

**U.S. Department of the Interior
Fish and Wildlife Service**

San Diego National Wildlife Refuge Complex
1080 Gunpowder Point Drive
Chula Vista, CA 91910

FINDING OF NO SIGNIFICANT IMPACT (FONSI)
for the
Seal Beach National Wildlife Refuge
Thin-layer Salt Marsh Sediment Augmentation Pilot Project
Orange County, California

The U.S. Fish and Wildlife Service (Service) and the California Coastal Conservancy (Conservancy) have prepared a joint Initial Study/Environmental Assessment (IS/EA) (USFWS and California Coastal Conservancy 2014) to evaluate the potential effects to the environment of implementing a pilot project for sea level rise adaptation within a 16-acre site in the existing coastal salt marsh habitat on the Seal Beach National Wildlife Refuge (NWR) in Orange County, California. The document was prepared in accordance with both the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA), with the Service acting as the Lead Agency under NEPA and the Conservancy acting as Lead Agency under CEQA.

The joint IS/EA (incorporated by reference herein) evaluated the potential effects of implementing the Seal Beach National Wildlife Refuge Thin-layer Salt Marsh Sediment Augmentation Pilot Project (Figures 1 and 2). The project proposes to apply a thin-layer of clean sediment of appropriate grain size to 10 acres of low salt marsh habitat within a 16-acre site on the Refuge to raise the marsh plain elevation. This action is proposed in response to ongoing adverse effects of subsidence and sea level rise on the quality of the site's cordgrass (*Spartina foliosa*)-dominated salt marsh habitat. The purposes of this action include improving habitat quality for the endangered light-footed Ridgway's rail (*Rallus obsoletus levipes*) (formerly referred to as the light-footed clapper rail) and determining if sediment augmentation is an effective sea level rise adaptation strategy for coastal salt marsh habitat along the California coast.

The scope of the project includes pre-construction monitoring to document the existing conditions on the site, followed by five years of annual monitoring of the physical and ecological responses of the salt marsh ecosystem to thin-layer sediment augmentation. It is the intent of this project to disseminate the results of the comprehensive monitoring program to interested Federal, State, and local agencies, coastal land managers, and other stakeholders to assist in further developing sea level rise adaptation strategies for coastal California, particularly for those salt marsh habitats that have no potential to migrate inland.

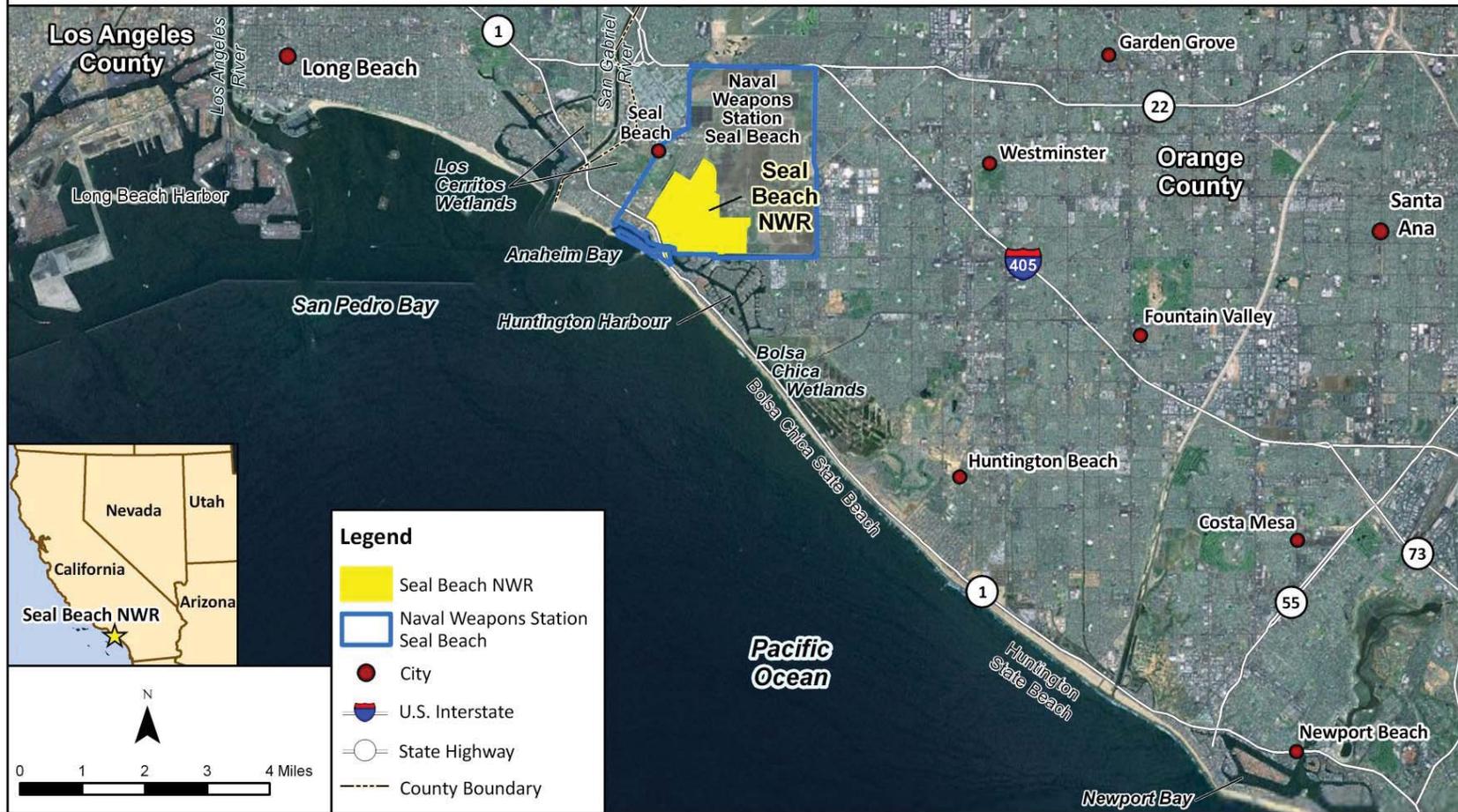


Figure 1. Vicinity Map



Figure 2. Location of the Pilot Project Site

Decision

Following comprehensive review and analysis of the proposed action and the no action alternative, as presented in the draft IS/EA, and considering all public comments and our responses to them, the Service has determined that the analysis in the IS/EA is sufficient to support the selection of the proposed action for implementation.

The purposes of the proposed project are to improve habitat quality on the Seal Beach NWR for the endangered light-footed Ridgway's rail and to determine if sediment augmentation is an effective sea level rise adaptation strategy. More detailed information about the proposed action and its purpose and need is provided in Sections 1 and 2 of the Final IS/EA.

The proposed action alternative was selected because its implementation will help ensure that the purposes for which the Seal Beach National Wildlife Refuge was established will be achieved. In addition, the proposed action best addresses the goals and objectives included in the Seal Beach National Wildlife Refuge Comprehensive Conservation Plan (USFWS 2012), particularly those related to the management of the Refuge's population of light-footed Ridgway's rails and associated salt marsh habitat.

The need to address the effects of sea level rise on coastal habitats and listed and sensitive species was also considered in making this determination. As described in the National Fish, Wildlife and Plants Climate Adaptation Strategy (National Fish, Wildlife, and Plants Climate Adaptation Partnership 2012), steps must be taken to address the effects of climate change, including sea level rise, to help conserve ecosystems and make them more resilient. The only options for retaining the existing acreage of tidal wetlands is to either implement adaptive management strategies that will allow these wetlands to keep pace with sea level rise or ensure that these wetlands can migrate inland to adjacent lands that are undeveloped. In California, there is little opportunity for coastal wetlands to migrate inland, therefore, effective management actions must be evaluated that can allow these wetlands to keep pace with sea level rise.

The proposed action is consistent with the goals outlined in the Service's Strategic Plan for Responding to Accelerating Climate Change (USFWS 2010) and the National Fish, Wildlife and Plants Climate Adaptation Strategy (National Fish, Wildlife, and Plants Climate Adaptation Partnership 2012). It is also consistent with the State of California's Safeguarding California: Reducing Climate Risk, an Update to the 2009 California Climate Adaptation Strategy (California Natural Resources Agency 2014).

Finally, the proposal to use dredge material for this beneficial use is consistent with the recommendations of the National Dredge Team and the conclusions of Dredged Material Management Action Agenda for the Next Decade (USEPA 2003) that "beneficial use must become a priority at all levels of management, funding must be increased for beneficial use projects and research, planning must be proactive, and there must be a recognition that dredged material is a valuable resource."

Alternatives Considered

Following is a brief description of the two alternatives considered in the draft IS/EA. For a complete description of each alternative, see the Final IS/EA.

Proposed Action (Selected Alternative)

Under the proposed action, 10,000 to 13,500 cubic yards [CY] of clean dredge material would be applied as a fairly uniform thin layer of sediment, about 8 to 10 inches (20.32 to 25.4 centimeters [cm]) deep, over approximately 10 acres of a 16-acre site situated within the Refuge's 565-acre intertidal salt marsh habitat. The sediment will come from a nearby maintenance dredging project to be conducted by Orange County Parks. Also proposed is the implementation of pre-sediment application monitoring to document the existing biological and physical conditions on the site and five years of post-sediment application monitoring. The results and lessons learned from this project will be disseminated to interested agencies and land managers in an effort to provide guidance necessary to implement this adaptation strategy elsewhere along the California coast.

No Action

Under the no action alternative, no sediment augmentation would occur on the Seal Beach NWR. This alternative represents the baseline from which the "action" alternative was evaluated. The effects of subsidence and sea-level rise on the existing habitat and affected species, including the light-footed Ridgway's rail, would continue under the no action alternative. The dredge material that would have been placed on the project site from an adjacent maintenance dredging project would be disposed of at U.S. Environmental Protection Agency (USEPA)-approved LA-2 open ocean site, reused at eelgrass mitigation sites within Huntington Harbour or elsewhere, or used for fill at an upland landfill site or port confined disposal site.

Environmental Consequences of Implementing the Proposed Action

A summary of the potentially adverse effects of implementing the proposed action are provided below. To ensure that no significant adverse effects to the environment would result from the proposed action, adequate measures have been incorporated into the scope of the project to avoid and minimize all potential adverse effects.

A more in-depth analysis of the potential affects to the environment is provided in the IS/EA. The analysis in the IS/EA tiers from the analysis of this proposal in the programmatic level EA prepared for the Seal Beach NWR CCP (USFWS 2012), and as such, the EA prepared for the CCP is incorporated by reference into the IS/EA. The programmatic EA for the Seal Beach CCP can be review downloaded at http://www.fws.gov/refuge/Seal_Beach/what_we_do/planning.html.

A. Air Quality

Overview. Transport of sediment from the nearby dredge site and application of the sediment onto the pilot project site is expected to take between four to six weeks depending upon the application techniques that are used. These activities will result in the short-term generation of criteria pollutant and toxic air contaminants (TAC) emissions.

Potential sources of these emissions include the operation of motorboats and/or a small containment barge, a booster pump to transport and/or apply the slurried sediment onto the site, and vehicle trips by construction workers and site monitors.

Air Quality Standards. An estimate of total direct and indirect emissions generated by the implementation of the pilot project indicates that project implementation will not exceed the South Coast Air Quality Management District (SCAQMD) Rule 1901 Conformity Applicability Thresholds. In addition, this short-term project will generate emissions below regional and localized SCAQMD construction thresholds, and will result in no changes in existing land use and no increases in population or employment following project completion. As a result, the implementation of the proposed action will not conflict with any air quality management plan.

Exposure to Sensitive Receptors. Construction activities associated with the proposed project will be short in duration (four to six weeks) and will occur a sufficient distance from sensitive receptors that implementation of the pilot project is not anticipated to result in an elevated health risk to exposed persons. Further, the project will not create substantial pollutant concentrations of criteria pollutants. The potential for impacts to sensitive receptors as a result of project implementation are therefore considered less than significant.

Objectionable Odors. The application of dredged sediment onto the Refuge site will occur using a mix of sediment and water, which will dilute any odors generated by the sediment. In addition, the application site is not located in proximity to any sensitive receptors. As such, no impacts related to odor are anticipated.

B. Biological Resources

Marsh Habitat. The proposed action has the potential to affect 16 acres of lower quality low salt marsh habitat on the Refuge. Within the 16 acres, approximately 10 acres will be modified through the application of 8 to 10 inches of sediment over the existing vegetation. The remaining six acres of vegetated salt marsh will provide a sediment trap for sediments that might flow from the 10-acre application site. This thin-layer of sediment will cover some but not all of the vegetation on the 10-acre site.

The Refuge currently supports approximately 565 acres of salt marsh vegetation and the proposed pilot project has the potential to temporarily modify approximately 2.8 percent of the total salt marsh habitat on the Refuge. Cordgrass is expected to grow up through the sediment and achieve the desired stem heights and density within two to five years of sediment augmentation. Additionally, regrowth and/or natural recruitment of other low marsh plant species and natural recruitment of invertebrates and other organisms is expected to occur within a similar timeframe. The quality of the habitat is expected to be better than pre-project conditions as a result of the increase in the marsh plain elevations. The improved habitat conditions will benefit the light-footed Ridgway's rail and other components of the marsh ecosystem.

If after five years, the condition of the salt marsh vegetation on the 10-acre pilot project site is not consistent with or of better quality than pre-project conditions, the following conservation measure will be implemented to avoid adverse effects to coastal salt marsh vegetation:

A restoration plan will be developed and implemented within the project site to reestablish native salt marsh vegetation at a density and percent cover similar to pre-project site conditions. Site management and monitoring will continue until salt marsh vegetation has been restored to the site in accordance with the specifications of the restoration plan.

Wildlife. Construction related disturbance on and adjacent to the pilot project site would occur over a period of four to six weeks. To avoid impacts to nesting birds, no construction will be permitted during the nesting season. Avian species, including the endangered light-footed Ridgway's rail and various shorebirds, some of which are identified by the Service as Birds of Conservation Concern, could be present on the site. Activities in the adjacent tidal channels associated with the transport and application of sediment has the potential to disturb the endangered eastern Pacific green turtle (*Chelonia mydas*) and various marine mammals. The conservation measures presented below have been incorporated into the scope of the project to avoid any potential take of listed species and to ensure that adverse effects to wildlife will be less than significant.

A qualified biologist will be on site during construction to monitor for the presence of sensitive species and other wildlife. The biologist shall have the authority to halt construction when wildlife is observed within or near the project site. Work crews will be briefed on how to identify sea turtles and marine mammals that could occur in water areas affected by the implementation of the pilot project. The biological monitor will prepare incident reports of any observed sea turtle activity and shall provide such reports to National Marine Fisheries Service (NMFS) within 24 hours of an observation.

Any work vessels (e.g., containment barge, workboat) moving about the project site shall comply with a five-mile per hour speed limit. In the event of a collision between the containment barge or workboat and a marine mammal or sea turtle, the USFWS shall immediately contact the NMFS Southwest Regional Office's Stranding Coordinator, and submit a report to the NMFS within 24 hours. To reduce the potential for impacts to sea turtles, sediment transport and application within the Refuge shall only occur between November 1 and February 15, when water temperatures are lower.

To avoid impacts to light-footed Ridgway's rails and other avian species in the vicinity of the project site, sediment application shall not occur during the nesting season.

Additionally, the three artificial light-footed Ridgway's rail nesting platforms located within and adjacent to the project site shall be removed after the end of the breeding season (after September 15) preceding sediment application to minimize the presence of rails in the area.

Prior to the daily application of sediment onto the pilot project site, a qualified biologist shall survey the 16-acre site and adjacent areas for the presence of rails and other birds. If any are present, an air horn or cracker shells will be deployed to move the birds off the site prior to sediment application. If noise proves ineffective, physical presence may be used to haze birds to move to other parts of the Refuge. Also, monitoring shall continue throughout the day to discourage rails and other birds from moving into the project site, particularly during periods when sediment is not being sprayed, such as during breaks or when adjustments in the application process are being implemented.

Eelgrass. The tidal channels located adjacent to the application site support eelgrass habitat. The movement of sediment from the site into the adjacent channels and/or increases in turbidity levels within these channels during and/or after sediment application could have an adverse effect on eelgrass. To minimize the potential for sediment to move off the site, a vegetated buffer will be maintained around the 10-acre application site, and the area will be monitored during sediment application. If necessary, additional measures will be implemented, such as the installation of silt fencing and/or the implementation of other forms of sediment control. To avoid, and if necessary, to adequately mitigate for, any significant adverse effects to eelgrass habitat, the conservation measures presented here have been incorporated into the scope of the project.

A vegetated buffer shall be maintained around the 10-acre application site, and the buffer area shall be monitored during sediment application to ensure that any sediment moving off the pilot project site is being trapped within the vegetated buffer area. If monitoring indicates that the sediment has the potential to migrate from the marsh into the adjacent tidal channel, additional measures shall be implemented to minimize the loss of sediment from the site. Such measures could include, but are not limited to, installing silt fencing, silt curtains, or straw wattles along the edge of the site.

Eelgrass surveys shall be conducted within the tidal channels that abut the 16-acre pilot project site, as well as another reference site within the Refuge, during the active growth phase for the vegetation (typically March through October). The distribution, density, and relationship to depth contours of any eelgrass beds that may be impacted by project implementation shall be thoroughly mapped and mapping protocols shall be consistent with those outlined in the Southern California Eelgrass Mitigation Policy (SCEMP). The same surveys shall be conducted within 30 days of completing the sediment application process and then annually for two years following application.

If impacts to eelgrass from project implementation are identified, compliance with the SCEMP shall be initiated and monitoring of the mitigation area(s) and a suitable local reference site shall be implemented per the requirements of the SCEMP. Monitoring reports shall be filed with the resource agencies and the California Coastal Commission.

C. Cultural Resources

The Service's Regional Archaeologist/Historic Preservation Specialist evaluated the potential impact of the proposed project on cultural resources and determined that no impacts are anticipated. No further cultural resource identification effort is necessary for the project. In compliance with the terms of the Service's Programmatic Agreement with the State Historic Preservation Office (SHPO), the project will be reported to the SHPO in the Service's annual report that will be prepared and submitted at the end of fiscal year 2014. Because the existence of cultural resources can never be predicted with certainty, the following conservation measure has been incorporated into the scope of the project to ensure that potentially significant impacts resulting from the encounter of an archaeological resource will be avoided.

In the event that cultural resources are discovered during any disturbance to subsurface material on the 16-acre pilot project site, the ground disturbing activity shall be halted, the Service's Regional Archaeologist and the Conservancy shall be notified, and additional consultation shall be initiated to ensure compliance with the National Historic Preservation Act and other applicable Federal regulations and policies. If any cultural resources are discovered on State lands during the implementation of this project, the USFWS and Conservancy shall also consult with the California State Lands Commission's Assistant Chief Counsel.

D. Greenhouse Gas Emissions

The delivery and application of up to 13,500 CY of dredged sediments from a nearby maintenance dredging site will result in the short-term generation of greenhouse gas (GHG) emissions, with the majority of the activities, and thus the majority of the GHG emissions, occurring over a period of four to six weeks. Total project-related construction emissions were calculated and then amortized over the life of the project to obtain total annual GHG emissions (CO₂e) of less than 4 metric tons. The California Air Pollution Control Officers Association (CAPCOA) threshold is 900 metric tons annually. Consequently, the impact of GHG emissions generated from this project is considered less than significant. Therefore, no mitigation is proposed.

Once the sediment application process is completed, emissions from small boats used for monitoring could be generated for 48 hours over the course of a year, with monitoring proposed for at least five years. Monitoring will likely occur using a combination of motorized and non-motorized vessels. The use of some non-motorized vessels will reduce the total emissions. Overall, GHG emissions associated with the monitoring program will be less than significant.

The enhancement of coastal salt marsh vegetation, which is the intent of this project, will provide benefit by offsetting some of the construction-related GHG emissions through carbon sequestration. Studies indicate that marsh grasses and other macrophytes, microalgae on the mud surface, and phytoplankton are the three primary components of the natural salt marsh community that remove large amounts of CO₂ from the atmosphere and store the carbon in the marsh soils (Choi and Wang 2004, Brigham et al. 2006). Although the benefits will be small because the project is limited to 10 acres, if thin-layer sediment augmentation proves to be an effective sea level rise adaptation strategy for conserving coastal salt marshes threatened by inundation, there will be additional benefits of implementing thin-layer sediment augmentation in the future.

E. Hazards and Hazardous Materials

Contamination in the Sunset/Huntington Harbour sediments proposed for use on the Refuge pilot project site was not severe enough to cause any statistically significant suspended particular phase toxicity (using mussel larvae, mysid shrimp and fish) or benthic toxicity (using amphipods and polychaete worms) (Kinnetic Laboratories, Inc. and Moffatt & Nichol 2014). There was statistically significant bioaccumulation of lead, DDTs, chlordane and PCBs in the test tissues. However, levels were determined to represent minimal threat to benthic organisms or species foraging in the marine benthic environment of the Refuge. Therefore, impacts from contaminants associated with placement of the dredged sediments to the benthic community or organisms dependent upon it at the Refuge site are not anticipated.

Although contaminated sites have been identified within Naval Weapons Station Seal Beach, these sites are not considered a threat to offsite locations (Southwest Division, Naval Facilities Engineering Command 1995), including the 16-acre pilot project site.

Project implementation requires the operation of boats and other motorized equipment within the tidal channels of the Refuge. Such operations have the potential to release hazardous materials such as gas and oil into the waterway due to spills or leaks related to the operation of the machinery. Requirements of appropriate local and State agencies for the implementation of best management practices (BMPs), the provision of spill kits on all vessels, and adherence to spill reporting requirements minimizes the potential for adverse effects to waterways as a result of the proposed operation. Because the project will comply with Federal, State, and local hazardous waste regulations, impacts related to the inadvertent release of hazardous materials into the waterways surrounding the project site will be less than significant, and no mitigation will be required.

F. Water Quality

The pilot project will involve the spraying of 10,000 to 13,500 CY of sediment onto 10 acres of the 16-acre site located adjacent to two tidal channels in Anaheim Bay. As a result, the project has the potential to introduce sediment into the adjacent tidal channels. Turbidity levels in these adjacent waters will increase, at least temporarily, if sediments in the dredge slurry move off the site and into adjacent tidal channels.

Monitoring of sediment movement and turbidity levels will occur during the sediment application process and application methods will be adaptively managed to ensure that movement of sediment off the site is minimized. Following completion of the sediment application process, post-application monitoring will include evaluation of sediment retention on the site and turbidity levels in the adjacent tidal channels. Turbidity sensors will be deployed to measure suspended sediment concentrations in the water. Following sediment application, sediment retention in the treatment areas will be monitored using cryo-coring within subplots that have been pre-treated with a feldspar marker horizon or other accepted methods for monitoring sediment retention. The specific techniques are currently being evaluated in consultation with researchers from the U.S. Geological Survey (USGS), UCLA, and California State University Long Beach.

According to Ray (2007), based on experiences in Gulf Coast, spray disposal operations, can be modified to target specific sites and avoid sensitive areas. Cahoon and Cowan (1987, 1988) report that in their experience, water from the liquid slurry rapidly drains off, quickly leaving the deposited sediment without producing unusually high levels of turbidity. The sediment to be applied to the pilot project site consists of a mixture of silt, sand, and clay, which has a moderate potential for localized increases in turbidity should material move off this site. Because this practice has not been attempted on the Pacific Coast, it will be necessary to adaptively manage the application process to meet project design criteria, including minimizing the potential for the introduction of sediment into the tidal channels that abut the site.

To ensure that appropriate actions are implemented to reduce the potential for turbidity associated with transporting and applying sediment within the 16-acre pilot project site, mitigation measures, as presented below, have been incorporated into the scope of the project to reduce potential water quality impacts to a less-than-significant level.

Prior to initiation of sediment transport and application to the pilot project site, the USFWS shall submit an application to the Santa Ana Regional Water Quality Control Board for coverage under a 401 Certification. The USFWS shall implement all conditions included in the 401 Certification, including the implementation of measures to reduce potential increases in sedimentation, turbidity, and other impacts associated with the transport and beneficial use of dredge material for habitat enhancement.

To reduce the potential for sediment to enter adjacent waterways, best management practices (BMPs) shall be implemented during all phases of the project. BMPs shall include providing approximately six acres of vegetated buffer around the application site; periodic inspection of the slurried sediment pipeline (if used); and monitoring for excessive turbidity near the transport pipeline or containment barge and associated sediment distribution apparatus (e.g., rainbow sprayer, open pipe, end-of-pipe baffle impingement). If a substantial leak is identified in the slurry pipeline, the affected pipeline segment shall be immediately repaired or replaced, or a silt curtain or similar measure shall be employed to capture and retain sediment at the source of the leak.

Monitoring of sediment movement and turbidity levels shall occur during and after sediment application. Movement of sediment on the site shall be adaptively managed until adequately compacted to ensure that movement of sediment off the site is minimized. Measures such as installation of silt fencing, a silt curtain, or straw wattles shall be installed if proposed vegetative buffers around the site cannot adequately maintain the sediment within the project boundary.

Based on the results of the sediment characterization for the dredge material that will be applied to the pilot project site, the sediment chemistry will not result in the release of any chemical constituents into adjacent waters that would represent cause for concern (Kinnetic Laboratories, Inc. and Moffatt & Nichol 2014). Therefore, the sediments to be disposed of on the pilot project site will not represent a potentially significant impact to water quality with respect to any chemical constituents.

G. Noise

Noise associated with the proposed pilot project will be generated by workboats, the flow of sediment from the application sprayer, and possibly a containment barge and booster pump. The noise will occur for a period of four to six weeks. However, this activity will occur more than 1,000 feet from the nearest dwelling unit or other sensitive receptor, therefore, residents will be unaffected by noise generated at the project site. The temporary increase in noise at the project site is considered less than significant, and no mitigation is required.

H. Cumulative Effects

All potentially significant impacts related to the proposed action would be mitigated to below a level of significance through the implementation of specific measures that have been incorporated into the scope of the project. Specifically:

The generation of air pollutants, GHG emissions, and noise would be limited in terms of duration and total emissions or decibels generated. Therefore, the proposed action would not contribute to regionally significant cumulative impacts related to air quality, GHG emissions, or noise.

The project is intended to improve habitat quality within the pilot project site and includes measures to protect eelgrass present in the tidal channels that abut the pilot project. However, if the intended project outcomes are not achieved; the project includes measures to restore salt marsh and/or eelgrass habitat quality to pre-project conditions. As a result, this action would not contribute cumulatively to the loss of eelgrass or low salt marsh habitat along coastal California.

With respect to water quality, sediment application will be adaptively managed to ensure that sediment applied to the site does not migrate into adjacent tidal channels or increase turbidity levels in the waters surrounding the site. Mitigation measures have been incorporated into the scope of the project to ensure that no significant adverse

effects to water quality, either direct or cumulative, will result from project implementation.

Effects to cultural resources are not anticipated, as ground-disturbing activities if required would be limited to the installation of stakes to secure silt fencing, silt screen, straw wattles, and/or other barriers to keep sediment on the site. However, if cultural resources are discovered, procedures have been incorporated in the scope of the project to avoid impacts to such resources. No cumulative impacts to cultural resources are therefore anticipated.

Public Review

A notice of availability of the draft IS/EA and accompanying draft Mitigation Negative Declaration (MND) prepared for the project was sent to more than 35 parties, submitted to the State Clearinghouse, and published as a legal notice in the Orange County Register. The draft IS/EA and draft MND was available for public comment for 32 calendar days. Public review began on August 8, 2014 and comments were accepted until 5 p.m. on September 8, 2014. Written comments were to be provided to Evyan Borgnis, Conservancy Project Manager.

During the public comment period, three comments related to the draft IS/EA and draft Mitigated Negative Declaration were received. Responses to these comments are included as Attachment B of the Final IS/EA. Changes to the main text of the draft IS/EA made in response to comments received are underlined in the Final IS/EA. Those who provided comments have been sent a compact disc (CD) containing the FONSI, Final IS/EA, and draft MND. Other interested parties can obtain a CD by contacting Victoria Touchstone, San Diego NWR Complex, at Victoria_Touchstone@fws.gov.

The FONSI, Final IS/EA, and Final MND are available for downloading at:

California Coastal Conservancy Website

www.scc.ca.gov, then click Public Notices under the Quick Links box in the upper left hand corner of the home page.

Seal Beach National Wildlife Refuge Website

www.fws.gov/refuge/Seal_Beach/what_we_do/resource_management.html

During the development of the project design, the Service held a meeting with agency representatives to describe the proposed project and discuss the permitting process. A subsequent meeting was held for researchers, land managers, and other stakeholders to discuss the project proposal and seek input on project implementation and monitoring.

Other Statutory Compliance Requirements

Compliance with all statutory requirements will be achieved and approval of all required permits will be obtained prior to sediment application. Required actions and permits include:

- California State Coastal Conservancy - Approval of Grant Funds
- U.S. Fish and Wildlife Service – Project Implementation, ESA Section 7 Compliance
- NOAA, National Marine Fisheries Service – Essential Fish Habitat Consultation, ESA Section 7 Compliance
- U.S. Navy – Concurrence on Project Implementation
- U.S. Army Corps of Engineers - Section 404, Nationwide Permit 27
- Regional Water Quality Control Board - 401 Certification
- California Coastal Commission - Coastal Consistency Determination

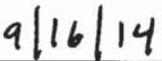
Conclusions

Based on review and evaluation of the information contained in the supporting references, it is my determination that implementing the proposed action does not constitute a major Federal action that would significantly affect the quality of the human environment within the meaning of Section 102(2)(c) of the NEPA of 1969. Accordingly, the Service is not required to prepare an Environmental Impact Statement.

This FONSI and supporting references are on file at the U.S. Fish and Wildlife Service, San Diego NWR Complex, 1080 Gunpowder Point Drive, Chula Vista, CA 91910 (telephone 619/476-9150 extension 103). These documents are available for public inspection. Interested and affected parties are being notified of our decision through a press release and website update.



Andrew Yuen
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San Diego National Wildlife Refuge Complex



Date

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FINAL INITIAL STUDY/ENVIRONMENTAL ASSESSMENT

Seal Beach National Wildlife Refuge Thin-layer Salt Marsh Sediment Augmentation Pilot Project (Orange County, California)

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September 16, 2014

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1. Introduction

The California State Coastal Conservancy (Conservancy), as the lead agency under the California Environmental Quality Act (CEQA), and the U.S. Fish and Wildlife Service (Service or USFWS), as the lead agency under the National Environmental Policy Act (NEPA) of 1969 (42 USC 4341 et seq.), have jointly prepared this Initial Study/Environmental Assessment (IS/EA). The purpose of this document is to evaluate the potential effects to the environment of implementing a pilot project for sea level rise adaptation on approximately 10 acres of existing coastal salt marsh habitat on the Seal Beach National Wildlife Refuge (NWR) in Orange County, California. Compliance with CEQA is required because the Conservancy has been asked to grant funding for the project, while compliance with NEPA is required because the Service, a Federal agency, proposes to take action on Federal lands. The California State Lands Commission is a trustee agency because of its trust responsibility for projects that could directly or indirectly affect sovereign lands, their accompanying Public Trust resources or uses, and the public easement in navigable waters.

This document, which serves as the Initial Study (IS) for the Final Mitigated Negative Declaration (MND) under CEQA and the Final Environmental Assessment (EA) under NEPA, has been prepared in accordance with CEQA (Public Resources Code Section 21000, et seq.), the State CEQA Guidelines [California Code of Regulations Section 15000, et seq.], NEPA, and the Council on Environmental Quality NEPA Regulations contained in C.F.R. Parts 1500-1508. This document describes the purpose and need for the proposed action (i.e., the project); presents a description of the proposed action and the alternative action; describes the environmental setting; analyzes the potential environmental impacts of each alternative; and addresses the public involvement process.

The Conservancy considered the information and analysis provided herein in making the finding that there is no substantial evidence in light of the whole record before the agency, that the project as revised to include mitigation measures may have a significant effect on the environment (14 CCR 15070(a)). The analysis provided in the IS/EA was also reviewed and considered by the Service to determine that the proposed action will not have a significant impact on the environment (refer to the Finding of No Significant Impact [FONSI] that accompanies this document). The analysis provided in this document will also be considered by the U.S. Navy, U.S. Army Corps of Engineers, and Santa Ana Regional Water Quality Control Board in their decision-making process.

In May 2012, the Service approved the Final Comprehensive Conservation Plan (CCP) for the Seal Beach National Wildlife Refuge (USFWS 2012) and signed a Finding of No Significant Impact based on the analysis provided in the EA prepared for the CCP. The EA analyzed, at the programmatic level, a proposal to apply “a thin layer of sediment” over the existing vegetation “to provide for a slight increase in the elevation of the marsh plain, while still enabling the vegetation to grow up through the added sediment. Part of this strategy will include pre- and post-sediment application monitoring . . .” (USFWS 2012). The proposed pilot project is consistent with the recommendations presented in the Seal Beach NWR CCP and will implement

one of the strategies identified in the CCP for achieving Refuge goals and objectives as they relate to the recovery and protection of the light-footed Ridgway's rail (*Rallus obsoletus levipes*), formerly referred to as the light-footed clapper rail.

The analysis in the Final IS/EA tiers from the analysis related to this proposal in the programmatic level EA for the Seal Beach NWR CCP, and as such, the EA prepared for the CCP is incorporated by reference into this document. The programmatic EA can be review online at http://www.fws.gov/refuge/Seal_Beach/what_we_do/planning.html.

Project Summary

The Service proposes to implement a pilot project for a sea level rise adaptation strategy on a portion of coastal salt marsh within the Seal Beach NWR. The pilot project consists of pre-application monitoring to document existing site conditions, applying a thin-layer of clean sediment over 10 acres of the marsh plain, and monitoring of the physical and ecological responses of the salt marsh ecosystem to sediment application for five years.

Raising the elevation of the salt marsh plain within the Seal Beach NWR is proposed to address the adverse effects of subsidence and sea level rise on the habitat quality of coastal salt marsh, particularly cordgrass (*Spartina foliosa*)-dominated salt marsh habitat, and to improve habitat quality for the federally and State listed endangered light-footed Ridgway's rail. It is also the intent of this project to disseminate the results of the comprehensive monitoring program to interested Federal, State, and local agencies, coastal land managers, and other stakeholders to assist in further developing sea level rise adaptation strategies for coastal California. The specific details of the proposed action are presented in Section 4 (Description of Alternatives).

Location and Land Ownership

The pilot project site is located within the Seal Beach NWR in northwestern Orange County, California (Figure 1), within the corporate boundaries of the City of Seal Beach. Managed by the Service as part of the National Wildlife Refuge System, the majority of the Seal Beach NWR lies within the boundaries of Naval Weapons Station Seal Beach. As shown in Figure 2, the 16-acre pilot project site includes property owned by the U.S. Navy, as well as sovereign land held by the California State Lands Commission for the benefit of the people of California and leased (PRC 5963.9) to the Service for management as a National Wildlife Refuge. These State lands are patented as Tideland Location 134, and all tidelands and submerged lands, granted or ungranted, as well as navigable waterways, are subject to the protections of the Common Law Public Trust.

Background

Refuge Planning. The current proposal to raise the elevation of the marsh plain was initially suggested during the planning effort for the Seal Beach NWR Comprehensive Conservation Plan (CCP) (USFWS 2012). The CCP describes the desired future conditions of the Refuge and provides direction for how the Refuge should be managed to best achieve Refuge purposes and goals. In the case of the Seal Beach NWR, the Refuge was established to preserve and manage the habitat necessary for the perpetuation of two endangered species – the light-footed Ridgway's rail and California least tern (*Sternula antillarum browni*), as well as to preserve habitat to support migratory waterfowl, shorebirds, and other water birds.

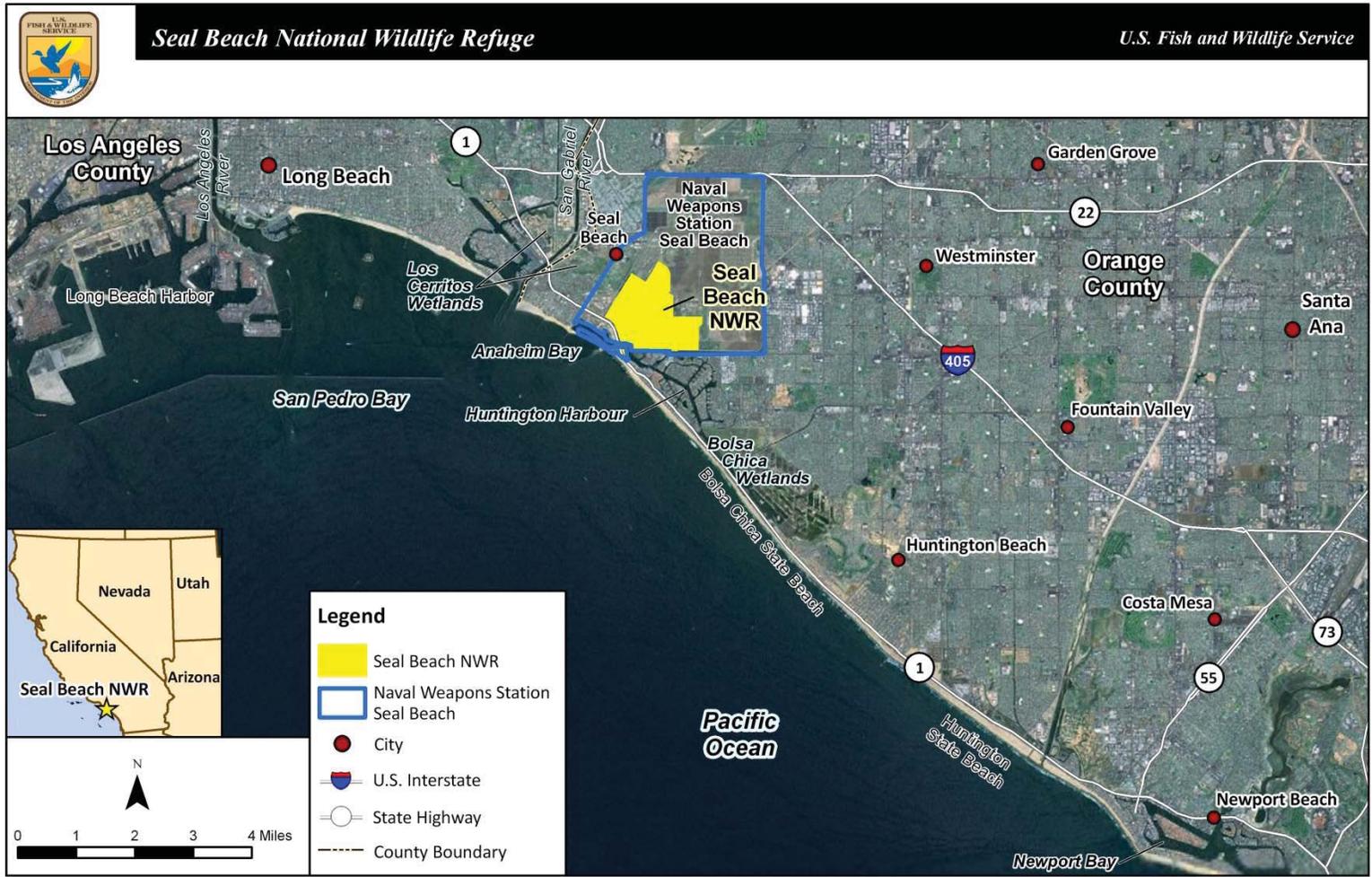


Figure 1. Vicinity Map



Figure 2. Location of the Pilot Project Site

During the issues identification process for the CCP planning effort, the short stature of the cordgrass and the existing elevations of the marsh plain were identified as the primary factors limiting natural Ridgway’s rail nesting on the Refuge. Although cordgrass is quite abundant on the Seal Beach NWR and cordgrass density (number of stems) is similar to nearby marshes, the height and cover of the cordgrass on the Refuge is much lower (Massey et al. 1984).

The vigor of the cordgrass appears to be compromised by several factors: the diversion of freshwater inputs resulting in increased salinities and a reduction or loss of sediment input (USFWS and U.S. Navy 1991), land subsidence, and sea level rise. The lower marsh elevations combined with short cordgrass stem height results in the complete inundation of the cordgrass stands in Anaheim Bay during higher high tides. This situation prevents light-footed Ridgway’s

rails from constructing natural nests within much of the Refuge's cordgrass-dominated salt marsh habitat. Currently, about 95 artificial nesting platforms are maintained in the marsh to provide the rails with alternative nesting opportunities.

The Final CCP includes various recommendations for improving habitat quality on the Refuge for the light-footed Ridgway's rail, including raising the elevation of the marsh plain by applying a thin-layer over the existing vegetation (USFWS 2012). The proposed pilot project is consistent with the CCP recommendations, and its implementation will assist the Service in achieving Refuge goals and purposes.

Planning for Climate Change. The need to address the effects of sea level rise on coastal habitats has been identified by both Federal and California State agencies. As described in the National Fish, Wildlife and Plants Climate Adaptation Strategy (National Fish, Wildlife, and Plants Climate Adaptation Partnership 2012), steps must be taken to address the effects of climate change, including sea level rise, to help conserve ecosystems and make them more resilient. The only options for retaining the existing acreage of tidal wetlands is to either implement adaptive management strategies that will allow these wetlands to keep pace with sea level rise or ensure that these wetlands can migrate inland to adjacent lands that are undeveloped. In California, there is little opportunity for coastal wetlands to migrate inland, therefore, effective management actions must be evaluated that can allow these wetlands to keep pace with sea level rise.

The State of California's Safeguarding California: Reducing Climate Risk, an Update to the 2009 California Climate Adaptation Strategy (California Natural Resources Agency 2014) identifies nine broad areas impacted by climate change and provides recommendations for actions that can be taken to ensure a better future. In addition, seven strategies that cut across the nine broad areas are presented that can be implemented to help safeguard California. The current proposal addresses the broad areas of safeguarding the natural world by providing habitat connectivity and chances for adaptation that will support species and habitat survival; relying on sound science to highlight risks and help provide solutions; and State agencies working collaboratively with Federal and local governments to address the risks of climate change. Two of the strategies applicable to this project include maximizing returns on investments by prioritizing projects that produce multiple benefits and promote sustainable stewardship of California's resources, and promoting collaborative and iterative processes for crafting and refining climate risk management strategies.

Beneficial Use of Dredge Material. In late 2013, the Service became aware of a proposal by the Orange County Department of Parks (OC Parks) to implement maintenance dredging actions within Sunset/Huntington Harbour, a portion of Anaheim Bay located to the south and southwest of the Refuge. The Service approached OC Parks about the potential for using some of the dredge material for beneficial use on the Refuge. OC Parks agreed to provide a portion of their dredged sediments to the Refuge and conducted the necessary sediment characterization work within the area to be dredged.

Based on the results of the sediment characterization, clean sediment of appropriate grain size was identified within the areas to be dredged. With the identification of a sediment source, the Service initiated the process of developing a thin-layer sediment augmentation pilot project for a small area of the Seal Beach NWR that includes pre- and post-application monitoring of the project site.

The use of dredge material for this beneficial use is consistent with the recommendations of the National Dredge Team. As stated in the Dredged Material Management Action Agenda for the Next Decade (USEPA 2003), “much of the several hundred million cubic meters of sediment dredged each year from United States ports, harbors, and waterways could be used in a beneficial manner, such as for habitat restoration and creation, beach nourishment, and industrial and commercial development. Yet most of this dredged material is instead disposed in open water, confined disposal facilities, and upland disposal facilities. . . Beneficial use must become a priority at all levels of management, funding must be increased for beneficial use projects and research, planning must be proactive, and there must be a recognition that dredged material is a valuable resource.”

All aspects of the maintenance dredging project within Sunset/Huntington Harbour will be implemented by OC Parks, with maintenance dredging scheduled to occur regardless of whether or not the proposed pilot project is implemented on the Seal Beach NWR. OC Parks and the City of Huntington Beach have prepared the Sunset/Huntington Harbour Maintenance Dredging and Waterline Installation Project Draft Initial Study/Mitigated Negative Declaration IP 14-148, dated August 2014 (OC Parks IS/MND) to address the potential environmental effects of several actions including dredging for navigational purposes (maintenance dredging) within Sunset/Huntington Harbour. The sediment that will be provided to the Refuge from this maintenance dredging project will come from the Main Channel West dredging area, as indicated in Figure 3.

Transport of sediment from the Main Channel West dredge site to the Refuge project site, application of the material onto the site, and pre- and post-application monitoring are addressed in this IS/EA. Analyses and conclusions of the OC Parks IS/MND that are relevant to this pilot project are summarized throughout this document. Copies of the OC Parks IS/MND are available for review upon request (contact information is provided on the cover page of this document).

2. Purpose and Need

Purpose of the Action

The purpose of this action is to improve habitat conditions for the federally listed endangered light-footed Ridgway’s rail consistent with the goals and objectives of the Seal Beach NWR CCP (USFWS 2012), as well as to evaluate the effectiveness of thin-layer sediment augmentation as an adaptation strategy for addressing sea level rise in coastal salt marsh habitats in California, particularly in those salt marshes where there will be no opportunity for inland migration.

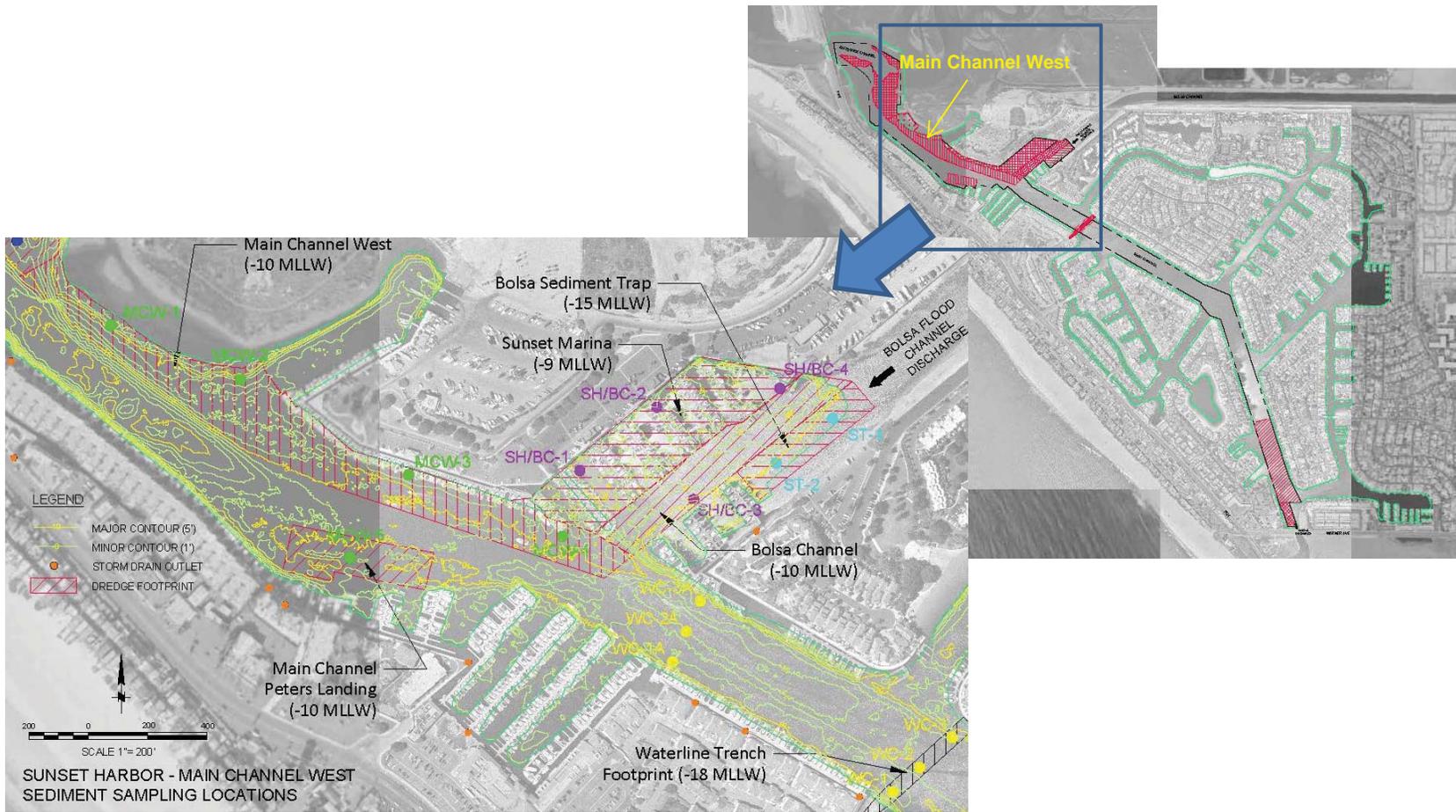


Figure 3. Location of Main Channel West within the OC Parks Maintenance Dredging Project Site

Specific project objectives include:

- Two years after applying sediment to the pilot project site, achieve/maintain a minimum 3-inch increase in the marsh plain elevation over pre-application elevations throughout the 10-acre application area.
- Within two years of sediment augmentation, achieve cordgrass stem lengths equivalent to pre-application conditions and achieve terminal cordgrass elevations higher than pre-application conditions throughout the application area.
- Within two years of sediment augmentation, achieve a diversity and abundance of native vegetation and benthic invertebrates that is similar to the pre-application conditions on the application site.
- Within one year of sediment augmentation, provide foraging opportunities for migratory birds and within two years provide foraging and nesting opportunities for light-footed Ridgway's rails within the 10-acre application area.

Following completion of pre- and post-application monitoring, compile and disseminate the monitoring results and lessons learned from the pilot project to the resource and regulatory agencies and interested land managers.

Need(s) for the Action

A pilot project is needed to determine whether thin-layer sediment augmentation is an effective tool to address the adverse effects of subsidence and sea level rise on habitat quality within the cordgrass-dominated salt marsh habitat on the Seal Beach NWR. Identifying measures to improve habitat quality within the Refuge is of particular interest to the Service because recent investigations by the U.S. Geological Survey (USGS) and researchers at the University of California, Los Angeles (UCLA) indicate that the salt marsh habitat within the Seal Beach NWR has the lowest mean elevation and mean elevation relative to mean high water (MHW) of the eight California marshes where survey-grade elevation surveys were conducted (Takekawa et al. 2013a).

Results of a study conducted by USGS in 2013 (Takekawa et al. 2013b) to determine the amount of subsurface subsidence occurring in and around the marsh since the last extensive subsidence survey was conducted in 1994 indicate that subsidence on the Seal Beach NWR is occurring at a rate of -4.13 mm/yr. (SE + 1.21 mm/yr.). With this data, USGS determined that the Refuge is experiencing a relative sea-level rise rate three times greater (6.23 mm/yr.) than that of similar southern California marshes not experiencing subsidence (Takekawa et al. 2013b). Implementing the proposed pilot project will provide valuable information about the effectiveness of thin-layer sediment augmentation as a sea-level rise adaptation strategy and could expand the ways in which dredge material might be used for beneficial use.

Similar to other U.S. west coast salt marsh ecosystems surrounded by urban development, the Seal Beach NWR is particularly vulnerable to the effects of climate change, including sea level rise. Addressing this vulnerability in California will require the implementation of a range of tools at various scales to ensure coastal wetland resilience to sea-level rise. Depending upon the site, these tools can include:

- protecting large areas that represent a range of habitat types to ensure biological connection and biodiversity, as well as an array of ecological functions;
- providing adequate open space adjacent to existing coastal wetlands to accommodate inland migration of salt marsh as sea levels rise; and
- increasing the elevation of the marsh plain to keep pace with sea-level rise.

At the Seal Beach NWR, the majority of what remains of the historical Anaheim Bay marsh complex is protected within the refuge boundaries. There are no other adjacent wetland areas available for protection. Although there is some room for migration of wetlands to the east and north of the marsh complex, these lands are located outside of the Refuge boundary on Navy lands. As a result, the only tool currently identified for addressing the effects of rising sea levels on the Refuge is increasing the elevation of the marsh plain. Thin-layer sediment augmentation has proved to be an effective tool on the Gulf and East coasts of the U.S. This approach has yet to be tested on the West coast, but based on the documented successes of this method outside of California (Ray 2007); it would appear prudent to evaluate its effectiveness along the coast of California.

3. Decisions to be Made and Applicable Authorities

A variety of decisions, approvals, and permits must be obtained to implement that proposed action, including:

- State Coastal Conservancy – Adoption of the Final Mitigated Negative Declaration and decision to grant funds
- U.S. Fish and Wildlife Service – Approval of a Finding of No Significant Impact and compliance with Section 7 of the Endangered Species Act (ESA)
- U.S. Department of the Navy – Agreement to implement the project on Navy land
- NOAA - ESA Section 7 compliance and consultation under the Magnuson-Stevens Fishery Conservation and Management Act for federal permitting and funding activities that could adversely affect Essential Fish Habitat
- U.S. Army Corps of Engineers - Issuance of a Nationwide 27 Permit
- Santa Ana Regional Water Quality Control Board - Issuance of a 401 Water Quality Certification
- California Coastal Commission - Coastal Consistency Determination

For the Federal Agencies utilizing this document to assist their decision making process, the following authorities apply to the proposed action:

- Coastal Zone Management Act of 1972, as amended
- National Wildlife Refuge Administration Act, as amended (16 U.S.C. 668 dd et seq.).
- National Wildlife Refuge System Improvement Act of 1997 (P.L. 105-57)
- National Environmental Policy Act of 1969 (NEPA) (P.L. 99-160)

- Endangered Species Act of 1973 (16 USC 1531 et seq.)
- National Historic Preservation Act of 1966, as amended (16 USC 470 et seq.)
- Archaeological and Historic Preservation Act of 1974
- Clean Air Act, as amended (42 USC 7401 et seq.)
- Federal Water Pollution Act of 1948, as amended (33 USC 1251 – 1376; Chapter 758; P.L. 845, 62 Stat. 1155) (Clean Water Act)
- Rivers and Harbors Act of 1899
- Fish and Wildlife Coordination Act of 1932, as amended
- Migratory Bird Treaty Act, as amended (16 USC 703 et seq.)
- Executive Order 12898, 11 February 1994, Environmental Justice

4. Description of Alternatives

Alternative Development

The Council on Environmental Quality regulations implementing NEPA (section 1508.9 (b)), state that an EA must briefly describe alternatives to the proposed action, as required by Section 102(2)(E) of NEPA. Section 102(2)(E) of NEPA requires Federal agencies to study, develop, and describe appropriate alternatives to recommended courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources. In general, the Federal agency preparing an EA should develop a range of alternatives that could reasonably achieve the need that the proposed action is intended to address.

In this EA, the range of alternatives is narrow because, the purpose and need for the proposed action is very limited in scope. In developing a range of alternatives to the proposed action, the Service looked at what, if any, other sources of material might be available for use at the site, as well as what other locations within the Refuge might be considered. The only source of clean material of appropriate grain size that has been identified for this project to date is material that would be generated by a planned dredging project in the immediate vicinity of the Refuge. There are likely other potential sources of dredge material along the Los Angeles/Orange County coast, although none has been identified. The costs associated with transporting the sediments from a distant site to the Refuge would be high, and could affect the feasibility of the effort.

The following criteria were used in selecting the pilot project site: the site is included within the area designated for marsh enhancement in the Seal Beach NWR CCP (USFWS 2012); the site is situated in one of the lowest areas of the Refuge; the site consists primarily of vegetated marsh plain with limited tidal creeks; and the site is easily accessible from a barge or boat. Resource values for sites within the Refuge that meet the site selection criteria are fairly similar which means that identifying an alternative location for implementing this project would not result in sufficient differences in impact evaluation to warrant the inclusion of such an alternative. Therefore, the Service has concluded that the no action and proposed action represent a reasonable range of alternatives.

No Action

The no action alternative can include not distributing funding, not providing approval, and/or not implementing an action (Council on Environmental Quality, 40 Most Asked Questions, Question 3). The no action alternative provides a description of what would happen if no action is taken, and serves as the baseline from which the action alternative is evaluated.

Under the no action alternative, no sediment augmentation would occur on the Seal Beach NWR. The effects of subsidence and sea-level rise on the existing habitat and affected species, including the light-footed Ridgway's rail, would continue. The dredge material from the OC Parks' maintenance dredging project that would have been used for sediment augmentation on the Refuge would be disposed of in one of several methods (as addressed in the OC Parks IS/MND) including disposal at U.S. Environmental Protection Agency (USEPA)-approved LA-2 open ocean site, reused at eelgrass mitigation sites within the Harbour or elsewhere, or as upland fill at an upland landfill site or port confined disposal site.

Proposed Action

Summary. Under this alternative, the Service proposes to implement a pilot project to evaluate the effectiveness of thin-layer sediment augmentation as an adaptation strategy for addressing the adverse effects of sea level rise and subsidence on coastal salt marsh habitat. In order to conduct this research over a manageable area and within a reasonable budget, the pilot project is proposed for approximately 10 acres of a 16-acre site situated within the Refuge's 565-acre intertidal salt marsh habitat. As indicated in Figure 2, the project site is located within the south central portion of the Refuge, to the southwest of NASA Island between two major tidal channels that extend well into the marsh from Anaheim Bay. The 16-acre site includes property owned by the U.S. Navy, as well as sovereign land held by the California State Lands Commission and leased to the Service for management as a National Wildlife Refuge.

The pilot project involves two major components: the application of approximately 10,000 to 13,500 cubic yards [CY] of clean dredge material of appropriate grain-size over approximately 10 acres of the 16-acre site, and pre- and post-sediment application monitoring. Revegetation of the 10-acre site is expected to occur over a period of approximately two to five years and will involve regrowth of existing vegetation through the new sediment layer, as well as natural recruitment from nearby seed sources.

Sediment Source. Sediment for this project will be provided by OC Parks in association with their Sunset/Huntington Harbour Maintenance Dredging Project. Specifically, OC Parks has agreed to provide for beneficial use, a portion of the sediment to be dredged from the Main Channel West segment of the larger maintenance dredging project. As described in the OC Parks IS/MND, the maintenance dredging project will occur entirely within the Sunset Aquatic Marina area and the main channel of the Harbour between the bridge over the Pacific Coast Highway and Warner Avenue. OC Parks proposes maintenance dredging within five locations of the main channel of the Harbour, including the Main Channel West area (refer to Figure 3), to improve boat navigation.

The decision to use material from the Main Channel West dredge site for sediment augmentation on the Refuge was made by the Service and Navy, based on the results of the sediment chemical and grain size analyses (Kinnetic Laboratories, Inc. and Moffatt & Nichol 2014), which were conducted for the sediments at the proposed dredge site and the Refuge’s receiving site.

The total maximum amount of dredged materials associated with OC Parks’ maintenance dredging activities is estimated to be 265,000 CY. Of that, the maximum amount of dredge material for the Main Channel West site is 41,770 CY, and of that total, 10,000 to 13,500 CY will be transported from the dredge site for beneficial use on the pilot project site. Dredge depths and volumes with and without the overdredge amounts for the Main Channel West segment of the maintenance dredging project are provided Table 1. Table 1 also provides the square-footage of the footprint at the Main Channel West dredge site (OC Parks IS/MND). Figure 4 illustrates the proximity of the pilot project site to the Main Channel West dredge site.

Table 1 Preliminary Maintenance Dredge Quantities for the Main Channel West Dredge Site						
Dredge Site	Dredge Design Depth (feet, MLLW)	Dredge Footprint Area (sf)	Dredge Volume to Design Depth (cy)	Dredge Volume with 1-foot Overdredge (cy)	Dredge Volume with 2-foot Overdredge (cy)	Volume of Dredge to be Transported to the Pilot Project Site (cy)
Main Channel West	-10	292,536	20,100	30,940	41,770	10,000 – 13,500
Source: Moffatt & Nichol, August 2013 in OC Parks IS/MND MLLW = mean lower low water sf = square feet						

The construction staging area for the maintenance dredging will be at the Sunset Aquatic Marina, likely in the parking lot area adjacent to the boat launch ramp. It is anticipated that maintenance dredging construction methods will involve a combination of a clamshell dredge, barge-based excavator, or cutter/suction head dredge equipment. Final construction methods will be determined by the construction contractor and will be subject to bridge clearances, channel/fairway widths and depths, and the location of boat docks.

All sediment generated from the maintenance dredging project will be disposed of offsite and could include one of the following disposal options: disposal at the USEPA-approved LA-2 open ocean site, which is located five nautical miles (nm) south of Point Fermin and 11.5 nm from the end of the Anaheim Jetties; reused at eelgrass mitigation sites within the Harbour or elsewhere; beach nourishment at a nearshore beach site; beneficial use associated with habitat enhancement; and as upland fill at an upland landfill site or port confined disposal site (OC Parks IS/MND).



U.S. Fish & Wildlife Service

Seal Beach National Wildlife Refuge



MAP DATE: Aug 01, 2014
 IMAGE SOURCE: US Navy
 C:\Users\kgilligan\Documents\ManagementFiles\ESRI\ESRDATA\Seal Beach Data\SealBeachSedimentAugmentationProject.mxd



Legend

- Seal Beach NWR Boundary
- Salt Marsh Sediment Augmentation
- Main Channel West Dredge Area



Figure 4. Relationship of the Project Site to the Main Channel West Dredge Area

Sediment Application on the Refuge. Approximately 10,000 to 13,500 CY of material dredged from the Main Channel West site is to be transported to the 16-acre project site for distribution over 10 acres using one or more methods of transport and application. Potential options for transport of the material to the site include the use of a small containment barge, which would travel from the dredge site up one of the two existing tidal channels that abut the project site. Once the barge is in place, the sediment would be mixed with water and distributed on to the site using a rainbow sprayer, open pipe, or end-of-pipe baffle impingement.

Alternatively, the sediment may be transported as a slurry (i.e., a mixture of water and sediment) through a pipeline that would extend from the dredge site into the Refuge via one of the two existing tidal channels that abut the project site. The pipeline could be placed on the bed of bay and channel or floated on the water surface from the maintenance dredge site to the project site. Once at the project site, the slurry would be applied using a rainbow sprayer, open pipe, or end-of-pipe baffle impingement.

Under either option, the slurry will be applied to 10 acres of the 16-acre site as a fairly uniform thin layer of sediment, approximately 8 to 10 inches (20.32 to 25.4 centimeters [cm]) deep. It may be necessary to test various application methods at the beginning of the project to ensure uniform coverage. The entire process, which could take from four to six weeks to complete, will be adaptively managed to meet project design criteria, including achieving the desired depth of sediment within the confines of the 10-acre application site and minimizing the potential for introduction of sediment into the tidal channels that abut the site. The remaining six acres of the 16-acre site will provide a vegetated buffer around the augmentation site in an effort to minimize the movement of sediment off the site and into the adjacent tidal channels.

Site Preparation. Prior to initiating the sediment application process on the site, which is expected to occur between November 2015 and February 15, 2016, the three Ridgway's rail artificial nesting platforms located near the project site (Figure 5) will be removed to discourage rail activity in the area during and immediately following sediment augmentation. The nesting platforms may be reinstalled once the sediment has compacted, if cordgrass heights are not sufficient to accommodate natural rail nesting. During sediment application, the site will be monitored daily for the presence of rails and other avian species, and if necessary, an air horn or cracker shells will be used to haze birds from the site prior applying sediment to the site.

Containing Sediments within the Project Site. To minimize the movement of sediment off the application site, sediment will not be applied during any high tides predicted to completely inundate the project site. In addition, a six-acre buffer will be provided around the 10-acre site that will continue to support existing salt marsh vegetation. This buffer is intended to help trap any sediment that might flow off the 10-acre pilot project site during or following application.

An on-site monitor will be present during sediment application to ensure that sediment is not moving off the site. Sediment movement and turbidity levels will be monitored throughout the process. The monitor will have the authority to direct the contractor to adapt the application technique to avoid offsite impacts, as well as to require the implementation of additional measures, such as the instillation of a silt curtain or other appropriate barrier, should these measures be deemed necessary to minimize the effects of the project on adjacent habitats.



Figure 5. Relationship of the Pilot Project Site to Eelgrass and Artificial Nesting Platforms

Pre- and Post-Sediment Application Monitoring. Pre- and post-application monitoring is an essential component of the proposed action, as monitoring results will inform the Service and other land managers of the effectiveness of thin-layer sediment augmentation in achieving the project objectives, as well as facilitate the evaluation of the physical and ecological responses of the marsh ecosystem to the action.

Some of the key questions to be addressed through this monitoring program include:

- Will the application of sediment enable the light-footed Ridgway's rail to nest naturally within the salt marsh habitats of the project area? If so, what is the time frame post-application for this to occur?

- How quickly will shorebirds, marshbirds, and other waterbirds return to the site for roosting and foraging?
- How will plants and invertebrates respond to the thin-layer application of sediment? Does it vary by species?
- How much sediment will remain on the application site during application, after 2 years, after 5 years?
- What effect does sediment application have on turbidity levels in adjacent waters?
- How effective is the vegetated buffer at reducing sediment runoff into adjacent tidal channels?
- What is the on-site sediment compaction rate, what is the depth of sediment following compaction?
- Following compaction, how has the topography of the site changed, are tidal channels forming?

The monitoring component of the pilot project will begin prior to application of the sediment and will continue for five years following the application of sediment to the site. Monitoring will require visual and physical access to the site both before and after sediment augmentation. Physical access will be achieved either by walking along the marsh surface from NASA Island or by using small motorized and non-motorized boats, depending upon the time of year. Monitoring will occur on an annual basis and will require human presence on the project site for one to two days for most activities, but up to a week for more site intensive study such as elevation and vegetation surveys. Should Ridgway's rails nest naturally within the project area during the five-year monitoring effort, any work near the nests, with the exception of Ridgway's rail nest surveys, will be avoided during the breeding season (March 1 to September 15).

Monitoring efforts will include, but are not limited to pre- and post-application documentation of marsh plain elevations; vegetation cover and composition; cordgrass (*Spartina foliosa*) terminal evaluation, stem length, stem density, and physiological plant condition; conditions in adjacent eelgrass beds; infaunal invertebrate community structure; epifaunal community diversity; abundance and diversity of avian species; and light-footed Ridgway's rail presence and use of the site. Monitoring will also determine sediment retention following application; document the depth of the sediment across the site immediately following application and at various intervals thereafter; establish the compaction rate of the applied sediment; and describe the pre-application status of tidal creek status, as well as the formation and/or reformation of tidal creeks following sediment application. Monitoring of the eelgrass beds in the adjacent tidal channels will also be conducted.

5. Affected Environment

The discussion included in this section and the topics addressed in the Initial Study Checklist (Appendix A), provide information needed for making informed decisions on the effect that implementing the alternatives could have on the environment. Only those aspects of the

environment that are potentially affected by the alternatives (i.e., air quality, biological resources, cultural resources, greenhouse gas emissions, hazardous materials, water quality, noise, cumulative effects) are discussed in detail in this section. The Initial Study Checklist provides documentation of our consideration of all potential aspects of the affected environment.

Detailed information about the affected environment within and surrounding the Seal Beach NWR is provided in the Final Seal Beach NWR Comprehensive Conservation Plan (USFWS 2012). Additional information regarding the affected environment in and around OC Parks maintenance dredging project is provided in the OC Parks IS/MND.

A. Air Quality

Regional Setting and Context. The project site is located within the South Coast Air Basin (Basin), an area covering approximately 6,745 square miles and bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The extent and severity of air pollution in the Basin is a function of the area's natural physical characteristics and existing development patterns (OC Parks IS/MND). The accumulation and dispersion of pollutants throughout the Basin is affected by wind, sunlight, temperature, humidity, rainfall, and topography. As a result, pollutant concentrations in the Basin vary with location, season, and time of day.

Air quality within the Basin is managed by the South Coast Air Quality Management District (SCAQMD), which has jurisdiction over an area of about 10,743 square miles, including all of Orange County. The Basin is a subregion of SCAQMD's jurisdiction, and although air quality in this area has improved, the Basin requires continued diligence to meet air quality standards.

Over the past 30 years, substantial progress has been made in reducing air pollution levels in Southern California. However, even though there has been improvement in air quality with respect to air toxics, the risks are still unacceptable and higher near sources of emissions such as ports and transportation corridors. Diesel particulate matter (DPM) continues to dominate the risk from air toxics. The average carcinogenic risk throughout the Basin attributable to toxic air contaminants (TACs) is approximately 1,194 in one million. Mobile sources (e.g., cars, trucks, trains, ships, aircraft) are the greatest contributors. About 84 percent of all risk is attributable to DPM emissions.

Data from the closest climate monitoring station, the Western Regional Climate Center (WRCC) station at Long Beach Airport, was used to characterize project vicinity climate conditions. The average project area summer (August) high and low temperatures are 84°F and 65°F, respectively; the average winter (January) high and low temperatures are 67°F and 46°F, respectively. The average annual rainfall is approximately 12 inches (WRCC 2012).

The closest wind monitoring station is the Long Beach wind monitoring station, which was used to characterize study area wind conditions. Wind patterns in the project vicinity arise

primarily as onshore flows from the west, with seasonal and diurnal variations resulting in northeasterly (during Santa Ana events) and southerly winds (before and during winter storms and during eddy conditions in summer) (National Oceanic and Atmospheric Administration [NOAA] n.d.). Wind speeds average 3.15 miles per hour (1.41 meters per second); calm wind conditions are present approximately 17.48 percent of the time (OC Parks IS/MND).

SCAQMD has divided the Basin into air monitoring areas, and the project site is located in the North Orange County Coastal Area (i.e., Source Receptor Area [SRA] Number 18). The nearest monitoring stations are the South Long Beach station, located approximately seven miles northwest of the project site, and the North Long Beach station, located approximately nine miles northwest of the project site. The South Long Beach station monitors particulate matter less than or equal to 10 micrometers in diameter (PM10) and particulate matter less than or equal to 2.5 micrometers in diameter (PM2.5); the North Long Beach station monitors ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), and sulfur dioxide (SO₂) (OC Parks IS/MND).

Based on the most recent complete data sets for air quality in the area, which cover the period from 2010 to 2012, the State 1-hour O₃ standard was exceeded once during the 3-year reporting period; the State and Federal 8-hour O₃ standards were each exceeded once during the 3-year period; CO concentrations were low and no exceedances were recorded during the 3-year reporting period; the Federal NO₂ standard was exceeded once during the 3-year period; the State 24-hour PM10 standard was exceeded three times during the 3-year reporting period.; and the Federal PM2.5 standard was exceeded eight times during the 3-year reporting period (OC Parks IS/MND).

Sensitive Receptors and Locations. Uses supporting sensitive receptors, such as children, the elderly, and acutely or chronically ill persons, that occur near the project area include residences located approximately 3,000 feet to the southwest and the Sunset Aquatic Marina located approximately 2,600 feet to the southeast of the sediment augmentation site.

Federal Regulatory Setting. The Clean Air Act (CAA) establishes the National Ambient Air Quality Standards (NAAQS) and specifies future dates for achieving compliance. The CAA also mandates that States submit and implement a State Implementation Plan (SIP) for local areas that fail to meet the standards. The plans must include pollution control measures that demonstrate how the standards will be met. Basin has been designated as a nonattainment area for certain pollutants that are regulated under the CAA.

The 1990 amendments to the CAA identify specific emission-reduction goals for areas that fail to meet the NAAQS. These amendments require both a demonstration of reasonable progress toward attainment and the incorporation of sanctions for failure to attain or meet interim milestones. The sections of the CAA that would most substantially affect the proposed project include Title I (Nonattainment Provisions) and Title II (Mobile-Source Provisions).

Title I provisions were established with the goal of attaining the NAAQS for criteria pollutants. In 1997, the NAAQS were amended to include a standard for PM_{2.5} and an 8-hour standard for O₃. The NAAQS for each criteria pollutant is listed in Table 2. The Orange County portion of the Basin is considered a Federal nonattainment area for O₃, PM₁₀, and PM_{2.5}, because the Federal standards for these pollutants are not being met.

California Regulatory Setting. The California Clean Air Act (CCAA) requires all areas of the State to achieve and maintain the California Ambient Air Quality Standards (CAAQS) by the earliest practical date. The CAAQS, which are more health protective than the corresponding NAAQS, incorporate additional standards for most criteria pollutants. The California standards also address other pollutants not recognized in the NAAQS, including standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. The Basin is in compliance with the California standards for sulfates, hydrogen sulfide, visibility-reducing particles, and vinyl chloride. Presented in Table 2 are the current NAAQS and CAAQS.

Table 2 Federal and State Ambient Air Quality Standards			
Pollutant	Averaging Time	CAAQS^a	NAAQS^b
Ozone (O ₃)	1 hour	0.09 ppm ^c	—
	8 hours	0.070 ppm	0.075 ppm
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm
	8 hours	9.0 ppm	9 ppm
Nitrogen Dioxide (NO ₂)	1 hour	0.18 ppm	100 ppb
	Annual Arithmetic Mean	0.030 ppm	53 ppb
Sulfur Dioxide (SO ₂)	1 hour	0.25 ppm	75 ppb
	24 hours	0.04 ppm	0.14 ppm
Respirable Particulate Matter (PM ₁₀)	24 hours	50 µg/m ³ ^c	150 µg/m ³
	Annual Arithmetic Mean	20 µg/m ³	—
Fine Particulate Matter (PM _{2.5})	24 hours	—	35 µg/m ³
	Annual Arithmetic Mean	12 µg/m ³	12.0 µg/m ³
Sulfates	24 hours	25 µg/m ³	—
Lead (Pb)	30-day average	1.5 µg/m ³	—
	Calendar quarter	—	1.5 µg/m ³
	Rolling 3-month Average	—	0.15 µg/m ³
Hydrogen Sulfide	1 hour	0.03 ppm	—
Vinyl Chloride	24 hours	0.01 ppm	—

^a CAAQS for O₃, CO, SO₂ (1-hour and 24-hour standards), NO₂, PM₁₀, and PM_{2.5} are values not to be exceeded. All other California standards shown are values not to be equaled or exceeded.

^b The NAAQS, other than those for O₃ and those based on annual averages, are not to be exceeded more than once a year. The O₃ standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than 1.

^c ppm = parts per million by volume; ppb = parts per billion; µg/m³ = micrograms per cubic meter.

Sources: CARB 2013, EPA 2013.

Table 3 addresses the attainment status for the Orange County portion of the Basin with respect to the NAAQS and CAAQS.

Table 3 Federal and State Attainment Status for the Orange County Portion of the South Coast Air Basin		
Pollutants	Federal Classification	State Classification
O ₃ (1-hour standard)	—	Nonattainment
O ₃ (8-hour standard)	Nonattainment, Extreme	Nonattainment
PM10	Attainment	Nonattainment
PM2.5	Nonattainment	Nonattainment
CO	Attainment/Maintenance	Attainment
NO ₂	Attainment/Maintenance	Attainment
SO ₂	Attainment	Attainment
Sources: ARB 2013, EPA 2014.		

South Coast Air Quality Management District. SCAQMD has adopted a series of air quality management plans (AQMPs) to meet the CAAQS and NAAQS. These plans require, among other emissions-reducing activities, control technology for existing sources; control programs for area sources and indirect sources; a SCAQMD permitting system, designed to allow no net increase in emissions from any new or modified (i.e., previously permitted) emission sources; and transportation control measures. The most recent AQMP was completed in 2012.

The Final 2012 AQMP was adopted by the SCAQMD Governing Board on December 7, 2012. Control measure IND-01 was approved for adoption and inclusion in the Final 2012 AQMP at the February 1, 2013, Governing Board meeting. The California Air Resources Board (CARB) approved the 2012 AQMP on January 25, 2013, and the AQMP has been submitted to EPA as a revision to the California SIP (ARB 2013). The 2012 AQMP addresses CAA requirements and includes a 24-hour PM2.5 plan, additional 8-hour O₃ measures with a vehicle-miles-traveled (VMT) offset demonstration, and a 1-hour O₃ attainment demonstration with VMT offset demonstration.

SCAQMD published the *CEQA Air Quality Handbook* in November 1993 (with subsequent updates) to help local governments analyze and mitigate project-specific air quality impacts. This handbook provides standards, methodologies, and procedures for conducting air quality analyses as part of CEQA documents prepared within SCAQMD’s jurisdiction. In addition, SCAQMD has published two additional guidance documents—*Localized Significance Threshold Methodology for CEQA Evaluations* (2003, revised 2008) and *Particulate Matter (PM) 2.5 Significance Thresholds and Calculation Methodology* (2006)—that provide guidance for evaluating localized effects from mass emissions during construction. These documents (SCAQMD 2006, 2008a) were used to analyze the potential effects to air quality of the proposed project.

The SCAQMD daily thresholds for construction emissions are presented in Table 4.

Table 4		
SQAQMD Significance Thresholds for Construction (pounds per day)		
Pollutant	Construction Thresholds	
	Regional	Localized^a
Nitrogen Oxides (NO _x)	100	92
Volatile Organic Compounds (VOCs)	75	N/A
Suspended Particulate Matter (PM10)	150	4
Fine Particulate Matter (PM2.5)	55	3
Sulfur Oxides (SO _x)	150	N/A
Carbon Monoxide (CO)	550	647
Lead (Pb) ^b	3	N/A
<p>^a Localized thresholds derived from SCAQMD's most recent LST tables are based on the project location (SRA 18, North Orange County Coastal), the project area disturbed in any given day (1 acre), and the distance to the nearest sensitive receptor (25 meters). SCAQMD has not developed LSTs for VOC, SO_x, or Pb emissions.</p> <p>^b The proposed project will result in no lead emissions sources during the construction or operations period. As such, lead emissions are not evaluated herein.</p> <p>Source: SCAQMD 2009, 2011b and OC Parks IS/MND.</p>		

Federal actions, including the implementation of the proposed action, are regulated by Rule 1901 - General Conformity in the Rules and Regulations of the SCAQMD. The provisions of Rule 1901, which apply to Federal actions conducted within the South Coast Air Basin, were incorporated into the regulations in accordance with Part 51, Subpart W, Title 40 of the Code of Federal Regulations (CFR). CFR Section 51.850 states that no department, agency, or instrumental of the Federal Government shall engage in, support in any way, provide financial assistance for, license or permit, or approve any activity that does not conform to the applicable air quality implementation plan, in this case the SCAQMD's 2012 AQMP (SCAQMD 2013).

Conforming activities or actions should not, through additional air pollutant emissions:

- Cause or contribute to new violations of any NAAQS in any area;
- Increase the frequency or severity of any existing violation of any NAAQS; or
- Delay timely attainment of any NAAQS or interim emission reductions.

The General Conformity Rule establishes conformity in coordination with and as part of the NEPA process. The rule takes into account air pollutant emissions associated with actions that are federally funded, licensed, permitted, or approved, and ensures emissions do not contribute to air quality degradation, thus preventing the achievement of State and Federal air quality goals. The general project area is designated as an extreme non-attainment area for the 8-hour NAAQS for O₃ and a non-attainment area PM2.5. It is a maintenance area for CO and NO₂.

In the South Coast Air Basin, a conformity determination is required for each pollutant where the total direct and indirect emissions in a non-attainment or maintenance area caused by a Federal action would equal or exceed established rates. As a non-attainment area for O₃ and PM_{2.5}, the following rates apply:

Ozone (VOCs or NO_x) – 25 tons/year,
PM_{2.5} direct emissions – 100/tons/year,
PM_{2.5} SO₂ – 100/tons/year,
PM_{2.5} NO_x – 100/tons/year, or
PM_{2.5} VOC or ammonia – 100/tons/year.

As a maintenance area for CO and NO₂, the following rates apply:

CO – 100 tons/year, or
NO₂ – 100 tons/year.

The requirements of Rule 1901 do not apply to Federal actions where the total of direct and indirect emissions is below these emission levels. However, when the total of direct and indirect emissions of a pollutant from a Federal action represents 10 percent or more of an area's total emissions of that pollutant, the action is defined as a regionally significant action.

B. Biological Resources

Regional Setting and Context. Most of what remains of the historical Anaheim Bay marsh complex is protected within the Seal Beach NWR. Other remnants of the historical bay have been altered to accommodate boat channels and marinas. Technically, today the “bay” is not a bay at all; rather, it consists of a man-made inner and outer harbor and the remnants of a much larger salt marsh complex (CDFG and USFWS 1976). The areas within the Refuge support habitats historically found along the southern California coast, with much of the site falling under the estuarine intertidal or estuarine subtidal habitat classification per the National Wetlands Inventory (USFWS 2010). Approximately 740 acres within the Refuge are subject to regular, unobstructed tidal influence, supporting 565 acres of coastal salt marsh vegetation, 60 acres of intertidal mudflats, and 115 acres of tidal channels and open water.

The proposed pilot project will occur within a 16-acre area of low salt marsh habitat, an area of the marsh that is subject to regular inundation. Dominant species within this habitat type include cordgrass and Pacific pickleweed (*Sarcocornia pacifica*). This habitat supports an array of avian and invertebrates species. Cordgrass-dominated salt marsh habitat is particularly important to the endangered light-footed Ridgway's rail, which uses this vegetation for foraging, nesting, and cover from predators.

Vegetation. Cordgrass and Pacific pickleweed are the dominant species within the 16-acre project site. Cordgrass is also quite abundant throughout the Refuge's low marsh habitat, but its pattern of growth on the Refuge is much different from that of nearby Upper Newport Bay.

The density of the cordgrass in the two locations is very similar, but the height and cover of the cordgrass on the Refuge is compromised by relative lack of freshwater influence within the marsh (USFWS and U.S. Navy 1991) and land subsidence. The lower elevation of the salt marsh on the Refuge combined with short stem height, results in the complete inundation of the cordgrass stands in Anaheim Bay during all but the lowest of high tides. This prolonged immersion has additional adverse effects on plant vigor as a result of reduced oxygen availability to the roots and reduced sunlight to the stems (Massey et al. 1984).

The average height of the cordgrass within the 16-acre project site when surveyed in October 2011 was 43.2 cm (Katherine Powelson, USGS, pers. Comm.). The average height of the cordgrass throughout the Refuge during a study conducted in 1979 was 57 cm, with stem heights ranging from 43 to 76 cm (Massey et al. 1984). According to Zedler (1993), “reference data from natural marshes that are used by Ridgway’s rails indicate that the standard for ‘suitable habitat’ should be a density of at least 100 stems/m² with at least 90 stems/m² greater than 60 cm, of which at least 30 stems/m² are greater than 90 cm in height.” The extent of inundation experienced in the Refuge’s low marsh habitat, along with the reduced stem heights and percent cover of much of the cordgrass, directly affects habitat quality for the Refuge’s population of light-footed Ridgway’s rail (USFWS 2012).

In addition to cordgrass and Pacific pickleweed, seven other plant species were identified on the 16-acre site by USGS in October 2011. These species included saltwort (*Batis maritima*), annual pickleweed (*Salicornia bigelovii*), jaumea (*Jaumea carnosa*), alkali heath (*Frankenia salina*), and saltgrass (*Distichlis spicata*), with a few specimens of California sealavender (*Limonium californicum*) and seablite (*Suaeda esteroa*). All are native salt marsh species.

The 16-acre project site is surrounded to the north, south, and west by two major tidal channels that support shallow subtidal habitat. Surveys conducted in these channels in April 2013 by Merkel & Associates (M&A) identified multiple patches of eelgrass (*Zostera marina*) (refer to Figure 5). The eelgrass beds within these two tidal channels are interspersed sparsely with the red alga (*Gracilaria verrucosa*) and green alga (*Ulva* sp.) (M&A 2014).

Eelgrass, an aquatic flowering grass, is an important component of coastal California’s shallow subtidal habitat providing foraging and shelter for a variety of fish and invertebrate species, as well as foraging habitat for migratory birds. The Southern California Eelgrass Mitigation Policy (1991) describes eelgrass vegetated areas as “important ecological communities because of their multiple biological and physical values. Eelgrass habitat functions as an important structural environment for resident bay and estuarine species, offering both predation refuge and a food source. Eelgrass functions as a nursery area for many commercially and recreational important finfish and shellfish species, including those that are resident within bays and estuaries, as well as oceanic species that enter estuaries to breed or spawn. Eelgrass also provides a unique habitat that supports a high diversity of non-commercially important species whose ecological roles are less well understood.”

No federally listed endangered or threatened plant species or State listed endangered, threatened, or rare plant species occur within the Seal Beach NWR. Estuary seablite (*Suaeda esteroa*), which does occur in small numbers on the project site, is included on the State's Special Vascular Plants, Bryophytes, and Lichens List (CDFW 2014) and on list 1B.2 (rare, threatened, or endangered in CA and elsewhere) of the CNPS Inventory of Rare and Endangered Plants.

Seablite occurs in various locations throughout the Refuge's salt marsh habitat, including at one location within the 16-acre Refuge site. During elevation surveys conducted throughout the Refuge by USGS, researchers also noted plant species diversity and coverage at each survey point. During the survey, 56 survey points throughout the Refuge included seablite. One of the survey points was located within the 16-acre project site. Researchers estimated that seablite represented 15 percent of the plant coverage at this survey point. The survey point is located at the edge of the project site adjacent to the southern tidal channel. The average height of seablite at the survey point was 3 inches (8 centimeters [cm]), while the average height of seablite throughout the Refuge was 8 inches (20.4 cm). Extended periods of inundation may account for the lower heights of the seablite present within the Refuge project site (Morzaria-Luna et al. 2004).

Birds. Seal Beach NWR and several nearby coastal wetland areas have collectively been recognized by the National Audubon Society as the Orange Coast Wetlands Important Bird Area (IBA). The areas within the Orange Coast Wetlands (each of which could qualify as a separate IBA) protect some of south California's most extensive wetlands, wetlands that provide essential foraging, resting, and nesting habitat for a variety of coastal-dependent migratory and resident bird species. More information and a species list for the Refuge are provided in the Seal Beach NWR CCP (USFWS 2012).

Avian surveys are routinely conducted throughout the Refuge. In addition to those surveys, specific surveys of avian use within the sediment augmentation site have been conducted twice monthly since April 15, 2014. Seven such surveys have been conducted to date with nine species observed, as indicated in Table 5.

Benthic Invertebrates. Surveys conducted in the 1970s identified at least 116 species of marine invertebrates in the salt marsh area of Anaheim Bay (Reish et al. 1975). Of the species identified, polychaetes comprised about 65 percent, crustaceans about 15 percent, and mollusks 13 percent. This and other studies indicate that a diverse array of invertebrates inhabit the estuarine and marsh habitats on the Refuge. These creatures fulfill many purposes within the bay and the marsh, including scavenging, filter feeding, and detritus feeding.

Mollusk communities in southern California salt marshes are typically dominated by *Cerithidea californica*, *Melampus olivaceous*, and *Assimineia californica*, which are all epifaunal surface feeders (USFWS and U.S. Navy 1991). Most mollusks are detritus and filter feeders or grazers, and to a lesser extent, predators. The California hornsnail (*Cerithidia californica*), which serves as food for crabs and birds, is widespread in the Refuge.

Table 5 Results of Recent Avian Surveys of the 16-Acre Project Site							
Species Observed	Survey Dates in 2014						
	April 15	May 4	May 13	June 15	June 21	July 13	July 19
Great blue heron (<i>Ardea herodias</i>)	2	-	1	1	2	-	1
Great egret (<i>Ardea alba</i>)	2	1	-	-	1	2	-
Snowy egret (<i>Egretta thula</i>)	-	-	-	-	1	-	-
Black-bellied plover (<i>Pluvialis squatarola</i>)	-	2	-	-	-	-	6
Willet (<i>Tringa semipalmata</i>)	1	2	-	-	-	-	-
Long-billed curlew (<i>Numenius americanus</i>)	-	-	-	-	-	-	1
Marbled godwit (<i>Limosa fedoa</i>)	-	-	-	-	-	-	1
Short-billed dowitcher (<i>Limnodromus griseus</i>)	-	-	-	-	-	-	3
Light-footed Ridgway's rail (<i>Rallus <u>obsoletus</u> levipes</i>)	-	-	-	-	-	-	2

The U.S. Navy was recently funded fish and benthic community surveys and marine habitat assessments within Anaheim Bay and the channels and ponds of Naval Weapons Station Seal Beach and the Seal Beach NWR. These surveys, which were conducted in 2013, included four quarterly (February, April, July, and October) daytime surveys and one nighttime survey conducted during the summertime sampling interval in July. Epibenthic invertebrates (i.e., invertebrates that live on sea floor sediments) captured in the fish sampling gear during these surveys were identified, counted, and released to further assist with the habitat characterization. The intent of this action was to generate a list of species that occur in the study area, rather than to provide definitive density and biomass data on their populations. The list of species generated from this effort, although considered a partial list of the species present in Anaheim Bay, is representative of common species found in Anaheim Bay (M&A 2014). Table 6 provides a list of those species captured in the general vicinity of the Refuge project site, an area referred to in the survey report as survey area A3.

A total of 56 species of epibenthic invertebrates were captured throughout the study area during the 2013 surveys, and of these, 20 species were captured within survey area A3, which includes the project site. During survey work conducted in February 2013, six species were captured in survey area A3 using the large beach seine, otter trawl, and purse seine. Bubble snail (*Bulla gouldiana*) was by far the most abundant species encountered (M&A 2014). Six species were also captured in April 2013 in survey area A3, but not all the species were the same as those captured in February. The two most abundant species were slender green shrimp or grass shrimp (*Hippolyte californiensis*) and broken back shrimp (*Heptacarpus* sp.). The grass shrimp, which was also abundant throughout the larger study area, was particularly abundant in the eelgrass beds located in survey area A3.

Table 6
Epibenthic Invertebrates Captured at Survey Area A3 during the
2013 Anaheim Bay Benthic and Fish Community Assessments

Phylum	Scientific Name	Common Name	Number of Individuals Captured				
			Totals for the 2013 Survey	Feb. 2013	April 2013	July 2013 (combined day and night surveys)	Oct. 2013
Bryozoa	<i>Zoobotryon verticillatum</i>	spaghetti bryozoan	4	0	0	2	2
Mollusca	<i>Arcularia tiarula</i>	mud dog whelk	2	0	0	1	1
	<i>Argopecten ventricosus</i>	speckled scallop	250	0	0	147	103
	<i>Bulla gouldiana</i>	bubble snail	1,775	287	9	587	892
	<i>Caesia perpinguis</i>	western fat dog whelk	1	0	0	1	0
	<i>Cerithidea californica</i>	California hornsnail	10	0	0	7	3
	<i>Crepidula sp.</i>	slipper shell	68	0	0	10	58
	<i>Kelletia kelletii</i>	Kellet's whelk	2	0	0	2	0
	<i>Laevicardium substriatum</i>	Pacific egg cockle	1	0	0	0	1
	<i>Navanax inermis</i>	navanax	52	19	5	2	26
Arthropoda	<i>Cancer oregonensis</i>	pygmy rock crab	1	1	0	0	0
	<i>Emerita sp.</i>	mole crab	9	0	9	0	0
	<i>Farfantepenaeus californiensis</i>	brown shrimp	2	0	0	2	0
	<i>Hemigrapsus oregonensis</i>	yellow shore crab	3	1	0	2	0
	<i>Heptacarpus sp.</i>	broken back shrimp	14	0	13	1	0
	<i>Hippolyte sp.</i>	grass shrimp	68	19	16	30	3
	<i>Pachygrapsis crassipes</i>	lined shore crab	3	0	0	3	0
	<i>Palaemon macrodactylus</i>	Oriental shrimp	1	0	0	1	0
	<i>Portunus xantusii</i>	Xantu's swimming crab	2	1	1	0	0
	<i>Pugettia producta</i>	northern kelp crab	1	0	0	0	1

Source: M&A 2014

In July 2013, a combined total of 15 species of epibenthic invertebrates were captured during day and night fish surveys, representing the greatest species diversity observed in survey area A3 during the study. The July catch was dominated by bubble snail, with speckled scallop (*Argopecten ventricosus*) the second most abundant species encountered (M&A 2014). Ten species were captured in survey area A3 during the October 2013 surveys, and the dominate species was once again bubble snail followed by speckled scallop.

Over the years, eighteen species of crustaceans have been documented in Anaheim Bay. In their larval form, they are an important food source for birds and fish. Crabs are conspicuous as they forage on mudflats. Amphipods, ostracods and copepods are abundant in subtidal and intertidal areas. Amphipods (*Orchestia traskiana* and *O. californica*) and isopods are found under debris near the upper margins of the marsh and ghost shrimp (*Callinassa californiensis*) live in muddy sediments.

Also observed on the Refuge in previous surveys was the California brackish water snail (*Tryonia imitator*), a species identified by the State of California as imperiled (USFWS and U.S. Navy 1991). This species, which inhabits coastal lagoons, estuaries, and salt marshes, is found only in permanently submerged areas and can tolerate a wide range of salinities and sediment types (Kellogg 1980). This species was not documented during the 2013 study.

Fisheries. The earliest available information regarding fish populations in Anaheim Bay is from a paper published in 1916 by Carl Hubbs, who collected fish in the bay in 1913. Additional collections were made by Hubbs and the California State Fisheries Laboratory between 1919 and 1928 (Lane 1975). No attempts to record the diversity of fish fauna in Anaheim Bay were made again until 1969, when a four-year effort to describe the biology of the bay was undertaken by California State University, Long Beach. Surveys to establish fish diversity in the bay were conducted between 1969 and 1971. A full account of the results of these surveys is provided in Fish Bulletin #165, “The Marine Resources of Anaheim Bay” (CDFG 1975) and summarized in the Seal Beach NWR Final CCP (USFWS 2012).

The recently completed fish and benthic community surveys conducted in Anaheim Bay (M&A 2014) provided updated fish data for the two channels located adjacent to the pilot project site. These fish surveys included the use of purse seines and otter trawls. Beach seines were also used to sample adult and juvenile fish along shallow water shoreline habitats located farther to the south of the project site. A complete description of the sampling methods and the results of the surveys are provided in a final report entitled “2013 Anaheim Bay Benthic and Fish Community Assessments at Naval Weapons Station Seal Beach” (M&A 2014).

The total number of fish species captured throughout the study area during the 2013 surveys was 57 species, with 36 species identified in survey area A3 (M&A 2014). The final survey report notes that the number of species captured varied by quarter, with 24 species captured in February, 30 species in April, 50 species in July (41 species during the day survey and 43 species during the night survey), and 36 species in October.

Similar to the results of the surveys conducted in the early 1970s, the 2013 studies found that fish abundance in the study area was highest in the summer. The 2013 studies also found that fish abundance was lowest in January. Although the most common fish species collected throughout the study area was queenfish (*Seriphus politus*), followed by topsmelt (*Atherinop affinis*) and northern anchovy (*Engraulis mordax*), within survey area A3 the most abundance species collected was topsmelt, followed by northern anchovy, and queenfish. Provided in Table 7 is a complete list of the fish species collected in survey area A3 during the 2013 Anaheim Bay Benthic and Fish Community Assessments.

Table 7							
Fish Species Collected in Survey Area A3 during the 2013 Anaheim Bay Benthic and Fish Community Assessments							
Scientific Name	Common Name	Number of Individuals Collected Near the Project Site					
		Totals for the 2013 Survey	Feb. 2013	April 2013	July 2013 (day)	July 2013 (night)	Oct. 2013
(listed in order of individuals collected from most abundant to least abundant)							
<i>Atherinop affinis</i>	Topsmelt	7,544	87	89	4,932	673	1,763
<i>Engraulis mordax</i>	Northern anchovy	2,110			261	1,841	8
<i>Seriphus politus</i>	Queenfish	473		1	106	80	286
<i>Cymatogaster aggregata</i>	Shiner surfperch	241		70	110	4	57
<i>Paralabrax nebulifer</i>	Barred sand bass	241			86	120	35
<i>Urobatis halleri</i>	Round stingray	143	30	72	21	15	5
<i>Ilypnus gilberti</i>	Cheekspot goby	97	1	1	17	76	2
<i>Leuresthes tenuis</i>	California grunion	90				83	7
<i>Leptocottus armatus</i>	Staghorn sculpin	75	18	31	8	18	
<i>Sardinops sagax</i>	Pacific sardine	59			55	4	
<i>Syngnathus leptorhynchus</i>	Bay pipefish	54	3	1	12	4	34
<i>Heterostichus rostratus</i>	Giant kelpfish	43	2	18	16	6	1
<i>Clevelandia ios</i>	Arrow/Shadow goby	37	4		33		
<i>Paralichthys californicus</i>	California halibut	37	5	7	5	15	5
<i>Pleuronichthys guttulatus</i>	Diamond turbot	29	2	5	5	14	3
<i>Paralabrax clathratus</i>	Kelp bass	27		3	1		23
<i>Roncador stearnsii</i>	Spotfin croaker	19		13	3	3	
<i>Paralabrax maculatofasciatus</i>	Spotted sand bass	18	10	2	3	1	2
<i>Umbrina roncadore</i>	Yellowfin croaker	15		10	3	2	
<i>Fundulus parvipinnis</i>	California killifish	9		1		3	5
<i>Hyperprosopon argenteum</i>	Walleye surfperch	9					9

Table 7 Fish Species Collected in Survey Area A3 during the 2013 Anaheim Bay Benthic and Fish Community Assessments							
Scientific Name	Common Name	Number of Individuals Collected Near the Project Site					
		Totals for the 2013 Survey	Feb. 2013	April 2013	July 2013 (day)	July 2013 (night)	Oct. 2013
(listed in order of individuals collected from most abundant to least abundant)							
<i>Hypsoblennius gentilis</i>	Bay blenny	8		2		2	4
<i>Acanthogobius flavimanus</i>	Yellowfin goby	7			2	5	
<i>Porichthys myriaster</i>	Specklefin midshipman	6				6	
<i>Anisotremus davidsonii</i>	Sargo	5			1		4
<i>Xenistius californiensis</i>	Salema	4					4
<i>Syngnathus auliscus</i>	Barred pipefish	3			3		
<i>Atractoscion nobilis</i>	White seabass	3					3
<i>Mustelus californicus</i>	Gray smooth- hound shark	2			1	1	
<i>Anchoa compressa</i>	Deepbody anchovy	2				1	1
<i>Anchoa delicatissima</i>	Slough anchovy	2	1	1			
<i>Strongylura exilis</i>	California needlefish	1				1	
<i>Atherinops californiensis</i>	Jacksmelt	1				1	
<i>Embiotoca jacksoni</i>	Black surfperch	1	1				
<i>Symphurus atricaudus</i>	California tonguefish	1		1			
<i>Gymnura marmorata</i>	California butterfly ray	1		1			

Source: M&A 2014

Essential Fish Habitat. The Magnuson-Stevens Act, as amended in 1996, states, “One of the greatest long-term threats to the viability of commercial and recreational fisheries is the continuing loss of marine, estuarine, and other aquatic habitats. Habitat considerations should receive increased attention for the conservation and management of fishery resources of the United States (16 U.S.C. 1801 (A)(9)).” The Magnuson-Stevens Act, as amended, requires Fishery Management Councils to amend all of their Fish Management Plans to describe and identify Essential Fish Habitat (EFH) for the fishery based on guidelines established by National Marine Fisheries Service (NMFS) to minimize to the extent practicable adverse effects on such habitat caused by fishing, and to identify other actions to encourage the conservation and enhancement of EFH.

EFH is defined by the Magnuson-Stevens Act as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” EFH can include both the water column and the underlying bottom substrate of a particular area. Areas designated as EFH contain habitat that is critical to the long-term health of our nation's fisheries. Various properties within the water column such as temperature, nutrients, or salinity can significantly influence which species are present. If these properties are changed, some species could be displaced. The integrity of the underlying ocean floor or tidal channel can also effect species composition and abundance. Some species may require unvegetated sandy or rocky bottoms, while others require underlying surfaces that are vegetated with seagrasses or kelp. Still others rely on structurally complex coral or oyster reefs. A single species may use many different habitats throughout its life to support breeding, spawning, nursery, feeding, and protection functions. EFH encompasses all of those habitats necessary to ensure healthy fisheries now and in the future (NOAA Fisheries, Office of Habitat Conservation, Essential Fish Habitat Webpage).

The Magnuson-Stevens Act also requires that Federal agencies consult with NMFS about any ongoing or proposed actions they may authorize, fund, or undertake that may adversely affect any EFH. If the action could adversely affect EFH, NMFS will provide recommendations to conserve EFH. Federal agencies must then respond within 30 days of receiving conservation recommendations from NMFS, describing measures to avoid, mitigate, or offset the impact of the proposed action on EFH.

Some EFH has been further defined to address Habitat Areas of Particular Concern (HAPC). HAPC, identified in specific fish management plans to help provide additional focus for conservation efforts, consist of areas supporting ecological functions that are very important or are especially vulnerable to degradation. A specific habitat area may be designated as an HAPC based on the importance of the ecological function provided by the habitat, the extent to which the habitat is sensitive to human-induced environmental degradation, the rarity of the habitat type, and/or the extent to which development activities are, or could be, stressing the habitat (PFMC 2014). The HAPC designation does not impose additional protection or restrictions upon an area.

Anaheim Bay includes areas identified as EFH for various life stages of fish species managed under the Pacific Groundfish and Coastal Pelagic Species Fishery Management Plans. The Pacific Coast Groundfish Fishery Management Plan (FMP) (PFMC 2014) manages more than 90 species of fish over a large and ecologically diverse area. Fish such as rockfish, roundfish, flatfish, and certain sharks that are often (but not exclusively) found on or near the ocean floor or other structures are managed under this plan. EFH for groundfish includes all areas off the Pacific Coast with depths less than or equal to 3,500 meters to mean higher high water level (MHHW) or the upriver extent of saltwater intrusion, defined as upstream and landward to where ocean-derived salts measure less than 0.5 parts per thousand (ppt) during the period of average annual low flow. Two of the HAPCs that have been identified for this EFH, estuaries and seagrass, occur within the Refuge.

None of the species managed under the Coast Groundfish FMP were collected within survey area A3, but California scorpionfish (*Scorpaena gutatta*) was identified in other portions of the survey area and a leopard shark (*Triakis semifasciata*) was noted in survey area A1, located to the west of Anaheim Bay (M&A 2014). A third species, English sole (*Parophrys vetulus*) was collected in Anaheim Bay in the 1970s (Klingbeil et al. 1975).

The Coastal Pelagic Species Fishery Management Plan (PFMC 2011) includes four finfish (Pacific sardine [*Sardinops sagax*], Pacific [chub] mackerel [*Scomber japonicas*], central and northern subpopulations of northern anchovy [*Engraulis mordax*], and jack mackerel [*Trachurus symmetricus*]), market squid (*Loligo opalescens*), and all euphausiid (krill) species that occur in the West Coast exclusive economic zone. Coastal pelagic species generally live nearer to the surface than the seafloor and the EFH is based on the temperature range where they are found, and on the geographic area where they occur at any life stage. This range varies widely according to ocean temperatures. This EFH includes all marine and estuary waters from the coasts of California, Oregon, and Washington to the 200-mile limit and above the thermocline where sea surface temperatures range between 10° and 26° Celsius. Northern anchovy and Pacific sardine were present in survey area A3 during the 2013 fish surveys (M&A 2014).

Endangered and Threatened Species and Other Species of Concern. The area within the vicinity of the Main Channel West dredge site and the 16-acre Refuge project site are known to support three federally listed endangered species, including the light-footed Ridgway's rail, California least tern, and eastern Pacific green turtle (*Chelonia mydas*). The rail and tern are also included on the California Endangered Species List. The eastern Pacific green turtle is included on the State's Special Animals List with a G3 (vulnerable) S1 (critically imperiled) ranking (CDFW 2014).

The federally listed threatened Pacific Coast population of western snowy plover (*Charadrius nivosus nivosus*), although occasionally observed on the Refuge in the past, has not been identified on the Refuge in the past few years. Another species of concern is the State endangered Belding's savannah sparrow (*Passerculus sandwichensis beldingi*).

Four birds, including the light-footed Ridgway's rail, California least tern, California brown pelican, and peregrine falcon, are fully protected species in California. The peregrine is present on the Refuge and can be seen foraging in uplands, high marsh, near the Refuge's tern colony, and on rare occasions over low marsh habitat in Anaheim Bay.

Eleven birds identified by the Service as Birds of Conservation Concern (USFWS 2008), and four California Bird Species of Special Concern (CDFG 2008) also occur on or near the project site as indicated in Table 8. No federally or State listed plant, fish, amphibian, or invertebrate species have been observed on the Refuge.

Table 8 Birds of Conservation Concern and <u>California Bird Species of Special Concern</u> with the Potential to Occur on or near the Pilot Project Site			
Common Name	Scientific Name	Bird of Conservation Concern¹	California Birds Species of Special Concern^{2,3}
Reddish egret	<i>Egretta rufescens</i>	yes	no
Black brant	<i>Branta bernicla</i>	no	yes
Northern harrier	<i>Circus cyaneus</i>	no	yes
Peregrine falcon	<i>Falco peregrinus</i>	yes	no
Black oystercatcher	<i>Haematopus bachmani</i>	yes	no
Lesser yellowlegs	<i>Tringa flavipes</i>	yes	no
Whimbrel	<i>Numenius phaeopus hudsonicus</i>	yes	no
Long-billed curlew	<i>Numenius americanus</i>	yes	no
Marbled godwit	<i>Limosa fedoa fedoa</i>	yes	no
Red knot	<i>Calidris canutus roselaari</i>	yes	no
Dunlin	<i>Calidris alpina</i>	yes	no
Short-billed dowitcher	<i>Limnodromus griseus</i>	yes	no
Black skimmer	<i>Rynchops niger niger</i>	yes	yes
Large-billed savannah sparrow	<i>Passerculus sandwichensis rostratus</i>	no	yes

¹USFWS 2008

²CDFG 2008

³List does not include species that may be present on or near the site during some parts of the year, but not during the season of concern (e.g., breeding)

Light-footed Ridgway's Rail (*Rallus obsoletus levipes*)

The light-footed Ridgway's rail, which can be observed in southern California coastal salt marshes, lagoons, and their maritime environs, typically nest in the lower littoral zone of coastal salt marshes where dense stands of cordgrass are present. They require shallow water and mudflats for foraging, with adjacent higher vegetation for cover during high water (Massey et al. 1984).

Light-footed Ridgway's rails forage in all parts of the salt marsh, concentrating their efforts in the lower marsh when the tide is out, and moving into the higher marsh as the tide advances. Foraging activity is greatest in the early morning, while vocalizing shows a strong peak just before dark. The rails are omnivorous and opportunistic foragers. They rely mostly on salt marsh invertebrates, such as beetles (*Coleoptera*), California hornsnails, salt marsh snails (*Melampus olivaceus*), fiddler and hermit crabs, crayfish, isopods, and decapods.

The pair bond in light-footed Ridgway's rails endures throughout the season, and often from year to year. Nesting usually begins in March and late nests have usually hatched by August. A nest generally contains four to eight eggs, which hatch in 18 to 27 days. Both parents care for the young. While one adult is foraging, the other adult broods the chicks. By the age of two days, chicks will accompany adults on foraging trips; however, adults

have been observed feeding fully-grown chicks of at least six weeks of age within 82 feet (25 meters) of their incubation nest. These rails generally construct a nest for egg laying, and a second nest, an incubation nest, for brooding the young.

In most southern California marshes that support light-footed Ridgway's rails, rail nests are typically placed to avoid flooding by tides, yet in dense enough cover to be hidden from predators and support the relatively large nest. Cordgrass provides the preferred nesting habitat for light-footed Ridgway's rails. Massey et al. (1984) describes the classical Ridgway's rail nest as follows:

A nest, built in the low littoral zone in a stand of tall dense cordgrass, constructed primarily of dead cordgrass stems. The platform of the nest is built up from the ground or supported in the cordgrass, the rim level as high as 45 centimeters off the ground. A canopy of live cordgrass stems is pulled over and entwined above the nest, hiding the nest completely from above. The surrounding tall cordgrass provides cover and also allows the nest to float upwards in place during a high tide. A ramp of dead cordgrass stems leads from the platform down and along the ground.

On the Seal Beach NWR, where cordgrass stem heights are low and much of the Refuge's cordgrass habitat is almost completely submerged by the higher high tides, the probability of a natural nest surviving even moderately high tides in Anaheim Bay's primary salt marsh habitat is extremely low. The quality of the Refuge's low marsh habitat is compromised by local subsidence and low rates of sediment accretion (Takekawa et al. 2013a). A recently completed USGS study of local subsidence at the Refuge (Takekawa et al. 2013b) indicates that the marsh is experiencing relative sea level rise rates of over 6 millimeters per year. This condition has resulted in the need for creative solutions for maintaining a healthy breeding population of light-footed Ridgway's rail on the Refuge.

One solution for addressing poor quality nesting habitat on much of the Refuge is the placement of artificial nesting platforms within the marsh. To date, approximately 95 artificial nesting platforms have been placed in the marsh for use by the rails. In 2012, when 87 nesting rafts were present in the marsh, monitoring during the breeding season identified 27 light-footed Ridgway's rail incubation nests. Another 32 rafts were used by the rails for brood nests. During the fall Ridgway's rail count in 2012, 73 rails were observed on artificial nesting platforms. As of June 2014, 42 of approximately 95 artificial nesting platforms contained clutches.

Other management activities conducted on Seal Beach NWR to protect and assist in the recovery of the light-footed Ridgway's rail include pre-season nesting preparation, monitoring during the nesting season, minimizing human disturbance, and implementing predator management. Pre-season nesting preparation involves surveying, maintaining, and replacing nesting platforms that have been installed in Anaheim Bay.

The Light-footed Clapper Rail Recovery Plan (USFWS 1985) includes the following recovery strategies specific to Anaheim Bay (Seal Beach NWR):

- Restore tidal action to surrounding uplands;
- Determine causes of elevational differences between Anaheim Bay and Upper Newport Bay, investigate feasibility of corrective actions;
- Develop fringing freshwater marsh and create nest hummocks;
- Enhance *Spartina* vigor;
- Control pollutants/debris;
- Identify and resolve water quality problems;
- Coordinate with vector control personnel;
- Establish and monitor permanent vegetation transects in Anaheim Bay; and
- Obtain information on the biology of the rail and its ecosystem to enhance recovery, including investigating factors limiting rail population size in Anaheim Bay.

The first known light-footed Ridgway's rail count for the Refuge, which was conducted in the early 1970s, estimated that 100 to 200 individual birds were present in Anaheim Bay (Wilbur 1974). Annual counts on the Refuge began in 1979 and call counts conducted throughout the bird's U.S. range were initiated in 1980. Ridgway's rail monitoring on the Refuge is conducted in partnership with Naval Weapons Station Seal Beach and involves monthly monitoring of rail nests during the breeding season, spring Ridgway's rail call counts, and fall high tide call counts. Call count surveys are conducted once or twice annually during the breeding season to estimate the ratio of males to females and of paired to unpaired rails. High tide counts are conducted at least once annually in the fall during daytime +6.7 foot or higher tides. During these very high tides, rails are forced to seek higher ground, generally in pickleweed habitat or on nesting platforms, where they are easily visible to observers. These counts, which provide minimum population estimates, have been conducted since 1975. Annual monitoring reports are prepared to document the data and observations made during the year. Breeding pair estimates for the Refuge between 1980 and 2012 are provided in Table 9.

California Least Tern (*Sternula antillarum browni*)

The California least tern is migratory, usually arriving at the Refuge in April and departing in August for the coast of Central or South America. Least terns are colonial but do not nest in as dense a concentration as many other tern species. The nest is a simple scrape or depression in the sand, in which one to four eggs are laid, usually two.

The first tern eggs of the season at the Seal Beach NWR are generally laid in the second week of May and the last eggs are laid in late June (Collins 2007). Range wide, only one brood is raised; however, the birds will re-nest if eggs or chicks are lost. Parents continue to feed their young even after they are strong fliers. This tern species is an exclusive fish-eater, typically feeding on topsmelt, northern anchovy, gobies, and jacksmelt (Massey 1974, Atwood and Kelly 1984). Studies on fish dropped at nesting sites suggest that fish size, rather than species, is the essential requirement of suitable prey for the least tern.

Table 9
Number of Light-footed Ridgway's Rails Breeding Pairs
at Seal Beach NWR, 1980-2012

Year	Breeding Pairs	Year	Breeding Pairs	Year	Breeding Pairs
1980	30	1991	28	2002	24
1981	19	1992	36	2003	23
1982	28	1993	65	2004	16
1983	20	1994	66	2005	15
1984	24	1995	51	2006	24
1985	11	1996	52	2007	24
1986	5	1997	37	2008	17
1987	7	1998	16	2009	19
1988	7	1999	15	2010	25
1989	6	2000	10	2011	34
1990	16	2001	11	2012	42

Source: Hoffman 2012

At Seal Beach NWR, least terns currently nest on a peninsula referred to as NASA Island, a three-acre fill site that was converted from military use to a potential least tern nesting site between 1977 and 1979. No tern nesting occurs within the pilot project site, but terns do forage in the tidal channels that abut the project site. Historically, California least terns nested on the adjacent coastal beaches of Seal Beach and Sunset Beach (Collins 2007). Terns began nesting on NASA Island in 1979 and by 1998, approximately 165 breeding pairs were observed using the site.

The number of breeding pairs and the number of fledglings at NASA Island fluctuate in some years as a result of various factors including food supply and predation. The NASA Island nesting site is intensely managed immediately prior to and during the breeding season. These activities are often implemented and/or funded through a partnership with the Navy.

Eastern Pacific Green Sea Turtle (*Chelonia mydas*)

The eastern Pacific green sea turtle is one of six species of sea turtles found in the oceans in and around the United States. Populations of the eastern Pacific green sea turtle have seriously declined due primarily to direct take of turtles and eggs. The Pacific green sea turtle was federally listed as threatened in 1978 throughout its Pacific Range, except for the federally endangered population nesting on the Pacific Coast of Mexico, which is covered under the Recovery Plan for the East Pacific Green Turtle (NOAA and USFWS 1998). Due to genetic testing results, the National Marine Fisheries Scientists believe that the majority of green sea turtles in southern California area are likely part of the federally endangered population that nests in Mexico (Dan Lawson pers. comm.).

In August 2007, researchers first observed eastern Pacific green sea turtles on the Refuge in the 7th Street Pond and in the associate feeder channel for this pond (Jirik and Lowe 2009). Multiple observations were made in these locations during August and September

2007, and June through October 2008. Observations were also made by the Refuge Manager in September 2009, June 2011, and during multiple months in 2012. Also in 2012, researchers from NOAA/NMFS and California State University Long Beach (CSULB) began a research project to tag and track turtles utilizing the Refuge as well as those in the nearby San Gabriel River. Early data confirmed that the turtles are moving between these two locations and generally do not use the Refuge waters during the colder winter months (Dan Lawson pers. comm.).

Speculation for why the sea turtles are present on the Refuge ranges from the presence of warm seawater temperatures in the mitigation ponds during the spring and summer to the availability of eelgrass and algae, which the sea turtle feed on. These turtles have the potential to be present in the tidal channels that abut the project site.

Western Snowy Plover (Pacific Coast Population) (*Charadrius alexandrinus nivosus*)

The Pacific Coastal population of western snowy plover is defined as those individuals that nest adjacent to or near tidal waters and includes all nesting colonies on the mainland coast, peninsulas, offshore islands, adjacent bays, and estuaries. The breeding range of this population of western snowy plover extends along coastal beaches from the southern portion of Washington State to southern Baja California, Mexico (USFWS 1993), and the breeding season extends from March 1 through September 15.

Some snowy plovers remain in their coastal breeding areas year-round, while others migrate south or north for the winter (USFWS 2007). Flocks of nonbreeding birds, consisting of a mixture of adult and hatching-year birds, begin to form along the Pacific coast in early July. During migration and winter, these flocks range in size from a few individuals to up to 300 birds. In the vicinity of the Refuge, near Huntington Beach and the Bolsa Chica wetlands, the numbers of wintering snowy plovers typically range from 30 to 60 individuals (USFWS 2007). A few individuals are also observed each year at Whiskey 8 Beach on the Naval Weapons Station during the winter count.

There are only a handful of snowy plover breeding locations currently used in southern California. Well used locations include Bolsa Chica (Orange County), Camp Pendleton, Baticuitos Lagoon, NAB Coronado, Silver Strand State Beach, Naval Radio Receiving Facility, and Tijuana Estuary in San Diego County.

The western snowy plover is only observed on the Refuge in very limited numbers and was not known to nest on the Seal Beach NWR until 2011, when one pair was found nesting on NASA Island. The three-egg nest hatched, but evidence indicated that the chicks were most likely depredated within the first week. No western snowy plovers were observed nesting on the Refuge in 2012, 2013, or 2014. Plovers are rarely observed foraging on the Refuge in winter.

Belding's Savannah Sparrow (*Passerculus sandwichensis beldingi*)

The Belding's savannah sparrow (Belding's) is one of only two wetland-dependent avian species that reside year-round in the coastal salt marshes of southern California (Powell and Collier 1998). This salt marsh species is therefore reliant upon coastal salt marsh

habitat for all of its life history requirements. This subspecies ranges along the southern California coast from Santa Barbara County (Goleta Slough) in the north to El Rosario, Baja California, Mexico in the south (James and Stadtlander 1991).

Belding's generally nests and forages within dense stands of pickleweed within the mid-to upper-littoral zones of coastal salt marsh (Powell and Collier 1998). Breeding territories can be very small. These birds nest semi-colonially or are locally concentrated within a larger block of habitat (Zembal and Hoffman 2002). Belding's savannah sparrows occur year-round on the Refuge, with relatively large numbers of territories documented annually around the marsh edges. During the April 2010 survey, 130 pairs of Belding's savannah sparrows were identified in the area of the Refuge located to the north of Bolsa Avenue. Twelve of these pairs were found in the pickleweed habitat occurring around the edges of the three islands in the Case Road Pond. Other areas of concentration included the edges of NASA and Hog Islands and the southeast corner of the Refuge, which was restored in 1980 (Zembal and Hoffman 2010). In 2010, the Refuge supported the second largest number of Belding's savannah sparrow territories in California. The low marsh habitat present on the pilot project site does not provide suitable nesting habitat for this species and Belding's present on the site for foraging is rare.

Migratory Birds of Concern

The Refuge's bird populations can be divided into several broad categories according to when they are present. The greatest species diversity and overall bird abundance on the Refuge occurs when wintering birds (consisting primarily of shorebirds, waterfowl, and raptors) are present. The Refuge's tidal and intertidal habitats are important foraging and resting areas for these and other birds traveling along the Pacific Flyway. Shorebirds, generally the first to arrive, can be expected in August, with the first ducks generally following in September. Past observations indicated that peak bird abundance is typically observed from November through February. Those birds that choose to stay on the Refuge for the entire winter are generally present until April. These wintering birds tend to move throughout the Refuge generally synchronizing their foraging and roosting activities with the changing tides.

Another category of birds supported by the Refuge are migrant birds that use the wetlands as feeding and resting stops on their journeys between breeding and wintering grounds. Migratory birds moving south for the winter generally begin arriving at the Refuge in late summer, and are most abundant in the fall. Spring migration generally occurs from February through May for species heading north.

C. Cultural Resources

Requirements for Federal agencies to identify, evaluate, and protect cultural resources are outlined in several Federal regulations, including the National Historic Preservation Act (NHPA) of 1966, as amended (PL 89-665; 50 STAT 915; 16 USC 470 et seq. 36 CFR 800).

The NHPA sets inventory, nomination, protection, and preservation responsibilities for federally owned cultural properties and directs Federal agencies to take into account the effects of their actions on items or sites listed or eligible for listing in the NRHP. The criteria used to evaluate eligibility to the NRHP, as contained in 36 CFR 60.4, include, among others, consideration of the quality of the property's significance in American history, architecture, archaeology, and culture and the property's known or likely ability to yield information important in prehistory or history. An historical property must also retain the integrity of its physical identity that existed during the resource's period of significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association.

All accessible lands (dry land areas) within the Seal Beach NWR have been surveyed for cultural resources, and one site, CA-ORA-298, has been identified within the Refuge boundary. This site was previously evaluated and determined to be eligible for listing in the National Register of Historic Places (NRHP). Four additional cultural sites have been recorded just beyond the Refuge boundary within Naval Weapons Station Seal Beach. A record search of the California Native American Heritage Commission Sacred Land Files was conducted in 1993 by Ogden Environmental in association with the Historic and Archaeological Resources Protection Plan for the Naval Weapons Station Seal Beach. No sacred lands were identified.

For that portion of the project site that is owned by the California State Lands Commission, the title of any abandoned archaeological sites and history or cultural resources present within the Public Trust Lands is vested in the State and under the jurisdiction of the California State Lands Commission. The State presumes that any submerged archaeological site or submerged historic resource that has remained in State waters for more than 50 years is significant.

D. Greenhouse Gas Emissions

According to EPA, a greenhouse gas (GHG) is any gas that absorbs infrared radiation in the atmosphere. This absorption traps heat within the atmosphere, maintaining the earth's surface temperature at a level higher than would be the case in the absence of GHGs. Increasing levels of GHGs resulting from human activities have increased levels of most of these naturally occurring gases in the atmosphere, which has and will continue to result in an increase in the temperature of the earth's lower atmosphere, a phenomenon that is commonly referred to as global warming. Warming of the earth's lower atmosphere induces a suite of additional changes, including changes in global precipitation patterns; ocean circulation, temperature, and acidity; global mean sea level; species distribution and diversity; and the timing of biological processes. These large-scale changes are collectively referred to as global climate change.

The GHGs listed by the Intergovernmental Panel on Climate Change (IPCC) include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆) (IPCC 2007).

State CEQA Guidelines contain a similar definition of GHGs (Health and Safety Code Section 38505(g); 14 CCR Section 15364.5). Water vapor, the most abundant GHG, is not included in this list because its natural concentrations and fluctuations far outweigh its human-made sources. To simplify reporting and analysis, GHGs are commonly defined in terms of a global warming potential (GWP). The IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of CO₂ equivalents (CO₂e). The GWP of CO₂ is, by definition, 1. GHG emissions are quantified and presented in terms of metric tons (MT of CO₂e emitted per year). The most recent GWPs from IPCC's Fifth Annual Assessment are used in this analysis.

Federal Regulatory Setting. Legislation has been enacted at the Federal level related to climate change. The following key pieces of legislation are applicable to the project:

The updated Corporate Average Fuel Economy standards incorporate the stricter standards promulgated by the State of California into one uniform standard. In addition, automakers are required to cut GHG emissions in new vehicles by roughly 25 percent by 2016 and evaluate four potential future standards, ranging from 47 to 62 miles per gallon, by 2025. Under the Endangerment and Cause and Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act, EPA finds that the current and projected concentrations of the six key well-mixed GHGs—CO₂, CH₄, N₂O, PFCs, SF₆, and HFCs—in the atmosphere threaten the public health and welfare of current and future generations. Under the Cause or Contribute Finding, EPA finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to GHG pollution that threatens public health and welfare. Under the authority of the CAA, EPA is beginning to regulate GHG emissions, starting with large stationary sources. In 2010, EPA set GHG thresholds to define when permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. In 2012, EPA proposed a carbon pollution standard for new power plants.

California Regulatory Setting. A variety of legislation has also been enacted in California related to climate change, much of which sets aggressive goals for GHG reductions within the state. The following key pieces of legislation are applicable to the proposed project:

Executive Order S-3-05 is designed to combat climate change by reducing California's GHG emissions to 1) 2000 levels by 2010, 2) 1990 levels by the 2020, and 3) 80 percent below 1990 levels by 2050. Note that executive orders are binding only on state agencies.

Executive Order B-16-2012 is designed to guide state agencies' efforts to control and regulate GHGs even further. It establishes benchmarks for reducing transportation-related GHG emissions to 80 percent less than 1990 levels by 2050.

Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006, codified the state's GHG emissions targets, which are similar to the reduction goals in Executive

Order S-3-05, while further mandating that ARB create a plan that includes market mechanisms and implement rules to achieve “real, quantifiable, cost-effective reductions of greenhouse gases.” Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state’s Climate Action Team.

The AB 32 Scoping Plan contains the main strategies California will use to reduce GHGs from the “business as usual” (BAU) emissions projected for 2020 back down to 1990 levels. The Scoping Plan outlines how emissions reductions from significant sources of GHGs will be achieved through regulations, market mechanisms, and other actions. ARB is currently updating the scoping plan to include both a 2020 element and a post-2020 element. The 2020 element will focus on state, regional, and local initiatives that are being implemented now to assist in meeting the 2020 goal.

The post-2020 element of the AB 32 Scoping Plan will provide a high-level view of a long-term strategy for meeting the 2050 GHG goals, consistent with the goals set forth in EO S-3-05 and EO B-16-2012.

Senate Bill 1368 (Perata) prohibits any retail seller of electricity in California from entering into a long-term financial commitment for baseload generation if the GHG emissions are higher than those from a combined-cycle natural gas power plant.

Senate Bills (SBs) 1078/107/X 1-2 and Executive Order S-14-08 obligated investor-owned utilities, energy service providers, and community choice aggregators to procure an additional one percent of retail sales per year from eligible renewable sources until 20 percent is reached, no later than 2010. Executive Order S-14-08 set forth a longer range target of procuring 33 percent of retail sales by 2020. SB X 1-2, called the California Renewable Energy Resources Act, obligates all California electricity providers to obtain at least 33 percent of their energy from renewable resources by 2020.

The State CEQA Guidelines, as amended in 2010, require lead agencies to analyze a project’s GHG emissions. The guidelines confirm the discretion of lead agencies to determine appropriate significance thresholds but require the preparation of an EIR if “there is substantial evidence that the possible effects of a particular project are still cumulatively considerable, notwithstanding compliance with adopted regulations or requirements” (Section 15064.4).

Local Regulatory Setting. SCAQMD has primary responsibility for development and implementation of rules and regulations to attain the NAAQS and CAAQS as well as permitting new or modified sources, developing air quality management plans, and adopting and enforcing air pollution regulations within the Basin. The AB 32 Scoping Plan does not provide an explicit role for local air districts with respect to implementing AB 32, but it does state that ARB will work actively with air districts in coordinating emissions reporting,

encouraging and coordinating GHG reductions, and providing technical assistance in quantifying reductions. The ability of air districts to control emissions (both criteria pollutants and GHGs) is provided primarily through permitting as well as through their role as a CEQA lead or commenting agency, the establishment of CEQA thresholds, and the development of analytical requirements for CEQA documents.

To provide guidance to local lead agencies regarding determining the significance of GHG emissions in their CEQA documents, SCAQMD is convening an ongoing GHG CEQA Significance Threshold Working Group. Members of the working group include government agencies that are implementing CEQA and representatives from various stakeholder groups that provide input to SCAQMD on developing GHG CEQA significance thresholds.

On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold of 10,000 MT per year for industrial permitting projects where SCAQMD is lead agency. (Note: This threshold is not applicable to the proposed project.)

The board letter, resolution, interim GHG significance threshold, draft guidance document, and attachments can be found under Board Agenda Item 31 on the December 5, 2008, Governing Board meeting agenda. No other quantitative thresholds have been developed by SCAQMD that would apply to the proposed project. In addition, the 2012–2035 Regional Transportation Plan/Sustainable Communities Strategy outlined SCAG’s plan for integrating transportation and land use planning in response to projected growth, housing needs, changing demographics, and transportation demands in compliance with the GHG emissions-reduction goals set forth by ARB per SB 375 (SCAG 2012).

E. Hazards and Hazardous Materials

A hazardous material is defined as any material that, due to its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or environment.

Hazardous materials include, but are not limited to, hazardous substances, hazardous wastes, and any material that a business or the local implementing agency has a reasonable basis for believing would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

Multiple State and local laws regulate the storage, use, and disposal of hazardous materials. The County of Orange Environmental Health Division was designated by the State Secretary for Environmental Protection on January 1, 1997, as the Certified Unified Program Agency (CUPA) for Orange County. The CUPA is the local administrative agency that coordinates the following six programs regulating hazardous materials and hazardous wastes: Hazardous Waste, Underground Storage Tanks (UST), Aboveground Petroleum Storage Tanks (APST), Hazardous Materials Disclosure (HMD), Business Plan, and California Accidental Release Program (CalARP).

Additionally, the Orange County Code of Ordinances provides regulations for the use and storage of hazardous materials. Section 3-3-14 of Chapter 27 requires the Orange County Fire Authority Chemical Classification packet to be completed and approved prior to approval of plans and/or the storage, use, or handling of chemicals on any premise. Pursuant to a database check with both the Geotracker (State Water Resources Control Board) and Envirostor (State Department of Toxic Substances Control) databases, the project site is not included on a list of hazardous material sites. There are no reported open hazardous materials sites within a 0.5-mile radius of the dredge site (DTSC 2013).

The Navy is responsible for the identification, assessment, characterization, and clean-up or control of contaminated sites within Naval Weapons Station Seal Beach, including the areas within the Seal Beach NWR that were contaminated prior to establishment of the Refuge. In 1985, an assessment of Naval Weapons Station Seal Beach, which included the Refuge, was conducted to identify sites posing a potential threat to human health or the environment that might warrant further investigation. The assessment identified eight sites within the Refuge boundary (U.S. Navy 2007).

To address the eight sites, which are referred to as “restoration sites,” the Navy has established an Installation Restoration Program (IRP) that is administered by Naval Facilities Southwest Division with regulatory oversight provide by the California EPA Department of Toxic Substance Control and the California Regional Water Quality Control Board, Santa Ana RWQCB. The IRP addresses past releases of hazardous substances, pollutants, or contaminants that pose toxicological risk to human health or the environment. As of 2014, there are seven remaining sites in various stages of investigation and cleanup.

Of the sites identified through the IRP, remediation of four of the sites is the responsibility of the Navy. These sites, which are described in Table 10, include site 7, 40, 70, and 74. Remediation of site 22, Oil Island, is the responsibility of the facility operator, Breitburn Energy Corporation, and the responsible party for site 75 has yet to be determined and is under review (NAVFAC 2014).

The Navy also addresses environmental health and safety hazards from unexploded ordnance (UXO), discarded munitions, and munitions constituents through the Munitions Response Program (MRP). MRP Site UXO1 and MRP Site AOC2 have been documented within the Refuge boundary. MRP Site UXO1 includes 39 acres in the northern portion of 7th Street Pond located within the Refuge boundary, as well as 48 acres to the north of the 7th Street Pond, outside the Refuge boundary (ChaduxTt 2011). MRP Site AOC2, the site of the drop tower, was found to contain munitions debris during a 2009 survey, and soil samples indicated the presence of several constituents of concern, including five metals (i.e., cadmium, copper, lead, selenium, zinc) that exceeded the corresponding ecological benchmarks and background screening criteria (ChaduxTt 2011). Neither of these sites occurs in proximity to the 16-acre pilot project site.

Table 10
Summary of Installation Restoration Program Sites
on Naval Weapons Station Seal Beach

Site Number	Description	Source of Contamination and Release Period	Waste Types	Current Status
7	Station landfill located to the east of Perimeter Pond; 33-acre site located on and adjacent to the Refuge	Navy landfill used from mid-1950s - 1973	Trash, debris, solvents, oils, paint sludge, asbestos, mercury	Removal action implemented in 2004, semiannual landfill cover inspections and maintenance ongoing, continuing vegetative cover restoration
22	Oil Island, located in the southwest quadrant of Anaheim Bay, outside the Refuge boundary	Current commercial oil production area; waste holding impoundments in use in 1954; not from a Navy source	Drilling muds, oily wastes, drill cuttings	Removal action to clean up contaminated soil and groundwater is recommended; oil operator responsible for site management
40	Concrete pit/gravel area, located off the Refuge, west of the Refuge office	Engine work area and drainage, used 1940s – 1978	VOC groundwater plume; oil and chlorinated solvents	In-situ bioremediation, annual groundwater monitoring finalized in 2013, soil vapor sampling to be conducted in late 2014
70	Former NASA research, test, and evaluation site; located northeast of the Refuge, but plume extends into northern end of the Refuge	Manufacture of Saturn V launch Vehicle between 1962 and 1973	VOC groundwater plume	In-situ bioremediation initiated in 2010 and implemented again in 2013. Semi-annual monitoring in 2014
74	Former skeet range, located just south of the current small weapons range, western portion of the site within the Refuge boundary	Skeet shooting from the late 1960s – early 1990s	Lead, antimony, and PAHs	Cleanup process currently being evaluated; remedial action scheduled for FY15/16
75	Agricultural well; near the southeast corner of the Naval Weapons Station	Not from a Navy source	VOCs in groundwater	Working with regulatory agencies to identify the source
UST 8 (Bldg. 500)	Former underground storage tank site, located well to the east of Refuge	1200 gallon tank believed to be abandoned in the 1950s	Diesel fuel in the soil	Site characterization completed July 2014, recommending no further action

Source: (NAVFAC 2014)

Sediment Characterization. Sediment characterization and grain-size analysis has been conducted by OC Parks for the various sites proposed for maintenance dredging in the Harbour, as well as within the proposed pilot project site. The results of this work are summarized below and presented in detail in the Dredge Material Evaluation Sunset/Huntington Harbour Maintenance Dredging and Waterline Installation Project Sampling and Analysis Report (Kinnetic Laboratories, Inc. and Moffatt & Nichol 2014), which available for review upon request.

A total of 24 locations within the Harbour were sampled on January 6 and 7, 2014. Project depths vary throughout the Harbour and range from -8 feet to -16 feet MLLW. In addition to the Sunset/Huntington Harbour samples, samples for grain size and chemical analyses were collected from three locations in the pilot project site on the Refuge. One composite sample was physically, chemically (Tier II), and biologically (Tier III) analyzed for each Harbour area in addition to a composite sample from the pilot project site. No Tier III testing was performed on the pilot project composite sample.

Bulk sediment chemical analyses conducted on the Harbour Tier II composite samples and Refuge reference samples included total organic carbon (TOC), percent solids, metals, total ammonia, nitrate + nitrite total volatile solids (TVS), oil and grease, total recoverable petroleum hydrocarbons, total sulfides, water soluble sulfides, butyltins, chlorinated pesticides, pyrethroid pesticides, polychlorinated biphenyl (PCB) congeners, phenols, phthalates, polyaromatic hydrocarbons (PAHs), and polybrominated diphenyl ethers (PBDEs).

The main factors dictating suitability of placing Sunset/Huntington Harbour dredged sediments on the pilot project site are grain size, sediment contaminant levels, and sediment toxicity. A comparison of grain size distribution data from dredge site samples along with three samples collected within the proposed pilot project site indicate that grain sizes of the Tier II dredge composite samples are not substantially different from the existing sediments within the pilot project site. Of the sample areas, the Main Channel West dredge area was determined to be the most compatible with the existing Refuge sediments (Table 11).

Chemical analysis of the Sunset/Huntington Harbour sediments indicated moderate contamination. Most sediment metal concentrations in the Sunset/Huntington Harbour Tier II composite samples were generally comparable to or less than soil background and Refuge reference concentrations. Copper, lead, and zinc do exceed background levels in some composite samples, but not in the Main Channel West composite sample. The report notes that copper and lead also exceed background concentrations in the pilot project reference sample and the zinc concentrations in the three Harbour composite samples were only slightly elevated (<8%) over the background concentration.

Table 11 Comparison of Grain Size Data for Main Channel West and the Seal Beach NWR				
% Grain Size Fraction	Tier II Composite Sample for Main Channel West	Seal Beach NWR Sample R1	Seal Beach NWR Sample R2	Seal Beach NWR Sample R3
Gravel	0	0	0	0
Sand	59	42	51	37
Silt	43	54	46	61
Clay	12	4.9	3.4	2.0

Source: Kinnetic Laboratories, Inc. and Moffatt & Nichol 2014

Contamination in the Sunset/Huntington Harbour sediments proposed for use on the Refuge pilot project site was not severe enough to cause any statistically significant suspended particular phase toxicity (using mussel larvae, mysid shrimp and fish) or benthic toxicity (using amphipods and polychaete worms). There was statistically significant bioaccumulation of lead, DDTs, chlordane and PCBs in the test tissues. However, levels were determined to represent minimal threat to benthic organisms or species foraging in the marine benthic environment of the Refuge. Therefore, impacts from contaminants associated with placement of the dredged sediments to the benthic community or organisms dependent upon it at the Refuge site are not anticipated.

F. Water Quality

Water quality in intertidal wetlands is influenced by the level, range, and/or timing of water temperature, salinity, pH, nutrients, oxygen availability, and turbidity, as well as the frequency and timing of tidal mixing and flushing (U.S. Navy 2014). The ebb and flow of the tides within Anaheim Bay circulate and mix ocean and salt marsh waters, and transport nutrients and organisms in and out of the system. The tides produce currents, induce small, localized changes in salinity, and alternately expose mudflats and adjacent shorelines. Tidal flushing is an important factor in dispersing pollutants, maintaining water quality, and moderating water temperature.

In an unaltered salt marsh system, salinity in the marsh can vary significantly depending upon the amount of freshwater that flows into the marsh during storm events. The system in Anaheim Bay has been disturbed to the point that the flow of freshwater into this marsh is extremely limited, which results in salinity levels comparable to ocean water, higher than can normally be found in other marshes along coastal southern California.

Unlike the salt marsh habitat in Anaheim Bay, Huntington Harbour does receive stormwater flows from storm drainage systems that direct runoff generated upstream of the Refuge through flood control channels that extend around the marsh and empty into the Bay near the entrance to Huntington Harbour.

The water body comprising the open bay portion of Anaheim Bay and Huntington Harbour is referred to as the Anaheim Bay/Huntington Harbour complex by the State Water Resources Control Board. Anaheim Bay is included on the State's 303(d) list of impaired water bodies for polychlorinated biphenyls (PCBs), sediment toxicity, and heavy metals (Nickel). Huntington Harbour is on the 303(d) list for pathogens, metals (Copper, Lead, and Nickel), PCBs, sediment toxicity, and pesticides (Chlordane) (California State Water Resources Control Board 2011).

The Santa Ana Water Board has adopted a basin plan for its region of responsibility, which includes the Anaheim Bay/Huntington Harbour complex. The basin plan contains water quality objectives, including development of numeric Total Maximum Daily Loads (TMDLs) for the 303(d) listed impairments. The TMDL is the total amount of a constituent that can be discharged while meeting water quality objectives and protecting beneficial uses. Because the Huntington Harbour is impaired, project-specific water quality plans (such as a Water Quality Management Plan) would be required by the Santa Ana Water Board to meet the TMDL requirements of this water body.

G. Noise

Noise generated during the transport of the dredge material from the Main Channel West dredge site to the pilot project site is subject to the policies and standards contained in the noise element and noise ordinance of Orange County. The County's noise ordinance exempts construction activities from the noise standard (provided that such activities take place between the hours of 7 a.m. and 8 p.m. on weekdays and Saturdays). With respect to the site proposed for sediment augmentation, sensitive receptors (e.g., developed areas) occur at least 0.5 miles beyond the boundaries of the project site.

6. Environmental Consequences

The discussion included in this section, as well as the issues addressed in the Initial Study Checklist (Appendix A), provide information needed for making informed decisions on the proposed project. Only those issues that are potentially affected by the proposed project are discussed in detail in this section. The Initial Study Checklist (Appendix A) provides documentation of our consideration of all potential environmental effects resulting from the proposed project. The direct and indirect effects of the proposed action, as well as the no action alternative, are analyzed below. Cumulative environmental consequences of implementing the proposed action and no action alternatives are addressed in Section 7 of this document. The analysis provided in this section tiers from the programmatic EA that was prepared in conjunction with the Seal Beach NWR CCP. The EA is incorporated by reference into this document. The potential environmental effects of the larger OC Parks maintenance dredging project are described in the Sunset/Huntington Harbour Maintenance Dredging and Waterline Installation Project Draft IS/MND prepared by OC Parks.

A. Air Quality

Thresholds of Significance

Appendix G, Section III of the Environmental Checklist form in the State CEQA Guidelines, states that, where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make determinations regarding air quality impacts. Because of SCAQMD's regulatory role in the Basin, the significance thresholds and analysis methodologies outlined in its CEQA Air Quality Handbook, Localized Significance Threshold Methodology for CEQA Evaluations, and Particulate Matter (PM) 2.5 Significance Thresholds and Calculation Methodology guidance documents were used in evaluating project impacts. Note that localized significance thresholds (LSTs) are based on the size or total area of the emissions source, the ambient air quality in each SRA where the emission source is located, and the distance to the sensitive receptor. The LSTs used herein are based on the project area potentially disturbed on any given day (1 acre), the project location (SRA 18, North Orange County Coastal), and the distance to the nearest sensitive receptor (25 meters).

Impact Analysis for the Proposed Action

The SCAQMD construction emissions thresholds previously presented in Table 4 are used for this assessment. SCAQMD operational emissions thresholds are not considered as the proposed pilot project will result in no operational changes. The air quality effects of the OC Parks maintenance dredging project are addressed in the OC Parks IS/MND, and will occur with or without the implementation of the proposed pilot project.

Transport and application of the sediment onto the pilot project site is expected to take between four to six weeks depending upon the application techniques that are used. These activities will result in the short-term generation of criteria pollutant and TAC emissions. Construction emissions associated with the delivery and application of up to 13,500 CY of dredged sediments from the Main Channel West site to the Refuge's pilot project site could be generated from several potential sources, including:

- the operation of one to two small boats used for monitoring construction activities;
- the operation of a small boat to install a floating pipeline from the dredge site to the application site, or the operation of a small containment barge and booster pump to transport and apply sediment from the dredge site to the application site; and
- vehicle trips by construction workers and site monitors.

The emissions calculations associated with workboats, a small containment barge, and a booster pump are based on horsepower and anticipated duration of use. If a pipeline is used to transport sediment from the dredge site to the Refuge site, the emissions associated with the Refuge pilot project would be generated by a workboat that would be needed to distribute sediment on to the site via the pipeline, another smaller boat that would be used by onsite monitors, and daily worker trips to and from construction site.

The engines used in each type of boat were assumed to be no larger than 50 horsepower (hp). If material were to be transported to the pilot project site by a small containment barge, emission would be generated by the barge's 500 hp engine and a 500 hp generator that would be needed to pump the slurry from the barge onto the pilot project site.

In estimating the emissions associated with worker commutes, it was assumed that there will be 12 worker trips per day (six employees, two trips per employee). Based on the CalEEMod default for a home-work commute in urban Orange County, total trip length was assumed to be 12.7 miles. Emissions associated with worker commutes are based on the annual average emission factors for light-duty automobiles and trucks from EMFAC2011.

Anticipated emissions associated with the implementation of the pilot project are presented in Table 12 at the daily time scale.

Table 12						
Estimate of Unmitigated Regional Construction Emissions Associated with the Implementation of the Pilot Project¹						
	Emissions (Pounds per Day)					
	VOC	CO	NO_x	SO₂	PM10	PM2.5
Workboats	1	4	6	0	0	0
Containment Barge (500 hp)	0.78	3.05	10.36	0.01	0.30	0.28
Booster Pump (500 hp)	1.3	6	16	0	0.5	0.5
Worker Commute	0	1.4	0.2	0	0.2	0
Total	3.08	14.45	32.56	0.01	1.0	0.78
<i>SCAQMD Regional Construction Thresholds</i>	<i>75</i>	<i>550</i>	<i>100</i>	<i>150</i>	<i>150</i>	<i>55</i>
<i>SCAQMD Localized Construction Thresholds</i>	<i>n/a</i>	<i>647</i>	<i>92</i>	<i>n/a</i>	<i>4</i>	<i>3</i>
<i>Exceedance of Threshold</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>
¹ Assumes the use of a containment barge and booster pump. Use of a floating pipeline from the dredge site to the pilot project site would result in fewer emissions.						

Fugitive dust emissions were assumed to be negligible during transport and application of the dredge sediments. Dredged materials will be saturated and most likely will not generate dust during dredging or during placement.

An estimate of total direct and indirect emissions generated by the implementation of the pilot project is presented in Table 13 to determine conformity with Rule 1901 of the AQMD regulations.

Compatibility with Applicable Air Quality Plan. The proposed action is a short-term project that will generate emissions below regional and localized SCAQMD thresholds, and will result in no changes in existing land use and no increases in population or employment following project completion. As a result, the implementation of the proposed action will not conflict with any air quality management plan, and impacts are considered less-than-significant.

Table 13 Estimate of Unmitigated Regional Construction Emissions over the Duration of the Sediment Augmentation Project¹						
	Emissions (tons)					
	VOC	CO	NO_x	SO₂	PM10	PM2.5
Workboats	0.023	0.09	0.135	0	0	0
Containment Barge	0.018	0.07	0.23	0	0.007	0.006
Booster Pump	0.03	0.14	0.36	0	0.01	0.01
Worker Commute	0	0.032	0.005	0	0.005	0
Total	0.071	0.332	0.73	0	0.022	0.016
<i>Rule 1901 Conformity Applicability Threshold</i>	<i>25</i>	<i>100</i>	<i>25</i>	<i>100</i>	<i>n/a</i>	<i>100</i>
<i>Exceedance of Threshold</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>-</i>	<i>No</i>
¹ Assumes 45 days for sediment transport and application, and the use of a containment barge and booster pump. Use of floating pipeline from the dredge site to the pilot project site would result in fewer emissions.						

Consistency with Adopted Air Quality Standards. Under the proposed sediment augmentation project, up to 13,500 CY of sediment from the OC Parks Sunset/Huntington Harbour maintenance dredging project will be disposed of near the dredge site, slightly reducing the emissions that would result from transporting the material a great distance either to LA-2 or to an inland site.

Implementation of the pilot project will not exceed SCAQMD Regional Construction Thresholds or SCAQMD Localized Construction Thresholds, nor will it exceed the Rule 1901 Conformity Applicability Thresholds, therefore, air quality impacts are considered less-than-significant and no mitigation is required.

Exposure to Sensitive Receptors. Although the proposed project will contribute to localized air pollutant emissions during short-term construction, implementation of the project alone is not anticipated to result in an elevated health risk to persons who may be exposed to construction related diesel fumes. SCAQMD does not consider diesel-related cancer risks from short-term use of construction equipment to be an issue (OC Parks IS/MND). Construction activities associated with the proposed project will be short in duration (four to six weeks) and will occur a sufficient distance from sensitive receptors that implementation of the pilot project is not anticipated to result in an elevated health risk to exposed persons. In addition, the project will not create substantial pollutant concentrations of criteria pollutants. The potential for impacts to sensitive receptors as a result of project implementation are therefore considered less than significant.

Objectionable Odors. The sediment to be dredged from the Main Channel West site is likely to contain organic materials that have the potential to generate objectionable odors, but any exposure would be brief and limited to the area immediately surrounding the dredging activities. Application of this material onto the Refuge site will occur using a mix of sediment and water, which will dilute any odors generated by the sediment. In addition, the application site is not located in proximity to any sensitive receptors. As such, no impacts related to odor are anticipated.

Impact Analysis for the No Action Alternative

Under the no action alternative, no sediment from the maintenance dredging project would be transported to and disposed of on the Refuge site. Therefore, emissions associated with transport of material to the site and boats used for monitoring would not be generated. However, it would still be necessary for OC Parks to dispose of the material that would have been used for the pilot project; therefore, even under the no action alternative, there would be emissions associated with transport of those same sediments to an alternative disposal site.

Compatibility with Applicable Air Quality Plan. A decision not to implement the proposed action would have no effect on the applicable air quality plan.

Consistency with Adopted Air Quality Standards. Under the no action alternative, the emissions generated from the transport and application of sediment to the pilot project would not occur. Therefore, this alternative would have no effect on adopted air quality standards.

Exposure to Sensitive Receptors. There would be no change in the potential for exposure of emissions to sensitive receptors under the no action alternative, as emissions to be generated by the disposal of sediment onto the Refuge site would be minimal.

Objectionable Odors. No objectionable odors would be generated under the no action alternative.

B. Biological Resources

Thresholds of Significance

A significant impact on biological resources may result from a project that has the potential to substantially modify habitat identified as necessary to support a species or suite of species identified as species of concern in State, Federal, local, or regional plans, policies, or regulations, or would result in a “taking” of a species listed, or proposed for listing, or a candidate for listing under the State and/or Federal Endangered Species Act, or protected by the Migratory Bird Treaty Act, or otherwise considered to have a special status in local or regional plans, policies, or regulations.

Impact Analysis for the Proposed Action

The proposed action has the potential to affect 16 acres of low salt marsh habitat on the Seal Beach NWR. Within the 16-acres, approximately 10 acres will be modified through the application of 8 to 10 inches of sediment over the existing vegetation. The remaining six acres of low salt marsh will provide a sediment trap for sediments that might flow from the 10-acre application site. As described previously, habitat quality on the site under existing conditions has been reduced to the point that the site no longer supports natural nesting habitat for the light-footed Ridgway’s rail. Prolonged immersion of the site during high tides is considered the primary cause for reduced plant vigor, including reduced cordgrass height and density (Massey et al. 1984). Plant vigor is expected to improve as a result of raising the elevation of site.

This thin-layer of sediment will cover some but not all of the vegetation on the site. Cordgrass stem height on the 16-acre site, as measured in 2011, averaged 43.2 cm and ranged from 34 to 72 centimeters. Therefore, the upper stems of the cordgrass will remain exposed. Pacific pickleweed will be affected in a similar manner. The other salt marsh plant species present on the site could be partially or fully covered by the sediment depending upon the height of the individual plants.

Based on the results of similar projects conducted in coastal salt marsh habitat along the Gulf and East Coasts (Ray 2007, Slocum et al. 2005, Ford et al. 1999), reestablishment of salt marsh vegetation at the pilot project site is expected to occur as existing plants grow up through the layer of new sediment and other low salt marsh vegetation reestablishes through natural recruitment from adjacent seed sources. It is anticipated and is a goal of the pilot project that the species composition in the 10-acre application site will change during the reestablishment period to favor increases in cordgrass stem terminal heights.

Slocum et al. 2005 postulates that sediment slurry enrichment increases salt marsh plant vigor by increasing both elevation and soil bulk density. Although thin-layer sediment augmentation has been proven successful elsewhere (Ray 2007), these projects were conducted where smooth cordgrass (*Spartina alterniflora*) is present. No thin-layer sediment augmentation studies have been conducted on Pacific cordgrass.

Although limited, there is some discussion of natural Pacific cordgrass recruitment in the literature. Ward et al. 2003 describes the establishment of Pacific cordgrass on a 6.5-hectare mudflat in Tijuana Estuary following sedimentation from winter storms. Initial establishment occur as seedlings in 1993, and by 1997, over 80 new clones were counted.

Year 2 post-construction monitoring results for the South San Diego Bay Coastal Wetland Restoration and Enhancement Project (Nordby Biological Consulting and Tijuana River National Estuarine Research Reserve 2014) indicate that some transplanted Pacific cordgrass rhizomes that displayed no survival success the first year did develop above ground plant coverage in year 2. The report states, "Transplanted cordgrass rhizomes frequently survive below ground while above ground biomass appears dead or has decomposed . . . [these rhizomes] subsequently support aerial shoots one or more growing seasons afterward."

The Refuge currently supports approximately 565 acres of salt marsh vegetation; the proposed pilot project has the potential to modify approximately 2.8 percent of the total salt marsh habitat on the Refuge. The impacts are expected to be temporary (two to five years). An important component of the pilot project is monitoring how the salt marsh vegetation and other organisms react to the application of the sediment and the increase in the elevation of the marsh plain. If the marsh responds as predicted, additional sediment augmentation within the Refuge would likely occur in the future in an effort to support the recovery of the light-footed Ridgway's rail and improve the habitat quality of the Refuge's low salt marsh vegetation.

Although the project is intended to benefit salt marsh habitat and will affect only a small area of salt marsh habitat, failure of the site to revegetate as predicted would represent a significant adverse effect unless adequate mitigation measures are implemented to reduce the impacts to below a level of significance. To avoid adverse effects to salt marsh habitat, the project scope includes a proposal to reestablish salt marsh vegetation on the site if after five years following sediment application, salt marsh vegetation has not returned to conditions at least similar to those present within the project site prior to sediment application. Site management and monitoring will continue until salt marsh vegetation is restored to pre-project conditions. Mitigation Measure BIO-1 will ensure that potential impacts to salt marsh vegetation will be mitigated to less-than-significant.

Mitigation Measure BIO-1: If, five years after sediment augmentation, reestablishment of native salt marsh vegetation to a density and percent cover similar to that present within the project site prior to sediment application has not occurred, the USFWS shall develop and implement a restoration plan to reestablish native salt marsh vegetation at a density and percent cover similar to pre-project site conditions. Site management and monitoring shall continue until salt marsh vegetation has been restored to the site in accordance with the specifications of the restoration plan.

Construction related disturbance on and adjacent to the pilot project site would occur for a period of from four to six weeks. To avoid impacts to nesting birds, no construction will be permitted during the nesting season. Further, construction is scheduled to occur in late fall or early winter when water temperatures are cooler, reducing the potential for the presence of sea turtles in the project area. Mitigation Measure BIO-2 will ensure that adverse effects to wildlife will be minimized.

Mitigation Measure BIO-2: A qualified biologist shall be on site during construction to monitor for the presence of sensitive species and other wildlife. The biologist shall have the authority to halt construction when wildlife is observed within or near the project site. Work crews will be briefed on how to identify sea turtles and marine mammals that could occur in water areas affected by the implementation of the pilot project. The biological monitor will prepare incident reports of any observed sea turtle activity and shall provide such reports to National Marine Fisheries Service (NMFS) within 24 hours of an observation.

Any work vessels (e.g., containment barge, workboat) moving about the project site shall comply with a five-mile per hour speed limit. In the event of a collision between the containment barge or workboat and a marine mammal or sea turtle, the USFWS shall immediately contact the NMFS Southwest Regional Office's Stranding Coordinator, and submit a report to the NMFS within 24 hours.

To reduce the potential for impacts to sea turtles, sediment transport and application within the Refuge shall only occur between November 1 and February 15, when water temperatures are lower.

The tidal channels located adjacent to the application site support eelgrass habitat. The introduction of sediment and/or increased turbidity within these channels could have an adverse effect on eelgrass. To minimize the potential for sediment to move off the site, a vegetated buffer will be maintained around the 10-acre application site, and the area will be monitored during sediment application. If necessary, additional measures will be implemented, including the installation of silt fencing or straw wattles and/or the implementation of other forms of sediment control.

Eelgrass surveys will be conducted in the tidal channels prior to and following sediment application to determine if eelgrass has been adversely affected during sediment transport to the site and/or from any sediment that migrates from the site into the tidal channels during application. Pre- and post-application surveys will also document habitat conditions at a reference site elsewhere on the Refuge in order to compare data to a site unaffected by project implementation. The reference site and a potential restoration site, should one be required, will be determined in consultation with NOAA's National Marine Fisheries Service (NMFS) during the required consultation related to Essential Fish Habitat.

Any loss of eelgrass associated with project implementation will require conformance with the Southern California Eelgrass Mitigation Policy (SCEMP). Provisions of the SCEMP require that any impacts to eelgrass be mitigated in a manner that compensates for direct habitat loss and loss of functions while mitigation habitat is becoming established. The SCEMP also requires monitoring of mitigation areas and suitable local reference sites for five years to assess mitigation site performance against that of a natural reference bed.

Mitigation Measure BIO-3 will ensure that any impacts to eelgrass that may occur during sediment application will be mitigated to below a level of significance.

Mitigation Measure BIO-3: A vegetated buffer shall be maintained around the 10-acre application site, and the buffer area shall be monitored during sediment application to ensure that any sediment moving off the pilot project site is being trapped within the vegetated buffer area. If monitoring indicates that the sediment has the potential to migrate from the marsh into the adjacent tidal channel, additional measures shall be implemented to minimize the loss of sediment from the site. Such measures could include, but are not limited to, installing silt fencing, silt curtains, or straw wattles along the edge of the site.

Mitigation Measure BIO-4 will ensure that any impacts to eelgrass from project implementation are identified and mitigated to below a level of significance in accordance with existing policy.

Mitigation Measure BIO-4: Eelgrass surveys shall be conducted within the tidal channels that abut the 16-acre pilot project site, as well as another reference site within the Refuge, during the active growth phase for the vegetation (typically March through October). The distribution, density, and relationship to depth contours of any eelgrass beds that may be impacted by project implementation shall be thoroughly mapped and mapping protocols shall be consistent with those outlined in the Southern California

Eelgrass Mitigation Policy (SCEMP). The same surveys shall be conducted within 30 days of completing the sediment application process and then annually for two years following application.

If impacts to eelgrass from project implementation are identified, compliance with the SCEMP shall be initiated and monitoring of the mitigation area(s) and a suitable local reference site shall be implemented per the requirements of the SCEMP. Monitoring reports shall be filed with the resource agencies and the California Coastal Commission.

The implementation of measures to protect and if necessary restore eelgrass within the tidal channels located adjacent to the pilot project site, will ensure that no adverse effects to fisheries within Anaheim Bay will occur as a result of sediment augmentation.

The monitoring component of the pilot project has the potential to result in trampling of salt marsh vegetation and disturbance to avian species. Monitoring will require visual and physical access to the site both before and after sediment augmentation. Most monitoring activities will occur on an annual basis and will require a human presence on the project site for period of one to two days for most activities, but up to a week for more site intensive study such as elevation and vegetation surveys. Should Ridgway's rails nest naturally within the project area during the five-year monitoring effort, any work near the nests, with the exception of Ridgway's rail nest surveys, will be avoided during the breeding season (March 1 to September 15). Because of the limited presence of monitors within the site during annual monitoring and the avoidance of the area during the breeding season for all but Ridgway's rail nesting surveys, the potential for adverse effects to sensitive vegetation and avian species will be less than significant.

With respect to listed and sensitive species, the application of sediment onto 10 acres of the 16-acre pilot project site could result in direct and indirect impacts to the light-footed Ridgway's rail. No natural nesting of Ridgway's rails occurs within the project site due to the limited height of the existing cordgrass and the extent of inundation experienced at this location. The site also offers limited cover to protect the rails from predation. During lower tides, the site does provide the rails with foraging opportunities. These foraging opportunities will be eliminated for up to two years. The temporary loss of foraging habitat is a small portion (2.8 percent) of the total foraging habitat available for rails on the Refuge; therefore, this temporary loss will not represent a significant adverse effect to rails.

There are currently three artificial nesting platforms (115, 117, and 132) anchored within or adjacent to the 16-acre project site (refer to Figure 5). Two of these platforms, 115 and 117, were used for nesting during the 2014 nesting season, although the nest on platform 115 was depredated and therefore unsuccessful. (Not all of the 95 platforms are occupied in given year.) To ensure that rails are not using the area during sediment application, the three nesting platforms will be removed following the end of the Ridgway's rail nesting season.

Disturbance during sediment application could also result in the relocation of avian species of concern to other areas of the Refuge. Because the affect is short term and the area to be impacted is very limited in size, disturbance and the temporary loss of foraging habitat will not represent a significant adverse effect to avian species.

To avoid any direct take of rails or other avian species during project implementation, Mitigation Measure BIO-5, presented below, will be implemented. Implementation of this measure will reduce any potential adverse impacts to rails and other avian species to less-than-significant levels.

Mitigation Measure BIO-5: To avoid impacts to light-footed Ridgway's rails and other avian species in the vicinity of the project site, sediment application shall not occur during the nesting season. Additionally, the three artificial light-footed Ridgway's rail nesting platforms located within and adjacent to the project site shall be removed after the end of the breeding season (after September 15) preceding sediment application to minimize the presence of rails in the area.

Prior to the daily application of sediment onto the pilot project site, a qualified biologist shall survey the 16-acre site and adjacent areas for the presence of rails and other birds. If any are present, an air horn or cracker shells will be deployed to move the birds off the site prior to sediment application. If noise proves ineffective, physical presence may be used to haze birds to move to other parts of the Refuge. Also, monitoring shall continue throughout the day to discourage rails and other birds from moving into the project site, particularly during periods when sediment is not being sprayed, such as during breaks or when adjustments in the application process are being implemented.

No impacts to the California least tern are anticipated, as this species is not present on the Refuge between November and February 15 when the project will be implemented.

Seablite, a California Special Status Species, is located at the edge of the project site adjacent to the southern tidal channel. Based on its location, this population of seablite will be included within the proposed vegetative buffer, and will likely experience minimal disturbance due to the project. Because this occurrence of seablite is limited to a small area of the project site and seablite, a short-lived species, recruits in disturbed areas through the dispersal of seeds, disturbance or loss of the existing specimens of seablite within the project site will not represent a substantial loss of the species within the Refuge. In addition, research on recruitment of various marsh species in southern California marshes indicates that seablite readily recruits in disturbed areas where a seed source is available to support recruitment (Lindig-Cisneros and Zedler 2002, Morzaria-Luna et al. 2004), therefore, natural recruitment of this species onto the project site is likely to occur within one or two years of sediment application. Impacts to seablite will be less-than-significant.

Placement of a pipeline in the open waters of the bay to transport the sediment to the site from the Main Channel West and/or use of a containment barge in the main tidal channels on the Refuge could adversely affect eelgrass and sea turtles. In addition, increased turbidity or sediment movement from the application site into the adjacent tidal channels could adversely affect the extent and/or quality of the eelgrass beds present in these tidal channels. Implementation of Mitigation Measure BIO-4 will reduce potential adverse impacts on eelgrass to less-than-significant, and the implementation of Mitigation Measure BIO-2 will reduce potential adverse impacts sea turtles and other sensitive marine species to less-than-significant.

The proposal to apply a thin-layer of sediment over existing coastal salt marsh habitat is expected to result in temporary impacts to the site's coastal salt marsh ecosystem, with the ultimate goal of enhancing the habitat quality for light-footed Ridgway's rails and other organisms supported by coastal salt marsh. Because the effects of the project will be temporary and will affect less than 2.8 percent of the total salt marsh habitat within the Refuge, the temporary loss of habitat function in this portion of the Refuge is considered less-than-significant.

Cordgrass and other coastal wetland plants that are currently present on the site are expected to grow up through the sediment or reestablish via vegetative or seed recruitment within a period of two years. Pre and post-application monitoring of the physical and biological responses of the site to sediment application are an integral part of the overall project design. If after five years of monitoring, reestablishment of vegetation to conditions similar to those present within the designated reference site has not occurred and project impacts are therefore considered long-term, the implementation of Mitigation Measure BIO-1 will reduce potential adverse impacts to less-than-significant levels.

Impact Analysis for the No Action Alternative

The potential for impacts to biological resources from the maintenance dredging project, which would be implemented with or without the Refuge's sediment augmentation component, would be identical to those addressed above. The implementation of mitigation measures would reduce potential impacts to a less-than-significant level. As no activities would be proposed on the Refuge under the no action alternative, there is no potential for adverse effects to biological resources.

C. Cultural Resources

Thresholds of Significance

A significant impact to cultural resources may result from a project that has the potential to:

- Alter (e.g., cause the adverse physical or aesthetic effects and/or the destruction of) a prehistoric or historic building (including an architecturally significant building), structure, object, or site;

- Cause a substantial adverse change in the significance of a historical or unique archaeological resource;
- Impact existing religious or sacred uses; or
- Disturb any human remains, including those interred outside of formal cemeteries.

Impact Analysis for the Proposed Action

Effects on Significant Historical and/or Archaeological Resources. To avoid adverse effects to cultural resources, when a project is first being considered for implementation that would require ground disturbance, Refuge staff submits a Request for Cultural Resource Compliance to the Service's Cultural Resources Program. The Request includes a map, indicating the APE for the project site and any associated access requirements that may involve grading, along with a detailed project description. Based on this information, Cultural Resource staff will determine the appropriate measures to be implemented to protect cultural resources. It may be determined that the action is a routine undertaking that would have little or no potential to affect historic or archaeological properties. In this case, the action would fall under the terms of the Service's Programmatic Agreements (PA) with the State Historic Preservation Office (SHPO) and the Advisory Council for Historic Preservation (Council) regarding the administration of routine undertakings under the NHPA in the states of California, Idaho, Nevada, Oregon, and Washington.

Through the PA, the Service has identified a process to review how routine undertakings may fall under the terms of the PA's Appendix A or Appendix B. Appendix A projects are defined as those "types of undertakings requiring consultation with the Regional Archaeologist/Historic Preservation Specialist (Specialist) and otherwise excluded from case-by-case review and consultation with the SHPO and requiring no cultural resource identification effort." Appendix B projects are those "requiring consultation with the Regional Archaeologist/Historic Preservation Specialist and otherwise excluded from case-by-case review and consultation with the SHPO but will be subject to a cultural resource identification effort."

Projects that fall under Appendix A can be cleared by the Specialist with a memo and the project can proceed. A project determined to fall under Appendix B requires field reconnaissance. If no historic properties are identified, the Specialist or archaeologist approved by the Specialist can issue clearance and the project can proceed. The Specialist subsequently completes an Appendix B Short Report for the project. All clearances include the stipulation that if cultural resources are discovered during the project, work will halt and the Service's Regional Archaeologist shall be contacted.

The Service's Regional Cultural Resources Team submits an annual report to the SHPO and the Council documenting the number and types of undertakings excluded from case-by-case review under the terms of Appendix A and Appendix B.

An Appendix A determination has been made for the Service's sediment augmentation project. This determination indicates that the Service has evaluated the potential impact of the proposed project on cultural resources and no impacts are anticipated. No further cultural resource identification effort is necessary for the project. In compliance with the terms of the PA, the project will be reported to the SHPO in the annual report, prepared and submitted at the end of fiscal year 2014.

The existence of cultural resources can never be predicted with certainty; therefore, the implementation of Mitigation Measure CR-1 will ensure that potentially significant impacts resulting from the encounter of an archaeological resource will be reduced to a level below significance.

Mitigation Measure CR-1: In the event that cultural resources are discovered during any disturbance to subsurface material on the 16-acre pilot project site, the ground disturbing activity shall be halted, the Service's Regional Archaeologist and the Conservancy shall be notified, and additional consultation shall be initiated to ensure compliance with the NHPA and other applicable Federal regulations and policies. If any cultural resources are discovered on State lands during the implementation of this project, the USFWS and Conservancy shall also consult with the California State Lands Commission's Assistant Chief Counsel.

Effects on Unique Paleontological Resources. No substantive excavation or digging is proposed on the 16-acre pilot project site; therefore, no impacts to paleontological resources will occur.

Impact Analysis for the No Action Alternative

Under the no action alternative, sediment would not be applied to the project site and no other actions would be taken at that site that would result in a potential for adverse effects to cultural or paleontological resources.

D. Greenhouse Gas Emissions

Thresholds of Significance

Appendix G, Section III of the Environmental Checklist form in the State CEQA Guidelines, states that, where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make determinations regarding air quality impacts. State CEQA Guidelines Section 15064.4 provides guidance to lead agencies for determining the significance of impacts from GHG emissions, and Section 15064.4(a) provides that a lead agency should make a good-faith effort, to the extent possible, based on scientific and factual data to describe, calculate, or estimate the amount of GHG emissions resulting from a project. State CEQA Guidelines Section 15064.4(b) also provides that, when assessing the significance of impacts from GHG emissions, a lead agency should consider (1) the extent to which the project may increase or reduce GHG emissions compared with existing conditions, (2) whether the project's GHG emissions exceed a threshold of significance that the lead

agency determines applicable to the project, and (3) the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

The State CEQA Guidelines do not provide numeric or qualitative thresholds of significance for evaluating GHG emissions. There are currently no adopted quantitative thresholds relevant to the project. SCAQMD has adopted a 10,000 MT significance threshold level for industrial facilities where SCAQMD is the lead agency. However, this 10,000 MT significance threshold level is not applicable to the proposed project because the project is not an industrial facility. Although SCAQMD has drafted a 3,000 MT significance threshold level for commercial/residential projects, no threshold has been proposed or adopted for construction or public works projects (SCAQMD 2008). Other quantitative thresholds have been adopted or recommended by other public agencies, including other air districts, or recommended by experts throughout the state, such as the 900 MT threshold level contained within California Air Pollution Control Officers Association's (CAPCOA's) CEQA and Climate Change Report (CAPCOA 2008) and thresholds adopted in statewide jurisdictions throughout the state. CAPCOA's 900 MT threshold level is the lowest quantitative threshold within the state. Thus, for purposes of this analysis, both direct and indirect GHG emissions from the project are discussed in regard to CAPCOA's 900 MT threshold level.

Note that GHGs and climate change are exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective (CAPCOA 2008). Therefore, in accordance with scientific consensus regarding the cumulative nature of GHGs, the analysis herein analyzes the cumulative contribution of project-related GHG emissions.

Impact Analysis for the Proposed Action

Generation of GHG Emissions. The delivery and application of up to 13,500 CY of dredged sediments from the Main Channel West site to the Refuge project site will result in the short-term generation of GHG emissions, with the majority of the activities, and thus the majority of the GHG emissions, occurring over a period of four to six weeks. For purposes of calculating GHG emissions, it was assumed that emissions could be generated for up to 45 days. Construction activities associated with the project will result in GHG emissions associated with fuel combustion from two workboats (500 hp), commuter vehicles traveling to and from the project site (12 trips/day), and depending on how sediment is transported to the site, a containment barge (500 hp) and booster pump (with a motor ranging from 150 hp to 500 hp). Estimated emissions associated with construction activities are summarized in Table 14. A description of the methodology used in estimating project-related emissions is provided under the air quality discussion.

Table 14
Estimate of GHG Emissions Associated with the Proposed Pilot Project

	Emissions (total metric tons)			
	CO ₂	CH ₄	N ₂ O	CO ₂ e
Workboats (2 w/ 500 hp motor)	64.3	0	0	64.3
Containment Barge (500 hp motor)	7.5	0	0	7.5
Booster Pump (150 to 500 hp motor) ¹	26.3	0	0	26.3
Worker Commute	7.7	0	0.02	13.7
<i>Maximum Total</i>	<i>113.4</i>	<i>0</i>	<i>0.02</i>	<i>119.4</i>
<i>Maximum 30-year Amortized Total</i>	—	—	—	3.98
CAPCOA Threshold	—	—	—	900
Exceed Significant Threshold?	—	—	—	No

¹ Calculation assumes worst case (500 hp)

Following the methodology prescribed by the SCAQMD CEQA Significance Threshold Working Group, total project-related construction emissions were amortized over the life of the project, defined by SCAQMD as 30 years, to obtain total annual GHG emissions (CO₂e) of less than 4 metric tons. The CAPCOA threshold is 900 metric tons. Consequently, the impact of GHG emissions generated from this project is considered less than significant and not adverse. Therefore, no mitigation is proposed.

Once the sediment application process is completed, emissions from small boats used for monitoring could be generated for 48 hours over the course of a year, with monitoring proposed for at least five years. Monitoring will likely occur using a combination of motorized and non-motorized vessels. The use of some non-motorized vessels will reduce the total emissions. Overall, GHG emissions associated with the monitoring program will be less than significant.

Consistency with Applicable Plans, Policies, or Regulations. AB 32 identified the acceptable level of GHG emissions in California in 2020 as 427 million metric tons of CO₂e, which is the same as the 1990 GHG emissions level and approximately 28.5 percent less than 2020 BAU conditions (596 million metric tons of CO₂e). It should be noted that the 2020 BAU has been revised downward by the Air Resources Board (ARB) to 545 metric tons of CO₂e, which reflects reduced GHG emission estimates resulting from the recent economic downturn. To reach the GHG emissions target level, there will have to be widespread reductions in GHG emissions across California. Some reductions will need to come in the form of changes pertaining to vehicle emissions and mileage standards. Some will come from changes pertaining to sources of electricity and increased energy efficiency at existing facilities. The remainder will need to come from plans, policies, or regulations that will require new facilities to have lower carbon intensities than they have under BAU conditions.

As discussed above, the GHG emissions to be generated by the proposed action will be below the CAPCOA threshold of 900 metric tons. As such, the proposed project will be consistent with the AB 32 goal of reducing statewide GHG emissions to 1990 levels by 2020. The project will not conflict with this GHG emissions-reduction plan.

The enhancement of coastal salt marsh vegetation, which is the intent of this project, will provide benefits related to carbon sequestration. Studies indicate that marsh grasses and other macrophytes, microalgae on the mud surface, and phytoplankton are the three primary components of the natural salt marsh community that remove large amounts of CO₂ from the atmosphere and store the carbon in the marsh soils (Choi et al. 2004, Brigham et al. 2006). Although the benefits will be small because the project is limited to 10 acres, if thin-layer sediment augmentation proves to be an effective sea level rise adaptation strategy for conserving coastal salt marshes threatened by inundation, there will be additional benefits of implementing thin-layer sediment augmentation in the future.

Impact Analysis for the No Action Alternative

Generation of GHG Emissions. Under the no action alternative, no sediment from the maintenance dredging project would be transported to and disposed of on the Refuge site. Therefore, emissions associated with transport to the site and boats used for monitoring would not be generated. The 10,000 to 13,500 CY of dredged sediment from Huntington Harbour would however still require disposal, therefore, even under the no action alternative, GHG emissions would be produced during the transport of these sediments to a different disposal site.

Consistency with Applicable Plans, Policies, or Regulations. A decision not to implement the proposed action would have no effect on the applicable plans, policies, or regulations.

E. Hazards and Hazardous Materials

Thresholds of Significance

The following thresholds of significance are based on Appendix G of the CEQA Guidelines. Project implementation would result in significant impacts related to hazardous materials if any of the following would occur:

- A significant hazard to the public or the environment would be created through the routine transport, use, or disposal of hazardous materials;
- A significant hazard to the public or the environment would be created through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Hazardous emissions would be emitted or hazardous or acutely hazardous materials, substances, or waste would be handled within one-quarter mile of an existing or proposed school; or
- The project site occurs on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.

Impact Analysis for the Proposed Action

Neither the Main Channel West maintenance dredging site nor the Refuge receiving site contain hazardous materials that could adversely affect the environment. Further, the contaminated sites located within Naval Weapons Station Seal Beach, are not considered a

threat to offsite locations (Southwest Division, Naval Facilities Engineering Command 1995), including the 16-acre project site. Therefore, impacts related to hazardous materials within the site that would create a significant hazard to the public or the environment will not occur, and no mitigation measures are required.

Implementation of the proposed pilot project requires the operation of boats and other motorized equipment within the tidal channels of the Refuge. Such operations have the potential to release hazardous materials such as gas and oil into the waterway due to spills or leaks related to the operation of the machinery. Requirements of appropriate local and State agencies for the implementation of best management practices (BMPs), the provision of spill kits on all vessels, and adherence to spill reporting requirements minimizes the potential for adverse effects to waterways as a result of the proposed operation. Because the project will comply with Federal, State, and local hazardous waste regulations, impacts related to the inadvertent release of hazardous materials into the waterways surrounding the project site will be less than significant, and no mitigation will be required.

The dredged material to be applied to the project site has been tested and found to be appropriate for placement within the 16-acre pilot project site. Therefore, the project will not create a significant hazard due to the disposal of hazardous materials. Impacts will remain less than significant, and no mitigation measures are required.

Impact Analysis for the No Action Alternative

No activities would occur on the 16-acre pilot project site under this alternative; therefore, there would be no potential for adverse effects related to hazardous materials.

F. Water Quality

Thresholds of Significance

Adverse impacts to water quality would be considered significant if the action would violate any water quality standards or waste discharge requirements, substantially increase downstream sedimentation or turbidity levels in Anaheim Bay or the marsh complex, introduce contaminants (non-point source pollution) into the watershed, or otherwise substantially degrade water quality.

Impact Analysis for the Proposed Action

Sedimentation and Turbidity. The pilot project will involve the spraying of 10,000 to 13,500 CY of sediment onto 10 acres of the 16-acre site located adjacent to two tidal channels in Anaheim Bay. As a result, the project has the potential to introduce sediment into the adjacent tidal channels. Turbidity levels in these adjacent waters will increase, at least temporarily, if sediments in the dredge slurry move off the site and into adjacent tidal channels. Monitoring of sediment movement and turbidity levels will occur during the sediment application process and application methods will be adaptively managed to ensure that movement of sediment off the site is minimized. Measures such as, but not limited to, silt fencing, a silt curtain, or straw wattles will be installed if proposed vegetative buffers around the site cannot adequately maintain the sediment within the project boundary.

Following completion of the application process, post-application monitoring will include evaluation of sediment retention on the site and turbidity levels in the adjacent tidal channels. Turbidity sensors will be deployed to measure suspended sediment concentrations in the water. Following sediment application, sediment retention in the treatments will be monitored using cryo-coring within subplots that have been pre-treated with a feldspar marker horizon or other accepted methods for monitoring sediment retention. The specific techniques are currently being evaluated in consultation with researchers from the U.S. Geological Survey (USGS), UCLA, and California State University Long Beach.

According to Ray (2007), based on experiences in Gulf Coast, spray disposal operations, which have the capability to deliver a variety of soil types ranging from sands to heavy clays and organic sediments, can be modified to target specific sites and avoid sensitive areas. Cahoon and Cowan (1987, 1988) report that in their experience, water from the liquid slurry rapidly drains off, quickly leaving the deposited sediment without producing unusually high levels of turbidity. The sediment to be applied to the pilot project site consists of a mixture of silt, sand, and clay (refer to Table 11), which has a moderate potential for localized increases in turbidity should material move off this site. Because this practice has not been attempted on the Pacific Coast, it will be necessary to adaptively manage the application process to meet project design criteria, including minimizing the potential for the introduction of sediment into the tidal channels that abut the site.

Mitigation Measures WQ-1 and 2 will ensure that appropriate actions are implemented to reduce the potential for turbidity associated with transporting and applying sediment to the 16-acre pilot project site. Implementation of these measures will reduce potential impacts to a less-than-significant level.

Mitigation Measure WQ-1: Prior to initiation of sediment transport and application to the pilot project site, the USFWS shall submit an application to the Santa Ana Regional Water Quality Control Board for coverage under a 401 Certification. The USFWS shall implement all conditions included in the 401 Certification, including the implementation of measures to reduce potential increases in sedimentation, turbidity, and other impacts associated with the transport and beneficial use of dredge material for habitat enhancement.

Mitigation Measure WQ-2: To reduce the potential for sediment to enter adjacent waterways, best management practices (BMPs) shall be implemented during all phases of the project. BMPs shall include providing approximately six acres of vegetated buffer around the application site; periodic inspection of the slurried sediment pipeline (if used); and monitoring for excessive turbidity near the transport pipeline or containment barge and associated sediment distribution apparatus (e.g., rainbow sprayer, open pipe, end-of-pipe baffle impingement). If a substantial leak is identified in the slurry pipeline, the affected pipeline segment shall be immediately repaired or replaced, or a silt curtain or similar measure shall be employed to capture and retain sediment at the source of the leak.

Monitoring of sediment movement and turbidity levels shall occur during and after sediment application. Movement of sediment on the site shall be adaptively managed until adequately compacted to ensure that movement of sediment off the site is minimized. Measures such as installation of silt fencing, a silt curtain, or straw wattles shall be installed if proposed vegetative buffers around the site cannot adequately maintain the sediment within the project boundary.

Chemical Pollutants. Based on the results of the sediment characterization (Kinnetic Laboratories, Inc. and Moffatt & Nichol 2014) conducted for the sediments to be dredged from the Main Channel West site, the sediment chemistry will not result in the release of any chemical constituents into adjacent waters that would represent cause for concern. Therefore, the sediments to be disposed of on the pilot project site will not represent a potentially significant impact to water quality with respect to any chemical constituents.

Impact Analysis for the No Action Alternative

The potential for impacts related to increased turbidity that could result from sediment transport and application onto the Refuge project site would not occur under the no action alternative.

G. Noise

Thresholds of Significance

An action that generates noise levels at the property line in excess of the affected city's noise standards would be considered a significant adverse effect.

Impact Analysis for the Proposed Action

Noise associated with the proposed pilot project will be generated by workboats, the flow of sediment from the application sprayer, and possibly a containment barge and booster pump. The noise will occur for a period of four to six weeks. However, this activity will occur more than 1,000 feet from the nearest dwelling unit or other sensitive receptor, therefore, residents will be unaffected by noise generated at the project site. The temporary increase in noise at the project site is considered less than significant, and no mitigation measures are required.

Impact Analysis for the No Action Alternative

The potential for temporary increases in noise associated with maintenance dredging, which would be implemented with or without the Refuge's sediment augmentation component, would be identical to those address above. The implementation of Mitigation Measure NOI-1 would reduce potential impacts to a less-than-significant level. No noise would be generated on the Refuge from construction equipment under the no action alternative.

7. **Cumulative Effects**

The proposed project would not result in any impacts to aesthetics or visual quality, air quality, agricultural resources, land use or traffic and transportation; the project would not involve the handling, disposal, or transport of hazardous materials or cause a hazardous release; the project is not located in a valuable mineral resource area; it would not add to the regional population; and it would not substantially increase the use of public services or utilities such that new services would be required. Therefore, any less-than-significant impact the proposed project has on these resources would not contribute to significant cumulative impacts to a considerable degree when combined with past, present, and reasonably foreseeable cumulative projects. Impacts related to these environmental topics would be less than cumulatively considerable.

As described in the previous sections of this document, the proposed project and the no action alternative would result in less-than-significant direct impacts on biological resources, cultural resources, and water quality with the implementation of required mitigation measures identified in the aforementioned resource areas of this document.

A cumulative impact could occur if the project would result in an incrementally considerable contribution to a significant cumulative impact in consideration of past, present, and reasonably foreseeable future projects for each resource area. The cumulative study area is confined to an approximately 2-mile radius around the project site. However, for some resources, cumulative impacts are considered over a greater area, and are addressed accordingly.

The following analysis evaluates the potential for the project to contribute considerably to a cumulative impact.

Biological Resources

Proposed Action

Eelgrass. Eelgrass habitat exists on the bottom of the Harbour floor within the proposed dredge footprint and in the subtidal channels adjacent to the Refuge project site. If impacts to eelgrass as a result of project implementation are identified, they will be mitigated by restoring eelgrass in another location in the area in accordance with Mitigation Measures BIO-4. Past dredging projects have implemented similar mitigation measures for impacts to eelgrass. Current and future projects within the Harbour would be conducted by OC Parks, and similar requirements for mitigation would apply to those projects. Therefore, the proposed action will not contribute to a cumulative loss of eelgrass.

Light-footed Ridgway's Rail. Implementing the proposed action will result in the short-term loss (two to five years) of approximately 2.8 percent of the total foraging habitat within the Refuge. This temporary loss is not expected to impact the existing rail population on the Refuge. In addition, any direct or indirect impacts to rails will be mitigated through the implementation of Mitigation Measures BIO-1 and BIO-5. As the intent of the proposed

action is to benefit these rails by improving habitat quality at the project site and providing valuable data regarding the effectiveness of the proposed action of improving habitat elsewhere on the Refuge, a benefit to rails is anticipated as a result of this project. The proposed action will not contribute to cumulative adverse effects to rails.

Eastern Pacific Green Turtle and Sensitive Marine Mammals. The implementation of Mitigation Measure BIO-2 will ensure that no adverse effects to sea turtles or sensitive marine mammals would occur as a result of the proposed action; therefore, the proposal will not contribute to a cumulatively significant impact.

Salt Marsh Vegetation. The proposed action will result in short term loss of approximately 2.8 percent of the total salt marsh habitat on the Refuge, with the intent of improving habitat quality following reestablishment of native salt marsh vegetation on a higher marsh plain. Mitigation Measure BIO-1 will ensure that no long term loss of salt marsh would occur. As such, the proposal will not contribute to a cumulatively to the loss of salt marsh vegetation.

No Action Alternative

No activities would occur on the Refuge under this alternative. Present and future projects would comply with the requirements of the Migratory Bird Treaty Act, Endangered Species Act, and other Federal and State regulations and policies related to the project of sensitive species and habitats to avoid and/or mitigate potential impacts to sensitive resources. Changes from the proposed project in combination with other past, present, and reasonably foreseeable future projects would not contribute to a cumulatively considerable impact on biological resources.

Cultural Resources

Under both the proposed action and no action alternative, present and future projects in the area would be required ensure the protection of cultural resources. Due to the site-specific nature of cultural resources impacts, changes from the proposed project in combination with other past, present, and reasonably foreseeable future projects will not contribute to a cumulatively considerable impact. After the incorporation of the mitigation measures provided herein the project is not expected to impact cultural resources, or to have any cumulative impacts on cultural resources.

Greenhouse Gas Emissions

The proposed action will generate GHG emissions and will contribute, albeit incrementally, to the total GHG emission in the Air Basin. However, the GHG emissions associated with the implementation of the pilot project will be below the CAPCOA threshold of 900 metric tons and below SCAQMD's thresholds, which were adopted to help achieve the GHG emissions reduction goals of AB 32. As such, the proposed project will be consistent with the AB 32 goal of reducing statewide GHG emissions to 1990 levels by 2020. The project will not conflict with this GHG emissions-reduction plan and will not represent a significant adverse cumulative effect with respect to GHG emissions.

Further, the project is intended to improve vegetation vigor in coastal salt marsh habitat. If successful, thin-layer sediment augmentation could be implemented elsewhere along the California coast as an adaptation strategy for addressing sea level rise in coastal salt marsh habitats, particularly in those salt marshes where there will be no opportunity for inland migration. The result would be the preservation of significant acreage of coastal salt marsh habitat, which annually sequesters carbon at a rate two to four times greater than mature tropical forests and stores three to five times more carbon per equivalent area than tropical forests (NOAA Habitat Conservation, www.habitat.noaa.gov/coastalbluecarbon.html).

Water Quality

The geographic scope for cumulative impacts on hydrology and water quality includes the Coastal Plain of Orange County Groundwater Basin. The cumulative setting for water quality includes all the development and infrastructure that have occurred in the areas surrounding and upstream of the Refuge in the past and would be expected to occur in the future. Implementation of either the proposed action or the no action alternative has the potential to contribute to cumulative water quality impacts by direct in-water disposal (at approved specified sites) and indirectly discharging dredged material during transport and application on the Refuge project site. Such occurrences could contribute to a violation of WDRs generation of stormwater runoff during construction and operation. The majority of the past, present, and reasonably foreseeable future projects would have associated construction impacts with the potential to result in discharge of stormwater to surface waters, either directly or, more commonly, via a local stormwater collection system. All of these projects have been and would be required to comply with regulatory agency requirements for disposal of dredge material and construction stormwater requirements of the local jurisdiction and compliance with the general NPDES permit for construction stormwater discharges. Furthermore, the BMPs and project design features would minimize the potential for sedimentation into the bay and tidal channels that could result from project implementation. All impacts resulting from the proposed project related to water quality will be less than significant. Thus, water quality impacts related to the proposed project will be less than significant and will not be cumulatively considerable.

Noise

The cumulative study area for noise includes the areas immediately surrounding the project site. Because there will be no operational aspects of the proposed action or the no action alternative that could contribute any noise, cumulatively significant impacts are addressed for construction only. Construction activities will occur within the permitted timeframes, as prescribed by Chapter 8.40.090[d] of the City's Noise Ordinance. Similarly, any other projects that would occur during the same time as the proposed project would be required to comply with the City's Noise Ordinance. Because compliance with the City's Noise Ordinance would be enforced for any present and/or future cumulative projects in the area, the proposed project will not contribute to a cumulatively considerable impact on noise during construction.

8. Direct or Indirect Environmental Effects on Human Beings

Based on the analysis presented in this document, the proposed project will have potentially significant environmental effects on biological resources, cultural resources, and water quality that could cause substantial adverse effects on human beings, either directly or indirectly. However, implementation of mitigation measures as provided within each of these resource topic sections will reduce project-related potentially significant impacts to a less-than-significant level. Therefore, after implementation of mitigation measures, the proposed project will result in a less-than-significant environmental impact on human beings.

9. Environmental Justice

Neither the proposed action nor the no action alternatives will result in disproportionate adverse human health impacts or environmental effects to low-income or minority populations.

10. Irretrievable and Irreversible Commitment of Resources

Implementation of the proposed action will require the commitment of non-renewable resources, primarily petroleum products, to transport and apply sediment to the site. All other aspects of the project are reversible, although by doing so additional non-renewable resource would be required.

11. Short-Term Uses of the Environment and Long-Term Productivity

Implementation of the proposed action will result the short-term generation of GHG emissions and other air emissions, the consumption of petroleum products, and the use of dredge sediments from Huntington Harbour. These short-term uses of the environment are intended to result in improved and long-term productivity of coast salt marsh habitat, which will result in a range of environmental benefits.

12. Energy Requirements and Conservation Potential of Alternatives

The energy requirements for implementing the proposed project are limited in terms of both total consumption and duration. The no action alternative would result in somewhat greater energy requirements as the 10,000 to 13,500 CY of sediment that would be placed on the Refuge under the proposed action would have to be disposed of either at LA-2 or an upland location. Both disposal sites would be located considerably further away from the dredge site than is the proposed sediment augmentation site.

13. Document Preparation

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14. Agencies and Persons Consulted

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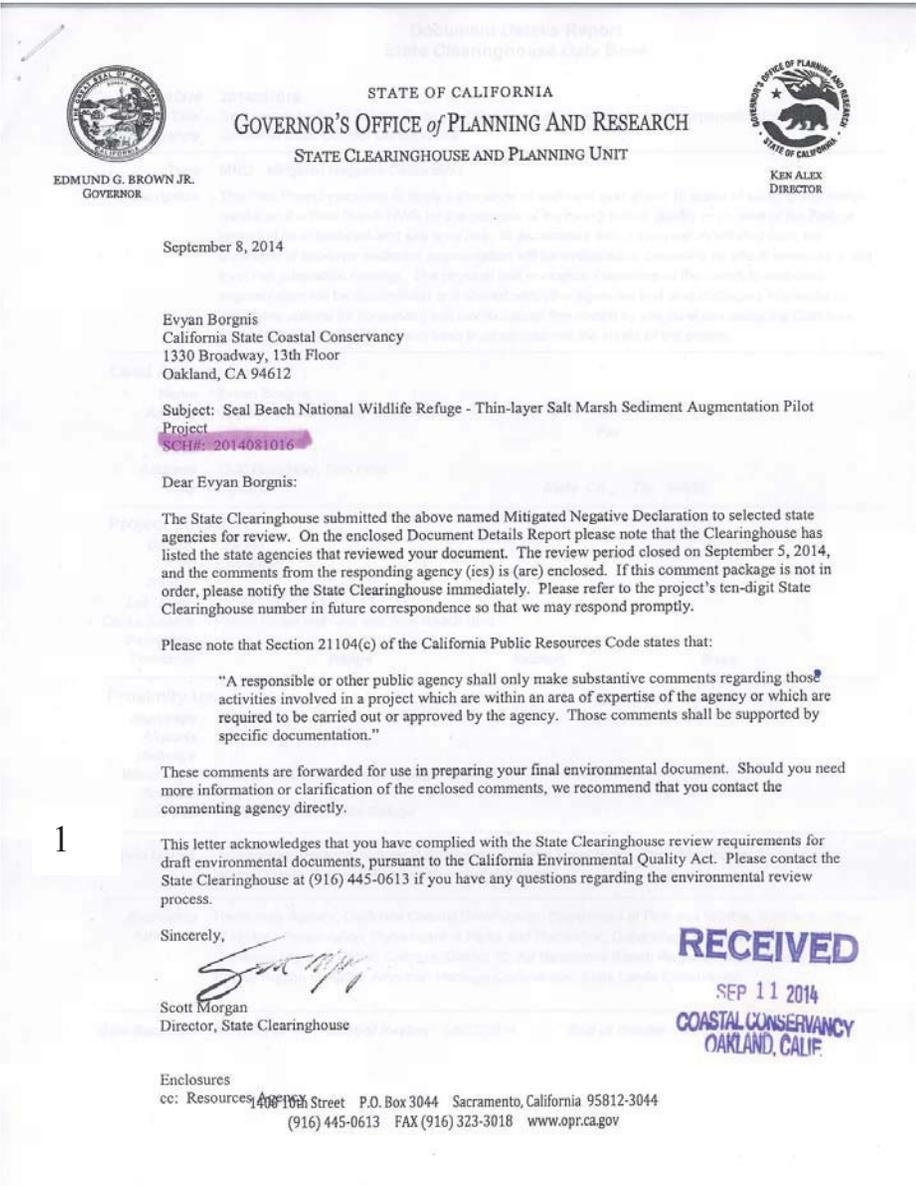
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Appendix A
Response to Comments

Attachment 1 - Response to Comments

Responses



1. No comment necessary.

Attachment 2 - Response to Comments

Responses

STATE OF CALIFORNIA

EDMUND G. BROWN JR., Governor

CALIFORNIA STATE LANDS COMMISSION
100 Howe Avenue, Suite 100-South
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September 5, 2014

File Ref: SCH #2014081016

Evyann Borgnis
California State Coastal Conservancy
1330 Broadway, 13th Floor
Oakland, CA 94612

**Subject: Draft Mitigated Negative Declaration/Environmental Assessment (MND/EA)
for the Seal Beach National Wildlife Refuge Thin-layer Salt Marsh Sediment
Augmentation Pilot Project, Orange County**

Dear Ms. Borgnis:

The California State Lands Commission (CSLC) staff has reviewed the Draft MND/EA for the Seal Beach National Wildlife Refuge Thin-layer Salt Marsh Sediment Augmentation Pilot Project (Project), which has been prepared by the California State Coastal Conservancy (CSCC) and U.S. Fish and Wildlife Service (USFWS). The CSCC, a State agency, is the lead agency under the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.), and the USFWS, a federal agency, is the lead agency under the National Environmental Policy Act (NEPA). The CSLC is a trustee agency because of its trust responsibility for projects that could directly or indirectly affect sovereign lands, their accompanying Public Trust resources or uses, and the public easement in navigable waters.

CSLC Jurisdiction and Public Trust Lands

The CSLC has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. The CSLC also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (Pub. Resources Code, §§ 6301, 6306). All tidelands and submerged lands, granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the Common Law Public Trust.

As general background, the State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable lakes and waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all people of the State for statewide Public Trust purposes, which include but are not limited to waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open

2. The Final Mitigated Negative Declaration (MND) and Initial Study/Environmental Assessment (IS/EA) includes text that identifies the California State Lands Commission (CSLC) as a trustee agency because of its trust responsibility for projects that could directly or indirectly affect sovereign lands, their accompanying Public Trust resources or uses, and the public easement in navigable waters.
3. Comment noted.

Attachment 2 - Response to Comments

Responses

Evyan Borgnis

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space. On tidal waterways, the State's sovereign fee ownership extends landward to the mean high tide line, except for areas of fill or artificial accretion or where the boundary has been fixed by agreement or a court. On navigable non-tidal waterways, including lakes, the State holds fee ownership of the bed of the waterway landward to the ordinary low water mark and a Public Trust easement landward to the ordinary high water mark, except where the boundary has been fixed by agreement or a court. Such boundaries may not be readily apparent from present day site inspections.

4 The Project site at Seal Beach National Wildlife Refuge is located within lands the State patented as Tideland Location 134. The Project may also extend onto lands within the bed of Anaheim Creek or its tributary, which at this location is under CSLC jurisdiction. The site is currently under lease PRC 5963.9 to the USFWS for management as part of the Seal Beach National Wildlife Refuge. The proposed Project appears to be compatible with the operation, management, and maintenance obligations authorized by CSLC under this lease; therefore, no lease amendment will be required at this time.

5 These comments are made without prejudice to any future assertion of State ownership or public rights, should circumstances change, or should additional information become available. This letter is not intended, nor should it be construed as a waiver or limitation of any right, title, or interest of the State of California in any lands under its jurisdiction.

Project Description

The USFWS proposes to apply a thin-layer of sediment (approximately 6 to 10 inches high) over approximately 10 acres of existing salt marsh habitat on the Seal Beach National Wildlife Refuge. The USFWS will document the overall effectiveness of this adaptation strategy in conserving salt marsh habitat threatened by sea level rise along the California coast, while also improving habitat quality within cordgrass (*Spartina foliosa*)-dominated salt marsh habitat to support the federally and State listed endangered light-footed clapper rail (*Rallus longirostris levipes*). Following sediment augmentation, the USFWS will monitor the physical and ecological responses of the marsh to the sediment augmentation for five years, and share the results and lessons learned from the Project to assist federal, State, and local agencies, coastal land managers, and other stakeholders in further developing sea level rise adaptation strategies for the California coast.

Environmental Review

CSLC staff requests that the CSCC consider the following comments on the Project's Draft MND.

Sea Level Rise

- 6 1. A tremendous amount of state owned lands and resources under the Commission's jurisdiction will be impacted by rising sea levels. Because of their nature and location, these lands and resources are already vulnerable to a range of natural events, such as storms and extreme high tides. The State of California released the final "Safeguarding California: Reducing Climate Risk, an Update to the 2009 California Climate Adaptation Strategy" (Safeguarding Plan) on July 31, 2014, to provide policy guidance for state decision-makers as part of continuing efforts to prepare for climate

4. The language in the draft IS/EA regarding lands leased to the Service by the CSLC has been expanded in the Final IS/EA in response to this comment.

5. Statement acknowledged.

6. A discussion of Safeguarding California: Reducing Climate Risk has been added to the Background section of the Final IS/EA.

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Evyan Borgnis

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risks. The Safeguarding Plan sets forth "actions needed" to safeguard ocean and coastal ecosystems and resources as part of its policy recommendations for state decision-makers. CSLC staff believes the goals of the proposed Project are consistent with the guidance and recommendations presented in the Safeguarding Plan, and that results of the study will benefit coastal management agencies' efforts to plan for more resilient shorelines and minimize adverse ecosystem impacts resulting from sea level rise. CSLC staff requests to be included among the recipients of the study findings, and further requests to be included in future adaptation strategy discussions that may be prompted by the Project's monitoring results. Please contact Kelly Keen, Division of Environmental Planning and Management (contact information at the end of this letter), for further information or questions about the CSLC's sea level rise and climate adaptation programs.

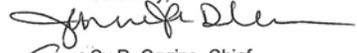
Cultural Resources

2. Title to Resources: The MND/EA should mention that the title to all abandoned archaeological sites and historic or cultural resources on or in the tide and submerged lands of California is vested in the State and under the jurisdiction of the CSLC. CSLC staff requests that the CSCC and USFWS consult with Assistant Chief Counsel Pam Griggs (see contact information below) should any cultural resources on State lands be discovered during the sediment augmentation process. Please note that any submerged archaeological site or submerged historic resource that has remained in State waters for more than 50 years is presumed to be significant.

Thank you for the opportunity to comment on the MND/EA for the Project. Because the Project will affect land and resources subject to the CSLC's trustee agency jurisdiction, we request that you consider our comments prior to adoption of the Final MND/EA.

Please send copies of future Project-related documents, including electronic copies of the Final MND, Mitigation Monitoring and Reporting Program (MMRP), and Notice of Determination (NOD) when they become available, and refer questions concerning environmental review to Kelly Keen, Environmental Scientist, at (916) 574-1938 or via e-mail at Kelly.Keen@slc.ca.gov. For questions concerning archaeological or historic resources under CSLC jurisdiction, please contact Assistant Chief Counsel Pam Griggs at (916) 574-1854 or via email at Pamela.Griggs@slc.ca.gov. For questions concerning CSLC leasing jurisdiction, please contact Randy Collins, Public Land Management Specialist, at (916) 574-0900, or via email at Randy.Collins@slc.ca.gov.

Sincerely,


Randy R. Oggins, Chief
Division of Environmental Planning
and Management

cc: Office of Planning and Research
R. Collins, LMD, CSLC
K. Keen, DEPM, CSLC
K. Colson, Legal, CSLC

7. This contact information has been added to our contact list for this project and we will distribute the Project's monitoring results to the CSLC as requested.
8. The Cultural Resources section under Affected Environment has been expanded to describe the CSLC responsibilities for cultural resources on Public Trust Lands. Mitigation Measure CR-1 has also been revised in response to this comment.
9. The comments provided by CSLC have been incorporated into the Final MND and IS/EA, a copy of the CSLC letter has been provided to the California State Conservancy Board for consideration prior to taking an action at their upcoming meeting, and the U.S. Fish and Wildlife Service (USFWS) considered the comments prior to preparing the Finding of No Significant Impact (FONSI).
10. Copies of these documents will be provided to CSLC when they are available.

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State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
South Coast Region
3883 Ruffin Road
San Diego, CA 92123
(858) 467-4201
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director



September 8, 2014

Ms. Evyan Borgnis, Conservancy Project Manager
California Coastal Conservancy
1330 Broadway, 13th Floor
Oakland, CA 94612
eborgnis@scc.ca.gov

Subject: Comments on the Draft Mitigated Negative Declaration and Joint Initial Study/Environmental Assessment for the Seal Beach National Wildlife Refuge Thin-Layer Salt Marsh Sediment Augmentation Pilot Project, Orange County (SCH #2014081016)

Dear Ms. Borgnis:

The Department of Fish and Wildlife (Department) has reviewed the Draft Mitigated Negative Declaration/Environmental Assessment (MND/EA) for the Thin-Layer Salt Marsh Sediment Augmentation Pilot Project (Project) at Seal Beach National Wildlife Refuge (NWR) in Orange County. The draft MND/EA was prepared by the California State Coastal Conservancy (Conservancy) acting as Lead Agency under the California Environmental Quality Act (CEQA) and the U.S. Fish and Wildlife Service (USFWS) acting as Lead Agency under the National Environmental Policy Act (NEPA).

The Project is located within the Seal Beach NWR in northwestern Orange County. The majority of the Seal Beach NWR lies within the boundaries of Naval Weapons Station Seal Beach. The Project site includes 16 acres of property owned by the U.S. Navy as well as sovereign land held by the California State Lands Commission for the benefit of the people of California and leased to the USFWS for management as a National Wildlife Refuge.

The Project includes a sea level rise adaptation strategy on a portion of coastal salt marsh within the Seal Beach NWR. The Project consists of the application of a thin-layer of clean sediment of appropriate grain size to a portion of the marsh plain within the Seal Beach NWR, followed by 5 years of annual monitoring of the physical and ecological responses of the salt marsh ecosystem to sediment application. Approximately 10,000-13,500 cubic yards of material dredged from the Main Channel West site is to be transported to the 16-acre project site for distribution over 10 acres approximately 8 to 10 inches deep using one or more methods of transport and application.

The entire process, which could take 4-6 weeks to complete, will be adaptively managed. The remaining 6 acres of the 16-acre site will provide a vegetated buffer around the augmentation site in an effort to minimize the movement of sediment off the site and into the adjacent tidal channels. Prior to initiating the sediment application process on the site, which is expected to occur between November 2014 and February 15, 2015, the three clapper rail artificial nesting platforms located in proximity to the project site will be temporarily removed.

The following statements and comments have been prepared pursuant to the Department's

Conserving California's Wildlife Since 1870

11. Although we hoped to implement the project in winter 2014/2015, it will likely be necessary to postpone sediment augmentation until winter 2015/2016 due to funding constraints and the timing required to obtain the necessary permits. This information has been included in the Final MND and IS/EA. Postponing the project until next year would not result in the need to change the analysis and/or conclusions presented in the draft MND and IS/EA, and pre-construction monitoring of the site is expected to begin in November 2014.

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California Coastal Conservancy
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authority as Trustee Agency with jurisdiction over natural resources affected by the project, (CEQA Guidelines § 15386) and pursuant to our authority as a Responsible Agency under CEQA Guidelines section 15381 over those aspects of the proposed project that come under the purview of the California Endangered Species Act (Fish and Game Code § 2050 *et seq.*).

Impacts to Biological Resources

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1. **Fully Protected Species** – The draft MND/EA states that the light-footed clapper rail (*Rallus longirostris levipes*), California least tern (*Sternula antillarum browni*), and American peregrine falcon (*Falco peregrinus*) occur or has the potential to occur on the Project site. However, the draft MND/EA does not include any discussion of these species, which are State-designated as fully protected (Fish and Game Code sections 3511). Except as provided in the Fish and Game Code (e.g., for necessary scientific research), take of any fully protected species is prohibited and cannot be authorized by the Department. The Department recommends the Conservancy and USFWS collaborate with the Department prior to implementation of the Project to ensure that no take of fully protected species occurs as a result of the Project.
 2. **CESA Compliance** – The draft MND/EA states that the Project site supports or has the potential to support federal Endangered Species Act (FESA)-listed species. However, the draft MND/EA does not include any discussion for CESA-listed species. The Department considers adverse impacts to a species protected under CESA, for the purposes of CEQA, to be significant without mitigation. As to CESA, take of any endangered, threatened, or candidate species that results from the Project is prohibited, except as authorized by state law (Fish and Game Code §§ 2080, 2085). Consequently, if the Project, Project construction, or any Project-related activity during the life of the Project will result in take of a species designated as endangered or threatened, or a candidate for listing under CESA, the Department recommends that the Project proponent seek appropriate take authorization under CESA prior to implementing the Project. Appropriate authorization from the Department may include an incidental take permit (ITP) or a consistency determination in certain circumstances, among other options (Fish and Game Code §§ 2080.1, 2080(b), (c)). Early consultation is encouraged, as significant modification to a Project and mitigation measures may be required in order to obtain a CESA Permit. Revisions to the Fish and Game Code, effective January 1998, may require that the Department issue a separate CEQA document for the issuance of an ITP unless the Project CEQA document addresses all Project impacts to CESA-listed species and specifies a mitigation monitoring and reporting program that will meet the requirements of an ITP. For these reasons, the final MND should analyze the likelihood of any CESA-listed species occurrence and adopt appropriate mitigation measures for those with high or moderate likelihood of occurrence. The Department recommends biological mitigation monitoring and reporting proposals should be of sufficient detail and resolution to satisfy the requirements for a CESA ITP.
 - a. **Impacts to Belding's Savannah Sparrow** – The draft MND/EA states that Belding's savannah sparrow (*Passerculus sandwichensis beldingi*) occur year-round at Seal Beach NWR. Belding's savannah sparrow is a State endangered species and protected under CESA. The MND/EA should provide a more detailed analysis of the potential for impacts to the species and its habitat through the implementation of the Project. If occupied Belding's savannah sparrow habitat is impacted by the Project, the Department is concerned the Project could result in direct impacts on Belding's savannah sparrow

12. The light-footed Ridgway's rail (formerly referred to as the light-footed clapper rail) was discussed on pages 29 – 32 and pages 51 – 52 of the draft IS/EA and the California least tern was discussed on pages 32 and 52. The peregrine falcon was not addressed, as there is no potential for adverse effects to this species from the proposed project. We have however added information to the Final IS/EA (Section 5.B - Effected Environment, Biological Resources) to indicate that this species is present on the Refuge and can be seen foraging in uplands, high marsh, near the Refuge's tern colony, and on rare occasions over low marsh habitat. In addition, several sentences were added to the Endangered and Threatened Species and Other Species of Concern section of the IS/EA to clarify that these species are fully protected by the State and that the light-footed Ridgway's rail and California least tern are also listed as endangered under the California Endangered Species Act.
13. As described in the draft IS/EA, no take of listed or fully protected species will occur as a result of this project. To insure that no take occurs, mitigation measures have been incorporated into the scope of the project and will be implemented by the USFWS as presented in the MMRP and Final MND.
14. The Department was invited to participate in several agencies and stakeholder collaboration meetings organized the Service prior to finalizing the scope of the project, and when no one was able to attend, the Service offered to meet individually with Department staff to review the details of the project. We welcome the Department's involvement in project implementation and will continue to seek the Department's input as we move forward.

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15. The State listed species present on or near the site include the light-footed Ridgway's rail, California least tern, and Belding's savannah sparrow. No other State listed species, including plants, fish, and reptiles, are known to be present in the area. Response 11 indicates where in the draft IS/EA the light-footed Ridgway's rail and California least tern are addressed. Page 34 of the draft IS/EA includes a discussion of Belding's savannah sparrow, including the areas of the Refuge where this species is present. This discussion has been expanded in the Final IS/EA to explain that Belding's savannah sparrows prefer to nest and forage in the mid- to upper-littoral zones of coastal salt marsh (Powell and Collier 1998).
16. The low marsh habitat present within the project site does not support nesting habitat for the Belding's savannah sparrow and little, if any, foraging opportunities are available at this site for the species. Should a Belding's savannah sparrow be present on the site during project implementation, adherence to Mitigation Measure BIO-5 (this mitigation measure, presented as BIO-4 in the draft MND and has been revised to clarify that other avian species in addition to rails would be moved off the site) would ensure that no adverse effects or take would occur to this species, the light-footed Ridgway's rail, and other avian species that may be present on the site.
17. As addressed in Responses 11, 14, and 15, this joint CEQA/NEPA document addresses all potential impacts to State and federally listed species known to occur within the areas affected by the proposed action, and all mitigation necessary to avoid significant adverse effects is assured through the Final MMRP.

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18. As addressed in Responses 14 and 15, although the Belding's savannah sparrow is present on the Refuge, in fact in 2010 the Refuge supported the second largest number of Belding's savannah sparrow territories in California, Belding's occur in mid- and high-marsh habitats located well to the north and east of the proposed project site. Therefore, no take or adverse effects to Belding's savannah sparrows would occur as a result of sediment augmentation. To ensure that no nesting sites are disturbed by monitors wishing to access the site from NASA Island (refer to page 15 of the draft IS/EA), all potential nesting areas would be avoided during the breeding season (March 1 – September 15). This measure, which is enforced annually for all research, monitoring, and mosquito abatement activities on the Refuge, has been added to the Final MMRP to ensure compliance with established Refuge procedures.

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(e.g., foraging and breeding) and potentially a loss of future breeding success, the Department recommends that the Conservancy and USFWS consult with the Department to minimize take and discuss the potential need for take authorization under CESA as soon as possible.

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3. Special Status Species – The draft MND/EA does not identify any species designated as California Species of Special Concern (SOC). CEQA provides protection not only for CESA and FESA-listed species, but for Rare species and any species that can be shown to meet the criteria for State listing, which includes SOC and California Native Plant Society (CNPS) Lists 1A, 1B, and 2, which consist of plants that, in a majority of cases, would qualify for listing (CEQA Guidelines Sections 15380(d), 15065(a)). The Department recommends the final MND/EA include a current inventory of the biological resources associated with each habitat type on site and within the area of potential include all those which meet the CEQA definition (see CEQA Guidelines, § 15380). Adjoining habitat areas should be included in this inventory assessment where site activities could lead to direct or indirect impacts offsite. Habitat mapping at the alliance level will help establish baseline vegetation conditions.
 4. Temporary Loss of Habitat – Mitigation Measure BIO-1 states that "If, within five years of sediment application, reestablishment of the native salt marsh vegetation community to a density and percent cover similar to that present within the project site prior to sediment application has not occurred, the Refuge shall develop and implement a restoration plan to reestablish native salt marsh vegetation at densities and a percent cover similar to pre-project site conditions."
The Mitigation Measure addresses the potential for significant impacts to sensitive species through the failure of the site to revegetate after the lifespan of the Project. The draft MND/EA should also include mitigation measures to address significant impacts to sensitive species during project implementation of sediment application and during the five years of monitoring. The Project has the potential to remove approximately 10 acres of foraging habitat for Belding's savannah sparrow, California least tern, light-footed clapper rail, and other sensitive species for at least 5 years. The MND/EA should include minimization and avoidance measures during implementation to avoid and minimize significant impacts to sensitive species. In addition, the Department recommends on-site habitat restoration or enhancement, if feasible, be identified in the final MND/EA for the Project to mitigate direct and temporal loss of the habitat to below a level of significance. If it is not feasible or would not be biologically viable on-site, off-site mitigation through habitat creation and/or acquisition and preservation in perpetuity should be addressed.
 5. Impacts to Light-footed Clapper Rail – Mitigation Measure BIO-4 states "...the three artificial light-footed clapper rail nesting platforms located within and adjacent to the project site shall be temporarily removed after the end of the 2014 breeding season (after September 15)."
 - a. In order to mitigate for this temporary loss of nesting habitat in the Project area, the Department recommends the three nesting platforms plus an additional three nesting platforms be secured in a nearby section of the marsh. This should be done in advance of the winter high tide season to provide refuge for the rails.
 - b. The Department recommends using straw wattles along the edges of the Project area and/or placement of an approximately 2-foot high berm to hold the sediment that is piped in. This would promote retention of sediment until the marsh plants root and provide natural sediment retention.

19. Table 9 has been revised to include California Bird Species of Special Concern that occur on or near the project site. Based on a review of the State's latest Special Animals List, published in September 2014, none of the invertebrate, fish, amphibian, or mammal species included on the list occur within the project site (CDFW 2014a). The eastern Pacific green turtle (*Chelonia mydas*) is included on the Special Animals List with a G3 (vulnerable) S1 (critically imperiled) ranking. A discussion of the potential for the presence of eastern Pacific green turtle in the project area is addressed on pages 32 and 33 of the draft IS/EA. In addition, implementation of Mitigation Measure BIO-2, as described in the Final MMRP, would ensure avoidance of impacts to this species.

The California brown pelican is fully protected by the State and may be present in the area. However, the implementation of Mitigation Measure BIO-5, which addresses rails and other avian species, would ensure that individual pelicans would not be affected by the proposed project. Note that no communal brown pelican roosting areas are present within the project area. No heron or egret nesting colonies, which are addressed in the Special Animal List, occur within or adjacent to the project site. Northern harrier and osprey, identified as a Species of Special Concern, have been observed flying over the project site, but these species do not nest within the low marsh areas of the Refuge. The implementation of Mitigation Measure BIO-5 would ensure that individual raptors would not be affected by the proposed project. None of the shorebirds listed on Table 9 nest on the Refuge and the implementation of Mitigation Measure BIO-5 would ensure that individual shorebirds are not adversely affected by project implementation. This discussion has been incorporated in the Final IS/EA.

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A review of the latest version of the State's Special Vascular Plants, Bryophytes, and Lichens List, prepared in July 2014, includes only one plant species located on the project site, estuary seablite (*Suaeda esteroa*) (CDFW 2014b). This species is described on page 35 of the draft IS/EA. The status of this plant has been updated in the Final IS/EA to indicate that this species has a rare plant ranking of 1B.2 (plants rare, threatened, or endangered in California and elsewhere).

20. A comprehensive discussion of the habitats and species present within and adjacent to the site is provided on pages 21 – 35 of the draft IS/EA.
21. As described in the draft IS/EA, no significant impacts to sensitive species or low salt marsh habitat are anticipated. The project purpose is to mitigate for ongoing adverse effects of subsidence and sea level rise on a portion of the Seal Beach NWR. We expect the project to result in benefits to the habitat quality of the project site's low salt marsh vegetation, particularly cordgrass (*Spartina foliosa*), and to the light-footed Ridgway's rail. At present, there is no natural nesting habitat available for the rail on this site. By raising the site elevation, we hope to reestablish (restore) higher quality cordgrass habitat that will support natural nesting habitat. As this is a pilot project, Mitigation Measure BIO-1 is provided to ensure that salt marsh vegetation is restored to the site should the pilot project not result in the regrowth of existing vegetation up through the new thin-layer of sediment. Based on results of similar projects conducted along the Gulf coast, we anticipate regrowth to begin almost immediately, with significant regrowth occurring by the end of year 2.

The 5-year monitoring program will provide valuable information about the feasibility of this technique to address sea level rise in

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coastal wetlands along the California coast. As a restoration project, no mitigation is required unless the restoration project fails (in which case, Mitigation Measure BIO-1 would be implemented).

22. The low marsh habitat on the site is not occupied by Belding's savannah sparrow and does not represent important foraging habitat for the species, nor does it provide habitat to support the California least tern. The project would temporarily affect approximately 2.8 percent of the total salt marsh habitat on the Refuge, requiring light-footed Ridgway's rails to forage elsewhere in the marsh. Because the Refuge has the capacity to support a larger population of rails that currently occupy the marsh, there would be adequate foraging area for the Refuge's current rail population.

At any one time there are between 85 and 95 artificial nesting platforms situated within the low marsh areas of the Refuge. Based on rail nesting surveys conducted on the Refuge, not all of the platforms are used in a given year. In 2011 and 2012, approximately 68 percent of the platforms were used for incubation nests and/or brood nests. As indicated in Figure 5 of the draft IS/EA, there are a significant number of platforms located in the general vicinity of the project site, providing ample opportunities for rails to find refuge from high tides and to establish incubation nests and brood nests despite the removal of the three platforms within the project site. As removal of the three platforms in the vicinity of the project site would not adversely affect the Refuge's population of rails, no mitigation is necessary. Additionally, if cordgrass height and coverage increases after sediment augmentation, as anticipated, platforms will no longer be needed in this area, as the rails can once again establish natural nests within this portion of the Refuge.

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23. At any one time there are between 85 and 95 artificial nesting platforms situated within the low marsh habitat areas of the Refuge. Based on light-footed Ridgway's rail nesting surveys conducted on the Refuge, not all of the platforms are used in a given year. In 2011 and 2012, approximately 68 percent of the platforms were used for incubation nests and/or brood nests. As indicated in Figure 5 of the draft IS/EA, there are a number of platforms located in the vicinity of the project site, providing ample opportunities for rails to find refuge from high tides and to establish incubation and brood nests. The removal of the three platforms would not adversely affect the Refuge's population of rails; therefore, no mitigation is necessary. If cordgrass height and coverage increases, as anticipated, following sediment augmentation, platforms will no longer be needed, and it will be possible for the rails to establish natural nests in the marsh.
24. As indicated on page 59 of the draft IS/EA, monitoring of sediment movement and turbidity levels will occur during the sediment application process and application methods will be adaptively managed to ensure that movement of sediment off the site is minimized. Measures such as installation of silt fencing will be installed if proposed vegetative buffers around the site cannot adequately maintain the sediment within the project boundary. Straw waddles would be another potential measure that could be used to retain sediment on the site. However, due to access constraints (i.e., the site is only accessible from adjacent tidal channels), the construction of a 2-foot berm around the site is problematic. The use of a silt curtain or silt fencing would be equally effective and considerably less expensive to install. Further, removal of the berm at the end of the project would be difficult and could result in unnecessary disturbance to the adjacent restore habitat.

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- 25 c. The physical presence of a biological monitor would be a more effective way to guide birds to specific direction out of the 10-acre Project site as opposed to using noise (air horn or cracker shells) that could cause birds to scatter in random directions. Therefore, the Department recommends that Mitigation Measure BIO-4 be revised to state that physical presence will be used to haze birds, and if this is ineffective, noise will then be used to haze them.
- 26 6. Impacts to Nesting Birds and Other Wildlife – The draft MND/EA acknowledges that Project-related activities may have potential adverse impacts to avian species and provides Mitigation Measure BIO-4 to avoid or minimize impacts to less-than-significant levels. The Department concurs that measures should be taken to avoid Project impacts to nesting birds. Migratory nongame native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) of 1918 (50 C.F.R., § 10.13). Sections 3503, 3503.5, and 3513 of the California Fish and Game Code prohibit take of all birds and their active nests including raptors and other migratory nongame birds (as listed under the Federal MBTA).
- a. Proposed Project activities (including, but not limited to, staging and disturbances to native and nonnative vegetation, structures, and substrates) should occur outside of the avian breeding season which generally runs from February 1-August 31 (as early as January 1 for some raptors) to avoid take of birds or their eggs. Take means to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill (Fish and Game Code, § 86), and includes take of eggs and/or young resulting from disturbances which cause abandonment of active nests. Depending on the avian species present, a qualified biologist may determine that a change in the breeding season dates is warranted. Please consider the following Department's recommended protective measures for nesting native birds during Project activities.
- 27 i. If avoidance of the avian breeding season is not feasible, the Department recommends that, beginning thirty days prior to the initiation of Project activities, a qualified biologist with experience in conducting breeding bird surveys conduct weekly bird surveys to detect protected native birds occurring in suitable nesting habitat that is to be disturbed and (as access to adjacent areas allows) any other such habitat within 300 feet of the disturbance area (within 500 feet for raptors). The surveys should continue on a weekly basis with the last survey being conducted no more than 3 days prior to the initiation of Project activities. If a protected native bird is found, the Project proponent should delay all Project activities within 300 feet of on- and off-site suitable nesting habitat (within 500 feet for suitable raptor nesting habitat) until August 31. Alternatively, the qualified biologist could continue the surveys in order to locate any nests. If an active nest is located, Project activities within 300 feet of the nest (within 500 feet for raptor nests) or as determined by a qualified biological monitor, must be postponed until the nest is vacated and juveniles have fledged and there is no evidence of a second attempt at nesting. Flagging, stakes, and/or construction fencing should be used to demarcate the inside boundary of the buffer of 300 feet (or 500 feet) between the Project activities and the nest. Project personnel, including all contractors working on site, should be instructed on the sensitivity of the area. The Project proponent should provide the County the results of the recommended protective measures described above to document compliance with applicable State and Federal laws pertaining to the protection of native birds.

25. The project site is surrounded by tidal wetlands and salt marsh vegetation; therefore, as long as the birds disperse from the site, it does not matter in which direction they leave. As stated in the draft IS/EA, to avoid impacts to rails and other avian species, both physical presence and noise will be used to encourage dispersal. As the sediment application process proceeds, it will become difficult to access the site by foot and the biological monitor will have to rely more heavily on the use of air horns or cracker shells.
26. The application of sediment onto the project site will only be permitted between November 1 through February 15, this would avoid the nesting season for light-footed Ridgway's rail, California least tern, and Belding's savannah sparrow. This requirement is included in Mitigation Measures BIO-2 and BIO-5 of the Final MMRP. Therefore, no impacts to nesting birds are anticipated.
27. Refer to Response 25.

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ii. If the biological monitor determines that a narrower buffer between the Project activities and observed active nests is warranted, he/she should submit a written explanation as to why (e.g., species-specific information; ambient conditions and birds' habituation to them; and the terrain, vegetation, and birds' lines of sight between the Project activities and the nest and foraging areas) to the County and, upon request, the Department. Based on the submitted information, the County (and the Department, if the Department requests) will determine whether to allow a narrower buffer.

28. Refer to Response 25.

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iii. The biological monitor shall be present on site during all grubbing and clearing of vegetation to ensure that these activities remain within the Project footprint (i.e., outside the demarcated buffer) and that the flagging/stakes/fencing is being maintained, and to minimize the likelihood that active nests are abandoned or fail due to Project activities. The biological monitor shall send weekly monitoring reports to the County during the grubbing and clearing of vegetation, and shall notify the County immediately if Project activities damage active avian nests.

29. No grubbing or clearing of the site is proposed. Refer also to Response 25.

We appreciate the opportunity to comment on the referenced draft MND/EA. Questions regarding this letter and further coordination on these issues should be directed to Victoria Chau, Environmental Scientist at (909) 455-8443 or Victoria.Chau@wildlife.ca.gov.

Sincerely,

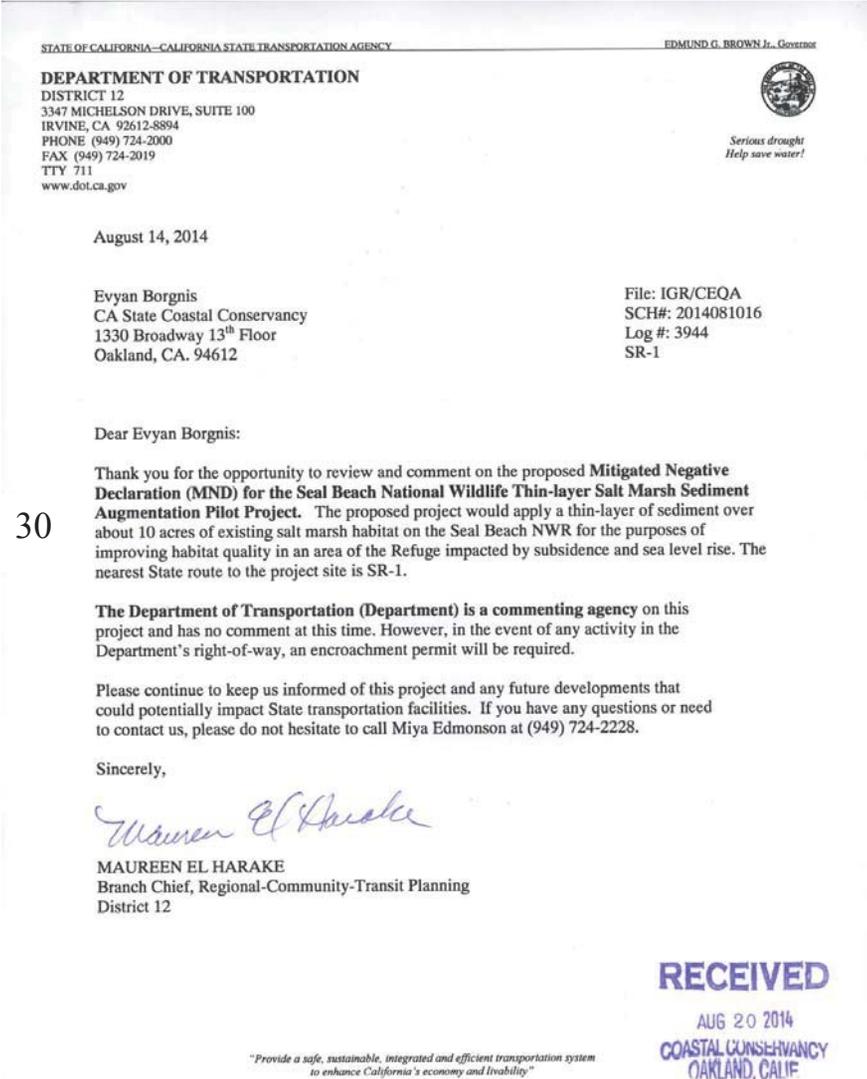


Betty Courtney
Environmental Program Manager I
South Coast Region

cc: Ms. Betty Courtney, CDFW, Santa Clarita
Ms. Erinn Wilson, CDFW, Los Alamitos
Ms. Marilyn Fluharty, CDFW, San Diego
Ms. Sarah Rains, CDFW, Newbury Park
Mr. Scott Morgan, State Clearinghouse, Sacramento

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30. Comment noted. As the pilot project site is located in Anaheim Bay and all access to the site will be via boat or foot, the need for an encroachment permit from Caltrans is unlikely.

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