# 5.4 Sacramento–San Joaquin Delta

The Sacramento–San Joaquin Delta region supports numerous drainages, which are treated here collectively as a single subbasin, the East County Delta Drainages subbasin. The East County Delta Drainages include Indian, Rock, Sand Mound, Dutch, Piper, and Taylor Sloughs, as well as False River.

## 5.4.1 East County Delta Drainages

### Physical Setting

This subbasin covers approximately 20,385 acres, representing approximately 12% of the inventory area. Figure 5-15a shows the location of WoUS found in the East County Delta Drainages subbasin.

#### Geology

Brentwood dune sands, deposited in the Pleistocene and Holocene, underlie the East County Delta Drainages. This deposit type extends through the northern portion of the region. These sands are being buried by Basin Deposits found in the surrounding areas of this region. The Basin Deposits are very fine silty clay and clay deposits at alluvial fan edges and adjacent to bay mud.

#### Soils

Soils of the East County Delta Drainages can be characterized as nearly level silty clay and clay loams. These comprise Capay clay, Brentwood clay loam, Marcuse clay, alkali Sacramento clay, with patches of Sycamore clay, Marcuse sand, and Rincon clay loam. A band of Delhi sands crosses the area from the northwest towards the southwest. Aside from the sands, these soils have low permeability and high alkali content. These soils hold water for long periods of time unless intentionally drained.

#### Climate

Average annual rainfall in this subbasin is 11 inches.

#### Hydrology and Land Use

Elevation in the subbasin ranges from 100 feet above sea level, towards the south, to 20 feet below sea level, in the northeast. Water originating in the subbasin from pumped groundwater and agricultural return flows generally flows

northeast towards the San Joaquin River and ultimately to the Delta. Additional water for agricultural use is pumped from the Delta. Channels in this basin consist of constructed irrigation and flood control channels, including the Contra Costa Canal, as well as channelized sloughs. Channelized reaches of Indian, Rock, Sand Mound, Dutch, Piper, and Taylor Sloughs are found in this subbasin, as well as False River. These channels are perennial due to return flows from agriculture and the conveyance of potable water. Some of these channels are vegetated, while others are formed by impervious concrete. PPEM wetlands are found in depressional areas along the northern and eastern edges of the subbasin boundary. Many of these wetlands are adjacent to sloughs or drainage channels, particularly along Old River, on the eastern edge of the subbasin.

Land use in this subbasin is dominated by agriculture, though portions are rapidly being developed for residential use. Row crops, such as corn, are grown in fields irrigated by groundwater and captured surface water. There are two active railroad lines that run through this subbasin. Maintenance and operation of rail lines involve lubrication of the tracks and wheels with oils and greases. These contaminants can be transported to drainage channels and thence to the Delta.

## Waters of the U.S. Types

WoUS in the East County Delta Drainages subbasin include three of the general types described in Chapter 4.

- PPEM (perennial, seasonal).
- Riverine (tidal and nontidal lower perennial).
- Riverine excavated artificial.

PPEM wetlands make up about 40% of WoUS acreage in the subbasin. Riverine lower perennial areas account for about 20% of WoUS acreage in the subbasin.

Figure 5-15b shows representative photos of WoUS commonly found in this East County Delta Drainages subbasin. Table 5-15 summarizes the functions of each WoUS type found in the subbasin.

## Waters of the U.S. Functions

### Habitat

#### Palustrine Persistent Emergent (Perennial, Seasonal)

PPEM wetlands in the subbasin are surrounded by intensive agriculture. Some of these wetlands are themselves farmed and therefore provide habitat only for those species that can tolerate frequent human disturbance. These PPEM wetlands do provide habitat for plant species associated with emergent marshes and seasonal wetlands. However, large populations of exotic ruderal species are

**Table 5-15.** East County Delta Drainages Subbasin: Summary of Wetland Functions/Valuation

| Functional Type | Hydrogeomorphic Class (HGM) | Biological Functions | Biological Quality | Hydrologic Functions | Hydrologic Quality | Overall Quality | Potential Quality* |
|---|---|---|---|---|---|---|---|
| Palustrine persistent emergent (PPEM) (seasonally or temporarily flooded wetlands) | Valley Bottom depressional wetlands, Stream Floodplains, Bottomlands or Pond Margins | Habitat quality varies with adjacent land use. Adjacent land is occupied by intensive agriculture, mostly row crops. Exotic aggressive ruderal species dominate. Vernal pool fairy shrimp have been documented. | Low | Filtration capacity of vegetation improves water quality of surface runoff waters. However, surrounding land uses degrades water quality. Little flood storage functioning. | Low | Low | Moderate |
| Riverine tidal | Coastal Plain Stream Channels | Marsh vegetation present in sloughs adjacent to agricultural lands provides habitat for a variety of species including rose mallow, documented in the area. | Moderate | The filtration capacity of vegetated channels improves degraded water quality of agricultural return waters. Vegetation prevents erosion from tidal action. | Moderate | Moderate | Moderate |
| Palustrine forest | Valley Stream Banks | Habitat quality limited by adjacent intensive agriculture. | Low | Filters sediment and cools water. | Moderate | Low | Low |
| Riverine excavated artificial | Aqueduct, Drainage channels | Open water habitat for waterfowl, shorebirds and some amphibians. Drainage channels may have PPEM vegetation. | Low | Human drinking water conveyance. Flood water conveyance. | Low | Low | Low |

* “Potential” as related to management considerations or mitigation efforts as proposed here or in the HCP.

| Functional Type | Est. Total in Inventory Area (acres) | Est. Impact (acres) | Mitigation Ratio | | Wetland Preservation Needed (acres) | Wetland Available for Preservation[a] (acres) | Wetland Needed for Restoration (acres) |
|---|---|---|---|---|---|---|---|
| | | | Preservation | Restoration | | | |
| Palustrine persistent emergent (PPEM) (seasonal) | 13 | | | | | | |
| Palustrine persistent emergent (PPEM) (undetermined inundation period) | 110 | | | | | | |
| Riverine tidal | 3 | | | | | | |
| Palustrine forest | 11 | | | | | | |
| Lacustrine impounded | 34 | | | | | | |
| Riverine excavated artificial | 93 | | | | | | |

[a] Available within Land Acquisition Analysis Zones with moderate or high acquisition priority

associated with agricultural land adjacent to these wetlands, and these exotic species may compete aggressively with some native wetlands species. Seasonal wetlands in the subbasin may provide habitat for vernal pool fairy shrimp, which have been documented in the subbasin (CNDDB 2003).

### Riverine Tidal and Nontidal (Lower Perennial)

Riverine WoUS in the subbasin include tidal portions of Old River and an unnamed tributary of False River along the eastern and north edges of the subbasin, as well as nontidal drainages in the center of the subbasin. Some of these sloughs, particularly on the northern edge of the subbasin, flow into tidal marsh along the Suisun Bay. While these sloughs are adjacent to agricultural areas, their proximity to tidal marsh implies that they may provide secondary habitat for marsh species. Slough banks may provide habitat for rose mallow, which has been documented in the area.

### Riverine Excavated Artificial

The Contra Costa Canal provides very limited habitat functions, as described above. Some artificial drainage ditches in the subbasin contain abundant marsh vegetation and provide habitat for species able to tolerate the frequent human disturbance associated with adjacent agricultural areas and periodic maintenance of the ditches themselves. Larger drainage channels contain dense populations of water hyacinth (*Eichhornia crassipes*), an invasive exotic plant species.

## Water Quality

### Riverine Tidal and Nontidal (Lower Perennial)

The lower perennial drainages have been modified to support agriculture and urban development. These drainages carry agriculture return and runoff flows from the surrounding developed land. Water within these channels is degraded by fertilizers, pesticides, and heavy metals from machinery, all contributing to reduced water quality for aquatic life. Maintenance and operation activities for active railroads can deposit oils and grease to nearby channels. Contaminants carried from these sources, in addition to contaminants from upland sources, degrade water quality.

Stable vegetation grows in the channel in this reach. The vegetation helps to filter and remove excessive nutrients and metals from surface and Delta waters. Tidal reaches help dilute surface waters carried from upland areas with brackish water of the Delta.

### Palustrine Persistent Emergent (Alkali)

Alkali wetlands are an important source of minerals and salts in the subbasin. Presence of these wetlands flushes minerals from the soils; the minerals are transported downstream and made available for uptake by aquatic life. An overabundance of salts dissolved in the water can degrade water quality to a level unfit for human consumption. However, concentrations of salt deposited in alkali wetlands in this subbasin have a minimal impact on the quality of potable water supplies.

### Hydrologic Cycling and Flood Storage

#### Riverine Tidal and Nontidal (Lower Perennial)

Channels of the East Delta Drainages function to capture and convey agricultural irrigation and return flows to and from the Delta. These channels function to convey, rather than store, flood flows. Vegetation growing in these perennial reaches provides structure against bank erosion due to wave action. This is particularly important during storm events when waves become larger and more forceful.

#### Palustrine Persistent Emergent (Alkali)

Seasonal wetlands provide little flood storage capacity.

## Management Considerations for WoUS Conservation and Enhancement

Table 5-15 summarizes the overall quality of WoUS types. Listed below are a few potential opportunities to improve habitat and water quality for this subbasin.

- Encourage farmers to reduce quantity of fertilizers and herbicides used on fields to improve water quality of marsh areas and ultimately the Delta.
- Discourage illegal dumping of garbage and chemical waste near and into sloughs and drainage channels.
- Reduce or remove invasive plant species growing within drainage channels to encourage establishment of native plant species and ultimately native wildlife species.