# Appendix K
# Land Use

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# Abbreviations and Acronyms

| | |
|---|---|
| Banks Pumping Plant | Harvey O. Banks Pumping Plant |
| CVP | Central Valley Project |
| Bay-Delta | San Francisco Bay/Sacramento-San Joaquin Delta Estuary |
| DMC | Delta-Mendota Canal |
| Jones Pumping Plant | C.W. “Bill” Jones Pumping Plant |
| SJR | San Joaquin River |
| SOD | South of Delta |
| Study | DMC Recirculation Project Feasibility Study |

# Appendix K
# Land Use

The U.S. Department of the Interior, Bureau of Reclamation is evaluating the feasibility of using recirculation strategies to improve water quality and flows in the lower San Joaquin River (SJR). The Plan Formulation Report is a component of the overall Delta-Mendota Canal (DMC) Recirculation Project Feasibility Study (Study) and will build upon the information presented in the Initial Alternatives Information Report. This appendix discusses the planning objectives, setting, and primary land uses (agriculture, recreation, urban areas) that could be affected by the alternative plans, and compares the alternative plans by discussing their possible impacts to land use in the project area.

## K.1 Objectives

As discussed in **Section 1.3**, the objectives of the proposed action are to provide greater flexibility in meeting the existing water quality standards, meet flow objectives for which the Central Valley Project (CVP) has responsibility; and reduce the demand for water from New Melones Reservoir.

## K.2 Setting

The SJR basin is in central California and covers approximately 15,000 square miles. It encompasses all or portions of Alameda, Alpine, Amador, Calaveras, Contra Costa, El Dorado, Fresno, Madera, Mariposa, Merced, San Joaquin, Stanislaus, and Tuolumne counties. The region is bordered on the east by the Sierra Nevada and on the west by the Diablo Range of the coastal mountains. The SJR basin is hydrologically separated from neighboring Tulare Lake basin by a low, broad ridge, which extends across the San Joaquin Valley between the SJR and Kings River (DWR 2005a).

**Figure K-1** illustrates predominant land uses in the SJR basin. Although a number of counties are located in the basin, most of the population and agricultural land use occurs in San Joaquin, Stanislaus, Merced, Contra Costa, and Madera counties.

The most productive farmland and rapidly growing urban areas of Stockton, Tracy, Modesto, Manteca, and Merced are in the valley portions of the region.

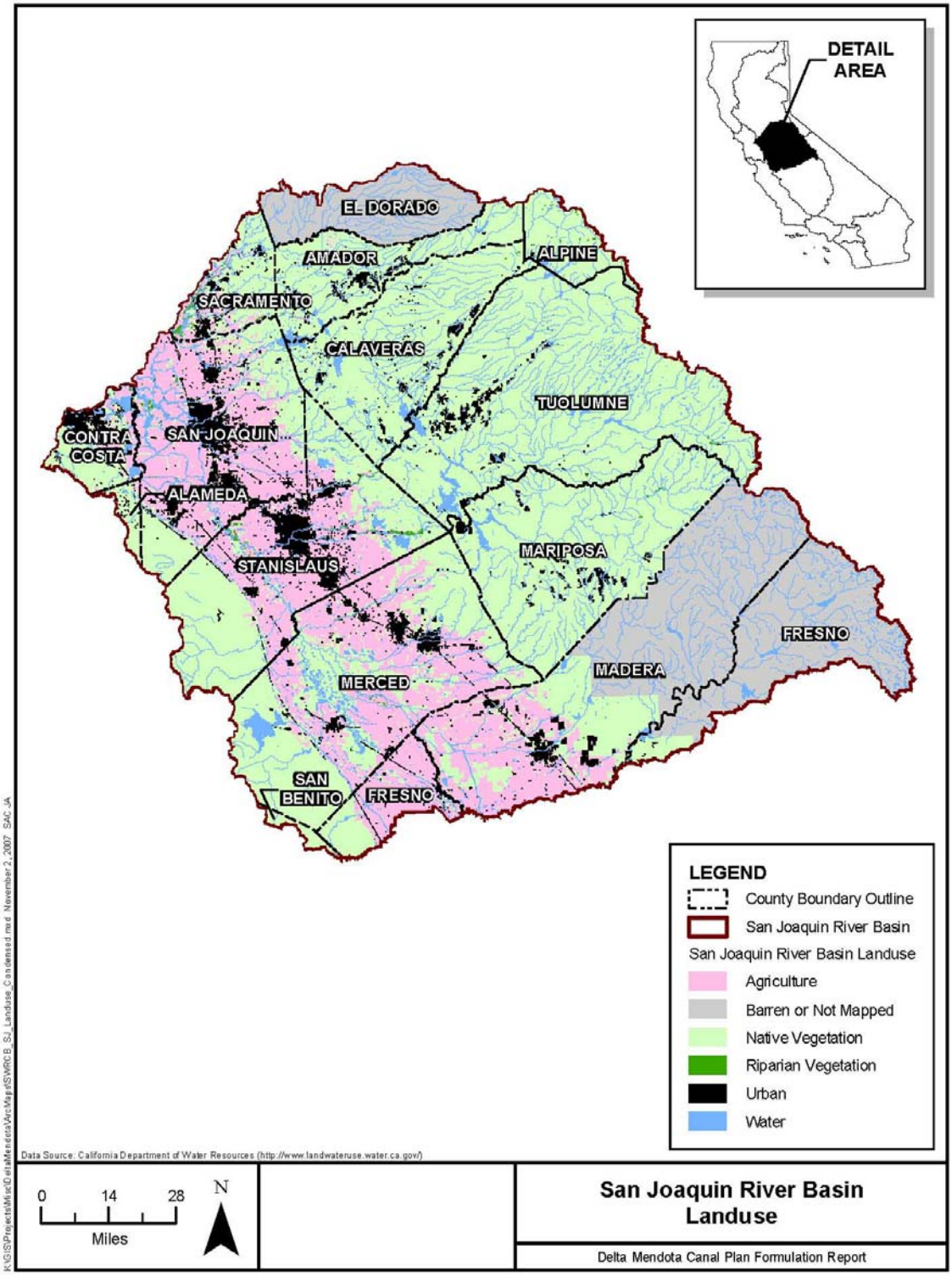


**Figure K-1 San Joaquin River Basin Land Use**

Land use in the area primarily consists of highly productive agricultural land and urban areas such as Stockton, Tracy, Modesto, Merced, and Manteca. **Table K-1** presents an estimated land use breakdown for the SJR basin.

**Table K-1. Land Uses in the San Joaquin River Basin**

| Land Use | Acres |
|---|---|
| **Urban Areas (DWR 2000)[1]** | |
| Residential | 107,600 |
| Urban | 153,520 |
| Urban Landscape | 12,970 |
| Commercial | 9,970 |
| Industrial | 34,070 |
| **Agricultural Areas (DWR 2005a)[1]** | |
| Citrus and Subtropical | 9,200 |
| Deciduous Fruits and Nuts | 507,520 |
| Field Crops | 554,880 |
| Grain and Hay Crops | 155,170 |
| Idle Agricultural Land | 31,940 |
| Pasture | 432,360 |
| Semi-agricultural and Incidental to Agriculture | 58,110 |
| Truck, Nursery, and Berry Crops | 207,040 |
| Rice | 21,210 |
| Vineyards | 233,010 |
| Native Vegetation (DWR 2000)[1,2] | 5,378,560 |
| Riparian Vegetation (DWR 2000)[1] | 30,400 |
| Barren/Wasteland/Vacant/Unknown (DWR 2000)[1] | 46,370 |
| Water Surface (DWR 2000) | 154,970 |

Notes:

[1] DWR Standard Land Use Legend

[2] Almost 3 million acres are national forest or national park land (DWR 2005a)

## K.2.1 Agriculture Uses

Agriculture is the major economic activity and this area is viewed as one of California's most important agricultural regions, as it contributes $4.9 billion per year in agricultural output value.

According to the *California Water Plan Update 2005* (DWR 2005b), agriculture is the major economic activity in the area with roughly 1.95 million acres of irrigated cropland (approximately 21 percent of the basin land area) in the year 2000. The SJR basin is viewed as one of California's most important agricultural regions, as it contributes $4.9 billion per year in agricultural output. Irrigated crops include permanent orchards and vineyards (34 percent); grains, hay, and pasture (29 percent); and other major crops including cotton, corn, and tomatoes (DWR 2005b).

### K.2.2 Recreation Uses

While the San Joaquin Valley floor contains most of the region's urban and agriculture areas, the foothills and Sierra Nevada contain mostly national forest and government-owned lands, including Yosemite National Park. National forest and park lands encompass more than 2.9 million acres. State parks and recreational areas, and other state property, account for an additional 80,000 acres. The SJR basin has many recreational opportunities, including hiking, boating, camping, fishing, and wildlife viewing. The San Joaquin Valley provides breeding and resting areas along the Pacific Flyway for many species of water fowl. (DWR 2005b)

The San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta) is also a valuable and unique recreational asset due to its natural and aesthetic values. Waterfowl and wildlife are abundant, sport fishing is popular, and the vegetation and beaches lining the channels and islands are attractive (State Water Resources Control Board 1995). Overall recreation use in the Bay-Delta region has increased substantially since 1963, when it was estimated to have approximately 2.4 million visitor days. By 1987, annual recreation use had reached an estimated 7 million visitor days. Visitor use in the Bay-Delta was estimated by California Department of Water Resources to be 12 million visitor days in 1993. The most important activity in the region is boating (without fishing), followed by fishing, relaxing, sightseeing, and camping.

### K.2.3 Urban Areas

Based on 2007 U.S. Census Bureau data, the most populated cities are Stockton, Modesto, Tracy, Merced, and Manteca (**Table K-2**). The cities of Stockton and Tracy have grown recently, largely in response to job development and housing constraints in the nearby San Francisco Bay Area. According to the California Department of Finance, population growth in the Study area will range between 24 and 30 percent between 2000 and 2010 (California Department of Finance 2007).

**Table K-2. City Population**

| City | County | Total Population |
|---|---|---|
| Stockton | San Joaquin | 287,245 |
| Modesto | Stanislaus | 203, 955 |
| Tracy | San Joaquin | 79,705 |
| Merced | Merced | 76,879 |
| Manteca | San Joaquin | 64,038 |

***Source:*** *U.S Census Bureau 2007*

## K.2.4 Environmental Uses

Restoration of the SJR and provision of essential habitat for fish and wildlife are also important within the Study area. Lands set aside for habitat restoration and wildlife refuge include the following:

- 26,600-acre San Luis National Wildlife Refuge (U.S. Fish and Wildlife Service 2008a)
- Approximately 6,500-acre San Joaquin River National Wildlife Refuge (U.S. Fish and Wildlife Service 2008b)
- Approximately 10,262-acre Merced National Wildlife Refuge (U.S. Fish and Wildlife Service 2008c)
- Approximately 6,217-acre Los Banos Wildlife Area (California Department of Fish and Game 2008a)
- 2,891-acre Volta Wildlife Area (California Department of Fish and Game 2008b)
- 7,069-acre North Grasslands Wildlife Area (California Department of Fish and Game 2008c)
- 880-acre White Slough Wildlife Area (California Department of Fish and Game 2008d)
- 352-acre Isenberg Sandhill Crane Reserve (California Department of Fish and Game 2008e) Approximately 46,000-acre Cosumnes River Preserve (Cosumnes River Project and Preserve 2008)
- Additional lands are set aside by private duck clubs for wetland habitat (DWR 2005b).

# K.3 Ranking Criteria

For purposes of the Plan Formulation Report, to identify potential land use changes that could occur with the implementation of the proposed DMC recirculation actions and alternative plans, the following ranking criteria will be used: potentially significant direct, indirect, and cumulative impacts. Potential impacts from construction activities in wasteways could result in temporary or permanent impacts to biology in disturbed areas. Specific land use impacts due to the alternative plans include water supply for agricultural delivery/use, and slight water supply increases for municipal and industrial use.

# K.4 Comparison of Alternative Plans

## K.4.1 No-Action Alternative

No action would be taken nor a project implemented involving DMC Recirculation under the No-Action Alternative. Therefore, the No-Action Alternative would not achieve the objectives of the proposed action. Land use changes included in the No-Action Alternative are reasonably foreseeable future actions, other present actions, past actions, and existing/natural land uses. Population growth and the resulting urbanization will generate increasing land use challenges. As populations increase, lands currently used for agriculture will likely be converted for urban uses. Ecosystem restoration programs will also likely seek agricultural lands for conversion to riparian habitat and refuge areas to provide increased habitat for fish and wildlife along the SJR and its tributaries.

*The No-Action Alternative would* not *result in a negative direct, indirect, and cumulative impact on current land uses in the Study area.*

## K.4.2 Alternative Plans

DMC Recirculation is evaluating six alternative plans. A detailed description of all the alternative plans can be found in **Chapter 4**. All the alternative plans will use existing facilities and features such as the C.W. “Bill” Jones Pumping Plant (Jones Pumping Plant), Harvey O. Banks Pumping Plant (Banks Pumping Plant), the DMC, the Westley or Newman wasteways, and the SJR below its confluence with the Merced River. The alternative plans significantly vary in the concept of operations, such as which pumping facility would be used and the release timing of recirculation releases, i.e., will releases be made before or supplemental to releases from New Melones Reservoir?

The following subsections will identify the potential land-use impacts of the alternative plans.

### *Alternative A1*

This alternative plan uses only available capacity at Jones Pumping Plant to supplement explicit New Melones flow and water quality releases. No changes in water supply for either CVP South of Delta (SOD) or New Melones water users would occur. As no changes in water supply are anticipated, no land use changes associated with increased/decreased water availability, typically caused by population changes, are anticipated. However, if Westley Wasteway is used for recirculation under this alternative plan, some farmlands and/or wetlands would be impacted by the extension of the wasteway to the SJR. Alternatively, if Newman Wasteway is lined some habitat could be impacted. The significance of these impacts on this same area of land has not yet been determined, nor has it been determined whether this alternative plan will indeed use Westley Wasteway, or require lining of Newman Wasteway.

*No significant* negative *direct, indirect, or cumulative impacts on current land uses including agricultural, environmental, recreational, or urban have been identified in the Study area; however, an impact determination cannot be made at this time.*

### *Alternative A2*

This alternative plan would enhance New Melones water supply and Vernalis compliance using available Jones Pumping Plant capacity. This alternative plan is similar to Alternative A1 except that recirculation water is released prior to explicit New Melones releases for Vernalis flow and water quality purposes. This prior release can result in reduced demand from New Melones for Bay-Delta releases (to the extent that recirculation water is available) and increased water for New Melones water users. Because only available capacity at Jones Pumping Plant is used, no changes in CVP SOD water supply are anticipated. This alternative plan may result in increased water supply for New Melones water users, but not to a degree sufficient to impact current land uses. As with Alternative A1, if Westley Wasteway is used for recirculation, some localized land use impacts may occur, but the significance of these impacts has not yet been determined, nor has it been determined whether this alternative plan will indeed use Westley Wasteway, or require lining of Newman Wasteway.

*No significant* negative *direct, indirect, or cumulative impacts on current land uses including agriculture, environmental, recreational, or urban have been identified in the Study area, however an impact determination can't be made at this time.*

### *Alternative B1*

This alternative plan will supplement Vernalis compliance using available capacity at both Jones and Banks pumping plants. This alternative plan is

similar to Alternative A1 except that pumping from Banks Pumping Plant is added when capacity is available. Recirculation flow supplements New Melones releases (No changes in New Melones Operations). No changes in water supply for either CVP SOD or New Melones water users would occur. Land use impacts would be similar to A1.

*No significant* negative *direct, indirect, or cumulative impacts on current land uses including agricultural, environmental, recreational, or urban have been identified in the Study area; however, an impact determination cannot be made at this time.*

### *Alternative B2*

This alternative plan would enhance New Melones water supply and Vernalis compliance using available capacity from both Jones and Banks pumping plants. This alternative plan is similar to Alternative A2 except that pumping from Banks Pumping Plant is added when capacity is available. Water is released prior to explicit New Melones Bay-Delta releases, which may result in enhanced New Melones water supply. No change in SOD water supply is anticipated. Land use impacts would be similar to Alternative A2.

*No significant* negative *direct, indirect, or cumulative impacts on current land uses including agricultural, environmental, recreational, or urban have been identified in the Study area; however, an impact determination cannot be made at this time.*

### *Alternative C*

This alternative plan includes limited reduction of CVP SOD deliveries for enhanced New Melones water supply and Vernalis compliance using both Jones and Banks pumping plants. Recirculation water that could impact CVP SOD deliveries would only be used to comply with Vernalis flow requirements in the SJR. Recirculation could occur for water quality compliance if determined available at Banks and Jones pumping plants without impact to deliveries. Recirculation flow would be released prior to explicit New Melones Bay-Delta releases to enhance New Melones water supply. Jones Pumping Plant would be used as needed to contribute to flow compliance and water supply benefits to New Melones.

Reductions in CVP SOD water contractor deliveries are anticipated, but would be less than under Alternative D (described below). No changes to State Water Project deliveries are anticipated.

This alternative plan may result in decreased water supply for CVP SOD users and increased water supply for New Melones water users, but not to a degree to cause permanent changes in land uses. As with all other alternative plans, land

uses changes near Westley Wasteway may occur if the wasteway is included in the final alternative plan.

*No significant* negative *direct, indirect, or cumulative impacts on current land uses including agricultural, environmental, recreational, or urban have been identified in the Study area; however, an impact determination cannot be made at this time.*

#### *Alternative D*

This alternative plan would include reduced CVP SOD deliveries to enhance New Melones water supply and Vernalis compliance using both Jones and Banks pumping plants. This alternative plan would use recirculation as needed to attempt to provide compliance with Vernalis water quality objectives and enhance New Melones water supply. Recirculation water would be released prior to explicit New Melones Bay-Delta releases for flow and water quality objectives, resulting in additional water supply in New Melones. Reductions in CVP SOD water contractor deliveries are anticipated. No impacts to State Water Project deliveries would occur. Land use impacts would be similar to Alternative C.

*No significant negative direct, indirect, or cumulative impacts on current land uses including agricultural, environmental, recreational, or urban are have been indentified in the Study area; however, an impact determination cannot be made at this time.*

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