

1 **3.4 BIOLOGICAL RESOURCES**

BIOLOGICAL RESOURCES – Would the Project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

2 **3.4.1 Environmental Setting**

3 The Project site is located near Bay Point along the shoreline of Suisun Bay in
 4 unincorporated Contra Costa County. The Project site is located primarily offshore, with
 5 the only onshore portion being an existing levee road that may provide onshore access
 6 for emergency services, and the contractor’s shore base at McAvoy Yacht Harbor in
 7 Bay Point. The onshore access portion is within an area classified as “muted tidal
 8 marsh” (California Department of Fish and Wildlife [CDFW] 2014a) whereas the near
 9 shore work will be located within soft mud habitat. Water depths directly above the
 10 outfall alignment vary during high tidal times from 17 feet of water at approximately
 11 275 feet out from the shoreline to 4 feet of water at 150 feet out from the shoreline.

1 In addition to the CEQA analysis presented below, an *Essential Fish Habitat*
2 *Assessment and Fisheries Biological Assessment* and a *Biological Habitat Assessment*
3 of the onshore habitats are provided as Appendix A and Appendix B, respectively.

4 **Habitats**

5 Aquatic habitat at the Project site consists of soft sediment along both sides of the pipe
6 and soft sediment and graded rock over the pipe. Two blades of eelgrass (*Zostera* sp.)
7 were identified approximately 25 feet east of the pipe centerline approximately 150 feet
8 from shore (Belcher 2014). The eelgrass was identified approximately 25 feet from the
9 pipe and will not be affected by pipe removal activities.

10 The onshore portions of the site provide virtually 100 percent vegetative cover in the
11 marshland adjacent to the GWF outfall pipe along its length on the west side and north
12 of the Alum Pond (Figure 3-1). The area was comprised of approximately 3.2 acres of
13 unvegetated alum pond, 5.2 acres of disturbed low-quality marsh and access roads,
14 and 11.9 acres of tidal salt marsh.

15 The marshlands west of the outfall pipe and north of the Alum Pond are dominated by
16 emergent halophytes, including pickleweed (*Sarcocornia pacifica*), rushes (*Juncus*
17 *spp.*), common reed (*Phragmites australis*), and patches of ruderal vegetation, primarily
18 common pepperweed (*Lepidium densiflorum*). The plant associations observed at the
19 site are typical of middle tidal salt marsh at elevations near and above Mean High Water
20 (MHW) within the Estuary (Goals Project 1999; Avocet Research 2014).

21 The parcel of low elevation marsh northeast of the access road and the Alum Pond is
22 disturbed, low-quality marshland with *Juncus*, pickleweed, cattail (*Typha* spp.), bulrush
23 (*Schoenoplectus* spp.), ruderal vegetation, and gumplant (*Grindelia stricta*) (Avocet
24 Research 2014).

25 *Suisun Bay*

26 Suisun Bay is unique because of the varying salinities among seasons and years, and
27 this creates a dynamic fish assemblage. During normal hydrologic years, Suisun Bay
28 generally support a mesohaline community (National Marine Fisheries Service [NMFS]
29 2007). Species typical of mesohaline/oligohaline waters with soft sediment substrate in
30 the San Francisco Bay include white sturgeon (*Acipenser transmontanus*), green
31 sturgeon (*Acipenser medirostris*), Sacramento splittail (*Pogonichthys macrolepidotus*),
32 longfin smelt (*Spirinchus thaleichthys*), and starry flounder (*Platichthys stellatus*). Many
33 species of fish including striped bass (*Morone saxatilis*), Chinook salmon
34 (*Oncorhynchus tshawytscha*), steelhead trout (*Oncorhynchus mykiss*) and northern
35 anchovy (*Engraulis mordax*) migrate through the Carquinez Strait and adjacent waters.

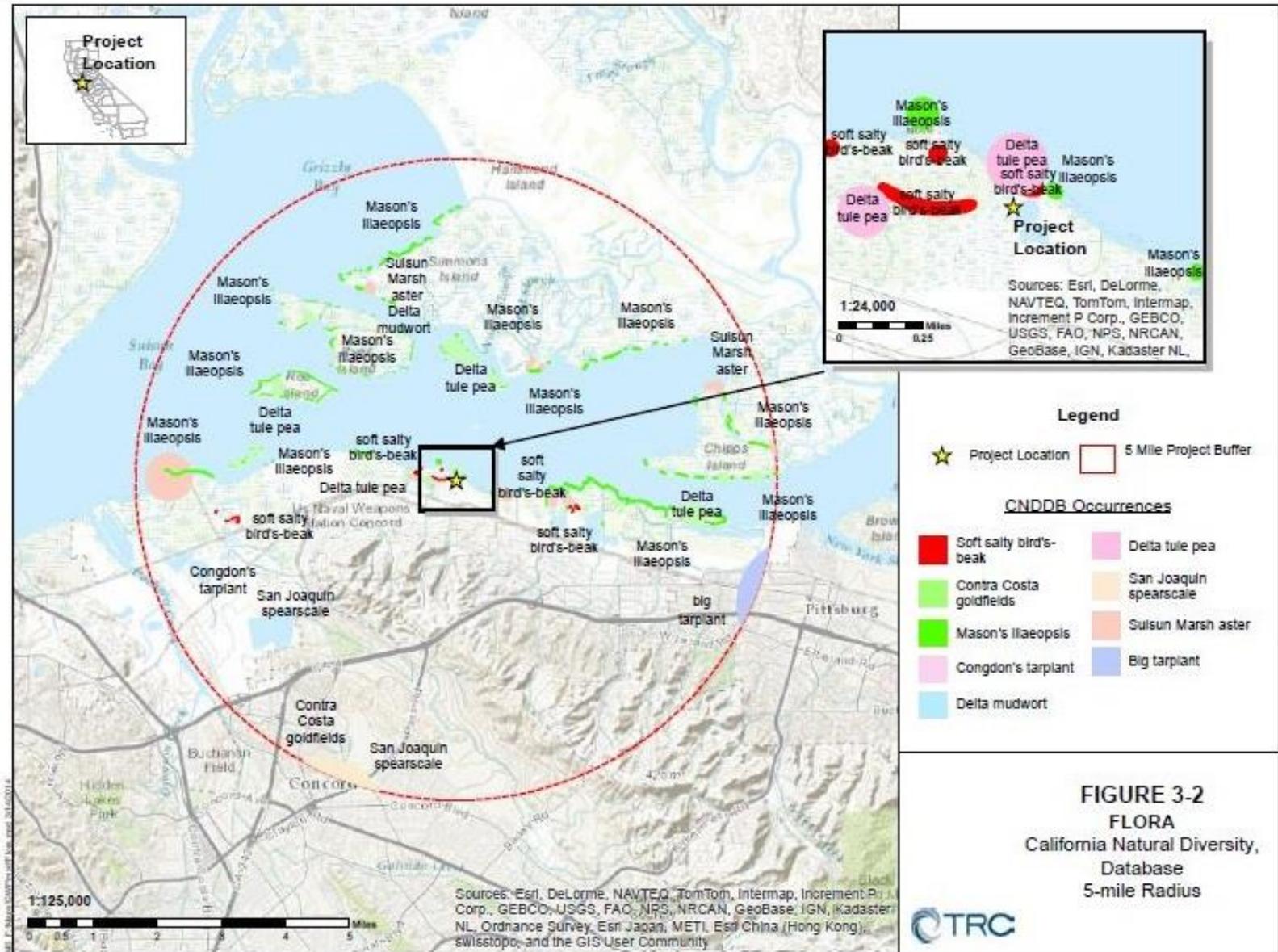


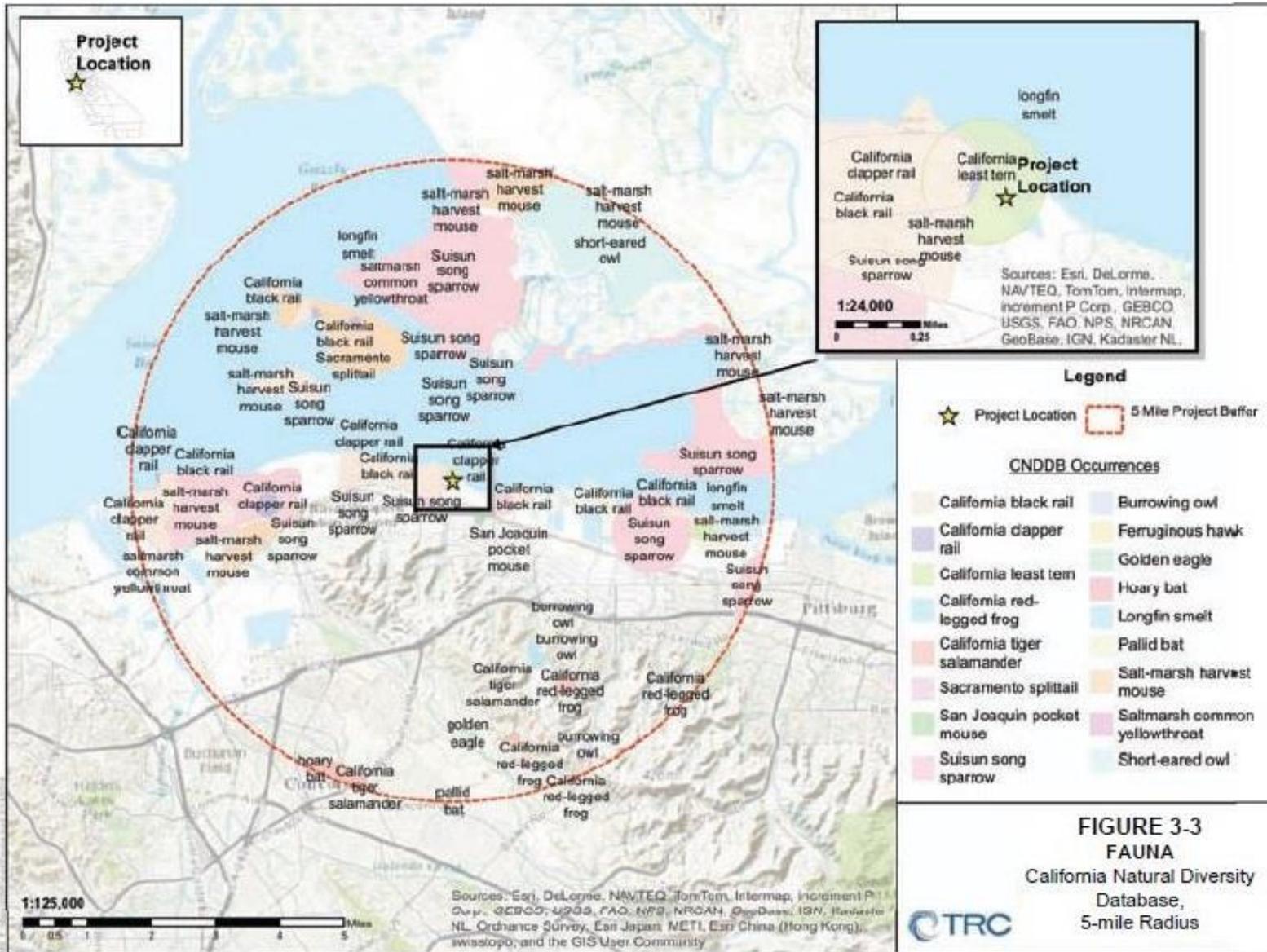
1 **Special-Status Species: Terrestrial**

2 Several special-status terrestrial plant and wildlife species have the potential to occur in
 3 the Project vicinity (Table 3.4-1: Special Status Terrestrial Plant and Wildlife Species).
 4 Special-status aquatic species (i.e., marine mammals, fish) are discussed separately
 5 below. For the purposes of this report, special-status species include those listed as
 6 endangered or threatened under the Endangered Species Act (ESA) or California
 7 Endangered Species Act (CESA), candidate species and species proposed for listing
 8 under the ESA or CESA, and species otherwise protected by the State of California and
 9 included in the CDFW’s California Natural Diversity Database (CNDDDB). A CNDDDB
 10 search was conducted to obtain recorded occurrences of special-status plant and
 11 animal species in the Project vicinity. The search included the U.S. Geological Survey
 12 7.5-minute quadrangle that the Project occurs in, and the eight surrounding
 13 quadrangles. Spatial distribution of CNDDDB records within 5 miles of the Project is
 14 shown in Figure 3-2 (flora) and Figure 3-3 (fauna) (CDFW 2014b).

Table 3.4-1: Special Status Terrestrial Plant and Wildlife Species

Taxon		Status
Flora	Mason’s lilaeopsis (<i>Lilaeopsis masonii</i>)	CNPS 1B.1
	Delta tule pea (<i>Lathyrus jepsonii</i> var. <i>jepsonii</i>)	CNPS 1B.2
	Soft bird’s beak (<i>Cordylanthus mollis</i> ssp. <i>mollis</i>)	FE, SR
Fauna	California least tern (<i>Sterna antillarum browni</i>)	FE, SE, FP
	Northern harrier (<i>Circus cyaneus</i>)	BSSC (3)
	California clapper rail (<i>Rallus longirostris obsoletus</i>)	FE, SE, FP
	California black rail (<i>Laterallus jamaicensis cortuniculus</i>)	ST, FP
	San Francisco common yellowthroat (<i>Geothlypis trichas sinuosa</i>)	BSSC (3)
	Suisun song sparrow (<i>Melospiza melodia maxillaries</i>)	BSSC (3)
	Salt marsh harvest mouse (<i>Reithrodontomys raviventris halicostus</i>)	FE, SE, FP
	“California” Red-Legged Frog (<i>Rana draytonii</i>)	FT
“California” Tiger Salamander (<i>Ambystoma californiense</i>)	FE, FT, ST	
Status codes BSSC (3): California Bird Species of Special Concern, priority 3. CNPS 1B: “rare, threatened or endangered in CA and elsewhere.” FE: Federally Endangered FP: California Department of Fish and Wildlife “fully protected.” FT: Federally threatened SE: State endangered ST: State threatened SR: State rare SSC: California Species of Special Concern (CDFW)		





1 The Project is not expected to result in adverse impacts to special-status reptiles,
2 amphibians, invertebrates, or plants, which are unlikely to occur in the Project vicinity.
3 California black rail (*Laterallus jamaicensis cortuniculus*) and salt marsh harvest mouse
4 (*Reithrodontomys raviventris halicostus*) are present within salt marsh habitat adjacent
5 to the work areas, and various sensitive fish species occur within Suisun Bay. On March
6 10, 2014, an Avocet Research biologist conducted a reconnaissance-level site survey of
7 the Project site to identify the presence of onshore sensitive habitats or special-status
8 species. Results of the surveys and other research are described below.

9 *Birds*

10 California Least Tern

11 The site does not support nesting sites for California least tern. Proximate nesting is
12 known from the Pacific Gas and Electric Pittsburg Power Plant (near Mallard Island),
13 3.6 miles east of the Project site. Terns forage in bay waters along the shoreline
14 adjacent to the tidal marsh from April through August (Avocet Research 2014).

15 Northern Harrier

16 The ground-nesting northern harrier nests and forages in tidal marsh habitat along the
17 Contra Costa County shoreline. One individual was observed on site on March 10,
18 2014. Local nesting in the adjacent marshlands is highly probable. The nesting season
19 extends from March through August (Avocet Research 2014).

20 California Clapper Rail

21 California clapper rails have been reported from the south shoreline of Suisun Bay in
22 the past, however population declines have been noted over the last decade and
23 reports in recent years in the Suisun system have been few and sporadic. One of the
24 habitat requirements of the California clapper rail is a well-developed system of tidal
25 channels, a habitat element not present in the immediate Project area. However, some
26 potential habitat occurs at Balloma Slough, 1.7 miles (2.7 kilometers [km]) west of the
27 site and within the Bay Point Regional Shoreline, 0.6 mile (1.0 km) east of the site,
28 therefore it is possible that California clapper rails could occur along the shoreline of the
29 study site foraging or commuting between more viable habitat patches (Avocet
30 Research 2014). Such movement is not likely during the nesting season.

31 California Black Rail

32 The tidal marsh habitat along the Contra Costa County shoreline is well-documented
33 California black rail habitat. Evens and Nur (2002) estimated that Suisun marshes
34 support 0.28 to 1.1 California black rail territories per acre (0.7 to 2.6 hectare [ha]).

1 Using these values, the 11.9 acres of marsh assessed for the Project may support as
2 many as 12 pair of California black rail. A study at nearby Concord Naval Weapons
3 Station found moderate (0.24-0.85 rails/acre [0.6-2.1 rails/hectare]) to high (>0.85
4 rails/acre [>2.1 rails/hectare]) densities of California black rail in tidal marsh habitat
5 similar to that found at this study site (Spear et al. 1999; Evens and Nur 2002). In a
6 wide-ranging study of the Estuary, Mallard Island, 0.6 mile (1 km) to the east, supported
7 the highest density of California black rail in the Suisun system (Evens et al. 1989). Four
8 individuals were detected on site on March 10, 2014, and it is a year-round resident in
9 the pickleweed-dominated marsh plain on site, which is prime habitat for this bird. High
10 tide refugial habitat, a critical component of its habitat requirements, is present on site
11 (Avocet Research 2014).

12 San Francisco Common Yellowthroat

13 In brackish and saline marshes around San Francisco Bay, San Francisco common
14 yellowthroat abundance is positively correlated with a high percentage cover of rushes
15 (*Schoenoplectus* or *Scirpus* spp.), peppergrass (*Lepidium latifolium*), and *Juncus*. The
16 habitat characteristics of the site likely support this species, both nesting and wintering.
17 The nesting season extends from mid-March into late-July (Avocet Research 2014).

18 Suisun Song Sparrow

19 The Suisun song sparrow occurs as a year-round resident in virtually every tidal marsh
20 in Suisun Bay. Suisun song sparrows are associated primarily with tidal channels. The
21 nesting season is protracted, extending from mid-march into mid-August (Avocet
22 Research 2014). Measures that protect the California black rail are assumed to protect
23 the Suisun song sparrow because the two species habitat affinities and breeding
24 season are similar (Avocet Research 2014).

25 Although not observed during the site visit, additional “special animals” likely to occur on
26 the site, either regularly or sporadically, given the habitat characteristics include those
27 listed below (CDFG 2011). In addition, the adjacent salt marsh habitat likely provides
28 foraging and nesting opportunities for various other migratory bird species.

- 29 • Great Blue Heron (*Ardea herodias*) [CDFW:SSC]
- 30 • Great Egret (*Ardea alba*) [CDFW:SSC]
- 31 • Snowy Egret (*Egretta thula*) [CDFW:SSC]
- 32 • Black-crowned Night-Heron (*Nycticorax nycticorax*) [CDFW:SSC]
- 33 • White-tailed Kite (*Elanus leucurus*) [CDFW:FP]
- 34 • Yellow Rail (*Coturnicops noveboracensis*) [BSSC-priority 2]
- 35 • Snowy Plover (*Charadrius nivosus*) [FT]
- 36 • Burrowing Owl (*Athene cunicularia*) [BSSC-priority 2]
- 37 • Short-eared Owl (*Asio flammeus*) [BSSC-priority 3]

- 1 • Loggerhead Shrike (*Lanius ludovicianus*) [BSSC-priority 2]
- 2 • “Bryant’s” Savannah Sparrow (*Passerculus sandwichensis alaudinus*) [BSSC-3]
- 3 • Saltmarsh Wandering Shrew (*Sorex vagrans halicoetes*) [CDFW:SSC]

4 *Mammals*

5 The south shoreline of Suisun Bay is included in the distributional range of the salt
6 marsh harvest mouse, federally endangered and CDFW fully protected. The proportion
7 of the site dominated by pickleweed (*Sarcocornia*) has the habitat characteristics
8 preferred by salt marsh harvest mouse. Given the habitat qualities, presence is
9 assumed (Avocet Research 2014).

10 *Amphibians*

11 As shown in Figure 3-3, above, occurrences of California red-legged frog and California
12 tiger salamander are well away from the Project location, and the tidal marsh uplands
13 adjacent to the Project, including the levee road, are not known to support individuals of
14 these species. Therefore, the Project will have no impact on the California red-legged
15 frog or California tiger salamander.

16 *Plants*

17 Three species of special status tidal marsh plants have been reported from the tidal
18 marshlands associated with the Project site (Table 3.4-1). None were observed during
19 the field visit. These plants are classified as California Rare Plant Rank 1B, meeting the
20 definition in State CEQA Guidelines section 15380 for purposes of this analysis.

21 **Special-Status Species: Aquatic**

22 *Mammals*

23 Marine mammals are rarely observed in Suisun Bay; however, California sea lions
24 (*Zalophus californianus*) and humpback whales (*Megaptera novaeangliae*) have been
25 seen upstream from Carquinez Strait. These species are protected under the Federal
26 Marine Mammal Protection Act (MMPA).

27 *Fish*

28 Because CNDDDB is limited to recorded observations, additional information on fish
29 species that may occur in the Project vicinity was obtained from NMFS (2001-2011).

30 The following special-status fish species are known to occur in Suisun Bay:

- 31 • Delta smelt (*Hypomesus transpacificus*), Federal and State Threatened

- 1 • Longfin smelt (*Spirinchus thaleichthys*), State Threatened
- 2 • Green sturgeon (*Acipenser medirostris*), southern Distinct Population Segment
- 3 (DPS), Federal Threatened, Species of Special Concern
- 4 • Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley fall/late fall-run
- 5 Evolutionarily Significant Unit (ESU), Species of Special Concern; Central Valley
- 6 spring-run ESU, Federal and State Threatened; and Sacramento River winter-run
- 7 ESU, Federal and State Endangered
- 8 • Steelhead trout (*Oncorhynchus mykiss irideus*), California Central Valley and
- 9 Central California Coast DPS, Federal Threatened
- 10 • River lamprey (*Lampetra ayresii*), Species of Special Concern
- 11 • Sacramento splittail (*Pogonichthys macrolepidotus*), Species of Special Concern

12 Suisun Bay is federally designated critical habitat for the delta smelt and green
13 sturgeon. Steelhead critical habitat includes the nearby ship channel but does not
14 extend to the Project area.

15 Delta Smelt

16 Delta smelt is a small, annual species endemic to the Estuary. Delta smelt spend much
17 of their lives in the brackish waters of the Estuary. They are weakly anadromous; after
18 the first high-winter flow, mature smelt migrate upstream in pulses between December
19 and April to spawn in fresh water. Most delta smelt die after spawning. By the beginning
20 of June, most larvae have entered a post-larvae state (0.6 inch to 1 inch) in which they
21 have developed a swim bladder and drifted passively downstream to rear in the
22 brackish waters of the Estuary. By the end of June, most smelt that will survive the
23 winter are in the Estuary and have entered the juvenile stage (0.8 inch to 1.6 inches).
24 June through August represents the delta smelt's primary growing season. Delta smelt
25 attain maturity between November and January when they are 2 to 3 inches in length
26 (Bennet 2005).

27 In the Estuary, delta smelt are distributed within turbid waters over large shoals (depth
28 < 23 feet) at the freshwater edge of the "entrapment zone," where they feed on small
29 crustaceans such as copepods and amphipods in the trophically rich waters
30 (Bennet 2005). The entrapment zone is an area where suspended materials
31 concentrate as a result of mixing by the outgoing freshwater flow from the Delta above
32 the heavier saltwater flow from the bay. The entrapment zone contains concentrations
33 of suspended materials such as nutrients, plankton, and fine sediments that are often
34 many times higher than in areas upstream or downstream of the entrapment zone
35 (Levine-Fricke 2004).

36 "X2" is another important term that aids in understanding the habitat and distribution of
37 fish species in the Estuary. X2 measures the distance in kilometers from the Golden

1 Gate Bridge to the location in the estuary where fresh and salt water first mix so that
 2 salinity near the bottom of the water column is 2 parts per thousand (ppt; about 6
 3 percent as salty as seawater). X2 corresponds to the central axis of open water estuary
 4 habitat, or brackish water. When X2 is located within Suisun Bay, the brackish water
 5 habitat is widely distributed throughout the slow, shallow waters and marshes of the
 6 bay; as X2 moves upstream in the channels of the Sacramento and San Joaquin
 7 Rivers, the total surface area of brackish water is reduced, the water channel is deeper,
 8 and the currents faster. X2 fluctuates over space and time depending on inflow levels of
 9 freshwater from the Delta rivers. Delta smelt distribution is highly correlated with the
 10 location of X2, which in turn depends on the volume of freshwater flow from the Central
 11 Valley Project and State Water Project, two of the world’s largest water-diversion
 12 projects. Water flows into the Delta are partially dependent on the previous water year’s
 13 water index. Water years are measured from October of the previous year through
 14 September of the current year. The water index for the water year is estimated by the
 15 California Department of Water Resources (DWR) starting in December; the final water
 16 index is available May 1.

17 During the summer, X2 and the entrapment zone are typically located in Suisun Bay.
 18 Under the provisions of the U.S. Fish and Wildlife Service (USFWS) Biological Opinion
 19 issued in relation to the Central Valley Project and State Water Project operations (as
 20 modified in *San Luis v Jewell*, Ninth Circuit, United States Court of Appeals, March
 21 2014), in the fall following wet years in the Sacramento Basin, freshwater flows are
 22 expected to be sufficient to create an average X2 of 74 km (55 miles) in September and
 23 October. This maintains the central axis of delta smelt distribution in Suisun Bay (DWR
 24 2011; USFWS 2008). Following the fall of above-normal water years, fall X2 will be
 25 maintained at 81 km (50 miles), at the confluence of the Sacramento and San Joaquin
 26 rivers. No additional releases are triggered following water years with a below normal or
 27 dry water index. Table 3.4-2 shows the average catch off New York Point from 1996 to
 28 2006.

Table 3.4-2: Average Delta Smelt Catch off New York Point 1996-2006

Month	Average Number of Delta Smelt Caught	Average Forklength (inches)
September	72	2.00
October	1	2.35
November	2	2.48
December	9	2.23

Source: California Department of Fish and Game (CDFG) 2008

1 Longfin Smelt

2 The longfin smelt is a small, pelagic fish distributed along the Pacific Coast of North
 3 America. San Francisco Bay supports the most southerly distributed and largest
 4 population in California. Longfin smelt mature at two to three years of age. They are
 5 partially anadromous, with at least some portion of the population of first-year smelt
 6 migrating in spring into coastal waters beyond the Golden Gate Bridge. Little is known
 7 about their movements in coastal waters, but they return to the Bay in their second
 8 winter just before spawning season (Rosenfield and Baxter 2007). Mature fish gradually
 9 migrate upstream December through February to spawn in fresh water. Longfin
 10 spawning occurs in fresh water over sandy-gravel substrates, rocks, and aquatic plants;
 11 the downstream extent of spawning is near the City of Pittsburg (LTMS 2009). Larvae
 12 develop a swim bladder and move downstream into the Estuary January through March.

13 Longfin smelt juveniles and adults feed on small copepods, though adults will also
 14 consume mysid shrimp when available. Longfin smelt can be found in the Bay
 15 throughout the year. Juveniles and adults aggregate in cooler waters in deep-water
 16 habitats and are thought to be intolerant of higher temperatures (>71.6 degrees
 17 Fahrenheit [°F]), thus, between approximately June and September, they are most
 18 abundant in the Central Bay (Rosenfield and Baxter 2007). Longfin smelt prefer deep
 19 channel areas (> 75 feet) over shallower shoals (< 75 feet). Data from the CDFW’s Fall
 20 Midwinter Trawl Surveys, which surveys September through December, show longfin
 21 smelt are found in the ship channel near Pittsburg throughout the fall, with numbers
 22 rising through November and average forklengh generally rising through December as
 23 mature longfin smelt migrate upstream (see Table 3.4-3). Like the delta smelt, longfin
 24 smelt distribution is correlated with the inland intrusion of saline waters, and they are
 25 relatively abundant in the Lower Estuarine River in all seasons of drought years (CDFG
 26 2008; Wang 1991).

27 **Table 3.4-3: Average Longfin Smelt Catch off New York Point 1996-2006**

Month	Average Number of Longfin Caught	Average Forklength (inches)
September	17	2.26
October	120	2.35
November	261	2.37
December	14	2.63
Source: CDFG 2008		

28 Green Sturgeon

29 The green sturgeon Southern DPS is a long-lived anadromous species found in marine
 30 and estuarine waters of the North Pacific. The Southern DPS consists of the population

1 segment of green sturgeon that uses the Sacramento River and tributaries for
2 spawning. Green sturgeon spend most of their life in marine and estuarine
3 environments. In winter, they aggregate in estuaries and migrate north along the North
4 Pacific coastal shelf. They overwinter in waters north of Vancouver Island and return
5 south in spring. Not all green sturgeon are migratory, however. They may be found in
6 San Francisco Bay throughout the year, though numbers increase in summer with the
7 return of migrants moving into the Estuary for feeding, holding, and spawning (Lindley et
8 al. 2011). Green sturgeon reach maturity between 10 and 15 years. Mature green
9 sturgeon are thought to spawn every two to four years. Mature fish enter and migrate
10 rapidly up the Sacramento River in March and April, where they spawn and then either
11 return to the Estuary or over-summer and migrate out of the river with the first fall flow
12 event (Heublein et al. 2009). Juveniles move from their natal river into the Estuary at
13 two years and may remain in the Estuary from one to four years before migrating to the
14 Pacific Ocean. In the Estuary, green sturgeon are associated with turbid water, where
15 they prey on benthic organisms such as clams and crabs. Green sturgeon live from 40
16 to 60 years and exhibit cohesive social behavior in overlapping age cohorts (Israel and
17 Kimley 2008).

18 Chinook Salmon

19 The Chinook salmon is the only coastal pelagic species covered under the Salmon
20 Fishery Management Plan (FMP) that has potential to occur in the vicinity of the Project.
21 Juvenile and adult Chinook salmon are potentially present in Suisun Bay. The Chinook
22 salmon occurring within the Estuary include three ESUs: the Central Valley fall/late fall-
23 run ESU; the Central Valley spring-run ESU; and the Sacramento River winter-run ESU.
24 Freshwater streams and estuaries provide important habitat for Chinook salmon. They
25 feed on terrestrial and aquatic insects, amphipods, and other crustaceans while young,
26 and primarily on other fish when older. Estuaries and associated wetlands provide
27 nursery areas for the Chinook prior to its departure to the open ocean (TRC 2014).

28 Steelhead

29 Central Valley steelhead mature between two and three years of age. They are mainly
30 “winter” run, though a small summer-run population exists. The small summer-run
31 population migrates into the Sacramento River starting in July. The majority of
32 steelhead begin migration in the fall. Spawning migration peaks in September and
33 October and may continue through February or March. Unlike the Chinook salmon, not
34 all steelhead die after spawning. Some may return to the ocean and return to spawn
35 several times. Most juvenile steelhead spend one to two years in fresh water before
36 migrating toward the ocean in the winter and spring, with an outmigration peak in mid-
37 March (Moyle et al. 2008). USFWS trawl data from Chipps Island, indicate that juvenile
38 steelhead are present in Suisun Bay from at least October through July, with hatchery
39 fish (clipped adipose fin) emigration peaking between January and March, and wild

1 juvenile outmigration more evenly spread out over 6 months or more (USFWS 2008).
2 The difference in emigration peak is a reflection of the timing of hatchery releases of
3 juvenile steelhead. Fish salvage data from the Delta pumps indicate that most steelhead
4 move through the Delta from November to June, with the peak numbers occurring in
5 February through April (USFWS 2008).

6 River Lamprey

7 Adult river lampreys spawn in gravel bottomed streams, at the upstream end of riffle
8 habitat. Adults typically die after the eggs are deposited and fertilized. After the eggs
9 hatch, young ammocoetes (larva) drift downstream to areas of low velocity and silt or
10 sand substrate. They remain burrowed in the stream bottom, living as filter feeders on
11 algae and detritus for two to seven years. Metamorphosis from the ammocoete to
12 macrophthalmia (juvenile) life stage occurs between July and April. At this time,
13 macrophthalmia are thought to live deep in the river channel. As adults, their oral disc
14 develops just before they enter the ocean between May and July. During the
15 approximately 10 weeks they are at sea in the parasitic phase, they remain close to
16 shore, feeding primarily on smelt and herring near the surface. After the adult feeding
17 phase, river lamprey migrate to spawning areas and cease feeding. Riffle and side
18 channel habitats are important for spawning and for ammocoete rearing. Because
19 lamprey ammocoetes colonize areas and are relatively immobile in the stream
20 substrates, good water quality is essential for rearing. Adults feed in nearshore marine
21 and estuarine habitat. (USFWS 2014).

22 Sacramento Splittail

23 The Sacramento splittail is an endemic inhabitant of brackish waters of the San
24 Francisco Bay. Its distribution is limited to the Estuary and estuarine environments of
25 large streams, including lower Walnut-San Ramon Creek, where it inhabits small,
26 shallow, turbid sloughs lined with emergent vegetation (Leidy 2007). Mature splittail
27 migrate into freshwater floodplains for the winter to forage and hold until spring
28 spawning. Spawning occurs from late February to July, with peak spawning in March
29 and April. Adults return to the Estuary after spawning. Young-of-year Splittail move into
30 the Estuary between April and August where they inhabit broad shoals or channels of
31 intertidal habitat at the mouths of estuarine streams (Feyrer et al. 2005). Splittail are
32 benthic feeders of macroinvertebrates and detritus. Feeding activity is greatest in the
33 morning and early afternoon and peak growth is between May and September (Daniels
34 and Moyle 1983).

35 **Essential Fish Habitat**

36 According to the Magnuson-Stevens Fishery Conservation and Management Act, as
37 amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), essential fish

1 habitat (EFH) for species regulated under a Federal FMP must be identified, conserved,
2 and enhanced.

3 The Project location overlaps with EFHs for three FMPs (National Oceanic and
4 Atmospheric Administration [NOAA] 2014).

5 1. **Pacific Groundfish Fishery.** Over 90 groundfish species (e.g., flatfish, rockfish,
6 sharks) are included in the Pacific Groundfish FMP. The groundfish EFH includes
7 seamounts, water depths less than 1,1483 feet, and the upriver extent of
8 saltwater intrusion. In the San Francisco Bay Delta, this definition encompasses
9 all of the Bay and the Delta, and upriver toward the cities of Sacramento and
10 Stockton.

11 2. **Pacific Salmon Fishery.** In California, Chinook and Coho salmon are included in
12 this FMP. This EFH includes all streams and other waterbodies occupied or
13 historically accessible to salmon in specified hydrologic units in the San
14 Francisco Bay Delta Region.

15 3. **Coastal Pelagic Species Fishery.** This fishery includes four finfish and one
16 invertebrate; however, only the northern anchovy is found regularly in the San
17 Francisco Bay. The geographic extent of this EFH includes all marine and
18 estuarine waters from the shoreline to the limits of the U.S. Exclusive Economic
19 Zone (EEZ); within the water column, it is limited to the water column between
20 the thermoclines where temperatures range from 50°F to 78.8°F.

21 The outfall pipe is further located within the Estuary Habitat Area of Particular Concern
22 incorporating the Estuary from the Pacific Ocean to the west bank of Broad Slough.

23 Suisun Bay has been identified as EFH for several species of fish as shown in Table
24 3.4-4.

Table 3.4-4 Species with EFH Designated in the Suisun Bay

Species	FMP ¹	Life Stage Present ²
English sole (<i>Parophrys vetulus</i>)	GF	J, A
Starry flounder (<i>Platichthys stellatus</i>)	GF	J, A
Brown rockfish (<i>Sebastes auriculatus</i>)	GF	J
Northern anchovy (<i>Engraulis mordax</i>)	CP	L, J, A
Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	PS	J, A
Notes: 1 - Fisheries Management Plans: GF – Pacific Coast Groundfish FMP CP – Coastal Pelagics FMP PS – Pacific Salmon FMP 2 - Life Stages: L - Larvae J – Juvenile Source: NMFS 2001 – 2011		

1 Invasive Species

2 The Estuary has been described as one of the most invaded ecosystems in North
 3 America (Cohen and Carlton 1995). Invasive nonindigenous aquatic species dominate
 4 many parts of the San Francisco Bay, to the extent that in some locations only
 5 introduced species can be found. In 2010, the CDFW collected 497 species from the
 6 Estuary, of which 98 species were classified as introduced, including three newly
 7 detected species to the Estuary that had likely been spread from other locations in
 8 California (CDFG & Office of Spill Prevention and Response [OSPR] 2011). Non-native
 9 species have been introduced to the Bay via many vectors, including the deliberate
 10 introduction of species for recreational or commercial purposes. Transoceanic vessel
 11 traffic has been identified as a major vector of non-native species, and hull fouling and
 12 ballast water are the single largest contributor of non-native species to the Bay.

13 Though some non-native species are benign or beneficial, others have the potential to
 14 become invasive. Invasive species may compete directly with native species for food or
 15 space or prey upon native species. Invasive species can also change the food chain or
 16 physical environment to the detriment of native species. Approximately 42 percent of
 17 the species on the federal Threatened or Endangered species list are at risk primarily
 18 because of predation, parasitism, and competition from nonindigenous invasive species
 19 (CDFG & OSPR 2011). The most important invasive species in the Project vicinity is the
 20 overbite clam, *Corbula amurensis*. Thought to have been introduced in the bay by
 21 ballast water exchange from a cargo ship, this phytoplankton eater species is now so
 22 abundant that the current population is capable of filtering the Estuary’s water column
 23 several times a day and has caused a crash in the abundance of phytoplankton in the
 24 Bay (San Francisco Estuary Project [SFEP] 2004).

25 3.4.2 Regulatory Setting

26 Federal and State

27 Federal and State laws and regulations pertaining to this issue area and relevant to the
 28 Project are identified in Table 3.4-5.

Table 3.4-5 Laws, Regulations, and Policies (Biological Resources)

U.S.	Endangered Species Act (ESA) (7 USC 136, 16 USC 1531 et seq.)	The ESA, which is administered in California by the USFWS and National Marine Fisheries Service (NMFS), provides protection to species listed as threatened or endangered, or proposed for listing as threatened or endangered. Section 9 prohibits the “take” of any member of a listed species. <ul style="list-style-type: none"> • Take is defined as “...to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” • Harass is “an intentional or negligent act or omission that creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering.”
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Table 3.4-5 Laws, Regulations, and Policies (Biological Resources)

		<ul style="list-style-type: none"> Harm is defined as "...significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering." <p>When applicants are proposing projects with a Federal nexus that "may affect" a federally listed or proposed species, the Federal agency is required to consult with the USFWS or NMFS, as appropriate, under Section 7, which provides that each Federal agency must ensure that any actions authorized, funded, or carried out by the agency are not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of areas determined to be critical habitat.</p>
U.S.	Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 USC 1801 et seq.)	The MSA is the primary law governing marine fisheries management in U.S. Federal waters. The MSA was first enacted in 1976 and amended in 1996. Amendments to the 1996 MSA require the identification of Essential Fish Habitat (EFH) for federally managed species and the implementation of measures to conserve and enhance this habitat. Any project requiring Federal authorization, such as a U.S. Army Corps of Engineers (USACE) permit, is required to complete and submit an EFH Assessment with the application and either show that no significant impacts to the essential habitat of managed species are expected or identify mitigations to reduce those impacts. Under the MSA, Congress defined EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 USC 1802(10)). The EFH provisions of the MSA offer resource managers a means to heighten consideration of fish habitat in resource management. Pursuant to section 305(b)(2), Federal agencies shall consult with the NMFS regarding any action they authorize, fund, or undertake that might adversely affect EFH.
U.S.	Marine Mammal Protection Act (MMPA) (16 USC 1361 et seq.)	The MMPA is designed to protect and conserve marine mammals and their habitats. It prohibits takes of all marine mammals in the U.S. with few exceptions. The NMFS may issue a take permit under section 104 if the activities are consistent with the purposes of the MMPA and applicable regulations at 50 CFR, Part 216. The NMFS must also find that the manner of taking is "humane" as defined in the MMPA. If lethal taking of a marine mammal is requested, the applicant must demonstrate that using a non-lethal method is not feasible.
U.S.	Migratory Bird Treaty Act (MBTA) (16 USC 703-712)	The MBTA was enacted to ensure the protection of shared migratory bird resources. The MBTA prohibits the take, possession, import, export, transport, selling, purchase, barter, or offering for sale, purchase, or barter, of any migratory bird, their eggs, parts, and nests, except as authorized under a valid permit. The responsibilities of Federal agencies to protect migratory birds are set forth in EO 13186. The USFWS is the lead agency for migratory birds. The USFWS issues permits for takes of migratory birds for activities such as scientific research, education, and depredation control, but does not issue permits for incidental take of migratory birds.
U.S.	Other	<ul style="list-style-type: none"> The Bald and Golden Eagle Protection Act makes it illegal to import, export, take (including molest or disturb), sell, purchase or barter any bald eagle or golden eagle or parts thereof. Clean Water Act (33 USC 1251 et seq.) and Rivers and Harbors Act (33 USC 401) (see Section 3.9, Hydrology and Water Quality). CZMA (see Table 1-2). Executive Order 13112 requires Federal agencies to use authorities to prevent introduction of invasive species, respond to and control invasions in a cost-effective and environmentally sound manner, and provide for restoration of native species and habitat conditions in invaded ecosystems. Executive Order 13158 requires Federal agencies to identify actions that affect natural or cultural resources within a Marine Protected Area (MPA) and, in taking such actions, to avoid harm to the natural and cultural resources that

Table 3.4-5 Laws, Regulations, and Policies (Biological Resources)

		are protected by a MPA.
CA	California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.)	The CESA provides for the protection of rare, threatened, and endangered plants and animals, as recognized by the CDFW, and prohibits the taking of such species without its authorization. Furthermore, the CESA provides protection for those species that are designated as candidates for threatened or endangered listings. Under the CESA, the CDFW has the responsibility for maintaining a list of threatened species and endangered species (Fish & G. Code, § 2070). The CDFW also maintains a list of candidate species, which are species that the CDFW has formally noticed as under review for addition to the threatened or endangered species lists. The CDFW also maintains lists of Species of Special Concern that serve as watch lists. Pursuant to the requirements of the CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any State-listed endangered or threatened species may be present in the project site and determine whether the proposed project will have a potentially significant impact on such species. The CESA also requires a permit to take a State-listed or candidate species through incidental or otherwise lawful activities (§ 2081, subd. (b)).
CA	Other relevant Fish and Game Code sections	<ul style="list-style-type: none"> • The California Native Plant Protection Act (Fish & G. Code, § 1900 et seq.) is intended to preserve, protect, and enhance endangered or rare native plants in California. This Act includes provisions that prohibit the taking of listed rare or endangered plants from the wild and a salvage requirement for landowners. The Act directs the CDFW to establish criteria for determining what native plants are rare or endangered. Under section 1901, a species is endangered when its prospects for survival and reproduction are in immediate jeopardy from one or more causes. A species is rare when, although not threatened with immediate extinction, it is in such small numbers throughout its range that it may become endangered. • The California Species Preservation Act (Fish & G. Code §§ 900-903) provides for the protection and enhancement of the amphibians, birds, fish, mammals, and reptiles of California. • Fish and Game Code sections 3503 & 3503.5 prohibit the taking and possession of native birds' nests and eggs from all forms of needless take. These regulations also provide that it is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nests or eggs of any such bird except as otherwise provided by this Code or any regulation adopted pursuant thereto. • Fish and Game Code sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), & 5515 (fish) designate certain species as "fully protected." Fully protected species, or parts thereof, may not be taken or possessed at any time without permission by the CDFW. • Fish and Game Code section 3513 does not include statutory or regulatory mechanism for obtaining an incidental take permit for the loss of non-game, migratory birds.

1 Local

2 The Conservation Element of the Contra Costa County General Plan 2005-2020
 3 includes goals and policies that aim to preserve and protect biological resources
 4 throughout the County. The following biological resources goals and policies were
 5 considered in the analysis of the Project:

- 1 • Goal 8-E - To protect rare, threatened and endangered species of fish, wildlife
2 and plants, significant plant communities, and other resources which stand out as
3 unique because of their scarcity, scientific value, aesthetic quality or cultural
4 significance. Attempt to achieve a significant net increase in wetland values and
5 functions within the County over the life of the General Plan. The definition of
6 rare, threatened and endangered includes those definitions provided by the
7 Federal Endangered Species Act, the California Endangered Species Act, the
8 California Native Plant Protection Act and the California Environmental Quality
9 Act.
- 10 • Goal 8-F - To encourage the preservation and restoration of the natural
11 characteristics of the San Francisco Bay/Delta estuary and adjacent lands, and
12 recognize the role of Bay vegetation and water area in maintaining favorable
13 climate, air and water quality, fisheries and migratory waterfowl.
- 14 • Policy 8-6 - Significant trees, natural vegetation, and wildlife populations
15 generally shall be preserved.
- 16 • Policy 8-7 - Important wildlife habitats which would be disturbed by major
17 development shall be preserved, and corridors for wildlife migration between
18 undeveloped lands shall be retained.
- 19 • Policy 8-13 - The critical ecological and scenic characteristics of rangelands,
20 woodlands, and wildlands shall be recognized and protected.
- 21 • Policy 8-15 - Existing vegetation, both native and non-native, and wildlife habitat
22 areas shall be retained in the major open space areas sufficient for the
23 maintenance of a healthy balance of wildlife populations.
- 24 • Policy 8-17 - The ecological value of wetland areas, especially the salt marshes
25 and tidelands of the bay and delta, shall be recognized. Existing wetlands in the
26 County shall be identified and regulated. Restoration of degraded wetland areas
27 shall be encouraged and supported whenever possible.
- 28 • Policy 8-24 - The County shall strive to identify and conserve remaining upland
29 habitat areas which are adjacent to wetlands and are critical to the survival and
30 nesting of wetland species.
- 31 • Policy 8-25 - The County shall protect marshes, wetlands, and riparian corridors
32 from the effects of potential industrial spills.

33 **3.4.3 Impact Analysis**

34 ***a) Have a substantial adverse effect, either directly or through habitat***
35 ***modifications, on any species identified as a candidate, sensitive, or special-***
36 ***status species in local or regional plans, policies, or regulations, or by the***
37 ***California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?***

1 **Less than Significant with Mitigation.** Because Project activities will be carried out
2 below MHW, and terrestrial activity will be limited to the potential use of the levee road,
3 the majority of potential impacts would occur to special-status and federally managed
4 aquatic species. Although various special-status avian species may occur within
5 adjacent terrestrial habitats, they are not expected to be adversely affected by Project
6 activities due to (1) the seasonal timing and short duration of the Project, and (2)
7 limitation of vehicle use to the levee road. The Project proposes to lift the pipe from
8 within its buried position beneath graded rock and mud while taking steps to minimize
9 disturbance and sediment resuspension. These activities could potentially result in the
10 following short-term effects on special-status and federally managed fish species:
11 physical displacement, loss of foraging area and prey species, and physical injury
12 caused by equipment. Because of the short-term and temporary nature of the work, the
13 schedule of work planned between September 1 and October 31, the small work area
14 that is involved, and procedures proposed for minimizing resuspension of sediment, the
15 Project is not expected to result in a substantial adverse effect to the marine
16 environment.

17 As described above, the Project area (Suisun Bay) has been identified as EFH for
18 several species of fish: English sole, starry flounder, brown rockfish, northern anchovy,
19 and Chinook salmon, (which includes two ESUs that are federally and state listed as
20 threatened or endangered). These fish species may use this area during a portion of
21 their life cycles. The Estuary is typically used as a forage area for juveniles and adults
22 and as a nursery area for larvae and juveniles. These species would not use the Project
23 area for spawning.

24 Juvenile or adult fish species in the area would be expected to move out of the area
25 during the pipe removal activities. Because of the temporary nature of the effects on
26 benthic invertebrates (the disturbed area will be recolonized), the cumulative effects of
27 this Project on EFH are negligible.

28 In addition to Chinook salmon, these other federal and state listed species have the
29 potential to occur in the Project area: green sturgeon, longfin smelt, delta smelt, and
30 Central Valley steelhead. Like the species listed above, these species may also use the
31 area during a portion of their life cycles. There is no point during the year in which all
32 special-status species are expected to be absent from the Project area; however, as
33 summarized in Table 3.4-6 and discussed in detail below, the Project timing has been
34 scheduled for the September through October season in order to reduce potential
35 impacts on special-status fish to the extent feasible. Generally, juvenile or adult fish
36 species in the area would be expected to move out of the area during the pipe removal
37 activities, and eggs/larval fish would not be present. Additionally, because of the
38 temporary nature of the effects on benthic invertebrates (the disturbed area will be
39 recolonized), the cumulative effects of this Project on threatened or endangered fish
40 species are negligible.

Table 3.4-6: Special-status Species and Timing in the Lower Estuarine River

Species	Status		Month											
	Federal	State	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Delta Smelt (water < 10 feet)	FT	SE	P	P	P	P	P	R	R	R	R	R	R	M _s
Delta Smelt (water > 10 feet)*	FT	SE	P	P	P	P	P	R	R					M _s
Longfin Smelt	None	ST	S	S	S	S	R	R	R	R	M _s	M _s	M _s	S
Sacramento Splittail	None	SSC					M _o	M _o	M _o	M _o			M _s	M _s
Green Sturgeon (adult)	FT	SSC	M _s					M _o						
Green Sturgeon (juv. and subadult)	FT	SSC	R	R	R	R	R	R	R	R	R	R	R	R
Central Valley Chinook Salmon (adult)														
Fall/Late Fall-run	FSC	SSC	M _s								M _s	M _s	M _s	M _s
Winter-run	FE	SE	M _s											
Spring-run	FT	ST		M _s										
Central Valley Chinook Salmon (juvenile)														
Fall/Late Fall-run	FSC	SSC	M _o											
Winter-run	FE	SE	M _o											
Spring-run	FT	ST	M _o	M _o								M _o	M _o	M _o
Central Valley Steelhead (adult)	FT	None	M _s	M _s					M _s					
Central Valley Steelhead (juvenile)	FT	None	M _o				M _o	M _o	M _o					
Notes: M _s = spawning migration; M _o = outmigration; R = rearing; S = spawning; P = Present														
Sources: Bennett, 2005; CDFG, 2011; Israel and Klimley, 2008; Levine-Fricke, 2004; LTMS, 2009; Moyle, 2002; Moyle et al, 2008; USFWS, 2008														

1 **Delta Smelt**

2 Delta smelt have the potential to occur in the vicinity of the Project throughout the
3 proposed term of removal activities. Beginning in December, delta smelt are expected
4 to begin to migrate upstream. As discussed in Section 3.4.1 – Environmental Setting,
5 the fall abundance of delta smelt in the area depends in large part on the water index of
6 the previous year. However, under any scenario, the Project is located within the low-
7 salinity zone, so there is potential for delta smelt to use nearby areas for rearing and
8 foraging while pipe removal is underway. Given the small area of disturbance and
9 abundant surrounding areas for dispersal, along with implementation of **Mitigation**
10 **Measures (MMs) BIO-1, BIO-2, BIO-3, and BIO-4** listed below, impacts to delta smelt
11 would be reduced to a less than significant level.

12 **Longfin Smelt**

13 Longfin smelt are expected to occur in the Project area year-round, but water conditions
14 that exist in the Project vicinity August 1 to September 31 (shallow [<20 feet] and warm
15 [$\geq 71.6^{\circ}\text{F}$]) are not ideal for longfin smelt. Longfin smelt are more likely to be abundant
16 in the ship channel north of the pipe removal area, and less likely in the shallow water
17 area of the Project. The furthest downstream extent of spawning occurs near the city of
18 Pittsburg. These factors, along with implementation of **MMs BIO-1, BIO-2, BIO-3, and**
19 **BIO-4** listed below, would reduce impacts to longfin smelt to a less than significant level.

20 **Chinook Salmon**

21 Adult chinook salmon could potentially migrate past the Project area during most
22 months of the year, but are not likely to be directly in the Project area. In-water work that
23 occurs July 1 to November 31 is unlikely to impact adults of the threatened or
24 endangered winter-run and spring-run chinook salmon. Juvenile chinook salmon from
25 the fall-run and late fall-run pass through Suisun Bay during all months of the year.
26 Smolt of the threatened or endangered winter-run and spring-run pass through the area
27 October 1 to April 30. Winter-run smolts enter the Delta January through April. Spring-
28 run smolts enter the Lower Estuarine River starting October 1, with peak numbers in
29 November and December. These life-history factors, along with implementation of **MMs**
30 **BIO-1, BIO-2, BIO-3, and BIO-4** listed below, would reduce impacts to Chinook salmon
31 to a less than significant level. In particular, the timing of the Project (**MM BIO-2**) will be
32 effective in reducing impacts to smolts/juveniles of the threatened or endangered winter-
33 run and spring-run Chinook salmon.

34 **Steelhead Trout**

35 While some adult steelhead move upstream through the Delta beginning in July, the
36 spawning migration through this area peaks in September and October and continues

1 into the winter. Most juvenile steelhead emigrate through the Delta from November
2 through June, with the peak numbers occurring in February through April. Relatively
3 small numbers of adult or juvenile steelhead are present in the Project area during the
4 summer months. Impacts to steelhead could include temporary interference with
5 migration, degradation or water quality, loss or degradation of habitat and interference
6 with foraging or food resources. Implementation of **MMs BIO-1, BIO-2, BIO-3, and**
7 **BIO-4** listed below, would reduce impacts to steelhead trout to a less than significant
8 level. In particular, the timing of the Project (**MM BIO-2**) will be effective in reducing
9 impacts to juveniles as relatively small numbers of juveniles are present during
10 September 1 through October 31.

11 **Green Sturgeon**

12 Adult green sturgeon could potentially be present in the Lower Estuarine River from
13 December through May, and juvenile and subadults of this species rear in Suisun Bay
14 all months of the year. Impacts could include interference with migration, temporary
15 degradation of water quality, temporary loss or degradation of habitat and interference
16 with foraging or food resources. However, green sturgeon are wide ranging throughout
17 the bay and it can be assumed that if individuals find the area obnoxious, they can
18 move elsewhere in the bay without adverse effect to their health or survival. This
19 avoidance behavior, and implementation of **MMs BIO-1, BIO-2, BIO-3, and BIO-4** listed
20 below, would reduce impacts to green sturgeon to a less than significant level.

21 **Sacramento Splittail and River Lamprey**

22 Sacramento splittail outmigrate through the Lower Estuarine River and juveniles gather
23 in the channels and at the mouths of streams during the summer months. They would
24 not be expected to occur in the Project area. River lamprey adults could feed in the
25 Project area but would likely disperse during Project activities. Although impacts could
26 include temporary degradation of water quality and interference with foraging, this
27 avoidance behavior, and implementation of **MMs BIO-1, BIO-2, BIO-3, and BIO-4** listed
28 below, would reduce impacts to Sacramento splittail and river lamprey to a less than
29 significant level. In particular, the timing of the Project (**MM BIO-2**) will be effective in
30 reducing impacts to splittails because they are not expected to occur in the Project area
31 during September 1 through October 31.

32 **Birds**

33 Special status bird species (California clapper rail, northern harrier, California black rail,
34 San Francisco common yellowthroat, and Suisun song sparrow) occur in adjacent tidal
35 marsh habitats, and California least terns forage over bay waters. Project activities
36 would primarily occur offshore. The onshore levee road would be used by a light utility
37 work vehicle. The vehicle would remain on the levee road and would not disturb salt

1 marsh habitat. With implementation of **MMs BIO-1, BIO-2, and BIO-5**, impacts to
2 California least tern, California clapper rail, northern harrier, California black rail, San
3 Francisco common yellowthroat, and Suisun song sparrow would be less than
4 significant.

5 To reduce potentially significant Project impacts to sensitive wildlife and their habitats
6 the Applicant will implement the following MMs.

7 **MM BIO-1. Worker Environmental Awareness Program (WEAP).** A qualified
8 biologist shall conduct pre-Project training (WEAP) for work crew members prior
9 to any Project site activities. The training shall include a discussion of sensitive
10 biological resources within the Project area and the potential presence of special-
11 status species, special-status species' habitats, and protection measures to
12 ensure species are not impacted by Project activities and Project boundaries.
13 The WEAP shall also include daily trash containment/removal requirements, and
14 prohibit workers from bringing domestic animals (i.e., dogs) and firearms to the
15 Project site, in order to ensure the protection of native wildlife.

16 **MM BIO-2. Work Windows.** All Project activities shall be conducted between
17 September 1 and October 31.

18 **MM BIO-3. In Water Turbidity Protections.** A turbidity curtain shall be installed
19 to protect fish from potential water quality/turbidity effects. The curtain (100 linear
20 feet) shall be installed and maintained around the shoreline terminus flange of
21 the pipe to contain muddy water and sediment materials that escape from the
22 6-inch-diameter outfall pipe during pipe removal. Sawdust generated during
23 cutting and removal of timber pilings will also be contained in this curtain and/or
24 skimmed and removed if floating in water (and disposed of in plastic bags). No
25 activities that would entrain or impinge fish shall be used.

26 **MM BIO-4. Protection from Release of Toxic Substances.** The Applicant shall
27 implement the following measures to prevent the release of toxic substances.

- 28 • All engine-powered equipment used and operated upon and from the deck of
29 the barge shall incorporate the use of drip-pans or other means to retain fluids
30 beneath the equipment.
- 31 • Only approved and certified fuel cans with “no-spill” spring loaded lids shall be
32 used when fueling up diesel or gas engines. Engines will be turned OFF and
33 fueling will not be done over the water. A spill kit with absorbent diapers shall
34 be readily available next to each filling area.
- 35 • A continuous floating oil-absorbent sock shall be deployed and maintained
36 around the entire barge to contain any accidental leakage of fuel or hydraulic
37 fluids.

1 **MM BIO-5. Confine Vehicle Use to Established Roadway.** Project-related
2 vehicle use and any other terrestrial activity shall be confined to the established
3 levee road. No staging, driving, walking, or any other human activity shall occur
4 in the salt marsh habitat. Vehicles shall not exceed 20 miles per hour in order to
5 ensure birds/wildlife that may be on or crossing the road have an opportunity to
6 move out of harm's way.

7 ***b) Have a substantial adverse effect on any riparian habitat or other sensitive***
8 ***natural community identified in local or regional plans, policies, regulations or by***
9 ***the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?***

10 **Potential Disturbance of Eelgrass**

11 **Less than Significant.** Results from the dive survey found eelgrass approximately
12 25 feet from the centerline of the pipe to be removed. The dive survey only identified
13 two blades of the grass at the outside edge of their survey corridor so the extent of the
14 eelgrass bed is not known. Eelgrass beds are important for sediment deposition and
15 substrate stabilization, as substrate for epiphytic algae and micro-invertebrates, and as
16 nursery grounds for many species of economically important fish and shellfish. The
17 species of eelgrass was not confirmed during the dive survey. Pacific eelgrass, *Zostera*
18 *marina*, is native to the California coast and beneficial to the ecosystem. Dwarf
19 eelgrass, *Zostera japonica*, is native to Asia and threatens to upset the natural balance
20 of California's wetlands. The eelgrass was observed approximately 150 feet from shore
21 and 25 feet from the centerline of the discharge pipe, and although it is not expected to
22 be disturbed by pipe removal activities, the implementation of **MM BIO-1**, instructing
23 how to recognize and avoid potential eelgrass beds, provides an abundance of caution
24 to ensure that the Project will result in less than significant impact.

25 **Potential Spread of Aquatic Invasive Species**

26 **Less than Significant.** Aquatic invasive species could be introduced to the Project area
27 by vessels involved in pipe removal. Vectors for invasive species may include ballast
28 water and biofouling (i.e., the accumulation of aquatic organisms) on vessel hulls or
29 accessory structures. Introduced species have the potential to affect indigenous species
30 through competition, predation, parasitism, genetic dilution, introduction of pathogens,
31 and smothering and loss of habitat.

32 Vessels contracted for the Project will originate from local ports, thus avoiding the
33 possibility of introducing invasive species from outside the local area. Therefore,
34 impacts due to invasive species would be less than significant and no mitigation is
35 required.

1 ***c) Have a substantial adverse effect on federally protected wetlands as defined by***
2 ***section 404 of the Clean Water Act (including, but not limited to, marsh, vernal***
3 ***pool, coastal, etc.) through direct removal, filling, hydrological interruption, or***
4 ***other means?***

5 **Less than Significant Impact with Mitigation.** Suisun Bay is subject to the Clean
6 Water Act (CWA) Section 404 and is regulated by the San Francisco Regional Water
7 Quality Control Board (SFBRWQCB) and CDFW. Any impacts, such as degraded water
8 quality due to pipe removal activities, would be short-term and less than significant. The
9 adjacent shoreland consists of tidal marsh, which is habitat for federally- and state-listed
10 wildlife species. Onshore access to the Project will be restricted to use of the existing
11 levee road. There would be no alterations to the shoreline and no removal, filling, or
12 hydrological interruption of any wetlands would occur as a result of the Project. To avoid
13 potential disruption of vulnerable life stages of sensitive onshore species whose habitat
14 is tidal marsh, the Applicant will implement **MM BIO-2**, listed above, which will avoid
15 activities in the nesting season for sensitive marsh birds.

16 ***d) Interfere substantially with the movement of any native resident or migratory***
17 ***fish or wildlife species or with established native resident or migratory wildlife***
18 ***corridors, or impede the use of native wildlife nursery sites?***

19 **Less than Significant Impact with Mitigation.** Pipe removal activities, such as vessel
20 movements and barge grounding would occur in Suisun Bay, which is a migratory
21 corridor for several special-status and federally managed fish species. Physical
22 disturbance and noise could impact the migration movement of these species. If there is
23 an adjacent eelgrass bed, fish using it as a nursery could also be affected. This would
24 be a less than significant impact due to the short duration of the work and timing
25 between September 1 and October 31 and implementation of **MM BIO-2** and **MM**
26 **BIO-4.**

27 ***e) Conflict with any local policies or ordinances protecting biological resources,***
28 ***such as a tree preservation policy or ordinance?***

29 **No Impact.** The Project is not inconsistent with the goals and policies of the Contra
30 Costa County General Plan.

31 ***f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural***
32 ***Community Conservation Plan, or other approved local, regional, or State habitat***
33 ***conservation plan?***

34 **No Impact.** There are currently no Habitat Conservation Plans or Natural Community
35 Conservation Plans in or near the Project site.

1 **3.4.4 Mitigation Summary**

2 Implementation of the following mitigation measures would reduce Project-related
3 impacts to biological resources to less than significant.

- 4 • MM BIO-1. Worker Environmental Awareness Program
- 5 • MM BIO-2. Work Windows
- 6 • MM BIO-3. In Water Turbidity Protections
- 7 • MM BIO-4. Protection from Release of Toxic Substances
- 8 • MM BIO-5. Confine Vehicle Use to Established Roadway