Environmental Assessment
For Partial Funding for the
Sears Point Restoration Project

September 2014

TABLE OF CONTENTS

I EXECUTIVE SUMMARY

1.0 INTRODUCTION
1.1 Purpose and Need
1.2 Public Participation
1.3 Organization of this EA

2.0 PROPOSED ACTION
2.1 Alternatives Considered

3.0 AFFECTED ENVIRONMENT
3.1 Protected and Special-Status Species
3.1.1 Special Status Wildlife
3.1.2 Special Status Fish
3.2.3 Special Status Plants
3.2 Climate

4.0 ENVIRONMENTAL IMPACTS
4.1.1 Special Status Wildlife
4.1.2 Special Status Fish
4.1.3 Special Status Plants
4.2.1 Climate

5.0 MITIGATION MEASURES AND MONITORING

6.0 CUMULATIVE AND INDIRECT IMPACTS
6.1 Baseline Conditions for Cumulative Impacts Analysis
6.2 Past, Present, and Reasonably Foreseeable Future Actions
6.3 Resources Discussed and Geographic Study Areas
6.4 Approach to Cumulative Impact Analysis

7.0 AGENCY CONSULTATIONS

I. Executive Summary

Ducks Unlimited requested funding through the National Oceanic and Atmospheric Administration's (NOAA) Community-based Restoration Program (CRP) for restoration of a 960 acre site that is part of Sears Point Wetlands and Watershed Restoration Project . The Sonoma Land Trust (SLT), a non-profit organization, purchased the 2,327-acre properties collectively known as Sears Point in 2004 and 2005, and is the recipient of a number of grants for its restoration. In April of 2012, the U.S. Fish and Wildlife Service, the STL and the California Department of Fish and Game published a final *Sears Point Wetland and Watershed Restoration Project Environmental Impact Report (SPWWRP) / Environmental Impact Statement* that assess the environmental impacts of restoration of Sears Point (State Clearinghouse #2007102037). In compliance with requirements of NOAA Administrative Order 216-6 (NAO 216-6) dated May 20, 1999, that implements the National Environmental Policy Act (NEPA), the NOAA Restoration Center is preparing this Environmental Assessment to assess the potential impacts to the human environment associated with the funding of a portion of the Sear Point restoration project. The SPWWRP EIR/EIS[1] is incorporated into this EA by reference.

The purpose of the Proposed Action is to facilitate restoration of a mosaic of wetland and associated habitats that would benefit estuarine biota including waterfowl, shorebirds, fishes, and small mammals, and would re-establish wildlife corridors and connectivity of habitats at the landscape scale by providing funding to Ducks Unlimited. This action would provide additional high-quality habitat for spawning, nursery, and foraging for a variety of aquatic species within the Sonoma Baylands and San Pablo Bay. These restoration actions proposed by Ducks Unlimited to be funded through NOAA are within the scope and scale of the project analyzed in the EIR/EIS referenced above. NOAA was a Cooperating Agency for development of the EIR/EIS. NOAA National Marine Fisheries Service (NMFS) administers trust resources in the affected area, including salmonids.

Two alternatives are considered in this EA; Funding of the proposed partial restoration actions and the No Action alternative. Other alternatives were considered in the EIS/EIR and are incorporated by reference but are not further evaluated in this EA.

In its evaluation of the Proposed Action, NOAA has identified benefits from the restoration of the coastal environment due to the capture of carbon dioxide in the salt marshes that will be restored. For the Sears Point project where 960 acres of marsh are going to be restored, this suggests that as much as 930 tons of carbon could be sequestered per year in the restored marsh area. The Proposed Action would remove carbon dioxide equivalent to permanently removing about 200 passenger vehicles from the highways. NOAA is investigating the potential in the development of these "Blue Carbon" resources in other coastal and near-shore restoration

[1] at http://www.sonomalandtrust.org/pdf/plans_reports/SearsPointEIR/FINAL_EIS-R_TEXT.pdf

activities that would offset releases of carbon dioxide and other greenhouse gasses. Blue carbon is the carbon captured by living coastal and marine organisms and stored in coastal ecosystems.[2]

Table ES-1 summarizes the short-term and long-term impacts of the Proposed Action and No Action Alternatives.

Table ES-1 Summary of Impacts

Resource Area	Alternative 1 No-Action	Alternative 2 Fund the partial tidal restoration plan for Sears Point, CA
Special-Status Wildlife	Short Term: no impact	Short-term: minor adverse impact.
	Long-term: minor adverse impact	Long-term: Moderate beneficial impact for the salt marsh harvest mouse, minor adverse to beneficial impact to California red-legged frog, foraging or itinerant birds. Minor beneficial impact to butterflies.
Special-Status Birds	Short Term: no impact	Short-term: minor
	Long-term: no impact	Long-term: minor
Special-Status Plants	Short Term: no impact	Short-term: minor adverse impact
	Long-term: slight negative impact	Long-term: minor, beneficial impact
Climate	Short Term: Negligible impact	Short-term: minor adverse impact
	Long-term: Negligible beneficial to minor adverse impacts	Long-term: moderate beneficial impact

[2] (http://www.habitat.noaa.gov/coastalbluecarbon.html

1. Introduction

The National Oceanic and Atmospheric Administration's (NOAA) Community-based Restoration Program (CRP) is administered within the National Marine Fisheries Service's Office of Habitat Conservation, under the authority of the Fish and Wildlife Coordination Act, 16 U.S.C. 661 *et seq*, as amended by the Reorganization Plan No. 4 of 1970, and the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006, 16 U.S.C. 1801 *et seq*. The CRP proposes to provide financial assistance to a habitat restoration activity entitled "Sears Point Restoration Project," through the NOAA Restoration Center's (RC) Conserving America's Coasts Partnership.

A Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Sears Point Wetland and Watershed Restoration Project was finalized in April 2012 (State Clearinghouse #2007102037). Along with the United States Army Corps of Engineers, NOAA was a cooperating federal agency in the development and review of that document. This EIR/EIS analyzed the environmental impacts of a larger restoration project of which the restoration project that CRP proposes to fund represents approximately one-third of the total project. The EIR/EIR for the total project is incorporated by reference in to this Environmental Assessment (EA) as provided for in Council on Environmental Quality regulations at 40 CFR 1502.21 and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act, dated May 20, 1999, Sections 5.09e and 5.09f.

On February 20, 2013 Ducks Unlimited requested funding under the CRP for restoration of a 960 acre parcel of the 2,327 acre area described in the EIR/EIS (See Figure 2.2). In compliance with requirements of NOAA Administrative Order 216-6 dated May 20, 1999, that implements the National Environmental Policy Act (NEPA), the NOAA Restoration Center is preparing this Environmental Assessment to specifically assess the potential impacts to the human environment associated with the funding of a portion of the Sear Point restoration project that were not specifically addressed in the EIR/EIS. These include protected resources, vegetation, and climate. This EA provides additional information related to NOAA trust resources in these areas and examines the resources as they relate to release or capture of greenhouse gases and the potential impacts of these actions on global climate change.

1.1 Purpose and Need:

Purpose: The purpose of the Proposed Action is to facilitate restoration of a mosaic of wetland and associated habitats that would benefit estuarine biota including waterfowl, shorebirds, fishes, and small mammals, and would re-establish wildlife corridors and connectivity of habitats at the landscape scale by providing funding to Ducks Unlimited. This action would provide additional high-quality habitat for spawning, nursery, and foraging for a variety of aquatic species within the Sonoma Baylands and San Pablo Bay.

Need: NOAA/NMFS administers trust resources in the affected area, including salmonids. Approximately 90% of the original tidal wetlands of San Francisco Bay have been destroyed. This

destruction is the result of the diking and filling of the tidal wetlands for purposes of agriculture, urban development, and salt production. Restoration needs have been established in public processes and documented in the restoration needs identified in the Bay Ecosystem Habitat Goals Report and the San Francisco Bay Joint Venture Implementation Strategy[3]. (EIR/EIS page ES-2)

1.2 Public Participation:

The Draft EIR/EIS was published on August 28, 2009, and public comments were accepted during the public comment period from August 28, 2009 to October 13, 2009. In addition, a public hearing on the project was held on September 22, 2009. Public comments received at the meeting were recorded and participants were encouraged to submit written comments to the project sponsors during the public comment period. The proposed project that CRP is evaluating for funding was generally described as part of the larger project in the EIR/EIS, and it has not changed since the release of the document. Since the specific restoration actions for the portion of the overall restoration project that is included in the Ducks Unlimited request are supported by the public, and there have been no changes, no additional public comment period was sought by NOAA for its proposed action in this EA.

All public comments (written and oral) that were received during the public comment period are included in Appendix A of the EIR/EIS. Appendix B provides the responses to the public comments. All comments were considered in the preparation of the Final EIR/EIS.

1.3 Organization of This EA

Following this introduction, this EA contains a description of the Proposed Action and alternatives to it that were considered (Chapter 2). Chapter 3 provides information on the existing environment in the area to be affected by the Proposed Action. Chapter 4 is a description of the potential direct and indirect impacts to the environment of the Proposed Action and alternatives. Chapter 5 evaluates the potential for adverse or beneficial cumulative impacts if the Proposed Action is considered in context with other past, present and reasonably foreseeable future actions.

2. Proposed Action:

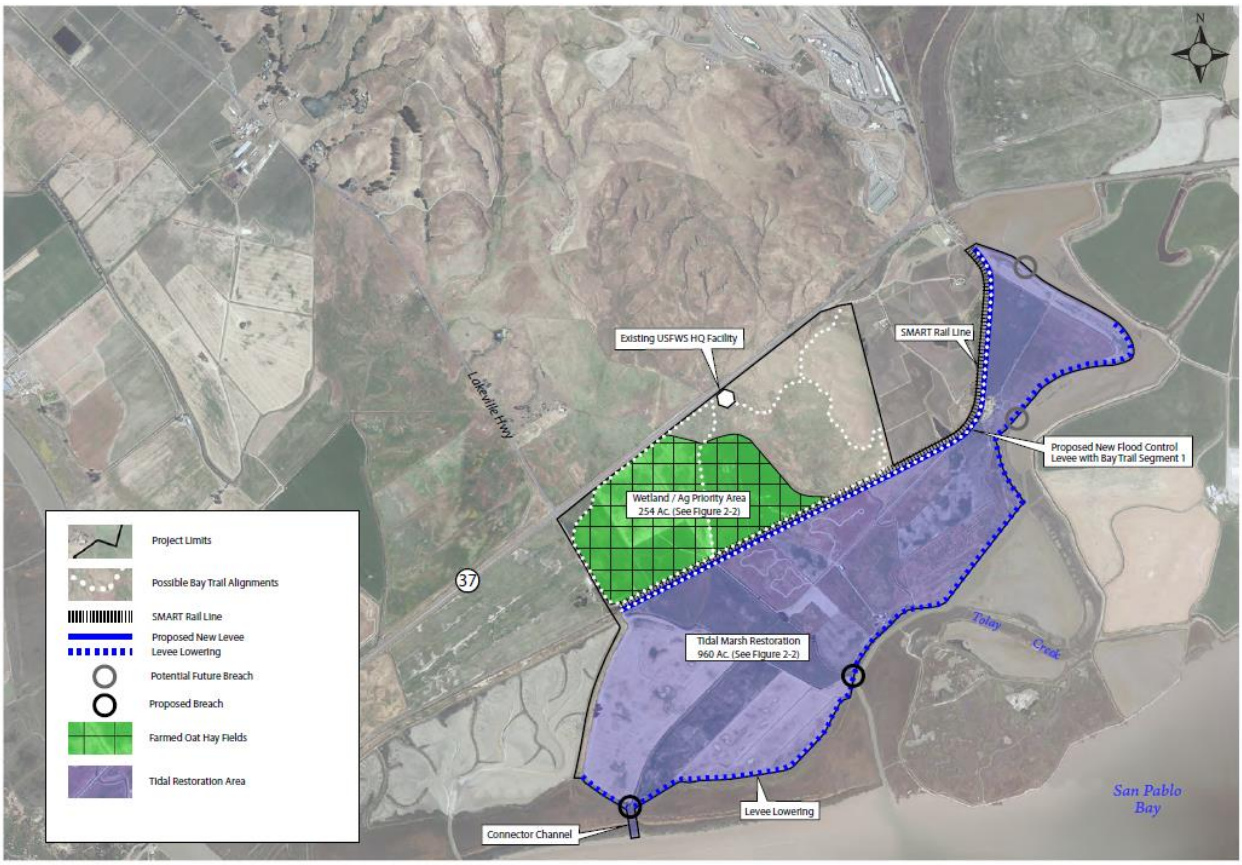
The CRP proposes to fund Ducks Unlimited via a multi-year cooperative agreement (#NA13NMF4630140) for the Sears Point Restoration Project (SPRP). These funds are being awarded through the FY13 Coastal and Marine Habitat Restoration Project Grants federal funding opportunity (FFO# NOAA-NMFS-HCPO-2013-2003587). The SPRP would restore approximately 960 acres of historic tidal marsh habitat in an area of San Francisco Bay, where approximately 90% of original tidal wetlands have been destroyed through diking and filling of wetlands for agriculture, development and salt production (see Figure 2.1).

The project to be funded by the RC is only one component of a larger 2,327-acre project known as the Sears Point Wetlands and Watershed Restoration Project (SPWWRP). The Sonoma Land

[3] EIR/EIS page ES-2

Trust (SLT), a non-profit organization, purchased the 2,327-acre properties collectively known as Sears Point in 2004 and 2005, and is the recipient of a number of grants for its restoration. The overall purpose of the larger SPWWRP is to restore natural estuarine ecosystems on diked baylands, enhance and manage existing watershed resources for ecological benefits including contributing to the recovery of federal and state threatened and endangered species, and retain viable agricultural uses and seasonal wetlands to the maximum extent practical while providing public access and recreational and educational opportunities compatible with ecological and cultural resources protection.

Figure 2.1 Project area showing the 960 acre project that is the subject of this EA

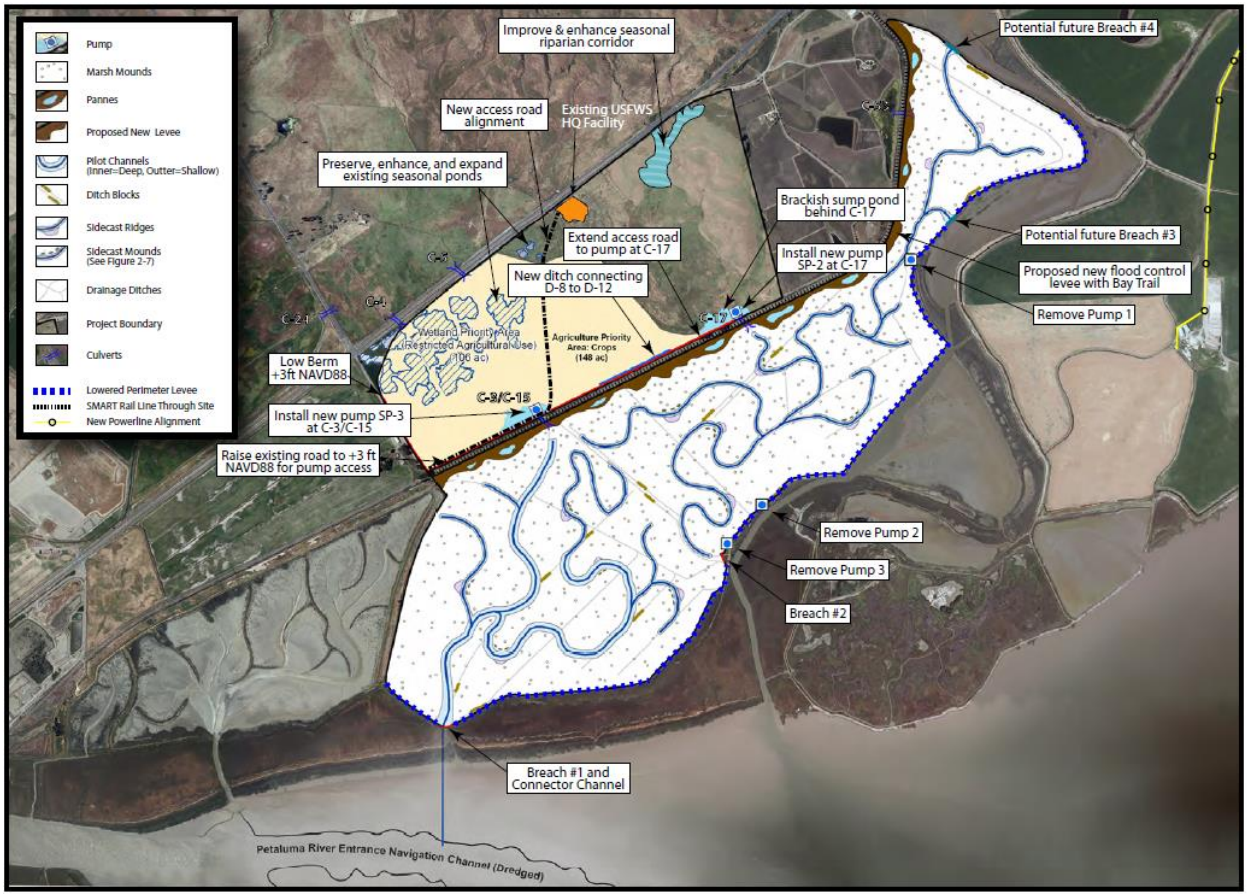


CRP funding would be directed towards levee construction, levee breaching, dredging pilot channels for each breach, personnel costs and approved indirect costs. Specific restoration activities to be conducted within the 960 acre SPRP site include: constructing two levee breaches (breach 1 would connect the project site to the San Pablo Bay and breach 2 would connect the project site to Tolay Creek); dredging a pilot channel to connect the primary breach to San Pablo Bay; constructing an approximately 12,000-linear foot flood control levee; excavating approximately 31,980 linear feet (6.05 miles) of interior slough channels; creating numerous

marsh mounds to accelerate marsh formation; and installing two new storm water pumps to maintain existing land use adjacent to the restoration project (see Figure 2.2).

These restoration activities are identified in the Bay Area's Baylands Ecosystem Habitat goals Report (ref), which specifically calls for preserving and restoring a large continuous band of tidal marsh along the bay front between the Petaluma River and Tolay Creek. In addition the project would aid in achieving the 38,000-acre bayland habitat restoration goal for the North Bay Subregion, also identified in the EIR/EIS.

Figure 2.2 Proposed project activities to be funded by NOAA



As a cooperating agency, NOAA reviewed the alternatives considered in the EIR/EIS. CRP is now proposing to fund a portion (identified above) of the Partial-Tidal Wetland Restoration alternative that was described in the EIR/EIS. A description of the major restoration components of the Partial-Tidal Wetland Restoration alternative is available in Chapter 2 (Project Description) of the Final EIR/EIS, and incorporated by reference.

The Proposed Action to be evaluated in this EA would provide funding to:

- restore approximately 960 acres of tidal marsh;
- preserve and enhance a 106-acre area of non-tidal seasonal wetland while maintaining existing agriculture between the Sonoma Marin Area Rail Transit (SMART) rail line and Highway 37;Par
- provide public recreation access south and possibly north of Highway 37;
- create 15.5 acres of additional breeding habitat for the California red-legged frog (CRLF), including 0.86 acres of excavation in the floodplain near the northern project boundary; and
- provide public education opportunities within the site following restoration.

2.1 Alternatives Considered

For this EA, only the Proposed Action and the No-Action are considered for further analyses. Other alternatives evaluated in the EIR/EIS are incorporated here by reference, and will not be further analyzed in this EA.

No Action Alternative

Under the no-action alternative, the NOAA RC would not fund the Proposed Action. As a result NOAA RC assumes that the action would not go forward, and the proposed enhancements would not be completed.

3. Affected Environment

Affected environmental elements analyzed in the EIR/EIS include water resources and hydrology, water quality, aquatic biology, wetlands, exotic species, protected species, vegetation, terrestrial wildlife, floodplains, sediment transport, coastal zone management, land use, climate, air quality, noise, visual aesthetics, recreational resources, traffic and transportation, utilities and infrastructure, cultural resources, socioeconomics and environmental justice. The EA incorporates by reference all of these sections of the EIR/EIS except the sections related to protected species, vegetation, and climate. This EA provides additional information related to NOAA trust resources in these areas and examines the resources as they relate to release or capture of greenhouse gases and the potential impacts of these actions on global climate change.

3.1 Protected and Special-Status Species

Protected and special-status species are plants and animals that are species listed and proposed for listing as threatened or endangered under the ESA, candidate species of concern, California protected species, or species protected under a federal or California policy.

The categories for special-status plants and animals are described below.

- Species listed or proposed for listing as threatened or endangered under the ESA (50 CFR 17.12 [listed plants], 50 CFR 17.11 [listed animals], and various notices in the FR [proposed species]);

- Species that are candidates for possible future listing as threatened or endangered under the ESA (71 FR 53755, September 12, 2006);
- Species listed or candidates for listing by the State of California as threatened or endangered under CESA (14 CCR 670.5);
- Species that meet the definitions of rare, threatened, or endangered under CEQA (State CEQA Guidelines, Section 15380);
- Plants listed as rare or endangered under the California Native Plant Protection Act (NPPA) (California Fish and Game Code, Section 1900 et seq.);
- Plants considered by the California Native Plant Society (CNPS) to be rare, threatened, or endangered in California (Lists 1B and 2 in California Native Plant Society [2001]);
- Plants listed by CNPS as those about which more information is needed to determine their status and plants of limited distribution (Lists 3 and 4 in California Native Plant Society [2001]) that may be included as special status species on the basis of local significance or recent biological information;
- Animals that are California species of special concern (California Department of Fish and Game 2007; Remsen 1978; California Department of Fish and Game and Point Reyes Bird Observatory 2001 [birds], Williams 1986 [mammals], Jennings and Hayes 1994 [amphibians and reptiles], and Moyle et al. 1995 [fish]); and
- Animals fully protected in California (California Fish and Game Code, Section 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]

Special-status plant, animal, and fish species that occur or have potential to occur in or near the Action area and their likely status in the Action area are presented in Table 3.2.1. Table 3.2.1 is adapted from the EIR/EIS, and incorporated by reference. Species without known distribution ranges within the project area, or species requiring habitat types not known to be present within the project have been omitted from this listing. Only those species deemed relevant for further analyses under the Proposed Action or the no-action alternative are listed, and will be discussed further in this Environmental Assessment.

3.1.1 Special Status Wildlife

Based on existing information from the CNDDB (20072011), the U.S. Fish and Wildlife Service USFWS list for the Sears Point and Petaluma Point USGS quadrangles and Sonoma County (USFWS 2007a), the *Sears Point Wetlands and Watershed Restoration Project Existing Conditions Report* and *Final Preliminary Plan* (Wetlands and Water Resources 2005b, 2007), the EIR/EIS concludes that 2530 special-status wildlife species are known to occur or have the potential to occur in the vicinity of the Action area. For this EA only those species known to occur in the project area, or for which suitable habitat exists within the project area are considered (Table 3.1.1). Five wildlife species (invertebrates, birds, mammals) listed as federally endangered are known to occur or have the potential to occur in the vicinity of the Action area. Twenty two special-status wildlife species are known to

occur within the Project site or have a moderate to high potential to occur within the Project site based on the presence of suitable habitat; known occurrences in the Project vicinity; or known sightings as transients (birds).

1Table 3.1.1 Specials Status Species within the project area

Common Name Scientific Name	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project/Study Area
INVERTEBRATES				
Callippe silverspot *Speyeria callippe callippe*	E/–	San Bruno Mountain, San Mateo County, and a single location in Alameda County.	Open hillsides where wild pansy (*Viola pendunculata*) grows; larvae feed on Johnny jump-up plants, whereas adults feed on native mints and non-native thistles.	High. Recorded to occur at Sears Point since 1988 (USFWS 2007). Suitable habitat, (*Viola pedunculata*) present at project site.
Myrtle's silverspot butterfly *Speyeria zerene myrtleae*	E/–	Historically known from San Mateo County north to the mouth of the Russian River in Sonoma County. No butterflies have been observed recently at the known population sites near Pacifica and San Mateo in San Mateo County.	Inhabits coastal terrace prairie, coastal bluff scrub, and associated non-native grassland habitats where the larval food plant, Viola sp. occurs.	High. Documented occurrences adjacent to project site; suitable habitat (*Viola* sp.) occurs on site
AMPHIBIANS				
California red-legged frog *Rana aurora draytoni*	T/SSC	Found along the coast and coastal mountain ranges of California from Marin County to San Diego County and in the Sierra Nevada from	Permanent and semipermanent aquatic habitats, such as creeks and cold-water ponds, with emergent and	High. Known to occur at project site.

Common Name Scientific Name	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project/Study Area
		Tehama County to Fresno County	submergent vegetation. May estivate in rodent burrows or cracks during dry periods.	
REPTILES				
Northwestern pond turtle *Emys marmorata marmorata*	–/SSC	Occurs from the Oregon border of Del Norte and Siskiyou Counties south along the coast to San Francisco Bay, inland through the Sacramento Valley, and on the western slope of Sierra Nevada	Occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests	Moderate. Known occurrences within 10 miles of project site; limited suitable habitat onsite.
BIRDS				
California black rail *Laterallus jamaicensis Coturniculus*	–/T	Permanent resident in the San Francisco Bay and east-ward through the Delta into Sacramento and San Joaquin Counties; small populations in Marin, Santa Cruz, San Luis Obispo, Orange, Riverside, and Imperial Counties	Tidal salt marshes associated with heavy growth of pickleweed; also occurs in brackish marshes or freshwater marshes at low elevations	High. Suitable habitat adjacent to the Project site within the Action Area. Project will create suitable habitat for this species and is expected to benefit the recovery of this species. Habitat exists along Tolay Creek and San Pablo Bay in dredging and breach areas.
California clapper rail *Rallus longirostris obsoletus*	E/E	Marshes around the San Francisco Bay and east through the Delta to Suisun Marsh	Restricted to salt marshes and tidal sloughs; usually associated with heavy	High. Suitable habitat adjacent to the Project site within the Action Area. Project will

Common Name Scientific Name	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project/Study Area
			growth of pickle-weed; feeds on mollusks removed from the mud in sloughs	create suitable habitat for this species and is expected to benefit the recovery of this species. Habitat exists along Tolay Creek and San Pablo Bay in dredging and breach areas.
Ferruginous hawk *Buteo regalis*	–/SSC	Does not nest in California; winter visitor along the coast from Sonoma County to San Diego County, eastward to the Sierra Nevada foothills and south-eastern deserts, the Inyo-White Mountains, the plains east of the Cascade Range, and Siskiyou County	Open terrain in plains and foothills where ground squirrels and other prey are available	Low. Potential winter visitor to project site.
Brown Pelican *Pelecanus occidentalis Californicus*	Delisted (ESA 2009 and CESA 2009. Will require monitoring for 5 years. /FP	Present most commonly May to the November in the San Francisco Bay during the non-breeding season. Flock moves along the more marine portion of the estuary following prey. The project site is not near the traditional roosting areas (e.g.	Forages in shallow nearshore water.	Low. Unlikely visitor to project site or Action Area.

Common Name Scientific Name	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project/Study Area
		Fisherman's Wharf, Alcatraz Island, Alameda Point Jetty, and Fort Cronkite, Sausalito.		
Golden eagle *Aquila chrysaetos*	__PR[4]/SSC	Foothills and mountains throughout California. Uncommon nonbreeding visitor to lowlands such as the Central Valley	Nest on cliffs and escarpments or in tall trees overlooking open country. Forages in annual grasslands, chaparral, and oak woodlands with plentiful medium and large-sized mammals	High. Known to use site for foraging.
Great blue heron *Ardea herodias* (rookery)	Sensitive resource	Found throughout much of North America and into Central and South America.	Rookeries occur in tall trees near a variety of wetland habitat types. Isolated areas that discourage predation and human disturbance are preferred.	None. Documented rookery record within 10 miles of the project site; suitable foraging habitat onsite only.
Long-billed curlew *Numenius americanus*	–/SSC	Nests in northeastern California in Modoc, Siskiyou, and Lassen Counties. Winters along the coast and in interior valleys	Nests in high-elevation grasslands adjacent to lakes or marshes. During migration and in winter; frequents coastal beaches and mudflats and	Low. Known occurrences within 10 miles of project site; suitable wintering habitat onsite.

[4] Protected under the Migratory Bird Treaty Act (16 U.S.C. 703–712) and the Bald and Golden Eagle Protection Act (72 FR 31131).

Common Name Scientific Name	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project/Study Area
		west of Sierra Nevada	interior grasslands and agricultural fields	
Merlin *Falco columbarius*	–/SSC	Does not nest in California. Rare but widespread winter visitor to the Central Valley and coastal areas	Forages along coastline in open grasslands, savannas, and woodlands. Often forages near lakes and other wetlands	Low. Potential winter visitor to project site.
Northern harrier *Circus cyaneus*	–/SSC	Occurs throughout lowland California. Has been recorded in fall at high elevations	Grasslands, meadows, marshes, and seasonal and agricultural wetlands	High. Known to use site for foraging; likely nests onsite.
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	–/SSC	Found only in the San Francisco Bay Area in Marin, Napa, Sonoma, Solano, San Francisco, San Mateo, Santa Clara, and Alameda Counties	Freshwater marshes in summer and salt or brackish marshes in fall and winter; requires tall grasses, tules, and willow thickets for nesting and cover	Moderate. Known occurrences within 10 miles of the project site; marginally suitable summer and winter habitat onsite. Habitat exists in Action Area along Tolay Creek and San Pablo Bay in dredging and breach areas.
San Pablo song sparrow *Melospiza melodia samuelis*	–/SSC	Found in San Pablo Bay	Uses tidal sloughs within pickleweed marshes; requires tall bushes (usually grindelia) along sloughs for cover, nesting, and songposts; forages over mudbanks and	High. Known occurrences onsite. Habitat exists in Action Area along Tolay Creek and San Pablo Bay in dredging and breach areas.

Common Name Scientific Name	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project/Study Area
			in the pickleweed	
California least tern *Stenula antillarum*	E/E	Colonies in the San Francisco Bay, Sacramento Delta, and areas along the coast of San Luis Obispo to San Diego counties	Nests along unvegetated coastal areas.	Low. Known occurrences within 10 miles of project site; but suitable habitat is not present on site or within Action Area. May forage in the Action Area May through August.
Short-eared owl *Asio flammeus*	–/SSC	Permanent resident along the coast from Del Norte County to Monterey County although very rare in summer north of San Francisco Bay, in the Sierra Nevada north of Nevada County, in the plains east of the Cascades, and in Mono County; small, isolated populations	Freshwater and salt marshes, lowland meadows, and irrigated alfalfa fields; needs dense tules or tall grass for nesting and daytime roosts	Moderate. Known occurrence just outside of project vicinity (approximately 12 miles from site); suitable nesting and foraging habitat occurs onsite.
Tricolored blackbird *Agelaius tricolor*	–/SSC	Permanent resident in the Central Valley from Butte County to Kern County. Breeds at scattered coastal locations from Marin County south to San Diego County; and at scattered locations in Lake, Sonoma, and Solano Counties.	Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grainfields. Habitat must be large enough to support 50 pairs. Probably	High. Known nesting colony occurs adjacent to the project site. Suitable nesting substrates occur onsite; may nest onsite.

Common Name Scientific Name	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project/Study Area
		Rare nester in Siskiyou, Modoc, and Lassen Counties	requires water at or near the nesting colony	
Western burrowing owl *Athene cunicularia hypogea*	–/SSC	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas. Rare along south coast	Level, open, dry, heavily grazed or low stature grassland or desert vegetation with available burrows	High. Known to occur onsite during winter. No documented breeding onsite.
Western snowy plover (coastal populations) *Charadrius alexandrinus nivosus* (nesting)	T/SSC	Population defined as those birds that nest adjacent to or near tidal waters, including all nests along the mainland coast, peninsulas, offshore islands, and adjacent bays and estuaries. Twenty breeding sites are known in California from Del Norte to Diego County	Coastal beaches above the normal high tide limit in flat, open areas with sandy or saline substrates; vegetation and driftwood are usually sparse or absent	Low. No suitable nesting habitat onsite; potential visitor to site.
White-tailed kite *Elanus leucurus*	–/ FP	Lowland areas west of Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills to western San Diego County at the Mexico border	Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands for foraging	High. Known to forage onsite; may use suitable nesting habitat onsite
FISH				
River lamprey (*Lampetra ayresii)*	–/SSC	Lower Sacramento and San Joaquin	Spawn in fresh water habitats in	High. Could occur in San Pablo

Common Name Scientific Name	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project/Study Area
		Rivers, Napa River, Sonoma Creek, Alameda Creek, Salmon Creek, Russian River tributaries, and tributaries to San Francisco Bay	gravelly riffles; ammocoetes (juveniles) rear in fresh water for 3–5 years before migrating to the ocean (Moyle 2002)	Bay during migration
Longfin smelt (*Spirinchus thaleichthys*)	C/C	Lower Sacramento-San Joaquin River, Suisun Bay, and San Pablo Bay	Spawns in lower Sacramento-San Joaquin River and Suisun Bay; prespawning adults and juveniles inhabit shoal areas of San Pablo Bay	High. Occur in San Pablo Bay and near Tolay Creek within Action Area.
Steelhead: Central California Coast (*Oncorhynchus mykiss*) Central Valley (*Oncorhynchus mykiss*)	T/SSC T/SSC	Coastal streams in California; critical habitat in San Pablo Bay (70 FR52571) Central Valley rivers and streams	Spawns in fresh water; juveniles rear in fresh and estuarine water before migrating to the ocean	High. Juveniles migrating to the ocean may use Action Area to rear; adults migrate through San Pablo Bay to reach freshwater spawning grounds; steelhead could stray into Tolay Creek
Chinook Salmon: Sacramento winter-run (*Oncorhynchus tshawytscha)* Central Valley spring-run (*Oncorhynchus tshawytscha)* Central Valley fall and late fall run (*Oncorhynchus*	E/E T/T SC/SSC	Central Valley rivers and streams; critical habitat for winter-run Chinook designated in San Pablo Bay (58 FR33213). Designated critical habitat for the Central California Coastal steelhead	Spawns in fresh water; juveniles rear in fresh and estuarine water before migrating to the ocean	High. Juveniles migrating to the ocean may use the Action Area to rear; adults from all ESUs migrate through San Pablo Bay to reach freshwater spawning grounds; San Pablo Bay is within the critical habitat

Common Name Scientific Name	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project/Study Area
tshawytscha)				defined for winter-run Chinook salmon. Could stray into Tolay Creek.
Green sturgeon (southern DPS) (*Acipenser medirostris)*	T/SSC	Sacramento, lower Feather, Klamath, and Trinity Rivers (Moyle 2002); southern DPS spawns in the Sacramento River	Spawns in well-oxygenated, cool, riverine habitat with water temperatures from 8.0 to 14°C; juveniles rear in estuarine waters	High. Adults migrate through San Pablo Bay on their way to spawning grounds in the Sacramento River juveniles and sub-adults rear in San Pablo Bay. Could occur in and near Tolay Creek
Delta smelt (*Hypomesus transpacificus*)	T/T	Found primarily in the Delta below Isleton on the Sacramento River and below Mossdale on the San Joaquin River, as well as in Suisun Bay Designated critical habitat for the Delta smelt includes the Delta west to the Carquinez Bridge. Designated critical habitat.	Inhabit open surface waters where they school. Spawning occurs primarily in sloughs and shallow edge-waters of channels in the upper Delta and in the Sacramento River.	Low. From January to July they move into freshwater for spawning and, during high flows, they can be washed downstream into San Pablo Bay (Moyle 2002), but are rarely found in the project area.
MAMMALS				
Pacific Townsend's (=western) big-eared bat *Corynorhinus townsendii*	–/SSC	Coastal regions from Del Norte County south to Santa Barbara County	Roosts in caves, tunnels, mines, and dark attics of abandoned buildings. Very	Moderate. Known occurrences within 10 miles

Common Name Scientific Name	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project/Study Area
Townsendii			sensitive to disturbances and may abandon a roost after one onsite visit	of project site; suitable roosting and foraging habitat onsite.
Pallid bat *Antrozous pallidus*	–/SSC	Occurs throughout California except the high Sierra from Shasta to Kern County and the northwest coast, primarily at lower and mid elevations	Occurs in a variety of habitats from desert to coniferous forest. Most closely associated with oak, yellow pine, redwood, and giant sequoia habitats in northern California and oak woodland, grassland, and desert scrub in southern California. Relies heavily on trees for Roosts	Moderate. Known occurrences within 10 miles of project site; suitable roosting and foraging habitat onsite.
Salt marsh harvest mouse *Reithrodontomys raviventris*	E/-	San Francisco, San Pablo, and Suisun Bays; the Delta	Salt marshes with a dense plant cover of pickle-weed and fat hen; adjacent to an upland site	High. Suitable habitat adjacent to the Project site but no suitable habitat onsite. Project will create suitable habitat for this species and is expected to benefit the recovery of this species. Habitat exists along Tolay Creek and San

Common Name Scientific Name	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project/Study Area
				Pablo Bay in dredging and breach areas.
Suisun ornate shrew *Sorex ornatus sinuosus*	–/SSC	Restricted to San Pablo Bay and Suisun Bay, both in Solano and Sonoma County.	Tidal, salt, and brackish marshes containing pickleweed, grindelia, bulrushes, or cattails; requires driftwood or other objects for nesting cover	Low. Known occurrences with 10 miles of the project site; marginally suitable habitat onsite.
American badger *Taxidea taxus*	–/SSC	In California, badgers occur throughout the state except in humid coastal forests of northwestern California in Del Norte and Humboldt Counties	Badgers occur in a wide variety of open, arid habitats but are most commonly associated with grasslands, savannas, mountain meadows, and open areas of desert scrub; the principal habitat requirements for the species appear to be sufficient food (burrowing rodents), friable soils, and relatively open, uncultivated ground	Low. Upland areas could provide suitable habitat.
PLANTS (NOTE: POTENTIAL OCCURRENCE COLUMN IDENTIFIES TOPOGRAPHIC QUAD OCCURRENCES IN VICINITY OF ACTION AREA)				
Point Reyes bird's-beak *Cordylanthus maritimus* subsp. *Palustris*	–/–/1B.2	Coastal northern California, from Humboldt to Santa Clara County; Oregon	Coastal salt marsh; blooms June–October	Petaluma River, San Rafael

Common Name Scientific Name	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project/Study Area
Soft bird's-beak *Cordylanthus mollis* subsp. *Mollis*	E/R/1B.2	San Francisco Bay	Tidal salt marsh; blooms July–September	Napa River, Petaluma River
Baker's Navarretia *Navarretia leucocephala* subsp. *Bakeri*	–/–/1B.1	Inner Coast Ranges: Mendocino to Solano County	Vernal pools and swales; blooms May–July	Novato
Marin knotweed *Polygonum marinense*	–/–/3.1	Coastal Marin, Napa, and Sonoma Counties	Salt marsh	Napa River, Petaluma River
Suisun Marsh aster *Symphyotrichum lentum*	–/–/1B.2	Sacramento–San Joaquin Delta, Suisun Marsh , Suisun Bay	Brackish and freshwater marsh; blooms August–November	Napa River, Petaluma
Saline clover *Trifolium depauperatum* var. *Hydrophilum*	–/–/1B.2	Sacramento Valley, central western California	Salt marsh, mesic alkaline areas in grasslands, vernal pools, below 990 feet (300 m); blooms April–June	Sonoma Valley, Napa
Golden (yellow) larkspur *Delphinium luteum*	E/R/1B.1	Northwestern Marin and southwestern Sonoma counties	Coastal prairie and coastal scrub; generally near areas showing ground disturbance	Coastal Marin and Sonoma Counties
Mason's lilaeopsis *Lilaeopsis masonii*	–/R/1B.1	Sacramento/San Joaquin River delta	Freshwater or brackish marsh, in tidal zone; blooms April–October	Napa River

Status explanations:

Federal
E = listed as endangered under the federal Endangered Species Act.
T = listed as threatened under the federal Endangered Species Act.
PT = proposed for federal listing as threatened under the federal Endangered Species Act.
C = species for which USFWS has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposed rule to list, but issuance of the proposed rule is precluded.
SC = species of concern; species for which existing information indicates it may warrant listing but for which substantial biological information to support a proposed rule is lacking.
– = no listing.
State
E = listed as endangered under the California Endangered Species Act.
T = listed as threatened under the California Endangered Species Act.
R = listed as rare under the California Endangered Species Act.

FP = fully protected under the California Fish and Game Code.
C = candidate for state listing
SSC = species of special concern in California under the California Fish and Game Code.
– = no listing.
Other: California Native Plant Society
1B = list 1B species: rare, threatened, or endangered in California and elsewhere.
2 = list 2 species: rare, threatened, or endangered in California, but more common elsewhere.
3 = list 3 species: plants about which we need more information.
Threat Rank
.1 = seriously threatened in California
.2 = fairly threatened in California

The following six special-status wildlife species are known to occur within the Project site:

- California red-legged frog - The two largest drainages on the site have deeply incised channels with well-developed aquatic habitat including occasional scour pools in their mid reaches. These scour pools currently provide the only potential breeding habitat for California red-legged frogs in the watershed. According to the EIR/EIS one adult California red-legged frog was observed in the eastern reach. More than 10 adult and juvenile bullfrogs were also observed in this reach and the stream to the west. There has been no evidence of onsite California red-legged frog or bullfrog breeding so it is assumed these frogs are moving onsite from a nearby offsite breeding pond. While a California red-legged frog mitigation pond is located on the adjacent Infineon Raceway property, the source pond for the California red-legged frog has not been confirmed (Wetlands and Water Resources 2007).
- White-tailed kite - White-tailed kite has been detected foraging over the property (Spautz and Strauss 2005 in Wetlands and Water Resources 2005b). This species is commonly found foraging over wetlands in the vicinity and nesting in trees or tall bushes (e.g., at Tolay Creek Wildlife Area) and may nest on the Project site (Wetlands and Water Resources 2005b).
- Northern harrier - Northern harrier is a regular breeder in the region with numerous individuals documented foraging over the property. The species nests in open areas, often adjacent to wetlands, and may breed on the site (Wetlands and Water Resources 2005b).
- Golden eagle - There are several reports of golden eagles on the Project site. These individuals are likely to breed in southern Sonoma County in forested areas north of the Project site. According to the EIR/EIS five individuals including pre-breeding birds were observed but no nesting habitat occurs on site for golden eagle.
- Burrowing owl – According to the EIR/EIS, there have been numerous recent sightings of burrowing owls by biologists conducting reconnaissance site surveys for this Project in the project area north of Highway 37, including at least one documented burrow site. This species is known to reside on and near the property, and is typically associated with levees and pasture edges (CH2M Hill 2003b and Spautz and Strauss 2005 in Wetlands and Water Resources 2005b). There is no documentation of this species breeding in the region for 15 years, and most individuals detected on the property are likely to be winter residents only (Burridge 1995 in Wetlands and Water Resources 2005b).
- San Pablo Song sparrow – The EIR/EIS for the project indicates that several pairs of San Pablo song sparrows were recently detected in a series of irrigation ditches with alkali bulrush in the field southeast of the junction of Highway 37 and Lakeville Highway

(Spautz and Strauss 2005 in Wetlands and Water Resources 2005b). This bird is usually found in a wide range of vegetated wetland types in San Pablo Bay and may nest in ditches and tidal marshes in the Action area (Wetlands and Water Resources 2005b).

No special-status invertebrates, reptiles, or mammals have been documented within the anticipated area of project effects (Wetlands and Water Resources 2005b). Eight special-status wildlife species have potential to occur at the Project site, based on the presence of suitable breeding habitat onsite and known occurrences within the Project vicinity. Those species are discussed below. Two of these species−Myrtles silverspot butterfly and tricolored blackbird−have high potential to occur onsite due to the presence of suitable habitat onsite and known occurrences adjacent to the site. The remaining six species−Callippe silverspot butterfly, short-eared owl, saltmarsh common yellowthroat, pallid bat, Townsends big-eared bat, and northwestern pond turtle−have moderate potential to occur onsite based on known occurrences within the Project vicinity and/or the presence of suitable habitat.

- Myrtle's silverspot butterfly is known to inhabit coastal prairie and coastal non-native grassland habitats that contain various violet species. This butterfly has been documented on an adjacent property (California Natural Diversity Database 2007) and has a high potential to occur on the Project site.
- A nesting colony of tricolored blackbirds was found at a stock pond in the Action area during surveys in 1997 (Wetlands and Water Resources 2005b), and surveys conducted in spring 2004 documented tricolored blackbirds foraging on the adjacent North Parcel property (Wetlands and Water Resources 2005b). This species is primarily associated with freshwater perennial marsh dominated by cattails and/or bulrush and riparian scrub. These wetland habitats are present in the vicinity of the Project site including a perennial stock pond immediately adjacent to the site. As such, tricolored blackbirds probably use the site for foraging. The small cattail patches present in some of the deeper ditches and ravines on the site are likely too small to support tricolored blackbird nesting colonies.
- According to the EIR/EIS, the Project site supports extensive stands of *Viola pedunculata*, the host plant for the Callippe silverspot butterfly and occurs within the species known historic range (Wetlands and Water Resources 2005b). While there are no confirmed observations of Callippe silverspot butterfly on the Project Site, it is considered to have moderate potential to occur.
- Short-eared owl nests and forages in a variety of wetland types. The closest recorded occurrence for this species is just outside of the Project vicinity (12 miles from the Project site) (California Natural Diversity Database 2007).
- Saltmarsh common yellowthroat has been documented to occur within the Project vicinity (Wetlands and Water Resources 2005b).
- Special-status bat species, pallid bat and Townsend's big-eared bat, are known to occur in the vicinity of the Project (California Natural Diversity Database 2007) and may forage on the Project site and use the barns onsite (associated with the Sears Point Ranch facilities) for roosting (Wetlands and Water Resources 2005b).

- Suitable habitat for northwestern pond turtle is present in the perennial stock pond immediately adjacent to the Project site near Lakeville Highway (Wetlands and Water Resources 2005b). Other potentially suitable habitat onsite may occur in Tolay Creek.

The following 5 special-status wildlife species have low potential to occur in the Project site due to the presence of limited to no suitable breeding habitat or because the Project site is outside of the species known range.

- The Long-billed curlew - Long-billed curlew are known to forage in a variety of wetland community types. These species have not been documented in the Project vicinity (California Natural Diversity Database 2007) and would not nest on the Project site because of a lack of suitable nesting habitat (Wetlands and Water Resources 2005b).

These species may occasionally forage on the Project site but would not be impacted by the Project.

- Ferruginous hawk and Merlin - Ferruginous hawk and merlin do not nest in California and are potential winter visitors to the Project site. These species may occasionally forage on the Project site but would not be impacted by the Project.
- Western snowy plover – No habitat for this species occurs on the Project site.
- California Least Tern - The northernmost population is located east of the Napa Marsh.
- California Brown Pelican, previously a special status species, was delisted in 2009; however, is included in the USFWS quad list for the site. It has very limited potential to occur at the project site.

3.1.2 Special Status Fish

Six special-status fish species are known to occur or are assumed to use suitable habitat within San Pablo Bay. These species are listed below.

- River lamprey–California Species of Concern
- Longfin smelt–California Species of Concern (candidate for listing)Threatened
- Steelhead (Central Valley and Central California Coast Distinct Population Segments [DPSs])–Both federally threatened
- Chinook salmon (Sacramento River winter-run (federally endangered), Central Valley spring-run (federally threatened), and Central Valley fall/late fall-run DPSs (federal species of concern)
- Coho salmon (Central California Coast DPS)–federally endangered
- Green sturgeon (Southern DPS)–federally threatened
- Delta smelt–California and federally threatened

The EIR/EIS states that no special-status fish surveys were conducted for the Project, but based on existing fisheries information for San Pablo Bay of the six special-status fish species, all can

be found in San Pablo Bay. San Pablo Bay is a migratory corridor for anadromous fish such as steelhead, Chinook salmon, green sturgeon and river lamprey. All of these species migrate through San Pablo Bay on their way up to fresh water spawning habitat in the Sacramento River. Due to the Project site being north of the main migratory pathway, salmonids are not expected to occur in large numbers in the northern part of San Pablo Bay near the Action area; however they could stray into Tolay Creek the action area. During Tolay Creek biological monitoring, salmonid carcasses were found on the bank, but were not identified to species (Takekawa et al. 2002:16). Green sturgeon rear in the San Pablo Bay. White sturgeon are thought to congregate in an area known as the "Sturgeon Triangle" that is favored by fisherman and this may also be a congregation area for green sturgeon, but this has not been demonstrated by comprehensive data. It is not likely that green sturgeon would occur in the immediate Action area in large numbers, but sturgeon carcasses were also observed on the creek bank in Tolay Creek monitoring. They were not identified to species, so it cannot be known if these were green sturgeon (Takekawa et al 2002:16). Adult longfin smelt could also occur near the Action area in San Pablo Bay. They were not found in Tolay Creek during monitoring (Takekawa et al 2002:16)

3.1.3 Special Status Plants

Based on existing information from the CNDDB, the USFWS Species list for the 9 quad area around Sears Point quad (accessed February 2012), and from the EIR/EIS, 9 special-status plant species occur in the vicinity of the project area or have potential to occur. According to the EIR/EIS only two of these species, saline clover[5] and Mason's lilaeopsis have been observed within the project area. Two species occurring in the Project vicinity are associated with vernal pools; Baker's navarretia and the previously mentioned saline clover). The *Existing Condition Report* states that these species have a moderate to low potential to occur on the Project site. However, saline clover was observed on the Project site in 2005 during surveys for the Restoration Plan. Saline clover was found within diked baylands north of Highway 37. The largest numbers were found around the southwest margin of a vernal pool situated in the upper edge of the historic baylands margin and in seasonally saturated grasslands to the southwest of this pool. In addition, a few scattered plants and small clusters of plants were found within topographically lower seasonally saturated annual grasslands just north of Highway 37. Seasonally saturated grassland south of Highway 37 is also potential habitat for this species. Golden Larkspur is associated with coastal prairie and other grasslands, both habitats in the project area.

Five species occurring in the Project vicinity are associated with tidal salt marsh (Point Reyes bird's-beak, soft bird's-beak, Mason's lilaeopsis, Marin knotweed, and Suisun Marsh aster). These species would not occur on the Project site because tidal salt marsh is absent; however, coastal salt marsh under tidal influence occurs adjacent to the southern edge of the Project site

[5] Saline Clover is a California Native Plant Society 1B.2 species meaning it is considered rare, threatened, or endangered in California and elsewhere, and considered fairly threatened in California. This species has no state or federal special-status listing.

along San Pablo Bay and Tolay Creek within the Action area (breach and dredging locations). Of these species, Mason's lilaeopsis is known to occur within the Action area at Midshipman's Point at the mouth of Tolay Creek according to the EIR/EIS.

3.2 Climate

The consensus of the scientific community is that climate change is occurring and releases of greenhouse gasses, including carbon dioxide, from human activities are the main cause (IPCC Working Group II 2014)[6]. Methods for removing carbon dioxide from the atmosphere are one key part of mitigating climate change. One of the most effective and inexpensive methods for removing carbon from the atmosphere remains the uptake and storage by natural ecosystems, and recent evidence suggests that coastal ecosystems are some of the most effective natural carbon "sinks." NOAA has been working to better understand the dynamics of carbon stored in coastal ecosystems and to identify projects that contribute benefits as carbon sinks. NOAA supports expanding scientific understanding of these benefits and enhancing awareness of the carbon benefits of coastal ecosystems by incorporating discussions of these benefits in NEPA evaluations, and working to develop models of carbon sequestration and storage for all coastal ecosystems which is necessary to facilitate the inclusion of carbon benefits into all future coastal NEPA evaluations.

Coastal ecosystems, including mangroves, salt marshes, and seagrasses, are very productive ecosystems that take carbon compounds out of the air at very high rates (Duarte et al. 2010, Donato et al. 2011, McLeod et al. 2011, Fourqurean et al. 2012). This ability to remove carbon at high rates makes these ecosystems approximately equivalent to terrestrial forests in their ability to serve as carbon sinks, despite covering significantly less of the globe (McLeod et al. 2011). The carbon stored in coastal ecosystems is often referred to as "blue carbon[7])

Most of the carbon stored in these ecosystems is stored belowground in the soils, although some of it is stored in aboveground plant biomass. Plants take up carbon dioxide from the air and incorporate it into plant biomass (this process is called "carbon sequestration") via photosynthesis. The soils in these systems do not contain much oxygen (anaerobic), which is important because it means the carbon in these soils is decomposed (i.e., chemically converted) back to carbon dioxide (CO_2) more slowly than in aerobic soils. Thus, it is these anaerobic conditions that make these ecosystems valuable natural carbon sinks. For context, these coastal ecosystems sequester carbon in their soils at rates that are greater than ten times the rate of carbon sequestration in most forested ecosystems (McLeod et al. 2011). These large fluxes of carbon into the soils build up year after year in ecosystems that remain undisturbed creating a large stockpile of stored carbon in the soils. As a result, soils of these ecosystems often are several meters thick and store carbon that is decades, centuries or even thousands of years old (Sifleet et al. 2011).

[6] IPCC Working Group II 2014
[7] McLeod et al. 2011; Sifleet et al. 2011

When these coastal ecosystems are disturbed, however, these natural sinks of carbon become substantial sources of carbon emissions released in the form of greenhouse gases. When vegetation is removed and the hydrology of the system is changed, oxygen is introduced into the soils and they become aerobic which causes the carbon stored in the soil to be converted to CO_2 and released, contributing to global climate change.

There is growing interest in preserving these ecosystems to preserve the carbon stored in them, or in restoring these ecosystems in order to gain additional climate mitigation benefits (Crooks et al. 2014). Additionally, protecting or restoring the carbon in these ecosystems means conserving healthy ecosystems. Carbon storage is only one of the important benefits provided by these coastal ecosystems with other key benefits including storm protection, nursery habitat, and water purification (Barbier et al. 2011).

4. Environmental Impacts

Type of Potential Impacts

Direct, indirect, and cumulative impacts are defined at 40 CFR 1508.7 and 1508.8, and these definitions are presented below. These categories are used to describe the timing and proximity of potential impacts on the affected area only. They have no bearing on the significance of the potential impacts, as described below, and are used only to describe or characterize the nature of the potential impacts.

- **Direct Impact**: A known or potential impact caused by the proposed action or project that occurs at the time and place of the action.
- **Indirect Impact**: A known or potential impact caused or induced by the proposed action or project that occurs later than the action or is removed in distance from it, but is still reasonably foreseeable.
- **Cumulative Impact**: A known or potential impact resulting from the incremental effect of the proposed action added to other past, present, or reasonably foreseeable future actions.

Duration of Potential Impacts

The duration of the potential impact can be defined as either short-term or long-term and indicates the period of time during which the environmental resource would be impacted. The duration of each potential impact is defined as follows:

- **Short-Term Impact**: A known or potential impact of limited duration, relative to the proposed project and the environmental resource. For the purposes of this analysis, these impacts may be instantaneous, last minutes, hours, days or years.
- **Long-Term Impact**: A known or potential impact of extended duration, relative to the proposed project and the environmental resource. For the purposes of this analysis, these improvements or disruptions to a given resource would last longer than 5 years.

Significance of the Potential Impacts

To determine the proposed action's magnitude or intensity, NOAA qualitatively assessed the degree to which the alternatives would impact a particular resource. The magnitude or intensity

of a known or potential impact is defined on a spectrum ranging from no impacts to major impacts. The potential impacts could be either beneficial or adverse for a particular resource.

- **Minor Impact:** This relative term is used to describe impacts that are typically localized to the project site but may in certain circumstances extend to beyond a project site.
- **Moderate Impact:** This relative term is used to describe impacts that can be both localized, or may extend beyond a project site.
- **Major Impact:** This relative term is used to describe impacts that can be both localized, or may extend beyond a project site. Generally, major impacts are those that, in their context and due to their severity, have the potential to meet the thresholds for significance set forth in CEQ regulations (40 CFR 1508.27).

The Proposed Action will not likely have any significant, adverse, long-term impacts on existing biological resources given that the action is designed to return the largely agriculture or post agricultural land uses to conditions more resembling tidal salt marsh. Land currently drained, dry or under a freshwater regime will subsequently become wetter with tidally influenced water flow, and increases in salinity.

In this evaluation the potential impacts due to the Proposed Action and the no-action alternative are discussed for Special-status wildlife, special-status fishes, and special-status plants as well as climate change impacts. The use of Best Management Practices (BMP) as discussed in Chapter 5 of this EA during construction can reduce these impacts. For a given project, we expect that the duration of construction, and the timeframe of these impacts, is likely to be short - a few weeks to a few months.

The No Action Alternative would not physically alter the existing proposed project area. However, the real estate has been obtained and is a Refuge area. It could be expected that natural succession would cause changes to the proposed project area regardless of the lack of construction proposed by the Proposed Alternative. These changes could be expected to change the environment, and either increase or degrade its usefulness as habitat compared to its current condition.

Special-status fishes, wildlife, and plants, as well as climate change impacts will be discussed below. For each of these resources, the impacts of the No Action Alternative and the Proposed Action will be analyzed in the short term (construction impacts and temporally short changes to habitats), and for longer term impacts.

4.1.1 Special Status Wildlife

No Action Alternative

The properties obtained for the Proposed Action have been a highly modified, by draining for agricultural and other land uses. Currently, they are refuge lands. If the Proposed action is not undertaken, these lands can be assumed to continue with ecological succession dependent on

freshwater influx via rain. Certain invasive species introduced to the area will continue to increase. Therefore, the No Action Alternative would result in no short-term, adverse or beneficial impacts. The No Action Alternative would result in either negligible or minor long-term, adverse impacts due to the proliferation of invasive, non-native species.

Proposed Action Alternative

Salt Marsh Harvest Mouse

The salt marsh harvest mouse (*Reithrodontomys raviventris*) (SMHM) relies on dense cover of pickleweed to avoid predation (USFWS 1984). The value of pickleweed increases with depth, density, and degree of intermixing with fat hen (*Atriplex patula*) and alkali heath (*Frankenia salina*) (CDFG 2003). SMHM are seldom found in cordgrass (*Spartina* sp.) or alkali bulrush (*Scirpus maritimus*), and species such as salt grass (*Distichlis spicata*) and brass buttons (*Cotula coronopifolia*) are too low-growing to provide ample cover (USFWS 1984). SMHM, which are partly diurnal, use adjacent upland habitat (i.e. grasslands)during daily or seasonal tidal peaks (USFWS 1984). The species is in decline throughout its range as a result of loss of habitat resulting from continuous development around San Francisco Bay. Historically,"…salt marsh harvest mice evolved with the creation of San Francisco Bay some8,000 to 25,000 years ago. During the last two hundred years approximately 79 percent of the tidal marshes of the Bay 144,234 acres (58,370 hectares) to 181,448 acres (73,430 hectares) have been filled, flooded, or converted to other types of vegetation" (Jones and Stokes et al. 1979). "Approximately 32 percent of historical tidal marsh has been converted into diked wetland and is marginal or inappropriate habitat for SMHM. Most of the remaining tidal marshes are fragmented strips situated along outboard dikes and along sloughs often separated from one another by considerable distances" (USFWS 1984). The SMHM is listed as endangered, both at the federal and state level, and is also listed by the state as a "fully protected" species. These designations under federal and state laws along with drastic range reduction and trends of habitat fragmentation indicate that this species and its habitat are undergoing major adverse (and to what degree?) cumulative impacts.

The Proposed alternatives will re-introduce tidal salt-water intrusion into the marsh. It will favor expansion of pickleweed, and other marsh plants which are preferred habitat of the SMHM. In the interim, during construction there will be disturbance, but present populations of the SMHM are at the fringes of the project site. The short-term, adverse impact should be minor. The long-term impact would be moderately beneficial to the habitat and presumably the populations of the SMHM.

California Red-Legged Frog

The California red-legged frog (CRLF) (*Rana aurora draytonii*) is the largest native frog found in the western United States. The CRLF requires habitat that consists of both aquatic and riparian elements. Adults use dense, shrubby, or emergent vegetation closely associated with deepwater pools with fringes of cattails and dense stands of overhanging vegetation (USFWS 2002). CRLF are found primarily in wetlands and streams in the coastal drainages of Central California. The

CRLF is federally listed as threatened and is a state species of special concern. The status of CRLF under federal and state provisions indicates it is experiencing cumulative impacts. The reasons for the decline of CRLF are multifaceted and include predation by the exotic bullfrog (*Rana catesbeiana*) and predatory fishes such as sunfish (*Lepomis* sp.), habitat alteration, the overharvest of frogs in the 19th century, air and water pollution, solar radiation, and pathogens and parasites (Cook 2007).

Incision of tidal salt water creeks may impact this amphibian's breeding spaces, although no breeding populations have been identified at the project site. The single frog identified on the project site during surveys probably had a deepwater breeding pond off-site and migrated to the site. Short-term alteration of foraging areas for the CRLF can be expected to be a minor, adverse impact during construction. Long-term, adverse impacts should be minor given that there is no diminution of breeding habitat due to the salt water intrusion coincident with the breaching of the dikes.

White-tailed kite

White-tailed kites have been detected foraging over the property (Spautz and Strauss 2005 in Wetlands and Water Resources 2005b). This species is commonly found foraging over wetlands in the vicinity and nesting in trees or tall bushes (e.g., at Tolay Creek Wildlife Area), and may nest on the Project site (Wetlands and Water Resources 2005b). During construction there could be an interruption in the utility of habitat and a short-term, minor, adverse impact from noise associated with construction. The long-term impact would be minor adverse to minor beneficial as there will be an increase of wetland in the project area, and therefore prey species would be more abundant.

Northern harrier

Northern harrier is a regular breeder in the region with numerous individuals documented foraging over the property. The species nests in open areas, often adjacent to wetlands, and may breed on the site (Wetlands and Water Resources 2005b). During construction there could be an interruption in the utility of habitat and a short-term, minor, adverse impact from noise associated with construction. The long-term impact would be minor adverse to minor beneficial as there will be an increase of wetland in the project area, and therefore prey species would be more abundant.

Golden eagle

There are several reports of golden eagles on the Project site. These individuals are likely to breed in southern Sonoma County in forested areas north of the Project site. Five individuals including pre-breeding birds were observed in February 2005 (Burridge 1995in Wetlands and Water Resources 2005b; CH2M Hill 2003b in Wetlands and Water Resources 2005b; and Spautz and Strauss 2005 in Wetlands and Water Resources 2005b). No nesting habitat occurs on site for golden eagle. During construction there could be an interruption in the utility of habitat and a short-term, minor, adverse impact from noise associated with construction. The long-term

impact would be minor adverse to minor beneficial as there will be an increase of wetland in the project area, and therefore prey species would be more abundant.

Burrowing owl

In the project area north of Highway 37, there have been numerous recent sightings of burrowing owls by biologists conducting reconnaissance site surveys for the overall Restoration Project including at least one documented burrow site (Vollmar Consulting 2000 in Wetlands and Water Resources 2005b). This species is known to reside on and near the property, and is typically associated with levees and pasture edges (CH2M Hill 2003b and Spautz and Strauss 2005 in Wetlands and Water Resources 2005b). There is no documentation of this species breeding in the region for 15 years, and most individuals detected on the property are likely to be winter residents only (Burridge 1995 in Wetlands and Water Resources 2005b). During construction there could be an interruption in the utility of habitat and a short-term, minor, adverse impact from noise associated with construction. The long-term impact would be minor adverse to minor beneficial as there will be an increase of wetland in the project area, and therefore prey species would be more abundant.

San Pablo Song sparrow

Several pairs of San Pablo song sparrows were recently detected in a series of irrigation ditches with alkali bulrush in the field southeast of the junction of Highway 37 and Lakeville Highway (Spautz and Strauss 2005 in Wetlands and Water Resources 2005b). This bird is usually found in a wide range of vegetated wetland types in San Pablo Bay and may nest in ditches and tidal marshes in the Action area (Wetlands and Water Resources 2005b). During construction there could be an interruption in the utility of habitat and a short-term, minor, adverse impact from noise associated with construction. The long-term impact would be minor adverse to minor beneficial as there will be an increase of wetland in the project area, and therefore suitable habitat would be more abundant.

Callippe silverspot

The Callippe silverspot has been recorded to occur at Sears Point since 1988 (USFWS 2007). Suitable habitat, (*Viola pedunculata*) is present at project site.). During construction there could be an interruption in the utility of habitat and a short-term, minor, adverse impact from noise associated with construction. The long-term impact would be minor adverse to minor beneficial as there will be an increase of wetland in the project area, and therefore suitable habitat would be more abundant.

Myrtle's silverspot butterfly

Myrtle's silverspot butterfly is historically known from San Mateo County north to the mouth of the Russian River in Sonoma County. No butterflies have been observed recently at the known population sites near Pacifica and San Mateo in San Mateo County. However, there are

documented occurrences adjacent to project site and suitable habitat (*Viola* sp.) occurs on site.). During construction there could be an interruption in the utility of habitat and a short-term, minor, adverse impact from noise associated with construction. The long-term impact would be minor adverse to minor beneficial as there will be an increase of wetland in the project area, and therefore suitable habitat would be more abundant.

Special-Status Wildlife impacts summary

Alternative 1 **No-Action**	**Alternative 2** **Fund the partial tidal restoration plan for Sears Point, CA**
Short Term: no impact	Short-term: minor adverse impact.
Long-term: minor adverse impact	Long-term: Moderate to major beneficial impact for the SMHM, minor adverse to beneficial impact to CRLF, foraging or itinerant birds. Minor beneficial impact to butterflies.

4.1.2 Special Status Fish

No Action Alternative

Currently most anadromous fishes are precluded from using any of the project area either for foraging or breeding due to the diked and drained nature of the project site. Without the Proposed alternative, this condition will remain, and none of the fish chosen for analysis will be present

Proposed Action Alternative

San Pablo Bay is a migratory corridor for anadromous fish such as steelhead, Chinook salmon, green sturgeon and river lamprey. All of these species migrate through San Pablo Bay on their way up to fresh water spawning habitat in the Sacramento River. The Proposed Action Project site is north of the main migratory pathway, therefore salmonids are not expected to occur in large numbers in the northern part of San Pablo Bay near the Proposed Action area. They could stray into Tolay Creek in the action area

There would be minor adverse short-term impacts to any of the species listed during the construction phase of this project due to potential release of sediments into the surrounding waters, in-water disturbances, and noise. Fish species are likely to avoid the active construction areas but return after construction if the areas are managed to minimize sediment issues. Implementations of the BMPs identified in Chapter 5 of this EA would minimize these impacts. Establishment of tidal saline creeks in the Proposed Action area could have a long-term, minor beneficial impact due to the opening up of foraging areas. It is not likely that the tidal creeks would provide breeding habitat for the listed special status fishes.

Alternative 1 **No-Action**	**Alternative 2** **Fund the partial tidal restoration plan for Sears Point, CA**
Short Term: no impact	Short-term: minor
Long-term: no impact	Long-term: minor

4.1.3 Special Status Plants

No Action Alternative

The properties obtained for the Proposed action have been a highly modified, by draining for agricultural and other land uses. Currently, they are refuge lands. If the Proposed action is not undertaken, these lands can be assumed to continue with ecological succession dependent on freshwater influx via rain. Certain invasive species introduced to the area will continue to increase. Therefore, the No Action Alternative would result in no short-term, adverse or beneficial impacts. The No Action Alternative would result in either negligible or minor long-term, adverse impacts due to the proliferation of invasive, non-native species.

Proposed Action Alternative

Eight (8) species of special status plants occur in habitats present within the Action area. Only two of these species, saline clover and Mason's lilaeopsis have been observed within the Action area. Six species occurring in Project vicinity are associated with tidal salt marsh (Point Reyes bird's-beak, soft bird's-beak, Delta tule pea, Mason's lilaeopsis, Marin knotweed, and Suisun Marsh aster). These species would not occur on the Project site because tidal salt marsh is absent; however, coastal salt marsh under tidal influence occurs adjacent to the southern edge of the Project site along San Pablo Bay and Tolay Creek within the Action area (breach and dredging locations). Of these species, Mason's lilaeopsis is known to occur within the Action area at Midshipman's Point at the mouth of Tolay Creek (Baye pers. comm.) Breaching the dikes and allowing the incursion of tidally influenced salt water creeks would almost certainly result in an increase of these salt marsh species.

There could be a minor adverse short term impact associated with the habitat destruction associated with construction. There should be a minor, beneficial long-term impact given that there is expected to be an increase in wetlands associated with the breaching of the dikes.

Alternative 1 **No-Action**	**Alternative 2** **Fund the partial tidal restoration plan for Sears Point, CA**
Short Term: no impact	Short-term: minor adverse impact
Long-term: slight negative impact	Long-term: minor, beneficial impact

4.2.1 Climate

No Action Alternative

Under current conditions the previously agricultural lands could be expected to gradually increase in biomass providing limited additional carbon capture. The dry grasslands would be expected to be largely inhabited by non-native or even invasive species, and provide an increasing fuel load for wildland fire. Frequent wildland fires would release smoke, soot, and additional carbon dioxide from the site. Therefore, the short-term impacts would be negligible and long-term impacts would be negligible beneficial to minor adverse impacts.

Proposed Action Alternative

The proposed Sears Point Restoration Project will also allow for gains in additional climate mitigation benefits because of the considerable amounts of carbon stored in coastal habitats, including tidal marsh (Crooks et al. 2014). The adjacent Petaluma River and SPB are very productive ecosystems that have the potential to sequester carbon at very high rates. On average coastal marshes sequester 218 grams of carbon per square meter per year (g C m^{-2} yr^{-1}) (McLeod et al. 2011) which is approximately 2.4 tons of carbon per hectare per year or on a per acre basis, this is 0.97 tons carbon per acre per year. This rate might not apply immediately after restoration when plants are still getting established, but plant communities would hopefully attain these rates within the first decade after restoration, if not sooner. For the Sears Point project where 960 acres of marsh are going to be restored, this suggests that as much as 930 tons of carbon could be sequestered per year in the restored marsh area. This is equivalent to taking about 200 passenger cars off of the roads permanently. (EPA 2014) The short term climate implications of the Proposed alternative would have a net release of CO2 due to the actions of heavy equipment, and earth moving. The long-term impact though can be expected to be a net sequestration of CO2 providing a moderate, beneficial impact due to additional carbon capture in salt marsh biomass.

Alternative 1 **No-Action**	**Alternative 2** **Fund the partial tidal restoration plan for Sears Point, CA**
Short Term: Negligible impact	Short-term: minor adverse impact
Long-term: Negligible beneficial to minor adverse impacts	Long-term: moderate beneficial impact

5. Mitigation Measures and Monitoring

NOAA has reviewed the measures identified in the FEIR/FEIS to avoid and mitigate environmental impacts that could result from implementation of the Proposed Action. Specific measures relevant to the impact areas being evaluated in this EA are:

- protecting special status wildlife and fish habitat through species-specific measures, avoiding their habitat and if necessary, relocating species.
- provide ample area at appropriate elevations to allow for immediate colonization of tidal marsh vegetation to mitigate for small losses during project construction of the breaches and connector channel.

Biological- Surveying for special status plants and replacement of special status plants through transplanting or reseeding would occur, as necessary. Special status wildlife and fish habitat would be protected through species-specific measures, their habitat avoided and if necessary, species would be relocated. The project design is expected to provide ample area at appropriate elevations to allow for immediate colonization of tidal marsh vegetation to mitigate for small losses during project construction of the breaches and Connector Channel.

(1) If water is present during any part of project activities, and dewatering is deemed necessary, a dewatering and species protection plan would be developed by the project's biologist. The plan would be developed and implemented by a qualified and permitted biologist.

(2) To avoid impacts on aquatic and terrestrial species within the immediate work area, prior to disturbance of the stream channel and removal of vegetation, a qualified biologist would conduct a preconstruction survey to ensure no special-status species are occupying the site. If special-status species are observed within the project site or immediate surroundings, these areas would be avoided until the animal(s) has (have) vacated the area, and/or the animal(s) have been relocated out of the project area by a qualified biologist, upon approval by the regulatory agencies. In addition, the site would be surveyed periodically during construction to ensure that no special-status species are being impacted by construction activities. The biologist would also monitor to ensure water quality standards are being met and sediment and/or debris are not entering downstream aquatic habitats.

(5) To avoid potential impacts on special-status plants, a focused botanical survey would be completed during the appropriate blooming period for the above-mentioned species. If special-status plants are found occupying the site, avoidance measures would be in place during construction to minimize disturbance (e.g., temporary construction fencing around existing populations).

(6) If impacts to special status plants are unavoidable, appropriate mitigation measures would be implemented (e.g., seed collection and revegetation). Replacement to disturbance would occur at a 4:1 ratio.

(7) The project biologist would conduct a preconstruction training session for construction crew members. The training would include a discussion of the sensitive biological resources within the project area and the potential presence of special-status species, special-status species' habitats, protection measures to ensure species are not impacted by project activities, and project boundaries.

(8) (9) Proper erosion control and other water quality BMPs would be implemented to avoid sedimentation and disturbance into downstream and adjacent aquatic habitats. Work in aquatic habitats would be scheduled to occur during the dry season, with work up on the elevated road surfaces scheduled toward the end of construction when rainfall becomes more probable. When work in wetted areas is necessary, they would be dewatered as described above. An

(1) If the excavation sites must be dewatered, the water would be discharged in a manner that would cause no substantial increase in stream turbidity or discharge of fine sediment to the stream channel.

(2) All appropriate BMPs would be implemented as needed to ensure that there is no discharge of fine sediment, concrete, concrete wash water, or roiled water to the creek.

(3) Building materials and/or construction equipment would not be stockpiled or stored where they could be washed into the water or where they would cover aquatic or riparian vegetation.

(4) Debris, soil, silt, bark, rubbish, creosote-treated wood, raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances resulting from project related activities that could be hazardous to aquatic life would be prevented from contaminating the soil and/or entering the waters of the state. Any of these materials placed within or where they may enter a stream or lake would be removed immediately.

6. Cumulative and Indirect Impacts

The CEQ regulations for implementing NEPA define cumulative impacts as:

…the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions (40 CFR 1508.07).

Cumulative impacts can result from individually minor but collectively significant actions taking place over time. NEPA requires the evaluation of cumulative impacts to assess the overall effect of a proposed action on resources, ecosystems, or human communities in light of past, present, and reasonably foreseeable future projects. The cumulative impact analysis includes actions by federal, non-federal, and private entities within Marin, Sonoma and Napa counties, the Sears Point parcel, Petaluma river, Sonoma river, and San Pablo Bay.

The purpose of this chapter is to assess the Sears Point Project's potential cumulative impacts to resources that the project may affect, even if project impacts are relatively small.
For this assessment NOAA/NMFS used the *Guidance for Preparers of Cumulative Impact Assessment*. As recommended in the guidance NOAA/NMFS established geographic study areas for the resources under discussion. Where possible, NOAA/NMFS gathered information to establish trends within the study areas concerning the present state of these resources, including whether a resource is subject to a cumulative impact. For each resource, NOAA/NMFS determined whether the Sears Point Partial Tidal Restoration Project would contribute to cumulative impacts associated with a specific resource. Finally general impacts to resources from other past, present, and foreseeable future projects are discussed.

Websites, documents, and other sources of information used for assessing cumulative impacts are identified in the discussion and listed under the reference section of this document.

6.1 Baseline Conditions for Cumulative Impacts Analysis

This chapter incorporates by reference the baseline conditions of Sears Point described in the Final EIR/EIS by reference for the cumulative impacts analysis; identifies past, present, and reasonably foreseeable future actions; and analyzes incremental impacts of the proposed action.

6.2 Past, Present, and Reasonably Foreseeable Future Actions

For this cumulative impacts analysis, the study area was defined to encompass the Proposed alternative project area, and the lower sections of Marin county (across the Petaluma River from

the Project area) Sonoma County (where the Project is located), and Napa county (adjacent to and east of the Project area) as well as water-based activities in San Pablo Bay. Several federal and private activities were considered for this cumulative impacts analysis. The following sections describe past, present, and reasonably foreseeable future actions in the lower sections of Marin county (across the Petaluma River from the Project area) Sonoma County (where the Project is located), and Napa county (adjacent to and east of the Project area) as well as water-based activities in San Pablo Bay that were considered likely to contribute to cumulative impacts on the resources in the area of the Proposed alternative. The impacts falling under Section 404 of the CWA and Section 10 of the River and Harbor Act of 1899 of non-Corps projects are subject to Corps permitting as well as CEQA review. In the course of permitting and review, impacts under NEPA, ESA, CWA, CEQA and other regimes falling within the appropriate scope of analysis are subject to independent evaluation by the individual project proponents, the Army Corps of Engineers, The State of California, and other regulatory agencies.

CEQA Guidelines, Section 15130, describes when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts, under CEQA, can be found in Section 15355 of the CEQA Guidelines.

6.3 Resources Discussed and Geographic Study Areas

The Final EIS/EIR considered a list of projects that could potentially combine with the Sears Point project to create cumulative impacts. It also considered the projections associated with the Sonoma County General Plan, Bay Trail Plan, and Sonoma Bay Trail Corridor Plan. The EIR/EIS concluded that a number of the projects considered were wetland restoration projects in areas that interface with San Francisco Bay that involved sediment control, improved aquatic and upland habitat, invasive species removal, trail and roadway improvements, and/or flood reduction actions. These projects have primarily beneficial impacts, and would combine with the Sears Point project to create cumulatively beneficial impacts. Other projects, such as maintenance dredging, CALTRANS projects, etc. were also considered.
The resources discussed in this cumulative impact assessment are Special Status Wildlife (birds, amphibians, invertebrates and mammals), special status fishes, special status plants, and climate. Other resources such as water quality, biological resources, wetlands, farmlands, archaeological resources, visual/aesthetics, and air quality are discussed in the EIR/EIS and incorporated by reference here. The basis for assessing cumulative impacts depends upon the impact of the Sears Point Partial Tidal Remediation Project (the Proposed alternative) and other projects within a closely related geographic area.

6.4 Approach to Cumulative Impact Analysis

The methodology used to develop the cumulative impact analysis for key resources areas included the following:

- developing a list of past, present, and reasonably foreseeable future projects in the vicinity of the project area (Table 6.4.1);
- reviewing planning and environmental documents associated with the list of past, present, and reasonably foreseeable future projects;

- qualitatively evaluating the potential contribution of the proposed project to cumulative impacts. The project would have a significant cumulative impact if it, in conjunction with other projects, would exceed the significance criteria established for a resource topic.

This multiple-source approach provided information about whether the project (Proposed alternative) would contribute to significant cumulative impacts.

Table 6.4.1 List of Private, State, and Federal Projects with Potentially Beneficial Impacts in the Area of the Proposed Action Project.

Potentially Beneficial Projects	Document(s) Reviewed
Hamilton Wetlands Restoration Project (HWRP) (950 acres)	Hamilton Wetlands Restoration Plan Final EIS/EIR (U.S. Army Corps of Engineers and California State Coastal Conservancy 1998, Jones & Stokes 2003).
Bel Marin Keys Unit V Wetlands Expansion of the HWRP (1,576 acres)	Bel Marin Keys Unit V Supplemental EIS/EIR (Jones & Stokes. 2003U.S. Army Corps of Engineers and California State Coastal Conservancy 2003). Currently in planning.
HWRP Aquatic Transfer Facility	Hamilton Wetland Restoration Project Dredge Material Aquatic Transfer Facility Draft EIS/EIR (U.S. Army Corps of Engineers and California State Coastal Conservancy 2008)
Napa River Salt Marsh Restoration Project (9,460 acres)	Napa River Salt Marsh Restoration Project Final EIS (Jones & Stokes 2004).
Suisun Marsh Restoration Project (4,660-6,660 acres)	DPEIS/R for the Habitat Management, Preservation, and Restoration Plan and DPEIS/R for the Suisun Marsh (Jones &Stokes 2010.Jones & Stokes, under development)
San Francisco Bay Trail	San Francisco Bay Trail Plan (Association of Bay Area Governments 1989). Sonoma Bay Trail Corridor Plan (Sonoma County Parks 2003).
Sonoma Baylands Wetland Demonstration Project (320 acres)	Ducks Unlimited. 2009. Final Environmental Impact Statement/Environmental Impact Report Cullinan Restoration Projects, Solano and Napa Counties. Project began September 2011 and is expected to complete December 2012.
Montezuma Wetlands Restoration Project (1,800 acres)	California Wetlands Information System. Montezuma Wetlands Project. Accessed on March 17, 2009 at:http://ceres.ca.gov/wetlands/projects/montezuma.html.

Table 6.4.2 List of Private, State, and Federal Projects with Potentially Adverse Impacts in the Area of the Proposed Action Project.

Potentially Adverse Projects	Document(s) Reviewed
Dredging in San Francisco Bay • includes Port of Oakland, Port of Richmond, San Pablo Bay Across the Flats Channel (i.e., Petaluma River channel), Port of Redwood City, and Pinole Shoal Channel • also includes dredged material disposal at SF-9, SF-10, Alcatraz, and SF-DODS	LTMS for the Placement of Dredged Material in the San Francisco Bay Region Final EIS/EIR (U.S. Army Corps of Engineers et al. 1998). Oakland Harbor Navigation Improvement (50-Foot) Project Final EIR/EIS (U.S. Army Corps of Engineers and Port of Oakland 1998).

Potentially Adverse Projects	Document(s) Reviewed
San Francisco Water Transit Authority Expansion	Expansion of Ferry Transit Service in the San Francisco Bay Area Final Program EIR (URS Corporation. 2003).
Trans-Bay Cable	Final EIR for the Trans Bay Cable Project (URS Corporation 2006)
Dredging in the Sacramento-San Joaquin Delta • includes Stockton Deep Water Channel, Sacramento River Deep Water Channel, and John Baldwin Channel	LTMS for Delta Sediments (U.S. Army Corps of Engineers under development)
Sonoma County General plan SMART Railroad	Sonoma County General Plan (Sonoma County 1989)Rail service restarted July 13, 2011 (Sonoma-Marin Area Rail Transit 2006).
Visitor Services Plan (VSP) for Lake Berryessa including: • Major Recreation Facilities, Visitor Services and Capital Investment at Lake Berryessa • Concession Sewer Pond • Remediation and Closure • ADA Retrofits	Environmental Assessment/Initial Study for Camp Berryessa, U.S. Department of the Interior Bureau of Reclamation, Napa County Regional Park and Open Space District, February 2011
Binford Road Storage Facility 8190 Binford Road	City of Novato Planning Department, November 2005, August 2006, and November 2008.
Costco Expansion 300 Vintage Way	City of Novato Planning Department, November 2005, August 2006, and November 2008.
Creekside Office (Novato Creek) 1744-1748 Novato Boulevard	City of Novato Planning Department, November 2005, August 2006, and November 2008.
Marion Heights 1750 Marion Avenue	City of Novato Planning Department, November 2005, August 2006, and November 2008.
New Beginnings Next Key 1399 North Hamilton Parkway	City of Novato Planning Department, November 2005, August 2006, and November 2008.
Oleander Lane Design Review 801 Oleander Lane	City of Novato Planning Department, November 2005, August 2006, and November 2008.
Olive Court 469 Olive Avenue	City of Novato Planning Department, November 2005, August 2006, and November 2008.
San Pablo Subdivision San Pablo Avenue/Hangar Avenue	City of Novato Planning Department, November 2005, August 2006, and November 2008.
Somerston Park (Marion Heights) Northside of Marion Avenue between Anna Court and Bryan Drive	City of Novato Planning Department, November 2005, August 2006, and November 2008.
Oak Ridge Estates End of Shevelin Road	City of Novato Planning Department, November 2005, August 2006, and November 2008.
Whole Foods/Mixed Use 790 Delong Avenue	City of Novato Planning Department, November 2005, August 2006, and November 2008.
Woodview Subdivision San Marin Drive/Dorothy Way	City of Novato Planning Department, November 2005, August 2006, and November 2008.
Dutra Asphalt & Recycling Facility 3355 Petaluma Blvd. S.	County of Sonoma, Community Development Commission, April 2009.
Royal Petroleum 2645 & 2525 Petaluma	County of Sonoma, Community Development Commission, April

Potentially Adverse Projects	Document(s) Reviewed
Blvd. South	2009.
Shamrock 210 & 222 Landing Way	County of Sonoma, Community Development Commission, April 2009.
Novato Disposal 2543 Petaluma Blvd. South	County of Sonoma, Community Development Commission, April 2009.
Intersection widening and Signalization project Adobe Rd/Corona Rd IS	City of Petaluma Community Development, Planning Division, December 2005 and November 2008.
Boulevard Apartments945 Petaluma Boulevard North	City of Petaluma Community Development, Planning Division, December 2005 and November 2008.
Deer Creek Plaza NW side of N. McDowell/Rainier Avenue Intersection	City of Petaluma Community Development, Planning Division, December 2005 and November 2008.
Lafferty Ranch Park 3.5 miles from Petaluma	City of Petaluma Community Development, Planning Division, December 2005 and November 2008.
Magnolia Place Magnolia Avenue, near Cemetery	City of Petaluma Community Development, Planning Division, December 2005 and November 2008.
Marina Office Building 785 Baywood Drive	City of Petaluma Community Development, Planning Division, December 2005 and November 2008.
McDowell/E. Washington Traffic improvement	City of Petaluma Community Development, Planning Division, December 2005 and November 2008.
Recycled Water Pipeline Phase I Brown's Lane/Ely Road/Casa Grande Road	City of Petaluma Community Development, Planning Division, December 2005 and November 2008.
Redwood Technology Center Old Redwood Highway and W. McDowell Blvd.	City of Petaluma Community Development, Planning Division, December 2005 and November 2008.
Riverview Subdivision Mission Drive near McNair Avenue	City of Petaluma Community Development, Planning Division, December 2005 and November 2008.
Sola Business Park 1490 Cader Lane (between Lakeville Hwy and South McDowell)	City of Petaluma Community Development, Planning Division, December 2005 and November 2008.
Technology Lane Commercial Center Technology Lane	City of Petaluma Community Development, Planning Division, December 2005 and November 2008.
Sweed School 331 Keller Street	City of Petaluma Community Development, Planning Division, December 2005 and November 2008.
East Washington Place East Washington Street and Ellis Street	City of Petaluma Community Development, Planning Division, December 2005 and November 2008.
US 101 Projects	
East Washington Interchange IP	*Marin-Sonoma Narrows HOV Widening Project FEIR/S 2014*
Old Redwood to Rohnert Park Expressway HOV Project	*Marin-Sonoma Narrows HOV Widening Project FEIR/S 2014*
Marin-Sonoma Narrows (MSN) HOV Widening Project	*Marin-Sonoma Narrows HOV Widening Project FEIR/S 2014*

Several of the identified projects are being developed specifically to benefit the environment, restore habitat and species diversity, and restore areas altered from their natural state to a more natural condition. The cumulative impacts of these projects, combined with the Proposed Action would be long-term and moderately beneficial. However, by comparing the lists of these projects with the projects that may have negative impacts, such as conversion of existing habitat to residential, commercial or transportation uses, one can conclude that the net cumulative

impacts will be adverse. Cumulative moderately adverse impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive types of agricultural cultivation. These land use activities can degrade habitat and species diversity through different types of impacts such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators.

Special Status Wildlife, Fish and Plants

As noted in Chapter 3, the species identified for special status protections have suffered from major adverse past impacts or they would not have been selected for protection. Although the Proposed Action would contribute benefits to many of these species, as would the projects listed in Table 6.4.1, the projects listed in Table 6.4.2 have offsetting adverse impacts. It is not possible to make an objective comparison of the magnitudes of the impacts since the species impacted and the areas of impact would be diverse and the exact timing of the impacts would vary. Generally, however, the projects in Table 6.4.2 are likely to have the impacts associated with habitat destruction or fragmentation associated with historic impacts to protect wildlife.

Each project has or will go through review and permitting processes suitable to the magnitude and type of project proposed. These regulatory processes are designed to minimize and/or mitigate for environmental impacts, and in most cases, require consideration of cumulative impacts. Therefore, the potential cumulative impacts from the Proposed action when considered with present and potential future actions would be minor and adverse. Past actions have been demonstrated to have had a major adverse impact to these species.

Climate Change

Climate change is the result of multiple past and present actions that have released a variety of greenhouse gases to the atmosphere. For the proposed projects listed in Table 6.4.1, benefits similar to the capture of carbon in restored salt marsh and similar wetland habitat would be a moderate long-term benefit to climate change because each project will contribute to reducing atmospheric carbon dioxide because a variety of wetland and tidal habitats have been shown to be major contributors to capture of carbon dioxide from the atmosphere and storage of the captured carbon in biomass and sediments.

The projects listed in Table 6.4.2 would have a variety of adverse impacts on climate change due to generation or release of greenhouse gases, principally carbon dioxide. Construction equipment would generate carbon dioxide from burning fuel. Transportation projects would contribute to increases in automobile and truck traffic. Dredging projects would release carbon dioxide captured in disturbed sediments. Each project has or will go through review and permitting processes suitable to the magnitude and type of project proposed. These regulatory processes are designed to minimize and/or mitigate for environmental impacts, and in most cases, require consideration of cumulative impacts. Therefore, the potential cumulative impacts on climate change from the Proposed action and other present and potential future actions would be minor and adverse.

7. Agency Consultations

The following regards the agencies that were consulted by the USFWS during the preparation and completion of its EIR/EIS. Since the NOAA's proposed action was included in the actions evaluated by the EIR/EIS and were included in the USFWS' consultations, and because nothing regarding NOAA's proposed action has changed, no additional consultations were required by NOAA.

Endangered Species Act: Section 7 Consultation; and Magnuson-Stevens Fisheries Conservation and Management Act (MSA): EFH Consultation

Because of the potential impacts to species listed under the Endangered Species Act, the project is subject to interagency consultation under Section 7 of that Act (16 U.S.C. § 1536(a)(2)). The USFWS completed formal consultation with the USFWS (FWS-file # 81420-2008-F-0296-1). The USFWS rendered a Biological Opinion (BO) dated January 10, 2013, and found that the action would not jeopardize listed species or adversely modify their critical habitat. The FWS BO states that the project is not likely to adversely affect the threatened delta smelt, threatened western snowy plover, and the endangered California least tern. The project is likely to adversely effect, but is not likely to jeopardize the continued existence of the California clapper rail or the salt marsh harvest mouse. An incidental take statement (ITS) containing reasonable and prudent measures designed to minimize the impact of any incidental take on the California clapper rail and the salt marsh harvest mouse was issued along with the BO, consistent with 16 U.S.C. § 1536(b)(4).

On June 3, 2013, the National Marine Fisheries Service (NMFS) issued a section 7 consultation response letter to the USFWS, concurring with the determination that the project is not likely to adversely affect listed fish species under NMFS jurisdiction, or their designated critical habitats. The overall restoration project (of which the NOAA RC funding action is one part) is expected to enhance habitat for federally endangered and threatened species such as the Green sturgeon, steelhead and Chinook salmon.

The restoration component to be funded under the NOAA's proposed action would convert hay fields, which are not suitable habitat for clapper rail or salt marsh harvest mouse, back to salt marsh. It would create a substantial increase in suitable habitat and contribute to a substantial benefit for these two federally protected salt marsh species, as well as the other federally protected species. Since there have been no subsequent changes in project scope or status of these species, the NOAA RC does not need to re-consult. In summary, the proposed action to be funded by NOAA will result in a substantial benefit to these salt marsh dependent species, with no effects to marine mammals or other non-target protected species

In regard to EFH, the same letter also addressed the USFWS regarding its required EFH consultation, and concluded that although the project would have temporary adverse impacts,

there are adequate measures to avoid and minimize these impacts, and would result in both short- and long-term overall enhancement and benefit to quality and quantity of EFH in the area.

Advisory Council on Historic Preservation (ACHP): National Historic Preservation Act (NHPA), Section 106 Consultation

(1) A preconstruction meeting will be held to acquaint project personnel with the possibility of encountering sensitive cultural resources. Prehistoric resources may include chert or obsidian flakes, projectile points, mortars, and pestles; dark friable soil containing shell and bone dietary debris; heat-affected rock; or human burials. Historic resources may include stone or adobe foundations or walls, structures and remains with square nails, and refuse deposits, often in old wells and privies.

(2) In the event that previously undocumented cultural resources (including but not limited to dark soil containing shellfish, bone, flaked stone, groundstone, or deposits of historic trash) are encountered during project construction by anyone, the state representative will temporarily halt at that specific location and direct contractors to other project-related tasks. A DPR-qualified archaeologist will record and evaluate the find and work with state representative to implement avoidance, preservation, or recovery measures as appropriate prior to any work resuming at that specific location.

(3) If the DPR-qualified archaeologist determines that the find(s) are significant, a qualified historian, archaeologist, and/or Native American representative (if appropriate) will monitor all subsurface work including trenching, grading, and excavations in that area. If it is determined, the find indicates a sacred or religious site. Formal consultation with appropriate representatives will occur as necessary.

(4) In the event that human remains are discovered, work will cease immediately in the area of the find and the project manager/site supervisor will notify the appropriate DPR personnel. Any human remains and/or funerary objects will be left in place. The DPR Sector Superintendent (or authorized representative) will notify the County Coroner, in accordance with §7050.5 of the California Health and Safety Code, and the Native American Heritage Commission (NAHC) will be notified within 24 hours of the discovery if the Coroner determines that the remains are Native American. The NAHC will designate the “Most Likely Descendent” (MLD) of the deceased Native American. The MLD will recommend an appropriate disposition of the remains. If a Native American monitor is on-site at the time of the discovery and that person has been designated the MLD by the NAHC, the monitor will make the recommendation of the appropriate disposition.