Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response and [Fish and Wildlife Coordination Act Recommendations]

Ammunition Pier and Turning Basin Construction Project at Naval Weapons Station Seal Beach

NMFS Consultation Number: WCRO-2018-00044 DOI: https://doi.org/10.25923/21am-pm70

Action Agency: U.S. Department of the Navy

Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species?	Is Action Likely To Jeopardize the Species?	Is Action Likely to Adversely Affect Critical Habitat?[1]	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
Green sea turtle; East Pacific Distinct Population Segment (DPS) (*Chelonia mydas*)	Threatened	Yes	No	N.A.	N.A.

1 Critical habitat has not been designated for these species in the action area.

Fishery Management Plan That Identifies EFH in the Project Area	Does Action Have an Adverse Effect on EFH?	Are EFH Conservation Recommendations Provided?
Pacific Coast Groundfish	Yes	Yes
Coastal Pelagic Species	Yes	Yes

Consultation Conducted By: National Marine Fisheries Service, West Coast Region

Issued By:

For Chu E Yates

Barry A. Thom
Regional Administrator

Date: ***April 29, 2019***

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

April 30, 2019

Refer to NMFS No:
WCR-2018-00044

N. J. Dahlke
Captain U. S. Navy
Commanding Officer
Naval Weapons Station Seal Beach
800 Seal Beach Boulevard
Seal Beach, California 90740-5000

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response, and Fish and Wildlife Coordination Act Recommendations, for the Ammunition Pier and Turning Basin Construction Project at Naval Weapons Station Seal Beach

Dear Captain Dahlke:

Thank you for your letter of November 6, 2018, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for the Ammunition Pier and Turning Basin Construction Project. Thank you, also, for your request for consultation pursuant to the essential fish habitat (EFH) provisions in section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA)(16 U.S.C. 1855(b)) for this action.

The attached biological opinion analyzes the potential impacts of the Navy's proposed action to build a new ammunition pier and associated improvement within Naval Weapons Station Seal Beach, including modification of the public navigation channel and sole passageway for water and marine life through Anaheim Bay. We determined that the threatened East Pacific DPS of green sea turtles may be adversely affected as a result of sustained disturbance and disruption of normal foraging and behavior patterns over the course of the entire 5.5 year proposed project. Additionally, we conclude that Coastal Pelagic Species EFH would be adversely affected through a number of project related impacts, including permanent alteration of important shallow water habitats that require mitigation.

As a result of these consultations, the Navy is required to comply with the Terms and Conditions of the ESA portion of the biological opinion that include development and submission of monitoring plans for assessing the impacts to green sea turtles and their preferred habitats within the action area during the proposed project, along with periodic reporting on the progress of the monitoring and project overall. The Navy must also review the EFH Conservation Recommendations and provide us a detailed response in writing within 30 days after receiving these Conservation Recommendations. The Conservation Recommendations provided include

recommendations relevant to mitigation requirements for and monitoring of the impacts from the proposed action.

Please contact Dan Lawson at 206-526-4740 or Dan.Lawson@noaa.gov, or Bryant Chesney at 562-980-4037 or Bryant.Chesney@noaa.gov if you have any questions concerning the ESA or EFH consultation, respectively, or if you require additional information.

Sincerely,

FOR

Barry A. Thom
Regional Administrator

Enclosure

cc: 151422WCR2019PR00012
Jessica Bredvik at jessica.bredvik@navy.mil
Jeffrey Seminoff at jeffrey.seminoff@noaa.gov

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List of Acronyms

CEMP	CALIFORNIA EEL GRASS MITIGATION POLICY
DPS	DISTINCT POPULATION SEGMENT
EFH	ESSENTIAL FISH HABITAT
ESA	ENDANGERD SPECIES ACT
FMP	FISHERIES MANAGEMENT PLAN
HAPC	HABITAT AREAS OF PARTICULAR CONCERN
ITS	INCIDENTAL TAKE STATEMENT
MLLW	MEAN LOWER LOW WATER
MSA	MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT
NMFS	NATINAL MARINE FISHERIES SERVICE
PBF	PHYSICAL OR BIOLOGICAL FEATURES
PCE	PRIMARY CONSTITUENT ELEMENT
PMFC	PACIFIC MARINE FISHERIES COUNCIL
SBNWR	SEAL BEACH NATIONAL WILDLIFE REFUGE
SWFSC	SOUTH WEST FISHERIES SCIENCE CENTER
USCG	UNITED STATES COAST GUARD

1. INTRODUCTION

This Introduction section provides information relevant to the other sections of this document and is incorporated by reference into Sections 2 and 3, below.

1.1. Background

The National Marine Fisheries Service (NMFS) prepared the biological opinion (opinion) and incidental take statement (ITS) portions of this document in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973 (16 USC 1531 et seq.), and implementing regulations at 50 CFR 402. We also completed an essential fish habitat (EFH) consultation on the proposed action, in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801 et seq.) and implementing regulations at 50 CFR 600.

Because the proposed action would modify a stream or other body of water, NMFS also provides recommendations and comments for the purpose of conserving fish and wildlife resources, and

enabling the Federal agency to give equal consideration with other project purposes, as required under the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.).

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available through the NOAA Institutional Repository (https://repository.library.noaa.gov/), after approximately two weeks. A complete record of this consultation is on file at NMFS WCR's Long Beach Office.

1.2. Consultation History

Discussion between the U.S. Department of the Navy (Navy) and NMFS about the proposed project and information needs relative to ESA and EFH consultation began with initial meetings between staff in July 2016. In the fall of 2016, the Navy began to host periodic meetings with a number of State and Federal agencies to discuss development of the proposed project and all the various environmental compliance steps and issues. On May 2, 2017, the Navy submitted a request for EFH consultation, along with a corresponding EFH assessment. On May 22, 2017, the Navy submitted a request to NMFS for informal ESA consultation and concurrence with a "not likely to adversely affect" determination for East Pacific DPS green sea turtles, along with a corresponding biological assessment (BA). Simultaneously, the Navy also provided a draft environmental assessment (EA).

We replied to the Navy's request with a letter on June 30, 2017, which provided a number of important findings. We informed the Navy: that the EFH assessment provided did not provide sufficient information to assess the effects of the action; that we believed the proposed alternative may result in substantial adverse effects on EFH; and requested that the Navy provide additional analysis and initiate an expanded EFH consultation. We also informed the Navy that we were not able to concur with the effect determination for East Pacific DPS green sea turtles made by the Navy based on the information provided in the BA, and that there were a number of outstanding questions and concerns that needed additional explanation or to be addressed before we could conclude ESA consultation.

In August 2017, the Navy provided us a copy of an updated application to the NMFS Office of Protected Species for a Letter of Authorization (LOA) under the Marine Mammal Protection Act (MMPA) to incidentally take non-ESA-listed marine mammals during the proposed project. On March 14, 2019, the Navy indicated they were intending to provide an updated LOA application to NMFS Office of Protected Resources, but no definitive timetable exists for the issuance of the LOA.

Following the June 30, 2017, letter, the Navy engaged and exchanged information with NMFS staff throughout the remainder of 2017 and beginning of 2018. In May 2018, coordination meetings between Navy, NMFS and other State and Federal agencies began to occur again to discuss the evolution of the proposed project, certain specific mitigation measures, and reinitiation of required consultations. On September 20, 2018, the Navy submitted a draft BA via email for a preliminary review by NMFS staff, generally coincident with release of a revised draft EA for public review. On October 4, 2018, NMFS staff responded via email with some

limited comments and suggestions on finalizing the BA before submitting. On November 8, 2018, we received the Navy's request for formal ESA consultation on East Pacific DPS green sea turtles and EFH consultation. On December 20, 2018, NMFS staff submitted a list of questions and information needs via email to Navy staff. The Navy provided responses to the information requests on January 16, 2019, during the lapse in appropriations and partial federal government shutdown. Following the resumption of government functions by NMFS WCR in late January 2019, NMFS resumed consultation and evaluation of the proposed action and available information. During a February 13, 2019, meeting to discuss the Navy's response to questions and information needs provided by NMFS, the Navy confirmed their "no effect" determination for ESA-listed marine mammals from this proposed project. On April 3, 2019, staff from the Navy and NMFS met to discuss and clarify proposed Terms and Conditions and draft EFH conservation recommendations that were shared by NMFS WCR on March 25, 2019 via email from Penny Ruvelas (NMFS-WCR) to Lisa Talcott (U.S. Navy).

1.3. Proposed Federal Action

Under the ESA, "action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies (50 CFR 402.02). Under the MSA, Federal action means any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by a Federal Agency (50 CFR 600.910).

The Navy proposes to conduct new construction activities to the entrance into the Naval Weapons Station Seal Beach in Anaheim Bay (Figure 1). The Navy has concerns about the existing facilities at the base as they are past their design life. There are significant concerns about seismic design deficiencies given the proximity to active faults nearby. The Navy also has ongoing security concerns with the proximity of munitions operations with civilian traffic along with an increase in the number of vessels the base would service through a redistribution of the U.S. Navy fleets. In response to these issues, the Navy proposes the following actions: the installation of a new ammunition pier, new mooring buoys and anchorages; construction/filling in a new causeway and truck turnaround; creating a new public navigation channel; and constructing a new breakwater, new security barriers, fencing, and lighting. The Navy also proposes to upgrade the existing wharf facilities to service vessels until the new construction projects are complete. The project is scheduled to begin in early 2020 (January), and activities are expected to take place over five and a half years in two phases. During the consultation, the Navy described their expectations for the generalized anticipated project schedule, including the relative sequencing of project components and their general overlap with each other. Dredging activities for the public navigation channel (PNC) and the turning basin are expected to occur simultaneously in conjunction with fill activities for the eelgrass mitigation sites and rock fill for the PNC and jetties (Phase 1). The Navy expects the mooring buoys to be moved early during the construction schedule and will require pile driving actions for the installation of the anchors (Phase 1). The causeway is scheduled to begin construction towards the end of dredging activities and is anticipated to take 17 months to complete (Phase 1). The construction of the new breakwater and east mole revetment will occur before the indicator pile program (Phase 1). Following the indicator pile program the Navy will drive pier support piles, which is estimated to take about 12 months to complete (Phase 2). Afterwards, the Navy will complete construction of the new pier along with supporting infrastructure (Phase 2)

Figure 1. Summary of proposed actions for the changes to Anaheim Bay.

1.3.1 Construction Activities

1.3.1.1 New Ammunition Pier

The Navy is proposing the construction of a new ammunitions pier approximately 1,100 ft. by 125 ft. The pier will be designed and constructed to meet current seismic code requirements and include a new fender system for loading and offloading vessels. The pier will be located at the end of the current south mole[1] (Figure 1), and designed to allow the simultaneous loading of two destroyer sized vessels. The pier will support crane loading from any location on the pier deck. This pier will have a concrete cast in place deck and beams supported by approximately 900 piles. The piles would include 728 24-inch octagonal concrete piles, 119 24-inch square concrete piles, and 51 16-inch fiberglass piles. Piles will be initially driven utilizing jetting and driven to final specifications using an impact hammer. The spacing of the piles is expected to be 20ft. by 20ft., except within the mole region which would have spacing of 8 ft. by 8 ft., or 10 ft. by 10 ft. It is expected that pile driving activities would occur during the hours of 7:00 am and 7:00 pm and be driven at a rate of three to four piles per day. The Navy estimates that it will take approximately 300 days to drive 900 piles and expects pile driving work to be completed over a two-and-a-half to three year period. There is not expected to be any pile work conducted over the weekend or on federal holidays. The Navy intends to use a total of 17 piles as indicator piles to help establish pile driving criteria to support monitoring and environmental compliance. Each indicator pile would take approximately one day to drive and be cut off near the mudline upon completion of the program.

Additionally as part of construction of the new ammunition pier, two mooring dolphins would be constructed with a concrete pile supported deck connected to the pier by aluminum gangways. Copper-clad ground rods driven 30 ft. into the mud below the pier and along the front and back edges of the pier, approximately 100 ft. apart from each other would complete pier grounding.

1.3.1.2 Updating the Existing Wharf

The Navy intends to update the existing wharf structure to support ongoing and continued operations until the new ammunition pier is operational. These upgrades could include demolition of the roadway near the south end of the wharf to support pile driving. A total of 12 48-inch steel pipe piles will be installed on land to support the wharf upgrades. It is estimated to take up to 12 days of work for installation of these piles, but these operations will occur over a month and a half depending on the time it takes to prepare the site. The Navy may retain the existing wharf for possible future ordnance contingency operations.

1.3.1.3 Mooring Buoy Anchorages

The Navy utilizes barges for loading and transporting ammunition. Currently there are 8 moorings for barges located within the inner harbor; two of which will be relocated to the outer harbor and attached to a permanent mooring. These moorings will have a plate attached and installed using a metal I-beam driven into the sea floor. Three inner harbor moorings will be

[1] Mole is a construction term for a structure used as a pier, breakwater, or a causeway between places separated by water.

removed and the remaining three inner harbor moorings will be relocated. Two additional anchorages for floating navigation aids would also be installed using concrete clump anchors.

1.3.1.4 Causeway Truck Turnaround Fill

The proposed action includes the construction and fill of a 930 ft. causeway across the current channel to connect the base of the south mole, as well as to separate munitions operations from civilian vessel traffic. As the public navigation channel is currently constructed, the new causeway will extend half to three quarters of the way across the channel until the construction of a new public navigation channel is complete. The causeway would start with installation of a five ft. rock blanket and consist of multiple lift dyke and fill structures. Fill will utilize dredged material where applicable and subsequent layers and dykes will be installed until the causeway reaches the designed elevation. The road and walkway will be approximately 59 ft. wide consisting of two 15 ft. lanes, a five ft. walkway, a two ft. gutter, two feet of curb, and a security fence and lighting for the roadway. A guard booth would also be constructed at the entrance to the causeway.

The south mole would be widened to approximately 126 ft to accommodate a truck turn-around. This would allow for the turning movements of a full 55 ft. trailer as well as parking for 12 back-in slots, or three parallel slots next to the pier. The turnaround would be constructed in the same manner as the causeway.

1.3.1.5 New Public Navigation Channel

Construction of a new public navigation channel would occur parallel to and within the confines of the current east jetty. The construction of the new channel would be the first activity to take place in order to provide the public access into Huntington Harbor. After completion of this component (including dredging; see Section 1.3.3 below), the new channel would be 250 ft. wide and approximately 20 ft. deep mean lower low water (MLLW). The channel will include: construction of new rock jetties to define the new navigation channel; and installation of a stationary pole-mounted navigation aide, two floating buoys, and floating security barriers. Additionally, public access to the new public navigation channel may be restricted for brief periods when Navy ships enter or exit the harbor.

1.3.1.6 New Breakwater

An inner harbor breakwater will be placed west of the south mole and within the harbor to shelter berthed Navy vessels. The new breakwater is expected to be 400 ft. long with a 10 ft. top and a 1.75:1 slope that will be marked with the appropriate navigation lighting. The new breakwater will be constructed with crushed rock and protected with armored stone, placed by the use of cranes and barges. The Navy intends to build the breakwater prior to any pile driving activities to help prevent the spread of underwater acoustic disturbance.

1.3.1.7 Security Fencing, Barriers, Lighting

The Navy intends to install new perimeter security fencing consisting of a seven ft. tall chain link fence topped with three strands of barbed wire. This will extend across the causeway and connect to a floating security barrier. The floating security barrier will be located parallel with the east jetty and extend from the public navigation channel out towards the west jetty. The floating barrier will have a chain and concrete anchors with an anchor point near the west jetty.

Lighting for the roadway, material staging, and parking would be provided by pole-mounted lighting fixtures. Additional lighting would be installed to provide lighting for the pier deck and sides. There will be approximately 50 to 60 pole mounted light fixtures placed about 100 ft. apart. LED high mast lighting would be placed on the new pier at 50 ft. above the deck level with 6 lights on each pole. Lights will be included on the approach jetty and navigational floating security barriers.

1.3.2. Demolition

Existing waterfront facilities no longer needed to support ordinance operations would be demolished. If the Navy decides to demolish the existing wharf it will be done using a vibratory hammer from a barge mounted crane and placed on a barge for removal. If piles fall apart or break during removal, a chain or clamshell bucket will be used. If a pile cannot be removed it will be cut at the mudline.

1.3.3. Dredging

The proposed actions require dredging in order to accommodate a larger turning basin and allow larger vessels to be serviced at the newly constructed ammunition pier. As referred to above, dredging will occur as part of construction of the new public navigation channel. Dredging would occur 24 hours a day and seven days a week until complete. Dredging operations are planned to use a clamshell dredge and material will be transported by barge; however, it is possible that a cutter suction dredge could be used for some dredging activities to facilitate direct placement of sediment for reuse. The target depth for the harbor is 30-41 ft. with a two ft. over dredge allowance. For the public navigation channel, the target depth is 20 ft. Dredging activities are expected to last for approximately 12 months with a total dredge foot print of 1.2 million cubic yards of material for all dredging activities.

1.3.4. Sediment Disposal

As indicated in Section 1.3.2 above, dredged material where suitable will be used to fill the causeway and truck turn-around. Addition uses for dredged material include habitat creation or beach replenishment (approximately 720,000 cubic yards total). Silt and clay material not suitable for construction activity or other reuses would be disposed of at approved offshore disposal sites LA-2 or LA-3. As described by the Navy during consultation, they expect somewhere between 125-250 disposal trips offshore over the course of dredging, depending on the size of barges ultimately used. Nearshore placement of sediment could occur via barge in approximately water depths 20 to 30 ft. or through direct pumping/placement in concert with use of cutter section dredges. Stockpiling of sandy materials will be located south of Pacific Coast

Highway on both sides of Kitts Highway between Anaheim Bay Road and the Perimeter Road. No upland disposal is anticipated.

1.4. Minimization and Avoidance Measures

The following minimization and avoidance measures proposed by the Navy are designed to avoid, reduce, and/or mitigate the impacts of the proposed project on protected species and habitats.

1.4.1. Construction Best Management Practices

The following best management practices (BMPs) will be applied for land-based and in-water construction activities:

- Temporary stockpiling of constructions material shall be restricted to designated construction staging areas within the project area.
- Contractors shall use only clean construction material suitable for use in the ocean environment. The contractor will ensure no debris, soil, silt, sand, sawdust, rubbish, cement or concrete washings thereof, chemicals, oil or petroleum products from construction will be allowed to enter into or placed where it may be washed by rainfall or runoff into waters of the U.S. Upon completion of the project authorized, any and all excess material of debris will be completely removed from the work area and disposed of in an appropriate upland site.
- Spill kits and cleanup materials will be present during construction should there be a leak into the surrounding water.
- A spill prevention plan will be developed and implemented if a spill occurs.
- The discharge of oil, fuel or chemicals to waters of the state is prohibited; therefore, less hazardous materials will be used when practicable
- All vessels associated with the construction project shall operate at “no wake/Idle” speeds at all times while in the construction area and while in water depths where the draft of the vessel provides less than a 4-foot clearance from the bottom
- The Navy will contact the NOAA Stranding coordinator immediately in the event of a watercraft collision with a marine mammal or sea turtle.
- All vessels will preferentially follow deep-water routes (e.g., marked channels) whenever possible.
- The Navy will post signs warning channel users of the potential construction activities and alert them to the upcoming change to the boat traffic pattern.
- The Navy will post signs along its perimeter fence at Seal Beach and Surfside Beach, alerting beachgoers, swimmers and surfers of the potential for increased turbidity associated with sediment disposal activities.
- The Navy will Post signs at the beach that will warn beach users of potential noise impacts.
- Protective measures for construction and demolition will include, but not be limited to, the use of catch devices and sheeting to prevent the release of debris and hazardous materials or wastes into Anaheim Bay

1.4.2. Pile BMPs

The following BMPs will be followed for pile driving activities.

- The contractor will ensure that all attachments (hydraulic connections and couplings) are in good operating order and inspected prior to the start of every day to prevent leaking of spilling of potentially hazardous or toxic products, including hydraulic fluid, diesel, gasoline and other petroleum products. Spill kits and containment booms must be maintained on-site in case of spills.
- Where possible, equipment used for in-water construction activities will be positioned to minimize damage or shading to sensitive habitat (e.g., eelgrass). Where possible, alternative methods will be employed (e.g., use of anchors instead of spuds).
- When necessary, the Navy will install silt curtains around each pile location to minimize the re-suspension of sediments in the water column during pile installation.
- Siltation barriers shall be made of a material that is unlikely to entangle any marine animals (e.g., reinforced impermeable polycarbonate vinyl fabric); installed in a manner in which a sea turtle cannot become easily entangled (i.e., stretched out tightly with very little slack); installed with the minimum extent of curtain needed (in terms of surface to bottom height, as well as total area surrounded); inspected daily to ensure proper integrity and for the presence of entangled or entrapped protected species; and removed immediately upon project completion.
- When feasible, remove piles with a vibratory hammer rather than a direct pull or clamshell method and slowly remove pile to allow sediment to slough off at or near the mudline.
- Hit or vibrate the pile first to break the bond between the sediment and the pile to minimize the likelihood of the pile breaking and to reduce the amount of sediment sloughed.
- If a pile is un able to be removed it will be cut at the mudline to avoid re-suspending contaminated sediments, with additional precautions taken to minimize suspension (e.g., proceed slowly).
- Any sheen associated with oil contamination at the water surface will be removed with oil absorbent materials.
- The Navy will monitor the turbidity of waters surrounding the pile work footprint to determine the need for additional turbidity control measures consistent with other permitting requirements imposed by other various State and Federal entities.

1.4.3. Dredging and Fill BMP's

The following best management practices will be followed for dredging and fill operations and use of dredged material for fill or reuse:

- If appropriate, the Navy will install silt curtains around each fill area to minimize the resuspension of sediments in the water column, when necessary.
- Siltation barriers shall be made of a material that is unlikely to entangle any marine animals (e.g., reinforced impermeable polycarbonate vinyl fabric); installed in a manner in which a sea turtle cannot become easily entangled (i.e., stretched out tightly with very little slack); installed with the minimum extent of curtain needed (in terms of surface to

bottom height, as well as total area surrounded); inspected daily to ensure proper integrity and for the presence of entangled or entrapped protected species; and removed immediately upon project completion.
- Turbidity levels will be monitored throughout dredging/placement operations with prescribed actions to be taken (e.g., slowing dredge cycle times, possible use of silt curtains) should turbidity exceed action levels.

1.4.4. Mitigation

A number of mitigation and conservation measures are described below and in the Eelgrass Habitat Mitigation and Conservation Plan (Mitigation Plan) to offset adverse impacts. The following measures will be implemented to reduce the effects of the Proposed Action on listed species:

- Weekly surveys for nesting birds within and adjacent to proposed activities will be performed and, if found, an appropriate buffer established around the nest to further reduce any impacts on protected bird species.
- The Navy will use qualified observers to monitor the presence of sea turtles during all pile driving, dredging, and fill activities. Monitors will record the presence of sea turtles from predetermined locations (that will vary with activity type) with a clear view of the bay and construction activities 30 minutes before activities start and 30 minutes after activities are complete. Monitors will have the authority to stop activities if a sea turtle is sighted in Anaheim Bay.
- Pile driving, dredging, and fill activities will re-commence if any one of the following conditions are met: (1) the animal is observed exiting Anaheim Bay, (2) the animal is thought to have exited Anaheim Bay based on its course and speed, or (3) Anaheim Bay has been clear from any additional sightings for a period of 30 minutes.
- Prior to the start of pile driving each day, after each break of more than 30 minutes, and if any increase in the intensity is required, the Navy will use a "ramp-up/dry fire start" procedure to allow any undetected species to behaviorally react, move away from the area.
- Temporary loss of eelgrass will be offset by creation of eelgrass mitigation areas (Figure 2).
- Pre-, post-, and two-years of post-construction eelgrass surveys will be conducted and loss of eelgrass will be mitigated by creation of eelgrass beds consistent with the California Eelgrass Mitigation Policy.
- A survey for the invasive alga Caulerpa taxifolia will be conducted before initiating in-water project activities, consistent with NMFS and California Department of Fish and Wildlife requirements (National Marine Fisheries Service, 2008). If Caulerpa taxifolia is found in the action area during this survey, NMFS-approved Caulerpa Control Protocols will be followed.
- Loss of dune habitat will be offset by creation of a dune habitat restoration area (Figure 2).
- Loss of intertidal habitat will be offset by creation of intertidal conservation areas (Figure 2).
- Loss of shallow water habitat will be offset by creation of shallow water habitat conservation areas (Figure 2).

1.4.5. Monitoring

The following are further monitoring activities for this project:

- The Navy, in cooperation with NMFS, will coordinate a satellite tagging study of green sea turtles to determine movement patterns in the action area and help understand the extent of impacts of the proposed project on green sea turtles in the area. In general, the Navy and NMFS will coordinate on research lead by the NMFS Southwest Fisheries Science Center (SWFSC) to conduct periodic capture/tagging of green sea turtles within or near the action area, under an ESA scientific research permit (permit #15634) held by the SWFSC. This research will begin approximately one year before project activities commence[2] to collect baseline information on green sea turtle use of the area. The Navy has proposed to share satellite tagging summary reports on a quarterly basis that will contain a table with metrics (carapace lengths and widths, weight, etc.) collected for captured turtles and maps with turtle locations, and will produce maps upon request at any time. The Navy has proposed to provide a more detailed report at the end of each tagging year with a summary of the annual results and comparison to previous years, when applicable, including home range analyses. The Navy has proposed to deliver these reports to NMFS within 120 days after the last tagging effort of the year. Prior to initiating project activities, the Navy has proposed to provide NMFS with a more detailed plan regarding schedules for turtle tagging and expectations for availability of results, analysis, etc.
- The Navy, in cooperation with NMFS, will establish a monitoring plan to collect environmental data within Anaheim Bay and the Seal Beach National Wildlife Refuge to monitor potential habitat impacts.
- The Navy may use additional conservation measures if their final underwater acoustic modeling results developed with their indicator pile program determines that sounds above the thresholds set by NMFS for level A and B harassment of marine mammals could travel outside Anaheim Bay.

1.4.6. Interrelated and/or Interdependent Actions

"Interrelated actions" are those that are part of a larger action and depend on the larger action for their justification. "Interdependent actions" are those that have no independent utility apart from the action under consideration (50 CFR 402.02). The Navy intends to service an increasing number of vessels as well as larger vessels given the increased capacity of the new ammunition pier and due to the planned increase in the size of the Navy's Pacific Fleet. As a result, we will consider the potential effect of an increased number and size of vessels that use the ammunition pier at Naval Weapons Station Seal Beach as an action "interrelated" to the proposed project. Currently 55 percent of U.S. Naval Vessels are assigned to the Pacific Fleet (137 vessels). Naval Weapons Station Seal Beach services around 40 of those a year. Naval Weapons Station Seal Beach already services destroyer class ships (there are currently 37 in the pacific fleet) which have a length of around 510 feet and a max draft of around 32 feet. The new pier design will be able to accommodate the simultaneous loading of two of these destroyer sized vessels at a time.

[2] Initial baseline study and tagging of green sea turtles began in November, 2018.

The Navy has indicated that the new facilities will also be able to accommodate larger Amphibious Assault Ships which have a length around 847 feet and a max draft of 29 feet. The Navy anticipates servicing around 10 more vessels per year at the base and expects four of these vessels to be the larger Amphibious Assault Ships.

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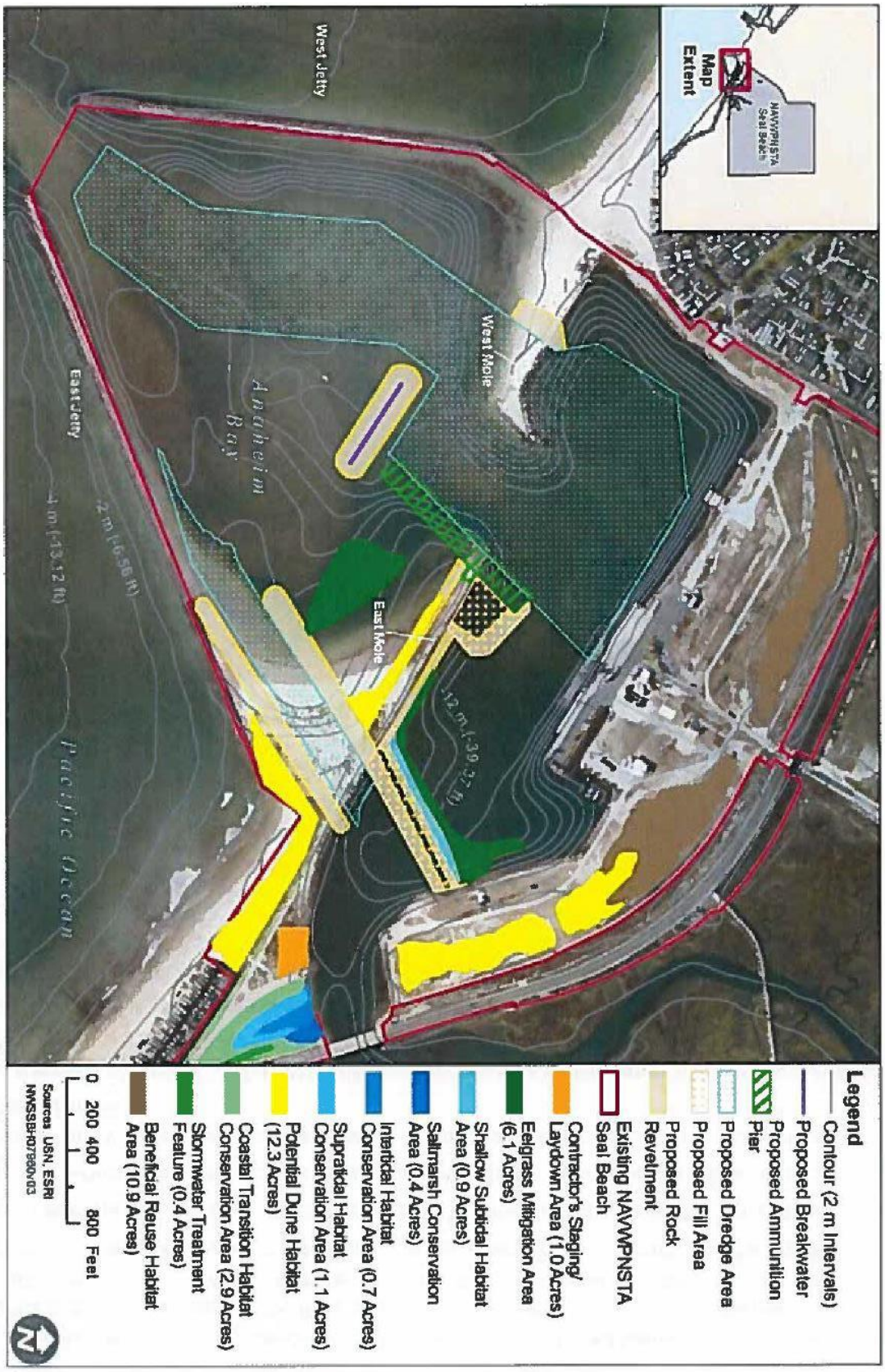

Figure 2. location and size of proposed mitigation and conservation areas.

2. ENDANGERED SPECIES ACT: BIOLOGICAL OPINION AND INCIDENTAL TAKE STATEMENT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the ecosystems upon which they depend. As required by section 7(a)(2) of the ESA, each Federal agency must ensure that its actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. Per the requirements of the ESA, Federal action agencies consult with NMFS and section 7(b)(3) requires that, at the conclusion of consultation, NMFS provides an opinion stating how the agency's actions will affect listed species and their critical habitats. If incidental take is reasonably certain to occur, section 7(b)(4) requires NMFS to provide an ITS that specifies the impact of any incidental taking and includes non-discretionary reasonable and prudent measures (RPMs) and terms and conditions to minimize such impacts.

2.1. Analytical Approach

This biological opinion includes a jeopardy analysis but no adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of "to jeopardize the continued existence of" a listed species, which is "to engage in an action that would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species. No critical habitat has been designated for Eastern Pacific DPS green sea turtles, therefore critical habitat and the "adverse modification" standard are not considered in this biological opinion.

We use the following approach to determine whether a proposed action is likely to jeopardize listed species or:

- Identify the rangewide status of the species expected to be adversely affected by the proposed action.
- Describe the environmental baseline in the action area.
- Analyze the effects of the proposed action on both species and their habitat using an "exposure-response-risk" approach.
- Describe any cumulative effects in the action area.
- Integrate and synthesize the above factors by: (1) Reviewing the status of the species; and (2) adding the effects of the action, the environmental baseline, and cumulative effects to assess the risk that the proposed action poses to the species.
- Reach a conclusion about whether species are jeopardized.
- If necessary, suggest a RPA to the proposed action.

In this biological opinion, we specifically consider the adverse effects of harassment of ESA-listed green sea turtles as a result of the proposed project. Consistent with the "Interim Guidance on the Endangered Species Act Term 'Harass'" (NMFS 2016a), we interpret harass in a manner similar to the USFWS regulatory definition for non-captive wildlife:

"Create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering."

Under this "Interim Guidance" we interpret the phrase "significantly disrupt normal behavioral patterns" to mean a change in the animal's behavior (breeding, feeding, sheltering, resting, migrating, etc.) that could reasonably be expected, alone or in concert with other factors, to create or increase the risk of injury to an ESA-listed animal when added to the condition of the exposed animal before the disruption occurred. An injury in the context of analyzing behavioral responses could be a physical injury or a physiological or other impact that would reasonably be expected to negatively affect the animal's growth, health, reproductive success, and/or ability to survive (i.e., an effect that results from a more than inconsequential behavioral response). Harassment does not require that an injury actually result or is proven; only that the behavioral response creates or increases the likelihood of injury.

2.2. Rangewide Status of the Species and Critical Habitat

This opinion examines the status of each species that would be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' current "reproduction, numbers, or distribution" as described in 50 CFR 402.02.

One factor affecting the range-wide status of ESA-listed species and aquatic habitat at large is climate change. Climate change has received considerable attention in recent years, with growing concerns about global warming and the recognition of natural climatic oscillations on varying time scales, such as long term shifts like the Pacific Decadal Oscillation or short term shifts, like El Niño or La Niña. Evidence suggests that the productivity in the North Pacific (Mackas et al. 1989; Quinn and Niebauer 1995) and other oceans could be affected by changes in the environment. Important ecological functions such as migration, feeding, and breeding locations may be influenced by factors such as ocean currents and water temperature. Any changes in these factors could render currently used habitat areas unsuitable and new use of previously unutilized or previously not existing habitats may be a necessity for displaced individuals. Changes to climate and oceanographic processes may also lead to decreased productivity in different patterns of prey distribution and availability. Such changes could affect individuals that are dependent on those affected prey.

Based upon available information, it is likely that sea turtles are being affected by climate change. Sea turtle species are likely to be affected by rising temperatures that may affect nesting success and skew sex ratios, as some rookeries are already showing a strong female bias as warmer temperatures in the nest chamber leads to more female hatchlings (Kaska et al. 2006; Chan and Liew 1995). Rising sea surface temperatures and sea levels may affect available nesting beach areas as well as ocean productivity. Based on climate change modeling efforts in the eastern tropical Pacific Ocean, for example, Saba et al. (2012) predicted that the Playa Grande (Costa Rica) sea turtle nesting populations would decline 7% per decade over the next

100 years. Changes in beach conditions are expected to be the primary driver of the decline, with hatchling success and emergence rates declining by 50-60% over the next 100 years in that area (Tomillo et al. 2012). Sea turtles are known to travel within specific isotherms and these could be affected by climate change and cause changes in their bioenergetics, thermoregulation, prey availability, and foraging success during the oceanic phase of their migration (Robinson et al. 2008; Saba et al. 2012). While the understanding of how climate change may impact sea turtles is building, there is still uncertainty and limitations surrounding the ability to make precise predictions about or quantify the threat of future effects of climate change on sea turtle populations (Hawkes et al. 2009).

We consider the ongoing implications of climate change as part of the status of ESA-listed species. Where necessary or appropriate, we consider whether impacts to species resulting from the proposed action could potentially influence the resiliency or adaptability of those species to deal with climate change that we believe is likely over the foreseeable future.

2.2.1. East Pacific DPS Green Sea Turtle

In 2016, NMFS finalized new listings for 11 green sea turtle DPSs, including listing the East Pacific DPS as threatened (81 FR 20057). The East Pacific DPS includes turtles that nest on the coast of Mexico which were historically listed under the ESA as endangered. All of the green turtles DPSs were listed as threatened, with the exception of the Central South Pacific DPS, Central West Pacific DPS, and the Mediterranean DPS which were listed as endangered Seminoff et al. 2015).[3]

Green turtles are found throughout the world, occurring primarily in tropical, and to a lesser extent, subtropical waters. The species occurs in five major regions: the Pacific Ocean, Atlantic Ocean, Indian Ocean, Caribbean Sea, and Mediterranean Sea. Molecular genetic techniques have helped researchers gain insight into the distribution and ecology of migrating and nesting green turtles. Throughout the Pacific, nesting assemblages group into two distinct regional areas: 1) western Pacific and South Pacific islands, and 2) eastern Pacific and central Pacific, including the rookery at French Frigate Shoals, Hawaii. In the eastern Pacific, greens forage coastally from southern California in the north to Mejillones, Chile in the South. Based on mitochondrial DNA analyses, green turtles found on foraging grounds along Chile's coast originate from the Galapagos nesting beaches, while those greens foraging in the Gulf of California originate primarily from the Michoacan nesting stock. Green turtles foraging in southern California and along the Pacific coast of Baja California originate primarily from rookeries of the Islas Revillagigedos (Dutton 2003).

Population Status and Trends: NMFS and USFWS (2007) provided population estimates and trend status for 46 green turtle nesting beaches around the world. Of these, twelve sites had increasing populations (based upon an increase in the number of nests over 20 or more years ago), four sites had decreasing populations, and ten sites were considered stable. For twenty sites there are insufficient data to make a trend determination or the most recently available

[3] The 2015 biological status report that was used to support the recent listing activities (Seminoff et al. 2015) can be found at: http://www.nmfs.noaa.gov/pr/species/Status%20Reviews/green_turtle_sr_2015.pdf

information is too old (15 years or older). A complete review of the most current information on green sea turtles is available in the 2015 Status Review (Seminoff et al. 2015).

Green turtles that may be found within the action area likely originate from the eastern Pacific. Green turtles in the eastern Pacific were historically considered one of the most depleted populations of green turtles in the world. The primary green turtle nesting grounds in the eastern Pacific are located in Michoacán, Mexico, and the Galapagos Islands, Ecuador (NMFS and USFWS 1998). Here, green turtles were widespread and abundant prior to commercial exploitation and uncontrolled subsistence harvest of nesters and eggs. Sporadic nesting occurs on the Pacific coast of Costa Rica. Analysis using mitochondrial DNA sequences from three key nesting green turtle populations in the eastern Pacific indicates that they may be considered distinct management units: Michoacán, Mexico; Galapagos Islands, Ecuador, and Islas Revillagigedos, Mexico (Dutton 2003).

Information has been suggesting steady increasing in nesting at the primary nesting sites in Michoacan, Mexico, and in the Galapagos Islands since the 1990s (Delgado and Nichols 2005; Senko et al. 2011). Colola beach is the most important green turtle nesting area in the eastern Pacific; it accounts for 75 percent of total nesting in Michoacan and has the longest time series of monitoring data since 1981. Nesting trends at Colola have continued to increase since 2000 with the overall eastern Pacific green turtle population also increasing at other nesting beaches in the Galapagos and Costa Rica (Wallace et al. 2010; NMFS and USFWS 2007). Based on recent nesting beach monitoring efforts, the current adult female nester population for Colola, Michoacán is over 11,000 females, making this the largest nesting aggregation in the East Pacific DPS comprising nearly 60 percent of the estimated total adult female population (Seminoff et al. 2015).

Two foraging populations of green turtles are found in U.S. waters adjacent to the proposed action area. South San Diego Bay serves as important habitat for a resident population of up to about 60 juvenile and adult green turtles in this area (Eguchi et al. 2010). There is also an aggregation of green sea turtles that appears to be persistent in the San Gabriel River and surrounding coastal areas in the vicinity of Long Beach, California (Lawson et al. 2011). This is the group of turtles that are likely to be impacted by the proposed action, although knowledge of their abundance, behavior patterns, or relationship with the population in San Diego Bay are somewhat limited (see Section 2.2.2 *Status in the Action Area* below). In general, sightings and strandings (see Section 2.4 *Environmental Baseline*) of green sea turtles in Southern California have been increasing, likely representing increasing abundance of these individuals in the area. Given this is the northern extent of their range, this may be indicating there is suitable habitat for green sea turtles in Southern California, and that the overall population maybe increasing.

Threats: A thorough discussion of threats to green turtles worldwide can be found in the most recent status review (Seminoff et al. 2015). Major threats include: coastal development and loss of nesting and foraging habitat; incidental capture by fisheries; and the harvest of eggs, sub-adults and adults. Climate change is also emerging as a critical issue. Destruction, alteration, and/or degradation of nesting and near shore foraging habitat is occurring throughout the range of green turtles. These problems are particularly acute in areas with substantial or growing coastal development, beach armoring, beachfront lighting, and recreational use of beaches. In

addition to damage to the nesting beaches, pollution and impacts to foraging habitat becomes a concern. Pollution run-off can degrade sea grass beds that are the primary forage food of green turtles. The majority of turtles in coastal areas spend their time at depths less than 5 m below the surface (Schofield et al. 2007; Hazel et al. 2009), and hence are vulnerable to being struck by vessels and collisions with boat traffic are known to cause significant numbers of mortality every year (NMFS and USFWS 2007; Seminoff et al. 2015). Marine debris is also a source of concern for green sea turtles especially given their presence in nearshore coastal and estuarine habitats.

The bycatch of green sea turtles, especially in coastal fisheries, is a serious problem because in the Pacific, many of the small-scale artisanal gillnet, setnet, and longline coastal fisheries are not well regulated. These are the fisheries that are active in areas with the highest densities of green turtles (NMFS and USFWS 2007). The meat and eggs of green turtles has long been favored throughout much of the world that has interacted with this species. As late as the mid-1970s, upwards of 80,000 eggs were harvested every night during nesting season in Michoacán (Clifton et al. 1982). Even though Mexico has implemented bans on the harvest of all turtle species in its waters and on the beaches, poaching of eggs, females on the beach, and animals in coastal water continues to happen. In some places throughout Mexico and the whole of the eastern Pacific, consumption of green sea turtles remain a part of the cultural fabric and tradition (NMFS and USFWS 2007).

Like other sea turtle species, increasing temperatures have the potential to skew sex ratios of hatchling and many rookeries are already showing a strong female bias as warmer temperatures in the nest chamber leads to more female hatchlings (Kaska et al. 2006; Chan and Liew 1995). Increased temperatures also lead to higher levels of embryonic mortality (Matsuzawa et al. 2002). An increase in typhoon frequency and severity, a predicted consequence of climate change (Webster el al. 2005), can cause erosion which leads to high nest failure (Van Houtan and Bass 2007). Green sea turtles feeding may also be affected by climate change. Seagrasses are a major food source for green sea turtles and may be affected by changing water temperature and salinity (Short and Neckles 1999; Duarte 2002).

2.3. Action Area

The action area includes all areas that are: (1) directly affected by project activities and interrelated actions, including the routes to dredge material disposal and the vessel approaches into areas near Naval Weapon Station Seal Beach; (2) surrounding project activities that are exposed to increased in-water sound levels or other forms of disturbance; and (3) surrounding the project area that may be indirectly affected by altered tide/current patterns or other changes in habitat as a result of project activities. The action area for this project includes Anaheim Bay, the Seal Beach National Wildlife Refuge, Huntington Harbor (a.k.a., Anaheim Bay estuarine complex), Seal Beach and nearshore areas, Sunset Beach and nearshore areas, the transit routes

to sediment disposal sites LA-2 and LA-3, and the coastal waters surrounding the Seal Beach/Long Beach area where vessels approach Naval Weapons Stations Seal Beach (Figure 3).

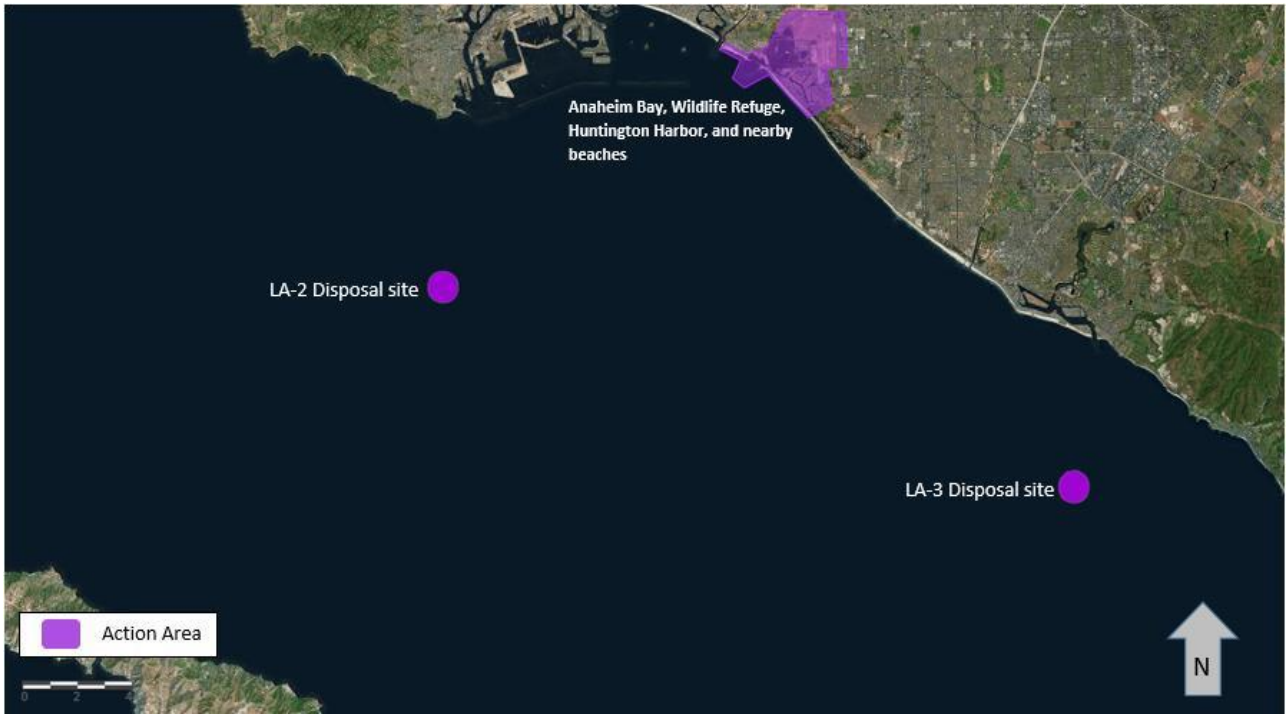

Figure 3. Action area for the proposed activities.

2.4. Environmental Baseline

The "environmental baseline" includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

Status in the Action Area

A small population of green sea turtles persists in the San Gabriel River about 1 mile northwest of the action area (entrance into Anaheim Bay), and within Anaheim Bay and the Seal Beach National Wildlife Refuge (SBNWR) estuarine complex (Crear et al. 2016). While green sea turtles are known to transit through the entrance into Anaheim Bay into SBNWR and other areas (referred to herein as the Anaheim Bay estuary), the ecology and total number of turtles using the Anaheim Bay estuarine complex has not been fully described. Over the last decade of study, we have identified over 50 different sea turtles occurring in the San Gabriel River/Anaheim Bay area (NMFS unpublished data) through research or strandings, although the duration of residence and/or transitory patterns of individuals in this area are the subject of ongoing research. Hashimoto et al. (2017) used photo identification to record at least 62 different individuals present in the San Gabriel River between 2008 and 2015. The genetic data from these turtles that have been sampled in this area have all identified eastern Pacific/Mexico nesting beach origins (SWFSC unpublished data).

The available information suggests that while green turtles are present in the San Gabriel River year round, their presence may be more seasonal in other locations during the summer and fall when water temperatures are warmer, including: Anaheim Bay, the SBNWR, Sunset/Huntington Harbour, and Alamitos Bay. Crear et al. (2016) showed that acoustically tagged juvenile sea turtles left SBNWR/Anaheim Bay and moved into the San Gabriel River during winter months, when temperatures dropped below 15° Celsius (C). Conversely, turtles moved through the action area to get to the 7th Street Basin in the SBNWR during summer and fall months to forage on eelgrass beds. Although observations of sea turtles in Anaheim Bay estuarine complex have not been collected systematically, the general trend in the SBNWR has been that turtles are first sighted in the spring (as early as April), may be present throughout summer/fall, and then may disappear by the beginning of winter (as late as the end of December). Recent marine mammal surveys in the bay recorded two sightings of green sea turtles in the inner bay near the Pacific Coast Highway Bridge on November 28, 2016 (U.S. Dept. of the Navy, unpublished data). Additionally, beginning in May 2018, the Navy and the SBNWR initiated surveys for turtles in the Refuge ponds utilizing SBNWR volunteers. Survey results indicated that sea turtles have been observed in all of the ponds within the SBNWR, with the exception of Forrestal Pond (U.S. Department of the Navy, unpublished data). In the SBNWR, individual turtles have exhibited residence in 7th Street Pond for several months at a time (Crear et al. 2016). Based on this information, we assume: that green turtles are seasonally foraging within the Anaheim Bay estuarine complex areas; may periodically or frequently transit through the action area; may reside within the Anaheim Bay estuarine complex for many months; may also occur in the offshore coastal area surrounding Long Beach and the LA-2 disposal site; and may occur in the action area at any time during the year although they are most likely to be found in the action area from spring through fall, depending in part on coastal water temperatures.

NMFS has also been studying a local population of green sea turtles in San Diego Bay. These turtles are known to be attracted to the high concentrations of eelgrass and the presence of this important food item and habitat for other preferred prey species likely influences their activity patterns within the Bay (Lemmons et al. 2011). While the specific importance of eelgrass in Anaheim Bay estuarine complex has not been characterized, areas such as the 7th Street Pond in the SBNWR where sea turtles have often been observed are also areas of relatively high concentrations of eelgrass, and we conclude eelgrass is likely a similarly important habitat feature for green sea turtles that may be found within the project area. In addition to eelgrass, other important prey species identified in San Diego Bay included mobile and sessile invertebrates, as well as red and green algae to a lesser degree (Lemmons et al. 2011), which are likely found throughout the action area and the Anaheim Bay estuarine complex.

As described above in the status section, green sea turtles have been and continue to be affected by numerous activities, although many of these threats are more prominent outside the U.S. or more acute in areas where green turtle nesting occurs. The proposed action area includes the entrance into Anaheim Bay along with the Anaheim Bay estuary, as well as the offshore area near Long Beach where dredge materials may be disposed. In this area, significant coastal development has occurred and remains ongoing. The action area is also the location of significant amounts of commercial and recreational vessel traffic. Below we summarize the known impacts of human activities on green sea turtles in the action area.

Strandings

Green turtle strandings are documented each year along the U.S. West Coast, with most of these strandings occurring in Southern California. Causes of green turtle strandings in Southern California include encounters with marine debris, illness, gunshot wounds, and cold stunning. Because not all dead stranded sea turtles are necropsied and causes of death can be difficult to ascertain in many circumstances during the limited evaluations conducted, the causes of the majority of strandings are unspecified or unknown. In the general vicinity of the action area, there were a total of 24 green sea turtle strandings (15 dead and 9 alive) reported to NMFS in Los Angeles and Orange counties between 2016 and 2017 (NMFS unpublished stranding data). Most of these strandings are from unknown origins, although entrainment in the power plant intakes, boat collisions, and interactions with recreational fishermen are likely the cause of many of these strandings.

Fisheries Interactions

Along the west coast of the U.S., and specifically within the vicinity of the action area, green turtles have been occasionally reported and observed interacting with fishing gear; including hook and line recreational fishing gear (NMFS unpublished stranding data). While there is no commercial fishing within Anaheim Bay, several fisheries do occur in the coastal and offshore waters near Seal Beach. When considering the impact of U.S. west coast Federal fisheries on ESA-listed species of sea turtles, recent biological opinions have found no jeopardy to any of these species, including green sea turtles (NMFS 2012a, 2012b) based on the level and severity of known or anticipated interactions. There are two state gillnet fisheries in California that may interact with sea turtles: the set gillnet fishery targeting halibut and white seabass; and the small mesh drift gillnet fishery targeting yellowtail, barracuda, and white seabass. No sea turtle interactions have been documented recently through sporadic observer coverage of those fisheries, although gillnets are believed to pose a threat to green turtles that are moving around in coastal California waters.

Scientific Research

NMFS issues scientific research permits to allow research actions that involve take of sea turtles along the U.S. west coast. Specifically within San Diego Bay, NMFS has issued Permit #15634 to the SWFSC to conduct long term monitoring of foraging green turtles throughout Southern California, including Anaheim Bay and the SBNWR to characterize population structure, foraging ecology, and movement patterns. This permit reflects a continuation of almost a decade of research conducted on the resident population of green turtles in the Long Beach area which has included numerous partners such as the Navy, U.S. Fish and Wildlife Service, and California State University of Long Beach. The permit allows a suite of activities that include targeted capture, tagging, tracking, and collection of biological data and samples. These activities are intended to be non-injurious, with only minimal short term effects. But the risks of a green turtle incurring an injury or mortality cannot be discounted as a result of directed research. We expect that green turtle research in the Seal Beach area will continue to occur into the foreseeable future, including within the proposed project area during the proposed project. Specifically, the

Navy has proposed to coordinate with NMFS on research conducted under this (and any subsequent permit issued to the SWFSC) permit to help monitor and better understand impacts of the proposed action on green sea turtles within the vicinity of the proposed project.

Coastal Development

Anaheim Bay (and associated estuarine areas like Huntington Harbour) is a highly urbanized coastal embayment where a significant amount of coastal development has and continues to occur. A significant portion of this development activity involves federal permitting by the U.S. Army Corps of Engineers (Corps) under the authorities of the Clean Water Act and/or Rivers and Harbors Act, similar to authorities that also oversee permitting of the Navy's proposed action. Some of this coastal development activity is conducted on behalf of the Navy, although numerous other public or private enterprises are involved in further development and/or maintenance of existing infrastructure inside Anaheim Bay. Common activities include the repair or replacement of piers, piles, and bulkheads, and maintenance dredging, similar to some components of this proposed action. At this time, NMFS is not aware of any other infrastructure maintenance activities that are expected to occur within Anaheim Bay over the course of the next 5.5 years, although it is reasonable to expect that some coastal development projects that may include dredging or infrastructure upgrades will occur. Until now, all of the ESA consultations conducted with the Navy or the Corps have concluded that these coastal development projects are not likely to adversely affect any ESA-listed species, including green sea turtles. These conclusions have been reached based in large part on the fact that these proposed coastal development projects have implemented the same types of minimization and avoidance measures that the Navy proposes to implement here to avoid some of the adverse effects of their proposed action, and the relative short duration and limited extent of those project activities and potential effects (in contrast to the proposed action).

Anaheim Bay and SBNWR are owned and managed by the Navy which prevents any future public development on these areas protecting the adjacent green turtle habitat. The Navy manages natural resources within this area in accordance with the Naval Weapons Station Seal Beach Integrated Natural Resources Management Plan (INRMP).

2.5. Effects of the Action

Under the ESA, "effects of the action" means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.

Approach to the Effects Analysis

NMFS determines the effects of the action using a sequence of steps. In this analysis, the first step identifies stressors (or benefits) associated with the proposed action with regard to listed species. The second step identities the magnitude of stressors (e.g., duration, extent, and frequency of the stressor and how many individuals of a listed species will be exposed to the stressors; *exposure analysis).* The third step describes how the exposed individuals are likely to

respond to these stressors (e.g., behavioral changes or the injury or mortality rate of exposed individuals; *response analysis).* The final step in determining the effect of the action is establishing the risks those responses pose to listed species *(risk analysis).* In this step of our analysis, we will relate information on the number and age (or life stage), if applicable, of the individuals likely to be exposed to the proposed action's effects, along with the likely responses of those individuals to the proposed action, to an expected impact on the populations or subpopulations those individuals represent.

2.5.1. Exposure and Response

The information presented above in Section 2.2.2 *Status in the Action Area* suggests that green sea turtle occurrence in the action area may be relatively less likely or frequent during the spring and winter months when water temperatures are coldest. However, there is a reasonable possibility that green sea turtles could occur within the action area at any time during the year, and the likelihood of frequent occurrence by a number of green sea turtles in the action area during significant portions of every year throughout the duration of the project is very high. As a result, the effects analysis herein considers the significance of the Anaheim Bay area for green sea turtles throughout the entire year, and assumes that presence will occur in varying degrees throughout the year, and during all of the proposed project activities.

Potential effects to green sea turtles from the proposed project would include: (1) general disturbance or potential strikes or direct encounters with vessels, in-water construction equipment, and fill or disposal activities; (2) exposure to potentially disruptive or injurious underwater sound levels generated by pile-driving activities; (3) alteration or disturbance of benthic habitats (particularly eelgrass habitat) from dredging and fill activities; (4) modified hydrology of the Anaheim Bay estuary or other environmental impacts that may lead to a changes in foraging habitat in the area; and (5) temporary disturbance or disorientation caused by modification of the only passage way into/out of the Anaheim Bay estuary with construction of a new public navigation channel. A separate EFH analysis, Section 3 below, details the potential impacts of the proposed action on managed habitats in the action area, including eelgrass beds where sea turtles forage. In addition to the potential effects that may result from the individual effect pathways identified above, we consider the potential effect that may result from exposure to multiple pathways of stressors simultaneously over a sustained period of time throughout the duration of the proposed project.

Direct Contact Injury

In general, the risks of direct contact injury for green sea turtles as a result of all activities included in the proposed action is relatively low given the proposed minimization and avoidance measures and anticipated response of green sea turtles that may occur in the action area. As described in Section 1.3 Proposed Action, the Navy will monitor all in-water project activities, and all activities will cease or be delayed if a sea turtle is in the vicinity of project activities. For pile-driving, dredging, and fill activities, the Navy has proposed to use protected species observers to monitor the entire Anaheim Bay project area within the breakwaters during these activities. There are other project activities for which the Navy has not yet specified the monitoring zone, which could be variable by project activity type based on previous consultations with the Navy (e.g., disposal). While a final monitoring plan is forthcoming, we

ultimately expect all monitoring zones with be commensurate with or exceed monitoring zones routinely employed during these type of project activities in Southern California that have been previously been consulted on by NMFS (e.g., at least 20 m for all in-water activity, 100 m for disposal). Activities will not commence or continue until an observed turtle has left or at least 30 minutes after the last sighting within these monitoring zones. The use of monitoring to identify the presence of turtles in the project area before the initiation of project activities and actions to postpone or cease activities until the turtle leaves should minimize the risk of direct injury. If any turtles are in project areas but avoid detection, we expect turtles will detect the commencement of project activities as construction equipment or vessels begin to ramp up operations in their immediate vicinity, and will have an opportunity to move away, especially during the initial stages of mobilizing equipment and vessels for work. Based on our general understanding of their behavior and observations of turtles during field studies (D. Lawson, NMFS, personal observations 2015), they are expected to avail themselves of this opportunity.

Although we believe the potential use of hydraulic cutterhead/suction dredges during the proposed actions poses the risk of negative sea turtle encounters, to date, NMFS is not aware of any evidence indicating confirmed negative interactions between turtles and cutterhead/suction dredges. In 2012, a dead green sea turtle was found near Encinitas with injuries consistent with contact from a hydraulic hopper dredge (Harris 2014). NMFS understands that dredging activities permitted by the Corps were occurring in the vicinity of Encinitas during that time period. Hopper dredge encounters with sea turtles known to occur in the Southeastern U.S. have been formally consulted upon numerous times by Corps and NMFS. The specific risks associated with cutterhead/suction dredging are not as well-known as hopper dredges. If a turtle were to come into physical contact with a hydraulic cutterhead/suction dredge, it might incur injuries similar to those experienced with hopper dredges. However, because of the greater disturbance associated with cutterhead/suction dredges (noise and turbidity), we would expect turtles that might be in the vicinity to sense the disturbance and avoid the dredge.

In addition to monitoring and maintaining a shutdown zone in the unlikely event a green turtle is present in a project area, other measures will be implemented as part of the proposed action. The proposed action includes numerous BMPs that will be implemented as necessary during projects that may produce debris to control and remove that debris from the immediate project area. All vessels associated with project operations under the proposed action will operate at idle speeds in the construction area during all projects. While there is no mandated speed limit for vessels towing barges away from the immediate vicinity of construction areas in Anaheim Bay, vessels with barges in tow are expected to travel at relatively slow speeds (<10 knots) to meet the general expectations for safe navigation as outlined by the USCG as an overall requirement for all vessels operating in all U.S. waters at all times (COLREG Rule 6; 33 CFR §83.06). While vessel collisions are the number one identified source of green sea turtle strandings along the U.S. west coast (LeRoux et al. 2019; NMFS stranding data), the likelihood of collisions with sea turtles at such slow speeds is remote. During research operations, NMFS staff repeatedly have observed the detection and avoidance reactions of sea turtles to slow moving vessels, even upon detecting them at very close proximity while surfacing, and concluded that the risk of a collision with vessels in construction areas or with barges in tow out of Anaheim Bay is discountable (Dan Lawson, NMFS West Coast Region, pers. obs., March 20, 2019).

While green turtles may occasionally be found transiting through the offshore and coastal waters where the LA-2, LA-3, and local beach disposal sites are located, we do not expect them to be regularly located at these locations. Green turtles are unlikely to be foraging in the offshore waters where LA-2 and LA-3 are located due to its depth (150+ m depth offshore), or at the coastal disposal sites near Sunset and Seal Beach (located at 7-10 m depth) commonly used as disposal sites due to their relatively barren sandy bottom and lack of eelgrass, surfgrass, or other vegetative habitat in this area. As a result, we conclude it is unlikely that a green sea turtle would be at the dredge disposal sites when such disposal occurs. If a green sea turtle is present, the monitoring measures proposed will help the Navy avoid disposal in the immediate vicinity of the turtle.

The proposed action does include potential use of silt barriers if deemed necessary to meet turbidity control and habitat minimization objectives. If the bottom of the turbidity curtain rises up off the bottom during high tides while the curtain remains deployed for a period of time, a green turtle encountering the curtain may attempt to transit under the curtain, which presents a risk of getting caught trapped under the curtain. In separate events in 2014 and 2016, green turtles were found dead in South San Diego Bay near a project where a turbidity curtain was being employed (NMFS unpublished stranding data). Information gathered by NMFS WCR staff after these incidents indicated that turtles had been seen at various times near these curtains, suggesting possible interactions such as attempts to transit underneath the curtains. It was not possible to confirm the ultimate cause of these strandings, but interaction with the turbidity curtain and possible entrapment and/or entanglement with them could not be ruled out (NMFS unpublished stranding data). These events have been particularly confounding given that sea turtle researchers have consistently reported that green sea turtles appear to be gifted at evading and escaping nets that have been designed specifically to capture them in similar shallow water and poor visibility conditions that exist in South San Diego Bay where these events occurred (Jeff Seminoff, SWFSC, personal communication, 2015; Dan Lawson, NMFS, personal observations 2015). In addition, although turbidity curtains are commonly used in numerous coastal development projects in the Southeastern U.S. in areas where sea turtle presence and abundance is relatively high, there has never been a documented or known case of incidence of an entanglement, drowning, or otherwise harmful interaction with a turbidity curtain and sea turtle there (Dennis Klemm, NMFS, personal communication, 2014). Although we urge caution, discretion, and vigilance with respect to use of silt barriers in this proposed action, we do expect any green turtles that encounter a turbidity curtain will be able to detect it, respond, and successfully negotiate the encounter without entanglement or other significant injury.

In total, we expect implementation of the proposed measures to be effective at minimizing the risks of direct contact between sea turtles and vessels, equipment, and debris. As a result of the avoidance and minimization measures proposed by the Navy, we conclude the risk of direct contact and injury or death as a result of the proposed action is extremely unlikely, and therefore discountable.

Increased Number and Size of Vessels at Naval Weapons Station Seal Beach

As described in Section 1.4, we identified the potential effect of an increased number and size of vessels that use the ammunition pier at Naval Weapons Station Seal Beach as an action

"interrelated" to the proposed project. After completion of the proposed project, the Navy is anticipating that approximately 10 more Navy vessels will be serviced at Naval Weapons Station Seal Beach each year. Estimates for vessel traffic in the area around Anaheim Bay are 4,000 shipping vessels each year for the Ports of Los Angeles and Long Beach.[4] This does not include civilian vessels and non-shipping related vessel traffic as depicted in Figure 4. Although we are generally aware that green sea turtles use the coastal waters surrounding Anaheim Bay and the Long Beach to some degree as they migrate along the coast or potentially for foraging in the nearshore waters, we are unaware of any locations in this area where green sea turtles concentrate and/or persistently occur similar to the estuarine areas of Seal Beach and Long Beach. While we recognize vessel collisions appear to be a source of strandings in the action area (Section 2.4 *Environmental Baseline*), we generally are unable to determine if vessel collisions occur with large commercial and military vessels or with smaller recreational vessels, and/or where these interactions may take place. Given the limited increase in overall vessel traffic in the action area expected to occur after the Navy completes the proposed action and our expectations for limited concentrations of green sea turtles in coastal waters surrounding Naval Weapons Station Seal Beach, we conclude the increased numbers and sizes of vessels coming to Naval Weapons Station Seal Beach does not pose a significant increase in vessel collision risk to green sea turtles outside of Anaheim Bay.

Naval Weapons Station Seal Beach already services destroyer class ships (there are currently 37 in the Pacific Fleet) which have a length of around 510 feet and a max draft of around 32 feet. The new pier design will be able to accommodate the simultaneous loading of two of these destroyer sized vessels at a time. The Navy has indicated that the new facilities will also be able to accommodate larger amphibious assault ships which have a length around 847 feet and a max draft of 29 feet. There are currently six of these larger amphibious assault ships in the Pacific fleet. We do not expect this increase in vessel size and number to have negative impacts on green sea turtles within Anaheim Bay at Naval Weapons Station Seal Beach. We anticipate that Navy vessels entering Anaheim Bay will be operating at slow speeds within the confines of Anaheim Bay, presenting a low risk for vessel collision in this area regardless of the size and numbers of vessels that operate in the area.

[4] https://www.portoflosangeles.org/business/statistics/facts-and-figures; http://www.polb.com/about/facts.asp

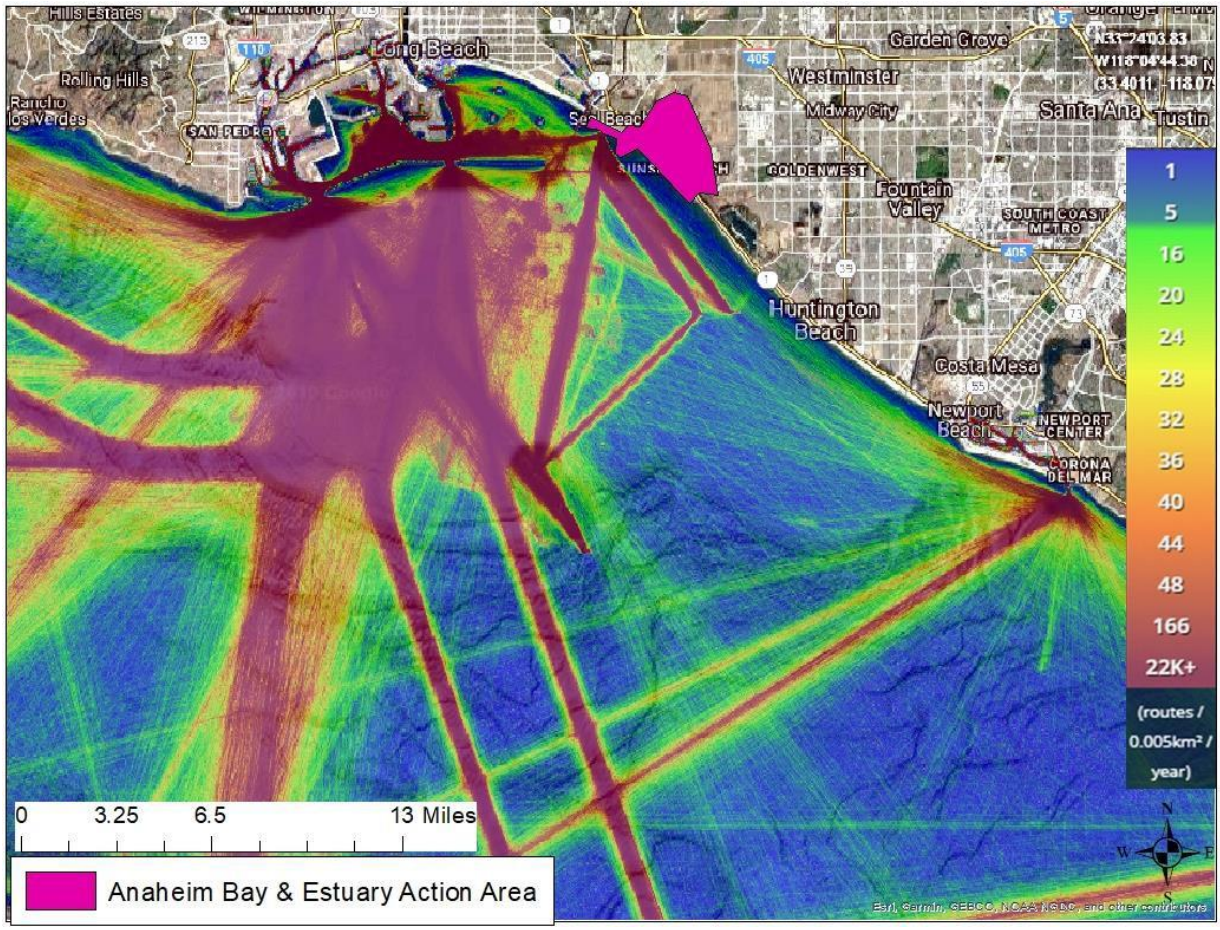

Figure 4. Action area for Anaheim Bay with 2017 vessel traffic density for the surrounding waters (data from www.marinetraffic.com).

General Disturbance

In general, all in-water construction projects present some risk of disturbance to any green sea turtles that may be present in these project areas. In particular, proposed project activities that may involve the generation of loud underwater sounds such as pile driving (considered further below) have the potential to create disturbance for any green sea turtles in the vicinity. We expect the reaction to disturbance will be avoidance of the immediate project areas. Although we are aware of the significance of the Anaheim Bay estuary for green sea turtle foraging in general, their use of the immediate project area where in-water work will occur beyond passage into/out of this estuarine area is not as well known. There are productive shallow water habitats in the project area (as described in detail in Section 3) that could be at least occasionally used by transiting turtles, and avoidance of these areas could affect foraging in these areas. It is also possible that disturbance could alter, delay, preclude, or otherwise disrupt passage into/out of the Anaheim Bay estuary foraging activities, which could affect foraging patterns in sites within the estuary that are known to be preferred foraging and residential locations.

The extent and consequences of potential avoidance and disruption that should be anticipated as a result of general disturbance created by the proposed project are difficult to assess, especially

given the 5-year duration of the project. Avoidance of the immediate project area for relatively short periods of time might not be that significant, given the relatively limited scope of the immediate project areas (limited to the entrance area of Anaheim Bay) compared to the entire Anaheim Bay estuary. However, the duration of the project suggests that general disturbances within the project area are likely to persist fairly continuously to some degree throughout the entire project. As described below *Impacts to Sea Turtle Foraging Habitat*, there is a considerable amount of available foraging habitat outside the immediate footprint of the proposed project inside the Anaheim Bay estuary, and other nearby locations like the San Gabriel River. However, potential disruptions of passage into/out of the Anaheim Bay could affect foraging success, especially if disruptions were to occur in a frequent or persistent manner over a long period of time. A number of the project activities involve in-water work that could cause some level of disturbance within or near the entrance into the Anaheim Bay estuary, including dredging/disposal, fill/removal of rock and sediments, causeway and pier construction, along with other pile-driving work, are expected to occur over and/or last many day, weeks, months, or years. As a result, we conclude there is potential for at least some significant disruptions of green sea turtle movements and passage into/out of the action area as a result of general disturbance that could affect foraging behaviors and success. Further considerations of the potential acoustic impacts from pile-driving, and the importance of the action area as the sole passage into/out of the Anaheim Bay and potential disruption of movements through the project area resulting from modification of the passage way channel, are provided below.

Exposure to Acoustic Impacts

There are risks of exposure to loud sounds that may cause injury during activities covered under the proposed action, including specific increased risks associated with pile driving. The Navy has indicated that the proposed project activities would employ avoidance and minimization measures to avoid adverse effects to green sea turtles as a result of exposure to acoustic impacts. Specifically for pile driving, these mitigation measures included visual monitoring of the entire Anaheim Bay area. Monitoring will commence at least 30 minutes prior to in-water construction activities and after each break of at least 30 minutes. If a sea turtle is observed prior to or during these activities, pile driving will not commence or continue until at least 30 minutes has passed since the last sighting.

Currently, there are no specific guidelines for safety criteria that directly relate to sea turtle injuries or behavioral changes resulting from elevated sound pressure levels that may result from the removal or installation of piles. In general, NMFS and other federal agencies have relied upon the noise criteria for marine mammals (cetaceans or pinnipeds) and the safety zones that have been employed for projects to minimize the risk of injury to these species as a conservative proxy for managing impacts of very loud sound on sea turtles. While sea turtle hearing has not been studied nearly as much as marine mammal hearing, the general consensus is that, given the relatively complex hearing and communication systems and the wide ranges (sound frequency) of sound detection that are known for many marine mammal species (reviewed in Southhall et al. 2007) compared to the relatively simple hearing systems and limited range of sound detection that has been described to date for sea turtles (see Piniak et al. 2016), it is likely that most, if not all, marine mammal species are more sensitive to underwater sound than sea turtles. Although experimental research on sea turtle response to loud underwater sources is limited, McCauley et

al. (2000) documented increased swimming activity for loggerhead and green sea turtles in a caged environment during periods of received sound in excess of 165 dB RMS (root mean squared), and increased erratic swimming behaviors at received sound levels above 175 dB RMS. The authors concluded these behaviors were marking the relative point where avoidance would occur for unrestrained turtles in that acoustic environment.

We expect the monitoring program proposed for pile driving to minimize the chance of green sea turtles being exposed to potentially injurious sound levels during pile driving using impact hammers. The 24-inch concrete piles are the largest/loudest piles included in the proposed action and the source sound levels expected to be produced by driving these piles is approximately 175 dB RMS (at 10 m; based on Caltrans 2015, NAVY P-151 NMAWC acoustic data). We expect that green sea turtles will not be exposed to sound levels greater than 160 dB RMS if they are beyond ~120 m of pile driving operations. The monitoring zone that has been proposed includes all of Anaheim Bay within the breakwaters is greater than the 120 m zone of acoustic influence at received levels 160 dB RMS for monitoring potential behavioral impacts to marine mammals under the MMPA[5] from impulsive sound sources for 24-inch concrete pile driving using impact hammers during Navy P-151 Fuel Pier Replacement Project, located in San Diego Bay (Caltrans 2015, NAVY P-151 NMAWC acoustic data). If green sea turtles are within 120 m and exposed to sound levels approaching 165 dB or greater and avoid detection during the initial monitoring, we expect the likely response will be to avoid the increased sound levels and leave the area. Given that ambient sounds in a high vessel traffic area may regularly approach or exceed 130 dB (NAVY P-151 NMAWC acoustic data), the risk of exposure to sound levels in excess of ambient noise far away from project sites is low. Regardless of the specific noise exposure that sea turtles might experience, we conclude that it is likely that any disturbance from this project would lead to turtles avoiding the immediate project area once the activity has commenced, reducing the likelihood of turtles remaining in the area long enough to experience hearing injury. As a result, the risk of injury for turtles resulting from exposure to loud sounds produced from activities such as pile driving is extremely unlikely and therefore discountable.

As discussed above in *General Disturbance*, we do anticipate that disturbances created by proposed project activities could lead to disruption of foraging in and movements through the action area. Based on the information described above in this section and our general understanding of how underwater sound affects marine life, we anticipate that the acoustic disturbance created by pile-driving during the proposed project is likely to produce a significant source of disturbance when this activity is occurring, especially in the vicinity of available (or former) passageways into/out of the Anaheim Bay estuary. Based on the anticipated schedule for proposed project activities, this source of potentially disruptive disturbance is expected to occur throughout the proposed project, although occurring consistently and with more frequency and intensity during the second half of the project after the new passage into Anaheim Bay estuary has been constructed.

[5] Updated NMFS guidance released July 2016 describing Level A acoustic harassment thresholds for the onset of permanent shifts in hearing thresholds (PTS) based on sound source type and functional hearing capabilities of different marine mammal hearing groups can be found at: http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm. The proposed project is being evaluated under this new Level A guidance and criteria for Level B harassment through an application for a Letter of Authorization under the MMPA by the NMFS Office of Protected Resources.

Impacts to Sea Turtle Foraging Habitat

As mentioned above, green sea turtles are known to regularly occur and transit within the action area, and may be found in the project area at any time during the year and take advantage of available foraging habitat in that project area. As part of the proposed project, the Navy is conducting an EFH consultation with NMFS, which includes an assessment of potential impacts to eelgrass and other habitat features. As described in the minimization and avoidance measures for the proposed the Navy is taking steps to minimize and mitigate impacts to eelgrass and other habitat features during this project. Foremost among a number of project BMPs designed to minimize habitat-related impacts described and characterized in Section 1.4 and Section 3.2 *Adverse Effects on Essential Fish Habitat*, the Navy has proposed to implement an eelgrass mitigation and habitat conservation plan (Mitigation Plan) to compensate for lost or modified habitat impacts in the action area.

During the EFH consultation, the potential impacts to the local habitat in the project area and throughout the Anaheim Bay estuary resulting from the proposed project were analyzed. Potential adverse effects to EFH may result from dredging, disposal of dredge material, permanent fill, overwater structure, and pile installation/removal. As a result of dredging and fill, the project is expected to impact up to 3.7 acres of eelgrass habitat within Anaheim Bay, which will reduce the amount of potential foraging habitat for green sea turtles in the action area. This will be mitigated as described in the Mitigation Plan and EFH analysis (Section 3.2 *Adverse Effects on Essential Fish Habitat*), in compliance with California Eelgrass Mitigation Policy (CEMP) minimizing the long term effect of these impacts. Because the project does involve activities such as dredging and fill or construction that can result in increased turbidity in the project area, there are additional risks of temporary short term habitat impact in the area surrounding project activities, which could in turn reduce green sea turtle foraging opportunity for a short time. Ultimately, we have concluded that adverse effects to EFH are expected, and we have provided additional Conservation Recommendations, Section 3.3 below, beyond the minimization and avoidance measures proposed.

The project area lies within the larger Anaheim Bay/ Huntington Harbour embayment and wetland, which NMFS generally defines as one seasonal foraging ground because these areas constitute one contiguous estuarine system. Green turtles that enter into Anaheim Bay are freely able to use all these adjacent areas for foraging, even if some turtles have a preference for certain areas within this estuary system. Overall, the proposed project is expected to impact up to 3.7 acres out of roughly 90 acres of eelgrass that currently exist in the Anaheim Bay/Huntington Harbour complex within and near the proposed project, according to eelgrass mapping efforts conducted in 2013 (Merkel and Associates 2014). The vast majority of eelgrass in the area lies within the SBNWR (81 acres), outside of the area that will be directly impacted by project construction activities. In total, the proposed project is expected to result in approximately 4.1% temporary reduction in available eelgrass habitat for green sea turtles that seasonally forage within the Anaheim Bay estuarine system. According to the CEMP milestones, within 12 months after eelgrass mitigation activities have been conducted, significant progress toward mitigation should be achieved toward restoration of that loss.

In addition to the eelgrass impacts, there will be additional habitat impacts that result in reductions of shallow subtidal habitats in the action area. Although there is not as clear a relationship between these habitats and preferred green sea turtle habitat as there is with eelgrass, we note that green sea turtles may also react to changes in these types of habitat in the action area as well in ways that are hard to predict. This could include a wide range of responses, from disorientation and avoidance due to the changes, to increased use for resting and foraging in some cases.

Analysis of the impacts of the proposed project indicates that there will be short term degradation and loss of potential green sea turtle foraging habitat as a result of the proposed project. The extent of direct impacts to eelgrass habitat within the Anaheim Bay estuarine system near the proposed project may be relatively small compared to what is available for them, and will occur within the immediate project area where the known use by green sea turtles is less than in other areas within action area. However, as discussed above, the potential effects of avoidance of disturbance are expected to be significant to the behavior due to the fact that the passageway to common foraging sites and potential forage in the project areas will be potentially disrupted on a periodic or sustained basis for periods of time throughout the proposed action. In combination, the proposed project may have an overall effect of reducing the value and accessibility of green sea turtle habitat within and adjacent to the action area, during the proposed project. As a result, we conclude that the potential risks of impacts related to the quantity, quality, or availability of sea turtle foraging habitat in Anaheim Bay estuary, as well as disruption of foraging behavior within and nearby the project area as a result of the proposed action, throughout the duration of the proposed project, are significant. However, we expect this risk will not result in a permanent reduction in the value and accessibility of green sea turtle foraging habitat in the action area sustained over the long term.

Modified Hydrology of the Anaheim Bay Estuary

In addition to the direct impacts to eelgrass habitat expected under the proposed project, there is also a risk that modification of the entrance into the Anaheim Bay estuary could lead to changes in hydrology through the system, which could in turn affect the quality or quantity of eelgrass habitat throughout the action area. As described in the Navy's draft EA and BA, modeling of the proposed action's impact on the hydrology of the system indicated that there would be little difference in the range and velocity of tides through the new channel compared to the current configuration of the channel, and that the residence time of water circulation in the action area would stay the same in some portions of the action area, and decrease in others. Overall, the Navy concluded that there will be little difference in the overall hydrology of the system after the proposed action, and that little change in the overall habitat resulting from changes in hydrology should be expected.

These results of the model are difficult to fully evaluate, given the complexity of the system and the effort needed to try and capture all the parameters that could affect the outcome of the proposed project. In the absence of contradictory information, we assume that the model's predictions represent the best available information and that there will be very little to no additional change in the extent of eelgrass habitat available for green sea turtles in the Anaheim Bay estuary beyond the immediate project area. As part of the EFH consultation, we provide

Conservation Recommendations that include an environmental monitoring program consisting of physical monitoring and biological monitoring (e.g., eelgrass surveys) throughout the action area. These monitoring efforts will be vital in helping to monitor the actual impact of the proposed project and validate model assumptions and predictions.

Modification of the Sole Passageway into the Anaheim Bay Estuary

As described in the proposed action, one of the primary objectives of the proposed project is to construct a new public navigation channel that leads into the Anaheim Bay estuary area in order to promote separation between the public boating traffic coming into/out of Huntington Harbour area and Navy property including the new pier proposed for construction. As illustrated in Figure 1, the former public navigation channel represents the sole passageway for green sea turtles into/out of the Anaheim Bay estuary, which as described in Section 2.2.2 *Status in the Action Area* is known to be an important foraging and residential area for numerous green sea turtles. After completion of the proposed project, the new public navigation channel will continue to represent the sole passageway for green sea turtles into/out of the Anaheim Bay estuary. As a result, we must consider the potential impact of modifying this important passageway over the course of the proposed project.

The sequence of events that has been proposed relative to the evolution of the passageway includes: (1) dredging the new navigation channel; (2) constructing the causeway over ~1-1.5 year period, leaving some access for green sea turtle (and other marine life) passage in the former navigation channel until the end of that project component stage; (3) completion of causeway and elimination of the previous passageway route. The phasing of construction and completing the construction of the causeway should provide some transition period where there will be multiple routes of passage and an opportunity for turtles to reorient themselves to their new surroundings.

The anticipated impacts from this aspect of the proposed project are highly uncertain. In certain respects, sea turtles are generally well known for their fidelity to important nesting, foraging, and migratory routes. Specifically, fidelity to foraging and resting locations by green sea turtles in Southern California has been well documented (Eguchi et al. 2010; Crear et al. 2016; MacDonald et al. 2013). Considering this fidelity, it is possible that individual green sea turtles that have been previously relying upon the former navigation channel for passageway into the Anaheim Bay estuary may continue to seek passage through this area, even after the new public navigation channel has opened, and the former channel is being filled or has been completely filled in at completion of the causeway. In addition to the general disruption of movements and disorientation that may be created by this scenario, which could impact access to forage and/or foraging and other behaviors, any additional time spent in the vicinity of the former navigation channel could also increase exposure of individuals to disturbances and potential sources of injury from ongoing project activities that may be occurring throughout the proposed project directly within this former route. These include dredging of the turning basin, pile-driving and pier construction, and fill/construction associated with the installation of the causeway, jetties, and breakwaters proposed.

In other respects, sea turtles are also known for their keen navigational sense that allows them to travel great distances to find their way back to their preferred habitats. Shimada et al. (2016) documented that several species of sea turtles in Australia returned fairly directly in a matter of a few days or weeks (depending on distance) to their previous home areas following release after significant displacement, although the displacements in that study were related more to rehabilitation or capture/release as opposed to disturbance and/or disruption of normal behaviors resulting from the imposition to any impediments to previous routes of travel. The specific mechanisms that provide the navigational abilities of sea turtles have been the subject of study and scientific debate. While particular interest has been paid to the apparent link between large-scale movements and orientation to magnetic cues (e.g., Lohmann et al. 2004), research is suggesting that sea turtles use a 'multifactor navigation system' that may include a combination of visual and magnetic cues, currents, and possibly olfactory cues over shorter distances (reviewed recently in Dodge et al. 2015). As a result, it is likely that sea turtles rely on a combination of orientation cues in different situations depending on the scale of movements and navigational sense needed.

Relative to the scale of the proposed action, it is unlikely that magnetic or any large-scale navigational sense will be useful for dealing with the changing passageway. However, it is possible that olfactory cues and/or response to the tidal currents will facilitate reorientation to a new passageway into/out of the Anaheim Bay estuary. Over the long term, given what we know about sea turtle navigational awareness, we conclude it is likely that green sea turtles will adjust and orient to the new passageway. In numerous places in the world, green sea turtles that use coastal environments likely face and overcome changing nearshore and estuarine conditions in response to storms or other events where channels may be shifted or rerouted altogether over the course of short time periods. Individuals who had not previously visited or resided for any length of time in the Anaheim Bay estuary will likely be unaffected by the fact the passageway will have been altered in the future. What is less certain is the length of time that might be associated with any disorientation for individuals that may have been previously/currently are residential or frequent visitors to this area, and ultimate reorientation to the new passageway. Based on this uncertainty, we anticipate that there could be some disruption of movements of individual green turtles into/out of Anaheim Bay. As discussed previously, there are likely to be other disruptive sources of disturbance resulting from interactions with project activities when individuals enter the action area throughout the duration of the proposed project. While there is no clear indication of exactly what to expect, the potential disorientation of individuals to the changing passageway and disruption of movement into/out of the Anaheim Bay estuary may be further exacerbated by exposure to these other disturbances simultaneous, and vice versa.

Ultimately, we conclude that disturbance and disruption of movements into/out of the Anaheim Bay estuary will occur as a result of modification of the public navigation channel. This could impact foraging success and other behaviors to some degree throughout the proposed project, especially in concert with other disruptions that may occur. However, we conclude this disruption and disturbance is likely to extend only through the duration of the proposed project and likely will not have long term effects on the movements of green sea turtles into/out of Anaheim Bay that will extend long past the conclusion of the proposed project. As part of the proposed action, the Navy has proposed to conduct monitoring of green sea turtle distribution and behavior in and around the action area (described in Section 1.4 above). One of the main

objectives of the monitoring program will be to examine the impact that alteration of the sole passageway into/out of a prime foraging area has on green sea turtle use of that area. We encourage ongoing assessment of the information gained from this research as it comes in, and consideration for further incorporation into the execution of the remainder of the proposed project if possible to help minimize any potential adverse effects from this aspect of the proposed project.

Exposure to Multiple Project Activities and Effects over Time

The duration of the proposed action is expected to last five years, with various aspects of the project potentially occurring at the same time. Given the anticipated effects associated with disturbance and disruption of green sea turtle behavior and/or foraging that have been discussed in association with various project components, we consider the potential that effects of individual project components could aggregate over time and/or occur simultaneously.

There is a general sequence of events that is expected to transpire under the proposed action due to logistic and timing considerations. However, it is evident from the proposed construction schedule there will be overlap in major project components such that multiple projects will be occurring simultaneously at various points in time, which could lead to multiple avenues for, and areas where, disturbance maybe occurring simultaneously. While some of the proposed projects activities may only take a few weeks or months to be completed, some project activities may take many months to complete and/or may occur over multiple years. Based on a draft project schedule provided by the Navy, early in the proposed project (during the first couple of years) there may be multiple dredging activities going on, along with some limited pile driving and the early stages of constructing the causeway that will ultimately pose a barrier to green sea turtle movements compared to pre-construction conditions. In the middle portion of the project, it is likely that construction/removal/fill activities will be occurring in concert with pile driving to support the new pier. The end of the project (last year) might involve only the final stages of construction and the last pile driving activities necessary to complete the project. This schedule is considered the preliminary plan, and ongoing construction developments and numerous factors that cannot be fully projected may affect and/or revise scheduling and actual completion times for various project components. However, NMFS finds it likely that multiple aspects of the proposed project will be ongoing throughout most, if not all, of the proposed project.

While we acknowledge that none of these project activities are necessarily expected to be continuous on an hourly and/or daily basis throughout the proposed project, we also acknowledge that there will likely be some periods of time where significant activities occur throughout much of the day on a daily basis that will be sustained for weeks and potentially months. To the extent that the work will generally be limited to the daylight hours, we note that green sea turtles in the area appear to be more active during the day and more likely to be impacted by project activities occurring during the day (Crear et al. 2016; 2017). As a result, it is possible that any individual green turtle could experience repeated and sustained exposure to disturbance and disruption of behaviors if trying to regularly transit into/out of or forage within the action area.

Summary of Effects from Disturbance and Disruption

During the proposed project, there will be sustained periods of time where project activity will be occurring on a regular basis. As stated above, given that all this activity will occur within an area known to be regularly occupied by green turtles, there is a high likelihood that green turtles will be consistently exposed to the presence of all activities and equipment associated with the proposed eelgrass mitigation project. Based on our general understanding of their behavior and observations of turtles during field studies (D. Lawson, NMFS, personal observations 2015), we expect that green turtles will generally attempt to avoid the immediate area where increased in-water activity is occurring. We also generally expect that the degree of behavioral response and avoidance that will be elicited is related to the magnitude of disturbance, such that avoidance behavior will increase and/or intensify along with the overall degree of disturbance present.

Impact of Disturbance on Health and Fitness

Exposure to the disturbance from project activities, especially multiple exposures during a short period of time, could lead to some increased stress as indicated by behavioral responses such as attempts to leave the area via rapid swimming, as well as physiological responses such as release of stress hormones (Gregory et al. 1996; Gregory and Schmid 2001; Harms et al. 2003; Hoopes et al. 2000; Stabenau and Vietti 2003). Recovery times from physiological effects, as well as changes in activity budgets can take or last up to a day after these experiences (Henwood and Stuntz 1987; Thomson and Heithaus 2014). However, considering the limited duration of any exposures given the expectations for avoidance behaviors by green sea turtles, and the relatively low intensity of these exposures that may occur given minimization and avoidance measures proposed and the nature of project activities, we conclude it is unlikely that this stress will lead to any significant long term health effects for individuals. In Anaheim Bay and in other places, sea turtles are occasionally subject to short term stress through directed capture in entanglement nets during research activities that are permitted by NMFS (including those that will be conducted by NMFS in association with monitoring in this proposed action). The expectation by NMFS is that sea turtles captured during research activities recover from those incidents and resume normal activities relatively quickly (NMFS 2015).

However, given that the action area is known be a common area of presence and route of movement throughout the area, the persistent presence of potentially disturbing and disruptive activities is expected to result in significant disruption of normal behavior or movement patterns of green sea turtles over a sustained period of time. This disturbance will force green turtles to react and find new avenues for movement or locations for foraging and resting during this time period. Although it is unknown how frequently green sea turtles actively forage within project areas, this disturbance could also deter them from transiting to or using preferred foraging sites adjacent to the project area. We also anticipate some disorientation and disruption of normal behavior and movement patterns into/out of Anaheim Bay estuary due to alteration of the sole passageway in this known preferred area, which affect foraging and other important behaviors. In addition, we also anticipate some short term degradation and loss of available foraging habitat in the action area.

Although disturbance and the resulting avoidance and/or disruption of normal behaviors and movements for green turtles in and around the vicinity of the project area is relatively straightforward to anticipate based on the project description and our general understanding of green turtle behavior, it is very difficult to quantify the impacts of this disturbance and disruption on the health of individual green turtles. A search of the scientific literature suggests that virtually no directed studies of sea turtle health effects resulting from sustained disturbance have been conducted, so we do not have available scientific information to directly point to for this analysis. Instead, we must rely upon general biological and ecological principles to understand what the results of these impacts could be. Conceptually, we recognize that disruptions of important functions and behavior such as regular movements, resting, and foraging patterns can have adverse effects on the health of individual sea turtles. Possible adverse effects could include exposure to increased stress levels and those associated biological responses, increased energy expenditures, reduced nutritional intake, temporary disorientation, or temporary abandonment of preferred habitat. It is possible that this disturbance could influence behavior patterns such that some individuals may discover or develop new areas of preferred habitat in other locations. Unfortunately, we also do not have any direct scientific information available to inform establishment of any thresholds for exactly how long or intense the disruptions have to be in order to produce some measurable reduction in overall health or fitness.

Currently, general characterizations of the health of individual sea turtles are not understood beyond obvious physical appearance without sophisticated veterinary examinations or laboratory analysis, typically conducted only on deceased individuals. The scale of possible impacts occasional, sustained, or multiple disruptions of normal behavior and life functions over extensive periods could have on the near-term health or fitness of a green turtle is expected to be highly variable and unique to each individual. In other analyses of potential impacts from coastal development projects, disturbance of behavioral patterns in those instances generally would have occurred in areas away from where NMFS expects green turtles typically spend significant portions of their time. Therefore, avoidance of the areas because of disturbance for any period of time was not likely to significantly impact or disrupt their regular foraging movement and behavior patterns. This expectation supported conclusions that any regular or sustained avoidance of those areas was unlikely to have any detectable effect on health.[6] However, for this proposed action we cannot reach the same conclusions. The proposed project occurs in an area where we expect many green turtles spend significant portions of time. We do expect sustained disturbance throughout the duration of the project, that at times there will be multiple project activities that may have disturbing or disruptive effects occurring simultaneously, and that this disturbance is likely to lead to disruption and alteration of important normal behavioral patterns, including movements between important known foraging sites. In addition, there will be some limited habitat degradation within the action area that is temporary which could further aggravate any disruptions associated with foraging activities. As a result, we conclude that adverse effects to the health of individual green sea turtles, through significant disruptions of normal behavior patterns including foraging and resting, are likely to occur.

[6] In 2016, NMFS completed formal ESA consultation with the Corps that concluded disturbance from an eelgrass mitigation project that was proposed to be conducted in an area where high concentrations of green sea turtles were expected to occur in South San Diego Bay resulted in "take" in the form of harassment (NMFS 2016b).

2.5.2. Risk

As described in Section 2.5.1 *Exposure and Response*, we conclude that disturbance and disruption of normal behaviors resulting from the proposed project is likely to occur and result in adverse health effects to any individual sea turtles that reside or visit the Anaheim Bay estuarine area where the proposed project is occurring. In particular, potential disturbance and disruption associated with modification of the primary passageway into/out of the Anaheim Bay estuary, exposure to disturbance over sustained periods of time and from multiple sources of disturbance from project activities over the course of several years, and potential disruption of foraging from short term loss of and/or avoidance of foraging habitat, are anticipated to occur during the proposed project, to some degree. The impacts of these types of persistent disturbances are uncertain, but disruption of normal foraging and resting patterns can have adverse impacts on the relative health of individuals if persistent or significant enough. The definition of "take" under the ESA (see section 2.9) includes the term "harass," but that term is not further defined in the ESA. As described in Section 2.1. *Analytical Approach* under our Interim Guidance, in this biological opinion we interpret harassment under the ESA to equate to significant disruption of normal behavior patterns (e.g., foraging) that could reasonably be expected, alone or in concert with other factors, to create or increase the risk of negatively affecting an ESA-listed animal's growth, health, reproductive success, and/or ability to survive (i.e., an effect that results from a more than inconsequential behavioral response). For the purposes of this analysis, we conclude that the proposed action is expected to create or increase the risk of negatively affecting ESA-listed green sea turtles in the Anaheim Bay estuary through significant disturbance and disruption of normal behaviors patterns over sustained periods of time and from multiple sources of disturbance that will last throughout the duration of the proposed project.

In Section 2.2.2 *Status in the Action Area,* we reviewed the available information regarding the abundance of green sea turtles in the area. We do not have a specific estimate for the number of turtles that may reside within or occasionally visit the action area. However, it appears that approximately 100 different green sea turtles have been identified over the last decade through observation, research, and strandings in the Long Beach/Seal Beach area near the action area, and research has confirmed some connectivity with green sea turtles in general area specifically with the Anaheim Bay estuary. As a result, we assume approximately 100 different individual green sea turtles may occur within or adjacent to the action area at some point over the next 5.5 years during the proposed action. Further, any turtle that may be found there would likely be disturbed or disrupted by project activities and potential blockage or delays in entrance to Anaheim Bay and the NWR over a sustained period of time that could significantly impact normal behaviors and movement or foraging patterns. The foraging green turtle population that may occur in the action area consists of a mix of adults and juveniles, both male and female (Crear et al. 2016; Allen et al. 2016). Thus, we assume that all individuals and demographic types that may occur in the Anaheim Bay estuary are equally vulnerable to exposure to the effects of this proposed action. We expect these green sea turtles to be disturbed and disrupted by project activities, and/or be forced to move around or away from the project area during the proposed project. We concede that the overall impact of periodic or sustained disturbance and disruption of behaviors for various periods over the course of days, weeks, months, or years is very uncertain, and likely to vary by individual. Ultimately, we conclude that the likely responses for at least some exposed individuals would be reflective of adverse effects to health and behavior.

The adverse effects identified are relevant to the entire 5.5-year duration of the proposed project, beginning in late 2019 when the project is expected to begin. Although there are risks of detectable impacts to individuals, we do not expect any significant long-term impacts that result in the death of any individual green turtles. The actual project area where project activities are occurring and where turtles may be excluded from entering or actively avoiding most prominently is relatively small. For green sea turtles that are able to negotiate the disturbances created by the proposed project and navigate the passageway to transit in and out of Anaheim Bay during the proposed project, the vast majority of suitable habitat for green sea turtles within the Anaheim Bay estuary lies outside the project area where disturbance and disruption is most likely to occur, and this area is generally expected to remain available and hospitable for green sea turtles to conduct normal behaviors such as foraging and resting when green sea turtles are present there. Based on our general understanding of green sea turtle behavior, we expect turtles that may avoid the immediate project area to relocate and take advantage of the other parts of the Anaheim Bay estuary after they enter Anaheim Bay and/or if they are discouraged from leaving Anaheim Bay due to project disturbances.

We concede there is uncertainty in the extent of disruption to green turtle behavior associated with the modification of the passageway into the Anaheim Bay estuary and disturbance within this passageway during the proposed project, and how quickly or easily green sea turtles may adjust. Although our understanding of green sea turtle behavior suggests they will likely adapt eventually, it is possible that some turtles may altogether avoid the area for the duration of the proposed project, and possibly develop new areas of preferred habitat. If this were to occur, there are a number of other coastal estuary sites in Southern California where green sea turtles are known to be found foraging, including the San Gabriel River and Alamitos Bay which are adjacent to the Seal Beach area. In these areas, any green sea turtle adversely affected by the proposed project should be able to resume normal foraging and other behaviors for extended periods similar to the opportunities that would have been available with Anaheim Bay.

While physical or physiological impacts associated with increased stress levels or reduced nutritional intake as a result of disruption in normal behaviors are likely to occur to some degree, we expect these affects to be temporary as turtles adapt and adjust to the disorientation of relocation, and we expect turtles to resume normal behaviors such as foraging as they have relocated. Given that the proposed action area is relatively small, we conclude that adequate habitat exists beyond the project area with adequate carrying capacity to support any relocating sea turtles without any risks of long-term reduction in their overall fitness. In addition, we assume that the Anaheim Bay estuary will continue to remain viable green sea turtle habitat to some degree during the proposed action, even if there is some overall reduction in habitat function given the disturbances that may occur throughout the project.

Following the completion of the proposed project, and likely during the interim period while green turtles are responding to the disruption and disorientation, we expect the green sea turtles will adjust and/or resume their normal and preferred behavior and movement patterns. Although the short-and-long term impacts of disturbance to sea turtles are not well documented, the available evidence suggests that disturbance does not trigger long-term changes in behavior patterns. Regardless of the exact extent of disturbance, avoidance, disruption, or displacement

that occurs for any individual turtle during the proposed project, we expect the adverse effects to be limited to the duration of the project, and that the risks of long-term health effects are limited. As a result, there should be no detectable long-term impact of the proposed project on the foraging population of green sea turtles in the Anaheim Bay estuary beyond short term disturbance that occurs during the proposed action.

In this opinion, we acknowledged that climate change could influence patterns of green sea turtle migrations and general occurrence within the action area and distributions of sea grass and other important habitat features within the action area. However, given the relatively limited duration of the proposed project and anticipated impacts (~5.5 years), we conclude climate change is unlikely to factor into or further modify the effects analysis considered in this opinion.

2.6. Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

This consultation includes a project action area encompassing a highly urbanized and industrialized coastal environment that has experienced continuous intense stress from human coastal development activities and management of public resources, such as fishing or energy development projects. Most of the projects that are expected to continue over time require Federal permits (e.g., Corps) or are Federal actions which are expected to be subject to future consultation under the ESA and are therefore not Cumulative Effects. In the BA, the Navy did identify several non-Federal actions that may be occurring in the general vicinity of the project, including beach renourishment in Seal Beach, as well as other coastal development activities in Huntington Beach. None of these actions are expected to occur or produce impacts that may affect green sea turtles or foraging habitat in the action area. After considering the available information, we have determined that current and continuing non-Federal actions that may continue to occur in the action area and may be affecting green sea turtles in the action area are already addressed in the *Environmental Baseline* section.

Some continuing non-Federal activities are reasonably certain to contribute to climate effects within the action area. However, it is difficult if not impossible to distinguish between the action area's future environmental conditions caused by global climate change that are properly part of the environmental baseline *vs.* cumulative effects. Therefore, all relevant future climate-related environmental conditions in the action area are described in the environmental baseline (Section 2.4).

2.7. Integration and Synthesis

The Integration and Synthesis section is the final step in our assessment of the risk posed to species as a result of implementing the proposed action. In this section, we add the effects of the

action (Section 2.5) to the environmental baseline (Section 2.4) and the cumulative effects (Section 2.6), taking into account the status of the species (Section 2.2), to formulate the agency's biological opinion as to whether the proposed action is likely toreduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution.

Based on the analysis of potential effects from the proposed action considered in this biological opinion, we determined that adverse effects from sustained disturbance and disruption of normal foraging and behavior patterns resulting from the proposed project for ESA-listed green sea turtles that occur in the Anaheim Bay estuary are likely over the duration of the proposed project. We have considered the potential for direct contact injury or death, or other long-term health effects as a result of the proposed project, and determined that these types of adverse effects are unlikely.

We have considered that all of the green sea turtles that may occur in the Anaheim Bay estuary (up to ~100 individuals) could be incidentally harassed through significant disruption of normal behavior patterns, either periodically or for sustained durations, over the entire 5-year duration of the proposed project. We have determined that these turtles could be of any age or sex in this population. Based on the nature of the disturbance, disruption, and disorientation, and the expected response, along with the minimization and avoidance measures being implemented, we conclude the most likely outcome from this disturbance is that individual turtles will experience adverse effects from disruption of normal behavior and movement patterns for various periods during the proposed project. However, we have concluded that there is adequate habitat in the vicinity outside of the action area to support green turtles during this time, and that all individual green turtles affected will ultimately survive this disturbance and resume normal behavior and movement patterns during and/or after the project is complete. As a result, we have concluded the proposed activities are not likely to have a detectable impact on the reproduction, numbers, or distribution of the foraging population of ESA-listed green sea turtles in the Anaheim Bay estuary or Eastern Pacific DPS green turtle population structure and diversity. Given the expected lack of long-term impacts on the population, we conclude that the proposed action is not likely to produce any detectable reduction in the ability of ESA-listed green sea turtles to adapt or be resilient to climate change in any way.

There are numerous impacts to green turtles in and around the Anaheim Bay estuary as discussed in the *Status* and *Environmental Baseline*. While we expect turtles to be disrupted from their normal behavior patterns due to the proposed project, we expect them to continue to use other portions of Anaheim Bay and adjacent areas that are known to be preferred locations. Any additional disturbance or stress created by other activities occurring in the same time and place will likely only be a temporary addition to the ongoing harassment caused by the proposed project and is not expected to be detectable beyond the impacts of the proposed project that have been considered. We note that the general indications are that the East Pacific DPS green sea turtle population has been showing signs of recovery, as evidenced by the recent revised listing status as "Threatened," and that occurrences of green turtles throughout Southern California appear to be on the increase in recent years. Although we expect some adverse effects to occur to individuals in the action area as a result of the proposed project, these signs suggest that the

surrounding areas are currently functioning as hospitable locations that are helping to support green sea turtles in the area and promoting recovery.

When considering the effect of this proposed action added to the status, environmental baseline, and cumulative effects of other activities, and the anticipated effects of climate change over the foreseeable future, NMFS anticipates no appreciable reduction in the likelihood of survival and recovery of the East Pacific DPS green sea turtles.

2.8. Conclusion

After reviewing and analyzing the current status of the listed species, the environmental baseline within the action area, the effects of the proposed action, any effects of interrelated and interdependent activities, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of East Pacific DPS green sea turtles. No critical habitat has been designated or proposed for this species; therefore, none was analyzed.

2.9. Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

As described earlier, NMFS has interpreted "harass" to mean creating the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering."

2.9.1. Amount or Extent of Take

In the biological opinion, we described incidental take of all green sea turtles residing and/or transiting through the Anaheim Bay estuarine complex through harassment as a result of sustained disturbance and disruption of normal foraging and behavior patterns due to the proposed project over the course of about 5.5 years from late 2019 through the end of 2024. This harassment may occur through changes in turtle movement, foraging, and resting behaviors due to avoidance of the project area, exposure to increased sound levels, disruption of movement in/out of Anaheim Bay, short-term restriction or reduction in habitat usage, and disorientation moving through and within the project area. All of these effects are expected to result in changes in normal behavior or movement patterns that could diminish the health and fitness of

individuals for periods throughout the duration of the project. We expect that all these individuals comprise an unknown mix of male and female juveniles and adults. We expect all of these individuals to survive, and to eventually resume normal patterns and health after the project is completed.

We expect as many as about 100 green sea turtles may be found in general vicinity of the project near Anaheim Bay at some point during the entire proposed project and would be exposed to the effects of the proposed action. However, it is also possible that more turtles could actually occur within the action area during the proposed project if recruitment or immigration to the project area occurs beyond historic data from the area and in keeping with signs of recovery of the Eastern Pacific DPS green turtle population. If any information becomes available that indicates harassment of green sea turtles resulting from the proposed project occurs or extends outside of the Anaheim Bay estuarine complex, then take will have occurred in excess of what has been considered in this biological opinion. If a green sea turtle is observed stranded within the Anaheim Bay estuarine complex at any time during the proposed project, or within 60 days following conclusion of proposed project, NMFS will evaluate the likely cause of the stranding and the overall health of the individual. Based on those results, we may determine that take will have occurred in excess of what has been considered in this biological opinion. NMFS will also evaluate the results of any research conducted on green sea turtles in the area before, during, and after the proposed project to determine if take has occurred in excess of what has been considered in this biological opinion.

In this biological opinion, we have determined that no green turtles are expected to be injured through entanglement or direct contact with equipment or vessels. If any green sea turtle is determined to have received an injury or be killed through direct contact with the proposed action, then take will have occurred in excess of what has been considered in this biological opinion.

2.9.2. Effect of the Take

In the biological opinion, NMFS determined that the amount or extent of anticipated take, coupled with other effects of the proposed action, is not likely to result in jeopardy to the species, or destruction or adverse modification of critical habitat.

2.9.3. Reasonable and Prudent Measures

“Reasonable and prudent measures” are nondiscretionary measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take (50 CFR 402.02).

1. The Navy shall implement measures to monitor, document, and report all incidental take of green sea turtles resulting from the proposed project.

2. The Navy shall implement measures to minimize the extent of disturbance and disruption of normal foraging and behavior patterns of green sea turtles as well as risk of injury during the proposed project.

2.9.4. Terms and Conditions

The terms and conditions described below are non-discretionary, and the Navy must comply with them in order to implement the RPMs (50 CFR 402.14). The Navy has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this ITS (50 CFR 402.14). If the entity to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse.

1. The following terms and conditions implement reasonable and prudent measure 1:

1A. Prior to initiating the proposed project, the Navy shall provide NMFS WCR an updated schedule for the anticipated start and completion of project activities that will occur under the proposed action. Commensurate with annual reporting requirements set forth in these Terms and Conditions, the Navy will provide NMFS WCR an updated schedule on the progress, anticipated start, and completion of project activities that have occurred, are occurring, or will occur under the remainder of the proposed action, on an annual basis.

1B. The Navy shall monitor the project area as described in section 1.3 and record the presence and behavior of green sea turtles that are observed by project monitors within and around the proposed project. On an annual basis, the Navy shall provide NMFS WCR a summary report on the observations collected during the previous calendar year, including at least the following information: number(s), estimated size/age class (if applicable), date, locations (latitude and longitude), and behaviors associated with the observations of any ESA-listed species under NMFS jurisdiction (e.g., sea turtles and ESA-listed marine mammals). To the extent possible, monitors shall attempt to photograph surfacing sea turtles (typically head photographs) observed in the action area and provide the images to NMFS. The Navy should also summarize all pertinent details regarding the progress and effectiveness of the monitoring and avoidance measures used during the proposed project, along with an assessment of potential impacts that may have occurred as a result of project activities based on what was observed. This report shall be provided by April 1 each year, to the following address:

Penny Ruvelas, Branch Chief
NMFS West Coast Region Protected Resources Division
501 W. Ocean Blvd, Suite 4200
Long Beach, CA 90802

Upon completion of the project, the Navy shall complete a report summarizing all data recorded during all monitoring throughout all phases of the proposed project, including all documentation and summary analysis of the presence and behavior of green sea turtles, effectiveness of the monitoring and avoidance measures, and assessment of any potential impacts that may have occurred throughout the entire proposed action. The report shall be provided to NMFS WCR within 120 days following completion of all project activities at the same address listed above.

1C. The Navy shall schedule a meeting/teleconference with NMFS WCR staff within 60 days of submission of the annual report on observations and effectiveness of the monitoring and

avoidance measures to review and discuss the report and overall progress of the proposed project.

1D. Prior to initiating the proposed project, the Navy shall provide NMFS WCR an updated monitoring plan for minimizing and avoiding the impacts of project activities on sea turtles and marine mammals. This plan should specify the project activity monitoring zone and the response of project activities if protected species are observed in this zone for each type of project activity. This plan should also include descriptions of the anticipated sound source levels along with the plans for monitor staging, as well as the protocols employed during monitoring. Commensurate with annual reporting requirements set forth in these Terms and Conditions, the Navy will provide any updates on relevant changes to the plan on an annual basis, or as appropriate, throughout the proposed action.

1E. The Navy shall coordinate with NMFS to require project monitors, key contractor and Navy project personnel to attend a project briefing prior to starting work the proposed project. The project briefing shall review the protocols for minimization and avoidance of impacts to sea turtles as described in section 1.3 and 2.9 of this biological opinion, as well as review the latest scientific information regarding green sea turtle ecology in the Anaheim Bay estuarine complex.

1F. Prior to initiating the proposed project, the Navy shall provide NMFS WCR a detailed plan (currently outlined generally in Section 1.3) for coordination with SWFSC and NMFS WCR on green sea turtle capture and tracking research as part of the proposed action, along with expectations for synthesis and analysis of results of this research and other available data sources relative to apparent impacts from the proposed action. Commensurate with annual reporting requirements set forth in these Terms and Conditions, the Navy shall provide NMFS WCR an update of results from capture and tracking research. Commensurate with requirements for reporting following the conclusion of all project activities set forth in these Terms and Conditions, the Navy shall provide a final report and assessment of the results from capture and tracking research.

1G. Prior to initiating the proposed project and in coordination with NMFS WCR, the Navy shall develop and provide NMFS WCR a detailed plan regarding environmental monitoring and assessment of the proposed project on habitat features within the action area and the adjacent Anaheim Bay estuary. The monitoring plan shall be developed to address and evaluate:

- the accuracy of key assumptions and expectations regarding the anticipated environmental impacts of the proposed action, including the conclusions from the hydrodynamic modeling referenced in the EA and BA about the extent changes in hydrology that may occur, in comparison to any resulting impacts that do occur;
- biological monitoring of key habitat features throughout the action area, including the immediate project area as well as adjacent areas that may be indirectly effected by the proposed action, and;
- requirements to meet objectives as part of any applicable environmental regulations, including conservation recommendations outlined as part of the EFH consultation.

1H. The Navy shall report any incidents or observations of injuries and/or mortalities of green sea turtles to the NMFS West Coast Region Stranding Coordinator, Justin Viezbicke, at 562-980-3230 or Justin.Viezbicke@noaa.gov, as soon as practicable. In the event an injury or mortality of a green sea turtle occurs at any time during the proposed project, the Navy shall cease any activities that may have resulted in the injury or mortality until such time as they evaluate the cause of the harm and consider application of additional protective measures to address those circumstances, in consultation with NMFS.

2. The following terms and conditions implement reasonable and prudent measure 2:

2A. If the Navy is required to use silt curtains at any time during the proposed project, the Navy shall notify NMFS WCR of this development prior to, or at least within 48 hours subsequent to, the placement of silt curtains in the project area. As part of this coordination process, the Navy shall provide NMFS WCR a description of the silt curtains being used, including specific deployment locations, as well as any expectations for the duration of use. In addition, the Navy shall provide the most recent relevant project monitoring data that is available. The Navy shall keep NMFS WCR appraised of updates on the use of silt curtains, including when they are removed.

2B. As part of the annual reporting requirements set forth in these Terms and Conditions, the Navy will coordinate with NMFS WCR on review of the ongoing results from monitoring efforts described in Section 1.3 and 2.9.4.1 of this opinion, and consideration of modification of current measures and/or development and implementation of any measures to reduce the potential disturbance and disruption of green sea turtle behavior.

2C. If green sea turtles are regularly seen by project monitors in the project area, especially within the vicinity of newly constructed pier and/or former passageway in the Anaheim Bay estuary, the Navy shall contact NMFS to discuss implementation of any additional measures to reduce the risks of direct contact injuries or other adverse effects, along with potential modification of the green sea turtle monitoring plan to more specifically evaluate the impacts of the proposed project within this specific area.

2.10. Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02).

1. Given the current information that suggests green sea turtle movements within and through the action area are more likely to occur during the summer and fall when coastal water temperatures are warmest, the Navy should consider incorporating the anticipated seasonality in the final project execution where possible. Specifically, conducting project activities that may present higher risks for direct interactions with green sea turtles during the winter/early spring should help lower the risk and/or extent of adverse effects. We also suggest incorporating monitoring and research information gathered during the

proposed project to help further inform how project activities could be scheduled and/or generally conducted to minimize the risk and/or extent of adverse effects.

2. During the proposed project and beyond, the Navy should use the information gathered during the proposed project to facilitate outreach to the local community (e.g., fishing/boating communities) regarding the presence of green sea turtles and measures to help avoid harmful interactions with them. The Navy should also use outreach efforts to help enhance the available information during the proposed project by soliciting the local community to help collect information by reporting sightings of sea turtles to the Navy and/or NMFS.

2.11. Reinitiation of Consultation

This concludes formal consultation for Ammunition Pier and Turning Basin Construction Project at Naval Weapons Station Seal Beach. As 50 CFR 402.16 states, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental taking specified in the ITS is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the agency action is subsequently modified in a manner that causes an effect on the listed species or critical habitat that was not considered in this opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action.

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT RESPONSE

Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. The MSA (section 3) defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH.

This analysis is based, in part, on the EFH assessment (EFHA) provided by the Navy dated November 2018, the Eelgrass Mitigation and Habitat Conservation Plan (Mitigation Plan) dated October 2018, and descriptions of EFH for Pacific Coast Groundfish (PCG) (Pacific Fishery Management Council [PFMC] 2005), Coastal Pelagic Species (CPS) (PFMC 1998), and Highly Migratory Species (HMS)(PFMC 2007) contained in the fishery management plans (FMPs) developed by the PFMC and approved by the Secretary of Commerce.

3.1. Essential Fish Habitat Affected by the Project

The proposed project occurs within EFH for various federally managed fish species within the PCG, CPS, and HMS FMPs. In addition, the project occurs in estuarine and eelgrass habitat, which are designated as habitat areas of particular concern (HAPC) for various federally managed fish species within the Pacific Groundfish FMP. HAPC are described in the regulations as subsets of EFH which are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Designated HAPC are not afforded any additional regulatory protection under MSA; however, federal projects with potential adverse impacts to HAPC will be more carefully scrutinized during the consultation process.

3.2. Adverse Effects on Essential Fish Habitat

The primary categories of project activities that may adversely affect EFH include dredging, disposal of dredge material, permanent fill, overwater structure, and pile installation/removal. The EFHA captures many of the general adverse effects of these activities. In addition, PFMC (2005) generally describes the effects of these activities and provides conservation measures to consider. The effects of dredging on EFH may include 1) direct removal/burial of organisms; 2) turbidity/siltation effects, including light attenuation from turbidity; 3) contaminant release and uptake, including nutrients, metals, and organics; 4) release of oxygen consuming substances; 5) entrainment; 6) noise disturbances; and 7) alteration to hydrodynamic regimes and physical habitat. The disposal of dredge material can adversely affect EFH by 1) impacting or destroying benthic communities, 2) affecting adjacent habitats, 3) creating turbidity plumes and introducing contaminants and/or nutrients. Adverse impacts to EFH from the introduction of fill material include 1) loss of habitat function and 2) changes in hydrologic patterns. Overwater structures and associated activities affect the ecological functions of EFH through the alteration of abiotic factors, including light regime, wave energy, substrate and water quality. The following effects analysis focuses on issues of concern that inform our conservation recommendations. Of primary concern to NMFS are the loss of eelgrass habitat; conversion of intertidal and extreme shallow subtidal habitat into relatively deep subtidal habitat to support navigation; and conversion of intertidal and extreme shallow soft bottom subtidal habitat into artificial rip-rap.

<u>Navy Responsiveness to Previous Eelgrass Mitigation Comments</u>

In our previous comments dated June 30, 2017, we noted that it is NMFS' policy to recommend no net loss of eelgrass habitat function in California, in accordance with the California Eelgrass Mitigation Policy (CEMP). Compensatory mitigation should be recommended for the loss of existing eelgrass habitat function, but only after avoidance and minimization of effects to eelgrass have been pursued to the maximum extent practicable. This is consistent with the Clean Water Act Section 404(b)(1) Guidelines (40 CFR 230). For impacts authorized under section 404, compensatory mitigation is not considered until after all appropriate and practicable steps have been taken to first avoid and then minimize adverse impacts to the aquatic ecosystem. In our June 30, 2017, letter, NMFS noted that Alternatives 2 and 3 result in less impact to eelgrass habitat compared to the proposed action which results in the greatest impact to eelgrass HAPC and asked the Navy to clarify why Alternatives 2 and 3 are not less environmentally damaging practicable alternatives. Neither the EFH Assessment nor the Revised EA addressed this request.

Navy staff shared a draft 404(b)(1) alternatives analysis with NMFS on February 27, 2019, though it had not yet been reviewed by the US Army Corps of Engineers. According to the draft analysis, the project cost of the proposed alternative would be relatively advantageous compared to other alternatives, or the project cost of the other alternatives would be such that it would render the project impracticable.

In addition, we requested that the Navy address the proposed impact to existing eelgrass mitigation sites. Previous maintenance dredging in Anaheim Bay impacted eelgrass in 2010, which prompted the Navy to implement a compensatory mitigation project within inner and outer Anaheim Bay. According to Figure 8 of the EFHA, much of the north mole and its fringing eelgrass habitat will be dredged to accommodate the new channel and turning basin. NMFS noted in our previous comments that these areas contain eelgrass mitigation sites that were established in 2012 to account for dredging impacts from a previous project. The previously established mitigation ratios for these sites were based on the assumption that the mitigation sites would be managed and protected for the long term. Since this fundamental assumption is no longer valid, the mitigation ratio for the pending impacts should be increased to account for the temporal loss of habitat function. The EFHA did not explicitly address our concern that the previous mitigation requirement was based on the underlying assumption that the mitigation site would receive long-term protection. NMFS notes that this is a basic requirement of the US Army Corps of Engineers and the Environmental Protection Agency's final rule regarding compensatory mitigation for losses of aquatic resources (33 CFR Parts 325 and 332, 40 CFR 230). One of the goals of the rule is to ensure permanent protection of all compensatory mitigation sites. For government property, long-term protection may be provided through federal facility management plans or integrated natural resources management plans 33 CFR 332.7(a). The Final Integrated Natural Resources Management Plan (INRMP) for the Naval Weapons Station Seal Beach includes a specific objective to 'achieve a long-term net gain in the area, function, value, and *permanence* [emphasis added] of vegetated shallows [i.e., eelgrass], the physical conditions that support this habitat, and populations of associated target species.'

Eelgrass Impact Analysis

The EFHA estimates direct impacts to eelgrass in Figure 8 by calculating the spatial overlap area of eelgrass vegetated cover from the most recent survey data, with the proposed dredge areas, proposed rock revetment areas, and the new ammunition pier. According to the Mitigation Plan, eelgrass impacts have been estimated to range from 1.6 to 3.7 acres depending upon the surveys used in the impact analysis and the extent of eelgrass variability that has occurred across multiple surveys. The upper estimate of eelgrass impact is considered to be conservative and is based on the July 2016 cover class mapping and thus does not take into consideration large gaps in the beds that are common within outer Anaheim Bay due to high energy of penetrating waves that impact the outer basin beaches. The lower eelgrass estimate is based on a hybrid of 2017 data from the west (north) mole and 2016 cover class data from the east (south) mole beach. Based upon the information provided, NMFS does not agree that the impact estimates are conservative as the analysis does not appear to explicitly consider the potential for indirect impacts in the acreage calculations, the analysis appears to be based upon vegetated cover and not aerial extent of eelgrass habitat, as described in the California Eelgrass Mitigation Policy (CEMP) Section I(B)(1)(b), and the project will result in a net loss of extreme shallow water habitat, which

generally contains the physical conditions necessary to support eelgrass habitat. NMFS discusses these impact estimate concerns in greater detail below.

The Mitigation Plan indicates that the proposed action has the potential for secondary indirect effects developing after completion of project construction. These may include subsequent shoreline erosion and sediment burial of eelgrass, increased scour within eelgrass beds, or damage from changing navigation patterns and navigational operations such as tug boat thrust positioning of vessels. However, the impact analysis does not appear to have explicitly considered the potential for indirect impacts in the above impact acreage calculations. For example, the proposed dredging will alter the bathymetry within the existing Anaheim Bay which may lead to indirect impacts to eelgrass habitat from slope failure and erosion. Such indirect impacts have occurred due to maintenance dredging in regional bay systems (e.g., Anaheim Bay, Morro Bay, and Mission Bay) and ultimately required compensatory mitigation. The creation of the new public navigation channel (PNC) may also adversely affect eelgrass habitat that occurs along the East Jetty. According to Figure 8 of the EFHA, a portion of the eelgrass habitat along the East Jetty was not considered in the impact calculations. However, increased vessel use, hydrological changes, and/or maintenance dredging associated with the PNC may adversely impact these areas. The EFHA indicates the frequency or volume of future maintenance dredging in Anaheim Bay or Huntington Harbour is not expected to change, with the exception of within the PNC. Sand from the nearby Surfside Beach migrates to the west over and through the east jetty; the sand transport occurs from both wind and wave action. Although the alignment of the PNC may have been optimized to minimize future maintenance dredging, it is reasonable to expect that maintenance dredging may adversely affect the eelgrass habitat in these areas.

Lastly, the proposed action includes substantial changes to the mouth of the Anaheim Bay, which is expected to indirectly alter hydrology throughout the larger bay complex, including Huntington Harbor, the Seal Beach National Wildlife Refuge, and Bolsa Bay. These changes to hydrology may also result in adverse indirect impacts to eelgrass in the Sunset/Huntington Harbor and Refuge area just north of Pacific Coast Highway. The EFHA indicates that modeling results suggest that average velocities under the proposed action are within the maximum range of thresholds for eelgrass and will most likely not impact eelgrass outside of the action area in the refuge in Huntington Harbor. However, reliance upon modeling results expressing average velocities may not be appropriate for predicting impacts on marine habitat and/or species. For example, Denny and Gaines (1990) demonstrated the inadequacy of means and variances as sole descriptors for considering the impact of wave forces on the population dynamics and evolution of marine species. Gaines and Denny (1993) suggest that many other ecological and evolutionary problems are also better expressed in terms of extreme values than in terms of means and variances. Thus, NMFS questions the Navy's ultimate conclusion on the effects of altered hydrodynamics on eelgrass in the project area, Huntington Harbor, and the Refuge. The EFHA recognizes that bay hydrology is very complex and difficult to predict, and indicates the need to work with NMFS to establish a monitoring plan to collect physical hydrological data within Anaheim Bay and the Seal Beach National Wildlife Refuge. Therefore, in addition to physical data collection, NMFS believes that eelgrass monitoring should extend beyond the eelgrass impact survey limit as delineated in Figure 2-7 of the Mitigation Plan, and should be extended

into the Sunset Aquatic Park area of Huntington Harbor and the Refuge to evaluate the potential for indirect impacts to eelgrass due to changes in hydrodynamics.

As mentioned previously, the impact analysis does not appear to have considered the full aerial extent of eelgrass habitat, but relied solely upon vegetation cover. Table 7 of the EFHA indicates that the planned compensatory mitigation sites contain additional extreme shallow subtidal and shallow subtidal areas for eelgrass planting. In addition, the Mitigation Plan indicates the currently proposed mitigation sites provide 10.5 acres of plantable eelgrass mitigation area Therefore, it is possible that the full aerial extent of anticipated impacts to eelgrass habitat may be adequately addressed, but the EFHA and Mitigation Plan do not explicitly make this clear. In addition, the proposed project is generally converting intertidal and shallow subtidal areas into deeper subtidal areas to be used for navigation purposes, which may lead to a net loss in the physical habitat conditions necessary to support eelgrass habitat. NMFS notes that the EFHA indicates there is a net loss of extreme shallow subtidal habitat due to permanent habitat conversions associated with the proposed dredging, fill, and riprap placement. Therefore, NMFS believes the Navy should update their eelgrass impact analysis to more explicitly include the aerial extent of eelgrass habitat, as described in CEMP Section I(B)(1)(b), and more clearly indicate whether there is a net loss in habitat that contains the physical conditions necessary to support eelgrass habitat, which is consistent with INRMP conservation objectives.

Adequacy of Eelgrass Compensatory Mitigation Plan

The Mitigation Plan proposes to offset impacts to eelgrass via the establishment of shallow water habitat conducive to eelgrass growth along with active transplants at two sites in inner and outer Anaheim Bay. The first is a shallow water plateau within the inner basin of the bay located along the proposed new causeway over to the east (south) mole. This site is presently designed as a sand fill placed against the revetment of the causeway with a plateau elevation of -5 ft MLLW and a slope of 8:1 to the basin floor. The second is a fill mound and plateau within the outer bay basin that is located offshore of the east (south) mole beach between the proposed PNC and the pier protection breakwater. This plateau is also presently planned to be filled to an elevation of -5 ft MLLW with fill slopes constructed at 10:1. The two designed eelgrass plateaus have a surface area at -5 ft MLLW of 6.1 acres with additional plantable area found on the slopes of the fills. Collectively, the area of the mitigation sites that occur within a suitable elevation range to support eelgrass totals 10.5 acres.

The Mitigation Plan acknowledges the dynamic nature of eelgrass and that various stressors may limit the aerial extent of eelgrass habitat within the mitigation sites. The Mitigation Plan indicates nearly all eelgrass beds are restricted by slope instability and geotropism along their lower margins. In addition, the upper margin of eelgrass within outer Anaheim Bay is restricted by wave energy. The Mitigation Plan skillfully utilized depth distribution data from a surrogate site (Cabrillo Beach in the Port of Los Angeles) to estimate the potential eelgrass yield at the proposed mitigation sites. The areal extent of eelgrass that would be anticipated to be generated from the currently designed mitigation sites is estimated at only 4.4 acres, only 42% of the suitable area. This contrasts with the 6.1 acres of created eelgrass habitat estimate provided in the EFHA. Regardless, the Mitigation Plan clearly indicates that the estimated eelgrass yield from the mitigation sites could fall short of the mitigation need using the high-end impact estimate.

Moreover, the Mitigation Plan indicates that the wave environment in outer Anaheim Bay is greater than that for Cabrillo Beach, and, thus, the eelgrass habitat in the outer mitigation site may be less stable. The Mitigation Plan concludes that the level of risk of site upset cannot be fully discounted and efforts should be taken to minimize the risks of mitigation shortfall. In addition, the Mitigation Plan explicitly acknowledges a relatively higher risk of eelgrass compensatory mitigation shortfall and that a supplemental mitigation project could be required at a future date. The Mitigation Plan identifies a number of refinements to the eelgrass mitigation site design that could be implemented to help minimize this risk of mitigation shortfall. However, the Mitigation Plan does not commit to those refinements and indicates the potential modifications have not yet had the benefit of full engineering review and Navy vetting.

NMFS also questions the long-term persistence of the outer basin eelgrass mitigation site. This site is located offshore of existing eelgrass beds and a sloping intertidal and subtidal shore. Thus, the physical characteristics of the constructed site are somewhat similar to a nearshore sand bar. However, the native shoreline and subtidal slope does not appear to naturally form nearshore bars. It is possible that the artificial construction of a bar-like feature may persist, but the Mitigation Plan does not provide detailed modeling results that estimate the equilibrium profile and quantify the risk of erosion, though it does indicate the outer basin site is subject to greater wave damage risk and is located between two deep water navigation channels. Because of the site's location between two deep channels, the site has no on-going source of feed sand to replace material that may be lost due to erosion. In addition, modeling that was referenced in the Mitigation Plan implies that waves from large storms may result in site erosion, and indicates the existing eelgrass could be exposed to sand overrun from the mitigation site. Moreover, wave-induced currents are expected to increase in the existing eelgrass habitat areas, which may make conditions less suitable for eelgrass persistence (Moffatt and Nichol, 2018).

In light of the identified mitigation risks and our concerns about the long-term persistence of the site's physical integrity, NMFS believes the anticipated eelgrass yield may be less than that estimated in the Mitigation Plan (4.4 acres). Furthermore, the Mitigation Plan did not recognize the need for additional compensation for impacts to an existing mitigation site, as we originally relayed in our June 2017 letter. In consideration of the above and the concerns we raised regarding the eelgrass impact analysis, NMFS believes there is a significant risk of eelgrass mitigation shortfall with the current Mitigation Plan. Therefore, as currently proposed, we do not concur with the EFHA's conclusion that impacts would be mitigated to less than significant levels. NMFS recommends that the Navy analyze the eelgrass mitigation site modifications described in Section 2.2.2 of the Mitigation Plan to help address the risk of mitigation shortfall, and implement those modifications, if deemed practicable and determined to be a more effective offsetting approach. In addition, the Navy should optimize any additional opportunities for in-kind, on-site eelgrass mitigation, and consider out-of-kind compensatory mitigation to further minimize the chance of mitigation failure.

Embayment Habitat Conversions

The EFHA indicates that permanent impacts would occur from conversion of unvegetated soft bottom benthic habitats into different tidal habitat depths and a net loss of soft-bottom tidal habitat. Overall, Table 7 of the EFHA indicates the project will result in a net loss of 8.4 acres of

soft bottom EFH and estuarine HAPC. The proposed project is expected to permanently reduce the amount of intertidal (0 to + 5.5 feet (ft) mean lower low water (MLLW)) and extreme shallow subtidal soft-bottom habitat (-6 to 0 ft MLLW) within Anaheim Bay. Specifically, a net loss of 3.5 acres of intertidal habitat, and 2 to 4.1 acres of extreme shallow subtidal habitat is expected.

In addition to the recognized value of eelgrass, shallow unvegetated habitats are also important for fish. Various studies regional to southern California convey the importance and productivity of extreme shallow subtidal habitats. For example, economically important fish species such as California halibut and sand bass, as well as other fishes, are frequently abundant in the shallow areas of California bays during their early life history. Valle et al. (1999) found 2-6 times more juvenile California halibut in extremely shallow, unvegetated habitat (<1.1 m deep) compared to eelgrass habitat within Alamitos Bay. These shallow protected habitats provide nursery values to halibut by decreasing the risk of mortality of newly-settled halibut and increasing growth of larger juveniles that feed upon abundant small fishes in southern California bays (Kramer 1991).

Another example is provided by the high fishery production rates found in shallow waters (1-2 m deep) in Upper Newport Bay (Allen 1982). Allen et al. (2006) reviewed comparable fish production estimates from other systems throughout the world and indicated that the annual productivity for the Upper Newport Bay littoral fish assemblage may be the highest yet recorded for any aquatic system. Shallow water habitats are also important to various elasmobranch species, such as leopard sharks which are federally managed under the Pacific Coast Groundfish FMP. Various studies have shown leopard shark aggregations in shallow, warm water near productive foraging grounds in sheltered bays and estuaries (Smith and Abramson 1990; Ebert and Ebert 2005; Hight and Lowe 2007; Carlisle and Starr 2009). Nosal et al. (2012) found that tracked leopard sharks within aggregations in La Jolla spent 71% of their time in shallow water less than or equal to 2 m deep, and Hight and Lowe (2007) found that tracked leopard sharks within aggregations were generally found in the upper 3 m of the water column.

As a result of Southern California's large population and intense economic and recreational activity, there is very little coastal space that has not been subject to construction, mineral extraction, or other forms of resource utilization and habitat alteration. These activities have led to permanent losses of intertidal and shallow water habitats and chronic effects on water and sediment quality. Coupled with overwater structure expansion and modification, Southern California embayments have experienced high levels of ecological stress, modification, and continual decline in viable intertidal and shallow water habitats. Moreover, climate change is expected to increase sea levels, which will further exacerbate losses of intertidal and shallow water habitat. In light of these cumulative impacts, NMFS believes special consideration should be given to these types of habitats when planning and implementing compensatory mitigation. Because intertidal and extremely shallow subtidal habitats (i.e. ~ -2 m MLLW and shallower) have disproportionately been impacted to accommodate navigation and other coastal development, additional value should be conferred upon these relatively rare and productive habitats.

The INRMP also recognizes the significance and rarity of embayment habitats, such as Anaheim Bay, within the Southern California Bight, and the higher relative loss of intertidal habitat

compared to other tidal habitats in the Anaheim Bay ecosystem. In addition, the INRMP recognizes that Navy project work may be bringing diminishing returns to the health of the marsh and Anaheim Bay as time goes on. In order to achieve the conservation goals outline in the INRMP, specific conservation objectives are described for some of the coastal habitats affected by the proposed project. More specifically, the INRMP contains objectives to ensure no net loss of existing structure and function of beach and dune habitat; achieve a long-term net gain in the area, function, value, and permanence of intertidal flats; and improve the function and value of unvegetated shallows, the physical conditions that support this habitat, and populations of associated target species. NMFS does not believe the net losses to these soft bottom habitats are consistent with the above INRMP objectives.

According to the EFHA, overall changes in substrate type would result in a net increase of 11.4 acres of hard-bottom riprap habitat across subtidal and intertidal depths associated with the new breakwater, PNC jetties, and causeway. Objective 1 of the INRMP is to maintain and restore the *natural* (emphasis added) structure, function, and disturbance processes of Navy lands. NMFS does not believe marine habitat conversions to artificial riprap habitat designed for the purpose of shoreline protection is consistent with this INRMP objective. NMFS recognizes that the artificial riprap may provide habitat values of benefit to some fishery species in some seascape contexts. However, artificial riprap is not synonymous with natural open coast reef ecosystems. Davis et al. (2002) examine factors affecting spatial and temporal variation of intertidal, hard substrate biota with emphasis on the influence of exposure, distance from the bay mouth, and similarly to open coast, our bottom communities. Specifically, exposed sites shared about 45% of the same species composition, whereas protected sites only shared about 8% of the same species composition. Moreover, given the relative lack of natural hard bottom habitat in estuaries, the addition of artificial hard structures within this type of habitat may provide an invasion opportunity for non-indigenous hard substratum species (Glasby et al. 2007, Wasson et al. 2005, Tyrell and Byers, 2007). Therefore, NMFS believes that artificial substrate in estuaries may contribute to further proliferation of non-indigenous species. Some researchers have recommended that coastal managers should consider limiting the amount of artificial hard substrates in estuarine environments (Wasson et al. 2005, Tyrell and Byers 2007). Both the invasive kelp, *Undaria pinnatifida*, and the established non-native (*Sargassum muticum*) have been observed along the artificial rip-rap. The EFHA indicates the invasive kelp species is able to rapidly colonize new or disturbed substrata and artificial floating structures. NMFS notes that the proposed project will be increasing the amount of artificial hard substrate via riprap conversions, new pilings, and various floating structures (e.g., buoys, moorings, barriers).

Furthermore, the proposed purpose of the riprap habitat is to reduce wave energy and/or erosion, not for habitat restoration and/or mitigation purposes. Thus, the riprap habitat may be subject to maintenance and repairs that would periodically disturb the artificial hard bottom habitat. Given the cumulative impacts of shoreline hardening in Southern California and the protected nature, of at least a portion of the proposed habitat conversion, NMFS does not believe such conversions are an appropriate offset for permanent losses to embayment soft bottom intertidal and extreme shallow subtidal habitat. If the Navy believes protected intertidal and extreme shallow subtidal riprap is an appropriate offset for the loss of relatively rare intertidal and extreme shallow subtidal soft bottom habitat within an embayment seascape context, then the Navy should

empirically demonstrate that the converted habitat provides equivalent native diversity and productivity, and is consistent with INRMP objectives.

Another marine habitat conversion involves the construction of a pier encompassing approximately 3.2 acres. NMFS has previously provided analyses regarding the potential adverse effects to EFH from overwater structure projects. For example, the EFH Programmatic Consultation for Overwater Structures applies to new or expanded overwater structure construction, modification, maintenance, and associated indirect activities in tidally influenced waters of the United States and immediate fringes within Orange and San Diego Counties. Information contained within that EFH Programmatic Consultation for Overwater Structures is applicable to the proposed project. In summary, the proposed pier will alter light regime, local hydrodynamics, substrate conditions, and water quality. NMFS believes these alterations further reduce the quality of EFH and estuarine HAPC.

Lastly, the reconfiguration of Anaheim Bay and construction of a new entrance channel may affect the hydrology of the bay's ecosystem. According to the EFHA, modeling results in the immediate project area and outside the area in the Seal Beach National Wildlife Refuge and south to Bolsa Bay (Table 6 and Figure 7) indicate that residence times would decrease in all modeling location areas within Navy Seal Beach. However, the EFHA does not discuss the biological ramifications of the modelled decrease in residence times. The percent change is greatest in outer Anaheim Bay (76%) and at the Pacific Coast Highway (61%) modeling locations and less within the two Refuge stations (29% and 8% respectively). The INRMP recognizes that historical modifications have diminished the estuarine nature of Anaheim Bay via decreased inputs of fresh water, sediment, organic material, etc., which has had significant negative consequences for productivity and diversity. NMFS notes that a decrease in residence time may further reduce estuarine characteristics within the Anaheim Bay complex.

In order to address impacts from construction and align with INRMP goals and objectives, the Mitigation Plan includes two habitat conservation areas that may address some of the anticipated impacts to EFH. According to Table 3 of the EFHA, the creation of these conservation areas are serving as mitigation for the marine habitat conversions association with construction of the new ammunition pier and associated floating structures, new breakwater, new deepwater navigation channels and turning basin, and fill and habitat conversions associated with causeway and mole re-design. Approximately 1.4 acres of intertidal and shallow water habitat would be created adjacent to the inner eelgrass mitigation site. In addition, rehabilitation of approximately 1.1 acres of intertidal and salt marsh habitat is proposed between PCH and Sunset Beach. However, NMFS does not believe this is an appropriate offset for the permanent losses of intertidal (3.5 acres) and extreme shallow subtidal (2 to 4.1 acres) soft bottom EFH and estuarine HAPC, and increased shoreline hardening (11.4 acres) and overwater structure coverage (3.2 acres). Therefore, the Navy should implement additional compensatory mitigation to offset the above adverse impacts to EFH.

Sediment Disposal Impacts

The EFHA does not provide an estimate of the amount of material proposed for beach replenishment, nor does it discuss impacts to beach ecology and/or downcoast sedimentation

processes. For example, California grunion spawning may be adversely affected by beach nourishment activities. California grunion are a unique species of fish endemic to southern California. Grunion are in the silversides family, which are ecosystem component species for the Coastal Pelagic Species, Pacific Coast Groundfish, and Highly Migratory FMPs. Along the coast of southern California to southern Baja California during the months of March through August, California grunion use intertidal sandy beach habitats for spawning and maturation of eggs. These eggs will mature over a period of approximately two weeks, when extreme high tides reach eggs and stimulate hatching. Activities that require moving or depositing of fill material on tidally influenced beach areas during this season may smother and/or physically damage grunion eggs because of compression by heavy work equipment or burial by the placement of material. This may have negative impacts on the reproductive success of grunion. Pelagic species including squid and sharks consume grunion as do marine mammals such as dolphins, seals and sea lions. One federally managed species example is the common thresher shark (Alopias vulpinus), which is managed under the Highly Migratory FMP. Young thresher sharks appear to prefer open coast and semi-enclosed bays with high concentrations of schooling prey on which they feed; common thresher shark have been reported to feed on grunion. Therefore, a reduction in grunion spawning habitat may reduce the amount of available prey for the common thresher shark.

The Bolsa Chica Lowlands Restoration Project lies to the south of the beach nourishment site and relies upon an open tidal inlet connection with the ocean. The USACE Civil Works program already conducts a beach nourishment program at Surfside/Sunset Beach, which may periodically increase sedimentation rates at the tidal inlet. If gross sediment transport increases due to a cumulative increase in beach nourishment at Surfside/Sunset Beach, sedimentation of the tidal inlet at Bolsa Chica may increase. Increased sedimentation within the tidal inlet may increase tidal muting and/or risk of inlet closure, which may adversely affect the ecological condition of the Bolsa Chica project.

3.3. Essential Fish Habitat Conservation Recommendations

The proposed action contains a number of best management practices, standard operating procedures, conservation measures, and mitigation measures to reduce the effects of the project on EFH. They are specifically outlined and described in section 4.4 of the EFHA. Except where noted in our conservation recommendations, NMFS believes the mitigation and conservation measures are integral components of the proposed action, and expects that all proposed activities will be completed consistent with those measures. Any deviation from these measures will be beyond the scope of this consultation and may require supplemental consultation in order to determine what effects, if any, the modified action is likely to have on EFH.

Based upon the above effects analysis, NMFS has determined that the proposed project would adversely affect EFH for various federally managed fish species under the Coastal Pelagic Species, Pacific Coast Groundfish Species, and Highly Migratory Species FMPs. Moreover, the project would adversely affect estuary and seagrass HAPC. Therefore, pursuant to section 305(b)(4)(A) of the MSA, NMFS offers the following EFH conservation recommendations to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH.

1. The Mitigation Plan explicitly acknowledges a relatively higher risk of eelgrass compensatory mitigation shortfall and that a supplemental mitigation project could be required at a future date. The Mitigation Plan identifies a number of refinements to the eelgrass mitigation site design that could be implemented to help minimize this risk of mitigation shortfall. However, the Mitigation Plan indicates these potential modifications have not yet had the benefit of full engineering review and Navy vetting. Therefore, the Navy should analyze the eelgrass mitigation site modifications described in Section 2.2.2 of the Mitigation Plan, and implement if deemed practicable and determined to be a more effective offsetting approach. Except for the potential modifications above, the Navy should implement the proposed eelgrass mitigation within inner and outer Anaheim Bay, as described in the Mitigation Plan. In addition, the Navy should implement the proposed actions within the intertidal/shallow water habitat conservation area and the intertidal and coastal transition habitat rehabilitation area, as described in the Mitigation Plan. These actions to create, restore, and rehabilitate eelgrass HAPC and estuarine HAPC would help to offset anticipated impacts to these habitats.

2. Consistent with the CEMP, the Navy should implement a monitoring program consisting of a pre-construction eelgrass survey and three post-construction eelgrass surveys within the project area and throughout the areas subject to the INRMP. In addition to addressing indirect effects to eelgrass, NMFS notes that such surveys are consistent with the identified objective and task within the INRMP for vegetated shallows (i.e., eelgrass). As the proposed action has the potential to affect hydrology throughout the entire system, NMFS questions whether the identified reference sites would serve their intended purpose. However, the identified sites are likely the best practical approximation to serve as a reference. Coincident with the eelgrass surveys, detailed bathymetric surveys should be conducted throughout inner and outer Anaheim Bay to evaluate the potential for slope failure and/or erosion from the new hydrologic regime.

3. NMFS believes additional compensatory mitigation should be implemented to address the uncertainty of eelgrass mitigation success, the net loss of intertidal and extreme shallow subtidal habitats, further conversion of protected bay habitat to artificial riprap, and decreases in the quality of EFH from the new pier. Based upon discussions with Navy staff, NMFS has assumed that the Navy has maximized their opportunity to compensate for impacts on site. Therefore, NMFS recommends that out of kind compensatory mitigation be evaluated, in consultation with NMFS, and implemented to address the above shortfalls. Rocky reef degradation has previously occurred in the project vicinity and within the larger San Pedro shelf ecosystem. In addition, two species of marine invertebrates, black and white abalone, that depend upon healthy rocky reef ecosystems are endangered. In light of these regional conservation needs, NMFS recommends the Navy support kelp forest restoration and support abalone out-planting efforts as additional compensation. Such efforts would restore canopy kelp HAPC and abalone out-planting would enhance rocky reef and kelp HAPCs.

4. The Navy, in cooperation with NMFS and US Fish and Wildlife Service Seal Beach National Wildlife Refuge personnel, should establish a monitoring plan to collect physical hydrological data (tidal velocity, sedimentation/erosion, etc.) within Anaheim

Bay and the Seal Beach National Wildlife Refuge. This monitoring plan should also be established in cooperation with existing monitoring conducted by academic institutions (e.g., California State University, Long Beach, University of California, Los Angeles, etc.). NMFS will work with the Navy to establish the appropriate contacts from those institutions. This additional collaboration will help ensure the monitoring plan incorporates previous and existing monitoring efforts, and will thus provide more robust results to inform potential effects of the project.

5. The Navy should develop, in consultation with NMFS and California Department of Fish and Wildlife, and implement an avoidance/minimization plan to address potential adverse impacts to grunion spawning.

6. The Navy should collaborate with USACE Civil Works program responsible for periodic beach nourishment at Surfside/Sunset to ensure there is not a net cumulative increase in sedimentation down coast that may impact sedimentation patterns within the tidal inlet channel connecting the Pacific Ocean to the full tidal basin within the Bolsa Chica Lowlands Restoration Project.

3.4. Statutory Response Requirement

Please be advised that regulations at section 305(b)(4)(B) of the MSA and 50 CFR 600.920(k) of the MSA require your office to provide a written response to this letter within 30 days of its receipt and at least 10 days prior to final approval of the action. A preliminary response is acceptable if final action cannot be completed within 30 days. Your final response must include a description of measures to be required to avoid, mitigate, or offset the adverse impacts of the activity. If your response is inconsistent with our EFH Conservation Recommendations, you must provide an explanation of the reasons for not implementing those recommendations. The reasons must include the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects

In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, we ask that in your statutory reply to the EFH portion of this consultation, you clearly identify the number of conservation recommendations accepted.

3.5. Supplemental Consultation

Pursuant to 50 CFR 600.920(l), the Navy must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH Conservation Recommendations.

4. FISH AND WILDLIFE COORDINATION ACT

Under the FWCA, an action occurs whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever, including navigation and drainage, by any department or agency of the United States, or by any public or private agency under Federal permit or license (16 USC 662(a). The purpose of the FWCA is to ensure that wildlife conservation receives equal consideration, and is coordinated with other aspects of water resources development (16 USC 661). The FWCA establishes a consultation requirement for Federal agencies that undertake any action to modify any stream or other body of water for any purpose, including navigation and drainage (16 USC 662(a)), regarding the impacts of their actions on fish and wildlife, and measures to mitigate those impacts. Consistent with this consultation requirement, NMFS provides recommendations and comments to Federal action agencies for the purpose of conserving fish and wildlife resources, and providing equal consideration for these resources. NMFS' recommendations are provided to conserve wildlife resources by preventing loss of and damage to such resources. The FWCA allows the opportunity to provide recommendations for the conservation of all species and habitats within NMFS' authority, not just those currently managed under the ESA and MSA.

The following recommendations apply to the proposed action:

As described in the EFH effects analysis, NMFS has determined that estuarine and seagrass habitat will be negatively impacted by proposed project activities. Given the importance of these habitats to a variety of fish and wildlife species, the Conservation Recommendations provided above to address adverse effects to EFH are also considered necessary to address negative impacts to fish and wildlife resources managed under the FWCA.

Pursuant to section 2(e) of the FWCA, Federal action agencies are authorized to transfer funds to NMFS as may be necessary to conduct all or part of the wildlife investigations associated with the proposed project. The BA and EFHA identifies various mitigation and conservation measures that the Navy would implement to reduce the effects of the action on green sea turtles and EFH. Among these are a green sea turtle tagging study that involves NMFS cooperation and expertise to determine movement patterns in the action area and help understand the extent of impacts of the proposed project on green sea turtles and habitat utilization in the area and physical monitoring to address uncertainty about hydrological impacts. Therefore, NMFS requests that the Navy collaborate with NMFS to develop a funding transfer agreement under section 2(e) of the FWCA to support NMFS's involvement and expertise in the satellite tagging study of green sea turtles to determine movement patterns in the action area and help understand the extent of impacts of the proposed project on green sea turtles and habitat utilization in the area.

The action agency must give these recommendations equal consideration with the other aspects of the proposed action so as to meet the purpose of the FWCA.

This concludes the FWCA portion of this consultation.

5. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

The Data Quality Act (DQA) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the opinion addresses these DQA components, documents compliance with the DQA, and certifies that this opinion has undergone pre-dissemination review.

5.1. Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion are the Navy, the U.S. Army Corps of Engineers, and other agencies and contract entities that will be permitting or performing the proposed action considered herein. Individual copies of this opinion were provided to the Navy. The document will be available through the NOAA Institutional Repository (https://repository.library.noaa.gov/), after approximately two weeks. The format and naming adheres to conventional standards for style.

5.2. Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

5.3. Objectivity

Information Product Category: Natural Resource Plan

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01 et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the References section. The analyses in this opinion and EFH consultation contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA and MSA implementation, and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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