

# RECLAMATION

*Managing Water in the West*

**Final Environmental Assessment**

## **Additional One-Year Extension of the Mendota Pool Group Exchange Agreements**

**EA-17-053**



U.S. Department of the Interior  
Bureau of Reclamation  
South-Central California Area Office

**May 2018**

## **Mission Statements**

The Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

# Contents

	Page
<b>Section 1 Introduction .....</b>	<b>1</b>
1.1 Background .....	1
1.2 Need for the Proposed Action.....	2
<b>Section 2 Alternatives Including the Proposed Action .....</b>	<b>3</b>
2.1 No Action Alternative.....	3
2.2 Proposed Action.....	3
2.2.1 MPG Exchange Program .....	4
<b>Section 3 Affected Environment and Environmental Consequences.....</b>	<b>7</b>
3.1 Resources Eliminated from Further Analysis .....	7
3.2 Biological Resources .....	8
3.2.1 Affected Environment.....	8
3.2.2 Environmental Consequences .....	10
3.3 Water Resources .....	12
3.3.1 Affected Environment.....	12
3.3.2 Environmental Consequences .....	17
<b>Section 4 Consultation and Coordination.....</b>	<b>21</b>
4.1 Public Review Period.....	21
4.2 List of Agencies and Persons Consulted.....	21
<b>Section 5 References .....</b>	<b>23</b>
Figure 1 Project Location and Vicinity.....	1
Figure 2 Subsidence Rates for the Central Valley for July 2012 to July 2017.....	16
Table 1 Resources Eliminated from Further Analysis .....	7
Table 2 Federally Listed Threatened and Endangered Species .....	8
Table 3 Annual MPG Pumpage 2005-2016.....	12
Appendix A   Comment Letter and Reclamation's Responses to Comments	
Appendix B   Cultural Resources Determination	



# Section 1 Introduction

The Bureau of Reclamation (Reclamation) provided the public with an opportunity to comment on the Draft Finding of No Significant Impact (FONSI) and Draft Environmental Assessment (EA) between April 20, 2018 and May 10, 2018. Reclamation received one comment letter. The comment letter and Reclamation's response to comments are included in Appendix A. Changes between this Final EA and the Draft EA, which are not editorial and minor in nature, are indicated by a line in the left margin of this document.

## 1.1 Background

Reclamation currently executes annual exchange agreements with the Mendota Pool Group (MPG) and Donald J. Peracchi and affiliates (Peracchi). Members of the MPG and Peracchi own and/or operate farmland served from the San Luis Canal in Westlands Water District (Westlands), as well as in the vicinity of the Mendota Pool in Farmers Water District (Farmers WD) and surrounding areas (see Figure 1). The annual exchange agreements allow MPG farmers and Peracchi to cumulatively exchange up to 25,000 acre-feet (AF) of groundwater pumped into the Mendota Pool for Central Valley Project (CVP) irrigation water delivered to their lands in Westlands via the San Luis Canal.

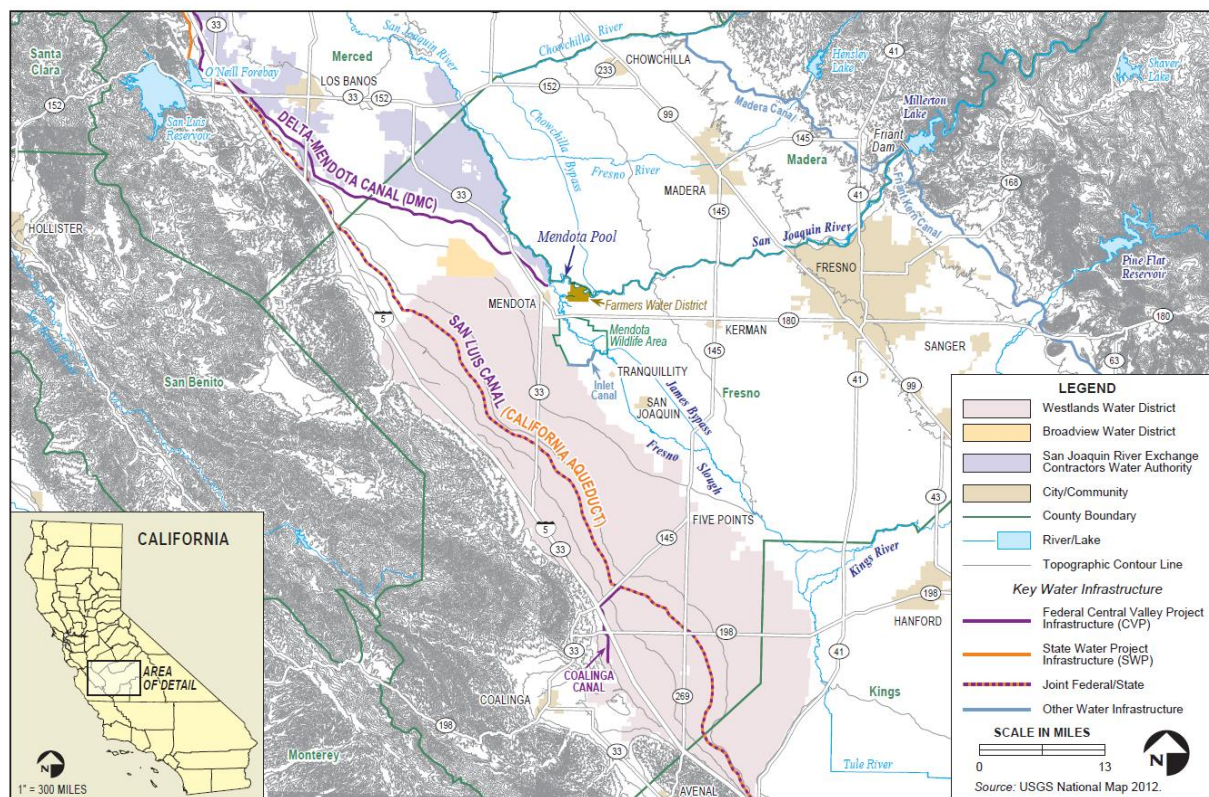


Figure 1 Project Location and Vicinity

The environmental documentation for the exchange agreements includes the 2005 Environmental Impact Statement (EIS) for the 10-year MPG exchange program (EIS-01-081) and a 2012 EA for the annual exchange agreements with Peracchi (EA-12-023) (Reclamation 2005, 2012). In addition, Reclamation executed a series of one-year exchange agreements with the MPG and Peracchi over a three-year period (2015-2018) to extend the existing 10-year exchange program that ended February 28, 2015 (EA-14-033; Reclamation 2015). For the purposes of this document, all subsequent references to the MPG will include both formal MPG members as well as Peracchi.

These documents evaluated the impacts to groundwater levels, groundwater quality, land subsidence, surface water quality and sediment quality in the Mendota Pool, biological resources, CVP operations, archaeological and cultural resources, Indian Trust Assets, land use, traffic, air quality, noise, environmental justice, and socioeconomics and are hereby incorporated by reference.

The 10-year MPG exchange program was anticipated to have less-than significant effects on the majority of resource areas considered in the analysis. The primary adverse effect of the action was to increase the cumulative rate of groundwater quality degradation in wells west of the Mendota Pool, primarily MPG wells. Mitigation actions that addressed potential impacts of the exchange program were included in the EIS and incorporated into the exchange agreements. These mitigation actions include a baseline pumping program, design constraints, a monitoring program, and adaptive management.

Since the 10-year MPG exchange program expired in February 2015, the MPG have requested a subsequent 20-year exchange program. Reclamation and Westlands are preparing a joint EIS/Environmental Impact Report (EIR) pursuant to the National Environmental Policy Act and California Environmental Quality Act for the proposed 20-year exchange program. However, since the environmental review of the proposed 20-year exchange program is not likely to be completed before the expiration of the existing three-year extension to the MPG exchange program, the MPG have requested a one-year extension of the existing program.

## **1.2 Need for the Proposed Action**

Due to legislative, regulatory, and environmental actions, the reliability of Westlands' CVP supply has been reduced substantially. MPG landowners in Westlands need to supplement their water deliveries with affordable water in order to maintain production on historically irrigated lands. The proposed one-year extension would allow the MPG to receive this supplemental water source while environmental review on the proposed 20-year exchange program is being prepared.

## Section 2 Alternatives Including the Proposed Action

This EA considers two possible actions: the No Action Alternative and the Proposed Action. The No Action Alternative reflects future conditions without the Proposed Action and serves as a basis of comparison for determining potential effects to the human environment.

### 2.1 No Action Alternative

Under the No Action Alternative, Reclamation would not execute one-year exchange agreements with the MPG. Additional water supplies would need to be acquired to meet the demands for their existing farmland in Westlands should CVP water supplies be insufficient. Groundwater pumping by farmers around the Mendota Pool would continue to be used for irrigation of lands adjacent to the Pool, as well as transfers or exchanges that do not involve Reclamation.

### 2.2 Proposed Action

Reclamation proposes to execute one-year exchange agreements with the MPG, thus providing a one-year extension until the joint EIS/EIR for the 20-year exchange program is completed. Under the proposed one-year exchange agreements, groundwater pumped annually into the Mendota Pool, minus losses, would be used by Reclamation to offset existing water contract obligations at the Mendota Pool. Reclamation would then reduce CVP deliveries to the Mendota Pool by the quantity exchanged and make an equivalent amount of CVP water (up to 25,000 AF per year (AFY) available via the San Luis Canal to be delivered to the MPG lands in Westlands for irrigation purposes.

Groundwater pumping would be conducted over a maximum of nine months each year, between March 1 and November 30, and would follow the same annual pumping program as the existing MPG pumping program, with modifications to the design constraints. The MPG pumping program consists of three seasonal components: spring, summer, and fall. During the spring (March through May), both shallow (< 130 feet deep) and deep (>130 feet deep and above Corcoran Clay) wells may be pumped. During the summer (June through mid-September) when groundwater levels are generally lower, only shallow wells may be pumped. However, during years when the program does not begin until after April 1, deep wells may be pumped during the month of June. During the fall (mid-September through November), both shallow and deep wells may be pumped.

Specific conditions for the proposed exchange agreements includes the following:

- Reclamation's environmental analysis and the implementation of the required design constraints and monitoring program, as described in Section 2.2.1, is conditioned

upon the annual execution of the agreements between the MPG, the San Joaquin River Exchange Contractors and Paramount Farming Company (now referred to as Wonderful Orchards), and notification on or about March 15 of the year that the agreements are in effect. Reclamation may execute the exchange agreements with the MPG once confirmation has been received from the San Joaquin River Exchange Contractors and Wonderful Orchards.

- In order to ensure that the effects of the pump-in program by the MPG are within the scope of analysis covered in this EA and that they are in compliance with any executed annual exchange agreements with Reclamation, the MPG are required to fully and promptly comply with the required annual agreements executed between the MPG, the San Joaquin River Exchange Contractors, and Wonderful Orchards. If there are modifications to the design constraints and monitoring program that are outside the scope of the analysis covered in this EA, or if unexpected impacts occur that were not analyzed, additional environmental review and approval by Reclamation will be required.
- In the event the joint EIS/EIR for the proposed 20-year exchange program is approved, the one-year exchange agreements under this Proposed Action would be superseded by the requirements of the 20-year exchange program.
- No new infrastructure, new facilities, or ground disturbing activities would be needed for movement of this water. However, normal pumping and irrigation practices may require refurbishing or replacement of existing wells. Some wells may be taken out of service and replaced during this program due to water quality impacts, poor yield, and/or disrepair.
- No native or untilled lands for three years or more would be cultivated with water involved with these actions. In addition, the Proposed Action would be subject to the same environmental commitments and design constraints placed on the current MPG exchange program as described below.

### **2.2.1 MPG Exchange Program**

The current pumping program for the MPG exchange program is adaptively managed to minimize environmental impacts. MPG pumping is developed and reviewed on an annual basis to allow for year-to-year variations in hydrologic conditions which are defined in the spring, prior to the start of pumping. The annual pumping program is based on the consideration of several factors including the design constraints (e.g., water quality at the San Joaquin River Exchange Contractor's canal intakes or at the Mendota Wildlife Area), the results of the previous year's monitoring program, the extent of groundwater level recovery, hydrologic conditions, and any Reclamation contractor's rescheduling of CVP deliveries from the previous water year. These factors would continue under the Proposed Action.

#### ***Design Constraints***

The existing MPG pumping program includes design constraints intended to minimize the potential environmental impacts of the pumping program. The constraints apply to the annual pumping program and to triggers based on the results of the annual monitoring program. The constraints include the following measures:



- Pump MPG wells along the Fresno Slough only when flow in the Fresno Slough is to the south. Wells in Farmers WD could pump irrespective of flow direction.
- Shut off MPG wells if electrical conductivity (EC) measurements at the San Joaquin River Exchange Contractors' canal intakes exceed that of the Delta-Mendota Canal flow into the Mendota Pool (as measured at Check 21) by 90 micromhos per centimeter ( $\mu\text{mhos/cm}$ ) for a period of three days or more. If the MPG wells are shut off for this reason, they would not be turned back on until the EC at the canal intakes returns to a level that is no more than 30  $\mu\text{mhos/cm}$  above the Delta-Mendota Canal inflow.
- Minimize deep zone drawdowns by reducing MPG deep zone transfer pumping during the summer months when the majority of non-MPG irrigation pumping occurs in the Mendota area.
- Limit total transfer pumping from the deep zone to 12,000 AFY to reduce subsidence, reduce water level impacts, and minimize the rate of groundwater quality degradation that would otherwise occur. Deep wells are defined as those with a perforated interval greater than 130 feet deep, while shallow wells are defined as those with a perforated interval less than 130 feet deep.
- Limit deep zone drawdowns throughout the pumping program to limit subsidence at the Yearout Ranch and Fordel extensometers caused by transfer pumping to less than an average of 0.005 foot per year. Compaction data collected from the extensometers will be used along with model results to estimate the amount of subsidence caused by the MPG pumping each year.
- Reduce transfer pumping if there is evidence that transfer pumping is causing long-term overdraft.
- Modify the pumping program based on the results of the surface water monitoring program to reduce overall surface water quality degradation, particularly with respect to salinity [total dissolved solids (TDS) or EC]. This will ensure that the quality of water supplied to the Mendota Wildlife Area and other users in the southern portion of the Mendota Pool will meet applicable water quality criteria. Water with TDS concentrations greater than 1,600 milligram per liter (mg/L) will not be pumped into the Mendota Pool as part of the Proposed Action. During the fall pumping period, when there is reduced flow in the Mendota Pool and water quality at the Mendota Wildlife Area is most critical, water with TDS higher than 1,200 mg/L will not be pumped into the Mendota Pool for transfer.
- Monitor during the fall (September, October, and November) pumping period when water quality at the Mendota Wildlife Area is most critical and the quality of water flowing into the Mendota Wildlife Area shall not exceed a monthly average of 450 mg/L.
- Shut off wells with selenium concentrations equal to or greater than the water quality criterion of 2 microgram per liter ( $\mu\text{g/L}$ ).
- Shut off wells with boron concentrations equal to or greater than the water quality criterion of 800  $\mu\text{g/L}$ .
- Minimize groundwater quality degradation by modifying the pumping program, based on the results of predictive modeling of the effects of the pumping program and the results of the groundwater monitoring program, and by minimizing drawdowns.

In addition to these measures, the MPG financially compensates the other major groundwater pumpers in the Mendota area for increased power and other additional costs due to drawdowns

estimated to have been caused by the MPG transfer pumping. The existing design constraints and financial compensation would continue under the Proposed Action.

### ***Monitoring Program***

The MPG, in cooperation with other interested parties, has designed a surface water, groundwater, and subsidence monitoring program to assess the impacts of this action. The current monitoring program was developed with input from the U.S. Fish and Wildlife Service (Service), the U.S. Geological Survey (USGS), and the California Department of Fish and Wildlife (CDFW). The monitoring program was initiated in 1999 and was planned to last for the duration of the 10-year exchange program. This monitoring program has continued under the three-year extension, and would continue under the Proposed Action, with modifications. In 2001, the MPG implemented a sediment sampling program, conducted every three years, to assess accumulation of selenium, boron, arsenic, and molybdenum in Mendota Pool sediments. This was completed in 2017, so would not be conducted under the Proposed Action. The monitoring program that will continue consists of the following components:

- Monitor pumpage of the MPG wells on at least a monthly basis
- Measure groundwater levels on a monthly basis throughout the year
- Conduct continuous monitoring at the Yearout Ranch and Fordel extensometers to estimate compaction and land subsidence
- Sample groundwater quality on an annual basis
- Evaluate data from continuous EC recorders located at the Delta-Mendota Canal, the Exchange Contractors' intakes, MPG discharge points to the Mendota Pool, and the Mendota Wildlife Area at regular intervals
- Conduct monthly surface water quality monitoring during periods of exchange

A quality assurance/quality control program is in place to verify accuracy of monitoring data. The monitoring data are provided to Reclamation to verify full implementation of the pumping and monitoring plan. In addition, monitoring data are provided to the Service, CDFW, San Joaquin River Exchange Contractors, and Wonderful Orchards, among others. All of those procedures would continue under the Proposed Action.

Data collected by the MPG for the 10-year exchange program and three-year extension has been summarized in annual monitoring reports prepared jointly by the MPG, San Joaquin River Exchange Contractors, and Wonderful Orchards at the conclusion of each pumping season. The results of the monitoring program are used in the design of the subsequent year's pumping program.

## Section 3 Affected Environment and Environmental Consequences

This section identifies the potentially affected environment and the environmental consequences involved with the Proposed Action and the No Action Alternative, in addition to environmental trends and conditions that currently exist.

### 3.1 Resources Eliminated from Further Analysis

Reclamation analyzed the affected environment and determined that the Proposed Action did not have the potential to cause direct, indirect, or cumulative adverse effects to the resources listed in Table 1.

Table 1 Resources Eliminated from Further Analysis

Resource	Reason Eliminated
Air Quality	Groundwater pumping by the MPG would occur with or without the Proposed Action and is therefore part of the existing conditions. No new construction or new facilities would be needed under the Proposed Action to deliver groundwater to the Mendota Pool. In addition, delivery of CVP water via the San Luis Canal to Westlands is water that would be delivered from existing facilities with or without the Proposed Action and is therefore part of the existing conditions. As there would be no change from existing conditions, a conformity analysis is not required and there would be no impact to air quality as a result of the Proposed Action.
Cultural Resources	Reclamation has determined that the Proposed Action does not have the potential to cause effects to historic properties pursuant to 36 Code of Federal Regulations Part 800.3(a)(1). See Appendix B for Reclamation's Determination.
Environmental Justice	The Proposed Action would not cause dislocation, changes in employment, or increase flood, drought, or disease nor would it disproportionately impact economically disadvantaged or minority populations.
Global Climate Change	The Proposed Action does not include construction of new facilities or modification to existing facilities. While pumping would be necessary to deliver CVP water, no additional electrical production beyond baseline conditions would occur. In addition, the generating power plant that produces electricity for the electric pumps operates under permits that are regulated for greenhouse gas emissions. As such, there would be no additional impacts to global climate change. Global climate change is expected to have some effect on the snow pack of the Sierra Nevada and the runoff regime. It is anticipated that climate change would result in more short-duration high-rainfall events and less snowpack runoff in the winter and early spring months by 2030, compared to recent historical conditions (Reclamation 2016, pg 16-26). However, the effects of this are long-term and are not expected to impact CVP operations within the one-year window of this action. Further, CVP water allocations are made dependent on hydrologic conditions and environmental requirements. Since Reclamation operations and allocations are flexible, any changes in hydrologic conditions due to global climate change would be addressed within Reclamation's operation flexibility.
Indian Sacred Sites	The Proposed Action would not limit access to ceremonial use of Indian Sacred Sites on federal lands by Indian religious practitioners or significantly adversely affect the physical integrity of such sacred sites. Therefore, there would be no impacts to Indian Sacred Sites as a result of the Proposed Action.
Indian Trust Assets	The Proposed Action would not impact Indian Trust Assets as there are none in the Proposed Action area.
Land Use	Under the Proposed Action, MPG would not change historic land and water

	management practices. Groundwater would continue to be pumped from existing wells and delivered to the Mendota Pool as it has been done for the MPG pumpers in the past. Pumped groundwater would be exchanged with Reclamation for a like amount, minus losses, of CVP water. Water delivered to their respective lands in Westlands would be done through existing facilities and would be used on existing crops. The water would not be used to place untilled or new lands into production, or to convert undeveloped land to other uses. Therefore, there would be no change to land use.
Noise	There would be no additional noise impacts under the Proposed Action as groundwater pumping into the Mendota Pool by MPG wells would occur with or without the Proposed Action and is therefore part of the existing conditions. In addition, there would be no physical changes to the environment or construction activities that could result in noise impacts.
Socioeconomics	The Proposed Action would have beneficial impacts on socioeconomic resources as exchanged water would be used to help sustain existing permanent crops and maintain farming on MPG lands within Westlands.
Traffic	The Proposed Action would not change regional traffic circulation. In addition, no physical changes to the environment or construction activities would occur that could impact traffic in the Action area.

## 3.2 Biological Resources

### 3.2.1 Affected Environment

The Proposed Action area includes the MPG lands in Westlands and the Mendota Pool area (waters from MPG, Peracchi, and non-MPG pumpers). Habitat types in the area are primarily cultivated agricultural lands which include field crops, vineyards, and orchards. These areas also include the irrigation water delivery systems and drainage canals.

Reclamation requested an official species list for the entire Action area (Westlands and Mendota Pool area) from the Service on January 12, 2018, by accessing their database: <https://ecos.fws.gov/ipac/> (Consultation Code: 08ESMF00-2018-SLI-0870). Reclamation further queried the California Department of Fish and Wildlife, California Natural Diversity Database (CNDDB) for records of protected species within 10 miles of the project location (CNDDB 2018). The two lists, in addition to other information within Reclamation's files were combined to create the following list (Table 2).

Table 2 Federally Listed Threatened and Endangered Species

Species	Status <sup>1</sup>	Effects <sup>2</sup>	Potential to occur and summary basis for ESA determination <sup>3</sup>
<b>Amphibians</b>			
California red-legged frog ( <i>Rana draytonii</i> )	T	NE	<b>Absent.</b> This species cannot use actively farmed lands and has not been documented at Mendota Pool. Not found on the valley floor anymore. Predatory nonnative fish and bullfrogs at Mendota Pool would prey on eggs and tadpoles.
California tiger salamander ( <i>Ambystoma californiense</i> )	T	NE	<b>Absent.</b> Agricultural activity precludes use by rodents whose burrows provide upland refugia; Mendota Pool contains predatory fish and bullfrogs.
<b>Birds</b>			
western yellow-billed cuckoo ( <i>Coccyzus americanus occidentalis</i> )	T	NE	<b>Absent.</b> Project area located outside of current known range. Suitable habitat limited and not observed during habitat assessment survey (Reclamation 2015). Not likely to occur due to extended absence from the region.
<b>Fish</b>			

Species	Status <sup>1</sup>	Effects <sup>2</sup>	Potential to occur and summary basis for ESA determination <sup>3</sup>
Delta smelt ( <i>Hypomesus transpacificus</i> )	T	NE	<b>Absent.</b> No natural waterways within the species' range would be affected by the Proposed Action.
Central Valley Spring-run Chinook salmon ( <i>Oncorhynchus tshawytscha</i> ) <sup>4</sup>	T (NMFS)	NE	<b>Absent.</b> No natural waterways within the species' range would be affected by the Proposed Action.
Central Valley steelhead ( <i>Oncorhynchus mykiss</i> )	T (NMFS)	NE	<b>Absent.</b> No natural waterways within the species' range would be affected by the Proposed Action.
<b>Invertebrates</b>			
vernal pool fairy shrimp ( <i>Branchinecta lynchi</i> )	T	NE	<b>Absent.</b> No land use changes would occur as a result of this action, no conversion of habitat, and no new facilities. In addition, agricultural activities in the past would have destroyed any seasonal wetlands, if any were ever present.
longhorn fairy shrimp ( <i>Branchinecta longiantenna</i> )	E	NE	<b>Absent.</b> Species does not occur in Proposed Action area. No land use changes would occur as a result of this action, no conversion of habitat, and no new facilities.
vernal pool tadpole shrimp ( <i>Lepidurus packardii</i> )	E	NE	<b>Absent.</b> Species does not occur in Proposed Action area. No land use changes would occur as a result of this action, no conversion of habitat, and no new facilities.
<b>Mammals</b>			
Fresno kangaroo rat ( <i>Dipodomys nitratoideis exilis</i> )	E, X	NE	<b>Absent.</b> The study area occupies part of this species' historical range. However, the most likely areas that the species might still occur are on native lands at the Alkali Sink Ecological Reserve, Madera Ranch, and some nearby areas of privately owned lands, which are outside of the Proposed Action area. Critical habitat absent from Proposed Action area.
giant kangaroo rat ( <i>Dipodomys ingens</i> )	E	NE	<b>Absent.</b> This species cannot use actively farmed lands.
San Joaquin kit fox ( <i>Vulpes macrotis mutica</i> )	E	NE	<b>Possible.</b> Kit foxes might forage in some of the agricultural lands that would receive water as part of the Proposed Action, but the foxes would not be expected to den there.
Tipton kangaroo rat ( <i>Dipodomys nitratoideis nitratoideis</i> )	E	NE	<b>Absent.</b> This species cannot use actively farmed lands.
<b>Plant</b>			
California jewelflower ( <i>Caulanthus californicus</i> )	E	NE	<b>Absent.</b> Does not occupy aquatic areas such as Mendota Pool and can't grow in agricultural fields.
palmate-bracted bird's-beak ( <i>Cordylanthus palmatus</i> )	E	NE	<b>Absent.</b> Does not occupy aquatic areas such as Mendota Pool and can't grow in agricultural fields.
San Joaquin woolly-threads ( <i>Monolopia congdonii</i> )	E	NE	<b>Absent.</b> Does not occupy aquatic areas such as Mendota Pool and can't grow in agricultural fields.
<b>Reptiles</b>			
Blunt-nosed leopard lizard ( <i>Gambelia sila</i> )	E	NE	<b>Absent.</b> This species cannot use actively farmed lands.
Giant garter snake ( <i>Thamnophis gigas</i> )	T	NE	<b>Possible.</b> Documented in the Mendota Pool area (Hansen 2008). Species is sensitive to impaired water quality. No land use changes would occur as a result of this action, no conversion of habitat, and no new facilities. Proposed Action is subject to environmental commitments and design constraints to provide protection to the species as were followed during the MPG exchange program, see Section 2.2.1.

- 1 Status = Status of federally protected species protected under the Endangered Species Act.
  - E: Listed as Endangered
  - NMFS: Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service
  - T: Listed as Threatened
  - X: Critical Habitat designated for this species
- 2 Effects = ESA Effect determination
  - NE: No Effect anticipated from the Proposed Action to federally listed species or designated critical habitat
- 3 Definition of Occurrence Indicators
  - Possible: Species recorded in area and habitat suboptimal.
  - Absent: Species not recorded in study area and suitable habitat absent.
- 4 A nonessential experimental population of spring-run Chinook salmon was released into the Restoration Area in spring 2014. Members of the experimental population have special regulations written for them under Section 4(d).

There is no proposed or designated critical habitat in the Proposed Action area.

Many of the species listed in Table 2 are assumed absent from the action area due to limited habitat provided by agricultural fields. However, San Joaquin kit fox and giant garter snake may occur within the Mendota Pool area (CNDDDB 2018).

Selenium contamination and impaired water quality are identified as potential threats to the giant garter snake because of the bioaccumulative nature and long term persistence of selenium in aquatic sediments and food (Service and NMFS 2000, Service 2012). Over the life of a snake it is possible to accumulate contaminants that can impact the growth, survival, and reproduction of individuals. Based on limited information of selenium toxicosis for snakes, and even reptiles in general, the Service recommends the giant garter snake toxicity threshold be comparable with birds (Service and NMFS 2000). As a result, the Service believes that a selenium criterion of 2.0 µg/L or less should protect habitat in the area used by the species (Service 2005).

Reclamation determined that the 10-year exchange program was not likely to adversely affect the giant garter snake (Reclamation 2005). Relying largely on our commitment that pumps from MPG would only pump groundwater into the Mendota Pool area whose selenium concentration level does not exceed 2.0 µg/L monthly mean, the Service concurred that the implementation of the 10-year exchange program was not likely to adversely affect giant garter snake (Service 2005; File Number: 1-1-04-I-1482).

### **3.2.2 Environmental Consequences**

#### ***No Action***

Under the No Action Alternative, farming activities would most likely continue on MPG lands. To meet existing water supply demands, additional groundwater would be pumped by farmers around the Mendota Pool for adjacent use as well as by transfers or exchanges. If these sources are not available, lands may become fallowed. During the 1-year period, San Joaquin kit fox could continue to access any agricultural lands in the area, and no new effects would occur to giant garter snake, as conditions would remain the same as existing conditions.

#### ***Proposed Action***

Most of the habitat types required by species protected by the Endangered Species Act do not occur in the Action area (see Table 2). The Proposed Action would not involve the conversion of any land fallowed and untilled for three or more years. In addition, the Proposed Action would not change the land use patterns of the cultivated or fallowed fields that do have some value to listed

species or to birds protected by the Migratory Bird Treaty Act. The Proposed Action would continue to provide the supplemental water source that has been provided under the previously approved 10-year MPG exchange program and its subsequent 3-year extension. Pumping into the Mendota Pool would not change; the same wells that were addressed under the exchange program would be used for the Proposed Action. Since no natural stream courses or additional surface water pumping would occur, there would be no effects on listed fish species. No critical habitat occurs within the area affected by the Proposed Action and so none would be affected.

As described in Section 2.2.1, MPG wells that participated in the groundwater exchange program must not exceed the 2.0 µg/L monthly mean for selenium from any of their wells. In the latest annual report, selenium concentrations in all MPG wells were <0.4 µg/L (LSCE & KDSA 2017). These levels are much lower than the Service's selenium criterion of 2.0 µg/L for the protection of giant garter snake. With the continued restrictions incorporated into the Proposed Action, any potential impacts to giant garter snake would be avoided. The water quality monitoring program would continue to be implemented during the Proposed Action to manage and minimize any potential impairment to water quality. Under the Proposed Action, MPG would continue to comply with the environmental commitments and design constraints of the MPG exchange program.

With the implementation of environmental commitments listed in Section 2.2.1, including the low levels of selenium concentrations recorded from participating MPG wells pumping into the Mendota Pool area, Reclamation has determined that there would be no affect to giant garter snake under the Endangered Species Act, as amended (16 U.S.C. §1531 et seq.), and there would be no take of birds protected under the Migratory Bird Treaty Act (16 U.S.C. §703 et seq.).

### ***Cumulative Impacts***

Related projects that may result in poorer water quality may increase the potential for adverse impacts on biological resources in the project area. Related projects identified as having potential impacts to biological species include those that would either transfer water or alter flows into or out of the Mendota Pool, Fresno Slough, or San Joaquin River. These include:

- Tranquillity Irrigation District Transfers to the San Luis Water District (Reclamation 2014b);
- Meyers Water Bank Expansion, the Exchange Agreement for Arvin-Edison Water Storage District (Reclamation 2013);
- Mendota Pool Bypass, the Reach 2B Improvements Project (Reclamation 2016); and
- Maintenance for the Mendota Dam.

However, groundwater and surface water monitoring programs, like the MPG exchange program, provides a mechanism to predict and assess changes in water quality from both MPG and non-MPG wells that pump into the Pool. Also, with the approved increase in banked surface water at Meyers groundwater bank in 2013, there have been improvements in surface water in the Mendota Pool (Reclamation 2013). As the Proposed Action would not result in any direct or indirect impacts to biological resources like giant garter snake, it would not contribute cumulatively to impacts on these resources.

### 3.3 Water Resources

#### 3.3.1 Affected Environment

The affected environment under the Proposed Action area is the same as described in Section 3.1 of the 10-year MPG exchange program (EIS-01-081) and Section 3.1.1 of the annual exchange agreements with Peracchi (EA-12-023) (Reclamation 2005, 2012). Rather than repeating the same information that has been incorporated by reference into this document, the affected environment and environmental consequences section in this EA will focus on updates or changes.

##### ***Mendota Pool Exchange Program***

As part of the original 10-year MPG Exchange Program and three-year extension, MPG wells pump groundwater for exchange with Reclamation as well as for adjacent land use on their lands located near the Mendota Pool. Since completion of the Record of Decision in 2005, the MPG has exchanged pumped groundwater with Reclamation nine times (2007, 2008, 2009, 2010, 2012, 2013, 2014, 2015, 2016); however, the MPG have been conducting transfer pumping (groundwater pumping that they transfer to other entities besides Reclamation) on and off since 1989 (LSCE & KDSA 2017). Table 3 summarizes pumping by the MPG since the initiation of the 10-year MPG Exchange Program.

Table 3 Annual MPG Pumpage 2005-2016.

<b>Year</b>	<b>MPG pumping exchanged with Reclamation (AF)</b>	<b>MPG pumping for adjacent use (AF)</b>	<b>Total (AF)</b>
2005	0	10,009	10,009
2006	0	6,364	6,364
2007	21,427	15,463	36,890
2008	22,814	11,845	34,659
2009	24,239	10,087	34,326
2010	11,271	8,071	19,342
2011	0	8,564	8,564
2012	23,614	14,312	37,926
2013	21,327	12,085	33,412
2014	21,951	9,222	31,173
2015	20,050	10,327	30,377
2016	21,206	9,393	30,599
<b>Average</b>	<b>15,658</b>	<b>10,479</b>	<b>26,137</b>

Source: LSCE & KDSA 2017 and Reclamation records.

As a requirement of the MPG exchange programs, the MPG implements data collection for the following resources: groundwater pumping, groundwater levels, groundwater quality, surface water flow, surface water quality, sediment quality, and subsidence. The most recent MPG exchange and monitoring program is summarized in the 2016 annual report (available upon request).

**Groundwater Pumping** As described in the 2016 annual report, MPG pumping for exchange with Reclamation occurred between March 1 and November 12 and totaled 22,322 AF (LSCE &



KDSA 2017). This was 1,838 AF less than originally planned. Pumping for irrigation of adjacent lands in the Mendota Pool area occurred between February through November and totaled 9,393 AF, 2,607 AF less than planned. Non-MPG pumping in the affected area is also summarized in the 2016 annual report.

**Groundwater Level Monitoring** As a requirement of the MPG exchange program, the MPG conducts a groundwater level monitoring program as described in Section 2.2.1. The primary purpose of the groundwater level monitoring program is to evaluate the effects of MPG transfer pumping on groundwater levels. As described in the 2016 annual report, groundwater levels in the Proposed Action area have experienced large fluctuations in recent years likely due to recharge from the San Joaquin River Restoration Program and increased groundwater pumping due to the extensive drought. From 2013 through 2015, seasonal drawdowns were greater than previous years and water levels in most wells did not recover after the irrigation season ended (LSCE & KDSA 2017). However, in MPG wells during 2016, groundwater levels generally increased.

**Groundwater Quality Monitoring** As a requirement of the MPG exchange program, the MPG conducts a groundwater quality monitoring program as described in Section 2.2.1. The purpose of the groundwater quality monitoring program is to evaluate changes in groundwater quality that may be caused by MPG transfer pumping and to forecast potential surface-water quality impacts in the Mendota Pool. Groundwater quality degradation has been occurring for decades in the Mendota Pool area and many wells have been taken out of service due to water quality impacts from the easterly movement of a saline front (Reclamation 2005). As described in the 2016 annual report, TDS concentrations vary widely around the Mendota Pool (from about 300 mg/L near the San Joaquin River to over 6,000 mg/L west of Fresno Slough). In addition, several Central California Irrigation District wells and MPG shallow and deep wells west of Fresno Slough continue to experience water quality degradation from movement of the saline front, which has increased due to MPG pumping; however, groundwater quality appears to be stable or improving at many of the northern and southern MPG wells along the Fresno Slough (LSCE & KDSA 2017). Improvements in the southern wells are largely attributed to the Meyers groundwater bank, which recharges groundwater east of Fresno Slough with lower salinity surface water from the Mendota Pool. Although the operation of the Meyers groundwater bank has resulted in substantial water quality improvements in the western portion of the Spreckels Sugar Company property, the shallow groundwater in the central portion remains degraded due to historical wastewater disposal practices and has migrated north toward the southernmost Farmers WD wells; however, most of the their wells exhibit low salinity and stable groundwater quality due to recharge from the San Joaquin River and the Mendota Pool (LSCE & KDSA 2017).

Water quality at most wells in Wonderful Orchards and Columbia Canal Company service areas have generally been stable and acceptable for irrigation, although many of their wells have experienced year-to-year salinity increases (LSCE & KDSA 2017).

**Surface Water Monitoring** As a requirement of the MPG exchange program, the MPG conducts a surface water quality monitoring program as described in Section 2.2.1 to detect any potential exceedances of water quality objectives in the Mendota Pool in order to adjust the

pumping program as needed (LSCE & KDSA 2017). Surface water monitoring at the Pool typically analyzes for boron and eight trace elements: arsenic, barium, copper, iron, manganese, molybdenum, selenium, and zinc. The concentrations of these constituents have been found to be generally low in both shallow and deep zone production wells in the Mendota area.

Selenium concentrations in MPG wells were all  $<0.4 \mu\text{g/L}$  in 2016 (LSCE & KDSA 2017). In 2008, there were slight exceedances in one sample from the Delta-Mendota Canal terminus, Central California Irrigation District Main and Outside Canals, and Columbia Canal. There were also slight exceedances from Tranquillity Irrigation District and James Irrigation District in 2013. However, subsequent sampling found that these elevations in selenium levels were most likely the result of laboratory error (LSCE & KDSA 2017). None of the increases in selenium are attributed to the MPG exchange program.

The salinity in the Delta-Mendota Cannel entering the Pool was lower in 2016, which followed high levels experienced in 2014 and 2015 (LSCE & KDSA 2017). Salinity measurements at the Columbia Canal and Central California Irrigation District main Canal intakes in the northern portion of the Mendota Pool was generally lower than the Delta-Mendota Canal due to San Joaquin River inflows from the San Joaquin River Restoration Program. However, there were two periods in March and April when EC at the canal intakes exceeded that of the Delta-Mendota Canal by  $90 \mu\text{mhos/cm}$  or more. As a consequence, the MPG was required to temporarily shut down groundwater pumping in March and April 2016 per the design constraints established for the program (see Section 2.2.1). Pumping resumed once EC dropped below the threshold limit.

**Sediment Monitoring** The MPG initiated a sediment quality monitoring program in 2001 at the request of the Service, and is reported on every three years. The purpose of this program is to provide baseline characterization of metal concentrations in the Mendota Pool sediments and to allow identification of temporal and spatial trends in sediment quality. In 2017, sediment sampling was conducted at eight locations in the Mendota Pool for the same trace elements analyzed in the surface water. Concentrations of all constituents were below thresholds of concern at all sampling locations (LSCE & KDSA 2017). Since this was completed in 2017, it would not be conducted under the Proposed Action.

**Subsidence** As a requirement of the MPG exchange program, the MPG collects compaction data from extensometers in the Mendota Pool area (the Fordel and Yearout Ranch) to evaluate compliance with the established subsidence criteria for the program (an average 0.005 foot of subsidence per year which is as close to “0” as is measurable).

In 2016, the Fordel extensometer measured 0.002 foot of inelastic compaction above the Corcoran Clay with a cumulative inelastic compaction since March 2000 of 0.051 foot (LSCE & KDSA 2017). This amounts to an average of about 0.003 foot per year. In 2016, the Yearout Ranch extensometer measured 0.003 foot of inelastic compaction over the same period, with a cumulative inelastic compaction since March 2000 of 0.206 foot. This amounts to an average of about 0.012 of inelastic compaction. The cumulative inelastic compaction caused by MPG transfer pumping since 2000 is estimated to be 0.068 foot, which corresponds to an average annual inelastic compaction of 0.004 foot (LSCE & KDSA 2017). This is less than the design

constraints limit of an average 0.005 feet per year subsidence due to MPG transfer pumping specified.

Total land subsidence is monitored by the Plate Boundary Observatory using high-definition Global Positioning System (GPS) equipment on the Meyers Farm property south of the City of Mendota. Between 2012 and 2016, there has been approximately 0.74 foot of subsidence at this location, 15 times more than was measured at the Fordel extensometer during the same period (LSCE & KDSA 2017). This discrepancy occurs because the Fordel and Yearout extensometers only measure subsidence occurring in the upper aquifer, overlying the Corcoran Clay layer, and not subsidence occurring in the lower aquifer. In comparison, the Plate Boundary Observatory measures total subsidence and cannot distinguish if this subsidence is occurring in the upper or lower aquifer. Under the 10-year Exchange Program and subsequent 3-year Extension of the Exchange Agreements, the vast majority of the MPG's groundwater pumping (97 percent) has occurred in the upper aquifer. When the relatively low level of subsidence measured at the Fordel and Yearout extensometers is compared with the greater subsidence measured at the Plate Boundary Observatory, it demonstrates that total subsidence is predominately caused by pumping in the lower aquifer. Only a relatively small amount of total subsidence results from pumping in the upper aquifer, which is where almost all of the MPG's pumping occurs.

In addition to the MPG, there are various entities, including Reclamation, USGS, California Department of Water Resources (DWR), National Aeronautics and Space Administration (NASA), San Luis and Delta-Mendota Water Authority, and the San Joaquin River Exchange Contractors, who have been monitoring subsidence trends within the Central Valley. One of the most recent monitoring studies was prepared for DWR by NASA which showed approximately 0.33 to 0.67 foot of subsidence in the Mendota Pool area for the period May 2015 to September 2016 (Farr et al. 2016).

In 2011, Reclamation established the San Joaquin River Restoration Program Geodetic Control Network to begin monitoring subsidence within the San Joaquin River Restoration Program Restoration Area. Subsidence in the San Joaquin River Restoration Program Restoration Area has been conducted biannually since 2011. Figure 2 shows the subsidence rates between July 2012 and July 2017 in the areas surrounding the Mendota Pool ranged between 0.15 and 0.3 feet per year.

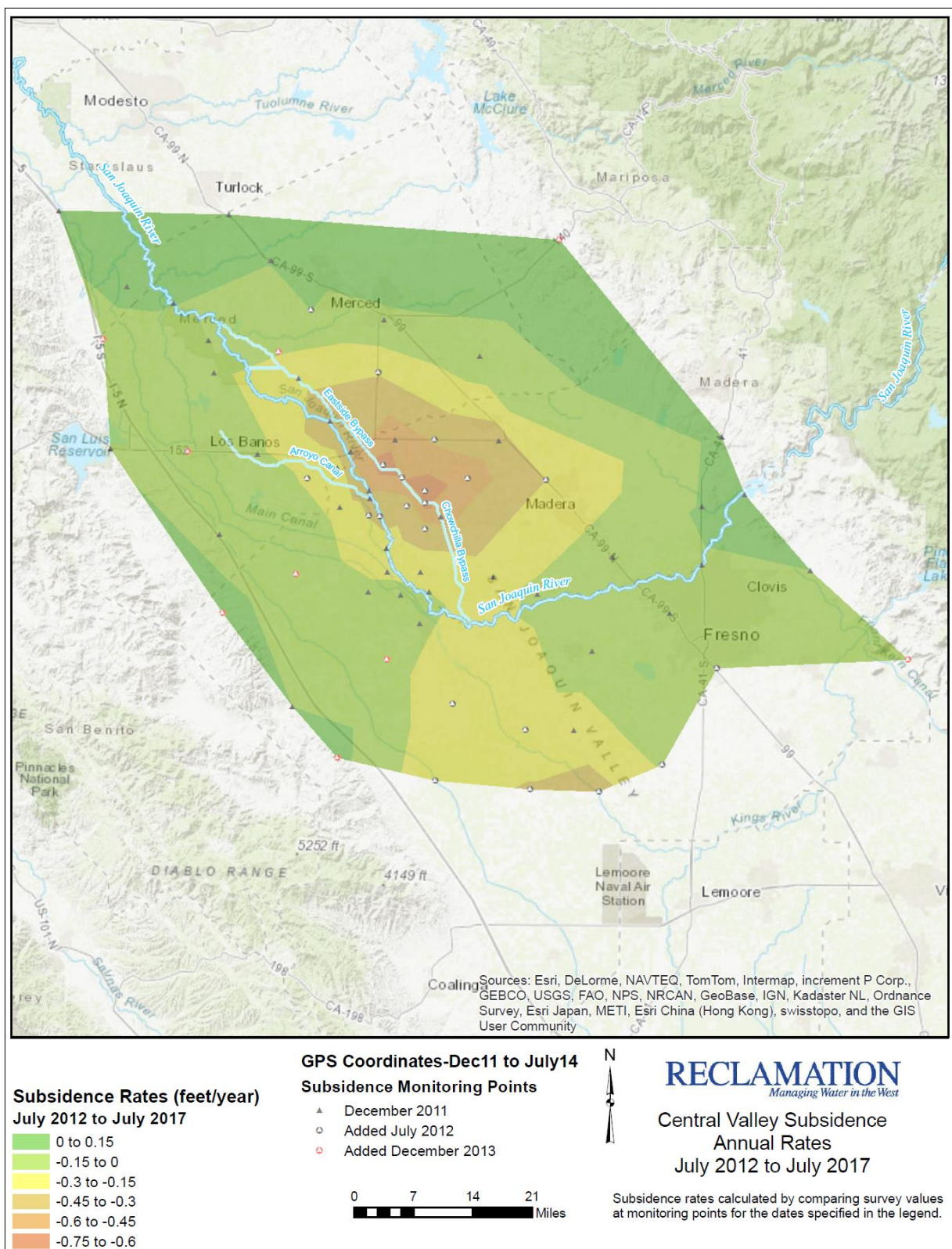


Figure 2 Subsidence Rates for the Central Valley for July 2012 to July 2017.

Source: <http://restoresjr-dev.com/wp-content/uploads/SJRRP-Subsidence-Mapping-Combined-Const.pdf>

### 3.3.2 Environmental Consequences

#### ***No Action***

Under the No Action Alternative, Reclamation would no longer exchange pumped groundwater for CVP water with the MPG and they would be without this supplemental water supply for use on their lands within Westlands. Reclamation would continue to convey and deliver CVP water to Westlands and to CVP contractors at the Mendota Pool pursuant to their respective CVP contracts, as water is available. However, without the Proposed Action, the MPG's options to minimize surface water supply deficits would be limited. They would need to either pump additional groundwater, for those lands that have available groundwater supplies in Westlands, or acquire other more costly surface water supplies in order to meet water supply demands. If other water supplies cannot be found, they may need to abandon permanent crops or fallow lands beyond what has been part of their historic practice.

Even without the Proposed Action, groundwater around the Mendota Pool would continue to be pumped by the MPG for adjacent land use and for transfer to other entities with or without Reclamation as it has in the past. However, the MPG have indicated that monitoring of groundwater pumping, groundwater levels, groundwater quality, surface water flow, surface water quality, sediment quality, and subsidence would likely cease as they are costly and are only required under the exchange agreements with Reclamation. Enacted in 2014, the Sustainable Groundwater Management Act (SGMA) requires local Groundwater Sustainability Agencies (GSAs) to manage groundwater in a manner that can be maintained long-term without causing undesirable results, including overdraft and a chronic lowering of groundwater levels. The California Department of Water Resources has designated groundwater subbasins underlying MPG wells and within Fresno and Madera Counties as high priority basins (DWR 2014). As such, the GSAs managing these basins are required to adopt Sustainability Plans by 2020. Among other requirements, the Sustainability Plans must set objectives to achieve sustainable groundwater withdrawal within 20 years of plan implementation (i.e., by 2040). Because this EA evaluates a one-year program ending in 2019, it would cease prior to the adoption of the Sustainability Plans in 2020, and thus, SGMA is not expected to require a reduction in groundwater withdrawal in the study areas even under the No Action Alternative.

As water would no longer be exchanged with Reclamation for the lands in Westlands, it is likely that the amount of groundwater used for irrigation around the Mendota Pool would increase beyond what has been done since 2005. This would provide some added recharge to groundwater in this area.

As groundwater pumping would continue, current subsidence trends would likely remain unchanged.

#### ***Proposed Action***

Under the Proposed Action, Reclamation would approve one-year exchange agreements with the MPG, pending completion of environmental review of the proposed 20-year exchange program. This would provide supplemental water supplies for the MPG to continue to irrigate their historically farmed lands within Westlands should CVP water supplies be insufficient to meet demands. All of the monitoring and mitigation requirements for the exchange agreements would continue over the next year as described in Section 2.2.1.

Although a Sustainability Plan for the Action area has not yet been developed under SGMA, and it is not known when it will be developed fully within the next year of the Proposed Action, as described in Section 2.2.1, groundwater level monitoring is required by Reclamation for all pumping completed by the MPG. While other groundwater management and monitoring programs are in place near the MPG study areas, data summarizing the full extent of these programs and their effects on groundwater is not provided to the MPG as part of their reporting program. However, the data collected at MPG wells does indicate that non-MPG pumping both within and outside of the MPG study areas is having an effect on groundwater levels, groundwater movement, and groundwater quality, independent of MPG pumping. In addition, specific design constraints are in place in order to minimize drawdowns during critical months. Previous years have shown recovery in the MPG wells likely due to groundwater recharge from Meyers Bank and the San Joaquin River Restoration Program Restoration Flows in the San Joaquin River (LSCE & KDSA 2017). As discussed above, total subsidence is still occurring in the MPG study areas; however, this subsidence is occurring primarily as a result of pumping in the lower aquifer. As a result, the MPG Monitoring and Reporting Program concludes that MPG pumping results in subsidence that is under the established design constraints threshold (i.e., an average annual subsidence of 0.005 feet due to MPG transfer pumping).

Under the MPG Program, groundwater quality, surface water flow, surface water quality, sediment quality, and subsidence would also continue to be monitored. Specific design constraints will remain in place that require pumping to cease should specific thresholds be reached (see Section 2.2.1). These environmental commitments help to reduce potential adverse water resource impacts.

The proposed exchange would utilize existing facilities and would not require new infrastructure, new facilities, or ground disturbing activities. The water would be used for existing agricultural purposes. No native or untilled lands for three years or more would be cultivated with water involved with these actions. In addition, CVP facilities would not be impacted as the exchanged water must be scheduled and approved by Reclamation in advance. No natural streams or water courses would be subject to new effects since no additional pumping or diversion from the Delta would occur that would not have happened under the No Action Alternative.

### ***Cumulative Impacts***

Reclamation has reviewed existing or foreseeable projects in the same geographic area that could affect or could be affected by the Proposed Action as Reclamation and CVP contractors have been working on various projects, including this one, in order to manage limited water supplies due to current hydrologic conditions and regulatory requirements. This and similar projects would have a cumulative beneficial effect on water supply during critically dry years.

As in the past, hydrological conditions and other factors are likely to result in fluctuating water supplies which drive requests for water service actions. Water districts provide water to their customers based on customers' demands and available water supplies and timing, while attempting to minimize costs. Farmers irrigate and grow crops based on these conditions and factors, and myriad water service actions are approved and executed each year to facilitate water needs. It is likely that during a drought, more districts will request exchanges, transfers, and Warren Act contracts (conveyance of non-CVP water in CVP facilities) due to hydrologic

conditions. Each water service transaction involving Reclamation undergoes environmental review prior to approval.

The Proposed Action and other similar projects would not hinder the normal operations of the CVP and Reclamation's obligation to deliver water to its contractors or to local fish and wildlife habitat. Since the Proposed Action would not involve construction of new facilities, nor interfere with CVP operations, there would be no cumulative impacts to existing facilities or other contractors.

As described previously, the primary adverse effect of the 10-year exchange agreements analyzed in EIS-01-81 was the increase in the cumulative rate of groundwater level degradation in wells west of the Mendota Pool, primarily MPG wells. This would likely continue during the proposed one-year exchange agreements; however, the temporary nature of the Proposed Action is not likely to increase these adverse impacts beyond what has occurred previously. Design constraints, monitoring, and mitigation as analyzed in EIS-01-81 would continue under the Proposed Action to address this cumulative effect.

Regarding subsidence, the Annual Reports are cumulative in nature because they consider subsidence on a regional basis. Subsidence is a result of total area groundwater pumping, which includes ongoing groundwater pumping by local groundwater users such as the City of Mendota, Fresno Slough Water District, Meyers Farm Water Bank, and James and Tranquillity Irrigation Districts, as well as pumping for other groundwater transfer programs, such as the Exchange Contractors 25-Year Water Transfer Program. As discussed above in Section 3.3.1, the Fordel extensometer measured a cumulative subsidence since March 2000 of 0.051 foot, while the Yearout extensometer measured a cumulative subsidence of 0.206 foot during this same period. The cumulative subsidence caused by MPG transfer pumping since 2000 is estimated to be 0.068 foot, which corresponds to an average annual subsidence of 0.004 foot, below the design constraints threshold of significance for MPG pumping (LSCE & KDSA 2017). As further noted, the Plate Boundary Observatory measured 0.74 foot of subsidence between 2012 and 2016. This indicates that total cumulative subsidence is largely the result of pumping in the lower aquifer. Since the vast majority of the MPG's groundwater pumping (97 percent) occurs in the upper aquifer and has resulted in an average annual subsidence of only 0.004 foot, the impact of MPG pumping on subsidence is not cumulatively considerable.

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## **Section 4 Consultation and Coordination**

### **4.1 Public Review Period**

Reclamation provided the public with an opportunity to comment on the Draft FONSI and Draft EA from April 20, 2018 to May 10, 2018. Reclamation received one comment letter. The comment letter and Reclamation's response to comments are included in Appendix A.

### **4.2 List of Agencies and Persons Consulted**

Reclamation and MPG is coordinating the Proposed Action with CDFW, San Joaquin River Exchange Contractors, Service, and Wonderful Orchards.

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