NATIONAL MARINE FISHERIES SERVICE
ENDANGERED SPECIES ACT SECTION 7
BIOLOGICAL AND CONFERENCE OPINION

Title:	Programmatic Biological and Conference Opinion on Construction and Operation of up to 25 New Offshore Patrol Cutters to Support Coast Guard Missions
Consultation Conducted By:	Endangered Species Act Interagency Cooperation Division, Office of Protected Resources, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce
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Table of Contents

List of Tables

Page

List of Figures

Page

1 INTRODUCTION

The Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. §1531 et seq.) establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their designated critical habitat. Federal agencies must do so in consultation with the National Marine Fisheries Service (NMFS) for those listed threatened or endangered species, or designated critical habitat that may be affected by actions that are under NMFS jurisdiction (50 C.F.R. §402.14(a)).

The Federal action agency shall confer with NMFS for species under NMFS jurisdiction on any action which is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat (ESA 7(a)(4) as implemented under 50 C.F.R. §402.10). If requested by the Federal agency and deemed appropriate, the conference may be conducted in accordance with the procedures for formal consultation in 50 C.F.R. §402.14 (50 C.F.R. 402.10(d)).

Section 7(b)(3) of the ESA requires that at the conclusion of consultation, NMFS provide an opinion, in this case a biological and conference opinion, stating whether the Federal agency was able to insure its action is not likely to jeopardize ESA-listed species or destroy or adversely modify proposed or designated critical habitat. If NMFS determines that the action is likely to jeopardize listed species or destroy or adversely modify critical habitat, NMFS provides a reasonable and prudent alternative that allows the action to proceed in compliance with section 7(a)(2) of the ESA. If incidental take is reasonably expected, section 7(b)(4) requires NMFS to provide an incidental take statement (ITS), which exempts take incidental to an otherwise lawful action, and specifies the impact of any incidental taking, including reasonable and prudent measures (RPMs) to minimize such impacts and terms and conditions to implement the RPMs.

On July 5, 2022, the U.S. District Court for the Northern District of California issued an order vacating the 2019 regulations that were revised or added to 50 C.F.R. part 402 in 2019 ("2019 Regulations," see 84 FR 44976, August 27, 2019) without making a finding on the merits. On September 21, 2022, the U.S. Court of Appeals for the Ninth Circuit granted a temporary stay of the district court's July 5 order. On November 14, 2022, the Northern District of California issued an order granting the government's request for voluntary remand without vacating the 2019 regulations. The district court issued a slightly amended order two days later on November 16, 2022. As a result, the 2019 regulations remain in effect, and we are applying the 2019 regulations here. For purposes of this consultation and in an abundance of caution, we considered whether the substantive analysis and conclusions articulated in the biological and conference opinion (Opinion) and incidental take statement would be any different under the pre-2019 regulations. We have determined that our analysis and conclusions would not be any different.

The lead Federal action agency for this consultation is the United States Coast Guard (USCG). The USCG proposes the acquisition, construction and operation of 25 cutters under its Offshore Patrol Cutter (OPC) Program. The first of these new cutters is expected to be operational in 2024. Construction of 25 OPCs are expected to be completed by 2037. The USCG proposes the use of the OPCs to meet mission demands in offshore waters 50 nautical miles (nm; 93 kilometers [km]) or more from shore that may require an extended on-scene vessel presence, a long transit time to reach the operational area, or a forward deployment of forces (e.g., national defense).

Program activities include actions associated with the operation of the new OPCs once construction of the first vessel commences through the expected 30-year service life of each vessel. The action is projected to cover 45 years because the first vessel is expected to become operational in 2037 and then a new vessel will be constructed every 1.5 years after, if funding is secured. This programmatic Opinion consults on activities by the USCG for the construction and operation of new vessels.

Programmatic Consultations

NMFS and the U.S. Fish and Wildlife Service (USFWS) have developed a range of techniques to streamline the procedures and time involved in consultations for broad agency programs or numerous similar activities with predictable effects on listed species and critical habitat. Some of the more common of these techniques and the requirements for ensuring that streamlined consultation procedures comply with section 7 of the ESA and its implementing regulations are discussed in the October 2002 joint Services memorandum, Alternative Approaches for Streamlining Section 7 Consultation on Hazardous Fuels Treatment Projects (see also 68 FR 1628 [January 13, 2003] for the notice of availability of the memorandum).

A programmatic consultation is a consultation addressing an agency's multiple actions on a program, region, or other basis usually over an extended period of time. Programmatic consultations allow the Services to consult on the effects of programmatic actions such as: (1) multiple similar, frequently occurring or routine actions expected to be implemented in particular geographic areas; and (2) a proposed program, plan, policy, or regulation providing a framework for future actions (84 FR 44976; August 27, 2019; 50 C.F.R. §402.02). Mixed programmatic action means, for purposes of an ITS, a Federal action that approves action(s) that will not be subject to further section 7 consultation, and also approves a framework for the development of future action(s) that are authorized, funded, or carried out at a later time and any take of a listed species would not occur unless and until those future action(s) are authorized, funded, or carried out and subject to further section 7 consultation (50 C.F.R. §402.02). NMFS is required to issue an ITS for those portions of the program that are authorized at the program level, not subject to a future section 7 consultation, and are reasonably certain to cause take (50 C.F.R. §402.14(i)(6)). Any future actions within the framework that will be subject to step-down consultations when the future actions are authorized, funded, or carried out may require an ITS for the incidental take associated with those actions.

A programmatic ESA section 7 consultation should identify project design criteria (PDCs) or standards that will be applicable to all future projects implemented under the program. PDCs are conservation measures that serve to prevent adverse effects to listed species, or to limit adverse effects to predictable levels that will not jeopardize the continued existence of listed species or destroy or adversely modify critical habitat. Avoidance and minimization of adverse effects to species and their designated critical habitat is accomplished by implementing PDCs at the individual project level or taken together from all projects under the programmatic consultation. For those activities that meet the PDCs, there is no need for project-specific consultation. For actions that do not meet the PDCs but are within the scope of the proposed action, or for which specifics of individual activities are not yet known, consistency review may be required and step-down consultations may be needed.

In this mixed programmatic action, any future actions within the framework that are consistent with this Opinion will not require further analysis. Future actions consistent with those described in this Opinion, but for which all of the applicable PDCs cannot be implemented, will undergo a consistency review with the regions and incorporate additional mitigation to allow those actions to proceed under this Opinion, as needed. Any future actions with effects exceeding those considered in this Opinion will be subject to a separate consultation.

This mixed programmatic consultation and the resulting Opinion and ITS were completed in accordance with section 7(a)(2) of the ESA, associated implementing regulations (50 C.F.R. §§402.01-402.17), and agency policy and guidance. This consultation was conducted by the NMFS Office of Protected Resources (OPR) Endangered Species Act Interagency Cooperation Division (hereafter referred to as “we” or “our”).

This document represents our opinion on the effects of these actions on bocaccio (*Sebastes paucispinis*, Puget Sound Distinct Population Segment [DPS]); chinook (*Oncorhynchus tshawytscha*, Sacramento River Winter-Run, Upper Columbia River Spring-Run, Snake River Spring/Summer-Run, Snake River Fall-Run, Central Valley Spring-Run, California Coast, Puget Sound, Lower Columbia River, and Upper Willamette River Evolutionary Significant Units [ESUs]), chum (*Oncorhynchus keta*, Hood Summer-Run and Columbia River ESUs), coho (*Oncorhynchus kisutch*, Central California Coast, Southern Oregon/Northern California Coasts, Lower Columbia River, and Oregon Coast ESUs), and sockeye salmon (*Oncorhynchus nerka*, Snake River and Ozette Lake ESUs); Pacific eulachon (*Thaleichthys pacificus*, Southern DPS); Atlantic (Gulf of Maine DPS) salmon (*Salmo salar*); steelhead trout (*Oncorhynchus mykiss*, Southern California, Upper Columbia River, Snake River Basin, Middle Columbia River, Lower Columbia River, Upper Willamette River, South-Central California Coast, Central California Coast, Northern California, California Central Valley, Puget Sound DPSs); yelloweye rockfish (*Sebastes ruberrimus*, Puget Sound/Georgia Basin DPS); giant manta ray (*Manta birostris*);

Nassau grouper (*Epinephelus striatus*); oceanic whitetip (*Carcharhinus longimanus*) and scalloped hammerhead (*Sphyrna lewini*, Northwest and Western Central Atlantic, Southwest Atlantic, Eastern Atlantic, Indo-West Pacific, Central Pacific, and Eastern Pacific DPSs), and daggernose sharks (*Isogomphodon oxyrhynchus*); blackchin guitarfish (*Rhinobatos cemiculus*); narrow (*Anoxypristis cuspidata*) and smalltooth sawfish (*Pristis pectinate*, U.S. and Non-U.S. portion of range DPS) including the U.S. portion of critical habitat; Gulf (*Acipenser oxyrinchus desotoi*), shortnose (*Acipenser brevirostrum*), green (*Acipenser medirostris*, Southern DPS), and Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*, Chesapeake Bay, Carolina, South Atlantic, New York Bight andand Gulf of Maine DPS); lobed star (*Orbicella annularis*), mountainous star (*Orbicella faveolata*), boulder star (*Orbicella franksi*), elkhorn (*Acropora palmata*), staghorn (*Acropora cervicornis*), pillar (*Dendrogyra cylindrus*), and rough cactus corals (*Mycetophyllia ferox*); ESA-listed Ind-Pacific corals: *Acropora globiceps*, *Acropora lokani*, *Acropora retusa*, *Acropora speciosa*, *Euphyllia paradivisa*, *Isopora crateriformis*, and *Seriatopora aculeata*; black (*Haliotis cracherodii*) and white abalone (*Haliotis sorenseni*); leatherback (*Dermochelys coriacea*), hawksbill (*Eretmochelys imbricata*), green (*Chelonia mydas*, North Atlantic, South Atlantic, East Indian-West Pacific Ocean, Central North Pacific Ocean, Central South Pacific Ocean, East Pacific Ocean, Southwest Indian Ocean, and Southwest Pacific DPSs), Kemp's ridley (*Lepidochelys kempii*), olive ridley (*Lepidochelys olivacea*, Mexico's Pacific coast breeding population and all other populations), and loggerhead (*Caretta caretta*, North Pacific Ocean, South Pacific Ocean, Northwest Atlantic Ocean, Northeast Atlantic, Southwest Indian Ocean, and Southeast Indo-Pacific Ocean DPSs) sea turtles; blue (*Balaenoptera musculus*), bowhead (*Balaena mysticetus*), fin (*Balaenoptera physalus*), gray (*Eschrichtius robustus*, Western North Pacific DPS), humpback (*Megaptera novaeangliae*, Western North Pacific, Central America, and Mexico DPSs), North Atlantic right (*Eubalaena glacialis*), North Pacific right (*Eubalaena japonica*), Southern right (*Eubalaena australis*), Rice's whale (*Balaenoptera riceii*), false killer (*Pseudorca crassidens*, Main Hawaiian Island Insular DPS), sei (*Balaenoptera borealis*), killer (*Orcinus orca*; Southern Resident DPS), and sperm whales (*Physeter microcephalus*); Steller (Western DPS) sea lion (*Eumetopias jubatus*); and bearded (*Erignathus barbatus*, Beringia DPS), ringed (*Phoca hispida hispida*, Arctic subspecies), Guadalupe fur (*Arctocephalus townsendi*), and Hawaiian monk seals (*Neomonachus schauinslandi*); North Atlantic green turtle, Northwest Atlantic loggerhead turtle, leatherback turtle, and hawksbill turtle critical habitat; North Pacific right whale critical habitat; Southern Resident killer whale critical habitat; Steller sea lion critical habitat; Hawaiian monk seal critical habitat; elkhorn and staghorn coral critical habitat and proposed habitat for *Acropora jacqelineae, A. globiceps, A. lokani, A. retusa, A. speciose, Euphyllia paradivisa, Isopora crateriformis, and Seriaopora aculeata*; green sturgeon Southern DPS critical habitat; and ringed seal Arctic subspecies and humpback whale Mexico and Northwest Pacific DPSs proposed critical habitat.

A complete record of this consultation is on file at the NMFS Office of Protected Resources in Silver Spring, Maryland.

1.1 Background

USCG operations occur inland (e.g., the Great Lakes, the Mississippi River), in coastal (within 12 nm [22 km] from shore), and in offshore waters (outside 12 nm from shore). Mission demands in offshore waters 50 nm (93 km) or more from shore may require an extended on-scene vessel presence, a long transit time to reach the operational area, or a forward deployment of forces (e.g., national defense). USCG personnel may be deployed on missions that take place in offshore waters for several months at a time in a variety of climates.

The USCG ensures the Nation's maritime safety, security, and stewardship. Its missions have evolved in response to changing national and international maritime security needs. The OPC program is a Department of Homeland Security (DHS) Level 1 Major Acquisition Program to provide surface assets to bridge the USCG operational capability gap between the National Security Cutters that patrol the open ocean and the Fast Response Cutters, which primarily operate within 50 nm (93 km) from shore. The purpose of the OPC program is to provide the USCG with a reliable and operationally available presence to accomplish assigned missions in offshore waters exceeding 50 nm (93 km). The OPC program is considered the USCG top acquisition priority and these cutters would provide the majority of the USCG offshore presence (USCG 2019).

From 1964 to 1991, the USCG acquired 30 Medium Endurance Cutters (MECs). Cutters in the Reliance-class (210 ft; 64 m) were commissioned between 1964 and 1969. Of these cutters, 14 of the 16 MECs are still operational and homeported in the Atlantic, Pacific, and Gulf of Mexico USCG operational areas. These cutters primarily execute maritime law enforcement (LE) and search and rescue (SAR) missions. Cutters in the Famous-class (270 ft [82 m]) were commissioned between 1979 and 1991, and all 13 are operational and homeported in the Atlantic and Gulf of Mexico USCG operational areas. Additionally, a former U.S. Navy (Navy) rescue and salvage ship, USCG Cutter ALEX HALEY, stationed in Kodiak, Alaska, was reconfigured for USCG MEC missions and transferred to USCG service in 1999. All of the MECs feature a flight deck for helicopter operations to primarily execute maritime LE and SAR missions. As the MECs age, they are becoming technologically obsolete and increasingly expensive to maintain and operate.

For these reasons, the USCG has requested the acquisition of 25 OPCs with planned 30-year service lives.

1.2 Consultation History

The USCG submitted a request for an informal section 7 consultation to the NMFS Office of Protected Resources (OPR) in Silver Spring, Maryland by letter dated December 14, 2021. OPR often conducts consultations for programmatic actions spanning multiple regions. The consultation was assigned to a consultation biologist on January 10, 2022.

This Opinion is based on information provided by the USCG, including the *Endangered Species Act Section 7 Informal Consultation:Offshore Patrol Cutter Biological Evaluation* (BE) submitted to OPR by the USCG Headquarters (USCG 2021). Our communication with the USCG regarding this consultation is summarized as follows:

- **December 14, 2021:** USCG sent OPR a request and information for initiation of ESA section 7 consultation.
- **January 10, 2022:** NMFS OPR notified the USCG via email that we received the consultation request and assigned a consultation lead contact.
- **February 3, 2022:** NMFS sent a letter response noting receipt of the initiation package and noted preliminary reasoning for the need for formal consultation.
- **February 7, 2022:** NMFS staff discussed with USCG staff via teleconference that NMFS believed the consultation should be formal, and noted that a request for additional information would be sent to USCG soon.
- **March 22, 2022:** NMFS sent USCG a letter requesting additional information to supplement the initiation package previously submitted. The letter informed USCG that once that information had been received, formal consultation would be initiated.
- **June 28, 2022:** NMFS initiated formal consultation with USCG on the OPC program.
- **August 19, 2022:** NMFS sent USCG a draft description of the action for review. NMFS initiated bi-weekly coordination calls.
- **September 16, 2022:** NMFS sent USCG draft PDCs (with additional suggested conservation measures/protocols) for review.
- **October 13, 2022:** NMFS and USCG agreed to a timeline extension to January 6, 2023, due to continuing discussions about programmatic mitigations (PDCs).
- **December 15, 2022:** NMFS and USCG agreed to a timeline extension to February 28, 2023, to allow USCG time to complete their review of the final PDCs.

2 THE ASSESSMENT FRAMEWORK

Section 7(a)(2) of the ESA requires Federal agencies, in consultation with NMFS, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species; or adversely modify or destroy their designated critical habitat.

"Jeopardize the continued existence of" means to engage in an action that reasonably 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 C.F.R. §402.02).

"Destruction or adverse modification" means a direct or indirect alteration that appreciably diminishes the value of designated critical habitat as a whole for the conservation of a listed species (50 C.F.R. §402.02).

This ESA section 7 consultation involves the following steps:

Description of the Action (Section 3): The general process for programmatic consultations is described in the introduction. This includes a description of the framework of the program and all of the component actions of the program. The framework also includes PDCs, monitoring and review requirements, consistency reviews, and a general program analysis.

Stressors Associated with the Action (Section 4): We discuss the aspects of the program and its actions that cause chemical, physical, and biological changes to land, water, and air (stressors).

Action Area (Section 5): We describe the action area as the spatial extent of the stressors caused by the program and its component actions discussed in Section 4. Thus, we define the geographic area where listed species and stressors may occur in the same time and place in *Species and Critical Habitat in the Action Area* (Section 6) and evaluate the status of those species and habitat. We also identify those *Stressors Not Likely to Adversely Affect Species or Critical Habitat* (Section 6.1), *Species and Critical Habitat Not Likely to be Adversely Affected* (Section 6.2) and detail our effects analysis for these species and critical habitats, and identify the status of the *Species and Critical Habitat Likely to be Adversely Affected* (Section 6.3).

*Environmental Baseline (*Section 7): We describe the environmental baseline as the condition of the listed species or its proposed or designated critical habitat in the action area, without the consequences to the listed species or proposed or designated critical habitat caused by the action. 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 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. The consequences to listed species or proposed or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 C.F.R. §402.02).

Effects of the Action (Section 8): Effects of the action are all consequences to listed species or critical habitat that are caused by the action, including the consequences of other activities that are caused by the action. A consequence is caused by the action if it would not occur but for the action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 C.F.R. §402.02).We include a section (8.1) for assumptions underlying the estimation of effects in this mixed programmatic action.

Exposure and Response Analysis (Section 8.2): In the analysis, we evaluate the potential adverse effects of the mixed programmatic action on ESA-listed species and proposed or designated critical habitat under NMFS jurisdiction with consideration of the PDCs. To do this, we begin with a problem formulation that identifies and assesses the stressors of the action and formulate risk hypotheses based on the anticipated exposure of listed species and critical habitat to stressors and the likely response of species and habitats to this exposure.

Cumulative Effects (Section 9): Cumulative effects are the effects to ESA-listed species and proposed or designated critical habitat of future state or private activities that are reasonably certain to occur within the action area (50 C.F.R. §402.02). Effects from future Federal actions that are unrelated to the action are not considered because they require separate ESA section 7 consultation.

Integration and Synthesis (Section 10): With full consideration of the status of the species and the proposed or designated critical habitat (Section 6), we consider the effects of the action within the action area on populations or subpopulations and on the physical and biological features essential to the conservation of the species specified for each designated and proposed critical habitatwhen added to the environmental baseline (Section 7) and the cumulative effects (Section 9) to determine whether the action could reasonably be expected to:

- Reduce appreciably the likelihood of survival and recovery of ESA-listed species in the wild by reducing its numbers, reproduction, or distribution, and state our conclusion as to whether the action is likely to jeopardize the continued existence of such species; or
- Appreciably diminish the value of proposed or designated critical habitat for the conservation of an ESA-listed species, and state our conclusion as to whether the action is likely to destroy or adversely modify designated (or proposed) critical habitat.

The results of our jeopardy analysis are summarized in the *Conclusion* (Section 11). If, in completing the last step in the analysis, we determine that the action under consultation is likely to jeopardize the continued existence of ESA-listed species or destroy or adversely modify proposed or designated critical habitat, then we must identify reasonable and prudent alternative(s) to the action, if any, or indicate that to the best of our knowledge there are no reasonable and prudent alternatives. See 50 C.F.R. §402.14(h)(3).

For a mixed programmatic action, an *Incidental Take Statement* (Section 12) is included for those actions where take of ESA-listed species is reasonably certain to occur. For future actions conducted under the framework of this program requiring consistency reviews that are unable to implement all PDCs and are likely to result in effects to ESA-listed species or proposed or designated critical habitat, we anticipate that an adaptive management approach may identify additional measures for the effects of those actions to be the same as those concluded in this Opinion. However, when adaptive management is unable to produce the same conclusions as considered in this Opinion, tiered, site-specific consultations will be conducted and an ITS issued for each consultation, as applicable. The ITS specifies the impact of the take, reasonable and prudent measures to minimize the impact of the take, and terms and conditions to implement the reasonable and prudent measures (ESA section 7 (b)(4); 50 C.F.R. §402.14(i)). Any take resulting from actions considered in this Opinion or future tiered consultations that is in compliance with the terms and conditions specified is not considered a prohibited taking of the ESA-listed species.

We provide discretionary *Conservation Recommendations* (Section 13) that may be implemented by the action agency (50 C.F.R. §402.14(j)). Finally, we identify the circumstances in which *Reinitiation of Consultation* (Section 14) is required (50 C.F.R. §402.16).

2.1 Evidence Available for the Consultation

To comply with our obligation to use the best scientific and commercial data available, we collected information identified through searches of Google Scholar, literature cited sections of peer reviewed articles, species listing documentation, and reports published by government and private entities. Searches were used to identify information relevant to the potential stressors (training, vessel transit, and other operations) and responses of ESA-listed species and proposed or designated critical habitat. This Opinion is based on our review and analysis of various information sources, including:

- Information submitted by the USCG
- Government reports
- Peer-reviewed scientific literature

These resources were used to identify information relevant to the potential stressors and responses of ESA-listed species and proposed or designated critical habitat under NMFS jurisdiction that may be affected by the action to draw conclusions on risks the action may pose to the continued existence of these species and the value of proposed or designated critical habitat as a whole for the conservation of ESA-listed species.

3 DESCRIPTION OF THE ACTION

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas (50 C.F.R. §402.02). Information in this section was obtained from USCG through their submission of a BE (USCG 2021) and supplemental information from discussions and within the Draft Programmatic Environmental Impact Statement (USCG 2022).

The USCG proposes the design, build and operation of up to 25 OPCs with planned 30-year service lives (USCG 2021). The will OPCs feature state-of-the-market technology and are intended to replace the 28 existing 210- to 270-foot MECs and the salvage cutter ALEX HALEY, which are becoming increasingly expensive to maintain and operate, and approaching technological obsoletion. The 360-foot (109 m) "Heritage class" OPC will provide a capability bridge between the larger-sized national security cutter, which patrols the open ocean in the most demanding maritime environments, and the smaller-sized fast response cutter, which serves closer to shore. New OPCs will be 54 ft (16 m) wide, draft 17 ft (5 m), and have two 16-Volt marine diesel engines and two five-blade, controllable pitch propellers (Figure 1). These vessels are intended for long periods offshore, up to 60 days at a time, and can sustain 22.5 knot speeds to travel worldwide to support the USCG's missions. Each OPC will have a typical idle speed of two knots, tow speed of 5 knots, transit speed of 7–19 knots, and, similar to MECs, will generally operate at speeds between 12–16 knots for ideal fuel consumption.

Figure 1. Offshore Patrol Cutter Vessel Design

The action includes vessel and aircraft operations, as well as training exercises, to meet the USCG mission responsibilities, which may include LE, SAR, homeland security and defense missions in the Atlantic and Pacific Oceans (including Alaska), and Gulf of Mexico. The OPC's vast operations and multi-mission responsibilities in the action area requires extended transits and sustained on-scene presence. To meet these requirements, OPCs will be equipped for longer transits and improved transit and intercept speed, allowing for rapid responses, a reduction in overall transit time, and an increase in on-scene availability (when compared to the current MEC fleet). During any patrol, an OPC will be able to sustain operations at sea for a minimum of 14 days in between fuel stops and 21 days in between food (chilled, frozen, and dry) and stores replenishment.

For fuel-efficient patrolling and transiting, the OPCs will have a minimum range of 8,500 nm (15,557 km) and threshold range of 9,500 nm (17,594 km) at a sustained speed of approximately 14 knots. Higher speeds will only be used to intercept another vessel (e.g., during search and rescue or drug interdiction missions) and for a short period of time, then the OPC will resume fuel-efficient speeds. Although the OPCs will operate in waters where ice may be present at certain times of the year (e.g., Alaska), the OPCs will not have icebreaking capabilities.

OPCs will transit to and from ports and homeports to operational areas. For the purposes of this analysis, the transit area is defined as from the coastline to 12 nm (22 km) from shore and transits between the seven operational areas. The operational area is defined as waters beyond 12 nm (22 km) from shore. During transit, OPCs will mainly travel to mission and training areas. Navigational systems will be used as the OPC is underway. A full list of program actions is in Section 3.2.

3.1 Authorities under which the Action will be Conducted

The USCG missions are mandated by Public Law 107-296, "Homeland Security Act of 2002," and are covered under Title 14 of the U.S.C. and 6 U.S.C. §468. The eleven USCG missions are ports, waterways, and coastal security; drug interdiction (DI); aids to navigation; search and rescue; living marine resources (LMR); marine safety; DR; migrant interdiction (MI); marine environmental protection; ice operations; and other law enforcement (OLE; e.g., illegal fishing). The acquisition of the 25 OPCs is guided by the Acquisition Directorate (USCG 2019), the mission of which is to "Efficiently and effectively deliver the capabilities needed to execute the full range of Coast Guard missions."

The USCG is the lead Federal maritime LE agency and the only agency with both the authority and capability to enforce national and international law on the high seas, outer continental shelf, and inward from the U.S. Exclusive Economic Zone (EEZ) to inland waters. As the only U.S. maritime agency capable of at sea enforcement, and one of the armed services, the USCG enforces the ESA and the Marine Mammal Protection Act (MMPA). The USCG provides on-the-water and aerial surveillance related to maritime safety (including search and rescue), homeland security, national defense, and environmental protection, including for fishing, marine mammal harassment, and marine pollution regulations. In Stellwagen Bank National Marine Sanctuary, for example, while the primary enforcement responsibility rests with the NOAA Law Enforcement Office, policing these waters can be a daunting task. Stellwagen Bank is located within the jurisdiction of the USCG First District. The USCG Auxilliary, First Northern District provides free vessel safety checks for the boating public and helps the Sanctuary disseminate information about safe boating practices around whales. While the above describes the USCG enforcement activities in Stellwagen Bank, these enforcement activities are typical of USCG MMPA and ESA enforcement in all waters of the United States.

3.2 Program Actions

The following section and subsections provide details of the actions that will be conducted once the new OPCs have been constructed and are in in the water in training and testing areas, and in regular operation. The subset of missions that OPCs will perform are:

- Ports, Waterways, and Coastal Security,
- Search and Rescue,
- Drug Interdiction,
- Migrant Interdiction,
- Living Marine Resources,
- Other Law Enforcement, and
- Defense Readiness.

Living Marine Resources are statutory missions for enforcement of any marine laws, which may include habitat protection, entanglement or stranding events, or other types of enforcement, and are discussed under LE. Table 1 provides a summary of the activities to be conducted as part of

OPC missions and identifies the primary operation areas (See Section 5, *Action Area*) where these activities will take place.

Table 1. Summary of program activities in operation areas (USCG 2021).

Activity[1]	*Proposed Action Area*						
	NW-ATL	*NW-ATL Florida and the Caribbean*	*GoMEX*	*NEPAC-South*	*NEPAC-North*	*AK*	*HI-PAC*
All Assets							
Law Enforcement	x	x	x	x	x	x	x
Defense Readiness Training		x[3]		x[4]			x[5]
Search and Rescue Training[2]	x	x	x	x	x	x	x
Vessels							
Crew and Passenger Transfer (via OTH boat)	x	x	x	x	x	x	x
Gunnery Training[6]	x	x	x	x	x	x	x
Functionality & Maneuverability Testing and Propulsion Test	x	x	x	x	x	x	x
Vessel Escort[2]	x	x	x	x	x	x	x
Vessel Tow[2]	x	x	x	x	x	x	x
Fueling Underway		x		x			x
Foreign Port of Call Visit		x	x				x
Aircraft							
Vertical Replenishments (Helicopter)	x	x	x	x	x	x	x
Helicopter Landing Qualifications	x	x	x	x	x	x	x
Reconnaissance (Helicopter or UAS)	x	x	x	x	x	x	x
Crew and Passenger Transfer (via Helicopter)	x	x	x	x	x	x	x
UAS deployment	x	x	x	x	x	x	x

[1] Patrols would encompass all activities listed in table.
[2] Excluding the emergency response associated with these activities.
[3] The Navy's Jacksonville Operating Area, off Florida and Georgia.
[4] The Navy's Fleet Training Area Hot range located within the Southern California Offshore range.
[5] In Hawaii, Coast Guard participates in large-scale naval exercises bi-annually, such as Rim of the Pacific Exercise.
[6] Every district has authorized locations for minor caliber gunnery exercises (.50 caliber/7.62mm). Locations are reviewed and agreed upon by Coast Guard, FAA, a

This Opinion analyzes the effects to ESA-listed species and designated and proposed critical habitat resulting from future actions associated with the operation of the new OPCs by the USCG. However, while the following actions are included in this program:

- Patrols;
- Use of navigational equipment during vessel operation;
- Anchoring in designated areas as well as locations that have coral reefs;
- Passenger and crew transfer;
- Law enforcement activities;
- Search and rescue training;
- Functionality and maneuverability training;
- Emergency response training;
- Gunnery training; and
- Fueling underway,

these actions will be conducted without any limits. A full list of mitigation measures for these activities is contained in Section 3.3. The stressors produced by the above actions will not require any further review when the appropriate mitigation measures are fully implemented. There are additional actions that will take place under this program that will not implement all of the PDCs. These actions are:

- Actions intended to use Military Expended Materials (MEM) outside military ranges, or over shallow coral reef areas;
- Anchoring in areas that have coral reefs;
- Aircraft operations under the action that would occur at altitudes below 500 ft;
- Towing derelict vessels, or those that have sat in the water unattended for long periods, and have accumulated extensive biofouling;
- Vessel construction and transit from a site not considered in this Opinion; and
- Vessel maintenance and decommissioning.

Most of these actions are only identified because they are exceptions to the mitigation contained in the programmatic action. These actions are expected to be infrequently conducted over the next 30 years, if at all. Therefore, if they occur, they will undergo consistency reviews (described in Section 3.3.2) by the appropriate NMFS Regional Office with the USCG..

3.2.1 **Patrols**

An OPC will support USCG missions that generally occur 12 to 200 nm (22-370 km) from shore and require long transit times to reach the farthest extent of the action area, forward deployment of forces (e.g., national defense) with the Navy, and an extended on-scene vessel presence. OPCs are expected to be deployed for up to four patrols per year, which typically last 45–60 days with a 2–3 day logistical break, or port of call, approximately every 14 days of operation (the range of time between port calls will be between 13 and 18 days due to fuel needs). Thus, over a continuous cycle throughout the year, the OPC will spend 60 days at sea and 60 days in a port. An OPC could spend 90–120 continuous days at sea with no ports of call while on patrol supporting Department of Defense (DoD) mission needs, but this would be rare. In the event that such a deployment does occur, a fuel barge, a replenishment supply ship, or helicopter vertical replenishment will conduct provisioning. The primary purpose of a port call for the OPC would be to conduct necessary repairs and to re-provision (e.g., fuel, food, supplies). In total, an OPC will spend at least 185 days and up to 230 days on patrol, away from its homeport, each year. Current MEC homeport locations are shown in Figure 2. During all missions, navigation systems will be used for all vessels underway. Patrols include all activities listed in Table 1, above, and Table 2, which provides an overview of the frequency and duration of activities.

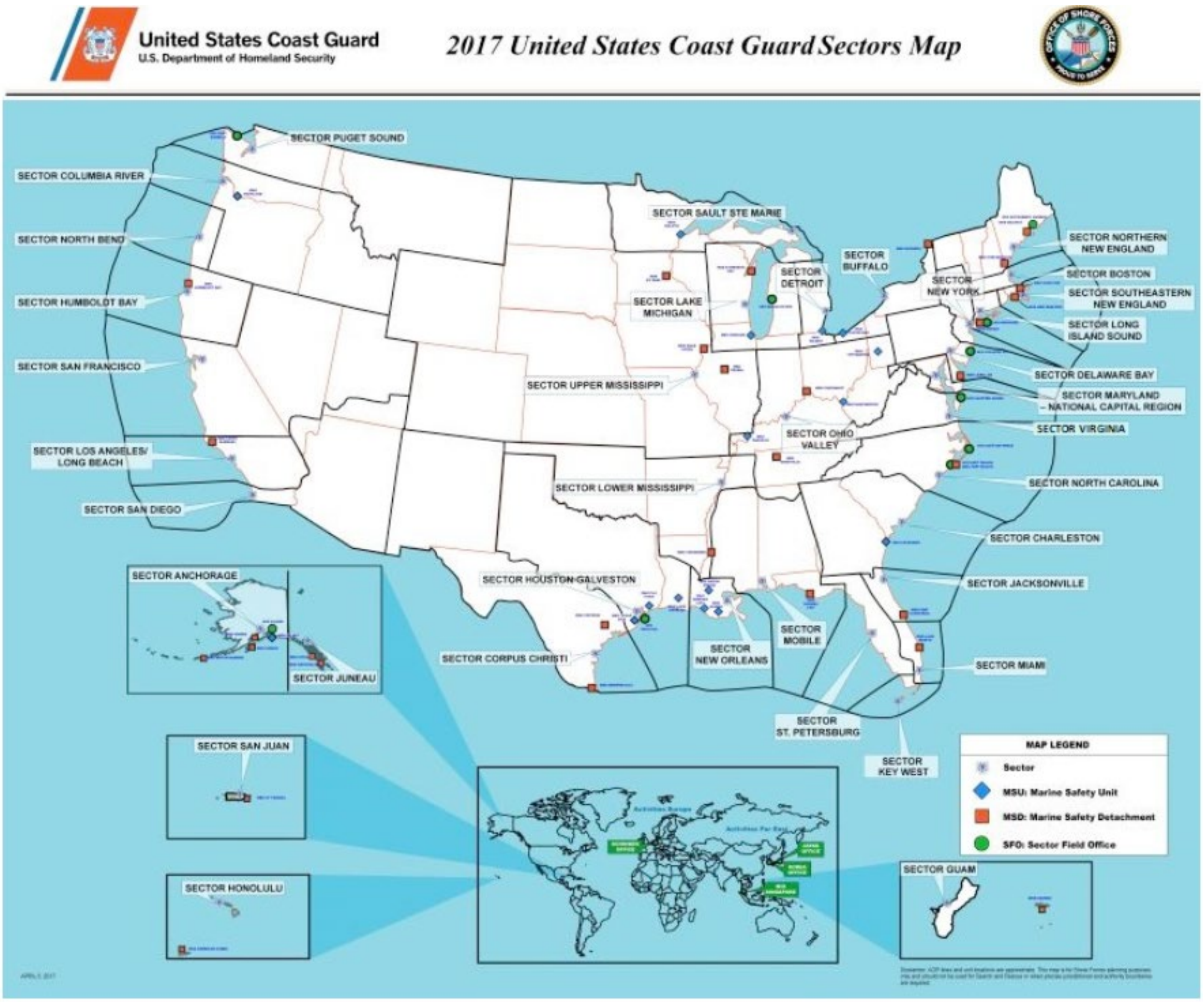

Figure 2. USCG Sectors Map displaying homeport locations.

Table 2. Frequency per year and number of hours each activity will occur in the different operation areas (Source information from (USCG 2022), adapted from Table 4-1).

Activity	Operation Area(s)	Frequency	Annual Duration (days)
OPC Patrols *OPC patrols encompass all activities listed below in this table	**All Seven Areas**: Alaska; HI-PAC; Northeast Pacific North; Northeast Pacific South; Gulf of Mexico; Northwest Atlantic; Northwest Atlantic, Florida and Caribbean	4 per year	185-230
Law Enforcement	All seven areas	20-30 per patrol	80-120
Defense Readiness Training	NW-ATL-Florida and the Caribbean; NEPAC-South; HI-PAC	1-2 per year	60-90
OPC Training and Evaluation: flooding, combat, fires, refueling at sea, towing, active shooter	All seven areas	Every 18-24 months	21-28
SAR Training: Simulation to render aid to distressed persons, vessels, aircraft	All seven areas	Every 18-24 months	21-28
Vessel Operations: Crew/Passenger Transfer (OTH vessel)	All seven areas	15-20 per patrol	5-20
Vessel Operations: Gunnery Training	All seven areas	3-4 per year for 2-3 hours	3-4
Vessel Operations: Escort	All seven areas	1-2 per patrol	1-3
Vessel Operations: Tow	All seven areas	1-2 per patrol	1-2
Vessel Operations: Foreign Port of Call Visit	NW-ATL; NW-ATL-Florida and the Caribbean; GoMEX; HIPAC	2-5 per patrol	16-60[1]
Vessel Operations: Functionality and Maneuverability Testing and Propulsion Test	All seven areas	1 per year	2[2]

Activity	Operation Area(s)	Frequency	Annual Duration (days)
Vessel Operations: Fueling Underway	NW-ATL-Florida and the Caribbean; NEPAC-South; HI-PAC	1 every 2 years	1
Aircraft Operations: Helicopter Operations	All seven areas	67-150 hours per patrol	12-25
Aircraft Operations: Vertical Replenishments (helicopter only)	All seven areas	2 per year	2
Aircraft Operations: Reconnaissance	All seven areas	15-20 per patrol	15-20
Aircraft Operations: Patrols	All seven areas	During each patrol; 120-160 hours per year	5-7
Aircraft Operations: Landing Qualifications	All seven areas	Every 21 days during patrol	8-12
Aircraft Operations: Community Outreach, Passenger Transfer[3]	All seven areas	5	1-5
Aircraft Operations: Unmanned Aircraft System (UAS) Deployment	All seven areas	TBD[4]	TBD[4]

[1] Every 13-18 days per 60 day patrol; 3-4 patrols per year; 3-4 days per event

[2] Maneuverability testing would be 2 to 6 hours (depending on activity) and may occur over two consecutive days.

[3] Helicopters would be the aircraft supporting these activities.

[4] UAS technology would be acquired in the future once a program of record is established.

3.2.2 OPC Operations, Mission Support and Training

The OPCs will perform the following activities in compliance with their assigned missions:

1. Searching for and rescuing passengers and/or crew that fall overboard from recreational, commercial, or government vessels, or for victims of crashed aircraft in the water, sometimes requiring a USCG rescue swimmer to enter the water to place the person in a harness or rescue basket to be winched into a hovering helicopter;
2. Rescuing persons on vessels in medical scenarios requiring evacuation by USCG helicopter or USCG rescue vessel;
3. Enforcing Federal law in the U.S. territorial sea and the high seas;
4. Maintaining awareness of vessel and aircraft activities within the U.S. EEZ;
5. Towing or escorting crippled vessels to safety;

6. Conducting homeland security missions aimed at preventing catastrophic events, such as port security patrols, escort and defense of vessels of high national security importance (High-Value Units, such as newly commissioned submarines) or interception of vessels suspected of housing illegal cargo (High Interest Vessels, such as a "go-fast" drug smuggling boat), escort and defense of strategic sealift vessels, security boardings, and surveillance of port approaches;
7. Supporting military defense missions around the world; and
8. Conducting maritime security operations before, during and after a threat (i.e., terrorist incident) occurs against the U.S. Maritime Domain.

A specific number of OPCs will be assigned to each of the seven respective operation areas. The expected snapshot of at sea coverage of the OPC fleet (25 cutters, once constructed and commissioned) at any moment in time is:

- One in the Pacific Islands EEZ,
- Two in the Atlantic EEZ north of Norfolk,
- Two in the Atlantic EEZ south of Norfolk,
- Two in the Caribbean Sea or Gulf of Mexico,
- Two in the Pacific EEZ north of San Francisco (including one in Alaska),
- Two in the Pacific EEZ south of San Francisco, and
- Two in the Pacific within 200 miles of Mexico and Central America.

The remaining 12 cutters (once constructed) will be in their respective homeports at the time the other 13 are expected to be at sea, with the cutters coming in to homeport after a patrol being replaced at sea by the OPC leaving its homeport to begin a patrol. For example, in the Atlantic, there will be up to four rotating patrols to ensure two OPCs are consistently patrolling offshore while another OPC may be in port.

Law Enforcement

Law enforcement includes a broad range of activities aimed at enforcing U.S. law on the high seas and waters over which the United States has jurisdiction, including enforcement of international laws. As noted above, LMR are statutory missions for enforcement of any marine laws, which may include habitat protection, entanglement or stranding events, or other types of enforcement. All vessels (including the OPC and OTH boats) and aircraft (including helicopters and Unmanned Aircraft Systems [UAS]) supporting an OPC patrol could participate in LE activities. The following elements fall under statutory OPC missions and the specific mission is in parentheses:

- Project a continuous enforcement presence throughout the U.S. EEZ (LMR, MI, DI);
- Operate in international waters when directed to provide an extended on-scene vessel presence or forward deployment of forces (LMR, DR);

- Prevent over-fishing, reduce mortality of protected species, and protect marine habitats by enforcing domestic fishing laws and regulations (LMR);
- Enforce the MMPA and ESA (LMR);
- Enforce foreign fishing vessel laws (OLE);
- Patrol the U.S. EEZ boundary areas to reduce the threat of foreign poaching of U.S. fish stocks (OLE);
- Monitor compliance with international living marine resource regimes and international agreements (OLE);
- Deter and enforce efforts to eliminate fishing using large drift-nets (OLE, LMR);
- Conduct port security patrols and surveillance of port approaches (PWCS);
- Escort and defense of high-value units and interception of high-interest vessels (PWCS); and
- Conduct surveillance and seize/detain and transport vessels, contraband, and suspects ashore (DI, MI).

Boarding operations are an integral part of OPC activities. Vessel boardings ensure compliance with all U.S. and international laws and with USCG LE authority. Fisheries enforcement occurs anywhere within the U.S. EEZ, but particularly in areas where fishing is concentrated in the open ocean within the operation areas. Fishery boardings typically take an average of three hours. For example, in the AK operation area, where fishing activity is concentrated, an OPC on an LMR mission will likely enforce U.S. fishing regulations. Other LE activities, such as drug or migrant interdiction will occur anywhere within the U.S. EEZ, but more often in certain operation areas. For example, an OPC on the high seas in the NW-ATL-Florida and the Caribbean operation area is likely to interdict potential drug smuggling vessels alongside U.S Custom and Border Protection assets. Other law enforcement activities include those conducted under international law, as established by the United Nations Convention on the Law of the Sea, treaties, or bilateral agreements. During a 60-day patrol, there will be approximately 20–30 OLE activities. OPCs may also participate with foreign naval ships in regional maritime LE training exercises.

All USCG bridge watchstanders have qualification standards, including those stationed on OPCs. In some action areas (e.g., AK) the watchstanders will complete region-specific LMR training, in addition to standard watchstander training. This one- to two-day training includes species awareness, identification, and reporting requirements. Special focus is given to no-fly zones and laws protecting biological resources, particularly distances required to minimize or avoid potential impacts to species. For all patrols where the USCG conducts LMR enforcement missions, every OPC will have 10–15 crew trained in law and enforcement issues specific to that region. These trainings take 1–2 weeks, must be retaken every two years, and many are conducted in a classroom-based setting (i.e., not on the vessel in waters of the action areas). An OPC without fully trained personnel cannot conduct LMR enforcement missions.

Other law enforcement covers any LE outside of the subset missions listed below that would be considered illegal or safety related, where the USCG has jurisdiction. Examples are catching foreign trawlers illegally fishing in the US EEZ, or investigating oil spills and ships suspected of causing those spills. In the case of oil spills, OLE will only include OPCs acting as a communications platform for oil spill response activities.

Defense Readiness

The USCG operates as a branch of the Navy in times of war or when directed by the President of the United States. Defense Readiness training with the Navy is not part of the action considered in this consultation. The action, as it relates to DR, that is included in this consultation is described in the following paragraphs.

In peacetime, USCG promotes U.S. national initiatives through various humanitarian and maritime security and safety engagements with other nations. The USCG will participate jointly with other U.S. Armed Services to defend the Nation and will perform the following essential military tasks: maritime intercept operations, deployed port operations, security and defense, threat engagement, coastal sea control, and environmental defense. If the United States were called to war, the USCG maintains proficiency (including equipment) for limited DR operations that will include the OPC and its assets.

Activities will include performing humanitarian assistance projects (including onload and offload of donated supplies), conducting professional exchanges, coordinating and participating in military exercises and conducting military exercises with allied and coalition partners. General DR mission activities include the surveillance, detection, classification, identification, and prosecution process for air and surface targets; launching, recovering and servicing USCG and DoD aircraft; providing escort protection and defense; and sharing simultaneous secure and clear data, voice, and intelligence information with multiple air and surface entities including DoD, USCG, and allied partners. Aircraft operations in support of this mission include air reconnaissance and air interdiction of targets of interest (i.e., vessels suspected of illegal activities).

The process for prosecuting air and service targets entails some or all of the below:

- Search for contacts (any vessel or aircraft) that are potential targets;
- Detect contacts that are potential targets;
- Identify and designate a detected contact as a target of interest;
- Acquire the target with a specific weapon system;
- Track the target with that weapons system and compute a fire control solution; and/or
- Engage (e.g., fire upon) the target, at direction of the Commanding Officer or Tactical Action Officer.

Search and Rescue Training

Search and Rescue takes precedence over all other missions except national defense (i.e., DR) and homeland security operations; however, actual SAR missions are considered emergencies, which are not part of the action considered in this consultation. Crews must be trained for such a response, and SAR training is part of the action considered in this consultation. Crew aboard the OPC will undergo 3–4 weeks of training and evaluation every 18–24 months.

The SAR mission involves numerous means of rendering aid to distressed persons, vessels, and aircraft on (and under) the high seas and the waters over which the United States has jurisdiction. OTH boats or helicopters may be deployed during SAR training to simulate rescue of persons in the water or delivery of damage control gear to a distressed vessel. Currently the OPC is expected to embark an HH-65 helicopter with its crew when required for a specific mission or deployment. Each HH-65 operational or training event could last up to two hours.

As part of aircraft training, the USCG will train for an actual SAR mission by dispatching helicopters to first locate a vessel in distress and report its status prior to dispatching a rescue vessel following the procedure that would be followed during an actual SAR mission. During transit between the OPC and the training location, helicopters will fly at an altitude of 1,500 ft or more. During SAR training, because crews are expected to train for actual emergencies, helicopters will conduct search training below 1,500 ft (300 ft or higher if training to look for larger vessels) and train for hoisting people from boats, which requires helicopters to operate at or below 50 ft. For this reason, SAR training will not be done in protected areas such as preserves and sanctuaries, or over haul out areas, rookeries, designated critical habitat, or proposed critical habitat.

The USCG will also train in how to transport people to safety and in damage control (e.g., plugging holes, patching pipes, or delivering supplies to aid in repair or control damage incurred by a vessel in distress). In addition to the OPC, other support boats may be employed during a SAR mission so training will include the use of other vessels. Support boats could travel at speeds up to 30 knots though this speed will not be sustained throughout the training activity.

Vessel Operations

OPCs will operate at a broad range of speeds to support USCG missions. MECs generally operate at speeds between 12–16 knots, which are the most economical speeds for fuel consumption (speed to fuel consumption ratio) for this type of vessel. Each OPC will have a typical idle speed of 2 knots, tow speed of 5 knots, transit speed of 7–19 knots, and a maximum speed of 22 knots and, similar to MECs, will generally operate at speeds between 12–16 knots. For fuel-efficient patrolling and transiting, the OPC will have a minimum range of 8,500 nm (15,557 km) and threshold range of 9,500 nm (17,594 km) at a sustained speed of approximately 14 knots. Higher speeds will only be used to intercept another vessel (e.g., during search and rescue or drug interdiction missions) and for a short period of time before the OPC resumes fuel-efficient speeds. Although the OPCs will operate in waters where ice may be present at certain times of the year (e.g., Alaska), the OPCs will not have icebreaking capabilities.

OPCs will transit to and from ports and homeports to operational areas. For the purposes of this analysis, the transit area is defined as from the coastline to 12 nm (22 km) from shore and the operational area is defined as waters beyond 12 nm (22 km) from shore. During transit, OPCs will mainly be traveling to areas where OPC missions and training (Table 2) will be conducted.

OTH boats will operate at an average speed of 15 knots and a maximum speed of 40 knots. OTH boats are not authorized to launch above a sea state[1] five. For routine operations in less than a sea state five, OTH boats will operate at 10–20 knots. OTH boats will enhance OPC operational effectiveness by allowing for simultaneous boarding, inspecting, seizing, and neutralizing of surface vessels of interest (i.e., a civilian suspected of breaking a law or requiring assistance). The OTH boats will also perform in situations and areas where it is either physically impossible or dangerous for the OPC to navigate. OTH boats will support activities such as vessel boardings, passenger transfers, and rescuing persons in the water. The OPC will launch and recover OTH boats using davits (a small crane-like device on board the OPC to support, raise and lower equipment) in all action areas.

OPCs will be equipped with specialized equipment similar to that on US Navy surface combatants for refueling at sea. This equipment permits transferring two different types of fuel simultaneously to support both aviation and ship propulsion. A picture of that equipment on a Navy ship is shown in Figure 2. This specialized equipment ensures that contaminant spills are minimized during transfers.

Navigation Systems

All USCG vessels, including OPCs, are be equipped with standard navigational technologies, including fathometers, radar, and a Doppler speed log. A single beam echosounder (fathometer), part of the vessel's navigation system, will be on at all times while a vessel is underway (potentially up to 24 hours per day). The fathometer frequencies can range from 3.5–1,000 kiloHertz (kHz); however, most navigation systems operate from 50–200 kHz, which is the assumed operating frequency for the action. During all missions, navigation systems will be used for all vessels underway.

Transmitted pulses from the fathometer are of short duration, typically milliseconds, but are operational for the entire time a vessel is underway. The maximum transmit powers may be as high as 227 decibels referenced at 1 micropascal at 1 meter (dB re 1 µPa @ 1 m), depending on frequency (the highest levels are used in low-frequency deep depth water applications), but during the action the source level will not be expected to be higher than 200 dB re 1 µPa @ 1 m. The most common geometry is one conical vertical beam, with sidelobes that may generate unwanted energy outside of the main lobe, but are typically 20 to 30 decibels (dB) below the

[1] Sea state is a measurement of wind waves and swell conditions.

main lobe's level. The pulse durations are normally about 0.1 percent to 1 percent of the echo reception delay, hence typically between 0.1 and 10 milliseconds, with longer pulses corresponding to lower frequencies and deep waters.

The Doppler speed log is an instrument used on ships to measure the ship's relative speed through the water (in which it is traveling) by the use of Doppler Effect on transmitted/reflected sound waves and the principles of the Doppler shift to calculate the speed of the vessel through water. The instrument consists of at least one transducer mounted on the hull of the vessel, which emits a high frequency sound pulse to measure the vessel's speed and distance through water, and a display unit on the bridge of the vessel. However, there may be additional transducers on the bow and stern to provide more precise measurements, such as when docking or anchoring the vessel. Typically, the transducer emits a continuous high frequency sound pulse ranging from 270-284 kHz in the forward direction at an angle of 60° from the keel. The beam bounces back from the seafloor and the frequency of the bottom echo will be higher when the ship is moving ahead or lower if the ship is moving astern.

Crew and Passenger Transfer

As a part of general operations, civilians or crewmembers may require transit to port from the OPC, from port to the OPC, or from another vessel (e.g., an intercepted vessel, a vessel involved in a SAR mission, or another USCG or allied vessel) to the OPC. The safest way to conduct passenger transfers is via helicopter, if one is available. This is especially true in heavy seas and high winds. OTH boats are also commonly used. The decision to conduct a passenger transfer is at the discretion of the captain of the OPC and the helicopter pilot or coxswain of the OTH boat. Transfers will typically take three hours with 30 minutes spent on the helicopter or two to three hours with one hour spent on an OTH boat. Although there may be up to three OTH boats on an OPC, transfers may not always use all three boats. Transfers of crew or passengers from the OPC will typically occur in a sea state less than five, and transfers could occur anywhere in the operation areas.

Gunnery Training

Gunnery training may occur 3–4 times per year on each OPC vessel. Gunnery training events last 2–3 hours each. Gunnery training would only occur in ranges authorized by the USCG and when possible, would occur in established Navy ranges, particularly when live ammunition is used. Examples of DoD ranges where the USCG would conduct gunnery training include the Fleet Training Area Hot range located within the Southern California Offshore range and the Kapu Hot range located within the Hawaii Range Complex. In Alaska, the USCG, NOAA and the FAA have identified specific areas where ships may conduct live ammunitions training. Areas with sensitive marine resources are not used for gunnery training. During peacetime activities, actual weapon systems onboard the OPC will only be used for training. The Mk 48 Gun Weapons System (GWS) with Mk 110 57 mm gun mount, Mk 38 25 mm Machine Guns System (MGS), and the M2 .50 cal. Browning Machine Gun (BMG) are tested biannually to conduct required proficiency drills. A single, one-time test of the Nulka decoy launching system, will be conducted on an established Navy range and no additional testing of the Nulka is currently planned. The Nulka decoy round is a 78.7 inch (in; 200 centimeter [cm]) anti-ship missile decoy that can be launched from the vessel. Once launched, the Nulka uses its short duration rocket to hover out beyond the vessel and simulate the vessel's radar return to lure anti-ship missiles away from the vessel. Several different types of targets may be used for gunnery training. Every 18–24 months, the USCG conducts training with air sleeves (targets towed behind aircraft) to simulate incoming missiles. In rare circumstances, rounds may also be fired at robot go-fast boats and/or a "killer tomato" target, a 10 ft (3 m) diameter red balloon, which will be retrieved, when feasible. OTH boats may be used to deploy or retrieve targets in support of gunnery training. Table 3 below displays the types of weapons expected to be used and the maximum firing ranges for each system. This table does not include the Nulka system because it is uncertain what the extent of the range will be (it has not yet been tested) and it is a one-time event, whereas the weapons in the table below will be regularly used.

Table 3. Description of Weapon Systems Used on Offshore Patrol Cutters and Respective Maximum Firing Ranges.

Weapon System	Maximum Firing Range
Mk110 57mm	9.1 miles (17,000 meters)
Mk38 25mm MGS (M242 25mm Bushmaster)	7,433 yards (6,800 meters)
Browning M2 .50cal	8,100 yards (7,400 meters)

Fueling Underway

Each new OPC will have the capability to refuel alongside another vessel, potentially occurring once every two years. Fueling will last up to four hours and could occur in the NW-ATL-Florida and the Caribbean; NEPAC-South; and HI-PAC operation areas. The OPC will receive one or more fuel lines from another vessel (most likely an oil tanker) that is not underway to be connected. The OPC will also be stationary. While refueling, crew fasten fuel lines to the vessel's fuel pipes and closely monitor the transfer firsthand as fuel passes through a vessel's fuel system into the tanks. The crew will constantly survey the fuel transfer and have preventative and reactive safety plans in place and spill kits on hand to respond should a fuel spill occur.

Figure 3. Underway fuel replenishment (Naval publication, NTTP 4-01-.4).

Functionality and Maneuverability Testing and Propulsion Test

This activity ensures that systems are properly working after vessel maintenance. Functionality and maneuverability testing for an OPC will be similar to the testing conducted for the current fleet of MECs and will occur every year. Functionality and maneuverability testing will occur after scheduled maintenance periods, which will likely occur within close proximity to the OPC's homeport. It should be noted that the exact locations of all the homeports for all OPCs are not known at this time.

Vessel Escorting and Towing

Emergency escorts or tows are not part of the action considered in this Opinion. Emergency escorts or tows would be part of individual emergency response consultations and are expected to occur infrequently (less than once every three to four patrols based on information provided by the USCG). Non-emergency escorts or tows are part of the action. The USCG will not tow unseaworthy (hazards to navigation) vessels or vessels that have sat in the water for long periods and have become heavily biofouled as part of the action.

<u>Vessel Escort</u>

When escorting a vessel OPCs travel at speeds of 5 knots to 22 knots depending on the mission. This typically involves the escort of large military vessels, fishing vessels, or commercial ships, as well as operating within a naval task force. A vessel escort may occur once or twice per patrol lasting up to 30 hours. This may also include a convoy escort (escorting multiple vessels) in all operation areas.

Vessel Tow

This involves towing another vessel behind an OPC. Speeds of 4 to 5 knots are typical for a vessel tow. Vessel tows last up to 24 hours. The OPC would be capable of towing vessels in a range of sizes, from small go-fast smuggling vessels (approximately 1 ton) to a small cruise ship (approximately 10,000 tons). The OPC will be able to launch and recover its OTH boats while engaged in towing operations. Towing of vessels is expected in all operation areas.

Foreign Port of Call Visit

A port of call is a 2–3 day logistical break to conduct necessary repairs and to re-provision (e.g., fuel, food, supplies) and is expected to occur about every 13-18 days per patrol for up to 72 hours. These breaks occur during OPC patrols and may occur in foreign ports, as needed.

Helicopter and Other Aircraft Operations and Training

Aircraft operations associated with emergency response are not part of the action under this consultation. The overarching consideration for all flight operations, particularly those conducted in the remote Alaska operation areas, is flight safety, based upon the judgment and direction of the aircraft commander. All USCG aircraft operations are conducted by regularly evaluating risk versus gain for the mission assigned and are regulated by USCG Air Operations doctrine.

All OPCs will be flight deck-equipped with the ability to launch, recover, hangar, and maintain manned (i.e., helicopter) aircraft (Figure 3). The flight deck of the OPC will be capable of launching and recovering helicopters including all variants up to equivalent weight of a Sikorsky S-92. The hangar will be able to store one helicopter up to the size of a USCG MH-65 and MH-60, and USN-H-60. Storage of aircraft will occur if, for example, the deployment required aircraft support, but was farther offshore than could be safely accessed by a helicopter leaving from land. In general, helicopters supporting an OPC will fly from an established airstrip on shore either to the OPC or from the OPC to shore, though some flights will be expected to depart and then return to an OPC without heading to shore. The OPC will conduct aircraft operations during both day and night, as well as in sea conditions up to and including sea state five. However, if there were not a direct threat to life, helicopters would not take off in wind in excess of 35 knots or in seas higher than a sea state of five. The OPC will deploy, maintain, support, protect, control/direct, launch/recover, and pressure fuel (on-deck or in-flight) aircraft.

Figure 4. Examples of USCG OPC aircraft (source: Asset poster on https://www.dcms.uscg.mil/Our-Organization/Assistant-Commandant-for-Acquisitions-CG-9/Resources/ accessed August 19, 2022)

The larger MH-60 Jayhawk is an all-weather, medium-range helicopter, specialized for search and rescue. A MH-60 helicopter could fly a maximum speed of 193 knots, with a cruising speed of 159 knots, and up to 648 nm (1,200 km). A MH-65 helicopter is a smaller short-range helicopter when compared to the MH-60 and could fly a maximum range of 290 nm (537 km), at a cruising speed of 148 knots and a maximum speed of 172 knots, but will then need to land to replenish fuel. Helicopters can carry a maximum of eight passengers, two of whom will be pilots.

All aircraft will follow the USCG Air Operations Manual (COMDTINST M3710.1 (series)). Per the USCG Air Operations Manual (COMDTINST M3710.1 (series)), aircraft would not operate at an altitude lower than 2,000 ft (610 m) within 0.5 miles (mi) (805 m) of marine mammals observed on ice or land. Helicopters will also not hover or circle above such areas. Per COMDTINST M3710.1 (series), aircraft (helicopters and UAS) will avoid any identified environmentally sensitive areas, to include, but not be limited to, critical habitat designated under the ESA, migratory bird sanctuaries, and marine mammal haul outs and rookeries, but if deemed necessary (e.g., personnel safety) to pass over such areas, aircraft will stay above 2,000 ft (610 m).

Aircraft conducting a SAR mission for persons in the water or a vessel in distress may require that the helicopter fly at an altitude below 500 ft (152 m). Emergency recovery of persons in the water and transfer of rescue equipment will also require that the helicopter hover below 500 ft (152 m). Any USCG response during a SAR mission is considered an emergency and is not a part of the action. However, SAR training is part of the action. As stated previously, environmentally sensitive areas will be avoided and flights will be expected to stay above 2,000 ft (610 m). Any SAR training that may require helicopters to fly below 2,000 ft (610 m) will avoid environmentally sensitive areas, critical habitat, migratory bird sanctuaries, marine mammal haul outs and rookeries, and areas where ESA-listed species are known to occur, and will follow the USCG Standard Operating Procedures (SOPs; Section 3.3.1).

During a typical OPC patrol (a duration of 45–60 days), approximately 30–40 flight hours will occur. However, several factors are considered when determining the range and endurance of an aircraft, which depends on the rate of fuel consumption. For example, under normal conditions for an MH-65, fuel availability typically limits total flight time per sortie to two hours, but for maximum endurance (fuel consumption per unit time), three and a half hours of flight time is possible. No more than six total flight hours are authorized per day. Helicopter flights associated with the action will occur in all operation areas, and will be used for transport of personnel and equipment and to conduct training (e.g., landing qualifications), in addition to supporting all OPC missions. Per the USCG Air Operations Manual (COMDTINST M3710.1 (series)), aircraft will not operate at an altitude lower than 2,000 ft (610 m) unless there is a navigational safety concern, such as a low ceiling. In this case, the low flight altitude will be temporary.

Crew and Passenger Transfer

Crew and passenger transfer includes transit by helicopter to port from the OPC, from port to the OPC, or from another vessel to the OPC for civilians or crewmembers. The safest way to conduct passenger transfers is via helicopter, if one is available. This is especially true in heavy seas and high winds. Helicopters deployed with an OPC could also be used to transport civilians and crewmembers to and from the OPC to ports or to other U.S. and allied vessels. Vertical insertion, when a boarding team is deployed from the OPC via helicopter, will occur when it is unsafe to deploy the team via an OTH boat. Medical evacuations of passengers (e.g., during a SAR mission) or crewmembers will also occur via helicopter, but are considered emergencies and are not part of the action.

Vertical Replenishments

Vertical replenishment of munitions and provisions will occur if an OPC were deployed on a patrol that will extend beyond a typical timeframe for a logistic break or port-call (beyond 18 days). This type of extended patrol will occur when an OPC is deployed on a DR mission, for example. Helicopters embarked with the OPC for this mission or shore-based helicopters could conduct vertical replenishments, per the USCG Air Operations Manual (COMDTINST M3710.1 (series)).

Helicopter Landing Qualifications

Semi-annual drills will take place for pilots and deck crew for each OPC, once the vessel is operational. Deck landing qualifications (DLQ) drills include hovering, flight refueling, and simulating a helicopter crash on deck. To maintain proficiency, up to 30 "touch and go" landings, during the day or night, may occur over a 6-hour period and may include other special circumstance evolutions. DLQs will occur every 21 days, at minimum, during OPC patrols. For every new class of ship, a series of dynamic tests are conducted to determine the roll, pitch, and wind safe flight envelope (the region within which an aircraft can operate safely) for each type of aircraft that will land or take off from that vessel.

Unmanned Aircraft Systems

All OPCs will be flight deck-equipped with the ability to launch, recover, hangar, and maintain short-ranged Unmanned Aircraft Systems (UAS). The number of UAS that may be on an OPC at any given time depends on available space as the UAS will be deployed and recovered from the

OPC. An OPC will have the capability to operate video-equipped UAS that will extend the visual capability of the OPC when conducting operations. At this time, the specific type of UAS that will be deployed from the OPC is not known because the USCG will acquire the most current UAS technology after OPCs are operational. USCG UAS Division sets policies and SOPs specific to UAS operations, including regulations that differ from those governing manned flight operations (e.g., USCG Air Operations Manual, COMDTINST M3710.1 (series)). UAS will follow either the Federal Aviation Administration (FAA) regulations, when within 12 nm (22 km) of the United States, or the International Civil Aviation Organization regulations, when beyond 12 nm (22 km) from U.S shores. In all cases, SOPs will apply (Section 3.3.1). Similar to the helicopters, UAS will avoid any identified environmentally sensitive areas, to include, but not limited to, critical habitat designated under the ESA, migratory bird sanctuaries, and marine mammal haul outs and rookeries. This activity supports LE and DR missions, which may include the observation of targets of interest (i.e., vessels suspected of illegal activities) from the air using video-equipped UAS.

Reconnaissance

Support of LE and DR missions may include the observation of targets of interest (i.e., vessels suspected of illegal activities) from the air. Helicopters or UAS may be used for air reconnaissance. The process for prosecuting air and service targets entails some or all of the below:

- Search for contacts (e.g., vessel, aircraft) that are potential targets.
- Detect contacts that are potential targets.
- Identify and designate a detected contact as a target of interest.
- Acquire the target with a specific weapon system.
- Track the target with that weapons system and compute a fire control solution.
- Engage (e.g., fire upon) the target, at direction of the Commanding Officer or Tactical Action Officer.

3.3 Project Design Criteria and Implementation Plans

This section details the PDCs that describe aspects of the program required for actions implemented under this Opinion to avoid or minimize adverse effects on ESA-listed species and designated or proposed critical habitat. The section also describes the procedures for project-specific activity consistency reviews. Finally, the section details the periodic comprehensive review procedures for the program.

3.3.1 **Project Design Criteria**

The USCG SOPs outline procedures for avoiding marine mammals and protected species; reporting whale and protected species sightings, strandings, and injuries; and enforcing the MMPA and ESA. The PDCs included in this Opinion are taken from the SOPs and best management practices (BMPs) the USCG implements based on the manuals and guidance documents described above (USCG 2017) and additional measures to avoid and minimize potential adverse effects of the action on ESA-listed species and proposed or designated critical habitat.The USCG Air Operations Manual M3710.1G prescribes measures for protection of wildlife applicable to all USCG air assets. The USCG Approach, Vessel Speed and Strike Response Guidance (COMPACAREA R142308Z DEC 11) prescribes measures for the protection of whales during routine vessel operations including to use caution, be alert, maintain a vigilant lookout and reduce speeds, as appropriate, to avoid collisions. The Maritime Law Enforcement Manual (USCG Command Instruction 16247.1) requires that, during all maritime LE activities, personnel shall seek to avoid collision with a whale. The Vessel Environmental Manual (USCG Command Instruction M16455.1) describes measures for protection of marine wildlife applicable to all waterborne USCG assets. The Protected LMR Program (COMDTINST 16475.7) outlines USCG actions, during USCG operations, to support the recovery of protected LMR through internal compliance with and enforcement of Federal, State, and international laws designed to preserve marine protected species.

In addition to the USCG mandates above, as part of this program, PDCs have been identified to limit environmental effects of patrols and associated vessel and aircraft operations described in Section 3.1, as well as the impacts of vessel transit to and from operation areas, described in Section 5. Project design criteria have also been included for vessel transit, fueling underway, gunnery training, SAR training, and vessel escort and towing activities but, because some activities will require consistency reviews, additional PDCs may be developed as part of these consistency reviews. These PDCs are based on past experience and ESA consultations involving vessel and aircraft operations, military training and testing, and oil spill response. These PDCs, when applied to in-water activities associated with the operation of the new OPCs, minimize the negative effects to ESA-listed species and proposed or designated critical habitat.

General PDCs applicable to all actions addressed in this consultation:

1. In accordance with the USCG Vessel Environmental Manual, all Commanding Officers and Officers in Charge should plan and act to protect ESA-listed species and proposed or designated critical habitat during operations and planning, including selection of navigation and flight routes that avoid proposed or designated critical habitat and areas where ESA-listed species are known to concentrate.
2. Marine mammal and sea turtle avoidance measures are prescribed, including requiring that vessel crew be especially alert for activity, and proceed with caution, in areas of known migration routes or high animal density, including areas with concentrations of floating vegetation where animals may be feeding, and that vessels do not approach marine mammals or sea turtles head-on during non-emergency maneuvering, when navigationally safe to do so.

PDCs applicable to Vessel Operations

1. Vessel operators would use caution, be alert, maintain a vigilant lookout and reduce speeds, as appropriate, to avoid collisions with marine mammals and sea turtles and to avoid collisions with benthic habitats during the course of normal operations.
2. Keep vigilant watch for other signs of protected species, such as whale blows, splashes, humpback whale bubble clouds, presence of sei whales or basking sharks could indicate presence of right whales (same prey), groups of birds feeding at the surface representative of potential cetacean presence, white belly flashes of giant manta rays feeding at the surface, patches of floating *Sargassum* where juvenile turtles feed and live, and/or aggregations of jellyfish on which leatherback turtles and *Mola mola* (another larger observable surface fish) would be feeding.
3. During non-emergency vessel operations, including LE activities, when marine mammals or sea turtles are sighted or known to be in the immediate vicinity at the time of operations (such as if helicopters sight animals along the vessel's intended course), operators would employ all possible precautions to avoid interactions or collisions with animals when navigationally safe to do so and, in the case of LE activities, when practical to do so. When implemented, these precautions would include one or more of the following:
    a. Reducing speed.
    b. Posting additional dedicated lookouts to assist in monitoring the location of sea turtles and/or marine mammals.
    c. Avoiding sudden changes in speed and direction, or if a swimming marine mammal or sea turtle is spotted, attempting to parallel the course and speed of the animal so as to avoid crossing its path.
    d. Avoiding approach of sighted animals head-on or from directly behind.
    e. When whales are sighted, maintain a distance of 200 yards (yd; 183 meters [m]) or greater between the whale and the vessel and a distance of 500 yd (457 m) or greater for right whales, provided it is safe to do so. In the Bering Sea, Gulf of Alaska, and along the east coast of the continental U.S., a whale should be treated as a right whale unless the whale is positively identified as another whale species.
    f. When in active speed restriction zones[2] to protect North Atlantic right whales, maintain vessel speed of 10 knots or less, to the extent practicable.
    g. For Rice's whale, a large baleen whale and a newly named species in the Gulf of

[2] Restriction zones may include Seasonal or Dynamic Speed Zones. https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-vessel-strikes-north-atlantic-right-whales#vessel-speed-restrictions

Mexico, vessels shall maintain a distance of 500 yd (457 m) or greater. Avoid or minimize transits, to the extent practicable, especially at night through Rice's whale Core Distribution Area[3] or proposed or designated critical habitat. When a transit cannot be avoided, maintain vessel speed of 10 knots or less, to the extent practicable. If transit exceeds 10 knots, maintain a log indicating time and geographic coordinates at which vessels enter and exit the area.

h. For North Pacific right whales and other ESA-listed whales, transit passes in the Aleutian Islands (e.g,. Unimak Pass, Seguam Pass, Samalga Pass, etc.) at vessel speeds of 10 knots or less, to the extent practicable.

i. For North Pacific right whales, vessels will:

- remain at least 500 yd (460 m) from North Pacific right whales.
- avoid transiting through designated North Pacific right whale critical habitat if practicable (50 C.F.R. §226.215). If traveling through North Pacific right whale critical habitat cannot be avoided, vessels will:
    - travel through North Pacific right whale critical habitat at 10 knots or less, to the extent practicable, while protected species observers maintain a constant watch for marine mammals from the bridge.
    - maintain a log indicating the time and geographic coordinates at which vessels enter and exit North Pacific right whale critical habitat when 10 knot speeds are exceeded by the vessel.

j. Maintain distance of 400 yd (366 m) in front or behind and 300 yd (274 m) on either side of southern resident killer whales. Reduce speeds to 7 knots or less when within ½ nautical mile of southern resident killer whales, to the extent practicable. If southern resident killer whales are traveling close to shore, stay on the offshore side of the whales. Avoid transit through the voluntary "no-go zone" on the west side of San Juan Island, Washington extending ¼ mile offshore from Mitchel Point to Cattel Point, with a ½ mile buffer around Lime Kiln Point State Park.[4]

k. When sea turtles are sighted, attempt to maintain a distance of 50 yd (46 m) or greater between the animal and the vessel wherever possible.

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[3] https://www.fisheries.noaa.gov/resource/map/rices-whale-core-distribution-area-map-gis-data
[4] https://www.bewhalewise.org/
https://www.fisheries.noaa.gov/west-coast/marine-life-viewing-guidelines/watching-marine-mammals-west-coast

l. All vessels in coastal waters will operate in a manner to minimize propeller wash and seafloor disturbance, and transiting vessels should follow deep-water routes (e.g., marked channels), as practicable, to reduce disturbance to sturgeon and sawfish critical habitat.

m. For Steller sea lions:

- Vessels will not approach within 5.5 km (3 nm) of rookery sites listed in (50 C.F.R. §224.103(d)).
- Vessels will not approach within 914 m (3,000 ft) of any Steller sea lion haulout or rookery which is not listed in 50 C.F.R. §224.103(d)).

n. For Cook Inlet beluga whales:

- Project vessel(s) operating in or transiting through Cook Inlet will maintain a distance of at least 1.5 miles south of the MLLW line in the Susitna Delta (Beluga River to the Little Susitna River, to the extent practicable; see Figure 4 below);

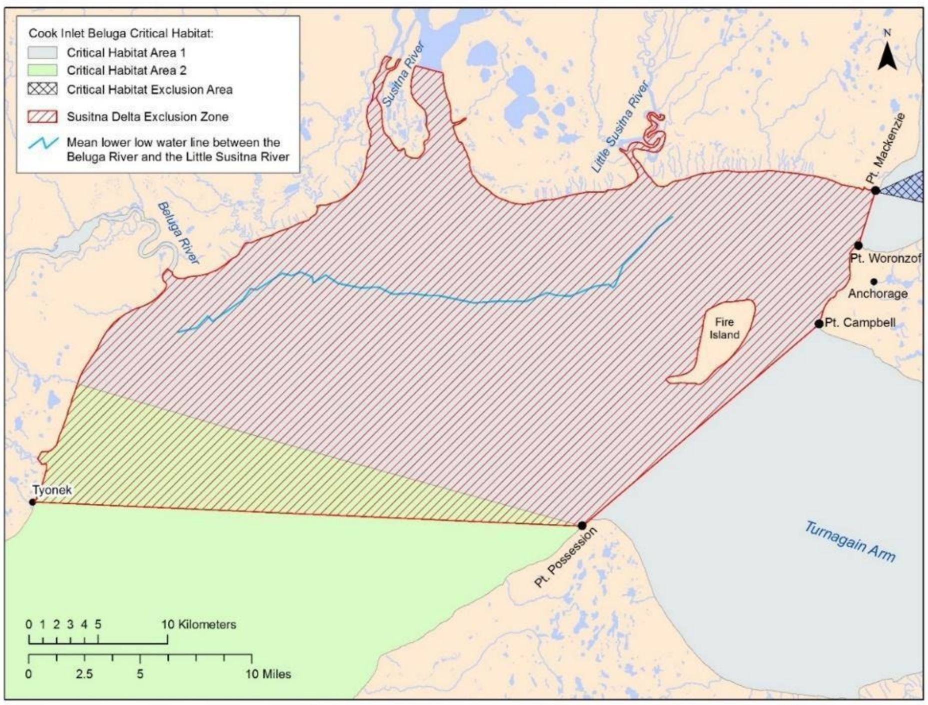

Figure 5. Susitna Delta Exclusion Zone, showing MLLW line between the Beluga and Little Susitna Rivers.

4. The USCG would consider a reduction in vessel speed to 10 knots or less when a whale is sighted within 5 nm of the intended vessel track. Vessels would use navigationally prudent courses to avoid striking the whale and, if necessary, reduce speed to bare steerageway or come to a stop.

5. Unless a vessel or aircraft's mission involves specifically investigating an ESA-listed species, or there is an aviation or navigation safety issue during transit or flight, the vessel or aircraft would plan its passage to avoid any known sanctuaries, feeding grounds, or other biologically important areas.

PDCs applicable to Aircraft Operations

1. In accordance with the instruction in the USCG Air Operations Manual, Commanding Officers would implement SOPs to prevent unnecessary overflight of sensitive environmental habitat areas to include, but not be limited to, proposed or designated critical habitat, migratory bird sanctuaries, and marine mammal haul-outs and rookeries. Environmentally sensitive areas would be properly annotated on pilot's chart, as required.
2. When it is necessary to fly over sensitive habitat areas (e.g., proposed or designated critical habitat, known haul outs and rookeries, pinniped aggregations), an altitude of 2,000 ft (610 m) above ground level would be maintained (unless a higher altitude is required by regulations promulgated in 50 C.F.R.), except in a situation defined by 50 C.F.R. §402.05 as an emergency (i.e., situations involving acts of God, disasters, casualties, national defense or security emergencies) and for reconnaissance. The amount of time spent at low altitudes should be limited to what is necessary to respond to the particular emergency or conduct reconnaissance overflights.
3. All aircraft will remain at least 3000 ft (914 m) from Steller sea lion haulouts and rookeries.
4. Aircraft would not operate at an altitude lower than 1,500 ft (457 m) within 0.5 miles (km; 0.805 km) of marine mammals observed on ice or land. Helicopters may not hover or circle above such areas or within 0.5 mi (0.0805 km) of such areas. When weather conditions do not allow a 1,500 ft (457 m) flying altitude, such as during severe storms or when cloud cover is low, aircraft may be operated below the 1,500 ft (457 m) altitude. However, when aircraft are operated at an altitude below 1,500 ft (457 m) because of weather conditions, the operator would attempt to avoid areas of known marine mammal concentrations and would take precautions to avoid flying directly over or within 0.5 mi (0.805 km) of these areas.
5. UAS would be flown in accordance with USCG Air Operations Manual COMDTINST 3710.1 (series) and either the Federal Aviation Administration, when within 12 nm (14 mi) of the U.S., or the International Civil Aviation Organization, when beyond 12 nm (14 mi) from U.S.
6. UAS would not operate within 1,000 ft (305 m) of marine mammals observed on ice or land. When UAS must be operated within 1,000 ft (305 m) of marine mammals due to weather conditions, the operator would take precautions to avoid flying directly over animals.

7. For passenger transfer, aircraft would operate at an altitude of at least 1,500 ft (457 m) between the OPC and a land-based point of departure, with the exception of during take-off and landing.
8. During vertical replenishments, aircraft routes would avoid operation over areas known to be used by or contain concentrations of marine mammals to the maximum extent practicable to minimize disturbance to these animals.

PDCs applicable to Vessel and Aircraft Observers

1. Crewmembers would be trained in marine mammal and sea turtle identification and would alert the Command of the presence of these animals and initiate the adaptive mitigation responses identified in Vessel Operations (2) and (3) above.
2. Crewmembers would be trained in ESA-listed species identification (e.g., giant manta ray) and would follow the same protocol as Vessel Observers (1) above.
3. At least one trained crewmember would look for marine mammals and sea turtles during all vessel operations and associated with the activities described in this Opinion, including aircraft operations. If a marine mammal or sea turtle is spotted, the vessel would avoid them by changing course and/or taking the measures identified in Vessel Operations (3) above unless there is a threat to vessel safety.
4. Small vessels would also have a trained crew member to look for marine mammals during vessel operations associated with the activities described in this Opinion. If a marine mammal or sea turtle is spotted, the vessel would avoid them by changing course and/or taking the measures identified in Vessel Operations (2) above.
5. The primary duty of watch personnel is to ensure safety of the vessel or aircraft, and this includes the requirement to detect and report all objects and disturbances sighted in the water that may be indicative of a threat to the ship and its crew, such as debris. Per safety requirements, watch personnel also report any marine mammals sighted that have the potential to be in the direct path of the ship as a standard collision avoidance procedure.

PDCs applicable to ESA-Listed Documentation, Reporting, and Planning

1. The USCG would document sightings of ESA-listed marine mammals and sea turtles during vessel transit whenever course changes or other measures are taken to avoid or minimize interactions with the animals in the daily Operational Summary (OPSUM). Information would include, at a minimum: date and time of the sighting that required action be taken to avoid or minimize vessel interaction with an animal, the species observed (if animals can be determined to species; if not, the type of animal [i.e., whale, sea turtle, pinniped]), number of animals sighted, approximate geographic coordinates, and action taken to avoid or minimize interactions between the vessel and the animal(s). Additional information, including photographs, would be collected as needed.

Sightings listed in the OPSUMs and any supplemental information, such as photographs, would be consolidated and submitted to NMFS Office of Protected Resources Interagency Cooperation Division and the appropriate regional Fish and Wildlife Conservation Office as part of any annual reporting requirements.

2. The USCG would document sightings of ESA-listed marine mammals within 200 yd (183 m) and sea turtles within 50 yd (46 m) of a vessel during vessel operations in all action areas including towing and escort, fueling underway, gunnery training, and SAR training in the daily OPSUM. Information would include, at a minimum: date and time for each sighting event; species observed, number of animals per sighting, number of animals that are adults/juveniles/calves/pups, behavior of the animals in sighting event, and geographic coordinates for the observed animals; information regarding sea state, weather conditions, visibility, and lighting conditions; and activity in which vessel(s) is (are) engaged and any actions taken to avoid or minimize interactions with the animals. Additional information, including photographs, would be collected as needed. Sightings listed in the OPSUMs and any supplemental information, such as photographs, would be consolidated and submitted to NMFS Office of Protected Resources Interagency Cooperation Division and the appropriate regional Fish and Wildlife Conservation Office as part of any annual reporting requirements.

3. Any collision with and/or injury to a marine mammal or sea turtle would be reported immediately to the appropriate NMFS or USFWS office, depending on jurisdiction, and local authorized stranding/rescue response organizations based on where the incident occurred (see https://www.fisheries.noaa.gov/report for regional contact information for reporting).

4. Sightings of any injured, dead or entangled right whales or other ESA-listed species, immediately report to NMFS at: https://www.fisheries.noaa.gov/report.

5. Sightings (location/time/date/species) of the most vulnerable endangered cetaceans including North Atlantic right whale, North Pacific right whale, Southern Resident killer whale, Main Hawaiian Island insular false killer whale, Cook Inlet beluga whale, and Rice's whale will be entered into a log, and when possible, reported within an hour through the corresponding mariner notification system for that region[5] to reduce strike risk. The log would be annually reported to the corresponding regional NMFS office, and would include any potential pictures taken of the species for identification confirmation (e.g., mobile phone images).

[5] Examples of mariner notification systems for Atlantic, Caribbean and Gulf of Mexico region: North Atlantic right whale Early Warning System; Pacific region: Washington State Whale Report Alert System (WRAS) https://wildwhales.org/wras/ or https://www.whalealert.org

PDCs applicable to Ballasting and Deballasting

1. In accordance with Chapter 10 of the Vessel Environmental Manual, ballasting and deballasting would be conducted in a manner to minimize the introduction of non-native species and reduce their potential impact on natural resources in areas where waters are discharged. Vessels would control all ballasting and de-ballasting evolutions as indicated below:
    a. Each transfer of ballast water would be recorded in the Machinery Log noting the ship's location, water depth, tanks involved, and amount of ballast taken aboard or discharged.
    b. To the maximum extent practicable, taking on ballast water under the following conditions would be avoided:
        I. In areas known to have infestations or populations of harmful organisms or pathogens (e.g., harmful algal blooms),
        II. In areas near sewage outfalls,
        III. In areas where tidal flushing is known to be poor at times or at times when tidal flow is known to cause more turbidity in water,
        IV. In darkness where bottom-dwelling organisms may rise up in the water column,
        V. In areas where propellers may stir up the sediment.
2. Ballasting and/or de-ballasting within 14 mi (12 nm) from land would be avoided. Ballast water taken on board from a location more than 230 mi (200 nm) from any shore and in water of a depth greater than 656 ft (200 m) may be discharged without restriction.
3. Ballast water taken on board within 230 mi (200 nm) from any shore or in water less than 656 ft (200 m) deep, must be managed in accordance with the applicable Damage Control Book and the stepwise protocol below:
    a. Exchange ballast water in an area greater than 230 mi (200 nm) from any shore and in water more than 656 ft (200 m) deep with an efficiency of 95% or more of the original volume. Do not exchange ballast in ballasted fuel tanks.
    b. If unable to meet requirements in (a), then exchange ballast water in area greater than 230 mi (200 nm) from any shore and in water more than 656 ft (200 m) deep, passing two complete tank volumes through. Do not exchange ballast in ballasted fuel tanks.
    c. If unable to meet requirements in (b), then exchange ballast water in area greater than 230 mi (200 nm) from any shore passing two complete tank volumes through. Do not exchange ballast in ballasted fuel tanks.

d. If unable to meet requirements in (c), then retain ballast water as long as safely practicable or conduct flushing as far from shore as possible.

4. In all cases, the minimum distance for de-ballasting would be 14 mi (12 nm) from land.

5. In the action areas, any ballast water taken on board would likely be released (ballast tanks cycled) prior to entering any port or navigable shallow waters. If it is suspected that invasive species are in this ballast water, efforts must be made to release these species in the open ocean.

PDCs applicable to Discharging Waste

1. OPCs would not discharge any plastic waste overboard, plastic waste would either be retained onboard until return to homeport, or incinerated while at sea in accordance with IAW MARPOL regulations and the M16455.1A Vessel Environmental Manual.

2. The USCG would coordinate with NMFS, USFWS, and local sources in the action areas to learn of confirmed haul out locations and communicate them to all field units in the operation areas environment as part of the requirement not to discharge sewage black water within 3 nm (2.5 mi) of known or reported marine mammals to the extent operating constraints permit.

PDCs applicable to Mooring, Anchoring, and Area Avoidance

1. When planning transit routes from one operation area to another and/or from the vessel homeport to another operation area, ports in which docking facilities are available to support the mooring of the OPC are preferred. If ports that do not have docking facilities for the OPC are used, then anchorage areas that do not contain ESA-listed species such as corals or benthic habitats that support ESA-listed species' feeding, refuge, and reproduction are preferred.

2. Impacts to ESA-listed corals associated with vessel operation, including anchoring, are prohibited unless a step-down review has been completed to address these effects or an emergency consultation is initiated under the ESA section 7 emergency consultation procedures, depending on the specific circumstances.

3. Avoid anchoring in abalone critical habitat.[6] Vessel operators would select the anchor location based on depth, protection from seas and wind, and bottom type. Preferred bottom types are sticky mud or sand, as those characteristics allow the anchor to dig into the bottom and hold the chain in place.

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[6]https://www.fisheries.noaa.gov/resources/maps?title=&term_node_tid_depth%5B1000000069%5D=1000000069&field_species_vocab_target_id=black+abalone&sort_by=created

PDCs applicable to Towing

1. All tow lines and cables used for towing a vessel would be kept taut to the greatest extent possible and would be monitored for fraying or other signs of potential failure that could result in entanglement.
2. A trained crew member would search for marine mammals along the transit route used for towing to minimize potential collisions with animals and the OPC and/or the vessel being towed. The lookout would inform the captain immediately upon sighting a marine mammal in order for the captain to determine whether changes to vessel speed are required.
3. A trained crew member would search for sea turtles along the transit route used for towing to minimize potential collisions with animals and the OPC and/or the vessel being towed. The lookout would inform the captain immediately upon sighting a sea turtle in order for the captain to determine whether changes to vessel speed or bearing are required.
4. For vessels being towed to a pier or other mooring, the OPC would bring the vessel as close as is safe such that lines can be passed to crew where the vessel would moor from the OPC and/or vessel being towed; or using smaller vessels to ferry the lines from the vessel to the mooring point to minimize the potential for slack in the lines that could result in entanglement.
5. Tow lines would be collected as soon as is safely possible to minimize dragging of lines in the water that may damage habitat or present an entanglement hazard.

PDCs applicable to Fueling Underway

1. The new OPCs and any tankers or other vessels providing fuel would be equipped with spill response equipment and would end fueling operations immediately upon detection of leaks or spills and clean up any fuel as quickly as possible to minimize any potential transfer of fuel to marine waters.
2. Should a spill occur during fueling underway, the USCG would engage in ESA section 7 emergency consultation, if appropriate, for the response activities associated with spill cleanup with NMFS and USFWS.
3. Fueling underway would be conducted when vessels are stationary or moving at very slow speeds.
4. No fueling underway would take place during inclement weather or in areas with rough seas to minimize the potential for accidental spills.

PDCs applicable to Gunnery Training

1. A mitigation zone with a radius of 200 yd (183 m) would be established for small-caliber gunnery exercises using non-explosive practice munitions with a surface target. Vessel personnel would observe the mitigation zone from the firing position.
2. The exercise would not commence if concentrations of floating vegetation (kelp patties) are observed within the mitigation zone.
3. Firing would cease if a marine mammal or sea turtle is sighted within or approaching the mitigation zone. Firing (aimed away from the animal) would recommence if the animal is observed exiting the mitigation zone, the mitigation zone has been clear from any additional sightings for a period of 30 minutes for a firing ship, or the intended target location has been repositioned more than 400 yd (370 m) away from the location of the last sighting and in a direction opposite the animal's path or direction in which it was moving.
4. Plastic "killer tomato" and other targets used during training would be retrieved from the water to the extent possible to minimize the potential for these to become marine debris and entangle marine mammals and other species or be ingested by animals. Targets with a floating line would be preferentially used to allow for easier recovery. If targets are left in the water, over the course of training exercises in the operation area observers would look for signs of entanglement and would follow appropriate reporting procedures, as necessary, to assist entangled animals (see https://www.fisheries.noaa.gov/insight/entanglement-marine-life-risks-and-response#what- should-i-do-if-i-see-an-entangled-animal?).

PDCs applicable to Vessel Lighting

1. OPCs would set "Darken Ship" each evening at sunset to minimize emission of white light from the ship and to protect the night vision of watch-standing personnel:
   a. All portlights would be covered;
   b. Red/blue lights would be used on weather decks (and only when required);
   c. Only navigational lighting would be consistently visible per the Navigation Rules and Regulations Handbook and maritime regulations regarding nighttime lighting.

3.3.2 Consistency Review and Adaptive Management Procedures

For actions that fully implement the PDCs above, no consistency review is needed. However, when only some of the PDCs can be implemented, a consistency review is required to ensure the effects of the action were analyzed in this Opinion. Consistency review involves the action agency and/or NMFS conducting a project-specific review of an action that is authorized, funded or carried out under the program. In some cases, the USCG and NMFS may be able to identify additional mitigation to keep the effects of those stressors consistent with those identified in this

Opinion, but in other cases a tiered consultation may be required.The need for and type of project-specific review will vary depending on the level of uncertainty at the programmatic consultation stage regarding aspects or potential effects of specific projects, approvals, or other actions that will be implemented in the future. The greater the uncertainty at the programmatic consultation stage, the greater the need for consistency review procedures, which may reveal that a stand-alone consultation is necessary for some actions that do not fall under the scope of the programmatic . In the case of the one-time Nulka decoy test, a consistency review is not necessary; however, the USCG will notify the appropriate NMFS regional office prior to the test with all of the details associated with that action component.

Because this mixed programmatic action is based on general information taken from current operations and there are some actions for which we still do not have information, project-specific review must be completed on the following actions to ensure all of the relevant PDCs are met and determine whether additional PDCs are required for a particular action or operation in which the OPC will engage. The actions that will require consistency review include:

- Actions intended to use MEM outside military ranges, or over shallow coral reef areas;
- Anchoring in areas that have coral reefs;
- Aircraft operations under the action that would occur at altitudes below 500 ft;
- Towing derelict vessels, or those that have sat in the water unattended for long periods, and have accumulated extensive biofouling;
- Vessel construction and transit from a site not considered in this Opinion; and
- Vessel maintenance and decommissioning.

The consistency review is conducted between the NMFS Regional Office and the USCG. This Opinion requires that the USCG make project-specific findings for actions they carry out, review, permit or otherwise authorize to determine consistency with this Opinion, including its effects analyses. When the project-specific review indicates the USCG cannot implement all PDCs, the USCG identifies whether the action will have different effects than those considered in this Opinion and if so, initiates a consistency review with NMFS.

To initiate the consistency review, the USCG will identify the action and corresponding PDC(s) that cannot be implemented along with the information described below to the appropriate NMFS regional office via email with a copy sent to the Office of Protected Resources (nmfs.hq.esa.consultations@noaa.gov). For actions in the Alaska operations area send to (akr.prd.section7@noaa.gov); for actions in the Northeast Pacific North and South, send to West Coast Regional Office (hanna.miller@noaa.gov); for actions in the Hawaii and Pacific Islands operations area send to Pacific Islands Regional Office (EFHESAconsult@noaa.gov); for actions in the Northwest Atlantic, Florida and Caribbean, and the Gulf of Mexico operations areas send to Southeast Regional Office (nmfs.ser.esa.consultations@noaa.gov); and for actions in the Northwest Atlantic operations area send to Greater Atlantic Regional Office (nmfs.gar.esa.section7@noaa.gov). The subject line should include a reference to "OPR-2021-

03512, Programmatic Consultation with the USCG for the Construction and Operation of New Offshore Patrol Cutters." The submission will include the following information:

1. Date of projected actions: This is the date range that the actions are expected to occur, including start and end dates.
2. Location: This should include the specific location of the actions
3. PDCs met: Answer yes or no as to whether or not all of the applicable PDCs in this document will be met by the proposed operation of the OPC for the actions identified as not requiring further analysis.
4. Action description: Project-specific information should also be provided, including details of the action and which program component it is conducted under, specifics of relevant measured levels, and any proposed changes to the actions that were analyzed in this Opinion. This information will enable NMFS to determine the potential effects specific to the site-specific action on ESA resources in the operation area and assess the risk to these resources as a result of the operations. The information will also enable NMFS to determine whether additional protective measures for avoidance and minimization of effects of the specified action are required.

In response to the initiation of a consistency review, NMFS will either: 1) add mitigation to ensure the action's effects will be consistent with those anticipated in this Opinion, or 2) determine a new consultation would be required. NMFS will respond to USCG within 15 days and may request more information, as needed. If USCG does not receive a response within a 15 day time period, then NMFS and USCG will discuss and agree on appropriate future procedures.

Following initiation of a consistency review, when NMFS identifies additional mitigation that can minimize the effects of a particular action so it stays within the scope of effects identified in this Opinion, an adaptive management process is triggered. NMFS will notify the USCG that additional mitigation for a site-specific action is necessary to stay within the analysis and conclusions of this Opinion. The USCG will have two options at that point, they can choose to incorporate those mitigations measures into the site-specific action or initiate a separate consultation to insure that site-specific action satisfies section 7(a)(2) of the ESA. If the USCG chooses to accept the additional mitigation for that site-specific action, they would re-submit their action for review by NMFS as the final step of the consistency review. If they choose not to incorporate the site-specific mitigation, they would be required to submit an initiation package consistent with 50 C.F.R. §402.14(c) of the ESA implementing regulations. This would initiate a separate consultation on that particular action.

3.3.3 **Programmatic Review**

The USCG and NMFS Office of Protected Resources in coordination with the regions will conduct an annual programmatic review of the operation of the new OPCs beginning one year after the first new OPC has been delivered and is operating. This review will evaluate, among other things, whether the scope of the operations of the new OPC is consistent with the description of the programmatic action; whether the nature and scale of effects predicted continue to be valid; whether the PDCs are being implemented and continue to be appropriate; and whether the project-specific consistency review and step-down consultation procedures are being implemented and are effective. To assist in this annual review, the USCG will submit a summary review 30 days prior to the end of the first 12-month period after the first new OPC is fully operational and 30 days prior to the close of all subsequent 12-month periods. The USCG will submit:

- a summary of the actions conducted by each new OPC;
- information regarding the effectiveness of the implementation of PDCs and any conservation measures developed for a specific location, project, or activity as part of consistency reviews. Effectiveness will be based on the ability of the USCG to implement the measure without modifications and the observer data collected during specific activities documenting ESA-listed marine mammal observations and responses to each activity. As part of the annual reporting requirements, the USCG will identify any issues with implementation of avoidance and minimization measures, provide information regarding modifications that were made in the field to improve the effectiveness of measures (if applicable), and make recommendations regarding the elimination of, need for modifications to, and/or need for development of measures to minimize the effects of take on ESA-listed species and their designated or proposed critical habitat- ;
- any recommendations for additional PDCs to further reduce effects programmatically;
- any issues identified by the watchstanders, vessel captain or other crew member in implementing avoidance and minimization measures;
- copies of sighting logs for marine mammals and sea turtles; and
- monitoring and reporting of take of ESA-listed species included in an ITS.

Additionally, NMFS will verify the regional contact email information used for requesting consistency reviews will remain valid for the upcoming year.

4 Potential Stressors to Endangered Species Act-Listed Species and Critical Habitat

Stressors are any physical, chemical, or biological agent, environmental condition, external stimulus or event that may induce an adverse response either in an ESA-listed species or its proposed or designated critical habitat (see Section 6.3 below). The action consists of the acquisition, construction, and operation of 25 OPCs over 30 years. Vessel acquisition and construction are not expected to result in stressors that affect ESA resources. Vessel operations, which are the subject of this programmatic consultation, are expected to include the scope of actions in Table 2. The action will occur on the surface of the water, underwater, and in the airspace of the action area. Protocols and equipment incidental to the normal operation of a USCG vessel will follow all regulations in order to comply with State and Federal laws regarding the protection of species and critical habitat. Each of the components of OPC operations can create stressors that may affect ESA-listed species and their proposed or designated critical habitat. The major categories of stressors are: vessel strike, vessel anchoring, sound from multiple sources (e.g., vessel noise during transit, echosounders, helicopters, gunnery training), pollution (i.e., vessel discharges and marine debris, including from ship husbandry and training activities), and entanglement and entrapment. Vessel grounding can be another stressor associated with the operation of large vessels. In the unlikely event that an OPC should ground, the USCG will engage in emergency consultation with NMFS. Therefore, vessel grounding is not included in this consultation as a stressor caused by the action.

4.1 Vessel Strike

The movement of vessels in waters shared with endangered or threatened marine mammals, sea turtles, and fish pose collision or ship strike hazards to those species. Thus, depending on transit routes, water depths, and habitats USCG vessels would have an increased likelihood of collision with larger listed species such as some fish species, turtles, and whales, particularly in coastal areas with limited water depths or at the surface when vessels are transiting offshore at higher speeds.

4.2 Vessel Anchoring

Anchoring of large vessels can result in significant damage to the marine bottom due to the size of the anchor and chain, particularly in areas where sea conditions cause the vessel to swing on anchor leading to dragging and scraping on the marine bottom. Areas containing habitats such as coral reefs and other coralline communities are an example of marine habitat that is particularly susceptible to impacts of vessel anchoring. Several of the ports where OPCs may homeport or visit while in transit, particularly to and from the separate operation areas (e.g., Pacific islands), are located in areas containing coral habitat, including ESA-listed corals. While the USCG noted that anchoring rarely occurs, when it does, it is in designated anchorage areas associated with existing ports. The use of designated anchorage areas in existing ports does not preclude the possibility of damage to benthic habitats. Many anchorage areas were designated based on navigational considerations and not protection of marine habitats. For example, designated anchorage areas associated with the Port of Ponce in Puerto Rico, Apra Harbor in Guam, and with the Port of Miami in Florida contain coral habitats.

4.3 Noise

The acoustic stressors from the action include underwater acoustic transmissions (sonar for navigation), vessel noise during regular operations and testing activities such as helicopter noise and gunnery noise (Table 4). Acoustic stressors could affect the ESA-listed fish, sea turtles, and marine mammals. Animals present in the operation areas will be exposed to navigation equipment, vessel and aircraft operation and other acoustic stressors.

Table 4. Sound Source Characteristics of Acoustic Stressors Associated with the Action (USCG 2022).

Source Type	Frequency Range (kHz)	Source Level (dB re: 1μPa @ 1m rms in water; 20 μPa @ 1m rms in air)	Associated Action
Small Vessel (OTH boats)	1 - 7	175 dB re 1 μPa at 1 m	LE, SAR training, crew and passenger transfer
Large Vessel	0.02 - 0.30	190 dB re 1 μPa at 1 m	OPC operations and training
Single-beam Echosounder (fathometer)	3.5 – 1,000 (24 – 200)[1]	205 dB re 1 μPa at 1 m [2]	OPC operations, training, and testing [5]
Doppler speed log	270 - 284	--	OPC operations, training, and testing
Helicopter (low flying; 100 ft above sea surface)	0.02 - 5	136 dB re 20 μPa 138 dB re 1 μPa	LE, SAR training, crew and passenger transfer, reconnaissance
UAS	0.06 – 0.15	80 dB re: 20μPa	Reconnaissance, UAS deployment
Gunnery	0.15 – 2.5 (with peak from 0.9 – 1.5)	139 – 161 dB re: 20μPa at 50 ft (15 m)[3]	Gunnery training

[1]Typical frequency range for most commercially-available devices

[2]Maximum source level is 227 dB root mean square at 1 m, but the maximum source level is not expected during operations

4.4 Pollution

Vessel operations have the potential to cause pollution and marine debris. Vessel maintenance such as hull cleaning and vessel repairs could result in pollution. These activities could result in impacts to water and sediment quality from the release of contaminants and impacts to habitat and animals from the release of debris. Vessels regularly discharge into marine waters as part of normal operations. There may also be leaks of petroleum products from vessls, including during fueling underway. Discharges include deck runoff, leaching of antifouling products, greywater, bilgewater, and other waste streams. There may also be unintentional loss of objects overboard, resulting in marine debris such as line, buckets, or other onboard gear. The USCG vessels are subject to Uniform National Discharge Standards regulations promulgated by the Environmental Protection Agency and Department of Defense, which restrict the location of discharges and require controls for some discharges that contain contaminants to minimize their release into marine waters.

Artificial light pollution is another stressor produced by vessels, which can disorient marine life or cause avoidance/attraction. Light pollution affects an area around each vessel, for which the area size depends on the power and intensity of the bulb used.

4.5 Physical Disturbance from Military Expended Materials

Military expended materials that may cause physical disturbance include all sizes of non-explosive (inert) practice munitions and the one-time test of the Nulka decoy. Similar to interactions with other types of marine debris (e.g., fishing gear, plastics), interactions with certain types of MEM could potentially result in negative sub-lethal effects. Gunnery training exercises using small caliber non-explosive practice munitions could result in expended materials (casings).

4.6 Entanglement

In the case of the activities to be conducted by the OPCs, vessel escort,vessel tow, SAR, or emergency response training have the potential to result in entanglement of ESA-listed species. These interactions could occur at the sea surface, in the water column, or on the seafloor. Tow lines may also pose an entanglement hazard to animals such as sea turtles if lines remain slack. The placement of temporary cofferdams on the hull of OPCs by divers, along with ship husbandry and other maintenance activities, have the potential to introduce marine debris, such as derelict gear, into waters of the action area wherever these activities may occur.

5 Action Area

Action area means all areas affected directly, or indirectly, by the Federal action, and not just the immediate area involved in the action (50 C.F.R. §402.02). While the action area is generally defined by the extent of the chemical, physical, and biological changes caused by an action, in a programmatic consultation that will span 30 years, the action area is all areas that may be used by the USCG in that time.

For this programmatic consultation, the action area includes the operation areas in Alaska; Hawaii and the Pacific Islands; Northeast Pacific (North and South); Gulf of Mexico; Northwest Atlantic; and Northwest Atlantic, Florida and Caribbean; as well as transit routes between the operation areas (Figure 5). Missions would be conducted primarily 12 nm (22 km) beyond U.S. shores and within the 200 nm (370 km) boundary of the U.S. Exclusive Economic Zone (EEZ) referred to as the “offshore operational area”; however, OPCs could be called upon to provide humanitarian aid and a LE and military presence that may require that they operate globally in international waters. For the purposes of this analysis, the action area may include waters classified as the high seas—defined as international waters not within any nation’s EEZ or territorial seas, as well as waters under the jurisdiction of a foreign government, classified as a foreign EEZ. Therefore, each operation area within the action area extends beyond the U.S. EEZ, but within the USCG corresponding district boundary. OPCs may spend limited amounts of time in inland harbors, canals, or navigable waterways, referred to as the transit area; however, this would only occur when the vessel is in transit between ports (e.g., shipbuilder and homeports) and not during vessel operations or training actions. Existing homeports (see Figure 19; in Chapter 8.1.1) for the current MEC fleet will be used for the new OPCs once each new vessel is constructed and commissioned. As noted in Section 3.3.2, any new or alteration to homeports were not considered under this action and need a separate, standalone consultation. The action will occur throughout the year, when logistically feasible, and will be conducted continuously in all locations within the action area.

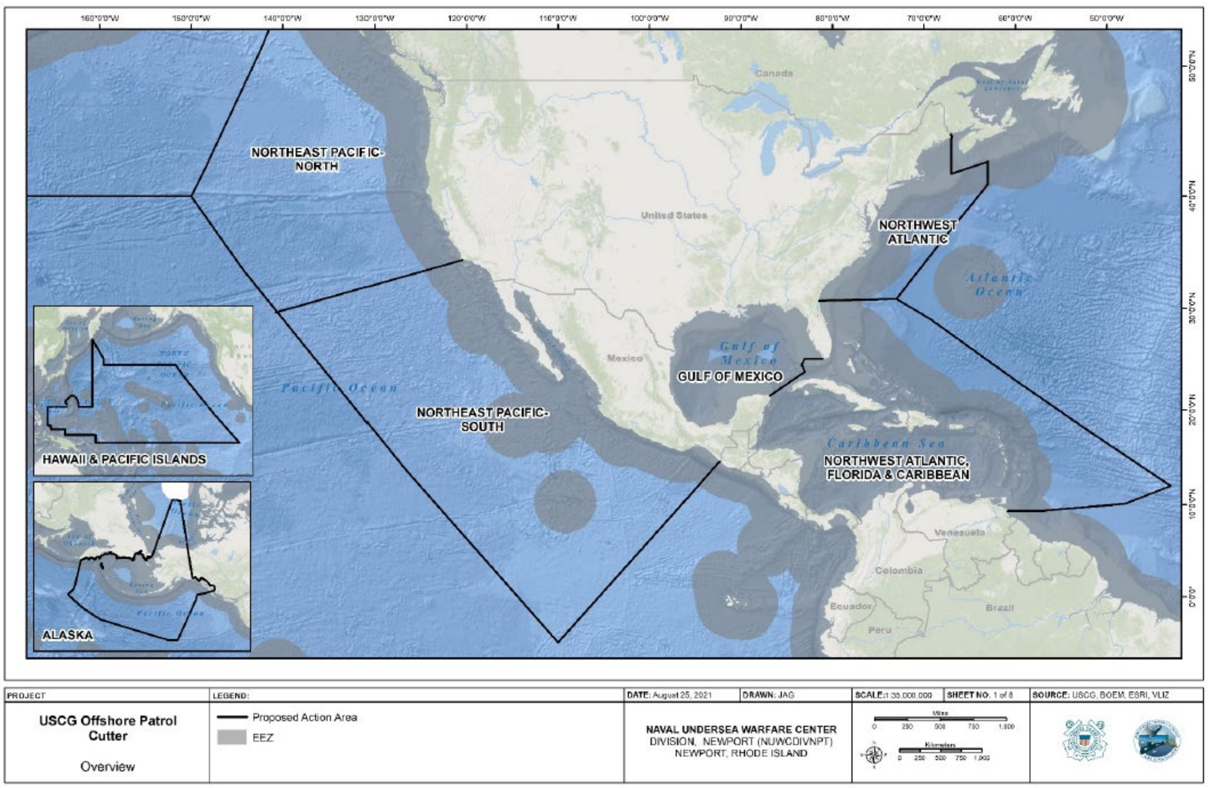


Figure 6. Action Area Including Divisions of All District Operations.

The Alaska operation area (Figure 6) includes all waters surrounding the state of Alaska, and areas of the high seas and foreign EEZs beyond the U.S. EEZ. This operation area covers a vast amount of ice-free open ocean, rivers, bays, and inlets extending from the Canadian border around the Aleutian Chain, above the Arctic Circle (which circles the Earth at 66 degrees [°] 30 minutes [’] North latitude [N]), and back to the Canadian border. The OPCs will not perform ice operations and will not typically operate in the Arctic Ocean, but may provide support to the USCG Polar Security Cutter that operates in this area. This operation area overlaps with the Seventeenth USCG District. A port within this action area where OPCs may be berthed or deploy from is Kodiak, Alaska. Air operations in support of the action will primarily occur within 100 nm (185 km) of air stations such as those in Kodiak and Sitka, Alaska. At least two OPCs will be homeported in this operation area in Kodiak, Alaska.

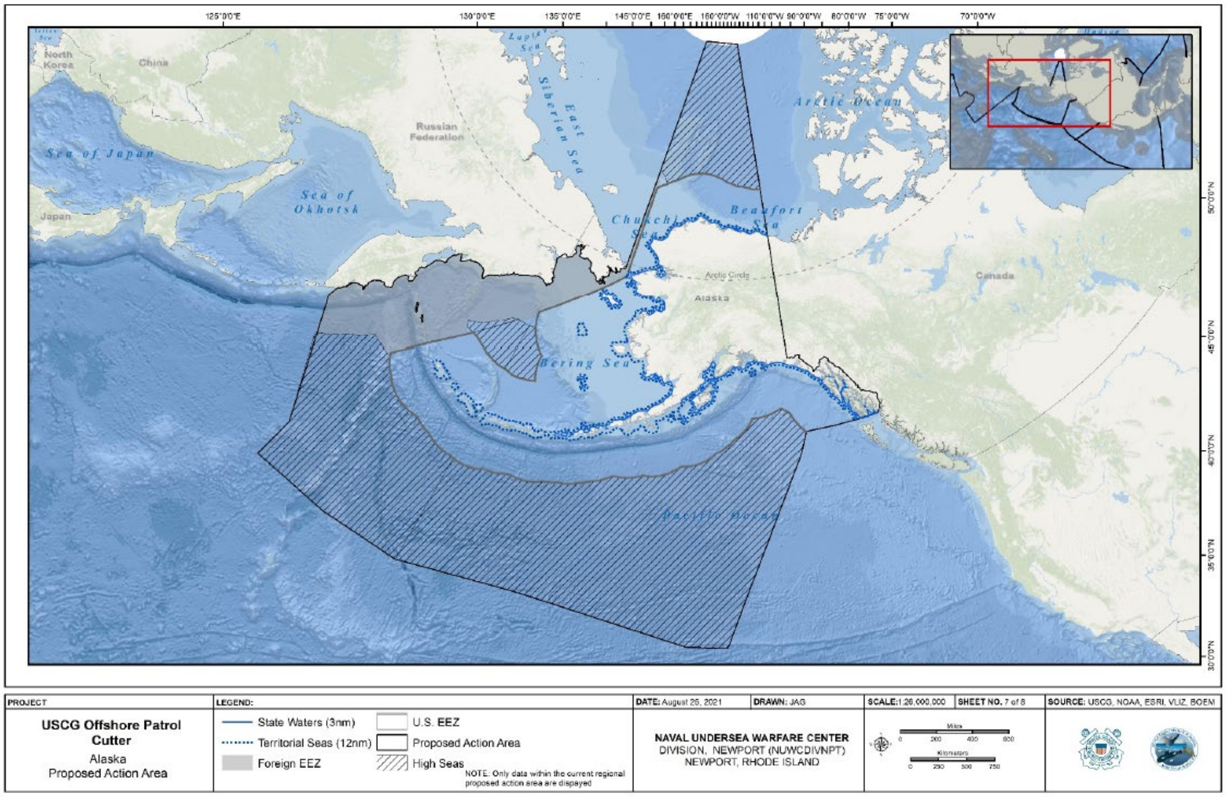


Figure 7. Alaska Operation Area

The Hawaiian and Pacific Islands (HI-PAC) operation area (Figure 7) includes the waters surrounding the main Hawaiian Islands, Northwestern Hawaiian Islands, and other Pacific U.S. protectorates and territories (including Guam, American Samoa, Johnson Atoll, Palmyra Atoll and regions of the Commonwealth of the Northern Mariana Islands [CNMI], collectively referred to as the Pacific Islands), as well as areas of the high seas and foreign EEZs (Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, and Palau). A port within this operation area where OPCs may be berthed or deploy from is Honolulu, Hawaii (although none have been officially designated). Aircraft operations in support of the action would primarily occur within 100 nm (185 km) of air stations such as that in Barbers Point, Hawaii. The Marshall Islands are not in the EEZ or on the high seas, so no ESA consultation is required because it does not meet the regulatory definition of "action." However, a separate consultation with NMFS' Pacific Islands Office under the Environmental Standards and Procedures for United States Army Kwajalein Atoll Activities in the Republic of the Marshall Islands (USAKA Environmental Standards, or UES)[7] would be required prior to any action.

[7] https://usagkacleanup.info/wp-content/uploads/2017/01/UES-14Ed-FNL-Nov-2014-15-16Sep2016-rd.pdf

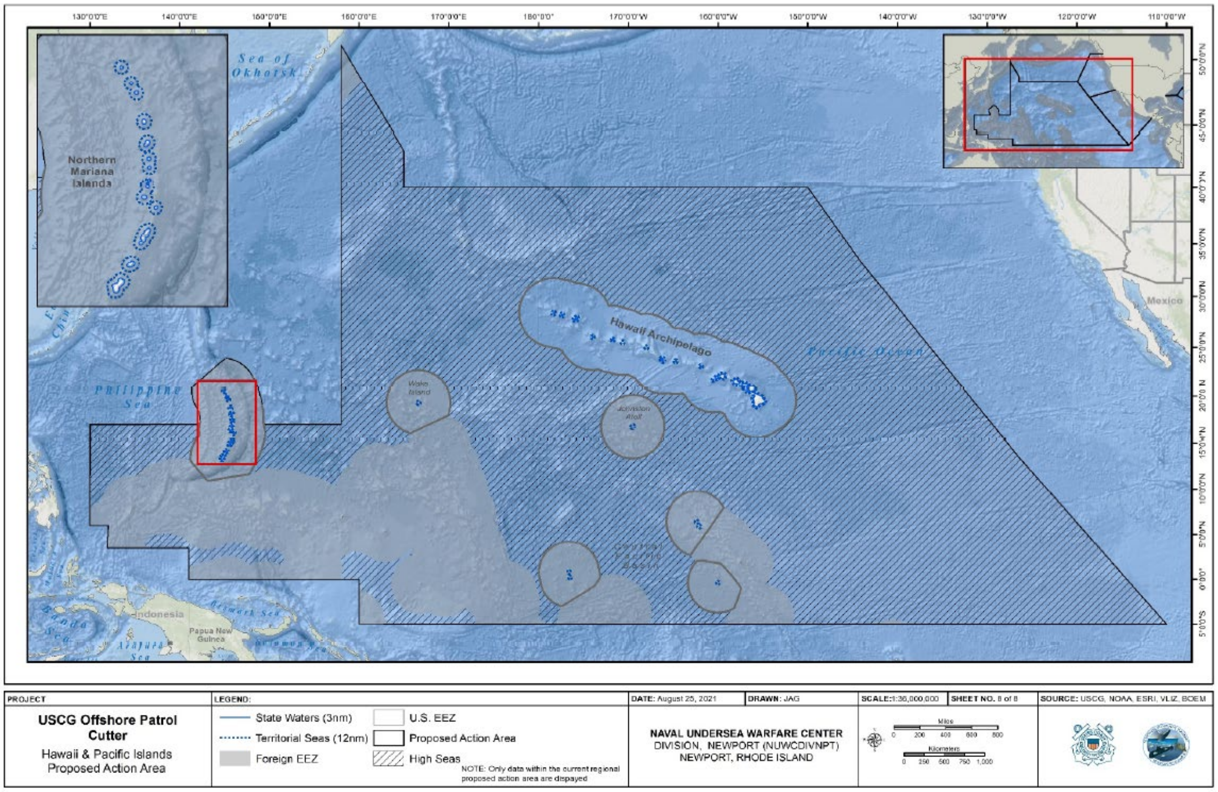


Figure 8. Hawaiian and Pacific Islands Operation Area

The Northeast Pacific-North (NEPAC-North) operation area (Figure 8) extends from Point Conception, California, north to Oregon and Washington, and areas of the high seas and foreign EEZs (Canada) beyond the U.S. EEZ. The Eleventh and Thirteenth USCG Districts manage this area, including Canadian waters in the jurisdiction of the Thirteenth USCG District. Ports within this action area where OPCs may be berthed or deploy from include Seattle, Washington (although none has been officially designated). Air operations in support of the action would primarily occur within 100 nm (185 km) of air stations such as those in Sacramento, San Francisco, and Humboldt Bay, California, and Seattle, Washington. At least two OPCs may be homeported in this operation area.

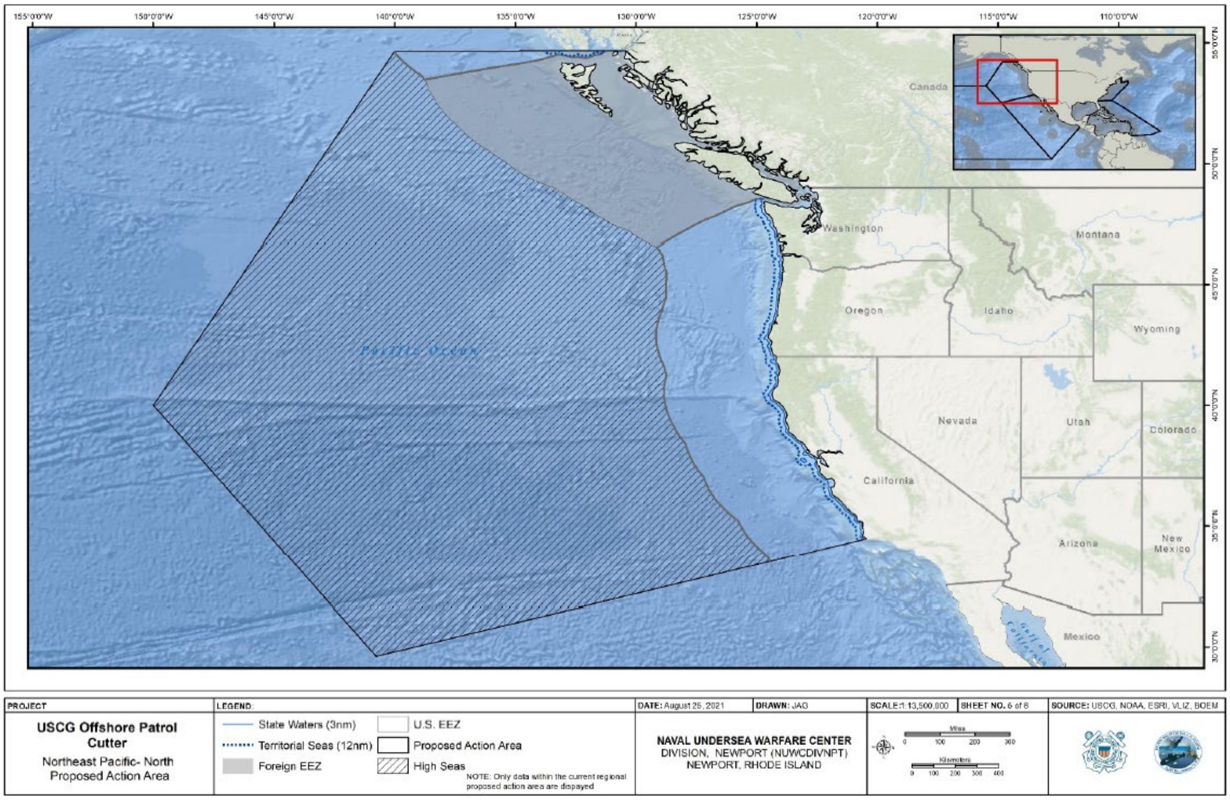


Figure 9. Northeast Pacific-North Operation Area

The Northeast Pacific-South (NEPAC-South) operation area (Figure 9) includes the Pacific Coast of the continental United States from Central California (Point Conception) to Mexico, Central America, and areas of the high seas and foreign EEZs (Mexico). Operations in this project area may also require transit through the Panama Canal. The Eleventh USCG District manages this region. A port within the action area where OPCs may be berthed or deploy from is Los Angeles/Long Beach, California. Air operations in support of the action would primarily occur within 100 nm (185 km) of air stations such as that in San Diego, California. At least two OPCs would be homeported in Los Angeles/Long Beach (USCG 2016).

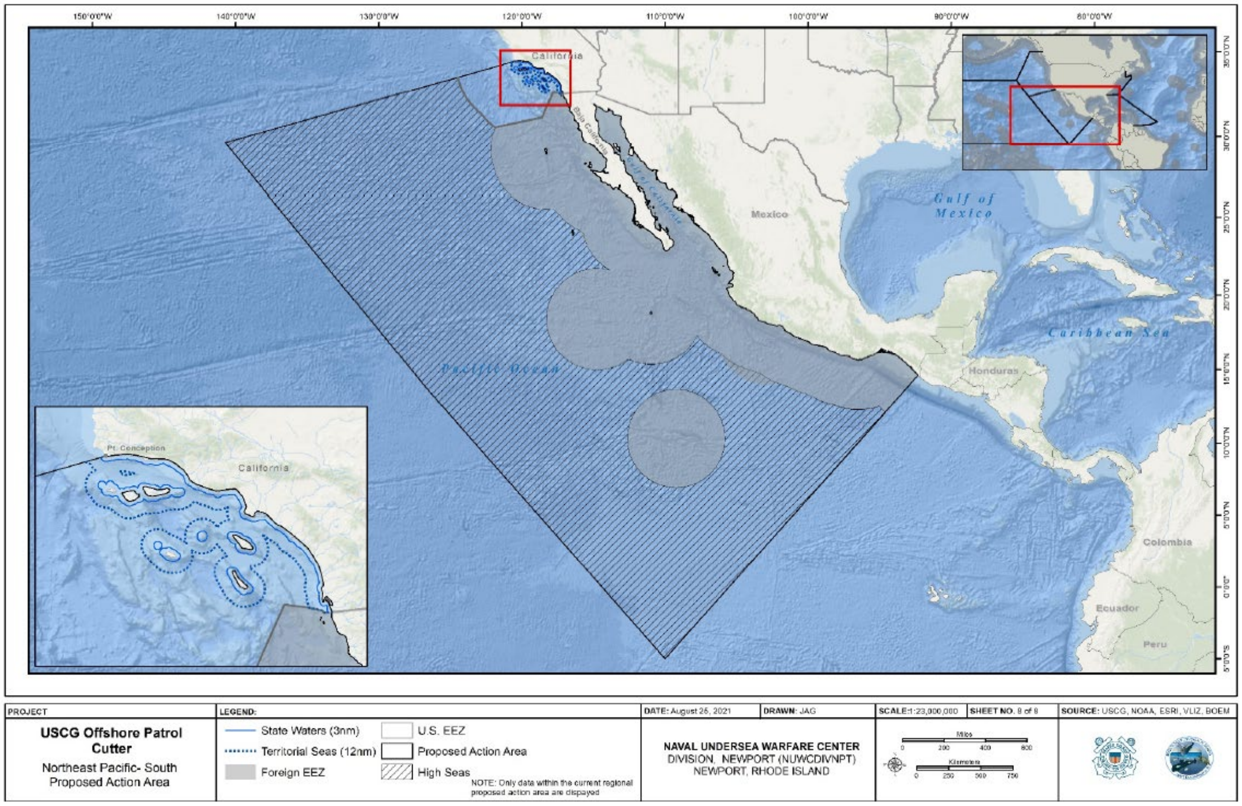


Figure 10. Northeast Pacific-South Operation Area

The Gulf of Mexico (GoMEX) operation area (Figure 10) includes state and territorial waters extending to the U.S. EEZ off the west coast of Florida, excluding the Florida Keys (off of Monroe County, Florida), to the east coast of Mexico, including the Mexico Basin and Yucatán Shelf, as well as areas of the high seas and foreign EEZs. The Seventh and Eighth USCG Districts manage this area. A port within this action area where OPCs may be berthed or deploy from is Galveston, Texas (although none has been officially designated). Aircraft operations in support of the action would primarily occur within 100 nm (185 km) of air stations such as those in Clearwater, Florida; Corpus Christi and Houston, Texas; and New Orleans, Louisiana.

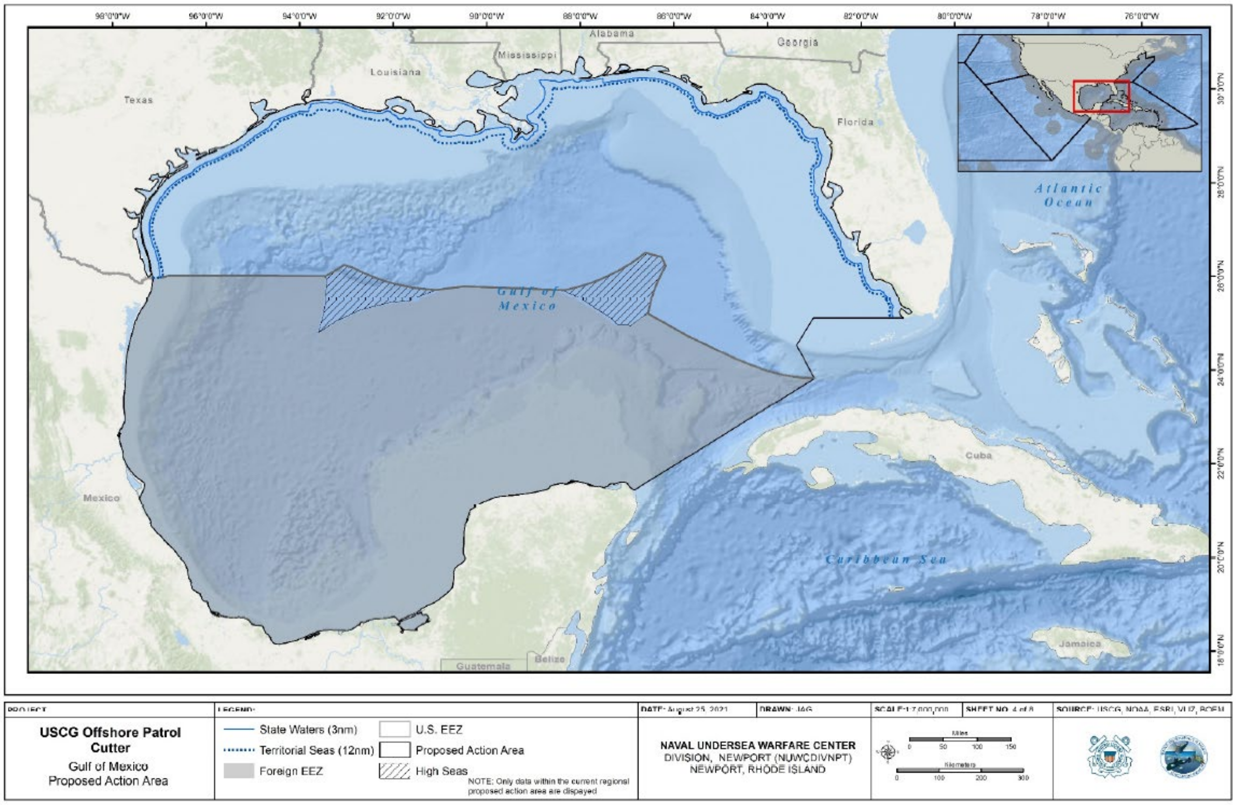


Figure 11. Gulf of Mexico Operation Area

The Northwest Atlantic (NW-ATL) operation area (Figure 11) includes the U.S. state and territorial waters extending to the U.S. EEZ from the Canada/Maine border to the Georgia/Florida border, and areas of the western Atlantic Ocean including areas of the Canadian EEZ and the high seas. The First and Fifth USCG Districts manage this region. Ports within this operation area where OPCs may be berthed or deploy from include Norfolk, Virginia; Charleston, South Carolina; and Boston, Massachusetts (although not officially designated). Aircraft operations in support of the action would primarily occur within 100 nm (185 km) of air stations, such as Savannah, Georgia; Atlantic City, New Jersey; Elizabeth City, North Carolina; and Buzzards Bay (Cape Cod), Massachusetts.

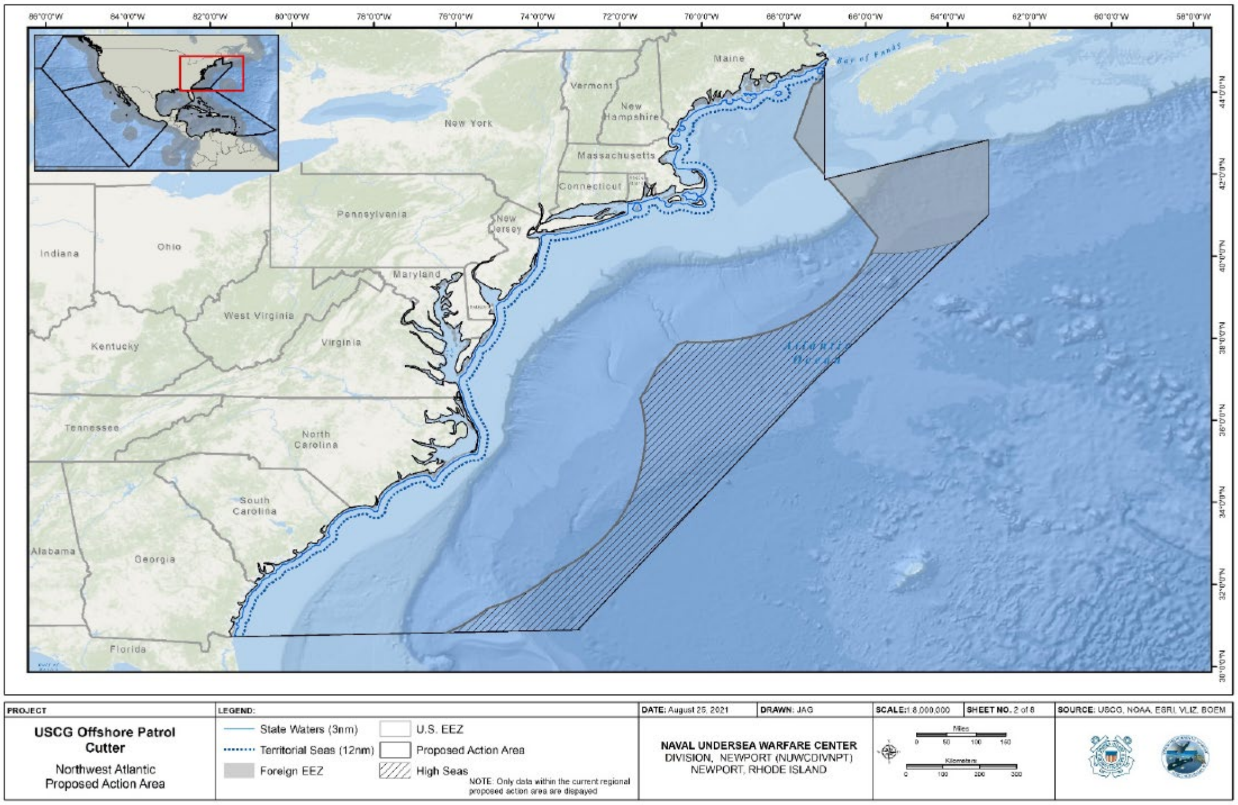


Figure 12. Northwest Atlantic Operation Area

The Northwest Atlantic-Florida and the Caribbean (NW-ATL-Florida and the Caribbean) operation area (Figure 12) includes state and territorial waters extending to the U.S. EEZ off the east coast of Florida, including the Florida Keys (off of Monroe County, Florida); the Virgin Islands; the Bahamas; Cuba; the Commonwealth of Puerto Rico; and areas of the western Atlantic Ocean, including the high seas and foreign EEZs (Table 5) beyond the U.S. EEZ. The Seventh and Eighth USCG Districts manage this region. A port where OPCs may be berthed or deploy from in this operation area is Mayport, Florida (although none have been officially designated). Aircraft operations in support of the action would primarily occur within 100 nm (185 km) of air stations such as those in Miami, Florida or Borinquen, Puerto Rico.

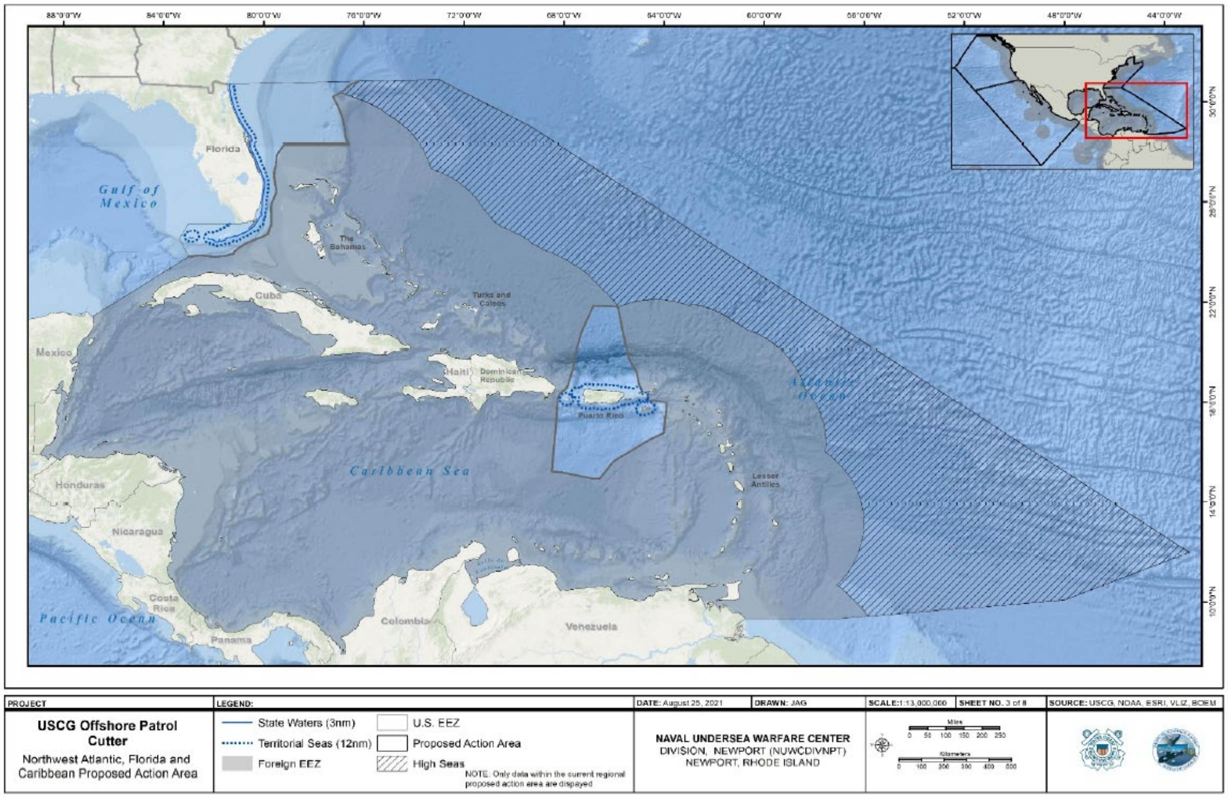


Figure 13. Northwest Atlantic-Florida and Caribbean Operation Area

Table 5. Foreign EEZs within the Northwest Atlantic-Florida and Caribbean Area

Islands of the Caribbean		*Mainland Central America*
Antigua and Barbuda	Guadalupe (France)	Belize
Anguilla (U.K.)	Haiti	Columbia
Aruba (Netherlands)	Jamaica	Costa Rica
Barbados	Martinique (France)	Guatemala
Bahamas	Montserrat (U.K.)	Honduras
Bermuda	Saba (Netherlands)	Mexico (East Coast)
Bonaire (Netherlands)	St. Eustatius (Netherlands)	Nicaragua
British Virgin Islands	St. Kitts and Nevis	Panama
Cayman Islands	St. Martin/St. Maarten (France and the Netherlands)	Venezuela
Cuba	St. Barthelemy (France)	
Curacao (Netherlands)	St. Lucia	
Dominica	St. Vincent and the Grenadines	
Dominican Republic	Trinidad and Tobago	
Grenada	Turks and Caicos	

The new OPCs will replace the legacy cutters and be transcontinental vessels that will travel worldwide to support the USCG's missions. Transit routes between the location where the new vessels are constructed and their expected homeport, and between operation areas described above may also result in effects to ESA-listed species. Although the location or locations of the shipbuilding facility or facilities that will be used during construction of each of the new OPCs is unknown at this time, the large shipbuilding companies likely to have the capacity to construct the new vessels are located in Louisiana, Mississippi, Florida, Virginia, Texas, Alabama, Maine, Connecticut, and California. Therefore, NMFS included consideration of possible transit routes between construction sites, homeports and action area.

6 Endangered Species Act Protected Resources in the Action Area

This section identifies the ESA-listed species and proposed or designated critical habitat that potentially occur within the action area (Table 6) that may be affected by the acquisition and operation of up to 25 new OPCs. Section 6.1 first identifies the species and proposed or designated critical habitats in the action area that may be affected, but are not likely to be adversely affected by the action. The remaining species and proposed or designated critical habitats that may be affected, and are likely to be adversely affected by the action in the action area are carried forward through the remainder of this Opinion.

Table 6. Threatened and Endangered Species That May Be Affected by the USCG's Acquisition, Construction and Operation of New OPCs

Species	ESA Status	Critical Habitat	Recovery Plan
Marine Mammals – Cetaceans			
Blue Whale (*Balaenoptera musculus)*	E – 35 FR 18319	-- --	07/1998
Bowhead Whale (*Balaena mysticetus*)	E – 35 FR 18319	-- --	-- --
Rice's Whale (*Balaenoptera ricei*)	E – 84 FR 15446 E – 86 FR 47022	-- --	-- --
Fin Whale (*Balaenoptera physalus)*	E – 35 FR 18319	-- --	75 FR 47538
Humpback Whale (*Megaptera novaeangliae*) - Western North Pacific, Central America, and Mexico DPSs	E – Western North Pacific and Central America DPSs T – Mexico DPS 81 FR 62259	86 FR 21082	11/1991 06/2022 (Outline))
Gray Whale (*Eschrichtius robustus*) – Western North Pacific DPS	E – 35 FR 18319 and revised listing E – 59 FR 31094	-- --	-- --
North Pacific Right Whale (*Eubalaena japonica*)	E – 73 FR 12024	73 FR 19000	78 FR 34347 06/2013

Species	ESA Status	Critical Habitat	Recovery Plan
North Atlantic Right Whale (*Eubalaena glacialis*)	E – 73 FR 12024	81 FR 4837	70 FR 32293 08/2004
False Killer Whale (*Pseudorca crassidens*) - Main Hawaiian Islands Insular DPS	E – 77 FR 70915	83 FR 35062	-- --
Sei Whale (*Balaenoptera borealis*)	E – 35 FR 18319	-- --	12/2011
Killer Whale (*Orcinus orca*) - Southern Resident DPS	E – 70 FR 69903 Amendment 80 FR 7380	71 FR 69054 86 FR 41668	73 FR 4176 01/2008
Sperm Whale (*Physeter macrocephalus*)	E – 35 FR 18319	-- --	75 FR 81584 12/2010
Marine Mammals – Pinnipeds			
Ringed Seal (*Phoca hispida hispida*) – Arctic Subspecies	T – 77 FR 76706	87 FR 19232 (Final)	-- --
Bearded Seal (*Erignathus barbatus*) – Beringia DPS	T – 77 FR 76739	87 FR 19180 (Final)	-- --
Guadalupe Fur Seal (*Arctocephalus townsendi*)	T – 50 FR 51252	-- --	-- --
Hawaiian Monk Seal (*Neomonachus schauinslandi*)	E – 41 FR 51611	80 FR 50925	72 FR 46966 2007
Spotted Seal (*Phoca largha*) – Southern DPS	T – 75 FR 65239	-- --	-- --
Steller Sea Lion (*Eumetopias jubatus*) – Western DPS	E – 55 FR 49204	58 FR 45269	73 FR 11872 2008
Turtles			
Green (*Chelonia mydas*) – North Atlantic, South Atlantic, East Indian-West Pacific Ocean, Central North Pacific Ocean, Central South Pacific Ocean, and East Pacific Ocean DPSs	E – Central South Pacific Ocean DPS T - rest of DPSs in action area 81 FR 20057	63 FR 46693 (North Atlantic DPS only)	U.S. Atlantic – 10/1991 U.S. Pacific – 63 FR 28359 01/1998

Species	ESA Status	Critical Habitat	Recovery Plan
Loggerhead (*Caretta caretta*) – North Pacific Ocean, South Pacific Ocean, and Northwest Atlantic Ocean DPSs	E – North Pacific, South Pacific DPSs T – Northwest Atlantic Ocean DPS 76 FR 58868	79 FR 39855 (Northwest Atlantic Ocean DPS only)	U.S. Pacific – 63 FR 28359 Northwest Atlantic - 74 FR 2995 U.S. Caribbean, Atlantic, and Gulf of Mexico - 10/1991 U.S. Pacific - 05/1998 Northwest Atlantic - 01/2009
Leatherback (*Dermochelys coriacea*)	E – 35 FR 8491	44 FR 17710 and 77 FR 4170	U.S. Caribbean, Atlantic, and Gulf of Mexico - 63 FR 28359, 10/1991 U.S. Pacific - 05/1998
Kemp's Ridley (*Lepidochelys kempii*)	E – 35 FR 18319	-- --	U.S. Caribbean, Atlantic, and Gulf of Mexico - 09/2011 (2nd revision))
Olive Ridley (*Lepidochelys olivacea*) – Mexico's Pacific Coast Breeding Populations, All Other Populations	E – Mexico's Pacific Coast Breeding Populations T – All Other 43 FR 32800	-- --	Mexico's Pacific Coast - 63 FR 28359
Hawksbill Turtle (*Eretmochelys imbricata)*	E – 35 FR 8491	63 FR 46693	U.S. Caribbean, Atlantic, and Gulf of Mexico - 57 FR 38818, 08/1992 Pacific - 63 FR 28359, 05/1998
Fishes			
Shortnose sturgeon (*Acipenser brevirostrum*)	E – 32 FR4001	-- --	63 FR 69613 12/1998

Species	ESA Status	Critical Habitat	Recovery Plan
Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) – Chesapeake Bay, Carolina, South Atlantic, New York Bight and Gulf of Maine DPSss	E – New York Bight, Chesapeake Bay, Carolina, South Atlantic DPS T – Gulf of Maine DPS 77 FR 5879, 77 FR 5913, 77 FR 5913	82 FR 39160	-- --
Green Sturgeon (*Acipenser medirostris*) – Southern DPS	T – 71 FR 17757	74 FR 52300	2010 (Outline)
Gulf Sturgeon (*Acipenser oxyrinchus desotoi*)	T – 56 FR 49653	68 FR 13370	09/1995
Bocaccio (*Sebastes paucispinis*) – Puget Sound DPS	E – 75 FR 22276 and amendment 82 FR 7711	79 FR 68041	81 FR 54556 (Draft)
Altantic Salmon (*Salmo salar*)– Gulf of Maine DPS	E – 74 FR 29344 and 65 FR 69459	74 FR 39903	70 FR 75473 and 81 FR 18639 (Drafts) 11/2005 2/2019- Final
Chinook Salmon (*Oncorhynchus tshawytscha*) – Sacramento River Winter-Run, Upper Columbia River Spring-Run, Snake River Spring/Summer-Run, Snake River Fall-Run, Central Valley Spring-Run, California Coast, Puget Sound, Lower Columbia River, and Upper Willamette River Evolutionary Significant Units (ESUs)	70 FR 37160	Sacramento River Winter-Run - 58 FR 33212 Upper Columbia River Spring-Run and Upper Willamette River - 70 FR 52629 Snake River Spring/Summer-Run - 64 FR 57399 Snake River Fall-Run - 58 FR 68543 Central Valley Spring-Run and California Coast - 70 FR 52488 Puget Sound and Lower Columbia River - 70 FR 52629	Sacramento River Winter-Run and Central Valley Spring-Run - 79 FR 42504 Upper Columbia River Spring-Run - 72 FR 57303 Snake River Spring/Summer-Run - 81 FR 74770 (Draft) Snake River Fall-Run - 80 FR 67386 (Draft) California Coast - 81 FR 70666 Puget Sound - 72 FR 2493 Lower Columbia River - 78 FR 41911

Species	ESA Status	Critical Habitat	Recovery Plan
			Upper Willamette River - 76 FR 52317
Chum Salmon (*Oncorhynchus keta*) – Hood Summer-Run and Columbia River ESUs	T – 70 FR 37160	70 FR 52629	Hood Summer-Run - 72 FR 29121 Columbia River - 78 FR 41911
Coho Salmon (*Oncorhynchus kisutch*) – Central California Coast, Southern Oregon/Northern California Coasts, Lower Columbia River, and Oregon Coast ESUs	E - Central California Coast T - rest of ESUs in action area (Southern Oregon/Northern California Coasts, Lower Columbia River) 70 FR 37160 Oregon Coast - 73 FR 7816	Central California Coast, Southern Oregon/Northern California Coasts_- 64 FR 24049 Lower Columbia River - 81 FR 9251 Oregon Coast - 73 FR 7816	Central California Coast - 77 FR 54565 Southern Oregon/Northern California Coasts - 79 FR 58750 Lower Columbia River - 78 FR 41911 Oregon Coast - 81 FR 90780
Sockeye Salmon (*Oncorhynchus nerka*) – Snake River and Ozette Lake ESUs	E - Snake River T - Ozette Lake 70 FR 37160	Snake River - 58 FR 68543 Ozette Lake - 70 FR 52630	Snake River - 80 FR 32365 Ozette Lake - 74 FR 25706
Pacific Eulachon (*Thaleichthys pacificus*) – Southern DPS	T – 75 FR 13012	76 FR 65323	9/2017
Steelhead Trout (*Oncorhynchus mykiss*) – Southern California, Upper Columbia River, Snake River Basin, Middle Columbia River, Lower Columbia River, Upper Willamette River, South-Central California Coast, Central California Coast, Northern California, California Central Valley, and Puget Sound DPSs	E - Southern California T - All other DPSs in action area 72 FR 26722	Southern California, South-Central California Coast, Central California Coast, Northern California, California Central Valley - 70 FR 52487 Upper Columbia River, Snake River Basin, Middle Columbia River, Lower Columbia River, Upper	Southern California - 77 FR 1669 Upper Columbia River - 72 FR 57303 Snake River Basin - 81 FR 74770 (Draft) Middle Columbia River - 74 FR 50165 Lower Columbia River - 78 FR 41911

Species	ESA Status	Critical Habitat	Recovery Plan
		Willamette River - 70 FR 52629 Puget Sound - 81 FR 9251	Upper Willamette River - 76 FR 52317 South-Central California Coast - 78 FR 77430 Central California Coast, Northern California - 81 FR 70666 California Central Valley - 79 FR 42504
Yelloweye Rockfish (*Sebastes ruberrimus*)	T - 82 FR 7711	79 FR 68041	81 FR 54556 (Draft)
Nassau Grouper (*Epinephelus striatus*)	T – 81 FR 42268	87 FR 62930	Recovery outline
Giant Manta Ray (*Manta birostris*)	T – 83 FR 2916	-- --	-- --
Oceanic Whitetip Shark (*Carcharhinus longimanus*)	T – 83 FR 4153	-- --	-- --
Scalloped Hammerhead Shark (*Sphyrna lewini*) – Central and Southwest Atlantic, Eastern Pacific, Indo-West Pacific DPSs	T - Central and Southwest Atlantic, Indo-West Pacific E - Eastern Pacific 79 FR 38213	-- --	-- --
Daggernose Shark (*Isogomphodon oxyrhynchus*	E – 82 FR 21722	-- --	-- --
Smalltooth Sawfish (*Pristis pectinata)* – U.S. and Non-U.S. portion of range DPS	E – 68 FR 15674, E - 79 FR 73977	74 FR 45353	74 FR 3566
Invertebrates			
Elkhorn Coral (*Acropora palmata*)	T – 79 FR 53851	73 FR 72210	80 FR 12146
Staghorn Coral (*Acropora cervicornis*)	T – 79 FR 53851	73 FR 72210	80 FR 12146
Lobed Star Coral (*Orbicella annularis*)	T – 79 FR 53851	85 FR 76302	Recovery outline

Species	ESA Status	Critical Habitat	Recovery Plan
Boulder Star Coral (*Orbicella franksi*)	T – 79 FR 53851	85 FR 76302	Recovery outline
Mountainous Star Coral (*Orbicella faveolata*)	T – 79 FR 53851	85 FR 76302	Recovery outline
Pillar Coral (*Dendrogyra cylindrus*)	T – 79 FR 53851	85 FR 76302	Recovery outline
Rough Cactus Coral (*Mycetophyllia ferox*)	T – 79 FR 53851	85 FR 76302	Recovery outline
Acropora globiceps	T – 79 FR 53851	85 FR 76262 (Proposed)	Recovery planning workshop summary
Acropora jacquelineae	T – 79 FR 53851	85 FR 76262 (Proposed)	Recovery planning workshop summary
Acropora lokani	T – 79 FR 53851	-- --	Recovery planning workshop summary
Acropora retusa	T – 79 FR 53851	85 FR 76262 (Proposed)	Recovery planning workshop summary
Acropora speciosa	T – 79 FR 53851	85 FR 76262 (Proposed)	Recovery planning workshop summary
Euphyllia paradivisa	T – 79 FR 53851	85 FR 76262 (Proposed)	Recovery planning workshop summary
Isopora crateriformis	T – 79 FR 53851	85 FR 76262 (Proposed)	Recovery planning workshop summary
Seriatopora aculeata	T – 79 FR 53851	85 FR 76262 (Proposed)	Recovery planning workshop summary
Black Abalone (*Haliotis cracherodii*)	E – 74 FR 1937	76 FR 66805	-- --
White Abalone (*Haliotis sorenseni*)	E – 66 FR 29046	-- --	73 FR 62257
Chambered Nautilus (*Nautilus pompilius*)	T – 83 FR 48976	-- --	-- --

*Other species (e.g., queen conch) and critical habitat have been proposed, however USCG indicated they do not wish to conference at this time.

6.1 Stressors Not Likely to Adversely Affect Species or Critical Habitat

The USCG analyzed the following stressors in their BE and PEIS: acoustic stressors, such as the fathometer and Doppler speed log, vessel, aircraft, and gunnery noise, and physical stressors, such as vessel and aircraft movement, and MEM(USCG 2021, 2022).

NMFS uses two criteria to identify those stressors that may affect, but are not likely to adversely affect ESA-listed species and critical habitat in the action area, as well as the ESA-listed or proposed or designated critical habitat not likely to be adversely affected by the action or the activities that are consequences of the Federal agency's action. The first criterion is exposure, or some reasonable expectation of a co-occurrence, between one or more potential stressors associated with the proposed activities and ESA-listed species or proposed or designated critical habitat. If we conclude that an ESA-listed species or proposed or designated critical habitat is not likely to be exposed to the proposed activities, we must also conclude that the species or critical habitat is not likely to be adversely affected by those activities.

The second criterion is the probability of a response given exposure. ESA-listed species or proposed or designated critical habitat that co-occur with a stressor of the action but is not likely to measurably respond to the stressor is also not likely to be adversely affected by the action. We applied these criteria to the ESA-listed species and designated critical habitat in Table 6 and we summarize our results below.

The probability of an effect on a species or designated critical habitat is a function of exposure intensity and susceptibility of a species or the physical and biological features (PBFs) of critical habitat to a stressor's effects (i.e., probability of response). An action warrants a "may affect, not likely to adversely affect" finding when its effects are wholly beneficial, insignificant, or discountable.

Beneficial effects have an immediate positive effect without any adverse effects to the species or habitat. Insignificant effects relate to the size or severity of the response and include those effects that are undetectable, not measurable, or so minor that they cannot be meaningfully evaluated.

Discountable effects are those that are extremely unlikely to occur. For an effect to be discountable, there must be a plausible adverse effect (i.e., a credible effect that could result from the action and that would be an adverse effect if it did affect a listed species), but it is very unlikely to occur(USFWS and NMFS 1998). In this section, we evaluate effects to ESA-listed species that may be affected and proposed or designated critical habitat that may be affected, but are not likely to be adversely affected, by the actions. Section 3 identified the components of the USCG OPC program and its resulting stressors: acoustic stressors, such as the fathometer and Doppler speed log, vessel, aircraft, and gunnery noise, and physical stressors, such as vessel and aircraft movement, and military expended materials (MEM)(USCG 2021, 2022).

6.1.1 Vessel Anchoring

There are a number of PDCs that restrict where USCG can anchor to protect listed species, benthic habitats they utilize, and proposed and designated critical habitat. Impacts to ESA-listed corals associated with vessel operation, including anchoring, are prohibited unless a consistency review has been completed to address these effects and ensure they do not exceed the extent of effects assessed in this Opinion. Because the PDCs will avoid impacts to listed species and any proposed or designated critical habitat, we have concluded the potential effects to corals or benthic habitats from vessel anchoring is extremely unlikely to occur. Further, if vessels were to anchor in benthic habitats, including designated critical habitat, the vessel anchor will impact a very small portion of these habitats in accordance with the requirements of the PDCs, including any additional PDCs established as part of a consistency review. Thus, these effects to benthic habitat, including critical habitat, are expected to be so minor as to be insignificant. Additionally, because the USCG will avoid anchoring in locations with sessile listed species and because mobile species can avoid anchor strike, we believe it is extremely unlikely any listed fish, sea turtles, pinnipeds, or whales will be struck by a falling anchor. Therefore, we conclude that effects from vessel anchoring are not likely to adversely affect ESA-listed species and will not be analyzed further in this consultation.

6.1.2 Noise

Hearing in Fish, Sea Turtles, and Marine Mammals

Sound can affect listed species in a number of ways. Loud enough sounds can cause behavioral responses or physical injury. Anthropogenic noise can produce sounds that mask communication between individuals, and even effect navigation and feeding. Sound is generated by the following components of this program: vessel operation, navigational instruments, gunnery training, and the use of aircraft. The OPCs are large vessels producing low frequency sound at approximately 190 dB (re 1 µPa @ 1m) between 20 to 300 Hz. Navigational equipment associated with the program produces a frequency range of about 3.5–1000 kHz. Gunnery noise in air would range in frequency from 150 Hz to 2.5 kHz (with a peak from 0.90–1.5 kHz) and a source level of 139–161 dB re 20 µPa at 50 ft (15 m) (Hood et al. 2012; Luz 1983; Ylikoski et al. 1995). Helicopters produce low frequency sound but are also generally operated at altitudes above water, reducing the amount of sound detectable within water. An alternative to helicopters, UAS, produce less noise than helicopters. Burgess and Greene (1998) reported that noise from a surrogate test for Nulka testing measured 145 dB re 20 µPa at 50 ft (15 m).

Helicopters will operate at an altitude of 1,500 ft or more when conducting transfers and mission support. Helicopters will fly at altitudes of 500 to 1,000 ft during vertical replenishments, though the route selected will attempt to avoid protected areas, critical habitat, haulouts, rookeries, and other areas where marine mammals may congregate. Helicopter flights will also adhere to altitudes of 2,000 ft over sensitive habitats and 3,000 ft over rookeries or haulouts. Helicopters are expected to operate in the immediate vicinity of an OPC during deck landing qualifications. Sound in air is refracted upon transmission into water because sound waves move faster through water than through air (a ratio of about 0.23:1). Based on this difference, the direct sound path is reflected if the sound reaches the surface at an angle more than 13 degrees from vertical. As a result, most of the acoustic energy transmitted into the water from an aircraft arrives through a relatively narrow cone extending vertically downward from the aircraft.

There are a number of ESA-listed fish in the action area. Many of them are pelagic, though some are benthic and would only be exposed to sound levels above ambient in shallow environments. The ESA-listed fish considered in this consultation are: Pacific salmonids, Atlantic salmon, Atlantic sturgeon, Gulf sturgeon, shortnose sturgeon, green sturgeon, smalltooth sawfish [U.S. and Non-U.S. portion of range DPS], bocaccio, Pacific eulachon, yelloweyey rockfish, Nassau grouper, giant manta ray, oceanic whitetip sharks, scalloped hammerhead sharks, and daggernose sharks. These fish species are not considered hearing specialists.

Fish can hear sounds between 50 and 1,000 Hertz (Hz; Casper 2006, Mickle and Higgs 2022). The frequency range of most sounds generated by this program are outside the hearing range of ESA-listed fish in the action area so most noise is not expected to affect ESA-listed fish in the action area. However, the low frequency sounds produced by OPCs and aircraft can be detected by fish. ESA-listed sea turtles (green, loggerhead, leatherback, Kemp’s ridley, olive ridley, and hawksbill sea turtles) in the action area hear best between 100 to 400 Hz. Therefore, like fish, most noise generated by this program will be outside of their hearing range. The low frequency sounds produced by OPCs and aircraft can be detected by sea turtles. Because aircraft are operating above the water and the way in which sound waves transition from air to water, the sound exposure of aircraft noise would be a narrow cone immediately beneath the aircraft. Noise generated by aircraft are not generated in the same place for prolonged periods of time.

The temporary movement of aircraft and other sound-producing equipment through operation areas would not likely result in prolonged exposures or the exclusion of individuals from feeding, breeding, or sheltering habitat. Similarly, the temporary effects from these noise sources may briefly mask fish communication, but there would be no long-term effects once the noise sources pass. We do not expect ESA-listed fish or sea turtles to respond to noise generated by this program in ways that would disrupt normal behavior patterns including breeding, feeding, or sheltering in any measurable way. Therefore, we believe the effects of noise on ESA-listed fish and sea turtles in the action area will be insignificant and thus not likely to adversely affect these animals.

ESA-listed mammals are much more sensitive to the stressor of noise generated by this program than either ESA-listed fish or sea turtles. Marine mammals are composed of 5 different groups of animals with specific hearing frequency ranges. The hearing ranges for each of these groups roughly overlaps from low frequency ranges at levels fish and sea turtles are capable of hearing but also encompassing various levels of high frequency sound. The low frequency sound produced by the OPCs is at the very lower threshold of hearing for the high frequency cetaceans, but they should be able to hear the sound produced.

Numerous studies of interactions between surface vessels and marine mammals have demonstrated that free-ranging marine mammals engage in avoidance behavior when surface vessels move toward them. Several authors suggest that the noise generated during motion is probably an important factor (Evans et al. 1992b, Blane and Jaakson 1994a, Evans et al. 1994b). Studies suggest that the behavioral responses of marine mammals to surface vessels are similar to their behavioral responses to predators. Most of the investigations reported that animals tended to reduce their visibility at the water's surface and move horizontally away from the source of disturbance or adopt erratic swimming strategies (Corkeron 1995a, Nowacek et al. 2001, Van Parijs and Corkeron 2001, Williams et al. 2002a, Williams et al. 2002b, Lusseau 2003, 2004, Lundquist et al. 2012). In the process, their dive times increased, vocalizations and surface-active behaviors were reduced (with the exception of beaked whales), individuals in groups moved closer together, swimming speeds increased, and their direction of travel took them away from the source of disturbance (Edds and Macfarlane 1987, Baker and Herman 1989, Kruse 1991, Evans et al. 1992b). Some individuals also dove and remained motionless, waiting until the vessel moved past their location. Most animals finding themselves in confined spaces, such as shallow bays, during vessel approaches tended to move towards more open, deeper waters (Kruse 1991). Richardson et al. (1985) reported that bowhead whales (*Balaena mysticetus*) swam in the opposite direction of approaching seismic vessels at distances between 1 and 4 km and engaged in evasive behavior at distances under 1 km.

Although many studies focus on small cetaceans (for example, bottlenose dolphins, spinner dolphins, spotted dolphins, harbor porpoises, beluga whales, and killer whales), studies of large whales have reported similar results for fin and sperm whales (David 2002). Fin whales also responded to vessels at a distance of about 1 km (Edds and Macfarlane 1987). Fin whales may alter their swimming patterns by increasing speed and heading away from a vessel, as well as changing their breathing patterns in response to a vessel approach (Jahoda et al. 2003). Vessels that remain 328 ft. (100 m) or farther from fin and humpback whales were largely ignored in one study where whale-watching activities are common (Watkins 1981). Only when vessels approached more closely did the fin whales in this study alter their behavior by increasing time at the surface and exhibiting avoidance behaviors. Other studies have shown when vessels are near, some but not all fin whales change their vocalizations, surface time, swimming speed, swimming angle or direction, respiration rates, dive times, feeding behavior, and social interactions (Au and Green 2000, Williams et al. 2002b, Richter et al. 2003b, Castellote et al. 2012). Sperm whales generally react only to vessels approaching within several hundred meters; however, some individuals may display avoidance behavior, such as quick diving (Wursig et al. 1998a, Magalhaes et al. 2002). One study showed that after diving, sperm whales showed a reduced timeframe from when they emitted the first click than before vessel interaction (Richter et al. 2006).

Based on passive acoustic recordings and in the presence of sounds from passing vessels, Melcon et al. (2012) reported that blue whales had an increased likelihood of producing certain types of calls. In the presence of approaching vessels, blue whales perform shallower dives accompanied by more frequent surfacing, but otherwise do not exhibit strong reactions (Calambokidis et al. 2009). Castellote et al. (2012) demonstrated that fin whales' songs had shortened duration and decreased bandwidth, center frequency, and peak frequency in the presence of high shipping noise levels. It is not known if these changes in vocal behavior corresponded to other behaviors.

In a study by Watkins (1981), humpback whales did not exhibit any avoidance behavior but did react to vessel presence. In a study of regional vessel traffic, Baker et al. (1983) found that when vessels were in the area, the respiration patterns of the humpback whales changed. The whales also exhibited two forms of behavioral avoidance: horizontal avoidance (changing direction or speed) when vessels were between 1.24 and 2.48 mi. (2,000 and 4,000 m) away, and vertical avoidance (increased dive times and change in diving pattern) when vessels were within approximately 1.2 mi (2,000 m; Baker and Herman 1983). Similar findings were documented for humpback whales when approached by whale watch vessels in Hawaii (Au and Green 2000). A study of humpback whales in the Western North Atlantic found slower descent rates and fewer side-roll feeding events per dive were associated with increased vessel noise (Blair et al. 2016a). Gende et al. (2011) reported on observations of humpback whales in inland waters of Southeast Alaska subjected to frequent cruise ship transits (i.e., in excess of 400 transits in a 4-month season in 2009). The study was focused on determining if close encounter distance was a function of vessel speed. The reported observations seem in conflict with other reports of avoidance at much greater distance so it may be that humpback whales in those waters are more tolerant of vessels (given their frequency) or are engaged in behaviors, such as feeding, that they are less willing to abandon. Saez et al. (2021) found that humpback whales in a high vessel traffic area near Juneau, Alaska did not exhibit elevated stress hormones compared to humpback whales in more remote areas, also suggesting a possible habituation. However, a lack of behavioral or stress response does not negate other effects of anthropogenic sound exposure.

Sei whales have been observed ignoring the presence of vessels and passing close to them (NMFS 1993). North Atlantic right whales tend not to respond to the sounds of oncoming vessels (Nowacek et al. 2004) and therefore might provide insight into behavioral responses of other baleen whales. North Atlantic right whales continue to use habitats in high vessel traffic areas (Nowacek et al. 2004). Studies showed that North Atlantic right whales demonstrate little if any visible reaction to sounds of vessels approaching or the presence of the vessels themselves (Terhune and Verboom 1999, Nowacek et al. 2004). However, reduced ship traffic in the Bay of Fundy, Canada that led to a 6 dB decrease in underwater noise with a significant reduction below 150 Hz was associated with decreased baseline levels of stress-related faecal hormone metabolites in North Atlantic right whales (Rolland et al. 2012). This suggests that exposure to low-frequency ship noise may be associated with chronic stress in whales with implications for all baleen whales in heavy ship traffic areas.

Killer whales, the largest of the delphinids, are targeted by numerous small whale-watching vessels in the Pacific Northwest. For the 2012 season, it was reported that 1,590 vessel incidents were possible violations of the Federal vessel approach regulations or MMPA and ESA laws as well (Eisenhardt 2013). Research suggests that whale-watching distances may be insufficient to prevent behavioral disturbances due to vessel noise (Noren et al. 2009). The effects of vessel activity is one of the three main threats to the survival of this population. As such, whale-watching activities, and specifically, viewing distances, are currently being reviewed and revised. The Southern Resident Orca Task Force published recommendations related to decreasing disturbance of and risk to Southern Resident killer whales from vessels such as "go-slow" requirements within half a nm of the animals, a limited-entry whale-watching permit system, recreational boater education, and improving enforcement (https://www.governor.wa.gov/sites/default/files/OrcaTaskForce_FinalReportandRecommendations_11.07.19.pdf).

Noise associated with components of this program will also produce sound in the air (gunnery training, Nulka decoy testing, helicopters, and the impact of non-explosive practice munitions). These sounds sources would be localized to training areas within designated offshore areas that the USCG has coordinated with NOAA and the FAA, or within an established Navy range. Gunnery noise would be generated for a few days each year. Aircraft noise may be generated for up to 20 days during a patrol. In the Arctic, a helicopter or UAS will be used to perform ice reconnaissance twice per year for two hours. These aerial sounds may be detected underwater. Any underwater sounds from these actions will be strongest just below the surface and directly under the source. Any sound that enters the water only does so within a narrow cone below the source (Richardson et al. 1995c, Eller and Cavanaugh 2000). These operational sound sources have specific characteristics, such as short duration or pulse length, narrow beam width, downward-directed beam, and low energy release, or manner of system operation, which minimize effects to ESA-listed species.

If any animals are present, they may react to sound in the air by avoiding the area but any avoidance behavior is expected to be minor and temporary as these exercises will be of short duration (2-3 hours). Because of the movement of sound waves from the air to water, a marine mammal would have to be surfacing in order for disturbance from aerial noise to be detectable to the animal (USCG 2017). The USCG requires that a lookout be on duty during gunnery actions in order to ensure disturbance of marine mammals does not occur. However, because of the transient nature of the sound generated in the air, the relatively small area of ensonification in the water, and the PDCs established to address aerial noise, we believe the effects on all 5 hearing groups of ESA-listed marine mammals in the operation areas (Table 6) will be insignificant and thus not likely to adversely affect these species. The Nulka testing would be a one-time event only involving the lead OPC in a Navy testing range producing sound levels well below those known to cause responses in marine mammals. Therefore, the effects from Nulka testing are expected to be immeasurable, and that program component is not likely to adversely affect any of the 5 hearing groups of marine mammals because the effects will be insignificant.

Unlike ESA-listed sea turtles and fish, all marine mammals in the action area are likely to detect a range of sounds from those produced by the action, including acoustic signals from navigational equipment and motor noise from small vessels. Based on accepted sound levels defined as de minimus (Navy 2018), any in-water active acoustic source with narrow beam widths, downward-directed transmissions, short pulse lengths, frequencies outside known hearing ranges, low source levels, or a combination of any of these factors are not expected to result in adverse effects. Although the frequency range of navigational equipment (50 to 200 kHz) does overlap with the hearing range of mid and high-frequency cetaceans and true seals underwater, these animals are expected to exhibit no more than short-term, minor responses to navigation equipment due to their characteristics of having narrow beam widths and downward-directed beams focused below the vessel. Therefore, we believe the effects of noise from the operation of navigational equipment as part of the action will be insignificant and not likely to adversely affect the ESA-listed marine mammals in the action area.

For designated and proposed critical habitat that includes prey-based PBFs, such as the presence of copepods or other prey items used by ESA-listed species, the noise from the operation of vessels and navigation equipment is not expected to cause a detectable difference in the ambient noise in the environment. Any disturbance of prey species associated with an OPC transiting through an area of proposed or designated critical habitat would be temporary and is not expected to alter the function of the essential features. We believe the effects of noise from vessel movement and navigation equipment on designated critical habitat in the action area are extremely unlikely to occur or insignificant and therefore not likely to adversely affect these critical habitats.

6.1.3 **Pollution**

Ship husbandry, hull cleaning and repair of the vessel as part of vessel maintenance would occur while the new OPCs are in port. The USCG has SOPs in place to minimize the release of materials into water bodies, except in accordance with regulations. Other discharges into waters surrounding the OPCs include accidental spills and lubricants and other petroleum products from motors. Water quality in many of the ports is affected by industrial and urban land use in heavily developeded areas. Any discharges resulting from infrequent activities associated with OPC maintenance, operation, and personnel training will not be separable from background conditions in the area. In addition, SOPs and regulations requiring that discharges to waters be minimized, including required spill response plans and equipment, will prevent large releases of contaminants.

Fueling underway is an activity that involves an OPC and a fuel vessel, both of which remain stationary, with fuel lines connecting the vessels in order refuel the OPC. This type of refueling is expected to occur once every two years and requires a few hours to complete. Accidental spills while refueling could affect ESA-listed species in the operation areas, though the requirement that vessels have spill plans and equipment to quickly respond to and clean up spills will minimize the potential effects of accidental spills. The equipment used for fueling underway is specialized to minimize spills and shipboard measures to reduce the probability of spills are part of standard operations; therefore, effects to ESA-listed species will be immeasurable or insignificiant. Thus, we conclude that effects from fueling underway is not likely to adversely affect ESA-listed resources.

In the event that a leak should occur, the amount of fuel or oil onboard is unlikely to cause widespread, high-dose contamination (excluding the remote possibility of severe damage to the vessel) that will impact ESA-listed species directly or pose hazards to their food sources. Because oil or fuel leakage is extremely unlikely to occur, we find that the risk from this potential stressor on ESA-listed species in the action area is discountable. Therefore, we conclude that pollution by oil or fuel leakage from vessels is not likely to adversely affect ESA-listed species.

USCG implements PDCs for vessel lighting that darken the ship, with the exception of the necessary navigation lights. PDCs will minimize potential effects of lighting to ESA-listed resources such that any effects would be immeasurable or insignificant. Thus, we conclude that effects from vessel lighting are not likely to adversely affect ESA-listed resources.

6.1.4 **Physical Disturbance from Military Expended Materials**

Gunnery training will occur twice per year for one hour using non-explosive rounds fired from gun mounts at various targets. Several different types of targets may be used for gunnery training. Every 18–24 months, the USCG conducts training with air sleeves (targets towed behind aircraft) to simulate incoming missiles. In rare circumstances, rounds may also be fired at robot go-fast boats and/or a “killer tomato” target, a 10 ft (3 m) diameter red balloon, which will be retrieved following training, when feasible. OTH boats may be used to deploy or retrieve targets in support of gunnery training. Gunnery training will result in marine debris in the form of spent practice rounds and target fragments. Projectiles will fall on soft or hard bottom habitats where they could be buried in sediment or sit on the bottom. Projectiles will be fired at surface targets, which will absorb most of the energy from firing before projectiles strike the water and sink, limiting the possibility of high-velocity impacts with any ESA-listed species present at or near the water surface. Non-explosive, inert rounds (three or four events per year with hundreds of rounds fired during each 2-3 hour training event) could enter the water. While disturbance or strike from rounds or targets is possible, it is not very likely because these items sink through the water column slowly, meaning animals can see and avoid them. Animals may mistake expended materials for food, particularly in the case of small items, or incidentally ingest materials along with prey while foraging, in the case of targets. Small caliber projectiles could be ingested by some fish species as they move downward through the water column and settle on the bottom, depending on the feeding habitats of the fish. Small metal items like hooks, bottle caps, and springs have been reported as eaten by marine fish, posing physical and toxicological risks (Davison and Asch 2011, Possatto et al. 2011, Dantas et al. 2012). There has never been a reported or recorded instance of a marine mammal or sea turtle entangled in military expended materials or of ingestion of these materials (NMFS 2015a, 2018a). Because one target will be used during each training event and the USCG will attempt to recover targets, in addition to using lookouts to ensure training activities do not interfere with marine mammals and sea turtles, we believe the effects of expended gunnery training materials on ESA-listed marine mammals, fish and sea turtles in operation areas (Table 6) will be extremely unlikely to occur and thus discountable. Therefore, effects from these materials may affect, but are not likely to adversely affect these ESA-listed species.

The use of MEM (e.g., during gunnery training), when adhering to the PDCs, will typically only occur on military ranges and, if not, USCG is required to request a consistency review of the planned activities. These activities are expected to occur 3-4 times per year for 2-3 hour periods. These exercises will not be conducted over ESA-listed coral habitats. In the case of the one-time Nulka decoy test, the USCG will notify the appropriate NMFS regional office prior to the test. It is extremely unlikely that a one-time Nulka decoy test on a military range would affect ESA-listed species, hence effects from this activity are discountable. The infrequent occurrence and short duration of gunnery training exercises, and small size of these munitions, in addition to the existing PDCs for gunnery training and vessel operations will minimize potential effects to ESA-listed resources such that any effects would be immeasurable or insignificant. Thus, we conclude that physical disturbance from MEM is not likely to adversely affect ESA-listed resources.

6.1.5 **Entanglement**

Gunnery training targets have a greater potential for disturbance of ESA-listed species due to the possibility for entanglement (if lines are on the target) and ingestion of fragments. Entanglement can result in death or injury of marine mammals and sea turtles (Hanni and Pyle 2000; Moore et al. 2009; Van Der Hoop et al. 2012), as well as fish. Entanglement of fish is more likely when materials form loops or incorporate rings, which is why discarded fishing gear often results in entanglement (Laist 1987, Derraik 2002, Macfadyen et al. 2009, Keller et al. 2010). Physical features such as the snouts of sawfish and sturgeon increase the risk of entanglement. Small metal items like hooks, bottle caps, and springs have been reported as eaten by marine fish, posing physical and toxicological risks (Davison and Asch 2011, Possatto et al. 2011, Dantas et al. 2012). The expected densities of ESA-listed fish species versus the small number of training events and targets that could be released into the water column and the large habitat area used by ESA-listed fish species in the operation areas make it unlikely that these species will encounter expended materials such as targets generated from the gunnery training. We believe the effects of expended gunnery training materials on ESA-listed fish in the operation areas (Table 6) will be extremely unlikely to occur and thus discountable. Therefore these effects are not likely to adversely affect these animals.

OPC training activities will comprise a variety of activities such as while the OPC is stationary and a small boat operates at three knots to deploy a boom around the vessel to practice containment of a spill or SAR training. This training will take place twice per year and last three to five hours. There will be a lookout on the vessel to ensure animals are not trapped or become entangled in the boom. Given the size of ESA-listed species likely to be entangled, animals will be seen by the lookout prior to any deployment of equipment or if animals surface within the area of the boom. The small vessel can recover the boom quickly to allow the animal to swim away. Therefore, we believe the effects of environmental response training on ESA-listed species within the operation areas (Table 6) will be extremely unlikely to occur and thus discountable and not likely to result in adverse effects to these animals.

In the case of the activities to be conducted by the OPCs, vessel escort and tow have the potential to result in entanglement or entrapment of ESA-listed species while lines or cables are slack, as can SAR or emergency response training, particularly when gear such as booms are deployed. For equipment to result in entanglement, it must be long enough to wrap around the appendages of marine animals. Another critical factor is rigidity; the item must be flexible enough to wrap around appendages or bodies. If emergency response gear used during emergency response training is properly deployed and taut, there should be no concern of entanglement. Further, because emergency response training would be a short duration exercise, the entanglement in momentarily placed gear would be extremely unlikely to occur. While an OPC line might be slack in the water for a few moments while initiating a tow, it is not expected to be in the water for a duration of time that would allow for an entanglement. Because the possibility for entanglement is extremely unlikely to occur, we find that the risk from this potential stressor on ESA-listed species in the action area is discountable. Thus, we conclude that entanglement as a result of vessel escort and tow or SAR and emergency training is not likely to adversely affect ESA-listed species.

6.2 Species and Critical Habitat Not Likely to be Adversely Affected

In this section, we evaluate effects to ESA-listed species that may be affected and proposed or designated critical habitat that may be affected, but are not likely to be adversely affected, by the action. For these ESA-listed species and critical habitat, we focus specifically on stressors associated with the USCG OPC actions and their effects on these ESA-listed species and critical habitat. The effects of other stressors associated with the actions, which are not likely to adversely affect ESA-listed species, were evaluated in Section 6.1. The species and critical habitat potentially occurring within the action area that may be affected, but are not likely to be adversely affected, are listed in Table 7, and summary of our determinations is in the text that follows.

Table 7. Endangered Species Act-listed threatened and endangered species and proposed or designated critical habitat potentially occurring in the action area (specific areas for a species are displayed in the right column) that may be affected, but are not likely to be adversely affected.

Species	Critical Habitat	Action Area[1]
Marine Mammals		
Bowhead Whale (*Balaena mysticetus*)	-- --	AK

Species	Critical Habitat	Action Area[1]
Rice's Whale (*Balaenoptera ricei*)	-- --	GOM
Gray Whale (*Eschrichtius robustus*) – Western North Pacific DPS	-- --	HI-PAC; NEPACN
North Pacific Right Whale (*Eubalaena japonica*)	73 FR 19000	HI-PAC; NEPACN; NEPACS; AK
North Atlantic Right Whale (*Eubalaena glacialis*)	81 FR 4837	NWATL; ATL-FL-CAR; GOM
False Killer Whale (*Pseudorca crassidens*) - Main Hawaiian Islands Insular DPS	83 FR 35062	HI-PAC
Killer Whale (*Orcinus orca*) - Southern Resident DPS	71 FR 69054 86 FR 41668	NEPACN
Pinnipeds		
Ringed Seal (*Phoca hispida hispida*) – Arctic Subspecies	87 FR 19232 (Final)	AK
Bearded Seal (*Erignathus barbatus*) – Beringia DPS	87 FR 19180 (Final)	AK
Guadalupe Fur Seal (*Arctocephalus townsendi*)	-- --	NEPACN; NEPACS
Hawaiian Monk Seal (*Neomonachus schauinslandi*)	80 FR 50925	HI-PAC
Spotted Seal (*Phoca largha*) – Southern DPS	-- --	AK
Steller Sea Lion (*Eumetopias jubatus*) – Western DPS	58 FR 45269	AK
Turtles		
Green (*Chelonia mydas*) – North Atlantic, South Atlantic, East Indian-West Pacific Ocean, Central North Pacific Ocean, Central South Pacific Ocean, and East Pacific Ocean DPSs	63 FR 46693 (North Atlantic DPS only)	HI-PAC; NEPACN; NEPACS; GOM; NWATL; ATL-FL-CAR
Loggerhead (*Caretta caretta*) – North Pacific Ocean, South Pacific Ocean, and Northwest Atlantic Ocean DPSs	79 FR 39855 (Northwest Atlantic Ocean DPS only)	HI-PAC; NEPACN; NEPACS; GOM; NWATL; ATL-FL-CAR

Species	Critical Habitat	Action Area[1]
Leatherback (*Dermochelys coriacea*)	44 FR 17710 and 77 FR 4170	HI-PAC; NEPACN; NEPACS; GOM; NWATL; ATL-FL-CAR
Kemp's Ridley (*Lepidochelys kempii*)	-- --	GOM; NWATL; ATL-FL-CAR
Olive Ridley (*Lepidochelys olivacea*) – Mexico's Pacific Coast Breeding Populations, All Other Populations	-- --	HI-PAC; NEPACN; NEPACS; ATL-FL-CAR
Hawksbill Turtle (*Eretmochelys imbricata)*	63 FR 46693	HI-PAC; NEPACN; NEPACS; GOM; NWATL; ATL-FL-CAR
Fishes		
Shortnose sturgeon (*Acipenser brevirostrum*)	-- --	NWATL; ATL-FL-CAR
Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) – Chesapeake Bay, Carolina, South Atlantic, New York Bight and Gulf of Maine DPSsDPSs	82 FR 39160	NWATL
Green Sturgeon (*Acipenser medirostris*) – Southern DPS	74 FR 52300	NEPACN; NEPACS;
Gulf Sturgeon (*Acipenser oxyrinchus desotoi*)	68 FR 13370	GOM
Bocaccio (*Sebastes paucispinis*) – Puget Sound DPS	79 FR 68041	NEPACN; NEPACS;
Altantic Salmon (*Salmo salar*)– Gulf of Maine DPS	74 FR 39903	
Chinook Salmon (*Oncorhynchus tshawytscha*) – Sacramento River Winter-Run, Upper Columbia River Spring-Run, Snake River Spring/Summer-Run, Snake River Fall-Run, Central Valley Spring-Run, California Coast, Puget Sound, Lower Columbia River, and Upper Willamette River Evolutionary Significant Units (ESUs)	Sacramento River Winter-Run - 58 FR 33212 Upper Columbia River Spring-Run and Upper Willamette River - 70 FR 52629 Snake River Spring/Summer-Run - 64 FR 57399 Snake River Fall-Run - 58 FR 68543	NEPACN; NEPACS;

Species	Critical Habitat	Action Area[1]
	Central Valley Spring-Run and California Coast - 70 FR 52488 Puget Sound and Lower Columbia River - 70 FR 52629	
Chum Salmon (*Oncorhynchus keta*) – Hood Summer-Run and Columbia River ESUs	70 FR 52629	NEPACN; NEPACS;
Coho Salmon (*Oncorhynchus kisutch*) – Central California Coast, Southern Oregon/Northern California Coasts, Lower Columbia River, and Oregon Coast ESUs	Central California Coast, Southern Oregon/Northern California Coasts - 64 FR 24049 Lower Columbia River - 81 FR 9251 Oregon Coast - 73 FR 7816	NEPACN; NEPACS;
Sockeye Salmon (*Oncorhynchus nerka*) – Snake River and Ozette Lake ESUs	Snake River - 58 FR 68543 Ozette Lake - 70 FR 52630	NEPACN; NEPACS;
Pacific Eulachon (*Thaleichthys pacificus*) – Southern DPS	76 FR 65323	NEPACN; NEPACS;
Steelhead Trout (*Oncorhynchus mykiss*) – Southern California, Upper Columbia River, Snake River Basin, Middle Columbia River, Lower Columbia River, Upper Willamette River, South-Central California Coast, Central California Coast, Northern California, California Central Valley, and Puget Sound DPSs	Southern California, South-Central California Coast, Central California Coast, Northern California, California Central Valley - 70 FR 52487 Upper Columbia River, Snake River Basin, Middle Columbia River, Lower Columbia River,	NEPACN; NEPACS;

Species	Critical Habitat	Action Area[1]
	Upper Willamette River - 70 FR 52629 Puget Sound - 81 FR 9251	
Yelloweye Rockfish (*Sebastes ruberrimus*)	79 FR 68041	NEPACN; NEPACS;
Nassau Grouper (*Epinephelus striatus*)	87 FR 62930	ATL-FL-CAR
Giant Manta Ray (*Manta birostris*)	-- --	-- --
Oceanic Whitetip Shark (*Carcharhinus longimanus*)	-- --	-- --
Scalloped Hammerhead Shark (*Sphyrna lewini*) – Central and Southwest Atlantic, Eastern Pacific, Indo-West Pacific DPSs	-- --	-- --
Daggernose Shark (*Isogomphodon oxyrhynchus*	-- --	ATL-FL-CAR
Smalltooth Sawfish (*Pristis pectinata)* – U.S. and Non-U.S. portion of range DPS	74 FR 45353	ATL-FL-CAR; GOM
Invertebrates		
Elkhorn Coral (*Acropora palmata*)	73 FR 72210	ATL-FL-CAR
Staghorn Coral (*Acropora cervicornis*)	73 FR 72210	ATL-FL-CAR
Lobed Star Coral (*Orbicella annularis*)	-- --	ATL-FL-CAR
Boulder Star Coral (*Orbicella franksi*)	-- --	ATL-FL-CAR
Mountainous Star Coral (*Orbicella faveolata*)	-- --	ATL-FL-CAR
Pillar Coral (*Dendrogyra cylindrus*)	-- --	ATL-FL-CAR
Rough Cactus Coral (*Mycetophyllia ferox*)	85 FR 76262 (Proposed)	ATL-FL-CAR
Acropora globiceps	85 FR 76262 (Proposed)	-- --
Acropora jacquelineae	85 FR 76262 (Proposed)	-- --
Acropora lokani	-- --	-- --
Acropora retusa	85 FR 76262 (Proposed)	-- --

Species		
Acropora speciosa	85 FR 76262 (Proposed)	-- --
Euphyllia paradivisa	85 FR 76262 (Proposed)	-- --
Isopora crateriformis	85 FR 76262 (Proposed)	-- --
Seriatopora aculeata	85 FR 76262 (Proposed)	-- --
Black Abalone (*Haliotis cracherodii*)	76 FR 66805	-- --
White Abalone (*Haliotis sorenseni*)	-- --	73 FR 62257
Chambered Nautilus (*Nautilus pompilius*)	-- --	-- --

[1]Action area abbreviations: AK, Alaska; HI-PAC, Hawaii-Pacific; NEPACN, Northeast Pacific North; NEPACS, Northeast Pacific South; GOM, Gulf of Mexico; NWATL, Northwest Atlantic; ATL-FL-CAR, Northwest Atlantic, Florida and Caribbean

Populations for some species and DPSs are generally delineated by ocean basins based on discrete differences in genetic structure and limited transoceanic migrations of the species. Unless otherwise noted, the information presented below was obtained from status review reports and other ESA-listing documents.

6.2.1 Endangered Species Act-Listed Pinnipeds

ESA-listed pinnipeds (Arctic ringed, bearded [Beringia DPS], Guadalupe fur, Hawaiian monk, and spotted seal, and Steller sea lion) may occur in the action area.

Pinnipeds are known to inhabit coastal waters. Most of the activities expected under the action are expected to occur offshore and hence have a low likelihood of interacting with ESA-listed pinnipeds. We generally expect pinnipeds to move away from or parallel to vessels, to avoid being struck. There are no historical data suggesting that a USCG vessel has struck a pinniped. Considering the very low density of animals that may be present in the offshore action area, the fact that the vessels will typically be traveling at slower speeds should an ESA-listed pinniped be observed, that seals and sea lions are highly maneuverable, and none of the vessels will resemble a predator that they are trying to evade, we conclude that vessel strike is extremely unlikely and that the normal activities of seals and sea lions will not be measurably disrupted by vessel activity. Small vessels and OPCs have lookouts dedicated to searching for animals in the water to minimize the potential for disturbance of animals during activities such as training exercises and vessel collisions. Adherence to observation and avoidance procedures (PDCs, Section 3.3.1) is expected to avoid vessel strikes. All factors considered, we have concluded the potential for vessel strike from an OPC on ESA-listed pinnipeds is extremely unlikely to occur.

Therefore, the potential effect of OPC activities on ESA-listed pinnipeds is discountable, and we conclude that the OPC action is not likely to adversely affect ESA-listed pinnipeds (Arctic ringed, Beringia bearded, Guadalupe fur, Hawaiian monk, and Southern spotted seal, and Western Steller sea lion).

6.2.2 Endangered Species Act-Listed Sea Turtles

ESA-listed sea turtles (Kemp's ridley, olive ridley [Mexico's Pacific Coast Breeding Populations, All Other Populations], green [North Atlantic, South Atlantic, East Indian-West Pacific Ocean, Central North Pacific Ocean, Central South Pacific Ocean, and East Pacific Ocean DPSs], loggerhead [North Pacific Ocean, South Pacific Ocean, and Northwest Atlantic Ocean DPSs], hawksbill, and leatherback turtles) may occur in the action area.

Leatherback sea turtles are wide-ranging and cold-tolerant with non-breeding turtles seen at high latitudes. McAlpine et al. (2004) suggested that the occurrence of leatherbacks off British Columbia, which is most frequent from July to September, indicates the species is an uncommon seasonal resident of the area. The occurrence of leatherback sea turtles in Alaska waters suggests that they are ranging into marginal habitat (Hodge and Wing 2000). Because of the infrequent occurrence of leatherback sea turtles in the Alaska operation area, exposure to stressors resulting from the activities that will be carried out in that operation area by the new OPCs and associated small vessels, AUVs, helicopters, and UASs, will be extremely unlikely to occur and therefore discountable. Thus, activities in the Alaska operation area associated with the action are not likely to adversely affect leatherback sea turtles.

Sea turtles are known to be affected by vessel strikes. In offshore waters, larger turtles would be at risk, especially leatherback turtles. We do not have recent or robust density estimates available for sea turtles offshore where the majority of the action will occur. However, we expect that turtles occurring offshore would likely be solitary and sparsely distributed with the exception of juvenile turtles associated with floating Sargassum mats. The majority of the world's oceans have not been surveyed in a manner that supports quantifiable density estimation of sea turtles. The Navy modeling for Phase III training and testing activities uses extrapolated densities for determining effects of acoustic stressors on marine mammals and sea turtles. These density models include a high degree of uncertainty that would not be appropriate for estimating risk of injury or mortality associated with offshore vessel strike risk (cooccurence of vessel and species, combined with the probability that the vessel track would overlap with an individual turtle). In general, areas (e.g., nearshore) where vessel traffic is high would have an increased strike risk for turtles (Santos et al. 2018).

There is a general lack of quantitative information on vessel traffic and use trends, particularly for offshore waters. Qualitatively, the OPC fleet would make up a very small proportion of total vessels that would be travelling offshore (Figure 13 and Figure 14). When considering the relevant proportion of OPCs to the majority of offshore vessel traffic, and the uncertainty associated with sea turtle density estimates for offshore areas, we expect that the likelihood of a vessel strike to sea turtles because of the action is extremely unlikely to occur. Further, USCG will apply PDCs (Section 3.3.1) to keep vigilant watch for ESA-listed sea turtles, and the larger individuals (e.g., leatherback) expected to be in deeper offshore waters are visible when they are floating at the surface and can be avoided. USCG OPCs will also be avoiding patches of Sargassum that juvenile sea turtles are known to inhabit. There are no historical data to suggest that a USCG vessel has struck a sea turtle.

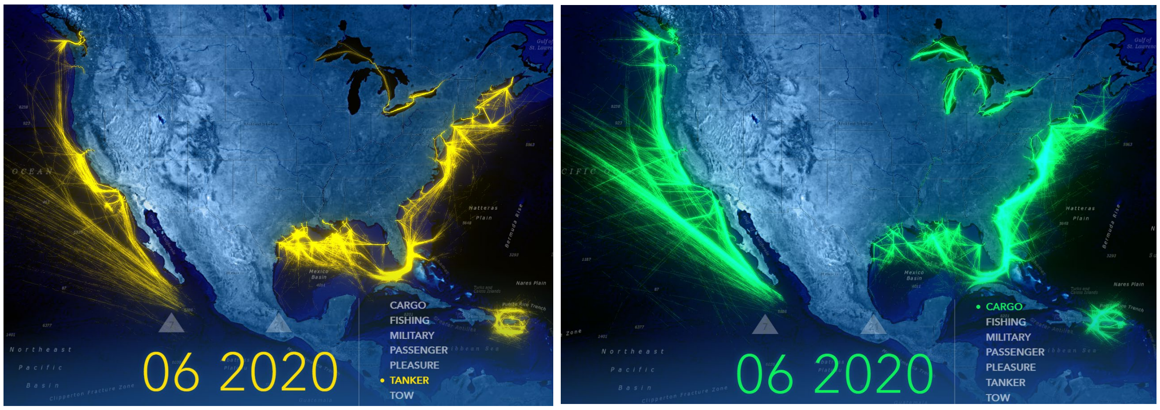


Figure 14. Tanker and Cargo vessel traffic from June 2020. Source: https://livingatlas.arcgis.com/vessel-traffic/

Figure 15. Vessel traffic on September 22, 2022 from https://www.marinetraffic.com/en/ais/home/.

We consider effects on sea turtles from vessel traffic associated with the action discountable. While vessel traffic does have a documented effect on sea turtles, in the absence of evaluating the effects of vessel traffic from the USCG OPC fleet, it is unrealistic for any individual OPC to determine anything but discountable effects on these species. We conclude that OPC vessel traffic is not likely to adversely affect ESA-listed turtles.

6.2.3 Endangered Species Act-Listed Fish

ESA-listed elasmobranchs (giant manta ray, oceanic whitetip shark, scalloped hammerhead shark [Central and Southwest Atlantic, Eastern Pacific, Indo-West Pacific DPSs], daggernose shark, and smalltooth sawfish [U.S. and Non-U.S. portion of range DPS]) and other ESA-listed fish (shortnose sturgeon, Atlantic sturgeon [Gulf of Maine, Carolina, South Atlantic, New York Bight and South Atlantic DPSs], green sturgeon [Southern DPS], Gulf sturgeon, bocaccio [Puget Sound/Georgia Basin DPS], Atlantic salmon [Gulf of Maine DPS], Chinook Salmon [Sacramento River Winter-Run, Upper Columbia River Spring-Run, Snake River Spring/Summer-Run, Snake River Fall-Run, Central Valley Spring-Run, California Coast, Puget Sound, Lower Columbia River, and Upper Willamette River Evolutionary Significant Units (ESUs)], Chum salmon [Hood Summer-Run and Columbia River ESUs], Coho salmon [Central California Coast, Southern Oregon/Northern California Coasts, Lower Columbia River, and Oregon Coast ESUs], sockeye salmon [Snake River and Ozette Lake ESUs], Pacific eulachon [Southern DPS], steelhead trout [Southern California, Upper Columbia River, Snake River Basin, Middle Columbia River, Lower Columbia River, Upper Willamette River, South-Central California Coast, Central California Coast, Northern California, California Central Valley, and Puget Sound DPSs], yelloweye rockfish [Puget Sound/ Georgia Basic DPS], and Nassau grouper may occur in the action area.

ESA-listed salmonids may be present in the Pacific and Alaska operation areas as juveniles or adults after their spawning, egg development, and larval stages are completed in freshwater streams of Washington, Oregon, California, and/or Idaho, depending on the DPS or ESU. ESA-listed fish are not expected to be present close to the surface in offshore areas where the majority of activities will occur. If any ESA-listed fish species are present during activities in the operation areas as part of the action, the short-term temporary nature of the activities is not likely to result in significant disturbance and associated behavioral changes on the part of the fish. Vessel collisions with fish are also rare and typically reported in confined water bodies such as rivers where species like sturgeon occur. Sturgeon are at risk for vessel strike in shallow channels leading into ports, but USCG will abide by all speed restrictions within those areas. There are no historical data to suggest that a USCG vessel has struck a Gulf sturgeon. While giant manta rays are known to occur in all action areas, with the exception of Alaska, there is a paucity of density information for manta rays offshore. Mantas are oceanic and solitary, and are observed sporadically (NMFS 2017), though there are known aggregation locations. While vessel traffic does have a documented effect on giant manta ray, this species is sparse and irregularly observed, meaning that the likelihood of overlap of a manta ray with the track of an OPC would be highly unlikely so as to conclude anything but discountable effects on these species. Similarly, sharks may occur at the surface, but the likelihood of a shark being at the surface and co-occur with the vessel track of an OPC, is extremely low. Further, implementation of vessel operation and other relevant PDCs (e.g., keep vigilant watch for signs of ESA-listed species, such as mantas, to avoid vessel strike) will reduce potential strike risk to ESA-listed fish to a level that would not be meaningfully measurable. We consider effects on salmon, sturgeon, smalltooth sawfish (U.S. and Non-U.S. portion of range DPS), sharks, and the giant manta ray from vessel traffic associated with the proposed action insignificant and/or discountable. We conclude that the OPC programmatic action is not likely to adversely affect ESA-listed fish and elasmobranchs.

6.2.4 Endangered Species Act-Listed Marine Invertebrates

ESA-listed invertebrates (Corals: elkhorn, staghorn, lobed star, boulder star, mountainous star, pillar, rough cactus, *Acropora globiceps*, *A. jacquelineae*, *A. lokani*, *A. retusa*, *A. speciosa*, *Euphyllia paradivisa*, *Isopora crateriformis*, *Seriatopora aculeata*, and molluscs: black abalone, white abalone, and the cephalopod: chambered nautilus) may occur in the action area. Most of these are benthic species, with the exception of the chambered nautilus, and are extremely unlikely to be affected by the activities because there are SOPs in place, especially those regarding anchoring that reduce or avoid effects to these species. The chambered nautilus is typically a deeper water species, sometimes associated with steep wall drops. OPC proposed activities would be extremely unlikely to cause disturbance to this species. Therefore, the potential effects of OPC activities on ESA-listed invertebrates in the action area is discountable. We conclude that the OPC programmatic action is not likely to adversely affect ESA-listed invertebrates.

6.2.5 Endangered Species Act-Listed Whales

Bowhead, blue, false killer, fin, gray (Western North Pacific), humpback (Mexico, Central America and Western North Pacific), killer (Southern Resident), right (North Atlantic and North Pacific), Rice's, sei, and sperm whale occur in the action area. Vessel actions associated with the action could result in vessel strike of these large whales. However, based on the densities and locations of certain species of these whales in relation to the action components, and based on documented strandings resulting from vessel strike by a USCG vessel [NMFS' National Stranding Database (accessed October 1, 2022) and NMFS' Large Whale Strike database (accessed September 16, 2022)][8], some species are less likely to be struck than others.

Western North Pacific gray whales are not common in U.S. waters and are observed more frequently in waters off Russia, Korea, and Japan. To date, there have been no known USCG vessel strikes involving a Western North Pacific gray whale. Because of the extremely low numbers of Western North Pacific gray whales in U.S. waters and their rare occurrence in the Gulf of Alaska, Bering Sea, and Aleutian Islands, the potential for vessel strike resulting from the actions that will be carried out in the operation areas by the new OPCs, will be extremely unlikely to occur and therefore discountable. Thus, activities in the operation areas associated with the action are not likely to adversely affect Western North Pacific gray whales.

Southern Resident killer whales occupy different locations depending on the time of year. During the spring, summer, and fall they are found in the inland waterways of Washington State and the transboundary waters between the United States and Canada. In recent years, they have been spotted as far south as central California and as far north as Southeast Alaska during the winter months. Southern Resident killer whales are likely to be present in areas where OPCs are operating or transiting from their expected homeports on the U.S. Pacific coast. Vessel operation

[8] These data sources will be discussed in detail in Section 8.

mitigations described in Section 3.3.1 would minimize the potential likelihood for strike. To date, there have been no known USCG vessel strikes involving a Southern Resident killer whale. Because Southern Resident killer whales, especially the stocks with the highest vulnerability, are relatively rare in offshore waters, exposure to stressors resulting from the actions that will be carried out in the Pacific and Arctic operation areas by the new OPCs and associated small vessels, helicopters, and UASs, will be extremely unlikely to occur and therefore discountable. Thus, this action is not likely to adversely affect Southern Resident killer whales.

The North Pacific right whale inhabits the Pacific Ocean, particularly between 20 and 60 degrees latitude. Prior to exploitation by commercial whalers, concentrations of right whales in the North Pacific where found in the Gulf of Alaska, Aleutian Islands, south central Bering Sea, Sea of Okhotsk, and Sea of Japan. There is little recent sighting data of right whales in the central North Pacific and Bering Sea, with the exception of sightings in February 2022 (https://www.fisheries.noaa.gov/feature-story/new-photos-may-be-first-visual-evidence-north-pacific-right-whales-feeding-bering-sea). However, since 1996, North Pacific right whales have been consistently observed in Bristol Bay and the southeastern Bering Sea during summer months. Presently, sightings are extremely rare, occurring primarily in the Okhotsk Sea and the eastern Bering Sea (Brownell Jr. et al. 2001, Shelden et al. 2005, Wade et al. 2006, Zerbini et al. 2010). To date, there have been no known USCG vessel strikes involving a North Pacific right whale. Because North Pacific right whales, as one of the most endangered whale species, are relatively rare in the action area waters, the potential for vessel strike or effects from other stressors resulting from the activities that will be carried out in the Pacific and Arctic operation areas by the new OPCs and associated small vessels, helicopters, and UASs, will be extremely unlikely to occur and therefore discountable. Thus, this action is not likely to adversely affect North Pacific right whale.

North Atlantic right whale is found in coastal waters in the northwest Atlantic Ocean from Nova Scotia to Florida. While there have been three reported USCG strikes of right whales since 1991, two of those were in the early 1990s and one was in 2009, which was by a smaller sized escort vessel (less than 90 ft long) and was travelling at a speed slower than 10 knots with no sign of injury to the animal. In 1999, Commandant Instruction 16214.3 implemented the USCG involvement in a mandatory ship reporting system on the Atlantic seaboard for North Atlantic right whales. There are less than 400 individuals, which means that the likelihood of an encounter with an OPC would be very low. There has not been a strike of a North Atlantic right whale by a USCG vessel in over a decade. The PDC’s include mitigation for USCG vessels to remain a minimum of 500 yards from North Atlantic right whales and OPC watchstanders are required to maintain vigilant observation. Because North Atlantic right whales, as one of the most endangered whale species, would be more likely in shallower waters than the offshore activities of the OPC, the potential for vessel strike and effects from other stressors resulting from the activities that will be carried out in the Atlantic operation area by the new OPCs and associated small vessels, helicopters, and UASs, will be extremely unlikely to occur and therefore discountable. Thus, activities in the Atlantic operation area associated with the action are not likely to adversely affect North Atlantic right whale.

Rice's whale is known to inhabit the northeastern Gulf of Mexico and there have also been confirmed visual and acoustic observations in the northern central and western Gulf of Mexico. There may be activities under the action occurring in areas where Rice's whale could occur; however, there are programmatic PDCs for USCG vessels to avoid the area where Rice's whale are mainly observed and, if transit is unavoidable, there is a 10 knot speed restriction for that area. Further, watchstanders are to avoid large whales (despite identification to species) by 500 yards. Crewmembers will be trained in marine mammal and sea turtle identification and will alert the Command of the presence of these animals and initiate the adaptive mitigation responses identified in the PDC's (Section 3.3.1) if they are sighted. There have been no reported strikes of Rice's whales by USCG vessels. Given the USCG OPC will have a watchstander at all times to alert and that there are programmatically implemented mitigations and no prior reports of USCG striking a Rice's whale, the potential for vessel strike resulting and effects of other stressors from the activities that will be carried out in the Gulf of Mexico operation area by the new OPCs and associated small vessels, helicopters, and UASs, will be extremely unlikely to occur and therefore discountable. Thus, activities in the Gulf of Mexico operation area associated with the action are not likely to adversely affect Rice's whale.

Main Hawaiian Island Insular False Killer whale is present closer to the main Hawaiian Islands, and there have been no reports of strandings of this species caused by vessels in the NMFS National Stranding Database, nor any reported struck by USCG vessels. There will be one OPC dedicated to the Pacific Islands and the likelihood of vessel strike and effects from stressors resulting from the actions that will be carried out in the Hawaii-Pacific Islands operation areas by the new OPCs and associated small vessels, helicopters, and UASs, will be extremely unlikely to occur and therefore discountable. Thus, activities in the Hawaii-Pacific operation area associated with the action are not likely to adversely affect Main Hawaiian Island Insular False Killer whale.

Bowhead whales are found almost exclusively in Arctic and subarctic waters. While there are bowhead whales that show signs of scars from vessel strikes, none of the reported confirmed bowhead strandings in the NMFS National Stranding database were caused by vessel strike. There have been no reported strikes of bowhead whales by USCG vessels. There will be one OPC dedicated to the Alaska operation area and, given the implementation of mitigations described in Section 3.3.1, interaction with bowhead whales is extremely unlikely to occur and therefore discountable. Thus, activities in the Alaska operation area associated with the action are not likely to adversely affect bowhead whales.

In summary, Western North Pacific gray whale, Southern Resident Killer whale, North Pacific and North Atlantic right whale, Rice's whale, Main Hawaiian Island Insular False Killer whale, and Western Arctic bowhead whale are not likely to be adversely affected by vessel strike or other stressors as a result of the action. In the unlikely event that any of the species that are described above should be struck by an OPC, reinitiation of consultation is required. Other ESA-listed whales likely to be affected by vessel strike are discussed in Section 6.3.

6.2.6 Proposed or Designated Critical Habitat

The actions will take place within the EEZ of U.S. waters, the high seas and foreign EEZs. The action area includes proposed or designated critical habitat for multiple ESA-listed species.

Each critical habitat is characterized by physical and biological features (previously referred to by NMFS as primary constituent elements) that are deemed essential to the conservation of the ESA-listed species for which the habitat was designated. Below we describe physical and biological features of each critical habitat, and then evaluate the effects that the action may have on these physical and biological features.

Designated or proposed critical habitat contains a variety of physical and biological features deemed essential to the conservation of the ESA-listed species for which they were designated. Table 8 lists these physical and biological features and also highlights those that may be affected by the action. With a few exceptions as noted below, the physical and biological features that may be affected by the action can be grouped into the following categories:

1. Waters free from obstruction;

2. Habitat with sufficient water quality (e.g., specific dissolved oxygen levels and temperatures, low contaminant levels);

3. Habitat with adequate availability of prey resources (including foraging habitat);

4. Habitat with adequate availability of quality substrate, water depth, and sea state; and

5. Areas free from disturbance (including anthropogenic noise).

Additionally, smalltooth sawfish critical habitat in waters of the U.S. includes the presence of red mangroves, North Atlantic Ocean DPS of loggerhead sea turtle critical habitat includes water free of artificial lighting to allow transit through the surf zone and outward toward open water and waters with minimal manmade structures that could promote predators, and seagrass habitat includes sufficient water transparency and stable, unconsolidated sediments.

Table 8. Essential physical and biological features for Endangered Species Act-listed species, distinct population segments, or evolutionarily significant units and effects from the action.

Species DPS or ESU	Physical or Biological Features Essential for the Conservation of the Species, DPS, or ESU	Category for Evaluation
Marine Mammals - Cetaceans		
False Killer Whale – Main Hawaiian Islands Insular DPS	(1) Adequate space for movement and use within shelf and slope habitat; (2) prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and	1, 2, 3, 5

Species **DPS or ESU**	**Physical or Biological Features Essential for the Conservation of the Species, DPS, or ESU**	**Category for Evaluation**
	development, as well as overall population growth; (3) waters free of pollutants of a type and amount harmful of Main Hawaiian Islands insular DPS of false killer whales; and (4) sound levels that will not significantly impair false killer whales' use or occupancy.	
Killer Whale – Southern Resident DPS	(1) Water quality to support growth and development; (2) prey species of sufficient quantity, quality, and availability to support individual growth, reproduction and development, as well as overall population growth; and (3) inter-area passage conditions to allow for migration, resting, and foraging.	1, 2, 3
North Atlantic Right Whale	Foraging habitat (Unit 1) – (1) The physical oceanographic conditions and structures of the Gulf of Maine and Georges Bank region that combine to distribute and aggregate *C. finmarchicus* for North Atlantic right whale foraging, namely prevailing currents and circulation patterns, bathymetric features (basins, banks, and channels), oceanic fronts, density gradients, and temperature regimes; (2) low flow velocities in Jordan, Wilkinson, and Georges Basins that allow diapausing *C. finmarchicus* to aggregate passively below the convector layer so that the copepods are retained in the basins; (3) late stage *C. finmarchicus* in dense aggregations in the Gulf of Maine and Georges Bank region; and (4) diapausing *C. finmarchicus* in aggregations in the Gulf of Maine and Georges Bank region. Calving habitat (Unit 2) – (1) Calm sea surface conditions of Force 4 or less on the Beaufort Wind Scale; (2) sea surface temperatures from a minimum of seven degrees Celsius, and never more than 17 degrees Celsius; and water depths of 6 to 28 meters (19.7 to 91.9 feet) where these features simultaneously co-occur over contiguous areas of at least 792.3 square kilometers (231 square nautical miles) of ocean waters during the months of November through April.	2, 3 None

Species DPS or ESU	Physical or Biological Features Essential for the Conservation of the Species, DPS, or ESU	Category for Evaluation
North Pacific Right Whale	Nutrients, physical oceanography processes, certain species of zooplankton (copepods), and long photo-period due to the high latitude.	3
Humpback whale – Western North Pacific, Central America and Mexico DPS	Adequate nutrition and prey abundance and availability, with specific biological features (i.e., prey species) identified for each DPS.	3
Marine Mammals - Pinnipeds		
Bearded Seal – Berengia DPS	(1) Sea ice habitat suitable for whelping and nursing, which is defined as areas with waters 200 m or less in depth containing pack ice of at least 25 percent concentration and providing bearded seals access to those waters from the ice.; (2) Sea ice habitat suitable as a platform for molting, which is defined as areas with waters 200 m or less in depth containing pack ice of at least 15 percent concentration and providing bearded seals access to those waters from the ice.; (3) Primary prey resources to support bearded seals: Waters 200 m or less in depth containing benthic organisms, including epifaunal and infaunal invertebrates, and demersal fishes.	1, 2, 3, 5
Ringed Seal – Arctic Subspecies	(1) Snow-covered sea ice habitat suitable for the formation and maintenance of subnivean birth lairs used for sheltering pups during whelping and nursing, which is defined as waters 3 m or more in depth (relative to MLLW) containing areas of seasonal landfast (shorefast) ice or dense, stable pack ice, that have undergone deformation and contain snowdrifts of sufficient depth to form and maintain birth lairs (typically at least 54 cm deep); (2) Sea ice habitat suitable as a platform for basking and molting, which is defined as areas containing sea ice of 15 percent or more concentration in waters 3 m or more in depth (relative to MLLW); (3) Primary prey resources to support Arctic ringed seals, which are defined to be small, often schooling, fishes, in particular Arctic cod, saffron cod, and rainbow smelt; and small crustaceans, in particular, shrimps and amphipods.	3, Other
Steller Sea Lion – Eastern and Western DPSs (*Eastern DPS	Terrestrial, air, and aquatic areas that support foraging, such as adequate prey resources and available foraging habitat.	2, 3

Species DPS or ESU	Physical or Biological Features Essential for the Conservation of the Species, DPS, or ESU	Category for Evaluation
delisted, but critical habitat still in effect*)		
Marine Reptiles		
Green Turtle – North Atlantic DPS	Activities requiring special management considerations include: seagrass beds for foraging, coral reefs for resting, shelter and protection, vessel traffic, coastal construction, point and non-point source pollution, fishing activities, dredge and fill activities, habitat restoration	4, 5
Hawksbill Turtle	Important features include natal development habitat, refuge from predation, shelter between foraging periods, and food for hawksbill turtle prey.	3, 5
Leatherback Turtle	U.S. East Coast – Habitat essential for nesting, within the Sandy Point National Wildlife Refuge. U.S. West Coast – Prey species, primarily scyphomedusae (i.e., jellyfish) of the order Semaeostomeae (e.g., *Chrysaora*, *Aurelia*, *Phacellophora*, and *Cyanea*), of sufficient condition, distribution, diversity, abundance, and density necessary to support individual as well as population growth, reproduction, and development.	1, 3
Loggerhead Turtle – North Atlantic Ocean DPS	Nearshore Reproductive Habitat – (1) Nearshore waters directly off the highest density nesting beaches and their adjacent beaches as identified in 50 C.F.R. 17.95(c) to 1.6 kilometers (0.9 nautical miles offshore); (2) waters sufficiently free of obstructions or artificial lighting to allow transit through the surf zone and outward toward open water; (3) waters with minimal manmade structures that could promote predators (i.e., nearshore predator concentration caused by submerged and emerged offshore structures), disrupt wave patterns necessary for orientation, and/or create excessive longshore currents. Winter Habitat: (1) Water temperatures above 10º Celsius from November through April; (2) continental shelf waters in proximity to the western boundary of the	1, 3, 5, Other

Species DPS or ESU	Physical or Biological Features Essential for the Conservation of the Species, DPS, or ESU	Category for Evaluation
	Gulf Stream; and (3) water depths between 20 and 100 meters (65.6 to 328.1 feet). Breeding Habitat – (1) High densities of reproductive male and female loggerheads; (2) proximity to primary Florida migratory corridor; and (3) proximity to Florida nesting grounds. Migratory Habitat – (1) Constricted continental shelf area relative to nearby continental shelf waters that concentrate migratory pathways; and (2) passage conditions to allow for migration to and from nesting, breeding, and/or foraging areas. Sargassum Habitat: (1) Convergence zones, surface-water downwelling areas, the margins of major boundary currents (Gulf Stream), and other locations where there are concentrated components of the *Sargassum* community in water temperatures suitable for the optimal growth of *Sargassum* and inhabitance of loggerhead turtles; (2) *Sargassum* in concentrations that support adequate prey abundance and cover; (3) available prey and other material associated with Sargassum habitat including, but not limited to, plants and cyanobacteria and animals native to the *Sargassum* community such as hydroids and copepods; and (4) sufficient water depth and proximity to available currents to ensure offshore transport (out of the surf zone), and foraging and cover requirements by *Sargassum* for post-hatching loggerhead turtles, i.e., greater than 10 meters (32.8 feet) depth.	
Fish		
Atlantic Salmon – Gulf of Maine DPS	Freshwater physical and biological features include sites for spawning and incubation, juvenile rearing, and migration. No marine features were designated.	4
Pacific Salmonids (Salmon and Steelhead) – Multiple DPSs and ESUs	Freshwater – Spawning sites with water quantity and quality conditions and substrate that support spawning, incubation, and larval development;	1,2,3,4

Species DPS or ESU	Physical or Biological Features Essential for the Conservation of the Species, DPS, or ESU	Category for Evaluation
	rearing sites with (1) water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; (2) water quality and forage that support juvenile development; and (3) natural cover such as shade, submerged and overhanging large wood, logjams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks; migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks that support juvenile and adult mobility and survival. Estuarine – areas free of obstruction and excessive predation with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation. Nearshore Marine – areas free of obstruction and excessive predation with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels. Offshore Marine – areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.	
Atlantic Sturgeon – New York Bight DPS, Chesapeake Bay DPS, Carolina DPS, South Atlantic DPS	Promote larval, juvenile, and sub-adult growth and development, foraging habitat, water conditions suitable for adult spawning, and an absence of physical barriers (e.g., dams).	4
Green Sturgeon – Southern DPS	Freshwater riverine systems, estuarine habitats, and nearshore coastal marine areas that provide sufficient food resources, substrate type suitable for egg deposition, and development, water flow,	1, 2, 3, 4

Species DPS or ESU	Physical or Biological Features Essential for the Conservation of the Species, DPS, or ESU	Category for Evaluation
	water quality, migratory corridors, depth (greater than or equal to 5 meters [16.4 feet], and sediment quality.	
Gulf Sturgeon	Abundant food items, riverine spawning sites with substrates suitable for egg deposition and development, riverine aggregation areas, a flow regime necessary for normal behavior, growth, and survival, water and sediment quality necessary for normal behavior, growth, and viability of all life stages, and safe and unobstructed migratory pathways.	1,2,3,4
Rockfish – Bocaccio – Puget Sound/Georgia Basin DPS and Yelloweye Rockfish – Puget Sound/Georgia Basin DPS	Adults – Sufficient prey resources, water quality, and rocks or highly rugose habitat (greater than 30 meters [98.4 feet]). Juvenile – sufficient prey resources and water quality	2,3,4
Eulachon – Southern DPS	(1) Freshwater spawning and incubation sites with water flow, quality and temperature conditions and substrate supporting spawning and incubation, and with migratory access for adults and juveniles; (2) freshwater and estuarine migration corridors associated with spawning and incubation sites that are free of obstruction and with water flow, quality and temperature conditions supporting larval and adult mobility, and with abundant prey items supporting larval feeding after the yok sac is depleted; and (3) nearshore and offshore marine foraging habitat with water quality and available prey, supporting juveniles and adult survival.	1,2,3
Smalltooth Sawfish – U.S. Portion of Range DPS	Within the nursery areas: red mangroves (*Rhizophora mangle*), and euryhaline habitats with water depths less than or equal to 0.9 meters (2.96 feet).	2, Other
Marine Invertebrates		
Black Abalone	Rocky substrate to cling to, nourishment resources (bacterial and diatom films, crustose coralline algae, and a source of detrital macroalgae), junvenile settlement habitat (rocky intertidal habitat containing crustose coralline algae, and crevices or cryptic biogenic structures [e.g., urchins, mussels, chiton holes conspecifics, anemones]), suitable water quality (temperature, salinity, pH,	2, 3, 4

Species DPS or ESU	Physical or Biological Features Essential for the Conservation of the Species, DPS, or ESU	Category for Evaluation
	and other chemical characteristics necessary for normal settlement, growth, behavior, and viability of black abalone), and suitable nearshore circulation patterns (where sperm, eggs, and larvae are retained in the nearshore environment).	
Elkhorn Coral and Staghorn Coral	Substrate of suitable quality and availability in water depths from the mean high water line to 30 meters (28.4 feet) to allow for successful sexual and asexual reproduction. Successful sexual and asexual reproduction includes flourishing larval settlement, recruitment, and reattachment of consolidated hard bottom or dead coral skeletons free from fleshy macroalgae or turf algae and sediment cover.	4

Potential stressors from the action that may affect the physical and biological features of proposed or designated critical habitat include pollution, aircraft and vessel operations, including transit, noise and visual disturbance. However, as further outlined in Section 6.1 above and the following paragraphs, the effects of these stressors on the identified physical and biological features were determined to be either insignificant or discountable based on the nature of the feature and the stressor. As mentioned above, most of the physical and biological features of proposed or designated critical habitat can be grouped into categories one through five (see Table 8). We evaluate the potential effects of the action on these categories below and for any features that do not fall into these categories (i.e., “other” in Table 8), a separate analysis is presented.

1 – Waters free from obstruction.

The action will not result in obstructions to migratory pathways for any species in areas of designated or proposed critical habitat. While the project may result in individual animals temporarily avoiding a small area during vessel movement or training activities near critical habitat, the avoidance will be short in duration (i.e., lasting a few hours) and localized. During the short time periods that training activities are conducted, any animals in the vicinity of these activities will be able to slightly alter course and access preferred habitats a short distance away. Further, while a transiting animal may need to slightly alter course (i.e., by a few meters) to avoid OPC activities, the presence of OPCs does not prevent animals from accessing preferred habitat areas. For these reasons, the training and vessel movement activities are expected to have an insignificant effect on essential features of designated and proposed critical habitat related to obstructions and migratory pathways.

2 – Habitat with sufficient water quality (e.g., specific dissolved oxygen levels and temperatures, low contaminant levels).

3 – Habitat with adequate availability of prey resources (including foraging habitat).

4 – Habitat with adequate availability of quality substrate, water depth, and sea state.

5 – Habitat free from disturbance (including anthropogenic noise).

Analysis for those categorized as “Other” in Table 8:

Generally speaking, for all designated or proposed critical habitat, interactions that may result from the proposed activities will be limited to aerial and vessel acoustics, and training activities. Given the nature of the OPC patrol activities, none of the physical and biological features essential to the conservation of the ESA-listed species found in operation areas will be significantly altered. OPC patrols will not significantly alter large scale physical or oceanographic conditions or processes, nutrients, bathymetry, photoperiod, or prey availability. While vessel operations can result in minor changes in water flow, turbidity, and movement, these will be extremely local and temporary and thus not meaningful on a scale that will be expected to adversely affect critical habitat. OPCs can come into close proximity with, or even in contact with, prey of ESA-listed species found within these critical habitats. We expect that any such interactions will only result in a slight displacement of prey. If larger prey were to come into contact with the vessel’s propellers, it is possible that individual prey can be killed. However, even if this unlikely event were to occur, the removal of several individual prey will have an immeasurable impact on the overall abundance of prey in these proposed or designated critical habitat areas. Given the short-term transient nature of OPC patrols, they will not restrict inter-area passage or significantly alter ambient noise levels. Only aircraft and vessel noise will occur, it will be short-term, minimal, diluted, and will not have any measurable impact on the physical and biological features.

While the proposed research and enhancement activities may directly overlap with the physical and biological features including water quantity, and quality and prey availability, very few if any, effects are possible. The proposed activities will not significantly alter the physical or oceanographic conditions within the action area, as only very minor changes in water flow and current will be expected from vessel traffic and no changes in ocean bathymetry will occur. The proposed activities will in no way alter the sea state, temperature, or water depth.

Vessel traffic, noise, and pollution discharge are expected to have an insignificant effect on proposed or designated critical habitat physical and biological features. Large (OPC) and small (OTH) vessels are proposed to be used during activities that fit within the scope of this programmatic consultation. Operation of vessels will result in a temporary increase of vessel traffic within proposed or designated critical habitat. This increase in vessel traffic is likely to consist of only one OPC operating within a particular critical habitat. The physical transit of vessels may result in brief obstruction of surface waters due to the presence of a vessel and slight changes in dissolved oxygen levels, water temperature, and currents due to the vessel displacement and mixing of water, but is not expected to have any effect on contaminant levels, depth, benthic habitat, and sea state. Vessel presence may also cause a slight change in distribution of prey. These effects will be highly localized; occurring only within close proximity to the transiting research vessel, and temporary, with habitat conditions quickly returning to pre-exposure values once the research vessel leaves the area. Given the localized and short-term nature of vessel operation in critical habitat, they are expected to have an insignificant effect on the physical and biological features of proposed or designated critical habitat.

Discharge and pollution from vessels may occur as a result of activities. The International Convention for the Prevention of Pollution from Ships (MARPOL73/78) prohibits certain discharges of oil, noxious liquid substances, sewage, garbage, and air pollution from vessels within certain distances of the coastline. Unintentional and intentional discharge of pollutants may occur. These potential discharges may affect certain water quality properties, trigger harmful algal blooms, and temporarily affect distributions and behaviors of ESA-listed species and their prey. However, the localized extent of any discharges from a few OPCs associated with the action will likely be minor relative to the size of the operation area. In addition, any pollutant discharge will be mixed rapidly into the water column and is likely to be indistinguishable from discharges associated with vessel traffic that are common in the operation areas proposed under this programmatic consultation. Therefore, the effects of discharge and pollution from vessels on proposed or designated critical habitat are considered to be insignificant.

Transiting vessels also produce a variety of sounds characterized as low-frequency, continuous, or tonal, with sound pressure levels at a source varying according to speed, burden, capacity, and length (Richardson et al. 1995); (Kipple and Gabriele 2007); (McKenna et al. 2012). While such noise will not physically obstruct water passage or affect water properties, depth, sea state, or oceanographic, benthic and algal features, it may affect prey in proposed or designated critical habitat. However, the vast majority of fishes do not show strong responses to low frequency sound. Although avoidance behavior in prey may lead to a change in distribution, any such change will be short-lived, likely lasting only while the vessel is in the area. Thus, we conclude the effects of vessel transit on proposed or designated critical habitat associated with the proposed activities are insignificant.

The operation of a fathometer or Doppler speed log involves actively transmitting sounds in the marine environment. Like noise from vessels, such transmission will not physically obstruct water passage or affect water properties, depth, sea state, or oceanography, benthic, and algal features, but, as further outlined below, it may affect prey in proposed or designated critical habitat. However, given the frequency bandwidth and sound sources, we expect sounds originating from the sound sources will be beyond the audible hearing range or reduced to negligible sound levels by the time they reach prey due to transmission loss. We do not expect any such responses to have a measurable impact on the abundance of prey within proposed or designated critical habitat. We do not expect the proposed actions to affect the oceanographic features that concentrate copepod prey in the action area. One essential feature of the critical habitat for the Main Hawaiian Islands insular DPS of false killer whale is "sound levels that would not significantly impair false killer whales' use or occupancy" (83 FR 35062). The use of a fathometer or Doppler speed log are temporary, short duration sounds, and, as discussed in Section 6.1.2, are not likely to affect ESA-listed species Therefore, the use of the fathometer and Doppler speed log are not expected to significantly impair the use or occupancy of critical habitat for the Main Hawaiian Islands insular DPS of false killer whale. Thus, we conclude that the effects of operating the sound sources on proposed or designated critical habitat within the action area are insignificant.

In conclusion, we find that the effects of the proposed actions on the physical and biological features of the proposed or designated critical habitat listed in Table 8 are either insignificant or discountable. As such, these proposed activities may afrect, but are not likely to adversely affect proposed or designated critical habitat under NMFS jurisdiction.

6.3 Status of Species Likely to be Adversely Affected

This Opinion examines the status of blue, fin, sei, sperm, and humpback (Western North Pacific, Central America and Mexico DPSs) whales that are likely to be adversely affected by the action.

The evaluation of adverse effects in this Opinion begins by summarizing the biology and ecology of those species that are likely to be adversely affected (Table 9) and what is known about their life histories in the action area. The status is determined by the level of risk that the ESA-listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This helps to inform the description of the species' current "reproduction, numbers or distribution" that is part of the jeopardy determination as described in 50 C.F.R. §402.02. More detailed information on the status and trends of these ESA-listed species, and their biology and ecology can be found in the listing regulations, critical habitat designations and stock assessment reports published in the Federal Register, status reviews, recovery plans, and on the NMFS Web site: [https://www.fisheries.noaa.gov/topic/endangered-species-conservation and https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-species-stock].

Table 9. Cetacean Species Likely to be Adversely Affected by the Action

Species	ESA Status	Critical Habitat	Recovery Plan
Blue Whale (*Balaenoptera musculus)*	E – 35 FR 18319	-- --	07/1998; 11/2020
Fin Whale (*Balaenoptera physalus)*	E – 35 FR 18319	-- --	75 FR 47538 07/2010

Species			
Humpback Whale (*Megaptera novaeangliae*) – Central America DPS	E – 81 FR 62259	86 FR 21082	11/1991
Humpback Whale (*Megaptera novaeangliae*) – Mexico DPS	T – 81 FR 62259	86 FR 21082	11/1991
Humpback Whale (*Megaptera novaeangliae*) – Western North Pacific DPS	E – 81 FR 62259	86 FR 21082	11/1991
Sperm Whale (*Physeter macrocephalus*)	E – 35 FR 18319	-- --	75 FR 81584 12/2010
Sei Whale (*Balaenoptera borealis*)	E – 35 FR 18319	-- --	12/2011

6.3.1 Blue Whale

The blue whale is a widely distributed baleen whale found in all major oceans (Figure 15).

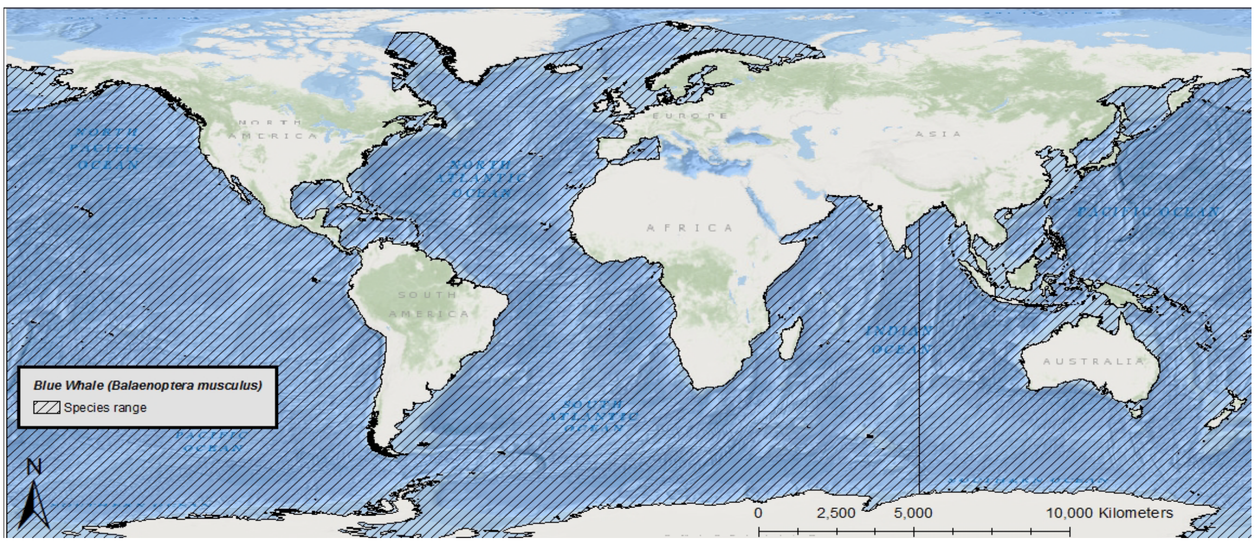


Figure 16. Map identifying the range of the endangered blue whale.

Most experts recognize at least three subspecies of blue whale, *B. m. musculus*, which occurs in the Northern Hemisphere, *B. m. intermedia*, which occurs in the Southern Ocean, and *B. m. brevicauda*, a pygmy species found in the Indian Ocean and South Pacific. The blue whale was originally listed as endangered on December 2, 1970.

Information from the recovery plan (NMFS 2020b), recent stock assessment reports (Hayes et al. 2019, Muto et al. 2019, Carretta et al. 2020), and the status review (NMFS 2020a) were used to summarize the life history, population dynamics and status of the species as follows.

6.3.1.1 Life History

The average life span of blue whales is 80 to 90 years. They have a gestation period of ten to 12 months, and calves nurse for six to seven months. Blue whales reach sexual maturity between five and 15 years of age with an average calving interval of two to three years. They winter at low latitudes, where they mate, calve and nurse, and summer at high latitudes, where they feed. Blue whales forage almost exclusively on krill and can eat approximately 3,600 kilograms (7,936.6 pounds) daily. Feeding aggregations are often found at the continental shelf edge, where upwelling produces concentrations of krill at depths of 90 to 120 meters (295.3 to 393.7 feet).

6.3.1.2 Population Dynamics

The following is a discussion of the species' population and its variance over time. This section includes abundance, population growth rate, genetic diversity, and spatial distribution as it relates to the blue whale.

The global, pre-exploitation estimate for blue whales is approximately 181,200 (IWC 2007). Current estimates indicate approximately 5,000 to 12,000 blue whales globally (IWC 2007). Blue whales are separated into populations by ocean basin in the North Atlantic, North Pacific, and Southern Hemisphere. There are three stocks of blue whales designated in U.S. waters: the Eastern North Pacific (current best estimate N = 1,496, N_{min} = 1,050 (Carretta et al. 2020)) Central North Pacific (N = 133, N_{min} = 63 (Carretta et al. 2021)), and Western North Atlantic (N = 402, N_{min} = 402; (Hayes et al. 2019)). In the southern hemisphere, the latest abundance estimate for Antarctic blue whales is 2,280 individuals in 1997/1998 (95 percent confidence intervals 1,160-4,500) (Branch 2007). While no range-wide estimate for pygmy blue whales exists (Thomas et al. 2016b), the latest estimate for pygmy blue whales off the west coast of Australia is 662 to 1,559 individuals based on passive acoustics (McCauley and Jenner 2010), or 712 to 1,754 individuals based on photographic mark-recapture (Jenner et al. 2008).

The default net productivity rate of 4 percent is currently used for all U.S. blue whale stocks, as maximum net productivity estimates are currently lacking for these populations (Carretta et al. 2021). In the southern hemisphere, population growth estimates are available only for Antarctic blue whales, which estimate a population growth rate of 8.2 percent per year (95 percent confidence interval 1.6–14.8 percent) (Branch 2007).

Little genetic data exist on blue whales globally. Data from Australia indicates that at least populations in this region experienced a recent genetic bottleneck, likely the result of commercial whaling, although genetic diversity levels appear to be similar to other, non-threatened mammal species (Attard et al. 2010). Consistent with this, data from Antarctica also demonstrate this bottleneck but high haplotype diversity, which may be a consequence of the recent timing of the bottleneck and blue whales long lifespan (Sremba et al. 2012). Data on genetic diversity of blue whales in the Northern Hemisphere are currently unavailable. However, genetic diversity information for similar cetacean population sizes can be applied. Stocks that have a total population size of 2,000 to 2,500 individuals or greater provide for maintenance of genetic diversity resulting in long-term persistence and protection from substantial environmental variance and catastrophes. Stocks that have a total population 500 individuals or less may be at a greater risk of extinction due to genetic risks resulting from inbreeding. Stock populations at low densities (less than 100) are more likely to suffer from the 'Allee' effect, where inbreeding and the heightened difficulty of finding mates reduces the population growth rate in proportion with reducing density.

In general, blue whale distribution is driven largely by food requirements; blue whales are more likely to occur in waters with dense concentrations of their primary food source, krill. While they can be found in coastal waters, they are thought to prefer waters further offshore. In the North Atlantic Ocean, the blue whale range extends from the subtropics to the Greenland Sea. They are most frequently sighted in waters off eastern Canada with a majority of sightings taking place in the Gulf of St. Lawrence. In the North Pacific Ocean, blue whales range from Kamchatka to southern Japan in the west and from the Gulf of Alaska and California to Costa Rica in the east. They primarily occur off the Aleutian Islands and the Bering Sea. In the northern Indian Ocean, there is a "resident" population of blue whales with sightings being reported from the Gulf of Aden, Persian Gulf, Arabian Sea, and across the Bay of Bengal to Burma and the Strait of Malacca. In the Southern Hemisphere, distributions of subspecies (*B. m. intermedia* and *B. m. brevicauda*) seem to be segregated. The subspecies *B. m. intermedia* occurs in relatively high latitudes south of the "Antarctic Convergence" (located between 48 degrees South and 61degrees South latitude) and close to the ice edge. The subspecies *B. m. brevicauda* is typically distributed north of the Antarctic Convergence.

6.3.1.3 Status

The blue whale is endangered as a result of past commercial whaling. In the North Atlantic Ocean, at least 11,000 blue whales were harvested from the late 19th to mid-20th centuries. In the North Pacific Ocean, at least 9,500 whales were killed between 1910 and 1965. Commercial whaling no longer occurs, but blue whales are threatened by vessel strikes, entanglement in fishing gear, pollution, harassment due to whale watching, and reduced prey abundance and habitat degradation due to climate change. Because populations appear to be increasing in size, the species appears to be somewhat resilient to current threats; however, the species has not recovered to pre-exploitation levels.

6.3.1.4 Recovery Goals

See the 2020 Recovery Plan (First Revision to the July 1998 Recovery Plan) (NMFS 2020) for the blue whale for complete down listing/delisting criteria for each of the following recovery goals:

1. Increase blue whale resiliency and ensure geographic and ecological representation by achieving sufficient and viable populations in all ocean basins and in each recognized subspecies, and
2. Increase blue whale resiliency by managing or eliminating significant anthropogenic threats.

6.3.2 **Fin Whale**

The fin whale is a large, widely distributed baleen whale found in all major oceans and comprised of three subspecies: *B. p. physalus* in the Northern Hemisphere, and *B. p. quoyi* and *B. p. patachonica* (a pygmy form) in the Southern Hemisphere (Figure 16).

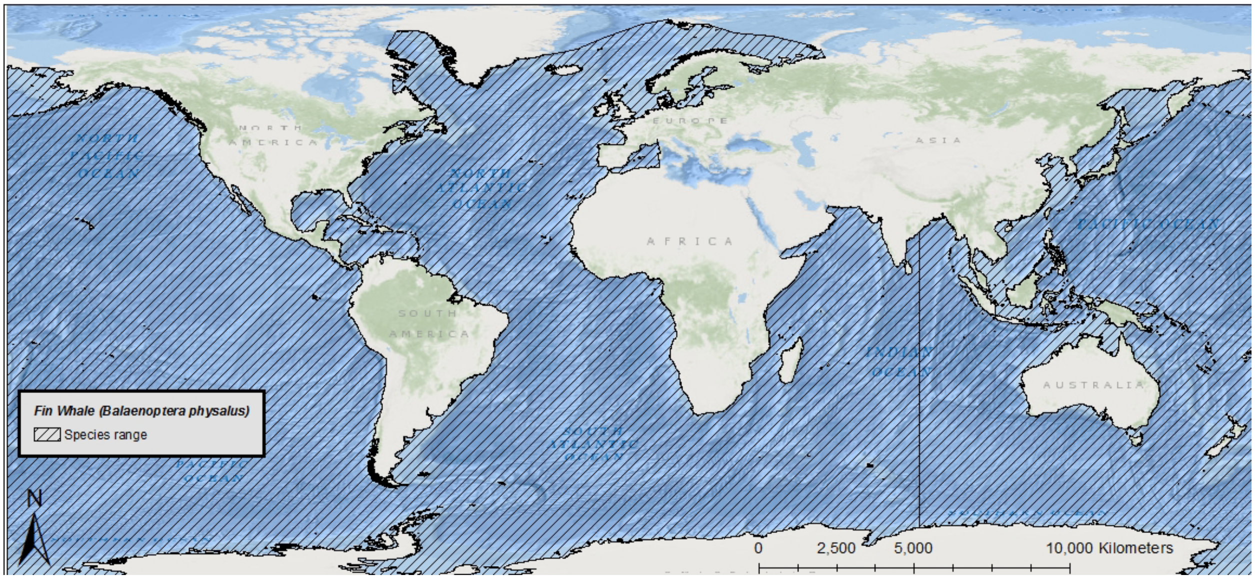


Figure 17. Map identifying the range of the fin whale.

The fin whale was originally listed as endangered on December 2, 1970.

Information available from the recovery plan (NMFS 2010b), recent stock assessment reports (Carretta et al. 2017, Hayes et al. 2017a, Muto et al. 2017a), and the status review (NMFS 2011a) were used to summarize the life history, population dynamics, and status of the species as follows.

6.3.2.1 Life History

Fin whales can live, on average, 80 to 90 years. They have a gestation period of less than one year, and calves nurse for six to seven months. Sexual maturity is reached between six and 10 years of age with an average calving interval of two to three years. They mostly inhabit deep, offshore waters of all major oceans. They winter at low latitudes, where they calve and nurse, and summer at high latitudes, where they feed, although some fin whales appear to be residential to certain areas. Fin whales eat pelagic crustaceans (mainly euphausiids or krill) and schooling fish such as capelin, herring, and sand lance.

6.3.2.2 Population Dynamics

The following is a discussion of the species' population and its variance over time. This section includes abundance, population growth rate, genetic diversity, and spatial distribution as it relates to the fin whale.

The pre-exploitation estimate for the fin whale population in the North Pacific was 42,000 to 45,000 (Ohsumi and Wada 1974). In the North Pacific, at least 74,000 whales were killed between 1910 and 1975. In the North Atlantic, at least 55,000 fin whales were killed between 1910 and 1989. Approximately 704,000 whales were killed in the Southern Hemisphere from 1904 to 1975. Of the three to seven stocks in the North Atlantic (approximately 50,000 individuals), one occurs in U.S. waters, where the best estimate of abundance is 6,802 individuals (N_{min}=5,573). There are three stocks in U.S. Pacific waters: Northeast Pacific (N=3,168; N_{min}=2,554), Hawaii (N=203; N_{min}=101), and California/Oregon/Washington (N=11,065; N_{min}=7,970). The IWC also recognizes the China Sea stock of fin whales, found in the Northwest Pacific, which currently lacks an abundance estimate (Reilly et al. 2013). Abundance data for the Southern Hemisphere stock are limited; however, there were assumed to be somewhat more than 15,000 in 1983 (Thomas et al. 2016a).

Current estimates indicate approximately 10,000 fin whales in U.S. Pacific Ocean waters, with an annual growth rate of 4.8 percent in the Northeast Pacific stock and 7.5 percent in the California/Oregon/Washington stock. Overall population growth rates and total abundance estimates for the Hawaii stock, China Sea stock, western north Atlantic stock, and southern hemisphere fin whales are not available at this time.

Archer et al. (2013) recently examined the genetic structure and diversity of fin whales globally. Full sequencing of mitochondrial DNA genome for 154 fin whales sampled in the North Atlantic, North Pacific, and Southern Hemisphere, resulted in 136 haplotypes, none of which were shared among ocean basins suggesting differentiation at least at this geographic scale. However, North Atlantic fin whales appear to be more closely related to the Southern Hemisphere population, as compared to fin whales in the North Pacific, which may indicate a revision of the subspecies delineations is warranted. Generally speaking, haplotype diversity was found to be high both within ocean basins, and across. Such high genetic diversity and lack of differentiation within ocean basins may indicate that despite some population's having small abundance estimates, the species may persist long-term and be somewhat protected from substantial environmental variance and catastrophes.

There are over 100,000 fin whales worldwide, occurring primarily in the North Atlantic, North Pacific, and Southern Hemisphere (Figure 16), where they appear to be reproductively isolated. The availability of prey, sand lance in particular, is thought to have a strong influence on the distribution and movements of fin whales.

6.3.2.3 Status

The fin whale is endangered as a result of past commercial whaling. Prior to commercial whaling, hundreds of thousands of fin whales existed. Fin whales may be killed under "aboriginal subsistence whaling" in Greenland, under Japan's scientific whaling program, and Iceland's formal objection to the IWC ban on commercial whaling. Japan withdrew from IWC in June 2019 and will be resuming commercial whaling. Additional threats include vessel strikes, reduced prey availability due to overfishing or climate change, and noise. The species' overall large population size may provide some resilience to current threats, but trends are largely unknown.

In the North Pacific Ocean, fin whales occur in summer foraging areas in the Chukchi Sea, the Sea of Okhotsk, around the Aleutian Islands, and the Gulf of Alaska (); in the eastern Pacific, they occur south to California; in the western Pacific, they occur south to Japan. Fin whales in the eastern Pacific winter from California south; in the western Pacific, they winter from the Sea of Japan, the East China, Yellow, and Philippine Seas (Gambell 1985).

Several subpopulations of fin whales are thought to exist within the North Atlantic, although some studies have found substantial gene flow between these populations and little genetic divergence suggesting there may only be one functional population (excluding the Mediterranean). The only stock in U.S. waters, the Western North Atlantic Stock, is estimated to comprise 1,618 individuals (N_{min}=1,234), although this is likely an underestimate (Hayes et al. 2017b). Like many other baleen whales, fin whales exhibit strong site fidelity and whales of the Western North Atlantic stock are no exception. Waters off New England represent an important feeding area for this stock and calving is thought to occur to the south, along the U.S. mid-Atlantic, although the exact location of breeding remains unknown.

Fin whales in the North Pacific Ocean occur in summer foraging areas in the Chukchi Sea, Bering Sea, the Sea of Okhotsk, around the Aleutian Islands, and in the Gulf of Alaska (Muto et al. 2017b). Peak fin whale call detection in the Bering Sea occurs from September to November and February to March (Stafford et al. 2010), which could be an indication of increased abundance or simply increased calling during these months (NMFS 2018b). Fin whale calls have been recorded year-round in the Gulf of Alaska, but are most prevalent from August-February (Moore et al. 1998, Moore et al. 2006). The abundance of fin whales in Alaska waters appears to be increasing since around 2002 (Friday et al. 2013), and the annual rate of increase of fin whales in coastal waters south of the Alaska Peninsula was estimated to be 4.8 percent between 1987 and 2003 (Zerbini et al. 2006). In the Southern Hemisphere, fin whales range from near 40ºS (Brazil, Madagascar, Western Australia, New Zealand, Colombia, Peru, and Chile) during the austral winter southward to Antarctica in the austral summer (Rice 1998). Fin whales appear to be present in Antarctic waters only from February to July and were not detected in the Ross Sea during year-round acoustic surveys in 2008 (Sirovic et al. 2009). Current population estimates are a fraction of former abundance because the population in the Southern Hemisphere was one of the most heavily exploited by commercial whaling. Approximately 200 fin whales have been observed in the Ross Sea (Pinkerton et al. 2010).

6.3.2.4 Recovery Goals

See the 2010 Final Recovery Plan (NMFS 2010b)for the fin whale for complete down listing/delisting criteria for both of the following recovery goals.

1. Achieve sufficient and viable population in all ocean basins.
2. Ensure significant threats are addressed.

6.3.3 Humpback Whale – Western North Pacific, Mexico and Central America Distinct Population Segments

The humpback whale is a widely distributed baleen whale found in all major oceans (Figure 17).

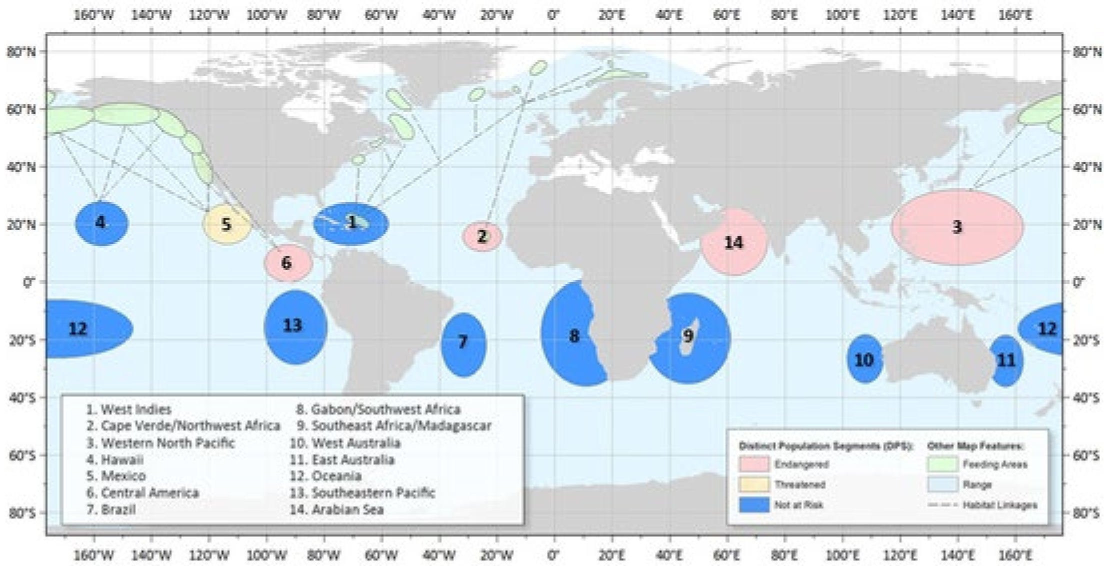


Figure 18. Map identifying 14 distinct population segments with one threatened and four endangered based on primary breeding locations of the humpback whale, its range, and feeding areas (Bettridge et al. 2015a).

The humpback whale was originally listed as endangered on December 2, 1970 (35 FR 18319). Since then, NMFS has designated fourteen DPSs with four identified as endangered (Cape Verde Islands/Northwest Africa, Western North Pacific, Central America, and Arabian Sea) and one as threatened (Mexico; 81 FR 62259).

Information available from the recovery plan (NMFS 1991), recent stock assessment reports (Carretta et al. 2016, Muto et al. 2016, Waring et al. 2016), the status review (Bettridge et al. 2015a), and the final listing (81 FR 62259) were used to summarize the life history, population dynamics, and status of the species as follows.

6.3.3.1 Life History

Humpbacks can live, on average, fifty years. They have a gestation period of eleven to twelve months, and calves nurse for one year. Sexual maturity is reached between five to eleven years of age with an average calving interval of two to three years. Humpbacks mostly inhabit coastal and continental shelf waters. They winter at low latitudes, where they calve and nurse, and summer at high latitudes, where they feed. Humpbacks exhibit a wide range of foraging behaviors and feed on a range of prey types, including: small schooling fishes, euphausiids, and other large zooplankton (Bettridge et al. 2015a).

6.3.3.2 Population Dynamics

The following is a discussion of the species' population and its variance over time. For humpback whales, DPSs that have a total population size of 2,000 to 2,500 individuals or greater provide for maintenance of genetic diversity resulting in long-term persistence and protection from substantial environmental variance and catastrophes. Distinct population segments that have a total population of 500 individuals or less may be at a greater risk of extinction due to genetic risks resulting from inbreeding. Population at low densities (less than one hundred) are more likely to suffer from the 'Allee" effect, where inbreeding and the heightened difficulty of finding mates reduces the population growth rate in proportion with reducing density.

Mexico DPS

This section includes abundance, population growth rate, genetic diversity, and spatial distribution as it relates to the Mexico humpback whale DPS. The Mexico DPS consists of humpback whales that breed along the Pacific coast of mainland Mexico and the Revillagigedos Islands, and transit through the Baja California Peninsula coast. The DPS feeds across a broad geographic range from California to the Aleutian Islands, with concentrations in California-Oregon, northern Washington – southern British Columbia, northern and western Gulf of Alaska, and Bering Sea feeding grounds (81 FR 62259).

The global, pre-exploitation estimate for humpback whales is 1,000,000 (Roman and Palumbi 2003b). The 2022 abundance of the Mexico humpback whale DPS is approximately 3,479 (Nmin=3,185) and population trend information is unavailable.

For humpback whales, distinct population segments that have a total population size of 2,000 to 2,500 individuals or greater provide for maintenance of genetic diversity resulting in long-term persistence and protection from substantial environmental variance and catastrophes. Distinct population segments that have a total population five hundred individuals or less may be at a greater risk of extinction due to genetic risks resulting from inbreeding. Populations at low densities (less than one hundred) are more likely to suffer from the 'Allee' effect, where inbreeding and the heightened difficulty of finding mates reduces the population growth rate in proportion with reducing density. The Mexico DPS is estimated to have more than 2,000 individuals and thus, should have enough genetic diversity for long-term persistence and protection from substantial environmental variance and catastrophes (81 FR 62259, Bettridge et al. 2015a).

Western North Pacific DPS

This section includes abundance, population growth rate, genetic diversity, and spatial distribution as it relates to the Western North Pacific humpback whale DPS.

The global, pre-exploitation estimate for humpback whales is 1,000,000 (Roman and Palumbi 2003b). The current abundance of the Western North Pacific DPS is approximately 1,084

(N_{min}=1,007) and population trend information for the Western North Pacific humpback is unavailable.

The Western North Pacific DPS has less than 2,000 individuals total, and is made up of two subpopulations, Okinawa/Philippines and the Second West Pacific. Thus, while its genetic diversity may be protected from moderate environmental variance, it could be subject to extinction due to genetic risks due to low abundance (81 FR 62259, Bettridge et al. 2015a).

The Western North Pacific DPS consists of humpback whales breeding/wintering in the area of Okinawa and the Philippines, another unidentified breeding area (inferred from sightings of whales in the Aleutian Islands area feeding grounds), and those transiting from the Ogasawara area. These whales migrate to feeding grounds in the northern Pacific, primarily off the Russian coast (Figure 17; 81 FR 62259).

Central America DPS

This section includes abundance, population growth rate, genetic diversity, and spatial distribution as it relates to the Central America humpback whale DPS. The Central America DPS is composed of humpback whales that breed along the Pacific coast of Costa Rica, Panama, Guatemala, El Salvador, Honduras, and Nicaragua. This DPS feeds almost exclusively offshore of California and Oregon in the eastern Pacific Ocean, with only a few individuals identified at the northern Washington – southern British Columbia feeding grounds.

The global, pre-exploitation estimate for humpback whales is 1,000,000 (Roman and Palumbi 2003a). Prior to 1905, whaling records indicate that the humpback whale population in the North Pacific Ocean was 15,000 individuals. By 1966, whaling had reduced the North Pacific Ocean population to about 1,200 individuals. In the 2015 status review of humpback whales, the abundance of the Central America DPS was 431 (CV=0.3) and 783 (CV=0.17) individuals (Bettridge et al. 2015b); however this estimate is based on data from 2004 through 2006, and is not considered a reliable estimate of current abundance (Carretta 2019a). The 2021 stock assessment report abundance of the Central America DPS of humpback whales is 918 (N_{min} unknown).

6.3.3.3 Status

Humpback whales were originally listed as endangered as a result of past commercial whaling, and the five DPSs that remain listed (Cape Verde Islands/Northwest Africa, Western North Pacific, Central American, Arabian Sea, and Mexico) have likely not yet recovered from this. Prior to commercial whaling, hundreds of thousands of humpback whales existed. Global abundance declined to the low thousands by 1968, the last year of substantial catches (IUCN 2012). Humpback whales may be killed under "aboriginal subsistence whaling" and "scientific permit whaling" provisions of the IWC. Additional threats include ship strikes, fisheries interactions (including entanglement), energy development, harassment from whale-watching, noise, harmful algal blooms, disease, parasites, and climate change.

Mexico DPS

The species' large population size and increasing trends indicate that it is resilient to current threats, but the Mexico DPS still faces a risk of becoming endangered within the foreseeable future throughout all or a significant portion of its range.

Western North Pacific and Central America DPS

The species' large population size and increasing trends indicate that it is resilient to current threats, but the Western North Pacific DPS still faces a risk of extinction.The California/Oregon/Washington stock (coincides with the Central America DPS, Hawaii DPS, and Mexico DPS) showed a long-term increase in abundance from 1990 through 2008, but more recent estimates have shown variable trends in the waters off the U.S. West Coast. The Central North Pacific Ocean stock (coincides with the Hawaii DPS, Mexico DPS, and Western North Pacific DPS) is estimated to increase at an annual rate of 6.6 percent in shelf waters of the northern Gulf of Alaska but current population trends are unavailable for Southeast Alaska.

In Puget Sound (defined as south of Admiralty Inlet), Calambokidis et al. (2003) recorded six humpbacks between 1996 and 2001. However, from January 2003 through July 2012 there were over 60 sightings of humpback whales reported to Orca Network, some of which could be the same individuals (Orca Network 2012). A review of the reported sightings in Puget Sound indicates that humpback whales usually occur as individuals or in pairs (Orca Network 2012). Sightings of humpback whales in Puget Sound vary by location but are infrequent. From the Rich Passage to Agate Passage area in the vicinity of NAVBASE Kitsap Bremerton and Keyport, only one unverified sighting of a humpback whale was reported to Orca Network (2012). In Hood Canal and Dabob Bay (where NAVBASE Kitsap Bangor and the Dabob Bay Range Complex [DBRC] are located, respectively), one humpback whale was observed for several weeks in January and February 2012. Prior to this sighting, there were no confirmed reports of humpback whales entering Hood Canal or Dabob Bay. In the Saratoga Passage area (between NAVSTA Everett and NASWI), one humpback whale was reported in Penn Cove south of Crescent Harbor in July 2008. This is the only humpback report from January 2003 through September 2012 that was considered a likely positive identification (Orca Network 2012). There have been no verified humpback sightings in the Carr Inlet area between January 2003 and July 2012. Two unverified sightings were reported to Orca Network to the north of Carr Inlet, near Point Defiance, Tacoma, over the same time period. The last verified sighting was in June and July of 1988 when two individually identified juvenile humpback whales were observed traveling throughout the waters of southern Puget Sound for several weeks (Calambokidis and Steiger 1990).

Eight stocks of humpback whales occur in waters off Antarctica. Individuals from these stocks winter and breed in separate areas but the degree of gene flow, if any, is uncertain (Carvalho et al. 2011). Genetic relatedness is high between eastern and western Australian breeding populations (Schmitt et al. 2014), while individuals from breeding grounds in Ecuador are somewhat heterogeneous from individuals in other breeding areas, but appear to maintain a genetic linkage (Felix et al. 2009). Humpbacks from these stocks are not part of an ESA-listed DPS.

6.3.3.4 Recovery Goals

In response to the current threats facing the species, NMFS developed goals to recover humpback whale populations. These threats will be discussed in further detail in the Environmental Baseline section of this consultation. See the 2022 Recovery Outline for Central America DPS, Mexico DPS, and Western North Pacific DPS of humpback whales for interim guidance to direct recovery efforts. The interim recovery program will focus on:

- Management activities that continue to protect humpback whales and their critical habitat.
- Management activities that reduce medium and high risk threats to humpback whales, including vessel strike and entanglement in fishing gear.
- Research activities to fill critical information gaps necessary to inform management actions.
- Education and outreach activities to engage ocean users and to promote public involvement in humpback whale research and recovery.

6.3.4 **Sei Whale**

Sei whales are distributed worldwide, occurring in the North Atlantic Ocean, North Pacific Ocean, and Southern Hemisphere. Throughout the Eastern Tropical Pacific, sei whales are uncommon, though there are reported sightings in the Gulf of California (Gendron and Rosales 1996). Sei whales mostly inhabit continental shelf and slope waters far from the coastline. Two subspecies of sei whale are recognized, *B. b. borealis* in the Northern Hemisphere and *B. b. schlegellii* in the Southern Hemisphere. The sei whale was originally listed as endangered on December 2, 1970.

Information available from the recovery plan (NMFS 2011c), recent stock assessment report (Carretta 2019b), and status review (NMFS 2012) were used to summarize the life history, population dynamics, and status of the species as follows.

6.3.4.1 Life History

Sei whales can live, on average, between 50 and 70 years. They have a gestation period of ten to 12 months, and calves nurse for six to nine months. Sexual maturity is reached between 6 and 12 years of age with an average calving interval of two to three years. Sei whales have a global distribution. They winter at low latitudes, where they calve and nurse, and summer at high latitudes, where they feed on a range of prey types, including: plankton (copepods and krill) small schooling fishes, and cephalopods.

6.3.4.2 Population Dynamics

Models indicate that total abundance declined from 42,000 to 8,600 individuals between 1963 and 1974 in the North Pacific Ocean. More recently, the North Pacific Ocean population was estimated to be 29,632 (95 percent confidence intervals 18,576 to 47,267) between 2010 and 2012 (IWC 2016, Thomas et al. 2016b). The best abundance estimate for sei whales in the Eastern North Pacific is 519 (N_{min}=374; CV=0.40) (Carretta 2019b). Abundance estimates for sei whales in Hawaii are 391 individuals (N_{min}=204). In the Atlantic, the Nova Scotia stock was surveyed between 2010 and 2013 at N=6,292 (N_{min}=3,098) and from 1978-1982 sightings between Cape Hatteras and Nova Scotia resulted in an estimated abundance of 253 for the Western North Atlantic. Population growth rates for sei whales are not available at this time as there are little to no systematic survey efforts to study sei whales.

Based on genetic analyses, there appears to be some differentiation between sei whale populations in different ocean basins. An early study of allozyme variation at 45 loci found some genetic differences between Southern Ocean and the North Pacific sei whales (Wada and Numachi 1991). However, more recent analyses of mtDNA control region variation show no significant differentiation between Southern Ocean and the North Pacific sei whales, though both appear to be genetically distinct from sei whales in the North Atlantic (Baker and Clapham 2004, Huijser et al. 2018). Within ocean basin, there appears to be intermediate to high genetic diversity and little genetic differentiation despite there being different managed stocks (Danielsdottir et al. 1991, Kanda et al. 2006, Kanda et al. 2011, Kanda et al. 2013, Kanda et al. 2015, Huijser et al. 2018).

6.3.4.3 Status

The sei whale is endangered as a result of past commercial whaling, reduced to about 20 percent of their pre-whaling abundance in the North Pacific Ocean (Carretta 2019b). Current threats include ship strikes, fisheries interactions (including entanglement), climate change (habitat loss and reduced prey availability), and anthropogenic sound.

6.3.4.4 Recovery Goals

See the 2011 Final Recovery Plan (NMFS 2011c)for the sei whale for complete downlisting/delisting criteria for both of the following recovery goals:

1. Achieve sufficient and viable populations in all ocean basins.
2. Ensure significant threats are addressed.

6.3.5 **Sperm Whale**

Sperm whales have a global distribution and can be found in relatively deep waters in all ocean basins. Sperm whale movements can range over 5,000 kilometers, likely driven by changes in prey abundance. While both males and females can be found in latitudes less than 40°, only adult males venture into the higher latitudes near the poles. The sperm whale was originally listed as endangered on December 2, 1970. Information available from the recovery plan (NMFS 2010a), recent stock assessment reports (Carretta 2019b), and status review (NMFS 2015b) were used to summarize the life history, population dynamics, and status of the species as follows.

6.3.5.1 Life History

The average lifespan of sperm whales is estimated to be at least 50 years (Whitehead 2009). They have a gestation period of one to one and a half years, and calves nurse for approximately two years. Sexual maturity for sperm whales in the North Pacific is reached between 7 and 13 years of age for females with an average calving interval for four to six years. Male sperm whales reach full sexual maturity between ages 18 and 21, after which they undergo a second growth spurt, reaching full physical maturity at around age 40 (Mizroch and Rice 2013). Sperm whales mostly occur far offshore, inhabiting areas with a water depth of 600 meters (1,968 feet) or more, and are uncommon in waters less than 300 meters (984 feet) deep. However, if there are shelf breaks or submarine canyons close to land, sperm whales can occur there. They winter at low latitudes, where they calve and nurse, and summer at high latitudes, where they feed primarily on squid; other prey includes octopus and demersal fish (including teleosts and elasmobranchs).

6.3.5.2 Population Dynamics

The sperm whale is the most abundant of the large whale species, with a global population of between 300,000 and 450,000 individuals (Whitehead 2009). The higher estimates may be approaching population sizes prior to commercial whaling. In the northeast Pacific Ocean, the abundance of sperm whales was estimated to be between 26,300 and 32,100 in 1997 (NMFS 2015b) and more recently stocks were estimated offshore the Western US Coast at N=1,997 (N_{min}=1,270) and in Hawaii at N=5,707 (N_{min}= 4,486). Gerrodette and Forcada (2002) calculated an abundance estimate of sperm whales in the Eastern Tropical Pacific of 4,145. For the Atlantic population, abundance is estimated at 4,349 individuals (N_{min}=3,451); northern Gulf of Mexico is approximately 1,180 individuals (N_{min}=983); and Puerto Rico and the US Virgin Islands do not have a current abundance estimate. There is insufficient data to evaluate trends in abundance and growth rates of sperm whales at this time.

Ocean-wide genetic studies indicate sperm whales have low genetic diversity, suggesting a recent bottleneck, but strong differentiation between matrilineally related groups (Lyrholm and Gyllensten 1998, Mesnick et al. 2011, Rendell et al. 2012). As none of the stocks for which data are available have high levels of genetic diversity, the species may be at some risk to inbreeding and ‘Allee’ effects, although the extent to which is currently unknown.

6.3.5.3 Status

The sperm whale is endangered as a result of past commercial whaling. Although the aggregate abundance worldwide is probably at least several hundred thousand individuals, the extent of depletion and degree of recovery of populations are uncertain. Commercial whaling is no longer allowed, however, illegal hunting may occur at biologically unsustainable levels. Continued threats to sperm whale populations include ship strikes, entanglement in fishing gear, competition for resources due to overfishing, population, loss of prey and habitat due to climate change, and noise.

6.3.5.4 Recovery Goals

See the 2010 Final Recovery Plan (NMFS 2010c)for the sperm whale for complete downlisting/delisting criteria for both of the following recovery goals:

1. Achieve sufficient and viable populations in all ocean basins.
2. Ensure significant threats are addressed.

7 Environmental Baseline

The "environmental baseline" refers to the condition of the listed species or its proposed or designated critical habitat in the action area, without the consequences to the listed species or proposed or designated critical habitat caused by the action. 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. The consequences to listed species or proposed or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 C.F.R. §402.02).

A number of human activities have contributed to the status of populations of ESA-listed blue, fin, sei, sperm, and humpback (Western North Pacific, Central America and Mexico DPSs) whales in the action area. Some human activities are ongoing and appear to continue to affect cetacean populations in the action area for this consultation. Some of these activities, most notably commercial whaling, occurred extensively in the past and continue at low levels that no longer appear to significantly affect cetacean populations, although the effects of past reductions in numbers persist today. The following discussion summarizes these impacts, which include climate change; commercial and recreational fisheries; whaling, subsistence hunting, and cultural resources; vessel traffic and tourism; water quality degradation; ocean noise; oil and gas activities; scientific research; commercial shipping, and military activities. Predation, a natural phenomenon that also affects these four species, is also discussed below.

7.1 Climate Change

There is a large and growing body of literature on past, present, and future impacts of global climate change, exacerbated and accelerated by human activities. Effects of climate change include sea level rise, increased frequency and magnitude of severe weather events, changes in air and water temperatures, changes in the quality and quantity of ice, and changes in precipitation patterns, all of which are likely to impact ESA resources. NOAA's climate information portal provides basic background information on these and other measured or anticipated climate change effects (see https://www.climate.gov).

In order to evaluate the implications of different climate outcomes and associated impacts throughout the 21st century, many factors have to be considered with greenhouse gas emissions and the potential variability in emissions serving as a key variable. Developments in technology, changes in energy generation and land use, global and regional economic circumstances, and population growth must also be considered.

The rising concentrations of greenhouse gases in the atmosphere, now higher than any period in the last 800,000 years, have also affected the chemistry of the ocean, causing it to become more acidic. Ocean acidification negatively affects crustaceans, crabs, mollusks, and other calcium carbonate-dependent organisms such as pteropods (free-swimming pelagic sea snails and sea slugs) which are an important part of the food web in the waters of the Northwest Atlantic Ocean. Some studies in the nutrient-rich regions have found that food supply may play a role in determining the resistance of some organisms to ocean acidification (Ramajo et al. 2016, Markon et al. 2018). Reduction in prey items can create a collapse of the zooplankton populations and thereby result in potential cascading reduction of prey at various levels of the food web, thereby reducing the availability of the larger prey items of marine mammals and sea turtles.

Below are excerpted highlights from (Pörtner et al. 2022), which we incorporate by reference:

“Climate change has altered marine, terrestrial and freshwater ecosystems all around the world (very high confidence). Effects were experienced earlier and are more widespread with more far-reaching consequences than anticipated (medium confidence). Biological responses, including changes in physiology, growth, abundance, geographic placement and shifting seasonal timing, are often not sufficient to cope with recent climate change (very high confidence). Climate change has caused local species losses, increases in disease (high confidence) and mass mortality events of plants and animals (very high confidence), resulting in the first climate-driven extinctions (medium confidence), ecosystem restructuring, increases in areas burned by wildfire (high confidence) and declines in key ecosystem services (high confidence). Climate driven impacts on ecosystems have caused measurable economic and livelihood losses and altered cultural practices and recreational activities around the world (high confidence).”

“Global mean sea surface temperature has increased since the beginning of the 20th century by 0.88°C… Global mean sea level has risen by about 0.20 m since 1901 and continues to accelerate… Most coastal ecosystems (mangroves, seagrasses, salt marshes, shallow coral reefs, rocky shores and sandy beaches) are affected by changes in relative sea level… Ocean stratification is an important factor controlling biogeochemical cycles and affecting marine ecosystems… stratification in the upper 200 m of the ocean has been increasing since 1970. Since the late 1970s, Arctic sea ice area has decreased for all months, with an estimated decrease of 2 million km2 (or 25%) for summer sea ice (averaged for August, September and October) in 2010–2019 as compared with 1979–1988.”

“Direct measurements of ocean acidity [as it relates to ocean acidification] from ocean time series, as well as pH changes determined from other shipboard studies, show consistent decreases in ocean surface pH over the past few decades… In recent decades, anthropogenic inputs of nutrients and organic matter (Section 3.1) have increased the extent, duration and intensity of coastal hypoxia events worldwide (Diaz and Rosenberg, 2008; Rabalais et al., 2010; Breitburg et al., 2018), while pollution-induced atmospheric deposition of soluble iron over the ocean has accelerated open-ocean deoxygenation (Ito et al., 2016). Deoxygenation and acidification often coincide because biological consumption of oxygen produces CO2. Deoxygenation can have a range of detrimental effects on marine organisms and reduce the extent of marine habitats… As with ocean acidification, reduced oxygen availability further alters the influence of warming on metabolic rates (high confidence). Acidification and hypoxia can contribute to a decrease or shift in thermal tolerance, while the magnitude of this effect depends on the duration of exposure."

The globally-averaged combined land and ocean surface temperature data, as calculated by a linear trend, show a warming of approximately 1.0°C from 1901 through 2016 (Hayhoe et al. 2018). The IPCC Special Report on the Impacts of Global Warming (2018) noted that human-induced warming reached temperatures between 0.8 and 1.2°C above pre-industrial levels in 2017, likely increasing between 0.1 and 0.3°C per decade. Warming greater than the global average has already been experienced in many regions and seasons, with most land regions experiencing greater warming than over the ocean (Allen et al. 2018). Average global warming up to 1.5°C as compared to pre-industrial levels is expected to lead to regional changes in extreme temperatures, and increases in the frequency and intensity of precipitation and drought (Hoegh-Guldberg et al. 2018).

The Atlantic Ocean appears to be warming faster than all other ocean basins except perhaps the southern oceans (Cheng et al. 2017). In the western North Atlantic Ocean surface temperatures have been unusually warm in recent years (Blunden and Arndt 2016). Over the last 100 years, sea surface temperatures have increased across much of the Northwest Atlantic Ocean, consistent with the global trend of increasing sea surface temperature due to anthropogenic climate change (Beazley et al. 2021). The effects of ocean warming have already been observed in the marine ecosystem across the Northwest Atlantic Ocean, through northward shifts in the range of commercially harvested fish and their catch distribution (Pinsky and Fogarty 2012) and varying shifts of ESA-listed marine mammals. Chavez-Rosales et al. (2022) examined habitat suitability for 16 species of cetaceans in the western Northwest Atlantic Ocean, including fin whale, sei whale, and sperm whale using generalized additive models developed from data collected by the NMFS Northeast Fisheries Science Center from 2010 through 2017. The models were based on observed species distribution as a function of 21 environmental covariates and compared species-specific core habitats between 2010 and 2017. Chavez-Rosales et al. (2022) noted that the largest shifts in the core habitat was for several species including fin whale, sei whale, and sperm whale. It was noted that the effects of these shifts are still unknown, but for already stressed species, the contraction or displacement of their historical habitat cold worsen their population status. McMahon and Hays (2006b) predicted increased ocean temperatures will expand the distribution into more northern latitudes and noted this is already occurring in the Atlantic Ocean. A study by Polyakov et al. (2009) suggests that the North Atlantic Ocean overall has been experiencing a general warming trend over the last 80 years of 0.031±0.0006 degrees Celsius per decade in the upper 2,000 meters (6,561.7 feet) of the ocean. Additional consequences of climate change include increased ocean stratification, decreased sea-ice extent, altered patterns of ocean circulation, and decreased ocean oxygen levels (Doney et al. 2012). Since the early 1980s, the annual minimum sea ice extent (observed in September each year) in the Arctic Ocean has decreased at a rate of 11 to 16 percent per decade (Jay et al. 2018). Further, ocean acidity has increased by 26 percent since the beginning of the industrial era (IPCC 2014) and this rise has been linked to climate change.

Climate change has the potential to impact species abundance, geographic distribution, migration patterns, and susceptibility to disease and contaminants, as well as the timing of seasonal activities and community composition and structure (MacLeod et al. 2005, Robinson et al. 2005, Kintisch 2006, Learmonth et al. 2006a, Mcmahon and Hays 2006a, Evans and Bjørge 2013, IPCC 2014). Though predicting the precise consequences of climate change on highly mobile marine species is difficult (Simmonds and Isaac 2007a), recent research has indicated a range of consequences already occurring.

Changes in the marine ecosystem caused by global climate change (e.g., ocean acidification, salinity, oceanic currents, dissolved oxygen levels, nutrient distribution) could influence the distribution and abundance of lower trophic levels (e.g., phytoplankton, zooplankton, submerged aquatic vegetation, crustaceans, mollusks, forage fish), ultimately affecting primary foraging areas of ESA-listed whales. Marine species ranges are expected to shift as they align their distributions to match their physiological tolerances under changing environmental conditions (Doney et al. 2012). Hazen et al. (2012) examined top predator distribution and diversity in the Pacific Ocean in light of rising sea surface temperatures using a database of electronic tags and output from a global climate model. They predicted up to a 35 percent change in core habitat area for some key marine predators in the Pacific Ocean, with some species predicted to experience gains in available core habitat and some predicted to experience losses. MacLeod (2009) estimated, based upon expected shifts in water temperature, 88 percent of cetaceans will be affected by climate change, with 47 percent predicted to experience unfavorable conditions (e.g., range contraction).

Similarly, climate-related changes in important prey species populations are likely to affect predator populations. For example, blue whales, as predators that specialize in eating krill, are likely to change their distribution in response to changes in the distribution of krill (Payne et al. 1986, Payne et al. 1990, Clapham et al. 1999). Pecl and Jackson (2008) predicted climate change will likely result in squid that hatch out smaller and earlier, undergo faster growth over shorter life-spans, and mature younger at a smaller size. This could have negative consequences for species such as sperm whales, whose diets can be dominated by cephalopods. For ESA-listed species that undergo long migrations, if either prey availability or habitat suitability is disrupted by changing ocean temperature regimes, the timing of migration can change or negatively impact population sustainability (Simmonds and Eliott 2009). Another example, the North Atlantic right whale, is a well studied species for which prey availability was previously predicted to, and has shifted, putting the whale at higher risk and that shift is considered to be associated at least in part with the current Unusual Mortality Event on the Atlantic coast (Meyer-Gutbrod et al. 2021).

Warming in the Arctic over the past few decades has been about twice the global mean (IPCC 2013). Even if greenhouse gases are limited immediately, sea ice loss, which has been faster than originally predicted by climate models, will still continue for several decades potentially leading to ice-free summers by 2040 (Overland and Wang 2013, Laidre et al. 2015, Wang et al. 2016). Changes in sea ice will also affect the food web through changes in the timing and quantity of primary production (spring phytoplankton blooms) that in turn would affect lower trophic levels and benthic invertebrates and subsequently higher trophic levels (Wang et al. 2016).

In addition to increased ocean warming and changes in species' distribution, climate change is linked to increased extreme weather and climate events including, but not limited to, hurricanes, cyclones, tropical sotrms, heat waves, and droughts (IPCC 2022). Research from IPCC (2022) shows that it is likely extratropical storm tracks have shifted poleward in both the Northern and Southern Hemispheres, and heavy rainfalls, and mean maximum wind speeds associated with hurricane events will increase with continued greenhouse gas warming.

This review provides some examples of impacts to ESA-listed species and their habitats that may occur as the result of climate change within the action area. While it is difficult to accurately predict the consequences of climate change to a particular species or habitat, a range of consequences are expected that are likely to change the status of the species and the condition of their habitats, and may be exacerbated by additional threats in the action area.

7.2 Oceanic Temperature Regimes

Oceanographic conditions in the Atlantic and Pacific Oceans can be altered due to periodic shifts in atmospheric patterns caused by the Southern oscillation in the Pacific Ocean, which leads to El Niño and La Niña events, the Pacific decadal oscillation, and the North Atlantic oscillation. These climatic events can alter habitat conditions and prey distribution for ESA-listed species in the action area (Beamish 1993, Mantua et al. 1997, Hare and Mantua 2001) (Benson and Trites 2002, Stabeno et al. 2004, Mundy 2005, Mundy and Cooney 2005). For example, decade-scale climatic regime shifts have been related to changes in zooplankton in the North Atlantic Ocean (Fromentin and Planque 1996), and decadal trends in the North Atlantic oscillation (Hurrell 1995) can affect the position of the Gulf Stream (Taylor et al. 1998) and other circulation patterns in the North Atlantic Ocean that act as migratory pathways for various marine species, especially fish.

The Pacific decadal oscillation is the leading mode of variability in the North Pacific and operates over longer periods than either El Niño or La Niña/Southern Oscillation events and is capable of altering sea surface temperature, surface winds, and sea level pressure (Mantua and Hare 2002, Stabeno et al. 2004). During positive Pacific decadal oscillations, the northeastern Pacific experiences above average sea surface temperatures while the central and western Pacific

Ocean undergoes below-normal sea surface temperatures (Royer 2005). Warm Pacific decadal oscillation regimes, as occurs in El Niño events, tends to decrease productivity along the U.S. west coast, as upwelling typically diminishes (Hare et al. 1999, Childers et al. 2005). Recent sampling of oceanographic conditions just south of Seward, Alaska has revealed anomalously cold conditions in the Gulf of Alaska from 2006 through 2009, suggesting a shift to a colder Pacific decadal oscillation phase. More research needs to be done to determine if the region is indeed shifting to a colder Pacific decadal oscillation phase in addition to what effects these phase shifts have on the dynamics of prey populations important to ESA-listed cetaceans throughout the Pacific action area. A shift to a colder decadal oscillation phase would be expected to impact prey populations, although the magnitude of this effect is uncertain.

In addition to period variation in weather and climate patterns that affect oceanographic conditions in the action area, longer terms trends in climate change and/or variability also have the potential to alter habitat conditions suitable for ESA-listed species in the action area on a much longer time scale. For example, from 1906 through 2006, global surface temperatures have risen 0.74° Celsius and this trend is continuing at an accelerating pace. Possible effects of this trend in climate change and/or variability for ESA-listed marine species in the action area include the alteration of community composition and structure, changes to migration patterns or community structure, changes to species abundance, increased susceptibility to disease and contaminants, and altered timing of breeding and nesting (MacLeod et al. 2005, Robinson et al. 2005, Kintisch 2006, Learmonth et al. 2006b, Mcmahon and Hays 2006a). Climate change can influence reproductive success by altering prey availability, as evidenced by the low success of Northern elephant seals (*Mirounga angustirostris*) during El Niño periods (McMahon and Burton 2005) as well as data suggesting that sperm whale females have lower rates of conception following periods of unusually warm sear surface temperature (Whitehead et al. 1997). However, gaps in information and the complexity of climatic interactions complicate the ability to predict the effects that climate change and/or variability may have to these species from year to year in the action area (Kintisch 2006, Simmonds and Isaac 2007b).

7.3 Commercial and Recreational Fisheries

Fisheries constitute an important and widespread use of the ocean resources throughout the action area. Fisheries can adversely affect fish populations, other species, and habitats. Direct effects of fisheries interactions on marine mammals include entanglement and entrapment, which can lead to fitness consequences or mortality as a result of injury or drowning. Effects include reduced prey availability, including overfishing of targeted species, and destruction of habitat. Use of mobile fishing gear, such as bottom trawls, disturbs the seafloor and reduces structural complexity. Impacts of trawls include increased turbidity, alteration of surface sediment, removal of prey (leading to declines in predator abundance), removal of predators, ghost fishing (i.e., lost fishing gear continuing to ensnare fish and other marine animals), and generation of marine debris. Lost gill nets, purse seines, and long-lines may foul and disrupt bottom habitats and have the potential to entangle or be ingested by marine mammals.

Fisheries can have a profound influence on fish populations. In a study of retrospective data, Jackson et al. (2001) concluded that ecological extinction caused by overfishing precedes all other pervasive human disturbance of coastal ecosystems, including pollution and anthropogenic climactic change. Marine mammals are known to feed on several species of fish that are harvested by humans (Waring et al. 2008). Thus, competition with humans for prey is a potential concern. Reductions in fish populations, whether natural or human-caused, may affect the survival and recovery of several populations.

Globally, 6.4 million tons of fishing gear is lost in the oceans every year (Wilcox et al. 2015). Entrapment and entanglement in fishing gear is a frequently documented source of human-caused mortality in cetaceans (see Dietrich et al. 2007). In an extensive analysis of global risks to marine mammals, incidental catch was identified as the most common threat category (Avila et al. 2018). Materials entangled tightly around a body part may cut into tissues, enable infection, and severely compromise an individual's health (Derraik 2002). Entanglements also make animals more vulnerable to additional threats (e.g., predation and vessel strikes) by restricting agility and swimming speed. The majority of cetaceans that die from entanglement in fishing gear likely sink at sea rather than strand ashore, making it difficult to accurately determine the extent of such mortalities. In excess of 97 percent of entanglement is caused by derelict fishing gear (Baulch and Perry 2014).Cetaceans are also known to ingest fishing gear, likely mistaking it for prey, which can lead to fitness consequences and mortality. Necropsies of stranded whales have found that ingestion of net pieces, ropes, and other fishing debris has resulted in gastric impaction and ultimately death (Jacobsen et al. 2010). Additionally, whales may unintentionally become entangled in fishing gear. Some individuals are able to shed the gear on their own, however others may carry gear for days to years, and may result a serious injury or death. As with vessel strikes, entanglement or entrapment in fishing gear likely has the greatest impact on populations of ESA-listed marine mammal species with the lowest abundance (e.g., Kraus et al. 2016). In 2015, we received a substantial increase in the number of confirmed reports of whales entangled in fishing gear (53 confirmed reports), and this continued in 2016 with 56 confirmed whale entanglements along the U.S. west coast. The number of confirmed lartge whale entanglements in 2018 (46 confirmed reports) was close to the 2015 and 2016 peak numbers, but the number of confirmed entanglements has generally decreased to between 17 in 2020 and 27 in 2021 (annual reports from 2015 to 2021 can be found at: https://www.fisheries.noaa.gov/west-coast/marine-mammal-protection/west-coast-large-whale-entanglement-response-program#large-whale-entanglement). From 1982 to 2017, gray whales and humpback whales were the most frequently reported species with 208 and 165 confirmed entanglements, respectively, on the U.S. West Coast (Saez et al. 2021). Since 2017, humpback whales are the most commonly entangled type of whale each year on the U.S. West Coast. Nevertheless, all species of cetaceans may face threats from derelict fishing gear. The latest five-year average annual mortality related to fisheries interactions for the bowhead whale is less than one animal (Hayes et al. 2017b, Henry et al. 2017). Data represent only known mortalities and serious injuries; more, undocumented moralities and serious injuries within the action area have likely occurred.

In addition to these direct impacts, cetaceans may also be subject to impacts from fisheries. Marine mammals probably consume at least as much fish as is harvested by humans (Kenney et al. 1985). Many cetacean species (particularly fin, sperm, and humpback whales) are known to feed on species of fish that are harvested by humans (Carretta et al. 2016). Thus, competition with humans for prey is a potential concern. Reductions in fish populations, whether natural or human-caused, may affect the survival and recovery of ESA-listed cetacean populations. Even species that do not directly compete with human fisheries could be affected by fishing activities through changes in ecosystem dynamics. However, in general the effects of fisheries on whales through changes in prey abundance remain unknown.

Commercial fisheries target species that are known prey items of marine mammals. U.S. fisheries are managed to prevent overfishing of individual stocks and the overall biomass levels of groundfish species have remained relatively stable since the 1970s (Mueter and Megrey 2006). Bycatch of other marine mammal prey items in fisheries could also affect them due to potential reductions in biomass of prey.

7.4 Whaling, Subsistence Hunting, and Cultural Resources

Large whale population numbers in the action area have historically been impacted by hunting, and early commercial exploitation, and some stocks were already reduced by 1864 (the beginning of the era of modern commercial whaling using harpoon guns as opposed to harpoons simply thrown by men). From 1864 through 1985, at least 2.4 million baleen whales (excluding minke whales [*Balaenoptera acutorostrata*]) and sperm whales were killed (Gambell 1999). The large number of baleen whales harvested during the 1930s and 1940s has been shown to correspond to increased cortisol levels in earplugs collected from baleen whales, suggesting that anthropogenic activities, such as those associated with whaling, may contribute to increased stress levels in whales (Trumble et al. 2018). Prior to current prohibitions on whaling most large whale species were significantly depleted to such an extent that it became necessary to list them as endangered under the Endangered Species Preservation Act of 1966. In 1982, the IWC issued a moratorium on commercial whaling beginning in 1986. Presently three types of whaling take place: (1) aboriginal subsistence whaling to support the needs of indigenous people; (2) special permit whaling; and (3) commercial whaling conducted either under objection or reservation to the moratorium. The reported catch and catch limits of large whale species from aboriginal subsistence whaling, special permit whaling, and commercial whaling can be found on the IWC's website at: https://iwc.int/whaling.

Historically, commercial whaling caused all of the large whale species to decline to the point where they faced extinction risks high enough to list them as endangered species. Since the end of large-scale commercial whaling, the primary threat to the species has been eliminated. Many whale species have not yet fully recovered from those historic declines. Scientists cannot determine if those initial declines continue to influence current populations of most large whale species in the Arctic, Atlantic, Indian, Pacific, and Southern Oceans. For example, the North Atlantic right whale has not recovered from the effects of commercial whaling and continue to face very high risks of extinction because of their small population sizes and low population growth rates. In contrast, populations of species such as the humpback whale have increased substantially from post-whaling population levels and appear to be recovering despite the impacts of vessel strikes, interactions with fishing gear, and increased levels of ambient sound.

7.5 Vessel Traffic, Commercial Shipping and Tourism

Potential sources of adverse effects from Federal vessel operations in the action area include operations of the US Department of Defense, Bureau of Ocean Energy Management, Bureau of Safety and Environmental Enforcement, Federal Energy Regulatory Commission, USCG, NOAA, and US Army Corps of Engineers. The offshore waters of the action area have a high level of commercial shipping activity with many large ports, especially those with transiting bulk carriers (Wiggins et al. 2016). Shipping activity in the action area, especially offshore, may be very high (see Figure 13 and Figure 14, above in section 6.2.2). This activity includes cruise ship traffic in addition to vessel traffic associated with the transport of goods such as oil and gas. Vessel traffic is also increasing in other portions of the action area as commercial shipping expands due to expansion of global markets, leading also to the construction of new ports and expansion of existing port facilities, often in areas containing ESA-listed species.

Vessels have the potential to affect animals through strikes, sound, and disturbance associated with their physical presence. Responses to vessel interactions include interruption of vital behaviors and social groups, separation of mothers and young, and abandonment of resting areas (Mann et al. 2000, Samuels et al. 2000, Boren et al. 2001, Constantine and Brunton 2001, Nowacek et al. 2004). Vessels operating at high speeds have the potential to strike marine mammals with their hulls or propellers. Shipping activities also pose a threat to whales due to the potential for oil spills. Fuel and oil shipments present a risk of spills in remote areas without a lot of spill response capacity, which could have significant impacts to ESA-listed species and their habitat, including prey species.

Acoustic impacts from sounds produced by vessels can also interrupt the normal behavior of animals that may also be disturbed by the presence of the ships themselves. Vessels are the greatest contributors to increases in low-frequency ambient sound in the sea (Andrew et al. 2011). It is predicted that ambient ocean sound will continue to increase at a rate of ½ dB per year (Ross 2005). Sound levels and tones produced are generally related to vessel size and speed. Larger vessels generally emit more sound than smaller vessels, and vessels underway with a full load, or those pushing or towing a load, are noisier than unladen vessels.

Whale-watching tourism is rapidly growing worldwide and is expected to continue increasing. Vessels (both commercial and private) engaged in marine mammal watching also have the potential to impact marine mammals in the action areas. In 2009, it was estimated that whale-watching generated an estimated 2.1 billion ($US) based on data from 144 maritime countries worldwide of which 68 have invested in this industry (Cisneros-Montemayor et al. 2010). Studies have shown an alteration or cessation of essential behaviors, such as feeding or resting, which could reduce fitness in the long-term, especially when there is prolonged or repeated exposure (Parsons 2012). Short-term effects include changes in swimming behavior, such as deeper and more frequent dives, or fast changes in direction. The frequency and strength of animals' responses can also change with the number of vessels present, with a higher number of boats causing stronger responses (Stensland and Berggren 2007, New et al. 2015). Long-term effects are difficult to measure because whales and dolphins are long-lived and typically reproduce every one to five years, depending on the species. Where long-termed effects have been measured in a population, whale-watching activities have been linked to a decrease in population size (Lusseau 2006) or movement of animals out of the area (Bejder et al. 2006). However, other studies indicate that the disruption to feeding minke whales caused by whale-watching is unlikely to have a measurable impact on a female's reproductive success over time (Christiansen and Lusseau 2013).

Based on the data available from Douglas et al. (2008), Jensen and Silber (2004), and Laist et al. (2001), there have been at least 25 incidents in which marine mammals are known to have been struck by ships in the Puget Sound region and southwestern British Columbia. The marine mammals that were involved in almost half of these incidents died as a result of the strike and they suffered serious injuries in four of those strikes. Jensen and Silber (2004) reviewed data from 1975 to 2002 and found that nine cases of ship strike (6.7 percent) were USCG vessels. Laist et al. (2001) found that five of the ship strike cases they reviewed worldwide were caused by USCG patrol boats with two of the cases resulting in the death of the animal. These cases occurred off Delaware, Florida, Cape Cod, and the Kenai Peninsula, Alaska.

Virtually all of the rorqual whale species have been documented to have been hit by vessels. This includes blue whales (Van Waerebeek et al. 2007, Berman-Kowalewski et al. 2010, Calambokidis 2012), fin whales (in November 2011 in San Diego and in 2018 in Alaska, which likely resulted in mortality; (Van Waerebeek et al. 2007, Douglas et al. 2008), sei whales (Felix and Van Waerebeek 2005, Van Waerebeek et al. 2007), Bryde's whales (Felix and Van Waerebeek 2005, Van Waerebeek et al. 2007), minke whales (Van Waerebeek et al. 2007), humpback whales (Lammers et al. 2003, Van Waerebeek et al. 2007, Douglas et al. 2008), and bowhead whales (George et al. 2017). For example, in April 2013 in Burien, Washington and in June 2013 at Ocean City, Washington, two stranded fin whales that had been struck by vessels brought the total to nine known fin whale strikes in Washington in approximately the last decade (Schorr et al. 2013). Approximately two percent of the total number of bowhead whales harvested in Alaska between 1990 and 2012 had clear indications of injuries (e.g., propeller scars) consistent with vessel strikes (Muto et al. 2017b) based on whales harvested by permitted subsistence hunters.

Large whales, such as fin whales and humpback whales, are occasionally found draped across the bow of large ships (Figure 18 and https://alaskafisheries.noaa.gov/pr/strandings). From 2012 to 2016 there were 31 incidents of vessel strike reported in the NMFS Alaska Region stranding database. While this averages to just over 6 strikes reported a year, 2012 saw 10 reported strikes. From 1978-2011, 108 whale-vessel collisions were reported within 200 miles of Alaska's coastline (Neilson et al. 2012). Most of these (86 percent) were humpback whales. Other species included fin whale, Cuvier's beaked whale, Stejneger's beaked whale, gray whale, and beluga whale (Neilson et al. 2012). In 15 of the 108 cases, whales struck anchored or drifting vessels, indicating that whales cannot always detect vessels (Neilson et al. 2012).

Figure 19. Photograph[9] of a Rice's whale on bow of cargo ship.

Collisions with commercial ships are an increasing threat to many large whale species, particularly as shipping lanes cross important large whale breeding and feeding habitats or migratory routes. The number of observed physical injuries to humpback whales as a result of ship collisions has increased in Hawaiian waters (Glockner-Ferrari et al. 1987, Lammers et al. 2007), possibly partly stemming from rapid humpback whale population growth. On the Pacific coast, a humpback whale is probably killed about every other year by ship strikes (Barlow et al. 1997). Through 2008, 82 instances of humpback whale shipstrike have been found (Gabriele et al. 2011). Ship strikes resulted in a minimum mean annual mortality and serious injury rate of 0.4 humpback whales from the Western North Pacific humpback stock from 2011-2015 (Muto et al. 2017b).

Although considered by many to be a non-consumptive use of marine mammals with economic, recreational, educational, and scientific benefits, marine mammal watching is not without potential negative impacts. One concern is that animals may become more vulnerable to vessel strikes once they habituate to vessel traffic. Another concern is that preferred habitats may be abandoned if disturbance levels are too high, which has been documented such as in a study of bottlenose dolphins (Bejder et al. 2006).

[9] Source: http://www.professionalmariner.com/October-November-2013/whale-zones/ accessed June 26, 2019.

Numerous studies of interactions between surface vessels and marine mammals have demonstrated that free-ranging marine mammals engage in avoidance behavior when surface vessels move toward them. It is not clear whether these responses are caused by the physical presence of a surface vessel, the underwater noise generated by the vessel, or an interaction between the two (Goodwin and Cotton 2004, Lusseau 2006). However, several authors suggest that the noise generated during motion is probably an important factor (Evans et al. 1992a, Blane and Jaakson 1994a, Evans et al. 1994a). These studies suggest that the behavioral responses of marine mammals to surface vessels are similar to their behavioral responses to predators.

Several investigators have studied the effects of whale watch vessels on marine mammals (Watkins 1986b, Corkeron 1995a, Au and Green 2000, Félix 2001b, Erbe 2002, Magalhaes et al. 2002, Williams et al. 2002a, Scheidat et al. 2004, Amaral and Carlson 2005b, Simmonds 2005b, Richter et al. 2006, Christiansen et al. 2011, Christiansen et al. 2013, May-Collado et al. 2014), including one targeting the response of humpback whales to whale-watching vessels in Juneau, Alaska (Schuler et al. 2019). The whale's behavioral responses to whale-watching vessels depended on the distance of the vessel from the whale, vessel speed, vessel direction, vessel noise, and the number of vessels. Responses changed with these different variables and, in some circumstances, the whales or dolphins did not respond to the vessels, but in other circumstances, whales changed their vocalizations, surface time, swimming speed, swimming angle or direction, respiration rates, dive times, feeding behavior, and social interactions, and dolphins abandoned important habitats due to long-terms disturbance (Bejder et al. 2006).

7.6 Water Quality Degradation

Exposure to pollution and contaminants have the potential to cause adverse health effects in marine species. Marine ecosystems receive pollutants from a variety of local, regional, and international sources, and their levels and sources are therefore difficult to identify and monitor (Grant and Ross 2002). Marine pollutants come from multiple municipal, industrial, and household as well as from atmospheric transport (Iwata et al. 1993, Grant and Ross 2002, Garrett 2004, Hartwell 2004). Contaminants may be introduced by rivers, coastal runoff, wind, ocean dumping, dumping of raw sewage by boats and various industrial activities, including offshore oil and gas or mineral exploitation (Grant and Ross 2002, Garrett 2004, Hartwell 2004). The action area includes ports and harbors in coastal areas, which are often some of the most highly developed lands in the U.S., and offshore areas that, in addition to vessel traffic as sources of pollutants, have wind and conventional energy infrastructure present and contributing effluent.

The accumulation of persistent organic pollutants, including polychlorinated-biphenyls, dibenzo-p-dioxins, dibenzofurans, and related compounds, through trophic transfer may cause mortality and sub-lethal effects in long-lived higher trophic level animals (Waring et al. 2016), including immune system abnormalities, endocrine disruption, and reproductive effects (Krahn et al. 2007). Persistent organic pollutants may also facilitate disease emergence and lead to the creation of susceptible "reservoirs" for new pathogens in contaminated marine mammal populations (Ross 2002). Efforts since 2000 have led to improvements in regional water quality and monitored pesticide levels have declined, although the more persistent chemicals are still detected and are expected to endure for years (Mearns 2001, Grant and Ross 2002).

Numerous factors can affect concentrations of persistent pollutants in marine mammals, such as age, sex, birth order, diet, and habitat use (Mongillo et al. 2012). In marine mammals, pollutant contaminant load for males increases with age, whereas females pass on contaminants to offspring during pregnancy and lactation (Addison and Brodie 1987, Borrell et al. 1995). Pollutants can be transferred from mothers to juveniles at a time when their bodies are undergoing rapid development, putting juveniles at risk of immune and endocrine system dysfunction later in life (Krahn et al. 2009).

Some environmental contaminants, such as chlorinated pesticides, are lipophilic and can be found in the blubber of marine mammals (Becker et al. 1995). Bowhead whale (as a representative baleen whale) blubber and some organs were collected during subsistence hunts from 1997-1999 at Barrow, Alaska to measure concentrations of persistent organochlorine contaminants (Hoekstra et al. 2005). Concentrations in bowhead whale tissues were correlated with lipid content. Relatively higher proportions of hexachlorocyclohexane (also known as benzene hexachloride) isomers (eight chemical forms of this synthetic chemical, some of which were used as insecticides) were observed in bowhead whale heart and diaphragm samples than in other tissues (Hoekstra et al. 2005). Bratton et al. (1993) measured organic arsenic in the liver tissue of one bowhead whale and found that about 98 percent of the total arsenic was arsenobetaine. Arsenobetaine is a common substance in marine biological systems and is relatively non-toxic.

Bratton et al. (1993) looked at eight metals (arsenic, cadmium, copper, iron, mercury, lead, selenium, and zinc) in the kidneys, liver, muscle, blubber, and visceral fat from bowhead whales harvested from 1983 to 1990. They observed considerable variation in tissue metal concentration among the whales tested. Metal concentrations evaluated did not appear to increase over time. The metal levels observed in all tissues of the bowhead are similar to levels reported in the literature in other baleen whales.

7.7 Oil and Gas Activities

In the U.S., oil and gas activities have been conducted off the coasts of Alaska, California and in the Gulf of Mexico for more than 50 years with highest activity levels in the Gulf of Mexico. These activities are expected to continue and may even increase in the future if oil reserves become more accessible. Oil and gas exploration, development, and production activities include seismic surveys, drilling operations, fill placement, offshore and coastal facility construction, and vessel and aircraft operations. Oil and gas exploration, development, and production activities have the potential to impact marine mammals. ESA-listed whales could be affected by oil spills and other discharges associated with oil and gas activities, as well as noise and physical disturbance and impacts to prey species. Spilled oil can cause disruptions in benthic communities and transfer of contaminants through the food web (Stowasser et al. 2004). Threats to marine mammals from oil and gas activities are greatest where activities converge with feeding and breeding aggregations or migratory corridors.

Exposure to hydrocarbons released into the environment via oil spills and other discharges pose risks to marine species. Marine mammals are generally able to metabolize and excrete limited amounts of hydrocarbons, but exposure to large amounts of hydrocarbons and chronic exposure over time pose greater risks (Grant and Ross 2002). Acute exposure of marine mammals to petroleum products causes changes in behavior and may directly injure animals (Geraci 1990). More recent studies to understand impacts on bottlenose dolphins conducted over a five year period following the Deepwater Horizon oil spill show dolphins from the most heavily oiled coastal areas have had chronic poor health, failed pregnancies, and increasd mortality from inhalation and other exposure to oil (Litz et al. 2014, Schwacke et al. 2014, Venn-Watson et al. 2015). Copepods and other small planktonic organisms on which these and other ESA-listed whales prey are highly susceptible to spills.

7.8 Ocean Noise

Much of the increase in sound in the ocean environment is due to increased shipping, as vessels become more numerous and of larger tonnage (NRC 2003, Hildebrand 2009, McKenna et al. 2012). Commercial shipping continues to be a major source of low-frequency sound in the ocean, particularly in the Northern Hemisphere where the majority of vessel traffic occurs. Although large vessels emit predominantly low frequency sound, studies report broadband sound from large cargo vessels above 2 kHz. The low frequency sounds from large vessels overlap with many mysticetes' predicted hearing ranges (7 Hz to 35 kHz; NOAA 2018) and may mask their vocalizations and cause stress (Rolland et al. 2012). The broadband sounds from large vessels may interfere with important biological functions of odontocetes, including foraging (Holt 2008, Blair et al. 2016). At frequencies below 300 Hz, ambient sound levels are elevated by 15 to 20 dB when exposed to sounds from vessels at a distance (McKenna et al. 2013). Analysis of sound from vessels revealed that their propulsion systems are a dominant source of radiated underwater sound at frequencies less than 200 Hz (Ross 1976). Additional sources of vessel sound include rotational and reciprocating machinery that produces tones and pulses at a constant rate. Other commercial and recreational vessels also operate within the action area and may produce similar sounds, although to a lesser extent given their much smaller size.

Individual vessels produce unique acoustic signatures, although these signatures may change with vessel speed, vessel load, and activities that may be taking place on the vessel. Peak spectral levels for individual commercial vessels are in the frequency band of 10 to 50 Hz and range from 195 dB re: μPa^2-s at 1 m sound exposure level (SEL) for fast-moving (greater than 37 kilometers per hour [20 knots]) supertankers to 140 dB re: μPa^2-s at 1 m SEL for small fishing vessels (NRC 2003). Small boats with outboard or inboard engines produce sound that is generally highest in the mid-frequency (1 to 5 kHz) range and at moderate (150 to 180 dB re: 1 μPa at 1 m rms) source levels (Erbe 2002, Gabriele et al. 2003, Kipple and Gabriele 2004). On average, sound levels are higher for the larger vessels, and increased vessel speeds result in higher sound levels. Measurements made over the period 1950 through 1970 indicated low frequency (50 Hz) vessel traffic sound in the eastern North Pacific Ocean and western North Atlantic Ocean was increasing by 0.55 dB per year (Ross 1976, 1993, 2005). Whether or not such trends continue today is unclear. Most data indicate vessel sound is likely still increasing (Hildebrand 2009). However, the rate of increase appears to have slowed in some areas (Chapman and Price 2011), and in some places, ambient sound including that produced by vessels appears to be decreasing (Miksis-Olds and Nichols 2016). Efforts are underway to better document changes in ambient sound (Haver et al. 2018), which will help provide a better understanding of current and future impacts of vessel sound on ESA-listed species.

Sonar systems are used on commercial, recreational, and military vessels and may also affect cetaceans (NRC 2003). Although little information is available on potential effects of multiple commercial and recreational sonars to cetaceans, the distribution of these sounds would be small because of their short durations and the fact that the high frequencies of the signals attenuate quickly in seawater (Nowacek et al. 2007). However, military sonar, particularly low frequency active sonar, often produces intense sounds at high source levels, and these may impact cetacean behavior (Southall et al. 2016).

Aircraft within the action area may consist of small commercial or recreational airplanes, helicopters, to large commercial airliners. These aircraft produce a variety of sounds that could potentially enter the water and impact marine mammals. While it is difficult to assess these impacts, several studies have documented what appear to be minor behavioral disturbances in response to aircraft presence (Nowacek et al. 2007).

There are seismic survey activities involving towed airgun arrays that may occur within the action area. They are the primary exploration technique to locate oil and gas deposits, fault structure, and other geological hazards. These activities may produce noise that could impact ESA-listed cetaceans and sea turtles within the action area. These airgun arrays generate intense low-frequency sound pressure waves capable of penetrating the seafloor and are fired repetitively at intervals of ten to 20 seconds for extended periods (NRC 2003). Most of the energy from the airguns is directed vertically downward, but significant sound emission also extends horizontally. Peak SPLs from airguns usually reach 235 to 240 dB at dominant frequencies of five to 300 Hz (NRC 2003). Most of the sound energy is at frequencies below 500 Hz, which is within the hearing range of baleen whales (Nowacek et al. 2007).

Marine construction in the action area that produces sound includes drilling, dredging, pile-driving, cable-laying, and explosions. These activities are known to cause behavioral disturbance and physical damage (NRC 2003). While most of these activities are coastal, offshore construction does occur.

7.9 Scientific Research

Regulations for section 10(a)(1)(A) of the ESA allow issuance of permits authorizing take of certain ESA-listed species for the purposes of scientific research. Prior to the issuance of such a permit, the proposal must be reviewed for compliance with section 7 of the ESA. Marine mammals have been the subject of field studies for decades. The primary objective of most of these field studies has generally been monitoring populations or gathering data for behavioral and ecological studies. Over time, NMFS has issued dozens of permits on an annual basis for various forms of "take" of marine mammals in the action area from a variety of research activities.

Authorized research on ESA-listed marine mammals includes aerial and vessel surveys, close approaches, photography, videography, behavioral observations, active acoustics, remote ultrasound, passive acoustic monitoring, biological sampling (i.e., biopsy, breath, fecal, sloughed skin), and tagging. Research activities involve non-lethal "takes" of these marine mammals.

There have been numerous research permits issued since 2009 under the provisions of both the MMPA and ESA authorizing scientific research on marine mammals all over the world, including for research in the action area. The completed ESA section 7 consultations for the issuance of these ESA scientific research permits concluded that the authorized research activities will have no more than short-term effects and will not result in jeopardy to the species nor destruction or adverse modification of proposed or designated critical habitat. However, cumulatively there may be some effects to species given that many of the studies target the same populations due to overlapping action areas.

In addition to directed take, a number of research permits and associated section 7 consultations allow for incidental take of whales from harassment associated with research activities targeting other species or a specific number of individuals from the same species.

7.10 Military Training and Testing

The Navy and Air Force have been conducting training and testing exercises in the Pacific Northwest (NWTT), Hawaii and Pacific Islands (HSTT and MITT), Atlantic (AFTT) and Gulf of Mexico (Eglin Air Force), and Alaska (GOAT) regions for decades. In terms of surface combatant ships, there are aircraft carriers and Navy destroyers home-ported at naval facilities within various ports in the action area. Monitoring in conjunction with Navy exercises to determine the effects of active sonar and explosives on marine mammals was initiated in 2010 as part of the MMPA regulations that allowed NMFS to issue Letters of Authorization (LOAs) for Navy military readiness activities in the military ranges from the areas mentioned above. Stranding data has been collected by researchers in the Northwest training and testing for approximately 30 years as well as by NMFS for a few decades. Though not all dead or injured marine mammals can be accounted for, if marine mammals were being harmed by the Navy training exercises in the Northwest with any regularity, evidence of that harm would likely have been detected over the 30-year period. Under the NMFS MMPA Rule and LOA for NWTT, incidental take is authorized for certain whale species in the Pacific Northwest. Authorized MMPA and ESA incidental take due to behavioral harassment was exceeded for humpback, fin, sperm, and killer whales by 4 to 19 takes depending on the species from 2012 to 2014 mainly due to sonar operations but in a few cases, due to the use of explosives (NMFS 2015a).

The U.S. Navy also regularly conducts training and testing activities in ranges located in other portions of the action area such as off the coast of Florida, the Northeast Atlantic, and in the Pacific Islands with similar potential for impacts to ESA-listed species, particularly marine mammals such as large whales. For AFTT, incidental take for mortality, injury and harassment was issued for North Atlantic right, blue, Rice's, minke, fin, humpback, and sei whales (84 FR 70712).

7.11 Predation

Within the operation areas, known predators of whales are killer whales (Muto et al. 2017b), and sharks (Ford et al 2011; Long and Jones 1996). Using 378 records from 1990 to 2012, George et al. (2017) observed scarring "rake marks" consistent with injuries inflicted from killer whales on 30 bowhead whales. In addition, two out of approximately 11 bowhead whale carcasses seen during the aerial surveys project in 2015 exhibited clear evidence of killer whale predation, including rake marks and a missing jaw/tongue (Suydam et al. 2016). Killer whales and sharks prey on other whale species as well, particularly calves, including in other portions of the action areas where other large whales (and their calves) are present during different parts of the year.

7.12 Synthesis of Baseline Impacts

Collectively, the stressors described above have had, and are likely to continue to have, lasting impacts on ESA-listed blue, fin, sei, sperm, and humpback (Western North Pacific, Central America and Mexico DPSs) whales within the action area. Some of these stressors result in mortality or serious injury to individual animals (e.g., vessel strikes, predation, whaling, and subsistence hunting), whereas others result in more indirect (e.g., soundscape degradation) or non-lethal (e.g., whale-watching) impacts. Assessing the aggregate impacts of these stressors on species is difficult and, to our knowledge, no such analysis exists. This becomes even more difficult considering that many of the species in this Opinion are wide-ranging and subject to stressors in locations throughout the action area and outside the action area.

We consider the best indicator of the aggregate impact of the *Environmental Baseline* on ESA-listed resources to be the status and trends of those species in the action area, including 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. As noted in Section 6.3, some of the species considered in this consultation are experiencing increases in population abundance, some are declining, and for others, their status remains unknown. Taken together, this indicates that the *Environmental Baseline* is impacting species in different ways. The species experiencing increasing population abundances are doing so despite the potential negative impacts of the *Environmental Baseline*. Therefore, while the *Environmental Baseline* may slow their recovery, recovery is not being prevented. For the species that may be declining in abundance, it is possible that the suite of conditions described in the *Environmental Baseline* is preventing their recovery. However, it is also possible that their populations are at such low levels (e.g., due to historical commercial whaling) that even when the species' primary threats are removed, the species may not be able to achieve recovery. At small population sizes, species may experience phenomena such as demographic stochasticity, inbreeding depression, and Allee effects, among others, that cause their limited population size to become a threat in and of itself. A thorough review of the status and trends of each species is discussed in the *Status of Species and Critical Habitat Likely to be Adversely Affected* (Section 6.3) section of this Opinion.

8 EFFECTS OF THE ACTION

"Effects of the action" means all consequences to listed species or critical habitat that are caused by the action, including the consequences of other activities that are caused by the action. A consequence is caused by the action if it would not occur but for the action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 C.F.R. §402.02).

This effects analysis section is organized following the stressor, exposure, response, risk assessment framework.

8.1 Key Assumptions Underlying the Estimation of Effects

Because this is a mixed programmatic action with a number of unknowns as the OPC Program evolves and new cutters are constructed, we made several assumptions to complete our effects analysis. Key assumptions discussed below were the locations and timing of activities in relation to ESA-listed marine mammals in the operation areas and the location of the existing homeports for the new OPCs. The effects analysis also presumes that conservation measures and other SOPs will be carried out as described as part of the action (Section 3).

8.1.1 Location and Timing of Activities in the Action Area and Homeport Locations

Our analysis is based on past and ongoing USCG operations, with consideration of projected future operation activities in the action area to include all activities listed in Table 1. Assuming a total of 25 vessels are constructed and operated as planned, we have determined the consultation will cover a 30-year period and we assume that future OPC activity levels will be similar to the last 30 years based on the current MEC fleet. Similarly, if USCG operations with the new OPCs change, particularly the location, timing or types of actions, such that there would not be the same or fewer effects to ESA-listed species and designated critical habitat as what was analyzed in this consultation, then reinitiation of consultation would be required.

Our analysis is also based on the current homeport locations for the existing USCG MEC fleet as shown in Figure 2. The use of these existing homeports in each of the sectors of the existing fleet is not expected to require modifications such as in-water construction or dredging. However, if the new OPCs' addition to the USCG fleet results in a future need to develop new, or expand or modify the facilities in a way that requires in-water construction or dredging resulting in changes to the potential effects of the action such that there would not be the same or fewer effects to ESA-listed species and proposed or designated critical habitat as what was analyzed in this consultation, then a separate or reinitiation of this consultation would be required. Similarly, if a different homeport location is selected for some or all of the new OPCs and this change would result in effects to ESA-listed species and proposed or designated critical habitat that are different from or greater than those analyzed in this consultation, then a separate consultation or reinitiation of consultation would be required.

8.1.2 Definition of Take, Harm, and Harass

Section 3 of the ESA defines take as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. We categorize two forms of take, lethal and sublethal take. Lethal take is expected to result in immediate, imminent, or delayed but likely mortality. Sublethal take is when effects of the action are below the level expected to cause death, but are still expected to cause injury, harm, or harassment. Harm, as defined by regulation (50 C.F.R. §222.102), includes acts that actually kill or injure wildlife and acts that may cause significant habitat modification or degradation that actually kill or injure fish or wildlife by significantly impairing essential behavioral patterns, including, breeding, spawning, rearing, migrating, feeding, or sheltering. Thus, for sublethal take we are concerned with harm that does not result in mortality but is still likely to injure an animal.

NMFS has not defined “harass” under the ESA by regulation. However, on October 21, 2016, NMFS issued interim guidance on the term “harass,” defining it as to “create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering.” NMFS revised this policy directive in 2023, affirming this definition of harass.

8.1.3 Species Distribution and Abundance in the Action Area

In order to estimate likelihood of exposure of ESA-listed species to the stressors associated with the action, we considered abundance of the species determined likely to be adversely affected. The status of the species sections (Section 6.3) provide an overview of the species abundance and distribution at the listed entity level, as well as population level when data are available, this information is relevant to the broad range of operation areas under this action for estimating exposure. Here, we summarize the distribution and abundance of ESA-listed whales in the action area, which are then used to estimate exposure of ESA-listed species to each stressor, in this case vessel strike, created by the action likely to result in adverse effects.

Additionally, we rely on information from current species abundance, which does not take into account population trends over the 30 years of the action. Population trends can fluctuate over time and estimations of effects are based on a snapshot of the current known population status. Thus, should a population trend shift, the estimations made in this Opinion may need to be reassessed.

For the purpose of this analysis, the activities in the operation areas we expect to result in stressors with adverse effects to ESA-listed whales include those related to vessel activity, namely vessel escort and tow; LE; DR training; SAR training; functionality and maneuverability qualifications; vertical replenishment; crew and passenger transfers; and training using UAS and helicopters. Stressors from these activities that may result in adverse effects include those that involve vessel presence, movement and potential for acoustic or visual disturbance.

We rely on NMFS stock assessment reports (https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-species-stock) to determine the abundance and relative densities of ESA-listed marine mammals in the operation areas and estimate exposure to stressors (strike) from vessel operation activities (Table 10).

Table 10. ESA-listed marine mammal abundance as listed in most recent NMFS stock assessment reports.

Species	Ncurrent	Nmin	Year	PBR*
Blue Whale (*Balaenoptera musculus*) -- Hawaiian stock (Central North Pacific)	133	63	2021	0.1
--Eastern North Pacific	1898	1767	2018	7
--Western North Atlantic	402	402	1980-2008	0.8
Fin Whale (*Balaenoptera physalus*) --CA-OR-WA	11065	7970	2018	80
--Hawaii	203	101	2017	0.2
--NE Pacific	916-3168	2554	2013-2015	5.1
--Western North Atlantic	6802	5573	2016	11
Humpback Whale (*Megaptera novaeangliae*) – Central America / Southern Mexico - CA/OR/WA	918	unknown	2021	Undetermined
Mainland Mexico - CA/OR/WA	3479	3185	2022	
Western North Pacific DPS	1084	1007	2004-2006	3.4
Sperm Whale (*Physeter macrocephalus*)-CA/OR/WA	1997	1270	2014	2.5
Hawaii	5707	4486	2017	18

Species	**Ncurrent**	**Nmin**	**Year**	**PBR***
North Pacific – Gulf of Alaska	129 and 345	244	2009 and 2015	0.5
North Atlantic	4349	3451	2016	6.9
Northern Gulf of Mexico	1180	983	2017-8	2
Puerto Rico and US Virgin Islands	uknown	NA	NA	NA
Sei Whale (*Balaenoptera borealis*)- North Pacific	519	374	2008 + 2014	0.75
Hawaii	391	204	2010	0.4
Nova Scotia**	6292	3098	2010-2013	6.2

* Potential Biological Removal (PBR) is the product of minimum population size, one-half the maximum productivity rate, and a recovery factor (MMPA Sec. 3. 16 U.S.C. 1362; Wade and Angliss 1997).

**Formerly known as the Western North Atlantic stock, which had an estimate of 253 from Cape Hatteras to Nova Scotia in surveys from 1978-82.

Blue, sei and fin whales are cosmopolitan species found offshore across most of the action areas. Blue whales are found mostly off eastern Canada in the Atlantic and in the Pacific, off the U.S. west coast, especially concentrated off California. For Pacific fin whales, abundance estimates were higher in cold years than in warm years, indicating a shift in distribution (Friday et al. 2012, Stabeno et al. 2012, Friday et al. 2013). The Alaska (ASAMM) 2018 surveys reported 77 sightings of 117 fin whales, including one calf, in the southcentral Chukchi Sea in July, September, and October (Clarke et al. 2019). The Western North Atlantic fin whale is commonly found in US EEZ waters and north into Canadian waters. Sei whales are found offshore in cooler Atlantic waters including the US EEZ (Gulf of Maine and Georges Bank), with the highest concentrations of animals in the spring (Kraus et al. 2016; Roberts et al. 2016; Palka et al. 2017; Cholewiak et al. 2018). Eastern Pacific sei whales found off the U.S. West Coast are sparse and rarely occur south of California, and the Central Pacific Hawaiian sei whale can be found both in Hawaiian waters and surrounding high seas. Sei whales in the Atlantic typically remain in the higher latitudes and prefer deeper waters. Distributions of blue, fin and sei whales are heavily influenced by their respective prey species. It is difficult to obtain reliable population data for these larger, more widespread offshore species of whales and most of them have unknown or uncertain population trends. We are not able to determine which life stages may be susceptible to varying degrees of exposure depending on the time of year, type of activities, and location in terms of the sea where OPC-related activities occur in the operation areas, but we expect that all life stages of blue, fin and sei whales will be present year-round during OPC patrol activity in the operation areas depending on OPC spatial and temporal presence.

Humpback whales have been observed throughout much of the shelf waters (waters over the continental shelves) of the Bering Sea, but densities of humpbacks appear relatively low in the northern shelf area, with relatively few sightings north of St. Lawrence Island (Moore 2000, Moore et al. 2002, Friday et al. 2013). Humpback whales have also been observed during the summer in the Chukchi and Beaufort Seas (Allen and Angliss 2015). The 2018 ASAMM surveys reported 53 sightings of 79 humpback whales, including two calves, in the southcentral Chukchi Sea from July through September (Clarke et al. 2019). Based on the observations of humpback whales, adults and mother-calf pairs will be susceptible to varying degrees of exposure depending on the time of year, type of activities, and location in terms of the sea where OPC-related activities occur in the Eastern Pacific and Hawaii-Pacific operation areas. The use of aircraft and vessels for OPC patrols are expected to occur within the current respective distributions of humpback whales (Western North Pacific, Central America and Mexico DPSs) including adults and mother-calf pairs of humpback whales.

Sperm whales can be found globally in all oceans, but less frequently in the icy areas of the Arctic. Females and immatures/calves will stay in warmer tropical waters year-round, while males make long migrations into temperate waters. They prefer deeper parts of the oceans in areas of higher productivity (Wursig et al. 2017). In the Pacific, they are known to inhabit waters off the US west coast and around Hawaii year-round. In the Atlantic, sperm whales are found off the US east coast, into the Caribbean and Gulf of Mexico.

8.2 Exposure, Risk and Response Analyses

Section 6.1 described the activities and associated stressors in the action area we believe are not likely to adversely affect ESA-listed whales. Some of the activities proposed in the respective operations areas are also not likely to adversely affect ESA resources. For the purpose of this analysis, the proposed activities in the operation areas that may result in stressors with adverse effects to blue, fin, humpback (Mexico, Central America and Western North Pacific), sei, and sperm whale are the OPC patrol activities that are associated with vessel movement and transit, especially at speeds above 10 knots.

8.2.1 **Exposure**

In considering the exposures that could cause an effect to the populations described above, we consider where and when these exposures may occur, how long exposure may occur, the frequency and intensity, and the life stages, age, and sexes of animals that may be affected.

Information on species-specific distribution and abundance in the operation areas is necessary to estimate the number of animals potentially affected by these activities. This information is often expressed as the number of animals per area, or relative density of each species that may be present in a specific area and time of year. Calculated density estimates for the action area for large whale species are scarce but we relied on population abundance to provide relative densities in specified operation areas. Because the operation areas are extremely large and because we lack USCG data on the number of at sea days for a specific operation area, we use data from NMFS' National Stranding Database (accessed October 1, 2022) and NMFS' Large Whale Strike database (accessed September 16, 2022) to provide estimates for large whale strike associated with USCG activities.

Vessel Strike

Vessel strikes from commercial, recreational, and military vessels are known to affect large whales and have resulted in serious injury and fatalities to cetaceans (Lammers et al. 2003, Douglas et al. 2008, Laggner 2009, Berman-Kowalewski et al. 2010, Calambokidis 2012). Records of collisions date back to the early 17th century, and the worldwide number of collisions appears to have increased steadily during recent decades (Laist et al. 2001, Ritter 2012). Vessel interactions can cause various forms of injury: sharp, intermediate, blunt, and a combination of these three (Moore and Barco 2013). Sharp parts of vessels (often propellers) can cause sharp or penetrating trauma that is obvious upon external examination (in the form of characteristic wound patterns). The bow, keel, and other parts of vessels can cause blunt trauma that leads to internal injuries (sub-dermal hemorrhage, edema, internal organ rupture, internal hemorrhage and broken bones), often without any obvious external signs. Vessels inflict very different wounds depending on the vessel size, the part of the vessel that is involved (keel, propeller, bow, etc.; below), what part of the animal is involved, and its posture in the water prior to impact (Moore and Barco 2013).

During transit through and between operation areas, the most common stressor for the fast-moving OPCs will be the potential for vessel strike. The expected speeds of daily vessel operations associated with the action and confirmed strikes of whales by USCG vessels over the last few decades raises concerns regarding the potential for strikes of ESA-listed whales over the 30 year time period analyzed in this Opinion.

Exposure analysis

In each of the seven project areas, OPCs are expected to conduct four patrols per year, each with an annual duration of up to 230 days (see Table 2). The activity levels that USCG provided were based on activity levels of the existing MEC fleet. According to the information provided during consultation, once all 25 cutters are constructed the typical operation of those cutters at sea will be:

- One in the Pacific Islands EEZ,
- Two in the Atlantic EEZ north of Norfolk,
- Two in the Atlantic EEZ south of Norfolk,
- Two in the Caribbean Sea or Gulf of Mexico,
- Two in the Pacific EEZ north of San Francisco (including one in Alaska),
- Two in the Pacific EEZ south of San Francisco,
- Two in the Pacific within 200 miles of Mexico and Central America.

The USCG estimates that OPCs will generally operate at speeds between 12–16 knots and up to 22 knots, depending on the activity. OTH boats (2-3 per OPC) would generally operate at speeds of 10–20 knots and up to 40 knots. This means that, during a 230 day patrol, vessels will be regularly traveling at speeds that could cause mortality of a large whale should a collision occur. This 230-day period covers the extent of time spent on the water for all activities including LE, DR, SAR training, functionality and maneuverability training, fueling underway, and all aircraft operations (for the number of days/events for each operation, see Table 2). This essentially means that, in each operation area, one or two cutters would be at sea every day of the year conducting patrols.

Support of LE activities is considered part of the action (e.g., vessel or helicopter activities), including associated USCG LE and DR training conducted from the vessels. There will be up to 120 days of LE activities and up to 90 days DR training during patrols per year using up to three over-the-horizon boats deployed from the OPC to board vessels and a helicopter to perform reconnaissance. Over-the-horizon boats would travel less than a mile from the OPC. Vessel operations including LE, SAR training, escort and tow, functionality and maneuverability training, OPC training, and all aircraft operations would occur in all seven operation areas. Defense readiness training up to two times per year and fueling underway every two years would occur in Atlantic/Florida and the Caribbean, Northeast Pacific South and Hawaii operation areas.

The USCG trains for actual SAR missions by dispatching helicopters, usually one at a time, to locate a vessel in distress and report its status and then dispatch a rescue vessel. Support boats simulating rescue vessels could travel at speeds up to 30-40 knots. The USCG also trains in how to transport people to safety and in damage control (e.g., plugging holes, patching pipes, or delivering supplies to aid in repair or control damage incurred by a vessel in distress).

To consider the exposure level or level of take that could occur resulting from vessel strike, we sought information from other similar consultations. If we examine large whale take numbers for Phase III Navy consultations resulting from vessel strike in each of the operation areas, over seven years, up to two fin, one blue, one sperm and one humpback whale (Mexico DPS) in the Hawaii-Southern California (HITT) training areas could be injured or fatally struck. Over seven years for Pacific North (NWTT), lethal take of up to two either fin or humpback (Central America and Mexico DPSs) and one sperm whale. For the Atlantic (AFTT), lethal strike take over seven years could include one fin, one sei, and one sperm whale. For the Alaska area (GOAT) no lethal take of large whales is exempted. Some of the whales are expected to be mother-calf pairs based on the large whale strike data depending on where the activity occurs in relation to the season or month of the year.

We used 30 years of historical strike data for the analysis. This time frame was selected because it represents the same period of time as the OPC programmatic action. Between 1991 and 2021, fifteen large whales were reported struck by USCG vessels (Table 11). Vessel collisions with humpback whales remain a significant management concern, given the increasing abundance of humpback whales migrating from their winter mating areas in warmer waters of the Eastern and

Central Pacific to their summer feeding grounds in Alaska, as well as the growing presence of marine traffic in all coastal and offshore waters. Neilson et al. (2012) reviewed 108 whale-vessel collisions in Alaska from 1978-2011 and found that 86 percent involved humpback whales. Collision hotspots occurred in Southeast Alaska in popular whale-watching locations. The data from Neilson et al. (2012) did not include any strandings of bowhead whales as a result of vessel collisions. The U.S. West Coast includes hotspot areas of vessel strike risk for blue, fin, and humpback whales near an within the shipping lanes off of San Francisco and Long Beach in California (Rockwood et al. 2017) and at the entrance and within the Strait of Juan de Fuca in Washington (Nichols et al. 2017). NMFS National Stranding Database (accessed October 1, 2022) also identified fin, gray, minke, North Atlantic right, and sei whales as those large whales that are struck more frequently than other species.

For purposes of our analysis, we assume that the large whale vessel strike data described above represents a complete record of recent USCG vessel strikes within the action area. To estimate vessel strikes for the action, we estimate the proportion of historic incidents of vessel strikes of large whales associated with USCG vessels traffic with the assumption that these historic estimates are representative of what is likely to occur in the future under the action. From 1991-2021, there were fifteen[10] large whales struck by USCG vessels (NMFS large whale strike database, September 2022; Table 11), which averages about 0.5 strikes per year or about one strike every two years. This rate is similar to the large whale lethal take rate that was calculated for Navy Phase III Testing and Training Activities,[11] which we consider to be similar in vessel activity level usage within the action area to the OPC program (using the same military ranges and transiting between areas. The Navy analyses consider 1.) historical strike data; 2.) historical offshore vessel activity levels and movements (at sea days) data from the action area; and 3.) species density data, to estimate future strike potential. The Navy Phase III analysis is described in detail in Chapter 6.6 (Vessel Strike Analysis) of the Navy's rulemaking/LOA application (Navy 2019).

Table 11. USCG vessel strike of large whales between 1991 and 2021 (NMFS large whale vessel strike database, accessed October 2022).

Date	Species	Location
7/6/1991	right whale	Delaware
1/5/1993	right whale	Florida
5/16/1996	unknown	Alaska*
8/16/2000	fin whale	Alaska*
8/25/2005	unknown	North Carolina
2/13/2006	humpback whale	Maui
9/3/2008	unknown	Massachusetts
9/9/2009	gray whale	Washington

[10] East Coast: 3 right whales; 2 unknown whales; West Coast: 2 gray; 1 sperm; 5 humpback, 1 fin, and 1 unknown whale species

[11] Navy Testing and Training take for every 7 years: Atlantic: 1 fin, 1 sei, 1 sperm; Hawaii: 2 fin, 1 humpback, 1 blue, 1 sperm; Pacific Northwest: 2 fin, 2 humpback, 1 sperm

Date	Species	Location
12/14/2009	right whale	Virginia
6/23/2016	humpback whale	Washington
7/22/2016	gray Whale	Oregon
6/7/2017	sperm whale	Alaska
8/21/2019	humpback whale	Alaska
2/14/2020	humpback whale	Maui
6/24/2021	humpback whale	Alaska*

*Incident occurred in Gulf of Alaska

NMFS' large whale vessel strike database is a collection of historical whale strikes from public records from various sources. These data have some limitations: 1. They only account for the observed/reported strikes and do not account for unobserved strikes or strikes that occur and are not noticed by the mariner (typically expected to occur with larger vessels); 2. Some of these data represent strike data for which speeds or fate were not known; 3. These are only those records that were compiled by the date they were accessed and there may be other strike data available. Hence, the vessel strike data are considered to be a minimum estimate of the total actual strikes. We consider the NMFS large whale vessel strike data the best available for projecting expected strikes over the thirty 30 year period. Three of the 15 strikes were determined as not serious injury,[12] based on the vessel speed being less than 10 knots. For the thirty-year period considered in this Opinion that would equate to about 15 large whale strikes, with about 3 of those strikes being unknown fate and the rest being serious injury (expected to result in mortality) or mortality. We conservatively assume that the three of unknown fate would result in mortality.

While we know that there is potential for unobserved strikes to occur, we will use the data presented above as the projected estimate for lethal strike and not adjust for unobserved strike occurrence. This is because USCG will report all large whale strikes, and that the strike rate we calculated based on the historical strike data was very close to lethal take of large whales calculated in similar actions (i.e., for vessel activity) of Navy consulations. The Navy consultations considered animal densities and prior vessel activity levels in the same areas as the action area for this consultation, this suggests that the projections from the historical NMFS' vessel strike data are somewhat robust. USCG's strict internal procedures and mitigation requirements include reporting of any vessel strikes of marine mammals, and the USCG's discipline, extensive training (not only for detecting marine mammals, but for detecting and reporting any potential navigational obstruction), and strict chain of command give NMFS a high level of confidence that all strikes actually get reported. A USCG vessel strike is less likely than a commercial vessel strike because it is highly unlikely that a USCG vessel would strike a whale without detecting it and, accordingly, NMFS is confident that the USCG's reported strikes are accurate and appropriate for use in the analysis. Specifically, USCG vessels have watchstanders on the forward part of the ship that can visually detect a hit animal, in the unlikely event ship

[12] https://repository.library.noaa.gov/view/noaa/29000

personnel do not feel or hear the strike. Unlike the situation for non-USCG vessels engaged in commercial activities, NMFS and the USCG have no evidence that the USCG has struck a whale and not detected it.

Animals could be affected by vessel operation associated with LE, DR, and SAR training, escort and tow, functionality and maneuverability training, OPC training, all aircraft operations, and other patrol activities described in Section 3.2. In terms of potential exposure, blue, fin, sei, humpback, right, and sperm whales are expected to be affected in the Atlantic operation areas (i.e., Northwest Atlantic, Northwest Atlantic/Florida/Caribbean, Gulf of Mexico). In the Northwest Atlantic, these whales could be encountered throughout the expected year round wherever operations are occurring. Similarly, bowhead, blue, Bryde's, fin, gray, humpback, minke, sei, and sperm whales have potential for exposure to OPC activities in the Pacific operation areas (i.e., Northwest Pacific-North, Northeast Pacific-South, Alaska, and Hawaii and the Pacific Islands) could be encountered year round throughout the operation area wherever actions are occurring. The size of the individual operation areas were not provided by the USCG but each area is a large swath of an ocean basin and the use of support vessels and aircraft during the actions discussed in this section will not be concentrated in a particular area or areas. Therefore, because we have no way to estimate the potential number of animals that will be exposed to stressors based on area of operation, we use estimates from previous Navy activities and strike records to determine the potential exposure of large ESA-listed whales.

Vessel Strike Risk

Any species of whale has the potential to be struck by a vessel. The relative risk of a large whale vessel strike within a particular area is primarily a function of animal density and the magnitude of vessel traffic (e.g., Fonnesbeck et al. 2008, Vanderlaan et al. 2008). Other factors, such as vessel speed, size, and maneuverability can also influence both the probability of a vessel strike occurring and the outcome (i.e., minor injury, serious injury, mortality) when a strike occurs. In this section we focus on the factors affecting vessel strike risk as they relate to the USCG's action. We will consider the factors that could affect the outcome of a vessel strike that could result from the action, in our response analysis below.

In an analysis of the probability of lethal mortality of large whales at a given speed, results of a study using a logistic regression model showed that the greatest rate of change in the probability of a lethal injury to a large whale, as a function of vessel speed, occurs between vessel speeds of 8.6 and 15 knots (Vanderlaan and Taggart 2007b). Across this speed range, they found that the chances of a lethal injury decline from approximately 80 percent at 15 knots to approximately 20 percent at 8.6 knots. Notably, it is only at speeds below 11.8 knots that the chances of lethal injury drop below 50 percent and above 15 knots the chances asymptotically increase toward 100 percent. Neilson et al. (2012) summarized 108 reported whale-vessel collisions in Alaska from 1987–2011. In reports where vessel speed at the time of collision was known, 49 percent were travelling at or faster than 12 knots, 31 percent were traveling slower than 12 knots, and 20 percent were anchored or drifting vessels. The collisions with moving vessels were those likely to result in injury or mortality, particularly for larger vessels (greater than 260 ft in length; (Neilson et al. 2012). The behavior of large whales that spend much of their time foraging or basking at the surface puts them at an increased risk for strike (Parks et al. 2012, Soldevilla et al. 2017).

The relative density of large whales in areas with concentrated vessel activity can vary significantly by species, time of year, and over time with changing environmental conditions (e.g., temperature, prey availability). We use two main data sources for our strike risk analysis: NMFS' large whale strike database to determine USCG vessel strike rate (discussed above) and NMFS' National Stranding Database to estimate which species are most likely to be killed as a result of ship strike. More specifically, to determine the likelihood of certain species being struck, we use the relative probability based on historical stranding data (Table 12).

Table 12. Relative probability of vessel strikes on species in the Atlantic and Pacific basins based on historical stranding records that resulted from vessel strike from 1991 through September 2022.

Species	Atlantic	Pacific/Alaska
Blue whale	0.007813	0.063218391
Bryde's whale	--	0.011494253
Fin whale	0.234375	0.16091954
Gray whale	--	0.16091954
Humpback whale	0.367188	0.494252874
Minke whale	0.125	0.011494253
Sei whale	0.085938	0.011494253
Sperm whale	0.023438	0.034482759
Unknown species	0.023438	0.051724138
N. Atlantic right whale	0.125	--
Rice's whale	0.007813	--

*Source: NMFS National Stranding Database

USCG vessel activity is described in Section 3.2.2. The USCG did not provide information about the specifics of when vessels would be where within the action area beyond noting that there will be one or two cutters dedicated to each of the areas identified in Section 4. Hence, using stranding data, we divided the expected number of strikes of ESA-listed whales into Atlantic and Pacific basins to estimate future strike take. Areas where there are higher relative densities of whales are expected to be higher risk areas.

Based on the National stranding database for large whales that died as a result of ship strike, incidents in the Atlantic accounted for 42% and in the Pacific for 58% of strandings. If we apply those percentages to the exposures expected (15) for a 30-year time period, that would equate to approximately six strikes in the Atlantic and nine strikes in the Pacific. We used the same historical stranding data to determine which species would be the most likely to be struck in the future as a result of the action.

According to NMFS' large whale vessel strike database and the National Stranding database, humpback whales are the most frequently identified struck species in both the Atlantic and Pacific Ocean basins. We are not considering the endangered Western North Pacific humpback population as likely to be struck based on there being one OPC for the Hawaii-Pacific area and the Hawaiian portion of the population of humpbacks is not listed. We expect OPC activity levels west of Hawaii (e.g., Mariana Islands) to be minimal relative to the rest of the OPC program activities. Thus, the likelihood of interaction with the Western North Pacific humpback is so low as to be discountable. Because both Mexico DPS and Central America DPS humpback whales occur within the Pacific, there is the potential that individual whales from either DPS could be struck as a result of the action. To determine which of these DPSs is most likely to be struck, we evaluated the relative abundance of each of these DPSs in U.S. West Coast waters. Curtis (2022) estimated the abundance of the Central America DPS to be 1,496 whales. From Wade (2017), about 93% (or 1,391 whales) of these humpbacks that winter in Central America will move to Oregon/California in the summer months. While there is currently no abundance estimate for the Mexico DPS, an estimated 3,477 whales from the Mexico DPS feed off the U.S. West Coast (Calambokidis and Barlow 2020, Curtis 2022). Based on this information, we estimate that approximately 30% of the humpback whales off the west coast may be from the Central America DPS, with the remaining 70% are expected to be from the Mexico DPS. Nearly half of the whales struck in the Pacific are humpback whales. Therefore, if a large whale is struck off the West Coast of the U.S., the estimated probability that it will be a humpback from the Central America DPS is 15% (i.e., 0.50 x 0.30; strike rate over 30 years multiplied by the probability of a particular species being struck), and the estimated probability that it would be a humpback from the Mexico DPS is 35% (i.e., 0.50 x 0.70). Therefore, we anticipate that, if a USCG vessel strike of a humpback whale were to occur within the Pacific operation area, it would likely be from the Mexico DPS. Based on historical strandings resulting from strike records, we expect that in 30 years, four of the nine strikes that may occur as a result of the action in the Pacific will be humpback whales.

If we do the same for other species using expected strike rate over 30 years and the relative probability of a particular species being struck (see Table 13), we get the following:

- Blue whales have been struck in both the North Atlantic and Pacific Oceans, but they have a much higher likelihood of strike in the Pacific. Based on relative percentages of species struck by vessels, we expect one strike of a blue whale as a result of the proposed activities in the Pacific over 30 years.

- Fin whales are one of the species with a higher likelihood to be struck in either the Atlantic or Pacific Oceans. We expect two strikes of fin whales in the North Atlantic and two strikes in the North Pacific as a result of the 30-year OPC proposed program.
- Sei whales have been struck in both the North Atlantic and Pacific, but are more likely to be struck in the Atlantic. Therefore, we expect one strike of a sei whale in the North Atlantic as a result of the 30-year OPC proposed program.
- Sperm whales have been struck in both the North Atlantic and Pacific, but are more likely to be struck in the North Pacific. Thus, we expect one strike of a sperm whale in the North Pacific as a result of the 30-year OPC proposed program.
- According to stranding data, the remainingremainingremaining three strikes in the Atlantic and one strike in the Pacific are expected to be non-ESA-listed whale species (e.g., minke, gray or non-listed humpback whale DPS).

Vessel Strike Mitigation Measures

Mitigation measures proposed by the USCG to reduce the risk of vessel strike include: 1) required training for watchstanders to improve the effectiveness of visual observations for marine mammals and other ESA-listed species; 2) issuance of area-specific seasonal awareness notification messages to alert vessels and aircraft operating in the area to the possible presence of concentrations of large whales; and 3) procedural mitigation involving the use of watchstanders to avoid approaching marine mammals when a vessel is underway. These mitigation measures are all described in detail in Section 3.3.1.

Watchstanders are required to monitor a 500-yard mitigation zone around whales and, if a whale is observed within the zone, the vessel will maneuver to maintain distance. The effectiveness of the vessel movement mitigation measure in terms of reducing vessel strike risk is largely based on the watchstanders' ability to effectively monitor the mitigation zone. The results of Oedekoven and Thomas (2022) suggest that Navy Lookout Teams (including lookouts and other crew members) fail to detect large whales within the designated mitigation zone a large proportion of the time (i.e., 85% undetected within 500 yards; 80% undetected within 200 yards). While the procedural mitigation for vessel movement may provide some benefit in terms of reducing vessel strike risk when whales (or signs of whales) are detected, the anticipated high rate of undetected whales in close proximity to the vessel suggests that the overall effectiveness of this mitigation may be limited, particularly in certain situations. Crew lookouts are likely to have a more difficult time monitoring the mitigation zone and detecting whales in areas with concentrations of large whales. In addition, maneuvering to avoid observed whales at the surface may inadvertently put the vessel on a collision course with undetected whales. Whales that spend a lot of time below the surface are particularly vulnerable to vessel strike because opportunities for lookouts to detect them are more limited. This risk is compounded by high vessel speeds, which can affect both the ability of lookouts to detect a whale, and the whale's ability to avoid being struck by the vessel.

While seasonal awareness notification messages may help inform vessel crews of concentrations of large whales, the usefulness of this information in reducing vessel strike risk is dependent on the proactive measures the vessel takes when transiting through these higher risk areas. This could include reducing vessel speed, adding lookouts, changing course to avoid (or partially avoid) the area, or complementing visual observations with passive acoustic assets. We have no information indicating that the USCG implements these proactive measures to minimize the risk of vessel strike in scenarios when that risk is likely very high (e.g., areas and times of year when concentrations of large whales are historically high, areas where recent military strikes have occurred, or real-time information based on observations by the vessel or other nearby platforms).

We recognize that additional mitigation measures, as well as changes in other vessel strike risk factors (e.g., whale population abundance, distribution through space and time, oceanographic conditions, ecological changes etc.), could affect the reliability of this time series for predicting future vessel strike risk. These potential changes are evaluated in our summary exposure analysis section below.

Exposure Analysis Summary

Our vessel strike exposure analysis was based on the results of historical strike rate for USCG vessels in combination with supplemental information, including an evaluation of vessel strike risk factors, historical strandings when animals died as a result of vessel strike in the action area, and species-specific biological and life history information. In summary, we anticipate the following number of large whale vessel strikes as a result of the action:

- Up to nine large whales over 30 years in the Pacific: of these, we expect one blue, two fin, four humpback (1 Central America DPS, 3 Mexico DPS), one sperm, and one non-ESA listed whale (e.g., minke whale) will be lethally struck as a result of the action.
- Up to six large whales over 30 years in the Atlantic; of these, we expect two fin, one sei, and 3 non-ESA listed whale (e.g., West Indies humpback whale) will be lethally struck as a result of the action.

The available information does not allow for a detailed analysis (many unknowns) of the sexes or life stages of large whales that we expect to be struck by vessels as a result of the action. Based on national stranding data, we assume that, for all affected ESA-listed whale species, vessel strikes could include a combination of both males and females, and any of the following life stages: adults, subadults, yearlings, and calves.

While vessel strike mitigation measures can serve to reduce the risk of vessel strike, the proposed mitigation measures are similar to the mitigation measures the USCG has had in place for years. Therefore, we do not anticipate that the USCG's proposed mitigation measures would further reduce the exposure risk beyond the level we anticipate.

8.2.2 **Response**

If an animal is struck by a vessel, responses can include death, serious injury, and/or minor, non-lethal injuries, with the associated response depending on the size and speed of the vessel, among other factors (Laist et al. 2001, Jensen and Silber 2004, Vanderlaan and Taggart 2007a, Conn and Silber 2013). In general, the probability of a vessel collision and the associated response depends, in part, on the size and speed of the vessel. Ship strikes with marine mammals can lead to death by massive trauma, hemorrhaging, broken bones, or propeller wounds (Laist et al. 2001). While massive wounds can be immediately fatal, if injury is more superficial, whales may survive the collisions (Silber et al. 2010).

It is important to note that many strikes may occur and go unnoticed, while others may occur and subsequently not get reported. Rockwood et al. (2017) modeled vessel strike mortalities of blue, humpback, and fin whales off California using carcass recovery rates of five and 17 percent and conservatively estimated that vessel strike mortality may be as high as 7.8, 2.0, and 2.7 times the recommended limit for blue, humpback, and fin whale stocks in this area, respectively.

Numerous studies of interactions between surface vessels and marine mammals have demonstrated that free-ranging marine mammals often, but not always (e.g., McKenna et al. 2015), engage in avoidance behavior when surface vessels move toward them. It is not clear whether these responses are caused by the physical presence of a surface vessel, the underwater noise generated by the vessel, or an interaction between the two (Bryant et al. 1984, Bauer 1986, Watkins 1986a, Corkeron 1995b, Wursig et al. 1998, Bejder et al. 1999, Au and Green 2000, Félix 2001a, Nowacek et al. 2001, Erbe 2002, Magalhaes et al. 2002, Williams et al. 2002b, Lusseau 2003, Richter et al. 2003, Goodwin and Cotton 2004, Scheidat et al. 2004, Amaral and Carlson 2005a, Simmonds 2005a, Bain et al. 2006, Lemon et al. 2006, Lusseau 2006, Bejder and Lusseau. 2008, Bejder et al. 2009). Several authors suggest that the noise generated during motion is probably an important factor (Evans et al. 1992b, Blane and Jaakson 1994b, Evans et al. 1994b). Water disturbance may also be a factor. These studies suggest that the behavioral responses of marine mammals to surface vessels are similar to their behavioral responses to predators. Avoidance behavior is expected to be even stronger when the USCG is conducting other simultaneous activities that may cause noise or visual disturbance.

Kelley et al. (2021) found differences between large (> 20m) and small vessels in terms of the relationship beween vessel speed and the lethality of large whale vessel strike. Their analysis showed that, for large vessels, a speed limit of 10 knots would provide only small reductions in the probability of a lethal strike, whereas, for small vessels, a combination of speed restrictions and lookouts may be an effective way to reduce the incidence of whale injury and mortality (Kelley et al. 2021). For large vessels, the authors suggest that the only practical way of reducing the risk of lethal collisions is to reduce the co-occurrence of these vessels with whales.

Whales may have a behavioral response to avoid approaching vessels (Wiley et al. 2016, Szesciorka et al. 2019). Escape responses could lead to injuries or collisions including contusions, lacerations, abrasions, hematomas, concussions, and fractures if animals panic or are trapped. Such injuries would reduce animal fitness. Chronic stress can impair the functionality of the immune and reproductive systems. Acute stress may result in more extreme sublethal to lethal effects. Fitness of these animals will decrease due to chronic or acute stress responses, which also increases the potential for injury or mortality from predation or due to the weakened physical condition of affected individuals.

Our exposure analysis considered vessel strike of large whales comprehensively, as a result of all OPC vessel movement within the action area, as opposed to in the context of specific activities or training exercises. For this reason, we are not able to predict the speed or size of OPC vessels that are expected to result in ship strikes of large whales. Based on the history of USCG vessel strikes of large whales in the action area, we would expect that strikes would be from either larger or smaller vessels. While we anticipate vessel speed will vary, based on historical strike records and USCG vessel speeds, in most cases vessel speed at the time of strike would likely exceed the 10 knot range for which probability of a lethal strike may be reduced. Therefore, while there are many unknowns regarding the size and speed of vessels that may be involved in future strikes, we assume that all incidences of ESA-listed large whale vessel strike associated with USCG OPC activities in the action area will result in mortality or a serious injury, which is defined as an injury that would likely result in mortality (50 C.F.R. §229.2).

8.2.3 Summary of the Effects of the Action on ESA-listed Whales

In summary, vessel activities associated with the action are likely to kill blue, fin, humpback (Mexico and Central America), sei and sperm whales.
https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-species-stock

The implementation of the USCG Program with up to 25 new OPCs over the next 30 years is expected to result in the lethal take of fin whales, humpback whales (Central America and Mexico DPSs), blue whales, sei whales, and sperm whales due to the use of fast-moving support vessels during OPC patrol activities from vessel strike, which could also result in non-lethal vessel strikes of whale species.

We estimate that the physical aspects of OPC activities will result in mortality or serious injury of up to nine large whales in the Pacific including one blue, two fin, four humpback (1 Central America DPS, 3 Mexico DPS), one sperm, and one non-ESA listed whale (e.g., minke whale); and up to six large whales in the Atlantic, we expect two fin, one sei, and 3 non-ESA listed (e.g., West Indies humpback whale) over the anticipated 30-year program life.

9 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 C.F.R. §402.02). Future Federal actions that are unrelated to the action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

For this consultation, cumulative effects include climate change, fishing, whaling and subsistence harvest, vessel traffic and tourism, water quality degradation, ocean noise, oil and gas activities, scientific research, military activities, and predation (See Environmental Baseline Section 7). Vessel traffic is likely to increase in the foreseeable future to support oil and gas activities, shipping and transportation, recreational cruises and whale-watching, scientific research, and military activities. Hunting and fishing activities are expected to continue into the foreseeable future. We are not aware of any proposed or anticipated changes in hunting and fishing that would substantially change the impacts of these activities on ESA-listed whales. Terrestrial and maritime development appear to be contributing to increases in transport of land-based pollutants to marine waters and discharges of pollutants to marine waters and this trend is expected to increase as climate change continues.

10 Integration and Synthesis

The *Integration and Synthesis* section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the action. In this section, we add the *Effects of the Action* (Section 8) to the *Environmental Baseline* (Section 7) and the *Cumulative Effects* (Section 9) to formulate the agency's biological and conference opinion as to whether the mixed programmatic action is likely to: (1) reduce appreciably the likelihood of both the survival and recovery of a ESA-listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) reduce the value of designated or proposed critical habitat for the conservation of the species. These assessments are made in full consideration of the *Status of the Species* (Section 6.3) and *Project Design Criteria* (Section 3.3.1).

In addition to the PDCs (Section 3.3.1) that USCG implements under the OPC program, NMFS considers other conservation efforts by an action agency and how that may reduce the potential for take. Through various programs, the USCG is actively involved with NMFS in vessel strike reduction efforts. On the U.S. Atlantic seaboard, they work with NMFS on various projects as follows (this is not a comprehensive list): the North Atlantic right whale implementation team, enforcing the speed rule, respond to out-of-habitat whales through emergency waterways management, work with NMFS stranding network on response efforts, report to and enforce compliance of the North Atlantic right whale mandatory ship reporting system, support the Early Warning System[13], education and outreach, provide seasonal and emergency broadcasts to mariners regarding slow zones, strandings, or managed areas. USCG works to balance appropriate marine resource focus alongside other agency missions.

[13] The Early Warning System is a comprehensive information exchange network dedicated to reducing the risk of vessel strikes to North Atlantic right whales off the southeast United States from all mariners (i.e., Navy and non-Navy vessels).

Some ESA-listed species and proposed or designated critical habitat are located within the action area but are not expected to be affected by the action or the effects of the action on these resources were determined to be insignificant or extremely unlikely to occur. Some activities evaluated individually were determined to be not likely to adversely affect some ESA-listed species and designated critical habitat (Section 6.2).

The following discussions separately summarize the probable risks the action poses to blue whales, fin whales, humpback whales (Central America and Mexico DPSs), sei whales and sperm whales. These summaries integrate the exposure profiles presented previously with the results of our response analyses for the OPC activities considered further in this Opinion, specifically vessel operations associated with SAR training, LE, DR, gunnery training, fueling underway, crew and passenger transport, functionality and maneuverability training, foreign port of call visits, vessel escort and tow, and helicopter and other aircraft use (Section 3.2). Lethal take of fin whales, humpback whales, blue whales, sei whales, and sperm whales are anticipated over the 30 year time period as a result of these activities. Take of any other ESA-listed species under the OPC program would require reinitiation of this consultation. Step-down review will be required to fully consider the extent and effects of specific activities (identified in Section 3.3.2) on ESA-listed species and their habitat in respective operation areas because additional effects potentially attributable to those activities, and the specifics of where and when the effects will occur will be better known.

10.1 Jeopardy 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 C.F.R. §402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species.

Blue, fin, humpback (Central America and Mexico DPSs), sei and sperm whales are present year-round in the operation areas. While these species differ in morphology, physiology, behavior, and ecology, they are expected to be exposed to the same stressors from the large and small vessel speeds associated with the vessel operations during activities specified above. In addition, as discussed in Section 8.3, we expect the responses of these whale species to these stressors to be similar.

No reduction in the current geographic ranges or distributions of these whale species is expected as a result of the proposed activities in the operation areas. We used abundance information from the most recent stock assessment reports (see Table 10) to inform our jeopardy analysis (Carretta et al. 2022, M. M. Muto et al. 2022, NMFS 2022).

Blue whale

While any life stages of blue whales, which are present year-round in the operation areas, could be affected by lethal take of one individual, none will be targeted by the proposed activities. In the eastern north Pacific, the blue whale winters off Mexico and Central America and feed during summer off the California coast. The central Pacific (Hawaii) stock feed in summer in the Gulf of Alaska and then migrate for winter breeding in the western and central Pacific. According to NMFS' stock assessment reports, blue whales are rare in Hawaii and the population trends for the Pacific and Atlantic populations are unknown. The minimum population estimate (and stock assessment data year) for the Hawaii stock is 63 (2021), the Pacific stock is 1,767 individuals (2018) and the Atlantic stock at last estimate was 402 (1980-2008), which should be cautiously considered due to the lack of a more recent estimate. Take of a sexually mature male, female, or a juvenile/calf in the Pacific, would lead to a loss in numbers at an individual level. Using the Pacific population estimate, take is not expected to exceed 0.056 percent of the total abundance. Thus, the loss of one individual blue whale in 30 years is not expected to affect overall reproduction or affect the blue whale species as a whole.

Fin whale

Based on the most recent stock assessment reports, the fin whale populations appear to be increasing in the Pacific, and the Atlantic stock population trend cannot be assessed. The most recent minimum estimate (and stock assessment data year) for the Hawaii population is 101 (2017), Northeast Pacific is 2,554 (2013-2015), California/Oregon/Washington is 7,970 (2018), and the minimum estimate for the Western North Atlantic stock is 5,573 (2016). It is likely that some or all of the apparent increases in abundance of fin whales in the operation areas are due to changes in distribution rather than population growth. Thus, increases in observed fin whale abundance may be due to distribution shifting and dispersal of new individuals into an area. Regardless, the population appears to be stable at a minimum. For fin whales, life stages that may be present at a particular time and location within the operation areas cannot be determined based on available data but could include female and male adults or juveniles/calves. Using the total Pacific and Atlantic population estimates, take is not expected to exceed 0.0018 and 0.036 percent of the total abundance, respectively. The anticipated lethal take of two fin whales in the Atlantic and two in the Pacific over the 30-year time period would lead to a loss of numbers at an individual level, but is not expected to affect overall reproduction or the species as a whole.

Humpback whale (Central America and Mexico DPSs)

For humpback whales, life stages that may be present are adults, juveniles, and mother-calf pairs. The action will not affect the range of humpback whale DPSs. The most recent minimum estimate (and stock assessment data year) for the Mexican humpback whale is 3,185 (2022). There is no current minimum estimate for the Central American humpback whale, but the current estimate of the population (from 2021) is 918. Based on the population estimates for these whale species (although limited by availability of data to allow detailed stock assessments), the lethal take of one Central American humpback whale and 3 Mexican humpback whales is not expected to exceed 0.1, and 0.09 percent of the total abundance, respectively, in waters within the operation areas over 30 years. Thus, the anticipated lethal take of in the Pacific over the 30-year time period would lead to a loss at an individual level, but is not expected to affect overall reproduction, reduce the population, or affect the humpback whale species as a whole.

Sei whale

Any life stage of sei whales may be present in the Atlantic operation area. The most recent minimum estimate (and stock assessment data year) for the sei whale is 3,098 (2010-2013), with highest abundance in US waters in spring and summer. The population trend is not available for this species, and though they are thought to prefer deeper water, it has been noted that their occurrence is somewhat unpredictable. Based on the population estimates for this whale species (although limited by availability of data), the lethal take of one sei whale is not expected to exceed 0.032 percent of the total minimum abundance in waters within the Atlantic operation area over 30 years. Thus, the anticipated lethal take of sei whales in the Atlantic over the 30-year time period would lead to a loss of numbers at an individual level, but is not expected to affect overall reproduction, reduce the population, or affect the sei whale species as a whole.

Sperm whale

For the sake of discussing Pacific sperm whales, we combine the managed populations in the Pacific waters of California, Oregon, and Washington and Hawaii; and exclude Alaska (the North Pacific stock is unreliable). Any life stage can be present but females, calves and juveniles are more likely to be found in warmer waters. The most recent minimum estimate (and stock assessment data year) for the sperm whale is 1,270 (California, Oregon, Washington, 2014) and 4,486 (Hawaii, 2017), respectively, with the former population trend appearing stable and the latter trend not available. Using the total Pacific minimum estimates, take is not expected to exceed 0.0017 percent of the of the total minimum abundance in waters within the Pacific operation area over 30 years. Thus, the anticipated lethal take of sperm whales in the Pacific over the 30-year time period would lead to a loss of numbers at an individual level, but is not expected to affect overall reproduction, reduce the population, or affect the sperm whale species as a whole.

We do not expect the lethal take of individuals of these species to result in population-level consequences to the survival of blue, fin, humpback, sei and sperm whales. Because we do not anticipate a substantial reduction in numbers or reproduction of these whale species as a result of the proposed activities associated with the proposed USCG OPC Program we determined were likely to result in adverse effects to these species, a reduction in the likelihood of survival for blue, fin, humpback (Central America and Mexico DPSs), sei and sperm whale species is not expected.

The 2020 Recovery Plan (NMFS 2020) for the blue whale identifies the following recovery goals:

- Increase blue whale resiliency and ensure geographic and ecological representation by achieving sufficient and viable populations in all ocean basins and in each recognized subspecies, and
- Increase blue whale resiliency by managing or eliminating significant anthropogenic threats.

The respective Final Recovery Plans (NMFS 2010b, a, 2011b) for the fin, sei and sperm whale identify the following recovery goals:

- Achieve sufficient and viable population in all ocean basins.
- Ensure significant threats are addressed.

The 1991 Final Recovery Plan (NMFS 1991) for the humpback whale identifies four recovery goals:

- Maintain and enhance habitats used by humpback whales currently or historically.
- Identify and reduce direct human-related injury and mortality.
- Measure and monitor key population parameters.
- Improve administration and coordination of recovery program for humpback whales.

No significant changes in habitat, extent or magnitude of threats to ESA-listed whales, or substantial reductions in populations of blue, fin, Central American humpback, Mexican humpback, sei, or sperm whales are anticipated as a result of the action. Where available, sighting and survey information indicate that populations of these species are stable or have increased in the operation areas. Because no effects to distribution are anticipated, and minimal effects on the reproduction or numbers of these species are expected as a result of the action, we do not anticipate that the action will impede the recovery objectives for the species.

11 Conclusion

After reviewing the current status of the ESA-listed species, the environmental baseline within the action area, the effects of the action, and cumulative effects, it is NMFS' biological and conference opinion that the action is not likely to jeopardize the continued existence of blue, fin, sei, Central America and Mexico humpback, and sperm whales.

It is also NMFS' biological and conference opinion that the action is not likely to adversely affect the following species and proposed or designated critical habitats: bocaccio (Puget Sound/Georgia Basin Distinct Population Segment [DPS]); chinook (Sacramento River Winter-Run, Upper Columbia River Spring-Run, Snake River Spring/Summer-Run, Snake River Fall-Run, Central Valley Spring-Run, California Coast, Puget Sound, Lower Columbia River, and Upper Willamette River Evolutionary Significant Units [ESUs]), chum (Hood Summer-Run and Columbia River ESUs), coho (Central California Coast, Southern Oregon/Northern California Coasts, Lower Columbia River, and Oregon Coast ESUs), sockeye salmon (Snake River and Ozette Lake ESUs) and Atlantic (Gulf of Maine DPS) salmon; Pacific eulachon (Southern DPS);

steelhead trout (Southern California, Upper Columbia River, Snake River Basin, Middle Columbia River, Lower Columbia River, Upper Willamette River, South-Central California Coast, Central California Coast, Northern California, California Central Valley, Puget Sound DPSs); yelloweye rockfish (Puget Sound/Georgia Basin DPS); giant manta ray; Nassau grouper; Oceanic whitetip and scalloped hammerhead (Northwest and Western Central Atlantic, Southwest Atlantic, Eastern Atlantic, Indo-West Pacific, Central Pacific, and Eastern Pacific DPSs), and daggernose sharks; blackchin guitarfish; narrow and smalltooth sawfish (U.S. and Non-U.S. portion of range DPS) including the U.S. portion of critical habitat; Gulf, shortnose, green (Southern DPS), and Atlantic sturgeon (Carolina, South Atlantic, New York Bight, Chesapeake Bay and Gulf of Maine DPSs); lobed star, mountainous star, boulder star, elkhorn, staghorn, pillar, and rough cactus corals; ESA-listed Pacific corals: *Acropora globiceps*, *Acropora lokani*, *Acropora retusa*, *Acropora speciosa*, *Euphyllia paradivisa*, *Isopora crateriformis*, and *Seriatopora aculeata*; black and white abalone; leatherback, hawksbill, green (North Atlantic, South Atlantic, East Indian-West Pacific Ocean, Central North Pacific Ocean, Central South Pacific Ocean, East Pacific Ocean, Southwest Indian Ocean, and Southwest Pacific DPSs), Kemp's ridley, olive ridley (Mexico's Pacific coast breeding population and all other populations), and loggerhead (North Pacific Ocean, South Pacific Ocean, Northwest Atlantic Ocean, Northeast Atlantic, Southwest Indian Ocean, and Southeast Indo-Pacific Ocean DPSs) sea turtles; bowhead, gray (Western North Pacific DPS), humpback (Western North Pacific DPS), North Pacific right, North Atlantic right, Southern right, false killer (Main Hawaiian Island Insular DPS), Rice's, and killer (Southern Resident DPS) whales; Ringed Seal (Arctic subspecies), bearded seal (Beringia DPS), spotted seal (Southern DPS); Steller (Western DPS) sea lion; Guadalupe fur and Hawaiian monk seals; North Pacific and North Atlantic right whale critical habitat; Southern Resident killer whale critical habitat; Steller sea lion critical habitat; Hawaiian monk, Beringia bearded and Arctic ringed seal critical habitat; green, Gulf and Atlantic sturgeon critical habitat; bocaccio critical habitat; Atlantic, Chinook, Chum, Coho, Sockeye salmon critical habitat; Pacific Eulachon critical habitat; steelhead trout critical habitat; yelloweye rockfish critical habitat; the U.S. portion of smalltooth sawfish critical habitat; North Atlantic green, Northwest Atlantic loggerhead, leatherback and hawksbill sea turtle critical habitat; Western North Pacific, Central America, and Mexico DPS humpback whale critical habitat; black abalone critical habitat; and critical habitat for the corals: elkhorn, staghorn, including proposed for *Acropora jacqelineae, A. globiceps, A. lokani, A. retusa, A. speciose, Euphyllia paradivisa, Isopora crateriformis, and Seriaopora aculeata*.

12 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 without an 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 results in death or injury to ESA-listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity (50 C.F.R. §402.02). Section 7(o)(2) provides 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 incidental take statement.

12.1 Amount or Extent of Take

Section 7 regulations require NMFS to specify the impact of any incidental take of endangered or threatened species; that is, the amount or extent, of such incidental taking on the species (50 C.F.R. §402.14(i)(1)(i)). The amount of take represents the number of individuals that are expected to be taken by actions while the extent of take specifies the impact, i.e., the amount or extent of such incidental taking on the species, which may be used if we cannot assign numerical limits for animals that could be incidentally taken during the course of an action (see 80 FR 26832).

We anticipate the USCG OPC Program for the construction and operation of 25 new OPCs over 30 years are reasonably likely to result in the incidental take of ESA-listed species by serious injury or death. Specifically, we anticipate the following annual take of ESA-listed cetaceans in the operation area:

- Lethal take of up to one blue whale in the Pacific Ocean associated with the physical effects of vessel collisions over the 30-year consultation period.
- Lethal take of two fin whales in the Atlantic and two fin whales in the Pacific associated with the physical effects of vessel collisions over the 30-year consultation period.
- Lethal take of one Central American humpback whale and three Mexican humpback whales (Pacific Ocean) associated with the physical effects of vessel collisions over the 30-year consultation period.
- Lethal take of one sei whale in the Atlantic Ocean associated with the physical effects of vessel collisions over the 30-year consultation period.
- Lethal take of one sperm whale in the Pacific Ocean associated with the physical effects of vessel collisions over the 30-year consultation period.

The take listed above does not exempt activities for which adverse effects are expected to occur but have not yet been quantified and thus will be determined during a consistency review. We cannot determine at this time at what levels take resulting from certain activities will occur until NMFS reviews the specific activity and its effects on ESA-listed species. The specific activities are:

- Activities intended to use MEM outside military ranges, or over shallow coral reef areas;
- Anchoring in areas that have coral reefs;

- Aircraft operations under the action that would occur at altitudes below 500 ft;
- Towing derelict vessels, or those that have sat in the water unattended for long periods, and have accumulated extensive biofouling;
- Vessel construction and transit from a site not considered in this Opinion; and
- Vessel maintenance and decommissioning.

Therefore, consistency reviews will be required for the implementation of these activities as the new OPCs are operated if the activity-specific analysis for each new OPC indicates that additional PDCs may be necessary for some or all of these activities in the future.

Section 7(b)(4)(C) of the ESA provides that take of ESA-listed marine mammals may be included in the ITS of a biological and conference opinion only if the taking is authorized under section 101(a)(5) of the MMPA. While we anticipate impacts to ESA-listed marine mammals from some of the proposed activities, none of the take noted above would be exempted until and unless MMPA authorization is granted.

The take expected to result from the action has been quantified in terms of numbers of individuals expected to be taken. To provide a clear standard for determining when the level of anticipated take has been exceeded for the take of whales associated with vessel interactions, USCG will monitor, count and report all vessel interactions or collisions with large whales in any of the operation areas. These activities will have lookouts monitoring for ESA-listed marine mammals who will report observations of animals in order to ensure take of blue whales, fin whales, humpback whales, sei whales, and sperm whales estimated in this Opinion is not exceeded.

12.2 Reasonable and Prudent Measures

The measures described below must be undertaken by the USCG so that they become binding conditions for the exemption in section 7(o)(2) to apply. Section 7(b)(4) of the ESA requires that when an agency action is found to be consistent with section 7(a)(2) of the ESA and the action may incidentally take individuals of ESA-listed species, NMFS will issue a statement that specifies the impact of any incidental taking of endangered or threatened species. To minimize such impacts, RPMs, and terms and conditions to implement the measures, must be provided. Only incidental take resulting from the agency actions and any specified RPMs and terms and conditions identified in the Incidental Take Statement are exempt from the taking prohibition of section 9(a), pursuant to section 7(o) of the ESA.

Reasonable and prudent measures are measures that the action agency must comply with to minimize the amount or extent of incidental take (50 C.F.R. §402.02). NMFS believes the reasonable and prudent measures described below are necessary or appropriate to minimize the impacts of incidental take on ESA-listed blue, fin, sei, sperm, and humpback (Central America and Mexico DPSs) whales:

1. The USCG shall incorporate standards and procedures into policy and guidance, directives, and SOPs associated with the OPC Program, including operation of vessels and aircraft.

2. The USCG shall report to OPR all observed interactions with ESA-listed cetaceans resulting in take associated with implementation of the proposed OPC Program activities and any observations of stranded or dead ESA-listed marine mammals that are not attributable to USCG OPC operations described in this Opinion but are observed during the course of USCG activities and while implementing monitoring requirements of this Opinion.

3. The USCG shall report all activities as required by this Opinion and as noted below in the terms and conditions.

4. The USCG shall report any activities not included in the Description of the Action (Section 3) and/or any changes to the activities described in this Opinion prior to implementation and any potential for exceedance of take immediately upon determining that levels are approaching exceedance. Exceedance of take shall require reinitiation of consultation.

12.3 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the USCG must comply with the following terms and conditions, which implement the RPMs described above. These include the take minimization, monitoring and reporting measures required by the section 7(b)(4) of the ESA regulations (50 C.F.R. §402.14(i.)(3)). The USCG must comply with these terms and conditions. If the USCG fails to ensure compliance with these terms and conditions to implement the RPMs, the protective coverage of section 7(o)(2) may lapse. The terms and conditions detailed below for each of the RPMs include monitoring and minimization measures where needed.

1. The USCG shall ensure the avoidance and minimization measures developed for this consultation, including the PDCs, are incorporated into policy and guidance, directives, and SOPs associated with the operation of vessels and aircraft under the OPC Program, particularly for activities that have the potential to affect ESA-listed species. This updating of existing policy and practice for the OPC Program should be completed prior to commissioning of the first new OPC.

2. The USCG shall report all observed interactions with ESA-listed species resulting in take associated with implementation of the proposed OPC Program activities. The USCG shall also report any observations of stranded or dead ESA-listed marine mammals that are not

attributable to USCG OPC operations described in this Opinion, but are observed during the course of USCG activities and while implementing monitoring requirements of this Opinion.

a. The USCG shall immediately contact the NMFS Office of Protected Resources via nmfs.hq.esa.consultations@noaa.gov and the appropriate stranding networks to report stranding details associated with death or injury of marine mammals due to OPC activities.
b. Observations of stranded or dead ESA-listed marine mammals while implementing monitoring requirements of this consultation that are clearly not attributable to the OPC Program shall also be reported within 24 hours of the observation. Stranded or dead marine mammals should be reported to the appropriate stranding network at: http://fisheries.noaa.gov/report and notification shall also be sent to the Office of Protected Resources at nmfs.hq.esa.consultations@noaa.gov with the subject line: dead or stranded animal observation.

3. The USCG shall submit annual summary monitoring reports that identify observations including locations of ESA-listed large whales or other aspects of the OPC activities analyzed in this Opinion and relevant to help assess the actual amount or extent of take incidental to the implementation of OPC Program activities.
   a. The USCG shall provide an annual report via email to NMFS summarizing number of days of vessel and aircraft operations per OPC in each operation area; PDCs implemented to avoid and minimize effects to ESA-listed marine mammals; and observer data with details on the number, locations, behaviors, responses to disturbance, and any other relevant information for each species encountered during the vessel and aircraft operations that were identified in this Opinion as likely to adversely affect ESA-listed marine mammals.

4. The USCG shall report to NMFS any possible exceedance of anticipated take, planned implementation of activities not included in the *Description of the Action* (Section 3), and/or any changes to the activities described in this Opinion prior to implementation immediately upon determining that a planned activity may exceed take. Exceedance of take, or changes to activities and/or implementation of new activities that were not considered in this consultation requires reinitiation of consultation (50 C.F.R. §402.14(i)(4) and 50 C.F.R. §402.16(a)(1). Procedures for consistency review outlined in Section 3.3.2 should be followed to submit the required information to NMFS. If USCG determines expected take was exceeded, that would be reported immediately to NMFS.

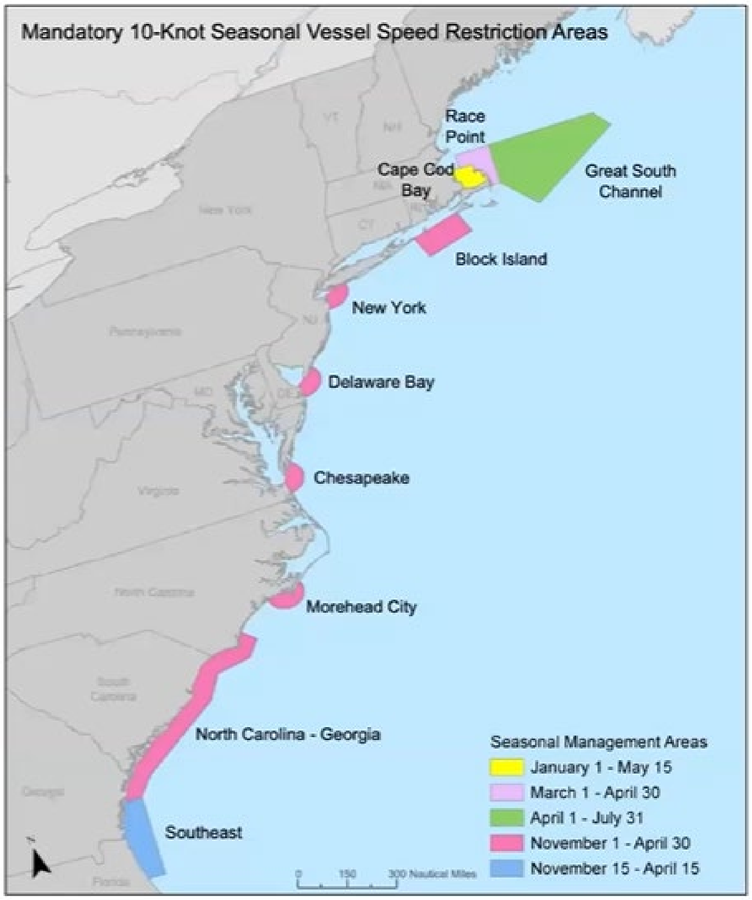
13 CONSERVATION RECOMMENDATIONS

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. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of an action on ESA-listed species or critical habitat, to help implement recovery plans or develop information (50 C.F.R. §402.02).

The following conservation recommendations are discretionary measures that NMFS believes are consistent with this obligation and therefore should be carried out by the USCG:

1. We recommend that the USCG work with NMFS to ensure training for all USCG watchstanders or crew members who serve as observers looking for ESA-listed species contains information regarding all ESA-listed species within all seven operation areas under the action, including transit-only areas and areas where vessels are likely to use ports while in transit from one operation area to another. Training on the identification of ESA-listed species in the action area will assist in the implementation of required clearance zones between vessels and some ESA-listed species and their habitats. Training should include how to alert Command to initiate adaptive mitigation responses, including reducing vessel speed, posting additional dedicated lookouts to assist in monitoring whales' location, avoiding sudden changes in speed and direction, or, if a swimming whale is spotted, attempting to parallel the course and speed of the moving whale so as to avoid crossing its path, and avoiding approach of sighted whales head-on, or directly from behind. We strongly recommend that USCG crewmembers take pictures of any ESA-listed species sighted for identification and reporting purposes. This can be done with any type of camera, including cell phones. The USCG should also create accurate job aids in collaboration with NMFS to ensure the best information on species is available to increase the likelihood of accurate identification of species.
2. We recommend reductions in speed for whales, avoidance and speed reductions for all other ESA-listed species, and a dedicated lookout upon sightings in the operating area. Avoidance of areas during times of the year where whale prey are found in higher concentrations (i.e., where primary productivity is high) is also recommended to the extent practicable.
3. We recommend that the USCG update sighting logs to include information for accurately reporting observations of all ESA-listed sea turtles, larger fish species (such as sharks and giant manta rays), and non-listed marine mammals that may be observed during transit of OPCs between operation areas and provide sighting reports to NMFS for all observations. This reporting would provide us with data to help us better understand the range of ESA-listed species in the operation areas.
4. Vessels actively engaged in search and rescue or enforcement activities or military vessels are exempt from these mandatory speed restrictions off the Atlantic coast, but

werecommend they be followed during all other activities (e.g., see Figure below for example from Atlantic).



5. We recommend USCG use existing information such as https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/archive/dolphinsmart/pdfs/turtle_guide.pdf to post on vessels or provide to crew for awareness of protected marine species.
6. We recommend USCG train on and implement use of thermal imaging cameras, in addition to reticled binoculars (Big-Eye and handheld) and the naked eye, for use during daytime and nighttime visual observations to test their effectiveness at detecting ESA-listed species.
7. We recommend the USCG continue to model potential impacts to ESA-listed species (including marine mammals, sea turtles, and fish), particularly in the seven operation areas, through refinements of relevant models; validate assumptions used in effects analyses; and seek new information and higher quality data for use in such efforts.
8. We recommend the USCG Cutters install ammunition casing catchment systems onboard the various vessels or weapon system(s). This would reduce the number of spent casings, that could potentially enter and be lost in the marine environment through ejection or

ricochets thereby minimizing potential effects to ESA-listed species from anthropogenic waste generated by the action.

9. We recommend the USCG explore utilizing drone technology to survey for and avoid turtles and marine mammals around targets in the action area immediately prior to conducting each of the proposed gunnery exercises. This can increase the possibility of an animal being detected before operations commence, particularly for animals that may be below the water's surface and not visible to the dedicated lookouts.
10. We recommend the USCG implement or assess the applicability of establishing surface danger zones during live-fire exercises.
    a. Small arms ballistic characteristics and ricochet probabilities were developed in the mid 1990's to determine projectile dispersion for a variety of weapon platforms and munitions in order to define firing range safety standards (Hoxha and Vasquez 1995, Beavers and Olsen 2009). Surface Danger Zones allow military entities to identify the extent and magnitude of the applicable impact area during an exercise to include the munitions dispersion and ricochet areas thereby establishing safe limits for live-fire exercises. This information was synthesized into U.S. Army DA PAM 385-63 and U.S. Marine Corps manual MCO 3570.1B. Surface danger zones take into account all probabilities of a rounds trajectory and dispersion patterns, and all probabilities of where all discharged rounds will land when fired at the same target, to include their potential ricochets and fragments.
    b. The U.S. Navy, in cooperation with U.S. Marine Corps, developed a system known as the Kinetic Integrated Lightweight Software Individual Tactical Combat Handheld for Android (KILSWITCH SDZ) which allows for real-time determination of Surface Danger Zones in an open ocean environment (U.S. Navy 2017). This has the potential to alter the expected action area for USCG live-fire exercises by establishing the expected trajectories of 1,000,000 rounds during each operation, assisting in determining observation zones, and can further reduce the potential of an impact from a projectile to an ESA-listed species during each exercise by quantifying the exact spatial-temporal impact zone.

In order for NMFS Office of Protected Resources Endangered Species Act Interagency Cooperation Divisions to be kept informed of actions minimizing or avoiding adverse effects on, or benefiting, ESA-listed species or their critical habitat, the USCG should notify the Endangered Species Act Interagency Cooperation Division of any conservation recommendations they implement.

14 Reinitiation Notice

This concludes programmatic formal consultation for the USCG for the acquisition, construction and operation of up to 25 new OPCs. Consistent with 50 C.F.R. §402.16, reinitiation of formal consultation is required and shall be requested by the Federal agency, where discretionary Federal involvement or control over the action has been retained or is authorized by law and:

(1) The amount or extent of taking specified in the incidental take statement is exceeded.

(2) New information reveals effects of the agency action that may affect ESA-listed species or critical habitat in a manner or to an extent not previously considered.

(3) The identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this Opinion.

(4) A new species is listed or critical habitat designated under the ESA that may be affected by the action.

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