



NORTHERN &
CENTRAL
DELTA-
MENDOTA

Public Draft Groundwater Sustainability Plan

For the Northern and Central Delta-Mendota Regions

September 2019



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Section 2

Plan Area



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2. PLAN AREA

2.1 PLAN AREA DESCRIPTION

This chapter describes the Northern and Central Delta-Mendota Regions of the Delta-Mendota Subbasin. Specifically, this chapter describes the location of the areas within the Delta-Mendota Subbasin covered by this Groundwater Sustainability Plan (GSP), including a detailed description of geographic areas covered by this GSP in relation to Sustainable Groundwater Management Act (SGMA) governing entities, jurisdictional boundaries, existing land use and related water sources, well density, areas of *de minimis* groundwater pumping, and groundwater-dependent communities. Existing water resource monitoring and management programs are described herein, along with a discussion as to how they may limit operational flexibility in the Northern and Central Delta-Mendota Regions of the Delta-Mendota Subbasin and how this Plan will adapt to such limits, and descriptions of existing conjunctive use programs in the subbasin. A discussion of general plans and other land use plans and how implementation of existing land use plans, both within and outside of the Subbasin, may change water demands or impact sustainable groundwater management and how the Plan addresses such potential effects is of concern to local land and water managers in the Plan is also included. Finally, local relevant well permitting processes as they relate to land use planning, as well as any additional Plan elements included in California Water Code (CWC) Section 10727.4 as appropriate are discussed. Implementation of this GSP may affect water supply assumptions of relevant land use plans; discussion of these potential impacts is included in Chapter 7, Sustainability Implementation.

The portion of the Delta-Mendota Subbasin covered by this GSP is shown in **Figure 2-1**. The Northern and Central Delta-Mendota Regions are not contiguous and abut several other areas in the Subbasin covered by other GSPs. As many of the planning documents and monitoring programs have been prepared for the Subbasin as a whole or for other contiguous portions of the Subbasin, some of the discussions below will focus solely on the Northern and Central Delta-Mendota Regions, while others will discuss the Subbasin as a whole. However, in total, this section of the Northern & Central Delta-Mendota Region GSP satisfies §354.8 of the GSP Emergency Regulations under SGMA.

2.1.1 Plan Area Definition

The Delta-Mendota Subbasin (California Department of Water Resources [DWR] Basin 5-022.07) is located in the San Joaquin Valley Groundwater Basin and adjoins the following nine (9) subbasins of the San Joaquin Valley Groundwater Basin: Tracy, Eastern San Joaquin, Modesto, Turlock, Merced, Chowchilla, Madera, Kings, and Westside. The Delta-Mendota Subbasin is bounded on the west by the Tertiary and older marine sediments of the Coast Ranges; on the north by San Joaquin-Stanislaus County line, except where Del Puerto Water District and West Stanislaus Irrigation District service areas extend into San Joaquin County; on the east generally by the San Joaquin River, Fresno Slough, James Bypass, and Mendota Pool, Aliso Water District, Farmers Water District, Mid-Valley Water District, Reclamation District 1606, James Irrigation District, Tranquillity Irrigation District, and Fresno Slough Water District service areas (except to include the entirety of the Columbia Canal Company); and on the south by the Tranquillity Irrigation District and Westlands Water District boundaries and including the San Luis Water District service area until reaching the Coastal Range. The Northern and Central Delta-Mendota Regions extend into five (5) counties: San Joaquin, Stanislaus, Merced, Fresno, and San Benito. The Northern & Central Delta-Mendota Region GSP Plan area is generally defined as the area of the Delta-Mendota Subbasin in San Joaquin and Stanislaus Counties, with the exception of the City of Newman area and east of Crows Landing; following the western boundary of the Delta-Mendota Subbasin to the west and south of the Delta-Mendota Canal; and the Tranquillity area at the southeastern tip of Delta-Mendota Subbasin in Fresno County (**Figure 2-1**). The portion of the Northern & Central Delta-Mendota Region GSP within each of the five counties is shown in **Figure 2-2** through **Figure 2-5**.

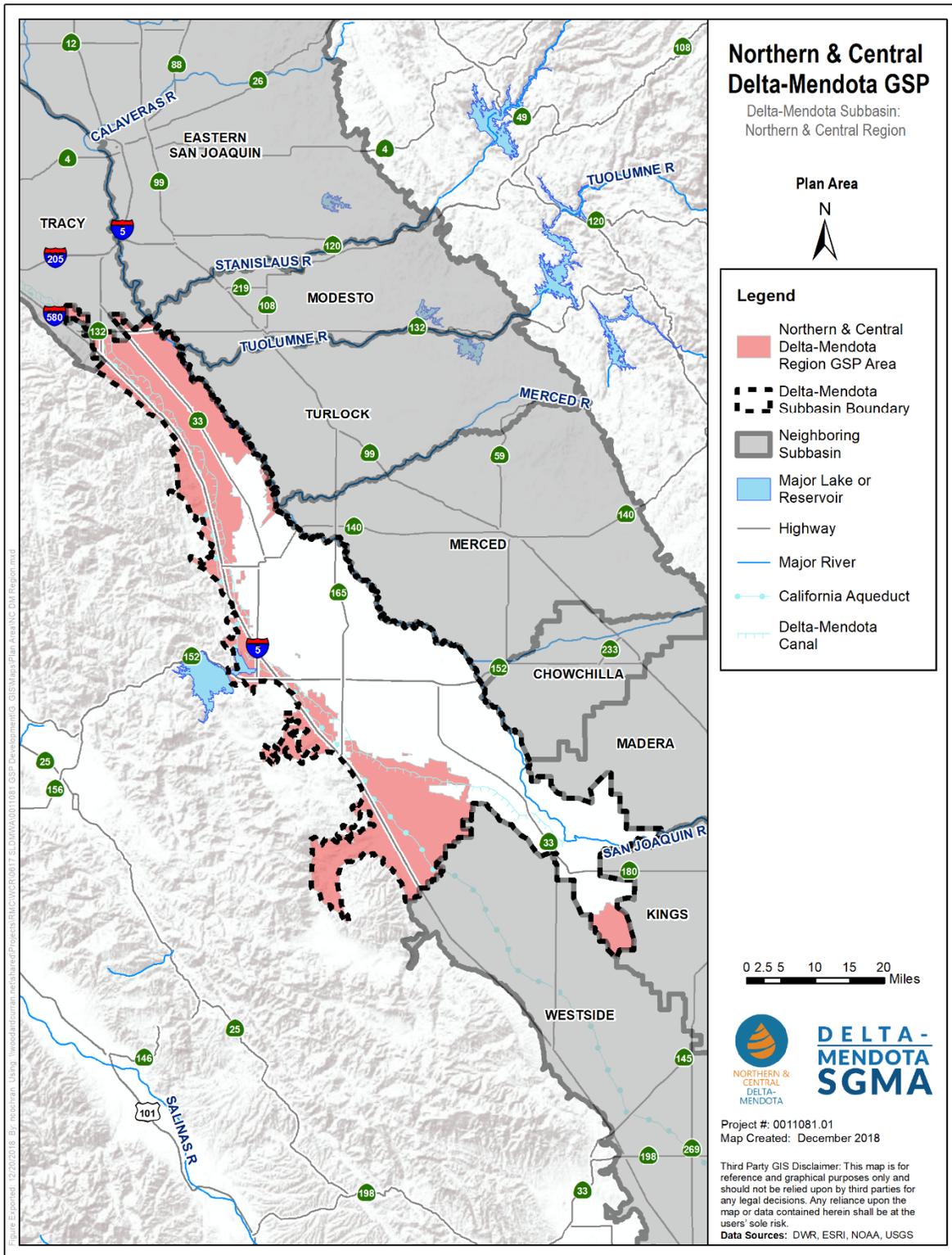


Figure 2-1. Plan Area Covered by the Northern & Central Delta-Mendota Region Groundwater Sustainability Plan

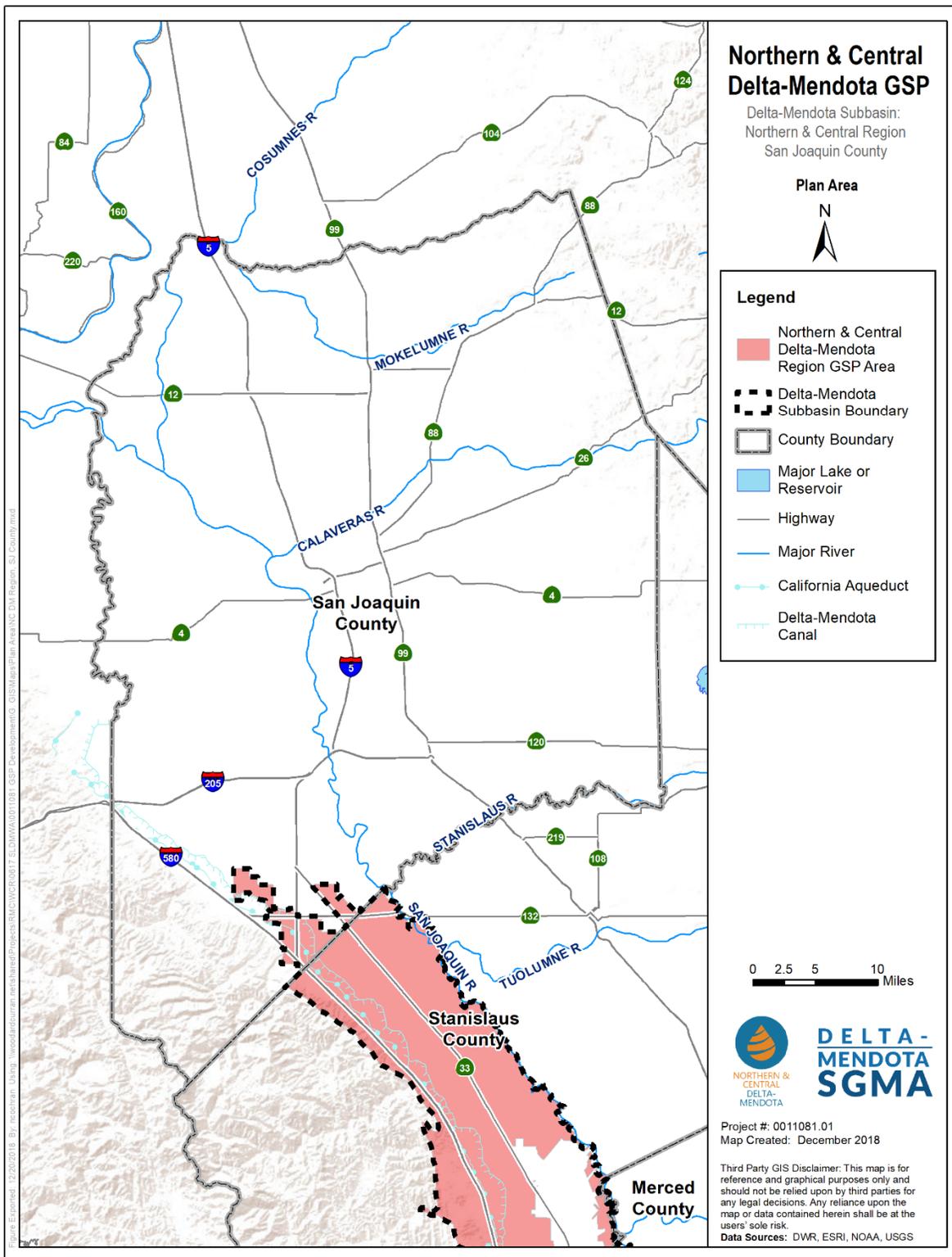


Figure 2-2. Plan Area Covered by the Northern & Central Delta-Mendota Region Groundwater Sustainability Plan in San Joaquin County

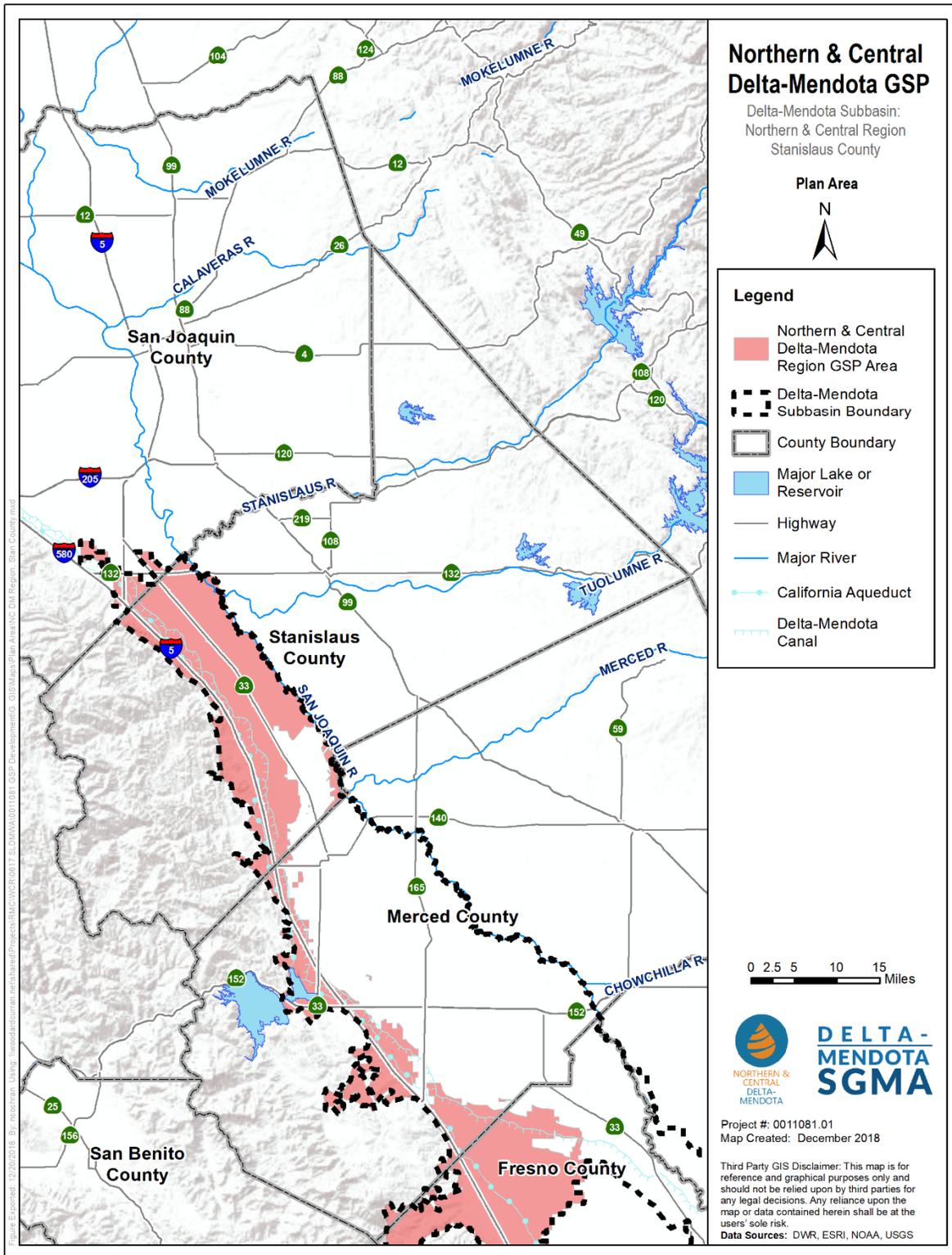


Figure 2-3. Plan Area Covered by the Northern & Central Delta-Mendota Region Groundwater Sustainability Plan in Stanislaus County

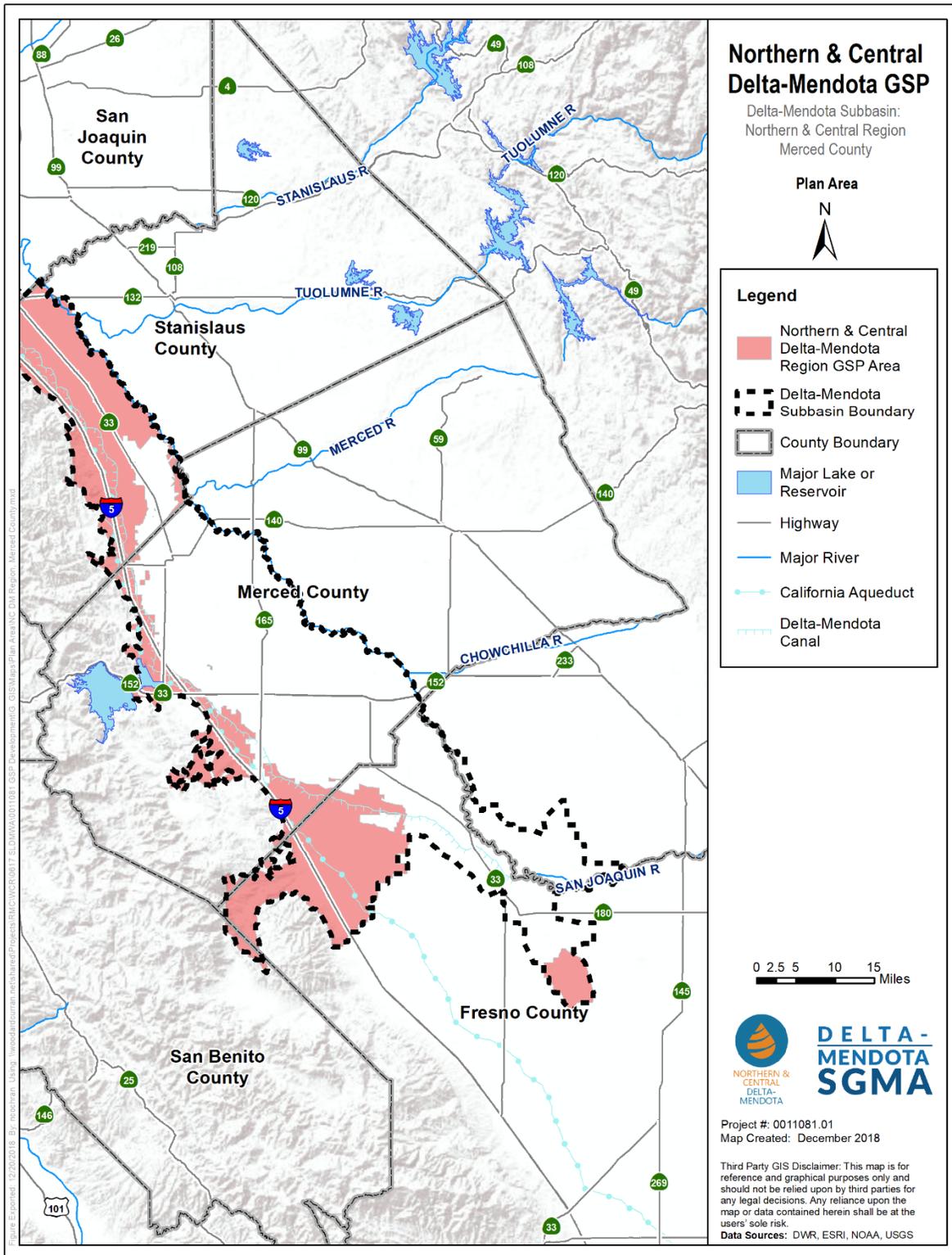


Figure 2-4. Plan Area Covered by the Northern & Central Delta-Mendota Region Groundwater Sustainability Plan in Merced County

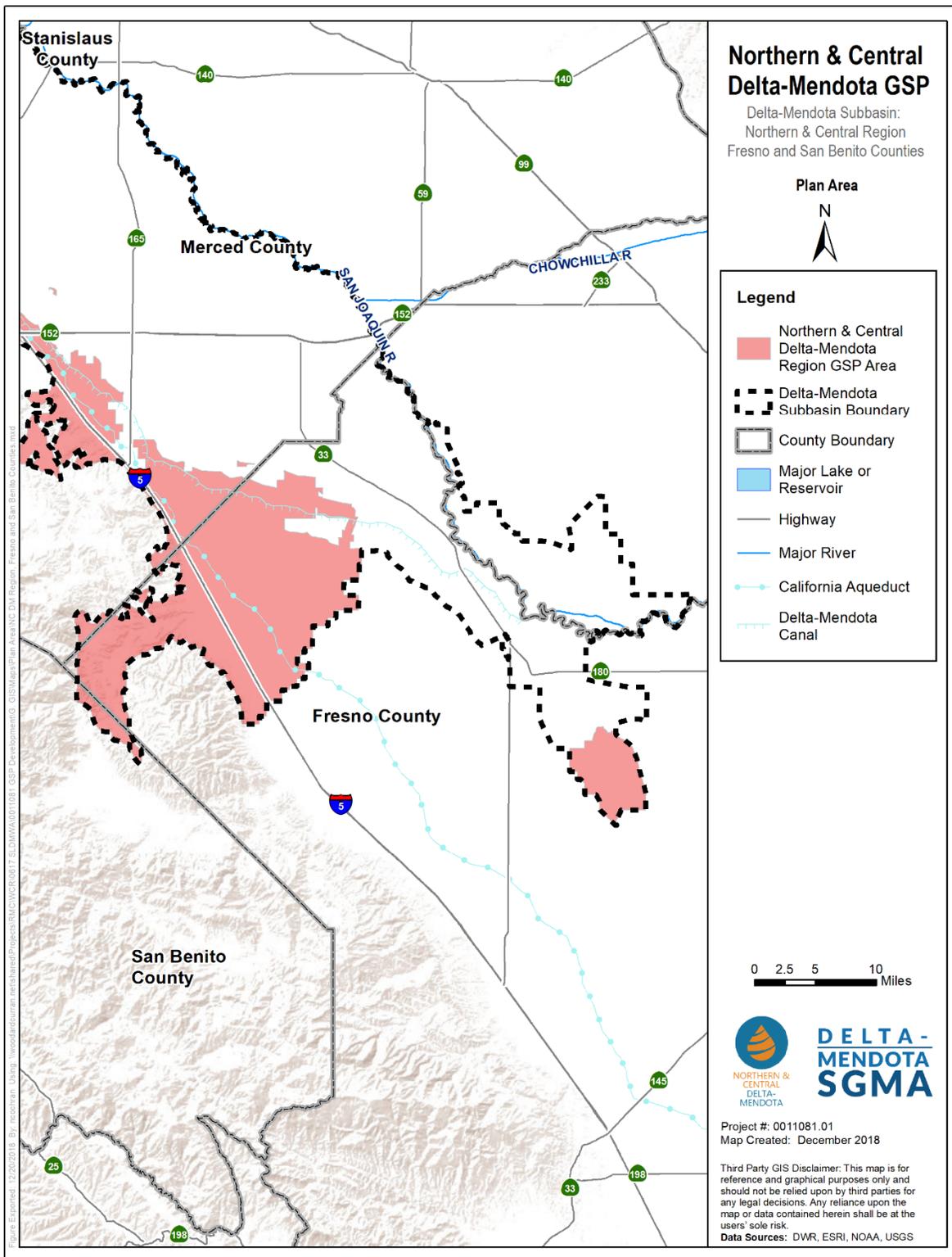


Figure 2-5. Plan Area Covered by the Northern & Central Delta-Mendota Region Groundwater Sustainability Plan in Fresno and San Benito Counties

2.1.2 Plan Area Setting

As previously noted, the Delta-Mendota Subbasin lies along the western margin of the San Joaquin Valley. This valley is part of the large, northwest-to-southeast-trending asymmetric trough of the Central Valley, which has been filled with up to six vertical miles of sediment. This sediment includes both marine and continental deposits ranging in age from Jurassic to Holocene. The San Joaquin Valley lies between the Coast Range Mountains on the west and the Sierra Nevada on the east, and extends northwestward from the San Emigdo and Tehachapi Mountains to the Sacramento-San Joaquin Delta (Delta) near the City of Stockton. The San Joaquin Valley is 250 miles long and 50 to 60 miles wide. The relatively flat alluvial floor is interrupted occasionally by low hills. Foothills adjacent on the west are composed of folded and faulted beds of mainly marine shale in the north and sandstone and shale in the south.

The San Joaquin Valley floor is divided into several geomorphic land types, including dissected uplands, low alluvial fans and plains, river floodplains and channels, and overflow lands and lake bottoms. Alluvial plains cover most of the valley floor and comprise some of the most intensely developed agricultural lands in the San Joaquin Valley. In general, alluvial sediments of the western and southern parts of the San Joaquin Valley tend to have lower permeability than east side deposits.

This section provides additional information relating to water resources in and around the Delta-Mendota Subbasin.

2.1.2.1 Watersheds

The Delta-Mendota Subbasin lies in the Middle San Joaquin-Lower Merced-Lower Stanislaus watershed and the Middle San Joaquin-Lower Chowchilla watershed (**Figure 2-6**). Historically, the San Joaquin River basin was a large floodplain of the San Joaquin River that supported vast expanses of permanent and seasonal marshes, lakes, and riparian areas. Almost 70 percent of the basin has been converted to irrigated agriculture, with wetland acreage estimated to have been reduced to approximately 120,300 acres. In combination with the adjacent uplands, the wetland complex is referred to as “the Grasslands” and consists of approximately 160,000 acres of private and public lands. Approximately 53,300 acres of the Grasslands are permanently protected in state or federal wildlife refuges or in federal conservation easements (**Figure 2-7**).

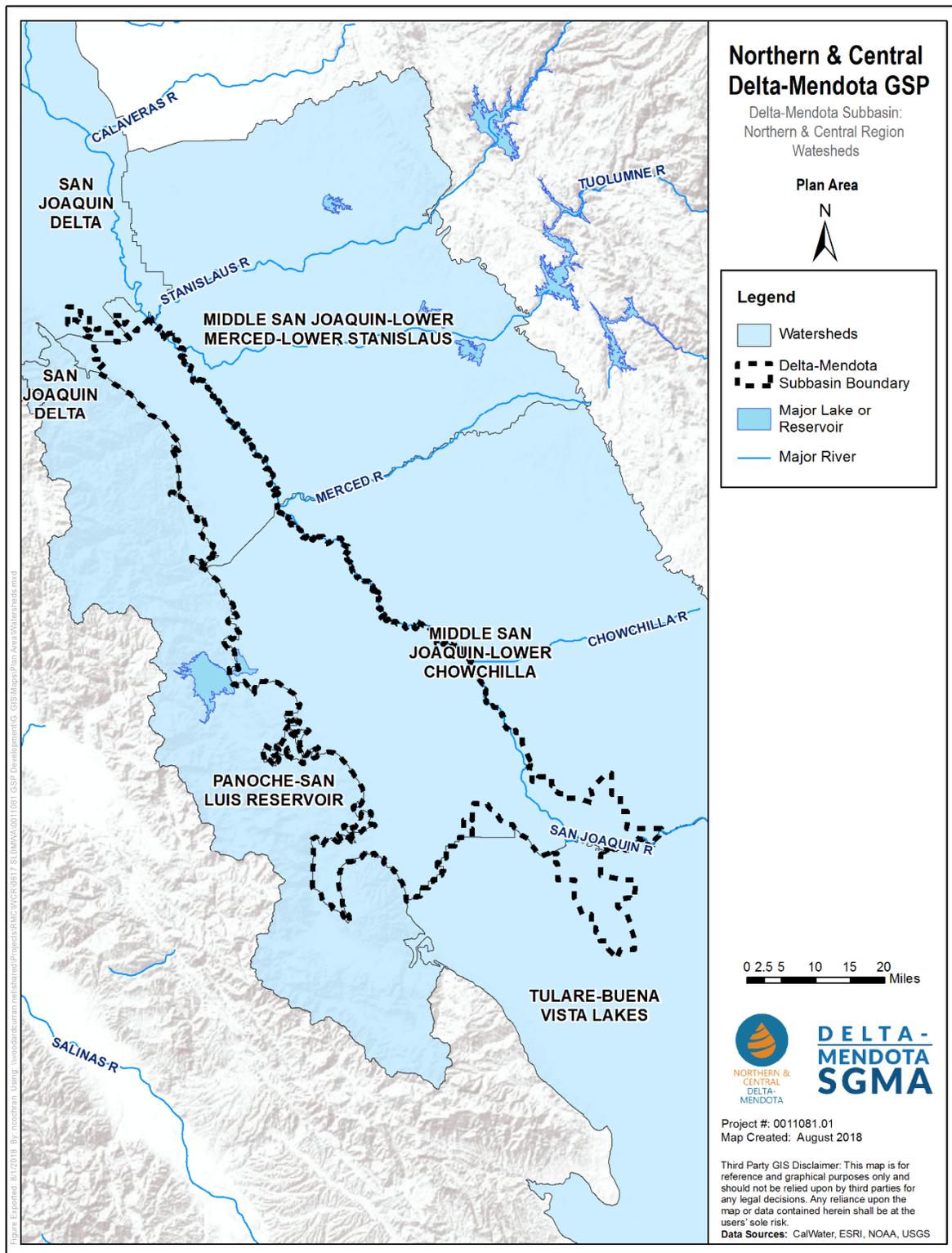


Figure 2-6. Watersheds in the Delta-Mendota Subbasin

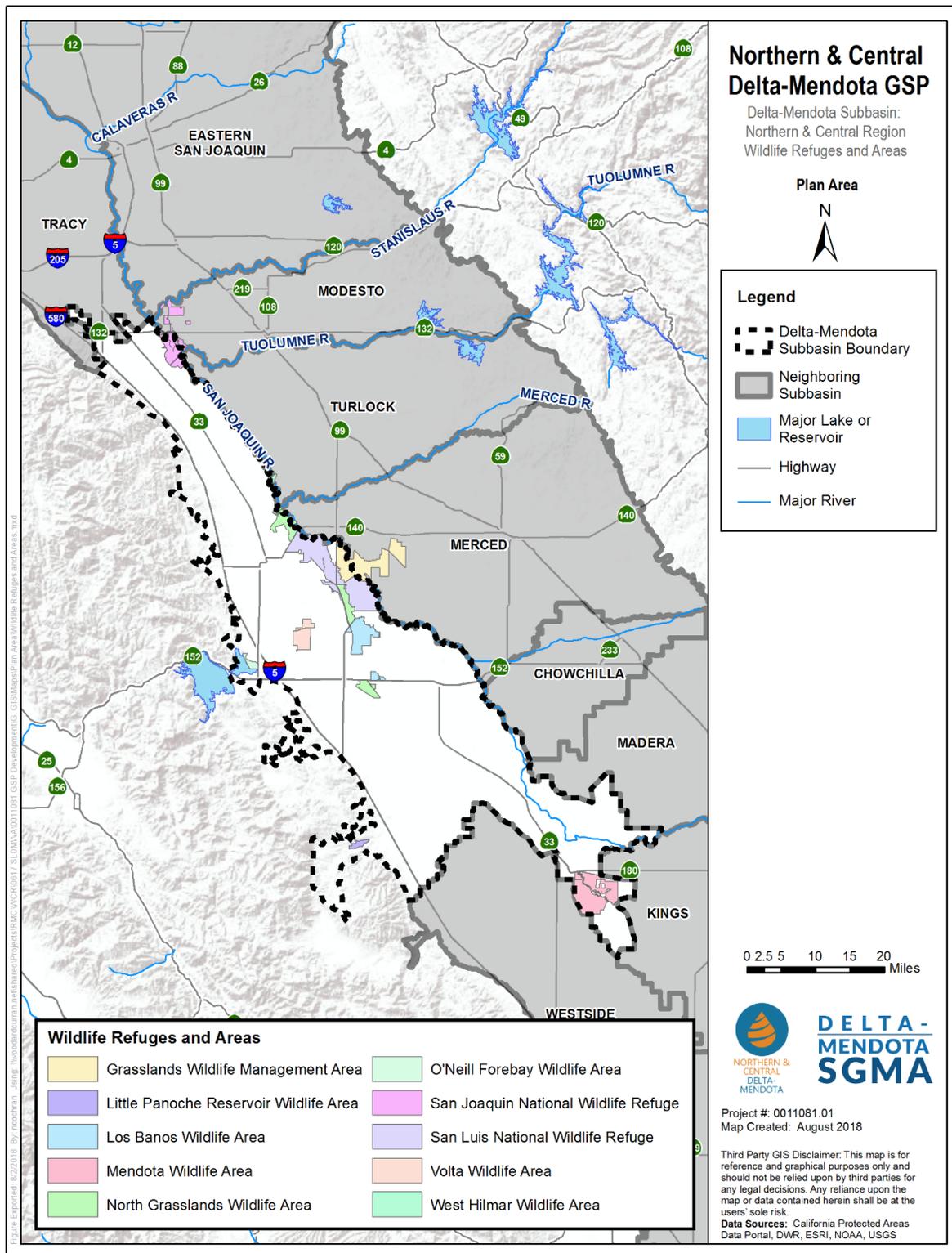


Figure 2-7. Wildlife Refuges and Areas in the Delta-Mendota Subbasin

2.1.2.2 Major Water-Related Infrastructure

Within the Delta-Mendota Subbasin lies an extensive series of water systems relied upon by multiple water agencies, cities, and private water users. Major water-related infrastructure in the Subbasin includes the facilities required to deliver the Central Valley Project (CVP) supplies to the Member Agencies in addition to key infrastructure of the State Water Project (SWP) utilized to deliver water to SWP Water Supply Contractors.

The San Luis & Delta-Mendota Water Authority (SLDMWA) consists of water agencies representing approximately 2.1 million acres of 28 federal and exchange water service contractors. The SLDMWA operates and maintains portions of the CVP, including the Delta Cross Channel, the C.W. "Bill" Jones Pumping Plant, the Delta-Mendota Canal (DMC), O'Neill Pumping-Generating Plant, San Luis Drain, Grassland Drainage Project, and the Tracy Fish Collection Facility. DWR operates and maintains the SWP facilities, designed to deliver nearly 4.2 million acre-feet of water per year to 29 long-term SWP Water Supply Contractors. SWP facilities include the California Aqueduct, Banks Pumping Plant, O'Neill Dam and Forebay, Sisk Dam and San Luis Reservoir, Los Banos Detention Dam and Reservoir, Little Panoche Detention Dam and Reservoir and Dos Amigos Pumping Plant.

2.1.2.2.1 CVP Facilities

Delta Cross Channel

The Delta Cross Channel, located near Walnut Grove, diverts water from the Sacramento River into Snodgrass Slough and is critical in controlling salinity as part of the CVP Delta Division. From the Slough, the water flows through natural channels for about 50 miles to the vicinity of the C.W. Bill Jones Pumping Plant. The Channel is designed to divert approximately 3,500 cubic feet per second (cfs) of water.

C.W. "Bill" Jones Pumping Plant

Surface water conveyed into the Delta-Mendota Subbasin is pumped from the Delta by the C.W. "Bill" Jones Pumping Plant and conveyed in the DMC by gravity. The pumping plant is located about 12 miles northwest of Tracy and is essential to agricultural, urban, and wildlife water deliveries to parts of the Delta and the San Luis and San Felipe Units of the CVP. Six pumps, each powered by a 22,500-horsepower electric motor, lift the Delta water about 200 feet from the intake through discharge pipes about one mile to the DMC. Power to operate the pumps is generated by CVP facilities. Total capacity of the plan is approximately 5,200 cfs, where each unit has a pumping capacity between 850 cfs and 1,050 cfs.

Delta-Mendota Canal

The Delta-Mendota Canal, a 116.6-mile-long canal completed in 1951, carries water southeasterly from the C.W. "Bill" Jones Pumping Plant to the Mendota Pool in the San Joaquin River and Fresno Slough (30 miles west of Fresno). DMC water used for irrigation of land along the west side of the San Joaquin Valley and to replace San Joaquin River water stored at Friant Dam. Initial conveyance capacity is 4,600 cfs, decreasing to 3,211 cfs at the terminus. Water delivery facilities providing irrigation service to lands in the San Luis Unit were not completed until the 1980s. Today, the DMC and associated facilities are essential to provide irrigation supply to the San Luis Unit and the CVP Delta Division.

DMC/California Aqueduct Intertie

The Intertie connects the DMC and the California Aqueduct (part of the State Water Project) via two 108-inch diameter pipes with a pumping capacity of 467 cfs. The connection is approximately 500 feet long and helps to address DMC conveyance conditions that have restricted use of the C.W. "Bill" Jones Pumping Plant to less than its design capacity, restoring as much as 35,000 acre-feet (AF) of average annual deliveries to the CVP. The intertie also provides redundancy in the CVP distribution system.

O'Neill Pumping-Generating Plant

The O'Neill Pumping Plant, located at Mile 70 of the DMC about 12 miles west of Los Banos, lifts water between 45 and 53 feet from the DMC into the O'Neill Forebay. This plant is essential in delivering water to the O'Neill Forebay, San Luis, and San Felipe Units of the CVP. The Plant was completed in 1968 and consists of an intake channel leading off the DMC and six pumping-generating units, each of which can discharge about 650 cfs and has a rating of 6,000 horsepower. When operating as turbines/generators, each unit can generate about 4,000 kilowatts.

San Luis Drain

The San Luis Drain, partially completed in 1974, was designed to convey and dispose of subsurface irrigation return flows from the San Luis service area in an attempt to keep saline irrigation drainage water out of the San Joaquin River. It is part of the San Luis Unit, West San Joaquin Division of the CVP, and consists of a concrete-lined channel with a design capacity of 300 cfs. Except for the portion being used by the Grassland Drainage Project, the drain was closed in 1986 due to waterfowl deaths and deformities occurring at Kesterson Reservoir, the San Luis Drain terminus at the time.

Grassland Bypass Project

The Grassland Bypass Project prevents discharge of subsurface agricultural drainage water into wildlife refuges and wetlands in those areas where the Grassland Drainage Area is located (within the southern portion of the Northern and Central Delta-Mendota Regions). The Bypass Project conveys drainage water through a segment of the San Luis Drain to Mud Slough, a tributary to the San Joaquin River. The Bypass Project improves water quality in the wildlife refuges and wetlands, sustains the productivity of 97,000 acres of farmland, and fosters cooperation between area farmers and regulatory agencies in drainage management reduction of selenium and salt loading. Since the implementation of the Project in 1996, all discharges of water from the Grassland Drainage Area into wetlands and refuges have been eliminated. The Project has reduced the load of selenium discharged from the Grassland Drainage Area by 61 percent (from 9,600 lbs to 3,700 lbs) and the salt load has been reduced by 39 percent (from 187,300 tons to 113,600 tons), as of 2017. The Project is operated jointly by the United States Bureau of Reclamation and SLDMWA.

Tracy Fish Collection Facility

The Tracy Fish Collection Facility (TFCF) intercepts fish from the Old River and the C.W. "Bill" Jones Pumping Plant. The facility, located about 2.5 miles upstream from the pumping plant, is vital for the preservation of various delta species as part of the Central Valley Project, Delta Division. Due to significant on-going research, the United States Bureau of Reclamation continues performing the operation and maintenance at the TFCF and the SLDMWA has a service contract to provide emergency assistance when requested. The TFCF was primarily built to intercept downstream migrant fish so they could to the main delta channel to resume their journey to the ocean.

2.1.2.2 SWP Facilities

California Aqueduct

The California Aqueduct is the primary method of transporting water from Northern California to Southern California for water supply. The concrete-lined canal originates at the Clifton Court Forebay in the Sacramento-San Joaquin Delta, and extends down the San Joaquin Valley, to and past the Tehachapi Mountains down to Lake Perris, the SWP's southernmost reservoir. The federally-built portion of the California Aqueduct is called the San Luis Canal and carries both CVP and SWP water from San Luis Reservoir and O'Neill Forebay and terminates in Kettleman City.

Harvey O. Banks Pumping Plant

The Banks Pumping Plant lies in the southern portion of the Sacramento-San Joaquin Delta, almost 20 miles southwest of the city of Stockton. Marking the beginning of the California Aqueduct, the plant provides the initial lift of water 244 feet into the canal.

O'Neill Dam and Forebay

Located along the western side of the San Joaquin Valley in Merced County, the California Aqueduct enters O'Neill Forebay from the north. Created by a dam across San Luis Creek, O'Neill Forebay is a forebay to the San Luis Reservoir and offers a variety of recreational activities including camping, boating, windsurfing, and fishing.

Sisk Dam and San Luis Reservoir

San Luis Reservoir, impounded by Sisk dam, lies at base of foothills on the west side of the San Joaquin Valley in Merced County, about 2 miles west of O'Neil Forebay and abutting the western side of the Delta-Mendota Subbasin. A key conservation facility of the SWP, the reservoir provides offstream storage for excess winter and spring flows diverted from the Sacramento-San Joaquin Delta. It is sized to provide seasonal carryover storage and provides a variety of recreational activities, as well as fish and wildlife benefits.

Los Banos Detention Dam and Reservoir

Los Banos Detention Dam and Reservoir provide flood protection for San Luis Canal, Delta-Mendota Canal, the City of Los Banos, and other downstream developments. The facility is located on the west side of the San Joaquin Valley in Merced County, about seven miles southwest of the city of Los Banos.

Little Panoche Detention Dam and Reservoir

Situated in Fresno County, 20 miles southwest of the city of Los Banos, Little Panoche Detention Dam and Reservoir provide flood protection for San Luis Canal, Delta-Mendota Canal, and other downstream developments. Water is stored behind the dam above dead storage of 315 acre-feet only during the period that inflow from Little Panoche Creek exceeds the capacity of the outlet works.

Dos Amigos Pumping Plant

Dos Amigos Pumping Plant is located on the San Luis Canal, about 10 miles south of the City of Los Banos and 18 miles southeast of Sisk Dam in Merced County. It lifts water 113 feet from the aqueduct as it flows south of O'Neill Forebay.

2.1.2.3 Groundwater Use

Groundwater is a key component of water supplies in the Delta-Mendota Subbasin. To protect the long-term sustainability of groundwater resources, pumping has been significantly reduced in past years, allowing the groundwater subbasin to recover to some extent. During the most recent drought period, groundwater was heavily relied upon throughout the Subbasin for irrigation as surface water deliveries were essentially non-existent for many water users (especially those with junior surface water rights), resulting in increased groundwater pumping.

There are many communities within and neighboring the Northern and Central Delta-Mendota Regions that are reliant, in whole or in part, on groundwater for municipal and domestic water supplies, such as the City of Patterson and the communities of Grayson, Westley, Crows Landing, Santa Nella, and Tranquillity, as well as unincorporated communities within Oro Loma Water District's service area (**Figure 2-8**). Other unincorporated areas of the Subbasin also rely on groundwater as the sole water supply source. There are several areas of *de minimis* groundwater extractors in the Subbasin, which are defined as a well owner who extracts two acre-feet or less per year from a parcel for domestic purposes (SWRCB, n.d. (f)) (**Figure 2-9**). Areas with *de minimis* extractors were identified using

Public Land Survey System (PLSS) Sections where available well completion reports indicated that wells other than municipal, irrigation, and industrial wells (i.e. private domestic wells) are present.

Groundwater quality also affects water supply availability in the Subbasin. In general, groundwater in the Subbasin has high levels of total dissolved solids (TDS or salts) in the semiconfined aquifer overlying the Corcoran Clay. In the Patterson area, salt levels are high and could eventually reach concentrations that would require treatment. In response to the elevated salt concentrations and associated taste concerns, many customers have installed salt-regenerative water softeners, which have resulted in significant salt loading to the City's wastewater treatment plant. In addition, the hexavalent chromium in the Patterson area has the potential to impact drinking water supplies (pending passage of a hexavalent chromium-specific drinking water standard). The City has begun installing deeper wells, below the Corcoran Clay, to provide protection from source water contaminants and to provide water with lower salinity concentrations. In 2008, the City approved a non-potable water program that is currently being used to irrigate public and commercial landscaping using the lower quality shallower groundwater, helping to match quality to use and reduce demands on the high quality, potable groundwater supply below the Corcoran Clay. Infrastructure for the non-potable use program is being designed and constructed to also convey recycled water in the future for non-potable use. Los Banos has had to remove one well from service due to uranium concentrations exceeding the Primary Maximum Contaminant Level (MCL). Another well was put on standby in 2010 due to arsenic levels but became active again in 2012.

Figure 2-10 through **Figure 2-12** show the density per square mile (PLSS Section) of domestic, production, and public wells in the Delta-Mendota Subbasin as identified by the California Department of Water Resources' (DWR) Well Completion Report Map Application. Domestic wells are defined as individual domestic wells which supply water for the domestic needs of an individual residence or systems of four or less service connections (DWR, 1981). Within the Northern and Central Delta-Mendota Regions, there are an estimated total of 1,426 domestic wells, where the majority of PLSS Sections contain five or fewer domestic wells (261 out of 330 PLSS sections with at least one domestic well) (**Figure 2-10**). Production well statistics include wells that are designated as irrigation, municipal, public, and industrial on well completion reports, generally indicating wells designed to obtain water from productive zones containing good-quality water (DWR, 1991). There are estimated to be 690 production wells within the Northern and Central Delta-Mendota Regions, where the majority of PLSS Sections contain only one or two production wells (238 out of 333 PLSS sections with at least one production wells) and only three PLSS Sections have seven or eight production wells (**Figure 2-11**). Public wells are defined as wells that provide water for human consumption to 15 or more connections or regularly serves 25 or more people daily for at least 60 days out of the year (SWRCB, n.d. (g)). Within the Northern and Central Delta-Mendota Regions, there are 37 public wells listed in the DWR database where 19 PLSS Sections have only one public well and nine PLSS Sections have two public wells (28 total PLSS Sections with at least one public well) (**Figure 2-12**). The status of the wells (e.g. active, abandoned, destroyed) contained in the DWR Well Completion Report Map Application have not been independently confirmed and it should be noted the well quantities are only estimated since not all well completion reports are in the map application and, at times, the well location has been misallocated on the well completion report.

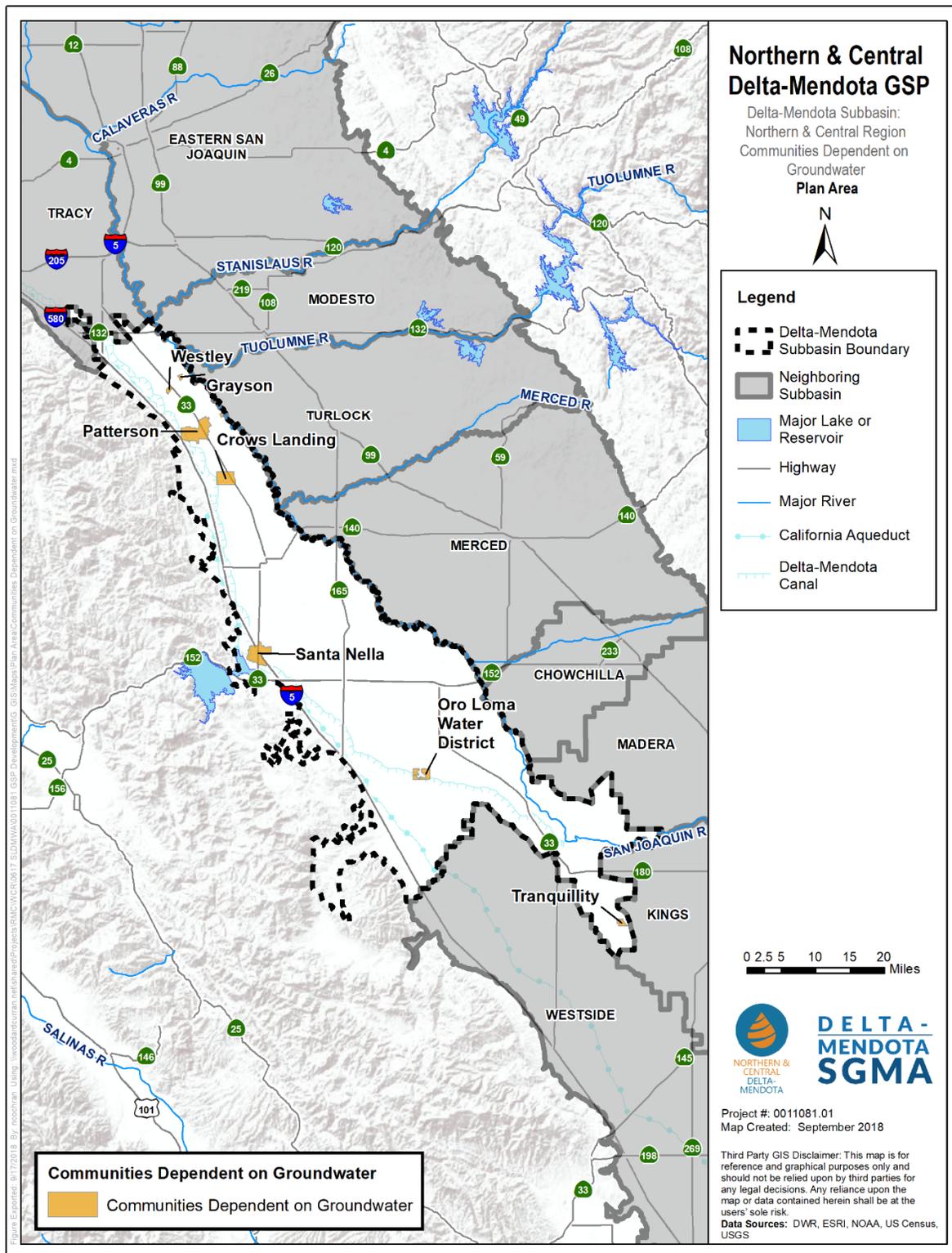


Figure 2-8. Communities Dependent on Groundwater in the Northern and Central Delta-Mendota Regions

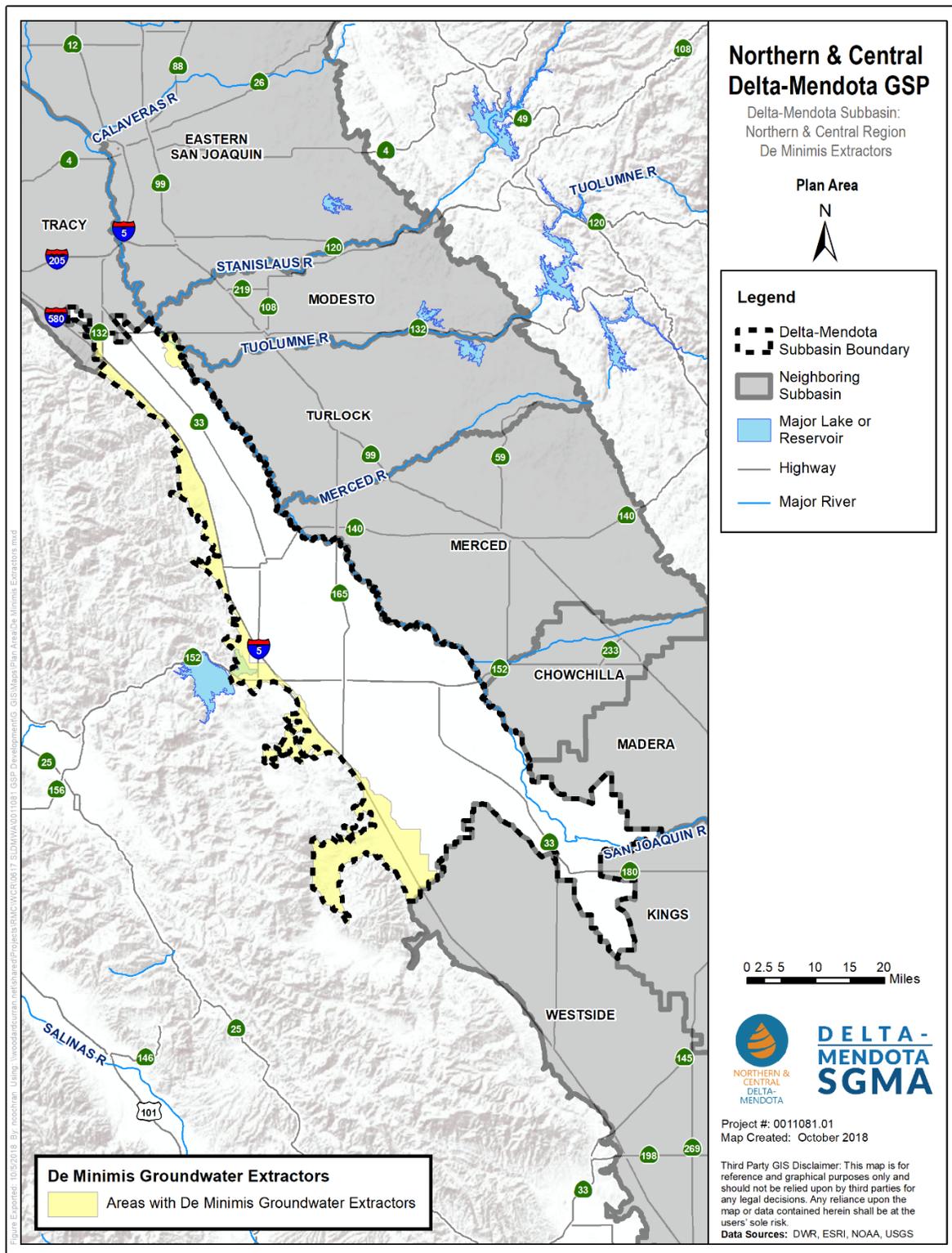


Figure 2-9. De Minimis Groundwater Extractors in the Northern and Central Delta-Mendota Regions

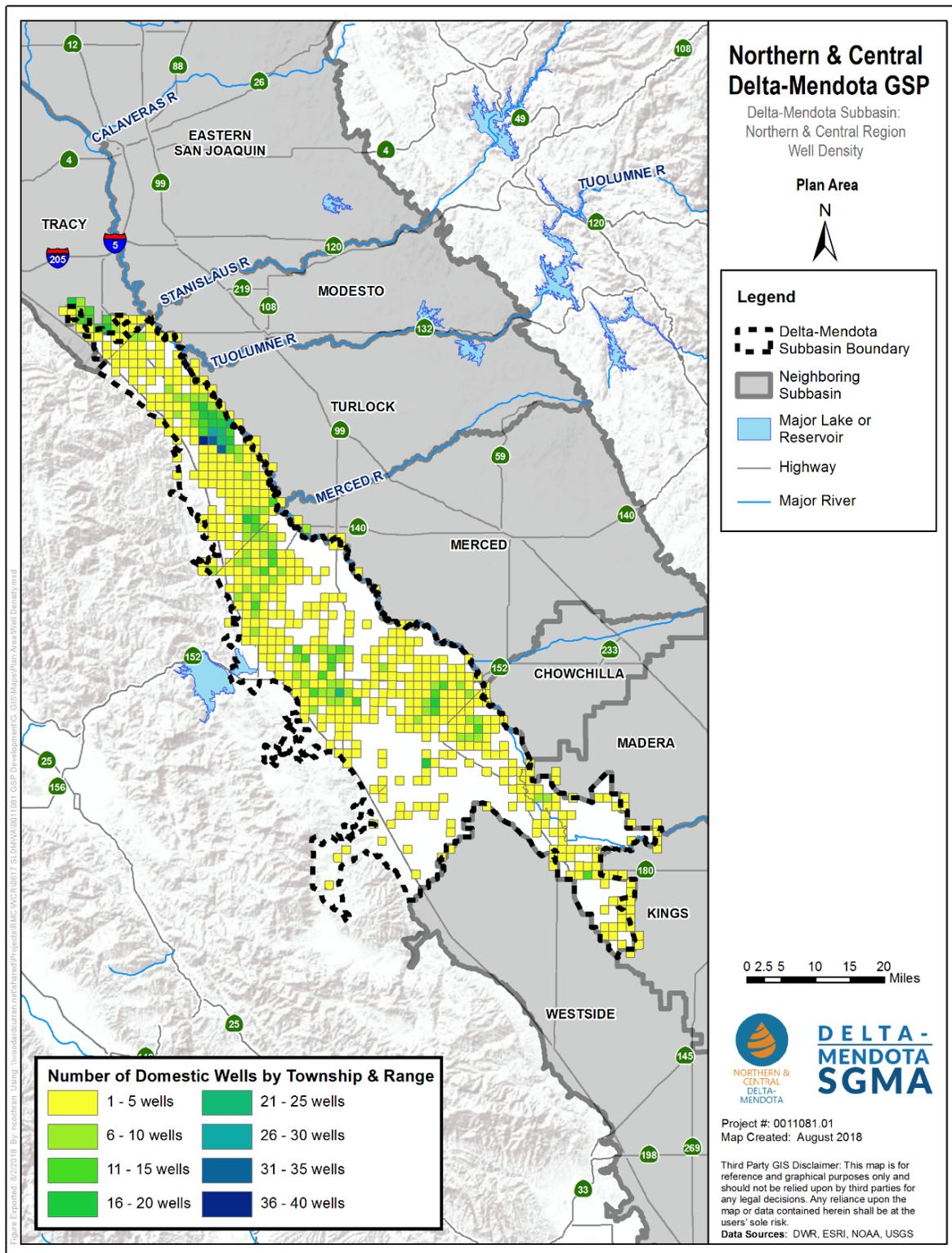


Figure 2-10. Estimated Domestic Well Density in the Delta-Mendota Subbasin

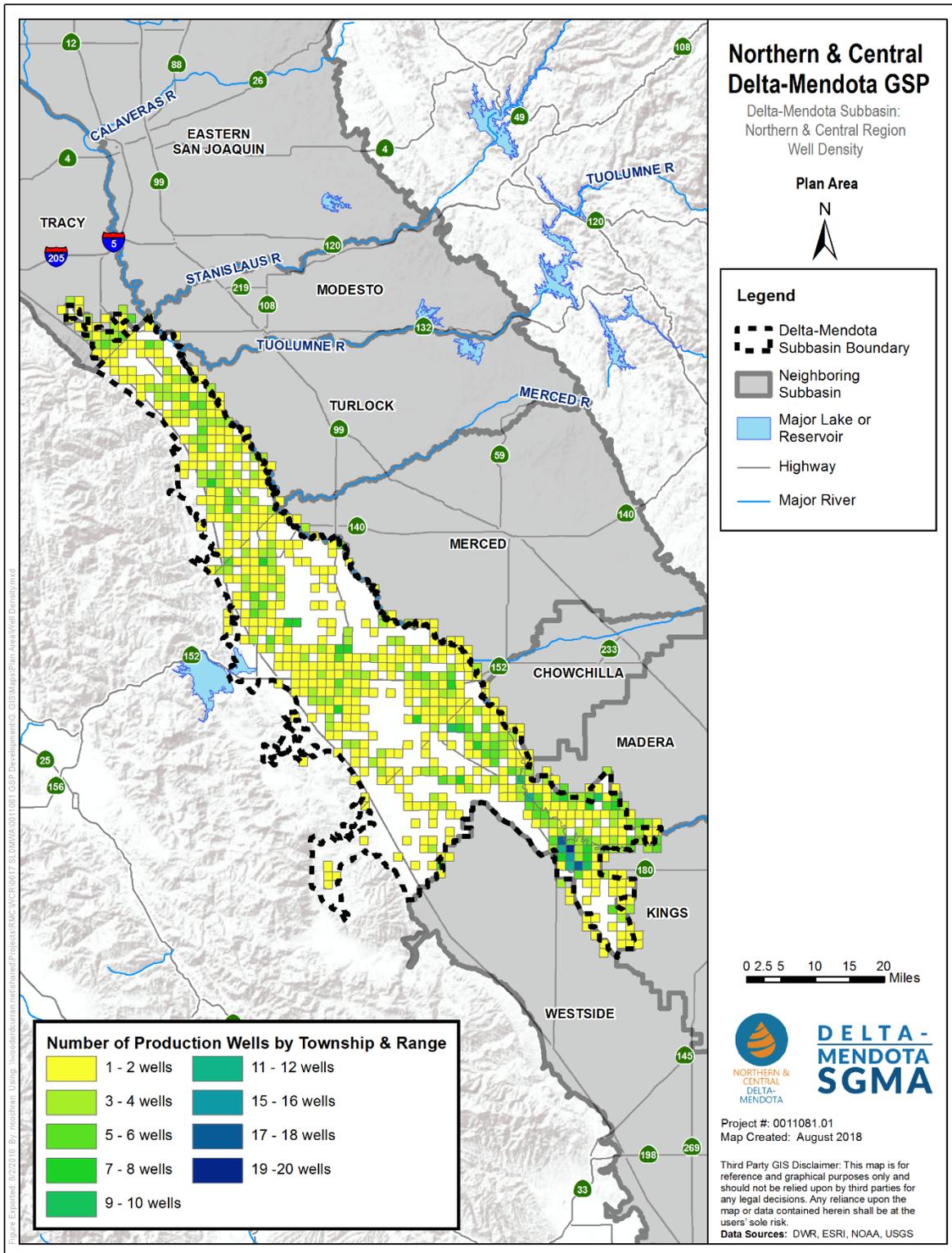


Figure 2-11. Estimated Production Well Density in the Delta-Mendota Subbasin

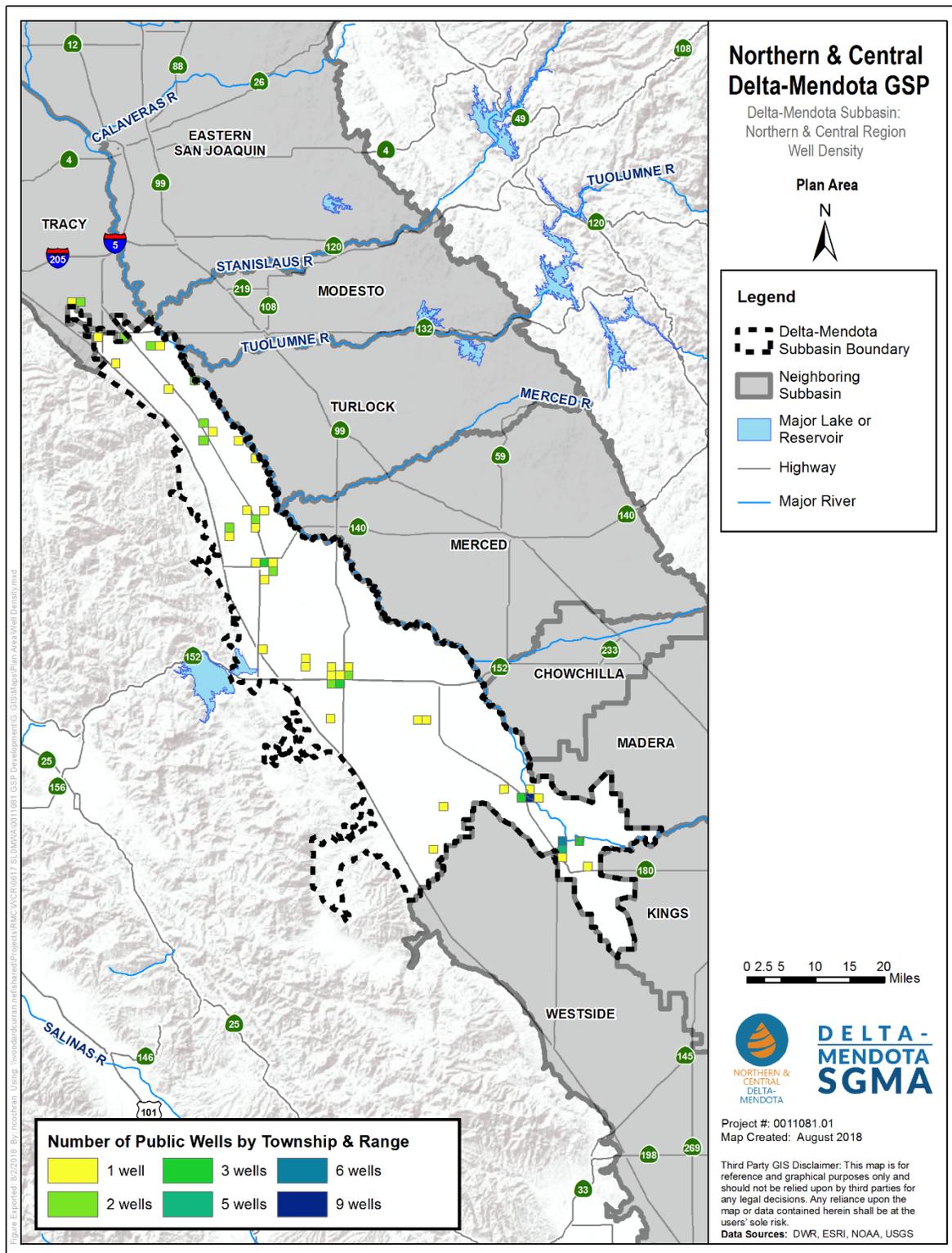


Figure 2-12. Estimated Public Well Density in the Delta-Mendota Subbasin

2.1.2.4 Flood Management

In general, the Delta-Mendota Subbasin slopes toward the San Joaquin River with steeper slopes along the western boundary (near the Coastal Mountain Range), tapering off closer to the San Joaquin River. The flood management system in the San Joaquin Valley includes reservoirs to regulate snowmelt from elevations greater than 5,000 feet, bypasses at lower elevations, and levees that line major rivers.

There has been significant localized flooding in recent years due to severe rain events in 1997/98, 2005/2006 and 2017, where some of the communities adjacent to the San Joaquin River in the Delta-Mendota Subbasin (specifically the communities of Firebaugh, Newman, and Gustine) were flooded and some localized flooding of farmland was caused by runoff impoundment by elevated canal banks. Based on the recent historical events, the primary threat of flooding to urban areas will be for those along (and immediately adjacent to) the San Joaquin River. Areas within the 100-year floodplain within the Northern and Central Delta-Mendota Regions are relatively minimal, as shown in **Figure 2-13**.

2.1.2.5 Major Land Use Divisions

The Delta-Mendota Subbasin consists mostly of agricultural land use types (**Figure 2-14**). Typical land uses in the Northern and Central Delta-Mendota Regions are described in the following sections and consist predominantly of the following:

- Grassland and Rangeland
- Agricultural Land
- Deciduous Forest (Riparian)
- Idle and Retired Farmland/Rangeland

The primary land use planning entities in the Northern and Central Delta-Mendota Regions of the Subbasin include the Counties, as well as the City of Patterson and Community of Santa Nella, as shown in **Figure 2-15**.

Grassland and Rangeland

Grasslands in the Central Valley were originally dominated by native perennial grasses such as needlegrass and alkali sacaton. Currently, grassland vegetation is characterized by a predominance of annual or perennial grasses in an area with few or no trees and shrubs. Annual grasses usually found in grassland vegetation include wild oats, soft chess, ripgut grass, medusa head, wild barley, red brome, and slender fescue. Perennial grasses found in grassland vegetation often include purple needlegrass, Idaho fescue, and California oatgrass. Forbs commonly encountered in grassland vegetation include long-beaked filaree, redstem filaree, dove weed, clovers, Mariposa lilies, popcornflower, and California poppy. Vernal pools found in small depressions with an underlying impermeable layer are isolated wetlands within grassland vegetation.

Most of the grasslands in California are dominated by naturalized annual grasses with perennial grasses existing in relict prairie communities or on sites with soil or water conditions unfavorable for annual grasses, such as on serpentine. Grassland vegetation occurs from sea level to about 3,900 feet in elevation. Grassland communities as a whole have relatively high species diversity when compared to other California plant communities.

Rangeland communities are composed of similar grasses, grass-like plants, forbs, or shrubs which are grazed by livestock. Rangelands are classified into three basic types: shrub and brush rangeland, mixed rangeland, and herbaceous rangeland. The shrub and brush rangeland is dominated by woody vegetation and is typically found in arid and semiarid regions such as the San Luis Unit. Mixed rangelands are ecosystems where more than one-third of the land supports a mixture of herbaceous species and shrub or brush rangeland species. Herbaceous rangelands are dominated by naturally occurring grasses and forbs as well as some areas that have been modified to include

grasses and forbs as their principal cover. Rangelands are, by definition, areas where a variety of commercial livestock are actively maintained.

Agricultural Land

General agricultural types occurring in the Northern and Central Delta-Mendota Regions include cropland, pasture, orchards, and vineyards. Management of agricultural lands often includes intensive management, including soil preparation activities, crop rotation, grazing, and the use of chemicals.

Cropland and Pasture

Pastures can consist of both irrigated and unirrigated lands dominated by perennial grasses and various legumes. The composition and height of the vegetation varies with management practices. Most crops grown in the San Joaquin Valley are annual species and are managed with a crop rotation system. During the year, several different crops may be produced on a given parcel of land. Typical crops grown in the Delta-Mendota Subbasin include, tomatoes, sugar beets, melons, grain crops (such as barley, wheat, corn, and oats), rice, cotton, and beans.

Orchards and Vineyards

Orchard and vineyard habitats consist of cultivated fruit or nut-bearing trees or grapevines. Orchards are typically open, single-species, tree-dominated habitats and are planted in a uniform pattern and intensively managed. Understory vegetation is usually sparse. In vineyards, the rows under the vines are often sprayed with herbicides to prevent the growth of herbaceous plants.

Deciduous Forest

Deciduous forests are composed of trees that lose their leaves in the winter. These include species such as the various California oaks, California buckeye, Fremont Cottonwoods, Goodding Willows, and California Sycamores. The interior live oak, which is not deciduous, is also found in deciduous forests. Valley oak woodlands are found in the Sacramento and San Joaquin Valleys and usually occur below elevations of 2,000 feet.

Idle or Retired Farmland/Rangeland

Lands of this category are similar to abandoned farmlands in ruderal (disturbed) areas. Plants on these parcels may consist of either native and/or non-native species.

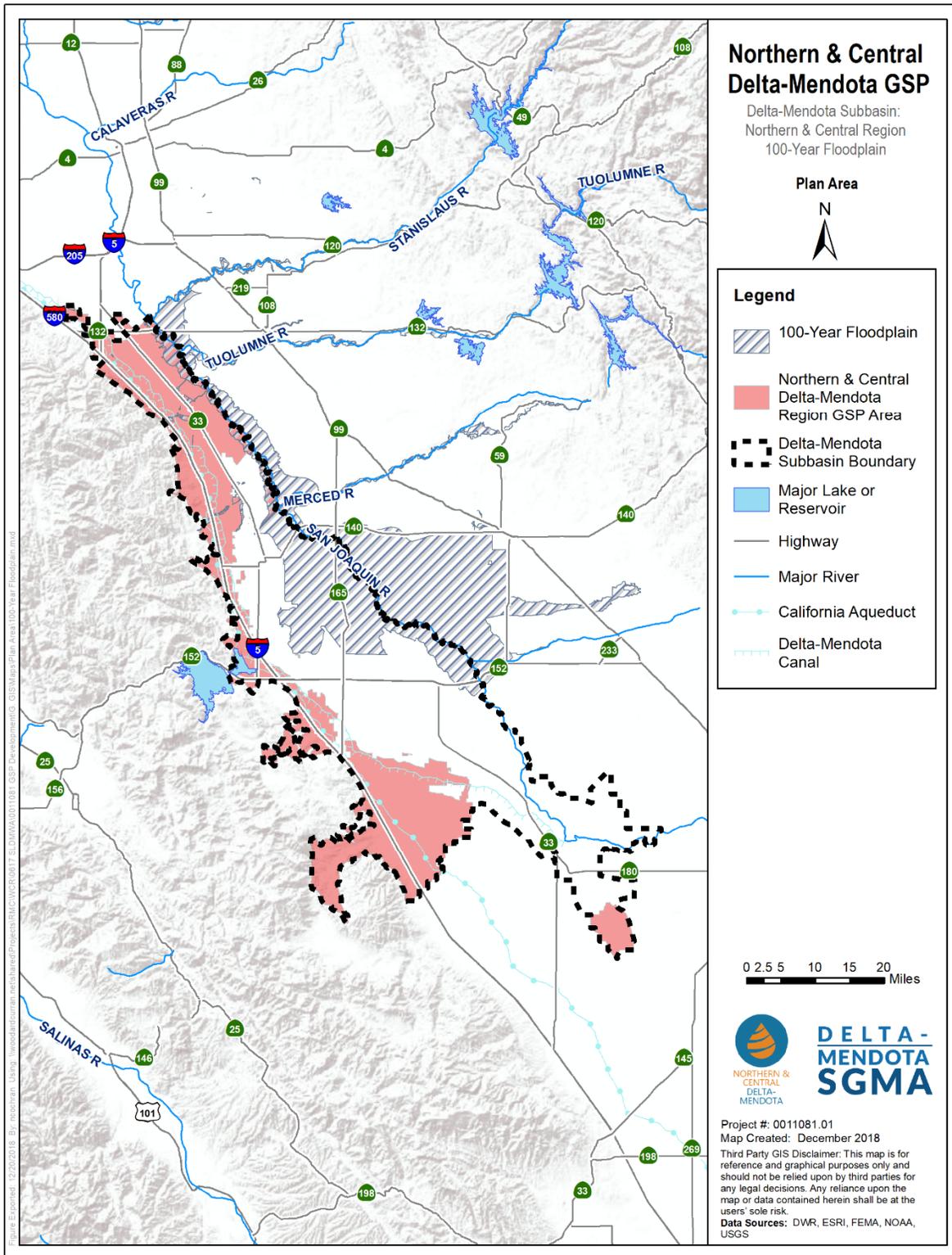


Figure 2-13. 100-Year Floodplain, Delta-Mendota Subbasin

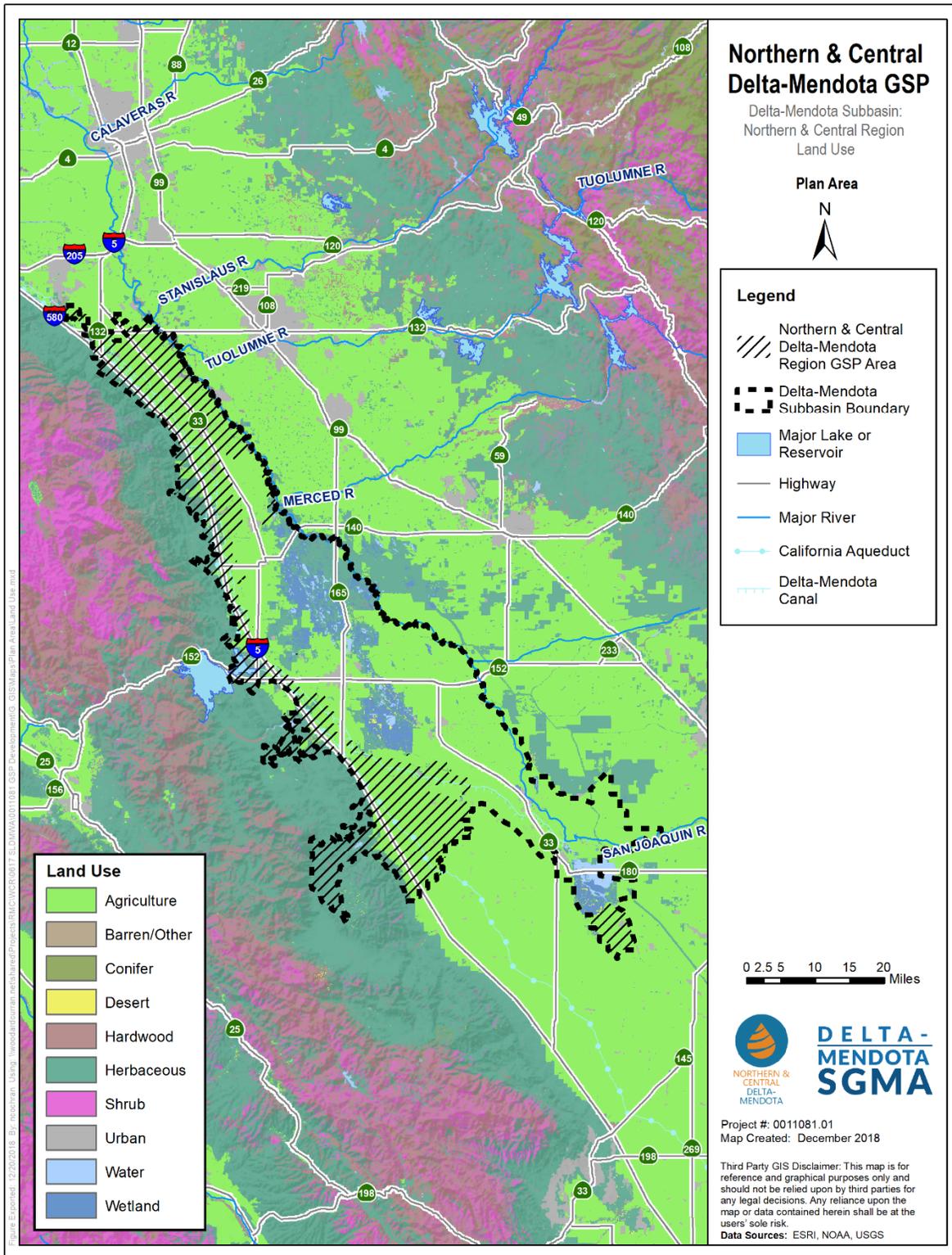


Figure 2-14. Land Cover, Delta-Mendota Subbasin

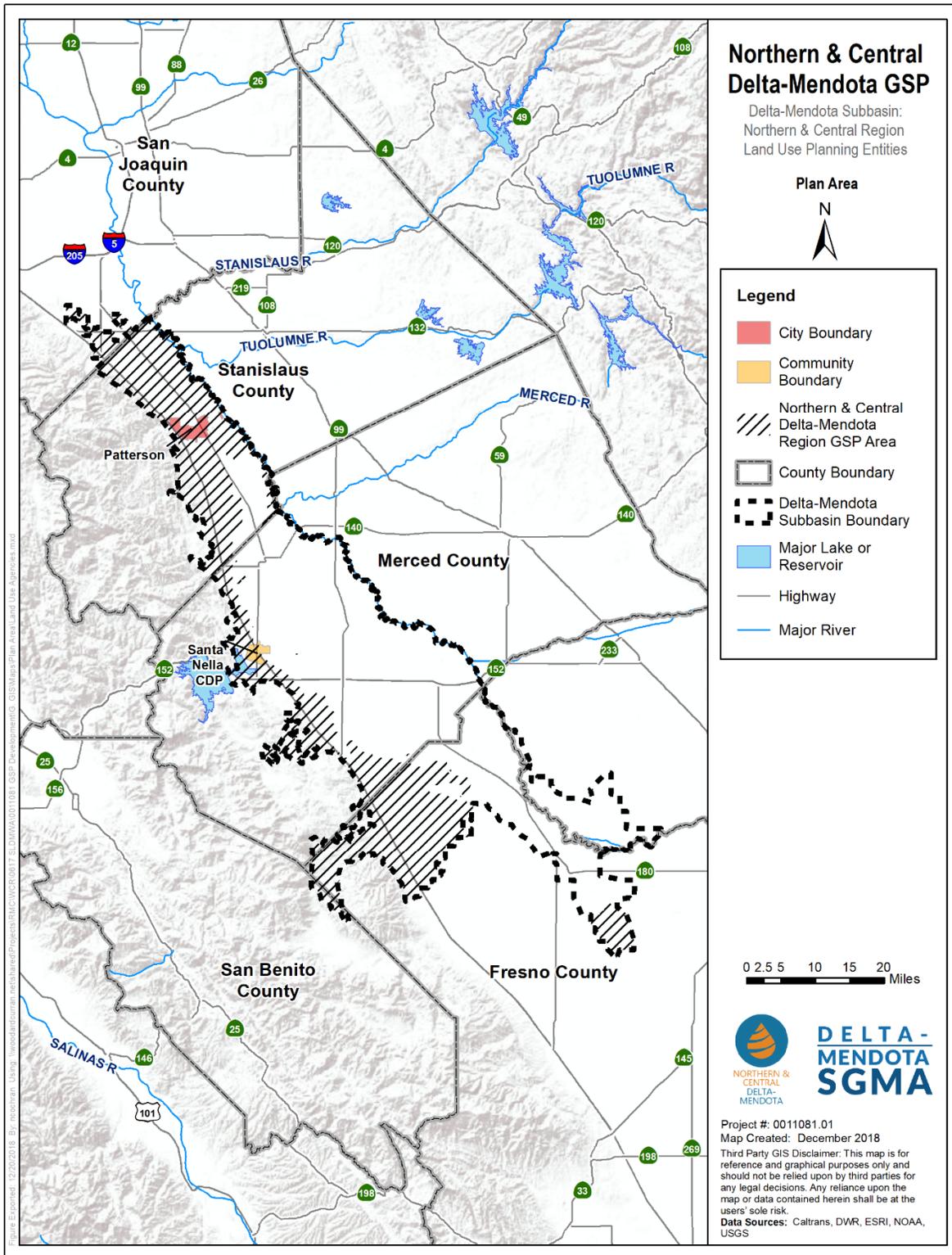


Figure 2-15. Land Use Planning Entities, Northern and Central Delta-Mendota Regions

2.1.2.6 Regional Economic Issues and Trends

The western San Joaquin Valley is a highly agricultural region. There are no large cities or industries in the Subbasin to provide an alternative economic base. The economy of this region is predominately driven by agricultural production and therefore, the availability of CVP agricultural water is an essential element to the economic health of the region. Other uses of CVP water in the Subbasin are used for municipal and industrial (M&I) purposes and wildlife refuge water supply.

Depending on water supply conditions, about 800,000 acres are partially or solely irrigated with CVP water. Other economic base industries include travel on the Interstate-5 (I-5) corridor, some petroleum extraction, and tourism. Wetlands benefit the local economies by attracting hunters, naturalists, and bird-watchers.

M&I water use, which is a small share of total water use in the Subbasin, occurs primarily within the cities. The largest M&I use areas in the Delta-Mendota Subbasin, based on 2015 population estimates from the U.S. Census Bureau, are the cities of Patterson (population 21,498) and Los Banos (population 37,457) (U.S. Census Bureau, 2015).

All communities within the Delta-Mendota Subbasin have economies greatly dependent on agricultural production. These communities include San Joaquin, Tranquillity, Mendota, Firebaugh, Dos Palos, Los Banos, Santa Nella, Newman, Gustine, Crows Landing, Westley, and Vernalis. All of these communities are strongly affected by the reliability of CVP agricultural water. Some of them are dependent upon agricultural water from the CVP for M&I use, and most have experienced dramatic rates of growth and urbanization over the last decade.

Disadvantaged Communities within the Delta-Mendota Subbasin

A disadvantaged community (DAC) is defined as a community with a Median Household Income (MHI) less than 80% of the California statewide MHI. DWR compiled U.S. Census Bureau's American Community Survey (ACS) data from 2012 to 2016; these data were used in Geographic Information System (GIS) software to identify DACs within the Delta-Mendota Subbasin. California's average statewide MHI from 2012 to 2016 is \$63,783; thus, a community with an MHI less than or equal to \$51,026 is considered a DAC. Based on these criteria, 93% of the geographic area of the Subbasin is considered disadvantaged. Furthermore, a community with an MHI of less than 60% of the California statewide MHI, meaning an MHI of less than or equal to \$38,270, is considered a severely disadvantaged community (SDAC). According to the U.S. Census ACS 2012-2016 data, there are a number of SDACs throughout the Subbasin. See **Figure 2-16** for a map of the DACs and SDACs throughout the Delta-Mendota Subbasin.

As noted above, a significant portion of the Subbasin contains DACs. Of the total population of 117,120 within the Subbasin, 80% of the population lives within a DAC, with 93% of the Subbasin's total geographic area consisting of DACs. **Table 2-1** includes the proportion of DACs in the Subbasin based on population and geographic area.

Table 2-1. DACs as a Percentage of the Delta-Mendota Subbasin

Area	Geographic Area (Square Miles)	% Based on Geographic Area	Population	% Based on Population
DAC (including SDAC)	1,109	93%	93,786	80%
Delta-Mendota Subbasin	1,194		117,120	

Table 2-2 includes Census Designated Places that are DACs in the Delta-Mendota Subbasin, with their associated MHIs and percentage of the California MHI from the ACS 5-Year 2012-2016 average. Several DACs in the Subbasin have considerably lower MHI than 80% of the California Statewide MHI and are further designated as SDACs. In **Table 2-2**, SDACs are indicated in bold text.

Table 2-2. DAC and SDAC Census Designated Places in Delta-Mendota Subbasin

Census Designated Place (CDP)	Median Household Income (MHI)	% of CA MHI
City of Dos Palos	\$36,509	57%
City of Firebaugh	\$36,181	57%
City of Gustine	\$37,770	59%
City of Los Banos	\$45,751	72%
City of Mendota	\$26,094	41%
City of Newman	\$52,783	83%
Crows Landing	\$26,786	42%
Dos Palos Y (CDP)	\$16,656	26%
Grayson	\$29,787	47%
Madera County	\$45,490	74%
Merced County	\$43,066	70%
Fresno County	\$45,963	72%
Santa Nella	\$27,778	44%
South Dos Palos	\$41,992	66%
Tranquillity	\$30,441	48%
Volta	\$48,250	76%
Westley	\$23,375	37%

Data Source: U.S. Census ACS data from 2012 to 2016 provided by DWR Mapping Tool.

MHI data are from the 2016 Census, and percent of CA MHI is calculated based on the 2012-2016 Statewide MHI. Bold rows indicate severely disadvantaged communities (less than 60% of CA Statewide MHI).

The Delta-Mendota Subbasin is also home to a large Hispanic or Latino population, which is greatly dependent upon production agriculture as a source of employment. At the county level, the percentage of Hispanic population runs from a low of 41.6% in San Joaquin County to a high of 59.6% in Merced County, according to U.S. Census Bureau estimates from 2017 (U.S. Census Bureau, 2017). However, Hispanic populations on the west side of the San Joaquin Valley are usually the majority in a given area and can be much higher percentages of the population. Improving water supply reliability and quality, and otherwise enhancing the conditions for production agriculture in the western San Joaquin Valley, will expand source of employment opportunities for these disadvantaged populations.

Note that according to the U.S. Department of the Interior Indian Affairs, as of January 2017 there are no listed federally recognized tribes within the Region (Mosley, 2017).

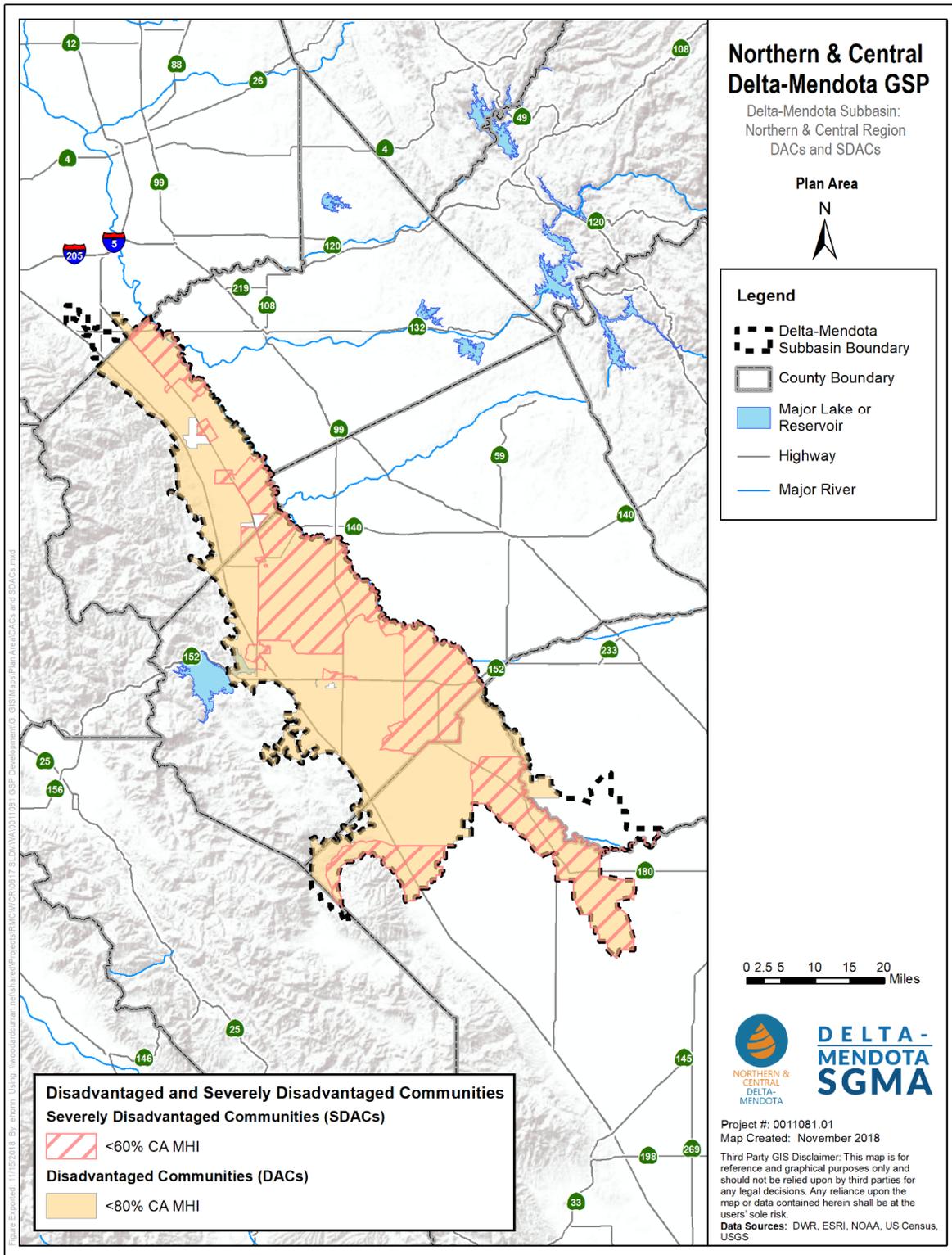


Figure 2-16. Disadvantaged and Severely Disadvantaged Communities in the Delta-Mendota Subbasin

Economically Disadvantaged Areas within the Delta-Mendota Subbasin

An economically distressed area (EDA) is defined by the State of California as a “municipality with a population of 20,000 persons or less, a rural county, or a reasonably isolated and divisible segment of a larger municipality where the segment of the population is 10,000 persons or less, with an annual median household income that is less than 85% of the statewide median household income, and with one or more of the following conditions as determined by the department:

1. Financial hardship
2. Unemployment rate at least two percent higher than the statewide average
3. Low population density (CA Assembly, 2014).

U.S. Census GIS data provided by DWR were used to identify EDAs in the Delta-Mendota Subbasin. **Figure 2-17** shows the location of EDAs within the Delta-Mendota Subbasin

A significant portion of the Subbasin contains EDAs. Of the total population of 117,120 within the Subbasin, 87% live in areas that meet EDA Criterion 2, 20% live in areas that meet EDA Criterion 3, and 87% live in areas that meet Criteria 2 or 3. In all, 93% of the geographic area within the Subbasin consists of areas considered to meet either EDA Criteria 2 or 3. **Table 2-3** includes the proportion of EDAs in Subbasin based on population and geographic area.

Table 2-3. EDAs as a Percentage of the Delta-Mendota Subbasin

Area	Geographic Area (Square Miles)	% Based on Geographic Area	Population	% Based on Population
EDA Criterion 2	1,112	93%	102,407	87%
EDA Criterion 3	1,004	84%	23,688	20%
EDA Criteria 2 or 3	1,112	93%	102,316	87%
Delta-Mendota Subbasin	1,194		117,120	

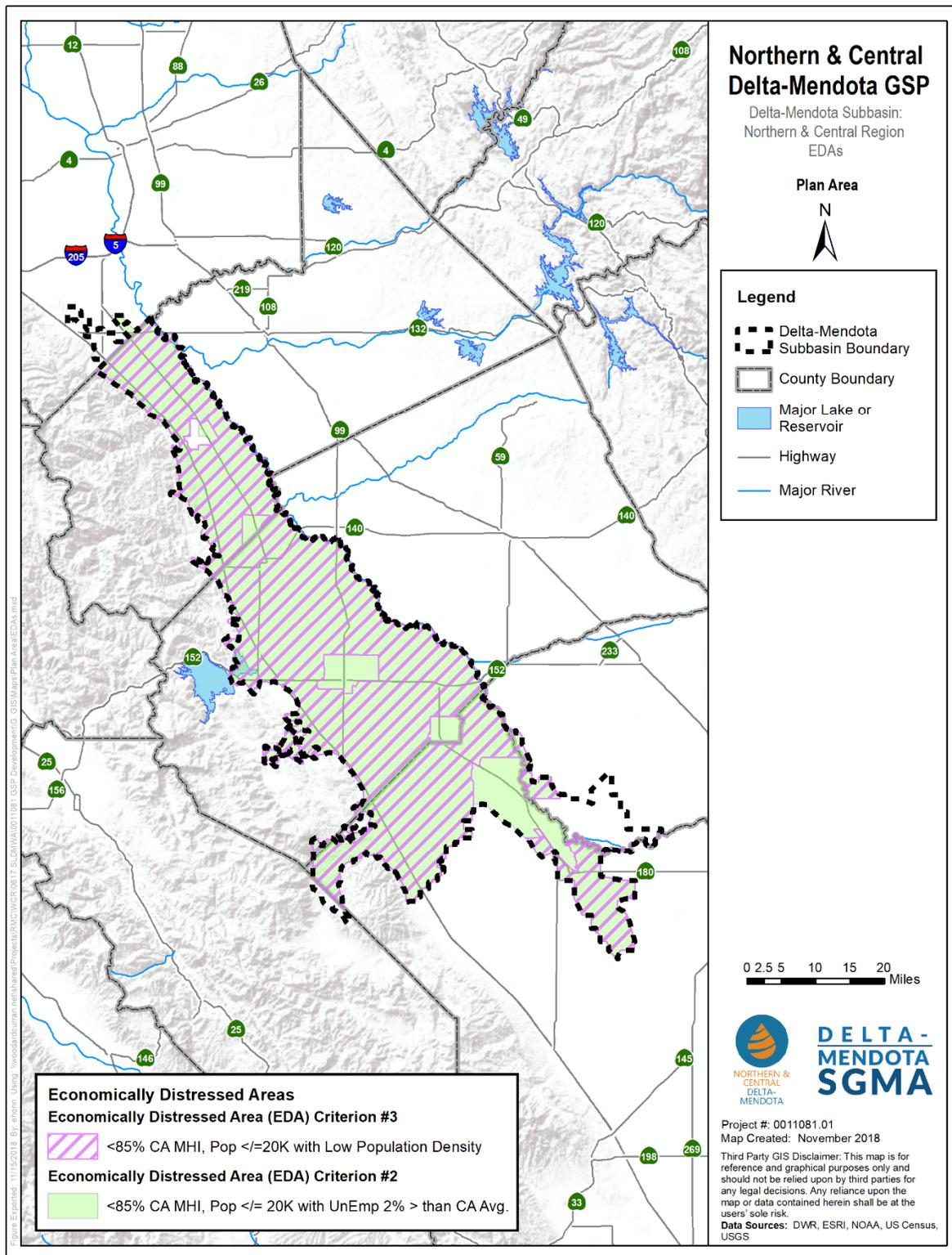


Figure 2-17. Economically Distressed Areas in the Delta-Mendota Subbasin

2.1.3 Plan Area Jurisdictional Boundaries

The Plan area for this GSP consists of the Northern and Central Delta-Mendota Regions, which is formed by the following Groundwater Sustainability Agencies (GSAs) (**Figure 2-18**):

- Central Delta-Mendota GSA
- City of Patterson GSA
- DM-II GSA
- Northwestern Delta-Mendota GSA
- Oro Loma Water District GSA
- Patterson Irrigation District GSA
- West Stanislaus Irrigation District GSA
- Widren Water District GSA

All GSAs within the Northern & Central Delta-Mendota Region GSP Plan area are exclusive Agencies.

The Northern & Central Delta-Mendota Region GSP is one of six GSP areas within the Delta-Mendota Subbasin. Other GSP Regions within the Subbasin include the following GSAs (**Figure 2-19**):

- San Joaquin River Exchange Contractors GSP Region (City of Dos Palos GSA, City of Firebaugh GSA, City of Gustine GSA, City of Los Banos GSA, City of Mendota GSA, City of Newman GSA, Portion of Merced County – Delta-Mendota GSA, Turner Island Water District – 2 GSA, County of Madera – 3 GSA, Portion of Fresno County Management Area B GSA, and San Joaquin River Exchange Contractors Water Authority GSA)
- Aliso Water District GSP Region (Aliso Water District GSA)
- Farmers Water District GSP Region (Farmers Water District GSA)
- Grassland Water District GSP (Grassland Water District GSA and Portion of Merced County – Delta-Mendota GSA)
- Fresno County Management Areas A and B GSP Region (Fresno Management Area A GSA and Fresno Management Area B GSA)

There are no adjudicated areas or areas covered by an Alternative Plan within the Delta-Mendota Subbasin.

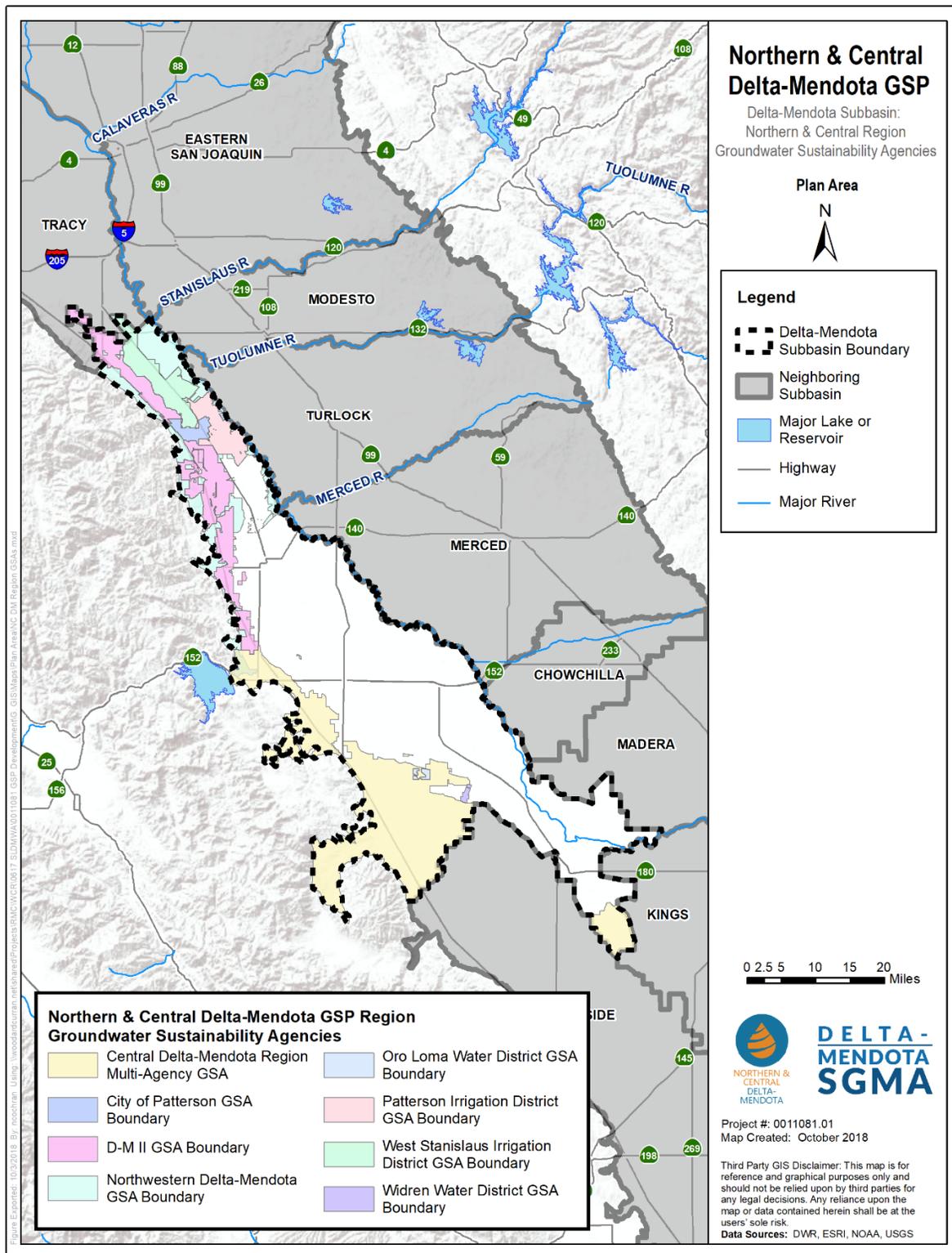


Figure 2-18. Northern & Central Delta-Mendota Region GSP GSAs

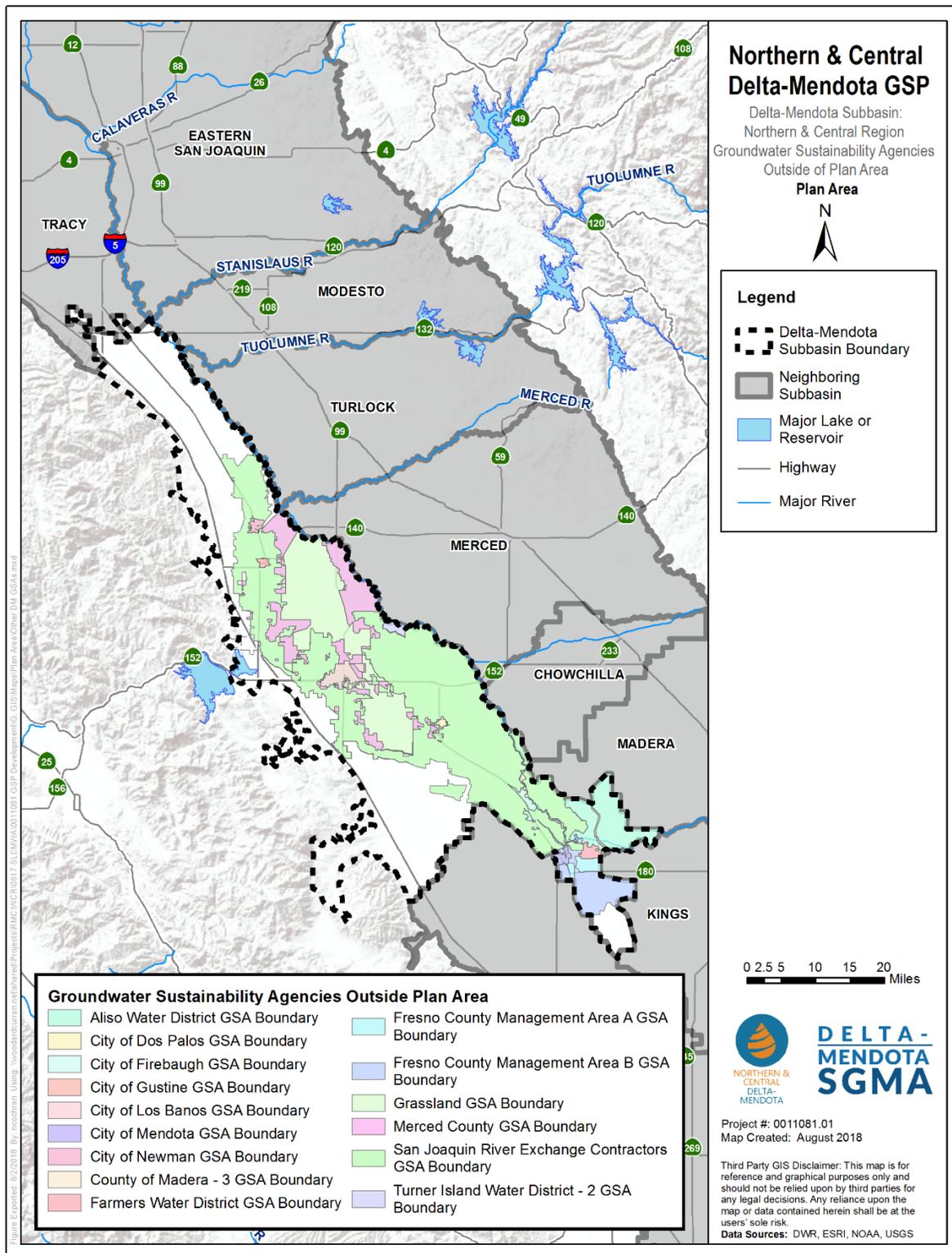


Figure 2-19. Other GSAs in the Delta-Mendota Subbasin

Table 2-4 and **Table 2-5** summarizes the jurisdictional areas within the Northern and Central Delta-Mendota Regions, respectively. These include counties, cities, water districts, irrigation districts, mutual water companies, and federal and state agencies. There are no federal- or state-recognized tribal communities in the Subbasin. The jurisdictional areas of these entities are shown on **Figure 2-20** through **Figure 2-22**.

In general, all municipal, water/irrigation districts and counties within the Northern and Central Delta-Mendota Regions are participating in GSP development either as a separate GSA or as members of a GSA. The California Department of Fish and Wildlife boundaries and the U.S. Fish and Wildlife Service boundaries overlay the wildlife refuges and areas and state parks within the Northern and Central Delta-Mendota Regions. The California Department of Water Resources manages the State Water Project and the California Aqueduct, and the U.S. Bureau of Reclamation, through the San Luis & Delta-Mendota Water Authority, manages the Delta-Mendota Canal. The California Department of Transportation (Caltrans) is responsible for managing the State and Interstate highways in the Region, including Interstate- (I-) 5, and State Highways 132, 33, 140, and 165.

Table 2-4. Jurisdictional Areas in the Northern Delta-Mendota Region

Jurisdictional Area	
	Del Puerto Water District
	Oak Flat Water District
	City of Patterson
	Patterson Irrigation District
	Twin Oaks Irrigation District
	West Stanislaus Irrigation District
	City of Grayson
	Westley Community Services District
	San Joaquin County
	Stanislaus County
	Merced County
Northern Delta-Mendota Region	Crows Landing Community Services District
	Blewett Mutual Water Company
	El Solyo Water District
	Eastin Water District
	White Lakes Mutual Water Company
	Stevinson Water District
	San Luis & Delta-Mendota Water Authority
	California Department of Fish and Wildlife
	California Department of Water Resources
	California Department of Transportation
	U.S. Fish and Wildlife Services
	U.S. Bureau of Reclamation

Table 2-5. Jurisdictional Areas in the Central Delta-Mendota Region

Jurisdictional Area	
Central Delta-Mendota Region	Eagle Field Water District
	Fresno County
	Fresno Slough Water District
	Merced County
	Mercy Springs Water District
	Oro Loma Water District
	Pacheco Water District
	Panoche Water District
	San Benito County
	San Luis Water District
	Santa Nella County Water District
	Tranquillity Irrigation District
	Widren Water District
	San Luis & Delta-Mendota Water Authority
	California Department of Fish and Wildlife
	California Department of Water Resources
	California Department of Transportation
U.S. Fish and Wildlife Service	
U.S. Bureau of Reclamation	

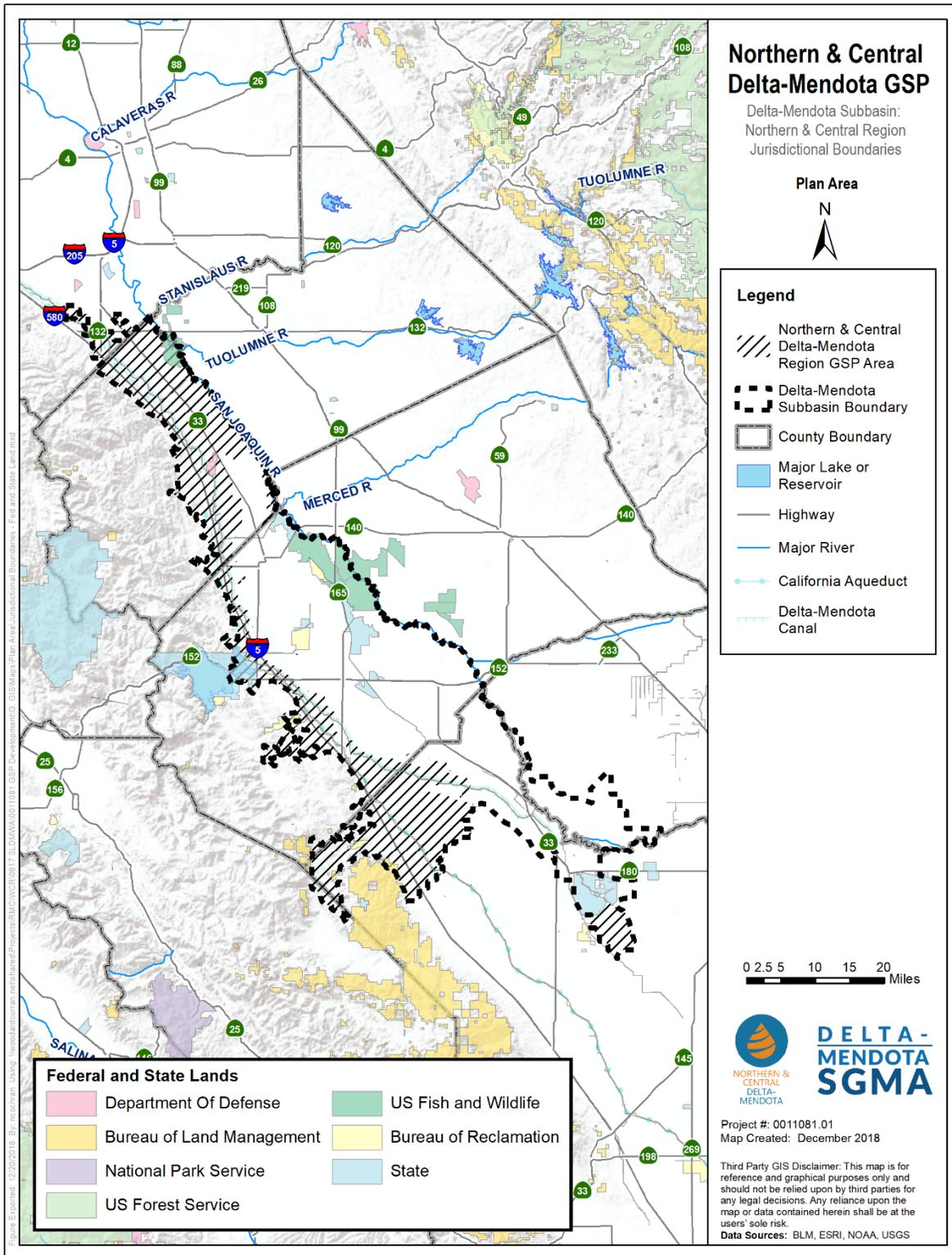


Figure 2-20. Federal and State Lands in the Northern and Central Delta-Mendota Regions

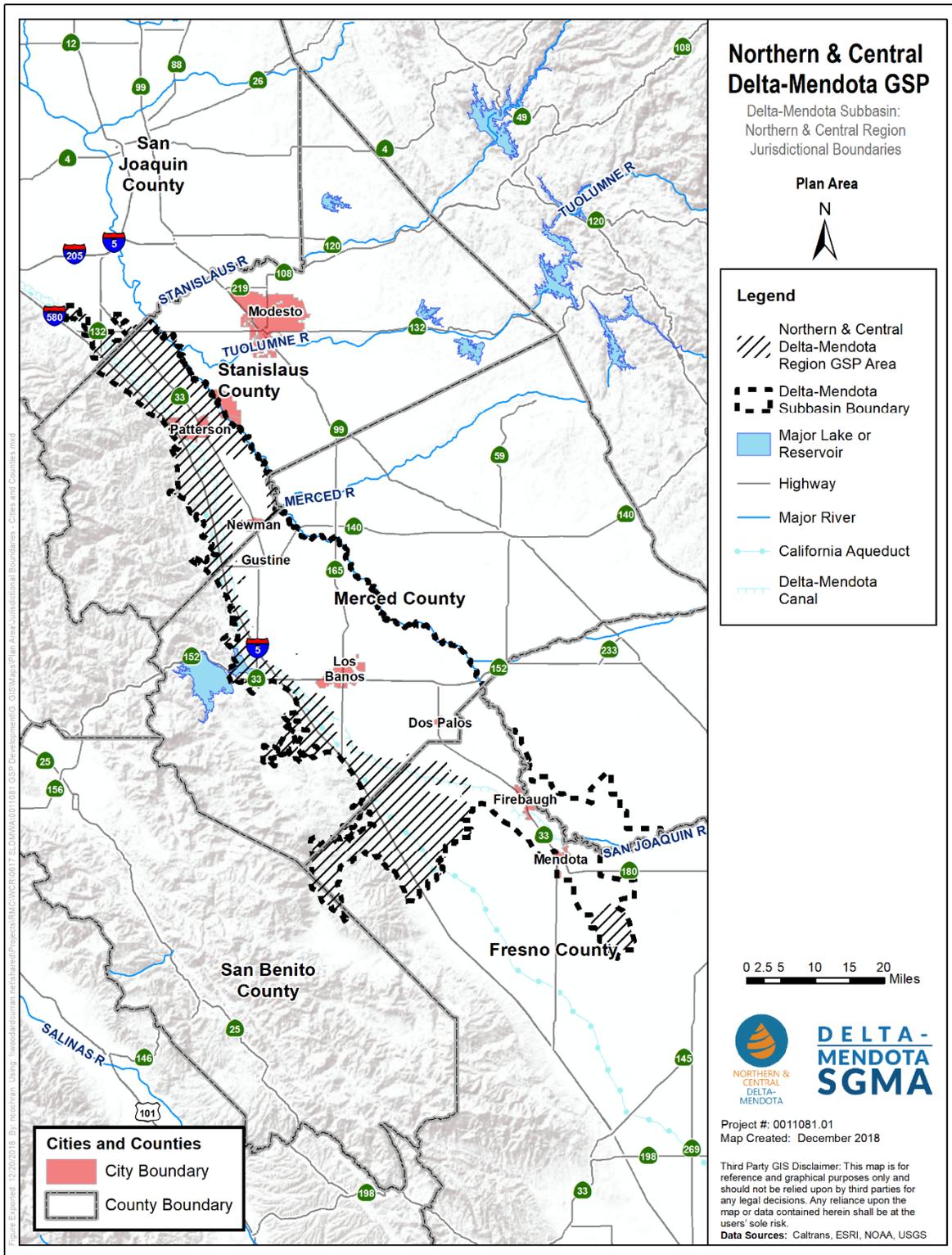


Figure 2-21. Cities and Counties in the Northern and Central Delta-Mendota Regions

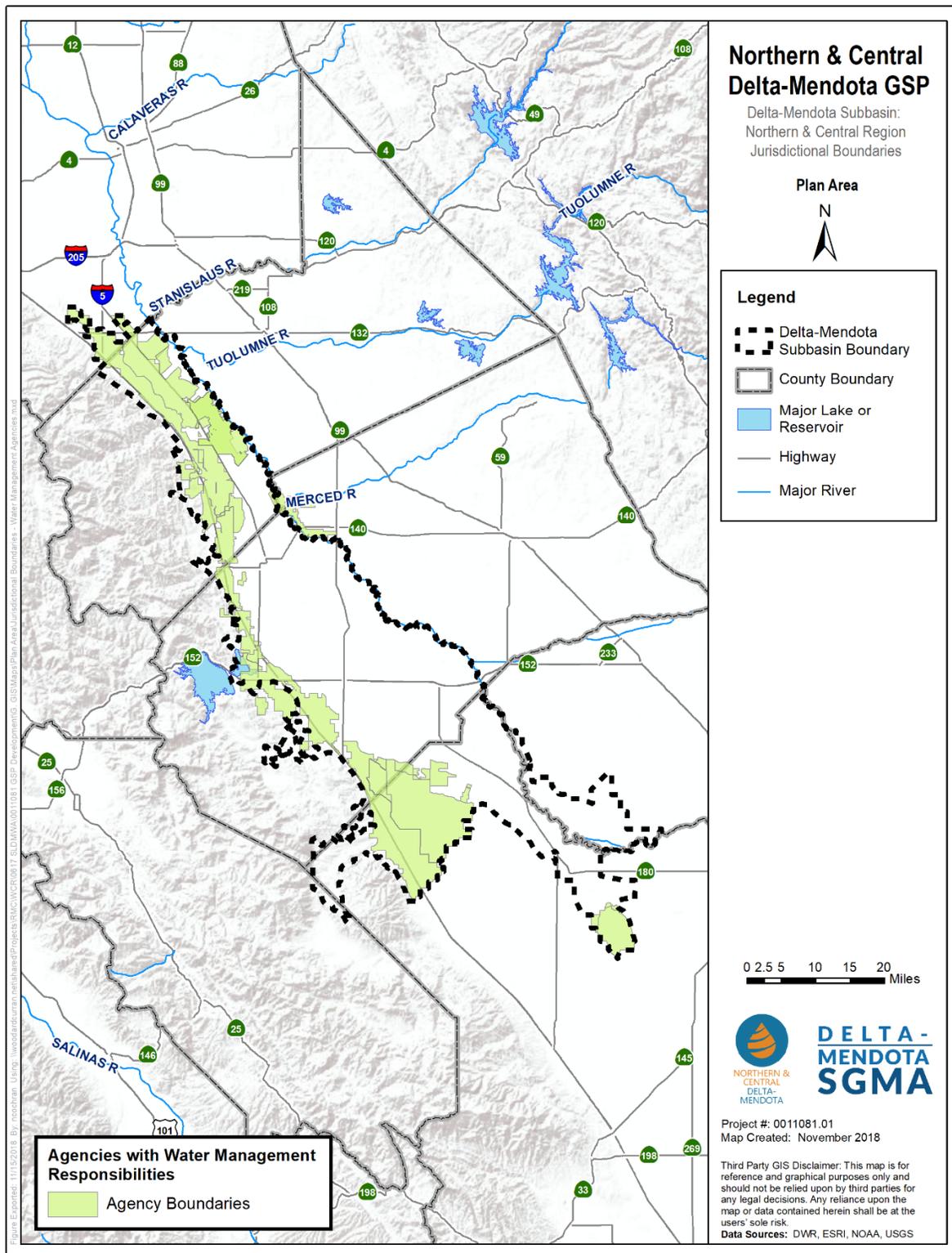


Figure 2-22. Agencies with Water Management Responsibilities in the Northern and Central Delta-Mendota Regions

2.2 LAND USE ELEMENTS

Land use in the Northern and Central Delta-Mendota Regions is predominantly agricultural with areas of municipal, industrial and commercial use. Predominant crops grown in the Regions include rice, grain and hay crops, nut and fruit trees, truck nursery crops, berries, and field crops. **Figure 2-23** shows the distribution of different land use types across the Delta-Mendota Subbasin, while

Table 2-6 summarizes the respective acreage of land use in the Northern and Central Delta-Mendota Regions by land use type.

Figure 2-24 shows land use by water source in the Northern and Central Delta-Mendota Regions. Conjunctive use of surface water and groundwater is practiced throughout much of the Northern and Central Delta-Mendota Regions. Urban centers, such as the City of Patterson, and most unincorporated county areas rely solely on groundwater for their water supplies. Oak Flat Water District receives water from the SWP and meets remaining demand with groundwater. Twin Oaks Irrigation District, El Solyo Water District, Patterson Irrigation District, and West Stanislaus Irrigation District all hold water rights to divert from the San Joaquin River, with additional demand met by groundwater. The following entities in the Northern and Central Delta-Mendota Regions receive water from the CVP and use groundwater as a supplemental source: Del Puerto Water District, Patterson Irrigation District, Stevinson Water District, Eagle Field Water District, Fresno Slough Water District, Mercy Springs Water District, Oro Loma Water District, Pacheco Water District, Panoche Water District, San Luis Water District, West Stanislaus Irrigation District, and Tranquillity Irrigation District.

Agriculture is the predominant water use sector throughout the Northern and Central Delta-Mendota Regions (**Figure 2-25**). Urban water uses are mostly concentrated within and surrounding the City of Patterson. Non-irrigated land includes any idle or native riparian land classifications, which are scattered throughout the Regions.

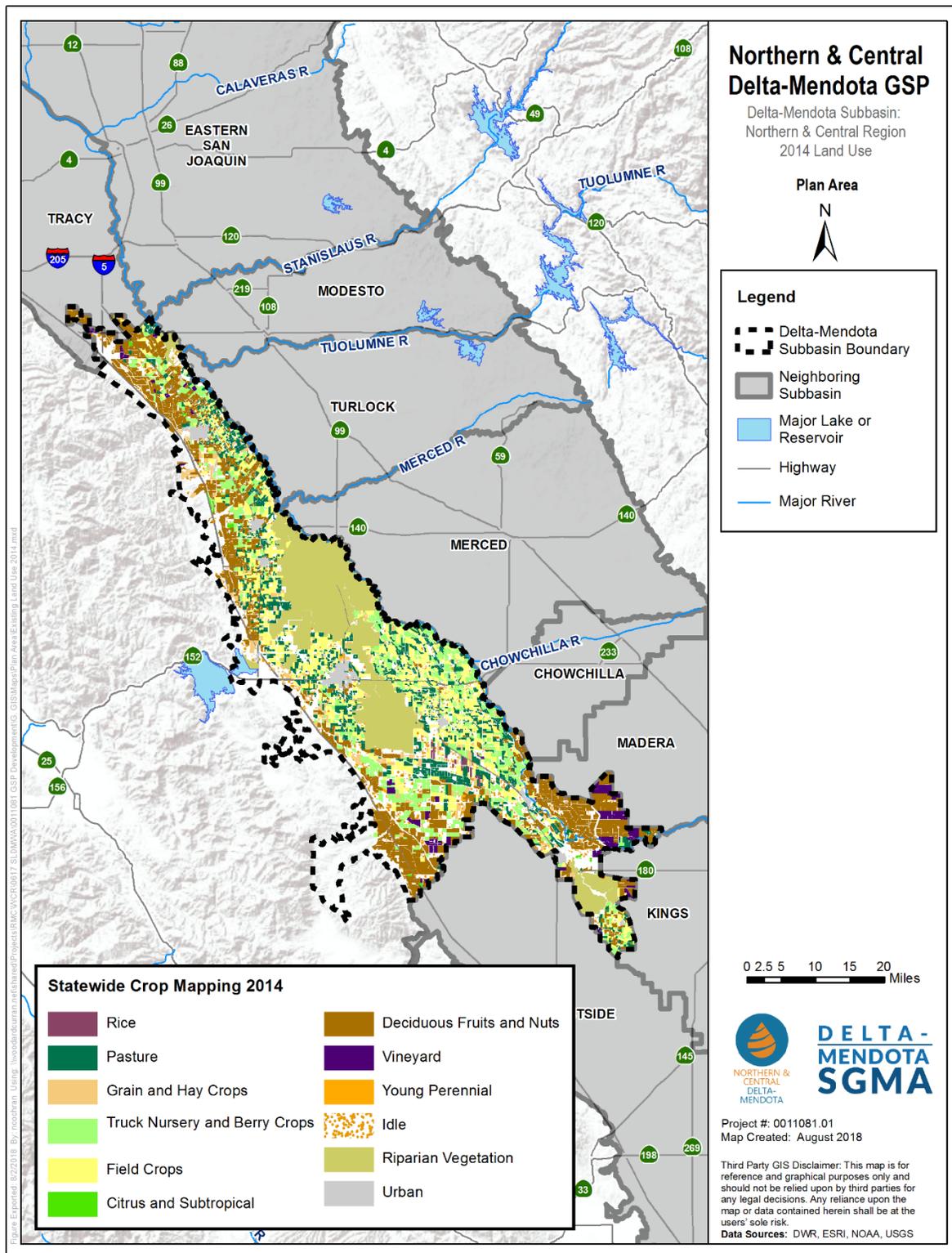


Figure 2-23. Existing Land Use Designations in the Delta-Mendota Subbasin

**Table 2-6. 2014 State Crop Mapping Acreage by Crop Category
Northern and Central Delta-Mendota Regions**

Statewide Crop Mapping Category	Acres
Citrus and Subtropical	1,089
Deciduous Fruit and Nuts	83,506
Field Crops	18,699
Grain and Hay Crops	10,471
Idle	34,022
Native Riparian	11,299
Pasture	18,911
Truck Nursery and Berry Crops	27,729
Urban	4,279
Vineyard	5,676
Young Perennial	677
Total Acreage	216,360

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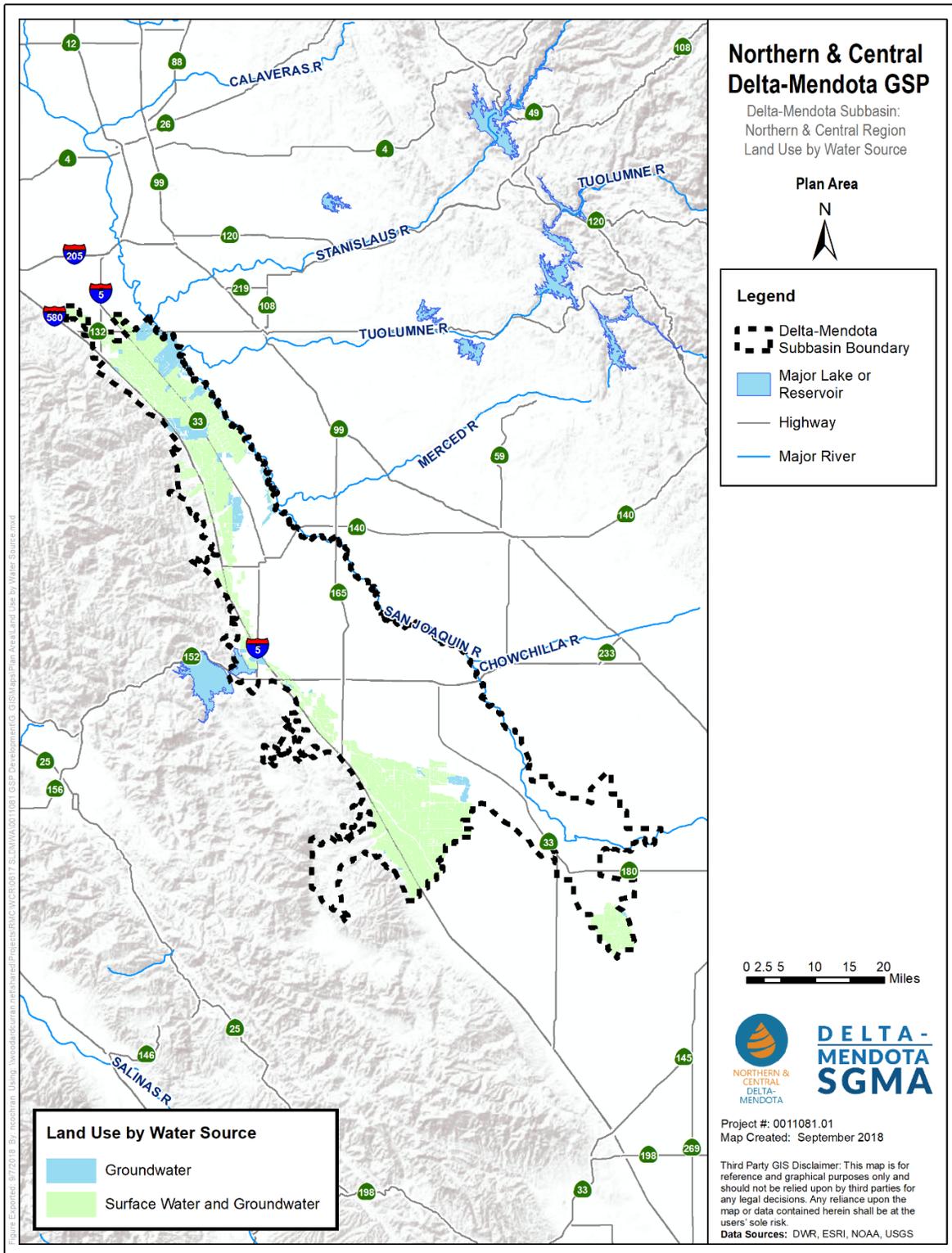


Figure 2-24. Land Use by Water Source in the Northern and Central Delta-Mendota Regions

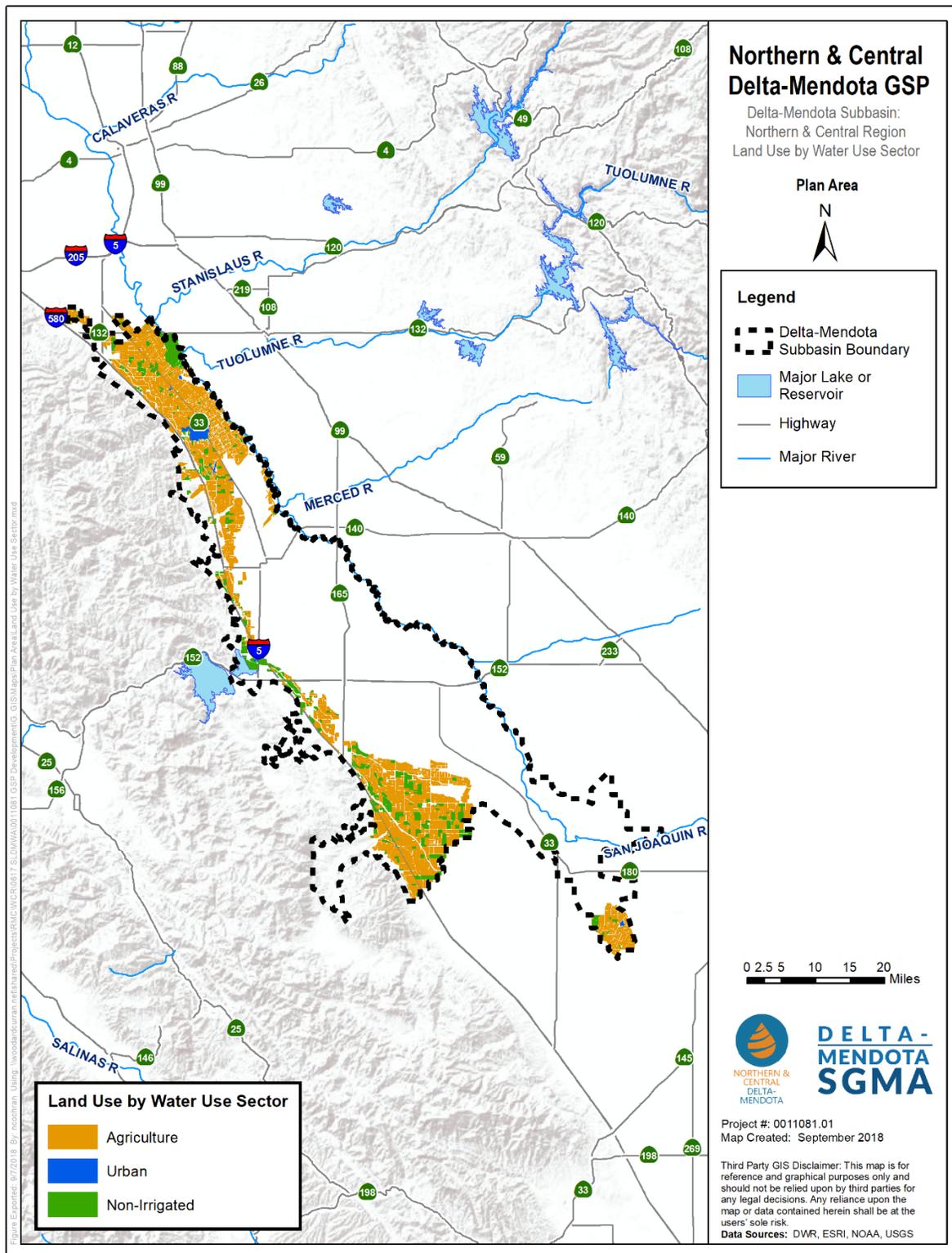


Figure 2-25. Land Use by Water Use Sector in the Northern and Central Delta-Mendota Regions

2.2.1 General Plans in Plan Area

Ten General Plans or Community Specific Plans overlie the Northern and Central Delta-Mendota Regions. These include:

- Fresno County General Plan
- Merced County General Plan
- San Benito County General Plan
- San Joaquin County General Plan
- Stanislaus County General Plan
- City of Patterson General Plan
- Santa Nella Community Specific Plan
- City of Modesto Urban Area General Plan (incorporating the Grayson Area)
- Crows Landing Community Plan
- Westley Community Plan

Figure 2-26, below, shows the locations of relevant plans and communities. The following section describes the General Plan policies and objectives relevant to water resources management in the Northern and Central Delta-Mendota Regions.

This section satisfies §354.8(f) of the GSP Emergency Regulations under SGMA.

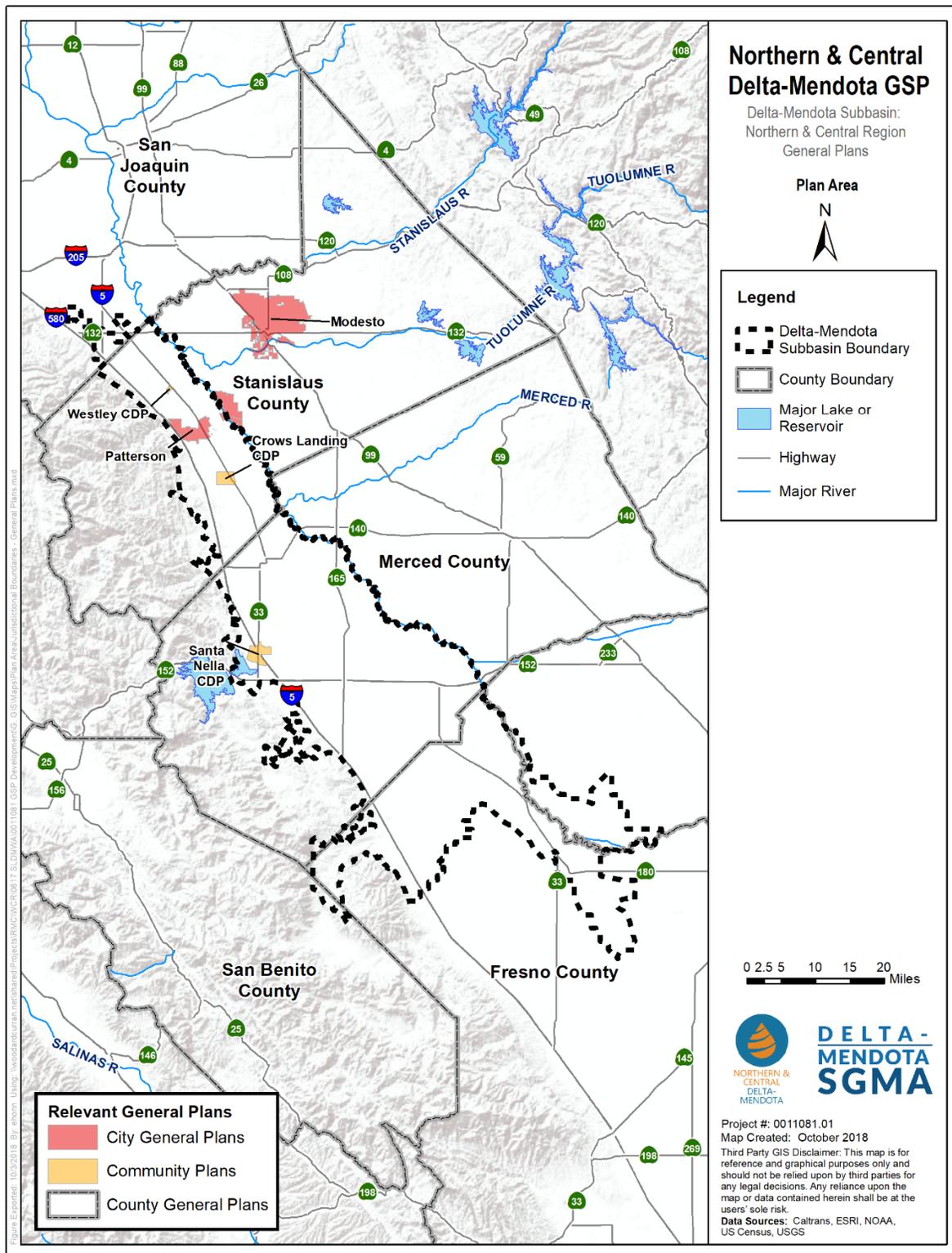


Figure 2-26. Relevant General Plans in the Northern and Central Delta-Mendota Regions

2.2.1.1 Fresno County General Plan

The Fresno County General Plan is a comprehensive, long-term framework for the protection of the County's agricultural, natural, and cultural resources and for development in the County. Designed to meet State general plan requirements, it outlines policies, standards, and programs and sets out plan proposals to guide day-to-day decisions concerning Fresno County's future.

The following policies from each relevant Element may potentially influence implementation of the GSP or be influenced by GSP implementation.

Economic Development Element

- **Policy ED-A.19:** The County shall actively develop, adopt, and implement measures to ensure an adequate water supply for municipal and industrial use and agricultural production. The County shall explore and implement where feasible innovative new arrangements for providing additional water. (See Section PF- C, Water Supply and Delivery).

Health and Safety Element

- **Policy HS-C.6:** The County shall promote flood control measures that maintain natural conditions within the 100-year floodplain of rivers and streams and, to the extent possible, combine flood control, recreation, water quality, and open space functions. Existing irrigation canals shall be used to the extent possible to remove excess storm water. Retention-recharge basins should be located to best utilize natural drainage patterns.
- **Policy HS-F.4:** For redevelopment or infill projects or where past site uses suggest environmental impairment, the County shall require that an investigation be performed to identify the potential for soil or groundwater contamination. In the event soil or groundwater contamination is identified or could be encountered during site development, the County shall require a plan that identifies potential risks and actions to mitigate those risks prior to, during, and after construction.
- **Policy HS-F.6:** The County shall work cooperatively with the State Department of Toxic Substances Control and Regional Water Quality Control Board to promote the timely and efficient cleanup of contaminated sites under the regulatory oversight of these agencies.

Land Use Element

- **Policy LU-A.20:** The County shall adopt and support policies and programs that seek to protect and enhance surface water and groundwater resources critical to agriculture.
- **Policy LU-E.8:** The County shall not allow further parcelization of uncommitted Rural Residential areas lying northeast of the Enterprise Canal due to potential groundwater supply problems. These areas shall be zoned to a Limited Agricultural Zone District. However, rezoning and development for Rural Residential use may be permitted.
- **Policy LU-E.10:** The County shall require new subdivisions within areas designated Rural Residential be designed to utilize individual on-site sewer and water systems.
- **Policy LU-E.11:** The County shall require subdividers of rural residential lots to install, provide, or participate in an effective means for utilization of available surface water entitlements for the area included in the subdivision.
- **Policy LU-E.23:** The County may approve land divisions in areas designated Rural Settlement Area when community water facilities are available and soils are suitable for individual septic systems.
- **Policy LU-E.27:** The County shall allow development within the designated Quail Lakes Planned Rural Community to proceed in accordance with the Specific Plan adopted at the time the designation was granted by the County. The County may grant amendments to the Specific Plan provided the overall density of development is not increased and the plan continues to demonstrate the development will have no significant adverse impacts on groundwater.

- **Policy LU-F.21:** The County shall require community sewer and water services for urban residential development in accordance with the Fresno County Ordinance Code or as determined by the State Water Quality Control Board.
- **Policy LU-F.23:** The County shall require community sewer and water services for commercial development in accordance with the provisions of the Fresno County Ordinance Code, or as determined by the State Water Quality Control Board.
- **Policy LU-F.30:** The County shall generally require community sewer and water services for industrial development. Such services shall be provided in accordance with the provisions of the Fresno County Ordinance, or as determined by the State Water Quality Control Board.
- **Policy LU-H.8:** The County shall prepare a regional plan for the Friant-Millerton area. The new regional plan shall at a minimum address the key issues including groundwater and surface water availability.

Open Space and Conservation Element

- **Policy OS-A.1:** The County shall develop, implement, and maintain a plan for achieving water resource sustainability, including a strategy to address overdraft and the needs of anticipated growth.
- **Policy OS-A.2:** The County shall provide active leadership in the regional coordination of water resource management efforts affecting Fresno County and shall continue to monitor and participate in, as appropriate, regional activities affecting water resources, groundwater, and water quality.
- **Policy OS-A.3:** The County shall provide active leadership in efforts to protect, enhance, monitor, and manage groundwater resources within its boundaries.
- **Policy OS-A.4:** The County shall update, implement, and maintain its Groundwater Management Plan.
- **Policy OS-A.5:** The Fresno County Water Advisory Committee shall provide advice to the Board of Supervisors on water resource management issues.
- **Policy OS-A.6:** The County shall support efforts to create additional water storage that benefits Fresno County, and is economically, environmentally, and technically feasible.
- **Policy OS-A.7:** The County shall develop a repository for the collection of County water resource information and shall establish and maintain a centralized water resource database. The database shall incorporate surface and groundwater data and provide for the public dissemination of water resource information.
- **Policy OS-A.8:** The County shall develop and maintain a water budget (i.e., an accounting of all inflows and outflows of water into a specified area) for the County to aid in the determination of existing and future water resource needs. The water budget shall be incorporated into the County GIS and included in the water resource database.
- **Policy OS-A.9:** The County shall develop, implement, and maintain a program for monitoring groundwater quantity and quality within its boundaries. The results of the program shall be reported annually and shall be included in the water resource database.
- **Policy OS-A.10:** The County shall develop and maintain an inventory of sites within the county that are suitable for groundwater recharge. The sites shall be incorporated into the County GIS and included in the water resource database.
- **Policy OS-A.12:** The County shall promote preservation and enhancement of water quality by encouraging landowners to follow the “Fresno County Voluntary Rangeland and Foothill Water Quality Guidelines.”
- **Policy OS-A.13:** The County shall encourage, where economically, environmentally, and technically feasible, efforts aimed at directly or indirectly recharging the County's groundwater.
- **Policy OS-A.14:** The County shall support and/or engage in water banking (i.e., recharge and subsequent extraction for direct and/or indirect use on lands away from the recharge area).
- **Policy OS-A.15:** The County shall, to the maximum extent possible, maintain local groundwater management authority and pursue the elimination of unwarranted institutional, regulatory, permitting, and policy barriers to groundwater recharge within Fresno County.
- **Policy OS-A.16:** The County shall permit and encourage, where economically, environmentally, and technically feasible, over-irrigation of surface water to maximize groundwater recharge.

- **Policy OS-A.17:** The County shall directly and/or indirectly participate in the development, implementation, and maintenance of a program to recharge the aquifers underlying the county. The program shall make use of flood and other waters to offset existing and future groundwater pumping.
- **Policy OS-A.19:** The County shall require the protection of floodplain lands and, where appropriate, acquire public easements for purposes of flood protection, public safety, wildlife preservation, groundwater recharge, access, and recreation.
- **Policy OS-A.21:** The County shall, where economically, environmentally, and technically feasible, encourage the multiple use of public lands, including County lands, to include groundwater recharge
- **Policy OS-A.22:** The County shall not approve the creation of new parcels that rely on the use of septic systems of a design not found in the California Plumbing Code. (California Code of Regulations, Title 24, Part 5).
- **Policy OS-A.23:** The County shall protect groundwater resources from contamination and overdraft by pursuing the following efforts:
 - Identifying and controlling sources of potential contamination;
 - Protecting important groundwater recharge areas;
 - Encouraging water conservation efforts and supporting the use of surface water for urban and agricultural uses wherever feasible;
 - Encouraging the use of treated wastewater for groundwater recharge and other purposes (e.g., irrigation, landscaping, commercial, and non-domestic uses);
 - Supporting consumptive use where it can be demonstrated that this use does not exceed safe yield and is appropriately balanced with surface water supply to the same area;
 - Considering areas where recharge potential is determined to be high for designation as open space; and
 - Developing conjunctive use of surface and groundwater.
- **Policy OS-A.24:** The County shall require new development near rivers, creeks, reservoirs, or substantial aquifer recharge areas to mitigate any potential impacts of release of pollutants in storm waters, flowing river, stream, creek, or reservoir waters.
- **Policy OS-A.25:** The County shall minimize sedimentation and erosion through control of grading, cutting of trees, removal of vegetation, placement of roads and bridges, and use of off-road vehicles. The County shall discourage grading activities during the rainy season unless adequately mitigated to avoid sedimentation of creeks and damage to riparian habitat.
- **Policy OS-A.28:** The County shall only approve new wastewater treatment facilities that will not result in degradation of surface water or groundwater. The County shall generally require treatment to tertiary or higher levels.
- **Policy OS-A.29:** In areas with increased potential for groundwater degradation (e.g., areas with prime percolation capabilities, coarse soils, and/or shallow groundwater), the County shall only approve land uses with low risk of degrading groundwater.
- **Policy OS-D.7:** The County shall support the management of wetland and riparian plant communities for passive recreation, groundwater recharge, nutrient storage, and wildlife habitats.

Public Facilities and Surfaces Element

- **Policy PF-C.1:** The County shall actively engage in efforts and support the efforts of others to retain existing water supplies within Fresno County.
- **Policy PF-C.2:** The County shall actively engage in efforts and support the efforts of others to import flood, surplus, and other available waters for use in Fresno County.
- **Policy PF-C.3:** To reduce demand on the county's groundwater resources, the County shall encourage the use of surface water to the maximum extent feasible.
- **Policy PF-C.4:** The County shall support efforts to expand groundwater and/or surface water storage that benefits Fresno County.

- **Policy PF-C.5:** The County shall develop a County water budget to determine long-term needs and to determine whether existing and planned water resource enhancements will meet the county's needs over the twenty (20) year General Plan horizon.
- **Policy PF-C.6:** The County shall support water banking when the program has local sponsorship and involvement and provides new benefits to the County.
- **Policy PF-C.7:** The County shall recommend to all cities and urban areas within the county that they adopt the most cost-effective urban best management practices (BMPs) published and updated by the California Urban Water Agencies, California Department of Water Resources, or other appropriate agencies as a means of meeting some of the future water supply needs.
- **Policy PF-C.8:** The County shall require preparation of water master plans for areas undergoing urban growth.
- **Policy PF-C.9:** The County shall work with local irrigation districts to preserve local water rights and supply.
- **Policy PF-C.10:** The County shall require any community water system in new residential subdivisions to be owned and operated by a public entity.
- **Policy PF-C.11:** The County shall assure an on-going water supply to help sustain agriculture and accommodate future growth by allocation of resources necessary to carry out the water resource management programs.
- **Policy PF-C.12:** The County shall approve new development only if an adequate sustainable water supply to serve such development is demonstrated.
- **Policy PF-C.13:** In those areas identified as having severe groundwater level declines or limited groundwater availability, the County shall limit development to uses that do not have high water usage or that can be served by a surface water supply.
- **Policy PF-C.14:** The County shall require that water supplies serving new development meet US Environmental Protection Agency and California Department of Health Services and other water quality and quantity standards.
- **Policy PF-C.16:** If the cumulative effects of more intensive land use proposals are detrimental to the water supplies of surrounding areas, the County shall require approval of the project to be dependent upon adequate mitigation. The County shall require that costs of mitigating such adverse impacts to water supplies be borne proportionately by all parties to the proposal.
- **Policy PF-C.17:** The County shall, prior to consideration of any discretionary project related to land use, undertake a water supply evaluation.
- **Policy PF-C.18:** In the case of lands entitled to surface water, the County shall approve only land use-related projects that provide for or participate in effective utilization of the surface water entitlement such as:
 - Constructing facilities for the treatment and delivery of surface water to lands in question;
 - Developing facilities for groundwater recharge of the surface water entitlement.
- **Policy PF-C.19:** The County shall discourage the proliferation of small community water systems.
- **Policy PF-C.20:** The County shall not permit new private water wells within areas served by a public water system.
- **Policy PF-C.21:** The County shall promote the use of surface water for agricultural use to reduce groundwater table reductions.
- **Policy PF-C.22:** The County supports short-term water transfers as a means for local water agencies to maintain flexibility in meeting water supply requirements. The County shall support long-term transfer, assignment, or sale of water and/or water entitlements to users outside of the County only under limited circumstances.
- **Policy PF-C.23:** The County shall regulate the transfer of groundwater for use outside of Fresno County. The regulation shall extend to the substitution of groundwater for transferred surface water.
- **Policy PF-C.24:** The County shall encourage the transfer of unused or surplus agricultural water to urban uses within Fresno County.
- **Policy PF-C.25:** The County shall require that all new development within the County use water conservation technologies, methods, and practices as established by the County.

- **Policy PF-C.27:** The County shall adopt, and recommend to all cities that they also adopt, the most cost-effective urban best water conservation management practices circulated and updated by the California Urban Water Agencies, California Department of Water Resources, or other appropriate agencies.
- **Policy PF-C.28:** The County shall encourage agricultural water conservation where economically, environmentally, and technically feasible.
- **Policy PF-C.30:** The County shall generally not approve land use-related projects that incorporate a man-made lake or pond that will be sustained by the use of groundwater.
- **Policy PF-D.1:** The County shall encourage the installation of public wastewater treatment facilities in existing communities that are experiencing repeated septic system failures and lack sufficient area for septic system repair or replacement and/or are posing a potential threat to groundwater.
- **Policy PF-E.14:** The County shall encourage the use of retention-recharge basins for the conservation of water and the recharging of the groundwater supply.
- **Policy PF-E.16:** The County shall minimize sedimentation and erosion through control of grading, cutting of trees, removal of vegetation, placement of roads and bridges, and use of off-road vehicles. The County shall discourage grading activities during the rainy season, unless adequately mitigated, to avoid sedimentation of creeks and damage to riparian habitat.
- **Policy PF-E.17:** The County shall encourage the local agencies responsible for flood control or storm drainage retention-recharge basins located in soil strata strongly conducive to groundwater recharge to develop and operate those basins in such a way as to facilitate year-round groundwater recharge.
- **Policy PF-E.18:** The County shall encourage the local agencies responsible for flood control or storm drainage to plan retention-recharge basins on the principle that the minimum number will be the most economical to acquire, develop, operate, and maintain.
- **Policy PF-E.20:** The County shall require new development of facilities near rivers, creeks, reservoirs, or substantial aquifer recharge areas to mitigate any potential impacts of release of pollutants in flood waters, flowing rivers, streams, creeks, or reservoir waters.

Transportation and Circulation Element

- **Policy TR-A.17:** The County should utilize road construction methods that minimize the air, water, and noise pollution associated with street and highway development.

2.2.1.2 Merced County General Plan

The 2030 Merced County General Plan is a legal document that serves as Merced County's "blueprint" or "constitution" for all future land use, development, preservation, and resource conservation decisions. Per the County's General Plan, general plans must be comprehensive and long-term.

The following policies from each relevant Element may potentially influence implementation of the GSP or be influenced by GSP implementation.

Agricultural Element

- **Policy AG-2.12 Antiquated Subdivisions:** Encourage the voluntary merger of antiquated subdivision lots that conflict with adjacent agricultural uses, and continue to require environmental review of permits that could result in adverse environmental impacts in agricultural and rural areas, including traffic generation, groundwater contamination, stormwater drainage disposal, and air quality deterioration.

Health and Safety Element

- **Policy HS-5.4 Contamination Prevention:** Require new development and redevelopment proposals that have suspected or historic contamination to address hazards concerns and protect soils, surface water, and groundwater from hazardous materials contamination by conducting Phase I Environmental Site Assessments (ESA) according to the American Society for Testing and Materials (ASTM) standards and applicable Department of Toxic Substances Control (DTSC) remediation guidelines. Also, complete

additional Phase II Environmental Site Assessments and soil investigations, and any identified or needed remediation when preliminary studies determine such studies are recommended.

Housing Element

- **Policy 6.5:** The County shall encourage the use of solar, wind, other renewable energy resources, and use of water conservation and water recycling systems in residential buildings.

Land Use Element

- **Policy LU-4.4 Efficient Development:** Require efficient and environmentally sound development, which minimizes impacts on sensitive habitat/species, protects water quality and supply, and provides adequate circulation, within Rural Centers.
- **Policy LU-5.A.3 Growth Limitations:** Limit growth in existing Urban Communities that lack public sewer and water systems to only include land use designations and densities which can be accommodated by individual septic systems and/or wells.
- **Policy LU-5.F.1 New Urban Community Size and Location Requirements:** Only accept applications for the establishment of additional new Urban Communities if they encompass a minimum area of 320 acres in order to achieve efficiencies in urban service delivery and provide for long-range growth needs. In addition, require that proposed new Urban Communities be located only in areas that are not located within areas that recharge to already compromised source water aquifers (i.e., in overdraft condition) or areas highly susceptible to groundwater contamination.
- **Policy LU-5.F.4 Water Impacts:** Prohibit new Urban Communities, or the expansion of existing urban communities, if they will negatively impact the water supply of existing users.

Natural Resources Element

- **Policy NR-1.4 Important Vegetative Resource Protection:** Minimize the removal of vegetative resources which stabilize slopes, reduce surface water runoff, erosion, and sedimentation.

Public Facilities and Services Element

- **Policy PFS-1.5 Public Facility Master Plans:** Require regular updates of County Facility Master Plans to coordinate with local service districts to ensure that sufficient water/wastewater treatment is available for unincorporated communities prior to directing additional growth to them.
- **Policy PFS-2.5 Ground or Surface Water Contamination:** Prohibit wastewater disposal facilities, including private residential facilities, that are determined to have the potential to contaminate the groundwater or surface water, on either a site-specific or cumulative basis.
- **Policy PFS-3.4 Agency Coordination:** Coordinate with the U.S. Army Corps of Engineers and other appropriate agencies to develop stormwater detention/retention facilities and recharge facilities that enhance flood protection and improve groundwater recharge.

Water Element

- **Goal W-1:** Ensure a reliable water supply sufficient to meet the existing and future needs of the County.
- **Policy W-1.1 Countywide Water Supply:** Ensure that continued supplies of surface and groundwater are available to serve existing and future uses by supporting water districts and agencies in groundwater management and water supply planning; requiring that new development have demonstrated long-term water supply; and assisting both urban and agricultural water districts in efforts to use water efficiently.
- **Policy W-1.2 Demonstrating Sufficient Water Supply for New Development:** Require all new development within the adopted service area of a water purveyor to demonstrate adequate quantity and quality of water will be available prior to issuing building permits.
- **Policy W-1.3 Agricultural Water Study:** In cooperation with local water agencies and districts, maintain the detailed General Plan study of countywide water use and needs for agriculture with periodic updates and with information that can be widely shared and publicized.

- **Policy W-1.4 Groundwater Recharge Projects:** Support implementation of groundwater recharge projects consistent with adopted Integrated Regional Water Management Plans to minimize overdraft of groundwater and ensure the long-term availability of groundwater.
- **Policy W-1.5 New Well Guidelines:** Coordinate with the cities and special districts in developing County-wide guidelines regarding the location and construction of new water wells.
- **Policy W-1.6 Surface Water Storage:** Support water agencies in the exploration of additional surface water storage opportunities.
- **Policy W-1.7 Water Sufficiency Requirement:** Require new developments to prepare a detailed source water sufficiency study and water supply assessment per Title 22 and Senate Bill 610, consistent with any Integrated Regional Water Management Plan or similar water management plan. This shall include studying the effect of new development on the water supply of existing users, with public input.
- **Policy W-1.8 Single User Well Consolidation:** Encourage consolidation of single user wells into local water districts (with management plans) where feasible.
- **Policy W-1.10 Groundwater Overdraft Protection:** Where a water supply source is nearby and accessible, encourage large water consumers to use available surface irrigation water (secondary water) for school athletic fields, sports complexes, and large landscape areas.
- **Policy W-2.1 Water Resource Protection:** Ensure that land uses and development on or near water resources will not impair the quality or productive capacity of these water resources.
- **Policy W-2.2 Development Regulations to Protect Water Quality:** Prepare updated development regulations, such as best management practices, that prevent adverse effects on water resources from construction and development activities.
- **Policy W-2.3 Natural Drainage Channels:** Encourage the use of natural channels for drainage and flood control to benefit water quality and other natural resource values.
- **Policy W-2.4 Agricultural and Urban Practices to Minimize Water Contamination:** Encourage agriculture and urban practices to comply with the requirements of the Regional Water Quality Control Board for irrigated lands and confined animal facilities, which mandate agricultural practices that minimize erosion and the generation of contaminated runoff to ground or surface waters by providing assistance and incentives.
- **Policy W-2.5 Septic Tank Regulation:** Enforce septic tank and onsite system regulations of the Regional Water Quality Control Board to protect the water quality of surface water bodies and groundwater quality.
- **Policy W-2.6 Wellhead Protection Program:** Enforce the wellhead protection program to protect the quality of existing and future groundwater supplies by monitoring the construction, deepening, and destruction of all wells within the County.
- **Policy W-3.1 Water Availability and Conservation:** Support efforts of water agencies and districts to prevent the depletion of groundwater resources and promote the conservation and reuse of water.
- **Policy W-3.4 High Water Use Processing Activities:** Prohibit any processing activities with high water use practices near areas where groundwater overdraft problems exist, unless the facility uses water recycling and conservation techniques that minimize effects of water use to the groundwater table.
- **Policy W-3.14 Agricultural Water Conservation:** Encourage farmers to use irrigation methods which conserve water in areas where flood irrigation is used for groundwater recharge.
- **Policy W-4.1 Water Resource Protection and Replenishment:** Protect watersheds, aquifer recharge areas, and areas susceptible to ground and surface water contamination by identifying such areas and implementing requirements for their protection.
- **Policy W-5.1 Countywide Water Supply Study:** Prepare and regularly update a comprehensive water supply study that includes all four groundwater basins and three hydrologic zones and takes into consideration activities in neighboring counties and the region. The plan shall consider reductions in Federal and State water deliveries in the western part of the County and anticipated reductions in water supplies due to climate change.

2.2.1.3 San Joaquin County General Plan

The 2035 General Plan for San Joaquin County presents a vision for the County's future. It is comprehensive, providing a framework for the County's physical, economic, and social development and environmental resources preservation. It addresses all geographic areas in the unincorporated county. The plan looks ahead to 2035, while at the same time presenting policies to guide day-to-day decisions. The 2035 San Joaquin County General Plan is a legal document that serves as San Joaquin County's "blueprint" or "constitution" for all future land use, development, preservation, and resource conservation decisions.

The following policies from each relevant Element may potentially influence implementation of the GSP or be influenced by GSP implementation.

Community Development Element

- **Policy C-2.1 Planning for Urban Communities:** The County shall plan Urban Communities to accommodate most of the unincorporated County's projected growth; provide a variety of land uses; receive urban services, including community wastewater treatment, water, and storm drainage.
- **Policy C-3.2 Development in Rural Communities:** The County shall limit development in Rural Communities to those that have adequate public services to accommodate additional population and commercial services that provide for immediate needs of the community's residents or the surrounding agricultural community.
- **Policy C-5.2 Community Expansion Considerations:** As part of any General Plan amendment to expand a community, the County shall consider the availability of water for all existing and planned development.
- **Policy C-6.17 New Urban Community Services:** The County shall require new Urban Communities to be served by public water, wastewater, and terminal storm drainage systems and provide for urban levels of police, fire, and flood protection. Public services shall be designed in such a manner as to be capable of serving only the proposed new Urban Community.
- **Policy C-6.18 New Urban Community Water Supply:** The County shall require new Urban Communities demonstrate access to adequate water supplies to meet the ultimate buildout of the community, consistent with General Plan policies for reducing further groundwater aquifer overdraft and maintaining sufficient water supplies for agriculture. Applicants for new Urban Communities shall be required to study and guarantee, through a development agreement, that existing and future water supply needs can be met and that existing users water supplies will not be negatively impacted.
- **Policy ED-2.4 Green Economy:** The County shall encourage the development and expansion of industries and businesses that rely on environmentally-sustainable products and services, such as renewable energy, green building, clean transportation, water conservation, waste management and recycling, and sustainable land management.
- **Policy ED-3.2 Considerations for New Commercial and Industrial Development:** The County shall consider the factors when reviewing proposed non-agricultural commercial and industrial development applications including water; new developments must have long-term water supplies to meet the ultimate demand of the development and surrounding area and ensure the continued viability of existing and future development.

Land Use Element

- **Policy LU-2.2 Sustainable Building Practices:** The County shall promote and, where appropriate, require sustainable building practices that incorporate a "whole system" approach to designing and constructing buildings that consume less energy, water and other resources, facilitate natural ventilation, use daylight effectively, and are healthy, safe, comfortable, and durable.
- **Policy LU-6.8 Sustainable Technologies:** The County shall encourage all employment and industrial projects to incorporate sustainable technologies including energy and water efficient practices.
- **Policy LU-8.1 Open Space Preservation:** The County shall limit, to the extent feasible, the conversion of open space and agricultural lands to urban uses, and place a high priority on preserving open space lands

for recreation, habitat protection and enhancement, flood hazard management, public safety, water resource protection, and overall community benefit.

Natural and Cultural Resources Element

- **Policy NCR-3.1 Preserve Groundwater Recharge Areas:** The County shall strive to ensure that substantial groundwater recharge areas are maintained as open space.
- **Policy NCR-3.2 Groundwater Recharge Projects:** The County shall encourage the development of groundwater recharge projects of all scales within the County and cities to increase groundwater supplies.
- **Policy NCR-3.3 Multi-Jurisdictional Groundwater Management Evaluation:** The County shall support multi-jurisdictional groundwater management that involves adjacent groundwater basins.
- **Policy NCR-3.4 Eliminate Pollution:** The County shall support efforts to eliminate sources of pollution and clean up the County's waterways and groundwater.
- **Policy NCR-3.6 Prohibit Discharge of Sewage Sludge:** The County shall prohibit the discharge of sewage sludge or septage to surface waters or surface water drainage sources, including wetlands and waterways.
- **Policy NCR-3.7 Septic Tank Regulation:** The County shall enforce its septic tank and onsite system regulations consistent with Central Valley Regional Water Quality Control Board policy that recognizes the County as the responsible agency to protect the water quality of surface water and groundwater.
- **Policy NCR-3.9 Require Water Projects to Mitigate Impacts:** The County shall require water projects to incorporate safeguards for fish and wildlife and mitigate erosion and seepage to adjacent lands.
- **Policy D-6.5 Water Storage Options:** The County shall advocate for the study of above- and below-ground storage options as part of a statewide improved flood management and water supply system.

Public Facilities and Services Element

- **Policy IS-4.1 Water Agency Support:** The County shall support efforts of local water agencies, special district, and water conservation districts to ensure that adequate high-quality water supplies are available to support existing and future residents and businesses.
- **Policy IS-4.2 Interagency Cooperation:** The County shall work with local water agencies to address existing and future water needs for the County.
- **Policy IS-4.3 Water Supply Availability:** The County shall consider the availability of a long-term, reliable potable water supply as a primary factor in the planning of areas for new growth and development.
- **Policy IS-4.4 Water Rights Protection:** The County shall support local water agencies in their efforts to protect their water rights and water supply contracts, including working with Federal and State water projects to protect local water rights.
- **Policy IS-4.5 Drought Response:** The County shall encourage all local water agencies to develop and maintain drought contingency and emergency services plans, emergency inter-ties, mutual aid agreements, and related measures to ensure adequate water service during drought or other emergency water shortages.
- **Policy IS-4.6 Coordinate Efforts for Adequate Water Supply:** The County shall support coordinated efforts to obtain adequate water supplies and develop water storage facilities to meet expected water demand.
- **Policy IS-4.7 Conjunctive Use:** The County shall support conjunctive use of groundwater and surface water by local water agencies to improve water supply reliability.
- **Policy IS-4.8 Water Conservation Measures:** The County shall require existing and new development to incorporate all feasible water conservation measures to reduce the need for water system improvements.
- **Policy IS-4.9 Groundwater Management:** The County shall continue to support cooperative, regional groundwater management planning by local water agencies, water users, and other affected parties to ensure a sustainable, adequate, safe, and economically viable groundwater supply for existing and future uses within the County.

- **Policy IS-4.10 Groundwater Monitoring Program:** The County shall continue to evaluate the quantity and quality of groundwater.
- **Policy IS-4.11 Integrated Regional Water Management:** The County shall support and participate in the development, implementation, and update of an integrated regional water management plan.
- **Policy IS-4.12 Water Supply Planning:** The County shall encourage local water agencies to develop plans for responding to droughts and the effects of global climate change, including contingency plans, water resource sharing to improve overall water supply reliability, and the allocation of water supply to priority users.
- **Policy IS-4.13 Water Quality Standards:** The County shall require that water supplies serving new development meet State water quality standards. If necessary, the County shall require that water be treated to meet State standards and that a water quality monitoring program be in place prior to issuance of building permits.
- **Policy IS-4.14 Sufficient Water Supply Assessments:** The County shall require new developments over 500 dwelling units in size to prepare a detailed water source sufficiency study and water supply analysis for use in preparing a Water Supply Assessment, consistent with any Integrated Regional Water Management Plan or similar water management plan. This shall include analyzing the effect of new development on the water supply of existing users.
- **Policy IS-4.15 Test Wells:** Prior to issuing building permits for new development that will rely on groundwater, the County shall require confirmation for existing wells or test wells for new wells to ensure that water quality and quantity are adequate to meet the needs of existing, proposed, and planned future development.
- **Policy IS-4.16 Permit for Groundwater Export:** The County shall continue to require a permit for the extraction of groundwater that is intended to be exported outside County boundaries.
- **Policy IS-4.20 Water Efficient Agricultural Practices:** The County shall encourage farmers to implement irrigation practices, where feasible and practical, to conserve water.

Public Health and Safety Element

- **Policy PHS-7.2 Avoid Contamination of Resources:** The County shall strive to ensure that hazardous materials and wastes do not contaminate air, water, or soil resources.

2.2.1.4 San Benito County General Plan

The San Benito County 2035 General Plan is a framework for implementing a clear direction for the County's future. The plan considers sustainability, environmental protection, economic expansion and diversification, and equity to consider goals, policies, and programs that will help the county achieve the community's long-term vision.

The following policies and goals from each relevant Element in the General Plan may potentially influence implementation of the GSP or be influenced by GSP implementation.

Land Use Element

- **Policy LU-1.2 Sustainable Development Patterns:** The County shall promote compact, clustered development patterns that use land efficiently; reduce pollution and the expenditure of energy and other resources; and facilitate walking, bicycling, and transit use; and encourage employment centers and shopping areas to be proximate to residential areas to reduce vehicle trips. Such patterns would apply to infill development, unincorporated communities, and the New Community Study Areas. The County recognizes that the New Community Study Areas comprise locations that can promote such sustainable development. (RDR)
- **Policy LU-1.3 Future Development Timing:** The County shall ensure that future development does not outpace the ability of either the County or other public/private service providers to provide adequate services and infrastructure. The County shall review future development proposals for their potential to reduce the

level of services provided to existing communities or place economic hardships on existing communities, and the County may deny proposals that are projected to have these effects. (RDR/MPSP)

- **Policy LU-1.8 Site Plan Environmental Content Requirements:** The County shall require all submitted site plans, tentative maps, and parcel maps to depict all environmentally sensitive and hazardous areas, including: 100-year floodplains, fault zones, 30 percent or greater slopes, severe erosion hazards, fire hazards, wetlands, and riparian habitats. (RDR)
- **Policy LU-1.10 Development Site Suitability:** The County shall encourage specific development sites to avoid natural and manmade hazards, including, but not limited to, active seismic faults, landslides, slopes greater than 30 percent, and floodplains. Development sites shall also be on soil suitable for building and maintaining well and septic systems (i.e., avoid impervious soils, high percolation or high groundwater areas, and provide setbacks from creeks). The County shall require adequate mitigation for any development located on environmentally sensitive lands (e.g., wetlands, erodible soil, archaeological resources, important plant and animal communities). (RDR)
- **Policy LU-2.1 Sustainable Building Practices:** The County shall promote, and where appropriate, require sustainable building practices that incorporate a “whole system” approach to designing and constructing buildings that consume less energy, water, and other resources; facilitate natural ventilation; use daylight efficiently; and are healthy, safe, comfortable, and durable. (RDR)
- **Policy LU-3.1 Agricultural Diversification:** The County shall support existing farms, vineyards, and other agricultural operations and encourage the agricultural industry to continue diversification that includes organic, value-added, small-scale, sustainable, and community-supported agricultural practices throughout the county. (RDR/MPSP)
- **Policy LU-3.3 Increased Agricultural Sustainability and Energy Efficiency:** The County shall encourage and support farms, vineyards, and ranches that seek to implement programs that increase the sustainability of resources, conserve energy, and protect water and soil in order to bolster the local food economy, increase the viability of diverse family farms and improve the opportunities for farm workers. (RDR)
- **Policy LU-3.4 Lower-Impact Agricultural Practices:** The County shall encourage and support farms, vineyards, and ranches that use lower-impact agricultural and/or organic practices and shall recognize the benefits that a flourishing organic sector industry can provide. (RDR)
- **Policy LU-3.9 Right to Farm and Ranch:** The County shall protect the rights of operators of productive agricultural properties (as defined in the Glossary) and ranching properties to commence and continue their agricultural and ranching practices (a “right to farm and ranch”) even though established urban uses in the general area may foster complaints against those agricultural and ranching practices. The “right to farm and ranch” shall encompass the processing of agricultural and ranching products and other activities inherent in the definition of productive agriculture and in ranching activities. The County shall require all parcel maps approved for locations in or adjacent to productive agricultural areas and ranching areas to indicate the “right to farm and ranch” policy. The County shall require the program to be disclosed to buyers of property in San Benito County. (RDR)
- **Policy LU-3.13 Illegal Dumping:** The County shall work with property owners, waste collection providers, and law enforcement to find solutions to illegal dumping on agricultural properties such as offering free trash drop-off days and increased penalties for illegal dumping. (MPSP)
- **Policy LU-4.5 Innovative Site Planning and Residential Design:** The County shall encourage new residential developments to use innovative site planning techniques and to incorporate design features that increase the design quality, and energy efficiency, and water conservation of structures and landscapes while protecting the surrounding environment. (RDR)
- **Policy LU-6.4 Sustainable Technologies:** The County shall encourage all employment and industrial projects to incorporate sustainable technologies including energy and water efficient practices. (RDR)
- **Policy LU-9.7 County General Plan Consistency Report:** The County shall monitor and report to the Local Agency Formation Commission (LAFCO) regarding the consistency with the General Plan with any proposed changes in the sphere of influence or other urban boundaries for governmental entities that provide water or sewer services. (RDR/IGC)

- **Policy LU-9.8 Sewer and Water Service Commitments:** The County shall require new development within the spheres of influence of Hollister or San Juan Bautista to obtain sewer and water service commitments from either the Cities or appropriate special districts prior to project approval. (RDR)

Economic Development Element

- **Policy ED-1.5 Quality of Life Improvements:** The County shall focus economic development efforts on creating positive change in the county relative to residents and workers' quality of life. This should include considering air quality, education opportunities, safety, water quality, scenic beauty, and recreational opportunities during economic development decisions. (RDR/MPSP)
- **Policy ED-6.1 Workforce Education and Training Promotion:** The County shall support programs that educate the local workforce on conventional, productive, sustainable, and organic agriculture concepts, including water conservation strategies; emerging high-tech industries; and alternative energy production. (MPSP/IGC)

Housing Element

- **Policy HOU-20:** The County shall assist where possible with the removal of infrastructure constraints for the provision of wastewater and water service.

Public Facilities and Services Element

- **Policy PFS-1.3 Efficient Infrastructure and Facilities:** The County shall update and replace public facilities and infrastructure with technologies that improve energy efficiency and conserve water, when feasible. (MPSP)
- **Policy PFS-1.12 New Development Requirements:** The County shall require new development, in compliance with local, State, and Federal law, to mitigate project impacts associated with public facilities and services, including, but not limited to, fire, law enforcement, water, wastewater, schools, infrastructure, roads, and pedestrian and bicycle facilities through the use of annexation fees, connection fees, facility construction/expansion requirements, or other appropriate methods. (RDR/FB)
- **Policy PFS-2.4 Monitoring Efficiency and Conservation:** The County shall monitor and regularly report on its progress in implementing energy efficiency, water conservation, and waste reduction measures and in meeting its greenhouse gas reduction targets and goals for County facilities and activities. (PSR/PI)
- **Policy PFS-2.5 Sustainability Retrofits:** The County shall increase energy efficiency in older County buildings through energy efficiency and retrofits (e.g., compact fluorescent light bulbs, motion-activated lighting, computerized HVAC systems), renewable energy generation (e.g., photovoltaic cells), and water conservation retrofits (e.g., low flow toilets and sinks, drip irrigation, water reuse). (MPSP/SO)
- **Goal PFS-3:** To ensure reliable supplies of water for unincorporated areas to meet the needs of existing and future agriculture and development, while promoting water conservation and the use of sustainable water supply sources.
- **Policy PFS-3.1 Water District Support:** The County shall support efforts of the San Benito County Water District to ensure that adequate high-quality water supplies are available to support current residents and businesses and future development projects. (MPSP/IGC)
- **Policy PFS-3.2 Interagency Coordination:** The County shall cooperate with public and private water agencies in order to help address existing and future water needs for the county. (IGC)
- **Policy PFS-3.3 Water Rights Protection:** The County shall support public and private water agencies in their efforts to protect their water rights and water supply contracts, including working with Federal and State water projects to protect local water rights. (IGC)
- **Policy PFS-3.4 Drought Response:** The County shall encourage all public and private water agencies to develop and maintain drought contingency and emergency services plans, emergency inter-ties, mutual aid agreements and related measures to ensure adequate water services during drought or other emergency water shortage. (MPSP/IGC)

- **Policy PFS-3.5 Water Supply Development:** The County shall support plans to develop new reliable future sources of supply, including, but not limited to, the expansion of surface water storage and conjunctive use of surface water and groundwater, while promoting water conservation and water recycling/reuse. (RDR/MPSP/IGC)
- **Policy PFS-3.6 Conjunctive Use:** The County shall support conjunctive use of groundwater and surface water to improve water supply reliability. (MPSP/IGC)
- **Policy PFS-3.7 Groundwater Management:** The County shall support cooperative, regional groundwater management planning by water resource agencies, water users, and other affected parties to ensure a sustainable, adequate, safe, and economically viable groundwater supply for existing and future uses within the county. (MPSP/IGC)
- **Policy PFS-3.8 Integrated Management:** The County shall support and participate in the integrated management of surface water and groundwater resources, wastewater, stormwater treatment and use, and the use of reclaimed water. (MPSP/IGC)
- **Policy PFS-3.9 Sufficient Water Supply for New Development:** The County shall require new developments to prepare a source water sufficiency study and water supply analysis for use in preparing, where required, a Water Supply Assessment per SB 610 and a Source Water Assessment per Title 22. This shall include studying the effect of new development on the water supply of existing users. The County encourages the development of integrated regional water management plans or similar plans. (RDR)
- **Policy PFS-4.1 Adequate Water Treatment and Delivery Facilities:** The County shall ensure, through the development review process, that adequate water supply, treatment and delivery facilities are sufficient to serve new development and are able to be expanded to meet capacity demands when needed. Such needs shall include capacities necessary to comply with water quality and public safety requirements. (RDR)
- **Policy PFS-4.2 Water Facility Infrastructure Fees:** As a condition of approval for discretionary developments, the County shall not issue approval for a final map until verification of adequate water and wastewater service has been provided, which may include verification of payment of fees imposed for water and wastewater infrastructure capacity per the fee payment schedule from the water and wastewater provider. (RDR)
- **Policy PFS-4.3 Minimum Lot Size:** The County shall require a minimum lot size for properties that have on-site septic systems to minimize adverse water quality impacts on groundwater. (RDR)
- **Policy PFS-4.4 Single User Well Consolidation:** The County shall encourage consolidation of single user wells into public water districts. (RDR/MPSP)
- **Policy PFS-4.5 Water System Rehabilitation:** The County shall encourage the rehabilitation of irrigation systems and other water delivery systems to reduce water losses and increase the efficient use and availability of water. (RDR/MPSP)
- **Policy PFS-4.6 New Community Water Systems:** The County shall require any new community water system, in the unincorporated area of the county, serving residential, industrial, or commercial development to be owned and operated by a public or private entity that can demonstrate to the County adequate financial, managerial, and operational resources. (RDR/IGC)
- **Policy PFS-4.8 Water Supply Planning:** The County shall encourage water purveyors to develop plans for responding to droughts and the effects of global climate change, including contingency plans, the sharing of water resources to improve overall water supply reliability, and the allocation of water supply to priority users. (MPSP/IGC)
- **Policy PFS-5.1 Water and Sewer Expansion:** The County shall encourage public wastewater system operators to maintain and expand their systems to meet the development needs of the county. (MPSP/IGC)
- **Policy PFS-5.3 Adequate Water Treatment and Disposal:** The County shall ensure through the development review process that wastewater collection, treatment, and disposal facilities are sufficient to serve existing and new development and are able to be expanded to meet capacity demands when needed. (RDR)
- **Policy PFS-5.5 Individual Onsite Septic Systems:** The County shall permit onsite septic systems only when connection to an existing wastewater system or sewer system is not reasonably available. Approval,

installation, and use of individual septic systems shall be consistent with Regional Water Quality Control Board regulations. (RDR)

- **Policy PFS-5.6 Septic System Design:** The County shall require individual septic systems to be properly designed, constructed, and maintained to avoid degradation of ground and surface water quality. (RDR)
- **Goal PFS-6:** To manage stormwater from existing and future development using methods that reduce potential flooding, maintain natural water quality, enhance percolation for groundwater recharge, and provide opportunities for reuse.
- **Policy PFS-6.1 Adequate Stormwater Facilities:** The County shall require that stormwater drainage facilities are properly designed, sited, constructed, and maintained to efficiently capture and dispose of runoff and minimize impacts to water quality. (RDR)
- **Policy PFS-6.2 Best Management Practices:** The County shall require best management practices in the development, upgrading, and maintenance of stormwater facilities and services to reduce pollutants from entering natural water bodies while allowing stormwater reuse and groundwater recharge. (RDR)
- **Policy PFS-6.3 Natural Drainage Systems:** The County shall encourage the use of natural stormwater drainage systems (e.g., swales, streams) to preserve and enhance the environment and facilitate groundwater recharge. (RDR)
- **Policy PFS-6.4 Development Requirements:** The County shall require project designs that minimize stormwater drainage concentrations and impervious surfaces, complement groundwater recharge, avoid floodplain areas, and use natural watercourses in ways that maintain natural watershed functions and provide wildlife habitat. (RDR)
- **Policy PFS-6.5 Stormwater Detention Facilities:** Where necessary, the County shall require on-site detention/retention facilities and/or velocity reducers to maintain pre-development runoff flows and velocities in natural drainage systems. (RDR)
- **Policy PFS-6.6 Stormwater Detention Basin Design:** The County shall require stormwater detention basins be designed to ensure public safety, be visually unobtrusive, provide temporary or permanent wildlife habitat, and where feasible, provide recreation opportunities. (RDR)
- **Policy PFS-6.7 Runoff Water Quality:** The County shall require all drainage systems in new development and redevelopment to comply with applicable State and Federal non-point source pollutant discharge requirements. (RDR)
- **Policy PFS-6.8 Reduce Erosion and Sedimentation:** The County shall ensure that drainage systems are designed and maintained to minimize soil erosion and sedimentation and maintain natural watershed functions. (RDR)
- **Policy PFS-13.5 Water Service Standards:** The County shall require all development within unincorporated communities to have adequate water supply, pressure, and capacity for fire protection. (RDR)
- **Policy PFS-13.10 Adequate Fire Flows for Agricultural Facilities:** The County shall require all agricultural commercial facilities to have adequate water supply and fire flows to meet the State Fire Code and other appropriate State laws. (RDR)

Natural and Cultural Resources Element

- **Policy NCR-1.1 Maintenance of Open Space:** The County shall support and encourage maintenance of open space lands that support natural resources, agricultural resources, recreation, tribal resources, wildlife habitat, water management, scenic quality, and other beneficial uses. (RDR)
- **Goal NCR-4:** To protect water quantity and quality in natural water bodies and groundwater basins and avoid overdraft of groundwater resources.
- **Policy NCR-4.1 Mitigation for Wetland Disturbance or Removal:** The County shall consider implementing Regional Water Quality Control Board Basin Plan policies to improve areas of low water quality, maintain water quality on all drainage, and protect and enhance habitat for fish and other wildlife on major tributaries to the Pajaro River (San Benito River, Pacheco Creek) and the Silver Creek watershed. (RDR/MPSP/IGC)

- **Policy NCR-4.2 Water Quality Tests:** The County shall require new development to prepare water quality tests prior to project approval, demonstrating whether proposed domestic water supply will meet State primary and secondary drinking water standards. (RDR)
- **Policy NCR-4.3 Agricultural Water:** The County shall require well tests for nonagricultural development to provide evidence that 100 percent of the water needs may be met without connecting to the San Felipe Water system. (RDR)
- **Policy NCR-4.4 Open Space Conservation:** The County shall encourage conservation and, where feasible, creation or restoration of open space areas that serve to protect water quality such as riparian corridors, buffer zones, wetlands, undeveloped open space areas, and drainage canals. (RDR/MPSP)
- **Policy NCR-4.5 Groundwater Recharge:** The County shall encourage new development to preserve, where feasible, areas that provide important groundwater recharge and stormwater management benefits such as undeveloped open spaces, natural habitat, riparian corridors, wetlands, and natural drainage areas. (RDR)
- **Policy NCR-4.6 Groundwater Studies for New Development:** To ensure an adequate water supply, large-scale development projects that meet the criteria in California Water Code section 10912 shall prepare an analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project in accordance with SB 610. (RDR)
- **Policy NCR-4.7 Best Management Practices:** The County shall encourage new development to avoid significant water quality impacts and protect the quality of water resources and natural drainage systems through site design, source controls, runoff reduction measures, and BMPs. (RDR)
- **Policy NCR-4.8 Water Education:** The County shall encourage water districts to provide public education to encourage existing homeowners to adopt water conservation practices for landscaping and interior plumbing. (IGC/PI)
- **Policy NCR-4.9 Water Conservation Plan:** The County shall maintain and implement the San Benito County Water Conservation Plan as necessary to promote water conservation and efficient use. (MPSP)
- **Policy NCR-4.10 Water Efficient Landscape Ordinance:** The County shall develop, maintain, and implement a Water Efficient Landscape Ordinance, consistent with the Model Water Efficient Landscape Ordinance prepared by the California Department of Water Resources, to require greater use of regionally native drought-tolerant vegetation, limitations on the amount of turf in residential development, and other measures as appropriate. (RDR)
- **Policy NCR-4.11 Reclaimed Water:** The County shall require, where feasible, the use of reclaimed water irrigation systems in new development wherever possible. (RDR)
- **Policy NCR-4.12 Rainwater Catchment:** The County shall encourage homeowners to install roof catchment systems and use rainwater for non-potable uses in order to reduce the need for groundwater. (RDR)
- **Policy NCR-4.13 Shared Water Systems:** The County shall develop, maintain, and implement an ordinance to allow for shared water systems to facilitate the clustering of homes and preservation of agricultural land, where an entity is established to provide maintenance or financing for the maintenance of the water system. (RDR)
- **Policy NCR-4.14 Wastewater Treatment:** The County shall require wastewater treatment systems to be designed to promote the long-term protection of groundwater resources in San Benito County. Domestic wastewater treatment systems shall be required to use tertiary wastewater treatment as defined by Title 22. (RDR/MPSP)
- **Policy NCR-4.15 Septic Systems:** The County shall require septic systems to be limited to areas where sewer services are not available and where it can be demonstrated that septic systems will not contaminate groundwater. (RDR)
- **Policy NCR-4.16 Develop in Existing Areas:** The County shall encourage development to occur in or near existing developed areas in order to reduce the use of individual septic systems in favor of domestic wastewater treatment in an effort to protect groundwater quality. (RDR)

- **Policy NCR-5.5 Hydrologic Report:** The County may require developers of new or expanded mining operations to prepare a hydrologic report to evaluate the up-and down-stream effects of the proposed operations. (RDR)
- **Policy NCR-6.4 Large-Scale Alternative Energy Installations:** The County shall encourage large-scale solar and wind energy production facilities in Rangeland designated areas, so long as they do not result in such major impacts as a tax burden to the County, result in permanent water transfers off of productive agricultural land, or pose a health or safety risk to existing residents. In addition, these facilities should include dedications of agricultural land and habitat mitigation, measures to control erosion, and financial assurances for decommissioning. (RDR)
- **Policy NCR-7.9 Tribal Consultation:** The County shall consult with Native American tribes regarding proposed development projects and land use policy changes consistent with the State's Local and Tribal Intergovernmental Consultation requirements. (RDR/IGC)

Health and Safety Element

- **Policy HS-1.7 Multi-Hazard Mitigation Plan:** The County shall develop, maintain, and implement a Multi-Hazard Mitigation Plan to address disasters such as earthquakes, flooding, dam or levee failure, hazardous material spills, epidemics, fires, extreme weather, major transportation accidents, and terrorism. (MPSP)
- **Policy HS-1.16 Public Awareness of Climate Change:** The County shall support public awareness of water conservation measures, agricultural changes, storm and flood preparedness, forest/range fire protection, air quality issues, extreme weather events, and disease prevention to help prepare for the potential impacts of climate change. (PI)
- **Policy HS-2.6 Multi-Purpose Flood Control Facilities:** The County shall encourage multi-purpose flood control facilities that incorporate recreation, resource conservation, preservation of natural riparian habitat, and scenic values of the of the county's streams, creeks, rivers, and lakes. (RDR)
- **Policy HS-4.2 Fire Protection Water Standard:** The County shall develop, maintain, and implement an appropriate fire protection water standard to be applied to all urban and rural development. (RDR)
- **Policy HS-4.3 Improve Water Systems:** The County shall coordinate with water purveyors to improve water systems in areas where substandard water supplies and/or flow currently exist. (RDR/IGC)

2.2.1.5 Stanislaus County General Plan

The Stanislaus County General Plan is a comprehensive, long-term plan to guide development within Stanislaus County through 2035. It provides a land-use framework responsive to the needs and conditions of the unincorporated area of Stanislaus County in compliance with State General Plan laws.

The following policies from each relevant Element may potentially influence implementation of the GSP or be influenced by GSP implementation.

Agricultural Element

- **Policy 2.7:** Proposed amendments to the General Plan Diagram that would allow the conversion of agricultural land to non-agricultural uses shall be approved only if they are consistent with the County's conversion criteria, including:
 - Availability of water;
 - Avoidance of adverse effects agricultural water supplies;
 - Availability of adequate and necessary public services and facilities; and
 - Mitigate impacts to agricultural lands, fish and wildlife resources, air quality, water quality and quantity, or other natural resources.
- **Policy 3.4:** The County shall encourage the conservation of water for both agricultural, rural domestic, and urban uses.
- **Policy 3.5:** The County will continue to protect the quality of water necessary for crop production and marketing.

- **Policy 3.6:** The County will continue to protect local groundwater for agricultural, rural domestic, and urban use in Stanislaus County.

Conservation and Open Space Element

- **Policy 5:** Protect groundwater aquifers and recharge areas, particularly those critical for the replenishment of reservoirs and aquifers.
- **Policy 7:** New development that does not derive domestic water from pre-existing domestic and public water supply systems shall be required to have a documented water supply that does not adversely impact Stanislaus County water resources.
- **Policy 8:** The County shall support efforts to develop and implement water management strategies.
- **Policy 9:** The County will investigate additional sources of water for domestic use.

Land Use Element

- **Policy 4:** Urban development shall be discouraged in areas with growth-limiting factors such as high water table or poor soil percolation, and prohibited in geological fault and hazard areas, flood plains, riparian areas, and airport and private airstrip hazard areas, unless measures to mitigate the problems are included as part of the application.
- **Policy 5:** Residential densities, as defined in the General Plan, shall be the maximum based upon environmental constraints, the availability of public services, and acceptable service levels. The densities reflected may not always be achievable and shall not be approved unless there is proper site planning and provision of suitable open space and recreational areas consistent with the supportive goals and policies of the General Plan.
- **Policy 24:** Future growth shall not exceed the capabilities/capacity of the provider of services such as sewer, water, public safety, solid waste management, road systems, schools, health care facilities, etc.
- **Policy 29:** Support the development of a built environment that is responsive to decreasing air and water pollution, reducing the consumption of natural resources and energy, increasing the reliability of local water supplies, and reduces vehicle miles traveled by facilitating alternative modes of transportation, and promoting active living (integration of physical activities, such as biking and walking, into everyday routines) opportunities.

2.2.1.6 City of Patterson General Plan

The City of Patterson's General Plan serves as the community's 'constitution' for development and the use of land within its planning area. The City's 2010 General Plan covers two timeframes – 20 year and 40 years into the future (2030 and 2050, respectively). The following policies from each relevant Element may potentially influence implementation of the GSP or be influenced by GSP implementation.

Community Design Element

- **Policy CD-1.1 Qualities desired in new residential neighborhoods:** The qualities desired in residential expansion areas shall include elements that foster the sustainable use of scarce or non-renewable resources.
- **Policy CD-1.8 Green building practices:** The City supports the use of green building practices in the planning, design, construction, management, renovation, operations, and demolition of all private buildings and projects, including water conservation indoors and outdoors.

Health and Safety Element

- **Policy HS-2.18 Low Impact Development:** New development shall incorporate provisions for low impact development as defined by as minimizing or eliminating pollutants in storm water through natural processes and maintaining pre-development hydrologic characteristics, such as flow patterns, surface retention, and recharge rates.

- **Policy HS-4.3 Water sources for firefighting:** The City shall identify alternative water sources for firefighting purposes for use during a disaster.
- **Policy HS-7.3 Management of hazardous materials:** The City shall regulate the storage of hazardous and waste materials consistent with state and federal law. The City shall not permit above ground tanks without considering the potential hazards that would result from the release of stored liquids caused by possible rupture or collapse, and may request applicants to have an emergency response plan.
- **Policy HS-7.6 Remediation:** The City shall work with other responsible agencies on efforts to clean up or contain identified soil or water contamination in the city limits.
- **Policy HS-7.7 Written confirmation of remediation:** The City shall require written confirmation from applicable local, regional, state, and federal agencies that known contaminated sites have been deemed remediated to a level appropriate for land uses proposed prior to the City approving site development or provide an approved remediation plan that demonstrates how contamination will be remediated prior to site occupancy. This documentation shall specify the extent of development allowed on the remediated site as well as any special conditions and/or restrictions on future land uses.

Land Use Elements

- **Policy LU-1.3 Planned development requirement --Residential Expansion Areas:** Development of areas outside the current (2010) City limits designated Low Density Residential shall be accompanied by an application for a general plan amendment, tentative subdivision map, pre-zoning and reorganization, as necessary, consistent with a planned development.
- **Policy LU-1.4 Planned development requirement — Mixed Use Hillside Development:** Development of areas designated Mixed Use Hillside Development shall be accompanied by an application for a general plan amendment, tentative subdivision map, pre-zoning and reorganization, as necessary, consistent with a planned development.
- **Policy LU-1.12 Status of land prior to urban development:** Land within the General Plan Area shall ultimately be developed to urban standards described in Part I – Land Use and Development Standards. Pending connection to City services, such land shall remain in agricultural, open space, or other low intensity uses.
- **Policy LU-1.13 Development of unincorporated land within the General Plan area:** The City shall encourage the County to require development on unincorporated lands within the Patterson Planning Area to be developed to standards consistent with City standards, including architectural compatibility, provision of adequate infrastructure improvements, and provision of City sewer service, and to ensure that such development adequately mitigates potential adverse impacts to the City.
- **Policy LU-1.15 Provision of public services:** Consistent with the policies and implementation measures of this General Plan, the City shall consider the adequacy of public services prior to approving new development.
- **Policy LU-7.4 Clean industries:** The City shall promote the development of clean industries that do not pose health risks associated with water and air pollution or potential leaks or spills.

Natural Resources Element

- **Policy NR-1.1 Open space conservation:** The City shall conserve open space areas and drainage canals to protect water resources within the local watershed and the San Joaquin River.
- **Policy NR-1.2 Stormwater quality:** The City shall implement measures to minimize the discharge of pollutants and sediment into Salado Creek, Del Puerto Creek and the San Joaquin River.
- **Policy NR-1.3 Inter-agency cooperation:** The City shall continue to work with local, state, and federal agencies and other watershed organizations to improve water quality.
- **Policy NR-1.4 Sedimentation:** The City shall continue to support local, regional, and statewide efforts to minimize the discharge of sediment into waterways, including Salado Creek, Del Puerto Creek and the San Joaquin River.

- **Policy NR-1.5 New development:** The City shall require new development to protect the quality of water bodies and drainage systems through adaptive site design, stormwater management, and the implementation of best management practices (BMPs).
- **Policy NR-1.6 Septic tanks:** The City shall seek the elimination of existing septic tanks in urbanized areas.
- **Policy NR-1.8 Well monitoring:** The City shall regularly monitor water quality in City wells for evidence of toxics, saltwater intrusion, and other contaminants.
- **Policy NR-1.10 Water conservation:** The City shall promote the efficient use of water.
- **Policy NR-1.11 Groundwater recharge areas:** Groundwater recharge is an important component of the City's long-term water supply program. Areas within the General Plan area suitable for groundwater recharge shall be preserved and incorporated into the design of new development.
- **Policy NR-3.2 Protection of sensitive species:** A project with the potential to adversely impact special status species or their habitat, shall provide evidence of compliance with the relevant provisions of state and federal laws relating to the preservation of rare, threatened, or endangered species and their habitat prior to project approval and/or prior to construction as determined by the requirements set forth in the federal and state Endangered Species Acts, the federal Clean Water Act, the federal Rivers and Harbors Act and the Implementation Measures provided in Appendix NR.
- **Policy NR-3.3 On-site resource preservation:** The City shall encourage new development to preserve on-site natural elements that contribute to the community's native plant and wildlife species value and to its aesthetic character.
- **Policy NR-3.7 Riparian habitat protection:** The City shall preserve the ecological integrity of creek corridors, canals, and drainage ditches that support riparian resources by preserving native riparian plants and, to the extent feasible, removing invasive nonnative plants. If preservation of the ecological integrity of existing resources is found to be infeasible, adverse impacts to riparian resources shall be fully mitigated consistent with the requirements of applicable state and federal regulations.
- **Policy NR-3.8 Wetland protection:** The City shall preserve and protect wetland resources including creeks, rivers, ponds, marshes, vernal pools, and other seasonal wetland areas, to the extent feasible. If preservation of the ecological integrity of existing wetland resources is found to be infeasible, adverse impacts to such resources shall be fully mitigated consistent with the requirements of applicable state and federal regulations.
- **Policy NR-3.9 Monitoring:** Monitoring of mitigation and restoration activities shall be consistent with requirements for each species or habitat as prescribed by the relevant regulatory jurisdictional agencies. For listed or candidate species, species of special concern, or sensitive habitats for which no mitigation or avoidance measures have been published, the City shall require evidence of coordination with the responsible agencies prior to acceptance of mitigation, avoidance measures, or monitoring requirements.
- **Policy NR-6.6 Landscaping options:** The City shall evaluate existing landscaping and options to convert reflective and impervious surfaces to landscaping, and shall, as feasible, install or replace vegetation with drought-tolerant, low maintenance native species that can also provide shade and reduce heat-island effects.

Parks and Recreation Element

- **Policy PR-1.11 Design for droughts:** The City shall emphasize the use of drought-tolerant, drought-resistant and low use irrigation landscaping in the development of City parks.

Public Services Element

- **Policy PS-1.1 Water Supply:** The City shall continue to use groundwater as a source of domestic water for the city. The City shall also pursue, as expeditiously as possible, a water supply program consisting of the development of multiple sources of water, the maximum use of recycled water, water conservation and groundwater management to accommodate projected water demand and provide for water supply security.

- **Policy PS-1.2 City-owned systems:** The City shall continue to expand water treatment, distribution, and storage facility systems for potable and non-potable systems as necessary to accommodate the needs of existing and planned development.
- **Policy PS-1.3 Supply for new development:** The City shall not approve any new development without the demonstrated assurance of an adequate water supply to support such development that meets City criteria for both potable and non-potable demands, and a City-approved funding mechanism to pay for necessary improvements.
- **Policy PS-1.4 Agency coordination:** The City shall coordinate, to the extent feasible, with other agencies involved in water resource development in the region.
- **Policy PS-1.5 Water conservation:** To minimize the need for the development of new water sources and facilities and sewer treatment needs, the City shall promote water conservation both in City operations and in private development.
- **Policy PS-1.6 Reclaimed water:** Where available, the City shall require the use of reclaimed water by industrial, commercial, recreational, agricultural and roadway landscaping uses.
- **Policy PS-1.7 Leaking water lines:** The City shall systematically replace or repair leaking water lines.
- **Policy PS-1.8 Agricultural uses:** The City shall discourage the use of treated, potable water supplies for commercial agricultural uses.
- **Policy PS-1.9 Improvement costs:** The City shall, through a combination of water development fees and other funding mechanisms, ensure that new development pays its share of the costs of water system improvements.
- **Policy PS-1.10 New development conservation measures:** The City shall require all new development to use best available technologies for water conservation including, but not limited to, water-conserving toilets, showerheads, faucets, and irrigation systems.
- **Policy PS-3.5 Pollutant requirements:** Future drainage system discharges shall comply with applicable state and federal pollutant discharge requirements.
- **Policy PS-3.12 Detention basins:** The City shall ensure that stormwater detention basin designs provide safety for the public, are visually appealing and unobtrusive, incorporate wildlife habitat, and, where feasible, offer recreational opportunities.
- **Policy PS-3.13 Surface pollutant control:** The City shall require new development to incorporate runoff control measures to minimize discharge of surface pollutants into drainage systems.
- **Policy PS-3.14 Erosion control:** The City shall require new development to incorporate erosion control measures to minimize sedimentation of streams and other natural drainage features.
- **Policy PS-3.15 Groundwater recharge:** Where feasible, storm drainage facilities shall be designed to assist with, and complement, the water supply program in regard to groundwater recharge.

2.2.1.7 Santa Nella Community Specific Plan

The community of Santa Nella lies within Merced County, with water service provided locally by the Santa Nella County Water District. General Plan policies affecting the development of Santa Nella are captured in both the Merced County General Plan (as described in Section 2.2.1.2, above), and in the Santa Nella Community Specific Plan. The following are policies from that Specific Plan that may potentially influence implementation of the GSP or be influenced by GSP implementation.

Agriculture Concept

- **Policy 1:** Investigate the use of groundwater and intermediate treated wastewater to irrigate adjacent agricultural lands in exchange for fresh surface water supplies for the community.

Housing Concept

- **Policy 6:** The available water supply within the Specific Urban Development Plan (SUDP) must be balanced between the demand by housing and by other urban uses.

Infrastructure Concept

- **Policy 1:** Water and wastewater infrastructure is implemented with each phase of development, as necessary to adequately provide potable water delivery, treatment and distribution, wastewater collection and treatment.
- **Policy 2:** The Santa Nella County Water District (SNCWD) shall coordinate with the State of California, Department of Health Services, Department of Water Resources, The Regional Water Quality Control Board, Merced County Department of Public Works, and other agencies as necessary to ensure compatibility with respective agency requirements.
- **Policy 3:** Apply the Sewer and Water Infrastructure Concept, found in the Santa Nella Water Resources Plan, the Master Water Plan and Master Sewer Plan, to ensure commitment of adequate water supply sources, development of potable water treatment facilities and distribution infrastructure systems with each development phase.
- **Policy 4:** The SNCWD will ensure that water and wastewater infrastructure services and facilities for each development phase, identified and approved through the Implementation Plan, are adequately funded.
- **Policy 5:** Prior to processing any discretionary application (tentative map, administrative permit or conditional use permit), a preliminary “can and will serve” letter must be obtained from the Santa Nella County Water District indication that adequate water supply, treatment and disposal capacity exists or is being made available to the project.

Land Use Concept

- **Policy 3:** All new urban development within the SUDP shall connect to existing or new public sewer and water systems.
- **Policy 4:** Ensure that Public facilities are adequate and available to serve the demand generated by new development.

Open Space, Conservation, and Recreation Concept

- **Policy 2:** Ensure that land uses and development on or near water resources will not impair the quality or productive capacity of these resources.
- **Policy 3:** Methods to prevent the depletion of groundwater resources and promote the conservation and reuse of water should be encouraged.
- **Policy 5:** Encourage water conservation in the community by using drought tolerant landscaping, by water conservation measures administered by the SNCWD and by avoiding overwatering.

2.2.1.8 City of Modesto Urban Area General Plan as applicable to Grayson

The community of Grayson lies within Stanislaus County, with water service provided locally by the City of Modesto. General Plan policies affecting the development of Grayson are captured in both the Stanislaus County General Plan (as described in Section 2.2.1.4, above), and in the City of Modesto’s Urban Area General Plan. The following are policies from the City of Modesto’s Urban Area General Plan that may potentially influence implementation of the GSP or be influenced by GSP implementation.

Community Growth Strategy

- **Criteria for Analysis of General Plan Amendment:** Any proposal to amend the Modesto Urban Area General Plan must be analyzed for the amendment’s effects compared to the adopted General Plan on the issues including:
 - Water quality impacts, as addressed in the Master Environmental Impact Report (EIR); and
 - Water supply and wastewater, as addressed in the Master EIR.

Community Services and Facilities

- **Water Policies – Baseline Developed Area:**

- **f.** The City of Modesto shall prepare and adopt an Urban Water Management Plan every five years in accordance with Water Code Section 10621.
- **g.** The City shall implement the Demand Measurement and Conservation Measures identified in the City's adopted Urban Water Management Plan.
- **h.** The City of Modesto shall prepare and maintain a Water Master Plan. The Water Master Plan shall be updated, as needed, to incorporate changes in growth projections, water supplies, and demands.
- **i.** The City of Modesto should continue to pursue additional potential water supply alternatives available to the City to accommodate growth and meet future demand in both normal and dry years.
- **j.** The City of Modesto will encourage the optimum beneficial use of water resources within the City. The City shall strive to maintain an adequate supply of high-quality water for urban uses. At a minimum, potable water supplies (including well water) delivered to water customers shall conform to the primary maximum contaminant levels as defined in the California Code of Regulations, Title 22, Section 64431-64444.
- **k.** The City of Modesto will strive to stabilize groundwater levels and eliminate groundwater overdraft, as part of a conjunctive groundwater–surface water management program. The City shall view regional water resources, such as groundwater, surface water, and recycled wastewater, as an integrated hydrologic system when developing water management programs.
- **l.** The City of Modesto will be the sole provider of municipal and industrial water services to the area within the City's Sphere of Influence, with the exception of private wells. The City will cooperate with the overlying agricultural water providers, Modesto Irrigation District and Turlock Irrigation District, and with adjacent municipal and industrial providers for the mutually beneficial management of the limited water resources. The City will also take into consideration its public trust duty with regard to environmental uses of water resources.
- **q.** The City of Modesto shall implement Local Basin Management Objectives (BMOs) discussed in the Integrated Regional Groundwater Management Plan that relate to the specific approaches to water management goals including groundwater supply, groundwater quality, and protection against inelastic land surface subsidence.
- **r.** The City of Modesto shall support the Regional BMOs discussed in the Integrated Regional Groundwater Management Plan.
- **u.** When approving a proposed residential subdivision of over 500 dwelling units, the City of Modesto must include a condition requiring a sufficient water supply to be available. Proof of availability of water supply depends upon several factors.

- **Stormwater Drainage Policies—Baseline Developed Area:** The City shall prevent water pollution from urban storm runoff as established by the Central Valley Regional Water Quality Control Board Basin Plan for surface discharges and the Environmental Protection Agency for underground injection.

2.2.1.9 Crows Landing Community Plan

The community of Crows Landing is a census-designated place in Stanislaus County. The Crows Landing Community Plan describes the community and available urban services, while the Stanislaus County General Plan (described in Section 2.2.1.4, above) provides policies relating to the larger region.

While there are no specific policies relating to water resources management in the Crows Landing Community Plan, the Plan does note that the Crows Landing Community Service District provides public water via two groundwater wells and that the water delivery pipelines are aging and the system is at capacity, limiting the District's ability to expand.

2.2.1.10 Westley Community Plan

Similar to Crows Landing, the community of Westley is a census-designated place in Stanislaus County. The Westley Community Plan describes the community and available urban services, while the Stanislaus County General Plan (described in Section 2.2.1.4, above) provides policies relating to the larger region.

While there are no specific policies relating to water resources management in the Westley Community Plan, the Plan does provide a description of the area and available public services.

2.2.2 Existing Land Use Plans and Impacts to Sustainable Groundwater Management

Numerous policies in each County's and Community's General Plan compliment this GSP's plan to conserve and sustainably manage groundwater resources. In general, the County and City General Plans guide future growth and development (and associated demands) within their respective jurisdictional areas. This additional growth may impact groundwater sustainability by placing additional demands on groundwater resources in an area where surface water resources are scarce or are otherwise unavailable. The General Plans also promote water conservation (in both the urban and agricultural sectors), which could potentially offset the additional demands associated with future development. In addition to conservation, some (though not all) General Plans promote groundwater recharge, the protection of recharge areas, and the use of water transfers to further benefit groundwater sustainability.

Most General Plans within the Northern and Central Delta-Mendota Regions include goals focused on preserving and expanding agriculture, efficient use of existing and future water sources in both the urban and agricultural sectors, connecting smaller rural communities to larger water systems, and water quality protection. With respect to the protection of water quality and groundwater dependent ecosystems, the General Plans generally protect riparian habitats, encourages the protection of water quality (including through the remediation of contamination that may impact groundwater quality, requiring the use of septic systems in rural areas that are design to be protective of groundwater quality and the use of community wastewater systems in urban areas), and promotes flood control and management (including the associated impacts of erosion and sedimentation of surface water courses).

Finally, the Fresno County General Plan, in particular, promotes sustainability by managing new wells in urban areas, supporting monitoring of water resources and associated habitats, and through the formation of a water resources document repository.

While the magnitude of impacts of these policies over the planning and implementation horizon are not known, such policies have been considered in this GSP, primarily through the use of the General Plans and associated zoning maps to identify future land use types and projected growth areas. These General Plans and mapping were used along with available water master plans, urban water management plans, agricultural water management plans, and other relevant planning documents to determine projected future land use and estimate future water demands by land use sector for use in the projected future water budgets.

Just as the General Plans complement the GSP, the Northern & Central Delta-Mendota Region GSP, along with the other five coordinated GSPs in the Delta-Mendota Subbasin, may influence the General Plans' goals and policies. Sustainable management of groundwater resources through the GSP may change the pace, location and type of development and/or land use that will occur in the Subbasin. GSP implementation is anticipated to be consistent with the General Plans' goals to sustainably manage land development and water resources in the Subbasin.

2.3 EXISTING WATER RESOURCES MONITORING AND MANAGEMENT PROGRAMS

As required by §354.8(c) and (d) of the GSP Emergency Regulations, the following section describes existing water resources-related management and monitoring programs, and a discussion of how these programs will either impact GSP implementation and/or will be incorporated into the GSP.

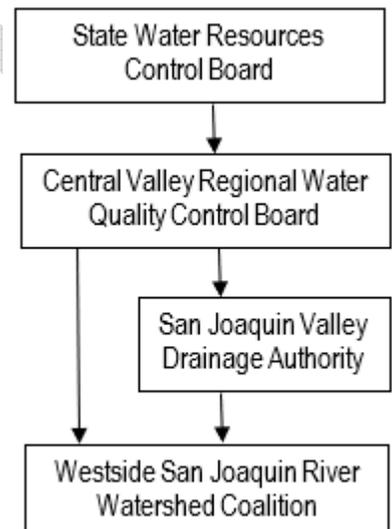
2.3.1 Water Resources Management Programs

2.3.1.1 Irrigated Lands Regulatory Program (ILRP)

In 1999, the California Legislature passed Senate Bill 390, which eliminated a blanket waiver for agricultural waste discharges. The Bill required the Water Boards to develop a program to regulate agricultural lands under the Porter-Cologne Water Quality Control Act. In 2003, the Central Valley Regional Water Quality Control Board (CV-RWQCB) issued an order that sets Waste Discharge Requirements (WDRs) from irrigated lands to protect both surface and groundwater throughout the Central Valley, primarily to address nitrates, pesticides, and sediment discharge. The resulting ILRP regulates wastes from commercial irrigated lands that discharge into surface and groundwater. The program is administered by the CV-RWQCB working directly with a regional or crop-based coalition as well as directly with growers. The goal of the ILRP is to protect surface water and groundwater and to reduce impacts of irrigated agricultural discharges to waters of the State. As a result of the ILRP, monitoring reports, assessment reports, management plans, surface water quality data, and groundwater quality data are made available to the public.

Implementation of the IRLP in the Delta-Mendota Subbasin is managed primarily by the Westside San Joaquin River Watershed Coalition under the San Joaquin Valley Drainage Authority, a California Joint Powers Authority (JPA). This region specifically emphasizes nitrogen, sediment, and erosion control. Management of waste discharge in the Westside Coalition area includes:

- Farm-scale evaluation surveys and management plans submitted by growers. In high vulnerability groundwater areas, growers must submit a plan with more stringent levels of certification.
- Comprehensive Groundwater Quality Management Plans (GQMP) submitted by the Western San Joaquin Coalition to the Central Valley Water Board for approval.
- Evaluation of the effectiveness of management practices by the regional Water Quality Management Practices Evaluation Program (MPEP) Group.
- Surface water Monitoring Plans, Annual Monitoring Reports, Management Plans, and Sediment Discharge and Erosion Assessment Reports.



A portion of the southern area of the Northern and Central Delta-Mendota Regions fall within the Grassland Drainage Area Coalition, which must meet the same management and reporting requirements as the Westside San Joaquin River Watershed Coalition.

2.3.1.2 CV-SALTS

The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is an initiative to reduce salt and nitrate impacts, restore groundwater quality, and provide safe drinking water supplies. Developed by a group of stakeholders (federal, state, and local agencies, dischargers and growers, and environmental groups) called the Central Valley Salinity Coalition, the Central Valley Salt and Nitrate Management Plan (SNMP) was released in 2017.

The Central Valley SNMP recommends revised and flexible regulations for existing Basin Plans and includes recommended interim solutions for salt and nutrient management in high priority basins in addition to long-term salt management strategies. Under the Central Valley SNMP, dischargers are provided two compliance pathways: (1) traditional permitting as an individual discharger or as a coalition (i.e. irrigated lands coalition), or (2) groundwater management zone permitting. Zone permitting allows dischargers to work as a collective in collaboration with the CV-RWQCB to provide safe drinking water with the option to extend time to achieve nitrogen balance.

The Delta-Mendota Subbasin is ranked “Priority 2” in the Central Valley SNMP and enforcement of the SNMP (once begun) will initially focus on other higher priority basins. At present, the Central Valley SNMP is in draft form, with comments due to the CV-RWQCB by August 13, 2018.

2.3.1.3 Integrated Regional Water Management Program

Three Integrated Regional Water Management Plans (IRWMPs) overlie the Delta-Mendota Subbasin. The Westside-San Joaquin IRWMP covers most of the Subbasin, while smaller portions of the Subbasin are covered by the East Stanislaus and Madera IRWMP.

2.3.1.3.1 Westside-San Joaquin 2019 Integrated Regional Water Management Plan

The 2019 Westside-San Joaquin (W-SJ) Integrated Regional Water Management Plan (2019 IRWMP) encompasses the majority of the Delta-Mendota Subbasin, as shown in **Figure 2-27**. The 2019 W-SJ IRWMP emphasizes multi-agency collaboration, stakeholder involvement, regional approaches to water management, water management involvement in land use decisions, and project monitoring to evaluate results of current practices. The W-SJ IRWMP identifies projects that help achieve regional objectives and targets while working to address water-related challenges in the region.

The SLDMWA, acting as the Regional Water Management Group (RWMG) for the region, has coordinated the evolution of planning documents and the regional objectives since 2001. Plan development and updates has been iterative and driven by stakeholder participation and has resulted in this Plan’s overarching goal of providing a more reliable water supply, protecting agricultural, municipal, and environmental water uses, and meeting community needs (including those of disadvantaged communities), by improving water supply sustainability, water quality, and drainage. Working off this overarching goal, the Integrated Regional Water Management (IRWM) Region identified the following 2019 W-SJ IRWMP objectives as they relate to integrated water resources management:

- Objective A:** Provide for more reliable water supply south of the Delta
- Objective B:** Improve regional self-reliance for water through investment in water use efficiency, water recycling, advanced water technologies, local and regional water supply projects, and improved regional coordination of local and regional water supply efforts
- Objective C:** Provide reasonable opportunity to advance ecosystem restoration through balanced project implementation
- Objective D:** Provide potential for environmental and habitat improvement, including wetlands
- Objective E:** Promote projects that meet the needs of disadvantaged communities
- Objective F:** Promote and enhance water conservation, water use efficiency, and sustainable water use
- Objective G:** Promote and enhance water recycling
- Objective H:** Maximize utility of Regional aquifers while improving sustainability
- Objective I:** Minimize risk of loss of life, infrastructure, and resources caused by significant storm events by utilizing uncontrolled flow beneficially
- Objective J:** Capture stormwater for higher beneficial use whenever practicable
- Objective K:** Develop Regional solutions that protect and enhance the quality of water supply, particularly in disadvantaged communities that are unable to meet water quality standards
- Objective L:** Consider recreational potential in project development

Objective M: Minimize energy consumption and associated greenhouse gas emissions, including use of renewable energy when appropriate

Objective N: Promote projects that increase operational flexibilities and supply management tools

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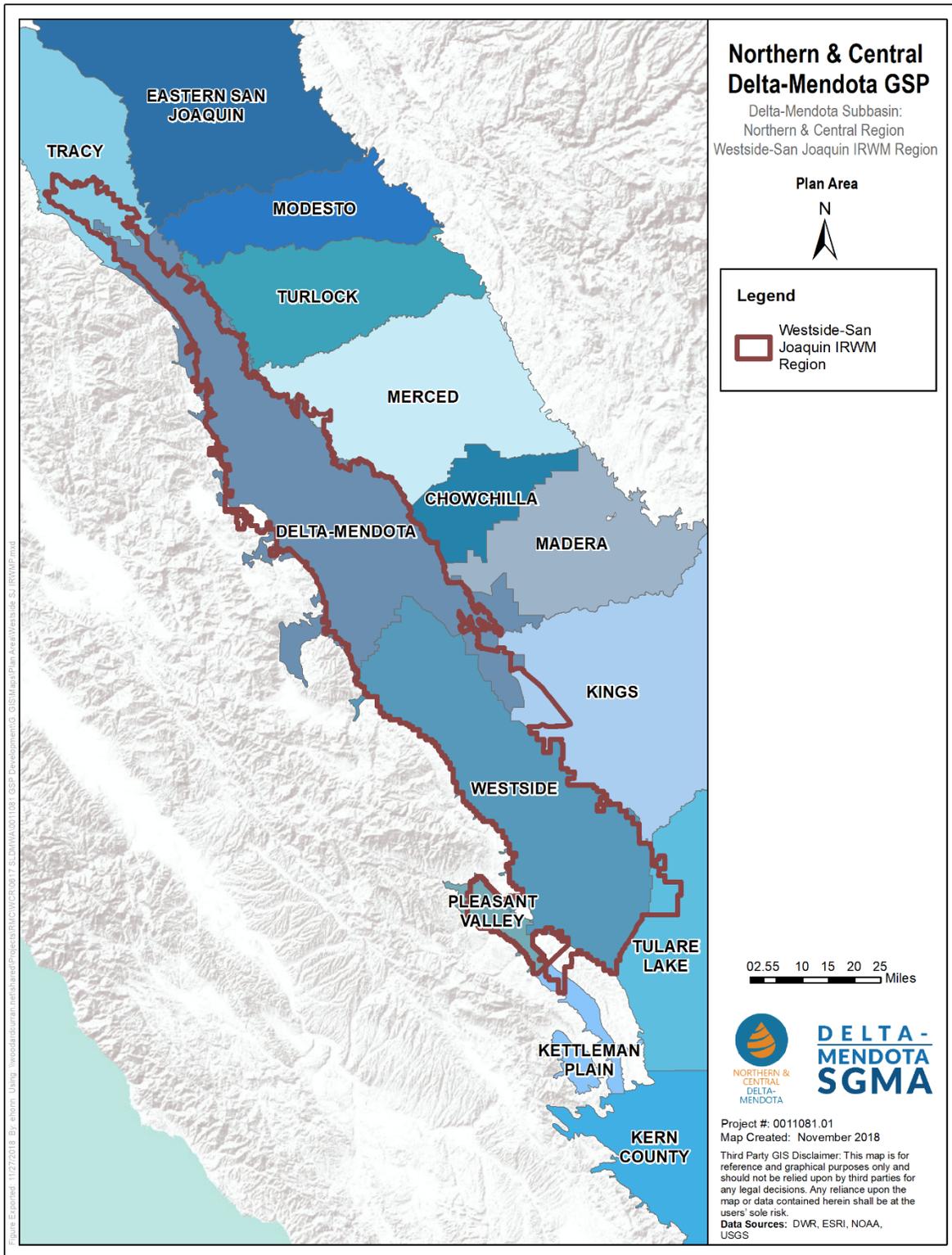


Figure 2-27. Delta-Mendota Subbasin underlying the Westside-San Joaquin IRWM Region

These objectives connect to regional conjunctive use of groundwater and surface water supplies and therefore have the potential to influence implementation of this GSP.

The 2019 W-SJ IRWMP provides valuable resources related to potential concepts, projects and monitoring strategies that can be incorporated into the Northern & Central Delta-Mendota Region GSP, especially as this is the primary IRWM region overlying the Delta-Mendota Subbasin.

2.3.1.3.2 2018 East Stanislaus Integrated Regional Water Management Plan

The 2018 East Stanislaus Integrated Regional Water Management Plan (ESIRWMP) area overlies a small portion of the Delta-Mendota Subbasin along the western side of San Joaquin River (**Figure 2-28**). This IRWM region is managed by the East Stanislaus Regional Water Management Partnership (ESRWMP), the Regional Water Management Group for the region, and is composed of representatives from the Cities of Modesto, Hughson, Ceres, Turlock, Waterford, and Stanislaus County.

In forming the East Stanislaus IRWM Region, the ESRWMP engaged regional stakeholders in the identification of regional conflicts and issues, discussions regarding goals and objectives for regional water resources management, and in the development of IRWMPs that contain a living list of projects, studies, and programs that, when implemented, will aid the Region in resolving the identified water-related conflicts. Specific to this, the IRWM Region has identified the following goals and objectives in the categories of Water Supply, Flood Protection, Water Quality, Environmental Protection and Enhancement, Regional Communication and Cooperation, and Economic and Social Responsibility:

Water Supply Goals and Objectives

Goal: Protect existing water supplies and water rights and improve regional water supply reliability.

Objectives:

- Provide a variety of water supply sources, including recycled water, to meet all current and future demands (urban, agricultural and the environment) under various hydrologic conditions.
- Promote the use of groundwater storage and conjunctive use options to reduce groundwater overdraft.
- Protect existing water rights, including permitted diversions and extractions.
- Implement water conservation plans for both urban and agricultural uses.
- Support monitoring and research to improve understanding of water supplies and needs.
- Address intra- and inter-regional conveyance infrastructure needs.
- Address changes in runoff and recharge due to climate change, including amount, intensity, timing, and variability.

Flood Protection Goals and Objectives

Goal: Ensure flood protection strategies are developed and implemented through a collaborative process, utilizing both local and watershed-wide approaches designed to maximize opportunities for comprehensive water resource management that meet multiple objectives.

Objectives:

- Develop outlines of regional projects and plans necessary to protect infrastructure from flooding and erosion from the 100-year event.
- Work with stakeholders to preserve existing flood attenuation by implementing land management strategies throughout the watershed.

- Develop approaches for adaptive management that minimize maintenance requirements and protect water quality and availability while preserving and enhancing ecologic and stream functions, including addressing adaptation to changes in timing and intensity of runoff due to climate change, as appropriate.
- Provide community benefits beyond flood protection, such as public access, open space, recreation, agricultural preservation, and economic development.
- Protect, restore, and enhance the natural ecological, geomorphic, and hydrologic functions and processes of rivers, creeks, streams and their floodplains.
- Address changes in timing and intensity of runoff due to climate change.
- Increase and improve the quantity, diversity, and connectivity of riparian, wetland, floodplain, aquatic, and shaded riverine aquatic habitats, including the agricultural and ecological values of these lands.
- Identify opportunities and incentives for expanding or increasing use of floodway corridors.

Water Quality Goals and Objectives

Goal: Protect and improve water quality for beneficial uses consistent with regional interests and the Regional Water Quality Control Board (RWQCB) Basin Plan in cooperation with local, state and federal agencies and regional stakeholders.

Objectives:

- Meet or exceed all applicable water quality regulatory standards, including drinking water standards.
- Deliver agricultural water to meet water quality guidelines established by stakeholders.
- Aid in meeting Total Maximum Daily Loads (TMDLs) established, or to be established, for the Tuolumne, Stanislaus, Merced, and San Joaquin River watersheds.
- Protect surface waters and groundwater basins from contamination and threat of contamination.
- Manage existing land uses while preserving or enhancing environmental habitats.
- Minimize impacts from storm water through implementation of Best Management Practices, Low Impact Development or other similar projects.
- Promote programs and projects to reduce the quantity and improve the quality of urban and agricultural runoff.
- Promote and support regional monitoring to further understanding of water quality issues.

Environmental Protection and Enhancement Goals and Objectives

Goal: Protect the environmental resources of the Stanislaus, Tuolumne, Merced and San Joaquin River watersheds by identifying, promoting and implementing opportunities to assess, restore and enhance natural resources of these watersheds.

Objectives:

- Identify and incorporate (where possible and reasonable) opportunities to assess, protect, enhance, and/or restore natural resources when developing water management strategies.
- Minimize adverse effects on biological and cultural resources, including riparian habitats, habitats supporting sensitive plant or animal species, and archaeological sites when implementing strategies and projects.
- Identify opportunities for open spaces, trails and parks along creeks and other recreational projects in the watershed to be incorporated with water supply, water quality, or flood protection projects.
- Contribute to the long-term sustainability of agricultural, commercial, industrial, and urban land uses and activities within the basin.
- Identify opportunities to protect, enhance, or restore habitat to support all watersheds in the Region in conjunction with water supply, water quality, or flood protection projects.
- Support projects to understand, protect, improve and restore the region's ecological resources.
- Promote the recovery and stability of regionally present native species and populations.

Regional Communication and Cooperation Goals and Objectives

Goal: Implement and promote this IRWMP through regional communication, cooperation, and education.

Objectives:

- Develop a forum for consensus decision-making and IRWMP implementation by regional entities.
- Build relationships with State and Federal regulatory agencies and other water forums and agencies to facilitate permitting of water-related projects and ensure continued consistency with state water plans.
- Facilitate dialogues between regional and inter-regional entities to reduce inconsistencies and conflicts in water management and to maximize benefits from water-related projects.
- Maintain avenues of communication with the general public and offering opportunities to provide feedback on the IRWM and water-related projects through the regional websites and other public forums.
- Identify opportunities for public education about water supply, water quality, flood management, and environmental protection.
- Implement focused outreach to DACs and EDAs relative to opportunities for water supply, water quality, flood management, and environmental protection projects.

Economic and Social Responsibility Goals and Objectives

Goal: Promote development and implementation of projects, programs and policies that are socially impartial and economically sound.

Objectives:

- Support the participation of disadvantaged communities and economically distressed areas in the development, implementation, monitoring and long-term maintenance of water resource projects.
- Develop cost-effective multi-benefit projects.
- Consider disproportionate community impacts to ensure environmental justice.
- Maximize economies of scale and governmental efficiencies.
- Protect cultural resources.
- Reduce energy use and associated greenhouse gas emissions and/or use renewable resources where appropriate.
- Adopt carbon sequestration strategies where appropriate.

As with the 2018 Westside-San Joaquin IRWMP, the East Stanislaus IRWMP provides valuable resources related to potential concepts, projects, and monitoring strategies that can be incorporated into the Northern & Central Delta-Mendota Region GSP. However, most of the IRWM Region does not overlie the Delta-Mendota Subbasin, so implementation of these projects may, for the most part, have little to no impact on groundwater management in the Delta-Mendota Subbasin.

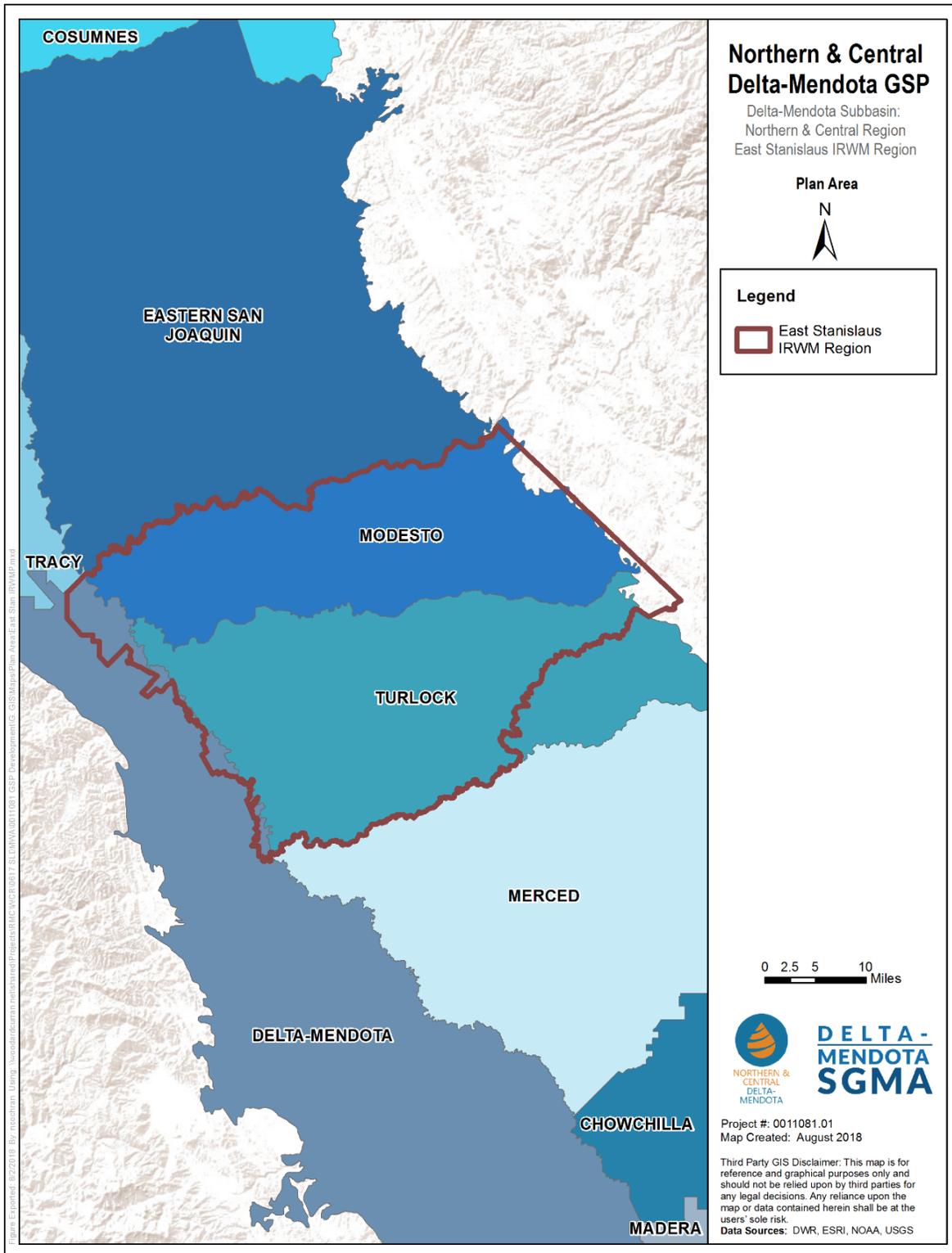


Figure 2-28. Delta-Mendota Subbasin underlying the East Stanislaus IRWM Region

2.3.1.3.3 2014 Madera Integrated Regional Water Management Plan

The Madera IRWMP was last updated in 2014 and represents a collaborative effort among 17 public, private, and not-for-profit groups and agencies which are signatory to the Memorandum of Understanding (MOU) forming the Madera Regional Water Management Group. The IRWMP was prepared in coordination with other interested groups and agencies who have participated in the process and who are not signatory to the agreement, but who share an interest in managing water resources throughout Madera County and its watersheds. The portion of the Delta-Mendota Subbasin underlying the Madera IRWM Region is shown in **Figure 2-29**.

As with the IRWMP from other regions overlying the Delta-Mendota Subbasin, the Madera IRWMP included a mission, goal and set of measurable objectives designed to promote effective water resources management in the Region. As stated in the Madera IRWMP:

“...[The] mission of the Regional Water Management Group (RWMG) will facilitate future coordination, collaboration, and communication for comprehensive management of water resources in the Madera Region. Through the mutual understanding among entities in the Madera Region regarding their joint efforts toward Integrated Regional Water management governance, development, planning, funding, and implementation to ensure that clean, adequate and affordable water supplies are available now and in the future to sustain this region and its responsible growth.” (Madera Regional Water Management Group, 2014).

The Madera IRWMP included separate goals for the Valley portion of the Region and for the Foothills/Mountain portion of the Region. The Valley goals are to:

- Achieve groundwater sustainability by 2024;
- Create an independent organization to manage groundwater resources;
- Expand stakeholder education;
- Assure groundwater quality meets drinking and irrigation water quality standards; and
- Improve flood control and protection.

Under each of these goals are measurable actions and methods (objectives) intended to help achieve the goals. Specific objectives that could affect groundwater management under SGMA include:

Valley Goal 1: Achieve Groundwater Sustainability by 2024

- Increase regional capacity for direct recharge by 50,000 acre-feet per year (AFY).
- Integrate flood/storm water conveyance infrastructure and regional irrigation system.
- Expand California Statewide Groundwater Elevation Monitoring (CASGEM) groundwater monitoring network to semi-annually measure regional groundwater on a per-aquifer basis.
- Improve water reliability.
- Expand water conservation efforts.

Valley Goal 2: Create an Independent Local Organization to Manage Groundwater Resources

- Determine most desirable form of organization and achieve buy-in from RWMG member agencies.
- Identify sources for ongoing operational funding for the independent local organization.
- Seek special legislation as required to create the chosen special district.

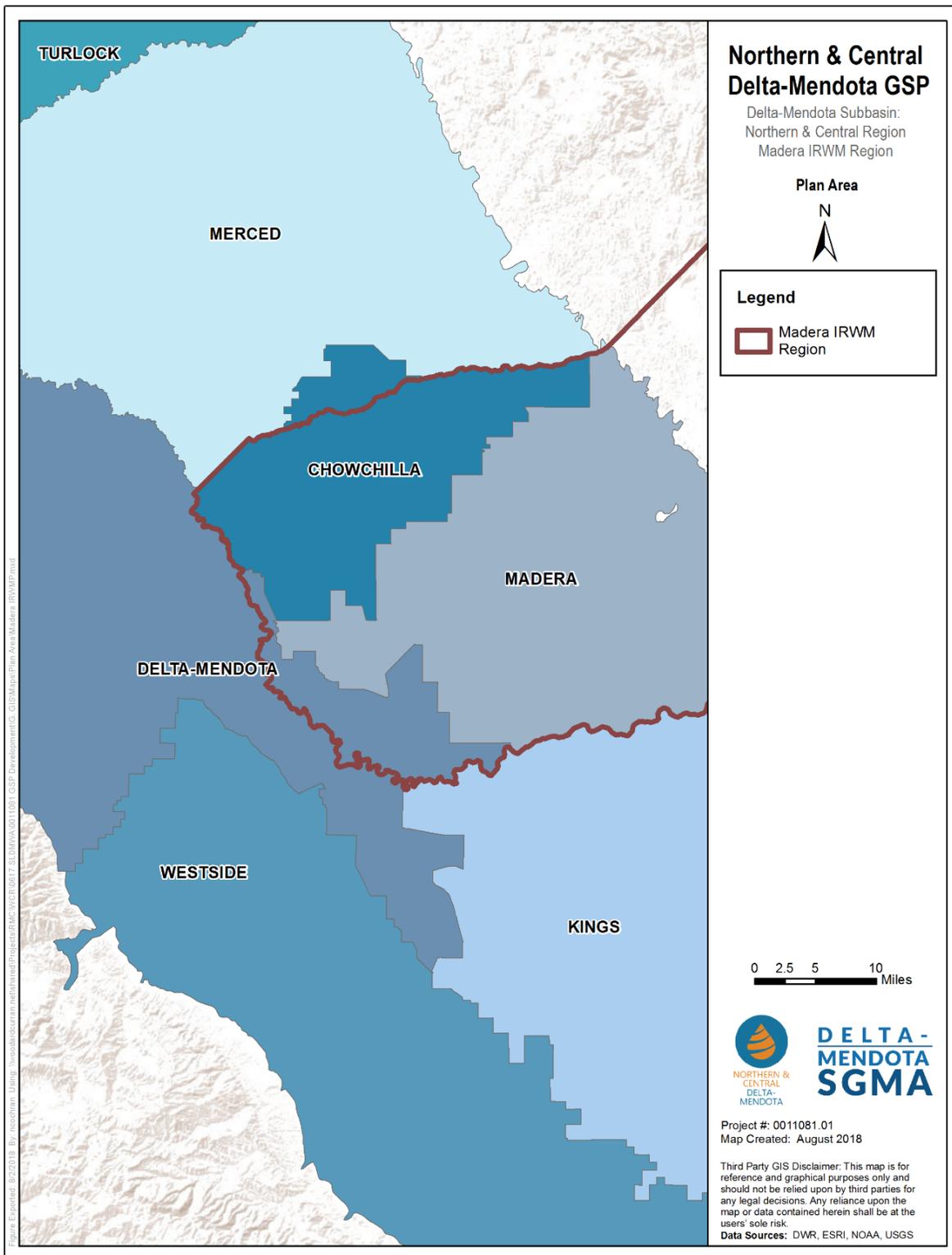


Figure 2-29. Delta-Mendota Subbasin underlying the Madera IRWM Region

Valley Goal 4: Assure Groundwater Quality Meeting Drinking and Irrigation Water Quality Standards

- Identify problem areas.
- Identify strategies to address chemical Constituents of Concern.
- Propose projects to address waters which do not meet State Public Health Goals or irrigation standards.

Valley Goal 5: Improve Flood Control and Protection

- Improve water storage capacity.

As the Foothill and Mountain portions of the Madera IRWMP do not overlie the Delta-Mendota Subbasin, they are not directly applicable to this GSP.

The Madera IRWMP is currently being updated to meet 2016 IRWM program guidelines, with an expected public draft completed by fall 2018.

2.3.2 County Well Construction/Destruction Standards and Permitting

DWR has developed well standards for the state per California Water Code Section 13700 to 13806. These standards have been adopted by the State Water Resources Control Board (SWRCB) into a statewide model well ordinance (Resolution No. 89-98) for use by the Regional Boards for enforcing well construction standards where no local well design ordinance exists that meets or exceeds the DWR standards. DWR's Well Standards are presented in Bulletin 74-81 and Bulletin 74-90.

Table 2-7 lists the counties in the Delta-Mendota Subbasin and the respective permitting agencies and local ordinances for well construction and destruction standards. A discussion of these standards and the respective permitting process as well as well abandonment and destruction procedures follows.

Fresno County

In Fresno County, the County Environmental Health Division issues permits for construction of new water wells, reconstruction, repair or deepening of existing wells, and for destroying abandoned wells to properly licensed water well drilling contractors in unincorporated Fresno County. To obtain a permit to construct a new well, properly licensed contractors must submit a completed Water Well Permit Form, along with applicable permit fees, to the Environmental Health Division. Once the permit application is approved, a well permit number is assigned and drilling may commence. The permit is valid for 180 days. Once the well construction, deepening, or destruction work is completed, the contractor is required to provide a Notice of Completion, also known as a Well Driller's Report or Well Log, to the Environmental Health Division within thirty (30) days of completion. The report is required to document that the work was completed in accordance with the Well Standards Ordinance. Once the report is received by the Environmental Health Division, the property owner is contacted by letter to schedule a final inspection of the new well. The inspection is required to ensure that the well has been completed in an approved manner and there are no apparent direct openings into the well that may allow the entry of contamination into the water supply. During the inspection, Environmental Health staff, if possible, conducts sampling of the new or deepened domestic wells to determine if there are certain contaminants of health concern.

Table 2-7. Summary of Applicable Well Construction/Destruction Standards in the Northern and Central Delta-Mendota Regions

County	Permitting Agency	Local Ordinance
Fresno (unincorporated areas)	Fresno County Department of Public Health, Environmental Health Division	Special considerations include well location and positioning of perforations listed in Bulletin 74-6.
Merced (Except cities of Atwater, Dos Palos, Gustine, Livingston, Los Banos, and Merced as well as on any federal or state land)	Merced County Department of Public Health, Division of Environmental Health	Chapter 9.28 of the Merced County Code (Well Ordinance) specifies use of the State's Well Construction Standards for the design of wells and includes setback and permitting requirements. The County's Ordinance preventing the mining and export of groundwater within unincorporated areas of Merced County (Chapter 9.27 of the Merced County Code) minimizes unsustainable groundwater extractions.
San Benito (all of the county)	San Benito County Water District or San Benito County Department of Environmental Health, Public Health Division	Individual wells are permitted by the San Benito County Water District across the whole county. If the well is part of a "local small water system," a small water system permit must also be obtained from the County Dept. of Environmental Health.
San Joaquin (Except Stockton, Ripon, and Tracy)	San Joaquin County Environmental Health Department	<p>Special requirements include determination of water quality during construction, depth limitations, perforation specification, and sealing-off strata listed in Bulletin 74-5.</p> <p>The County also has a Groundwater Export Ordinance (Division 8, Chapter 1, Section 5-8100 of the County Code) that is designed to protect local groundwater users from groundwater exports and unsustainable groundwater extractions as part of the well permitting process.</p>
Stanislaus (unincorporated areas)	Stanislaus County Department of Environmental Resources	While the County does not have any specific changes/additions to the State's Well Construction Standards, the County's Groundwater Ordinance (Chapter 9.37 of the Stanislaus County Code) requires a specific well permit application review process to minimize unsustainable groundwater extractions.

Fresno County Department of Public Health, Environmental Health Division enforces the provisions of the California Well Standards Ordinance and the construction standards set forth in the California Well Standards, Bulletins 74-81 and 74-90. As mentioned in **Table 2-7**, Fresno County has a local well ordinance approved by DWR, Bulletin 74-6. Additionally, Fresno County Code of Ordinances, Chapter 14.08 – Well Construction, Pump Installation and Well Destruction Standards includes adopted standards that fall under the following categories:

- Well location
- Sealing
- Surface construction features
- Disinfection and sanitary requirements
- Sealing-off strata
- Well development
- Water quality sampling
- Special provisions for large diameter shallow wells, driven wells, repair or deepening of wells, and temporary covers
- Well destruction standards
- Requirements for abandoned wells and their destruction
- Standards for cathodic production wells

Program PF-C.B of the County General Plan states the County will adopt a well construction and destruction ordinance that will include, among other requirements, the mapping of location information on abandoned wells in the County GIS database and which includes a procedure for ensuring the abandoned wells are properly destroyed.

Fresno County Department of Public Health, Environmental Health considers a well “abandoned” when it has not been used for a period of one year, unless the owner demonstrates intention to use the well again (following the California Well Standards Ordinance). Wells must be destroyed by a licensed C-57 water well contractor with an active license. Proper maintenance of inactive wells is enforced according to Section 115700 of California Health and Safety Code, where the top of the well or well casing is secured by a locked, water-tight cover. The inactive well shall be marked to be easily visible, located, and identified as a well, where the area around the well shall be kept clear of brush, debris and waste materials.

All well destructions are performed according to Water Well Standards Bulletins 74-81 and 74-90 published by DWR. Before destroying a well, a permit must be issued by the Fresno County Department of Public Health where all available construction data shall be submitted with the application for a well destruction permit. Following the destruction of a well, a State of California Well Completion Report shall be submitted to the Fresno County Department of Public Health within thirty (30) days of the completion of any well destruction.

Merced County

The well permitting process in Merced County begins with applicants filling out the Well Construction, Destruction, Mining, and Export Application/Permit, as appropriate. Merced County has published a User Guide for filling out this application, which includes step-by-step information for filling out the application and relevant links and resources. In addition to the Well Construction, Destruction, Mining, and Export Application/Permit, a Letter of Intent must be submitted to the County for each existing well on a parcel at the time a new domestic, irrigation, or out-of-service well permit application is submitted. Well applications are reviewed to determine the purpose of the well, the proposed pumping volume, and possible environmental impacts. If the well meets all screening and review requirements, it would be eligible for approval. Replacement wells with the same size and capacity are exempted from the Merced County Groundwater Ordinance.

Prior to the construction, modification, abandonment, or destruction of a well, the well contractor shall apply for and obtain a permit from the health officer. Construction of a proposed well cannot commence until the permit application has been approved by the health officer and the owner and contractor are in receipt of the approved permit. The well contractor is required to possess a valid C-57 license and contractor's bond. The health officer is to be notified by the well contractor at least twenty-four (24) hours prior to commencement of the work authorized by the permit. Within thirty (30) days of completing the work, the well contractor is required to submit an official copy of the well completion report to the health officer, which will then be submitted to DWR. When one or more wells are existing on a parcel, an application for a permit to construct a water well on the same parcel must be accompanied by a "letter of intent" for each well, signed by the property owner which elects one of the following options concerning the future of the existing well(s): destruction at the time the new well is placed in service; the existing well will continue to be used; or take the well out of service and maintain it in accordance with the provisions of the Merced County Well Ordinance for a period of no more than one year, after which the well will be restored to service or destroyed.

As mentioned in **Table 2-7**, Chapter 9.28 (Wells) of the Merced County Code specifies use of the State's Well Construction Standards for the design of wells and includes setback and permitting requirements. The County General Plan includes Policy W-1.5 which encourages coordination between cities and special districts in developing County-wide guidelines regarding location and construction of new water wells.

Merced County Department of Public Health, Division of Environmental Health (MCDEH) requires individuals to fill out a Well Construction, Destruction, Mining, and Export Application/Permit before commencing any well destruction activities. Merced County Code, Title 9, Chapter 9.28 Wells outlines the standards that must be adhered to when abandoning and destroying a well.

San Benito County

The San Benito County Code of Ordinances, Chapter 15.05 *Water* lists multiple types of permits that must be obtained for different well applications.

To construct an individual well, the San Benito County Water District is considered the enforcing agency. A permit must be obtained to "dig, bore, drill, deepen, modify, repair or destroy a water well, cathodic protection well, observation well, monitoring well or any other excavation that may intersect groundwater" (Code of Ordinances Chapter 15.05.075). If a person fails to obtain a permit, the initial fee is doubled to form the price of the fine, unless the work is done in an emergency to maintain drinking water or agricultural supply.

A permit can be acquired by submitting an application to the enforcing agency that includes information about the proposed construction and a filing fee. Only persons permitted to work on wells must carry out the construction, reconstruction, or destruction work. Standards for well construction in San Benito County are in accordance with California Department of Water Resources Bulletin 74-81. Variances from these standards can be obtained under special circumstances. There are general standards, however, that the enforcing agency complies with for well and well seal inspections. Agency representatives have the right to make an inspection or test at all reasonable times in the day. A well completion report for new wells shall be provided to the enforcing agency within 30 days of a well construction, reconstruction, or destruction job.

Landowners are prohibited from knowingly retaining any permanently inactive well, cathodic protection well, or monitoring well that connect to a known pathway for pollutants from either above or below ground. The proper disposal of drilling fluids is required. Any abandoned wells must be destroyed as a condition of a new construction or reconstruction permit.

Permits to install local small water systems are enforced by the San Benito County Department of Environmental Health within the Public Health Division. Such a system is considered a supply of water for between 2 and 4 dwelling units. The system can include any type of collection, treatment, storage, or distribution facilities between those units. The County's Environmental Health Department must deem the underlying aquifer to have sufficient water quantity and quality to support that supply. Laboratory tests are required as part of the permit application to ensure water

quality. Water quantity standards for each well include a sustained source capacity of 3 gallons/minute during a 24-hour period of continuous pumping or for a spring or horizontal well, a continuous yield of 1 gallons/minute between August and October.

All new wells that do not pass quality standards listed in Chapter 15.05.036 of the County Code of Ordinances must be sealed or destroyed according to the standards of Department of Water Resources Bulletin No. 74-81, unless sufficient mitigation can be done to render the water potable again and ensure that the local groundwater supply is not threatened. For all wells that were constructed before the effective date of the ordinance, well owners must apply to construct a replacement well in that location or repair the damaged well. If one of these wells cannot provide the quantity requirements in the Local Small Water Systems Ordinance, then well owner must prove to the Health Officer that there are sufficient storage facilities to provide adequate supply for domestic use. The Health Officer has the authority to inspect and carry out tests on facilities at any time.

Additionally, permits must be obtained to inject native surface water or imported water into a groundwater aquifer within county lines. This does not apply to a public agency operating a public water system. An environmental review must be done in order to determine that the water quantity or quality of the underlying aquifers are not threatened by permitted activity. The fee for the permit pays for the required environmental review document. The permit is reviewed annually for compliance.

In unincorporated areas, an applicant must get a permit to extract groundwater for sale or for use off parcel, given that the safe yield of the subbasin is not exceeded. Mining of groundwater on private property to be transported outside of county lines is prohibited.

San Joaquin County

Applicants are required to fill out and submit the Well/Pump Permit form to the San Joaquin County Environmental Health Department for the construction of a new well, replacement well, modification to an existing well, installation of a monitoring well, or putting a well out of service. A permit issued by the Environmental Health Department expires one year from the date issued, but an additional year extension may be granted by the Director if requested. Additional forms required for permitting a well in San Joaquin County, including the Well Exemption Statement and New Well Information form. The Well Exemption Statement must be completed to document the exemption criteria applicable for the new well application. Exemption criteria for a new well includes: the well is not located in a critically overdrafted basin (Tracy or Cosumnes Subbasins are not critically overdrafted), the new well owner is a *de minimis* extractor (maximum extraction of 2 AFY or less for domestic purposes only), the replacement well has the same extraction as the existing well (where the existing well must be destroyed or meet *de minimis* extractor requirements), a public agency that substantially meets or exceeds these requirements through another requirement of the law, or a city or municipal well to provide water supply solely for residents of the city or county. If the new well does not meet the exemption criteria, the New Well Information form must be submitted to the Environmental Health Department before a new well permit is issued. The collected information must be posted to the Department's website for public information.

The San Joaquin County Well Standards contains standards for well location (minimum distances from potential sources of contamination and pollution), construction or repair, well disinfection, sampling, construction and abandonment of geophysical or seismological test holes or wells, and monitoring wells. As noted in **Table 2-7**, special requirements for well construction in San Joaquin County include determination of water quality during construction, depth limitations, perforation specification, and sealing-off strata listed in Bulletin 74-5, which was approved by DWR. Division 11: Infrastructure Standards and Requirements, Chapter 9-1115 of the County Zoning Code states that a well permit may be approved by the Director of Environmental Health Division only if the following conditions are met: (1) the proposed well shall not be offensive, dangerous, or injurious to health, or create a nuisance; (2) the proposed water complies in all respects to the standards of the Environmental Health Division for the construction of wells; and (3) upon completion of the well, the applicant or the Well Contractor shall file a copy of a Well Drillers Report with the Environmental Health Division, where these report forms will be furnished by the

Director of Environmental Health Division or the State of California Water Resources Control Board. Policy IS-4.15 of the County General Plan states that prior to issuing building permits for new development that will rely on groundwater, the County shall require confirmation for existing wells and test wells for new wells to ensure that water quality and quantity are adequate to meet the needs of existing, proposed, and planned future development.

When a well no longer functions as originally designed, or cannot appropriately function in place of another design, or has fallen in to such a state of disuse or disrepair that it may become a source of impairment to groundwater quality, constitutes a safety hazard, or found to be abandoned, it must be destroyed under a well destruction permit. Sealing requirements, as detailed in Chapter 6.3 (Sealing Requirement) of San Joaquin County Well Standards, must be adhered to in order to prevent vertical movement of water entering the well casing and interacting with the groundwater. Under no circumstances are abandoned wells to be used for the disposal of any solid or liquid wastes. If the owner declares intention to use the well again, and the well is capable of functioning as originally designed, the well shall be maintained in such a way that: (1) the well has no defects that will impair the quality of water in the well or the water bearing formations; (2) the well is capped with a watertight seal or cover; (3) the well is marked so it may be easily seen; and (4) the area around the well is kept clear of brush and debris. After remaining out of service for five (5) years, the Director of Environmental Health Division may call the well to be properly abandoned. According to County Code, Title 5, Division 4, Chapter 3 Well Drilling Requirements, the District Health Office is authorized, after reasonable efforts to eliminate pollution, contamination, or a safety hazard, to enforce the permanent abandonment by destruction of any well that is polluted, contaminated or is located as to become polluted or contaminated or is a safety hazard. The District Health Officer is authorized to destroy any such well and recover the cost of the destruction from the owner of the property on which the well is located.

Stanislaus County

Well applicants must first fill out the Application for Well Construction or Destruction form and submit it to the Stanislaus County Department of Environmental Resources, in addition to paying the appropriate fees, before receiving a well construction or destruction permit. After receipt of the application, it is reviewed by the Department of Environmental Resources to determine whether it is subject to prohibitions in the Groundwater Ordinance against unsustainable groundwater extraction and export of water using the following criteria:

- The well is pumping from a known and definite channel;
- The well is intended to replace an existing well permitted prior to November 25, 2014 and the replacement well has no greater capacity than the well it is replacing;
- The well is located in an unincorporated area of the County;
- Wells on property served by a public water agency that is in compliance with an adopted Groundwater Management Plan or Groundwater Sustainability Plan;
- Wells intended to extract 2 AFY of groundwater or less; and
- Groundwater extraction or water export in compliance with a permit previously granted by the Department of Environmental Resources.

If the application is not exempt based on these criteria, the applicant must submit a Supplemental Application for Non-Exempt Wells with information to demonstrate that groundwater pumped from the well is being sustainably extracted without causing any of the “Undesirable Results” listed in Section 97.030 (9) of the Groundwater Ordinance. “Undesirable Results consist of the following:

- Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon;
- Significant and unreasonable reduction in groundwater storage;
- Significant and unreasonable degradation of water quality;

- Significant and unreasonable land subsidence that substantially interferes with surface land uses; and
- Surface water depletions that have significant and unreasonable adverse impacts on the beneficial uses of surface water.

A technical review is then conducted to verify whether the information submitted by the applicant demonstrates that groundwater extraction from the well will not cause, or substantially contribute to, any “Undesirable Results.” If the applicant fails to demonstrate that proposed extractions will not substantially contribute to any “Undesirable Results,” there is an opportunity for the applicant to submit additional data, accept mitigation measures, or amend their application. While not required, if the above steps aren’t taken by the applicant an Environmental Impact Report under the California Environmental Quality Act (CEQA) is required.

As previously stated, Stanislaus County adopted a Groundwater Ordinance in November 2014 (Chapter 9.37 of the County Code, hereinafter, the “Ordinance”) that codifies requirements, prohibitions, and exemptions intended to help promote sustainable groundwater extraction in unincorporated areas of the county. The Ordinance prohibits the unsustainable extraction of groundwater and makes issuing permits for new wells that are not exempt from this prohibition discretionary. Applications for non-exempt wells must include substantial evidence that they will not withdraw groundwater unsustainably. For unincorporated areas covered in an adopted GSP pursuant to SGMA, the County can require holders of permits for wells it reasonably concludes are withdrawing groundwater unsustainably to provide substantial evidence that continued operation of such wells does not constitute unsustainable extraction and has the authority to regulate future groundwater extraction.

Similar to well construction, well owners must fill out an Application for Well Construction or Destruction form prior to destroying a well. Every abandoned well must be destroyed in accordance with methods prescribed in Chapter 9.36 (Water Wells) of the Stanislaus County Code as well as DWR Bulletin 74. The County health officer has the authority to order the destruction or repair of any well that is polluted or unsafe or is so located as likely to become polluted. Well owners are required to continuously maintain any well that is out of service, so as to be safe and to prevent pollution of any aquifer. A properly maintained out-of-service well shall not be considered to be an abandoned well.

2.3.3 Water Resources Monitoring Programs

2.3.3.1 Delta-Mendota Canal Groundwater Pump-in Program Water Quality Monitoring Plan

The Pump-in Program (PIP) is an agreement between the U.S. Bureau of Reclamation (USBR), the San Luis & Delta-Mendota Water Authority, and its Member Agencies to convey up to 50,000 acre-feet of groundwater in the DMC. This is permitted through the Warren Act of 1911 which allows the USBR to issue temporary contracts to convey non-project water in federal irrigation canals, such as the DMC, in times of need. The PIP is subject to environmental commitments through the National Environmental Protection Act (NEPA), including monitoring groundwater quality, levels, and subsidence.

The program monitors conditions of private wells participating in the program in addition to in-stream measurements. Specifically, groundwater reporting includes wellhead:

- Water quality analysis (i.e. heavy metals, nitrate, TDS, radioactivity, organic chemicals, pH); and
- Depth to groundwater

If groundwater depth exceeds a specified depth and/or water quality reaches maximum limits, then PIP pumping is mandated to stop.

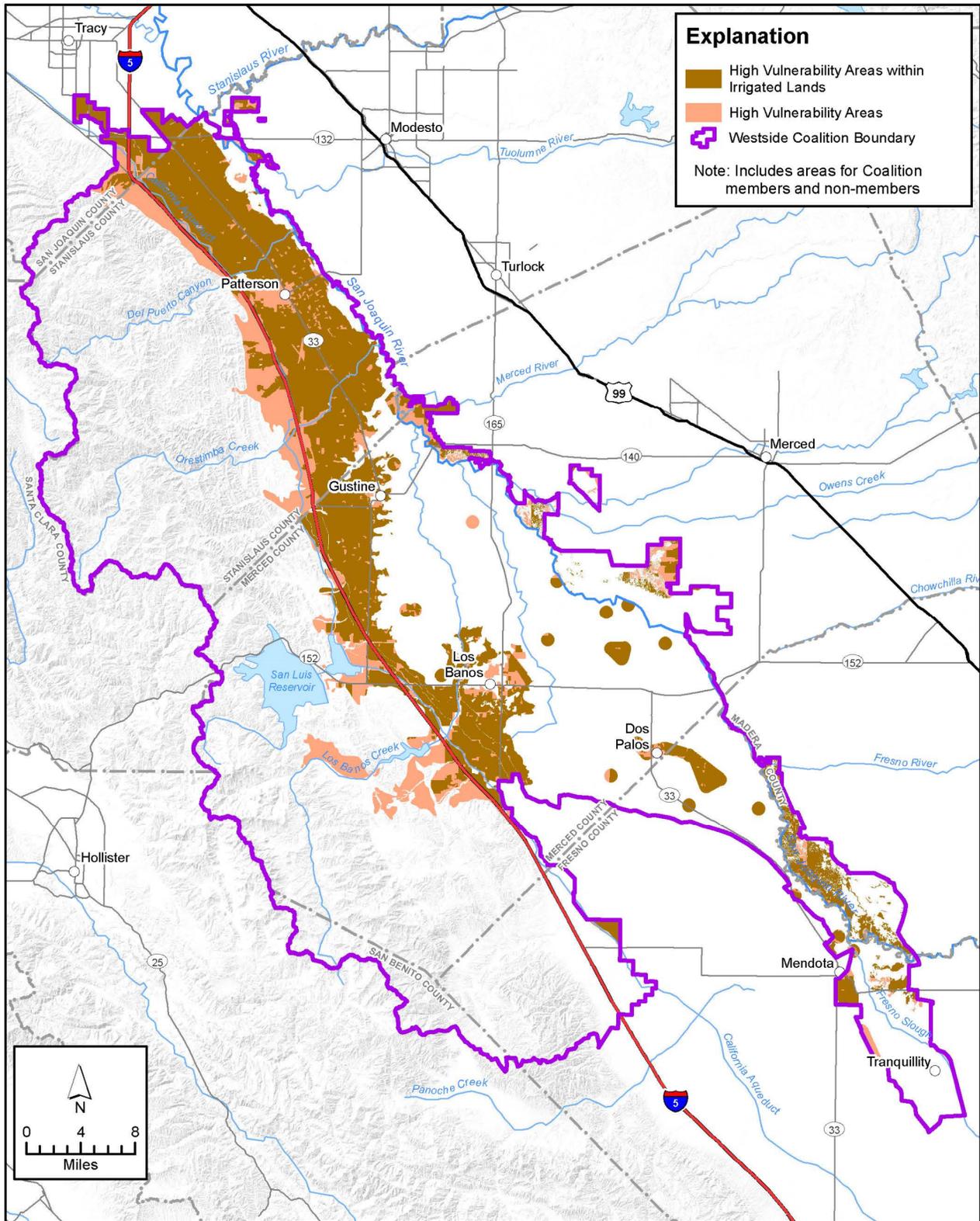
2.3.3.2 Irrigated Lands Regulatory Program (ILRP)

As part of the Irrigated Lands Regulatory Program, growers in the Delta-Mendota Subbasin (as part of the Western San Joaquin River Watershed Coalition, Grassland Drainage Area Coalition and/or Eastern San Joaquin River Watershed Coalition) participate in a Groundwater Quality Trend Monitoring (GQTM) Program, a regional shallow groundwater quality monitoring program intended to ensure that irrigated agricultural discharges do not impair access to safe and reliable drinking water. The GQTM Program under the ILRP is designed to be coordinated with other regulatory and non-regulatory monitoring programs associated with agricultural operations to minimize duplicative regulatory oversight.

As documented in the GQTM Programs associated with each Coalition, the goals of the monitoring program are to determine current water quality conditions of groundwater relevant to irrigated agriculture and to use that information, along with historical data, to evaluate the regional effects of irrigated agricultural practices. The monitoring network developed for the GQTM Program uses factors relating to the vulnerability of groundwater and prioritization of high vulnerability areas (HVAs) in focusing locations for monitoring. **Figure 2-30** and **Figure 2-31** show the high vulnerability areas as identified in the Northern and Central Delta-Mendota Regions. The HVAs represent areas where intrinsic physical properties make groundwater more vulnerable to influences from overlying land use activities; the prioritization of HVAs considers the relative vulnerability within the HVAs along with additional factors including existing groundwater quality conditions, land use, and other factors such as the proximity of communities reliant on groundwater.

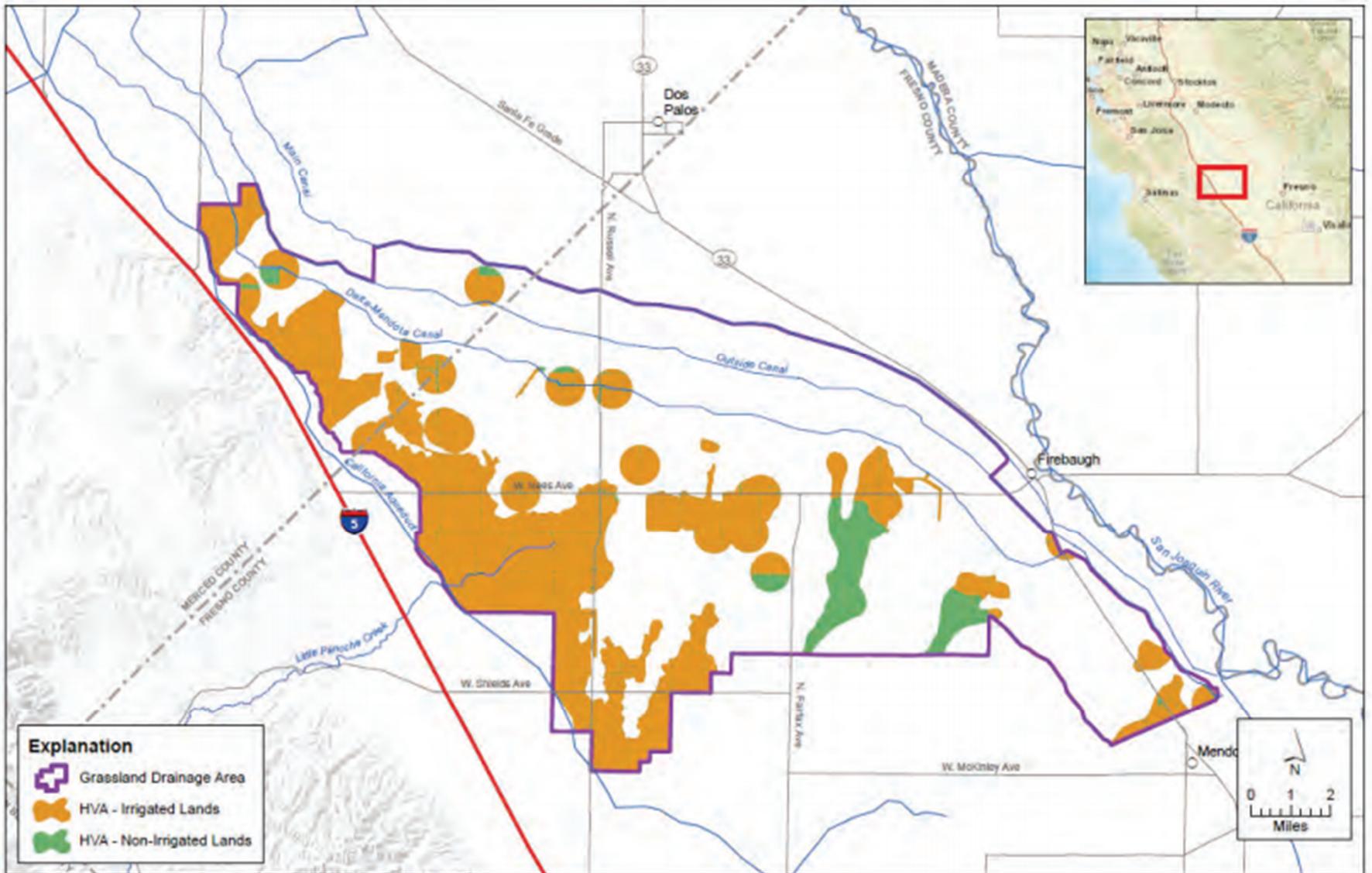
Existing larger-capacity wells that are relatively shallow, but not completed in the zone of first-encountered groundwater, were the main candidate for inclusion as monitoring wells in the GQTM Program. These types of wells were prioritized as they are more likely to exhibit regional groundwater trends that are relevant to agricultural operations on a regional scale because of the greater potential for lateral and vertical constituent transport along longer flow paths with the increased depth. Additionally, these wells have relatively large groundwater capture zones drawing groundwater from more regional contributing areas and minimizing the degree to which selected monitoring wells reflect only localized groundwater conditions around a well. Wells selected for monitoring are shown in **Figure 2-32**.

Wells included in the GQTM Program are monitored for selected water quality parameters, including nitrate (as nitrogen), electrical conductivity, pH, dissolved oxygen, temperature, oxygen-reduction potential, and turbidity on an annual basis, and total dissolved solids, carbonate, bicarbonate, chloride, sulfate, boron, calcium, sodium, magnesium and potassium every five years.



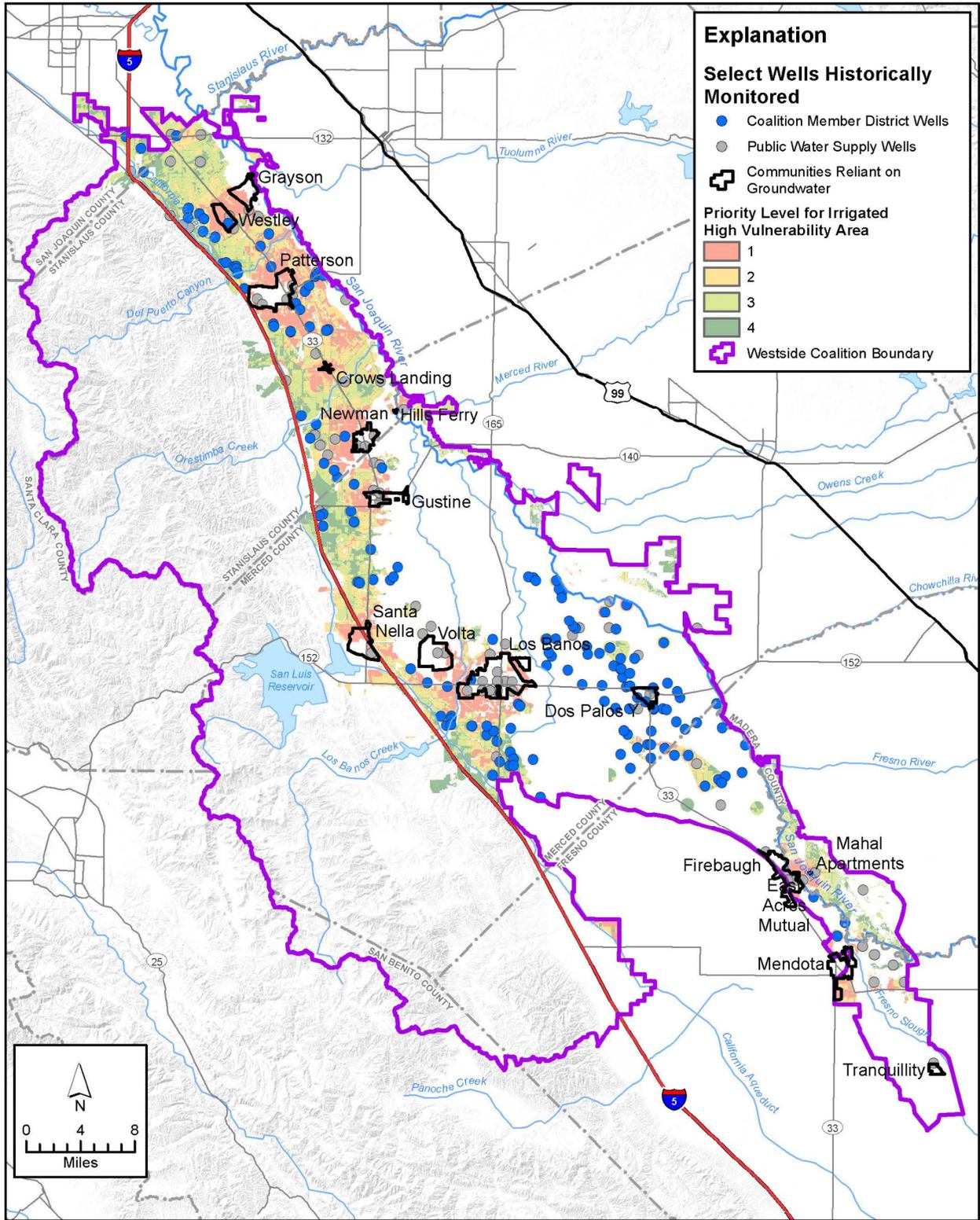
Source: Western San Joaquin River Watershed Groundwater Quality Trend Monitoring Workplan, Phase I – Monitoring Design Approach, 2016

Figure 2-30. High Vulnerability Areas, Western San Joaquin River Watershed Coalition



Source: Grassland Drainage Area Groundwater Quality Management Plan, 2017

Figure 2-31. High Vulnerability Areas, Grassland Drainage Area



X:\2016\16-049 Westside Coalition - GW Quality Trend Monitoring Workplan\GIS\Workplan Figures\Figure 3 Map of Coalition Member District Wells and Monitored PWS Wells.mxd

Source: Western San Joaquin River Watershed Groundwater Quality Trend Monitoring Workplan, Phase I – Monitoring Design Approach, 2016
Figure 2-32. Groundwater Quality Trend Monitoring Program Wells, Western San Joaquin River Watershed Coalition

2.3.3.3 Department of Water Resources Water Data Library (WDL)

DWR's WDL is a database that stores groundwater elevation measurements from wells in the Delta-Mendota Subbasin measured from 1930 through 2018. Data contained in the WDL is from several different monitoring entities, including DWR, Kings River Conservation District, Westlands Water District, SLDMWA, Madera-Chowchilla CASGEM Group, and USBR.

DWR's WDL includes a compendium of groundwater level and quality data. Samples are collected from a variety of well types including irrigation, stock, domestic, and some public supply wells. Wells are not regularly sampled, and most wells have only one- or two-days' worth of sampling measurements and contain large temporal gaps. Constituents most frequently monitored include dissolved chloride, sodium, calcium, boron, magnesium, and sulfate. Measurements taken include conductance, pH, total alkalinity, and hardness (more than 1,000 total samples per parameter). Additional dissolved nutrients, metals, and TDS are also sampled but have fewer sample results available (one to 1,000 samples per parameter).

2.3.3.4 GeoTracker Groundwater Ambient Monitoring and Assessment Program (GAMA)

Established in 2000, the GAMA Program monitors groundwater quality throughout the State of California. GAMA is intended to create a comprehensive groundwater monitoring program throughout California and increase public availability and access to groundwater quality and contamination information. GAMA receives data from a variety of monitoring entities including DWR, U.S. Geological Survey (USGS), and the SWRCB. For the Delta-Mendota Subbasin, DWR, the California Department of Health Services and Department of Pesticide Regulation, Environmental Defense Fund, and the USGS submit data from monitoring wells for a suite of constituents including TDS, nitrates and nitrites, arsenic, and manganese.

2.3.3.5 National Water Information System (NWIS)

The USGS's NWIS contains extensive water data, including manual measurements of depth to water in wells throughout California. Wells are monitored by the USGS. Most of the wells that were monitored in 2017 have been monitored since 2008, although a few have measurements dating back to 1983. Groundwater level measurements at these wells are taken approximately once per quarter.

2.3.3.6 State Water Resources Control Board Division of Drinking Water

The SWRCB's Division of Drinking Water (DDW, and formerly the Department of Health Services) monitors public water system wells for California Code of Regulations Title 22 requirements relative to levels of organic and inorganic compounds such as metals, microbial compounds and radiological analytes. Data are available for active and inactive drinking water sources, for water systems that serve the public, and wells defined as serving 15 or more connections, or more than 25 people per day for 60 or more days per year. In the Delta-Mendota Subbasin, DDW wells are monitored for Title 22 requirements, including pH, alkalinity, bicarbonate, calcium, magnesium, potassium, sulfate, barium, copper, iron, zinc, and nitrate.

2.3.3.7 CASGEM

In 2009, the CASGEM Program began systematic, local monitoring of groundwater levels throughout the state. The intent of the program is to track and make publicly available seasonal and long-term groundwater elevation trends to use as a tool for effective groundwater management.

The Groundwater Monitoring Program (GMP) in the Delta-Mendota Subbasin is managed by the San Luis & Delta-Mendota Water Authority. The GMP characterizes the groundwater basin and outlines monitoring procedures for depth-to-water and groundwater quality. The figures below display the CASGEM network of groundwater wells by aquifer (**Figure 2-33**) and additional groundwater wells that voluntarily share groundwater depth data (**Figure 2-34**).

2.3.3.8 Department of Water Resources Groundwater Information Center Interactive Map

The Groundwater Information Center Interactive Map (GICIMA) is a database that collects and stores groundwater elevations and depth-to-water measurements. Groundwater elevations are measured biannually in the spring and fall by local monitoring agencies. Depth-to-water and groundwater elevation data is submitted to DWR for inclusion in the GICIMA by various monitoring entities around the state.

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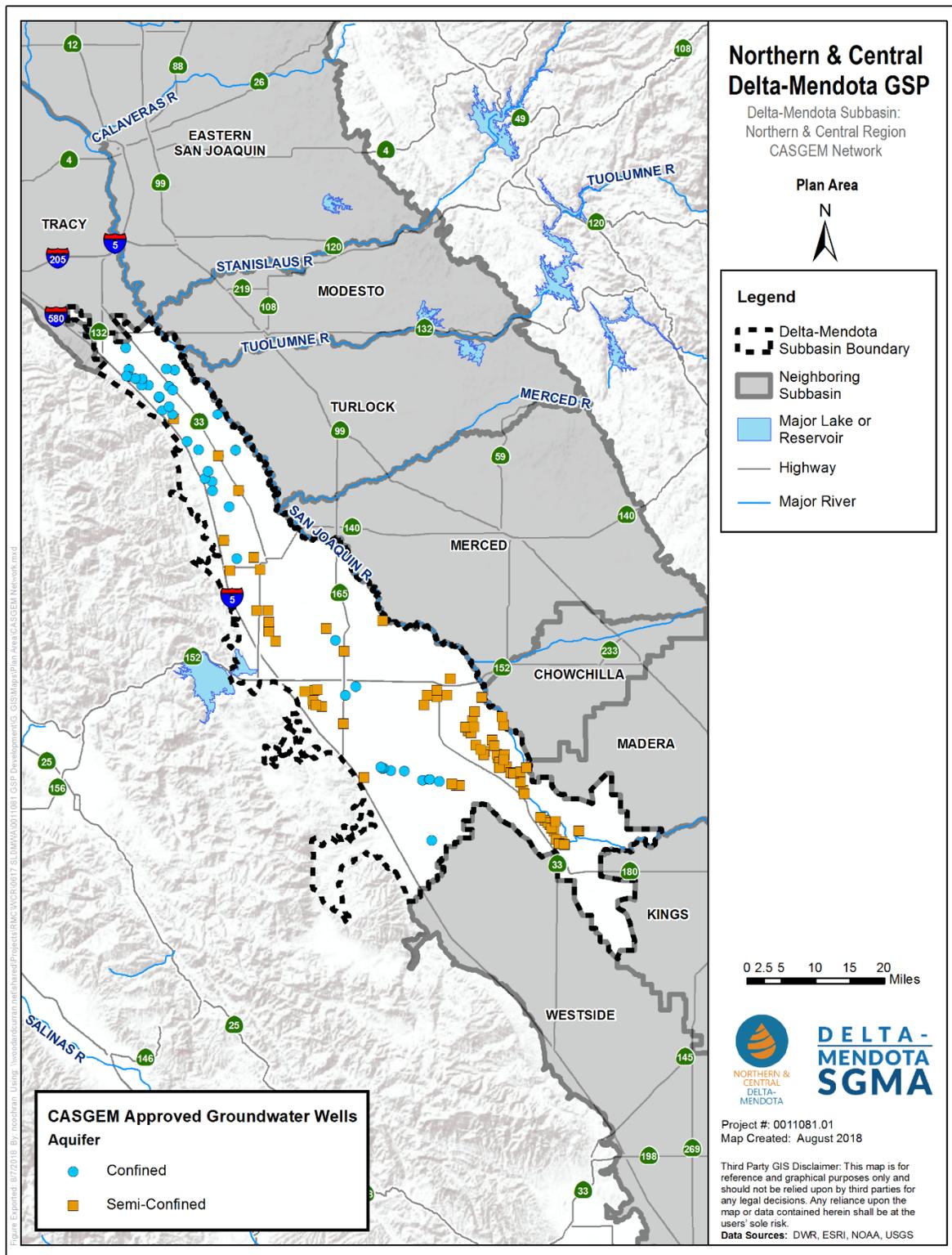


Figure 2-33. Delta-Mendota Subbasin CASGEM Groundwater Monitoring Network

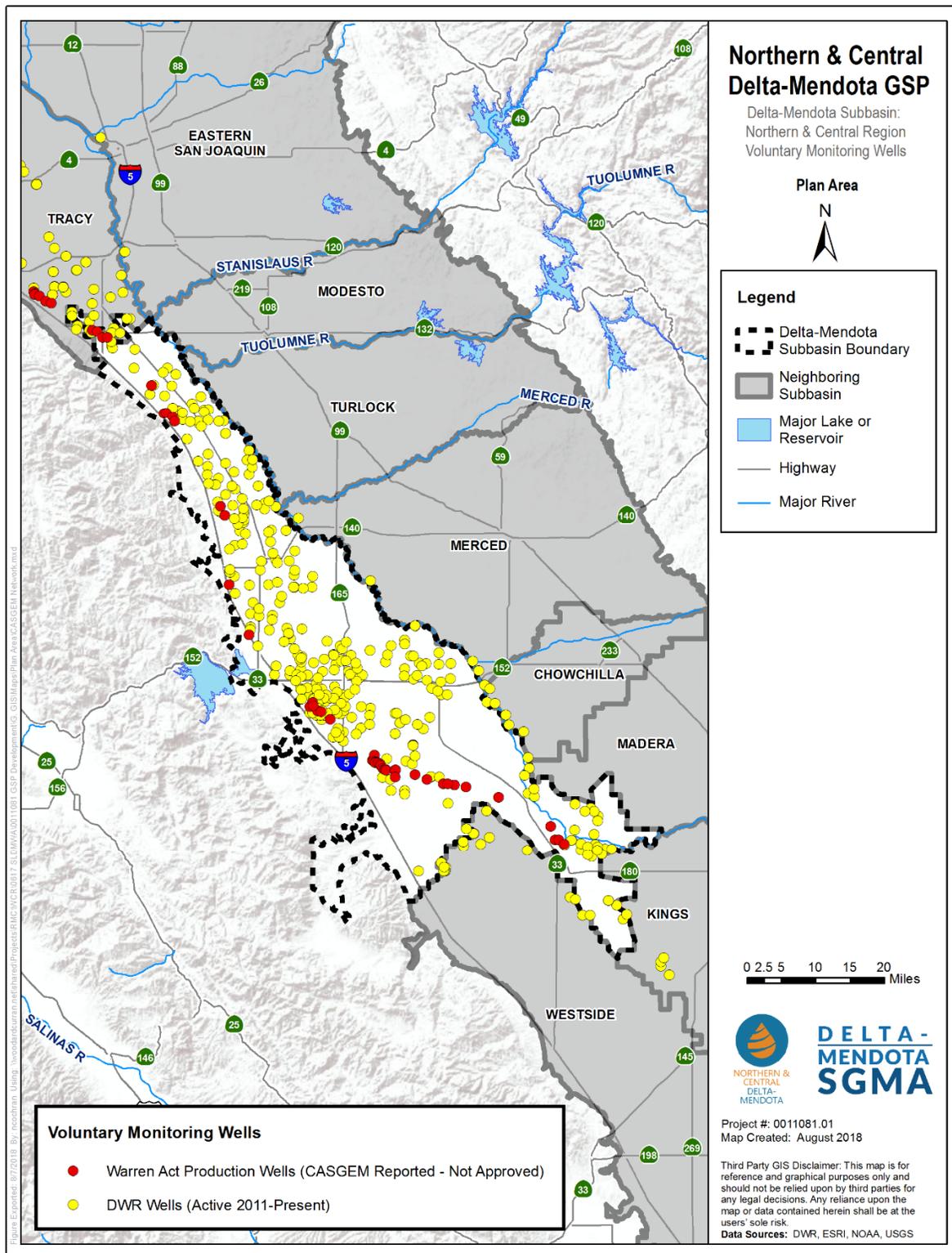


Figure 2-34. Voluntary Monitoring Wells in the Delta-Mendota Subbasin

2.3.3.9 Subsidence Monitoring

There are a variety of agencies that monitor subsidence in the San Joaquin Valley. Most of the agencies provide publicly available subsidence data that can be used by local agencies for groundwater management. **Table 2-8**, below, summarizes the monitoring agencies and methods.

Table 2-8. Summary of Subsidence Monitoring in the Central Valley

Agency	Subsidence Monitoring Method
DWR	<ul style="list-style-type: none"> • Extensometers and borehole extensometers • Surveying/Spirit Leveling
USGS	<ul style="list-style-type: none"> • Extensometers (National water Information System) • Interferometric Synthetic Aperture Radar (InSAR) • Surveying/Spirit Leveling
UNVACO	<ul style="list-style-type: none"> • Continuous Global Positioning System (CGPS) stations
NASA	<ul style="list-style-type: none"> • Uninhabited Aerial Vehicle Synthetic Aperture Radar (UAVSAR) (InSAR) • Gravity Recovery & Climate Experiment (GRACE)
San Joaquin River Restoration Program (SJRRP)	<ul style="list-style-type: none"> • Extensometers

2.3.3.9.1 DWR Surveying/Spirit Leveling

Spirit leveling is a precise way to obtain data for smaller land areas, and is commonly used along road, railroad tracks, aqueducts, and canals. DWR and the USBR have collected spirit-level measurements along the Delta-Mendota Canal and in the Central California Irrigation District since 1935.

2.3.3.9.2 USGS Extensometers (NWIS)

The USGS California network consists of 20 extensometer stations in the Central Valley with the intention of measuring subsidence. Of the 20 stations, four are located within the Delta-Mendota Subbasin: (1) The 365325120391501 station has subsidence data from 1958 through 2000 and 2009 through 2018; (2) the 364536120184301 station has subsidence data from 1966 through 1983 and 1999 through 2018; (3) the 364518120222401 station has subsidence data from 1999 through 2018; and (4) the 364518120222401 station has subsidence data from 1999 through 2018.

2.3.3.9.3 USGS InSAR

Interferometric Synthetic Aperture Radar (InSAR) takes high-density measurements over large areas by using radar signals from Earth-orbiting satellites to measure changes in land-surface altitude. USGS has records of 15 InSAR measurement points in California, three of which are within the Delta-Mendota Subbasin: the InSAR measurement point near Panoche Area, Oro Loma extensometer (12S/12E-16H2), and Panoche extensometer (14S/13E-11D6). All three InSAR measuring locations have data from 2003 to 2008.

2.3.3.9.4 University NAVSTAR Consortium (UNAVCO) CGPS

Continuous Global Positioning System (CGPS) stations have typically been constructed to monitor motions caused by plate tectonics but are widely used for other purposes, including subsidence monitoring. UNAVCO Plate Boundary Observatory (PBO) operates a network of about 1,100 CGPS and meteorology stations in the western U.S. There are six stations in the Delta-Mendota Subbasin: (1) The Mendota_CN2004 station (also referenced to as the P304 station) has subsidence data from 2004 through 2018. (2) The Los Banos_CN2005 station (also referenced to as the P303 station) has subsidence data from 2005 through 2018. (3) The Patterson_CN2005 station (also referenced as the 259 station) has subsidence data from 2005 through 2018. (4) The LilPanocheCN2004 station (also referenced as the P301 station) has subsidence data from 2004 through 2018. (5) The ArkansaCrkCN2006 station (also referenced as the P255 station) has subsidence data from 2006 through 2018. And (6) the QuintoCrk_CN2005 Station (also referenced as the P252 station) has subsidence data from 2005 through 2018.

2.3.3.9.5 NASA UAVSAR and InSAR

The National Aeronautics and Space Administration's (NASA) Uninhabited Aerial Vehicle Synthetic Aperture Radar (UAVSAR) uses an airborne radar to study a variety of parameters, including subsidence. The NASA UAVSAR and InSAR satellites measurements cover most of the Delta-Mendota Subbasin, with data gaps south of Patterson, Newman, and Gustine, east of Dos Palos, and north and south of Tranquillity. Available data for the Delta-Mendota Subbasin are limited to Spring 2015 through 2017, a 2-acre pixel grid, and measurement resolution within the range of 0.2 to 0.39 inches.

2.3.3.9.6 NASA GRACE

NASA's Gravity Recovery and Climate Experiment (GRACE) maps Earth's gravity field by making accurate measurements of the distance between two satellites, using Global Positioning System and a microwave ranging system. Among a variety of parameters, GRACE measures changes in hydrology and can be used as a subsidence measuring tool. GRACE's land water storage data is provided on a 0.5-degree global grid.

2.3.3.9.7 SJRRP Geodetic Network

The San Joaquin River Restoration Program (SJRRP) is a comprehensive long-term effort to restore flows to the San Joaquin River from Friant Dam to the confluence of Merced River and restore a self-sustaining Chinook salmon fishery in the river, while reducing or avoiding adverse water supply impacts from Restoration Program flows. The Program began monitoring subsidence in 2011, with the USBR surveying a network of over 70 subsidence monitoring points along the San Joaquin River and within the Delta-Mendota Subbasin in July and December of each year.

2.3.4 Implications of Existing Monitoring and Management Programs in this GSP

Several existing groundwater monitoring programs in the Northern and Central Delta-Mendota Regions will form the basis for future monitoring in these regions of the Delta-Mendota Subbasin. Specifically, appropriate monitoring stations currently being utilized for CASGEM, the Delta-Mendota Canal Groundwater Pump-in Program Water Quality Monitoring Program, the Western San Joaquin River Coalition Groundwater Quality Trend Monitoring Program and Real-time Monitoring Program will be utilized for groundwater elevation and quality monitoring programs, while appropriate existing extensometers and other subsidence monitoring stations will be utilized along with ongoing surveying programs in the Regions for subsidence monitoring. Over the long-term, the GSAs representing the Northern and Central Delta-Mendota Regions will be looking to streamline ongoing monitoring programs through coordination with the respective State and Federal agencies.

Several existing groundwater management and/or monitoring programs exist that may limit the operational flexibility of the groundwater basin. Programs with the largest impacts include the following:

USBR Delta-Mendota Canal Pump-in Program – Currently, the USBR issues five-year Warren Act Contracts to the DMC PIP Participating Districts that include additional design constraints to address their potential contribution to subsidence along the DMC. Each Warren Act Contract allows the annual introduction, conveyance, and storage of up to 10,000 AF of groundwater within federal facilities under a series of designed constraints and operating criteria, including the establishment of a static maximum depth to groundwater and Fall/Winter Median Levels, environmental protection measures, water quality, and groundwater monitoring and reporting.

The cumulative volume of groundwater introduced into the DMC under the PIP is limited to 50,000 AFY. The 50,000 AF is annually allocated by the Authority among the Participating Districts based on need. Introduction, conveyance, and storage of non-Project Water in CVP facilities is also subject to available capacity as determined by USBR. Furthermore, San Luis Water District, Panoche Water District, and Pacheco Water District require an exchange with the USBR in order to deliver a portion of the non-Project Water from the San Luis Canal. Exchanged water is used by the USBR to meet CVP demands downstream of the points of introduction and a like amount of CVP water is delivered to the respective districts participating in the exchange.

In general, constraints established and documented in the Final Environmental Assessment (EA) for the Delta-Mendota Canal Groundwater Pump-in Program Revised Design Constraints (EA-18-007) limit the volume and quality of water that can be pumped into the DMC, which may limit the ability to move water around the Delta-Mendota Subbasin to balance demands and supplies.

Irrigated Lands Regulatory Program - The Irrigated Lands Regulatory Program has been implemented by the CV-RWQCB to manage individual farm discharges to surface water and groundwater. Components of the program are specifically intended to regulate discharges to groundwater. Whenever a crop is grown, irrigated and fertilized, it is assumed that a portion of the soil amendments (specifically fertilizer) is converted to nitrate percolating to groundwater. This is intended to evaluate and manage the loading of nitrate to groundwater to minimize impacts to domestic groundwater users and the subbasin. Therefore, reductions in nitrate loading to the groundwater basin are linked to both reduced fertilizer use and/or to reduced irrigation (resulting in reduced percolation). As such, implementation of this regulation will have a net effect of reducing groundwater recharge from agricultural irrigation.

County Groundwater Use Ordinances – All of the counties in which the Delta-Mendota Subbasin lies include groundwater export limitations within their county ordinances. These ordinances will limit Subbasin operational flexibility by limiting the ability to move water around the Delta-Mendota Subbasin to balance demands and supplies.

Federal and/or State Drinking Water Standards- Federal and State drinking water standards are in place to be protective of human health, but they may limit Subbasin operational flexibility by limiting the ability to use groundwater to meet water demands without treatment. For example, naturally-occurring concentrations of hexavalent chromium exceed the State's proposed MCL of 10 parts per billion. Passage of this MCL will require the City of Patterson to treat all of its groundwater extractions prior to distribution, potentially limiting groundwater use to meet demands in this area without undue financial burden. Similar constraints may limit the ability of Delta-Mendota Subbasin to effectively use conjunctive use to meet all demands.

2.4 EXISTING AND PLANNED CONJUNCTIVE USE PROGRAMS

Conjunctive use programs in the Northern and Central Delta-Mendota Regions are currently implemented and planned by single agencies as well as through multi-agency partnerships. Maximizing the beneficial use of surface water, groundwater, and recycled water resources is of critical concern to water managers throughout the Delta-Mendota Subbasin, as urban and agricultural demands expand and as climate change continues to impact water supply availability. The following programs demonstrate efforts within the Northern and Central Delta-Mendota Regions to utilize existing water resources conjunctively and demonstrate feasibility to continue to implement conjunctive use projects in the future.

Del Puerto Water District is partnering with Central California Irrigation District on a 20-acre project to develop the Orestimba Creek Groundwater Recharge and Recovery Project, located in western Stanislaus County near the community of Newman. The proposed groundwater recharge facility near Orestimba Creek would allow the recharge of 500 AFY of surface water to the Delta-Mendota Subbasin. Existing connections to the Delta-Mendota Canal would deliver up to 500 AFY to the groundwater recharge facility and serve as a conveyance facility for deliveries during dry periods. A production well would be constructed to recover the banked water during dry periods, with the recharge water source varying from year to year. The proposed project would help provide a long-term solution by banking excess water during wet periods by diverting excess water and storing it in recharge ponds, accelerating the rate of groundwater recharge for the local aquifer. Monitoring or observation wells would be installed at key locations to monitor the rate of groundwater recharge. This data would also be used to determine the volume of water allowed to be extracted so that the rate of recharge would always exceed extraction.

Patterson Irrigation District (PID) primarily receives surface water deliveries and pumps groundwater on an as-needed basis. PID has focused its efforts on improving surface water deliveries and pumping efficiencies by recycling surface drainage, as opposed to limiting canal seepage. Deep percolation of irrigation water and distribution system losses recharge the groundwater within PID's service area. This stored groundwater supply is available to PID and others during drought conditions, thus recharge is an important component of PID's water management strategy.

Pacheco Water District and San Luis Water District maintain Warren Act contracts to allow pumping of groundwater meeting water quality standards into the Delta-Mendota Canal when surface water supplies are insufficient to meet demand. Pacheco Water District, San Luis Water District, and some landowners own deep wells tied into the Districts' and private surface water distribution systems. When surface waters are insufficient to meet demand, groundwater is conjunctively used with surface water supplies.

The North Valley Regional Recycled Water Program (NVRWP) is a large-scale conjunctive use project located primarily within San Joaquin, Stanislaus, and Merced Counties. A partnership between Del Puerto Water District, the City of Modesto, and the City of Turlock has been formed to implement the NVRWP. Tertiary-treated recycled water from the Cities of Modesto and Turlock will be blended with water in the Delta-Mendota Canal to provide deliveries of up to 59,000 AFY to farms within Del Puerto Water District's service area in San Joaquin, Stanislaus, and Merced Counties as well as south of the Delta Central Valley Project Improvement Act-designated Refuges. The NVRWP meets two critical objectives: the opportunity for the Cities of Modesto and Turlock to permanently remove their wastewater discharges to the San Joaquin River, reducing exposure to increasingly stringent regulatory requirements and putting recycled water to beneficial use; and a regional solution to address water supply shortages within Del Puerto Water District's service area.

Several GSAs in the Delta-Mendota Subbasin participate in the San Joaquin River Water Quality Improvement Project (SJRIP). The SJRIP is a project designed to reduce the amount of salt and selenium delivered to the San Luis Drain and Mud Slough through the Grassland Bypass. Specifically, under the SJRIP, shallow groundwater that would be extracted via tile drains are diverted to acreage for reuse rather than discharged to the San Luis Drain and Mud Slough. As of 2015, approximately 5,341 acres of the project site have been planted with salt-tolerant crops and irrigated with agricultural drainwater. Most of the salt-tolerant crops (3,863 acres) are located on 4,095 acres, commonly referred to as the eastern project area because they are situated east of Russell Avenue, near the city of Firebaugh, in Fresno County, California. An additional 1,861 acres, acquired in 2008 and referred as the western project area, were planted with 1,478 acres of salt-tolerant crops.

San Benito County includes two policies that encourage the support of future conjunctive use programs in their 2035 General Plan as an important component in reaching their sustainable water supply goals. Policy PFS-3.5 and PFS-3.6 are listed in Section 2.2.1.10 above.

In addition to projects directly managing conjunctive use and underground storage, underground storage occurs throughout the Delta-Mendota Subbasin through stormwater recharge and agricultural water recharge. Stormwater collects both naturally and artificially and eventually percolates through the ground and into aquifers for beneficial use

for both urban and agriculture. Recharge from agricultural water irrigation percolates into the ground and eventually into aquifers where it can be pumped again for use. Groundwater percolation also occurs through unlined irrigation ditches and canals. This natural and unmanaged recharge creates future opportunities for conjunctive use programs; however, this recharge may decline as farmers move toward more precise and water efficient irrigation methods.

2.5 PLAN ELEMENTS FROM CWC SECTION 10727.4

2.5.1 Control of Saline Water Intrusion

The Delta-Mendota Subbasin does not experience saline water intrusion; therefore, this element is not applicable to the Northern and Central Delta-Mendota Regions.

2.5.2 Wellhead Protection Areas and Recharge Areas

Wellhead Protection Areas, as defined under the Federal Wellhead Protection Program (Section 1428 of the Safe Drinking Water Act Amendments of 1986), are the surface and subsurface areas surrounding a water well or well field supply for a public water system through which contaminants are reasonably likely to move toward and reach such water or well field. The State of California's Drinking Water Source Assessment and Protection Program (DWSAP) serves as the State's Wellhead Protection Program. There are no existing local wellhead protection programs in the Northern and Central Delta-Mendota Regions; therefore, agencies within the Plan area adhere to federal, state, and county regulations governing wellhead protection.

Important sources of groundwater recharge in the Northern and Central Delta-Mendota Regions are derived from percolation of surface water (mainly from applied irrigation) as well as a small component of rainfall. Management of potential groundwater quality impacts associated with this recharge is through the Irrigated Lands Regulatory Program.

2.5.3 Migration of Contaminated Groundwater

There are several federal, state, and regional programs in place in the Northern and Central Delta-Mendota Regions to monitor for and mitigate groundwater contamination. The Central Valley Regional Water Quality Control Board, under the State Water Resources Control Board, has primary responsibility in enforcing water quality regulations within the Northern and Central Delta-Mendota Regions. The SLDMWA acts as the regional monitoring coordinator under the Groundwater Management Plans for the North and South Agencies in the Delta-Mendota Canal Service Area. As the regional monitoring coordinator, the SLDMWA has helped to better understand the hydrogeology of the Groundwater Management Areas, the vertical and lateral groundwater flow directions, and water quality based on the various groundwater monitoring activities supporting the Groundwater Management Plans. Such groundwater quality monitoring efforts have made participating agencies aware of new sources of contamination or changes in existing plumes of contamination that are occurring.

The San Joaquin County Environmental Health Department (SJCEHD) carries out the "Underground Injection Control" program with the purpose to protect public health and the environment from exposure to contaminants that may exist in shallow underground injection wells, such as dry wells, seepage pits, and sumps, that can transport contaminants to soil and groundwater. Activities include identifying, mapping, inspecting, and remediating potential or existing contaminant sources. The SJCEHD also permits and inspects well installation and destruction to minimize the potential for the wells to adversely impact groundwater. The Stanislaus County Department of Environmental Resources is also charged with protecting groundwater through the management of wells (construction and destruction), groundwater recharge, storage and recovery programs, contamination remediation and agricultural operations. Similarly, the Merced County Division of Environmental Health (MCEHD) and the Fresno County Division of Environmental Health (FCEHD) permit and inspect well installations, including the installation of appropriate well seals, and abandonments to minimize the potential for the wells to adversely impact groundwater. Additionally, San Joaquin County, Stanislaus County, Merced County, Fresno County, and SWRCB operate underground storage tank

programs with the primary focus of preventing contamination of groundwater by inspecting, permitting, monitoring, repairing, installation and removal of underground storage tanks.

San Benito County Code of Ordinances, Chapter 15.05.125 specifies that San Benito County Water District (SBCWD) may delineate certain areas with poor groundwater quality. The SBCWD can prevent the mixing of water from multiple aquifers if a proposed well construction, reconstruction, or destruction is in such an area. To allow the project to proceed, SBCWD may require a report prepared by a registered geologist or civil engineer with a stratigraphic description of the site and recommendations for the location and what types of seal(s) are necessary to prevent the migration of contaminated water.

The SWRCB's DDW (former under the California Department of Public Health) regularly collects data and monitors public drinking water supplies as part of the State's Drinking Water Program. Data are maintained in a database and utilized to develop reports and source water assessments. Under the Pesticide Contamination Prevention Act of 1985, the California Department of Pesticide Regulation (DPR) maintains a Ground Water Protection Program where DPR evaluates risk and monitors for pesticide contamination in groundwater, identifies sensitive areas, and develops mitigation measures to prevent further contamination. DPR adopts regulations to protect groundwater as part of the Ground Water Protection Program.

Finally, agricultural agencies with irrigated commercial cropland not covered under an individual order are subject to the CV-RWQCB's Irrigated Lands Regulatory Program, which requires a groundwater monitoring program for specified constituents under general orders for waste discharge requirements. Agencies that participate in Watershed Coalitions are required to coordinate their participation in irrigated lands programs for the Watershed Coalition as well as RWQCB.

2.5.4 Well Abandonment and Well Destruction Programs

A summary of the well abandonment and destruction programs within the Northern and Central Delta-Mendota Regions are detailed in Section 2.3.2 (County Well Construction/Destruction Standards and Permitting).

2.5.5 Activities Implementing, Opportunities for, and Removing Impediments to Conjunctive Use or Underground Storage

Conjunctive use management is already utilized by water managers throughout the Delta-Mendota Subbasin to increase storage and resiliency in the system in the face of increasing demands and climate change. Within the Northern and Central Delta-Mendota Regions, both small and large conjunctive use projects are currently being developed at the time of GSP development. A description of conjunctive use programs within the Northern and Central Delta-Mendota Regions are discussed in Section 2.4 (Existing and Planned Conjunctive Use Programs). There are also opportunities for additional conjunctive use and underground storage projects, which can be aided with efforts to reduce impediments to such projects.

The Groundwater Management Plan for the Northern Agencies in the Delta-Mendota Canal Service Area identified three primary focal points for potential conjunctive use opportunities: (1) Identify areas of local overdraft and evaluate the viability of a recharge program using direct recharge; (2) Evaluate the availability of additional surface water supplies, which could be utilized in conjunctive use programs either directly or via exchange of CVP supplies; and (3) Optimize the overall groundwater yield during dry periods through sound basin management. Conjunctive use has largely remained unmanaged throughout the Delta-Mendota Subbasin. When full surface water supplies are being received, less groundwater pumping occurs which allows for recharge through seepage and deep percolation of surface water. Whereas during dry periods, pumping increases to supplement curtailed surface water deliveries. There are many opportunities throughout the Delta-Mendota Subbasin to implement managed recharge projects and more emphasis has been placed on locating water supplies for recharge as water users experience more frequent and prolonged surface water shortages.

Cities and counties throughout the Subbasin have incorporated goals and policies into their General Plans to support conjunctive use projects. The City of Patterson completed an update to the City's General Plan in 2010 that includes new policies oriented toward implementing conjunctive use of recycled water and imported surface water supplies to augment the City's supplies through application to landscape irrigation and non-potable municipal uses providing in-lieu groundwater recharge. Fresno County's General Plan also includes policies to protect groundwater resources from contamination and overdraft by developing conjunctive use of surface water and groundwater. While local cities and counties have made efforts to remove impediments to conjunctive use and underground storage projects, there are impediments at the state and federal level causing barriers to local agencies trying to implement these types of projects.

Permitting required for direct groundwater basin augmentation is a major regulatory barrier to conjunctive use projects statewide. Active recharge of groundwater basins with surface water treated to drinking water standards typically requires obtaining Water Discharge Requirements (WDRs) for discharges to land from the State. As potable water is chlorinated, there is the potential to degrade groundwater through the introduction of chlorine and the formation of disinfection byproducts (DBP) in the subsurface. In 2012, the State adopted a state-wide General Order (Water Quality Order 2012-0010: General Waste Discharge Requirements for Aquifer Storage and Recovery Projects that Inject Drinking Water into Groundwater) that recognizes the benefits of storing treated surface water in aquifers. To obtain coverage under the General Permit, an application has to be made to the State, and includes preparation of an anti-degradation analysis. Regulatory approval is also required from the U.S. Environmental Protection Agency (EPA) for injecting water into underground aquifers. The U.S. EPA classifies aquifer storage recovery (ASR) wells as "Class V" injection wells, which are regulated through EPA's Underground Injection Control (UIC) Program. ASR wells would need to be registered as a Class V injection well through EPA's website.

In addition to regulatory barriers, legal, economic, and physical obstacles must be overcome to expand the development and implementation of conjunctive use projects statewide. Generally, in-lieu groundwater banking has not historically required permits, but under new regulations and programs to be developed under SGMA, it is unknown if this will remain true. Additionally, in some areas, the location of water available for recharge, the location of recharge facilities and the cost and engineering associated with implementing such recharge projects pose physical and economic challenges to such projects. Easing or removing these impediments would involve streamlining the regulatory process by passing additional legislation to make the process for approving and permitting conjunctive use projects easier, providing legal protections/agreements for the right to use banked water, supporting of local partnerships to increase the economy of scale, and providing funding support specifically targeted toward conjunctive use projects.

2.5.6 Measures Addressing Groundwater Contamination Cleanup, Groundwater Recharge, In-Lieu Use, Diversions to Storage, Conservation, Water Recycling, Conveyance, and Extraction Projects

Groundwater contamination cleanup activities are largely the responsibility of local agencies, such as the cities and the counties. As part of the CASGEM program, the SLDMWA has coordinated development of a basin-wide groundwater monitoring plan that includes a groundwater monitoring network approved by DWR. Historically, SLDMWA has also coordinated the development of Groundwater Management Plans for the Delta-Mendota Subbasin to address basin management and protection. The City of Patterson has included water supply planning and policy documents to increase local groundwater recharge and protect groundwater quality. Currently, Pacheco Water District and San Luis Water District as well as some local landowners own and operate deep wells to conjunctively manage surface water and groundwater. These facilities allow for the pumping and transfer of groundwater from areas of good water quality to areas where the water is needed.

All active recharge, in-lieu use, diversions to storage, and water recycling projects within the Northern and Central Delta-Mendota Regions are described in Section 2.5.5 (Activities Implementing, Opportunities for, and Removing Impediments to Conjunctive Use or Underground Storage).

Water conservation is implemented through various measures as documented in Urban Water Management Plans (UWMPs) and Agricultural Water Management Plans (AWMPs). Within the Northern and Central Delta-Mendota Regions, the City of Modesto, which serves the community of Grayson, and the City of Patterson submitted 2015 UWMPs. Within the 2015 UWMPs, Modesto and Patterson are required to address demand management measures that fall under the following categories: Water Waste Prevention Ordinances, Metering, Conservation Pricing, Public Education and Outreach, Programs to Assess and Manage Distribution System Real Losses, and Water Conservation Program Coordination and Staffing Report. The Cities are also required to demonstrate compliance with SBx7-7 (Water Conservation Act of 2009), which requires that water agencies reduce potable water demands 20% by 2020, where interim targets are reported in 2015 UWMPs.

Within the Northern and Central Delta-Mendota Regions, Patterson Irrigation District, West Stanislaus Irrigation District, and San Luis Water District submitted 2015 AWMPs. Agricultural water suppliers are required to implement and demonstrate the following efficient water management practices in their 2015 AWMPs: measure the volume of water delivered to customers and adopt a pricing structure for water customers based at least in part on quantity delivered. Additional efficiency measures are optional for agricultural water providers if they are locally cost effective and technically feasible. Patterson Irrigation District, West Stanislaus Irrigation District, and San Luis Water District all implement efficiency measures beyond what is required in the 2015 AWMPs, such as on farm evaluations.

The primary conveyance projects within the Northern and Central Delta-Mendota Regions are the Delta-Mendota Canal and California Aqueduct, which run the length of the Plan area. The Delta-Mendota Canal carries water southeasterly from the C.W. "Bill" Jones Pumping Plant to the Mendota Pool and is an essential irrigation supply as part of the San Luis Unit and the Central Valley Delta Division. Water from the Central Valley Project moved by the Delta-Mendota Canal is used for irrigation along the San Joaquin Valley and is meant to replace San Joaquin River water stored at Friant Dam. The canal is 116.5 miles long and terminates at the Mendota Pool, about 30 miles west of Fresno. Initial diversion capacity is 4,600 cubic feet per second (cfs), which gradually decreases to 3,211 cfs at the terminus. Many of the irrigation and water districts within the Northern and Central Delta-Mendota Regions purchase surface water from the Central Valley Project to offset additional water demand not met by groundwater.

The California Aqueduct is the primary conveyance structure for the State Water Project, carrying water from the Sacramento-San Joaquin Delta (Delta) to the San Joaquin Valley and Southern California. The San Luis Reservoir, which is located along the western border of the Central Delta-Mendota Region just outside the Subbasin, is a key facility jointly serving both the State Water Project and Central Valley Project. San Luis Reservoir is the largest off-stream reservoir in the United States and has a maximum capacity of up to 2 million AF (MAF) of water. The reservoir feeds water into the California Aqueduct and Delta-Mendota Canal and allows for storage of excess winter and spring flows diverted from the Delta until the water is needed by the State Water Project and Central Valley Project contractors.

The Delta-Mendota Canal Groundwater Pump-in Program is a basin-wide extraction project jointly operated by USBR and SLDMWA on behalf of the following SLDMWA Member Agencies: Banta Carbona Irrigation District, Byron-Bethany Irrigation District, Del Puerto Water District, Mercy Springs Water District, Panoche Water District, Pacheco Water District, San Luis Water District, and West Stanislaus Irrigation District. Warren Act Contracts from USBR are held by SLDMWA for the annual cumulative introduction of up to 50,000 AF of groundwater into the Delta-Mendota Canal to augment surface water deliveries from the Central Valley Project.

2.5.7 Efficient Water Management Practices, as defined in Section 10902, for the Delivery of Water and Water Conservation Methods to Improve the Efficiency of Water Use

As mentioned in Section 2.5.6 (Measures Addressing Groundwater Contamination Cleanup, Groundwater Recharge, In-Lieu Use, Diversions to Storage, Conservation, Water Recycling, Conveyance, and Extraction Projects), within the Northern and Central Delta-Mendota Regions, 2015 AWMPs were submitted by Patterson Irrigation District, West Stanislaus Irrigation District, Panoche Water District and San Luis Water District. Documented in the 2015 AWMPs are water conservation and efficiency measures implemented by each agency that are "reasonable and economically

justifiable programs to improve delivery and use of water used for agricultural purposes” (Section 10902(b)) and promote water conservation through “the reduction of the amount of water irretrievably lost to saline sinks, moisture-deficient soils, water surface evaporation, or non-crop evapotranspiration in the process of satisfying an existing beneficial use achieved either by improving the technology or method for diverting, transporting, applying, or recovering the water or by implementing of other conservation methods” (Section 10902(c)).

PID documented its adherence to BMPs for Agricultural Contractors in its 2015 AWMP. PID requires farmers to install PID-approved flow meters on new pressurized irrigation systems. The PID approval process consists of a list of specific devices or technologies to be approved, a written understanding of the obligations of the farmer/district regarding maintenance and access, and written requirements related to proper installation of the flow meters. PID also offers on-farm evaluations consisting of farm irrigation and drainage system evaluations using their mobile lab type assessments. While there has been a low level of interest for farm evaluations in the past, district staff are also readily available to landowners to answer questions regarding irrigation efficiency and provide recommendations for most efficient irrigation practices on a case by case basis. A wide array of water use and crop water use reports and information is also provided to growers, including their field water use by crop and comparison to district averages. PID maintains extensive materials in its water conservation library, which is available to staff, farmers, and the public. These materials include books and videos on water management, water measurements, soil-plant-water relationships, engineering, fertigation, etc. Tiered pricing as also been implemented by PID to discourage inefficient use.

West Stanislaus Irrigation District (WSID) documents its adherence to BMPs for Agricultural Contractors in its 2015 AWMP. WSID hosts grower seminars and short courses to promote BMPs for water quality improvement, provide information on new regulations and enforcement, provide information on available grants and resources, and other topics as determined necessary. On-farm irrigation system evaluations are coordinated through the San Luis & Delta-Mendota Water Authority and are performed to improve water use efficiency and water quality in local waterways. The District provides information about on-farm evaluation programs to customers and may offer incentives for participation.

Panoche Water District’s AWMP includes an inventory of the District’s water resources, location and facilities, documents GMPs used by their agricultural contractors, and outlines the District’s operating rules and regulations. BMPs utilized by the District include providing timely field and crop-specific water delivery information to the local growers, providing agricultural water management educational programs and materials, and using a tiered pricing system as an incentive for increased irrigation efficiency. The Plan also includes the Westside Regional Drainage Plan, which promotes the effective management of high saline drainage water and promoting drainage reuse.

San Luis Water District currently measures water at each individual grower turnout and collects a portion of its revenue based on the quantity of water delivered to growers. The District has already implemented the following “conditional” efficient water management practices (EWMPs) identified in Water Code § 10608.48: alternative land use, recycled water use, on-farm irrigation system improvements, incentive pricing, distribution system improvements, order/delivery flexibility, supplier spill and tailwater systems, conjunctive use, automated canal controls, facilitated customer pump test and evaluations, designate a Water Conservation Coordinator, water management services to customers, and supplier pump efficiency.

2.5.8 Efforts to Develop Relationships with State and Federal Regulatory Agencies

Entities in the Northern and Central Delta-Mendota Regions, as well as throughout the Delta-Mendota Subbasin, have a long history of working with both state and federal agencies. Such state agencies include DWR, SWRCB, CV-RWQCB, and California Department of Fish and Wildlife (CDFW). Long-standing relationships on the federal side include the USBR and U.S. Fish and Wildlife Service (USFWS).

The Northern and Central Delta-Mendota Regions water managers have a long history of working with DWR through the SWP and CASGEM program. Oak Flat Water District holds a long-term water supply contract for water service

from the SWP, which was executed in 1965 and deliveries beginning in 1968. Oak Flat Water District's contract Table A delivery is 5,700 AFY. Additionally, Oak Flat Water District participates in various water transfer and substitution programs through the SWP. Other entities in the Northern and Central Delta-Mendota Regions have entered into short-term contracts with DWR to use SWP conveyance structures and participate in water transfers. An exchange agreement among DWR, USBR, Del Puerto Water District, and Oak Flat Water District, executed in May 2014, approved the exchange of up to 2,000 AF of Del Puerto Water District's CVP water supplies for an equivalent amount of Oak Flat Water District's approved SWP water supplies through April 2015. Deliveries were made using Oak Flat's turnouts in the California Aqueduct. In exchange, USBR made an equivalent amount of Del Puerto Water District's CVP water supplies available to DWR at O'Neill Forebay. During 2015, a total of 19 AF was delivered to Oak Flat's turnouts under this agreement.

Water managers in the Northern and Central Delta-Mendota Regions also participate in groundwater level monitoring programs through DWR. The San Luis & Delta-Mendota Water Authority, of which many Northern and Central Delta-Mendota Regions water agencies are Member Agencies, is the CASGEM monitoring entity for the Delta-Mendota Subbasin.

Surface water rights holders within the Northern and Central Delta-Mendota Regions coordinate with the SWRCB Division of Water Rights annually to report surface water extractions. West Stanislaus Irrigation District, Twin Oaks Irrigation District, and El Solyo Water District are the primary surface water rights holders in the Northern and Central Delta-Mendota Regions. West Stanislaus Irrigation District is entitled to extract up to 189,790 AFY from the San Joaquin and Tuolumne rivers, Twin Oaks Irrigation District is entitled to 10,560 AFY from the San Joaquin River, and El Solyo Water District is entitled to 22,805 AFY from the San Joaquin River.

Through the CV-RWQCB, many Northern and Central Delta-Mendota Regions entities participate in the ILRP through the Westside San Joaquin River Watershed Coalition and Grassland Drainage Area Coalition. The ILRP was initiated in 2003 to prevent agricultural runoff from impairing surface waters, and in 2012, groundwater regulations were added to the program. Waste discharge requirements, which protect both surface water and groundwater, address irrigated agricultural discharges throughout the Central Valley. Commercial growers are required to implement management practices to protect water quality and submit farm information to either their coalition or the Central Valley Water Board. Monitoring reports, assessment reports, management plans, surface water quality data, and groundwater quality data are required to be developed and collected by coalitions and must be submitted to the CV-RWQCB.

CDFW owns and operates wildlife areas and conservation easements throughout the Delta-Mendota Subbasin (**Figure 2-7**). The Mendota Wildlife Area, North Grasslands Wildlife Area, Little Panoche Reservoir Wildlife Area, O'Neill Forebay Wildlife Area, and West Hilmar Wildlife Area are operated by CDFW. Entities in the Northern and Central Delta-Mendota Regions have developed similar relationships with the USFWS. San Luis National Wildlife Refuge and San Joaquin River National Wildlife Refuge are the primary federally-owned and -operated refuges in or adjoining the Northern and Central Delta-Mendota Regions. While there are no formal working relationships between local water managers and CDFW or USFWS relating to land use and water supply planning, local water managers have conducted informal discussions with representatives from CDFW and USFWS representatives regarding involvement in SGMA activities.

Water from the CVP is delivered to the following Northern and Central Delta-Mendota Regions purveyors, as available: Del Puerto Water District, West Stanislaus Irrigation District, Patterson Irrigation District, San Luis Water District, Panoche Water District, Eagle Field Water District, Oro Loma Water District, Mercy Springs Water District, Fresno Slough Water District, Tranquillity Irrigation District, and Pacheco Water District. CVP deliveries to these contractors began the early 1950s. CVP water has been a crucial water supply source throughout the Delta-Mendota Subbasin and agreements with USBR to use CVP facilities for water transfers and substitutions, such as for the North Valley Regional Recycled Water Project, are vital to maximize the beneficial use of water throughout the Delta-Mendota Subbasin.

2.5.9 Processes to Review Land Use Plans and Efforts to Coordinate with Land Use Planning Agencies to Assess Activities that Potentially Create Risk to Groundwater Quality or Quantity

Entities with land use authority in the Delta-Mendota Subbasin includes the counties, cities, and communities overlying the basin. Within the Delta-Mendota Subbasin, these same entities are either individual GSAs or part of larger GSAs participating in the development and implementation of this GSP. As such, land use planning is integrally combined with groundwater management through the implementation of this GSP.

2.5.10 Impacts on Groundwater Dependent Ecosystems

A description of the impacts on groundwater dependent ecosystems can be found in Chapter 6, Sustainable Management Criteria, Section 6.2, Undesirable Results of this GSP.

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