expected benefits and costs	What is the magnitude of different benefits?
		How cost-effective is the project?
Climate Change	Contribution of the project in adapting to the effects of climate change in the region ● Include potential effects of climate change on the region and consider if adaptations to the water management system are necessary ● Consider the contribution of the project to adapting to identified system vulnerabilities to climate change effects on the region ● Consider changes in the amount, intensity, timing, quality, and variability of runoff and recharge ● Consider the effects of sea level rise on water supply conditions and identify suitable adaptation measures	Does the project consider effects of climate change and address one of the region's vulnerabilities?
		Does the project consider changes in the amount, intensity, timing, quality, and variability of runoff and recharge and address one or more of the expected hydrologic changes?
		Does the project consider the effects of sea level rise on water supply conditions and identify suitable adaptation measures?
	Contribution of the project in reducing GHG emissions as compared to project alternatives ● Consider the contribution of the project in reducing GHG emissions compared to project alternatives ● consider the project's ability to help the IRWM region reduce GHG emissions as new projects are implemented over the 20-year planning horizon ● Reduce energy consumption, especially the energy embedded in water use, and ultimately reducing GHG emissions	Is the project more energy efficient or does it reduce or avoid energy consumption or emissions, especially the energy embedded in water use, more than the project alternatives?
		Will this project continue to provide or increase GHG emissions reductions as new projects are implemented over the 20-year planning horizon?
		Will the project sequester carbon?
Readiness	Project status	Is the project feasibility study complete?
		Is the preliminary design complete?
		Is the CEQA/NEPA document complete or is the project exempt?
		Have all the necessary permits been secured?
		Are the plans & specs or appropriate contract documents complete?

5.3 Project Review Process: Prioritization

The second step of the project review process is for the RWMG to score the projects using the Pajaro River Watershed's scoring metrics (Table 5-2). The point scores are distributed among six categories, with a maximum score of 1000 points:

- Goals and Objectives: 500 points
- Integration: 150 points
- Social: 100 points
- Financial/Economic: 100 points
- Climate Change/Environmental: 100 points
- Readiness: 50 points

For each project, the RWMG reviews each project form for completeness. For incomplete forms, the RWMG reaches out to the project contact to request additional information. Once enough information is received or the RWMG determines that the additional information is unavailable, the RWMG scores each project based on the scoring metrics.

The Goals and Objectives category receives half of the possible points because of the importance of evaluating projects based on their ability to achieve the region's goals and objectives. The next greatest number of points is for Integration because it promotes projects that address multiple water resource management strategies and leverage other projects. Social, Financial/Economic, and Climate Change all receive equal points. Readiness receives the fewest points because the region decided that the potential benefits of a project is more important than its readiness. Different weights and additional metrics may be applied when selecting projects for funding applications.

The RWMG will send scores to project sponsors for review and comment once the initial scoring is complete. Based on project sponsor input, the RWMG may adjust project scores. The RWMG may also convene a committee to review project scores.

The final step in the project review process involves determining which projects are high, medium and low priorities. Project scores will be used to determine the project priorities. The high priority projects will be those that score above the 75th percentile. The medium priority projects will be those that score between the 25th percentile and the 75th percentile. The low priority projects will be those that score below the 25th percentile. The decision to categorize projects in this manner is driven by the desire to use the high priority designation to emphasize the most highly integrated, multi-objective projects that offer significant potential to meet the region's highest priority needs while satisfying the IRWM criteria.

While the project prioritization process will result in a ranking of projects and the designation of high, medium and low project priorities, it is important to note that these ranks and designations will not be equivalent to implementation priorities. All the projects, regardless of project priority, will be considered in the integration process.

5.4 Communicating Project List

The 2019 prioritized project list is included in Appendix C and posted at https://www.pajaroirwmp.org/s/ProjectList_6-20-19.pdf. The project list was also emailed to the stakeholder list in June 2019. The RWMG will periodically update the project list. Updated lists will be posted at and emailed to the stakeholder list.

Table 5-2: Weighting of the Goals and Objectives

Category	Pajaro IRWM Scoring Metric	Scoring	Maximum Score
General Information	Has project sponsor adopted the IRWM plan or indicated their intent to do so?	Yes: Project eligible	0
Goals and Objectives	Which objectives does the project help accomplish?	25 points per objective achieved, up to 400	500
	Does the project include investment in water use efficiency, water recycling, advanced water technologies, and/or development of local supplies?	High Level: 100 points Moderate Level: 50 points Low Level: 10 points	
Integration	Which RMS does the project implement to help diversify the water management portfolio?	10 points per RMS substantially implemented, up to 100 points	150
	How can the project be integrated with other projects to leverage resources, increase benefits, and better achieve regional goals and objectives?	● High integration potential: 50 points ● Moderate integration potential: 15 points ● Low integration potential: 0 points	
Social	What is the level of benefits related to water supply or water quality needs of a DAC?	● High: 40 points ● Moderate: 20 points ● Low: 5 points	100
	What is the level of benefits to critical water issues for Native American Tribal communities?	● High: 30 points ● Moderate: 15 points ● Low: 5 points	
	How does the project address environmental justice considerations?	● Substantially Addresses EJ: 30 points ● No Change: 0 points ● Worsens EJ: -50 points	
Financial/Economic	Can the project sponsor secure sufficient funding for matching and operations costs? How certain is the project sponsor's financing?	High certainty: 10 points	100
	How certain are the cost estimates?	High certainty: 10 points	
	Is there sufficient documentation that the project can achieve the claimed benefits?	● Yes: 10 points	
	What is the magnitude of different benefits?	● High certainty of significant benefits: 50 points ● Moderate certainty of significant benefits/high certainty of moderate benefits: 25 points ● Low certainty of significant benefits/moderate or high certainty of low benefits: 0 points	
	How cost-effective is the project?	Project is cost-effective: 20 points	
Climate Change	Does the project consider effects of climate change and address one of the region's vulnerabilities?	Yes: 35 points	100
	Does the project consider changes in the amount, intensity, timing, quality, and variability of runoff and recharge and address one or more of the expected hydrologic changes?	Yes: 30 points	
	Does the project consider the effects of sea level rise on water supply conditions and identify suitable adaptation measures?	Yes: 20 points	
	Is the project more energy efficient or does it reduce or avoid energy consumption or emissions, especially the energy embedded in water use, more than the project alternatives?	Yes: 5 points	
	Will this project continue to provide or increase GHG emissions reductions as new projects are implemented over the 20-year planning horizon?	Yes: 5 points	
	Will the project sequester carbon?	Yes: 5 points	
Readiness	Is the project feasibility study complete?	0 points	50
	Is the preliminary design complete?	0 points	
	Is the CEQA/NEPA document complete or is the project exempt?	0 points	
	Have all the necessary permits been secured?	0 points	
	Are the plans & specs or appropriate contract documents complete?	0 points	
		Maximum Score:	**1000**

5.5 Project Integration

To identify project integration opportunities and promote regional collaboration, the projects are compared to Resource Management Strategies (RMS; Table 5-3). There are watershed projects addressing each RMS category that is included in the Pajaro IRWM. Therefore, there are no project gaps from the March 2019 solicitation.

As shown, there are potential integration opportunities. For example, the water supply category has two watershed projects aimed at increasing groundwater recharge on agricultural lands. In addition, there are other projects that could increase water capture and recharge on open space, such as the Butterfield Basin Reactivation Project or the Agricultural Preserve Restoration Project.

Table 5-3: Project Categorization by Resource Management Strategy

Category	RMS	Projects
Reduce Water Demand	• Agricultural Water Use Efficiency • Urban Water Use Efficiency	• Regional Mobile Lab • Advanced Metering Infrastructure
Improve Operational Efficiency and Transfers of Water	• Conveyance – Delta • Conveyance – Regional/Local • System Reoperation • Water Transfers	• Gilroy Water Main Replacement • Crestwood Heights Water Distribution System Replacement • Pauline Pump Station Generator
Increase Water Supply	• Conjunctive Management & Groundwater Storage • Desalination • Recycled Municipal Water • Surface Storage – CALFED • Surface Storage – Regional/ Local	• Gilroy Water Master Plan • Stormwater Capture on Agricultural Lands • Gilroy Water Well • Butterfield Basin Activation • Multi-benefit Water Capture Project • Stormwater Recharge on Farms • Pacheco Reservoir Expansion
Improve Water Quality	• Drinking Water Treatment and Distribution • Groundwater/Aquifer Remediation • Matching Quality to Use • Pollution Prevention • Salt and Salinity Management • Urban Runoff Management	• Hexavalent Chromium Well Treatment • Freedom Sewer Manhole Rehabilitation • Gilroy Corporate Yard Stormwater Project • Residential Stormwater Management • Behler Road Sewer Replacement
Practice Resource Stewardship	• Agricultural Lands Stewardship • Economic Incentives • Ecosystem Restoration • Forest Management • Land-Use Planning and Management • Recharge Area Protection • Water-Dependent Recreation • Watershed Management	• College Lake Watershed Management • Pajaro River Agricultural Preserve Restoration • Lower Watsonville Slough Coastal Ecosystem Resiliency Project • Middle Struve Slough Project • Forest Health Management Program • Upper Pajaro River Uplands Conservation and Stewardship • Upper Struve Slough Project Upper Pajaro River Restoration • Pajaro River Watershed Habitat Restoration

Category	RMS	Projects
Improve Flood Management	• Flood Risk Management	• Pajaro River Stream Maintenance Program • Soap Lake Floodplain Preservation • Pajaro River Levee Embankment Stabilization • Pajaro River Flood Risk Reduction

6 Impacts and Benefits

This chapter meets the following IRWM Plan Standard from the Propositions 1 2016 IRWM Program Guidelines (DWR, 2016).

> **Impact and Benefit** – The IRWM Plan must contain a discussion of potential impacts and benefits of Plan implementation. This discussion must include both impacts and benefits within the IRWM region, between regions, and those directly affecting DAC, EJ related concerns, and Native American Tribal communities.

Benefits and impacts of the IRWM Plan implementation are linked to the mission, goals, and objectives established in Chapter 3; the resource management strategies included in Chapter 4, and the projects identified in Chapter 5. This chapter describes the potential impacts and benefits that could occur through implementation of projects included in the Pajaro IRWM Plan as well as through implementation of the Plan itself. More detailed analyses of project benefits and impacts will occur as projects near implementation. For example, project-specific environmental impacts are evaluated in California Environmental Quality Act (CEQA) and/or National Environmental Policy Act (NEPA) documents prior to project construction / implementation. The status of CEQA/NEPA review varies by project and was collected and recorded during the project review process. See Chapter 5 for further information on the project review process.

This IRWM Plan consists of a planning study and basic data compilation that would not result in the disturbance of any environmental resource. These activities are exempt from the California Environmental Quality Act (CEQA) pursuant to CEQA Guidelines §15262 and §15306. As such, programmatic environmental analysis under CEQA is not required. Furthermore, implementation of each short-term priority project included in the IRWM Plan will be the responsibility of the project sponsor and any applicable project partners. If implementing a project, project sponsors bear responsibility for ensuring all regulatory requirements for the project are met.

This chapter will be reviewed and updated as necessary as projects are added and/or removed from the IRWM Plan. Updates to the project list and associated impacts and benefits are an informal information update to the plan and, as such, do not require re-adoption.

6.1 Benefits of IRWM Plan Process

This chapter summarizes the benefits of the IRWM in relation to regional collaboration and coordination. Regional collaboration affords many benefits associated with economies of scale and sharing of knowledge. However, collaborative processes can be time consuming and require a significant level of consensus building. Planned interregional efforts (coordination with neighboring IRWM regions) are described with a cursory discussion of benefit and impact areas.

6.1.1 Advantages of Regional Planning

The advantages of planning and implementing the integrated programs of this IRWM Plan on a regional scale, rather than each project as an individual effort, include sharing of knowledge and expertise (such as sharing information, data, reports, studies, and management strategies), identification of possible overlap or duplicative efforts and their eventual consolidation, labor resource efficiency, cost sharing, better utilization of existing facilities, and collaboration. Additionally, implementing specific programs that integrate projects to collectively achieve IRWM Plan goals and objectives will ultimately be more beneficial to the watershed.

Regional planning is advantageous for issues that span the watershed and cross jurisdictional boundaries. IRWM provides a forum for sharing experience, insights, and knowledge among agencies within and across regions and funding areas and for developing solutions that can be effectively implemented at a regional scale.

There are many issues in the watershed that can only be effectively addressed through a coordinated regional planning approach. For example, an effective flood management solution for the Lower Pajaro River, where the flooding impacts occur, requires consideration of activities by multiple agencies in both the upper and lower portions of the river. The Pajaro River Flood Risk Reduction project assumes that the current flood attenuation benefits provided in the upper watershed are maintained. Without these upstream flood attenuation benefits, the levee project would have to be designed to accommodate an increased flow of 16,000 cubic feet second. The coordinated levee project with the upper watershed floodplain management project (Soap Lake Floodplain Preservation project) was determined to be the most cost-effective and beneficial approach to flood management in the Pajaro River Watershed through a coordinated regional planning approach.

Addressing water quality issues such as TMDLs involves concerted efforts to control point source and non-point source pollution by agencies, cities and counties. The Pajaro River crosses many jurisdictions and the source of the contaminants knows no agency boundary. Therefore, a collaboration of agencies is needed to address the water quality problems in the river. High TDS concentration in groundwater is another water quality issue that requires coordinated planning.

Surface water resources can be carefully managed to improve water supply reliability and water quality. For example, agencies can work together to learn and apply new stormwater capture techniques on agricultural lands to help increase water supplies, improve water quality, and preserve the ecological and flood benefits of open space. Managed stormwater capture on agricultural lands is a relatively new approach for groundwater recharge that still requires piloting to understand the associated regulatory requirements and its potential benefits. By implementing these projects at a regional level, agencies can increase efficiency by working through regulatory questions together and learning from each other's projects. .

There is also a regional water supply imbalance present between coastal and inland groundwater basins. In the PV Water coastal area, there is a looming shortage of water supply because excessive groundwater pumping has led to overdraft and seawater intrusion. Conversely, inland SBCWD users have encountered the problem of high groundwater levels, which can threaten crops and infrastructure, and is partly due to a surplus of groundwater recharge. An integrated solution could involve a transfer of water from SBCWD to PV Water that would allow a shift in groundwater pumping production to inland areas and solve both issues. Regional planning can help agencies with different capabilities identify synergistic solutions. Another example is a possible agreement for exchange of Cienega Valley water for CVP water between the City of Hollister and SBCWD. Hollister owns the Cienega Valley water rights but lacks required treatment facilities. Exchange of this water with SBCWD, which does have the treatment capability, allows this valuable local surface water resource to be made available.

Finally, a regional planning process will allow agencies planning single purpose projects to work together and combine efforts to develop multi-objective solutions or to examine projects for potential enhancements that can address additional issues simultaneously within one project. Examples include tying recreational and public access opportunities to flood management actions, enabling fish migration as a component of water supply projects, and restoring habitat while addressing water quality issues. Developing multiuse projects increases efficiency and public acceptance. It does require a coordinated effort between multiple stakeholders, which is best accomplished through the IRWM process.

6.1.2 Objectives Requiring Regional Planning

All objectives established for the Pajaro River Watershed will necessitate some degree of regional cooperation and collaboration if they are to be met. Generally, objectives associated with surface water and groundwater will need to be met on a regional basis as jurisdictional boundaries are crossed in the watershed. Table 6-1 summarizes the objectives for which regional cooperation and collaboration are especially critical.

Table 6-1: Objectives Requiring Regional Cooperation and Collaboration

Objective	Need for Regional Solutions
Optimize use of existing import surface water entitlements from the San Felipe Division.	Optimization requires cooperation among the three San Felipe Division contractors: SBCWD, Valley Water, and PV Water.
Optimize the use of groundwater and aquifer storage.	This watershed objective is most effectively addressed through regional cooperation. Coordination among agencies allows for conjunctive management on a regional scale, which increases storage options for the region. Additionally, in areas where agencies have a common groundwater basin, cooperation ensures that projects implemented locally consider the regional benefits and/or impacts.
Maximize the use of recycled water during the irrigation season and expand other uses of recycled water.	This recycled water objective cannot be met by a single agency. Therefore, multiple projects in various jurisdictions will need to be established.
Meet or exceed all applicable groundwater, surface water, wastewater, and recycled water quality regulatory standards.	Water quality in relation to groundwater and surface water is influenced by activities of multiple jurisdictions. Therefore, regional coordination and collaboration are necessary.
Implement flood management strategies throughout the watershed that provide multiple benefits.	Coordination between flood protection projects in multiple jurisdictions is needed to realize the maximum benefits and implement sustainable projects and strategies. Therefore, regional coordination and collaboration are necessary.
Reach consensus on the Pajaro River Risk Reduction Project necessary to protect existing urban areas and infrastructure from flooding and erosion from the 100-year event and to maximize opportunities to protect agricultural land uses.	A sustainable 100-year Pajaro River Flood Protection Project requires coordination between flood protection projects in multiple jurisdictions and land use agencies throughout the watershed to protect against watershed conditions changing in a way that increase the flows in the Pajaro River.
Address opportunities for open spaces, trails, parks along creeks and other recreational projects in the watershed that can be incorporated with water management strategies, consistent with public use and property rights	Environmental, open space, and recreational advocates cross jurisdictional lines to work with water supply, water quality, land use, and flood protection agencies to meet this objective.

Objective	Need for Regional Solutions
	Therefore, regional coordination and collaboration are necessary.

6.2 IRWM Plan Implementation Benefits and Impacts

Pajaro River Watershed IRWM Plan partners and stakeholders recognize the importance of pursuing and integrating multiple resource management strategies to achieve the greatest amount of, and most equitable benefit for, the region. In general, the following benefits will be realized through Pajaro IRWM Plan implementation:

- **Reliable and high quality water supply.** Water supply projects and water transfer and banking agreements lead to enhanced water supply reliability and assist with protection of water quality. Reliable and high quality water supply is directly linked to economic and environmental wealth and well-being.
- **Protection of people and economy within a disadvantaged community.** Projects included in Pajaro IRWM Plan provide direct benefits to disadvantaged communities, such as flood protection, improved water supply reliability, and improved water quality.
- **Multi-beneficial projects.** Opportunities that can achieve a multitude of goals and objectives for several stakeholders rather than a single entity have increased value for stakeholders and the communities served by projects.
- **Cost effectiveness.** Integrated planning and collaboration can lead to multi-beneficial projects that achieve cost savings through cost sharing opportunities, economies of scale, and resource/staff sharing.
- **Sharing experience, resources, and facilities.** Integrated planning and collaboration facilitate the sharing of experience, resources and facilities and better equips agencies to overcome future challenges.

The ultimate purpose of plan implementation is to provide watershed benefits that support and achieve the identified regional goals and objectives, described in more detail in Chapter 3. It is envisioned that the RWMG's overall mission of preserving the economic and environmental wealth and well being of the Pajaro River watershed will be accomplished through watershed stewardship and comprehensive management of water resources in a practical, cost effective and responsible manner.

The potential impacts and benefits from implementing different types of projects included in this IRWM Plan are summarized in Table 6-2 and described in more detail in the following chapters. These are organized by the regional goals: Water Supply, Water Quality, Flood Protection, and Environmental Protection and Enhancement. Within each goal, the projects included in the Pajaro IRWM Plan are listed and categorized by the primary goal of the project in Chapter 5 Table 5-3. For each project, the potential benefits and impacts are assumed to be similar to those identified for the associated project type.

Table 6-2: Impacts and Benefits by Regional Goal Categories

Goal	Within the Pajaro Region		Interregional	
Project Type	**Potential Impacts**	**Potential Benefits**	**Potential Impacts**	**Potential Benefits**
Water Supply	• Degrades water quality • Increases habitat disturbance • Increases energy use	• Improves water supply reliability • Increases groundwater recharge / storage • Improves water quality • Improves local reservoir operation conditions • Reduces reliance on imported water supplies • Maximizes use of water rights available • Increases potable water offsets • Increases flexibility of water supply delivery and water management • Improves understanding of the hydrologic and biological environment in the watershed • Improves drought protection • Improves expanded recycled	• Degrades water quality	• Improves water supply reliability • Provides potable water offsets

Goal	Within the Pajaro Region		Interregional	
Project Type	**Potential Impacts**	**Potential Benefits**	**Potential Impacts**	**Potential Benefits**
		water use opportunities ● Reduces or prevents seawater intrusion ● Increases water and energy savings ● Reduces constituent loading to the Monterey Bay National Marine Sanctuary		
Water Quality	● Increases habitat disturbance	● Improves groundwater quality ● Improves surface water quality ● Provides habitat improvements ● Provides long-term bank stabilization ● Reduces future erosion and sedimentation ● Reduces agricultural runoff and leaching ● Reduces or prevent seawater intrusion ● Improves understanding of the hydrologic and biological	● None	● Reduces constituent loading to the Monterey Bay National Marine Sanctuary ● Improves water quality

Goal	Within the Pajaro Region		Interregional	
Project Type	**Potential Impacts**	**Potential Benefits**	**Potential Impacts**	**Potential Benefits**
		environment of the watershed ● Reduces constituent loading to the Monterey Bay National Marine Sanctuary ● Promotes salinity awareness and teach salinity reduction techniques		
Flood Protection	● Degrades water quality degradation ● Increases habitat disturbance	● Reduces flood damages and losses ● Reduces the threat of life during major flood events ● Increases economic development ● Re-establishes river-floodplain hydrologic continuity ● Increases public access to open space, natural areas, and rivers, and creeks ● Restores and improves aquatic and terrestrial habitat ● Allows for re-establishment of natural floodplain functions	● None	

Goal	Within the Pajaro Region		Interregional	
Project Type	**Potential Impacts**	**Potential Benefits**	**Potential Impacts**	**Potential Benefits**
		● Protects the percolation and natural treatment characteristics of land ● Increases bank stability and provide habitat suitable for fish passage ● Provides early warning of potential flood events to communities		
Environmental Protection and Enhancement	● Degrades water quality degradation ●	● Promotes habitat protection ● Establishes migration corridors ● Re-introduces anadromous fish population to the watershed ● Enhances and protects watershed forest and meadow systems ● Restores and improves aquatic and terrestrial habitat ● Improves water quality	● None	● Establishes migration corridors

6.2.1 Water Supply

Ensuring an adequate, reliable water supply is a critical need for the Pajaro River Watershed. The ability to meet future demands is impacted by the heavy reliance on groundwater throughout the watershed, which has led to overdraft in some areas, as well as by the varying reliability of imported CVP water. Successfully meeting future water supply challenges requires the coordination of the agencies within the watershed that share these issues and that can work together to develop solutions that could not be implemented on an individual agency basis. Projects with the primary goal of water supply will provide numerous benefits to the region, but also some potential impacts to locally affected communities and adjacent areas. Water Supply projects and project elements may include, but are not limited to:

- Construction, repair and replacement of water conveyance facilities
- Urban and agricultural water use efficiency (e.g. water conservation programs or rebate programs)
- Water recycling
- Conjunctive management
- Groundwater recharge
- Reservoir reoperation
- Aquifer storage and recovery
- Water transfers
- Water storage facilities
- Well construction and/or replacement

Depending on the specific type of project and components of the project, benefits could include, but not necessarily be limited to, the following water supply-related benefits. Additionally, improved flood protection, increased recreational opportunities, and environmental benefits can sometimes be achieved from Water Supply projects.

- Improved water supply reliability – projects that diversify the Region's water supply portfolio, create new supplies, improve efficiencies of existing supplies, or offset potable water supplies will improve water supply reliability for communities in the Region and for the Region as a whole.
- Increased groundwater recharge / storage – use of groundwater has led to overdraft in the Pajaro Valley Groundwater Basin. Increasing groundwater recharge/storage in the groundwater basin could improve the condition of the basin and increase water supplies in the Region.
- Improved water supply quality – groundwater recharge projects that increase water supply can also improve water quality of groundwater basins by reducing overdraft or recharging with higher quality surface water.
- Improved local reservoir operation conditions – reoperating reservoirs can optimize operational efficiencies and improve operation conditions.
- Reduced reliance on imported water supplies – increasing local water supplies would reduce reliance on imported water supplies which would lead to other benefits,
- Maximized use of water rights available – maximizing the use of existing water rights available is key as population continues to grow in the Pajaro Region and water supplies become limited.

- Increased flexibility of water supply delivery and water management – increasing the flexibility of water supply delivery and water management can be achieved through the increase of new water supplies, operation modifications, and cooperation among multiple agencies in the Region.
- Improved understanding of the hydrologic and biological environment in the watershed – water supply studies and projects that include analyses and/or monitoring and data collection can help improve the understanding of the hydrologic and biological environmental within the Region.
- Improved drought protection – diversifying the Region's water supplies, promoting water conservation, conjunctive use, and water recycling, and efficient groundwater management will help provide drought protection and respond to potential climate change impacts in the future.
- Expanded recycled water use opportunities – expanding recycled water distribution system and/or upgrading wastewater treatment facilities to tertiary or advanced treatment technologies can allow for expanded recycled water use, offsetting potable water supplies and diversifying the Region's water supply portfolio.
- Reduced or prevent seawater intrusion – reducing groundwater pumping and/or groundwater recharge/storage projects can help reduce seawater intrusion, a significant issue in the coastal areas of the Pajaro Region.
- Improved water and energy savings – implementation of demand management measures (i.e. water conservation practices) for both urban and agricultural water users can reduce water use and associated energy consumption.
- Reduced constituent loading to the Monterey Bay National Marine Sanctuary – utilizing wastewater effluent for recycled water applications would reduce discharges to surface water bodies and constituent loading to the Monterey Bay National Marine Sanctuary, a federally protected marine area off the coast of Monterey.

Most potential Water Supply project impacts are temporary and would be related to the construction of facilities. Other potential project impacts include alterations to stream flows, loss of land due to facility construction, impacts to groundwater quality and/or groundwater levels. If groundwater pumping increases without a commensurate increase in recharge, there is the potential to impact groundwater levels, contribute to seawater intrusion, and affect groundwater quality. A project that would increase groundwater pumping would be implemented, only after necessary groundwater modeling and studies have been conducted to ensure potential impacts would be minimized.

Implementing certain projects could increase energy use. Water treatment and conveyance that require significant amounts of power may result in increased energy consumption that can increase greenhouse gas emissions.

There are also potential interregional water supply impacts and benefits. The benefits can range from the simple sharing of data and knowledge regarding successful water supply projects and programs to the more complex opportunities involving water transfers and shared infrastructure. For example, Valley Water and SBCWD, as CVP contractors, coordinate annual and long-term water transfers with agencies outside the IRWM region to deliver water supply benefits to the Pajaro River Watershed. However, it should be noted that there may be impacts from these transfers, depending on the terms.

6.2.2 Water Quality

Surface water quality within the watershed is influenced strongly by the highly agricultural nature of the area. The most significant surface water quality pollutants are sediment and nutrients which are generated through agricultural activities near rivers and creeks that run through the watershed. These pollutants are eventually carried downstream and cause water quality degradation throughout the watershed drainage area. Improving surface water quality requires the cooperation of stakeholders and agencies in all parts of the watershed. Groundwater quality is also an issue throughout the region, with salinity and nitrate being the major concerns. Project elements that can contribute to the Water Quality goal and objectives identified by the Region include, but are not limited to:

- Salinity management
- Upgrades to wastewater treatment plants and collection systems
- Stormwater capture and treatment
- Wetlands construction
- Contaminant removal/treatment
- Removal of invasive species
- Erosion control to reduce and/or prevent sediment and/or nutrient transportation
- TMDL implementation
- Non-point source pollution reduction
- On-farm technical assistance and/or education
- Agricultural best management practice (BMP) implementation
- Hydrogeologic investigations
- Groundwater monitoring and/or modeling

These project elements listed above can provide the following significant benefits to the Pajaro Region and other neighboring regions, depending on the project they are part of:

- Improve groundwater quality –Salinity management, TMDL implementation, non-point source pollution reduction, on-farm technical assistance, and agricultural BMP implementation can improve groundwater quality by reducing loading to groundwater.
- Improve surface water quality – stormwater capture and treatment, erosion control measurements, TMDL implementation, non-point source pollution reduction, on-farm technical assistance, and agricultural BMP implementation can reduce sedimentation and contamination loading into nearby surface water bodies, improving water quality.
- Provide habitat improvements – wetlands construction, contaminant removal, and removal of invasive species can all provide habitat improvements.
- Provide long-term bank stabilization – an erosion control project implemented to improve water quality may also provide long-term bank stabilization.

- Reduce future erosion and sedimentation – projects that implement erosion control measures help reduce future erosion and sedimentation into nearby surface water bodies, improving water quality.
- Reduce agricultural runoff and leaching – on-farm technical assistance and education and the implementation of agricultural BMPs will help reduce agricultural runoff and leaching, providing water quality benefits in the Region.
- Reduce or prevent seawater intrusion – salinity management can help reduce seawater intrusion, an issue in the coastal area of the Pajaro Region.
- Improve understanding of the hydrologic and biological environment of the watershed – hydrogeologic investigations, groundwater modeling and/or monitoring, and projects that include analyses and/or monitoring and data collection can help improve the understanding of the hydrologic and biological environmental within the Region.
- Reduce constituent loading to the Monterey Bay National Marine Sanctuary –reduce discharges to surface water bodies and constituent loading to the Monterey Bay National Marine Sanctuary, a federally protected marine area off the coast of Monterey.
- Promote salinity awareness and teach salinity reduction techniques – providing education and outreach to water users in the Pajaro Region can be incorporated into many projects and provide significant, long-term benefits.

Potential impacts from Water Quality projects can include temporary impacts from construction or long-term impacts such as waste discharge issues associated with brine disposal.

There are also potential interregional water quality impacts and benefits. Groundwater basins that span IRWM regions create opportunities for coordinated groundwater management. For example, seawater has intruded the groundwater basin in the coastal region of the Pajaro Valley. The seawater intrusion zone extends beyond the Pajaro IRWM region into the Greater Monterey IRWM region. This creates a regional opportunity to efficiently manage groundwater extractions and protect the basin. However, if all regions extracting from a shared groundwater basin are not coordinated, these basin management efforts may not deliver the anticipated benefits.

Additionally, four Central Coast IRWM regions have discharges to the Monterey Bay National Marine Sanctuary. To adequately protect the Sanctuary, all regions must participate in the reduction of constituent loading for the protection of the Bay and the benefit of all.

6.2.3 Flood Protection

Throughout history, the Pajaro River watershed has regularly experienced flooding, and at times, catastrophic flooding, such as that which occurred in the late 1990s and damaged communities and agricultural areas. Such events have necessitated research into and implementation of various solutions to protect the people and economies of the region, as well as to honor, preserve and protect the natural environment sustained by the Pajaro River. For the past half century, several agencies have been exploring water resource management strategies to mitigate flooding impacts of the Pajaro River and its tributaries, and have identified projects to aid in this effort. Although some projects were implemented, many required refinement and restudy to identify the most feasible solution for this diverse region. Project elements that have the primary goal of Flood Protection may include, but are not limited to:

- Floodplain preservation projects
- Watershed studies

- Creek excavation projects
- Creek restoration projects
- Projects that raise infrastructure, such as road, to reduce water damage and losses
- Levee improvements
- Stormwater collection, diversion and/or capture improvements

Floods can be caused by stream-side overbank flows, in areas of flat terrain with slow surface drainage, and by inundation due to structural dam failure. Implementing projects that help prevent floods will provide numerous benefits to local communities, including the DACs in the region. The projects will also contribute to local and state priorities, such as the Statewide Priority identified by DWR: Practice Integrated Flood Management. Additionally, the projects advocate support for funding mechanisms to administer and provide a cost share, work with the community to develop recreational opportunities along the river, and aid in flood warning and damage reduction to local communities.

Typically, the benefits that may be achieved by Flood Protection projects include:

- Reduce flood damages and losses – projects that enhance flood control and flood management can help reduce flood damages and losses to residential and commercial structures and transportation systems in communities affected by floods.
- Reduce the threat of life during major flood events – implementing flood protection projects can help reduce the loss of life sometimes caused by major flood events.
- Increase economic development – providing increased flood protection can allow for commercial and industrial development that will contribute to increased economic development in the Region.
- Re-establish river channel-floodplain hydrologic connectivity – floodplain preservation projects can help re-establish river channel-floodplain hydrologic connectivity.
- Increase public access to open space, natural areas, and rivers, and creeks – restoration projects that provide flood protection can also sometimes provide recreational opportunities and/or public access to open space, natural areas, rivers, and creeks.
- Restore and improve aquatic and terrestrial habitat – creek and floodplain preservation and/or restoration projects can help restore and improve aquatic and terrestrial habitat in the Pajaro River Watershed.
- Allow for re-establishment of natural floodplain functions - floodplain restoration projects can contribute to the re-establishment of natural floodplain functions, maximizing flood protection for the Region.
- Protect the percolation and natural treatment characteristics of land – protecting the natural percolation and treatment characteristics of land can contribute to maintaining and improving water supply, water quality, and flood attenuation.
- Increase bank stability and provide habitat suitable for fish passage – creek excavation and levee improvements can have an added benefit of flood protection, increased bank stability, decreased erosion and sedimentation, and increased suitable habitat for fish passage.
- Provide early warning of potential flood events to communities – flood management projects that provide early warning of potential flood events can further reduce flood damages and losses and reduce the threat to life.

Potential impacts from Flood Protection projects include relocation of residences, loss of land for facility construction, and increased recreational use of water bodies that could have water quality impact implications.

The Pajaro IRWM region is based on the watershed boundary and, thus, the potential benefits and impacts of interregional coordination are limited. However, there's still an opportunity to share information and learn from implementation of successful flood protection strategies in other IRWM regions.

6.2.4 Environmental Protection and Enhancement

There are opportunities to address riparian habitat, open space and recreational needs as part of projects that meet the other water management needs of the watershed. In addition, protecting and enhancing the environment can contribute to preserving or increasing ecosystem services such as water supply, flood attenuation, and water quality improvement. Stakeholders have voiced the desire to make proactive, lasting policies and decisions that will sensitize and educate the public about the importance of the Pajaro River Watershed and enhance the public's role as custodians of the riparian environment.

Water management policies and decisions can incorporate elements that provide for the protection, preservation and restoration of native plants, wetlands, open space, terrestrial and aquatic wildlife habitat, and riparian forest. This will require agencies involved in water supply, water quality and flood management issues in the watershed to take proactive steps to work with environmentally-focused agencies and organizations to incorporate environmental benefits to the maximum extent possible when implementing water management projects.

Examples of Environmental Protection and Enhancement project elements include:

- Fish passage improvements
- River and watershed restoration projects/programs
- Land conservation
- Wetlands restoration
- Removal of invasive species
- Streamflow augmentation

Implementing these project elements could provide the following benefits:

- Promote habitat protection – habitat protection can be implemented directly from certain projects (e.g. wetlands restoration) or promoted through public education and access.
- Establish migration corridors – projects that help establish migration corridors provide habitat improvement and enhancement and can help protect sensitive species.
- Re-introduce anadromous fish population to the watershed – fish passage improvement projects can help re-introduce anadromous fish populations to the watershed.
- Enhance and protect watershed forest and meadow systems – Environmental Protection and Enhancement projects can help protect watershed forest and meadow systems, key in adapting to potential climate change impacts.
- Restore and improve aquatic and terrestrial habitat – habitat, wetlands, and watershed restoration projects will restore and improve habitat for aquatic and/or terrestrial species.

- Improved water quality – land conservation (i.e. conservation easements) is a proven method of protecting land from conversion to other uses and protecting the environment while allowing for natural treatment and percolation of precipitation into underlying groundwater basins, improving water quality. Removal of invasive species in creeks, canals, and surface water bodies can also improve water quality.
- Improved water supply – projects that increase retention of stormwater provide water supply benefits.

Environmental Protection and Enhancement projects can sometimes include public education and/or recreation opportunities as well, providing a wide range of benefits. If the projects include recreation components, there is the potential for water quality impacts. Recreation components can have associated increased motor vehicle and foot traffic leading to increased erosion and sedimentation to adjacent water bodies. Economic impacts could occur through implementation of a land conservation project in which the land would not be used for commercial or residential purposes in the future, and therefore limit the potential for revenue.

Environmental Protection and Enhancement often requires interregional coordination. As noted in the Water Quality chapter, four Central Coast IRWM regions have discharges to the Monterey Bay National Marine Sanctuary. To adequately protect the Sanctuary, all regions must participate in the reduction of constituent loading for the protection of the Bay and the environmental habitat. Additionally, wildlife corridors span IRWM regions. The Nature Conservancy completed a Pajaro River Watershed study to increase the understanding of wildlife movement between the Hamilton and Santa Cruz ranges, which are outside of the Pajaro River Watershed IRWM region. The study was designed to identify wildlife movement and presence along a variety of habitats including riparian systems, agricultural lands, road infrastructure and ranch lands. The study has been shared with other IRWM regions to increase the understanding of the needs across regions to improve environmental habitat.

6.3 Disadvantaged Communities, EJ Concerns, and Native American Communities

Major needs of the disadvantaged communities (DACs) in the Pajaro Region can be met through implementation of the regional water management programs and projects included in the Pajaro IRWM Plan. The Pajaro Region prioritizes the protection of the people and economy of DACs and Native American tribal communities. The continuing IRWM Plan process will continue to consider and be responsive to the needs, cultural resources, and environmental justice concerns of DACs and Native American communities. Environmental justice is addressed by ensuring all stakeholders have the potential to participate in the Pajaro IRWM planning process. Also, the IRWM planning process and individual project development attempt to eliminate disproportionately high or adverse impacts to minority or low-income communities. The IRWM planning and individual project development processes attempt to respect and support the interests of local Native American tribal communities in protecting and restoring the water-related resources of historic tribal lands by consulting with and involving tribal communities in regional planning and stewardship activities.

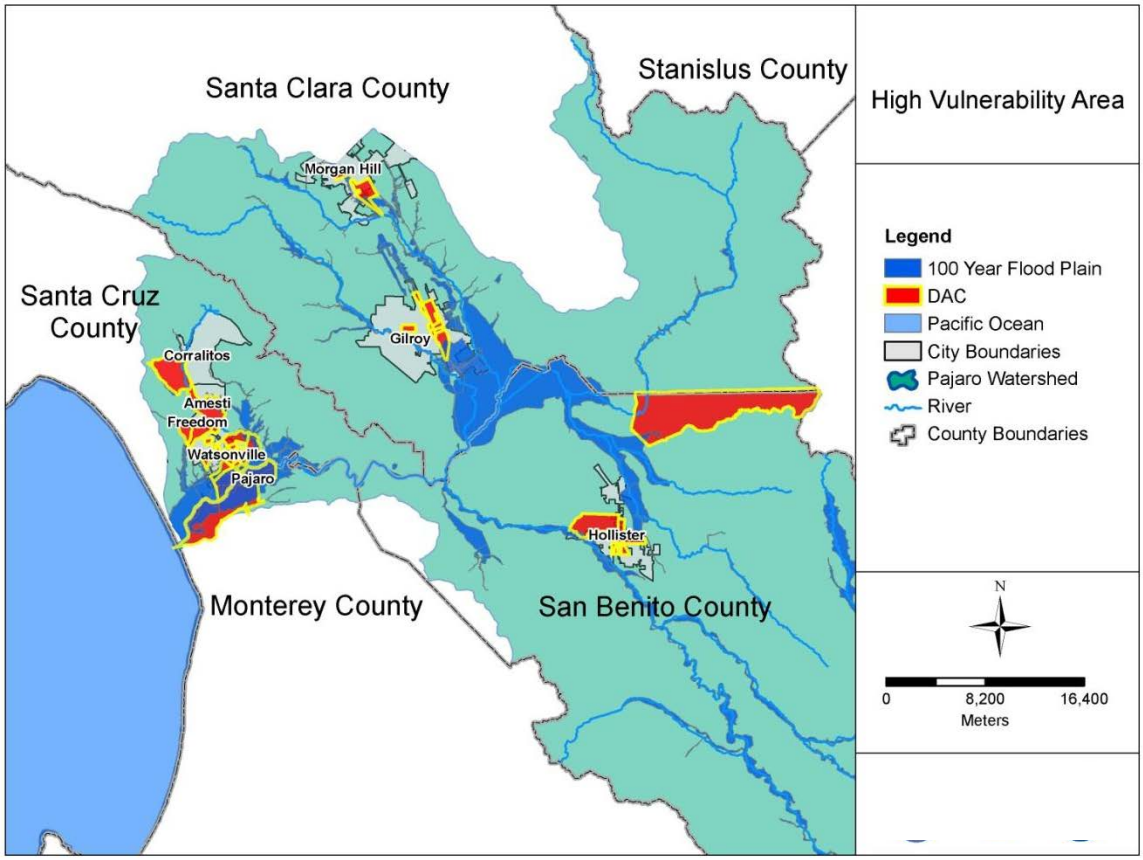
As described in Chapter 2, a DAC is defined in the California Public Resource Code as a community with an annual median household income (MHI) that is less than 80% of the statewide MHI [PRC §75005 (g)]. DWR collected and compiled the U.S. Census American Community Survey MHI data for 2010 to 2014 (i.e. 2014 Census Data). The State MHI was $61,489; therefore, communities with an average MHI of $49,191 are considered disadvantage communities.. The communities of Pajaro, Watsonville, Amesti, and Freedom were identified as DACs and there are other areas of DACs throughout the region.

The benefits to DACs will involve three main categories of benefit:

- Increased Water Supply Reliability
- Improved Water Quality
- Flood Protection

DACs are particularly vulnerable to flooding damages causing temporary and/or permanent displacement. Some of the DACs within the Pajaro region currently lie within the 100-year floodplain as shown in Figure 6-1.

Figure 6-1: Low-lying Disadvantaged Communities in Pajaro Watershed



Flood protection projects included in the IRWM Plan can increase flood management benefits to these low-lying DACs. Projects that can provide flood protection, waters supply, and water quality benefits to DACs will continue to be identified and grant monies will be sought to help offset project implementation costs. Project and Plan implementation will be conducted in such a way to ensure DACs are not being adversey affected. Ongoing coordination and public involvement will aid in preventing possible environmental justice impacts and support restoration and protection of tribal lands. Construction of project facilities will create short-term environmental impacts at neighboring communities. A preliminary analysis of areas affected by construction of project facilities will help assure that these construction impacts will not be borne predominantly, or unfairly, by any minority population or low-income group.

7 Plan Performance and Monitoring

This chapter meets the following IRWM Plan Standard from the Proposition 1 IRWM 2016 Program Guidelines (DWR, 2016).

The intent of the Plan Performance and Monitoring chapter is to confirm that the Pajaro Region is:

- Making efficient progress toward meeting the Pajaro Plan objectives,
- Implementing projects listed in the IRWM Plan, and
- Ensuring that each project in the Pajaro Plan is monitored to comply with all applicable rules, laws, and permit requirements.

This chapter describes the general process that will be employed to track Pajaro Plan performance and to monitor progress being made to implement the projects contained in this plan. Through the Plan Performance and Monitoring process, the Pajaro Plan will promote adaptive management, further consideration of climate change as effects manifest, and the application or inclusion of new tools and information.

7.1 Tracking and Reporting Pajaro Plan Performance

A Pajaro Plan Performance Review will be conducted, at a minimum, every two years (or as deemed appropriate by the RWMG) to evaluate progress made toward achieving Plan objectives. The Plan performance review will be administered by the Regional Water Management Group (RWMG) and supported by the stakeholder steering committee. The RWMG will use the measures identified in Chapter 3, Table 3-1 to assess Plan performance. The extent to which the Plan's objectives have been met will be assessed as part of each performance review, as described in the following sections. During the Plan performance review, the RWMG and stakeholder steering committee will consider lessons learned from implementing projects in the Plan, identify areas for adaptive management to better achieve Plan objectives, and adjust the Plan with new projects or regional information that can influence the Pajaro Watershed's goals, objectives, or RMS.

During the Plan performance review, the RWMG will monitor and report on how the Plan is addressing critical water issues for the Amah Mutsun Tribal Band, which is the Native American Tribal community within the Pajaro Region. While the Amah Mutsun Tribal Band has no land holdings within the region, their ancestral lands cover the entire Pajaro Region. The Amah Mutsun Tribal Band has a "guiding vision" that includes environmental stewardship of their ancestral lands to improve water quality and ecosystem health (amahmutsun.org/land-trust). In the 2019 project solicitation, the Amah Mutsun Tribal Band chose not to submit any projects as the sponsor or co-sponsor. However, projects were submitted by other stakeholders that will indirectly benefit the Amah Mutsun Tribal Band by improving the water quality and environmental resiliency of the watershed, both of which are aspects of their guiding vision. The Amah Mutsun have three tribal members on the SSC, and through the SSC, the RWMG will keep the Amah Mutsun Tribal Band informed of Plan performance and the status of projects within the Plan. The RWMG will monitor and report on how the project sponsors provide tribal notifications, identify opportunities for tribal engagement, and identify and mitigate potential project impacts to cultural resources.

7.1.1 Water Supply

The Pajaro Region's water supply goal is as follows:

> **Water Supply Goal -** Protect and improve regional water supply reliability, protect groundwater resources from overdraft, reduce dependence on imported water, and protect watershed

communities from drought while considering climate change impacts on water supply resources and demands.

The measures used to evaluate program performance toward meeting the water supply goal and objectives are listed in Table 7-1 and will include ongoing groundwater monitoring; comparisons of the current water supply portfolios against corresponding water supply portfolios following implementation of the program; comparisons of the water supply portfolios after implementation with water demand projections and recycled water production; and stakeholder feedback. The primary monitoring system necessary for this program is already in place since each of the water management agencies already has a groundwater monitoring program that is used to collect groundwater use and level data. Additionally, all groundwater basins in the Pajaro River Watershed are being monitored in compliance with CASGEM and managed to meet the Sustainable Groundwater Management Act (SGMA) requirements. Additionally, potable water use and recycled water use meters for monitoring the use of delivered water are in place. Programs for surveying customers to monitor changes in behavior with respect to conservation are currently being implemented, such as the Agricultural Water Use Study being completed for Santa Clara County. Additional sources of information for assessing performance are Project Sponsors. The RWMG will use the performance evaluations to determine what adaptive management opportunities exist within the watershed to better meet regional water supply objectives and to better respond to and prepare for climate change. The RWMG will update the plan with the adaptive management opportunities, including new tools and information, as needed.

Table 7-1: Water Supply Objectives and Measures

Objectives	Measure(s)
1. Meet 100% of M&I and agricultural demands (both current and future conditions) in wet to dry years including the first year of a drought.	• Current and projected annual acre-feet of total supply by water year type
2. Meet 85% of M&I and 75% agricultural demands (both current and future conditions) in second and subsequent years of drought.	• Current and projected annual acre-feet of total supply by water year type
3. Identify and address water supply needs of disadvantaged communities in the Pajaro River Watershed	• Reliability of disadvantaged community supplies
4. Implement water conservation programs to reduce M&I and agricultural water use consistent with SBx7-7 and CVPIA	• Estimated annual water conservation savings
5. Maximize the use of recycled water during the irrigation season and expand other uses of recycled water	• Annual recycled water use
6. Optimize the use of groundwater and aquifer storage	• Sustainable yields • Operational storage
7. Maximize conjunctive use opportunities including interagency conjunctive use	• Groundwater levels
8. Optimize and sustain the use of existing import surface water entitlements from the San Felipe Unit	• Long-term average CVP deliveries
9. Maximize the beneficial use of existing local water supplies while protecting existing surface water rights	• Long-term average local surface water use

7.1.2 Water Quality

The Pajaro Region's water quality goal is as follows:

> **Water Quality Goal -** Protect and improve water quality for beneficial uses consistent with regional community interests and the RWQCB basin plan objectives through planning and implementation in cooperation with local and state agencies and regional stakeholders.

The measures used to evaluate water quality improvements are listed in Table 7-2 and will include groundwater modeling; groundwater quality data; recycled water quality data; ability to meet or exceed all applicable groundwater, surface water, wastewater, and recycled water quality regulatory standards and targets; and stakeholder feedback. The main monitoring system necessary for this program is already in place, since each of the water management agencies already has a groundwater monitoring program that is used to collect water quality data. Recycled water quality monitoring is also performed. Monitoring for total maximum daily loads (TMDLs) will directly evaluate performance related to surface water loading and will provide an indirect evaluation of performance related to groundwater quality. This program will also rely on cooperative monitoring efforts developed in response to the conditional agricultural waiver requirements and information from Project Sponsors on implementation of BMPs and other actions to address impacts from surface water runoff.

In addition, Salt and Nutrient Management Plans (SNMPs) consistent with the State Water Resources Control Board Recycled Water Policy have been completed for the major groundwater basins in the region: the Llagas Subbasin; the Bolsa, Hollister, and San Juan Bautista Area Subbasins; and the Pajaro Valley Groundwater Basin. These planning efforts identify sources of salt and nutrient loading, analyze assimilative capacity, and perform an anti-degradation analysis. In addition, the SNMPs include Groundwater Monitoring Plans designed to fill data gaps, monitor the salt and nutrient balance and source loading, and provide ongoing assessment of salt and nutrient issues throughout the study area.

The RWMG will use the performance evaluations to determine what adaptive management opportunities exist within the watershed to better meet regional water quality objectives and to better respond to and prepare for climate change. The RWMG will update the plan with the adaptive management opportunities, including new tools and information, as needed.

Table 7-2: Water Quality Objectives and Measures

Objective	Measure(s)
1. Meet or exceed all applicable groundwater, surface water, wastewater, and recycled water regulatory standards	• Concentrations of constituents of concern (i.e., nitrate, chloride, pathogens, turbidity, toxins, etc)
2. Identify and address the drinking water quality of disadvantaged communities in the Pajaro River Watershed	• Exceedences of drinking water standards
3. Protect groundwater resources from contamination including salts and nutrients	• Effectiveness of groundwater protection programs • Acres of protected recharge areas • Cleanup and abatement of groundwater contamination plumes • Implementation of Salt and Nutrient Management Plans
4. Address impacts from surface water runoff through implementation of Best Management Practices or other surface water management strategies	• Acre-feet of stormwater capture • Number of LID projects • Acreage managed with approved Best Management Practice (BMP) techniques.
5. Meet or exceed delivered water quality targets established by recycled water users	• Concentrations of salts in recycled water

7.1.3 Flood Management

The Pajaro Region's flood management goal is as follows:

> **Flood Management -** Ensure flood management strategies are developed and implemented through a collaborative and watershed-wide approach and are designed to maximize opportunities for comprehensive management of water resources.

The measures used to evaluate the Pajaro Region's progress toward achieving its flood management goal are listed in Table 7-3 and will include flow and water level monitoring, and damage reports after flooding events. The monitoring protocol for flood protection would include provisions for stream gauge monitoring, measuring sediment deposition and erosion, vegetation growth or loss, and levee wear. Other monitoring measures would include the amount of damage claims and overtopping sightings experienced during wet weather events. A key measure of project success would involve removal of areas from the FEMA 100-year flood plain. For floodplain preservation, monitoring would include tracking the total acreage acquisition of property or development rights. Data for assessing progress toward the flood management objectives will be provided by flood protection agencies and Project Sponsors. The RWMG will use the performance evaluations to determine what adaptive management opportunities exist within the watershed to improve flood management and mitigate or adapt to the potential flood-related impacts of climate change. The RWMG will update the plan with the adaptive management opportunities, including new tools and information, as needed.

Table 7-3: Flood Management Objectives and Measures

Objective	Measure
1. Implement flood management strategies throughout the watershed hat provide multiple benefits	• Level of flood protection • Effectiveness of flood risk reduction programs
2. Reach consensus on the Pajaro River Risk Reduction Project necessary to protect existing urban areas and infrastructure from flooding and erosion the 100-year event and to maximize opportunities to protect agricultural land uses	• Level of community and agency support
3. Work with stakeholders to preserve existing flood attenuation by implementing land management and conservation strategies throughout the watershed	• Acres of floodplain preserved
4. Develop approaches for adaptive management to minimize maintenance requirements and protect quality and availability of water while preserving ecologic and stream functions, and enhancing when appropriate	• Sediment load • Invasive species
5. Provide community benefits beyond flood protect such as public access, open space, recreation, agriculture preservation and economic development	• Level of additional recreational opportunities • Number of agricultural acres preserved • Per capita income • Value of agricultural production

7.1.4 Environmental Protection and Enhancement

The Pajaro Region's environmental protection and enhancement goal is as follows:

> **Environmental Protection and Enhancement -** Preserve the environmental wealth and well-being of the Pajaro River watershed by identifying opportunities to restore and enhance natural resources of streams, watersheds, wetlands, and the Monterey Bay when developing and implementing water management strategies.

The measures used to evaluate the Pajaro Flood Protection program progress toward achieving the environmental protection and enhancement goal and associated objectives are listed below in Table 7-4 and will include protocols to assess the extent to which habitat is protected and restored, sensitive species and cultural resources are preserved, and new recreation opportunities are provided. This data will be collected from Project Sponsors. The RWMG will use the data provided by Project Sponsors and information provided by regional stakeholders to determine what adaptive management opportunities exist within the watershed to better meet environmental protection and enhancement objectives currently and as the effects of climate change manifest. The RWMG will update the plan with the adaptive management opportunities, including new tools and information, as needed.

Table 7-4: Environmental Protection and Enhancement Objectives and Measures

Objective	Measure(s)
1. Address opportunities to enhance the local environment and protect and/or restore natural resources, in cooperation with landowners, when developing water management strategies	● Number of fish passage barriers ● Miles of streams restored and/or rehabilitated ● Acres of wetlands protected and/or restored
2. Improve biological and cultural resources, including riparian habitats, habitats supporting sensitive plant or animal species and archaeological/historic sites when implementing strategies and projects	● Sensitive species occurrence ● Stream flow ● Sediment loading ● Acres of culturally valuable area and/or resource acquired or preserved through conservation easements or other means
3. Address opportunities to protect, enhance, or restore habitat to support Monterey Bay National Marine Sanctuary marine life in conjunction with water management strategies	● Sediment loading ● Progress toward meeting Total Maximum Daily Loads (TMDLs)
4. Address opportunities for open spaces, trails, parks along creeks or other recreational projects in the watershed that can be incorporated with water management strategies, consistent with public use and property rights	● Level of additional recreational opportunities ● Miles of trails ● Acres of parklands and/or access ● Number of amenities ● Number of visitor days ● Miles of upgrades to trails ● Acres of upgrades to parklands

7.2 Tracking and Reporting Pajaro Project Performance

As part of the periodic Pajaro Plan Performance Review, progress toward implementing Plan projects will also be assessed. The RWMG will perform the assessment by reviewing project-specific monitoring results. Project Sponsors are responsible for developing and implementing project-specific monitoring plans.

Proponents of projects implemented as part of the Pajaro Region IRWM Program will be required to develop project-specific monitoring plans prior to or in conjunction with project implementation. Project proponents will be responsible for collecting the data, performing the monitoring activities, validating the data, and reporting both to the RWMG and to appropriate state databases. Data collected and analyses performed as part of the performance monitoring plans will be reported to the RWMG and appropriate statewide databases on at least an annual basis, along with required documentation and an evaluation of project performance. This will help ensure that implemented projects fulfill Pajaro Plan objectives as originally intended.

Project-specific monitoring plan requirements will vary based on the type of project being implemented, but typically required contents include, but are not limited to:

1. A table describing what is being monitored for the project (e.g. water quality, water depth, flood frequency), and effects the project may have on habitat or particular species (before and after construction).
2. Measures to remedy or react to problems encountered during monitoring.
3. Location of monitoring.
4. Monitoring frequency.
5. Monitoring protocols/methodologies and quality assurance and quality control (QA/QC) procedures, including who will perform the monitoring and how the monitoring protocols / methodologies and QA / QC procedures are consistent with requirements for applicable statewide databases including SWAMP, GAMA, and WRAMP).
6. An identified data management system (DMS) that will be used or procedures to keep track of what is monitored.
7. Procedures and a schedule for incorporating collected data into statewide database(s).
    a. Projects that involve surface water quality must meet the criteria for and be compatible with SWAMP, http://www.waterboards.ca.gov/water_issues/programs/swamp/tools.shtml).
    b. All projects that involve groundwater quality must meet the criteria for and be compatible with GAMA, http://www.waterboards.ca.gov/gama/).
    c. All projects that involve wetland restoration must meet the criteria for and be compatible with the State Wetland and Riparian Area Monitoring Plan (WRAMP, http://www.waterboards.ca.gov/mywaterquality/monitoring_council/wetland_workgroup/docs/2010/tenetsprogram.pdf).
8. Procedures and a schedule for reporting to the RWMG confirmation of data submittal to appropriate statewide database(s).
9. Procedures to ensure the monitoring schedule is maintained and that adequate funding is available to maintain monitoring of the project throughout the scheduled monitoring timeframe.

7.3 Biennial IRWM Plan Performance and Progress Report

The RWMG will monitor and evaluate plan and project implementation. Plan performance will be reported every two years through publication of a biennial IRWM progress report. The progress report will include the following information:

- List of projects implemented during previous 2 years and who was responsible,
- Progress on each project,
- Summary of monitoring and reporting based on the project-specific monitoring plans, particularly for those projects with IRWM Implementation Grant funding,
- Projects and programs implemented across the Region which help meet plan goals and objectives,
- Qualitative assessments of progress for those achievements difficult to quantify,
- Lessons learned which need to be considered for future projects, and

- Potential modifications or adaptations needed to the Pajaro IRWM Plan in general or to specific projects.

The Biennial Progress Report, and any associated links to project specific information and data, will be posted on the Pajaro River Watershed's IRWM web page.

It should be noted that it is not always possible to quantify the results of certain projects, programs and actions, and not always possible to determine an exact correlation between project outcomes and the IRWM Plan goals. In some cases the assessments will be qualitative, though when appropriate and possible, quantitative assessments will be provided and assumptions made as to how well the projects and other actions help meet the IRWM Plan goals.

The IRWM Plan is a living document which needs to be flexible to adapt to changing conditions, new information, and modifications based on lessons learned. The progress report will help identify the changes needed in subsequent updates, which will be prepared every 5 years or as needed.

8 Data Management

This chapter meets the following IRWM Plan Standard from the Proposition 1 2016 Integrated Regional Water Management (IRWM) Program Guidelines.

> **Data Management** – The IRWM Plan must describe the process of data collection, storage, and dissemination to IRWM participants, stakeholders, the public, and the State. Data in this standard may include, but is not limited to technical information such as designs, feasibility studies, reports, and information gathered for a specific project in any phase of development including the planning, design, construction, operation, and monitoring of a project.

In the Pajaro River Watershed IRWM, data management will benefit the RWMG and IRWM stakeholders, including neighboring IRWM regions and general public. The data categorized, curated and stored in the Data Management System demonstrates that the IRWM Region has an accessible and transparent IRWM Program and Plan.

8.1 IRWM Plan Data Needs, Collection and Management

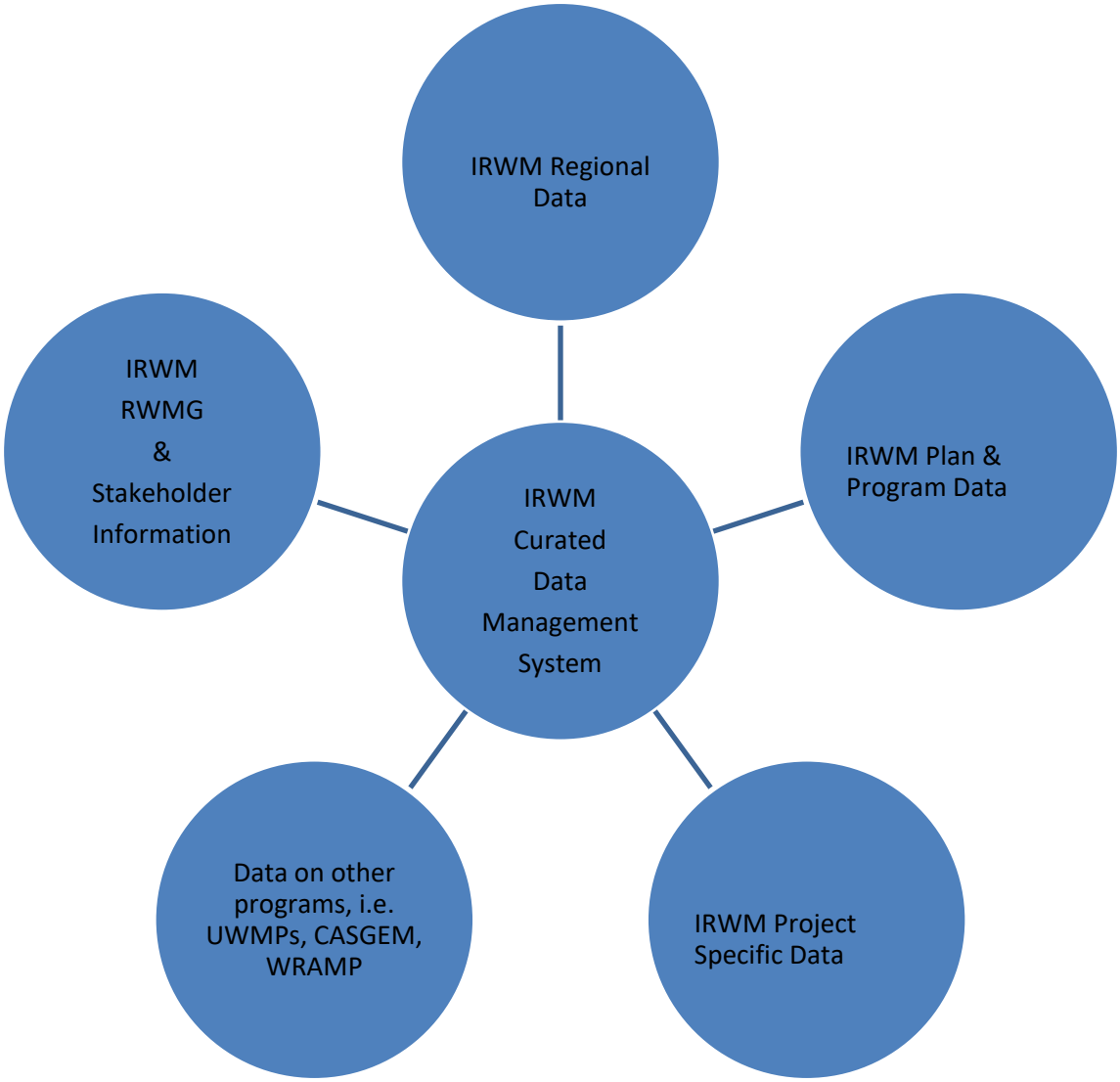
The Pajaro River Watershed IRWM has a need for data related to the overall IRWM Region and the projects listed within the IRWM Plan. Data is needed for the following purposes:

1. To derive an accurate characterization of the region's water needs and programs;
2. To provide a correct understanding and picture of the IRWM's regional water management structure and water resources;
3. To ensure that the Region meets the formatting and procedural standards of the State's databases, i.e. SWAMP, GAMA, CERES, among other programs; and
4. To track and document the Region's progress toward attainment of IRWM goals and objectives, as well as project and Plan Performance.

Meeting the needs and goals of the Region requires current and accurate project level data. Moreover, correct project information ensures that there is a complete and precise assessment of Plan performance as tied to project performance. Further, data is required to chronicle and document interaction between the RWMG, SSC, Project Sponsor, and general stakeholders as it relates to RWMG meetings, public and stakeholder meetings and workshops, and project solicitations and project selections. Data on the Plan and overall IRWM implementation and programming must also be tracked, collected and stored in the Data Management System. The Data Management System will be a repository and hub for all information related to the IRWM Plan and program in the Pajaro River Watershed. Data will also be formatted in a way to communicate with other State programs.

All data that is retrieved and stored will be updated on a regular basis and will be available for viewing through an accessible online data management system. The data management system catalog and organized data topically for ease of review and reference.

Well-collected and concisely presented data will effectively encapsulate and communicate the goals, objectives, needs and successes of the region to an interested audience. The processes for data tracking, collection, storage and management is discussed in the ensuing sections of this chapter.



8.1.1 Data Tracking, Collection and Management

As discussed above, there is a need to track, collect, categorize, store and manage data on a project-specific and general IRWM basis. Data collection with be solicited on a regular basis and will be both project specific and general. The RWMG group will outreach to the Project Proponents, SSC, and other stakeholders to ensure that data is collected in a manner that allows for easy integration with existing State systems.

Links and information will also be posted on the website and updated on a regular basis by the RWMG. Posted information includes details on the Pajaro River Watershed Plan status, project implementation, meeting notices, agenda materials and minutes, and Statewide IRWM program development, process improvements and status.

Data related to background documents and other source material will also be solicited and added to the curated library and/or archive. Examples of this data include watershed management plans, UWMPs, etc.

Project Proponents will be responsible for the Quality Assurance/Quality Control (QA/QC) checks of data submitted to State databases and the RWMG. The RWMG will perform annual reviews of information posted on the Pajaro Region website to ensure all information is accurate, updated, and accessible.

8.1.1.1 Project Specific Data Tracking and Collection

Data will be collected from the members of the RWMG, SSC, and Project Sponsors on a regular basis. The RWMG will enter specific project related information and upload documents, such as project-specific monitoring plans and reports, project design documents, feasibility studies, reports, and information gathered for a specific project in any phase of development including the planning, design, construction, operation, and monitoring of a project.

In addition to collection and storage of data such as planning studies, feasibility studies, designs, and other technical reports, data associated with the planning, design, implementation, and monitoring of projects included in the Pajaro IRWM Plan may include, but is not limited to:

- Streamflow
- Surface water diversions
- Groundwater extractions
- Groundwater elevations
- Precipitation
- Water demand
- Land use
- Groundwater quality
- Surface water quality
- Stormwater quality
- Wastewater quality
- Wastewater treatment plant flows
- Locations of sensitive species' habitat
- Locations and conditions of water- and wastewater-related facilities

Data tracking and collection, review, and dissemination as described throughout this chapter will be conducted for all projects that are implemented as part of the Pajaro Region Program. Project Performance Monitoring Plans will be developed, as described in Chapter 7 about Plan Performance and Monitoring. These plans will define the types of data to be collected, methods and tools to collect the data, the frequency of collection, and the QA/QC measures to be applied. The project proponent implementing the project will be responsible for preparing and implementing the Project Performance Monitoring Plan, including performing the QA/QC procedure as outline in the Project Sponsor's Project Performance Monitoring Plan. Since QA/QC measures are specific to each project and dataset, the specific QA/QC measures will be determined by the Project Sponsor and described in the Project Sponsor's Project Performance and Monitoring Plan. However, example measures include having each dataset reviewed for accuracy, reviewing that project findings match the data, and ensuring the most updated information is included in project analyses. Overall, the project Sponsor will collect the data in accordance with the Plan, follow the QA/QC procedures, and submit the data to the appropriate statewide databases.

8.1.1.2 General IRWM Data Tracking and Collection

Similar to the process outlined above, the RWMG will outreach to the SSC, Project Sponsors, and general stakeholders to collect information pertinent to general IRWM Plan implementation. Data tracking and collection will extend to information and complementary planning and project processes and documents, for example, watershed studies or documents as well as information on RWMG contact information, changes in water management structures and information on related programs and documents such as Urban Water Management Plans, etc.

8.1.1.3 Management of Complied Data

Once data is submitted to the system, the RWMG will ensure that data and information is organized topically and curated such that current and relevant data and information is always on the home page and easily and readily identifiable and accessible. As data and information accumulates, it will be relocated into logical locations such as accessible archives that will be searchable through a site map or site search tool.

8.1.2 Existing Data Dissemination Methods

Data generated and collected during the course of the IRWM process has been and will continue to be managed to ensure that it will be available to fulfill the needs of stakeholders, the state, and the general public. The mechanisms for data dissemination that have been employed to date are described in this chapter.

Dissemination of data to stakeholders, agencies, and the public is integrated into the IRWM process through stakeholder and Partner agency meetings, newspaper announcements, handouts, e-mail notices, and agency contacts available to provide data files to any requester. Regular stakeholder workshops have served as the main venue for distributing information to stakeholders. Data has also been shared between the three Partner agencies. Other information and data are disseminated to agency boards and committees with the presentation of Plan components and progress given by Partner agency staff. In addition, Project Sponsor disseminate information during the planning and implementation of their projects. Lastly, California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) processes also allow public review of data as individual projects move from planning to implementation phases.

The internet is also being utilized for data dissemination. Public meeting dates and tentative agendas are posted on the existing Partner agency websites, as well as other pertinent information. Whenever possible, reports and data are made available in electronic format. Other relevant data from this IRWM Plan process is provided to stakeholders online through Partner websites. The web addresses are: PV Water (www.pvwater.org), Valley Water (www.valleywater.org) and SBCWD (www.sbcwd.com). Data has also been distributed via the Pajaro River Watershed Flood Prevention Authority (http://www.pajaroriverwatershed.org/) and the Pajaro Watershed Information Center (http://www.pajarowatershed.org/). The RWMG is in the process of working with AMBAG to tailor the Pajaro River Watershed Flood Prevention Authority website ((http://www.pajaroriverwatershed.org/) to meet IRWM-specific data management needs.

Because of the proactive distribution and sharing of data, to date there have not been a significant number of requests for data. The RWMG is committed to satisfying future requests for information. Information and data can be requested by stakeholders through the Partner agencies via email or written requests, and at public meetings and IRWM Plan stakeholder workshops.

8.1.3 Available Data Management Systems

There are a multitude of water resources data management systems (DMSs) available for use by the region. Different options to be considered include off-the-shelf project management applications that enable data sharing and customized web-based applications. The following systems were assessed for potential use in the future:

- Groundwater Analyst
- Groundwater Data Center
- HydroDaVE
- HydroDMS
- WISKI

These DMSs were assessed based on their ability to receive a variety of data from different sources, implementation and maintenance requirements and cost, and their ability to make data available to other parties. Table 8-1 provides a comparison of the features among the DMSs. The comparison was developed by reviewing marketing literature including brochures and websites, web-based demonstrations and videos, and review of publicly available installations of the system, where available. A brief technical description of each system is provided in the following chapters.

Groundwater Analyst

Developed by Aquaveo, Groundwater Analyst is a component of their Arc Hydro Groundwater (AHGW) Tools. Tools in the Groundwater Analyst help users import data into their AHGW datamodel, manage key attributes, and visualize their data. With Groundwater Analyst, users are able to import a variety of datasets (wells, time series, cross sections, volumes) into their geodatabase, manage symbology of layers in ArcMap and ArcScene, map and plot time series data, and create common products such as water level, water quality, and flow direction maps.

Groundwater Analyst is an ArcGIS-based system that is installed on the desktop and requires the user to have an ArcMap level license. The system primarily stores and manages groundwater and subsurface data. Additional tools may be purchased to store and analyze groundwater (MODFLOW) model data. Groundwater Analyst has numerous visualization tools to view data, and since it is based on the ArcGIS platform, comes with the inherent ArcGIS tools for mapping and analyzing features, as well as the standard export tools, provided the user has the ArcGIS license.

Groundwater Data Center

The Groundwater Data Center is a web-based system developed by Kennedy Jenks for San Joaquin County to capture, update, and publish groundwater data. Kennedy/Jenks customized a colorful, user-friendly Groundwater Data Center to fill the County's needs and more. Now it exists in two forms: an updatable version on the Intranet for the Water Resources Division and Flood Control District staff, and a limited version with more help functions on the County's public website.

Staff members now have at their fingertips a backlog of accessible data and history. Meanwhile, outside users – farmers, residents, staff from other agencies and irrigation districts – can instantly find a wealth of groundwater information, for whatever area and time period they are interested in, without waiting for a semiannual report. The version for the staff contains access to updatable tables on "Well Information Detail," "Water Level Data," and "Water Quality Data," the latter two sortable by year and season. This allows them to quickly add a record on the tables. The system is map-based and provides a number of interactive features. The user only needs to have a web browser installed in order to access the site.

HydroDaVE

HydroDaVE, developed by Wildermouth Synergies, is a web-enabled software tool that provides users an easy to use, secure, and reliable data management platform to efficiently manage, access, and analyze environmental data. HydroDaVE allows users to mine and explore data and improve reporting capabilities. It expands the user's ability to share data within and outside of an enterprise. Sophisticated data-analysis tools make it possible to understand seasonal and long-term trends, to evaluate data quality and errors, and to resolve conflicts. This greater visibility of data enables users to make informed management and operational-level decisions.

The system is map-based and consists of two interfaces: (1) a web-enabled data management interface (HydroDaVE Manager), and (2) a graphical user interface for data visualization (HydroDaVE Explorer). The data management interface is used to import datasets to the database, which exists on a server, while HydroDaVE Explorer is a Windows application that runs on the user's desktop and accesses the database through an Internet-connected computer. The HydroDaVE Explorer integrates GIS capabilities and supports the ESRI shapefile format.

HydroDMS

Developed by RMC Water and Environment, HydroDMS is a web-based, GIS-enabled system for storing, viewing, and analyzing hydrologic and environmental data. The HydroDMS is a comprehensive data management tool that stores data in a relational database management system that may be analyzed and viewed in a map-based Google or ArcGIS interface. HydroDMS is built upon a state-of-the art system architecture that combines the power of GIS with web technology. While hiding the complexity of the database and system architecture, the system provides a suite of easy-to-use comprehensive tools that mimic the user's workflow process while they enter and validate water related data and perform complex analysis. HydroDMS can also store and display input and output of hydrologic models that are used in IRWM Plans.

The user only needs to have a web browser installed in order to access the system. Secure access to data is controlled using configurable user permissions and privacy settings. The system contains a module to import and view model data. The HydroDMS is part of RMC's Integrated Data Management (IDM) Suite of products and it can be integrated with other project management tools for tracking and reporting on project monitoring progress.

WISKI

WISKI is a water management information system developed by Kisters to manage a wide and flexible range of data types, including both time series and static data. WISKI's primary purpose is as a hydrological database solution that can manage all hydrological data in one location. Many organizations often have distributed "silos" of critical project and operational data that needs to be monitored and updated. These same organizations often routinely use cumbersome desktop spreadsheet applications, or custom built databases to manage this data with wildly varying degrees of success. WISKI helps users eliminate the chances of deleting critical data, track editing history with a complete audit trail, and finally, get access to an enterprise level system with the convenience of an easy to use desktop GUI with WISKI.

The system facilitates navigation through individual data structures and allows users to directly access graphs, tables and reports. In order to view the data in a map-based interface, the WISKI Extension for ArcGIS may be installed on a PC running ArcGIS. WISKI Web Pro allows data consumers with a direct connection to the database and tools for visualization over the Internet. The WISKI solution contains a series of fully integrated modules that can be selected based on the agency's needs.

Table 8-1: Water Resources Data Management Systems Comparison

Feature	Groundwater Analyst (Aquaveo)	Groundwater Data Center (Kennedy Jenks)	HydroDaVE (Wildermuth Synergies)	HydroDMS (RMC Water and Environment)	WISKI (Kisters)
General System Features					
Ability to:					
Access system over the Internet (web-based)		✔	✔	✔	✔
View map of features (GIS-based)	✔	✔	✔	✔	**With Extension**
Integrate with project tracking tools			✔	✔	
Link to external data sources or websites					✔
Integrate with model data	**With Additional Package**			✔	
Data Types					
Ability to store the following time series data:					
Groundwater: including elevation, water quality, and production	✔	✔	✔	✔	✔
Surface water: including streamflow, precipitation, and water quality			✔	✔	✔
Ability to store the following static types of data:					
Well information: including location, construction, and pump information	✔		✔	✔	✔
Geophysical Logs			✔	✔	✔
Lithologic Data			✔	✔	✔
Well Logs			✔	✔	✔
Data Visualization					
Ability to use the following chart and graph features:					
View time-series data in a tabular format	✔	✔	✔	✔	✔
View time series data in a graph format (hydrographs)	✔	✔	✔	✔	✔
Customize graph display parameters			✔	✔	✔
Display water quality data and maximum			✔	✔	

Feature	Groundwater Analyst (Aquaveo)	Groundwater Data Center (Kennedy Jenks)	HydroDaVE (Wildermuth Synergies)	HydroDMS (RMC Water and Environment)	WISKI (Kisters)
contamination limits (MCLs) in graph					
Create Piper diagrams			✔		
Ability to use the following map features:					
View well and site information on the map		✔	✔	✔	**With Extension**
Upload and view GIS shapefiles	✔		✔		**With Extension**
Use zoom, pan, and distance measuring tools	✔	✔	✔	✔	**With Extension**
Add multiple overlays on the map	✔		✔	✔	**With Extension**
Show filtered data in map	✔			✔	
Ability to view attached documents/files		✔	✔	✔	✔
Ability to access a weather report for a well location		✔			
Data Entry					
Ability to:					
Enter well information, time series data, and static data using data entry interfaces or import wizards	✔	✔	✔	✔	✔
Attach electronic files to wells or sites		✔	✔		✔
Update datasets	✔	✔	✔	✔	✔
Import metadata for datasets					✔
Link to continuous data collection systems (e.g. SCADA)					✔
Data Export					
Ability to:					
Export data to CSV or MS Excel format	✔		✔	✔	✔
Export data to PDF format	✔		✔		
Print charts, graphs, and reports	✔			✔	✔

Feature	Groundwater Analyst (Aquaveo)	Groundwater Data Center (Kennedy Jenks)	HydroDaVE (Wildermuth Synergies)	HydroDMS (RMC Water and Environment)	WISKI (Kisters)
Data Analysis					
Ability to:					
Create standard pre-defined reports			✔	✔	✔
Create custom report and ad-hoc queries on-the-fly				✔	✔
Monitor Basin Management Objectives (BMOs)				✔	
Create report for CASGEM upload			✔	✔	
Perform statistical calculations on time series data	✔			✔	✔
Query time series data to generate maps	✔			✔	**With Extension**
Create raster images	✔				
Use automatic calculations to calculate a well's water level elevation		✔		✔	
Calculate flow measurements and rating curves					✔
Create contour maps	✔			✔	
Exclude wells during contouring				✔	
Create lithologic cross section reports				✔	
Create flow direction maps	✔				
Other Features					
Ability to:					
Control user access to data and features			✔	✔	✔
Maintain data confidentiality				✔	
Validate and correct data			✔	✔	✔
Publish data and reports to the web		✔		✔	✔

The Pajaro River Watershed IRWM is committed to implementing a comprehensive, thorough and methodical approach to the tracking, collection, storage and management of data as described in this chapter. Based on the assessment, the RWMG has opted not to employ any of the data management systems in the Table. This decision was made based on judicious use of limited resources and the ability of the

region to capitalize on the existing data infrastructure already in place and synergizing existing systems and project proponent involvement to meet the data management needs of the region. The potential costs of upkeep of the Data Management Systems would detract from other vital areas of Plan requirements and potentially create a duplicative and parallel process.

It has also been ascertained that given the existing network of data collection and storage within the Region, the RWMG can use the existing website to provide the necessary support to implement a system that provides for the data needs of the region and provides for making data and information accessible to stakeholders, neighboring IRWM regions, and State and federal agencies.

8.1.4 Future Data Dissemination and Management Methods

As discussed above, based on the evaluation of data management systems, the RWMG will enhance and maintain a Pajaro River Watershed IRWM website (). This will implement a more robust outreach program and institute a more regular and frequent regimen of data tracking, collection and storage. Furthermore, relevant information will be sorted, categorized topically and curated on an on-going and scheduled basis by the RWMG. Standard protocols will be adhered to in terms of type of information required, timing, updates, and data storage.

Managing the list of projects in the IRWM Plan is another component of on-going data management. Each RWMG member can login and update existing project information or enter new project information in an on-going basis. The RWMG will request that Project Sponsors provide information described in Chapter 8 on an annual basis. As projects are added or removed from the list of projects included in the IRWM Plan, the IRWM Plan will be modified accordingly. The RWMG will keep track of new projects that have been submitted for inclusion in the IRWM Plan as well as projects which have been implemented or are no longer under consideration, and the RWMG will publish, on an annual basis or as needed, an updated list of projects.

8.2 Compatibility with Statewide Databases

Where opportunities for data sharing exist, the RWMG will request Project Sponsors to coordinate with state and federal monitoring and data management efforts to determine specific reporting requirements and formats. Where appropriate, Project Sponsors will manage data in a format that is compatible with these databases to facilitate efficient submission. This will include ensuring that proper quality control and quality assurance of data has been performed by the agency responsible for data collection. Table 8-2 summarizes some of the statewide databases to which IRWM-related data may be submitted.

Table 8-2: State Monitoring and Data Management Programs

Program	Program Manager	Description
California Environmental Resources Evaluation System (CERES)	California Natural Resources Agency	The goal of CERES is to improve environmental analysis and planning by integrating natural and cultural resource information from multiple contributors. It includes an environmental information catalog and a natural resources project inventory. These information systems can be accessed at the CERES website here: http://ceres.ca.gov/.
Groundwater Ambient Monitoring and Assessment (GAMA)	SWRCB	The GAMA program monitors groundwater for a broad suite of chemicals at very low detection limits. Monitoring and assessments for priority groundwater basins are to be completed every 10 years. GAMA is California's most comprehensive water quality monitoring program. It is grouped into 35 groundwater basin groups called "study units." The Pajaro Region is included multiple Study Units within the South Coast Ranges Province (http://ca.water.usgs.gov/projects/gama/Provs/SCoast.htm).
Surface Water Ambient Monitoring Program (SWAMP)	SWRCB	SWAMP is a statewide monitoring effort to assess the conditions of surface waters. In addition to monitoring conducted under the program, SWAMP also hopes to capture information collected under TMDL, Non-Point Source and Watershed Project Support systems. SWAMP provides guidance on methods and quality assurance. This guidance can be found at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/qapp/qaprp082209.pdf.
State Wetland and Riparian Area Monitoring Plan (WRAMP)	SWRCB	WRAMP is intended to track trends in wetland extent and condition to determine the performance of wetland, stream, and riparian protection programs in California. The program defines standardized assessment methods and data management with the goal of minimizing new costs and maximizing public access to assessment information. Additional information on the WRAMP program can be found here: http://www.waterboards.ca.gov/mywaterquality/monitoring_council/docs/wramp_implementation_letter.pdf.
California Environmental Data Exchange Network (CEDEN)	SWRCB	CEDEN was designed to facilitate integration and sharing of data related to California's water bodies (e.g. streams, lakes, and rivers). Water quality data and data related to aquatic habitat and wildlife health are made available to the public through CEDEN. Templates, modeled after SWAMP, are available in Microsoft Excel format to facilitate submission of data to CEDEN (http://www.ceden.org/ceden_datatemplates.shtml).
California Statewide Groundwater Elevation Monitoring Program (CASGEM)	DWR	Senate Bill x7-6 (SBx7-6) mandated a statewide groundwater elevation monitoring program to track the seasonal and long-term trends in groundwater elevations in California's groundwater basins. The bill requires DWR collect the data, which it does through CASGEM. CASGEM reports groundwater elevations in all or part of a groundwater basin or subbasin. DWR oversees the program and coordinates with local entities to maintain groundwater elevation data to ensure it is available to the public. California Water Code (CWC) § 10933.7 requires any entity that manages all or part of a groundwater basin to assume responsibilities for groundwater elevation monitoring and reporting, as required by CWC § 10920 et seq. Monitoring entities can create, edit, and submit data for specific groundwater basins or subbasins through the CASGEM website: http://www.water.ca.gov/groundwater/casgem/.

Currently, each of the three Partner agencies generates an annual groundwater report that can be submitted and utilized for statewide data needs. All groundwater and surface water data reports developed as required by the Project Performance Monitoring Plans for State-funded projects will also be compatible with CERES, SWAMP, GAMA, CASGEM, CEDEN, and WRAMP reporting requirements and formats, as well as other identified, appropriate statewide databases. Project Performance Monitoring Plans will be developed for each State-funded project consistent with State requirements and compatible with State formats.

8.3 Data Gaps

Available data sets and reports have been reviewed for their applicability to the IRWM Plan and statewide data needs and for identification of data gaps. Data gaps represent areas where sufficient information to inform decision making is lacking. Because the identification of information needs can lead to the development of new projects, identifying areas where data gaps exists can be an important part of enhancing watershed understanding and IRWM planning.

An example of a data gap for the region is the need for improving understanding of how groundwater and surface water interact in the upper watershed. Filling this data gap is crucial to obtaining a more complete understanding of the Pajaro River Watershed in the context of developing ecosystem restoration plans and assessing the impact local water management projects may have on the environmental resources in the region. In the case of the upper Pajaro River Watershed, the Groundwater Study & Biological Assessment of the Upper Pajaro River Project was implemented to gather data and clarify the groundwater-surface water interactions and the potential impacts to environmental resources.

For data gaps relating to the region's environmental or cultural resources, more information will be developed in conjunction with the CEQA and NEPA processes required during project environmental compliance processes.

Section 8.1.2 identified the protocol for including source documents as well as complementary documents that have previously been data gaps, thereby shrinking the margin of data gaps and seamlessly absorbing these documents into the data management system. These documents will be collected, topically categorized and curated for reference and for potential project development.

9 Finance

This chapter meets the following IRWM Plan Standards from the Proposition 1 2016 IRWM Program Guidelines (DWR, 2016).

> **Finance** – The IRWM Plan must include a plan for implementation and financing of identified projects and programs (CWC §10541.(e)(8)). The IRWM Plan must also identify and explain potential financing for implementation of the IRWM Plan. The financing discussion must, at a minimum, include the following items:
>
> - List known, as well as, possible funding sources, programs, and grant opportunities for the development and ongoing funding of the IRWM Plan.
> - List the funding mechanisms, including water enterprise funds, rate structures, and private financing options, for projects that implement the IRWM Plan.
> - An explanation of the certainty and longevity of known or potential funding for the IRWM Plan and projects that implement the Plan.
> - An explanation of how operation and maintenance (O&M) costs for projects that implement the IRWM Plan would be covered and the certainty of operation and maintenance funding.

This chapter describes the funding/financing options for the implementation and O&M of IRWM Plan programs and projects and the ongoing funding of the IRWM Plan. Financing plans include a variety of mechanisms including state grant funding, federal grant funding, and local financing from the sale of municipal bonds, low interest loans, land assessments, water rates, and other sources.

9.1 IRWM Plan Funding

In October 2004, Pajaro Valley Water Management Agency (PV Water), San Benito County Water District (SBCWD), and Santa Clara Valley Water District (Valley Water) entered into a Memorandum of Understanding (MOU) for the purpose of coordinating water resources planning and implementation activities watershed-wide. The MOU defined the responsibilities associated with consultant contracting, cost sharing, and information sharing. The MOU also specified the potential need for future agreements to further coordinate long-term water resources management. The three agencies were collectively known as the Pajaro River Watershed Collaborative (Collaborative). In 2005, the Collaborative applied for and was awarded a $500,000 Proposition 50 Integrated Regional Water Management (IRWM) Planning Grant to complete the Pajaro River Watershed IRWM Plan. The Collaborative led and financially supported the development of the IRWM Plan through in-kind services and matching funds. The Pajaro River Watershed IRWM Plan was completed and adopted in 2007.

In 2009, the Collaborative was recognized as the Regional Water Management Group (RWMG) for the Pajaro River Watershed IRWM effort during the California Department of Water Resources' (DWR's) Plan Review Regional Acceptance Process. In 2010, the newly recognized RWMG submitted and was awarded a $1,000,000 Proposition 84 IRWM Planning Grant to update the IRWM Plan to new standards and address data gaps in the region. Again, the Collaborative led and financially supported the development of the IRWM Plan through in-kind services and matching funds. The 2014 Pajaro River Watershed IRWM Plan is the update that was completed through that effort. The current 2019 Pajaro River Watershed IRWM Plan is being updated using in-kind services and funds from each RWMG member agency.

As documented in the Plan Performance and Monitoring Chapter, the RWMG is committed to monitoring and evaluating plan and project implementation. Plan performance will be reported every two years through publication of a biennial IRWM progress report. The RWMG recognizes that the IRWM Plan is a living

document, which needs to be flexible to adapt to changing conditions, new information, and modifications based on lessons learned. The IRWM progress report will help identify the changes needed in subsequent updates, which will be prepared every 5 years or as needed. The RWMG will continue to support these plan efforts through in-kind services and local funds. However, in the future, a more significant update to the plan may require additional funding. IRWM planning funds are no longer available through Propositions 50 and 84; however, a potential new water bond may include IRWM funds for additional planning efforts. This funding source is not a highly secure source given it requires a public vote but the RWMG continues to participate in efforts to support the water bond. Additional funding is not required at this time but may be needed at some point in the future. At that time, the RWMG will lead the effort to identify and secure funding for the IRWM updates, as needed.

9.2 General Plan for Implementation and Financing

Securing funding for project implementation is a significant issue for IRWM Plan implementation. The Pajaro River Watershed has had success in securing funding through the IRWM Implementation Grant Program for project implementation. The RWMG attributes that success to the region's commitment to identifying and supporting projects that deliver multiple benefits and are, thus, more competitive in the funding program.

The RWMG has taken the lead in keeping the stakeholders and project sponsors informed on and involved in IRWM Implementation funding. As IRWM Implementation funding becomes available, the RWMG implements the project review process which involves a call for projects and a project review and prioritization. The projects are then evaluated against the IRWM funding criteria and a suite of projects is selected for inclusion in the grant application, if the region opts to pursue funding. Through this process, the region successfully secured a $25 million Proposition 50 grant, a $7.6 million Proposition 84 grant, and $12.1 million Proposition 84 grant through the Emergency Drought Funding program.

The RWMG's focus for funding has generally been on IRWM funding opportunities. However, given the limited and competitive nature of those funds, it is recognized that the region and the IRWM plan implementation can benefit from coordination on a broader range of funding programs. However, funding opportunities are typically focused on a specific resource management strategy or policy issue, and some stakeholders and project sponsors are not interested in receiving all funding program information. Therefore, the RWMG is considering options for disseminating project funding information only to those stakeholders interested in that particular resource management strategy. The State and Federal funding programs that may be included in the general funding information program are presented in the following sections.

Funding requirements that cannot be secured through outside sources are paid through local funding mechanisms, as described in Section 9.5.

9.3 State Funding Opportunities

Funding for IRWM project implementation may be available through numerous state programs, as presented below.

9.3.1 Proposition 1

Proposition 1E, the Disaster Preparedness and Flood Protection Bond Act, encourages new investments for flood protection and storm water management programs.

9.3.1.1 Storm Water Grant Program

Through Proposition 1 section 79747, DWR will award up to $200 million in grant funds for multi-benefit stormwater management projects. These projects can include green infrastructure, rainwater and stormwater capture projects, and stormwater treatment facilities. Stormwater Resource Plans are required to obtain grant funds for stormwater or dry weather capture projects. The State Water Board awarded $10 million in planning grants and $80 million during Round 1 for implementation grants. Round 2 implementation grants has approximately $90 million available and the solicitation period is planned for summer 2019.

9.3.1.2 IRWM Implementation Grant Program

DWR provides funding under Proposition 1 for implementation of projects that are part of an IRWM plan. Approximately $222 million in grant funding is being made available for implementation projects, awarded over two rounds. Round 1 grant proposals are due in fall of 2019 and the round 2 solicitation is planned to occur the following year. The Pajaro Region plans to submit a proposal for both rounds of grant funding to support multi-benefit projects in the watershed.

9.3.2 Other State Funding

9.3.2.1 State Revolving Fund

The Federal Safe Drinking Water Act (SDWA) Amendments of 1996 authorized the creation of a revolving fund program for public water system infrastructure needs specific to drinking water. There is similar state legislation and the Safe Drinking Water State Revolving Fund reflects the intent of federal and state laws to provide grant funding or low-interest loans to correct deficiencies in public water systems based on a prioritized system. Other programs established State Revolving Fund (SRF) programs to address clean water and other infrastructure needs. There are three different entities that provide loans and/or grants under the State Revolving Fund (SRF).

9.3.2.1.1 Safe Drinking Water SRF

Under this SRF program, CDPH provides loans to assist public water systems in achieving and maintaining compliance with the SDWA. Up to $20 million is available per project. Disadvantaged community systems can obtain a zero interest loan and may be eligible for partial grant funding. All applications to this program are initially made for loans, however financial review may determine if grant funds apply.

9.3.2.1.2 Infrastructure SRF

The California Infrastructure and Economic Development Bank, also known as I-Bank, provides financing to local municipal entities for construction and/or repair of publicly owned water supply, treatment and distribution systems, and drainage, and flood control facilities. In addition to water-related projects, loans are available for public infrastructure projects that include parks and recreational facilities and environmental mitigation.

9.3.2.1.3 Clean Water SRF

SWRCB also provides financing for wastewater treatment facility construction projects and expanded use projects that include nonpoint source and estuary projects. Funding options are available to public agencies, as well as non-profit organizations and Native American tribes, for up to $50 million per year.

9.3.2.2 State Water Resources Control Board – Federal 319 Program

This program, administered by the SWRCB, is a nonpoint source pollution control program that is focused on controlling activities that impair beneficial uses and on limiting pollutant effects caused by those activities. The program is federally funded on an annual basis. Project proposals that address Total Maximum Daily Load (TMDL) implementation and those that address problems in impaired waters are favored in the selection process. There is also a focus on implementing management activities that reduce and/or prevent release of pollutants that impair surface and ground waters. Nonprofit organizations, local government agencies including special districts, tribes, and educational institutions qualify. State or federal agencies may qualify if they are collaborating with local entities and are involved in watershed management or proposing a statewide project.

9.3.2.3 State Water Resources Control Board – Water Recycling Funding Program

This is a long-term program operated by the SWRCB that offers grants and low-interest loans for the planning, design and construction of water recycling facilities. Grants are provided for facilities planning studies to determine the feasibility of using recycled water to offset the use of fresh/potable water from state and/or local supplies. Pollution control studies, in which water recycling is an alternative, are not eligible. Planning grants are limited to 50 percent of eligible costs, up to $75,000. Construction grants are limited to 25 percent of project costs or $5,000,000, whichever is less. Only public agencies are eligible. The Water Recycling Funding Program receives funding from various sources, including Proposition 50 and the SRF. Due to the varying funding sources, preferences for funding can vary. For example, funding from Proposition 50 gives preference to those recycling projects that result in benefits to the Delta.

9.3.2.4 Department of Water Resources – New Local Water Supply Construction Loans

Under this program, DWR provides loans to local public agencies for projects. Eligible projects include canals, dams, reservoirs, desalination facilities, groundwater extraction facilities, or other construction or improvements which will remedy existing water supply problems. Loans for construction projects can be provided for up to $5 million, with an interest rate equal to those of the general obligation bonds sold to finance the program.

9.3.2.5 Department of Housing and Community Development – Community Development Block Grant

The California Department of Housing and Community Development provides grants to cities and counties with a program emphasis on creating or retaining jobs for low-income workers in rural communities. Activities may include housing rehabilitation and public improvements, which may involve among other things, water, wastewater and other infrastructure projects as well as feasibility studies.

9.3.2.6 California Energy Commission (CEC) – Energy Financing Program

The California Energy Commission provides loan financing for water and wastewater utilities for energy efficiency projects, feasibility studies, and implementing energy-saving and renewable energy measures. Eligible uses include, but are not limited to, lighting, motors or variable frequency drives, pumps, insulation, HVAC, energy generation and cogeneration.

9.4 Federal Funding Opportunities

Agencies in the Pajaro River Watershed have been awarded Federal Funding to implement water resource management projects. More recent awards have included a $7 million award to Valley Water through

ARRA for the South County Recycled Water Improvement Project pipelines and a $20 million award to the City of Watsonville and PV Water for construction of the Watsonville Recycled Water Treatment Facility. This chapter includes a discussion of funds available through various federal programs and specifies eligibility requirements.

9.4.1 Environmental Protection Agency, Source Reduction Assistance

The purpose of this program is to prevent the generation of pollutants at the source and ultimately provide an overall benefit to the environment. This program seeks projects that support source reduction, pollution prevention, and/or source conservation practices. Source reduction activities include: modifying equipment or technology; modifying processes or procedures; reformulating or redesigning products; substituting raw materials; and generating improvements in housekeeping, maintenance, training, or inventory control. Pollution prevention activities reduce or eliminate the creation of pollutants via such procedures as: using raw materials, energy, water or other resources more efficiently; protecting natural resources through conservation; preventing pollution; and promoting the re-use of materials and/or conservation of energy and materials. Eligible organizations include units of state, local, and tribal government; independent school district governments; private or public colleges and universities; nonprofit organizations; and community-based grassroots organizations. This program is on a two-year cycle, with program funding based on congressional appropriations.

9.4.2 Environmental Protection Agency, Wetlands Program Development Grants

This program seeks projects that promote the coordination and acceleration of research, investigations, experiments, training, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, reduction, and elimination of water pollution. The US EPA has identified three priority areas: (1) the development of a comprehensive monitoring and assessment program; (2) the improvement of the effectiveness of compensatory mitigation; and (3) the refinement of the protection of vulnerable wetlands and aquatic resources. A 25 percent match is required. Eligible entities include states, tribes, local governments, interstate associations, intertribal consortia, and national non-profit, non-governmental organizations.

9.4.3 Environmental Protection Agency, Five Star Restoration Program

This program is a partnership among various entities, including the US EPA, U.S. Forest Service, National Association of Counties and National Fish and Wildlife Foundation. This program provides grants, technical support and opportunities for information exchange to develop community capacity to sustain local natural resources for future generations. Projects focus on elements, including on the ground restoration, meaningful environmental education, diverse partnerships, and measurable ecological and educational/social benefits.

9.4.4 Water Resources Development Act

The Water Resources Development Act is federal legislation, first passed in 1974, that enables authorization of Corps projects, including levee repair, beach management, aquatic ecosystems, flood emergency and water infrastructure projects. The Act has traditionally been reauthorized every two years and was last reauthorized in 2018. After reauthorization, Congress appropriates funds for specific projects that meet the purpose of the Act.

9.4.5 National Marine Fisheries Service (NMFS), NOAA Coastal and Marine Habitat Restoration

This program provides funding for restoration projects that use a habitat-based approach to rebuild productive and sustainable fisheries, contribute to the recovery and conservation of protected resources, promote healthy ecosystems, and yield community and economic benefits. The funding opportunity focuses on coastal habitat restoration projects that aid in recovering listed species and rebuilding sustainable fish populations or their prey. For the 2019 grant cycle, award amounts will range from $75,000 to $3 million. For more information see: .

9.4.6 National Park Service (NPS), Rivers, Trails, and Conservation Assistance (RTCA) Program

The purpose of this program is to conserve rivers, preserve open space, and develop trails and greenways. The program provides staff assistance, but not funding, to meet this intent. Projects are evaluated on how successfully they meet the following criteria: (1) a clear anticipated outcome leading to on-the-ground success; (2) commitment, cooperation, and cost-sharing by interested public agencies and non-profit organizations; (3) opportunity for significant public involvement; (4) protection of significant natural and/or cultural resources and enhancement of outdoor recreational opportunities; and (5) consistency with the NPS mission. Eligible organizations include non-profits, community groups, tribes or tribal governments, and state or local government agencies.

9.4.7 U.S. Department of Agriculture (USDA) – Rural Development, Water and Waste Disposal Program

The Water and Waste Disposal Program provides financial assistance in the form of grants and loans for the development and rehabilitation of water, wastewater, and storm drain systems within rural communities. Funds may be used for costs associated with planning, design, and construction of new or existing water, wastewater, and storm drain systems. Eligible projects include storage, distribution systems, and water source development. Projects must benefit cities, towns, public bodies, and census-designated places with a population less than 10,000 persons. The intent of the program is to improve rural economic development and improve public health and safety.

9.4.8 U.S. Bureau of Reclamation (USBR), WaterSMART Grant Programs

This grant program is intended to fund collaborative local projects that improve water conservation and management through advanced technology and conservation markets. Through this program, federal funding is provided to irrigation and water districts for up to 50 percent of the cost of projects involving conservation, efficiency and water marketing. Eligible applicants include irrigation and water districts and state governmental entities with water management authority. Applicants must be located in the western U.S. (California is an eligible area). Applicants do not have to be part of a USBR project but proposals with a connection to USBR will receive more weight in the evaluation process. Past and proposed programs have included Basin Studies, Water and Energy Efficiency Grants, Advanced Water Treatment Pilot and Demonstration Projects, Grants to Develop Climate Analysis Tools, and Title XVI – Water Reclamation and Reuse. Funding opportunities vary depending on available program funding.

9.4.9 U.S. Fish and Wildlife Service (USFWS), North American Wetlands Conservation Act Grant

This grant program funds projects that provide long-term protection of wetlands and the species that depend upon wetlands. Applicants must provide local match equal to that requested. The Small Grants Program

provides up to $100,000 per project in funding and the Standard Grants Programs provided approximately $47 million in funding to the whole U.S. in 2018 and is applicable to projects exceeding $75,000. Entities that are eligible include organizations and individuals who have developed partnerships to carry out wetlands conservation projects in the U.S., Canada, and Mexico. Small Grants only apply to the U.S. These USFWS grants are on a two year funding cycle.

In addition to the programs listed above, specific congressional authorizations and funding may be obtained to study, build, and construct specific projects in the Region. Potential sources include legislation and funding associated with renewal of the Clean Water Act (CWA), SDWA, and appropriations for specific agencies, such as the Corps and the US EPA.

The Water Resources Development Act (WRDA) authorizes projects and policies of the Civil Works program of the Corps. The Corps is a federal agency in the Department of Defense with military and civilian responsibilities. At the direction of Congress, the Corps plans, builds, operates, and maintains a wide range of water resources facilities in U.S. states and territories. The agency's traditional civil responsibilities have been creating and maintaining navigable channels and flood risk management. However, in the last two decades, Congress has increased the Corps' responsibilities in ecosystem restoration, municipal water and wastewater infrastructure, disaster relief, and other activities. WRDA often includes specific authorizations for federal, regional, and local projects. Inclusion in WRDA authorizes a given project but does not guarantee funding for a specific project.

Local projects can also receive authorization and federal funding as part of appropriations for the US EPA. The US EPA will enter into assistance agreements with local agencies to fund studies and projects associated with: (1) various environmental requirements (e.g., wastewater treatment); (2) identifying, developing, and/or demonstrating necessary pollution control techniques to prevent, reduce, and eliminate pollution; and/or (3) evaluating the economic and social consequences of alternative strategies and mechanisms for use by those in economic, social, governmental, and environmental management positions.

9.5 Local Funding Mechanisms

Local funds are required for construction of projects when outside funding is not secured; to meet matching fund requirements consistent with any awarded grant funding; and operations and maintenance costs. Local funding mechanisms may include water and wastewater general funds; capital improvement funds; development impact fees; and general funds from local cities, county departments, other local agencies, private organizations, member dues, etc. Local taxpayers may also fund these projects through rate increases, bond measures, and tax increases. These mechanisms are described below.

9.5.1 Capital Improvements Program Funding (Revenue Bonds, Certificates of Participation)

Water districts, as well as other government entities (e.g., counties and cities), can raise funds by issuing municipal bonds or certificates of participation. Bonds and certificates of participation are governed by an extensive system of laws and regulations. Under these systems, investors provide immediate funding for the promise of later repayment. Generally, bonds and certificates of participation are used for capital improvement projects. In the case of a water district, bonds and certificates are secured by revenues from the water system and by property taxes received by the agency.

9.5.2 Benefits/Assessments, Benefits/Assessment Zone Formation

Benefit assessments are special charges levied on property to pay for public improvements that benefit property in a predetermined district. Benefit assessments link the cost of public improvements to those landowners who specifically benefit from the improvements. Benefit assessment zones are defined

geographically and levies are put on all properties within a designated benefit assessment zone. The boundaries of a benefit assessment district may coincide exactly with those of a city, county, or other existing special district, or they may cover only part of those jurisdictions.

A comprehensive engineer's report is needed to form a benefit assessment district. The report must outline the proposed area, key projects, estimated project costs, annual cost to each property, and the benefit formula used to determine each property's share of the cost. It forms the legal basis for a benefit assessment district and must be formally approved by the governing body that will administer the district. In November 1996, California voters approved Proposition 218, the Right to Vote on Taxes Act, which among other constraints, established a strict definition of special benefits, and instituted a common formation and ratification process for all benefit assessment districts.

9.5.3 User Fees

Funding for construction and operation and maintenance of water-related projects often comes from user fees, which are charges for water delivered to a home or business, or charges for wholesale water supplies. In addition to these fees, many agencies also charge "hook-up" or "connection" fees – charges for providing facilities to provide water or wastewater services to new development. These fees are also known as "facility capacity fees." Facility capacity fee revenue is difficult to forecast due to the unpredictable timing of development activity. Development activity depends on real estate demands, the regional economy, and land use planning activity. Revenue from user fees and water charges can also fluctuate with the regional economy, short-term water use reductions or restrictions, and precipitation.

9.6 Certainty and Longevity of Funding

9.6.1 Funding for the Plan and Projects that Implement the Plan

The RWMG will continue to support the Plan through in-kind services and local funds. However, in the future, a more significant update to the plan may require additional funding through state grants or a cost share agreement with Region stakeholders. IRWM planning funds are no longer available through Propositions 50 and 84; however, a potential new water bond may include IRWM funds for additional planning efforts. This funding source is not a highly secure source given it requires a public vote but the RWMG continues to participate in efforts to support the water bond. To support major updates to the Plan, a cost share agreement could be developed with the Region stakeholders to fund the Plan review and updates. Additional funding is not currently required but may be needed at some point in the future. At that time, the RWMG will lead the effort to identify and secure funding for the IRWM updates, as needed.

The RWMG will help Project Sponsors implement Plan projects by supporting grant applications, maintaining the Plan, and providing information on State funding opportunities. However, Project Sponsors are responsible for applying to grants to fund their projects. There are several funding options available for project implementation as described in sections 9.3-9.5. New State and Federal funding is likely to be available through existing programs and through new bond measures. Projects can also obtain matching or full funding through local funding mechanisms.

9.6.2 Funding for Operations and Maintenance of Projects that Implement the Plan

The Project Submittal Form requests information on estimated annual costs for projects that implement the plan. The Project Sponsor is responsible for ensuring they can secure grant funds or use local funding mechanisms to operate and maintain their project. The RWMG considers the Project Sponsor's ability to operate and maintain the project when scoring the project. Projects with higher scores are more likely to be

implemented and are considered high priority projects for the region. DAC projects have the greatest uncertainty for funding of operations and maintenance (O&M) costs. However, many of the DAC projects in the plan have project partners that can help support the O&M of the project and there are grant opportunities described in section 9.3 and 9.4 that can support DAC community needs.

10 Technical Analysis

This chapter addresses the following standard from the Proposition 1 2016 IRWM Program Guidelines:

> **Technical Analysis** – The IRWM Plan must document the data and technical analyses that were used in the development of the Plan.

The intent of this standard is to document that the IRWM Plan is based on sound technical information, analyses, and methods. This chapter presents an overview of the technical information that was used in IRWM Plan development, lists pertinent technical analyses and methods, and identifies data gaps where additional monitoring or studies are needed.

10.1 Technical Information

The IRWM Plan documents the results of a collaborative effort between public agencies with varying water, wastewater, flood and watershed management responsibilities and numerous other interested entities. The Pajaro River Watershed was developed using data and technical analyses developed by the RWMG partners as well as other local, state, and federal agencies. The information represents the best known information on the current and projected water resource conditions in the watershed. Planning and analysis was conducted at the local, subregional, regional, and interregional levels and has been used as the basis for analysis in the IRWM Plan.

- **Local Level**. The "Local Level" refers to water resources planning that is conducted over a relatively limited geographic extent, such as an individual municipality, flood zone, or small/partial watershed. Planning and analysis occurring at the local level frequently serves as the basis for planning and analysis conducted at larger geographic scales. An example of local planning includes city and county general plans and agency specify capital improvement plans.
- **Subregional Level**. The "Subregional Level" refers to water resources planning and analysis that is conducted across a larger geographic scale than the local level, while not encompassing the entire region. Subregional-level planning includes planning across multiple municipalities, large flood zones, or large watersheds. An example of subregional planning is the Hollister Urban Area Water and Wastewater Management Plan. This type of analysis and planning frequently builds upon analyses and plans developed at the local level.
- **Regional Level.** The "Regional Level" refers to the water resources planning and analysis being conducted across the entire Pajaro River Watershed region, such as that being conducted through IRWM Plan development and the Pajaro River Watershed Flood Prevention Authority. This type of planning frequently incorporates and builds upon planning conducted at both the local level and the subregional level.
- **Interregional Level.** The "Interregional Level" refers to water resources planning that is conducted beyond the boundaries of the Pajaro River Watershed. This level of planning includes efforts such as the South Central California Coast Steelhead Recovery Plan or climate change analyses.

10.2 Technical Analyses

This section provides a description of the studies, models, and other technical methodologies that were used to develop the RWMG's and stakeholders' understanding of the water management issues in the Pajaro River Watershed. The information in Table 10-1 is categorized by local, sub-regional, regional, and interregional studies and data sets.

Table 10-1: Technical Analyses Documents and Data Sets

Document Title/Data Type	Date	Prepared For	Description
Local Level			
City of Gilroy General Plan	June 2002	City of Gilroy	Provides list of Cities' policies, goals and actions for land use, water conservation, water reclamation, flood control, habitat protection and open space preservation
City of Hollister General Plan	December 2005	City of Hollister	
City of Morgan Hill General Plan	July 2016	City of Morgan Hill	
City of Watsonville General Plan	May 1994, August 2012	City of Watsonville	
City of Hollister Long-Term Wastewater Management Plan	December 2005	City of Hollister	Provides plan for wastewater treatment, effluent management and recycled water for the City of Hollister. Identifies projects and schedule of implementation.
City of Watsonville 2015 Urban Water Management Plan UWMP	2015	City of Watsonville	Provides understanding of Watsonville urban water needs, management, and planning objectives
Salsipuedes Creek Maintenance Analysis (File #50275)	February 2005	Santa Cruz County Flood Control and Conservation District Zone 7	Provides technical understanding of Salsipuedes Creek hydrology, hydraulics, and sedimentation and further understanding of Lower Pajaro River watershed dynamics and maintenance activities
Biological Assessment Pajaro River and Salsipuedes and Corralitos Creeks Management and Restoration Plan Santa Cruz County, California	September 2001	County of Santa Cruz	Provides understanding of biological and restorative plans within the Pajaro River
Subregional Level			
Monterey County General Plan 2010	October 2010	Monterey County	Provides list of Counties' policies, goals and actions for land use, water conservation, water reclamation, flood control, habitat protection and open space preservation
San Benito County General Plan	July 2015	San Benito County	
The Santa Clara County General Plan (1995-2010)	December 1994	Santa Clara County	
Santa Cruz County General Plan	May 1994	Santa Cruz County	
County Crop Reports	Annual	Counties	Information on agricultural production and trends

Document Title/Data Type	Date	Prepared For	Description
Hollister Area UWMP	June 2016	Sunnyslope County Water District, City of Hollister, and SBCWD	Provides understanding of Hollister area's urban water needs, management, and planning objectives
Hollister Urban Area Water and Wastewater Master Plan Update (HUAWWMP)	June 2017	City of Hollister, Sunnyslope County Water District, County of San Benito, and SBCWD	Provides an understanding of the water and wastewater needs of the Hollister urban area as well as a plan of implementation for meeting those needs
Coordinated Water Supply and Treatment Plan	2009	City of Hollister, Sunnyslope County Water District, County of San Benito, and SBCWD	Provides an understanding of the water and wastewater needs of the Hollister urban area as well as a plan of implementation for meeting those needs
Hollister Urban Area Water and Wastewater Master Plan and Coordinated Water Supply Treatment Plan Final PEIR	2011	City of Hollister, Sunnyslope County Water District, County of San Benito, and SBCWD	Provides an understanding of the water and wastewater needs of the Hollister urban area as well as a plan of implementation for meeting those needs
Basin Management Plan Update	February 2014	PV Water	Provides an understanding of groundwater management conditions and needs in the Pajaro Valley, basin management objectives, and projects and programs to address the objectives
Revised Basin Management Plan	February 2002	PV Water	Groundwater sustainable yield
SBCWD Groundwater Management Plan Update for the San Benito County Part of the Gilroy-Hollister Groundwater Basin	May 2004	SBCWD and Water Resource Association of San Benito County	Provides understanding of San Benito groundwater issues and management plans in the San Benito County portion of the Gilroy-Hollister groundwater basin
Development of a Water Quality Monitoring Program – Hollister Groundwater Basin	June 2004	SBCWD	Groundwater quality data

Document Title/Data Type	Date	Prepared For	Description
Valley Water UWMP	2015	Valley Water	Provides an understanding of Santa Clara County water needs and management strategies
2016 Groundwater Management Plan	2016	Valley Water	Provides an understanding of groundwater management conditions and needs in the Llagas Groundwater Subbasin, basin management objectives, and projects and programs to address the objectives
Water Supply and Infrastructure Master Plan	2012	Valley Water	Presents Valley Water's water supply strategy for providing a reliable supply of water
South County Recycled Water Master Plan	2015	SCRWA & Valley Water	Provides understanding of South Santa Clara County plans for recycled water availability and use
South County Water Supply Plan (SCWSP)	July 2010	Valley Water	Provides specific strategies for ensuring a reliable supply of high quality water in southern Santa Clara County; prepared in conjunction with local land use agencies
Groundwater Quality Report	Annual	Valley Water	Groundwater quality data
Upper Llagas Creek Project FEIR	May 2014	Valley Water	Upper Llagas Creek flooding history and proposed project.
San Felipe Preventive Maintenance Shutdown, Final Study/Environmental Assessment	August 2003	Valley Water	For understanding of the environmental issues surrounding San Felipe Preventative Maintenance Shutdown
Pajaro River Bench Excavation Analysis (Supplemental) & Analysis 2	2004	Santa Cruz County Flood Control and Water Conservation District	Directly related to the Lower Pajaro River Bench Excavation Project, Pajaro River Flood Protection Program
Pajaro River Stable Planform Study – Pajaro River Channel Planform and Channel Forming Discharge Analysis	July 2003	Corps	For recommendations regarding lowering bench elevations as one of four methods proposed for restoring the Pajaro River channel to its original bankfull dimensions
Lower Pajaro River Enhancement Plan: For Green Valley, Casserly,	December 2002	Santa Cruz County Resource	Directly related to Erosion Control, Vegetative Treatment, and Riparian Restoration Project, which is part of

Document Title/Data Type	Date	Prepared For	Description
Hughes, Tynan, Coward, and Thompson Creeks		Conservation District	the Pajaro River Water Quality Program
Final Environmental Impact Report Pajaro River and Salsipuedes and Corralitos Creeks Management and Restoration Plan, Santa Cruz County, California	February 2002	County of Santa Cruz	For understanding of the environmental impacts of environmental and restorative plans for the Pajaro River and tributaries
Pajaro Valley Sub-basin Salt and Nutrient Management Plan	2016	PV Water	Plan for managing groundwater salts, nutrients, and other significant chemical compounds
Llagas Sub-basin Salt and Nutrient Management Plan	2014	Valley Water	Plan for managing groundwater salts, nutrients, and other significant chemical compounds
Regional Level			
Land Use Data	2010	NOAA	Land cover maps and analysis
Groundwater Basin Boundaries	2018	DWR	Groundwater basin boundaries
Pajaro River Watershed Study Reports Phase I Phase II Phase III Phase IV	 July 2002 April 2003 February 2005 June 2005	Pajaro River Watershed Flood Prevention Authority (PRWFPA)	Directly related to Soap Lake Floodplain Preservation Project, Pajaro River Flood Protection Program
Pajaro River Watershed Water Quality Management Plan	June 1999	Association of Monterey Bay Area Governments	Provides understanding of AMBAG water quality management goals
Interregional Level			
Water Quality Control Plan for Central Coastal Basin (Basin Plan)	2017	Central Coast RWQCB	Provides understanding of the surface- and groundwater quality objectives of the Central Coast RWQCB.
TMDL Reports and Web Page	Accessed July 2014	Central Coast RWQCB	Information TMDLs that have been completed or are in process
Order No. R3-2012-0011 (Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands	2012	Central Coast RWQCB	RWQCB requirements for irrigated lands

Document Title/Data Type	Date	Prepared For	Description
2010 Integrated Report	2010	U.S. Environmental Protection Agency	Information on TMDLs and pollutants in the Pajaro River Watershed
Action Plan IV: Agriculture and Rural Lands Water Quality Protection Program	October 1999	Monterey Bay National Marine Sanctuary	Provides understanding of the MBNMS water quality protection program, which has aided in the development of the Pajaro River Water Quality Program
2011 State Water Project Reliability Report Delivery Reliability Report	2012	DWR	Imported water delivery projections
Designation of Critical Habitat for the California Tiger Salamander, Central Population; Final Rule	2005	U.S. Fish and Wildlife Service	Location of the critical habitat
South-Central California Coast Steelhead Recovery Plan	2013	National Marine Fisheries Service	Location of critical habitat and specific biological objectives
U.S. Census American Community Survey	2010	U.S. Census Bureau	Median Household Incomes
California Natural Diversity Database	Regularly Updated	California Department of Fish and Wildlife	Inventories of the status and location of plants and animals in California
California Water Plan Update	2018	DWR	Resource Management Strategies, climate change impacts and adaptation strategies
Draft California Water Plan Update	2013	DWR	Resource Management Strategies
Cal-Adapt	Regularly Updated	California Energy Commission (CEC)	Climate change data and projections
Using Future Climate Projections to Support Water Decision Making in California	2009	CEC	Climate change projections, and vulnerability analysis
Best Practice Approaches for Characterizing, Communicating, and Incorporating Scientific Uncertainty in Decisionmaking	2009	U.S. Climate Change Science Program	Climate change vulnerability analyses; adaptation strategies

Document Title/Data Type	Date	Prepared For	Description
Adapting to the Impacts of Climate Change	2010	National Academy of Sciences	Climate change vulnerability analyses; adaptation strategies
Synthesis of Adaptation Options for Coastal Areas	2009	U.S. EPA	Climate change vulnerability analyses; adaptation strategies
State of California Sea-Level Rise Guidance 2018 Update	2018	California Climate Action Team Coastal and Ocean Working Goup	Climate change projections and vulnerability analysis
Climate Change Handbook for Regional Water Planning	2011	DWR and U.S. EPA	Climate change analysis and evaluation techniques; information references; summaries of vulnerabilities
The Future is Now: An Update on Climate Change Science, Impacts, and Response Options for California	2009	CEC	Climate change impacts
2009 California Climate Adaption Strategy	2009	California Natural Resources Agency	Climate change vulnerability analysis and adaptation strategies
Simulation of Climate Change in San Francisco Bay Basins, California: Case Studies in the Russian River Valley and Santa Cruz Mountains	2012	U.S. Geological Survey	Climate change projections

10.3 Data Gaps

During the course of the preparation of this IRWM Plan, data needs were identified by stakeholders and resource specialists working on the plan. Data needs identified for the region include:

- Data on sea level rise
- Improved projections of wetland response to sea level rise
- Projections of future habitat change
- Regional hydroclimate (hydrology and weather), including projections of microclimatic change and fog
- Statewide hydroclimate data on imported water supplies that show influence of climate change
- Updated climate change projections to reflect new data, methods, and improved understanding of climate change
- Weather variability (e.g., monthly averages of maximum and minimum daily air temperatures monthly precipitation and ET, etc.) Market saturation of water efficient fixtures

11 Relation to Local Water and Land Use Planning

The Pajaro River Watershed IRWM Plan process is designed to meet the collective needs of cities, counties, water and wastewater agencies and other stakeholders in the region. These entities have been involved in many planning efforts to develop goals and plans related to water management issues. The planning documents created from these efforts serve as an important foundation for the IRWM Plan. The IRWM Plan has integrated the goals, objectives and programs contained in these documents to ensure that it is consistent with local issues and needs.

The Pajaro River Watershed IRWM Plan process was borne out of collaborative discussions regarding regional needs, proposed projects, and teaming for regional effectiveness. With the recognition that multiple agencies had shared needs and similar objectives, the RWMG has worked toward developing and implementing a regional plan and programs that could bring about integrated projects for the benefit of many stakeholders. This effort is supported by the MOU described in Chapter 1 that was signed by all Partners to support regional water resources management planning. This MOU demonstrated their dedication to joint coordination of local water resources planning efforts.

The IRWM Plan was developed in coordination with local agencies and the planning documents that have been produced for the Pajaro River Watershed region. These include General Plans, Urban Water Management Plans, Basin Management Plans, Stormwater Resources Plans, and other plans covering several areas such as recycled water, groundwater management, water resources, and environmental enhancement. The relevance of these documents to the IRWM Plan is discussed below and summarized in Table 11-1, provided at the end of this chapter. Studies, analyses and assessments which directly support these plans are also shown. Coordination and collaboration occurred through meetings, teleconferences, workshops, and personal communications (See Chapter 12 – Stakeholder Involvement) with agencies and entities identified in this table to understand their various efforts, planning goals and objectives, and proposed water management strategies. This table is not intended to be a comprehensive list of every report reviewed, but does reflect many of the documents and efforts within the Pajaro River watershed. Table 11-1 also includes some plans that are currently being prepared. In the future, local planning efforts will be incorporated into the IRWM Plan through an ongoing local planning review process that will identify additional documents, efforts, and projects throughout the implementation of the IRWM Plan.

11.1 Relation to Local Water Planning

This chapter meets the following IRWM Plan Standard from the Integrated Regional Water Management Grant Program Guidelines.

> **Relation to Local Water Planning –** The IRWM Plan must be congruent with local plans and include current, relevant elements of local water planning and water management issues common to multiple local entities in the Region. This IRWM Plan describes how the RWMG coordinates its water management planning activities to address or incorporate all or part of the following member actions:
>
> - Sustainable Groundwater Management
> - Urban and Agricultural Water Management
> - Water Supply Assessments
> - City and County General Planning
> - Stormwater Resources Plans

- Flood Protection and Watershed Management
- Multipurpose Program Planning
- Low Impact Development
- Salt and Salinity Management
- Emergency Response, Disaster Plans

11.1.1 Local Planning Documents

The IRWM Plan is built on a foundation of local water planning documents and serves to coordinate the water-related portions of these planning efforts. The IRWM Plan thus provides a means of coordinating the diverse water planning documents developed for and within the Pajaro region. In addition, the RWMG will consider and incorporate water management issues and climate change adaptation and mitigation strategies from local plans into the IRWM Plan.

11.1.1.1 Urban Water Management Plans

The IRWM Plan has been coordinated with various Urban Water Management Plans (UWMPs) in the Pajaro River Watershed and will continue to coordinate with the UWMPs as they are updated in 2021 to comply with State of California requirements. UWMPs consider city and county population growth projections developed at the local level and link these directly to the assessment of water supply needs. The UWMPs rely in part on other planning documents such as general plans and land use plans to provide these projections. The projected water demands from the UWMPs are utilized in the IRWM Plan to determine regional water supply needs. UWMPs also take into account local conservation and recycled water planning and provide a greater understanding of water needs and issues faced by local water agencies and communities. To the extent that the updated UWMPs consider climate change adaptation and mitigation strategies, those strategies will be incorporated into the IRWM Plan as appropriate.

11.1.1.2 Sub-Regional Plans

Other plans in the Pajaro River Watershed consist of efforts to address specific water management issues. Some of these plans have already taken steps to consolidate local planning efforts and address specific issues such as water supply, groundwater, wastewater, and habitat restoration on a sub-regional basis within the Pajaro River Watershed. In most cases, these are multi-agency efforts that involve the participation of a number of stakeholders. Thus, these sub-regional plans have achieved certain levels of integration and stakeholder consensus and provide an important foundation for development of the IRWM Plan. Projects recommended in sub-regional plans have already been coordinated at the sub-regional level and are included in the IRWM Plan. As sub-regional plans incorporate climate change adaptation and mitigation strategies, the IRWM Plan will consider and incorporate those strategies as appropriate. Examples of sub-regional plans are described below.

11.1.1.2.1 Pajaro Valley Basin Management Plan Update

Pajaro Valley issues of seawater intrusion, overdraft and water supply, and water recycling have been determined as high priority issues through the IRWM Plan process. The Basin Management Plan Update is the result of a comprehensive stakeholder driven planning effort to determine solutions to those issues and its recommended projects are incorporated into the IRWM Plan to address the local needs identified for that area of the watershed. As an indicator of the importance of the Basin Management Plan, the City of Watsonville's General Plan specifically calls for the city to participate in the Basin Management Plan development process.

11.1.1.2.2 Groundwater Management Plan Update for the San Benito County Portion of the Gilroy-Hollister Groundwater Basin

The Groundwater Management Plan (GMP) Update addresses groundwater issues such as groundwater quality, high groundwater levels and limited wastewater effluent disposal options, which are a priority in the San Benito County area. Many of the objectives described in the GMP Update are represented in the IRWM Plan objectives. The IRWM Plan includes a number of near- and long- term projects that were drawn from the GMP Update project toolbox.

11.1.1.2.3 Hollister Urban Area Water and Wastewater Management Plan

The Hollister Urban Area Water and Wastewater Management Plan was completed in 2011 through a partnership of the City of Hollister, SBCWD, and the Sunnyslope County Water District. The plan has three main components – expanded drinking water treatment, improved water supply reliability and recycled water, and protection of the groundwater basin – and is being implemented as the Hollister Urban Area Water Project. The project elements are included in the Pajaro River Watershed IRWM Plan.

11.1.1.2.4 Santa Clara Habitat Plan

The Santa Clara Habitat Plan (Habitat Plan) is a 50-year regional plan to protect endangered species and natural resources while allowing for future development in Santa Clara County. In 2013 the Habitat Plan was adopted by all local participating agencies (including Valley Water, the County of Santa Clara, and the cities of Morgan Hill and Gilroy) and permits were issued from the US Fish and Wildlife Service and California Department of Fish and Wildlife. It is both a habitat conservation plan and natural community conservation plan, or HCP/NCCP. This planning document:

- Helps private and public entities plan and conduct projects and activities in ways that lessen impacts on natural resources, including specific threatened and endangered species.
- Identifies regional lands—called reserves—to be preserved or restored to benefit those species.
- Describes how reserves will be managed and monitored to ensure that they benefit those species.

In providing a long-term, coordinated program for habitat restoration and conservation, the Habitat Plan aims to enhance the viability of threatened and endangered species throughout the Santa Clara Valley. Thus, the plan is consistent with many of the IRWM Plan objectives listed under the Environmental Protection and Enhancement goal.

11.1.1.2.5 South County Water Supply Planning project

Valley Water completed the South County Water Supply Planning Project in 2010 in collaboration with the cities of Morgan Hill and Gilroy and the County of Santa Clara. The recommendations of the project included:

- Repair or replace the Main Avenue and Madrone Pipelines (completed in 2019);
- Develop additional recycled water options, including turnouts along SCRWA's South Pipeline;
- Focus on groundwater recharge and recycling in future water supply planning efforts; and
- Continue groundwater protection efforts.

These recommendations have been incorporated into the Pajaro IRWM Plan goals and objectives, resource management strategies, and projects. The IRWM Plan strives to include all possible existing local and sub-

regional water plans and projects and to integrate these at the scale of the Pajaro River Watershed Region to identify additional opportunities for linkages and integration between sub-regions.

11.1.1.2.6 Central Coast RWQCB Basin Plan

The Central Coast RWQCB Basin Plan contains goals for protecting and enhancing all basin waters, allowing unrestricted use of surface waters, efficient management of wastewater, and utilization of recycled water and reducing man-made erosion. These goals are all reflected in the IRWM Plan objectives. In addition, implementation of the IRWM Plan will contribute directly towards helping meet these goals. For instance, the Pajaro Valley Basin Management Plan includes water recycling as an essential component. The Pajaro River Watershed IRWM Plan has objectives and projects that provide for TMDL implementation and NPS pollution management, which is a major water quality focus of the Central Coast RWQCB.

11.1.1.2.7 Stormwater Resources Plans

The SWRCB views stormwater and dry weather runoff as a resource that can provide water supply, water quality, and flood control benefits if properly managed. Therefore, the SWRCB requires Stormwater Resources Plans for watersheds or sub-watersheds to receive state funding for stormwater-related projects. Given the differences in water supply, water quality, flood control, and environmental enhancement needs and approaches throughout the Pajaro River Watershed, municipalities and other agencies have decided to develop stormwater resources plans for watersheds and sub-watersheds that are smaller than the Pajaro River Watershed. The goals of stormwater resources plans are reflected in the IRWM Plan objectives and projects that are within the Pajaro River Watershed that help address IRWM Plan objectives are also included in the IRWM Plan project list.

11.1.2 Linkages and Interaction with Local Plans

The IRWM Plan builds upon previously completed land use planning documents. The role of the IRWM Plan is to consolidate the projects and programs within these documents and allow them to be considered and prioritized at a regional level through the stakeholder process. Local plans can then be updated to account for the impact of regional implementation on local planning. For instance, the City of Watsonville will need to update its General Plan as specified water supply and flood control actions become implemented through the IRWM Plan. As the Soap Lake Floodplain Preservation Project proceeds, the Counties of San Benito and Santa Clara may need to update their General Plans and add the goal of maintaining flood attenuation benefits of the Soap Lake floodplain. In addition, local plans may include projects or programs that provide important local or regional climate change adaptation and mitigation benefits. These projects or programs will be integrated into the IRWM Plan through the regional project prioritization process. Mechanisms for maintaining active stakeholder involvement will help to ensure that these updates occur as the opportunities arise.

11.1.3 Coordination of Water Management Planning Activities

The projects included in the IRWM Plan will effectively implement many of the local plans that are its foundation and serve as sources of projects. This includes the Basin Management Plan Update, the Pajaro River Watershed Studies, the Hollister Urban Area Water and Wastewater Management Plan, the SCWSP, the Habitat Plan, the Lower Pajaro River Enhancement Plan, Stormwater Resources Plans, and the Pajaro River Parkway Plan. The RWMG will continue to participate in local water planning activities and incorporate the results of those planning activities into IRWM planning and implementation.

Stormwater Resources Plans will be adopted into the IRWM Plan as they are completed. To adopt each Stormwater Resources Plan, the RWMG will send out the Stormwater Resources Plan for stakeholder review. Then, the RWMG will address any stakeholder concerns with the Stormwater Resources Plan and hold a meeting with the stakeholders to adopt the plan. Using this process, the Santa Cruz County Stormwater Resources Plan was adopted by the RWMG in March 2017 (Appendix E).

11.2 Relation to Local Land Use Planning

This chapter meets the following IRWM Plan Standard from the Integrated Regional Water Management Grant Program Guidelines:

Relation to Local Land Use Planning – IRWM Plans are required to exchange knowledge and expertise between land use and water resource managers; examine how RWMGs and land use planning agencies currently communicate; and identify how to improve planning efforts between the RWMGs and land use planning agencies. IRWM Plans must document:

- Opportunities for coordination among land use planners and the RWMG.
- Current relationship between local land use planning and water management entities.
- Future plans to further a collaborative, proactive relationship between land use decision makers and water managers.

Developing and maintaining collaborative opportunities on land use planning and water management issues, projects, and programs will assist California and the Pajaro Region in successfully managing multiple water demands throughout the State and the Region, adapting regional water management systems to climate change, and potentially offsetting climate change impacts to water supplies in the State and the Region.

General Plans for municipalities in the Pajaro region have provided critical background information and have fed into the IRWM Plan goals and objectives. The IRWM Plan projects will implement many actions called for in the cities' and counties' General Plans, such as reduction of groundwater overdraft, water conservation, water recycling, flood protection, habitat restoration and open space creation. Some examples of specific General Plan policies or actions implemented by IRWM Plan projects are placing development restrictions in flood areas (City of Gilroy) and wetlands preservation and enhancement (City of Hollister).

11.2.1 General Plans

The IRWM Plan has been coordinated with the elements of local General Plans through the stakeholder involvement of cities and counties within the Pajaro River Watershed. General Plans provide land use, environmental, economic, administrative, and other pertinent information with regard to the use, need, quantity, quality, and management of water resources within a particular jurisdiction. General Plans also chart existing and future goals and objectives to be accomplished for the communities they describe, and can provide valuable insight into the needs, priorities, and values of the local community. These elements have been considered and have helped to shape the water resources management needs identified in this IRWM Plan for the communities of the Pajaro River watershed.

To assist in development of the IRWM Plan, the General Plans of the major cities (Gilroy, Hollister, Morgan Hill and Watsonville) and the counties (Monterey, San Benito, Santa Clara and Santa Cruz) that comprise the region were reviewed. The IRWM Plan goals of water supply, water quality, flood protection and environmental protection and enhancement are consistent with local needs expressed in the General Plans as discussed below.

11.2.1.1 Water Supply Goal

The IRWM Plan Water Supply goal contains objectives of meeting future water demand, promoting water conservation and increasing recycled water usage. These objectives mirror planning goals as expressed in the General Plans. All General Plans describe expected future growth and recognize the need for a reliable water supply to support the projected growth. Water conservation is emphasized in each General Plan as an important strategy for meeting water supply. The expanded use of recycled water is specifically called for in the General Plans of the Cities of Gilroy, Hollister and Watsonville.

11.2.1.2 Water Quality Goal

All the General Plans stressed the need for maintaining high levels of water quality, and this is supported through objectives contained in the IRWM Plan Water Quality Goal. One of the major water quality issues listed in the General Plans of Monterey County and the City of Watsonville is seawater intrusion, which has been brought on by overdraft of the groundwater basin. Prevention of seawater intrusion is implicit within the IRWM Plan water quality objectives, consistent with action items found in these General Plans. The IRWM Plan objective of minimizing impacts from surface water runoff through Best Management Practices is consistent with all the cities' General Plans and many of the Counties' General Plans which specify actions such as the use of stormwater detention basins and the preservation of permeable surfaces for stormwater management.

11.2.1.3 Flood Protection Goal

Flood Mitigation is recognized as a high priority item by the City of Watsonville, Santa Cruz County and Monterey County in their General Plans, consistent with the IRWM Plan emphasis on achieving flood protection in the Lower Pajaro area of the watershed in the immediate term. Goals, actions and policies consistent with other IRWM Plan Flood Protection objectives such as protecting infrastructure from a 100-year flood; preserving and enhancing ecologic and stream functions; and providing community benefits beyond flood protection can be found in all chapters of the General Plans that discuss flood control.

11.2.1.4 Environmental Protection and Enhancement Goal

The IRWM Plan objectives under the Environmental Protection and Enhancement Goal are consistent with provisions listed in all of the General Plans regarding habitat restoration, open space and protection of the Monterey Bay. The Gilroy General Plan contains specific implementation actions to preserve and protect natural resource and habitat areas, which include both Uvas Creek and Llagas creek riparian communities, preserve greenbelts and recreational lands. Other General Plans call for actions consistent with IRWM Plan projects such as wetland restoration programs and removal of non-native plants. The IRWM Plan objective of supporting Monterey Bay marine life is consistent with a chapter in the City of Watsonville's General Plan that recognizes the Monterey Bay as a National Marine Sanctuary and calls for specific actions to protect it.

The IRWM Plan projects will also implement many actions called for in the cities' and counties' General Plans, such as reduction of groundwater overdraft, water conservation, water recycling, flood protection, habitat restoration and open space creation. Some examples of specific General Plan policies or actions implemented by IRWM Plan projects are placing development restrictions in flood areas (City of Gilroy), wetlands preservation and enhancement (City of Hollister), and upgrades to the Corralitos filter plant (City of Watsonville).

11.2.2 Current and Future Relationships with Local Land Use Agencies

Local water and land use agencies have a history of coordinating on shared topics and interests, such as planning for infrastructure for water and wastewater facilities to address unmet and future needs. The

IRWM planning process, including land use agency participation on the SSC, will help land use agencies and water managers collaborate on developing future projects and programs that manage multiple water demands, adapt water management systems to climate change, and potentially offset climate change impacts to water supply. As previously described, land use agencies including cities and counties have participated to varying degrees in the Pajaro IRWM planning process since its inception and are included in the SSC. Through SSC and general stakeholder meetings and the RWMG making IRWM Plan information readily available (i.e., through the website and meetings), land use agencies and water managers can develop collaborative projects that maximize project benefits while achieving the IRWM Plan goals.

Coordination with cities and counties as well as other land use decision-makers has occurred through the stakeholder process and allowed land use considerations to be fully incorporated into the IRWM Plan while also ensuring that future land use decisions necessary for successful IRWM Plan implementation will be supported at the local level. As discussed above, coordination with land use planners and water planners has occurred through sub-regional efforts such as the Pajaro Valley Basin Management Plan Update, Hollister Urban Area Water and Wastewater Management Plan, the South County Water Supply Planning Project, and the Habitat Plan. The results of these efforts have been integrated into the IRWM Plan. The Pajaro River Watershed Flood Prevention Authority is a JPA of the counties in the watershed and the Monterey County Water Agency, SBCWD, Valley Water, and the Santa Cruz County Flood Control and Water Conservation District Zone 7. The counties of Santa Cruz and Monterey are the local sponsors, in coordination with the Corps, for the Pajaro River Risk Reduction Project, which is a critical IRWM Plan project.

Land use coordination and involvement with the IRWM Plan will ensure that regional priorities and efforts developed by the IRWM Plan are 1) consistent with local land use plans and 2) will be supported through local decisions and updates to General Plans.

11.2.3 Plans to Further Collaboration between Land Use Planners and Water Managers

The following actions are proposed to further collaboration between land use planners and water managers in the region in the future.

- Increase the Frequency of Periodic City-County-Water Agency Planning Meetings: The RWMG will continue to encourage city and county planners and local water managers to hold joint planning meetings at regular intervals to improve communication and efficiencies. Joint planning meetings can be held at the staff level and/or by governing boards. Both options provide value in different ways, and both should be continued.

- Water Resource Planning Forum: To develop a better understanding and mutual appreciation of the issues and constraints faced by land use and water managing agencies (including the mission, priorities, and decision-making organization of these entities) the RWMG could host a forum where agency representatives present targeted information regarding their organization's mission, constraints, overlapping areas of interest, potential conflicts in priorities or objectives, and potential areas for improved coordination.

- Climate Change: Utilize climate change as a common denominator to encourage agency collaboration for integrated solutions. For example, Valley Water is part of Santa Clara County's Silicon Valley 2.0 effort to develop a climate action plan.

- Increase Land Use Agency Participation in the IRWM Process: Currently, the Pajaro River Watershed IRWM Plan Stakeholder Steering Committee includes representatives from the County

of Santa Cruz and the City of Watsonville. The RWMG will continue to encourage participation from land use agency staff in Santa Clara and San Benito counties.

Through these actions, collaboration and more effective coordination between and among land use planners and water managers will be enhanced.

11.3 Conclusions

The Pajaro River Watershed IRWM Plan has been designed to combine and build upon the strategies and recommendations of local planning documents. As demonstrated by the consistency of the IRWM Plan with local plans and the implementation of projects that help achieve local objectives, the IRWM Plan has been developed as an extension to and integration of, rather than a substitution for, local planning efforts. To avoid conflict with local efforts, stakeholder involvement has been and will continue to be an integral part of the IRWM Plan process. Stakeholder workshops have been conducted to provide a forum for interaction and collaboration and to allow the IRWM Plan to interface with local planning efforts. Such stakeholder involvement and participation ensures that local agency planning (and their respective goals and objectives) are represented and considered in the Pajaro River Watershed IRWM Plan process. Local planning strategies are at the heart of this IRWM Plan and have played a dynamic role in its development.

Existing planning documents and current planning efforts are, and will continue to be, an integral part of the IRWM Plan process. As previously described, existing planning documents were reviewed to identify needs and issues in the region and were used to develop IRWM Plan goals, objectives, strategies, and integrated implementation programs. Together, local planning documents and stakeholder input have provided the basis to complete the IRWM Plan development effort and have provided direction to the RWMG with regard to the most feasible and beneficial water management strategies to pursue. The RWMG and its members will continue to collaborate and partner with local land use agencies to further integration and coordination of land use planning and water management.

Table 11-1: Major Planning Documents Utilized for IRWM Planning

Document Title/Description	Publication Date	Agency/Entity	Relation to IRWM Plan
General Plans			
City of Gilroy General Plan	June 2002	City of Gilroy	Provides list of Cities' policies, goals and actions for land use, water conservation, water reclamation, flood control, habitat protection and open space preservation
City Hollister General Plan	December 2005	City of Hollister	
City of Morgan Hill General Plan	July 2016	City of Morgan Hill	
City of Watsonville General Plan	May 1994	City of Watsonville	
Monterey County General Plan 2010	October 2010	Monterey County	Provides list of Counties' policies, goals and actions for land use, water conservation, water reclamation, flood control, habitat protection and open space preservation
San Benito County General Plan	July 2015	San Benito County	
The Santa Clara County General Plan (1995-2010)	December 1994	Santa Clara County	

Document Title/Description	Publication Date	Agency/Entity	Relation to IRWM Plan
Santa Cruz County General Plan	May 1994	Santa Cruz County	
Urban Water Management Plans			
City of Watsonville Urban Water Management Plan UWMP	2015	City of Watsonville	Provides understanding of Watsonville urban water needs, management, and planning objectives
Hollister Area UWMP	July 2016	Sunnyslope County Water District, City of Hollister, and SBCWD	Provides understanding of Hollister area's urban water needs, management, and planning objectives
Valley Water UWMP	2015	Valley Water	Provides understanding of Santa Clara County water needs and management strategies
Other Plans			
Biological Assessment Pajaro River and Salsipuedes and Corralitos Creeks Management and Restoration Plan Santa Cruz County, California	September 2001	County of Santa Cruz	Provides understanding of biological and restorative plans within the Pajaro River
City of Hollister Long-Term Wastewater Management Plan	December 2005	City of Hollister	Provides plan for wastewater treatment, effluent management and recycled water for the City of Hollister. Identifies projects and schedule of implementation.
Hollister Urban Area Water and Wastewater Master Plan (HUAWWMP)	June 2017	City of Hollister, Sunnyslope County Water District, and SBCWD	Provides an understanding of the water and wastewater needs of the Hollister urban area as well as a plan for implementation for meeting those needs
Lower Pajaro River Enhancement Plan: For Green Valley, Casserly, Hughes, Tynan, Coward, and Thompson Creeks	December 2002	Santa Cruz County Resource Conservation District	Directly related to Erosion Control, Vegetative Treatment, and Riparian Restoration Project, which is part of the Pajaro River Water Quality Program
Pajaro River Watershed Study Reports Phase I Phase II Phase III Phase IV	 July 2002 April 2003 February 2005 March 2005	Pajaro River Watershed Flood Prevention Authority (PRWFPA)	Directly related to Soap Lake Floodplain Preservation Project, Pajaro River Flood Protection Program

Document Title/Description	Publication Date	Agency/Entity	Relation to IRWM Plan
Pajaro River Watershed Water Quality Management Plan	June 1999	Association of Monterey Bay Area Governments	Provides understanding of AMBAG water quality management goals
Basin Management Plan Update	February 2014	PV Water	Provides an understanding of groundwater management conditions and needs in the Pajaro Valley, basin management objectives, and identifies projects and programs to achieve the objectives
SBCWD Groundwater Management Plan Update for the San Benito County Part of the Gilroy-Hollister Groundwater Basin	May 2004	SBCWD and Water Resource Association of San Benito County	Provides understanding of San Benito groundwater issues and management plans in the San Benito County portion of the Gilroy-Hollister groundwater basin
Groundwater Management Plan	2016	Valley Water	Provides an understanding of groundwater management conditions and needs in Santa Clara County, basin management objectives, and projects and programs to address the objectives
Water Supply and Infrastructure Master Plan	2012	Valley Water	Presents Valley Water's water supply strategy for providing a reliable supply of water
South County Recycled Water Master Plan	October 2015	SCRWA & Valley Water	Provides understanding of South Santa Clara County plans for recycled water availability and use
South County Water Supply Plan (SCWSP)	July 2010	Valley Water	Provides specific strategies for ensuring a reliable supply of high quality water in southern Santa Clara County; prepared in conjunction with local land use agencies
Santa Cruz County Storm Water Resources Plan	December 2016	County of Santa Cruz	Outlines stormwater project priorities and stormwater permit compliance to address water quality, water supply, and flood control needs.
Water Quality Control Plan for Central Coastal Basin (Basin Plan)	2019	Central Coast RWQCB	Provides understanding of the surface- and groundwater quality objectives of the Central Coast RWQCB.
Analyses, Assessments, Reports and Studies			
Salsipuedes Creek Maintenance Analysis (File #50275)	February 2005	Santa Cruz County Flood Control and	Provides technical understanding of Salsipuedes Creek hydrology, hydraulics, and sedimentation and

Document Title/Description	Publication Date	Agency/Entity	Relation to IRWM Plan
		Conservation District Zone 7	further understanding of Lower Pajaro River watershed dynamics and maintenance activities
Pajaro River Bench Excavation Analysis 1 (Supplemental) & Analysis 2	February 2004 October 2004	Santa Cruz County Flood Control and Conservation District Zone 7	Directly related to the Lower Pajaro River Bench Excavation Project, Pajaro River Flood Protection Program
Pajaro River Bench Excavation Project, Tree Resource Evaluation/ Sediment Excavation Impact Assessment	May 2005	Santa Cruz County Public Works Department	Directly related to the Lower Pajaro River Bench Excavation Project, Pajaro River Flood Protection Program
File #50275; Memo, RE: Pajaro River Bench Excavation Analysis;	October 2004	Santa Cruz County Flood Control and Conservation District Zone 7	For technical understanding of the Pajaro River Bench Excavation Project
Soap Lake Floodplain Preservation Project – Draft Initial Study and Negative Declaration	September 2004	PRWFPA	Directly related the Soap Lake Floodplain Preservation Project, Pajaro River Flood Protection Program
Watsonville Area Water Recycling Project Feasibility Study	August 2004	City of Watsonville and PV Water	Directly related to the WRWTF & CDS projects, Pajaro Valley Water Supply Program
Technical Report for an Iron and Manganese Treatment Facility at the San Juan Road Well Site for the Pleasant Acres and San Juan Road Wells	August 2004	Aromas Water District	Provides understanding of the Aromas Wellhead Treatment Project
San Benito County Regional Recycled Water Project Feasibility Study Report – Draft	May 2004	SBCWD and Water Resource Association of San Benito County	Provides understanding of San Benito County Recycled Water project plans
Pajaro River Flood Control Project Alternative Formulation Briefing Document (F4a Milestone)	April 2004	Corps, San Francisco District	Directly related to the Corps Pajaro Levee Reconstruction Project, Pajaro River Flood Protection Program
Pajaro River Bench Excavation Analysis 1 (File #50275)	January 2004	Santa Cruz County Flood Control and Conservation District Zone 7	Directly related to the Lower Pajaro River Bench Excavation Project, Pajaro River Flood Protection Program

Document Title/Description	Publication Date	Agency/Entity	Relation to IRWM Plan
San Felipe Preventive Maintenance Shutdown, Final Study/Environmental Assessment	August 2003	Valley Water	For understanding of the environmental issues surrounding San Felipe Preventative Maintenance Shutdown
Pajaro River Stable Planform Study – Pajaro River Channel Planform and Channel Forming Discharge Analysis	July 2003	Corps	For recommendations regarding lowering bench elevations as one of four methods proposed for restoring the Pajaro River channel to its original bankfull dimensions
Annual Groundwater Report	January 2018	Valley Water	For understanding of existing groundwater conditions in Valley Water jurisdiction
Final Environmental Impact Report Pajaro River and Salsipuedes and Corralitos Creeks Management and Restoration Plan, Santa Cruz County, California	February 2002	County of Santa Cruz	For understanding of the environmental impacts of environmental and restorative plans for the Pajaro River and tributaries
Action Plan IV: Agriculture and Rural Lands Water Quality Protection Program	October 1999	Monterey Bay National Marine Sanctuary	Provides understanding of the MBNMS water quality protection program, which has aided in the development of the Pajaro River Water Quality Program
Final EIR for the Long Term Wastewater Management Plan, Cities of Gilroy and Morgan Hill	May 1990	South County Regional Wastewater Authority	Provides understanding of Gilroy and Morgan Hill wastewater management plans/needs
Upper Llagas Creek Project Final EIR	May 2014	Valley Water	For understanding of the environmental impacts of environmental and restorative plans for the Upper Llagas Creek

12 Native American and Stakeholder Involvement

This chapter meets the following standard from the 2016 Integrated Regional Water Management Program Guidelines.

Native American Tribes and Stakeholder Involvement – The IRWM Plan must contain the following items:

- A public process that ensures the RWMG gives the opportunity to all interested parties to actively participate in the IRWM decision-making process on an on-going basis. It should be noted that Native American Tribes are sovereign nations, and as such coordination with Tribes is on a government-to-government basis.
- The process used to identify, inform, invite, and involve stakeholder groups in the IRWM process, including mechanisms and processes that have been or will be used to facilitate stakeholder and Native American Tribal involvement and communication during development and implementation of the IRWM Plan.
- A discussion on how the RWMG will endeavor to involve DACs and Native American Tribal communities in the IRWM planning effort.
- A description of the decision-making process including IRWM committees, roles, or positions that stakeholders and Native American Tribes can occupy and how a stakeholder goes about participating in those committees, roles, or positions regardless of their ability to contribute financially to the Plan.
- A discussion regarding how stakeholders and Native American Tribes are necessary to address the objectives and resource management strategies of the IRWM Plan and are involved or are being invited to be involved in Plan activities.
- A discussion of how collaborative processes will engage a balance of the interest groups listed above in the IRWM process regardless of their ability to contribute financially to the IRWM Plan's development or implementation.

The Pajaro River Watershed IRWM Plan process is built upon the premise that future implementation of an IRWM Plan would not be possible unless the objectives and strategies were first identified, prioritized and developed by the affected stakeholders. As a result, stakeholder involvement is a central element to the Pajaro River Watershed IRWM planning process and implementation success will necessarily involve water management strategies that address the concerns of local communities and reflect the public's interests and values within the watershed.

Stakeholder involvement is a central element to the Pajaro River Watershed IRWM planning process. With this in mind, numerous stakeholder groups throughout the Pajaro River Watershed were identified and contacted, and several public announcements were published in regional newspapers to reach the general public. These outreach efforts were successful in obtaining stakeholder input during the planning process. Stakeholders have participated through various stakeholder meetings, stakeholder steering committee meetings and regular correspondence with the RWMG to develop, influence, and complete the IRWM Plan. It is anticipated that active stakeholder involvement will continue during implementation of the IRWM Plan.

12.1 Stakeholder Identification

Stakeholders were initially identified through discussions with local agencies and organizations with jurisdiction, projects, and stakeholder experience in the Pajaro River Watershed. Throughout the IRWM planning process, the stakeholder list has continued to evolve as new organizations or individuals have been added and, in some cases, have been removed from the list, as requested. Stakeholders identified to date include those shown in Table 12-1. The stakeholder list is expected to evolve over time; therefore, additional stakeholders are expected to be identified and contacted for their on-going participation in IRWM planning and project generation. Individuals may request to be added to the stakeholder list by e-mailing the RWMG representatives at the following addresses:

RWMG Representative	Agency	E-Mail Address
Samantha Greene	Valley Water	sgreene@valleywater.org
Brian Lockwood	PV Water	lockwood@pvwater.org
Jeff Cattaneo	SBCWD	jcattaneo@sbcwd.com

A special effort has been made to identify and involve disadvantaged communities and Native American Tribal communities in the region, such as residents of the City of Watsonville and the county-level disadvantaged communities of Pajaro, Amesti and Freedom and representatives of the Amah Mutsun Tribal Band. These communities were encouraged to be actively involved in the planning process and to proactively address environmental justice concerns. Stakeholder meetings were and will continue to be held in locations throughout the watershed to encourage widespread participation and to accommodate stakeholders with limited resources and opportunities to travel to meetings.

The IRWM planning process has focused on identifying as broad a range of stakeholders as possible and the list includes organizations dealing with all aspects of water resource management, including water supply, water quality, flood protection and environmental protection and enhancement. Previously, stakeholder groups coalesced around project- or community-driven efforts, which tended to be more narrowly focused on specific water management strategies developed by various agencies and organizations in the watershed. There is increasing awareness that it is beneficial to integrate the efforts of these stakeholders groups. Catastrophic events, such as Pajaro River flooding, have heightened awareness of the necessity of local communities to collaborate in developing effective water management strategies throughout the region. Furthermore, stakeholders recognize the need to work together given their shared dependence on limited local water supplies in the watershed. Additionally, stakeholders are already teaming up to maintain water quality levels that meet various beneficial uses by implementing such programs as agricultural water quality and irrigation mitigation programs. Other stakeholders have demonstrated a desire to collaboratively implement environmental restoration and habitat protection in the Pajaro River Watershed. These efforts demonstrate willingness to pool resources and act collaboratively to develop water management strategies that provide multiple benefits to the watershed and its communities. The Pajaro River Watershed IRWM planning process has created a forum for many of these stakeholders to come together to work collaboratively on their shared and/or overlapping issues. In order to make this forum most effective, steps have been taken to identify as many of the potential stakeholders with water management interests in the Pajaro River Watershed as possible, and to make them aware of the IRWM process.

Table 12-1: Stakeholders in the Pajaro River Watershed IRWM Plan

Stakeholder	Description of Authority/Interests
Amah Mutsun Tribal Band	The Amah Mutsun Tribal Band (AMTB) is comprised of the living descendants of the Mutsun and Awaswas speaking peoples whose ancestral homeland encompasses the lands and waters of Santa Cruz, San Benito, and parts of San Mateo and Santa Clara counties—the territory known to the Tribe as Popeloutchom. A goal of the Amah Mutsun is to restore lands and waterways within the Pajaro Watershed using the knowledge and approaches of their ancestors. In 2013, the AMTB established the Amah Mutsun Land Trust (AMLT)—a Native-led 501(c)(3) non-profit organization—to serve as a vehicle for the Tribe's re-engagement with its ancestral territory and stewardship role.
Aromas Water District	Aromas Water District is located on the westerly edge of the PV Water service area. This special district provides water treatment and supply service for approximately 750 customers.
Association of Monterey Bay Area Governments (AMBAG)	AMBAG was organized for the permanent establishment of a forum for planning, discussion and study of regional problems of mutual interest and concern to the counties and cities in Monterey, San Benito, and Santa Cruz Counties; and for the development of studies, plans, policies and action recommendations.
California Coastal Conservancy	The California Coastal Conservancy works with other groups to protect, conserve, restore, and enhance environmental and human-based resources of the California coast and ocean for environmentally sustainable and prudent use by current and future generations.
Central Coast Agricultural Water Quality Coalition	This coalition is a partnership of Central Coast growers organized through their respective county Farm Bureaus. Established by the California Farm Bureau, six Central Coast counties receive grant monies to fund research and monitoring of agricultural water quality effects. The Coalition is working to identify local water quality threats and learn about economically viable water quality protection practices. The various county Farm Bureau program coordinators assist watershed groups to implement these practices.
Central Coast Regional Water Quality Control Board (RWQCB) – Region 3	The Central Coast RWQCB is a regulatory extension of the State Water Resources Control Board. The Central Coast RWQCB coordinates and controls the quality of water in its region through the protection of beneficial uses, the development of water quality objectives to protect the beneficial uses, and implementation planning to accommodate the water quality objectives. This entity was established by the Porter-Cologne Water Quality Control Act (1969), which became Division Seven ("Water Quality") of the State Water Code. The State Water Code establishes the responsibilities

Stakeholder	Description of Authority/Interests
	and authorities of the nine RWQCBs (previously called Water Pollution Control Boards) and the State Water Resources Control Board (SWRCB). The federal Clean Water Act (Public Law 92-500, as amended) provides for the delegation of certain responsibilities in water quality control and water quality planning to the states. Where the Environmental Protection Agency (EPA) and the SWRCB have agreed to such delegation, the Regional Boards implement portions of the Clean Water Act, such as the National Pollutant Discharge Elimination System (NPDES) program and toxic substance control programs
Central Coast Resource Conservation & Development Council	The Central Coast Resource Conservation & Development Council serves South Santa Clara, San Benito, Santa Cruz, Monterey, San Luis Obispo, and Santa Barbara Counties. The council's activities focus on agritourism, steelhead habitat enhancement, water quality education, coordinated resource management and planning (CRMP) coordination and permit streamlining.
City of Gilroy	Located in South Santa Clara County, the City of Gilroy provides water service to residences and businesses. Gilroy is a South County Regional Wastewater Authority (SCRWA) Partner which provides wastewater service for the Cities of Gilroy and Morgan Hill.
City of Hollister	The City of Hollister is a major urban service area in San Benito County. The City of Hollister provides various municipal and industrial (M&I) services include wastewater collection and treatment and water supply service.
City of Morgan Hill	Located in South Santa Clara County, the City of Morgan Hill provides water service to residences and businesses. Morgan Hill is a SCRWA Partner that provides wastewater service for the Cities of Morgan Hill and Gilroy.
City of San Juan Bautista	Located in San Benito County, the City of San Juan Bautista provides wastewater and water services. San Juan Bautista is a member of the Water Resource Association of San Benito County.
City of Watsonville	The City of Watsonville is a major urban service area within PV Water. The City provides various M&I services including wastewater collection and treatment and water supply service.
County of Monterey	The County of Monterey is a government agency with land use jurisdiction within its boundaries. The County also manages water and sanitation systems in unincorporated County Service Areas. The southern portion of the PV Water service area is in Monterey County.
County of San Benito	The County of San Benito is a government agency with land use jurisdiction within its boundaries. A significant portion of the upper Pajaro River watershed (including the San Benito River) is within San Benito County.

Stakeholder	Description of Authority/Interests
County of Santa Clara	The County of Santa Clara is a government agency with land use jurisdiction within its boundaries. A portion of the upper Pajaro River watershed is within Santa Clara County.
County of Santa Cruz	The County of Santa Cruz is a government agency with land use jurisdiction within its boundaries. The County of Santa Cruz also has jurisdiction over stormwater, drainage, watershed management, water resources management and water quality protection for the unincorporated areas of Santa Cruz County. The northern portion of the PV Water service area is in Santa Cruz County.
Farm Bureaus (Monterey County, San Benito County, Santa Clara County, and Santa Cruz County)	Farm Bureaus are organized on a county, state, and national level with the county Farm Bureaus serving as the core of the organization. Santa Cruz, Monterey, San Benito and Santa Clara Counties each have their own Farm Bureau. The Farm Bureau is a voluntary, nongovernmental, nonpartisan organization of farm and ranch families seeking solutions to the problems that affect their lives, both socially and economically. The Central Coast Agricultural Water Quality Coalition is the local Farm Bureau partnership that works with growers within the Pajaro River watershed.
Land Trust of Santa Cruz County	The land trust is a community-based nonprofit organization that works cooperatively with land owners, government entities, and other organizations to protect and manage lands of significant value. Their primary focuses are protecting prime agricultural lands, protecting lands with significant habitat value, and providing effective stewardship of lands already protected.
Monterey Bay National Marine Sanctuary (MBNMS)	The MBNMS mission is to understand and protect the coastal ecosystem of Central California. The MBNMS is an extension of the National Oceanic and Atmospheric Administration (NOAA) National Marine Sanctuary Program (NMSP). The NMSP mission is to serve as the trustee for the nation's system of marine protected areas, to conserve, protect, and enhance their biodiversity, ecological integrity and cultural legacy. Its goals are appropriate to the unique diversity contained within individual sites. They may include restoring and rebuilding marine habitats or ecosystems to their natural condition or monitoring and maintaining already healthy areas.
Monterey County Water Resources Agency (MCWRA)	MCWRA is a special district formed to manage, protect, and enhance the quantity and quality of water and provide specified flood control services for Monterey County, and to be a leader in efficient, innovative, and equitable water resources management for the County. As a County water agency and stakeholder, MCWRA has an interest in flood prevention and water supply management of the lower Pajaro River that falls within its jurisdiction.
Pajaro River Watershed Flood Prevention Authority (PRWFPA)	PRWFPA was established in 2000 by the State of California Assembly Bill 807 to identify, evaluate, fund, and implement

Stakeholder	Description of Authority/Interests
	flood prevention and control strategies in the Pajaro River watershed, on an intergovernmental basis. Since the Pajaro River watershed covers an area within four counties (Santa Clara, San Benito, Santa Cruz, and Monterey) and four water districts (Santa Clara Valley Water District; San Benito County Water District; Santa Cruz County Flood Control and Water Conservation District, Zone 7; and Monterey County Water Resources Agency), the PRWFPA is comprised of one representative from each of the eight interested agencies. The PRWFPA is a governing body through which each member organization can participate and contribute to finding a method to provide flood protection in the watershed and promote general watershed interests. A further goal is to identify and prioritize strategies and projects that will provide multiple benefits, such as water supply, groundwater recharge, or environmental restoration and protection benefits.
Pajaro/Sunny Mesa Community Services District	Pajaro/Sunny Mesa Community Services District is a water supplier for smaller communities in the Pajaro Valley and has consolidated water delivery service for a number of mutual water companies in northern Monterey County.
Pajaro Valley Chamber of Commerce	The Pajaro Valley Chamber of Commerce promotes Watsonville and surrounding community areas and is dedicated to advancing the business success of its members.
Planning and Conservation League Foundation	The Planning and Conservation League Foundation mission is to ensure that California continues to be an attractive, livable, and equitable state by engaging in cutting-edge environmental public policy research, and educating and empowering local communities to understand and participate in local and state environmental decision making processes. The Planning and Conservation League Foundation also produces publications that educate the public about environmental challenges in the areas of planning, natural resource conservation, environmental protection, clean air, clean water, sustainable energy policies, and environmental justice.
Resource Conservation Districts (RCDs)	California RCDs are special districts organized under the state Public Resources Code, Division 9. The RCDs in the Pajaro Watershed are the Santa Cruz RCD, Monterey County RCD, San Benito RCD and Loma Prieta RCD. Each district has a locally elected or appointed volunteer board of directors made up of landowners in that district. Interests of the RCDs which relate to water management include water quality, wildlife habitat restoration, soil erosion control, and conservation education. RCDs are a source of technical assistance and can provide a critical link between the goals and objectives of the IRWM Plan and the land owners and managers that are integral to implementing actions.

Stakeholder	Description of Authority/Interests
San Benito County Agricultural Land Trust	This land trust is devoted to providing financial options to landowners in order to protect the agricultural heritage of San Benito County. The land trust can protect land permanently and directly by accepting donations of conservation easements designed to meet the individual needs of landowners. As a non-profit, tax-exempt organization, the Trust is funded through membership, donations and grants.
San Benito County Chamber of Commerce	The San Benito County Chamber of Commerce is organized for the purpose of creating, promoting, and celebrating economic vitality within San Benito County by providing resources to businesses and individuals.
San Martin Neighborhood Alliance	This community alliance encompasses local topics and issues.
Santa Clara County Open Space Authority	The immediate high priorities of the Open Space Authority are preservation of open spaces and creation of greenbelts between communities, lands on the valley floor, hillsides, viewsheds and watersheds, baylands and riparian corridors. The Open Space Authority promotes land preservation to maintain the quality of life in the County and to encourage outdoor recreation and continuing agricultural activities. It promotes development and implementation of land management policies that provide proper care of open space lands and allow public access appropriate to the nature of the land for recreation.
Santa Cruz County Flood Control and Water Conservation District, Zone 7 (SCCFC&WCD)	This district is governed by the Santa Cruz County Board of Supervisors, City of Watsonville, and PV Water. It provides flood control services to Santa Cruz County except the cities of Santa Cruz, Scotts Valley and Capitola. As a County agency and stakeholder, SCCFC&WCD has an interest in flood prevention of the lower Pajaro River that falls within its jurisdiction.
Sierra Club, Loma Prieta Chapter	This local chapter of the Sierra Club is committed to participating in the South Santa Clara County Habitat Conservation Plan/Natural Communities Conservation Plan. The planning area includes the Uvas-Llagas watershed, which is a tributary to the Pajaro River.
Sierra Club, Ventana Chapter	This local chapter of the Sierra Club is interested in preserving the Pajaro River and its watershed through environmental activism.
Silicon Valley Land Conservancy	The Silicon Valley Land Conservancy is a nonprofit entity formed to preserve and protect the remaining open space in Silicon Valley.
Soquel Creek Water District	This government agency provides water resource management for communities in mid-Santa Cruz County.
South County Regional Wastewater Authority	South County Regional Wastewater Authority is the regional wastewater authority for South Santa Clara County, primarily serving the Cities of Gilroy and Morgan Hill. SCRWA has

Stakeholder	Description of Authority/Interests
	partnered with the Santa Clara Valley Water District to expand water recycling in southern Santa Clara County.
South Valley Streams for Tomorrow	This organization is concerned with streams in South Santa Clara County and tributaries of the Pajaro River in Santa Clara and San Benito Counties.
Sunnyslope County Water District	Sunnyslope County Water District is a water and wastewater management district for a portion of the City of Hollister and the Ridgemark Development in San Benito County.
The Nature Conservancy (TNC)	TNC is a leading international, nonprofit organization dedicated to preserving the diversity of life on Earth. Their mission is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. TNC is currently working on projects within the Pajaro River watershed that promotes private lands conservation and other conservation practices. They work with landowners, communities, cooperatives and businesses to establish local groups that can protect land.
U.S. Army Corps of Engineers (Corps)	The Corps provides engineering and environmental services throughout the nation. The Corps is currently conducting a flood risk management study on the lower Pajaro River and tributaries.
Water Resources Association of San Benito County	The Water Resource Association is comprised of the SBCWD, San Benito County Government, Sunnyslope County Water District, City of Hollister, and City of San Juan Bautista.
Watsonville Wetlands Watch	The Watsonville Wetlands Watch is a nonprofit community based organization dedicated to the protection, restoration and appreciation of the wetlands of the Pajaro Valley.
Wildlands, Inc.	Wildlands, Inc. is a habitat development and land management company with projects throughout California and the western United States. Wildlands is one of the nation's first private organizations to establish mitigation banks and conservation banks that protect wildlife habitat in perpetuity.

12.2 Stakeholder Steering Committee

Since formally launching the Pajaro River Watershed IRWM Plan effort in early 2005, the RWMG has been proactive and focused on ensuring stakeholders are aware of, informed about, and participating in IRWM planning and implementation. This included formation of a Stakeholder Steering Committee (SSC) in 2005. This committee provided a forum for on-going discussion and stakeholder input, and provided review and stakeholder oversight throughout the initial IRWM Plan development process.

The SSC has historically been responsive and reactive to changing regional needs, requirements and conditions, which demonstrates the active adaptive management of the Plan. In 2019, for example, the SSC was convened to address continued IRWM planning and implementation tasks including:

- Review approach and schedule for responding to new Proposition 1 IRWM guidelines,
- Provide input on the level of interest in applying for implementation grants, and

- Continue soliciting implementation projects.

In 2011, the Pajaro River Watershed IRWM Region was awarded a planning grant. The planning grant work plan included a task to formalize the SSC. Therefore, the RWMG went through a planning process to formalize communications and develop better and more strategic approach to identify and enjoin stakeholders in the IRWM process. As a result, a new SSC was established.

The new SSC represents the interests necessary to address the objectives and resource management strategies of the Pajaro River Watershed IRWM Plan in both the upper and lower watershed. Furthermore, consistent with California Water Code Section 10541(g), the SSC is designed to provide a balance of water management interests and geography. The RWMG invited interested watershed stakeholders to participate in the SSC and reviewed the list of interested participants to ensure adequate representation and identify potential gaps in coverage, either in resource area or geography. As gaps were identified, additional participants were solicited to ensure balanced representation in the SSC. The SSC membership list is in Table 12-2.

Table 12-2: Stakeholder Steering Committee

Committee Member	Organization	Upper Watershed	Lower Watershed
Lynn Overtree Stewardship Manager	Land Trust of Santa Cruz County		·
Matt Freeman Assistance General Manager	Santa Clara County Open Space Authority	·	
Jennifer Scheer Executive Director	Santa Clara County Farm Bureau	·	
Chris Coburn Executive Director	Resource Conservation District of Santa Cruz County		·
Susan Meyer Executive Director	Loma Prieta Resource Conservation District	·	
Don Ridenhour General Manager	Sunnyslope County Water District	·	
Ray Creech General Manager	Tres Pinos Water District	·	
Rob Johnson General Manager	Aromas Water District	·	·
Mark Strudley Flood Control Program Manager	County of Santa Cruz		·
John Ricker Water Resources Division Director	County of Santa Cruz		·
Jackie McCloud Senior Utilities Engineer	City of Watsonville		·
Matt Keeling	Central Coast Regional Water Quality Control Board	·	·
Valentin Lopez Tribal Chairperson	Amah Mutsun Tribal Band	·	·
Kenn Reiller	Sierra Club, Ventana Chapter	·	·
Marlene Freeland	Bolado Park Golf Course	·	

The SSC, as described above, provides advice from diverse perspectives to the RWMG. The purpose of the SSC is to reflect the concerns and issues of various stakeholders and the general public, serve as a link to the community, serve as a "sounding board" for the Partners, and comment on IRWM Plan documents. The RWMG will work with the SSC to ensure that SSC and public concerns and ideas are understood and considered in Partner decisions.

The SSC comprises 15 members, designed to provide a balance of water management interests and geography. The ability of the SSC to be effective relies on the roles, responsibilities and communication among the SSC and with the RWMG. The role of the SSC is to serve as an advisory body in reviewing and providing recommendations on work items completed by RWMG staff and consultants as well as to:

1. Assist with ongoing Public Participation in the IRWM Program.
    a. Assist in receiving public input;
    b. Coordinate with other entities for areas of represented expertise;
    c. Encourage outreach/educational activities to promote the IRWM program within agencies and constituencies (i.e., website recognition, events); and
    d. Assist in outreach to disadvantaged communities (DACs) within agencies and constituencies.
    e. Assist in outreach to tribal communities whose traditional territories are located within the Pajaro River watershed
2. Provide input on the project prioritization process and criteria.
    a. Provide input on the planning goals and objectives;
    b. Provide input on project screening criteria to measure a project's benefit in meeting the planning goals and objectives; and
    c. Provide input on the weighting of the criteria that emphasizes the region's priorities.
3. Assist in Preparation and Submittal of IRWM Plan Update (2019).
    a. Provide recommendations on chapters of Draft IRWM Plan;
    b. Assist in the development of Resolutions of Support; and
    c. Provide SSC recommendation to RWMG policymakers on IRWM Plan adoption.
4. Review and Provide Recommendations on Proposition 84 Grant Applications.
    a. Assist in coordinating and consolidating implementation projects;
    b. Provide input on criteria for selecting recommended implementation projects based on the Proposal Solicitation Package funding priorities; and
    c. Provide SSC recommendation to RWMG policymakers on grant applications.
5. Coordinate with Adjacent Planning Regions.
    a. Assist in coordinating with adjacent planning regions; and
    b. Review and recommend on a process for selecting cross-regional projects with adjacent planning regions.

SSC membership expectations include:

- Attending SSC meetings regularly;
- Articulating their interests, concerns and perspectives on the issues being addressed;
- Maintaining an open mind regarding other views;

- Focusing on the "big picture" of the IRWM Plan;
- Constructively managing conflict between SSC members;

The SSC may also form subcommittees to address major programs in the Pajaro IRWM Plan, such as water supply, salt management, agricultural water quality, and Pajaro River flood protection. The role of the subcommittees is to further evaluate the projects within their respective programs, make program recommendations and lead implementation efforts for the projects included in their recommendations. The potential responsibilities of the subcommittees include:

- Outline program implementation schedule
- Develop program financing plan
- Lead project implementation efforts
- Develop project evaluation processes including degree of benefit assessment
- Enhance project definitions in terms of regional program objectives
- Define the subcommittee's stakeholder involvement process (including disadvantaged communities) and actively engage their stakeholders, as the subcommittees serve as the primary means of stakeholder participation

The SSC members will also help provide a link with other major stakeholder engagement efforts in the region, including flood protection on the Pajaro River, groundwater charges in the Pajaro Valley, water supply reliability, and water quality management throughout the region. The RWMG will monitor SSC participation and, if needed, recommend changes to the membership to ensure the committee continues to represent the interests necessary to address the objectives and resource management strategies of the Pajaro River Watershed IRWM Plan and effort.

12.3 Stakeholder Outreach and Involvement Processes

A broad stakeholder outreach process is crucial to ensure that the IRWM Plan identifies local issues, reflects local needs, promotes the formation of partnerships, and encourages coordination with state and federal agencies.

12.3.1 Balanced Access and Opportunity for IRWM Process Participation

The primary method for participation in the IRWM process is through the SSC. As noted above, the RWMG ensured that the SSC includes a broad and balanced representation of community sectors and environmental and water resources interests. Other opportunities for participation in the IRWM process include being a Project Sponsor, signing up for the general stakeholder list, and participating in SSC subcommittees. No one is denied the opportunity to participate in the IRWM process; rather, the RWMG encourages interested parties to participate in the SSC and/or other stakeholder groups.

12.3.2 Effective Communication

The RWMG's communication plan establishes how communication flows and is managed throughout IRWM planning and implementation and provides a framework for continued engagement and communication flow. The purpose of the plan is to build a solid, inclusive and representative agency, stakeholder and DAC base that is supportive of the aims of the IRWM Plan.

This Communication Plan identifies the procedures used to manage communication. The plan focuses on formal communication elements. Other communication channels exist on informal levels and enhance those

discussed within this Plan. This Plan is not intended to limit, but to enhance communication. Open, ongoing communication actively engaging stakeholders is critical to the success of the Plan and projects, ultimately the Region. The outreach strategy engages a balance of the interest groups in the IRWM process regardless of their ability to contribute financially to the IRWM Plan's development or implementation. Stakeholders are necessary to address the objectives and resource management strategies of the IRWM Plan. Furthermore, a robust and broad stakeholder and public outreach lays a solid foundation for regional (and sub-regional) involvement as well as build overall regional (and sub-regional) capacity. It sets forth a framework to provide guidance for implementing projects and carrying on the goals of IRWM effort throughout future years. The Communication Plan outlines a process to knit together a core group of active and engaged regional and sub-regional representatives who are motivated and equipped to meet the formidable challenges involved in planning for increased water quality, groundwater protection, stormwater management, water reliability, flood management, water quality, water supply, and equitable environmental benefits. In summary, the objectives of the communication effort are to:

- Marshal many points of view
- Understand the interests and needs of the watershed
- Develop constructive relationships
- Create an understanding among collaborators about the benefits and purposes of the IRWM program and individual IRWM projects
- Maintain credibility with regulators and funding agencies
- Demonstrate responsiveness to stakeholder issues or concerns

12.3.2.1 Stakeholder Outreach Approach

As part of the Communication Plan, the RWMG, Implementation Project Sponsors, and the Stakeholder Steering Committee conduct three tiers of focused outreach activities to provide different venues for the stakeholders and the general public to voice their comments and concerns throughout the IRWM planning and implementation process. The stakeholder outreach activities are summarized in Table 12-3, and described in the subsequent chapters.

Table 12-3: Stakeholder Outreach Approach

	Tier One	Tier Two	Tier Three
Goals:	**Planning-Level Outreach**	**Project-Specific Outreach**	**IRWM Plan General Outreach**
Organizers:	Stakeholder Steering Committee (SSC) and Subcommittee	Implementation Project Sponsors	RWMG
Objectives:	Identify needs of the watershed, develop recommendations on project priorities/rankings	Coordinate and collaborate on project implementation, solicit community input and concerns regarding the implementation of projects	Provide oversight. Report on progress, updates, and decisions related to the IRWM Plan
Target Audience:	All interested parties, including stakeholders, other watershed stakeholders, other IRWM regional stakeholders	Project-specific stakeholders, residents, project beneficiaries, and agencies	Stakeholders and agencies, and all interested parties
Outreach Venues:	Stakeholder workshops/meetings, conferences, board meetings, subcommittee meetings	Workshops/meetings	Public workshops/ meetings SSC meetings
Minimum Frequency:	Quarterly or as-needed, at locations throughout the region	As-needed, at locations near the projects	Quarterly or as-needed, at locations throughout the region

12.3.2.2 Planning-Level Outreach (Tier One)

The Stakeholder Steering Committee provides forum for coordinating input from the subcommittees and making recommendations to the RWMG. The outreach activities provide the general stakeholders a forum to:

- Share their ideas and concerns regarding the IRWM Plan
- Identify the needs of the watershed, and potential projects that align with the goals and objectives of the respective regional water management programs
- Identify, discuss, and resolve regional conflicts associated with potential projects
- Work with other stakeholders and the general public to make recommendations on project prioritization and rankings, transfer the information to the Partners to make decisions.
- Coordinate with other activities in the Pajaro river watershed and coordinate with other IRWM regional stakeholders

12.3.2.3 Project-Specific Outreach (Tier Two)

Each of the Implementation Project Sponsors conducts project-specific outreach to interested parties related to their respective project. The outreach activities provide the general stakeholders a forum:

- To provide information to the community regarding specific projects that are being implemented. Identify, discuss, and resolve concerns from stakeholders and the general public who might be impacted by the project
- For stakeholders and general public to communicate throughout the implementation period to resolve potential conflicts

12.3.2.4 IRWM Plan General Outreach (Tier Three)

The RWMG conducts general IRWM Plan outreach to all interested parties to report on the progress, updates, and decisions made related to the IRWM Plan. The outreach activates provided the stakeholders and the general public a forum to:

- Discuss IRWM Plan progress, review key deliverables, provide comments, and gain consensus
- Continue stakeholder process allowing for IRWM Plan updates to reflect changes in local water management needs and priorities. Changes were also necessary to respond to updates to City and County General Plans, or other newly completed local planning documents.

12.3.2.5 Outreach Venues and Strategies

It is the intent of the RWMG is to continue to hold outreach workshops/meetings to ensure that all interested stakeholders have an opportunity to participate in the IRWM program through the life of the Plan. Meetings would be held at different locations throughout the watershed so that stakeholders from different regions would be able to attend and held at times that facilitate the best attendance.

Notification occurs at least two weeks prior to workshops/meetings via a variety of methods, including print media, letters, emails, and, potentially, agency websites. The purpose of the meetings is to inform stakeholders of IRWM efforts, solicit feedback on key IRWM deliverables, and solicit projects to be considered in the IRWM Plan as well as to update the project list and be responsive to solicitations and/or other topics and issues related to IRWM. Following each workshop, the Partners prepare and distribute a brief summary of stakeholder input and how the Partners plan to address the input.

The RWMG will also continue to engage stakeholders through related workshops, board meetings, and other venues that include audiences with potential interest in the Pajaro River Watershed IRWM effort. These venues have previously included the Pajaro River Watershed Council, South County Regional Wastewater Authority TAC, Water Resources Association of San Benito County Board, Santa Clara Valley Water District Board Advisory Committees, and Santa Cruz County Board of Supervisors. The Partners will also continue to conduct outreach with their own Boards.

Stakeholders and the general public who are interested in the development and implementation of IRWM Plan but are unable to participate at a more significant level (such as being a member of the SSC or a subcommittee), would be able to provide their comments through multiple outreach activities conducted by the RWMG, SSC, and Implementation Project Sponsors and shape the development and implementation of the IRWM Plan.

12.3.3 Effective Decision Making

All the RWMG's decisions are made by consensus. The decisions are informed by input from the SSC, Project Sponsors, general stakeholders, and the RWMG's Boards' policies. By incorporating all the sources

of input, the RWMG's decisions reflect the interests and priorities of the entire Pajaro River Watershed. Making decisions on a consensus basis ensures all decisions are completely supported by the RWMG.

12.4 Pajaro River Watershed Regional Coordination

A number of regional coordination activities are occurring to improve the understanding of and conditions within the watershed. These activities involve agricultural associations, land trusts, business associations, environmental, and community groups among others. A goal of the RWMG is to provide a forum for these stakeholders to identify additional opportunities to coordinate and improve the watershed. A few examples of the ongoing coordination are presented below.

The RWMG has been working with the Pajaro River Watershed Flood Prevention Authority (FPA), an eight-agency Joint Powers Authority spanning the four counties and four water districts of the Pajaro River Watershed. Two of the RWMG partners, Valley Water and SBCWD, are members of the FPA. This organization was established to provide flood protection and promote general watershed interests such as identifying and prioritizing strategies and projects that will provide multiple benefits with regard to water supply, groundwater recharge, and environmental restoration and protection benefits. The FPA is another key working group that has assisted the IRWM planning effort in developing water management strategies that meet multiple stakeholders' goals and objectives and is implementing the Soap Lake Floodplain Preservation Project. Through the project implementation, the FPA has coordinated with land preservation organizations like The Nature Conservancy, Santa Clara County Open Space Authority, and the Land Trust of Santa Cruz County.

Another partnership formed during IRWM Plan development was the integration of the Resource Conservation Districts (RCDs). The RCDs previously developed water management strategies for implementation within the Pajaro River Watershed with support mainly from the Natural Resources Conservation Service (NRCS). The RCD has now joined the efforts of the RWMG and the SSC to implement those strategies on a broader scale as part of the integrated programs developed through the IRWM process. It was important to the RWMG and all stakeholders that RCD needs were heard and their water management strategies considered.

The Central Coast Agricultural Water Quality Coalition (CCAWQC) has been an active stakeholder in the Pajaro River Watershed IRWM planning effort. The mission of the Coalition is to represent farmers and ranchers in the development and implementation of voluntary, cost-effective, producer-directed programs to protect water quality on the Central Coast. A demonstration of the benefits of coordination through the IRWM is the integration of the CCAWQC and RCD agricultural irrigation efficiency program with the PV Water recycled water expanded delivery project. Due the integrated nature of the project, it received a high score in the IRWM project prioritization process and was selected for inclusion in the Drought Emergency Grant Application.

Another example of regional coordination to implement IRWM projects is the Hollister Urban Area (HUA) Water Program. The HUA Program was developed in partnership by the City of Hollister (COH), San Benito County (SBC), SBCWD, and Sunnyslope County Water District (SSCWD) to address water supply, water quality, and wastewater discharge requirements through an integrated and comprehensive approach across agency boundaries and throughout the HUA. A Memorandum of Understanding (MOU) was executed in 2004 by the COH, SBC, SBCWD, and later amended to include SSCWD. The MOU established the goals and institutional framework for regional water and wastewater master planning. The MOU described the principles, objectives, and assumptions that ultimately formed the institutional framework and basis of the 2008 HUA Water and Wastewater Master Plan. The project and delivery of benefits will be delivered across agency boundaries on a regional scale, demonstrating the benefits of regional planning.

The RWMG also presents IRWM region updates and receives general stakeholder feedback to the Pajaro Compass network at their semi-annual meetings. The Pajaro Compass is a group of landowners, resource

managers, public agencies, conservation organizations, funders, and elected officials that, through coordinated action, strive to promote opportunity for nature conservation and productive agriculture. By presenting to the Pajaro Compass network, the RWMG is able to receive feedback on the types of projects our general stakeholders are interested in and encourage stakeholder collaboration on projects.

The RWMG will continue to encourage and support regional coordination to enhance the implementation of the Pajaro River Watershed IRWM Plan.

12.5 Collaborative Process Used to Establish Plan Objectives

A consensus-based approach was used to develop the Pajaro River Watershed IRWM goals and objectives for the 2007 IRWM Plan. During the development of the 2007 goals and objectives, the RWMG considered both the needs and issues identified for the region and the statewide priorities. The goals and objectives were presented to stakeholders and then refined based on stakeholder input and consensus. The same process was used to update the goals and objectives for the 2019 IRWM Plan, with the addition of considering climate change more explicitly. Specifically, the RWMG reviewed the goals and objectives, presented proposed revised goals and objectives to the SSC, met with the SSC to obtain input on the goals and objectives, reviewed SSC input, and incorporated all the SSC input into the goals and objectives in Chapter 2.

12.6 Consensus Building

The major obstacles that could hinder implementation of the IRWM Plan are opposition from the various stakeholders throughout the watershed and from permitting agencies that have authority within the region. To minimize these obstacles, the RWMG has adopted a consensus building approach. All stakeholders – from local interest groups to regulatory agencies – have been invited to participate in the IRWM planning process. Providing a forum to address stakeholder concerns during the development of the IRWM Plan reduces the potential for conflicts during the implementation phase.

Consensus building will be integral to implementation of the Flood Protection goals because a local cost share is needed to pay for construction and on-going operations and maintenance of the Pajaro River Flood Risk Reduction Project. Establishing local funding for flood protection projects requires a vote of property owners and local voters to institute a self-imposed tax and this will require achieving community consensus on a locally preferred plan. The Community Consensus, Benefit Assessment Vote and Local Governance subtask of the Flood Risk Reduction Project focuses on gaining the public involvement and agreement critical obtaining voter approval for funding and ensuring that the Flood Project can move forward.

Where project impacts are identified, mitigation measures will be necessary. The measures which could be required in order to obtain regulatory approval for projects may serve as obstacles to plan implementation. To minimize regulatory obstacles, the RWMG will coordinate with local, state and federal regulatory agencies early in the process to determine necessary, corrective actions. Further discussion of agency coordination is provided in Chapter 13 Coordination.

12.7 Disadvantaged Community Involvement

As described in Chapter 2, a DAC is defined in the California Public Resource Code as a community with an annual median household income (MHI) that is less than 80% of the statewide MHI [PRC §75005 (g)]. 2010 Census data were collected and reviewed to identify any DACs in the region. The 2012-2016 State MHI was $63,783; therefore, communities with an average MHI of $51,026 are considered disadvantaged communities. The communities of Pajaro, Watsonville, Amesti, and Freedom were identified as DACs and there are other areas of DACs throughout the region. Protection of the people and economy of DACs in the Pajaro Region is a priority.

The City of Watsonville is a stakeholder in the IRWM planning process and is actively involved in the planning and implementation of the integrated water management strategies, which ensured that the needs and concerns of its residents were represented in the decision-making process. Since Watsonville's economy is tightly linked to local agricultural activities, which are threatened by seawater intrusion, groundwater basin water supply imbalance and flooding, the development of a sustainable water supply and flood mitigation projects will aid in the sustainability of the local economy and well-being of the community in the future.

Representatives from the other DACs, though not actively involved in the IRWM Plan development, were invited to participate in the process. The RWMG contracts with Rural Community Assistance Corp (RCAC) on behalf of the Pajaro region. RCAC provides community income surveys to identify hidden DACs, provides information about the IRWM program, and provides educational opportunities to help DACs address community issues. Through the RCAC outreach, several DACs submitted projects to the IRWM plan and are working with RCAC to secure funding for certain projects that are a priority for the community. In general, the RWMG is committed to ensuring the DACs are adequately represented in the IRWM process. This is reflected in the region's DAC targeted objectives:

- Water Supply Goal – Identify and address water supply needs of disadvantaged communities in the Pajaro River Watershed.
- Water Quality Goal - Identify and address the drinking water quality of disadvantaged communities in the Pajaro River Watershed.

The commitment is also demonstrated by the inclusion of DAC projects in each of the regions IRWM grant applications including water supply and water quality projects for the City of Watsonville and the community of Pajaro.

12.8 Tribal Communities

As described in Chapter 2, the Pajaro River watershed was inhabited for millennia by Native American tribal communities prior to colonization and features numerous sites and resources of cultural significance for tribal communities in the region. Generally, areas within a quarter mile of rivers and creeks have a moderate to high potential for archeological sensitivity.

Within the scope of the IRWM Plan, further research to compile and document the cultural resources within the Pajaro Watershed will be performed in conjunction with environmental evaluations on a project-specific basis. Due to the sensitivity of cultural resources, specific details about the location and nature of identified cultural resources are kept confidential.

The continuing IRWM process will continue to take into account and be responsive to the needs of and potential impacts to Native American communities and will support the identification and preservation of important tribal cultural resources. Environmental justice is addressed by ensuring all stakeholders have the potential to participate in the Pajaro IRWM planning process. The IRWM planning process and individual project development attempt to respect and support the interests of local Native American tribal communities in protecting and restoring the water-related resources of historic tribal lands. A representative of the Amah Mutsun Tribal Band participates in the SSC to ensure that the needs and concerns of its community were represented in the decision-making process. Stakeholders developing projects with the potential to impact cultural resources are encouraged to contact the Amah Mutsun Tribal Band representative on the SSC early in the project planning process. The RWMG will continue to reach out to the Native American community and encourage IRWM participation.

13 Coordination

This chapter addresses the following standard from the 2016 IRWM Grant Program Guidelines:

Coordination – The IRWM Plan must include:

- Identification of a process to coordinate water management projects and activities with local agencies, Native American Tribes, and stakeholders to avoid conflicts and best use resources (CWC §10541.(e)(13)).
- Identification of other neighboring IRWM efforts, the approach for cooperation or coordination with these other efforts, providing opportunities to discuss ongoing water management conflicts with adjacent IRWM efforts, and a summary of how joint project opportunities and/or conflicts.
- Identification of areas where a State agency or other agencies may be able to assist in communication, cooperation, or implementation of IRWM Plan components, processes, and projects, or where State or Federal regulatory decisions are required before implementing the projects.

In order to adequately plan and implement the integrated water management strategies recommended herein, it is vital to the success of this IRWM Plan effort that stakeholders and the appropriate federal, state, and local regulatory and jurisdictional agencies be actively involved. Traditionally, participation of the stakeholders and agencies occurred on a project-specific basis, depending on the requirements and needs of each effort. In the integrated planning process, however the role of the stakeholders and agencies were identified proactively and the potential involvement of each stakeholder and agency during IRWM Plan implementation was determined. The first form of involvement is to help coordinate and/or communicate the IRWM Plan to other stakeholders and agencies within the region. Another form of involvement is to assist in implementation of the IRWM Plan through facilitation or active project involvement. The final form of involvement, which applies only to agencies, is through granting of necessary regulatory approvals. In many cases, a given stakeholder or agency can be involved in IRWM Plan implementation in all of these ways. This chapter describes the state, federal and local agencies active in the Pajaro River Watershed and identifies opportunities for their involvement and assistance in IRWM Plan implementation through coordination, communication, project implementation, and regulatory approval.

13.1 Coordination within Pajaro River Watershed

13.1.1 Coordination with Stakeholders

Coordination with stakeholders on water management projects and activities was discussed in Chapter 1 – Governance and Chapter 12 - Stakeholder Involvement. In summary, the IRWM Plan process invites active public participation of all interested stakeholders. The main forums for IRWM planning and implementation are the Stakeholder Steering Committee (SSC), the SSC subcommittees, and general stakeholder meetings. In addition to SSC and SSC subcommittee meetings, the RWMG conducts general stakeholder meetings or updates around major milestones such as updates to the IRWM Plan goals and objectives, project solicitation and review, and project selection for grant applications and provides updates and presentations to interested stakeholder groups. The SSC, the SSC subcommittees' meetings, and general stakeholder meetings provide an opportunity to identify synergies and avoid conflicts between projects.

13.1.2 Local Agency Coordination

Local water and land use agencies have a history of coordinating on shared topics and interests, such as planning for infrastructure for water and wastewater facilities to address unmet and future needs. As identified in Table 13-1, there are several local agencies with statutory authority over water supply or water management in the Pajaro River Watershed region. The table also provides the basis and nature of that statutory authority. As previously described in Chapter 11, land use agencies including cities and counties have participated to varying degrees in the Pajaro IRWM planning process since its inception. Coordination with cities and counties as well as other land use decision-makers has occurred through the stakeholder process and allowed land use considerations to be fully incorporated into the IRWM Plan while also ensuring that future land and water use decisions will be supported at the local level and will help avoid conflict.

Coordination within the watershed has occurred through sub-regional efforts such as the Pajaro Valley Basin Management Plan Update, Hollister Urban Area Water and Wastewater Management Plan, the South County Water Supply Planning Project, and the Habitat Plan. The results of these efforts have been integrated into the IRWM Plan. The Pajaro River Watershed Flood Prevention Authority is a JPA of the counties in the watershed and the Monterey County Water Agency, SBCWD, Valley Water, and the Santa Cruz County Flood Control and Water Conservation District Zone 7. The counties of Santa Cruz and Monterey are the local sponsors, in coordination with the Corps, for the Pajaro River Risk Reduction Project, which is a critical IRWM Plan project.

The following actions are proposed to further agency coordination within the region:

- Increase the Frequency of Periodic City-County-Water Agency Planning Meetings: The RWMG will continue to encourage city and county planners and local water managers to hold joint planning meetings at regular intervals to improve communication and efficiencies. Joint planning meetings can be held at the staff level and/or by governing boards. Both options provide value in different ways, and both should be continued.
- Water Resource Planning Forum: To develop a better understanding and mutual appreciation of the issues and constraints faced by land use and water managing agencies (including the mission, priorities, and decision-making organization of these entities) the RWMG could host a forum where agency representatives present targeted information regarding their organization's mission, constraints, overlapping areas of interest, potential conflicts in priorities or objectives, and potential areas for improved coordination.
- Climate Change: Use climate change as a common denominator to encourage agency collaboration for integrated solutions. For example, Valley Water is part of Santa Clara County's Silicon Valley 2.0 effort to develop a climate action plan.
- Increase Land Use Agency Participation in the IRWM Process: Currently, the Pajaro River Watershed IRWM Plan Stakeholder Steering Committee includes representatives from the County of Santa Cruz and the City of Watsonville. The RWMG will continue to encourage participation from land use agency staff in Santa Clara and San Benito counties.

Through these actions, and the stakeholder involvement efforts described in Chapter 12, coordination of water management projects and activities of participating local agencies and local stakeholders will help avoid conflicts and take advantage of efficiencies.

Table 13-1: Local Agencies in the Pajaro Watershed

Local Agency	Basis of Authority
Aromas Water District	Aromas Water District is located on the westerly edge of the PV Water service area. This special district provides water treatment and supply service for over 900 customers.
Central Coast Regional Water Quality Control Board (RWQCB) – Region 3	The Central Coast RWQCB is a regulatory extension of the State Water Resources Control Board. The Central Coast RWQCB coordinates and controls the quality of water in its region through the protection of beneficial uses, the development of water quality objectives to protect the beneficial uses, and implementation planning to accommodate the water quality objectives. This entity was established by the Porter-Cologne Water Quality Control Act (1969), which became Division Seven ("Water Quality") of the State Water Code. The State Water Code establishes the responsibilities and authorities of the nine RWQCBs (previously called Water Pollution Control Boards) and the State Water Resources Control Board (SWRCB). The federal Clean Water Act (Public Law 92-500, as amended) provides for the delegation of certain responsibilities in water quality control and water quality planning to the states. Where the Environmental Protection Agency (EPA) and the SWRCB have agreed to such delegation, the Regional Boards implement portions of the Clean Water Act, such as the National Pollutant Discharge Elimination System (NPDES) program and toxic substance control programs
City of Gilroy	Located in South Santa Clara County, the City of Gilroy provides water service to residences and businesses. Gilroy is a South County Regional Wastewater Authority (SCRWA) Partner which provides wastewater service for the Cities of Gilroy and Morgan Hill.
City of Hollister	The City of Hollister is a major urban service area in San Benito County. The City of Hollister provides various municipal and industrial (M&I) services include wastewater collection and treatment and water supply service.
City of Morgan Hill	Located in South Santa Clara County, the City of Morgan Hill provides water service to residences and businesses. Morgan Hill is a SCRWA Partner that provides wastewater service for the Cities of Morgan Hill and Gilroy.
City of San Juan Bautista	Located in San Benito County, the City of San Juan Bautista provides wastewater and water services. San Juan Bautista is a member of the Water Resource Association of San Benito County.
City of Watsonville	The City of Watsonville is a major urban service area within PV Water. The City provides various M&I services including wastewater collection and treatment and water supply service.
County of Monterey	The County of Monterey is a government agency with land use jurisdiction within its boundaries. The County also manages

Local Agency	Basis of Authority
	water and sanitation systems in unincorporated County Service Areas. The southern portion of the PV Water service area is in Monterey County.
County of San Benito	The County of San Benito is a government agency with land use jurisdiction within its boundaries. A significant portion of the upper Pajaro River watershed (including the San Benito River) is within San Benito County.
County of Santa Clara	The County of Santa Clara is a government agency with land use jurisdiction within its boundaries. A portion of the upper Pajaro River watershed is within Santa Clara County.
County of Santa Cruz	The County of Santa Cruz is a government agency with land use jurisdiction within its boundaries. The County of Santa Cruz also has jurisdiction over stormwater, drainage, watershed management, water resources management and water quality protection for the unincorporated areas of Santa Cruz County. The northern portion of the PV Water service area is in Santa Cruz County.
Freedom County Sanitation District	The special district that manages the sanitation collection system for the unincorporated area of Freedom
Monterey County Water Resources Agency (MCWRA)	MCWRA is a special district formed to manage, protect, and enhance the quantity and quality of water and provide specified flood control services for Monterey County, and to be a leader in efficient, innovative, and equitable water resources management for the County. As a County water agency and stakeholder, MCWRA has an interest in flood prevention and water supply management of the lower Pajaro River that falls within its jurisdiction.
Pacheco Pass Water District (PPWD)	PPWD owns and operates Pacheco Dam and Reservoir on Pacheco Creek for local water supply benefits.
Pajaro River Watershed Flood Prevention Authority (PRWFPA)	PRWFPA was established in 2000 by the State of California Assembly Bill 807 to identify, evaluate, fund, and implement flood prevention and control strategies in the Pajaro River watershed, on an intergovernmental basis. Since the Pajaro River watershed covers an area within four counties (Santa Clara, San Benito, Santa Cruz, and Monterey) and four water districts (Santa Clara Valley Water District; San Benito County Water District; Santa Cruz County Flood Control and Water Conservation District, Zone 7; and Monterey County Water Resources Agency), the PRWFPA is comprised of one representative from each of the eight interested agencies. The PRWFPA is a governing body through which each member organization can participate and contribute to finding a method to provide flood protection in the watershed and promote general watershed interests. A further goal is to identify and prioritize strategies and projects that will provide multiple benefits, such as water supply, groundwater recharge, or environmental restoration and protection benefits.

Local Agency	Basis of Authority
Pajaro/Sunny Mesa Community Services District	Pajaro/Sunny Mesa Community Services District is a water supplier for smaller communities in the Pajaro Valley and has consolidated water delivery service for a number of mutual water companies in northern Monterey County.
Resource Conservation Districts (RCDs)	California RCDs are special districts organized under the state Public Resources Code, Division 9. The RCDs in the Pajaro Watershed are the Santa Cruz RCD, Monterey County RCD, San Benito RCD and Loma Prieta RCD. Each district has a locally elected or appointed volunteer board of directors made up of landowners in that district. Interests of the RCDs which relate to water management include water quality, wildlife habitat restoration, soil erosion control, and conservation education.
Santa Cruz County Flood Control and Water Conservation District, Zone 7 (SCCFC&WCD)	This district is governed by the Santa Cruz County Board of Supervisors, City of Watsonville, and PV Water. It provides flood control services to Santa Cruz County except the cities of Santa Cruz, Scotts Valley and Capitola. As a County agency and stakeholder, SCCFC&WCD has an interest in flood prevention of the lower Pajaro River that falls within its jurisdiction.
Soquel Creek Water District	This government agency provides water resource management for communities in mid-Santa Cruz County.
South County Regional Wastewater Authority	South County Regional Wastewater Authority is the regional wastewater authority for South Santa Clara County, primarily serving the Cities of Gilroy and Morgan Hill. SCRWA has partnered with the Santa Clara Valley Water District to expand water recycling in southern Santa Clara County.
Sunnyslope County Water District	Sunnyslope County Water District is a water and wastewater management district for a portion of the City of Hollister and the Ridgemark Development in San Benito County.
U.S. Army Corps of Engineers (Corps)	The Corps provides engineering and environmental services throughout the nation. The Corps is currently conducting a flood risk management study on the lower Pajaro River and tributaries.

13.2 Neighboring IRWM Coordination

The Pajaro River Watershed IRWM region is one of six IRWM regions in the DWR designated Central Coast Funding Area. The Pajaro River Watershed IRWM RWMG is coordinating with the five other IRWM regions. In 2005, three agencies – Monterey County Water Resources Agency, Monterey Peninsula Water Management District, and PV Water took the lead in developing and enacting a Memorandum of Understanding (MOU) for IRWM in the Monterey Bay area. The goal of the Monterey Bay MOU was to more effectively manage resources and costs, and to better serve the public with regard to water resources management across the entire Monterey Bay region.

The Pajaro River Watershed IRWM Plan is one of four detailed IRWM planning efforts in the greater Monterey Bay region. All IRWM Plan efforts originate within four Monterey Bay regions, which can

generally be described as (1) the Santa Cruz County Region which includes northern Santa Cruz County through and including Aptos Creek, San Andreas and the Watsonville Sloughs watershed, (2) the Pajaro River Watershed which includes parts of Santa Clara, San Benito, Santa Cruz, and Monterey Counties, (3) the Greater Monterey County Region which includes the majority of Monterey County, and (4) Monterey Peninsula, Carmel Bay, and South Monterey Bay Region which includes the Carmel River watershed and Seaside groundwater basin in Monterey County. Collaborative efforts have been undertaken with representatives from each of the other three IRWM Plan regional groups to ensure overlapping areas and projects are understood and coordinated. In particular, the RWMG is currently coordinating with the Santa Cruz County Region on the funding and implementation of a multi-benefit IRWM project in Watsonville on Upper Struve Slough. Different aspects of the project benefit each region, so it is important that both regions coordinate to ensure there is no conflict and the project benefits can be maximized for both regions. All other Monterey Bay area IRWM Plan efforts considered their delineations to be appropriate.

In February 2007, in response to the State's definition of the Central Coast as a funding area for future IRWM grant programs, all six IRWM planning regions within the Central Coast began discussions regarding regional cooperation within the framework of the IRWM process pursuant to Propositions 50 and 84. The six IRWM Plan efforts within the Central Coast are the four Monterey Bay IRWM Plans, the San Luis Obispo County IRWM Plan and the Santa Barbara County IRWM Plan. Some of these IRWM planning regions have common, overlapping water interests, but most water issues are more effectively managed within the six individual regions. Water management interests that may be coordinated across the Central Coast funding area include, but are not limited to, water conservation, water quality monitoring and improvements, fisheries restoration and drought protection. An additional area of coordination among the regions will be to address the geographic areas within the Central Coast region that are not currently covered by an IRWM Plan. There are no identified conflicts with neighboring IRWM regions.

Valley Water is also participating in the San Francisco Bay Area IRWM Plan. The Valley Water service area can be divided into two regions – South County and North County, which drain to Monterey Bay and San Francisco Bay, respectively. In addition to falling within different watersheds, South County and North County have fairly distinct land uses and social, cultural and economic compositions. Because South County is more aligned with the make-up of PV Water and SBCWD and is in the same watershed, Valley Water determined that coordination with these agencies provided the best opportunity to address water management issues within its South County region, while the Bay Area IRWM Plan could best address issues within the Santa Clara North County region.

13.3 State and Federal Agency Coordination

As discussed in the Stakeholder Involvement Chapter, state and federal agencies have been engaged through a variety of stakeholder activities. These activities have included stakeholder meetings, workshops, Board presentations, and personal communications (via email and telephone).

Table 13-2 identifies agencies that will be central to implementing the IRWM Plan. The table focuses mainly on agencies with regulatory jurisdiction; however, select non-regulatory agencies that were formed from State and Federal legislation have also been identified. The table describes the jurisdictional authority or interest of each agency as well as coordination efforts that have been either completed or planned. Coordination and involvement of these agencies with the IRWM Plan effort will continue throughout implementation.

Table 13-2: Federal and State Agencies

Agency	Jurisdiction/Interest	Completed or Planned Coordination/Interaction
Federal		
U.S. Army Corps of Engineers (Corps)	Protection, preservation, and enhancement of waters of the U.S.	Collaboration through Pajaro River Watershed Study and federal sponsor of the Levee Reconstruction Project.
NOAA National Marine Fisheries Service	Protection, preservation, and enhancement of fisheries, endangered species and habitat	Participation through APV stakeholder process and permitting coordination through the Levee Reconstruction Project, PV Water Revised Basin Management Plan (BMP), Corralitos Creek Surface Fisheries Enhancement Project, South County Resources Management Plan (SCRMP), Santa Clara Habitat Conservation Plan (HCP) and Natural Communities Conservation Plan (NCCP)
U.S. Fish and Wildlife Service	Protection, preservation, and enhancement of fisheries, endangered species and habitat	Participation through APV stakeholder process and permitting coordination through the Levee Reconstruction Project, BMP, SCRMP, HCP and NCCP.
U.S. Bureau of Reclamation (USBR)	Manage, develop, and protect water and related resources in an environmentally and economically sound manner.	Permitting coordination through BMP and funding coordination through Watsonville Recycled Water Treatment Facilities and Coastal Distribution System; CVP water transfers within the San Felipe Division
U.S. Environmental Protection Agency	Responsible for protecting human health and the environment. Develops and enforces regulations, provides funding assistance, performs environmental research and education. Manages Superfund program and cleanup of contaminated sites.	Administering federal grant funded work for perchlorate cleanup that impacts water supply, Main Avenue and Coyote-Madrone Pipeline Repair.
Monterey Bay National Marine Sanctuary	Resource protection, research, education, and public use of the Federally protected 276 miles of marine area offshore of California's central coast, stretching from Marin to Cambria	Invitation to participate in IRWM Plan process and coordination through permitting of near-term water supply projects.

Agency	Jurisdiction/Interest	Completed or Planned Coordination/Interaction
United States Department of Agriculture Natural Resources Conservation Service (NRCS)	Manage natural resource conservation programs that provide environmental, societal, financial and technical benefits. Provide assistance to private landowners and managers. (Non-regulatory agency)	Participation through technical support provided to the RCDs.
State		
SWRCB	Preserve, enhance and restore the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations	Meetings and planned collaboration on SWAMP and GAMA, permitting and financing coordination through BMP and permitting coordination through Corralitos Creek Fisheries Enhancement Project; Regional Mobile Lab; grant funding of South County Recycled Water Program expansion
DWR	Manages the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments. Operates and maintains the State Water Project, including the California Aqueduct, provides dam safety and flood control services, assists local water districts in water management and conservation activities, promotes recreational opportunities, and plans for future statewide water needs.	Coordination through Pajaro River Levee Reconstruction Project, BMP Proposition 13 grant, and Proposition 50 Planning and Implementation Grants
Central Coast RWQCB	Protection and management of surface water and groundwater.	Invitation to participate in IRWM Plan process and coordination on the Farm and Range Water Quality Management Program. Oversight on perchlorate management.
California Coastal Commission	Protection, preservation, and management of the California Coast and resources.	Participation through APV stakeholder process and permitting coordination through Levee Reconstruction Project and BMP.

Agency	Jurisdiction/Interest	Completed or Planned Coordination/Interaction
California Department of Fish and Wildlife	Protection, preservation, and enhancement of endangered species and habitat.	Participation through APV stakeholder process and permitting coordination through Levee Reconstruction Project and BMP, HCP and NCCP
Resource Conservation Districts (RCDs)	Interest in water management including water quality, wildlife habitat restoration, soil erosion control, and conservation education. (Non-regulatory agencies representing Monterey, San Benito, Santa Clara, and Santa Cruz Counties)	Workshop participation and overall participant in IRWM Plan process.

State and federal agencies can actively assist in communication and coordination of IRWM Plan efforts that fall under areas of their jurisdictional authority. The involvement of state and federal agencies is also critical in facilitating IRWM Plan implementation, which can be done through endorsement of projects, participating in regional working groups and through direct project funding and implementation. This chapter discusses the participation of active state and federal agencies in the Region and describes how their future involvement will assist in implementation of the IRWM Plan.

13.3.1 U.S. Army Corps of Engineers

The Corps has been heavily involved over the last 40 years in developing flood risk management strategies for the Lower Pajaro River. The Pajaro River Flood Risk Reduction Project is the culmination of the planning that was conducted and the project is now being implemented as part of the IRWM Plan. The Corps coordinated this project with the Pajaro River Watershed Study, which focused on developing floodplain management strategies for the Upper Pajaro River. Because flood projects in the Upper and Lower Pajaro are linked, the continued cooperation of the Corps is essential for success of the Pajaro River Flood Protection Program. Additionally, the Corps has conducted public meetings on the project. Continuing these public forums will be critical to provide ongoing communication about the project itself and to convey the additional benefits that are gained from implementation of the project within the context of integrated regional planning. Also, Corps funding of 65% of the project costs is critical for the implementation of the Levee Reconstruction Project. FEMA is another federal agency for which coordination is necessary as it defines the floodplain for the Pajaro River Watershed.

13.3.2 U.S. Bureau of Reclamation

USBR is responsible for managing the CVP system and allocation and fulfillment of CVP contracts. Coordination with the Mid-Pacific Region of USBR will be vital for any projects in the watershed related to imported water such as the Coastal Distribution System. USBR will play a key role in the CVP water transfers within the San Felipe Division, and will be important in communicating with the agencies involved in explaining the transfer agreements and maintaining proper accounting so that a fair, transparent and efficient market based system can be achieved. The USBR is also involved in the Watsonville Recycled Water Treatment Facility and Coastal Distribution System and the South County Recycled Water Improvements.

13.3.3 Resource Conservation Districts

The four RCDs are special districts created under state law. In the Pajaro River Watershed, they have been active in dealing with issues in the areas of water quality, wildlife habitat restoration, soil erosion control and conservation. RCDs have developed working relationships with a diverse array of stakeholders in the Region (including other state and federal agencies), and thus have served as an important resource for stakeholder coordination and communication. An example is the SCCRCD, which has relationships with:

- Farm Bureau
- California Department of Conservation
- California Department of Forestry and Fire Protection
- California Department of Parks and Recreation
- U.S. Environmental Protection Agency
- Department of Water Resources
- State Water Resources Control Board
- Regional Water Quality Control Board
- Coastal Conservancy
- California Department of Fish and Game
- The Nature Conservancy
- Santa Cruz Land Trust
- Bureau of Land Management
- California State University at Monterey Bay
- Local community colleges
- United States Department of Agriculture Natural Resources Conservation Service
- UCCE Farm Advisors

Because of these relationships, the RCDs can serve as a center of coordination for these other agencies on IRWM Plan issues related to resource conservation. The RCDs can also assist in implementation of the IRWM Plan through projects and are the lead agencies on several projects in the IRWM Plan.

13.3.4 Central Coast Basin RWQCB

The Central Coast Basin RWQCB is responsible for communicating the requirements for the conditional agricultural waivers to growers and for explaining the water quality benefits of meeting the waiver requirements to the public. As the RWQCB is the primary regulatory agency for water quality, the stakeholders will rely on it to sanction the solutions, partnerships and methods in the IRWM Plan that are proposed for addressing issues such as NPS pollution and TMDL compliance. This will include most of the water quality projects in the IRWM Plan.

13.3.5 NOAA National Fisheries Marine Service, U.S. Fish and Wildlife Service and the Monterey Bay National Marine Sanctuary

The participation of the NOAA National Fisheries Marine Service, the U.S. Fish and Wildlife Service and the Monterey Bay National Marine Sanctuary in the watershed is necessary because these agencies are responsible for protecting fisheries and marine life, which can suffer from the unintended negative effects of water management projects. Coordination with these agencies is important for the flood and surface water projects in the IRWM Plan.

13.3.6 Other State and Federal Agencies

State and Federal agencies can also assist in implementation by providing funding opportunities as listed in the Finance Chapter. SWRCB, DWR, USEPA and USBR are the federal and state agencies that provide the most significant funding opportunities for the Pajaro River Watershed and close coordination should be maintained with these agencies to identify future funds for implementation.

The State and Federal agencies in the Pajaro River Watershed that can assist in the implementation of this IRWM Plan have been identified. Proactive coordination with the appropriate agencies will ensure that projects receive endorsement and support and can prevent issues from arising later that can block implementation.

13.4 Regulatory Support

Regulatory and jurisdictional agency involvement is vital to the eventual implementation of the water management programs, projects and integrated water management strategies identified in this plan. Many of the projects will require some level of regulatory approval or oversight and will fall under the purview of one or more of the agencies listed in this chapter. The on-going IRWM Plan effort will continue to communicate, coordinate, and collaborate at all steps of the process with the appropriate local, State, and Federal agencies in their regulatory roles where necessary. Participation by these agencies at an early stage will streamline the regulatory process, and ensure that the implementation of projects will not be unnecessarily delayed.

There are a number of IRWM Plan projects that illustrate the advantages of such participation:

- The Corps is both an active participant in the Pajaro River Flood Risk Reduction Project as well as an approving agency for the project through its jurisdiction over projects that impact waters of the United States, which includes the Pajaro River. Its participation will greatly facilitate federal approval.
- The Permit Coordination Program that was developed through the IRWM planning process is an excellent example of an effort to streamline the regulatory process at a watershed level. It was designed to address the fact that implementing certain habitat restoration projects such as streambank restoration can often require going through as many as eight different environmental regulation processes administered by a variety of agencies, which presents an ironic obstacle. The program provides landowners and agricultural growers access to a single coordinated process of regulatory approval for permitting restoration related BMPs.
- Regulatory coordination with DHS will be necessary for projects that involve drinking water standards or adherence to Title 22 reclaimed water standards such as Watsonville Hexavalent Chromium Well Treatment and regional recycled water projects.

Several actions can be taken to streamline regulatory and permitting processes for the IRWM Plan components. These may include preliminary consultations with individual regulatory agencies and joint

workshops between the appropriate regulatory representatives and Pajaro River Watershed IRWM Plan stakeholders. Such coordination would facilitate the permitting and regulatory decision process by identifying action items to be addressed by stakeholders. Such involvement by federal, state, and local agencies will assist the IRWM Plan effort to be more efficient during overall program implementation.

Table 13-3 lists the range of potential permits and approvals that will be needed, are in the process of being obtained, or have been obtained from the appropriate regulatory and jurisdictional agencies for Pajaro River Watershed IRWM Plan implementation projects. Several of the project teams are already working with the appropriate regulatory agencies and working through the permitting and/or approval process. Depending on the specific action required, certain permits and approvals will be pursued by each implementing party/stakeholder for their respective projects; for success, this process will necessitate clear communication, collaboration, and close coordination with the regulatory agencies.

Table 13-3: Potential Permits and/or Approvals Needed for IRWM Plan Strategies Implementation

Agency/Organization	Permit or Approval	Action Requiring Permit/Consultation
Federal		
U.S. Army Corps of Engineers	Section 404 Permit	Impacts to wetlands and/or waters of the United States
U.S. Bureau of Reclamation	Acquire additional CVP supplies, compliance with National Environmental Policy Act	CVP water deliveries, Connection to Santa Clara Conduit, CVP water transfers; O&M
U.S. Fish and Wildlife Service; National Marine Fisheries Service	Consultation and Coordination under Endangered Species Act	Construction in wetland and upland areas where federally listed species may be present, operations of some facilities
State		
California Coastal Commission	Coastal Development Permits	Projects within local Coastal Commission jurisdiction
California Department of Fish and Game	1601 Streambed Alteration Agreement	Alteration of streambeds during construction
California Department of Health Services	Title 22 Report Approval	Recycled Water treatment and delivery, Wellhead treatment; Desalination
California OSHA Mining and Tunneling Unit	Mining and Tunneling Permit	Trenches or excavations deeper than 5 feet
Caltrans	Encroachment Permits	Construction under California State Highways
Central Coast Regional Water Quality Control Board	401 Certification or Waiver Low Threat Discharge Permit Comments on Title 22 Report	Potential for water quality impairment from sediment discharge to waterways during construction, dewatering and disposal at construction sites, consultation with DHS on Title

Agency/Organization	Permit or Approval	Action Requiring Permit/Consultation
		22 Report, water recycling, desalination
State Water Resources Control Board	National Pollutant Discharge Elimination System (NPDES) General Permit Storm Water Pollution Prevention (SWPP); Change in Place of Use; water rights permitting.	Construction and grading of areas greater than 1 acre, authorization for use of CVP water in the PV Water service area, and authorization to divert Harkins Slough and Corralitos Creek surface waters.
Local		
Cities of Gilroy, Hollister, Morgan Hill, San Juan Batista and Watsonville; Monterey County, San Benito County, Santa Clara County, and Santa Cruz County	Development Permit	Construction projects within City and County limits
County Flood Control and/or Public Works	Encroachment Permit Approval	Construction affecting levees and drainage ditches
County Health Services, Valley Water (for Santa Clara County)	Well Drilling Permit, Grading Permit, Development and Coastal Development Permits, Riparian Exclusion Permit, Encroachment Permit	New well construction or decommissioning and construction projects within County jurisdiction and local coastal zone.
Private Industry		
PG&E	Infrastructure Review; Encroachment Permit	Construction within right-of-way for overhead electrical wires and potentially under buried pipelines
Telecommunications & Cable Companies	Infrastructure Review; Prior Notification to Construction	Construction near or crossing buried lines
Union Pacific Railroad/Southern Pacific Railroad	License Agreement or Easement; Right of Entry	Cross railroad tracks, parallel tracks; conduct surveys, enter the railroad right-of-way

14 Climate Change

This chapter addresses the following 2016 IRWM Plan Standard:

> **Climate Change** - The IRWM Plan must address region vulnerabilities to climate change impacts, adaptation to the effects of climate change, and mitigation of GHG emissions. The IRWM Plan must include the following items:
>
> - An assessment of the IRWM region's vulnerabilities to the effects of climate change equivalent to the vulnerability assessment contained in the Climate Change Handbook for Regional Water Planning, Section 4 and Appendix B
> - A discussion of potential adaptation responses to identified climate change-related vulnerabilities.
> - A process that considers GHG emissions when choosing between projects alternatives.
> - A list of prioritized vulnerabilities based on the vulnerability assessment and the IRWM's decision making process.
> - The IRWM Plan must contain a plan, program, or methodology for further data gathering and analysis of the prioritized vulnerabilities.

Scientific evidence has determined that global climate conditions are changing and will continue to change as greenhouse gas (GHG) concentrations increase in the Earth's atmosphere. Changes in climate can affect municipal water supplies through modifications in the timing, amount, and form of precipitation, as well as water demands and the quality of surface runoff. These changes can affect all elements of water supply systems, from watersheds to reservoirs, conveyance systems, and treatment plants. Climate change can also affect wildfire severity and frequency, flooding potential, riparian and aquatic habitat and ecosystems, and seawater intrusion.

Planning for and adapting to anticipated changes in climate will be essential to ensuring water supply reliability for all users and to protecting sensitive infrastructure against more frequent and extreme precipitation and wildfire events. This section summarizes anticipated climate change impacts on the State of California and the Pajaro River Watershed Integrated Regional Water Management (IRWM) region, evaluates the impacts of those changes with regards to water resources management, assesses the vulnerabilities to anticipated climate change impacts, and provides recommended adaptation and mitigation strategies to address vulnerabilities and reduce GHG emissions. In addition, this section includes a plan for ongoing data collection to fill data gaps and monitor the frequency and magnitude of local hydrologic and atmospheric changes.

14.1 Climate Change Science

Heat is transferred between the sun, the Earth's atmosphere, and the Earth's surface via radiation. The sun emits shortwave radiation that passes through the Earth's atmosphere and is absorbed by the Earth's surface. The Earth's surface, in turn radiates the heat it absorbed from the sun as longwave radiation. The Earth's lower atmosphere is composed of gases that absorb longwave radiation, helping to maintain heat in the Earth's lower atmosphere, where life exists. The phenomenon is commonly known as the greenhouse effect, and gases that absorb longwave radiation are known as GHGs (USEPA, 2012; Figure 14-1). Scientists have observed a statistically significant increase in GHG concentrations in the Earth's atmosphere over the past century and have attributed this increase to anthropogenic activities beginning during the Industrial Revolution (1750s). The increased heat associated with the rise in GHGs is causing the Earth's ocean and air temperatures to increase beyond that possible without the increased GHGs in the atmosphere. The increased temperatures are causing changes in global climate patterns that may significantly impact

our ability to meet future water management objectives in areas such as water supply reliability, water quality, flood control, stormwater management, and habitat protection.

Figure 14-1: The Greenhouse Effect

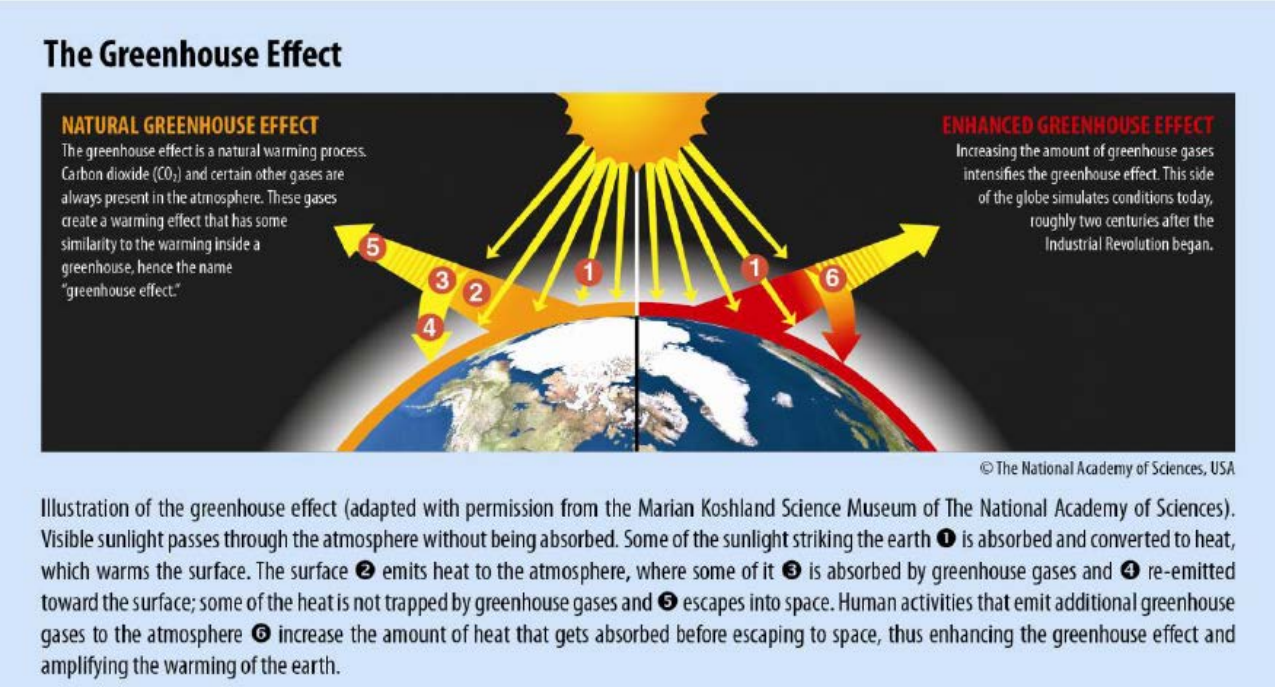


Illustration of the greenhouse effect (adapted with permission from the Marian Koshland Science Museum of The National Academy of Sciences). Visible sunlight passes through the atmosphere without being absorbed. Some of the sunlight striking the earth ❶ is absorbed and converted to heat, which warms the surface. The surface ❷ emits heat to the atmosphere, where some of it ❸ is absorbed by greenhouse gases and ❹ re-emitted toward the surface; some of the heat is not trapped by greenhouse gases and ❺ escapes into space. Human activities that emit additional greenhouse gases to the atmosphere ❻ increase the amount of heat that gets absorbed before escaping to space, thus enhancing the greenhouse effect and amplifying the warming of the earth.

(Pew Center, 2011)

There is consensus among the scientific community that there is a significant correlation between increased anthropogenic GHG concentrations and observed warming trends. According to the Intergovernmental Panel on Climate Change (IPCC), "Most of the observed increases in global average temperatures since the mid-20th century are very likely due to the observed increase in anthropogenic GHG concentrations," (IPCC, 2007b). The most recent IPCC report states that the minimum global average surface warming is predicted to be 1.5 degrees Celsius (C) by 2030, and rising temperatures thus far have already begun to impact the presence of glaciers, atmospheric and oceanic circulation patterns, and the severity and variability of weather events (IPCC, 2007a).

Reducing GHG emissions is the primary method for mitigating extreme or catastrophic climate change. However, because current GHG emissions are expected to continue to affect climate into the future, even under aggressive GHG reduction scenarios, it is prudent to begin identifying strategies needed to adapt to future climate conditions. Before strategies can be identified, water resource managers must first understand future climate projections and uncertainties associated with these projections.

14.2 Statewide Observations and Projections

Climate change will have significant impacts on California's water resources due to rising sea levels, decreased mountain snowpack, and increased water and air temperatures. In addition, extreme conditions, including droughts and floods, are expected to become more frequent and severe. Multiple models are available to simulate climate processes and project future climate. The results from these models vary based on the approach used to simulate the Earth's physical, chemical, and biological processes. Despite model variability, there is consensus on the directional impact of climate change on air temperature, snow pack,

and timing of precipitation (CalAdapt 201X). The following sections discuss the range of climate impacts projected for California based on a range of modeled results.

14.2.1 Temperature Changes

NASA and California State University, Los Angeles analyzed temperature observations from 331 weather stations across the state and found that average temperatures rose by 2˚F from 1950 to 2000 (LaDocy et al. 2007). This increase has not been uniform throughout the state with southern California warming more than central California and the northeastern Sierras experiencing cooling over part of the region. In addition, higher elevations have experienced the greatest temperature increases (DWR, 2008).

GCMs project that in the first 50 years of the 21st century, mean annual temperatures will increase between 1.8 to 7.8˚ F (CalAdapt). By the end of the 21st century, mean annual temperatures in California are expected to increase by 5.8 to 14˚ F (Cayan et al, 2006). Increases in temperature are unlikely to be felt uniformly throughout the State. Model projections generally conclude that warming will be greater in California in summer months than in winter months (CAT, 2009), but warming during the winter months could have significant implications for water supply by increasing the amount of outdoor watering. Inland areas will experience more extreme warming than coastal areas since they do not have the moderating effect of the ocean (California Natural Resources Agency [CNRA], 2009). These non-uniform warming trends reinforce the importance of implementing local and regional approaches to addressing climate change.

14.2.2 Precipitation Changes

While temperature projections exhibit high levels of agreement across various models and emissions scenarios, projected changes in precipitation are more varied. Taken together, downscaled GCM results show little change in average precipitation for California before 2050 (DWR, 2006), with a drying trend emerging after 2050 (BOR, 2011a and CCSP, 2009). In particular, the average Sierra Nevada snowpack is expected to significantly decrease in the latter half of the century and there is significant uncertainty whether precipitation will change along the central and northern coast. However, models do indicate that future climate will likely be more extreme, with more droughts and more intense rain storms.

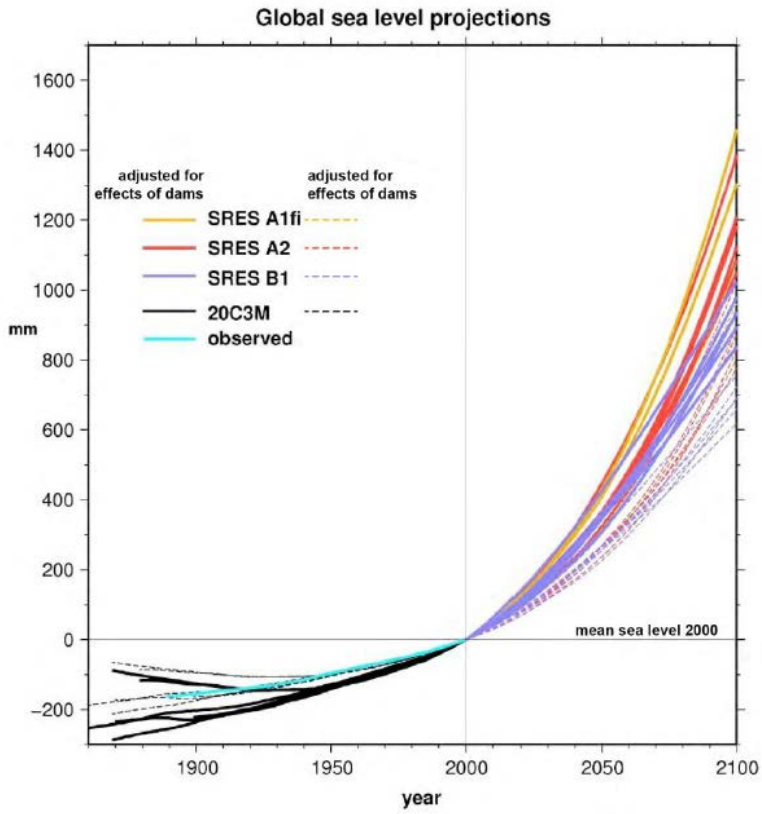
14.2.3 Sea-level Rise

In the last century, the California coast has recorded a sea level rise of seven inches (DWR, 2008). There are several approaches to estimating the extent of sea level rise due to climate change. The Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT) has taken the IPCC's modeling scenarios and used them to create more California-specific estimates of climate change impacts. CO-CAT estimates sea levels will rise between 10 and 17 inches by 2050, and between 31 and 69 inches by the end

of the century (CO-CAT 2010). This projection has been adopted by the California Ocean Protection Council (OPC) in a resolution on sea-level rise (OPC, 2010).

Rising sea levels threaten levees, particularly in the Sacramento – San Joaquin Delta, which is the source of much of California's water supply. Sea level rise increases the risk of storm surges and the flooding of coastal residences and infrastructure. Increasing salinity resulting from sea-level rise may impact the quality of vulnerable water supplies throughout California. Sea-level rise and changing precipitation patterns will also impact ecosystems in coastal areas that rely on a balance between freshwater and salt water, and may increase saline intrusion into coastal aquifers.

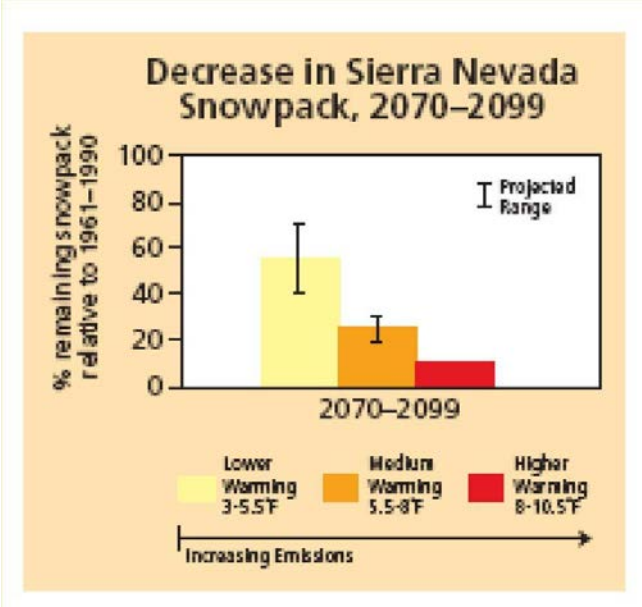
Figure 14-2: Sea Level Rise Projection by CO-CAT



14.2.4 Snowpack Reduction

The average April 1 snowpack in the Sierra Nevada region (a primary storage mechanism for California's water supply) has decreased in the last half century (Howat and Tulaczyk, 2005 and CCSP, 2008). As the climate warms, the Sierra Nevada's snowpack is anticipated to continue to shrink. Based on simulations conducted to date, Sierra Nevada snowpack is projected to shrink by 30% between 2070 and 2099 (Figure 14-3), with drier, higher warming scenarios putting that number as high as 80% (Kahrl and Roland-Holst 2008).

Figure 14-3: Projected Snowpack Changes in the Sierra Nevada



Source: Hopmans et al. 2008

14.2.5 Extreme Events

As the climate warms, extreme events, including wildfires, floods, droughts, and heat waves, are expected to become more frequent. In contrast, freezing spells are expected to decrease in frequency over most of California (CNRA, 2009). While GCM projections may indicate little if any change in average precipitation in the future, extreme precipitation events are expected to become more common (Congressional Budget Office [CBO], 2009). Atmospheric rivers originating from the tropics have historically been responsible for creating the heaviest storms in California. These storms are characterized by long, thin bands of air with a high water vapor content that occasionally stretches over California from the Pacific Ocean. Years with several atmospheric river events could become more frequent over the next century (Dettinger, 2011).

In addition to atmospheric river events, droughts and heat waves are expected to become more frequent, longer, and more spatially-extensive (CNRA, 2009). The combination of drier and warmer weather compounds expected impacts on water supplies and ecosystems (CCSP, 2009).

Wildfires are becoming more frequent, longer, and more wide-spread (Sierra Nevada Alliance [SNA], 2010 and CCSP, 2008) and are expected to continue to increase in frequency and severity (CCSP, 2009 and SNA, 2010). Increased wildfire can impact water supplies indirectly by causing increased soil erosion followed by sedimentation in water supply reservoirs.

14.3 Regional Climate Change Projections

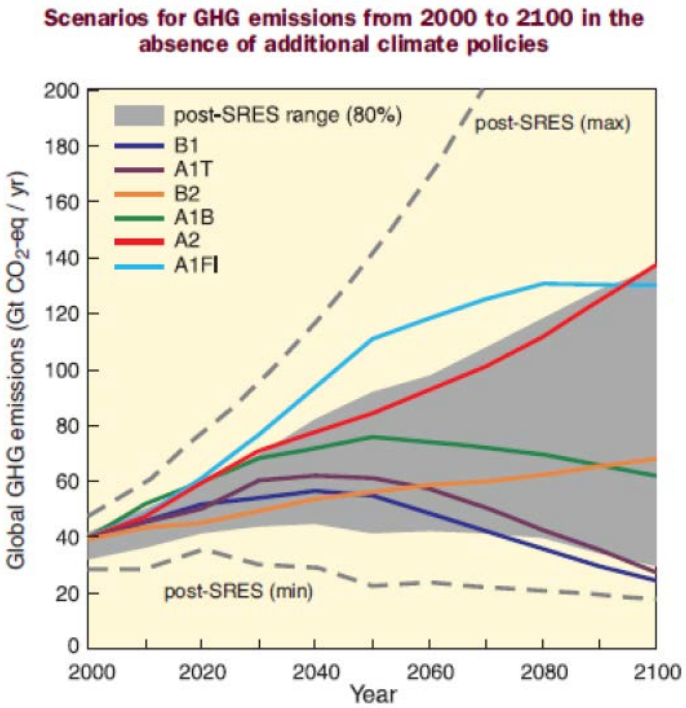
14.3.1 Climate Change Models and Scenarios

Due to the dynamic nature of climate change, historic climate records may not be accurate predictors of future trends. For this reason, several global circulation models (GCMs) were developed as part of the 2009 Scenarios Project to represent the international community's best understanding of the Earth's atmosphere and oceans over time (Cal-Adapt Strategy, 2009) and to predict temperature and precipitation trends for use in other analyses. For the purposes of planning efforts in California, these GCMs are capable

of providing climate change projections only at a large spatial scale. The CEC has developed a set of tools, known as Cal-Adapt, which uses projections from 32 different GCMs and downscales them to provide regional data for California, including at the IRWM scale. Four of the ten GCMs have been selected by California agencies as priority models contributing to California's Fourth Climate Change Assessment (Cal-Adapt 2018). The four GCMs include:

- HadGEM2-ES (warm/dry)
- CanESM2 (average
- MIROC5 (complement)
- Centre de Recherches Meteorologiques (CNRM) (cool/wet)

Figure 14-4: Climate Change Scenarios from IPCC



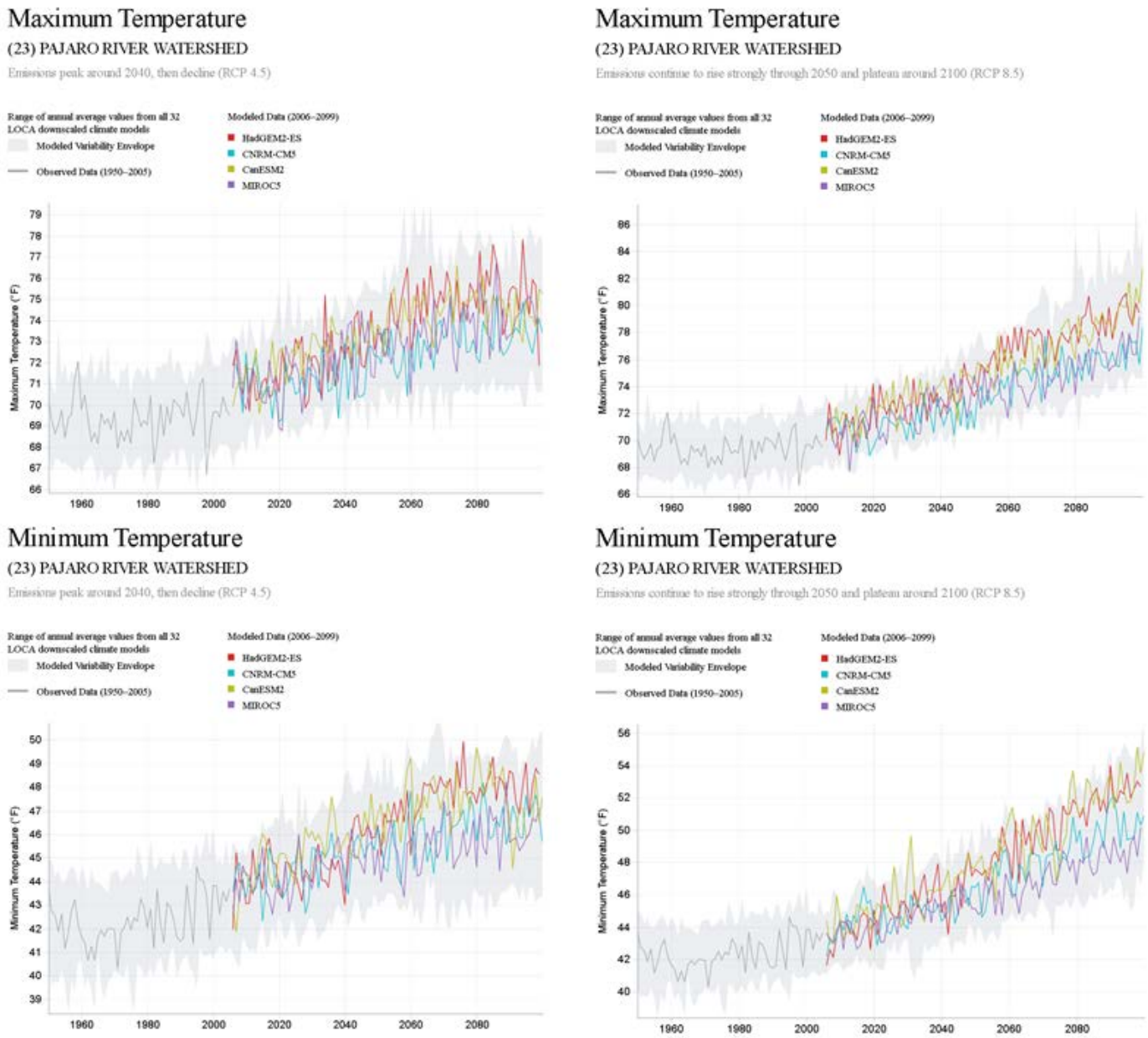
Cal-Adapt downscales model data from these model two potential emissions scenarios: RCP 4.5 (low) and RCP 8.5 (no action). The low emissions scenario (RCP 4.5) represents emissions increasing until 2040 and then decreasing thereafter. RCP 8.5 represents emissions increasing rapidly through 2050 and then plateauing by 2100. RCP 8.5 is often described as the emissions pathway if the world continues with the status quo and does not reduce GHGs.

Cal-Adapt uses the most current data and tools whenever possible, including recent data on temperature, precipitation, snowpack, and sea level rise. In addition to being California-specific, Cal-Adapt has the advantage of being an accessible web-based tool (thus expected to be widely used across the state) that functions to identify potential climate change risks and vulnerabilities in specific areas. Cal-Adapt does not provide forecasts or predictions, but rather potential future scenarios based on downscaled models that are part of the IPCC/CMIP5 program. These scenarios can serve as a starting point for planning for climate change adaptation.

14.3.2 Temperature

According to Cal-Adapt, the average annual minimum and maximum temperatures in the Pajaro River watershed is projected to increase by 3 to 5 degrees F by mid-century and 5 to 8 degrees F by late-century, depending on future GHG emission levels. Figure 14-5 is adapted from Cal-Adapt to illustrate the overall projected average temperature change in the watershed for the high emissions scenario from four GCMs used in Cal-Adapt. Figure 14-6 shows average monthly temperature projections for mid and late century in comparison to historic temperature.

Figure 14-5: Projected average temperature change in the Pajaro River Watershed



As previously described, temperature increases are not expected to be uniform throughout California. Higher temperature increases are expected to occur in inland areas without irrigated agriculture, with less severe temperature increases in irrigated areas and coastal areas. Projected temperature patterns for major cities in the Pajaro River watershed are illustrated in Figure 14-7. As shown in this figure, cities closer to the coast generally have lower projected temperature increases, while inland regions are projected to experience greater climate change-related temperature increases.

Temperatures for other times of the year are also going to increase in smaller magnitude as compared to summertime.

Figure 14-6: Average Monthly Temperature Projection in Pajaro Watershed

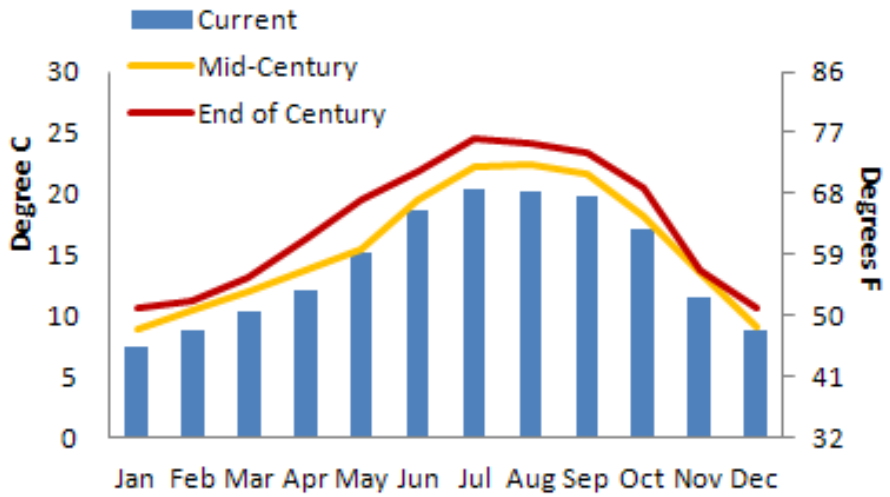
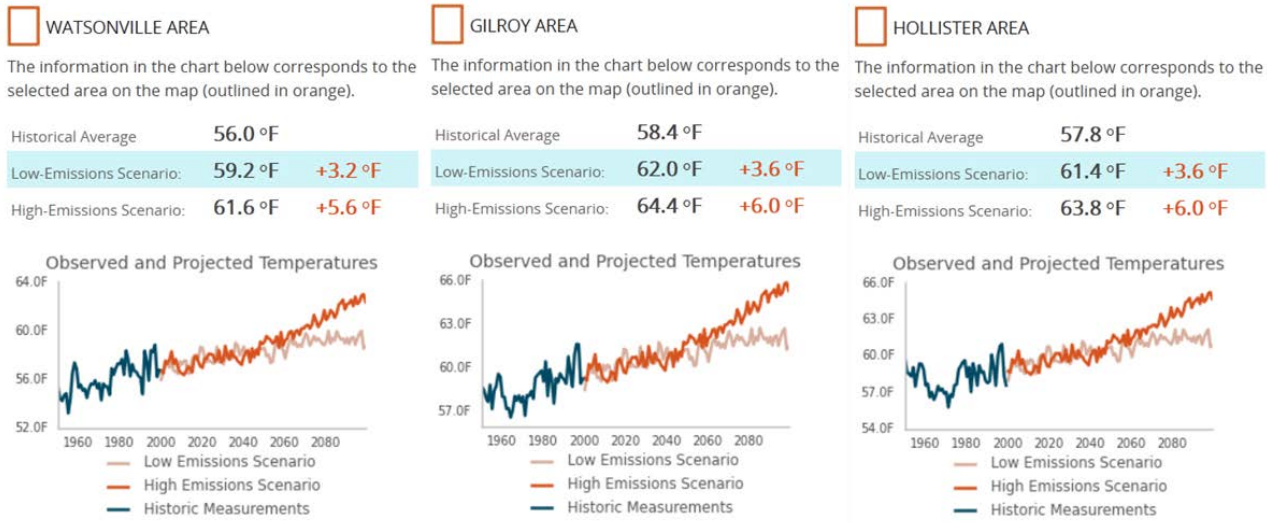


Figure 14-7: Monthly Average Temperature Projection in Different Locations in the Watershed



14.3.3 Precipitation

Although all GCMs predict that temperature will increase throughout this century, the projected impact of climate change on precipitation patterns is highly variable as demonstrated in Table 14-1. Climate models show less consistency in projecting the change in amount and timing of precipitation. With exception to the MIROC5 downscaled GCM, modeling indicates that precipitation will likely increase on average, regardless of emissions scenario. However, the increased precipitation will likely come in the form of large atmospheric rivers during wet years followed by more severe dry years. Therefore, despite increased average precipitation, droughts will likely be more severe and more prolonged.

Table 14-1: Annual average change in precipitation from the observed 1961-1990 annual average precipitation of 19.5".

RCP 4.5	HadGEM2-ES	CNRM-CM5	CanESM2	MIROC5
2030-2060	+1.1"	+8.5"	+0.5"9.6%	+0.6"
2070-2099	+0.7"	+5.9"	+3.5"	-2.3"
RCP 8.5	**HadGEM2-ES**	**CNRM-CM5**	**CanESM2**	**MIROC5**
2030-2060	+2.0"	+6.2"	+3.9"	-1.1"
2070-2099	+2.7"	+7.7"	+9.5"	-0.8"

Additionally, with rising temperatures in the future, more precipitation will fall as rain rather than snow. Although precipitation in the form of snowfall is not directly relevant to the Pajaro River watershed area, the region heavily relies on the CVP for its irrigation and urban water use. It is thus important to understand the snowpack reduction projected for the Sierra-Nevada mountain range. With rising temperatures in the future and more rain than snow, there will be increased challenges to store the water for dry season while protecting downstream areas from flood waters during the wet season (CNRA, 2009).

A recent study conducted by the USGS projected, towards the end of this century, peak flow in Santa Cruz Mountain range to increase by 20 to 30 percent in a high emission scenario using the GFDL GCM (NOAA's GCM), and lower low flows than historical values. The study also projects drought to occur nearly twice as frequently in the future (USGS, 2012).

14.3.4 Extreme Weather Conditions

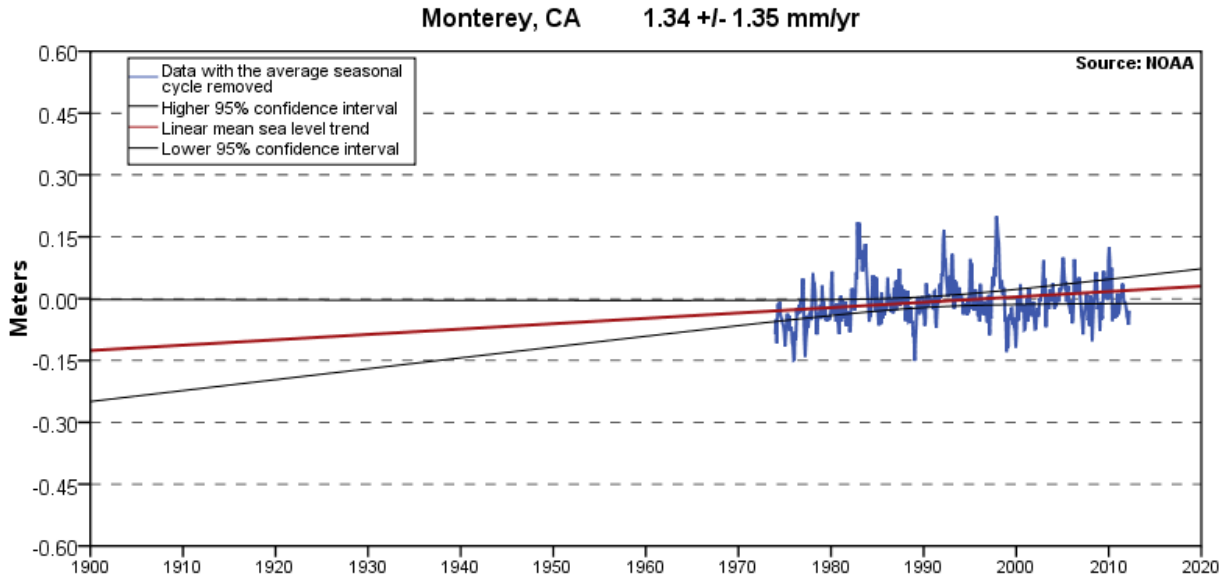
The intensity and frequency of extreme weather conditions are expected to increase as temperatures increase and rainfall patterns shift. Flood, drought and heat waves will occur more frequently, and storm and runoff will be more intense. In general, it is predicted summers will be longer and drier in the future, resulting in longer dry spells or droughts than has been experienced in recent history. While the frequency of large coastal storms and heavy precipitation would not change significantly over this century, increased storm intensity, coupled with sea-level rise may cause higher storm surges, more intense inland flooding, and increased erosion along the state's coastline (CNRA, 2009).

14.3.5 Sea-Level Rise

As previously described and displayed in Figure 14-2, CO-CAT estimates sea levels will rise between 10 and 17 inches by 2050, and between 31 and 69 inches by the end of the century (CO-CAT 2010). In the Pajaro region, which relies heavily on water from the impacted CVP, the additional impact of sea-level rise and the potential for saline intrusion into groundwater resources could have a serious effect on freshwater

resources in the region. According to the IRWM Plan climate change handbook, regional sea level rise may be higher or lower than state projections. Local tidal gauge data at Monterey Bay was obtained from NOAA's Tides and Currents monitoring site. The mean sea level data shows that the equivalent sea-level change is 0.48 feet in 100 years, or 1.34 mm per year. As shown in Figure 14-8, this projection uses linear trend, which is different from the hyperbolic shape projected by CO-CAT. The linear trend is likely to give a more accurate local projection for near-term estimation, but for long-term planning purpose, CO-CAT projection should be considered until more accurate data becomes available.

Figure 14-8: Local Sea Level Rise Projection by NOAA

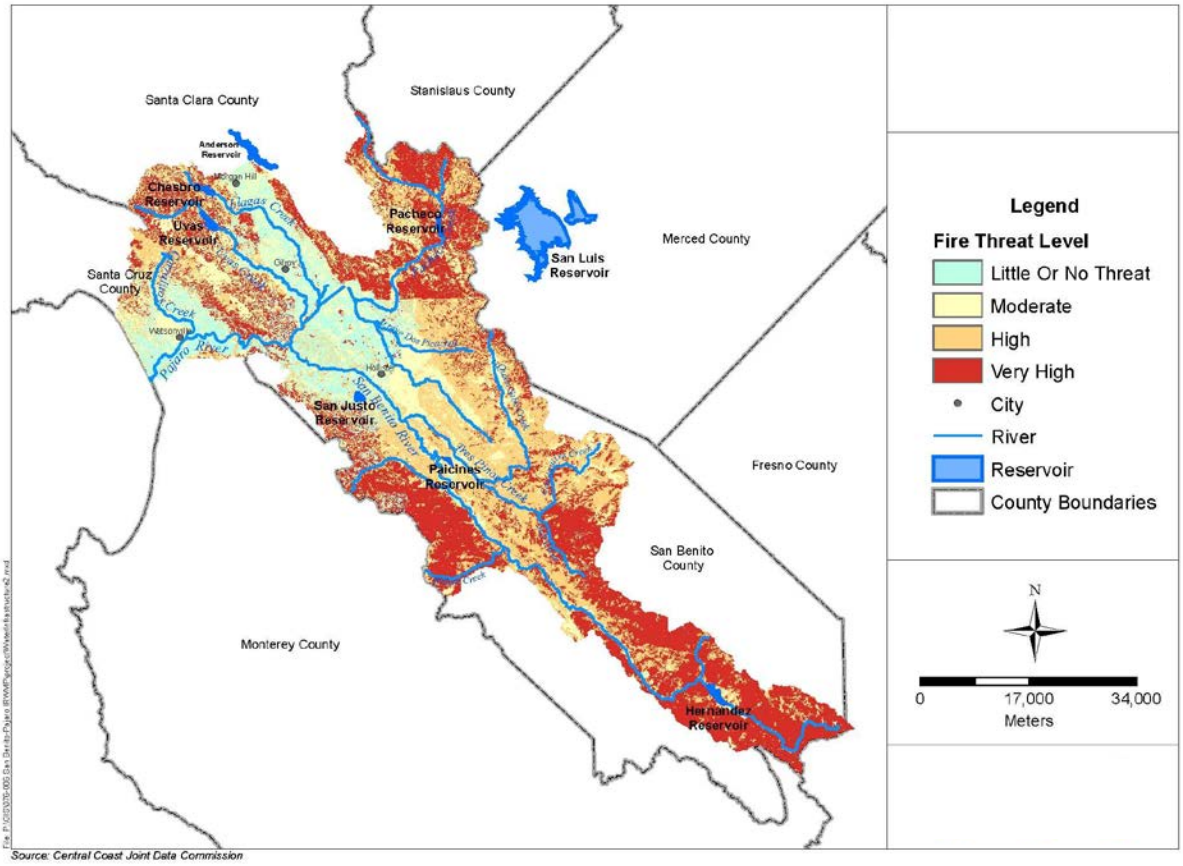


The mean sea level trend is 1.34 millimeters/year with a 95% confidence interval of +/- 1.35 mm/yr based on monthly mean sea level data from 1973 to 2006 which is equivalent to a change of 0.44 feet in 100 years.

14.3.6 Wildfire

The California Department of Forestry and Fire Protection conducted a fire threat study in 2004, which determined fire threat by counting fire frequency and behavior. Fire threat can be used to estimate the potential for impacts, with higher threat classes indicating higher likelihood and/or increase severity of wildfires. Most land cover in Pajaro River watershed is forest and shrub land. These areas are highly susceptible to wildfire, whereas developed areas and agricultural lands typically have adequate water infrastructure to prevent wildfires from spreading. As such, these areas are characterized as lower threats. The overall fire threat distribution is presented in Figure 14-9 and examples of the different fire threat for specific locations within the watershed are presented in Figure 14-10.

Figure 14-9: Fire Threats in Pajaro Watershed



Source: Central Coast Joint Data Commission

The probability of wildfire is projected to slightly increase because of projected drier summer and fall conditions. Based on Cal-Adapt projections, inland shrub lands are expected to experience a 7 to 14 percent increase in potential burned area, compared to a 10 to 20 percent reduction in potential burned area for coastal and irrigated agricultural areas, due to increased water use for irrigation and increased risks of flooding.

Figure 14-10: Fire Risk Projections in Different Locations in Pajaro River Watershed

14.4 Regional Water Resource Vulnerability

The RWMG conducted a vulnerability assessment using the DWR Climate Change Handbook for Regional Water Planning. Based on the assessment, vulnerabilities were identified in the following areas: water demand, water supply, water quality, sea level rise, flooding, and ecosystem and habitat. Projected climate change impacts to water resources in the Pajaro River watershed and watershed vulnerabilities are summarized in the following sections.

14.4.1 Water Demand

Existing water demands were compiled from various planning documents developed by SBCWD, PV Water and Valley Water for inclusion in the Region Description section of this Plan. Major uses in the watershed include agricultural irrigation and municipal and industrial (M&I) use, with approximately 75% of water use meeting agricultural demands and 25% of water use meeting M&I demands.

While the relative agricultural and M&I usage percentages are expected to remain relatively constant over the next 20 years, the proportion of agriculture usage in the SBCWD service area is expected to grow by 2-3% per year, due to a projected increase in irrigated acreage of approximately 17,000 acres by 2022. In addition, the PV Water service area over the past few decades has observed a significant shift in the types of crops grown, moving from lower to higher water-use crops such as caneberries and strawberries. It is assumed that a majority of the approximately 2,000 acres of deciduous crops still in the Pajaro Valley will be converted to berry crops by 2040, equally distributed between strawberry and caneberry crops.

Water Demand Vulnerabilities

Increased agricultural irrigation demands

Increased landscape irrigation demands

Increased cooling

The seasonal variability of water demands is projected to increase with climate change as droughts become more common and more severe (DWR, 2008). In addition, warmer temperatures will increase evapotranspiration rates while extending the length of growing seasons, resulting in an overall increase in agricultural water demands (CNRA, 2009). In addition, fruit crops are more climate-sensitive and may

require additional water as the climate warms. Therefore, more water may be necessary to maintain yield and quality in future years.

Other seasonal uses such as landscape irrigation and cooling demands are also expected to increase as a result of climate change (DWR, 2008 and CNRA, 2009). Identification of industrial cooling towers and similar facilities will help the region gain better understanding of the potential increases in seasonal demands.

Streamflow needed to support habitat (environmental water demand) in the region may also be impacted by increased temperatures. PV Water is currently considering the development of surface water supply projects. The estimated yield from the projects is impacted by the amount of flow required to remain in the waterway to support habitat. The minimum habitat flow requirements must consider projected climate change impacts and be designed accordingly.

14.4.2 Water Supply

The region's water supplies include groundwater, local surface water, imported surface water from the Central Valley Project (CVP), and recycled water. All but recycled water could be affected by the climate change impacts previously described. Potential climate change impacts on water supply include:

- Snowpack quantity is expected to decrease overall as snowlines recede, potentially reducing CVP supplies to the region (DWR 2008, CNRA 2009).
- Snowmelt runoff timing is expected to shift as flows increase in the winter and decrease in the late spring/early summer (DWR 2008). This could result in shifted timing of flood-control dam functionality and changes in reservoir storage throughout the year.
- While precipitation projections are less definitive than other climate variables, there is general consensus that precipitation in the Southwestern US will decline over the second half of the 21st Century (CCSP 2009).
- CVP supplies are expected to be subject to environmental flow restrictions and other flow limitations (DWR 2008, Chung et al 2009), including increased flows to the Bay to minimize salt water intrusion, which may become more difficult to meet as climate changes.
- Coastal aquifers will be subject to seawater intrusion, especially in aquifers with high pumping rates (DWR 2008).
- Droughts are expected to be more severe and potentially more frequent (DWR 2008, CNRA 2009).

Water Supply Vulnerabilities

Reduced imported water supplies
Increased groundwater overdraft
Increased seawater intrusion
Reduced drought reliability

Because the Region relies on imported supplies, any reduction or change in the timing or availability of those supplies could have negative impacts on the Region. Reductions in imported water supplies would lead to increased reliance on local groundwater, recycled water, desalination, or other sources of supplies if demand was not reduced. Changes in local hydrology could affect surface storage of water and natural recharge to the local groundwater and the quantity of groundwater that could be pumped in a sustainable manner. Additional overdraft could exacerbate seawater intrusion in the Pajaro Valley. In general, the region could become less drought tolerant.

14.4.3 Water Quality

Existing water quality issues in the Pajaro River Watershed include seawater intrusion, salinity and nitrates in groundwater, groundwater contamination from spills and leaks including MTBE and perchlorate, and numerous surface water bodies that suffer significant water quality impairments (nutrients, sediment, fecal coliform, mercury, chloride, pH, low dissolved oxygen and pesticide pollutants/stressors). Climate change impacts may affect water quality in a multitude of ways, including:

- Eutrophication is expected to occur more often in surface water as water temperatures increase (DWR 2008).
- Water quality can be impacted by both extreme increases and decreases in precipitation. Increases in storm event severity may result in increased turbidity in surface water supplies while decreases in precipitation may leave contaminants more concentrated in stream flows (DWR 2008).
- Higher water temperatures may exacerbate reservoir water quality issues associated with dissolved oxygen levels and increased algal blooms (DWR 2008).
- Increased salinity intrusion into estuaries and brackish environments as seasonal freshwater flows decrease and sea levels rise (DWR 2008, IPCC 2008).
- Pollutant loads may increase with more intense storms (DWR 2008).

CVP water quality is vulnerable to potential effects of climate change in the Delta. Sea-level rise could increase the intrusion of salinity into the Delta and its exported water. This would increase chloride and bromide (a DBP precursor that is also a component of sea water) concentrations in CVP imported water. In addition, decreased freshwater flows into the Delta could increase the concentration of organic matter, which contribute to potentially higher DBP formation concentrations.

Water quality impacts to surface waters due to climate change include increased temperature, more frequent heavy rainfall events, and longer periods of low natural stream flow due to decreased annual precipitation. Increased water temperature generally reduces dissolved oxygen and can promote algal blooms if nutrients are available in the source. The storm events can transport sediments and other pollutants insto streams and water impoundments while long periods of low flow can increase concentrations of pollutants from wastewater plant and non-point source discharges. Increased wildfires that contribute to high erosion rates in subsequent storms may also contribute to the turbidity events.

Increased salinity intrusion into the local sloughs in Watsonville could affect their viability for agricultural production and impact habitats. Groundwater quality could be affected as a result of recharge with poorer quality surface water.

Water Quality Vulnerabilities

Increased pollutant concentrations in surface water

Increased frequency of eutrophication and algae blooms

Increased turbidity and sedimentation

14.4.4 Sea Level Rise

The majority of the region will not be direct impacted by sea level rise, but it could have significant impacts in the lower Pajaro River Watershed along the coast. Potential sea level rise impacts include:

- Coastal structures, especially earthen levees, are placed under additional stress and are more likely to fail as sea level rises (DWR 2008, CNRA 2009).

- Coastal flooding is more likely to inundate coastal infrastructure as base sea levels increase (DWR 2008). Areas within the tidal reach may also be more susceptible to flooding.

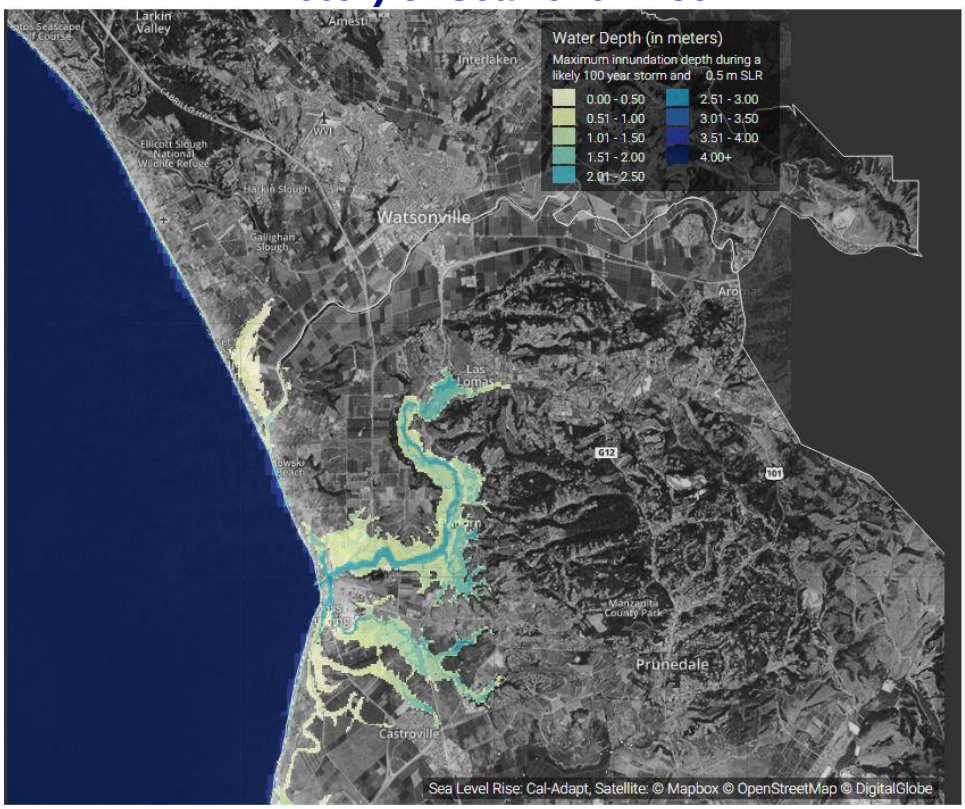
Sea Level Rise Vulnerabilities

Increased coastal flooding
Reduced habitat quality
Increased damage to existing infrastrastructure

Coastal flooding is projected to be more severe in the future, due to sea-level rise. According to Cal-Adapt projections, the area inundated by future coastal flooding will increase by 11% in the Pajaro Watershed. Under existing conditions, the cities of Watsonville and Pajaro and surrounding agricultural areas are subject to flooding during the 100-year coastal flood. Critical water infrastructure, such as the Watsonville Wastewater Treatment Plant, face potential inundation. Small coastal communities that depend on tourism will also be disrupted. The California Ocean Protection Council (Griggs et al. 2017) published an updated review of sea level rise science and projections that estimates there will likely be nearly one foot of sea level rise in the San Francisco Bay by 2050 and more than two feet of sea level rise by the end of the century. Figure 14-11 shows the areas that would be inundated by a 100-year coastal flood with 1.6 feet (0.5 meters) of sea level rise.

As stated earlier, sea level rise may also impact CVP supplies. As sea level rises, more CVP water will need to be released to the Delta to prevent increases in salinity. As a result, less water may be available to import for agricultural and M&I supply into the Pajaro watershed.

Figure 14-11: Future Coastal Flood Threat with 1.6 feet (0.5 meter) of Sea-level Rise



Other vulnerabilities to sea level rise include existing levees and roads that may not be designed to withstand higher mean sea levels and reduced habitat quality because of salt water/freshwater balance changes.

14.4.5 Flood Management

Flood management is an issue throughout the watershed. Flooding on the lower Pajaro River has been an issue since the 1950s. The existing channel capacity in the lower reaches of Pajaro River is approximately 22,000 cubic feet per second (cfs), well below the expected 100-year flood event of approximately 42,000 cfs. Flooding has also been issue on Llagas Creek and is a risk to CVP supplies. Potential climate change impacts on flooding include:

- Delta levee breeches may occur, reducing the reliability of CVP supplies (DWR 2008).
- Storms are expected to increase in intensity. The 2009 California Water Plan recommends that no new critical facilities (e.g., fire stations, hospitals, schools, emergency shelters) be built within a 200-year flood plain (DWR 2008, DWR 2009, CNRA 2009).
- Increased storm intensity may stress levee systems, increase erosion, and cause roadway failures.

Critical infrastructure throughout the region lies in the 100-year floodplain, as portions of Morgan Hill, Gilroy, Hollister, and Watsonville are the 100-year flood plain. Regional mapping of 200-year floodplains and critical infrastructure has yet to be completed. Additional vulnerabilities within the watershed may be aging flood protection infrastructure that may not be resilient to more intense storms and increased risk of flooding associated with wildfires. Low-lying disadvantaged communities (DACs) will be particularly vulnerable to flooding damages causing temporary and/or permanent displacement. Some of the DACs within the Pajaro region currently lie within the 100-year floodplain and the effects of climate change, including more intense storms and sea level rise, could exacerbate this vulnerability. Delta levee breaches could impact the reliability of the region's CVP supplies.

Flood Management Vulnerabilities

Increased flooding

Reduced imported water supplies

14.4.6 Ecosystem and Habitat

Several creeks and rivers in the Pajaro River Watershed support riparian habitat, including the Pajaro River, Llagas Creek, Uvas/Carnadero Creek, San Benito River, Miller Canal, Corralitos Creek, and other associated tributaries. Riparian and wetland areas along these water features and along various drainage ditches provide habitat and movement corridors for wildlife. Some of the wetland areas contain suitable habitat for two sensitive species known to occur in the project vicinity: the California red-legged frog and the California tiger salamander. San Felipe Lake, which is the central feature of the "Bolsa de San Felipe", is designated as a "California Important Bird Area" by the National Audubon Society. The fields surrounding San Felipe Lake are saturated with water during the winter months and it is possible that vernal pools could be located here. If vernal pools do exist around the lake, they could serve as potential habitat for fairy shrimp and the larval stage of California tiger salamander (Valley Water, 2003). In addition, the Pajaro River serves as a migration pathway for adult steelhead (*Oncorhynchus mykiss*) migrating to spawning and nursery habitat in the upper watershed and for steelhead smolts (1-2 year old juveniles) migrating from that habitat to the ocean. Uvas, Llagas, and Corralitos Creeks provide potential spawning and rearing habitat, and Uvas provides access, spawning and rearing in all but extreme drought years. In addition, the Pajaro River Watershed is a tributary to Monterey Bay, a federally protected National Marine Sanctuary administered by the National Oceanic and Atmospheric Administration. Potential impacts of climate change on ecosystems and habitat include:

- Aquatic and terrestrial invasive species may spread in some areas (NAS 2010a).
- Certain habitats, such as estuaries and other coastal habitats, are especially vulnerable to climate change effects (EPA 2009a).
- Some temperature-sensitive fish species are especially sensitive to climate change (DWR 2008).
- Water quality issues associated with increased erosion and sedimentation may be detrimental to some benthic and aquatic communities (DWR 2008, EPA 2009a).

The Pajaro River Watershed includes aquatic habitats that are vulnerable to erosion and sedimentation. These include river and creek reaches that support steelhead trout as well as the Monterey Bay National Marine Sanctuary. Increased water temperatures could also affect steelhead trout. Increased temperatures and drought conditions could also affect other sensitive species such as the California red-legged frog and the California tiger salamander. Reduced water quality and flows could affect habitat for a variety of species, as could the spread of invasive species. Estuarine habitats, such as the Watsonville Slough, could be impacted by reduced seasonal freshwater flows. Invasive species may become even more challenging to manage (CCSP, 2009). Climate change will stress forested areas, making them more susceptible to pests, disease, and changes in species composition. With less frequent but more intense rainfall, wildfires are likely to become more frequent and intense, potentially resulting in changes in vegetative cover (CCSP 2009, SNA 2010). Coastal ecosystems that are sensitive to acidification and changes in salinity balances, sedimentation, and nutrient flows (such as estuaries and coastal wetlands) may be particularly vulnerable (CNRA, 2009).

Ecosystem and Habitat Vulnerabilities

Reduced habitat availability

Reduce habitat quality

Reduced water quality

14.4.7 Hydropower

The region does not rely on local hydropower generation and does not plan to develop hydropower as a significant energy source. Therefore, the Pajaro River Watershed is not vulnerable to climate change impacts on hydropower generation.

14.4.8 Vulnerability Prioritization

The RWMG evaluated each of the climate change vulnerabilities using the factors in the Climate Change Handbook for Regional Water Planning. These factors are:

1. The region's overall planning priorities.
2. Risks associated with vulnerabilities. Risk is defined as the probability of an event occurring, multiplied by the consequence of its occurrence.
3. Presence of multiple potential stressors.
4. The potential for a vulnerability to shape regional objectives and inform IRWM Plan decisions. Some vulnerabilities exist that, even after being quantified, will not be useful for decision making. For example, if adaptation options for addressing a climate vulnerability are limited, little may be gained from further analysis or forming a related planning objective.

Most of the vulnerabilities ranked high for all of the factors and, therefore, have a high priority for the Pajaro River Water Watershed IRWM Plan. Two of the vulnerabilities – increased coastal flooding and increased damage to existing infrastructure – ranked high for the first three factors but ranked medium for the potential to affect regional objectives or decisions. They were ranked medium because adaptation will require significant changes to the social, economic, and environmental policies that extend beyond the

scope of the IRWM Plan. They were given an overall medium rank. One objective – increased cooling demand – was ranked low because cooling demands are a relatively small demand in the region and will not likely influence decisions in the region. The results of the vulnerability prioritization for the IRWM Plan are presented in Table 14-2.

Table 14-2: Climate Change Vulnerability Prioritization

Vulnerability	Priority	Mitigation/Adaptation Feasibility
Increased agricultural demand	High	Possible
Increased landscape demand	High	Possible
Increased environmental demands	High	Possible
Reduced imported water supplies	High	Possible
Increased groundwater overdraft	High	Possible
Increased saltwater intrusion	High	Possible
Reduced drought reliability	High	Possible
Increased pollutant concentrations	High	Possible
Increased frequency of eutrophication and algae blooms	High	Testing
Increased turbidity and sedimentation	High	Possible
Reduced habitat quality	High	Difficult
Increased flooding	High	Difficult
Reduced habitat availability	High	Difficult
Reduced water quality	High	Possible/Testing
Increased coastal flooding	Medium	Not Possible
Increased damage to existing infrastructure	Medium	Possible
Increase cooling demand	Low	Possible

The goals and objectives described in Chapter 3 address the vulnerabilities list above.

14.5 Adaptation and Mitigation Strategies

Chapter 4 discussed the Resource Management Strategies (RMS) that will achieve the region's goals and objectives. It also included a table that identified whether each RMS included in the Pajaro River Watershed could address climate change adaptation and mitigation. The following strategies will help address the vulnerabilities identified above:

- Agricultural Water Use Efficiency
- Urban Water Use Efficiency
- Conveyance – Delta
- Conveyance — Regional / Local
- System Reoperation
- Water Transfers
- Conjunctive Management and GW Storage
- Desalination
- Recycled Municipal Water
- Surface Storage – CALFED
- Surface Storage — Regional/Local
- Drinking Water Treatment and Distribution
- Groundwater and Aquifer Remediation
- Matching Water Quality to Use
- Pollution Prevention
- Salt and Salinity Management
- Urban Runoff Management
- Agricultural Lands Stewardship
- Economic Incentives
- Ecosystem Restoration

- Forest Management
- Land Use Planning and Management
- Recharge Areas Protection
- Watershed Management
- Flood Risk Management

Another aspect of climate change is reducing GHG emissions, or mitigating climate change. As described in Section 14.1, The Science of Climate Change, increasing GHG concentrations in the Earth's atmosphere contribute to warming trends and climate change impacts. Because the water industry is a significant contributor to GHG emissions and the overall increasing concentrations in the atmosphere, there is a great opportunity to make a difference, help achieve the GHG emission goals set by AB32, and reduce GHG emissions through this IRWM planning process. The RMS included in the Pajaro River Watershed IRWM Plan that will help mitigate climate change are:

- Agricultural Water Use Efficiency
- Urban Water Use Efficiency
- System Reoperation
- Conjunctive Management and GW Storage
- Recycled Municipal Water
- Surface Storage – CALFED
- Surface Storage — Regional/Local
- Economic Incentives
- Forest Management
- Land Use Planning and Management
- Watershed Management

As described above, climate change will result in reduced snowpack and increased rainfall in the Sierra Mountains. In addition, climate change will likely result in shifted timing and changed intensity of precipitation and drought throughout the IRWM region and in the Sierra Mountains. Changes in timing will impact flood and water supply operations in the CVP system and in reservoirs within the IRWM region. Locally, flood rule curves can be adjusted to address shifting in timing and intensity of precipitation. However, a reoperations study of the imported water supply system indicates that the reoperations necessary to address flooding issues will result in reduced water supplies. If precipitation is in the form of intense storms, there will be longer dry periods in between storms. These longer dry periods may result in increased water demands. Drier periods can be addressed by decreasing agricultural and landscape water demands by improving irrigation methods and installing drought-tolerant landscaping.

Water quality may also be impacted if climate change results in increased droughts and storm intensity. During droughts, pollutants can build up in the surface soils. These surface soils are then eroded by strong storms and transported to waterways. Alternatively, the pollutants may also get carried to the groundwater as stormwater percolates through the soil. To protect surface and groundwater supplies, the IRWM region can use forest and watershed management plans and land use planning to protect natural areas that could aid in filtering out pollutants from runoff.

14.6 Climate Change in the Project Review Process

The project review process described in Chapter 5 includes a project-level evaluation of how projects help adapt to and mitigate climate change. The evaluation is usually qualitative during the project review process, but becomes more quantitative as projects are better defined and environmental documents are completed. Projects that address climate change adaptation and/or mitigation receive additional points in the project review process, which can increase their priority for implementation. Through the CEQA process during project implementation, a project-level assessment of how the project will impact or mitigate GHG emissions and carbon sequestration will be completed.

14.7 Next Steps

14.7.1 Updates on Climate Change Research

Research on the climate change impacts on water resources is ongoing and continues to evolve with further analysis and more refined methodologies. During the preparation of this Plan update, key literature resources on climate change have been reviewed. New scientific findings should be reviewed periodically and incorporated into the climate change vulnerability assessment.

14.7.2 Climate Change Models and Scenarios

The Climate Change Center of the California Energy Commission prepares periodic reports on climate model simulations for California. It also maintains the Cal-Adapt site and updates the modeling tools as new climate change modeling results, based on more refined data, become available from the IPCC. In addition, some agencies in the Region have prepared their own climate change analyses for their watersheds and have used these studies to develop scenarios for vulnerability and adaptation assessments. Agencies within the Region should explore ways where existing and updated climate models, and other available climate change tools and projections for the Region, can be used for future vulnerability assessments updated in future versions of the Plan.

14.7.3 Vulnerability Assessment Next Steps

The intent of future data gathering is to address gaps in the current vulnerability assessment, to improve the understanding of climate change impacts and vulnerabilities, and to enable more quantitative analyses. Future data gathering efforts should include data that facilitate more quantitative analysis of the vulnerability, as described in the following sections. Data gathering efforts should be also be considered in the context of the current and proposed projects and funding available. Consideration should be given to coordinated multi-agency funding of more localized modeling, projections, and more rigorous vulnerability analysis of the more critical areas.

14.7.3.1 Demands

Future data gathering efforts to quantify the climate change effects on municipal and agricultural water demand include the following (note these efforts will require coordination among water purveyors who use different data collection systems):

- Increase the frequency of water use measurement to quantify the weather effects on water use and seasonal variations in response to changes in historical temperature.
- Based on the water demand and temperature data, develop regression analyses correlating water demand to temperature on a maximum day, monthly, and seasonal bases. The historical responses can be used to infer future response with the projected changes in temperature with climate change.
- Characterize the variations in indoor and outdoor water use. Future data gathering should focus on the seasonal and monthly patterns both in indoor and outdoor usage to evaluate the effects of weather conditions on each use category.
- Collect and analyze historical agricultural water demand to quantity the weather effects on water use and seasonal variations in response to changes in historical temperature.

14.7.3.2 Water Supply

Future data gathering efforts to quantify the climate change effects on water supply include the following:

- Continue to monitor updates on surface water supply projections from the CVP to assess the effects of future climate change on regional water supply.
- Update information on projections of changes in surface water runoff to regional local water storage facilities for future climate change scenarios when such projections are available.
- Evaluate the effects of reduction in precipitation from climate change on natural groundwater recharge. Further analysis is suggested to refine and to quantify the potential reduction in groundwater supply due to potential reduction in precipitation from climate change.

14.7.3.3 Water Quality

Future data gathering efforts to quantify the climate change effects on water quality include:

- Monitor and collect historical water quality data within each sub-region during storm events and dry-season flows.
- Collect long-term weather records associated with air temperature, precipitation, and ET to assess potential correlations with seasonal water quality.

14.7.3.4 Sea Level Rise

New projections of sea-level rise are being developed; each increasingly sophisticated and with higher resolution. Future data gathering efforts to address the potential climate change effects on sea-level rise include the following:

- Regional monitoring of the geomorphological and ecological response of marshes and mudflats to observed sea-level rise.
- Develop regional adaptation strategies that incorporate both evolution of the natural shorelines and the protection of the built environment.
- Identify opportunities for the realignment of existing flood risk management levees that would create more resilient shorelines.
- Develop demonstration projects of shorelines that incorporate “green infrastructure” or “living shorelines” principles.

14.7.3.5 Flooding

A quantitative assessment of the potential impacts of climate change on flooding cannot be performed as climate projections are not detailed enough to project short-term extreme events such as flooding (flooding from sea level rise can be looked at more quantitatively). Future data gathering efforts to address the potential climate change effects on flooding include the following:

- Perform an inventory of runoff monitoring stations in the region to see if a more robust runoff record can be developed. Those data may allow an analysis of historical storm events correlated with precipitation events as well as annual precipitation to provide a better understanding of conditions that may lead to more extreme flooding conditions. This could also support a more robust flood warning system.
- Future work should focus on gathering the 200-year floodplain maps for the Region after DWR develops them. Currently, the 100-year and 500-year floodplain maps are available from the Federal Emergency Management Agency (FEMA).
- Promote better understanding of value of open space, riparian corridor, wetlands or natural habitats among land use decision makers.
- Coordinate with the region stakeholders for advanced flood preparation and quick response and document the protocol(s).
- Perform an inventory of critical infrastructure located in floodplains and level of vulnerability to flooding.

- Update the projections of runoff with climate change as updates from the California Climate Change Center and the ICCC become available.
- Work with local flood plain managers and/or equivalent to determine areas of concern.

14.7.3.6 Ecosystem and Habitat

Adaptive management strategies need to be developed that can accommodate changing climatic conditions. This may require new management goals as it may not be possible to restore historical systems. Water resource managers are subject to regulatory requirements based on certain hydrology and other species related criteria (i.e. temperature). With climate change it may become more difficult for agencies to abide by the regulatory requirements they have committed to and more importantly, be able to achieve the ecosystem mitigations and enhancements that they are trying to accomplish. There needs to be an adaptive component to the regulatory requirements to acknowledge that the natural environment will be altered as a result of climate change. The efforts taken through projects, operations and mitigations may not be able to fully achieve their intended environmental outcomes, through no fault of their own, with respect to improvements in the natural environment. Goals may have to be set based on anticipated future conditions.

Future data gathering efforts to address the potential climate change effects on ecosystem and habitat include the following:

- Regional monitoring of the geomorphological and ecological response of marshes and mudflats to observed sea-level rise.
- Regional monitoring of the geographic range shifts of plants and animals to inform discussions on potential managed relocation.
- Vulnerability analysis of how climate change may affect specific habitats and inform future open space or buffer acquisition programs.
- Identify open space or buffer that would be critical to allow existing systems to evolve.
- Identify optimal genotypes for future conditions either by modeling future climates and patterns of adaptive variation across the range of a species or by experimental plantings and observing natural selection.

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Appendix A: 2004 Partner Memorandum of Understanding

MEMORANDUM OF UNDERSTANDING
among the
PAJARO VALLEY WATER MANAGEMENT AGENCY,
SAN BENITO COUNTY WATER DISTRICT
and
SANTA CLARA VALLEY WATER DISTRICT
for
COORDINATION OF WATER RESOURCES PLANNING

This Memorandum of Understanding (MOU) dated October 7, 2004 is entered into among the Pajaro Valley Water Management Agency (PVWMA), the San Benito County Water District (SBCWD) and the Santa Clara Valley Water District (SCVWD) for the purpose of coordinating water resources planning activities undertaken by the three water districts.

WHEREAS, the PVWMA is a state-chartered water management district formed to efficiently and economically manage existing and supplemental water supplies in order to prevent further increase in, and to accomplish continuing reduction of, long-term overdraft and to provide and insure sufficient water supplies for present and anticipated needs within its boundaries; and

WHEREAS, the SBCWD, a water conservation and flood control district, preserves the economic and environmental wealth and well-being of San Benito County through the control, management and conservation of waters and the provision of water services in a practical, cost-effective and responsible manner; and

WHEREAS, the SCVWD manages groundwater and wholesale drinking water resources, provides stewardship for the county's vast watersheds and promotes flood protection for Santa Clara County's 1.7 million residents to achieve a healthy, safe, and enhanced quality of living in Santa Clara County through watershed stewardship and comprehensive management of water resources in a practical, cost-effective, and environmentally-sensitive manner; and

WHEREAS, it is in the interests of the signatory Parties and the region served by the Parties that these water resources are responsibly managed and conserved to the extent feasible; and

WHEREAS, the Parties wish to coordinate their long term water supply planning efforts to ensure that the water supply benefits of conservation, water recycling, groundwater management and other water supply initiatives undertaken by each of the Parties on behalf of their constituents inure primarily to the party making the financial investment to create such programs and contribute to meeting the needs of the region; and

WHEREAS, the Parties anticipate the potential need for future agreements on specific projects or programs and with other affected agencies to further coordinate long term water supply planning;

NOW, THEREFORE, it is mutually understood and agreed as follows:

SECTION 1:
AUTHORITY OF PARTIES

1.1 The PVWMA is a state-chartered special purpose district formed under State Law pursuant to the Pajaro Valley Water Management Agency Act.

1.2 The SBCWD is a special purpose district formed under State Law pursuant to the San Benito County Water District Act.

1.3 The SCVWD is a special purpose district formed under State Law pursuant to the Santa Clara Valley Water District Act.

SECTION 2:
DEFINITIONS

The abbreviations and capitalized words and phrases used in this MOU shall have the following meanings:

2.1 **"PVWMA"** means the Pajaro Valley Water Management Agency.

2.2 **"SBCWD"** means the San Benito County Water District.

2.3 **"SCVWD"** means the Santa Clara Valley Water District.

2.4 **"Parties"** means the PVWMA, SBCWD and SCVWD.

SECTION 3:
PURPOSES AND GOALS OF THIS MOU

3.1 **Purposes and Goals:**

This MOU is to memorialize the intent of the parties to coordinate and share information concerning water supply planning programs and projects and other information, and to improve and maintain overall communication among the parties involved. It is anticipated that coordination and information sharing among the three parties will assist the agencies in achieving their respective missions in a cost-effective and environmentally responsive manner and contribute to the overall well-being of the region. Coordination and information sharing will focus on the following issue areas of water supply planning that are of common interest:

3.2 **Common Issues and Interest:**

3.2.1 Water supply programs and projects that may provide mutual benefits in improving water supply reliability and/or water quality.

3.2.2 Coordination of near-term and long-term water supply planning activities.

3.2.3 Development of regional approaches to problem-solving and issues resolution as well as to further common interests.

SECTION 4:
JOINT AGENCY PLANNING FOR PROJECTS AND PROGRAMS

4.1 **Projects and Programs Covered by this MOU:** It is the intent of PVWMA, SBCWD and the SCVWD that they coordinate and collaborate to address the common issues identified. The parties may develop and implement projects and programs individually or jointly in groupings of two or three, or enter into additional agreements in furthering those goals. Applicable projects and programs include, but are not limited to, the following:

4.1.1 Water conservation programs and other demand management programs.

4.1.2 Water recycling, desalination and groundwater basin management programs and projects.

4.1.3 Water banking, conjunctive use and transfer arrangements.

4.1.4 Storage development to improve system reliability, efficiencies, and flexibility.

4.1.5 Project and program planning and development to solicit external funding.

4.1.6 Other meritorious projects or programs consistent with the purposes of this MOU.

4.2 **Communication and Coordination:** It is the intent of the Parties to meet on at least a quarterly basis in order to carry out the purposes and goals of this MOU.

SECTION 5:
GENERAL PROVISIONS GOVERNING MOU

5.1 **Term:** The term of this MOU is indefinite. The MOU may be terminated by any of the Parties by written notice at least 45 days prior to the requested termination date.

5.2 **Construction of Terms:** This MOU is for the sole benefit of the Parties and shall not be construed as granting rights to any person other than the Parties or imposing obligations on a Party to any person other than another Party.

5.3 **Good Faith:** Each Party shall use its best efforts and work wholeheartedly and in good faith for the expeditious completion of the objectives of this MOU and the satisfactory performance of its terms.

5.4 **Governing Law:** This MOU is made under and shall be governed by the laws of the State of California.

5.5 **Rights of the Parties and Constituencies:** This MOU does not contemplate the parties taking any action that would:

5.5.1 Adversely affect the rights of any of the parties; or

5.5.2 Adversely affect the customers or constituencies of any of the parties.

IN WITNESS WHEREOF, the parties have executed this Memorandum of Understanding as of the day and year indicated on the first page of this MOU.

PAJARO VALLEY WATER MANAGEMENT AGENCY

By: Chris McNeish Date: 9/16/04
Charles McNeish, General Manager

APPROVED AS TO FORM:

By: Date: 9/15/04
General Counsel

SAN BENITO COUNTY WATER DISTRICT

By: Date: 9/13/04
John S. Gregg, District Manager/Engineer

APPROVED AS TO FORM:

By: Date: 9/13/04
District Counsel

SANTA CLARA VALLEY WATER DISTRICT

By: Date: 10/7/04
Stan Williams, Chief Executive Officer

APPROVED AS TO FORM:

By: Emily J. Cotter Date: October 1, 2004
Asst. General Counsel

Appendix B: Pajaro River Watershed IRWM Project Submittal Form

Pajaro River Watershed IRWM Project Submittal Form

Please submit the completed form to pajaroirwm@gmail.com. For additional assistance, contact Samantha Greene sgreene@valleywater.org or 408-630-2275.

General Information

Submittal Date

Project Name:

Sponsor Name:

Other Partners:

Project Website:

Project Location Description:

Latitude:

Longitude:

Contact Person:

Contact Organization:

Contact Email:

Contact Phone:

Project Description:

Has the project sponsor adopted the IRWM Plan? If not, when will the project sponsor adopt the plan?

Is the project a stormwater project?

If a stormwater project, is it in a stormwater resources plan that is in the Pajaro Watershed IRWM Plan?

Goals and Objectives

Which IRWM Plan objectives does the project help accomplish? Check the applicable boxes and discuss below. See Chapter 3 of the IRWM Plan for more complete descriptions of the objectives.

Water Supply

- ☐ Meet Normal Demands
- ☐ Meet Drought Demands
- ☐ Meet DAC Water Supply Needs
- ☐ Implement Water Conservation
- ☐ Maximize Recycled Water
- ☐ Optimize Groundwater Storage
- ☐ Maximize Conjunctive Use
- ☐ Optimize Use of Imported Supplies
- ☐ Maximize Local Surface Water

Flood Management

- ☐ Implement Flood Management
- ☐ Pajaro River Flood Protection Project
- ☐ Preserve Flood Attenuation
- ☐ Adaptively Manage
- ☐ Provide Community Benefits

Water Quality

- ☐ Meet Water Quality Standards
- ☐ Meet DAC Water Quality Needs
- ☐ Protect Groundwater Quality
- ☐ Protect Surface Water Quality
- ☐ Meet Recycled Water Quality Targets

Environmental Protection and Enhancement

- ☐ Enhance the Local Environment
- ☐ Improve Resources
- ☐ Protect Monterey Bay
- ☐ Provide Recreation Opportunities

How does the project improve regional self-reliance through investment in water use efficiency, water recycling, advanced water technologies, and/or development of local/regional supplies?

Integration

Which Resource Management Strategies (RMS) does the project implement to help diversify the water management portfolio? Check the applicable boxes and discuss below. See Chapter 4 of the IRWM Plan for more information on RMS.

- ☐ Agricultural Water Use Efficiency
- ☐ Urban Water Use Efficiency
- ☐ Conveyance-Delta
- ☐ Conveyance – Regional/Local
- ☐ System Reoperation
- ☐ Water Transfers
- ☐ Flood Risk Management
- ☐ Agricultural Lands Stewardship
- ☐ Economic Incentives
- ☐ Ecosystem Restoration
- ☐ Forest Management
- ☐ Recharge Area Protection
- ☐ Sediment Management
- ☐ Outreach and Engagement
- ☐ Conjunctive Management
- ☐ Desalination
- ☐ Recycled Municipal Water
- ☐ Surface Storage- CALFED
- ☐ Surface Storage – Regional/Local
- ☐ Drinking Water Treatment and Distribution
- ☐ Groundwater/Aquifer Remediation
- ☐ Land Use Planning and Management
- ☐ Matching Quality to Use
- ☐ Pollution Prevention
- ☐ Salt and Salinity Management
- ☐ Urban Runoff Management
- ☐ Water-Dependent Recreation
- ☐ Watershed Management
- ☐ Water and Culture

How can the project be integrated with other projects to leverage resources, increase benefits, and better achieve regional goals and objectives?

Social Considerations

What are the specific benefits to DAC water issues, including how the project helps address critical water supply or water quality needs of a DAC?

What are the specific benefits to Native American Tribal communities water issues, including how the project helps address critical water supply or water quality needs of a Tribal community?

How does the project address environmental justice considerations?

Financial and Economic Considerations

Construction/Implementation Cost | Annual Costs

What is the basis of the cost estimates, e.g., conceptual, feasibility study, or partial design? Include a link to any cost estimates.

What are the funding sources for the project?

Describe the technical feasibility of the project, including knowledge of project site conditions, materials and methods to be employed for project construction/implementation, and permit requirements? Include a link to any documents.

Project Physical Benefits

Type of Benefit (e.g., water supply, flood protection)	Quantitative Benefit (e.g., project yield, parcels protected)	Benefit Units (e.g., AF, # parcels)

Describe the project benefits, including the physical benefit(s) above and any non-quantified benefits, and how they were determined.

Describe the project's economic feasibility. What alternative projects have been considered to achieve the same types and amounts of physical benefits as the proposed project? List the alternative projects and estimated costs. If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any advantages of the proposed project that are different from the alternative project or methods. Alternately, provide an economic analysis showing the proposed project's benefit cost ratio. Please include links to supporting documentation.

Provide additional information on the project's benefits, costs, and economic feasibility as needed.

Climate Change

Describe how the project considers the effects of climate change and helps adapt to at least one of the Region's climate change vulnerabilities described in Chapter 14 of the IRWM Plan.

Describe how the project considers changes in the amount, intensity, timing, quality, and variability of runoff and recharge and addresses one or more of the expected hydrologic changes.

Describe how the project considers the effects of sea level rise on water supply conditions and identifies suitable adaptation measures.

Is the project more energy efficient, or does it reduce or avoid energy consumption or emissions, especially the energy embedded inw ater use, more than the project alternatives? Please describe.

Will this project continue to provide or increase GHG emissions reductions as compared to project alternatives as new projects are implemented over the 20-year planning horizon? Please describe.

Will the project sequester carbon? Please describe.

Readiness/Project Status

Provide a link to the project feasibility study, if one has been completed.

Provide a link to preliminary design documents, if they have been completed.

Describe where the project is in complying with CEQA (e.g., Notice of Preparation has been completed) or if the project is exempt.

List the types of permits that will be required and whether they have been acquired.

Provide a link to the any plans & specs, or other construction documents, that have been completed.

Please provide additional information to help assess the project's readiness for construction/ implementation?

Appendix C: 2019 Project Priority List

Project	Sponsor
1. City of Watsonville Levee Embankment Stabilization Project	City of Watsonville
2. City of Watsonville Hexavalent Chromium Well Treatment	City of Watsonville
3. Upper Struve Slough Watershed Enhancement and Public Access Project	City of Watsonville
4. Advanced Metering Infrastructure Conversion Project	City of Gilroy
5. Corp Yard Stormwater Improvement Project	City of Gilroy
6. Casey and Swanston Water Main Replacement Project	City of Gilroy
7. City of Gilroy Water Master Plan	City of Gilroy
8. Potable Water Well Number 9 (McCarthy Well)	City of Gilroy
9. Crestwood Heights Tract 448 Water Distribution System Replacement Project	City of Watsonville
10. Morgan Hill Stormwater Capture on Agricultural Lands	City of Morgan Hill
11. Butterfield Basin Activation	City of Morgan Hill
12. Morgan Hill Multi-Benefit Water Capture Project	City of Morgan Hill
13. Urban & Rural Residential Stormwater Management	Resource Conservation District of Santa Cruz County
14. Pajaro River Agricultural Preserve Restoration Project	Santa Clara Valley Open Space Authority
15. Stormwater management, collection, and recharge on farms	Resource Conservation District of Santa Cruz County (RCDSCC)
16. Coastal Ecosystem Resiliency Project in the Lower Watsonville Slough	Pajaro Storm Drain Maintenance District
17. Pajaro River Stream Maintenance Program	Santa Cruz County Flood Control and Water Conservation District, Zone 7
18. U.S. Army Corps of Engineers Pajaro River Flood Risk Reduction Project	Santa Cruz County FC&WCD Zone 7; MCWRA
19. Behler Road Sewer Replacement Project	Freedom County Sanitation District
20. Freedom Sewer Manhole Rehabilitation	Freedom County Sanitation District
21. Middle Struve Slough Restoration Project	City of Watsonville
22. Pajaro River Watershed Collaborative Forest Health Management Program	Resource Conservation District of Santa Cruz County
23. Pajaro River Watershed Habitat Restoration Program	Resource Conservation District of Santa Cruz Count
24. Regional Irrigation and Nutrient Management Mobile Lab for the Lower Pajaro Basin	Resource Conservation District of Santa Cruz County
25. Freedom Sewer Rehabilitation Project - Phase 2	Freedom County Sanitation District
26. Pauline Pump Station Generator	Freedom County Sanitation District
27. College Lake Integrated Water Resources Management Project	Pajaro Valley Water Management Agency
28. Soap Lake Floodplain Preservation Project	Pajaro River Watershed Flood Prevention Authority
29. Upper Pajaro River Project	Santa Clara Valley Open Space Authority
30. Upper Pajaro River Uplands Project	Santa Clara Valley Open Space Authority
31. Pacheco Reservoir Expansion Project	Santa Clara Valley Water District

Appendix D: Abbreviations and Acronyms

Acronyms and Abbreviations

AF	Acre-feet
AFY	Acre-feet per year
AMBAG	Association of Monterey Bay Area Governments
APV	Action Pajaro Valley
BMP	Best Management Practice
CASGEM	California Statewide Groundwater Elevation Monitoring
CCA	Critical Coastal Area
CDS	Coastal Distribution System
cfs	Cubic feet per second
CEQA	California Environmental Quality Act
CERES	California Environmental Resources Evaluation System
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Corps	U.S. Army Corps of Engineers
CSSC	California Species of Special Concern
CVP	Central Valley Project
CWA	Clean Water Act
DAC	Disadvantaged Community
DWR	California Department of Water Resources
EPA	U.S. Environmental Protection Agency
ESU	Evolutionary Significant Unit
FC	Federal Candidate
FE	Federally listed Endangered
FEMA	Federal Emergency Management Agency
FT	Federal listed Threatened
GAMA	Groundwater Ambient Monitoring Assessment
GSA	Groundwater Sustainability Agency
IRWM	Integrated Regional Water Management
IRWM Plan	Integrated Regional Water Management Plan
LOD	Level of Development
M&I	Municipal and Industrial
MBNMS	Monterey Bay National Marine Sanctuary

MCWRA	Monterey County Water Resources Agency
MHI	Median Household Income
MOU	Memorandum of Understanding
MTBE	Methyl Tertiary Butyl Ether
NFIP	National Flood Insurance Program
NMSP	National Marine Sanctuary Program
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NPS	Non-point Source
QA/QC	Quality assurance and quality control
Partners	PV Water, SBCWD, Valley Water
PCLF	Planning and Conservation League Foundation
PRWFPA	Pajaro River Watershed Flood Prevention Authority
PV Water	Pajaro Valley Water Management Agency
RCDs	Resource Conservation Districts
RWMG	Regional Water Management Group
RWQCB	Regional Water Quality Control Board
SBCWD	San Benito County Water District
SCCFC&WCD	Santa Cruz County Flood Control and Water Conservation District, Zone 7
SCRWA	South County Regional Wastewater Authority
Valley Water	Santa Clara Valley Water District
SGMA	Sustainable Groundwater Management Act
SE	State listed Endangered
SP	State Protected
SR	State listed as Rare
SSC	Stakeholder Steering Committee
SSCWD	Sunnyslope County Water District
ST	State listed Threatened
SWAMP	Surface Water Ambient Monitoring Program
SWP	State Water Project
SWRCB	State Water Resources Control Board
TM	Technical Memorandum
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy

UCCE	University of California Cooperative Extension
USBR	U.S. Bureau of Reclamation
USFWS	U.S. Fish and Wildlife Service
WAWRP	Watsonville Area Water Recycling Project
WRA	Water Resources Association
WRDA	Water Resources Development Act
WRWTF	Watsonville Recycled Water Treatment Facility
WWTP	Wastewater Treatment Plant

Appendix E: Stormwater Resources Plan

Storm Water Resource Plans

The California State Water Resources Control Board (SWRCB) adopted the Final Proposition 1 Storm Water Grant Program Guidelines and Storm Water Resource Plan Guidelines on December 15, 2016. State law requires a Storm Water Resource Plan, or functionally equivalent plan(s), for Proposition 1 Storm Water funding. Further, State law requires that the Storm Water Resource Plans be incorporated into Integrated Regional Water Management (IRWM) plans.

The goals of Storm Water Resource Plans, as defined in the SWRCB's guidelines, are consistent with those of the Pajaro River Watershed IRWM Plan. As such, the Pajaro River Watershed IRWM Regional Water Management Group supports incorporating Storm Water Resource Plans into the Pajaro River Watershed IRWM Plan.

The Storm Water Resource Plan listed below align with the Pajaro River Watershed IRWM Plan goals and objectives and was originally added to the 2014 Pajaro River Watershed IRWM Plan in March 2017 and is hereby added to the 2019 Pajaro River Watershed IRWM Plan:

- Santa Cruz County Storm Water Resources Plan – added to the 2014 Pajaro River Watershed IRWM Plan in March 2017
- South Santa Clara County Storm Water Resources Plan – added to the 2019 Pajaro River Watershed IRWM Plan in March 2020
- Greater Monterey County Storm Water Resources Plan – added to the Pajaro River Watershed IRWM Plan in March 2020

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