Final

Supplemental Environmental Impact Statement/ Overseas Environmental Impact Statement Atlantic Fleet Training and Testing

TABLE OF CONTENTS

List of Figures

List of Tables

3.7 Marine Mammals

MARINE MAMMALS SYNOPSIS

The Action Proponents considered all stressors that marine mammals could potentially be exposed to from the Proposed Action within the Study Area. The following conclusions have been reached for the Preferred Alternative (Alternative 1).

- Acoustics: Marine mammals may be exposed to multiple acoustic stressors, including sonars and other transducers (hereinafter called sonars), air guns, pile driving, vessel noise, aircraft noise, and weapons noise. The potential for exposure varies for each marine mammal population present in the study area. Exposures to sound-producing activities may cause auditory masking, physiological stress, or minor behavioral responses. Exposure to some sonars, air guns, and pile driving may also affect hearing (temporary threshold shift [TTS] or auditory injury [AINJ]) and cause significant behavioral reactions. The number of auditory and significant behavioral impacts are estimated for each stock. Susceptibility to these impacts differs among marine mammal auditory and behavioral groups. Although individual marine mammals would be impacted, no impacts to marine mammal populations are anticipated.
- Explosives: The potential for exposure to explosives (in the water or near the water surface) varies for each marine mammal population present in the study area. The impulsive, broadband sounds introduced into the marine environment may cause auditory effects (TTS or AINJ), auditory masking, physiological stress, and behavioral responses. Explosions in the water or near the water's surface present a risk to marine mammals located near the explosion, because the resulting shock waves can injure or kill an animal. The number of auditory (TTS and AINJ), non-auditory injury (injury and mortality), and significant behavioral impacts are estimated for each stock. Susceptibility to these impacts differs among marine mammal species and auditory groups. Although individual marine mammals would be impacted, no impacts to marine mammal populations are anticipated.
- Energy: Based on the relatively weak strength of the electromagnetic field created by Navy activities, a marine mammal would have to be in close proximity for there to be any effect and impacts on marine mammal migrating behaviors and navigational patterns are not anticipated. Potential impacts from high-energy lasers would only result for marine mammals directly struck by the laser beam. Statistical probability analyses demonstrate with a high level of certainty that no marine mammals would be struck by a high-energy laser. Energy stressors are temporary and localized in nature and based on patchy distribution of animals, no impacts to individual marine mammals and marine mammal populations are anticipated.
- Physical disturbance and strike: Historical data on Navy ship strike records demonstrate a low occurrence of interactions with marine mammals over the last 15 years. Since the Action Proponents do not anticipate a higher level of vessel use compared to the last decade, the potential for striking a marine mammal remains low. Physical disturbance due to vessel movement and in-water devices of individual marine mammals may also occur, but any stress response of avoidance behavior would not be severe enough to have long-term fitness consequences for individual marine mammals. Results for each of these physical disturbance and strike stressors suggest a very low potential for marine mammals to be struck by any of these items. Impacts to individuals or long-term consequences to marine mammal populations from physical disturbance and strike stressors associated with miliary readiness activities are not anticipated.

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MARINE MAMMALS SYNOPSIS

- Entanglement: Physical characteristics of wires and cables, decelerators/parachutes, and biodegradable polymers combined with the sparse distribution of these items throughout the Study Area indicate a very low potential for marine mammals to encounter and become entangled in them. Long-term impacts to individual marine mammals and marine mammal populations from entanglement stressors associated with training and testing activities are not anticipated.
- Ingestion: Adverse impacts from ingestion of military expended materials would be limited to the unlikely event that a marine mammal would be harmed by ingesting an item that becomes embedded in tissue or is too large to be passed through the digestive system. The likelihood that a marine mammal would encounter and subsequently ingest a military expended item associated with military readiness activities is considered low. Long-term consequences to marine mammal populations from ingestion stressors associated with military readiness activities are not anticipated.
- Secondary: In-water explosions would not substantially impact prey availability for marine mammals. Explosion byproducts and unexploded munitions would have no meaningful effect on water or sediment quality; therefore, they are not considered to be secondary stressors for marine mammals. Available research indicates metal contamination is very localized and that bioaccumulation resulting from munitions would not occur. Through rapid dilution, toxic concentrations of chemicals are unlikely to be encountered by marine mammals. Furthermore, bioconcentration or bioaccumulation of chemicals introduced by Navy activities to levels that would significantly alter water quality and degrade marine mammal habitat has not been documented. The Navy's use of marine mammal systems is not likely to increase the risk of transmitting diseases or parasites to wild marine mammals. Secondary stressors from military readiness activities in the Study Area are not expected to have short-term impacts on individual marine mammals or long-term impacts on marine mammal populations.

3.7.1 Introduction

The following sections describe the marine mammals found in the Study Area, the habitats where they can be found, and the analysis of potential effects of their exposure to the Proposed Action.

3.7.2 Affected Environment

The Study Area is generally consistent with that analyzed in the 2018 *Final Atlantic Fleet Training and Testing Environmental Impact Statement/Overseas Environmental Impact Statement* (EIS/OEIS) (hereinafter referred to as the 2018 Final EIS/OEIS). Additions to the Study Area include pierside training and testing events and transit along established navigation channels from pierside locations to offshore range complexes in the Gulf of America. United States (U.S.) Coast Guard activities are similar in nature to Navy activities and fall under the same stressor categories. A review of literature published since 2018 revealed that the affected environment for marine mammals in the Study Area described in the 2018 Final EIS/OEIS is substantially the same. Exceptions are summarized in the subsequent sections, with further details in Appendix F (Biological Resources Supplemental Information).

Extralimital marine mammal species to the Study Area, such as the bowhead whale, narwhal, beluga whale, ringed seal, bearded seal, walrus, and polar bear, are not part of the analysis of potential impacts, because they would not be exposed to stressors from the Proposed Action.

3.7.2.1 General Background

With noted exceptions, the general background for marine mammals in the Study Area is not meaningfully different from what is described in the 2018 Final EIS/OEIS Section 3.7.2.1 (General Background). The details are specified in this section when they directly affect the analysis. There is updated information regarding the number and population status of species in the Study Area that considers the most recent Atlantic and Gulf of Mexico Marine Mammal Stock Assessment Reports (Hayes et al., 2023). Updated information is presented in Appendix F (Biological Resources Supplemental Information).

There are 48 marine mammal species known to exist in the Study Area. Among these species are 93 stocks managed by either the National Marine Fisheries Service (NMFS) or the U.S. Fish and Wildlife Service (USFWS) in the U.S. Exclusive Economic Zone. These species and stocks are presented in Table 3.7-1 along with an abundance estimate, an associated coefficient of variation value, a minimum population estimate, as well as the range complexes, inshore waters, and port and pierside areas where each species occurs.

Four main types of marine mammals are recognized: cetaceans (whales, dolphins, and porpoises), pinnipeds (seals, sea lions, and walruses), sirenians (manatees and dugongs), and other marine carnivores (sea otters, marine otters, and polar bears) (Jefferson et al., 2015; Rice, 1998). To maintain consistency with past analyses and retain familiar terminology, "odontocetes" refers to toothed whales, dolphins, and porpoises, "mysticetes" to baleen whales, and "cetaceans" to be inclusive of both. Mysticetes are further divided into four families: right whales, rorquals, gray whales, and pygmy right whales. Odontocetes are divided into 10 families: sperm whales, Kogiids, beaked whales, dolphins, porpoises, beluga/narwhal, and four families of river dolphin. Pinnipeds are of the order Carnivora and can be divided into three families: phocids (true seals), odobenidae (walruses), and otariids (fur seals and sea lions). Other marine carnivores include polar bears and sea otters. The order Sirenia (sirenians) are slow-moving plant eaters, such as manatees, that inhabit shallow coastal and inshore waters. Detailed species descriptions, status and management, habitat and geographic range, population trends, predator and prey interactions, and species-specific threats are provided in Appendix F (Biological Resources Supplemental Information). Hearing and vocalization information is detailed in Appendix D (Acoustic and Explosive Impacts Supporting Information).

3.7.2.2 Endangered Species Act-Listed Species

Table 3.7-1 shows the marine mammal species and applicable stocks listed under the Endangered Species Act (ESA) and occurring within the Study Area. Critical habitat and proposed critical habitat are provided in Figure 3.7-1 for the North Atlantic right whale, Figure 3.7-2 for the West Indian manatee, and Figure 3.7-3 for the Rice's whale. Changes in the ESA listings and critical habitat designations since the 2018 Final EIS/OEIS include the following:

- The taxonomy and common name for the Gulf of Mexico subspecies of Bryde's whale (*Balaenoptera edeni*) was revised under the ESA. The revision classifies this new species as Rice's whale (*Balaenoptera ricei*) (84 *Federal Register* 15446, April 15, 2019).
- Proposed Rule for Critical Habitat in the Gulf of Mexico for Rice's Whales was published in the *Federal Register* (88 *Federal Register* 47453, July 24, 2023).

- Proposed Rule to list the Florida manatee as a threatened species with a blanket 4(d) rule and the Antillean manatee as an endangered species under the Act, which would remove the West Indian manatee from the Federal List of Endangered and Threatened Wildlife (List), add the Florida manatee and Antillean manatee to the List, and extend the Act's protections to the Florida manatee and Antillean manatee (90 *Federal Register* 3131).

3.7.2.3 Species Not Listed under the Endangered Species Act

Table 3.7-1 also shows the marine mammal species and applicable stocks not listed under the ESA and occurring within the Study Area.

Table 3.7-1: Marine Mammal Occurrence in the Study Area

Species	Scientific Name[1]	Stock[2]	Population Status[3]	Stock Abundance[4] Best (CV)/Min. Population Estimate	Occurrence in the Study Area		
					Range Complex	Associated Inshore Waters	Port and Pierside
Order Cetacea							
Suborder Mysticeti (baleen whales)							
Family Balaenidae (right whales and bowhead whales)							
North Atlantic right whale	*Eubalaena glacialis*	Western North Atlantic	Endangered, strategic, depleted	340 (0) / 337[5]	Northeast RC*, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC*, SFOMF, SINKEX Box, Other AFTT Areas	Northeast Range Complexes Inshore, VACAPES Inshore, Jacksonville Range Complex (JAX RC) Inshore	Civilian Ports Boston, MA; Earle, NJ; Delaware Bay, DE; Hampton Roads, VA; Morehead City, NC; Wilmington, NC; Kings Bay, GA; Savannah, GA; Mayport, FL Coast Guard Stations Boston, MA; Virginia Beach, VA; Charleston, SC; Mayport, FL
Family Balaenopteridae (rorquals)							
Blue whale	*Balaenoptera musculus*	Western North Atlantic (Gulf of St. Lawrence)	Endangered, depleted, strategic stock	Unknown / 402; 39 (.64)[6]	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, Other AFTT Areas	–	–
Bryde's whale	*Balaenoptera edeni*	Atlantic (only expected outside of U.S. EEZ)	–	Unknown	Other AFTT Areas	–	–
Fin whale	*Balaenoptera physalus*	West Greenland	Endangered, depleted	4,468 (1,343–14,871)[7]	Other AFTT Areas	–	–
		Gulf of St. Lawrence	Endangered, depleted	328 (306–350)[8]	Other AFTT Areas	–	–
		Western North Atlantic	Endangered, depleted, strategic stock	6,802 (0.24) / 5,573	Northeast RC, VACAPES RC, Navy Cherry Point RC, JAX RC, Key West RC, Gulf RC (extralimital), NSWC Panama City Testing Range (extralimital), Other AFTT Areas	Northeast Range Complexes Inshore, VACAPES Inshore	–

[1] Taxonomy follows Committee on Taxonomy (2016) and Perrin et al. (2009).
[2] Stock designations for the U.S. EEZ and abundance estimates are from the U.S. Atlantic Marine Mammal Stock Assessment Reports prepared by NMFS (Hayes et al., 2023).
[3] ESA/MMPA - Populations or stocks are defined by the MMPA as "strategic" for one of the following reasons: (1) the level of direct human-caused mortality exceeds the potential biological removal level; (2) based on the best available scientific information, numbers are declining and species are likely to be listed as threatened species under the ESA within the foreseeable future; (3) species are listed as threatened or endangered under the ESA; or (4) species are designated as depleted under the MMPA.
[4] Stock abundance, CV, and minimum population are numbers provided by the Stock Assessment Reports (Hayes et al., 2023). The stock abundance is an estimate of the number of animals within the stock. The CV is a statistical metric used as an indicator of the uncertainty in the abundance estimate. The minimum population estimate is either a direct count (e.g., pinnipeds on land) or the lower 20th percentile of a statistical abundance estimate. Canadian stocks, USFWS-managed species, and the North Atlantic right whales are handled differently; see subsequent footnotes.
[5] NMFS uses "credible interval" to characterize the uncertainty as opposed to CV for North Atlantic right whales (Hayes et al., 2023).
[6] Photo-ID catalog count of 402 recognizable blue whale individuals from the Gulf of St. Lawrence is considered a minimum population estimate for the western North Atlantic stock (Waring et al., 2010). An additional 39 (0.64) were documented in the summer of 2016 for Central Virginia to Bay of Fundy (Waring et al., 2010).
[7] The West Greenland stock of fin whales is not managed by NMFS and, therefore, does not have an associated Stock Assessment Report. Abundance and a 95% confidence interval were presented in Heide-Jorgensen et al. (2010a).
[8] The Gulf of St. Lawrence stock of fin whales is not managed by NMFS and, therefore, does not have an associated Stock Assessment Report. Abundance and 95% confidence interval were presented in Ramp et al. (2014).
* Intersects with species designated critical habitat

Table 3.7-1: Marine Mammal Occurrence in the Study Area (continued)

Species	*Scientific Name[1]*	*Stock[2]*	*Population Status[3]*	*Stock Abundance[4] Best (CV)/Min. Population Estimate*	*Occurrence in the Study Area*		
					Range Complex	*Associated Inshore Waters*	*Port and Pierside*
Humpback whale	*Megaptera novaeangliae*	Gulf of Maine	–	1,396 (0) / 1,380	Northeast RC, NUWC Division, Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, Gulf RC, Other AFTT Areas	Northeast Range Complexes Inshore, VACAPES Inshore, Jacksonville Range Complex (JAX RC) Inshore	Civilian Ports Boston, MA; Earle, NJ; Delaware Bay, DE; Hampton Roads, VA; Morehead City, NC; Wilmington, NC Coast Guard Stations Boston, MA; Newport, RI; Virginia Beach, VA; Charleston, SC; Mayport, FL; Cape Canaveral, FL; Fort Pierce, FL; Dania, FL; Miami, FL; Key West, FL; St. Petersburg, FL; Pensacola, FL; New Orleans, LA; Corpus Christi, TX
Minke whale	*Balaenoptera acutorostrata*	Canadian East Coast	–	21,968 (0.31) / 17,002	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, Gulf RC, Other AFTT Areas	Northeast Range Complexes Inshore, VACAPES Inshore, Jacksonville Range Complex (JAX RC) Inshore	Civilian Ports Boston, MA; Earle, NJ; Delaware Bay, DE; Hampton Roads, VA; Morehead City, NC; Wilmington, NC; Kings Bay; GA, Savannah, GA Coast Guard Stations Boston, MA; Newport, RI; Virginia Beach, VA; Charleston, SC; Mayport, FL; Cape Canaveral, FL; Fort Pierce, FL; Dania, FL; Miami, FL; Key West, FL; St. Petersburg, FL; Pensacola, FL; New Orleans, LA; Corpus Christi, TX
		West Greenland	–	16,609 (7,172–38,461) / NA[9]	Other AFTT Areas	–	Civilian Ports Boston, MA; Earle, NJ; Delaware Bay, DE; Hampton Roads, VA; Morehead City, NC; Wilmington, NC
Rice's whale	*Balaenoptera ricei*	Gulf of America	Endangered, depleted, strategic stock	51 (.05) / 34	Gulf RC**, Key West RC, NSWC Panama City Testing Range*	Gulf Range Complex (Gulf RC) Inshore	Civilian Ports Tampa, FL; Beaumont, TX; Corpus Christi, TX; Gulfport, MS
Sei whale	*Balaenoptera borealis*	Nova Scotia	Endangered, depleted, strategic stock	6,292 (1.02) / 3,098	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, Gulf RC, Other AFTT Areas	–	–
		Labrador Sea	Endangered, depleted	Unknown[10]	Other AFTT Areas	–	–
Suborder Odontoceti (toothed whales)							
Family Physeteridae (sperm whale)							
Sperm whale	*Physeter macrocephalus*	North Atlantic	Endangered, depleted, strategic stock	5,895 (0.29) / 4,639	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, Gulf RC, SINKEX Box, Other AFTT Areas	–	–
		Northern Gulf of America	Endangered, depleted, strategic stock	1,180 (.22) / 983	Gulf RC	–	–

[9] The West Greenland stock of minke whales is not managed by NMFS and, therefore, does not have an associated Stock Assessment Report. Abundance and 95% confidence interval were presented in Heide-Jorgensen et al. (2010b).
[10] The Labrador Sea stock of sei whales is not managed by NMFS and, therefore, does not have an associated Stock Assessment Report. Information was obtained in Prieto et al. (2014).
** Intersects with species proposed critical habitat

Table 3.7-1: Marine Mammal Occurrence in the Study Area (continued)

Species	Scientific Name[1]	Stock[2]	Population Status[3]	Stock Abundance[4] Best (CV)/Min. Population Estimate	Occurrence in the Study Area		
					Range Complex	Associated Inshore Waters	Port and Pierside
Sperm whale (continued)		Puerto Rico and U.S. Virgin Islands	Endangered, depleted, strategic stock	Unknown	Other AFTT Areas	–	–
Family Kogiidae (sperm whales)							
Pygmy and dwarf sperm whales	*Kogia breviceps and Kogia sima*	Western North Atlantic	–	9,474 (0.36) / 7.080	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, Gulf RC, Other AFTT Areas	–	–
	Kogia breviceps and Kogia sima	Gulf of America	–	336 (0.35) / 253	Gulf RC	–	–
Family Ziphiidae (beaked whales)							
Blainville's beaked whale	*Mesoplodon densirostris*	Western North Atlantic[11]	–	2,936 (0.26) / 2,374	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, Gulf RC, Other AFTT Areas	–	–
		Northern Gulf of America	–	98 (0.46) / 68	Gulf RC	–	–
Goose-beaked whale (formerly Cuvier's beaked whale)	*Ziphius cavirostris*	Western North Atlantic	–	4,260 (0.24) / 3,817	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Other AFTT Areas	–	–
		Northern Gulf of America	–	18 (0.75) / 10	Gulf RC	–	–
		Puerto Rico and U.S. Virgin Islands	Strategic	Unknown	Other AFTT Areas	–	–
Gervais' beaked whale	*Mesoplodon europaeus*	Western North Atlantic	–	8,595 (0.24) / 7,022[12]	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, Gulf RC, Other AFTT Areas	–	–
		Northern Gulf of America	–	20 (0.98) / 10	Gulf RC	–	–
Northern bottlenose whale	*Hyperoodon ampullatus*	Western North Atlantic	–	Unknown	Other AFTT Areas	–	–
Sowerby's beaked whale	*Mesoplodon bidens*	Western North Atlantic	–	492 (0.50) / 3430	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, Gulf RC, Other AFTT Areas	–	–
True's beaked whale	*Mesoplodon mirus*	Western North Atlantic	–	4,480 (0.34) / 3,391	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, Gulf RC, Other AFTT Areas	–	–
Family Delphinidae (dolphins)							
Atlantic spotted dolphin	*Stenella frontalis*	Western North Atlantic	–	31,506 (0.28) / 25,042	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, Gulf RC, Other AFTT Areas	–	–
		Gulf of America	–	21,506 (0.26) / 17,339	Gulf RC, Other AFTT Areas	–	–
		Puerto Rico and U.S. Virgin Islands	Strategic	Unknown	Other AFTT Areas	–	–

[11] Estimate includes undifferentiated *Mesoplodon* species.
[12] Estimate includes Gervais' and Blainville's beaked whales.

Table 3.7-1: Marine Mammal Occurrence in the Study Area (continued)

Species	Scientific Name[1]	Stock[2]	Population Status[3]	Stock Abundance[4] Best (CV)/Min. Population Estimate	Occurrence in the Study Area		
					Range Complex	Associated Inshore Waters	Port and Pierside
Atlantic white-sided dolphin	*Lagenorhynchus acutus*	Western North Atlantic	–	93,233 (0.71) / 54,443	Northeast RC, VACAPES RC, Other AFTT Areas	–	Civilian Ports Boston, MA Coast Guard Stations Boston, MA
Clymene dolphin	*Stenella clymene*	Western North Atlantic	–	21,778 (.72)/ 12,622	Northeast RC, NUWC Division, Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, Gulf RC, Other AFTT Areas	–	–
		Gulf of America	Strategic	513 (1.3) / 250	Gulf RC, Other AFTT Areas	–	–
Common bottlenose dolphin	*Tursiops truncatus*	Western North Atlantic, Offshore	–	64,587 (0.24) / 52,801[13]	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Other AFTT Areas	–	–
		Western North Atlantic Northern Migratory Coastal	Depleted, strategic stock	6,639 (0.41) / 4,759	VACAPES RC, Navy Cherry Point RC, JAX RC, Key West RC, Other AFTT Areas	Virginia Capes Range Complex (VACAPES RC) Inshore	Civilian Ports Earle, NJ; Delaware Bay, DE; Hampton Roads, VA; Morehead City, NC Coast Guard Stations Virginia Beach, VA
		Western North Atlantic Southern Migratory Coastal	Depleted, strategic stock	3,751 (0.06) / 2,353	Navy Cherry Point RC, JAX RC, Key West RC, Other AFTT Areas	Jacksonville Range Complex (JAX RC) Inshore	Civilian Ports Hampton Roads, VA; Morehead City, NC; Wilmington, NC; Kings Bay, GA; Savannah, GA Coast Guard Stations Virginia Beach, VA
		Western North Atlantic South Carolina / Georgia Coastal	Depleted, strategic stock	9,121 (0.28) / 7,261	Other AFTT Areas	Jacksonville Range Complex (JAX RC) Inshore	Civilian Ports Kings Bay, GA; Savannah, GA
		Northern North Carolina Estuarine System	Strategic	823 (0.06) / 782	Other AFTT Areas	–	Civilian Ports Morehead City, NC; Wilmington, NC
		Southern North Carolina Estuarine System	Strategic	Unknown	Other AFTT Areas	–	Civilian Ports Morehead City, NC; Wilmington, NC
		Northern South Carolina Estuarine System	Strategic	453 (0.28) / 359	Other AFTT Areas	Jacksonville Range Complex (JAX RC) Inshore	–
		Charleston Estuarine System	Strategic	Unknown	Other AFTT Areas	Jacksonville Range Complex (JAX RC) Inshore	–
		Northern Georgia /Southern South Carolina Estuarine System	Strategic	Unknown	Other AFTT Areas	Jacksonville Range Complex (JAX RC) Inshore	–
		Central Georgia Estuarine System	Strategic	Unknown	Other AFTT Areas	–	–
		Southern Georgia Estuarine System	Strategic	Unknown	Other AFTT Areas	Jacksonville Range Complex (JAX RC) Inshore	Civilian Ports Kings Bay, GA; Savannah, GA

[13] Estimate may include sightings of the coastal form.

Table 3.7-1: Marine Mammal Occurrence in the Study Area (continued)

Species	*Scientific Name*[1]	*Stock*[2]	*Population Status*[3]	*Stock Abundance*[4] *Best (CV)/Min. Population Estimate*	*Occurrence in the Study Area*		
					Range Complex	*Associated Inshore Waters*	*Port and Pierside*
Common bottlenose dolphin (continued)	*Tursiops truncatus*	Western North Atlantic, Northern Florida Coastal	Depleted, strategic stock	3,619 (0.35) / 2,711	Other AFTT Areas	Jacksonville Range Complex (JAX RC) Inshore	Civilian Ports Kings Bay, GA; Savannah, GA
		Jacksonville Estuarine System	Strategic	Unknown	JAX RC	Jacksonville Range Complex (JAX RC) Inshore	Civilian Ports Kings Bay, GA; Savannah, GA
		Western North Atlantic, Central Florida Coastal	Depleted, strategic stock	2,541 (0.46) / 1,760	JAX RC	Jacksonville Range Complex (JAX RC) Inshore	Civilian Ports Port Canaveral, FL
		Indian River Lagoon Estuarine System	Strategic	1,032 (0.03) / 1,004	Other AFTT Areas	Jacksonville Range Complex (JAX RC) Inshore	Civilian Ports Port Canaveral, FL
		Biscayne Bay	Strategic	241 (0.04) / 233	Other AFTT Areas	–	–
		Florida Bay	–	Unknown	Other AFTT Areas	–	–
		Gulf of America Continental Shelf	–	63,289 (0.11) / 57,917	Gulf RC	–	–
		Gulf of America Eastern Coastal	–	16,407 (0.17) / 14,199	Gulf RC	Gulf Range Complex (Gulf RC) Inshore	–
		Gulf of America Northern Coastal	–	11,543 (0.19) / 9,881	Gulf RC	Gulf Range Complex (Gulf RC) Inshore	Gulfport, MS
		Gulf of America Western Coastal	–	20,759 (0.13) / 18,585	Gulf RC	Gulf Range Complex (Gulf RC) Inshore	Civilian Ports Beaumont, TX; Corpus Christi, TX; Pascagoula, MS; Gulfport, MS Coast Guard Stations Corpus Christi, TX
		Gulf of America Oceanic	–	7,462 (0.31) / 5,769	Gulf RC	–	–
		Laguna Madre	Strategic	80 (1.57) / unknown	Gulf RC	–	–
		Neuces Bay, Corpus Christi Bay	Strategic	58 (0.61) / unknown	Gulf RC	–	Civilian Ports Corpus Christi, TX
		Copano Bay, Aransas Bay, San Antonio Bay, Redfish Bay, Espiritu Santo Bay	Strategic	55 (0.82) / unknown	Gulf RC	–	Civilian Ports Corpus Christi, TX
		Matagorda Bay, Tres Palacios Bay, Lavaca Bay	Strategic	61(0.45) / unknown	Gulf RC	–	–
		Gulf of America Bay, Sound, and Estuaries	Strategic	–	Gulf RC	Gulf Range Complex (Gulf RC) Inshore	–
		West Bay	–	37 (0.05) / 35	Gulf RC	–	–
		Galveston Bay/ East Bay/ Trinity Bay	–	842 (0.08) / 787	Gulf RC	–	–
		Sabine Lake	–	122 (0.19)/104	Gulf RC	–	Civilian Ports Beaumont, TX
		Calcasieu Lake	Strategic	Unknown	Gulf RC	–	–

Table 3.7-1: Marine Mammal Occurrence in the Study Area (continued)

Species	*Scientific Name*[1]	*Stock*[2]	*Population Status*[3]	*Stock Abundance*[4] *Best (CV)/Min. Population Estimate*	*Occurrence in the Study Area*		
					Range Complex	*Associated Inshore Waters*	*Port and Pierside*
Common bottlenose dolphin (continued)	*Tursiops truncatus*	Vermillion Bay, West Cote Blanche Bay, Atchafalaya Bay	Strategic	Unknown	Gulf RC	Gulf Range Complex (Gulf RC) Inshore	–
		Terrebonne Timbalier Bay Estuarine System	–	3,870 (0.15) / 3,426	Gulf RC	–	–
		St. Andrew Bay	–	199 (0.09) /185	Gulf RC	Gulf Range Complex (Gulf RC) Inshore	–
		Barataria Bay Estuarine System	Strategic	2,071 (0.06) / 1,971	Gulf RC	–	–
		Mississippi River Delta	–	1,446 (0.19) / 1,238	Gulf RC	–	–
		Mississippi Sound, Lake Borgne, Bay Boudreau	Strategic	1,265 (0.35) / 947	Gulf RC	Gulf Range Complex (Gulf RC) Inshore	–
		Mobile Bay, Bonsecour Bay	Strategic	122 (0.34) / unknown	Gulf RC	–	–
		Perdido Bay	Strategic	Unknown	Gulf RC	–	–
		Pensacola Bay, East Bay	Strategic	33 (0.80) / unknown	Gulf RC	–	–
		St. Joseph Bay	Strategic	142 (0.17) / 123	Gulf RC	–	–
		Choctawhatchee Bay	Strategic	179 (0.04) / unknown	Gulf RC	–	–
		St. Vincent Sound, Apalachicola Bay, St. George Sound	Strategic	439 (0.14) / unknown	Gulf RC	–	–
		Apalachee Bay	Strategic	491 (0.39) / unknown	Gulf RC	–	–
		Waccasassa Bay, Withlacoochee Bay, Crystal Bay	Strategic	Unknown	Gulf RC	–	–
		St. Joseph Sound, Clearwater Harbor	Strategic	Unknown	Gulf RC	–	–
		Tampa Bay	Strategic	Unknown	Gulf RC	–	Civilian Ports Tampa, FL
		Sarasota Bay, Little Sarasota Bay	–	158 (0.27) / 126	Gulf RC	–	–
		Pine Island Sound, Charlotte Harbor, Gasparilla Sound, Lemon Bay	Strategic	826 (0.09) / unknown	Gulf RC	–	–
		Caloosahatchee River	Strategic	Unknown	Gulf RC	–	–
		Estero Bay	Strategic	Unknown	Gulf RC	–	–
		Chokoloskee Bay, Ten Thousand Islands, Gullivan Bay	Strategic	Unknown	Gulf RC	–	–
		Whitewater Bay	Strategic	Unknown	Gulf RC	–	–

Table 3.7-1: Marine Mammal Occurrence in the Study Area (continued)

Species	Scientific Name[1]	Stock[2]	Population Status[3]	Stock Abundance[4] Best (CV)/Min. Population Estimate	Occurrence in the Study Area		
					Range Complex	Associated Inshore Waters	Port and Pierside
Common bottlenose dolphin (continued)	*Tursiops truncatus*	Florida Keys (Bahia Honda to Key West)	Strategic	Unknown	Gulf RC	Key West Range Complex Inshore	–
		Puerto Rico and U.S. Virgin Islands	Strategic	Unknown	Other AFTT Areas	–	–
False killer whale	*Pseudorca crassidens*	Western North Atlantic	–	1,298 (0.72) / 755	NUWC Division, Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, Gulf RC, Other AFTT Areas	–	–
		Gulf of America	–	494 (0.79) / 276	Gulf RC, Other AFTT Areas	–	–
Fraser's dolphin	*Lagenodelphis hosei*	Western North Atlantic	–	Unknown	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, Gulf RC, Other AFTT Areas	–	–
		Northern Gulf of America	–	213 (1.03) / 104	Gulf RC	–	–
Killer whale	*Orcinus orca*	Western North Atlantic	–	Unknown	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, Gulf RC, Other AFTT Areas	–	–
		Gulf of America	–	267 (0.75) / 152	Gulf RC	–	–
Long-finned pilot whale	*Globicephala melas*	Western North Atlantic	–	39,215 (0.30) / 30,627	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, Gulf RC, Other AFTT Areas	–	–
Melon-headed whale	*Peponocephala electra*	Western North Atlantic	–	Unknown	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, Gulf RC, Other AFTT Areas	–	–
		Northern Gulf of America	–	1,749 (0.68) / 1,039	Gulf RC	–	–
Pantropical spotted dolphin	*Stenella attenuata*	Western North Atlantic	–	2,757(0.50) / 1,856	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, Gulf RC, Other AFTT Areas	–	–
		Northern Gulf of America	–	37,195 (0.24) / 30,377	Gulf RC	–	–
Pygmy killer whale	*Feresa attenuata*	Western North Atlantic	–	Unknown	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, Gulf RC, Other AFTT Areas	–	–
		Northern Gulf of America	–	613 (1.15) / 283	Gulf RC	–	–

Table 3.7-1: Marine Mammal Occurrence in the Study Area (continued)

Species	*Scientific Name[1]*	*Stock[2]*	*Population Status[3]*	*Stock Abundance[4] Best (CV)/Min. Population Estimate*	*Occurrence in the Study Area*		
					Range Complex	*Associated Inshore Waters*	*Port and Pierside*
Risso's dolphin	*Grampus griseus*	Western North Atlantic	–	44,067 (0.19) / 30,662	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, Gulf RC, Other AFTT Areas	–	–
		Northern Gulf of America	–	1,974 (0.46) / 1,368	Gulf RC	–	–
Rough-toothed dolphin	*Steno bredanensis*	Western North Atlantic	–	Unknown	Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, Gulf RC, Other AFTT Areas	–	–
		Northern Gulf of America	–	Unknown	Gulf RC	–	–
Short-beaked common dolphin	*Delphinus delphis*	Western North Atlantic	–	93,100 (0.56) / 59,897	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, Gulf RC, Other AFTT Areas	–	–
Short-finned pilot whale	*Globicephala macrorhynchus*	Western North Atlantic	Strategic	18,726 (0.33) / 14,292	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, Gulf RC, Other AFTT Areas	–	–
		Northern Gulf of America	–	1,321 (0.43) / 934	Gulf RC	–	–
		Puerto Rico and U.S. Virgin Islands	Strategic	Unknown	Other AFTT Areas	–	–
Spinner dolphin	*Stenella longirostris*	Western North Atlantic	–	3,181 (0.64) / 1,930	Northeast RC, NUWC Division, Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, Gulf RC, Other AFTT Areas	–	–
		Northern Gulf of America	Strategic	2,991 (0.54) / 1,954	Gulf RC	–	–
		Puerto Rico and U.S. Virgin Islands	Strategic	Unknown	Other AFTT Areas	–	–
Striped dolphin	*Stenella coeruleoalba*	Western North Atlantic	–	48,274 (0.29) / 38,040	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, Gulf RC, Other AFTT Areas	–	–
		Northern Gulf of America	Strategic	1,817 (0.56) / 1,172	Gulf RC	–	–
White-beaked dolphin	*Lagenorhynchus albirostris*	Western North Atlantic	–	536,016 (0.31) / 415,344	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC	–	–

Table 3.7-1: Marine Mammal Occurrence in the Study Area (continued)

Species	Scientific Name[1]	Stock[2]	Population Status[3]	Stock Abundance[4] Best (CV)/Min. Population Estimate	Occurrence in the Study Area: Range Complex	Occurrence in the Study Area: Associated Inshore Waters	Occurrence in the Study Area: Port and Pierside
Family Phocoenidae (porpoises)							
Harbor porpoise	*Phocoena phocoena*	Gulf of St. Lawrence[14]	–	Unknown[14]	Other AFTT Areas	–	–
		Newfoundland[15]	–	Unknown[15]	Other AFTT Areas	–	–
		Greenland[16]	–	Unknown[16]	Other AFTT Areas	–	–
		Gulf of Maine/Bay of Fundy	–	85,765 (0.53) / 56,420	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC	Northeast Range Complexes Inshore, Virginia Capes Range Complex (VACAPES RC) Inshore	<u>Civilian Ports</u> Boston, MA; Earle, NJ; Delaware Bay, DE; Hampton Roads, VA <u>Coast Guard Stations</u> Boston, MA; Virginia Beach, VA
Order Carnivora							
Family Phocidae (earless seals)							
Gray seal	*Halichoerus grypus atlantica*	Western North Atlantic	–	27,911 (0.20) / 23,624	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC	Northeast Range Complexes Inshore, Virginia Capes Range Complex (VACAPES RC) Inshore	<u>Civilian Ports</u> Boston, MA; Earle, NJ; Delaware Bay, DE; Hampton Roads, VA; Morehead City, NC <u>Coast Guard Stations</u> Boston, MA; Virginia Beach, VA
Harbor seal	*Phoca vitulina*	Western North Atlantic	–	61,336 (0.08) / 57,637	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC	Northeast Range Complexes Inshore, Virginia Capes Range Complex (VACAPES RC) Inshore	<u>Civilian Ports</u> Boston, MA; Earle, NJ; Delaware Bay, DE; Hampton Roads, VA; Morehead City, NC <u>Coast Guard Stations</u> Boston, MA; Virginia Beach, VA
Harp seal	*Pagophilus groenlandicus*	Western North Atlantic	–	7.6M (0.12) / 7.1M	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC	–	–
Hooded seal	*Cystophora cristata*	Western North Atlantic	–	Unknown	Northeast Range Complex, NUWC Division, Newport Testing Range, Virginia Capes Range Complex, Navy Cherry Point Range Complex	–	<u>Civilian Ports</u> Boston, MA; Earle, NJ; Delaware Bay, DE; Hampton Roads, VA; Morehead City, NC

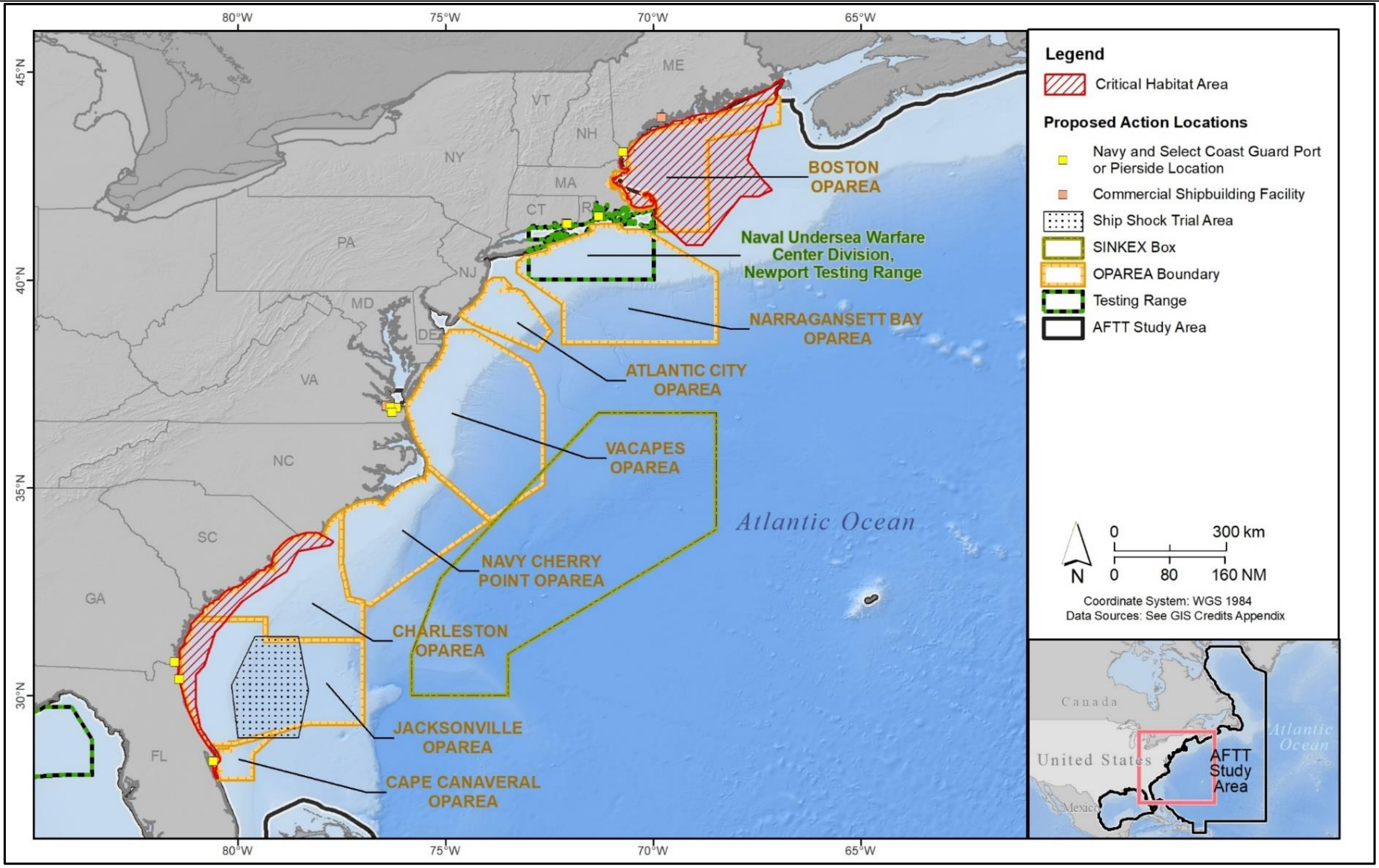
[14] Harbor porpoises in the Gulf of St. Lawrence are not managed by NMFS and have no associated Stock Assessment Report.
[15] Harbor porpoises in Newfoundland are not managed by NMFS and have no associated Stock Assessment Report.
[16] Harbor porpoises in Greenland are not managed by NMFS and have no associated Stock Assessment Report.

Table 3.7-1: Marine Mammal Occurrence in the Study Area (continued)

Species	Scientific Name[1]	Stock[2]	Population Status[3]	Stock Abundance[4] Best (CV)/Min. Population Estimate	Occurrence in the Study Area		
					Range Complex	Associated Inshore Waters	Port and Pierside
Family Trichechidae (manatees)							
West Indian manatee[17]	*Trichechus manatus latirostris* (Florida subspecies)	Florida	Threatened, depleted	8,810 (.08) /8,237[17]	Virginia Capes Range Complex, Navy Cherry Point Range Complex, Jacksonville Range Complex, South Florida Ocean Measurement Facility, Key West Range Complex, NSWC Panama City Division Testing Range, Gulf Range Complex, Other AFTT Areas	Virginia Capes Range Complex (VACAPES RC) Inshore, Jacksonville Range Complex (JAX RC) Inshore, Key West Range Complex Inshore, Gulf Range Complex (Gulf RC) Inshore	Civilian Ports Hampton Roads, VA; Morehead City, NC; Wilmington, NC; Kings Bay, GA; Savannah, GA; Mayport, FL; Port Canaveral, FL; Tampa, FL; Beaumont, TX; Corpus Christi, TX; Gulfport, MS; Pascagoula, MS Coast Guard Stations Virginia Beach, VA; Portsmouth, VA; Elizabeth City, NC; Charleston, SC; Mayport, FL; Cape Canaveral, FL; Fort Pierce, FL; Dania, FL; Miami, FL; Key West, FL; St. Petersburg, FL; Pensacola, FL; New Orleans, LA, Corpus Christi, TX
	Trichechus manatus manatus (Antillean subspecies)	Puerto Rico	Threatened	386 (.23) / 318	Other AFTT Areas	–	–

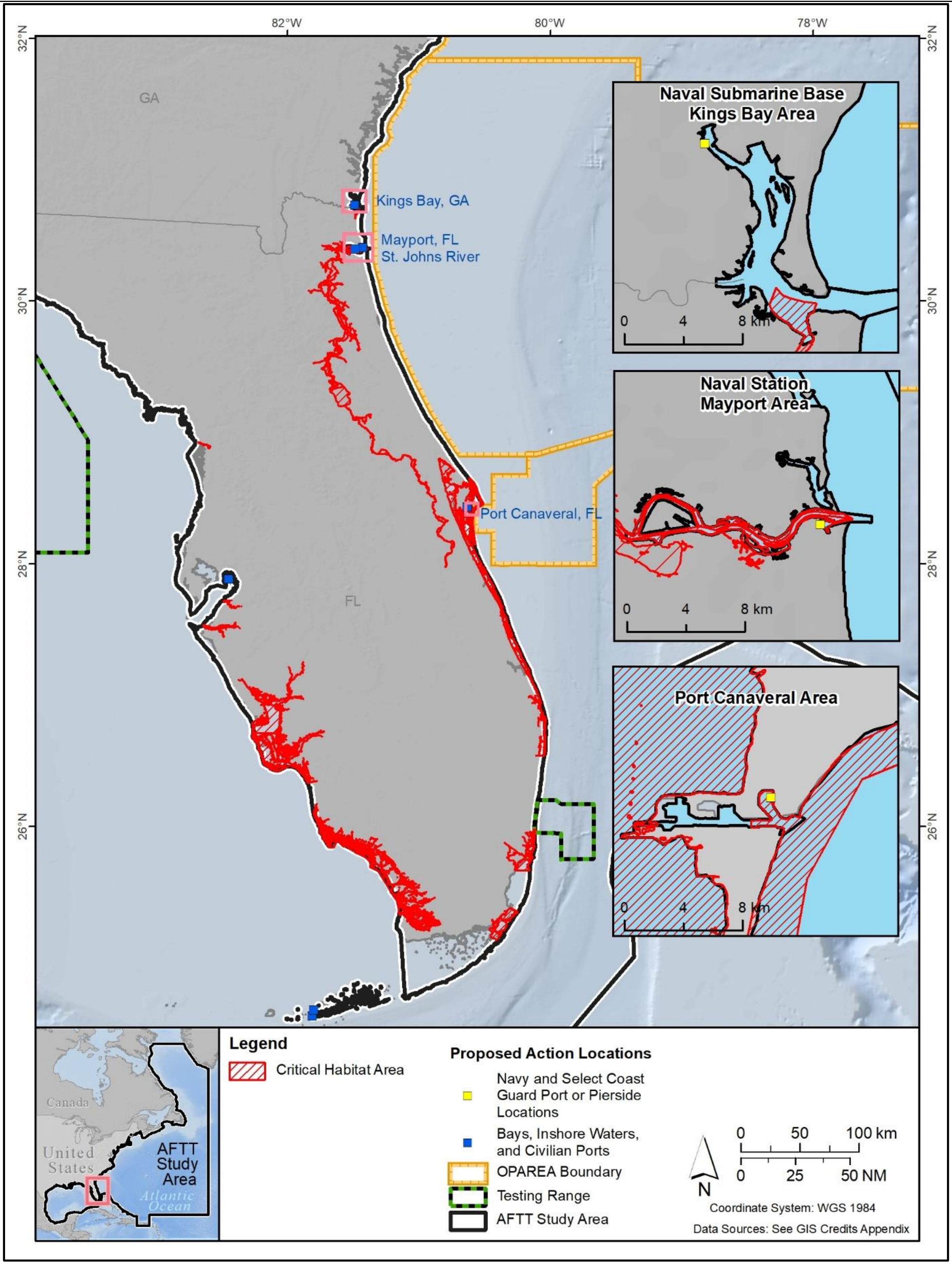
[17]The West Indian manatee is managed by the USFWS.

Notes: % = percent; AFTT = Atlantic Fleet Training and Testing; CV = coefficient of variation; EEZ = Exclusive Economic Zone; EIS = Environmental Impact Statement; ESA = Endangered Species Act; JAX = Jacksonville; Min. = minimum; MMPA = Marine Mammal Protection Act; NMFS = National Marine Fisheries Service; NSWC = Naval Surface Warfare Center; NUWC = Naval Undersea Warfare Center; RC = Range Complex; SAR = Stock Assessment Report; SFOMF = South Florida Ocean Measurement Facility Testing Range; U.S. = United States; USFWS = U.S. Fish and Wildlife Service; VACAPES = Virginia Capes



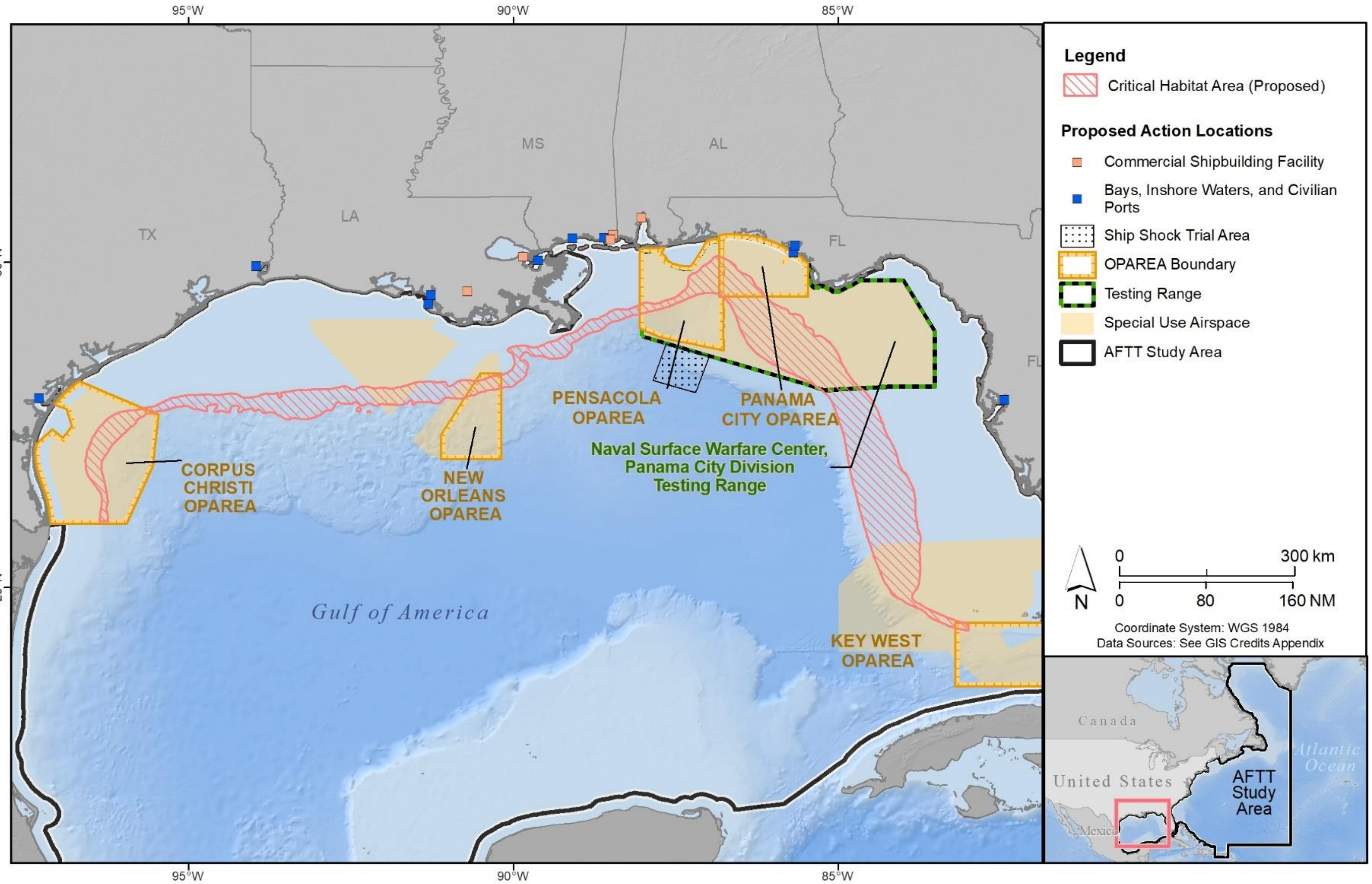
Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area; SINKEX = Sinking Exercise; VACAPES = Virginia Capes

Figure 3.7-1: Designated Critical Habitat for North Atlantic Right Whales in the Study Area



Notes: AFTT = Atlantic Fleet Training and Testing; FL = Florida; GA = Georgia; OPAREA = operating area

Figure 3.7-2: Designated Critical Habitat for West Indian Manatees in the Study Area



Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area

Figure 3.7-3: Proposed Critical Habitat for Rice's Whales in the Study Area

3.7.3 Environmental Consequences

Under the No Action Alternative for all stressors and substressors, the Action Proponents would not conduct any of the proposed military readiness activities in the Study Area. Therefore, baseline conditions of the existing environment for marine mammals would either remain unchanged or would improve after cessation of ongoing military readiness activities. The No Action Alternative is not analyzed further within this section.

This section evaluates how and to what degree the activities described in Chapter 2 (Description of Proposed Action and Alternatives) and the stressors described in Section 3.0.3.3 (Identifying Stressors for Analysis) could potentially impact marine mammals known to occur within the Study Area. With noted exceptions, the environmental consequences are not meaningfully different from what is described in the 2018 Final EIS/OEIS.

The Action Proponents conducted a review of changes in regulatory status and scientific information since 2018 that could alter the stressor analysis presented in the 2018 Final EIS/OEIS. The review identified one newly identified marine mammal species that also has ESA-listing status (Rice's whale; formerly known as the Gulf of Mexico Bryde's whale). The review also concluded that for marine mammals in general, the background information in the 2018 Final EIS/OEIS remains valid for energy stressors. The following stressors have updated background information: (1) acoustics, (2) explosives, (3) physical disturbance and strike. A large body of new literature and/or affected environment data prompted the reanalysis of all or portions of these stressors (refer to Appendix D, Acoustic and Explosive Impacts Supporting Information, and Appendix G, Non-Acoustic Impacts Supporting Information).

The stressors and substressors analyzed for marine mammals in this chapter include the following:

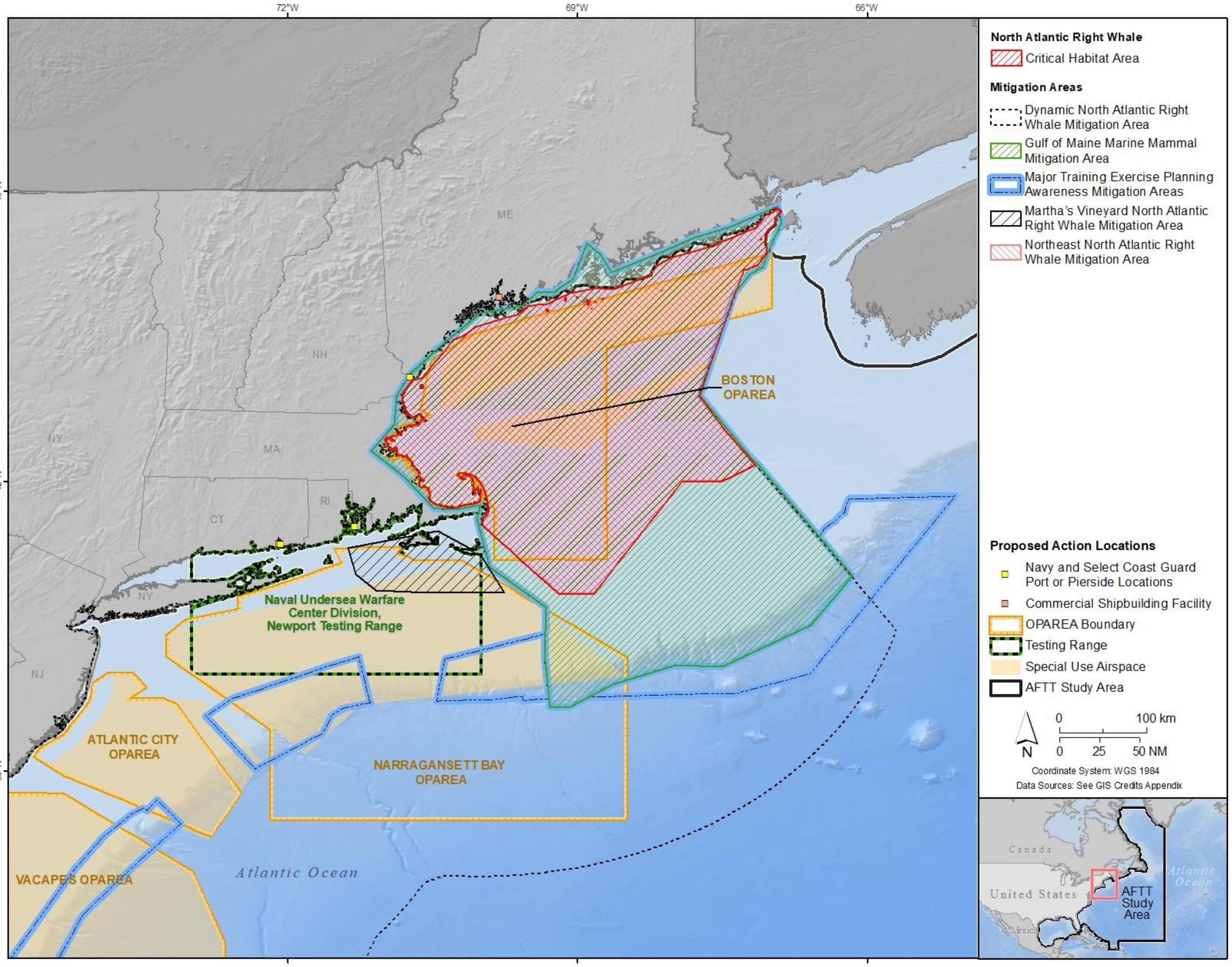
- **acoustic** (sonar and other transducers; air guns; pile driving; vessel noise; aircraft noise; and weapons noise)
- **explosives** (explosions in-air [near the water surface]; explosions in-water)
- **energy** (in-water electromagnetic devices; high-energy lasers)
- **physical disturbance and strike** (vessels and in-water devices; military expended materials; seafloor devices)
- **entanglement** (wires and cables; decelerators/parachutes; biodegradable polymers)
- **ingestion** (military expended materials – munitions; military expended materials other than munitions)

A discussion of secondary stressors, to include the potential impacts to habitat or prey availability, and the potential impacts of all the stressors combined are provided at the end of this section.

The analysis of potential impacts to marine mammals considers the standard operating procedures and mitigation measures that the Action Proponents will implement under Alternative 1 and Alternative 2 of the Proposed Action. Standard operating procedures relevant to marine mammals are detailed in Appendix A (Activity Descriptions, Section A.1.7, Standard Operating Procedures). Details on mitigation measures are provided in Chapter 5 (Mitigation). Standard operating procedures and mitigation relevant to marine mammals are summarized in Table 3.7-2 and relevant mitigation areas are shown in Figure 3.7-4 through Figure 3.7-7. Unlike in the prior analysis, model-predicted impacts due to sonar and explosives are not reduced to account for activity-based mitigation.

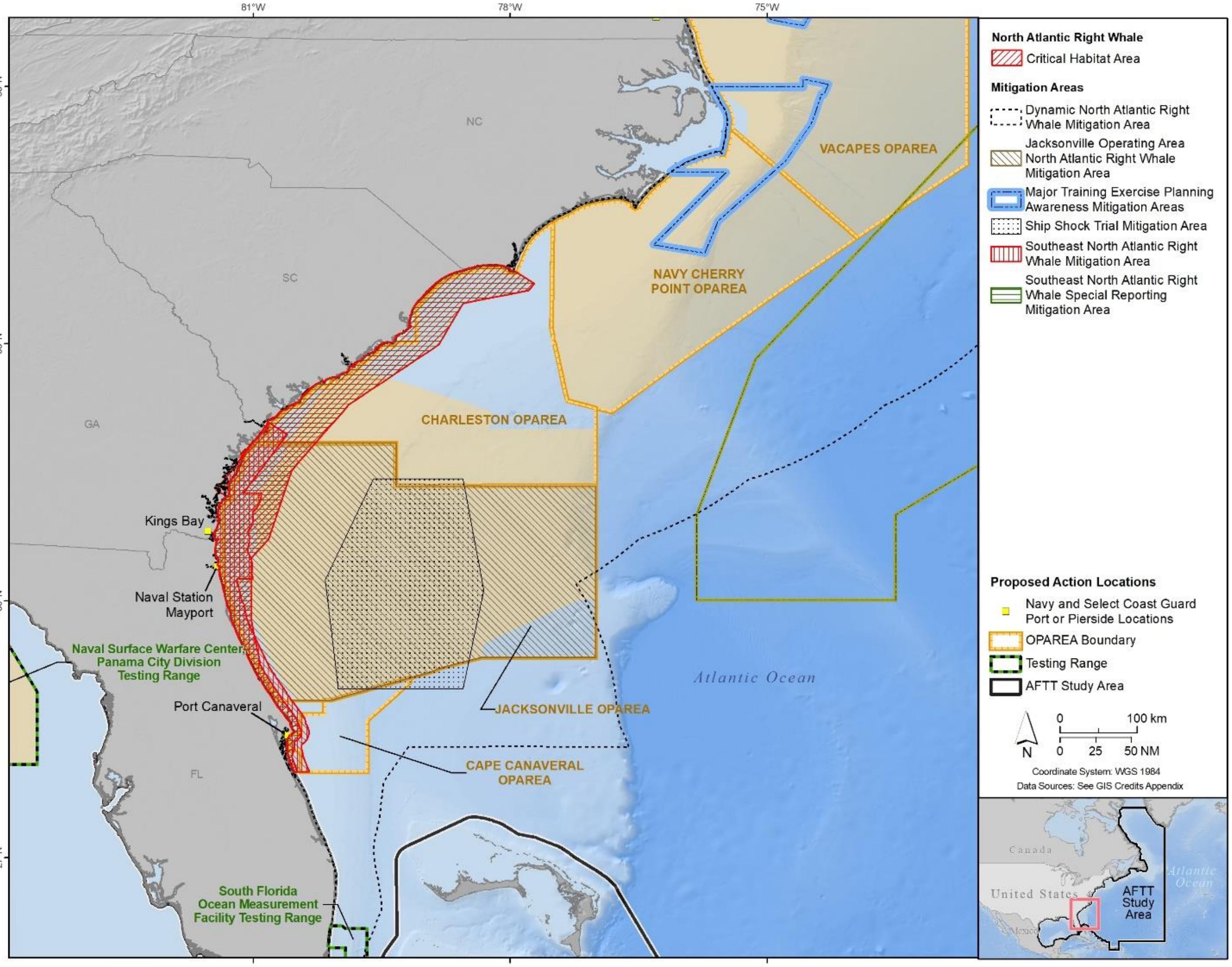
Table 3.7-2: Mitigation Requirements Summary by Stressor

Applicable Stressor	*Requirements Summary and Protection Focus*	*Section Reference*
Acoustics	Conduct visual observations for events involving active acoustic sources, pile driving, and weapons firing noise.	Section 5.6 (Activity-Based Mitigation)
	Restrictions on use of active acoustic stressors within mitigation areas, marine mammal foraging, reproduction, migration, and critical habitat.	Section 5.7.7 (Inshore Manatee and Sea Turtle Mitigation Areas) Section 5.7.10 (Northeast North Atlantic Right Whale Mitigation Area) Section 5.7.11 (Gulf of Maine Marine Mammal Mitigation Area) Section 5.7.13 (Jacksonville Operating Area North Atlantic Right Whale Mitigation Area) Section 5.7.14 (Southeast North Atlantic Right Whale Mitigation Area) Section 5.7.16 (Dynamic North Atlantic Right Whale Mitigation Areas) Section 5.7.7 (Rice's Whale Mitigation Area)
Explosives	Conduct visual observations for events involving 10 explosive mitigation categories.	Section 5.6 (Activity-Based Mitigation)
	Restrictions on use of explosive stressors within mitigation areas, marine mammal foraging, reproduction, migration, and critical habitat.	Section 5.7.8 (Ship Shock Trial Mitigation Areas) Section 5.7.10 (Northeast North Atlantic Right Whale Mitigation Area) Section 5.7.13 (Jacksonville Operating Area North Atlantic Right Whale Mitigation Area) Section 5.7.14 (Southeast North Atlantic Right Whale Mitigation Area) Section 5.7.16 (Dynamic North Atlantic Right Whale Mitigation Areas) Section 5.7.17 (Rice's Whale Mitigation Area)
Physical disturbance and strike	Conduct visual observations for events involving six mitigation categories.	Section 5.6 (Activity-Based Mitigation)
	Restrictions on use of physical disturbance and strike stressors within mitigation areas for marine mammal foraging, reproduction, and migration, and critical habitat.	Section 5.7.7 (Inshore Manatee and Sea Turtle Mitigation Areas) Section 5.7.10 (Northeast North Atlantic Right Whale Mitigation Area) Section 5.7.12 (Martha's Vineyard North Atlantic Right Whale Mitigation Area Section 5.7.13 (Jacksonville Operating Area North Atlantic Right Whale Mitigation Area) Section 5.7.14 (Southeast North Atlantic Right Whale Mitigation Area) Section 5.7.16 (Dynamic North Atlantic Right Whale Mitigation Areas)



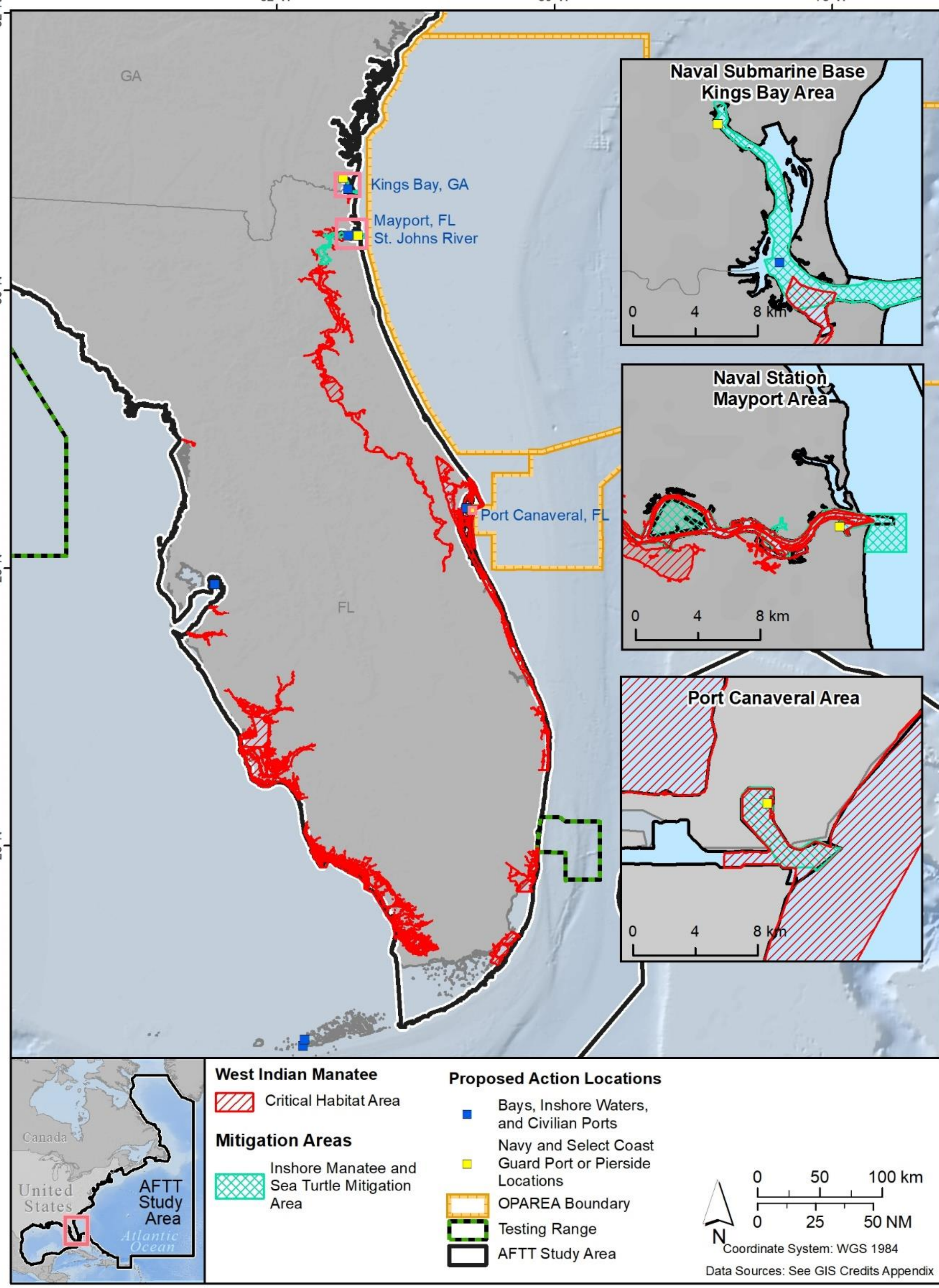
Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area; VACAPES = Virginia Capes Operating Area

Figure 3.7-4: Northeast and Mid-Atlantic Mitigation Areas for North Atlantic Right Whale in the Study Area



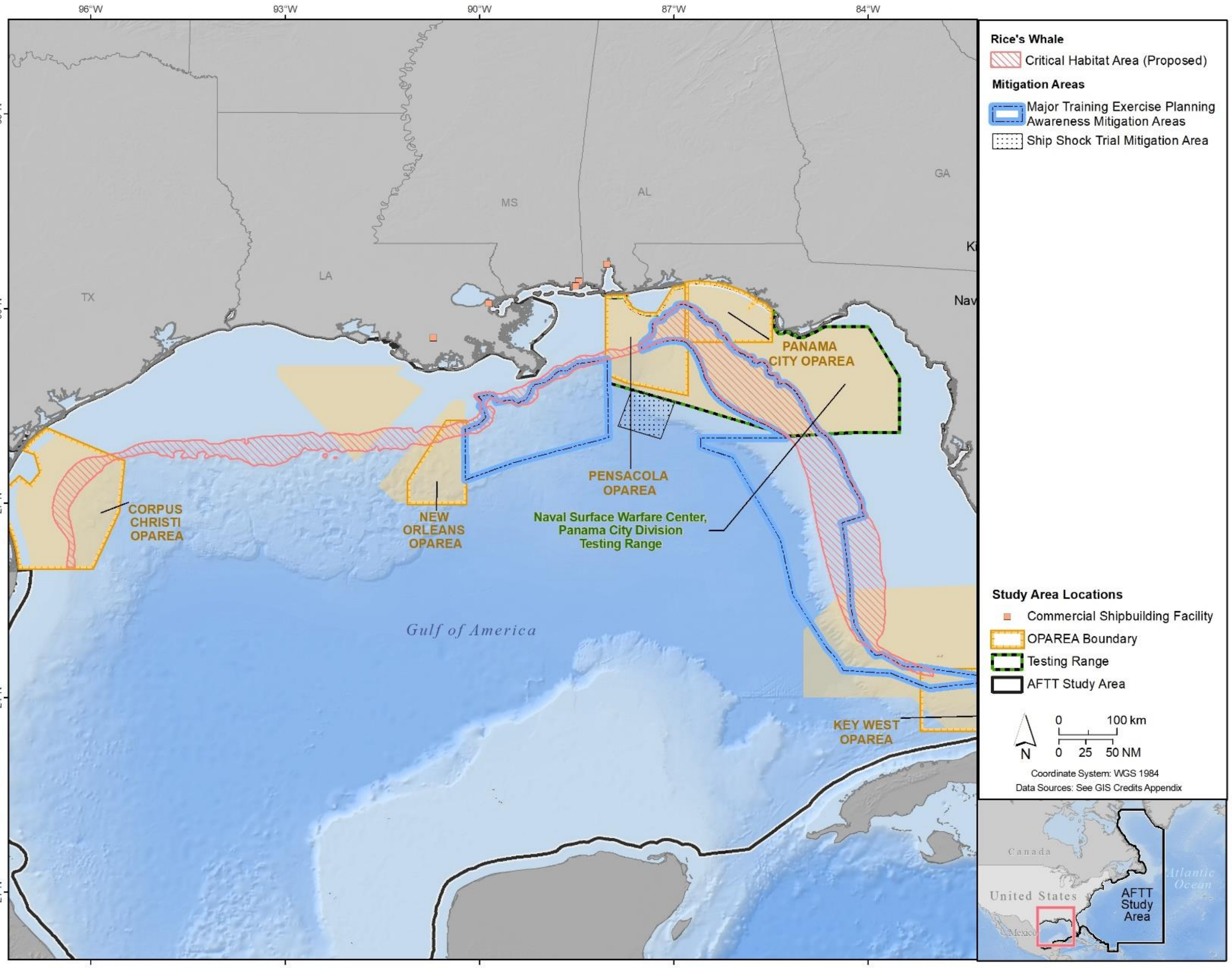
Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area; SINKEX = Sinking Exercise; VACAPES = Virginia Capes Operating Area

Figure 3.7-5: Southeast Mitigation Areas for North Atlantic Right Whale in the Study Area



Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area

Figure 3.7-6: Mitigation Areas for West Indian Manatee in the Study Area



Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area

Figure 3.7-7: Mitigation Areas for Rice's Whale in the Study Area

In the analysis for this Supplemental EIS/OEIS, marine mammal species may be grouped together based on similar biology (e.g., hearing) or behaviors (e.g., feeding or expected reaction to stressors) when most appropriate for the analysis. For some stressors, species are grouped based on their taxonomic relationship and discussed as follows: mysticetes (baleen whales), odontocetes (toothed whales), pinnipeds (seals), and the West Indian manatee. When impacts are expected to be similar for all species or when it is determined there is no impact on any species, the discussion will be general and not species-specific. However, when impacts are not the same to certain species or groups of species, the discussion will be as specific as the best available data allow. In addition, if activities only occur in or will be concentrated in certain areas, the discussion will be geographically specific. Based on acoustic thresholds and criteria developed with NMFS, impacts from sound sources as acoustic stressors will be quantified at the species or stock level as is required by the Marine Mammal Protection Act (MMPA).

Criteria for determining the significance of Proposed Action stressors on marine mammals are described in Table 3.7-3. The analysis under each substressor and alternative provides the technical support for these determinations, with reference to supporting appendices for details.

Table 3.7-3: Criteria for Determining the Significance of Proposed Action Stressors on Marine Mammal Populations

Impact Descriptor	*Context and Intensity*	*Significance Conclusions*
Negligible	Impacts would be temporary (lasting up to several hours) and within the natural range of variability of species' populations, their habitats, or the natural processes sustaining them. Impacts could include disturbances to communication and/or echolocation and behaviors of individuals without interference to feeding, reproduction, or other biologically important functions affecting population levels. There would be no displacement of marine mammals from preferred breeding, feeding, or nursery grounds, migratory routes, or designated critical habitat.	Less than significant
Minor	Impacts would be temporary or short term (lasting several days to several weeks) but within the natural range of variability of species' populations, their habitats, or the natural processes sustaining them. Impacts could include non-life-threatening injury to individual marine mammals and disruptions of behavioral patterns, including occasional disruption of communication and/or echolocation, behavioral disturbance of individuals or groups of marine mammals, and displacement of individuals or groups without interference to feeding, reproduction, or other biologically important functions affecting population levels. Displacement of marine mammals from preferred breeding, feeding, or nursery grounds, migratory routes, or designated critical habitat would be limited to the project area or its immediate surroundings.	
Moderate	Impacts would be short term or long term (lasting several months or longer) and outside the natural range of variability of species' populations, their habitats, or the natural processes sustaining them. Impacts could include injury (up to and including mortality) and repeated disruptions of communication and/or echolocation	

Table 3.7-3: Criteria for Determining the Significance of Proposed Action Stressors on Marine Mammal Populations (continued)

Impact Descriptor	*Context and Intensity*	*Significance Conclusions*
Moderate (continued)	and time-sensitive behaviors such as feeding and breeding, but in low enough numbers such that the continued viability of the population is not threatened. Behavioral responses to disturbance by individuals or groups could be expected in the project area, its immediate surroundings, or beyond, including extended displacement of individuals from preferred breeding, feeding, or nursery grounds, migratory routes, or designated critical habitat.	
Major	Impacts would be short term or long term and well outside the natural range of variability of species' populations, their habitats, or the natural processes sustaining them. Impacts could include extensive (i.e., affecting a large proportion of the local population), life-threatening, or debilitating injury and mortality and substantial disruption of communication and/or echolocation and time-sensitive behaviors such as breeding so that the continued viability of the local population is seriously threatened. Displacement from preferred breeding, feeding, or nursery grounds, migratory routes, or designated critical habitat would be short term or long term within and well beyond the project area. Full recovery of a population would not be expected to occur in a reasonable time.	Significant

3.7.3.1 Acoustic Stressors

The acoustic substressors included for analysis are (1) sonar and other transducers (hereinafter referred to as sonars), (2) air guns, (3) pile driving, (4) vessel noise, (5) aircraft noise, and (6) weapons firing noise. Table 3.7-4 contains brief summaries of background information relevant to the analyses of impacts for each acoustic substressor on marine mammals. Detailed information on acoustic terminology used in this analysis and acoustic impact categories in general, as well as a summary of best available science on effects to marine mammals specific to each substressor, are provided in Appendix D (Acoustic and Explosive Impacts Supporting Information). For a listing of the types of activities that use or produce acoustic stressors, refer to Appendix A (Activity Descriptions) and Appendix B (Activity Stressor Matrices). The types and quantities of sonar sources, air guns, and pile driving, the number of events using vessels and aircrafts and the locations of those events under each alternative are shown in Section 3.0.3.3.1 (Acoustic Stressors).

Table 3.7-4: Acoustic Stressors Background Information Summary

Substressor	*Background Information Summary*
Sonar and other transducers	Sonar and other transducers may result in hearing loss, masking, physiological stress, or behavioral reactions. Behavioral responses can depend on the characteristics of the signal, behavioral state of the animal, sensitivity and previous experience of an individual, and other contextual factors including distance of the source, movement of the source, physical presence of vessels, time of year, and geographic location. Different groups of marine mammals may respond in different ways to sonar and other transducers: • Mysticetes: species are within the Low Frequency (LF) and Very Low Frequency (VLF) hearing groups. Low-frequency and mid-frequency active

Table 3.7-4: Acoustic Stressors Background Information Summary (continued)

Substressor	***Background Information Summary***
Sonar and other transducers (continued)	sonar may cause masking, behavioral responses, and hearing impacts. Mysticetes are less likely to be affected by high-frequency sonars and very-high-frequency sonars that are above their hearing range. While sonar could have a greater impact to whale behavior within seasonal foraging and breeding grounds, mysticetes are more adaptive while migrating. • Odontocetes: species are within the High Frequency (HF) and Very High Frequency (VHF) hearing groups. Active sonars may result in masking, behavioral responses, noise-induced vocal modification, and hearing impacts. Mid-frequency active and high-frequency active sonars are more likely to result in masking and hearing impacts than other sonars. Harbor porpoises and beaked whales are more sensitive to disturbance than other odontocetes. • Pinnipeds: species within the Study Area are all within the phocid carnivores in water and in air (PCW and PCA: true seals) hearing group. Mid-frequency and high-frequency active sonars are more likely to result in hearing loss. In addition, mid-frequency active sonar could mask underwater vocalizations. Very-high-frequency active sonars are outside of the hearing range of phocid seals. Animals are most likely to respond to nearby or approaching sonar. • Sirenians: West Indian manatee, the only Sirenian (SI) within the Study Area, is within the SI hearing group. Mid-frequency and high-frequency active sonar may result in hearing loss and masking. Little information is available on manatee responses to sonars, although responses to pingers and tones have been reported.
Vessel disturbance (including vessel noise)	Vessel disturbance may result in masking, physiological stress, or behavioral reactions. Behavioral responses to vessels can be caused by multiple factors. Vessel sound exposure is rarely decoupled from the physical presence of a surface vessel. In some more industrialized or populated areas, vessel noise is a chronic and frequent stressor. Different groups of marine mammals may respond in different ways to vessels disturbance. • Mysticetes: Vocalizations are likely to be masked or otherwise affected (noise-induced vocal modification) by vessel noise, resulting in decreased communication space. Responses to vessel disturbance are varied and include not responding at all (e.g., North Atlantic right whales) to approaching vessels, as well as both horizontal (swimming away) and vertical (increased diving) avoidance. Noise from vessels and other sources may increase stress hormones in baleen whales. • Odontocetes: Communication calls are more likely to be masked by vessel noise than echolocation, but masking of echolocation is possible. Responses to vessel disturbance includes both attraction (e.g., bowriding) and avoidance behaviors by more sensitive species (e.g., Kogia whales and beaked whales) or individuals. Many noise-induced vocal modifications and short-term responses to boat traffic have been documented. • Pinnipeds: Underwater vocalizations may be masked by vessel noise. Responses to vessel disturbance are varied and include avoidance, alerting, and reduced time feeding, resting, or nursing. Others demonstrate in-water attraction or a lack of significant reaction when hauled out, suggesting habituation to or tolerance of vessels.

Table 3.7-4: Acoustic Stressors Background Information Summary (continued)

Substressor	*Background Information Summary*
Vessel disturbance (including vessel noise) (continued)	• Sirenians: Manatees generally seek out areas with a lower density of vessels and are prone to habitat displacement. They will fluke or attempt to avoid approaching vessels by increasing their speed, moving toward deeper water, changing their heading or depth, or rolling. However, they may not be able to determine the direction of approaching vessels in shallow water and are more likely to avoid if given more time from slower moving vessels.
Aircraft disturbance (including aircraft noise)	Aircraft disturbance may result in masking, physiological stress, or behavioral reactions. Aircraft sound exposure is rarely decoupled from the physical presence of an aircraft. Different groups of marine mammals may respond in different ways to aircraft disturbance. • Mysticetes: Typically whales either ignore or occasionally dive in response to aircraft overflights. Some whales may avoid helicopters or fixed-wing aircraft, but UAVs have not produced responses in any mysticete species. • Odontocetes: Responses to aircraft disturbance is varied, but overall, little change in behavior has been observed. Some odontocetes will fluke, flipper slap or avoid the noise source, particularly sensitive species like beaked whales or Kogia whales. Helicopters may elicit a greater reaction in odontocetes, but do not appear responsive to smaller UAVs except at low altitudes. • Pinnipeds: Responses are dependent on aircraft variables (e.g., altitude, distance, noise abruptness), and pinniped life cycle stage (e.g., breeding and molting). Pinnipeds may be more responsive to UAVs at low altitudes since they could resemble predatory birds but have generally the same possible reactions to all type of aircraft. They may startle, orient toward the sound source, increase vigilance, or briefly re-enter the water, but are generally unresponsive to crewed overflights and typically remain hauled out or immediately return to their haul out location. • Sirenians: Few reactions to aircraft disturbance have been reported. Limited studies suggest that sirenians may not respond to UAVs or fixed-wing aircraft, but like odontocetes, may be more responsive to helicopters.
Impulsive noise (includes air guns, pile driving, and weapons firing)	Impulsive noise may result in hearing loss, masking, physiological stress, or behavioral reaction. The intermittent nature of most impulsive sounds would result in very limited probability of any masking effects. Due to the rapid rise time and higher instantaneous peak pressure of impulsive noise, nearby noise is more likely to cause startle or avoidance responses. Different groups of marine mammals may respond in different ways to impulsive noise: • Mysticetes: LF and VLF species are likely impacted since low-frequency explosive noise propagates long distances and overlaps with the range of best hearing for mysticetes. They have shown a variety of responses to impulsive noise, including avoidance, habitat displacement, reduced surface intervals, altered swimming behavior, and changes in vocalization rates. • Odontocetes: Impulsive noise can result in hearing loss for VHF and HF odontocetes, with the VHF group exhibiting greater sensitivity. Masking effects are possible but release from masking during the silent period between sounds is likely. Most odontocetes are behaviorally less sensitive to impulsive noise than mysticetes, with responses occurring at much

Table 3.7-4: Acoustic Stressors Background Information Summary (continued)

Substressor	Background Information Summary
Impulsive noise (includes air guns, pile driving, and weapons firing) (continued)	closer distances, except for harbor porpoises that avoid both stationary and moving impulsive sources. • Pinnipeds: Pinnipeds may experience hearing effects before exhibiting a behavioral response. No significant behavioral reactions to impulsive noise have been recorded in pinnipeds; they are the least behaviorally sensitive taxonomic group in the Study Area. Pinnipeds are only likely to respond to loud impulsive noises at close ranges by startling, jumping into the water when hauled out, or ceasing foraging, but only for brief periods before returning to their previous behavior. • Sirenians: No information is available on sirenian responses to impulsive noise.

Notes: HF = high frequency; LF = low frequency; PCA = phocid carnivores in water; PCW = phocid carnivores in water; SI = Sirenian; UAV = unmanned aerial vehicle; VHF = very high frequency; VLF = very low frequency;

The quantitative analyses of impacts due to sonars, air guns, and pile driving in this section supplant the quantitative analyses in the 2018 Final EIS/OEIS. In addition to changes in the Proposed Action, changes in the predicted acoustic impacts due to sonars, air guns, and pile driving compared to the 2018 Final EIS/OEIS are due to the following:

- Updates to criteria used to determine if exposures to acoustic stressors may cause auditory effects and behavioral responses. Changes to the auditory effects criteria include changes to some hearing group divisions and names. The Low Frequency (LF) cetacean group containing mysticete cetaceans was split into two auditory groups: Very Low Frequency (VLF) cetaceans and LF cetaceans. The group previously called the Mid-Frequency (MF) cetaceans (most odontocetes) is now called the High-Frequency (HF) cetaceans. The group previously called the HF cetaceans (harbor porpoises and *Kogia* species) is now called the Very High Frequency (VHF) cetaceans. For non-impulsive sounds like sonars, the HF cetacean, Phocid in Water (PCW), and Otariid in Water (OCW) groups are predicted to have increased susceptibility to auditory effects; the VHF cetaceans are predicted to have decreased susceptibility to auditory effects; and the new LF group is predicted to be more susceptible to effects at higher frequencies than the VLF group. For impulsive sounds like air guns and impact pile driving, HF cetaceans are predicted to be more susceptible to auditory effects, especially at low to mid-frequencies, where most explosive energy is concentrated. Peak pressure thresholds increased for VLF and LF cetaceans and decreased for PCW. Susceptibility to auditory effects for the Sirenian (SI) group increased slightly for both impulsive and non-impulsive sounds. For behavioral response criteria, the behavioral response functions for sonars were revised to include experimental behavioral response data available since the prior analysis. Beaked whales and harbor porpoises were placed in a new Sensitive behavioral group with an associated behavioral response function. The cut-off conditions for the behavioral response functions were also revised. A summary of these changes is in Appendix E (Acoustic and Explosives Impact Analysis). For additional details see the technical report *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase IV)* (U.S. Department of the Navy, 2024a).
- Revisions to the modeling of acoustic effects due to sonars and air guns in the Navy Acoustic Effects Model, including incorporation of a new sonar avoidance model. A summary of these changes is in Appendix E (Acoustic and Explosives Impact Analysis). For additional details, see the technical report *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase IV Training and Testing* (U.S. Department of the Navy, 2024b).

- Updates to data on marine mammal presence, including estimated density of each species or stock (number of animals per unit area), group size, and depth distribution. For additional details, see the technical reports *U.S. Navy Marine Species Density Database Phase IV for the Atlantic Fleet Training and Testing Study Area* (U.S. Department of the Navy, 2024c) and *Dive Distribution and Group Size Parameters for Marine Species Occurring in the U.S. Navy's Atlantic and Hawaii-California Training and Testing Study Areas (Oliveira et al., 2024)*.
- Changes in how mitigation is considered in reducing model-predicted impacts. The number of model-predicted auditory injuries are not reduced due to activity-based mitigation, unlike in prior analyses.

The following sections summarize impacts due to acoustic stressors on marine mammals. A comprehensive analysis of impacts due to acoustic and explosive stressors is in Appendix E (Acoustic and Explosives Impact Analysis), where impacts to marine mammal stocks are assessed considering species life history traits, susceptibility to impacts, and potential for repeated impacts to individuals based on acoustic impacts modeling. Appendix E also assesses impacts to critical habitat for ESA-listed species. While model-predicted impacts are summarized for sonar, air guns, and pile driving in the sections below, Appendix E provides additional detail on modeled impacts to each stock, including seasons and regions in which impacts are most likely to occur; which activities are most likely to cause impacts; and how impacts are summed to estimate maximum annual and seven-year total impacts.

3.7.3.1.1 Impacts from Sonars and Other Transducers

Table 3.7-4 contains a summary of the background information used to analyze the potential impacts of sonars and other transducers (hereinafter inclusively referred to as sonars) on marine mammals. Other transducers include items such as acoustic projectors and countermeasure devices. As discussed, in Section 3.0.1.1.1 (Acoustic Stressors), a detailed comparison of sonar quantities analyzed in the 2018 Final EIS/OEIS with sonar quantities under this Proposed Action is not feasible due to changes in the source binning process.

The below information briefly summarizes information relevant to the assessment of the impacts of sonars on marine mammals under the Proposed Action. A more extensive assessment of the impacts on marine mammals due to exposure to sonars under this Proposed Action is in Appendix E (Acoustic and Explosives Impact Analysis).

Sonars have the potential to affect marine mammals by causing auditory injuries, temporary hearing threshold shifts (TTS), masking, non-injurious physiological responses (such as stress), or behavioral reactions. Low- (less than 1 kilohertz [kHz]), mid- (1 to 10 kHz) frequency sonars, and some high (10 to 100 kHz) frequency sonars are within hearing range of all marine mammals. Additionally, all high- and very high-frequency (100 to 200 kHz) sonars are in the hearing range of all odontocetes (HF and VLF hearing groups).

Sonars with higher source levels, longer durations, higher duty cycles, and frequencies near the best range of hearing are more likely to affect hearing. Due to their high source levels and low transmission loss (compared to higher frequency sources), anti-submarine warfare sonar sources, including hull-mounted sonar (MF1) and high duty cycle hull-mounted sonar (MF1C), have large zones of effects. The ranges to auditory effects for MF1, MF1C, and other selected sonars are in in Appendix E (Acoustic and Explosive Impacts Analysis for Marine Mammals, Reptiles, and Fishes in the Atlantic Fleet Training and Testing Study Area).

In general, the estimated number of predicted auditory impacts has increased since the 2018 Final EIS/OEIS. While some increases may be attributable to changes in the Proposed Action, most increases are due to changes in methodologies used to model impacts that are listed above in Section 3.7.3.1

(Acoustic Stressors). Notably, the updated criteria for the HF cetacean auditory group, which includes delphinids and most other odontocetes, and the PCW auditory group indicate increased susceptibility to auditory effects at low and mid-frequencies compared to the prior auditory criteria. Consequently, predicted auditory effects due to most anti-submarine warfare sonars are substantially higher for these groups than in prior analyses of the same activities. The change in susceptibility to auditory impacts due to sonars is less pronounced for other auditory groups. For most auditory groups, the revision to the avoidance model, which assumes that some marine mammals may avoid sound levels that can cause auditory injury, has also resulted in increased estimates of auditory injuries for certain activities, particularly certain high duty cycle sources. The revised avoidance method bases the initiation of an avoidance response on the behavioral response criteria. The ability to avoid a sonar exposure that may cause auditory impacts in the model depends on a species' susceptibility to auditory effects, a species' sensitivity to behavioral disturbance, and characteristics of the sonar source, including duty cycle, source level, and frequency. Thus, predicted auditory impacts for species that are less sensitive to disturbance compared to susceptibility to auditory effects have increased.

Most anti-submarine warfare sonars are composed of individual sounds which are short, lasting up to a few seconds each. Systems typically operate with low-duty cycles for most tactical sources, but some systems may operate nearly continuously or with higher duty cycles. Some testing activities may also use sonars with high duty cycles. These higher duty cycle sources would pose a greater risk of masking than intermittent sources. Most anti-submarine warfare activities are geographically dispersed, have a limited duration, and intermittently use sonars with a narrow frequency band. These factors reduce the potential for significant or extended masking in marine mammals.

The number of predicted behavioral impacts has changed for all stocks since the prior analysis. These changes are primarily due to revisions to the behavioral response functions. The updated behavioral response functions predict greater sensitivity for the pinniped behavioral group and lower sensitivity for the odontocete and mysticete behavioral groups compared to the previous behavioral response functions. The new function for the sensitive species behavioral group predicts greater sensitivity at lower received levels for beaked whales and harbor porpoises. In addition, the cut-off conditions for predicting behavioral responses have been revised. These factors interact in complex ways, which means the results from this analysis may not be directly comparable to the prior analysis.

As discussed in Section 3.7.3 (Environmental Consequences), the Action Proponents will implement activity-based mitigation under Alternative 1 and Alternative 2 to reduce potential impacts from sonar on marine mammals. While model-predicted impacts are not reduced to account for activity-based mitigation, opportunities to mitigate model-predicted impacts were identified by determining if the closest points of approach associated with predicted auditory injuries were also within the mitigation zone. This analysis is presented in Appendix E (Acoustic and Explosives Impact Analysis, Section 2.3.2).

The Action Proponents will also implement geographic mitigation to reduce potential acoustic impacts within important marine mammal habitats as identified in Table 3.7-2. Some of the geographic mitigations limit the use of certain sonars. Table 3.7-5 lists these geographic mitigations and whether their requirements are reflected in the model-predicted impacts to marine mammals presented below. It does not list other geographic mitigation that may still reduce impacts but cannot be modeled, such as pre-event planning, awareness notification messages, or obtaining Early Warning System North Atlantic right whale sighting data.

3.7.3.1.1.1 Impacts from Sonar and Other Transducers under Alternative 1

Under Alternative 1, the overall use of sonar and other transducers would decrease from the 2018 Final EIS/OEIS for both training and testing activities for most sources. Compared to the prior analysis, the

Action Proponent proposes to use fewer hours of hull-mounted surface ship sonar (greater than 40 percent fewer for regular duty cycle [MF1] and greater than 20 percent fewer for high duty cycle sonar [MF1C]) and 50 percent fewer hours of hull-mounted submarine sonars in the Study Area during training and testing activities.

Table 3.7-5: Geographic Mitigation Reflected in the Sonar Modeling Results

Geographic Mitigation Section Reference	*Reflected in Modeling Results?*	*Summary of Relevant Mitigation*
Section 5.7.9 (Major Training Exercise Planning Mitigation Areas)	Yes	• Limits on the annual number of Major Training Exercises
Section 5.7.10 (Northeast North Atlantic Right Whale Mitigation Area)	No	• Minimization of low-frequency active sonar, mid-frequency active sonar, and high-frequency active sonar
Section 5.7.11 (Gulf of Maine Marine Mammal Mitigation Area)	Yes	• Limit of 200 hours of surface ship hull-mounted mid-frequency active sonar annually
Section 5.7.14 (Southeast North Atlantic Right Whale Mitigation Area)	No	• No use of, or minimization of, certain active sonar sources from November 15 to April 15
Section 5.7.17 (Rice's Whale Mitigation Area)	Yes	• Limit of 200 hours of surface ship hull-mounted mid-frequency active sonar annually

Under Alternative 1, the number and location of training activities using sonar would be similar to those analyzed in the 2018 Final EIS/OEIS. The following notable changes would occur:

- There would be fewer Integrated and Coordinated Anti-Submarine Warfare training activities in the Virginia Capes, Navy Cherry Point, and Jacksonville Range Complexes.
- Mine Warfare activities would newly occur in the Key West Range Complex.
- Unmanned Underwater Vehicle Training – Certification and Development would newly occur in the Gulf, Jacksonville, Navy Cherry Point, Virginia Capes, and Northeast Range Complexes, as well as Virginia Capes Range Complex Inshore.

Under Alternative 1, the following are new activities or location-specific increases compared to the previous analysis in the 2018 Final EIS/OEIS for testing activities using sonars:

- There would be a notable increase in Anti-Submarine Warfare activities in the high seas; Bath, Maine; NS Norfolk; NS Mayport; Pascagoula, Mississippi; and the Gulf Range Complex.
- There would be a notable increase in Mine Warfare testing events in the Gulf Range Complex and the Naval Surface Warfare Center Panama City Testing Range.

For most other locations, there would be a decrease or a similar number of activities that involve the use of sonar compared to the 2018 Final EIS/OEIS.

The number of impacts to each stock due to exposure to sonar during testing and training under Alternative 1 are shown in Table 3.7-6 for a maximum year of activities and in Table 3.7-7 for 7 years of activities. Depending on the stock, impacts to individuals may be permanent (auditory injuries) or temporary (TTS, masking, stress, or behavioral response). Behavioral patterns of some individuals, which may include communication, foraging, or breeding, are likely to be temporarily disrupted. Individuals or groups may avoid areas around sonar activities and be temporarily displaced from a preferred habitat.

Table 3.7-6: Impacts Due to a Maximum Year of Sonar Testing and Training Activity under Alternative 1 and Alternative 2

Species	Stock or Population	Alternative 1			Alternative 2		
		BEH	TTS	AINJ	BEH	TTS	AINJ
ESA Listed							
Blue whale	Western North Atlantic	10	57	1	12	66	1
Fin whale	Western North Atlantic	547	1,843	18	569	2,029	18
North Atlantic right whale	Western North Atlantic	89	292	2	89	296	2
Rice's whale	Northern Gulf of America	81	210	2	84	268	2
Sei whale	Nova Scotia	114	618	7	117	716	8
Sperm whale	Northern Gulf of America	246	25	-	515	158	0
	North Atlantic	8,871	3,705	4	10,727	4,341	4
Non ESA Listed							
Bryde's whale	Atlantic [Nsd]	2	9	-	3	17	-
Humpback whale	Gulf of ME	184	617	11	184	659	14
Minke whale	Canadian East Coast	642	3,908	54	659	4,621	57
Atlantic spotted dolphin	Western North Atlantic	51,765	68,898	78	59,410	78,980	87
	Northern Gulf of America	7,066	5,705	18	7,367	6,717	20
Atlantic white-sided dolphin	Western North Atlantic	7,160	3,719	6	7,297	3,907	6
Bottlenose dolphin	Western North Atlantic Southern Migratory Coastal	2,908	7,212	3	2,972	7,340	3
	Western North Atlantic SC GA Coastal	1,412	3,526	4	1,492	3,690	4
	Western North Atlantic Offshore	91,136	95,683	89	105,281	109,625	93
	Western North Atlantic Northern Migratory Coastal	57,194	16,460	53	57,195	16,460	53
	Western North Atlantic Northern FL Coastal	17,048	4,327	3	17,049	4,327	3
	Western North Atlantic Central FL Coastal	7,899	2,560	0	7,915	2,560	0
	Tampa Bay	163	187	-	163	187	-
	St. Joseph Bay	42	-	-	42	-	-
	St. Andrew Bay	44	0	0	44	0	0
	Southern NC Estuarine System	81	80	-	81	80	-
	Southern GA Estuarine System	85	38	1	85	38	1
	Sabine Lake	1	-	-	1	-	-
	Nueces and Corpus Christi Bays	4	-	-	4	-	-
	Northern NC Estuarine System	8,578	1,953	6	8,578	1,953	6
	Northern Gulf of America Continental Shelf	46,413	24,331	21	49,521	40,591	27

Table 3.7-6: Impacts Due to a Maximum Year of Sonar Testing and Training Activity under Alternative 1 and Alternative 2 (continued)

Species	*Stock or Population*	*Alternative 1*			*Alternative 2*		
		BEH	*TTS*	*AINJ*	*BEH*	*TTS*	*AINJ*
Bottlenose dolphin (continued)	Northern GA/Southern SC Estuarine System	2	-	-	2	-	-
	MS Sound, Lake Borgne, and Bay Boudreau	151	43	1	153	44	1
	Jacksonville Estuarine System	269	91	0	269	91	0
	Indian River Lagoon Estuarine System	1,438	138	0	1,438	138	0
	Gulf of America Western Coastal	1,771	1,557	-	1,773	1,558	-
	Gulf of America Oceanic	4,759	1,508	3	5,508	2,490	3
	Gulf of America Northern Coastal	4,543	503	-	5,018	3,335	4
	Gulf of America Eastern Coastal	74	3	-	74	3	-
	Central GA Estuarine System	0	-	-	0	-	-
Clymene dolphin	Western North Atlantic	60,202	72,475	95	75,253	91,153	97
	Northern Gulf of America	389	208	1	517	440	2
Dwarf sperm whale	Western North Atlantic	1,266	4,955	164	1,409	6,243	175
	Northern Gulf of America	21	132	5	41	320	7
False killer whale	Western North Atlantic	317	254	1	410	373	1
	Northern Gulf of America	167	61	0	325	349	0
Fraser's dolphin	Western North Atlantic	1,360	1,540	2	1,619	1,866	3
	Northern Gulf of America	167	72	0	310	256	0
Killer whale	Western North Atlantic	99	79	1	113	89	1
	Northern Gulf of America	84	26	0	159	170	0
Long-finned pilot whale	Western North Atlantic	12,760	8,883	8	15,085	10,573	9
Melon-headed whale	Western North Atlantic	1,992	2,605	3	2,695	3,518	3
	Northern Gulf of America	578	191	1	1,136	1,172	2
Pantropical spotted dolphin	Western North Atlantic	6,434	6,631	4	9,040	10,128	5
	Northern Gulf of America	4,586	1,715	3	8,133	8,152	5
Pygmy killer whale	Western North Atlantic	216	260	0	285	357	0
	Northern Gulf of America	203	80	0	402	430	0
Pygmy sperm whale	Western North Atlantic	1,301	4,889	157	1,449	6,139	164
	Northern Gulf of America	22	115	5	41	302	7
Risso's dolphin	Western North Atlantic	20,203	16,987	19	23,117	19,862	20

Table 3.7-6: Impacts Due to a Maximum Year of Sonar Testing and Training Activity under Alternative 1 and Alternative 2 (continued)

Species	*Stock or Population*	*Alternative 1*			*Alternative 2*		
		BEH	*TTS*	*AINJ*	*BEH*	*TTS*	*AINJ*
	Northern Gulf of America	154	47	0	243	178	0
Rough-toothed dolphin	Western North Atlantic	1,871	2,876	5	2,239	3,457	5
	Northern Gulf of America	981	649	1	1,222	1,241	2
Short-beaked common dolphin	Western North Atlantic	136,482	132,189	133	152,777	155,566	139
Short-finned pilot whale	Western North Atlantic	16,957	16,040	12	20,150	18,939	12
	Northern Gulf of America	628	390	2	743	514	2
Spinner dolphin	Western North Atlantic	2,606	2,748	2	3,501	3,986	2
	Northern Gulf of America	478	177	0	1,027	1,140	1
Striped dolphin	Western North Atlantic	107,566	101,182	156	129,433	127,852	167
	Northern Gulf of America	1,727	637	0	3,031	3,298	1
White-beaked dolphin	Western North Atlantic	10	6	-	11	7	-
Blainville's beaked whale	Western North Atlantic	25,549	151	0	29,890	169	0
	Northern Gulf of America	126	0	-	178	2	-
Gervais' beaked whale	Western North Atlantic	25,108	334	-	29,562	377	-
	Northern Gulf of America	123	1	-	179	6	-
Goose-beaked whale	Western North Atlantic	111,449	607	0	128,625	653	0
	Northern Gulf of America	457	2	-	647	5	-
Harbor porpoise	Gulf of ME/Bay of Fundy	80,932	5,655	54	83,039	5,749	54
Northern bottlenose whale	Western North Atlantic	1,641	9	-	1,792	9	-
Sowerby's beaked whale	Western North Atlantic	25,255	363	-	29,763	417	-
True's beaked whale	Western North Atlantic	25,215	363	-	29,702	417	-
Gray seal	Western North Atlantic	9,725	5,850	19	9,744	5,902	20
Harbor seal	Western North Atlantic	13,277	8,597	25	13,304	8,689	26
Harp seal	Western North Atlantic	16,621	9,146	4	16,621	9,146	4
Hooded seal	Western North Atlantic	1,078	644	2	1,079	644	2

Notes: AINJ = auditory injury; BEH = significant behavioral response; FL = Florida; GA = Georgia; ME = Maine; MS = Mississippi; NC = North Carolina; SC = South Carolina; TTS = temporary threshold shift
A dash (-) indicates a (true zero) and zero (0) indicates a rounded value less than 0.5.
Stocks are not shown if no effects are estimated.
Nsd = No stock designation under MMPA

Table 3.7-7: Impacts Due to 7 Years of Sonar Testing and Training Activity under Alternative 1 and Alternative 2

Species	Stock or Population	Alternative 1			Alternative 2		
		BEH	TTS	AINJ	BEH	TTS	AINJ
ESA Listed							
Blue whale	Western North Atlantic	69	387	2	80	452	2
Fin whale	Western North Atlantic	3,649	12,279	114	3,848	13,852	120
North Atlantic right whale	Western North Atlantic	588	1,881	8	596	2,012	8
Rice's whale	Northern Gulf of America	544	1,428	5	567	1,855	8
Sei whale	Nova Scotia	754	4,139	44	778	4,892	52
Sperm whale	Northern Gulf of America	1,505	144	-	3,398	1,076	0
	North Atlantic	59,161	25,438	16	72,719	30,042	17
Non ESA Listed							
Bryde's whale	Atlantic [Nsd]	7	63	-	10	119	-
Humpback whale	Gulf of ME	1,227	4,054	73	1,247	4,434	90
Minke whale	Canadian East Coast	4,307	26,171	366	4,483	31,621	397
Atlantic spotted dolphin	Western North Atlantic	343,513	452,446	532	403,657	534,438	603
	Northern Gulf of America	46,565	37,044	113	50,355	46,633	131
Atlantic white-sided dolphin	Western North Atlantic	46,473	25,066	32	47,773	26,633	35
Bottlenose dolphin	Western North Atlantic Southern Migratory Coastal	18,805	45,670	20	19,521	48,082	21
	Western North Atlantic SC GA Coastal	8,883	21,759	16	9,640	23,800	17
	Western North Atlantic Offshore	608,573	636,463	601	714,961	744,330	645
	Western North Atlantic Northern Migratory Coastal	397,112	110,047	343	397,181	110,146	344
	Western North Atlantic Northern FL Coastal	116,814	26,078	11	118,146	27,735	12
	Western North Atlantic Central FL Coastal	52,655	13,523	0	52,808	13,821	0
	Tampa Bay	490	560	-	490	560	-
	St. Joseph Bay	287	-	-	287	-	-
	St. Andrew Bay	301	0	0	301	0	0
	Southern NC Estuarine System	255	279	-	255	279	-
	Southern GA Estuarine System	499	212	1	499	212	1
	Sabine Lake	2	-	-	2	-	-
	Nueces and Corpus Christi Bays	11	-	-	11	-	-
	Northern NC Estuarine System	59,057	12,978	37	59,057	12,978	37
	Northern Gulf of America Continental Shelf	318,648	158,661	132	344,353	283,603	182
	Northern GA/Southern SC Estuarine System	6	-	-	6	-	-

Table 3.7-7: Impacts Due to 7 Years of Sonar Testing and Training Activity under Alternative 1 and Alternative 2 (continued)

Species	*Stock or Population*	*Alternative 1*			*Alternative 2*		
		BEH	*TTS*	*AINJ*	*BEH*	*TTS*	*AINJ*
Bottlenose dolphin (continued)	MS Sound, Lake Borgne, and Bay Boudreau	832	238	1	842	242	1
	Jacksonville Estuarine System	1,855	622	0	1,855	622	0
	Indian River Lagoon Estuarine System	9,717	958	0	9,717	958	0
	Gulf of America Western Coastal	9,836	8,273	-	10,970	9,174	-
	Gulf of America Oceanic	30,904	9,650	9	36,580	16,901	14
	Gulf of America Northern Coastal	31,749	3,519	-	35,070	23,337	22
	Gulf of America Eastern Coastal	429	14	-	429	14	-
	Central GA Estuarine System	0	-	-	0	-	
Clymene dolphin	Western North Atlantic	403,174	498,843	653	513,098	631,792	674
	Northern Gulf of America	2,304	1,266	2	3,312	3,006	4
Dwarf sperm whale	Western North Atlantic	8,406	33,508	1,111	9,496	42,805	1,205
	Northern Gulf of America	126	875	32	266	2,198	47
False killer whale	Western North Atlantic	2,143	1,728	1	2,821	2,578	1
	Northern Gulf of America	1,035	386	0	2,162	2,420	0
Fraser's dolphin	Western North Atlantic	9,128	10,293	12	11,034	12,740	17
	Northern Gulf of America	1,030	455	0	2,042	1,764	0
Killer whale	Western North Atlantic	657	535	1	757	612	1
	Northern Gulf of America	521	159	0	1,060	1,173	0
Long-finned pilot whale	Western North Atlantic	85,407	60,382	49	102,522	72,640	53
Melon-headed whale	Western North Atlantic	13,542	17,543	12	18,554	24,145	12
	Northern Gulf of America	3,599	1,203	1	7,559	8,117	2
Pantropical spotted dolphin	Western North Atlantic	44,261	44,899	24	62,675	69,940	33
	Northern Gulf of America	29,007	10,896	13	54,122	56,199	34
Pygmy killer whale	Western North Atlantic	1,471	1,754	0	1,959	2,456	0
	Northern Gulf of America	1,262	509	0	2,677	2,979	0
Pygmy sperm whale	Western North Atlantic	8,645	33,035	1,063	9,775	42,072	1,131
	Northern Gulf of America	136	754	24	271	2,072	41
Risso's dolphin	Western North Atlantic	132,910	112,684	124	155,505	134,720	136
	Northern Gulf of America	966	284	0	1,603	1,211	0
Rough-toothed dolphin	Western North Atlantic	12,509	19,032	24	15,256	23,463	29
	Northern Gulf of America	6,491	4,253	3	8,282	8,585	5

Table 3.7-7: Impacts Due to 7 Years of Sonar Testing and Training Activity under Alternative 1 and Alternative 2 (continued)

Species	*Stock or Population*	*Alternative 1*			*Alternative 2*		
		BEH	*TTS*	*AINJ*	*BEH*	*TTS*	*AINJ*
Short-beaked common dolphin	Western North Atlantic	921,672	894,394	862	1,045,088	1,066,123	968
Short-finned pilot whale	Western North Atlantic	113,770	108,022	75	137,252	129,618	76
	Northern Gulf of America	3,768	2,407	12	4,793	3,509	13
Spinner dolphin	Western North Atlantic	17,786	18,720	10	24,142	27,584	12
	Northern Gulf of America	3,241	1,217	0	7,085	7,957	4
Striped dolphin	Western North Atlantic	707,993	689,502	1,071	869,671	878,964	1,166
	Northern Gulf of America	11,261	4,119	0	20,426	22,796	7
White-beaked dolphin	Western North Atlantic	64	39	-	67	43	-
Blainville's beaked whale	Western North Atlantic	171,529	1,043	0	203,382	1,170	0
	Northern Gulf of America	812	0	-	1,183	8	-
Gervais' beaked whale	Western North Atlantic	170,028	2,305	-	202,607	2,619	-
	Northern Gulf of America	798	1	-	1,191	36	-
Goose-beaked whale	Western North Atlantic	748,316	4,192	0	875,568	4,539	0
	Northern Gulf of America	2,959	2	-	4,316	25	-
Harbor porpoise	Gulf of ME/Bay of Fundy	545,991	37,142	338	564,665	38,306	367
Northern bottlenose whale	Western North Atlantic	10,821	57	-	12,021	58	-
Sowerby's beaked whale	Western North Atlantic	171,025	2,504	-	203,967	2,894	-
True's beaked whale	Western North Atlantic	170,795	2,502	-	203,585	2,892	-
Gray seal	Western North Atlantic	66,035	38,524	121	66,463	40,082	132
Harbor seal	Western North Atlantic	90,522	56,456	164	90,989	58,760	176
Harp seal	Western North Atlantic	111,489	62,995	23	111,537	63,075	24
Hooded seal	Western North Atlantic	6,734	4,240	5	6,758	4,284	6

Notes: AINJ = auditory injury; BEH = significant behavioral response; FL = Florida; GA = Georgia; ME = Maine; MS = Mississippi; NC = North Carolina; SC = South Carolina; TTS = temporary threshold shift
A dash (-) indicates a (true zero) and zero (0) indicates a rounded value less than 0.5.
Stocks are not shown if no effects are estimated
Nsd = No stock designation under MMPA

Displacement may be brief for short duration activities or extended for multi-day events and would depend on the behavioral sensitivity of the species. Sensitive species, particularly beaked whales, may avoid for farther distances and for longer durations. Most activities do not occur for extended multi-day periods and would occur over small areas relative to population ranges. The average rate of predicted impacts to individuals in most populations would range from less than once per year to several times per year. Individuals of some behaviorally sensitive species or in populations concentrated near range complexes in the Atlantic may have higher repeated impacts. These impacts are not expected to interfere with feeding, reproduction, or other biologically important functions such that the continued viability of the population would be threatened. The analysis conclusions for impacts due to sonar during training and testing activities under Alternative 1 are consistent with a minor to moderate impact on marine mammals.

Under the MMPA, the use of sonar and other transducers during military readiness activities as described under Alternative 1 would result in the unintentional taking of marine mammals incidental to those activities, as defined by the MMPA. As required by section 101(a)(5)(a) of the MMPA, the Action Proponents have requested authorization from NMFS to take marine mammals incidental to the use of sonar and other transducers during military readiness activities.

The Action Proponents have concluded that the use of sonar and other transducers during military readiness activities as described under Alternative 1 may affect ESA-listed blue whale, Rice's whale, fin whale, North Atlantic right whale, sei whale, sperm whale, and West Indian manatee. The Action Proponents have also concluded that use of sonar during military readiness activities would have no effect on critical habitat for the North Atlantic right whale and West Indian manatee and may affect proposed critical habitat for Rice's whale. The Action Proponents have consulted with NMFS and USFWS as required by section 7(a)(2) of the ESA.

3.7.3.1.1.2 Impacts from Sonar and Other Transducers under Alternative 2

Under Alternative 2, sonar use during training activities would increase compared to Alternative 1:

- The maximum number of Composite Training Unit Exercises would occur each year, and an additional Composite Training Unit Exercise would occur in the Gulf Range Complex each year.
- There would be an increase in the number of Anti-Submarine Warfare Tracking Exercise – Ship activities in the Virginia Capes, Navy Cherry Point, and Jacksonville Range Complexes as well as in Other AFTT Areas.
- Additional Maritime Security Operations and Waterborne Training would be conducted.

Under Alternative 2, there would be a small increase in sonar use during testing due to a small increase in the number of some activities. The number of impacts to each marine mammal stock due to exposure to sonar during testing and training under Alternative 2 are shown in Table 3.7-6 for a maximum year of activities and in Table 3.7-7 for 7 years of activities.

Due to the addition of a Composite Training Unit Exercise in the Gulf of America, impacts due to sonar under Alternative 2 would primarily increase for stocks located in the Gulf of America, particularly delphinid stocks in the northern Gulf of America. The Composite Training Unit Exercise is a multi-day, multi-platform event. The use of multiple active acoustic sources, including anti-submarine warfare sonars, increases impacts compared to Alternative 1 because exposure to anti-submarine warfare sonars in the Gulf of America would be otherwise limited. Despite the increase in impacts, individuals in most stocks would be impacted on average once a year or less. Impacts would also increase to ESA-listed Rice's and sperm whales in the Gulf of America, although no additional injuries are predicted under Alternative 2 compared to Alternative 1. Overall impacts are not meaningfully different from Alternative 1 for most other stocks. The conclusions for significance, ESA-listed species and critical habitat are the same as Alternative 1.

3.7.3.1.2 Impacts from Air Guns

Table 3.7-4 contains a summary of the background information used to analyze the potential impacts of air guns on marine mammals. Air guns create intermittent, broadband, impulsive sounds.

The below information briefly summarizes information relevant to the assessment of the impacts of air guns on marine mammals under the Proposed Action. A more extensive assessment of the impacts on marine mammals due to exposure to air guns under this Proposed Action is in Appendix E (Acoustic and Explosives Impact Analysis).

The broadband impulses from air guns are within the hearing range of all marine mammals. Potential impacts from air guns could include auditory injuries, TTS, behavioral reactions, physiological response, and masking. Single, small air guns lack the peak pressures that could cause auditory injuries for most auditory groups. The ranges to auditory effects and behavioral responses for air guns are in in Appendix E (Acoustic and Explosives Impact Analysis).

While studies have observed marine mammal responses to large, commercial air gun arrays, the small single air guns used in the Proposed Action would be used over a much shorter period and more limited area. Reactions to air gun use in the Proposed Action are less likely to occur or rise to the same level of severity as observed during seismic use.

As discussed in Section 3.7.3 (Environmental Consequences), the Action Proponents will implement activity-based mitigation under Alternative 1 and Alternative 2 to reduce potential impacts from air guns on marine mammals.

3.7.3.1.2.1 Impacts from Air Guns under Alternative 1

Air guns would not be used during training activities. The proposed use of air guns decreased for testing from the 2018 Final EIS/OEIS. Air gun use would only occur in two testing activities: Semi-Stationary Equipment Testing and Acoustic and Oceanographic Research. While air gun use during Semi-Stationary Equipment Testing may occur nearshore at Newport, Rhode Island, air gun use during Acoustic and Oceanographic Research would not occur within 3 nautical miles of shore. Acoustic and Oceanographic Research may occur in the Northeast, Virginia Capes, Jacksonville, and Gulf Range Complexes.

The number of impacts to each stock due to exposure to air guns during testing under Alternative 1 is shown in Table 3.7-8 for a maximum year of activities and in Table 3.7-9 for 7 years of activities. Appendix E (Acoustic and Explosives Impact Analysis) provides additional detail on modeled impacts to each stock, including seasons and regions in which impacts are most likely to occur; which activities are most likely to cause impacts; overlap with biologically important areas; and analysis of impacts to designated critical habitat for ESA-listed species, where applicable. Appendix E also explains how impacts are summed to estimate maximum annual and seven-year total impacts.

Overall, the number of potential impacts to marine mammals is very low. A small number of auditory effects are predicted for species in the most sensitive hearing group, the VHF cetaceans, which has a substantially lower threshold for auditory effects than other auditory groups for exposure to peak pressures from impulsive sounds. A small number of behavioral responses are also predicted for several stocks.

Table 3.7-8: Impacts Due to a Maximum Year of Air Gun Testing Activity under Alternative 1 and Alternative 2

Species	Stock or Population	Alternative 1			Alternative 2		
		BEH	TTS	AINJ	BEH	TTS	AINJ
ESA Listed							
Fin whale	Western North Atlantic	1	-	-	1	-	-
North Atlantic right whale	Western	0	-	-	0	-	-
Sperm whale	North Atlantic	0	-	-	0	-	-
Non-ESA Listed							
Minke whale	Canadian Eastern Coastal	-	0	-	-	0	-
Atlantic spotted dolphin	Western North Atlantic	0	-	-	1	-	-
	Northern Gulf of America	0	-	-	0	-	-
Atlantic white-sided dolphin	Western North Atlantic	0	-	-	0	-	-
Bottlenose dolphin	Western North Atlantic Southern Migratory Coastal	0	-	-	0	-	-
	Western North Atlantic SC GA Coastal	0	-	-	0	-	-
	Western North Atlantic Offshore	1	-	-	1	-	-
	Western North Atlantic Northern Migratory Coastal	0	0	-	0	0	-
	Western North Atlantic Northern FL Coastal	0	-	-	0	-	-
	Western North Atlantic Central FL Coastal	0	-	-	0	-	-
	Northern Gulf of America Continental Shelf	1	0	-	1	0	-
	Gulf of America Western Coastal	0	-	-	0	-	-
	Gulf of America Oceanic	0	-	-	0	-	-
Dwarf sperm whale	Western North Atlantic	1	1	0	1	1	0
	Northern Gulf of America	1	-	-	1	-	-
Killer whale	Western North Atlantic	0	-	-	0	-	-
Pantropical spotted dolphin	Western North Atlantic	0	-	-	0	-	-
	Northern Gulf of America	0	-	-	0	-	-
Pygmy sperm whale	Western North Atlantic	1	1	-	1	1	-
Risso's dolphin	Western North Atlantic	0	-	-	0	-	-
Rough-toothed dolphin	Northern Gulf of America	0	-	-	0	-	-
Short-beaked common dolphin	Western North Atlantic	1	-	-	1	-	-
Short-finned pilot whale	Western North Atlantic	0	-	-	0	-	-
	Northern Gulf of America	0	-	-	0	-	-
Striped dolphin	Western North Atlantic	1	-	-	1	-	-
Gervais' beaked whale	Western North Atlantic	0	-	-	0	-	-
Harbor porpoise	Gulf of ME/Bay of Fundy	2	3	1	2	3	1

Table 3.7-8 : Impacts Due to a Maximum Year of Air Gun Testing Activity under Alternative 1 and Alternative 2 (continued)

Species	*Stock or Population*	*Alternative 1*			*Alternative 2*		
		BEH	*TTS*	*AINJ*	*BEH*	*TTS*	*AINJ*
Gray seal	Western North Atlantic	1	0	-	1	0	-
Harbor seal	Western North Atlantic	1	0	-	1	0	-
Harp seal	Western North Atlantic	0	-	-	0	-	-

Notes: AINJ = auditory injury; BEH = significant behavioral response; ESA = Endangered Species Act; FL = Florida; GA = Georgia; ME = Maine; SC = South Carolina; TTS = temporary threshold shift
A dash (-) indicates a (true zero) and zero (0) indicates a rounded value less than 0.5.
Stocks are not shown if no effects are estimated.

Table 3.7-9: Impacts Due to 7 Years of Air Gun Testing Activity under Alternative 1 and Alternative 2

Species	*Stock or Population*	*Alternative 1*			*Alternative 2*		
		BEH	*TTS*	*AINJ*	*BEH*	*TTS*	*AINJ*
ESA Listed							
Fin whale	Western North Atlantic	1	-	-	1	-	-
North Atlantic right whale	Western	0	-	-	0	-	-
Sperm whale	North Atlantic	0	-	-	0	-	-
Non-ESA Listed							
Minke whale	Canadian Eastern Coastal	-	0	-	-	0	-
Atlantic spotted dolphin	Western North Atlantic	0	-	-	1	-	-
	Northern Gulf of America	0	-	-	0	-	-
Atlantic white-sided dolphin	Western North Atlantic	0	-	-	0	-	-
Bottlenose dolphin	Western North Atlantic Southern Migratory Coastal	0	-	-	0	-	-
	Western North Atlantic SC GA Coastal	0	-	-	0	-	-
	Western North Atlantic Offshore	1	-	-	1	-	-
	Western North Atlantic Northern Migratory Coastal	0	0	-	0	0	-
	Western North Atlantic Northern FL Coastal	0	-	-	0	-	-
	Western North Atlantic Central FL Coastal	0	-	-	0	-	-
	Northern Gulf of America Continental Shelf	1	0	-	1	0	-
	Gulf of America Western Coastal	0	-	-	0	-	-
	Gulf of America Oceanic	0	-	-	0	-	-

Table 3.7-9: Impacts Due to 7 Years of Air Gun Testing Activity under Alternative 1 and Alternative 2 (continued)

Species	Stock or Population	Alternative 1			Alternative 2		
		BEH	TTS	AINJ	BEH	TTS	AINJ
Dwarf sperm whale	Western North Atlantic	3	2	0	3	2	0
	Northern Gulf of America	1	-	-	1	-	-
Killer whale	Western North Atlantic	0	-	-	0	-	-
Pantropical spotted dolphin	Western North Atlantic	0	-	-	0	-	-
	Northern Gulf of America	0	-	-	0	-	-
Pygmy sperm whale	Western North Atlantic	2	4	-	3	4	-
Risso's dolphin	Western North Atlantic	0	-	-	0	-	-
Rough-toothed dolphin	Northern Gulf of America	0	-	-	0	-	-
Short-beaked common dolphin	Western North Atlantic	4	-	-	4	-	-
Short-finned pilot whale	Western North Atlantic	0	-	-	0	-	-
	Northern Gulf of America	0	-	-	0	-	-
Striped dolphin	Western North Atlantic	2	-	-	2	-	-
Gervais' beaked whale	Western North Atlantic	0	-	-	0	-	-
Harbor porpoise	Gulf of ME/Bay of Fundy	12	15	1	14	17	1
Gray seal	Western North Atlantic	7	0	-	7	0	-
Harbor seal	Western North Atlantic	5	0	-	5	0	-
Harp seal	Western North Atlantic	0	-	-	0	-	-

Notes: AINJ = auditory injury; BEH = significant behavioral response; ESA = Endangered Species Act; FL = Florida; GA = Georgia; ME = Maine; SC = South Carolina; TTS = temporary threshold shift

A dash (-) indicates a (true zero) and zero (0) indicates a rounded value less than 0.5.

Stocks are not shown if no effects are estimated.

Although air gun impacts are limited, there is a potential for long-term impacts to any individual with an auditory injury. Most impacts, however, are expected to be TTS or temporary behavioral responses. The average risk of impact to individuals in any population is low. Impacts due to air guns are unlikely to impact survival, growth, recruitment, or reproduction of any marine mammal populations. This is consistent with a negligible to moderate impact on marine mammal populations.

Under the MMPA, the use of air guns during military readiness activities as described under Alternative 1 will result in the unintentional taking of marine mammals incidental to those activities, as defined by the MMPA. As required by section 101(a)(5)(a) of the MMPA, the Action Proponents requested authorization from NMFS to take marine mammals incidental to the use of air guns during military readiness activities.

The Action Proponents have concluded that the use of air guns during military readiness activities as described under Alternative 1 may affect blue whales, Rice's whales, fin whales, North Atlantic right whales, sei whales, sperm whales, as defined by the ESA. The Action Proponents have concluded that testing activities under Alternative 1 may affect the West Indian manatee, but training activities are not applicable to the West Indian manatee, as defined by the ESA. The Action Proponents have also concluded that the use of air guns during military readiness activities would be not applicable to critical habitat for West Indian manatee, and may affect critical habitat for North Atlantic right whales and proposed critical habitat for Rice's whale. The Action Proponents have consulted with NMFS and USFWS as required by section 7(a)(2) of the ESA.

3.7.3.1.2.2 Impacts from Air Guns under Alternative 2

Air guns would not be used during training activities. The number of impacts to each stock due to exposure to air guns during testing under Alternative 2 is shown in Table 3.7-8 for a maximum year of activities and in Table 3.7-9 for 7 years of activities. Impacts from air guns under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for testing activities.

3.7.3.1.3 Impacts from Pile Driving Noise

Table 3.7-4 contains a summary of the background information used to analyze the potential impacts of pile driving noise on marine mammals. Only the Port Damage Repair training activity includes pile driving. Additional information on the assessment of these acoustic stressors under this Proposed Action is in Appendix E (Acoustic and Explosives Impact Analysis). The below information briefly summarizes information relevant to the assessment of the impacts of pile driving on marine mammals under the Proposed Action. A more extensive assessment of the impacts on marine mammals due to exposure to pile driving under this Proposed Action is in Appendix E (Acoustic and Explosives Impact Analysis).

The impact and vibratory pile driving hammers would expose marine mammals to impulsive and continuous non-impulsive broadband sounds, respectively. Potential impacts could include auditory injuries, TTS, behavioral reactions, physiological responses (stress), and masking. This analysis applies NMFS' recommended thresholds for behavioral responses to impact and vibratory pile driving. The ranges to auditory effects and behavioral responses for pile driving are in in Appendix E (Acoustic and Explosives Impact Analysis).

As discussed in Section 3.7.3 (Environmental Consequences), the Action Proponents will implement activity-based mitigation under Alternative 1 and Alternative 2 to reduce potential impacts from pile driving on marine mammals.

3.7.3.1.3.1 Impacts from Pile Driving Noise under Alternative 1

Pile driving would not occur during testing activities. The activity type and location for pile driving activities for training have changed from the 2018 Final EIS/OEIS.

Under Alternative 1 for training:

- Pile driving would occur up to 20 days each year as part of Port Damage Repair activities in Gulfport, Mississippi.
- Pile driving would no longer occur as part of the Elevated Causeway System at Joint Expeditionary Base Little Creek in the Virginia Capes Range Complex or Marine Corps Base Camp Lejeune in the Navy Cherry Point Range Complex.

Only two species are anticipated to be present in the nearshore waters by Gulfport: West Indian manatees and two stocks of bottlenose dolphins. Pile driving activities would not overlap with the presence of ESA-listed blue whales, Rice's whales, fin whales, North Atlantic right whales, sei whales, and sperm whales nor critical habitat for North Atlantic right whales or proposed critical habitat for Rice's whales.

The pile driving mitigation zone encompasses the relatively short ranges to auditory injuries and TTS for the HF and SI hearing groups and soft start procedures are employed. Auditory impacts are unlikely, but masking, physiological responses, or behavioral reactions may occur over limited periods at farther distances. Pile driving would occur in an industrialized location with existing higher ambient noise levels. Depending on where the activity occurs in the port, transmission of pile driving noise may be reduced by earthen pier structures. The number of impacts to each stock due to exposure to pile driving during training under Alternative 1 are shown in Table 3.7-10 for a maximum year of activities and in Table 3.7-11 for 7 years of activities. Due to the low number of days the activity would occur and the intermittent use of pile driving hammers, impacts are expected to be minor and temporary (lasting minutes to hours) or short-term (day). This is consistent with a negligible to minor impact on marine mammal populations.

Under the MMPA, the use of pile driving during military readiness activities as described under Alternative 1 will result in the unintentional taking of marine mammals incidental to those activities, as defined by the MMPA. As required by section 101(a)(5)(a) of the MMPA, the Action Proponents requested authorization from NMFS to take marine mammals incidental to the use of pile driving during military readiness activities.

The Action Proponents have concluded that the use of pile driving during training activities as described under Alternative 1 may affect the West Indian manatee, as defined by the ESA, but testing activities are not applicable. The noise footprint from the pile driving activities in Gulfport, Mississippi would not overlap West Indian manatee critical habitat. The Action Proponents have consulted with USFWS as required by section 7(a)(2) of the ESA.

3.7.3.1.3.2 Impacts from Pile Driving Noise under Alternative 2

Pile driving would not occur during testing activities. The number of impacts to each stock due to exposure to pile driving during training under Alternative 2 is shown in Table 3.7-10 for a maximum year of activities and in Table 3.7-11 for 7 years of activities. Impacts from pile driving during training under Alternative 2 are no different from Alternative 1 and therefore the conclusions for significance, ESA-listed species and critical habitat are the same.

Table 3.7-10: Impacts Due to a Maximum Year of Pile Driving Training Activity under Alternative 1 and Alternative 2

Species	Stock or Population	Alternative 1			Alternative 2		
		BEH	TTS	AINJ	BEH	TTS	AINJ
Non ESA Listed							
Bottlenose dolphin	MS Sound, Lake Borgne, and Bay Boudreau	1,564	0	-	1,564	0	-
	Gulf of America Northern Coastal	1,894	0	-	1,894	0	-

Notes: AINJ = auditory injury; BEH = significant behavioral response; ESA = Endangered Species Act; MS = Mississippi; TTS = temporary threshold shift
A dash (-) indicates a (true zero) and zero (0) indicates a rounded value less than 0.5.
Stocks are not shown if no effects are estimated.

Table 3.7-11: Impacts Due to 7 Years of Pile Driving Training Activity under Alternative 1 and Alternative 2

Species	Stock or Population	Alternative 1			Alternative 2		
		BEH	TTS	AINJ	BEH	TTS	AINJ
Non ESA Listed							
Bottlenose dolphin	MS Sound, Lake Borgne, and Bay Boudreau	10,944	0	-	10,944	0	-
	Gulf of America Northern Coastal	13,255	0	-	13,255	0	-

Notes: AINJ = auditory injury; BEH = significant behavioral response; ESA = Endangered Species Act; MS = Mississippi; TTS = temporary threshold shift
A dash (-) indicates a (true zero) and zero (0) indicates a rounded value less than 0.5.
Stocks are not shown if no effects are estimated.

3.7.3.1.4 Impacts from Vessel Noise

Table 3.7-4 contains a summary of the background information used to analyze the potential impacts of vessel noise on marine mammals. Vessels produce broadband, non-impulsive, continuous noise during operation and transit. Additional information on the assessment of this acoustic stressor under the Proposed Action is in Appendix E (Acoustic and Explosives Impact Analysis).

3.7.3.1.4.1 Impacts from Vessel Noise under Alternative 1

For both training and testing activities, vessel activity would decrease overall from the 2018 Final EIS/OEIS. This Supplemental EIS/OEIS will rely on the previous 2018 Final EIS/OEIS analysis of vessel noise, so impacts would be expected to be similar or lesser than previously concluded. Based on the updated background and previous analysis for training and testing under Alternative 1, vessel noise impacts on marine mammals could include brief behavioral reactions and short periods of masking while in the proximity of a vessel. Vessels do not purposefully approach marine mammals and are not expected to elicit significant behavioral responses (entanglement response is not a military readiness activity). The analysis conclusions for impacts due to vessel noise during training and testing activities under Alternative 1 are consistent with a negligible impact on marine mammals.

Under the MMPA, the Action Proponents have concluded that vessel noise during military readiness activities as described under Alternative 1 will not result in the unintentional taking of marine mammals incidental to those activities, as defined by the MMPA.

The Action Proponents have concluded that vessel noise during military readiness activities as described under Alternative 1 may affect blue whales, Rice's whales, fin whales, North Atlantic right whales, sei whales, sperm whales, as defined by the ESA. The Action Proponents have concluded that training activities may affect the West Indian manatee, but that testing activities are not applicable. The Action Proponents have also concluded that vessel noise during military readiness activities would have no effect on critical habitat for the North Atlantic right whale and West Indian manatee and may affect proposed critical habitat for Rice's whales. The Action Proponents have consulted with NMFS and USFWS as required by section 7(a)(2) of the ESA.

3.7.3.1.4.2 Impacts from Vessel Noise under Alternative 2

Although the number of activities with associated vessel noise would increase in all range complexes under Alternative 2 compared to Alternative 1, impacts from vessel noise under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species and critical habitat are the same for both training and testing.

3.7.3.1.5 Impacts from Aircraft Noise

Table 3.7-4 contains a summary of the background information used to analyze the potential impacts of aircraft noise on marine mammals. Aircraft produce broadband, non-impulsive, continuous noise during operation and transit. Additional information on the assessment of this acoustic stressor under the Proposed Action is in Appendix E (Acoustic and Explosives Impact Analysis).

3.7.3.1.5.1 Impacts from Aircraft Noise under Alternative 1

For both training and testing activities, aircraft activity would decrease overall from the 2018 Final EIS/OEIS. This Supplemental EIS/OEIS will rely on the previous 2018 Final EIS/OEIS analysis of aircraft noise, so impacts would be expected to be similar or lesser than previously concluded.

Based on the updated background and previous analysis for training and testing under Alternative 1, aircraft noise may cause brief temporary changes in the behavior of marine mammals. Marine mammals at or near the surface when an aircraft flies overhead at low altitude may startle, divert their attention to the aircraft, or avoid the immediate area by swimming away or diving. No long-term consequences for individuals would be expected. The analysis conclusions for impacts due to aircraft noise during training and testing activities under Alternative 1 are consistent with a negligible impact on marine mammals.

Under the MMPA, the Action Proponents have concluded that aircraft noise during military readiness activities as described under Alternative 1 will not result in the unintentional taking of marine mammals incidental to those activities, as defined by the MMPA.

Under the ESA, the Action Proponents have concluded that aircraft noise during military readiness activities as described under Alternative 1 may affect blue whales, Rice's whales, fin whales, North Atlantic right whales, sei whales, sperm whales, and West Indian manatees as defined by the ESA. The Action Proponents have also concluded that aircraft noise during military readiness activities would have no effect on critical habitat for the North Atlantic right whale and may affect proposed critical habitat for Rice's whales. The Action Proponents have concluded that aircraft noise during training would have no effect on the West Indian manatee critical habitat but that testing activities are not applicable. The Action Proponents have consulted with NMFS and USFWS as required by section 7(a)(2).

3.7.3.1.5.2 Impacts from Aircraft Noise under Alternative 2

Impacts from aircraft noise under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species and critical habitat are the same for both training and testing.

3.7.3.1.6 Impacts from Weapons Noise

Table 3.7-4 contains a summary of the background information used to analyze the potential impacts of weapons noise on marine mammals. Firing of guns, vibrations from the hull of ships, items that impact the water's surface, and items launched from underwater may produce weapons noise.

As discussed in Section 3.7.3 (Environmental Consequences), the Action Proponents will implement activity-based mitigation under Alternative 1 and Alternative 2 to reduce potential impacts from weapons noise on marine mammals. The Action Proponents will also implement geographic mitigation to reduce potential acoustic impacts within important marine mammal habitats as identified in Table 3.7-2.

3.7.3.1.6.1 Impacts from Weapons Noise under Alternative 1

For both training and testing activities, weapons activity would decrease overall from the 2018 Final EIS/OEIS. This Supplemental EIS/OEIS will rely on the previous 2018 Final EIS/OEIS analysis of weapons noise, as impacts are expected to be similar to or less than previously analyzed.

Based on the updated background and previous analysis for training and testing under Alternative 1, the impact of weapon noise on marine mammals would be limited to temporary behavioral responses. Marine mammals may startle or avoid the immediate area. Because firing of medium and large caliber gunnery would occur greater than 12 nautical miles (NM) from shore, impacts to coastal species are unlikely. The analysis conclusions for impacts due to weapons noise during training and testing activities under Alternative 1 are consistent with a negligible impact on marine mammals.

The Action Proponents have concluded that weapons noise during military readiness activities as described under Alternative 1 will not result in the unintentional taking of marine mammals incidental to those activities, as defined by the MMPA.

The Action Proponents have concluded that weapons noise during military readiness activities as described under Alternative 1 may affect blue whales, Rice's whales, fin whales, North Atlantic right whales, sei whales, sperm whales, and are not applicable to the West Indian manatee, as defined by the

ESA. The Action Proponents have also concluded that weapons noise during military readiness activities would have no effect on critical habitat for the North Atlantic right whale and West Indian manatee and may affect proposed critical habitat for Rice's whale. The Action Proponents have consulted with NMFS and USFWS as required by section 7(a)(2) of the ESA.

3.7.3.1.6.2 Impacts from Weapons Noise under Alternative 2

Impacts from weapons noise under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species and critical habitat are the same for both training and testing.

3.7.3.2 Explosive Stressors

This section summarizes the potential impacts of explosives used during military readiness activities within the Study Area. Explosives analyzed for impacts to marine mammals include those in water and those that detonate within 19 meters (m) (30 ft.) above the water surface, which are analyzed as in-water explosives. Table 3.7-12 summarizes background information that is relevant to the analyses of impacts for explosives. New applicable and emergent science regarding explosive impacts is presented in Appendix D (Acoustic and Explosive Impacts Supporting Information).

Table 3.7-12: Explosive Stressors Background Information Summary

Substressor	*Background Information Summary*
Explosives	Explosives may cause auditory effects (auditory injuries and TTS), non-auditory injury (including mortality), and behavioral responses. Susceptibility to auditory effects differs by auditory group. Non-auditory injury depends on the charge size, the geometry of the exposure (e.g., distance and depth), and the size of the animal. The intermittent nature of most impulsive sounds would result in very limited probability of any masking effects. Few studies on reactions to explosives exist, but responses to other impulsive noises have been recorded, as summarized in Table 3.7-4. Marine mammals may respond to explosions by alerting, startling, breaking off feeding dives and surfacing, diving, or swimming away, changing vocalization, pausing or changing migration path, or showing no response at all.

Note: TTS = temporary threshold shift

The quantitative analyses of impacts due to explosives in this section supplant the quantitative analyses in the 2018 Final EIS/OEIS. In addition to changes in the Proposed Action, changes in the predicted explosive impacts since the 2018 Final EIS/OEIS are due to the following:

- Updates to criteria used to determine if an exposure to explosive energy may cause auditory effects, non-auditory injury (including mortality), and behavioral responses. Changes to auditory criteria for explosives are the same as for other impulsive sounds. Behavioral response thresholds are related to TTS thresholds and were revised accordingly. Non-auditory injury criteria are unchanged, but the onset thresholds were applied. A summary of these changes is in Appendix E (Acoustic and Explosives Impact Analysis). For additional details see the technical report *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase IV)* (U.S. Department of the Navy, 2024a).
- Revisions to the modeling of explosive effects in the Navy Acoustic Effects Model, including an updated explosive propagation model. See the technical report *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase IV Training and Testing (U.S. Department of the Navy, 2024b)*.

- Updates to data on marine mammal presence, including estimated density of each species or stock (number of animals per unit area), group size, and depth distribution. For additional details see the technical reports U.S. Navy Marine Species Density Database Phase IV for the Atlantic Fleet Training and Testing Study Area (U.S. Department of the Navy, 2024c) and Dive Distribution and Group Size Parameters for Marine Species Occurring in the U.S. Navy's Atlantic and Hawaii-Southern California Training and Testing Study Areas (Oliveira et al., 2024).
- Changes in how mitigation is considered in reducing predicted impacts in the modeling. The number of model-predicted mortalities are not reduced due to activity-based mitigation, unlike in prior analyses.

The following section summarizes impacts due to explosive stressors on marine mammals. A comprehensive analysis of impacts due to acoustic and explosive stressors is in Appendix E (Acoustic and Explosives Impact Analysis), where impacts to marine mammal stocks are assessed considering species life history traits, susceptibility to impacts, and potential for repeated impacts to individuals based on acoustic impacts modeling. Appendix E also assesses impacts to critical habitat for ESA-listed species. While model-predicted impacts are summarized for explosives in the section below, Appendix E provides additional detail on modeled impacts to each stock, including seasons and regions in which impacts are most likely to occur; which activities are most likely to cause impacts; and how impacts are summed to estimate maximum annual and seven-year total impacts.

3.7.3.2.1 Impacts from Explosives

For information on the size and quantity of explosives under each alternative, see Table 3.0-5 (Explosive Sources Quantitatively Analyzed that Could Be Used Underwater or at the Water Surface).

The below information briefly summarizes information relevant to the assessment of the impacts of explosives on marine mammals under the Proposed Action. A more extensive assessment of the impacts on marine mammals due to exposure to explosives under this Proposed Action is in Appendix E (Acoustic and Explosives Impact Analysis).

Explosions produce loud, impulsive, broadband sounds with sharp pressure peaks that can be injurious. Potential impacts from explosive energy and sound include non-auditory injury (including mortality), auditory effects (auditory injuries and TTS), behavioral reactions, physiological response, and masking. Ranges to effects for mortality, non-auditory injury, and behavioral responses are shown in Appendix E (Acoustic and Explosives Impact Analysis).

Explosive noise is very brief and intermittent. Detonations usually occur in a limited area over a brief period rather than being widespread. The potential for masking is limited. Marine mammals may behaviorally respond, but responses to single detonations or clusters may be limited to startle responses.

As discussed in Section 3.7.3 (Environmental Consequences), the Action Proponents will implement activity-based mitigation under Alternative 1 and Alternative 2 to reduce potential impacts from explosives on marine mammals. An assessment of the potential opportunities to mitigate mortalities due to explosives under this Proposed Action is in Appendix E (Acoustic and Explosives Impact Analysis).

The Action Proponents will also implement geographic mitigation to reduce potential impacts within important marine mammal habitats as identified in Table 3.7-2. Some of the geographic mitigations limit the use of explosives. Table 3.7-13 lists these geographic mitigations and whether their requirements are reflected in the model-predicted impacts to marine mammals presented below. It does not list other geographic mitigation that may still reduce impacts but cannot be modeled, such as pre-event planning, awareness notification messages, or obtaining Early Warning System North Atlantic right whale sighting data.

Table 3.7-13: Applicable Geographic Mitigation Reflected in the Explosive Modeling Results

Geographic Mitigation Section Reference	*Reflected in Modeling Results?*	*Summary of Relevant Mitigation*
Section 5.7.8 (Ship Shock Trial Mitigation Areas)	Yes	Repositioning of the ship shock trial box outside of Rice's whale core distribution as identified by NMFS in 2019 (84 *Federal Register* 15446) and updated in 2021 (86 *Federal Register* 47022). • No ship shock trials overlapping the Jacksonville OPAREA from November 15 through April 15
Section 5.7.9 (Major Training Exercise Planning Mitigation Areas)	Not Applicable[1]	• Limits on the annual number of Major Training Exercises
Section 5.7.10 (Northeast North Atlantic Right Whale Mitigation Area)	Yes	• No in-water explosives
Section 5.7.14 (Southeast North Atlantic Right Whale Mitigation Area)	No	• No in-water explosives from November 15 to April 15.
Section 5.7.17 (Rice's Whale Mitigation Area)	Yes	• No in-water explosives (except mines)

[1] For Major Training Exercises, only sonar during anti-submarine warfare activities were analyzed. Other warfare area training conducted during Major Training Exercises, including any use of explosives, was analyzed as unit-level training, including in the modeling.

Notes: NMFS = National Marine Fisheries Service; OPAREA = operating area

3.7.3.2.1.1 Impacts from Explosives under Alternative 1

The use of explosives would generally decrease from the 2018 Final EIS/OEIS for both training and testing activities. Notably, for testing there would be no use of bin E17 (> 14,500 – 58,000 pounds [lb.] net explosive weight [NEW]) and reduced use of bin E16 (> 7,250 to 14,500 lb. NEW) for Ship Shock Trials. There is also a reduction in use of most of the largest explosive bins for both training and testing, and a large decrease in explosives associated with medium-caliber gunnery (bin E1 [0.1 to 0.25 lb. NEW]).

Most explosive activities would occur in the Virginia Capes, Navy Cherry Point, Jacksonville, and Gulf Range Complexes, although activities with explosives would also occur in other areas as described in Appendix A (Activity Descriptions). Activities involving in-water explosives from medium- and large-caliber naval gunfire, missiles, bombs, or other munitions are conducted more than 12 NM from shore. Explosive munitions used during surface warfare activities would typically detonate at or within 9 m (30 ft.) above the water surface. Certain activities with explosives may be conducted closer to shore at locations identified in Appendix A, including the training activity Mine Neutralization Explosive Ordnance Disposal and testing activities Semi-Stationary Equipment Testing and Line Charge Testing.

The number of impacts to each stock due to exposure to explosives during testing and training under Alternative 1 is shown in Table 3.7-14 for a maximum year of activities and in Table 3.7-15 for 7 years of activities. Appendix E (Acoustic and Explosives Impact Analysis) provides additional detail on modeled impacts to each stock, including seasons and regions in which impacts are most likely to occur; which activities are most likely to cause impacts; and analysis of impacts to designated critical habitat for ESA-listed species, where applicable. Appendix E also shows total impacts to each stock due to training or testing activities under this alternative and explains how impacts are summed to estimate maximum annual and seven-year total impacts. The number of impacts to marine mammals are over-estimated in this analysis by modeling explosions at or near the water surface as underwater explosions.

Table 3.7-14: Impacts Due to a Maximum Year of Explosive Testing and Training Activity under Alternative 1 and Alternative 2

Species	*Stock or Population*	*Alternative 1*					*Alternative 2*				
		BEH	*TTS*	*AINJ*	*INJ*	*MORT*	*BEH*	*TTS*	*AINJ*	*INJ*	*MORT*
ESA Listed											
Blue whale	Western North Atlantic	2	2	-	-	-	2	2	-	-	-
Fin whale	Western North Atlantic	141	84	3	-	-	143	85	3	-	-
North Atlantic right whale	Western North Atlantic	20	13	0	-	-	20	14	0	-	-
Rice's whale	Northern Gulf of America	7	5	1	-	-	8	5	1	-	-
Sei whale	Nova Scotia	11	4	0	-	-	12	4	0	-	-
Sperm whale	Northern Gulf of America	2	2	0	0	0	2	2	0	0	0
	North Atlantic	7	7	2	1	-	7	7	2	1	-
Non ESA Listed											
Bryde's whale	Atlantic [Nsd]	0	0	-	-	-	0	0	-	-	-
Humpback whale	Gulf of ME	28	15	1	-	-	29	16	1	-	-
Minke whale	Canadian East Coast	51	42	2	-	-	53	43	2	-	-
Atlantic spotted dolphin	Western North Atlantic	75	60	7	2	0	76	61	7	2	0
	Northern Gulf of America	19	14	2	0	0	20	14	2	0	0
Atlantic white-sided dolphin	Western North Atlantic	12	10	2	1	0	13	10	2	1	0
Bottlenose dolphin	Western North Atlantic Southern Migratory Coastal	28	32	5	1	0	29	32	5	1	0
	Western North Atlantic SC GA Coastal	14	8	2	0	1	15	8	2	0	1
	Western North Atlantic Offshore	118	108	12	2	2	120	109	12	2	2
	Western North Atlantic Northern Migratory Coastal	23	43	6	1	0	23	43	6	1	0
	Western North Atlantic Northern FL Coastal	6	4	2	0	-	6	5	2	0	-
	Western North Atlantic Central FL Coastal	22	13	2	1	0	22	13	2	1	0
	St. Andrew Bay	1	1	-	-	-	1	1	-	-	-
	Southern NC Estuarine System	1	-	-	-	-	1	-	-	-	-
	Northern SC Estuarine System	0	-	-	-	-	0	-	-	-	-
	Northern NC Estuarine System	1	0	0	-	-	1	0	0	-	-
	Northern Gulf of America Continental Shelf	387	199	6	2	0	390	200	6	2	0
	Gulf of America Western Coastal	2	1	1	0	-	2	1	1	0	-

Table 3.7-14: Impacts Due to a Maximum Year of Explosive Testing and Training Activity under Alternative 1 and Alternative 2 (continued)

Species	*Stock or Population*	*Alternative 1*					*Alternative 2*				
		BEH	*TTS*	*AINJ*	*INJ*	*MORT*	*BEH*	*TTS*	*AINJ*	*INJ*	*MORT*
Bottlenose dolphin (continued)	Gulf of America Oceanic	5	2	1	0	0	5	2	1	0	0
	Gulf of America Northern Coastal	87	119	17	-	-	87	119	17	-	-
	Gulf of America Eastern Coastal	1	2	0	-	-	1	2	0	-	-
	Central GA Estuarine System	0	-	-	-	-	0	-	-	-	-
Clymene dolphin	Western North Atlantic	21	25	7	2	1	22	26	7	2	1
	Northern Gulf of America	1	1	1	1	0	1	1	1	1	0
Dwarf sperm whale	Western North Atlantic	41	62	16	0	0	43	64	16	0	0
	Northern Gulf of America	5	30	17	0	-	5	30	17	0	-
False killer whale	Western North Atlantic	0	1	-	-	-	0	1	-	-	-
	Northern Gulf of America	1	1	0	-	-	1	1	0	-	-
Fraser’s dolphin	Western North Atlantic	2	3	1	0	-	2	3	1	0	-
	Northern Gulf of America	1	1	0	0	-	1	1	0	0	-
Killer whale	Western North Atlantic	1	1	0	-	-	1	1	0	-	-
	Northern Gulf of America	0	0	0	-	-	0	0	0	-	-
Long-finned pilot whale	Western North Atlantic	23	14	3	1	0	23	14	3	1	0
Melon-headed whale	Western North Atlantic	1	0	0	0	0	1	0	0	0	0
	Northern Gulf of America	1	1	0	0	0	1	1	0	0	0
Pantropical spotted dolphin	Western North Atlantic	2	1	1	0	0	2	1	1	0	0
	Northern Gulf of America	3	12	3	3	2	3	12	3	3	2
Pygmy killer whale	Western North Atlantic	0	1	1	0	-	0	1	1	0	-
	Northern Gulf of America	1	1	0	0	0	1	1	0	0	0
Pygmy sperm whale	Western North Atlantic	39	63	19	0	-	41	65	20	0	-
	Northern Gulf of America	6	32	17	-	-	6	33	17	-	-
Risso’s dolphin	Western North Atlantic	23	26	4	2	0	25	27	4	2	0
	Northern Gulf of America	1	1	0	0	0	1	1	0	0	0
Rough-toothed dolphin	Western North Atlantic	3	3	1	0	-	3	3	1	0	-
	Northern Gulf of America	7	5	1	1	0	7	5	1	1	0
Short-beaked common dolphin	Western North Atlantic	437	296	26	2	0	445	299	27	2	0
Short-finned pilot whale	Western North Atlantic	21	17	3	0	0	22	17	3	0	0
	Northern Gulf of America	1	2	1	0	0	1	2	1	0	0

Table 3.7-14: Impacts Due to a Maximum Year of Explosive Testing and Training Activity under Alternative 1 and Alternative 2 (continued)

Species	Stock or Population	Alternative 1					Alternative 2				
		BEH	TTS	AINJ	INJ	MORT	BEH	TTS	AINJ	INJ	MORT
Spinner dolphin	Western North Atlantic	1	1	0	0	-	1	1	0	0	-
	Northern Gulf of America	0	1	0	0	-	0	1	0	0	-
Striped dolphin	Western North Atlantic	29	24	5	2	0	32	26	6	2	0
	Northern Gulf of America	1	11	5	2	1	1	11	5	2	1
White-beaked dolphin	Western North Atlantic	0	-	-	-	-	0	-	-	-	-
Blainville's beaked whale	Western North Atlantic	2	3	1	0	-	2	3	1	0	-
	Northern Gulf of America	0	0	-	-	-	0	0	-	-	-
Gervais' beaked whale	Western North Atlantic	2	2	1	-	-	2	2	1	-	-
	Northern Gulf of America	0	1	-	-	-	0	1	-	-	-
Goose-beaked whale	Western North Atlantic	8	6	2	0	0	9	6	2	0	0
	Northern Gulf of America	0	1	0	-	-	0	1	0	-	-
Harbor porpoise	Gulf of ME/Bay of Fundy	171	356	92	0	0	185	370	95	0	0
Northern bottlenose whale	Western North Atlantic	1	0	1	-	-	1	0	1	-	-
Sowerby's beaked whale	Western North Atlantic	2	2	1	-	-	2	2	1	-	-
True's beaked whale	Western North Atlantic	2	2	0	-	-	2	2	0	-	-
Gray seal	Western North Atlantic	85	63	5	0	-	93	66	5	0	-
Harbor seal	Western North Atlantic	128	91	7	0	0	139	95	7	0	0
Harp seal	Western North Atlantic	15	10	2	0	-	18	11	2	0	-
Hooded seal	Western North Atlantic	2	2	0	-	-	2	2	0	-	-

Notes: AINJ = auditory injury; BEH = significant behavioral response; ESA = Endangered Species Act; FL = Florida, GA = Georgia; INJ = Non-Auditory Injury; ME = Maine; MORT = Mortality; NC = North Carolina; SC = South Carolina; TTS = temporary threshold shift
A dash (-) indicates a (true zero) and zero (0) indicates a rounded value less than 0.5.
Stocks are not shown if no effects are estimated.
Nsd = No stock designation under MMPA

Table 3.7-15: Impacts Due to 7 Years of Explosive Testing and Training Activity under Alternative 1 and Alternative 2

Species	Stock or Population	Alternative 1					Alternative 2				
		BEH	TTS	AINJ	INJ	MORT	BEH	TTS	AINJ	INJ	MORT
ESA Listed											
Blue whale	Western North Atlantic	4	4	-	-	-	4	5	-	-	-
Fin whale	Western North Atlantic	876	493	17	-	-	887	499	18	-	-
North Atlantic right whale	Western North Atlantic	127	86	0	-	-	130	88	0	-	-
Rice's whale	Northern Gulf of America	49	26	1	-	-	50	27	1	-	-
Sei whale	Nova Scotia	68	20	0	-	-	72	21	0	-	-
Sperm whale	Northern Gulf of America	2	2	0	0	0	2	2	0	0	0
	North Atlantic	35	41	4	1	-	36	42	4	1	-
Non ESA Listed											
Bryde's whale	Atlantic [Nsd]	0	0	-	-	-	0	0	-	-	-
Humpback whale	Gulf of ME	177	86	1	-	-	182	88	1	-	-
Minke whale	Canadian East Coast	330	198	11	-	-	344	205	11	-	-
Atlantic spotted dolphin	Western North Atlantic	468	377	39	6	0	478	383	40	6	0
	Northern Gulf of America	125	93	10	0	0	130	94	10	0	0
Atlantic white-sided dolphin	Western North Atlantic	71	59	8	3	0	78	62	8	3	0
Bottlenose dolphin	Western North Atlantic Southern Migratory Coastal	188	220	28	4	0	189	221	28	4	0
	Western North Atlantic SC GA Coastal	87	52	6	0	1	88	52	6	0	1
	Western North Atlantic Offshore	747	667	70	6	2	762	675	72	6	2
	Western North Atlantic Northern Migratory Coastal	157	294	31	1	0	157	294	31	1	0
	Western North Atlantic Northern FL Coastal	29	24	2	0	-	31	25	2	0	-
	Western North Atlantic Central FL Coastal	132	82	8	2	0	132	82	8	2	0
	St. Andrew Bay	1	1	-	-	-	1	1	-	-	-
	Southern NC Estuarine System	1	-	-	-	-	1	-	-	-	-
	Northern SC Estuarine System	0	-	-	-	-	0	-	-	-	-
	Northern NC Estuarine System	1	0	0	-	-	1	0	0	-	-
	Northern Gulf of America Continental Shelf	2,697	1,384	31	2	0	2,718	1,394	33	2	0
	Gulf of America Western Coastal	10	4	1	0	-	13	6	1	0	-

Table 3.7-15: Impacts Due to 7 Years of Explosive Testing and Training Activity under Alternative 1 and Alternative 2 (continued)

Species	Stock or Population	Alternative 1					Alternative 2				
		BEH	TTS	AINJ	INJ	MORT	BEH	TTS	AINJ	INJ	MORT
Bottlenose dolphin (continued)	Gulf of America Oceanic	19	11	2	0	0	20	11	3	0	0
	Gulf of America Northern Coastal	604	823	114	-	-	604	823	114	-	-
	Gulf of America Eastern Coastal	4	8	0	-	-	4	8	0	-	-
	Central GA Estuarine System	0	-	-	-	-	0	-	-	-	-
Clymene dolphin	Western North Atlantic	142	165	41	4	3	149	171	42	4	3
	Northern Gulf of America	4	3	1	1	0	4	3	1	1	0
Dwarf sperm whale	Western North Atlantic	277	351	73	0	0	291	365	75	0	0
	Northern Gulf of America	21	89	41	0	-	23	91	41	0	-
False killer whale	Western North Atlantic	0	1	-	-	-	0	1	-	-	-
	Northern Gulf of America	1	1	0	-	-	1	1	0	-	-
Fraser’s dolphin	Western North Atlantic	7	7	2	0	-	7	8	2	0	-
	Northern Gulf of America	1	1	0	0	-	1	1	0	0	-
Killer whale	Western North Atlantic	2	1	0	-	-	2	2	0	-	-
	Northern Gulf of America	0	0	0	-	-	0	0	0	-	-
Long-finned pilot whale	Western North Atlantic	138	82	13	1	0	141	83	13	1	0
Melon-headed whale	Western North Atlantic	1	0	0	0	0	1	0	0	0	0
	Northern Gulf of America	1	3	0	0	0	1	3	0	0	0
Pantropical spotted dolphin	Western North Atlantic	8	6	1	0	0	8	6	1	0	0
	Northern Gulf of America	18	38	7	8	5	19	38	7	8	5
Pygmy killer whale	Western North Atlantic	0	1	1	0	-	0	1	1	0	-
	Northern Gulf of America	1	1	0	0	0	1	1	0	0	0
Pygmy sperm whale	Western North Atlantic	260	356	94	0	-	272	370	97	0	-
	Northern Gulf of America	27	100	41	-	-	29	102	42	-	-
Risso’s dolphin	Western North Atlantic	145	138	17	2	0	157	143	18	2	0
	Northern Gulf of America	1	1	0	0	0	1	1	0	0	0
Rough-toothed dolphin	Western North Atlantic	10	11	1	0	-	10	11	1	0	-
	Northern Gulf of America	40	24	1	1	0	41	24	1	1	0
Short-beaked common dolphin	Western North Atlantic	2,686	1,800	148	5	0	2,745	1,826	152	6	0
Short-finned pilot whale	Western North Atlantic	124	91	16	0	0	127	92	17	0	0
	Northern Gulf of America	3	5	1	0	0	3	5	1	0	0

Table 3.7-15: Impacts Due to 7 Years of Explosive Testing and Training Activity under Alternative 1 and Alternative 2 (continued)

Species	Stock or Population	Alternative 1					Alternative 2				
		BEH	TTS	AINJ	INJ	MORT	BEH	TTS	AINJ	INJ	MORT
Spinner dolphin	Western North Atlantic	2	5	0	0	-	3	5	0	0	-
	Northern Gulf of America	0	1	0	0	-	0	1	0	0	-
Striped dolphin	Western North Atlantic	189	152	32	6	0	211	162	35	6	0
	Northern Gulf of America	5	29	10	5	2	5	29	10	5	2
White-beaked dolphin	Western North Atlantic	0	-	-	-	-	0	-	-	-	-
Blainville's beaked whale	Western North Atlantic	6	9	1	0	-	6	10	1	0	-
	Northern Gulf of America	0	0	-	-	-	0	0	-	-	-
Gervais' beaked whale	Western North Atlantic	2	4	1	-	-	3	4	1	-	-
	Northern Gulf of America	0	1	-	-	-	0	1	-	-	-
Goose-beaked whale	Western North Atlantic	44	35	5	0	0	45	35	5	0	0
	Northern Gulf of America	0	1	0	-	-	0	1	0	-	-
Harbor porpoise	Gulf of ME/Bay of Fundy	1,158	2,414	615	0	0	1,254	2,517	637	0	0
Northern bottlenose whale	Western North Atlantic	1	0	1	-	-	1	0	1	-	-
Sowerby's beaked whale	Western North Atlantic	8	9	1	-	-	8	9	1	-	-
True's beaked whale	Western North Atlantic	2	2	0	-	-	2	2	0	-	-
Gray seal	Western North Atlantic	591	428	30	0	-	642	448	32	0	-
Harbor seal	Western North Atlantic	879	624	40	0	0	952	652	41	0	0
Harp seal	Western North Atlantic	102	63	5	0	-	124	73	6	0	-
Hooded seal	Western North Atlantic	6	5	0	-	-	7	6	0	-	-

Notes: AINJ = auditory injury; BEH = significant behavioral response; ESA = Endangered Species Act; FL = Florida; GA = Georgia; INJ = Non-Auditory Injury; ME = Maine; MORT = Mortality; NC = North Carolina; SC = South Carolina; TTS = temporary threshold shift

A dash (-) indicates a (true zero) and zero (0) indicates a rounded value less than 0.5.

Stocks are not shown if no effects are estimated.

Nsd = No stock designation under MMPA

All model-predicted mortalities and a large portion of model-predicted non-auditory injuries are due to small ship shock trials, which could occur in the Jacksonville or Gulf Range Complexes. The Action Proponents conduct extensive activity-based mitigation for ship shock trials in accordance with NMFS-reviewed event-specific mitigation and monitoring plans (see Chapter 5, Mitigation). Adherence to these plans increases the likelihood that Lookouts would sight surface active marine mammals within the ship shock trial mitigation zone. For other explosive activities, the Action Proponents will also implement mitigation to relocate, delay, or cease detonations when a marine mammal is sighted within or entering a mitigation zone to avoid or reduce potential explosive impacts.

Depending on the stock, impacts to individuals may be permanent (auditory injuries or mortality) or temporary (non-auditory injury, TTS, masking, stress, or behavioral response). The behavioral patterns of a limited number of individuals may be interrupted. Individuals or groups may temporarily avoid areas around explosive activities if multiple detonations occur. Activities would be relatively brief and occur over small areas relative to population ranges. Permanent impacts would be present in low enough numbers such that the continued viability of populations is not threatened. The total impacts are not expected to interfere with feeding, reproduction, or other biologically important functions such that the continued viability of the population would be threatened. The analysis conclusions for impacts due to use of explosives during training and testing activities under Alternative 1 are consistent with a minor to moderate impact on marine mammals.

Under the MMPA, the use of explosives during military readiness activities as described under Alternative 1 will result in the unintentional taking of marine mammals incidental to those activities. As required by section 101(a)(5)(a) of the MMPA, the Action Proponents requested authorization from NMFS to take marine mammals incidental to the use of explosives during military readiness activities.

The Action Proponents have concluded that the use of explosives during military readiness activities as described under Alternative 1 may affect blue whales, Rice's whales, fin whales, North Atlantic right whales, sei whales, sperm whales, and West Indian manatees, as defined by the ESA. The Action Proponents have also concluded that explosives used during military readiness activities would have no effect on critical habitat for the North Atlantic right whale and West Indian manatee and may affect proposed critical habitat for the Rice's whale. The Action Proponents have consulted with NMFS and USFWS as required by section 7(a)(2) of the ESA.

3.7.3.2.1.2 Impacts from Explosives under Alternative 2

Under Alternative 2, the use of explosives during training activities would be identical to Alternative 1. Under Alternative 2, there would be an increase in use of some explosive bins during testing compared to Alternative 1. This would slightly increase impacts to some stocks as shown in Table 3.7-14 and Table 3.7-15. Still, impacts from explosives in water under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing.

3.7.3.3 Energy Stressors

Table 3.7-16 contains brief summaries of the background information that is relevant to the analyses of impacts of in-water electromagnetic devices on marine mammals. Details on the updated information in general, as well as effects specific to each substressor, are provided in Appendix G (Non-Acoustic Impacts Supporting Information). Energy stressors from human activities have not been identified among the causes of decline in marine mammal populations to date (Appendix F, Biological Resources Supplemental Information).

Table 3.7-16: Energy Stressors Background Information Summary

Substressor	*Background Information Summary*
In-air electromagnetic devices	In-air electromagnetic devices are not applicable to marine mammals because of the lack of transmission of electromagnetic radiation across the air/water interface and distant proximity to in-air sources. For pinnipeds that occur on land, in-air electromagnetic sources used during training or testing will never be in close enough proximity to land-based haul-outs or areas to have an effect on those animals. As a result, in-air electromagnetic devices will not be analyzed further.
In-water electromagnetic devices	Impacts to marine mammals from the use of in-water electromagnetic devices are not expected. • The in-water devices producing an electromagnetic field are towed or unmanned mine countermeasure systems. • The electromagnetic field is produced to simulate a vessel's magnetic field. In an actual mine-clearing operation, the intent is that the electromagnetic field would trigger an enemy mine designed to sense a vessel's magnetic field. • Impacts from the use of in-water electromagnetic devices are not anticipated because the electromagnetic field is the simulation of a ship's magnetic field, having no greater impact than that of a passing ship.
High-energy lasers	Impacts to marine mammals from the use of high energy lasers are not expected. Based on the statistical probability analysis described in Appendix I (Military Expended Materials and Direct Strike Impact Analysis), results indicate that no marine mammal would be struck by a high-energy laser over the course of a year. • Marine mammals could be exposed to a laser only if the beam missed the target. • The probability analysis does not take into account that high-energy laser systems used in military readiness activities automatically shut down when target-lock is lost; meaning that if a high-energy laser beam aimed at a small boat on the surface, either from an aircraft or surface vessel, moves off the target, the system ceases projecting laser light, preventing any energy from striking the water or a nearby marine mammal. Therefore, even though marine mammals may be present at the time high-energy lasers are used, there is no plausible route of effects to the listed species.

3.7.3.3.1 Impacts from In-Water Electromagnetic Devices

The types of activities that create an electromagnetic field under water are listed in Appendix B (Activity Stressor Matrices). The in-water devices producing an electromagnetic field are towed or unmanned mine countermeasure systems. The electromagnetic field is produced to simulate a vessel's magnetic field. In an actual mine-clearing operation, the intent is that the electromagnetic field would trigger an enemy mine designed to sense a vessel's magnetic field.

With the increased use of undersea power cables associated with offshore energy generation, there has been renewed scientific interest in the possibility of electromagnetic fields affecting migrating marine mammals (Driessen et al., 2020; Gill et al., 2014; Kremers et al., 2016; Kremers et al., 2014; Zellar et al., 2017). Reported analysis of empirical observations of humpback whale migrations suggested that the migratory decisions for the species are relatively insensitive to changing oceanographic and geomagnetic conditions (Horton et al., 2017; Horton et al., 2020). These additional scientific findings do not change the rationale for the dismissal of in-water electromagnetic devices as presented in the 2018 Final EIS/OEIS analyses. As presented and at the most basic level, impacts from the use of in-water electromagnetic devices are not anticipated because the electromagnetic field is the simulation of a ship's magnetic field, having no greater impact than that of a passing ship.

3.7.3.3.1.1 Impacts from In-Water Electromagnetic Devices under Alternative 1

For both training and testing activities, in-water electromagnetic device activity would decrease overall from the 2018 Final EIS/OEIS (see Supplemental EIS/OEIS Table 3.0-6, Number and Location of Activities Using In-Water Electromagnetic Devices).

Under Alternative 1 for training:

- In-water electromagnetic devices would occur in two areas not previously analyzed (Key West Range Complex and Virginia Capes Range Complex Inshore) for the 2018 Final EIS/OEIS. There would also be notable increases in in-water electromagnetic devices in the Virginia Capes and Gulf Range Complexes. For all other locations, there would either be a decrease or similar amount of in-water electromagnetic devices.

Under Alternative 1 for testing:

- In-water electromagnetic devices would occur in two areas not previously analyzed (Northeast Range Complexes and Hampton Roads, Virginia) in the 2018 Final EIS/OEIS. There would also be a notable increase in in-water electromagnetic devices in the Naval Surface Warfare Center Panama City Testing Range. For all other locations, there would either be a decrease or cessation of in-water electromagnetic devices.

For locations without notable increases in activity, the impact analysis that was conducted in the 2018 Final EIS/OEIS remains valid; the updates to the affected environment noted in Section 3.7.2 (Affected Environment) do not alter the analysis because the general distribution and sensitivity of marine mammals among training and testing locations has not changed.

For locations with notable increase in activity, the impact analysis that was conducted in the 2018 Final EIS/OEIS would not change because the infrequent and localized nature of in-water electromagnetic device activity remains an accurate characterization of the Proposed Action in those locations.

For the locations not previously analyzed, standard operating procedures (e.g., in-water device safety) will help reduce potential impacts to marine mammals. Potential impacts would be limited to temporary behavioral and stress-startle responses to individual sensitive marine mammals within localized areas.

Military readiness activities that use in-water electromagnetic devices would occur within the northeast and southeast portions of North Atlantic right whale designated critical habitat. Since North Atlantic right whales occur within the southeast critical habitat area primarily in winter months, any potential overlap with military readiness activities in these areas would be seasonal. Physical and biological features identified for North Atlantic right whale conservation and considered in the critical habitat designation include water temperatures, depths, and sea surface conditions that are suitable for the southern calving habitats (National Marine Fisheries Service, 2015). These habitat features would not be impacted by in-water electromagnetic devices.

Physical and biological features identified for Rice's whale conservation and considered in the proposed critical habitat designation include continental shelf and slope associated waters between the 100 to 400m isobaths that support individual growth, reproduction, and development, social behavior, and overall population growth through sufficient prey density, waters with elevated productivity, water temperatures of 10-19° C, low pollution, and sufficiently quiet conditions (88 *Federal Register* 47453). These habitat features would not be impacted by in-water electromagnetic devices.

Under the MMPA, the use of in-water electromagnetic devices during the proposed military readiness activities as described under Alternative 1 will not result in the unintentional taking of marine mammals incidental to those activities.

The Action Proponents have concluded that the use of in-water electromagnetic devices during military readiness activities as described under Alternative 1 may affect the blue whale, fin whale, North Atlantic right whale, sei whale, sperm whale, and Rice's whale as defined by the ESA. The Action Proponents have also concluded that the use of in-water electromagnetic devices during the proposed military readiness activities would have no effect on the West Indian manatee, the designated critical habitat for the North Atlantic right whale and West Indian manatee, nor on proposed Rice's whale critical habitat. The Action Proponents have consulted with NMFS or USFWS for affected species and critical habitat as required by section 7(a)(2) of the ESA.

The analysis conclusions for in-water electromagnetic device use under Alternative 1 are consistent with negligible impact on marine mammal populations.

3.7.3.3.1.2 Impacts from In-Water Electromagnetic Devices under Alternative 2

Impacts from in-water electromagnetic devices under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species and critical habitat are the same for both training and testing.

3.7.3.3.2 Impacts from High-Energy Lasers

Table 3.7-16 contains a summary of the background information used to analyze the potential impacts of high-energy lasers on marine mammals. For a listing of the types of activities that use high-energy lasers, refer to Appendix B (Activity Stressor Matrices). High-energy laser weapons are designed to disable surface targets and automatically shut down when target-lock is lost.

3.7.3.3.2.1 Impacts from High-Energy Lasers under Alternative 1

For training activities, the use of high-energy lasers increased from the 2018 Final EIS/OEIS, and for testing activities, the use of high-energy lasers would decrease (Table 3.0-7, Number and Location of Activities Using High-Energy Lasers).

Under Alternative 1 for training:

- High-energy lasers would occur in one area not previously analyzed (Navy Cherry Point Range Complex) for the 2018 Final EIS/OEIS. There would also be notable increases in high-energy lasers at the Virginia Capes and Jacksonville Range Complexes.

Under Alternative 1 for testing:

High-energy lasers would no longer occur in two locations (South Florida Ocean Measurement Facility and Key West Range Complex) that they occurred in for the 2018 Final EIS/OEIS. For all other locations, there would be a decrease in high-energy lasers.

Due to changes in the understanding of how high-energy lasers operate during military readiness activities, the below analysis has been updated from that included in the 2018 Final EIS/OEIS.

High-energy lasers are used from surface or aircraft platforms to disrupt or disable targets, such as small boats or aircraft, over short ranges. During a high-energy laser testing activity, the system specifications, integration, and performance are evaluated as the laser is deployed against an unmanned aerial or surface target. After system evaluation, similar scenarios are used to train operators on the use of high-energy laser systems.

The only potential effect on marine mammals from the use of high-energy lasers is direct exposure to laser light incident on the water's surface at the same time a marine mammal is at or near the water's surface, and for the exposure to cause injury. A marine mammal could only be exposed if a laser beam missed the intended target and inadvertently struck a nearby marine mammal. The statistical probability analysis (see Appendix I [Military Expended Materials and Direct Strike Impact Analysis] in this Supplemental AFTT EIS/OEIS) indicates that even for short-beaked common dolphins, the species with the highest density in the Study Area, the probability of a marine mammal being hit by a high-energy laser beam is so low that it is considered discountable.

The probability analysis does not take into account that high-energy laser systems used in military readiness activities automatically shut down when target-lock is lost; meaning that if a high-energy laser beam aimed at a small boat on the surface, either from an aircraft or surface vessel, moves off the target, the system ceases projecting laser light, preventing any energy from striking the water or a nearby marine mammal. Therefore, even though marine mammals may be present at the time high-energy lasers are used, there is no plausible route of effects to the listed species.

For the same reasons the use of higher energy lasers would not affect marine mammal species, the use of high-lasers would not result in permanent or temporary impacts on the essential features defining critical habitat in the Study Area. Military readiness activities that use high-energy lasers would not occur within the northeast portion of North Atlantic right whale designated critical habitat but would occur in the southeast critical habitat area. Since North Atlantic right whales occur within the southeast critical habitat area primarily in winter months, any potential overlap with military readiness activities in these areas would be seasonal. Given the high level of certainty that no marine mammals would be struck by a high-energy laser, the Action Proponents do not anticipate a strike of a North Atlantic right whale with a high-energy laser during training activities. Physical and biological features identified for North Atlantic right whale conservation and considered in the critical habitat designation include water temperatures, depths, and sea surface conditions that are suitable for the southern calving habitats (National Marine Fisheries Service, 2015). High-energy lasers would not impact these habitat features.

Physical and biological features identified for Rice's whale conservation and considered in the proposed critical habitat designation include continental shelf and slope associated waters between the 100 to 400m isobaths that support individual growth, reproduction, and development, social behavior, and overall population growth through sufficient prey density, waters with elevated productivity, water temperatures of 10-19° C, low pollution, and sufficiently quiet conditions (88 *Federal Register* 47453). High-energy lasers would not impact these habitat features.

Military readiness activities that use high-energy lasers would not occur within West Indian manatee critical habitat.

Under the MMPA, the Action Proponents have concluded that the use of high-energy lasers during military readiness activities as described under Alternative 1 would have no effect on North Atlantic right whale critical habitats, or the proposed Rice's whale critical habitat, and is not applicable to West Indian manatee critical habitat as defined by the ESA. The use of high-energy lasers will have no effect on the blue whale, fin whale, North Atlantic right whale, Rice's whale, sei whale, sperm whale, and West Indian manatee as defined by the ESA. The Action Proponents have consulted with NMFS (or USFWS) for affected species and critical habitat as required by section 7(a)(2) of the ESA.

The analysis conclusions for high-energy laser use with military readiness activities under Alternative 1 are consistent with negligible impact on marine mammal populations.

3.7.3.3.2.2 Impacts from High-Energy Lasers under Alternative 2

Impacts from high-energy lasers under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing.

3.7.3.4 Physical Disturbance and Strike Stressors

This section analyzes the potential impacts of the various types of physical disturbance, including the potential for strike during military readiness activities within the Study Area from (1) vessels; (2) in-water devices; (3) military expended materials, including non-explosive practice munitions and fragments from high-explosive munitions; and (4) seafloor devices.

The way a physical disturbance may affect a marine mammal would depend in part on the relative size of the object, the speed of the object, the location of the mammal in the water column, and reactions of marine mammals to anthropogenic activity, which may include avoidance or attraction. It is not known at what point or through what combination of stimuli (visual, acoustic, or through detection in pressure changes) an animal becomes aware of a vessel or other potential physical disturbances before reacting or being struck. Refer to Section 3.7.3.1.1.3 (Physiological Stress) and Section 3.7.3.1.1.5 (Behavioral Reactions) of the 2018 Final EIS/OEIS for the discussion of the potential for disturbance from acoustic stimuli. Given that the presentation of a physical disturbance should be very rare and brief, the cost from the response is likely to be within the normal variation experienced by an animal in its daily routine unless the animal is struck (see Table 3.7-17). If a strike does occur, the cost to the individual could range from slight injury to death. While the analysis of potential impacts from the physical presence of the vessel is presented here, the analysis of potential impacts in response to sounds produced by vessel operations is addressed in Section 3.7.3.1.4 (Impacts from Vessel Noise). For a summary of background studies on physical disturbance and strike stressors, refer to Appendix G (Non-Acoustic Impacts Supporting Information).

Table 3.7-17: Physical Disturbance and Strike Stressors Background Information Summary

Substressor	*Background Information Summary*
Vessels and in-water devices	Vessel strikes may impact marine mammal species, but mitigation measures are in place that reduce the potential for a strike to occur. • Vessel strikes from commercial, recreational, and military vessels are known to have resulted in serious injury and occasional fatalities to cetaceans. The majority of the military readiness activities under all alternatives involve some level of vessel activity. • An examination of vessel traffic within the Study Area determined that military vessel occurrence is two orders of magnitude lower than that of commercial traffic. Standard operating procedures for vessel safety and additional mitigation measures will benefit marine mammals through a reduction in the potential for vessel strike. It is possible that marine mammal species that occur in areas that overlap with in-water device use associated with the Proposed Action may experience some level of physical disturbance, but it is not expected to result in more than a momentary behavioral response. • In-water devices are generally smaller (several inches to 111 feet) than most vessels. • Devices that could pose a collision risk to marine mammals are those that are operated at high speeds and that are unmanned. Since some in-water devices are identical to support craft (typically less than 15 meters in length), marine mammals could respond to the physical presence of the device similar to how they respond to the physical presence of a vessel.

Table 3.7-17: Physical Disturbance and Strike Stressors Summary Background Information (continued)

Substressor	*Background Information Summary*
Military expended materials	While no strike from military expended materials has ever been reported or recorded, military expended materials may impact marine mammal species. • The primary concern is the potential for a marine mammal to be hit with military expended material at or near the water's surface, which could result in injury or death. • While disturbance or strike from an item falling through the water column is possible, it is not very likely given that objects generally sink slowly through the water and can be avoided by most marine mammals. Therefore, the discussion of military expended materials strikes focuses on the potential of a strike at the surface of the water. • The potential for marine mammals to be struck by military expended materials was evaluated using statistical probability modeling to estimate potential direct strike exposures to a marine mammal under a worst-case scenario.
Seafloor devices	Seafloor devices are not likely to impact marine mammals. • The likelihood of any marine mammal species encountering seafloor devices is considered low because these items are either stationary or move very slowly along the bottom. • In the unlikely event that a marine mammal is in the vicinity of a seafloor device, the stationary or very slowly moving devices would not be expected to physically disturb or alter natural behaviors of marine mammals. • The only seafloor device used during military readiness activities that has the potential to strike a marine mammal at or near the surface is an aircraft-deployed mine shape, which is used during aerial mine laying activities.
Pile driving	Pile driving will not affect marine mammals. • Given the nearshore locations for this training activity and the temporary nature of the structures, it is not likely that marine mammals would experience physical disturbance from the presence of the temporary pier structure. • Furthermore, it is not likely that any marine mammal would be struck by a piling during installation. Mitigation measures discussed in Chapter 5 (Mitigation) would be implemented to further reduce any potential for impacts. • Therefore, the Action Proponents have determined that the pile driving training activity would not strike a marine mammal or result in physical disturbance impacts above those associated with acoustic impacts described in Section 3.7.3.1.3 (Acoustic Stressors, Impacts from Pile Driving Noise). Accordingly, this activity is not considered further in this section.

3.7.3.4.1 Impacts from Vessels and In-Water Devices

Vessel strikes from commercial, recreational, and military vessels have resulted in serious injury and fatalities to cetaceans (Abramson et al., 2011; Berman-Kowalewski et al., 2010; Calambokidis, 2012; Douglas et al., 2008; Laggner, 2009; Lammers et al., 2003; Van der Hoop et al., 2013; Van der Hoop et al., 2012). Reviews of the literature on ship strikes mainly involve collisions between commercial vessels and whales (Jensen & Silber, 2004; Laist et al., 2001).

In the Study Area, commercial traffic is heaviest in the nearshore waters, near major ports and in the shipping lanes along the entire U.S. East Coast and along the northern coast of the Gulf of America, while military vessel traffic is primarily concentrated between the mouth of the Chesapeake Bay and Jacksonville, Florida (Mintz, 2016). An examination of vessel traffic within the Study Area determined that military vessel occurrence is two orders of magnitude lower than that of commercial traffic. The study also revealed that while commercial traffic is relatively steady throughout the year, military vessel usage within the range complexes is episodic, based on specific exercises being conducted at different times of the year (Mintz, 2012); however, military vessel use within inshore waters occurs regularly and routinely consists of high-speed small craft movements.

Large military vessels (greater than 18 m in length) within the offshore areas of the Study Area operate differently from commercial vessels in ways important to the prevention of whale collisions. For example, the average speed of large military ships ranges between 10 and 15 knots. Submarines generally operate at lower speeds. By comparison, this is slower than most commercial vessels where full speed for a container ship is typically 24 knots (Bonney & Leach, 2010). Even given the advent of "slow steaming" by commercial vessels in recent years due to fuel prices (Barnard, 2016; Maloni et al., 2013), this is generally a reduction of only a few knots, given that 21 knots would be considered "slow," 18 knots is considered "extra slow," and 15 knots is considered "super slow" (Bonney & Leach, 2010). Small military craft (less than 50 feet [ft.] in length), have much more variable speeds (0 to 50 knots or more, depending on the mission).

Military vessel movements include both surface and sub-surface operations. Navy vessels include ships, submarines and boats ranging in size from small, 22 ft. (7 m) rigid hull inflatable boats to aircraft carriers with lengths up to 1,092 ft. (333 m). The Marine Corps would operate small boats from 10 to 50 ft. (3 to 15.2 m) in length and include small unit riverine craft, rigid hull inflatable boats and amphibious combat vehicles. Coast Guard vessels range from small boats between 13 and 65 ft. (3.9 to 19.8 m) to large cutters with lengths up to 418 ft. (127.4 m).

The ability to detect a marine mammal and avoid a collision depends on a variety of factors including environmental conditions, ship design, size, speed, and manning, as well as the behavior of the animal. Differences between most large military ships and commercial ships also include the following:

- The operation of military vessels incorporates standard operating procedures for vessel safety that will benefit marine mammals through a reduction in the potential for vessel strike, as discussed in 2018 Final EIS/OEIS Section 2.3.3.2 (Vessel Safety). For example, military ships have personnel assigned to stand watch at all times, day and night, when moving through the water (i.e., when the vessel is underway). Watch personnel undertake extensive training to certify that they have demonstrated all necessary skills. While on watch, personnel employ visual search and reporting procedures in accordance with the U.S. Navy Lookout Training Handbook, Coast Guard, or civilian equivalent. Watch personnel are responsible for using correct scanning procedures while monitoring an assigned sector and reporting any indication of danger to the ship and personnel on board, such as a floating or partially submerged object or piece of debris, periscope, surfaced submarine, wisp of smoke, flash of light, or surface disturbance. As a standard collision avoidance procedure, watch personnel also monitor for marine mammals that have the potential to be in the direct path of the ship. Vessels are required to operate in accordance with applicable navigation rules, including Inland Navigation Rules (33 Code of Federal Regulations part 83) and the International Regulations for Preventing Collisions at Sea, which were formalized in the Convention on the International Regulations for Preventing Collisions at Sea, 1972. Applicable navigation requirements include, but are not limited to, Rule 5 (Lookouts) and Rule 6 (Safe Speed). These rules require that vessels at all times proceed at a safe speed so that proper and effective action can be taken to avoid collision and so they can be stopped within a distance appropriate to the prevailing circumstances and conditions.
- Many military ships have their bridges positioned closer to the bow, offering good visibility ahead of the ship.

- There are often aircraft associated with military readiness activities, which may support the detection of marine mammals in the vicinity or ahead of a vessel's present course.
- Military ships are generally much more maneuverable than commercial merchant vessels if marine mammals are spotted and the need to change direction is necessary.
- Military ships operate at the slowest speed possible consistent with either transit needs or training or testing needs. While minimum speed is intended as a fuel conservation measure particular to a certain ship class, secondary benefits include a better ability to detect and avoid objects in the water, including marine mammals.
- In many cases, military ships will likely operate within a sub-area of the Study Area for a period of time from 1 day to 2 weeks as compared to straight line point-to-point commercial shipping.
- Military vessel overall crew size, including bridge crew, is much larger than merchant ships allowing for more watch personnel on the bridge.
- When submerged, submarines are generally slow moving (to avoid detection) and therefore marine mammals at depth within the vicinity of a submarine are likely able to avoid collision with the submarine. When a submarine is transiting on the surface, there are Lookouts serving the same function as they do on surface ships.
- Vessels will implement mitigation to avoid or reduce potential impacts from vessel strikes on marine mammals (see Chapter 5, Mitigation).

The history of Navy and Coast Guard large whale strikes reported in the Study Area from 2009 to 2024 is provided in Figure 3.7-8. It is both Navy and Coast Guard policy to report all marine mammal strikes to NMFS as soon as feasible. The frequency of military vessel strikes reported in the scientific literature and NMFS databases are the result of the Navy's and Coast Guard's commitment to reporting vessel strikes (even if it cannot be confirmed to be a marine mammal), rather than a greater frequency of collisions relative to other ship types. Most documented vessel strikes of marine mammals involve commercial vessels and occur over or near the continental shelf (Laist et al., 2001), and reporting of whale strikes by commercial vessels is not required, therefore, reporting rates are unknown but likely to be much lower than actual occurrences.

In the Study Area, no large whales have been struck by the Navy since 2012. The most recent large whale strike in the Study Area occurred in early 2024 by the Coast Guard. Prior to this, the Coast Guard had not struck a whale in the Study Area since 2009. All reported strikes in the Study Area have been in the Virginia Capes Operating Area. In the most recent strikes reported by the Coast Guard, the whales were observed swimming away with no apparent injuries. While not all injuries are evident when a whale is struck, not all whale strikes result in mortality. In 2021, a small Navy vessel struck a dolphin in waters offshore Panama City, Florida. This was considered an anomaly (the only known Navy vessel dolphin strike), since dolphins are highly maneuverable and can avoid boat collisions in open water. Lastly, two manatees were struck by the Coast Guard in 2013.

In-water devices could pose a collision risk to marine mammals when operated at high speeds or when unmanned. In-water devices, such as unmanned underwater vehicles, and in-water devices towed from unmanned platforms that move slowly through the water are highly unlikely to strike marine mammals because the mammal could easily avoid the object. In-water devices towed by manned platforms are unlikely to strike a marine mammal because of the observers on the towing platform and other standard safety measures employed when towing in-water devices. Torpedoes (a type of in-water device) are generally smaller (several inches [in.] to 111 ft.) than most vessels. The Navy reviewed torpedo design features and a large number of previous anti-submarine warfare torpedo exercises to assess the potential of torpedo strikes on marine mammals. The tactical software that guides U.S. Navy torpedoes is sophisticated and would not identify a marine mammal as a target. All torpedoes are recovered after being fired and are reconfigured for reuse. In thousands of exercises in which torpedoes were fired or in-water devices used, there have been no recorded or reported instances of a marine mammal strike.

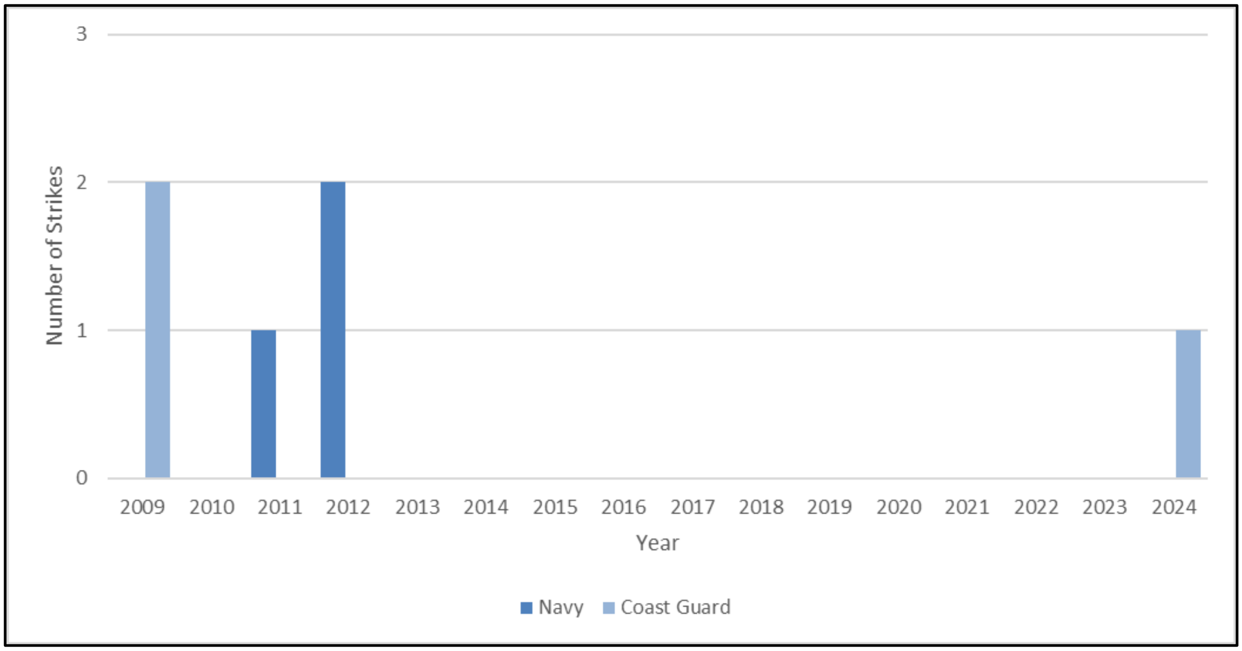


Figure 3.7-8: Large Whale Strikes in the Study Area by Year (2009 to 2024)

Since some in-water devices are identical to support craft, it is possible that marine mammals could respond to the physical presence of the device similar to how they respond to the physical presence of a vessel. It is possible that marine mammal species occur in areas that overlap with in-water device use and may experience some level of physical disturbance, but it is not expected to result in more than a momentary behavioral response.

3.7.3.4.1.1 Impacts from Vessels and In-Water Devices under Alternative 1

For all military readiness activities, vessel and in-water device activity would decrease from the 2018 Final EIS/OEIS (Table 3.0-9, Number and Location of Activities Including Vessels and Table 3.0-10, Number and Location of Activities Including In-Water Devices).

Under Alternative 1 for training:

- Vessel activity would occur in one new location (Gulfport, Mississippi) that it did not occur in the 2018 Final EIS/OEIS, and one area not previously analyzed (Pascagoula, Mississippi) in the 2018 Final EIS/OEIS. For all other locations, there would either be a decrease or similar amount of vessel activity.
- In-water device activity (including both expended and recovered water-based targets) would occur in one location not previously analyzed (Northeast Range Complexes Inshore) in the 2018 Final EIS/OEIS. For all other locations, there would either be a decrease, similar amount, or cessation of in-water device activity.

Under Alternative 1 for testing:

- Vessel activity would occur in five locations not previously analyzed (Other AFTT Areas; Northeast, Virginia Capes, and Gulf Range Complexes Inshore; Hampton Roads, Virginia) that it did not occur in for the 2018 Final EIS/OEIS. There would also be notable increases in vessel activity at the Naval Surface Warfare Center Panama City Division Testing Range; Naval Station Norfolk; and Pascagoula, Mississippi. For all other locations, there would either be a decrease, similar amount, or cessation of vessel activity.
- In-water device activity (including both expended and recovered water-based targets) would occur in four locations not previously analyzed (Gulf Range Complex Inshore; Bath, Maine; Newport, Rhode Island; and Pascagoula, Mississippi). For all other locations, there would either be a decrease, similar amount, or cessation of in-water device activity.

For locations without a notable increase in vessel and in-water device activity, the analysis from the 2018 Final EIS/OEIS remains valid; the updates to the affected environment noted in Section 3.7.2 (Affected Environment) do not alter the analysis because the general distribution and sensitivity of marine mammal taxa among military readiness locations has not changed.

For the new inshore location and locations not previously analyzed, standard operating procedures and mitigation will be implemented as in the currently existing areas. Consequently, the level at which physical disturbance and strikes are expected to occur is likely to remain consistent with or lower than the previous decade. For locations with notable increases in activity, the impact analysis that was conducted in the 2018 Final EIS/OEIS would not change because the infrequent and localized nature of vessel and in-water device use remains an accurate characterization of the Proposed Action in those locations.

Most military readiness activities involve vessel movement. Vessel strikes to marine mammals are not associated with any specific training or testing activity but rather a limited, sporadic, and accidental result of vessel movement within the Study Area. Vessel movement can be widely dispersed throughout the Study Area, occurring in both offshore and inshore water areas. Physical disturbance from large vessels and in-water devices would be more likely in the continental shelf portions than in the open ocean portions of the Study Area because of the concentration of large vessel movements and in-water device activities in those areas. Marine mammal species that occur over the continental shelf would therefore have a greater potential for impacts, and include mysticete, odontocete, and pinniped species. Large vessels may occasionally be required to operate at speeds that are higher than normal operating speeds, which may pose a greater strike risk to marine mammals because there would be less time for the vessel crew to detect a marine mammal and maneuver to avoid a strike, and there would be less time over a given distance for the animal to react and avoid the vessel. However, the potential for greater risk may be offset by marine mammal avoidance behavior occurring at a greater distance due to the higher noise levels that are typically generated by any vessel transiting at high speed. Historically, the few vessel strikes of whales that have occurred in the Study Area (see Figure 3.7-8) have not been associated with vessels operating at higher speeds.

The use of small crafts associated with training activities within inshore waters would occur on a more regular basis than offshore vessel use and typically involve high speed (greater than 10 knots) vessel movements. The inshore waters are generally more confined waterways where mysticetes and offshore odontocete species do not typically occur. As stated in Section 3.7.3.4.1 (Impacts from Vessels and In-Water Devices under Alternative 1), odontocetes known to occur within inshore waters, such as bottlenose dolphins and harbor porpoises, are not as susceptible to vessel strikes as compared to mysticetes. The Action Proponents do not anticipate an odontocete strike as a result of training activities in inshore waters.

Physical disturbance from small crafts would be more likely in the inshore water locations listed in Table 3.0-9 (Number and Location of Activities Including Vessels), especially in areas where high-speed training activities occur. Marine mammal species with the greatest potential for impact are those that occur in the inshore waters (e.g., bottlenose dolphins, harbor porpoise, manatees, and pinniped species).

Testing activities primarily involve large vessel movement. However, the number of activities that include large vessel movement and use for testing is comparatively lower than the number of training activities. In addition, testing often occurs jointly with a training event, so it is likely that the testing activity would be conducted from a training vessel.

Propulsion testing, which sometimes includes ships operating at speeds in excess of 30 knots, and use of large high-speed unmanned surface vessels occurs infrequently but may pose a higher strike risk because of the high speeds at which some vessels need to transit to complete the testing activity. These activities would occur in the Northeast, Virginia Capes, Jacksonville, and Gulf Range Complexes. However, there are just a few of these events proposed per year, so the increased risk is nominal compared to all vessel use proposed for testing activities under Alternative 1. Testing activities involving the use of in-water devices would occur in the Study Area at any time of year.

Military readiness activities involving vessels and in-water devices may occur year-round; therefore, impacts from physical disturbance would depend on each species' seasonal patterns of occurrence or degree of residency in the continental shelf portions of the Study Area. As previously indicated, any physical disturbance from vessel movements and use of in-water devices is not expected to result in more than a momentary behavioral response.

Historical vessel use (steaming days) and ship strike data were used to calculate the probability of a direct strike during proposed training activities in the offshore portion of the Study Area by a large Navy or Coast Guard vessel. Between 2009 and early 2024, there were a total of 42,748 Navy steaming days (days where ships were at sea in the Study Area) and 26,756 steaming days where Coast Guard ships were at sea in the Study Area. During that same time, there were three Navy vessel strikes and three Coast Guard vessel strikes. This corresponds to an average of 14,249 Navy steaming days per strike and 8,919 Coast Guard steaming days per strike.

These values were used to determine the rate parameters to calculate a series of Poisson probabilities (a Poisson distribution is often used to describe random occurrences when the probability of an occurrence is small, e.g., count data such as cetacean sighting data, or in this case strike data, are often described as a Poisson or over-dispersed Poisson distribution).

In modeling strikes as a Poisson process, we assume this strike rate for the future, and we use the Poisson distribution to estimate the number of strikes over a defined time period:

$$P \left\langle n \middle| \mu \right\rangle = \frac{e^{-\mu} \bullet \mu^{n}}{n!}$$

P($n|\mu$) is the probability of observing *n* events in some time interval, when the expected number of events in that time interval is *u*.

Based on the annual steaming days average from 2009 to early 2024, the Action Proponents estimate that 18,702 Navy and 11,706 Coast Guard steaming days will occur over the seven-year period associated with the anticipated MMPA authorization. Given a strike rate of 0.000070 Navy strikes per steaming day, and 0.000112 Coast Guard strikes per steaming day, the calculated number of whale strikes over a seven-year period would be 1.31 strikes by the Navy and 1.31 strikes by the Coast Guard. Results of the strike probability analysis based on a Poisson distribution are shown in Table 3.7-18.

Most Navy-reported whale strikes are not identified to the species level; however, the Action Proponents predict that large whales have the greatest potential to be struck by a large vessel as a result of military readiness activities over the continental shelf portion of the Study Area.

Table 3.7-18: Probability of Whale Strike in a 7-Year Period

Number of Whales	*Percent Probability of Strike in a 7-Year Period – 2018 Final EIS/OEIS (Navy)*	*Percent Probability of Strike in a 7-Year Period – Supplemental EIS/OEIS (Navy)*	*Percent Probability of Strike in a 7-Year Period – Supplemental EIS/OEIS (Coast Guard)*
0	12	27	27
1	26	35	35
2	27	23	23
3	19	10	10
4	10	3	3
5	4	1	1

Notes: EIS = Environmental Impact Statement; OEIS = Overseas Environmental Impact Statement

Feeding areas for fin whales, humpback whales, minke whales, and sei whales as well as a small and resident area for harbor porpoises have been identified as key habitats that seasonally overlap with portions of the Northeast Range Complexes within the Study Area (LaBrecque et al., 2015a). Military readiness activities that involve vessel movements and the use of in-water devices within the Northeast Range Complexes could occur year-round, however, any potential overlap with feeding activities in these biologically important areas would be seasonal. Harbor porpoises resident to the northern Gulf of Maine and southern Bay of Fundy within the Northeast Range Complexes may be impacted year-round. Physical disturbance from vessels and in-water device use may result in a momentary behavioral response but would not result in abandonment of feeding behaviors in these areas or cause resident marine mammals to avoid these areas.

LaBrecque et al. (2015a) also identified a migratory corridor, two reproductive areas, and three feeding areas for North Atlantic right whales that seasonally overlap with portions of the Study Area, including the Northeast, Virginia Capes, Navy Cherry Point, and Jacksonville Range Complexes. Any potential overlap of activities that involve vessel movement and the use of in-water devices with seasonal presence of North Atlantic right whales while engaged in migratory, reproductive, and feeding activities in these biologically important areas would be limited to those times of year. Vessel movement and in-water device use may occur within the North Atlantic right whale's designated critical habitat year-round. Physical and biological features identified for North Atlantic right whale conservation and considered in the critical habitat designation include oceanic conditions that distribute and aggregate dense concentrations of copepods within the northern foraging habitats and water temperatures, depths, and sea surface conditions that are suitable for the southern calving habitats (National Marine Fisheries Service, 2015). These habitat features would not be impacted by vessels and in-water devices.

It is possible that North Atlantic right whales encountered could be disturbed by the physical presence of large vessels and in-water devices. Disturbance within the southeast critical habitat is most likely to occur in winter months and during summer months within the northeast critical habitat; however, the direct route that the Navy predominantly uses for large vessels between Norfolk and Jacksonville largely avoids the coastal North Atlantic right whale migratory corridor and reproductive areas, as well as critical habitat, especially off the coasts of South Carolina and Georgia. Disturbance due to the physical presence of vessels and in-water devices is not expected to result in more than a momentary behavioral response and would not result in a permanent abandonment or alteration of migratory, reproductive, and feeding behaviors in these areas. Refer to Section 3.7.3.1.4 (Impacts from Vessel Noise) for a discussion on disturbance and impacts caused by vessel noise. The Action Proponents do not anticipate that it will strike a North Atlantic right whale because of the extensive mitigation in place to reduce the risk of a strike to that species.

LaBrecque et al. (2015b) also identified one year-round small and resident area for Rice's whale (Bryde's whale in LaBrecque et al., 2015b)) and three small and resident areas for bottlenose dolphins that overlap with the Gulf Range Complex. Five additional small and resident areas for bottlenose dolphins were identified along the U.S. East Coast (LaBrecque et al., 2015a), three of which overlap with the Jacksonville Range Complex, including Naval Submarine Base Kings Bay and Naval Station Mayport, and two of which overlap with the Navy Cherry Point Range Complex. Training activities that involve large vessels and in-water device use within the Navy Cherry Point, Jacksonville, and Gulf Range Complexes could occur year-round. Physical disturbance from the presence of large vessels and in-water devices may result in a momentary behavioral response but would not cause resident marine mammals to avoid these areas.

The use of small crafts associated with training activities within inshore waters would occur on a more regular basis than offshore vessel use and typically involve high speed (greater than 10 knots) vessel movements. The inshore waters are generally more confined waterways where mysticetes and offshore odontocete species do not typically occur. Odontocetes known to occur within inshore waters, such as bottlenose dolphins and harbor porpoises, are not as susceptible to vessel strikes as mysticetes. In addition, no vessel strikes of marine mammals have been reported due to inshore training activities (the previously mentioned dolphin strike occurred when a vessel involved in a testing activity was returning to port). Therefore, the Action Proponents do not anticipate that it will strike an odontocete as a result of training activities in inshore waters.

Pinniped occurrence within the northeast and mid-Atlantic portions of the Study Area is seasonal, and very close to shore where the majority of large vessel movements are conducted. Pinnipeds also seasonally occur within inshore waters and near the mouth of the Chesapeake Bay where high-speed small craft movements associated with inshore training would be conducted year-round. While it is possible that during military readiness activities, large vessels could transit outside the range complex and train anywhere within the Study Area. Large vessel movements are expected to be very infrequent and would have limited overlap with pinniped occurrence over continental shelf waters. High-speed small craft movements within the lower Chesapeake Bay would occur frequently; however, pinnipeds spend large amounts of time on land and display high maneuverability in the water, suggesting they could avoid interactions with small crafts. Compared to cetaceans and sirenians, pinnipeds are not as susceptible to vessel strikes; therefore, the Action Proponents do not anticipate that it will disturb or strike pinnipeds.

The Action Proponents do not anticipate encountering a manatee during the use of in-water devices from military readiness activities. Manatees occur in a very limited portion of the Study Area, primarily close to shore in the inshore and coastal waters of the Mid-Atlantic States and the Gulf coast of Florida, and there are few activities that may involve the use of in-water devices there. Potential impacts on manatees would only result from military readiness activities that include small craft use in the inshore waters of the Mid-Atlantic States and the Gulf coast of Florida. High-speed small craft movements would primarily occur within the Northeast Range Complexes Inshore, VACAPES Range Complex Inshore, and Jacksonville Range Complex Inshore. Military readiness activities that occur in this northern portion of the Study Area would not have an impact on manatees since they typically do not occur there. Training activities that use small crafts within inshore waters of the Jacksonville Range Complex Inshore, Key West Range Complex Inshore, and Gulf Range Complex Inshore are limited, yet have the potential to impact manatees in these areas.

In the St. Johns River, areas of known manatee occurrence have been designated by the Florida Fish and Wildlife Conservation Commission as Manatee Protection Zones. These areas are marked with signs and enforce vessel speed restrictions to protect manatees from boat strikes. Training units follow all manatee protection rules and are briefed on requirements before each exercise. Similar precautions would be followed for high-speed small craft movements in Port Canaveral and St. Andrew Bay.

Vessel movements within inshore waters of Savannah, Georgia; Kings Bay, Georgia; Mayport, Florida; St. Johns River; Port Canaveral, Florida; Tampa, Florida; and St. Andrew Bay would co-occur with manatees. Implementation of mitigation measures in these areas would reduce the likelihood of a strike.

There have been no reported manatee boat strikes as a result of Navy training in inshore waters of the Study Area, but there have been two manatee strikes by the Coast Guard in the St. Mary’s River. With the implementation of mitigation as described in Section 5.6.2 (Mitigation Specific to Vessels, Vehicles, and Towed In-Water Devices) and Section 5.7.7 (Inshore Manatee and Sea Turtle Mitigation Areas), a manatee strike is not anticipated. Disturbance due to the physical presence of vessels and in-water devices is not expected to result in more than a momentary behavioral response. Manatees also occur in the coastal waters of Puerto Rico, which is within the Study Area, but no training or testing is anticipated in these areas. Based on these factors and the implementation of mitigation, the Action Proponents do not anticipate that it will disturb or strike a West Indian manatee.

Vessel movements and in-water device use would occur within West Indian manatee designated critical habitat, specifically within inshore waters associated with Mayport and Port Canaveral, Florida, and the St. Johns River, year-round. Disturbance within manatee habitat is most likely to occur during spring, summer, or fall, because manatees generally move farther inshore during winter. The current critical habitat designation for the West Indian manatee does not identify specific physical and biological features essential for species conservation, but essential habitat features have been reported to include warm water refuges, various food sources (seagrasses and freshwater vegetation), travel corridors, and shelter for calving (75 *Federal Register* 1574). These habitat features would not be impacted by vessel and in-water device use during military readiness activities within the designated critical habitat.

Vessel movement and in-water device use related to military readiness activities occur near marine mammals only on an incidental basis. Mitigation measures described in Chapter 5 (Mitigation) will minimize interactions with marine mammals, which would further reduce any potential physical disturbance and direct strike impacts from vessels. Long-term consequences to populations of marine mammals are not expected to result from vessel movement and in-water device use associated with the proposed military readiness exercises.

The use of vessels during military readiness activities as described under Alternative 1 could result in the unintentional taking of marine mammals incidental to those activities, as defined by the MMPA. The Action Proponents have requested authorization from NMFS as required by section 101(a)(5)(A) of the MMPA in that regard. The use of in-water devices during training activities as described under Alternative 1 would not result in the unintentional taking of marine mammals incidental to those activities, as defined by the MMPA.

The Action Proponents have concluded that the use of vessels and in-water devices during military readiness activities as described under Alternative 1 would have no effect on North Atlantic right whale critical habitats, and proposed Rice's whale critical habitat, as defined by the ESA. The use of vessels will have no effect on West Indian manatee critical habitat, and the use of in-water devices during training events will have no effect on West Indian manatee critical habitat, testing activities are not applicable. The use of vessels and in-water devices may affect the blue whale, Rice's whale, fin whale, North Atlantic right whale, sei whale, sperm whale, and West Indian manatee, as defined by the ESA. The Action Proponents have consulted with NMFS and USFWS as required by section 7(a)(2) of the ESA regarding potential impacts to those ESA-listed species that may be affected by the use of vessels and in-water devices during military readiness activities.

The analysis conclusions for vessel and in-water device use with training activities under Alternative 1 are consistent with a moderate (due to limited potential for injury/mortality) impact on marine mammal populations.

3.7.3.4.1.2 Impacts from Vessels and In-Water Devices under Alternative 2

Impacts from vessels and in-water device activities under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing.

3.7.3.4.2 Impacts from Military Expended Materials

This section analyzes the strike potential to marine mammals from the following categories of military expended materials: (1) all sizes of non-explosive practice munitions, (2) fragments from high-explosive munitions, (3) expendable targets and target fragments, and (4) expended materials other than munitions, such as sonobuoys, expended bathythermographs, and torpedo accessories. For a discussion of the types of activities that use military expended materials, refer to Appendix B (Activity Stressor Matrices) and for a discussion on where items would be used or expended under each alternative, see Table 3.0-11 (Number and Location of Non-Explosive Practice Munitions Expended during Military Readiness Activities) through Table 3.0-14 (Number and Location of Other Military Materials Expended during Military Readiness Activities). For physical disturbance and strike stressors as they relate to marine mammals, impacts from fragments from high-explosive munitions are included in the analysis presented in Section 3.7.3.2 (Explosive Stressors), and are not considered further in this section. Potential impacts from military expended materials as ingestion stressors to marine mammals are discussed in Section 3.7.3.6.1 (Impacts from Military Expended Materials – Munitions) and Section 3.7.3.6.3 (Impacts from Military Expended Materials Other Than Munitions).

The primary concern is the potential for a marine mammal to be hit with military expended material at or near the water's surface. While disturbance or strike from an item falling through the water column is possible, it is not very likely given the objects generally sink slowly through the water and can be avoided by most marine mammals. Therefore, the discussion of military expended materials strikes focuses on the potential of a strike at the surface of the water.

While no strike from military expended materials has ever been reported or recorded, the possibility of a strike still exists. Therefore, the potential for marine mammals to be struck by military expended materials was evaluated using statistical probability modeling to estimate potential direct strike exposures. To estimate potential direct strike exposures, a scenario was calculated using the marine mammal species with the highest average monthly density in areas with the highest amounts of military expended material expenditures, specifically the Virginia Capes Range Complex. This is considered a worst-case scenario because, as described below, exposure calculations of a single military item hitting an animal assumes all activities would be conducted during the season associated with the marine mammal species with the highest average seasonal density and that all marine mammals have equal densities. These highest estimates would provide reasonable comparisons for all other areas and species. Direct strike exposures of marine mammal species protected under the ESA are estimated separately from non-ESA species. Because the ESA has specific standards for understanding the likelihood of impacts on each endangered species, estimates were made for all endangered marine mammal species found in the areas where the highest levels of military expended materials would be expended. In this way, the appropriate ESA conclusions could be based on the highest estimated probabilities of a strike for those species. Specific details of the modeling approach, including model selection and calculation methods, are presented in Appendix I (Military Expended Materials and Direct Strike Impact Analysis). This analysis provides a reasonably high level of certainty that marine mammals would not be struck by military expended materials.

3.7.3.4.2.1 Impacts from Military Expended Materials under Alternative 1

For both training and testing activities, the number of military expended materials would decrease from the 2018 Final EIS/OEIS (see Supplemental EIS/OEIS Table 3.0-11, Number and Location of Non-Explosive Practice Munitions Expended during Military Readiness Activities; Table 3.0-12, Number and Location of Explosives that May Result in Fragments Used during Military Readiness Activities; Table 3.0-13, Number and Location of Targets Expended during Military Readiness Activities; Table 3.0-14, Number and Location of Other Military Materials Expended during Military Readiness Activities; and Table 3.0-17, Number and Location of Wires and Cables Expended during Military Readiness Activities).

Under Alternative 1 for training:

- Military expended materials would occur in one location not previously analyzed (Key West Range Complex Inshore) in the 2018 Final EIS/OEIS. For all other locations, there would be either a decrease, cessation of use, or similar amount of military expended materials.

Under Alternative 1 for testing:

- Military expended materials would occur in three locations not previously analyzed (other AFTT Areas; Naval Submarine Base Kings Bay, and Port Canaveral, Florida) in the 2018 Final EIS/OEIS. For all other locations, there would either be a decrease of military expended materials.

For locations without a notable increase in military expended materials, the analysis from the 2018 Final EIS/OEIS remains valid; the updates to the affected environment noted in Section 3.7.2 (Affected Environment) do not alter the analysis because the general distribution and sensitivity of marine mammal taxa among military readiness locations has not changed.

For locations with notable increases in activity, the impact analysis that was conducted in the 2018 Final EIS/OEIS would not change because the localized nature of military expended materials remains an accurate characterization of the Proposed Action in those locations.

For locations not previously analyzed, these increases would not change the impact analysis that was conducted in the 2018 Final EIS/OEIS because the likelihood of marine mammals encountering military expended materials remains low for marine mammals.

Military readiness activities involving military expended materials as described under Alternative 1 would not result in the unintentional taking of marine mammals incidental to those activities, as defined by the MMPA, and potential impacts would be considered negligible.

Physical and biological features identified for North Atlantic right whale conservation, and considered in the critical habitat designation, include water temperatures, depths, and sea surface conditions that are suitable for the southern calving habitats (National Marine Fisheries Service, 2015). These habitat features would not be impacted by training or testing activities involving military expended materials.

Physical and biological features identified for Rice's whale conservation and considered in the proposed critical habitat designation include continental shelf and slope associated waters between the 100 to 400m isobaths that support individual growth, reproduction, and development, social behavior, and overall population growth through sufficient prey density, waters with elevated productivity, water temperatures of 10 to 19° C, low pollution, and sufficiently quiet conditions (88 *Federal Register* 47453). These habitat features would not be impacted by training or testing activities involving military expended materials.

The current critical habitat designation for the West Indian manatee does not identify specific physical and biological features essential for species conservation, but essential habitat features have been reported to include warm water refuges, various food sources (seagrasses and freshwater vegetation), travel corridors, and shelter for calving (75 *Federal Register* 1574). These habitat features would not be impacted by training or testing activities involving military expended materials.

The Action Proponents have concluded that activities involving military expended materials may affect the blue whale, Rice's whale, fin whale, North Atlantic right whale, sei whale, sperm whale, and West Indian manatee, as defined by the ESA. The Action Proponents have concluded that activities involving military expended materials will have no effect on the North Atlantic right whale and West Indian manatee critical habitats, or the proposed Rice's whale critical habitat. The Action Proponents have consulted with NMFS and USFWS as required by section 7(a)(2) of the ESA regarding potential impacts to those ESA-listed species that may be affected by training or testing activities involving military expended materials.

The analysis conclusions for military expended materials for military readiness activities under Alternative 1 are consistent with a negligible impact on marine mammal populations.

3.7.3.4.2.2 Impacts from Military Expended Materials under Alternative 2

Impacts from military expended materials under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species and critical habitat are the same for both training and testing.

3.7.3.4.3 Impacts from Seafloor Devices

Table 3.7-16 contains a summary of the background information used to analyze the potential impacts of seafloor devices on marine mammals. For a listing of the types of activities that include seafloor devices, refer to Appendix B (Activity Stressor Matrices). These include items placed on, dropped on, or moved along the seafloor such as mine shapes, anchor blocks, anchors, bottom-placed devices, and bottom-crawling unmanned underwater vehicles. The likelihood of any marine mammal species encountering seafloor devices is considered low because these items are either stationary or move very slowly along the bottom. In the unlikely event that a marine mammal is in the vicinity of a seafloor device, the stationary or very slowly moving devices would not be expected to physically disturb or alter natural behaviors of marine mammals. The only seafloor device used during military readiness activities that has the potential to strike a marine mammal at or near the surface is an aircraft-deployed mine shape, which is used during aerial mine laying activities. These devices are identical to non-explosive practice bombs, and, therefore, the analysis of the potential impacts from those devices is covered in Section 3.7.3.4.2 (Impacts from Military Expended Materials) and is not further analyzed in this section.

3.7.3.4.3.1 Impacts from Seafloor Devices under Alternative 1

For both training and testing activities, the proposed use of seafloor devices would increase from the 2018 Final EIS/OEIS devices (Table 3.0-15, Number and Location of Activities that Use Seafloor Devices).

Under Alternative 1 for training:

- Seafloor device use would occur in four locations not previously analyzed (Northeast Range Complexes; Other AFTT Areas; Jacksonville Range Complex Inshore, Naval Station Mayport), and one new area (Gulfport, Mississippi) that was not in the 2018 Final EIS/OEIS. There would also be notable increases in seafloor devices at the Virginia Capes Range Complex, Virginia Capes Range Complex Inshore, and Key West Range Complex Inshore. For all other locations, there would either be a decrease, similar amount, or cessation of seafloor device use.

Under Alternative 1 for testing:

- Seafloor device use would occur in five locations not previously analyzed (Virginia Cape Range Complex Inshore, Key West Range Complex Inshore, Naval Submarine Base New London, Naval Station Mayport, and Port Canaveral, Florida) in the 2018 Final EIS/OEIS. There would also be notable increases in seafloor devices in the Northeast and Jacksonville Range Complexes, and in the Naval Surface Warfare Center Panama City Testing Range. For all other locations, there would either be a decrease or similar amount of seafloor devices.

For locations without a notable increase in seafloor devices, the analysis from the 2018 Final EIS/OEIS remains valid; the updates to the affected environment noted in Section 3.7.2 (Affected Environment) do not alter the analysis because the general distribution and sensitivity of marine mammal taxa among military readiness locations has not changed.

For locations with notable increases in activity, the impact analysis that was conducted in the 2018 Final EIS/OEIS would not change because the infrequent and localized nature of seafloor device activity remains an accurate characterization of the Proposed Action in those locations. There is a reasonable level of certainty that no marine mammals would be struck by seafloor devices.

For new locations and ones not previously analyzed, these increases would not change the impact analysis that was conducted in the 2018 Final EIS/OEIS because the likelihood of marine mammals encountering a seafloor device remains low for marine mammals.

Military readiness activities that involve seafloor devices would occur within the North Atlantic right whale southeast critical habitat area year-round but would not occur in the Northeast Critical Habitat Area. Since North Atlantic right whales occur within the southeast critical habitat area primarily in winter months, any potential overlap with military readiness activities in these areas would be seasonal. The Action Proponents do not anticipate that the use of seafloor devices would result in physical disturbance or direct strike of North Atlantic right whales. Physical and biological features identified for North Atlantic right whale conservation, and considered in the critical habitat designation, include water temperatures, depths, and sea surface conditions that are suitable for the southern calving habitats (National Marine Fisheries Service, 2015). These habitat features would not be impacted by seafloor devices.

Physical and biological features identified for Rice's whale conservation and considered in the proposed critical habitat designation include continental shelf and slope associated waters between the 100 to 400m isobaths that support individual growth, reproduction, and development, social behavior, and overall population growth through sufficient prey density, waters with elevated productivity, water temperatures of 10 to 19° C, low pollution, and sufficiently quiet conditions (88 *Federal Register* 47453). These habitat features would not be impacted by seafloor devices.

There is a low likelihood that the West Indian manatee would be exposed to seafloor devices during military readiness activities in the offshore areas where the Action Proponents generally conduct the types of activities that use these devices, due to their primarily inshore/coastal distribution. Military readiness activities that use seafloor devices could occur within West Indian manatee critical habitat, specifically in inshore waters near Port Canaveral, Florida, and to a limited extent, Mayport, Florida. The Action Proponents do not anticipate that the use of seafloor devices would result in physical disturbance or direct strike of manatees. The current critical habitat designation for the West Indian manatee does not identify specific physical and biological features essential for species conservation, but essential habitat features have been reported to include warm water refuges, various food sources (seagrasses and freshwater vegetation), travel corridors, and shelter for calving (75 *Federal Register* 1574). These habitat features would not be impacted by seafloor devices.

The use of seafloor devices during military readiness activities as described under Alternative 1 would not result in the unintentional taking of marine mammals incidental to those activities, as defined by the MMPA, and potential impacts would be considered negligible.

The Action Proponents have concluded that the use of seafloor devices during military readiness activities as described under Alternative 1 would have no effect on North Atlantic right whale and West Indian manatee critical habitats, or proposed Rice's whale critical habitat, as defined by the ESA. The use of seafloor devices may affect the blue whale, Rice's whale, fin whale, North Atlantic right whale, sei whale, sperm whale, and West Indian manatee, as defined by the ESA. The Action Proponents have consulted with NMFS and USFWS as required by section 7(a)(2) of the ESA regarding potential impacts to those ESA-listed species that may be affected by training activities involving seafloor devices.

The analysis conclusions for seafloor devices for military readiness activities under Alternative 1 are consistent with a negligible impact on marine mammal populations.

3.7.3.4.3.2 Impacts from Seafloor Devices under Alternative 2

Impacts from seafloor device activities under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing.

3.7.3.5 Entanglement Stressors

Table 3.7-19 contains brief summaries of background information that is relevant to analyses of impacts for each entanglement substressor (wires and cables, decelerators/parachutes, and biodegradable polymer). Details on the updated information in general, as well as effects specific to each substressor, is provided in Appendix G (Non-Acoustic Impacts Supporting Information). Links to substressor details that are unchanged from the 2018 Final EIS/OEIS (Section 3.7.3.5, Entanglement Stressors) are provided in Table 3.7-19.

Table 3.7-19: Entanglement Stressors Background Information Summary

Substressor	***Background Information Summary***
Wires and cables	Wires and cables are unlikely to impact marine mammals. • The chance that an individual animal would encounter expended cables or wires is most likely low based on: (1) the sparse distribution of both the cables and wires expended throughout the Study Area, (2) the fact that the wires and cables will sink upon release, and (3) the relatively few marine mammals that are likely to feed on the bottom in the deeper waters where wires and cables would be expended. • It is very unlikely that an animal would get entangled even if it encountered a cable or wire while it was sinking or upon settling to the seafloor. • A marine mammal would have to swim through loops, become twisted within the cable or wire, or in the case of mysticetes, get the cable or wire stuck in their baleen to become entangled, and given the properties of the expended wires (low breaking strength, sinking rates, and reluctance to coiling or looping) this is unlikely.
Decelerators/ parachutes	Entanglement of a marine mammal in a decelerator/parachute assembly at the surface or within the water column would be unlikely. • This is due to decelerator/parachute size and distribution of decelerators/parachutes expended in the Study Area. The decelerator/parachute would have to land directly on an animal, or an animal would have to swim into it and become entangled within the cords or fabric panel before it sinks or while it is sinking through the water column. • The majority of small and medium decelerators/parachutes expended will occur in deep ocean areas and sink to the bottom relatively quickly. • The main potential for entanglement is with the large and extra-large decelerators/parachutes. While the large parachutes would eventually sink and flatten, there is the potential that these decelerators/parachutes could remain suspended in the water column or billow at the seafloor for a longer period of time before flattening. The length of the parachute lines poses an entanglement risk as well.
Biodegradable polymer	It is unlikely a marine mammal would become entangled in a biodegradable polymer. • Based on the constituents of the biodegradable polymer the Navy proposes to use, it is anticipated that the material would breakdown into small pieces within a few days to weeks. This would breakdown further and dissolve into the water column within weeks to a few months. • The final products which are all environmentally benign would be dispersed quickly to undetectable concentrations. Unlike other entanglement stressors, biodegradable polymers only retain their strength for a relatively short period of time, therefore the potential for entanglement by a marine mammal would be limited.

Table 3.7-19: Entanglement Stressors Background Information Summary (continued)

Substressor	*Background Information Summary*
Biodegradable polymer (continued)	• Furthermore, the longer the biodegradable polymer remains in the water, the weaker it becomes making it more brittle and likely to break. A marine mammal would have to encounter the biodegradable polymer immediately after it was expended for it to be a potential entanglement risk. If an animal were to encounter the polymer even a few hours after it was expended, it is very likely that it would break easily and would no longer be an entanglement stressor.

3.7.3.5.1 Impacts from Wires and Cables

For a listing of the types of activities that include wires and cables, refer to Appendix B (Activity Stressor Matrices).

Marine mammal species that occur within the Study Area were evaluated based on the likelihood of encountering these items. Marine mammal species that occur where these military readiness activities take place and forage on the bottom could encounter these items once they settle to the seafloor.

An evaluation of potential environmental impacts related to guidance wire left at sea where torpedo tests are conducted by the Navy suggests there is an low entanglement potential for marine animals found within these range areas (Swope & McDonald, 2013). As indicated in the report by Neilson et al. (2009), a large percentage of whales have been non-lethally entangled in their lifetime, suggesting some degree of ability to become disentangled. So, while an animal may initially become entangled in a cable or wire while either swimming in the water column or feeding on the bottom, they may become free in situations where the item breaks or if it is only loosely attached and the animal is able to maneuver to free itself from permanent entanglement. As a result, no long-term impacts would occur. Based on the estimated concentration of expended cables and wires, impacts from cables or wires are unlikely to occur. In fact, data suggests that torpedo guidance wires do not present a physical hazard in the marine environment (Swope & McDonald, 2013).

3.7.3.5.1.1 Impacts from Wires and Cables under Alternative 1

For training activities, the use of wires and cables would increase overall from the 2018 Final EIS/OEIS, and for testing activities, the use of wires and cables would decrease overall (Table 3.0-17, Number and Location of Wires and Cables Expended during Military Readiness Activities).

Under Alternative 1 for training:

- The use of wires and cables would occur in one location not previously analyzed (Key West Range Complex) in the 2018 Final EIS/OEIS. There would also be a notable increase in the use of wires and cables in the Virginia Capes and Jacksonville Range Complexes. For all other locations, there would either be the same amount or a similar amount of wires and cables.

Under Alternative 1 for testing:

- The use of wires and cables would occur in one area not previously analyzed (Other AFTT Areas) in the 2018 Final EIS/OEIS. There would also be a notable increase in wires and cables in the Virginia Capes and Key West Range Complexes. For all other locations, there would either be a decrease or similar amount of wires and cables.

For locations without a notable increase in wires and cables, the analysis from the 2018 Final EIS/OEIS remains valid; the updates to the affected environment noted in Section 3.7.2 (Affected Environment) do not alter the analysis because the general distribution and sensitivity of marine mammal taxa among military readiness locations has not changed.

For locations with notable increases in activity, the impact analysis that was conducted in the 2018 Final EIS/OEIS would not change because the infrequent and localized nature of wire and cable releases remains an accurate characterization of the Proposed Action in those locations.

For locations not previously analyzed, these increases would not change the impact analysis that was conducted in the 2018 Final EIS/OEIS because the likelihood of marine mammals encountering a wire or cable and becoming entangled remains low for marine mammals.

Marine mammals resident to, or engaging in migratory, reproductive, and feeding behaviors within the range complexes of the Study Area may encounter wires expended during military readiness activities. Based on the analysis in Appendix G (Non-Acoustic Impacts Supporting Information), and the low concentration of expended wires combined with their physical characteristics, the Action Proponents anticipate that no marine mammals would become entangled.

Military readiness activities that expend wires would occur within the Northeast and Southeast North Atlantic right whale critical habitat year-round. Since North Atlantic right whales occur within the southeast critical habitat area primarily in winter months and occur within the northeast critical habitat area during summer months, any potential overlap with military readiness activities in these areas would be seasonal. Physical and biological features identified for North Atlantic right whale conservation and considered in the critical habitat designation include oceanic conditions that distribute and aggregate dense concentrations of copepods within the northern foraging habitats and water temperatures, depths, and sea surface conditions that are suitable for the southern calving habitats (National Marine Fisheries Service, 2015). These habitat features would not be impacted by wires and cables.

Physical and biological features identified for Rice's whale conservation and considered in the proposed critical habitat designation include continental shelf and slope associated waters between the 100 to 400m isobaths that support individual growth, reproduction, and development, social behavior, and overall population growth through sufficient prey density, waters with elevated productivity, water temperatures of 10-19° C, low pollution, and sufficiently quiet conditions (88 *Federal Register* 47453). These habitat features would not be impacted by wires and cables.

Although manatees may occur in coastal areas of the Gulf of America, military readiness activities that expend wires would not take place in shallow waters where manatees would be feeding and potentially encounter these items on the seafloor. Training activities that expend wires will not occur within West Indian manatee critical habitat.

Although manatees may occur in coastal, estuarine, and riverine areas along the southeast and Gulf of America coasts of the U.S., testing activities that use cables, guidance wires, and sonobuoy cables would not take place in shallow waters where manatees would be feeding and therefore potentially encounter these items on the seafloor. Testing activities that expend wires and cables would be conducted within a small portion of West Indian manatee critical habitat that occurs within the South Florida Ocean Measurement Facility. The potential for wires and cables to be expended in this area would be very low based on the limited overlap between West Indian manatee critical habitat and the South Florida Ocean Measurement Facility area. It is not anticipated that a West Indian manatee would become entangled in expended wires and cables. The current critical habitat designation for the West Indian manatee does not identify specific physical and biological features essential for species conservation, but essential habitat features have been reported to include warm water refuges, various food sources (seagrasses and freshwater vegetation), travel corridors, and shelter for calving (75 *Federal Register* 1574). These habitat features would not be impacted by cables and wires expended during testing activities.

The use of wires during military readiness activities as described under Alternative 1 will not result in the unintentional taking of marine mammals incidental to those activities, as defined by the MMPA, and potential impacts are considered negligible.

The Action Proponents have concluded that the use of wires during military readiness activities as described under Alternative 1 will have no effect on North Atlantic right whale critical habitat, and proposed Rice's whale critical habitat, and are not applicable to West Indian manatee critical habitat, as defined by the ESA. The use of wires may affect the blue whale, Rice's whale, fin whale, North Atlantic right whale, sei whale, and sperm whale, and West Indian manatee, as defined by the ESA. The Action Proponents have consulted with NMFS and USFWS as required by section 7(a)(2) of the ESA regarding potential impacts to those ESA-listed species that may be affected by the use of wires during military readiness activities.

The analysis conclusions for wires and cables for military readiness activities under Alternative 1 are consistent with a negligible impact on marine mammal populations.

3.7.3.5.1.2 Impacts from Wires and Cables under Alternative 2

Impacts from wires and cables under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing.

3.7.3.5.2 Impacts from Decelerators/Parachutes

Parachutes used during the proposed activities range in size from 18 in. up to 80 ft. in diameter. A small decelerator/parachute has short attachment cords (1 to 3 ft.) and upon water impact may remain at the surface for 5 to 15 seconds before it sinks to the seafloor, where it becomes flattened. Sonobuoy decelerators/parachutes are designed to sink within 15 minutes, but the rate of sinking depends on sea conditions and the shape of the decelerator/parachute; the duration of the descent depends on the water depth. Prior to reaching the seafloor, a decelerator/parachute could be carried along in a current or become snagged on a hard structure near the bottom. Conversely, the decelerator/parachute and associated lines could settle to the bottom, where they would be buried by sediment in most soft bottom areas or colonized by attaching and encrusting organisms, which would further stabilize the material and reduce the potential for reintroduction as an entanglement risk.

Illumination flares and targets use medium-sized parachutes, which are up to 19 ft. in diameter with attachment cords that are up to 18 ft. long. Some aerial targets use large and extra-large decelerators/parachutes. Large parachutes are up to 50 ft. in diameter, and extra-large parachutes are up to 80 ft. in diameter. More information on large and extra-large parachutes can be found in Section 3.0.3.3.5.2 (Decelerators/Parachutes) of the 2018 Final EIS/OEIS. The majority of these larger sized decelerators/parachutes that would be expended are the medium parachutes, with a small amount of large and extra-large decelerators/parachutes being expended. The large and extra-large decelerators/parachutes have long attachment cords, up to 70 ft. and 82 ft. in length, respectively, and upon water impact may remain at the surface for up to 5 minutes before sinking to the seafloor. As previously stated, the rate of sinking depends on sea conditions and the shape of the decelerator/parachute, and the duration of the descent depends on water depth.

The majority of large decelerators/parachutes would be expended within the Jacksonville and Virginia Capes Range Complexes. Large decelerators/parachutes may also be expended in the Northeast, Navy Cherry Point, Gulf, and Key West Range Complexes, as well as Naval Undersea Warfare Center Division, Newport Testing Range and the Naval Surface Warfare Center Panama City Testing Range. For aerial targets that are launched from shore, as they would be in the Virginia Capes Range Complex, efforts are made to recover the large decelerators/parachutes if it is safe to do so; however, this analysis assumes they are not recovered. The extra-large decelerators/parachutes are primarily expended in the Virginia Capes Range Complex with the potential to be expended in Northeast, NUWC Newport, Navy Cherry Point, Jacksonville, NSWC Panama City, and the Gulf Range Complexes on an infrequent basis and during testing only.

The chance that an individual animal would encounter expended decelerators/parachutes that have sunk to the bottom is low based on the sparse distribution of the decelerators/parachutes expended throughout the Study Area and the relatively few marine mammals that feed on the bottom. Mysticetes found within the Study Area are not expected to encounter decelerators/parachutes on the seafloor because, with the exception of humpback whales and right whales, they do not feed there or make frequent contact with the bottom. The majority of decelerators/parachutes will be expended in deep ocean areas, as opposed to the shallow water locations where humpback whales feed on the bottom. The possibility of odontocetes, pinnipeds, and manatees becoming entangled exists for species that feed on the bottom in areas where decelerators/parachutes have been expended. This is unlikely because decelerators/parachutes are primarily used in exercises that occur in waters far out to sea. Species that are known to feed on the bottom in deep water as well as the mid-water column include beaked whales, sperm whales, and dwarf/pygmy sperm whales.

The possibility of these species becoming entangled exists if an animal is feeding in areas where decelerators/parachutes have been expended, but it is considered unlikely because of the infrequency of use of larger-sized decelerators/parachutes. Sunken decelerators/parachutes would eventually flatten and become encrusted with benthic organisms, lowering the risk of entanglement. There has never been any recorded or reported instance of a marine mammal becoming entangled in a decelerator/parachute; thus, decelerators/parachutes are not likely to be an entanglement hazard.

For a discussion of the types of activities that use decelerators/parachutes, see Appendix B (Activity Stressor Matrices), and for a discussion on where they are used and how many decelerators/parachutes would be used or expended under each alternative, see Table 3.0-14 (Number and Location of Other Military Materials Expended during Military Readiness Activities). Military readiness activities that introduce decelerators/parachutes into the water column can occur anywhere in the Study Area and may pose an entanglement risk to marine mammals. Potential impacts from decelerators/parachutes as ingestion stressors to marine mammals are discussed in Section 3.7.3.6.3 (Impacts from Military Expended Materials Other Than Munitions).

3.7.3.5.2.1 Impacts from Decelerators/Parachutes under Alternative 1

For both training and testing activities, decelerator/parachute use would increase from the 2018 Final EIS/OEIS (see Supplemental EIS/OEIS Table 3.0-14, Number and Location of Other Military Materials Expended during Military Readiness Activities).

Under Alternative 1 for training:

- Decelerators/parachutes would be used in the same locations they did for the 2018 Final EIS/OEIS. However, there would be notable increases in the Virginia Capes and Jacksonville Range Complexes. For all other locations, there would be a similar amount of decelerators/parachutes.

Under Alternative 1 for testing:

- Decelerators/parachutes would be used in one location not previously analyzed (Other AFTT Areas) in the 2018 Final EIS/OEIS, and there would be a notable increase in the Northeast, Virginia Capes and Key West Range Complexes. For all other locations, there would either be a decrease, the same, or similar amount of decelerators/parachutes.

For locations without a notable increase in decelerators/parachutes, the analysis from the 2018 Final EIS/OEIS remains valid; the updates to the affected environment noted in Section 3.7.2 (Affected Environment) do not alter the analysis because the general distribution and sensitivity of marine mammal taxa among military readiness locations has not changed.

Although there are notable increases in decelerators/parachutes for training activities, these increases would not change the impact analysis that was conducted in the 2018 Final EIS/OEIS because the likelihood of marine mammals encountering a decelerator/parachute and becoming entangled remains low.

For locations not previously analyzed for testing activities, these increases would not change the impact analysis that was conducted in the 2018 Final EIS/OEIS because the likelihood of marine mammals encountering a decelerator/parachute and becoming entangled remains low.

Marine mammals resident to, or engaging in migratory, reproductive, and feeding behaviors within the range complexes of the Study Area may encounter decelerators/parachutes expended during military readiness activities. Based on the low concentration of expended decelerator/parachutes, the Action Proponents do not anticipate that any marine mammal would become entangled in decelerators/parachutes.

Military readiness activities would expend decelerators/parachutes within the North Atlantic right whale's designated critical habitat year-round. Since North Atlantic right whales occur within the southeast critical habitat area primarily in winter months and occur within the northeast critical habitat area during summer months, any potential overlap with military readiness activities in these areas would be seasonal. Physical and biological features identified for North Atlantic right whale conservation and considered in the critical habitat designation include oceanic conditions that distribute and aggregate dense concentrations of copepods within the northern foraging habitats and water temperatures, depths, and sea surface conditions that are suitable for the southern calving habitats (National Marine Fisheries Service, 2015). These habitat features would not be impacted by decelerators/parachutes.

Thirty-two large decelerator/parachutes are expected to be expended in the Gulf Range Complex per year during training activities, and the likelihood of a Rice's whale encountering it is minimal; therefore, the risk of entanglement is low. Extra-large decelerators/parachutes are not expended during training activities. Fourteen large and six extra-large decelerator/parachutes are expected to be expended in the NSWC Panama City Testing Range during testing activities, however it remains true that the risk of entanglement is low. Physical and biological features identified for Rice's whale conservation and considered in the proposed critical habitat designation include continental shelf and slope associated waters between the 100 to 400 m isobaths that support individual growth, reproduction, and development, social behavior, and overall population growth through sufficient prey density, waters with elevated productivity, water temperatures of 10° to 19° C, low pollution, and sufficiently quiet conditions (88 *Federal Register* 47453). Decelerators/parachutes would not impact these habitat features.

Military readiness activities that expend decelerators/parachutes will not occur within West Indian manatee critical habitat.

The use of decelerators/parachutes during military readiness activities as described under Alternative 1 would not result in the unintentional taking of marine mammals incidental to those activities, as defined by the MMPA, and potential impacts are considered negligible.

The Action Proponents have concluded that the use of decelerators/parachutes during military readiness activities as described under Alternative 1 would have no effect on North Atlantic right whale or the proposed Rice's whale critical habitat, as defined by the ESA. The use of decelerators/parachutes may affect the blue whale, Rice's whale, fin whale, North Atlantic right whale, sei whale, and sperm whale, as defined by the ESA. The use of decelerators/parachutes during testing activities may affect the West Indian manatee and would have no effect on their critical habitat, training activities are not applicable. The Action Proponents have consulted with NMFS and USFWS as required by section 7(a)(2) of the ESA regarding potential impacts to those ESA-listed species that may be affected by the use of decelerators/parachutes during training activities.

The analysis conclusions for decelerators/parachutes for military readiness activities under Alternative 1 are consistent with a negligible impact on marine mammal populations.

3.7.3.5.2.2 Impacts from Decelerators/Parachutes under Alternative 2

Impacts from decelerators/parachutes under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing.

3.7.3.5.3 Impacts from Biodegradable Polymers

Table 3.7-19 contains a summary of the background information used to analyze the potential impacts of biodegradable polymer on marine mammals. For a listing of the types of activities that include biodegradable polymer, refer to Appendix B (Activity Stressor Matrices).

3.7.3.5.3.1 Impacts from Biodegradable Polymers under Alternative 1

Biodegradable polymer would not be used during training activities associated with the Proposed Action.

The proposed use of biodegradable polymer would decrease for testing from the 2018 Final EIS/OEIS.

Under Alternative 1 for testing:

- Activities using biodegradable polymer would occur in three locations not previously analyzed (Northeast Range Complexes, Navy Cherry Point Range Complex, and Joint Expeditionary Base Little Creek Fort Story) in the 2018 Final EIS/OEIS. For all other locations, there would be a decrease in the activities using biodegradable polymer (Table 3.0-18, Number and Location of Activities Including Biodegradable Polymers during Testing).

For locations with a proposed decrease in biodegradable polymer use, the analysis from the 2018 Final EIS/OEIS remains valid; the updates to the affected environment noted in Section 3.7.2 (Affected Environment) do not alter the analysis because the general distribution and sensitivity of marine mammal taxa among these locations has not changed.

For locations not previously analyzed, these additions would not change the impact analysis that was conducted in the 2018 Final EIS/OEIS because the likelihood of marine mammals encountering a biodegradable polymer and becoming entangled remains low. Based on the small levels of activity, the concentration of these items being expended throughout these areas is likewise considered low and the Action Proponents do not anticipate that any marine mammals would become entangled with biodegradable polymers.

Testing activities would expend biodegradable polymers within the North Atlantic right whale's designated Northeast and Southeast critical habitat year-round. Physical and biological features identified for North Atlantic right whale conservation and considered in the critical habitat designation include oceanic conditions that distribute and aggregate dense concentrations of copepods within the northern foraging habitats and water temperatures, depths, and sea surface conditions that are suitable for the southern calving habitats (National Marine Fisheries Service, 2015). These habitat features would not be impacted by biodegradable polymers expended during testing activities.

Rice's whales may encounter testing activities using biodegradable polymers in the shelf break waters of the Gulf Range Complex. Rice's whales inhabit continental shelf and slope waters between 100 and 400 meters deep throughout the U.S. Gulf of America (Garrison et al. 2024). The area with the highest density of Rice's whales is located in the northeastern Gulf, south of the Florida Panhandle, and overlaps with portions of the Gulf Range Complex. Testing activities that involve biodegradable polymer use in the Gulf Range Complex could occur year-round; however, entanglement from use of biodegradable polymers is unlikely due to the very low density of Rice's whales. Physical and biological features identified for Rice's whale conservation and considered in the proposed critical habitat designation include continental shelf and slope associated waters between the 100 to 400m isobaths that support individual growth, reproduction, and development, social behavior, and overall population growth through sufficient prey density, waters with elevated productivity, water temperatures of 10° to 19° C, low pollution, and sufficiently quiet conditions (88 *Federal Register* 47453). Biodegradable polymers would not impact these habitat features.

Testing activities that expend biodegradable polymers would not be conducted within West Indian manatee critical habitat.

The use of biodegradable polymers during testing activities as described under Alternative 1 would not result in the unintentional taking of marine mammals incidental to those activities, as defined by the MMPA, and potential impacts are considered negligible.

The Action Proponents have concluded that the use of biodegradable polymers during testing activities as described under Alternative 1 would have no effect on North Atlantic right whale, and proposed Rice's whale critical habitat, as defined by the ESA. The use of biodegradable polymers may affect the blue whale, Rice's whale, fin whale, North Atlantic right whale, sei whale, sperm whale, and would have no effect on the West Indian manatee, as defined by the ESA. The Action Proponents have consulted with NMFS and USFWS as required by section 7(a)(2) of the ESA regarding potential impacts to those ESA-listed species that may be affected by the use of biodegradable polymers during testing activities.

The analysis conclusions for biodegradable polymer for military readiness activities under Alternative 1 are consistent with a negligible impact on marine mammal populations.

3.7.3.5.3.2 Impacts from Biodegradable Polymers under Alternative 2

There would be no use of biodegradable polymers associated with training activities.

Impacts from biodegradable polymer use during testing under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same.

3.7.3.6 Ingestion Stressors

This section analyzes the potential impacts of the various types of ingestion stressors used during military readiness activities within the Study Area. This analysis includes the potential impacts from the following types of military expended materials: non-explosive practice munitions (small- and medium-caliber), fragments from high-explosives, fragments from targets, chaff, flare casings, and biodegradable polymer.

Table 3.7-20 contains a summary of the background information used to analyze the potential impacts of military expended materials that are munitions on marine mammals. For a listing of the types of activities that include military expended materials – munitions, refer to Appendix B (Activity Stressor Matrices).

Table 3.7-20: Ingestion Stressors Background Information Summary

Substressor	*Background Information Summary*
Military expended materials – munitions	Ingestion of military expended materials - munitions is not expected in most species of marine mammal, unless they are species that feed on the bottom. • Types of non-explosive practice munitions generally include projectiles, missiles, and bombs. Of these, only small- or medium-caliber projectiles would be small enough for a marine mammal to ingest. • Small- and medium-caliber projectiles include all sizes up to and including 2.25 inches in diameter. These solid metal materials would quickly move through the water column and settle to the seafloor. Ingestion of non-explosive practice munitions is not expected to occur in the water column because the munitions sink quickly. Instead, they are most likely to be encountered by species that forage on the bottom. • Types of high-explosive munitions that can result in fragments include demolition charges, projectiles, missiles, and bombs. Fragments would result from fractures in the munitions casing and would vary in size depending on the net explosive weight and munitions type; however, typical sizes of fragments are unknown. • These solid metal materials would quickly move through the water column and settle to the seafloor; therefore, ingestion is not expected by most species.
Military expended materials other than munitions	Non-munition military expended materials that would remain floating on the surface are too small to pose a risk of intestinal blockage to any marine mammal that happened to encounter them. • The impacts of ingesting military expended materials other than munitions would be limited to cases where an individual marine mammal might eat an indigestible item too large to be passed through the gut. • The marine mammals would not be preferentially attracted to these military expended materials, with the possible exception of decelerators/parachutes that may appear similar to the prey of some species such as sperm whales and beaked whales. • For the most part, these military expended materials would most likely only be incidentally ingested by individuals feeding on the bottom in the precise location where these items were deposited.

Table 3.7-20: Ingestion Stressors Summary Background Information (continued)

Substressor	*Background Information Summary*
Military expended materials other than munitions (continued)	It is unlikely a marine mammal would ingest biodegradable polymer or bio-inspired slime. • Based on the constituents of the biodegradable polymer the Navy proposes to use, it is anticipated that the material would break down into small pieces within a few days to weeks. This would break down further and dissolve into the water column within weeks to a few months. • The final products, which are all environmentally benign, would be dispersed quickly to undetectable concentrations. Unlike other ingestion stressors, biodegradable polymers only remain in the water column for a relatively short period of time, and therefore the potential for ingestion by a marine mammal would be limited. • A marine mammal would have to encounter the biodegradable polymer immediately after it was expended for it to be a potential ingestion risk. If an animal were to encounter the polymer even a few hours after it was expended, it is very likely that it would break easily and would no longer be an ingestion stressor.

The distribution and density of expended items plays a central role in the likelihood of impact on marine mammals. The Action Proponents conduct military readiness activities throughout the Study Area and those that result in expended materials that could be ingested are widely distributed and low in density. There may be areas within the study area where expended materials may be more concentrated, however they are still dispersed widely within those locations. The majority of material expended during military readiness activities would likely penetrate into the seafloor and not be accessible to most marine mammals. Since potential impacts depend on where these items are expended and how a marine mammal feeds, the following subsections discuss important information for specific groups or species.

3.7.3.6.1 Impacts from Military Expended Materials – Munitions under Alternative 1

Table 3.7-20 contains a summary of the background information used to analyze the potential impacts of military expended materials that are munitions on marine mammals. For a listing of the types of activities that include military expended materials – munitions, refer to Appendix B (Activity Stressor Matrices).

Military expended materials – munitions for both training and testing activities (Table 3.0-11, Number and Location of Non-Explosive Practice Munitions Expended during Military Readiness Activities, and Table 3.0-12, Number and Location of Explosives that May Result in Fragments Used during Military Readiness Activities) would decrease from the 2018 Final EIS/OEIS.

Under Alternative 1 for training:

- Ingestible munitions (including fragments from explosive munitions) would occur in mostly the same locations they did in the 2018 Final EIS/OEIS. There would not be any ingestible munitions released in the Northeast, Virginia Capes, or Jacksonville Range Complexes Inshore, and there would be a notable increase in the Key West Range Complex Inshore.

Under Alternative 1 for testing:

- Ingestible munitions would occur in one location not previously analyzed (Naval Undersea Warfare Center Division, Newport Testing Range) in the 2018 Final EIS/OEIS. For all other locations, there would be a decrease in the amount of ingestible munitions.

For both training and testing, the analysis from the 2018 Final EIS/OEIS remains valid; the updates to the affected environment noted in Section 3.7.2 (Affected Environment) do not alter the analysis because the general distribution and sensitivity of marine mammal taxa among military readiness locations has not changed.

For locations not previously analyzed, these increases would not change the impact analysis that was conducted in the 2018 Final EIS/OEIS because the likelihood of marine mammals that forage on the bottom in this areas encountering a munition or munition fragment and consuming it remains low. Therefore, the Action Proponents do not anticipate that any marine mammals would experience adverse ingestion impacts from non-explosive practice munitions and high-explosive munition fragments associated with military readiness activities under Alternative 1.

Military readiness activities that expend non-explosive practice munitions and high-explosive munitions fragments would occur within the North Atlantic right whale's designated critical habitat year-round. Physical and biological features identified for North Atlantic right whale conservation and considered in the critical habitat designation include oceanic conditions that distribute and aggregate dense concentrations of copepods within the northern foraging habitats and water temperatures, depths, and sea surface conditions that are suitable for the southern calving habitats (National Marine Fisheries Service, 2015). These habitat features would not be impacted by expended non-explosive practice munitions and high-explosive munitions fragments.

Physical and biological features identified for Rice's whale conservation and considered in the proposed critical habitat designation include continental shelf and slope associated waters between the 100 to 400m isobaths that support individual growth, reproduction, and development, social behavior, and overall population growth through sufficient prey density, waters with elevated productivity, water temperatures of 10-19° C, low pollution, and sufficiently quiet conditions (88 *Federal Register* 47453). These habitat features would not be impacted by military expended materials – munitions.

Military readiness activities that expend non-explosive practice munitions and high-explosive munitions would not occur within West Indian manatee designated critical habitat.

Military readiness activities involving military expended materials as described under Alternative 1 would not result in the unintentional taking of marine mammals incidental to those activities, as defined by the MMPA, and potential impacts are considered negligible.

The Action Proponents have concluded that military readiness activities involving military expended materials – munitions as described under Alternative 1 would have no effect on North Atlantic right whale, or the proposed Rice's whale critical habitat, as defined by the ESA. Training and testing activities involving military expended materials – munitions may affect the blue whale, Rice's whale, fin whale, North Atlantic right whale, sei whale, sperm whale, and West Indian manatee, as defined by the ESA. The Action Proponents have consulted with NMFS and USFWS as required by section 7(a)(2) of the ESA regarding potential impacts to those ESA-listed species that may be affected by the use of military expended materials – munitions during Military readiness activities.

The analysis conclusions for military expended materials – munitions for military readiness activities under Alternative 1 are consistent with a negligible impact on marine mammal populations.

3.7.3.6.2 Impacts from Military Expended Materials – Munitions under Alternative 2

Impacts from military expended materials – munitions under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing.

3.7.3.6.3 Impacts from Military Expended Materials Other Than Munitions under Alternative 1

Table 3.7-20 contains a summary of the background information used to analyze the potential impacts of military expended materials other than munitions on marine mammals. For a listing of the types of activities that include military expended materials other than munitions, refer to Appendix B (Activity Stressor Matrices).

Military expended materials – other than munitions for both training and testing activities (Table 3.0-14, Number and Location of Other Military Materials Expended during Military Readiness Activities) would decrease from the 2018 Final EIS/OEIS.

Under Alternative 1 for training:

- Ingestible military expended materials other than munitions would no longer occur at one location (Virginia Capes Range Complex Inshore) that they did in the 2018 Final EIS/OEIS. However, there would be a notable increase in military expended materials other than munitions at the Virginia Capes Range Complex and the Key West Range Complex. For all other locations, there would either be a decrease or similar amount of military expended materials other than munitions.

Under Alternative 1 for testing:

- Ingestible military expended materials other than munitions would occur in one location not previously analyzed (Other AFTT Areas) in the 2018 Final EIS/OEIS. For all other locations, there would either be a decrease or similar amount of military expended materials other than munitions.
- Activities using biodegradable polymer would occur in three locations not previously analyzed (Northeast Range Complexes, Navy Cherry Point Range Complex, and Joint Expeditionary Base Little Creek Fort Story) in the 2018 Final EIS/OEIS. For all other locations, there would be a decrease or cessation in the activities using biodegradable polymer (Table 3.0-18, Number and Location of Activities Including Biodegradable Polymers during Testing).

For locations without a notable increase in ingestible non-munitions and target fragments, the analysis from the 2018 Final EIS/OEIS remains valid; the updates to the affected environment noted in Section 3.7.2 (Affected Environment) do not alter the analysis because the general distribution and sensitivity of marine mammal taxa among military readiness locations has not changed.

For locations with notable increases in military expended materials other than munitions and targets, overall, there would be a decrease in expended materials in the Study Area. The impact analysis that was conducted in the 2018 Final EIS/OEIS remains valid because the likelihood of marine mammals encountering ingestible military expended material or target fragment and consuming it remains low.

Target-related material, chaff, flares, decelerators/parachutes, and their subcomponents have the potential to be ingested by a marine mammal, although that is considered unlikely since most of these materials would quickly drop through the water column and settle on the seafloor. Some Styrofoam, plastic endcaps, chaff, and other small items may float for some time before sinking. The Action Proponents do not anticipate that any marine mammals would experience adverse ingestion impacts from target-related material, chaff, flares, and decelerators/parachutes associated with military readiness activities under Alternative 1. There would be no use of biodegradable polymers associated with training activities, only testing activities.

Military readiness activities that expend non-munition military expended materials would occur within the North Atlantic right whale's designated critical habitat year-round. Physical and biological features identified for North Atlantic right whale conservation and considered in the critical habitat designation include oceanic conditions that distribute and aggregate dense concentrations of copepods within the northern foraging habitats and water temperatures, depths, and sea surface conditions that are suitable for the southern calving habitats (National Marine Fisheries Service, 2015). These habitat features would not be impacted by military expended materials other than munitions.

Physical and biological features identified for Rice's whale conservation and considered in the proposed critical habitat designation include continental shelf and slope associated waters between the 100 to 400m isobaths that support individual growth, reproduction, and development, social behavior, and overall population growth through sufficient prey density, waters with elevated productivity, water temperatures of 10-19° C, low pollution, and sufficiently quiet conditions (88 *Federal Register* 47453). These habitat features would not be impacted by military expended materials other than munitions.

Military readiness activities that expend non-munition military expended materials would not occur within West Indian manatee designated critical habitat.

Training and testing activities involving military expended materials other than munitions as described under Alternative 1 will not result in the unintentional taking of marine mammals incidental to those activities, as defined by the MMPA, and potential impacts are considered negligible.

The Action Proponents have concluded that military readiness activities involving military expended materials other than munitions as described under Alternative 1 would have no effect on North Atlantic right whale, or the proposed Rice's whale critical habitat, as defined by the ESA. Training and testing activities involving military expended materials other than munitions may affect the blue whale, Rice's whale, fin whale, North Atlantic right whale, sei whale, sperm whale, and West Indian manatee, as defined by the ESA. The Action Proponents have consulted with NMFS and USFWS as required by section 7(a)(2) of the ESA regarding potential impacts to those ESA-listed species that may be affected by training activities involving military expended materials other than munitions.

The analysis conclusions for military expended materials other than munitions for military readiness activities under Alternative 1 are consistent with a negligible impact on marine mammal populations.

3.7.3.6.4 Impacts from Military Expended Materials Other Than Munitions under Alternative 2

Impacts from military expended materials other than munitions under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance impacts, ESA-listed species and critical habitat are the same for both training and testing.

3.7.3.7 Secondary Stressors

This section analyzes potential impacts on marine mammals exposed to stressors indirectly through impacts on their habitat (sediment or water quality) or prey. For the purposes of this analysis, indirect impacts on marine mammals via sediment or water quality that do not require trophic transfer (e.g., bioaccumulation) to be observed are considered here. Bioaccumulation considered previously in this document in the analysis of habitats (Section 3.3), invertebrates (Section 3.5) and fish (Section 3.6) indicated minimal to no impacts on potential prey species of marine mammals. It is important to note that the terms "indirect" and "secondary" do not imply reduced severity of environmental consequences but instead describe how the impact may occur in an organism. Bioaccumulation is considered in the Ecosystem Technical Report for the Atlantic Fleet Training and Testing (AFTT) Final Environmental Impact Statement (U.S. Department of the Navy, 2012). Additionally, the transportation of marine mammals (the Navy's marine mammal system) in association with force protection and mine warfare exercises is presented to detail the lack of potential for the introduction of disease or parasites from those marine mammals to the Study Area. The potential for impacts from all of these secondary stressors are discussed below.

Stressors from military readiness activities that could pose indirect impacts on marine mammals via habitat or prey include (1) explosives, (2) explosive byproducts and unexploded munitions, (3) metals, (4) chemicals, and (5) transmission of disease and parasites (see Table 3.7-21). Analyses of the potential impacts on sediment and water quality are discussed in Section 3.2 (Sediment and Water Quality).

Table 3.7-21: Secondary Stressors Background Information Summary

Substressor	*Background Information Summary*
Explosives	Underwater explosions could impact other species in the food web, including prey species that marine mammals feed upon. • The impacts of explosions would differ depending on the type of prey species in the area of the blast. • In addition to physical effects of an underwater blast, prey might have behavioral reactions to underwater sound. For instance, prey species might exhibit a strong startle reaction to explosions that might include swimming to the surface or scattering away from the source. • Any of these scenarios would be temporary, only occurring during activities involving explosives, and no lasting effect on prey availability or the pelagic food web would be expected.
Explosion byproducts and unexploded munitions	Explosion byproducts associated with high order detonations present no indirect stressors to marine mammals through sediment or water. • Low-order detonations and unexploded munitions present elevated likelihood of impacts on marine mammals. • Most explosions occur in depths exceeding that which normally support seagrass beds, an area that is commonly occupied by manatees. • Low-order detonations and unexploded munitions present elevated likelihood of secondary impacts on marine mammals.
Metals	See Appendix G (Non-Acoustic Impacts Supporting Information).
Chemicals	Several military readiness activities introduce chemicals into the marine environment that are potentially harmful in higher concentrations; however, rapid dilution would occur, and toxic concentrations are unlikely to be encountered. • Chemicals introduced are principally from flares and propellants for missiles and torpedoes. Properly functioning flares, missiles, and torpedoes combust most of their propellants, leaving benign or readily diluted soluble combustion byproducts (e.g., hydrogen cyanide). • Operational failures may allow propellants and their degradation products to be released into the marine environment. Flares and missiles that operationally fail may release perchlorate, which is highly soluble in water, persistent, and impacts metabolic processes in many plants and animals if in sufficient concentration. • Such concentrations are not likely to persist in the ocean.

Table 3.7-21: Secondary Stressors Background Information Summary (continued)

Substressor	*Background Information Summary*
Transmission of disease and parasites	The Navy Marine Mammal Program has operated globally for 40 years with no known impacts to wild populations due to the excellent veterinary care provided to the marine mammal systems, as well as the handling procedures in place for the systems. • When not engaged in the training event, Navy marine mammals are either housed in temporary enclosures or aboard ships involved in training exercises. • All marine mammal waste is disposed of in a manner approved for the specific holding facilities. • When working, sea lions are transported in boats, and dolphins are transferred in boats or by swimming alongside the boat under the handler's control. Their open-ocean time is under stimulus control and is monitored by their trainer.

3.7.3.7.1 Impacts from Secondary Stressors Under Alternative 1

For all secondary stressors, the analysis from the 2018 Final EIS/OEIS remains valid. See Appendix G (Non-Acoustic Impacts Supporting Information) for all information regarding secondary stressors.

The impact of the Proposed Action on secondary stressors were considered negligible to moderate (depending on the primary stressor) on marine mammal populations.

The Action Proponents have concluded that secondary stressors as described under Alternative 1 would have no effect on North Atlantic right whale, proposed Rice's whale, or manatee critical habitat; may affect the blue whale, Rice's whale, fin whale, North Atlantic right whale, sei whale, sperm whale, and West Indian manatee, as defined by the ESA. The Action Proponents have consulted with NMFS and USFWS as required by section 7(a)(2) of the ESA.

3.7.3.7.2 Impacts from Secondary Stressors Under Alternative 2

Impacts from secondary stressors under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing.

3.7.3.8 Combined stressors

3.7.3.8.1 Combined Impacts of All Stressors under Alternative 1

As described in Section 3.0.3.5 (Resource-Specific Impacts Analysis for Multiple Stressors), this section evaluates the potential for combined impacts of all the stressors from the Proposed Action. The analysis and conclusions for the potential impacts from each of the individual stressors are discussed in Section 3.7.3.1 (Acoustic Stressors) through Section 3.7.3.6 (Ingestion Stressors) and, for ESA-listed species, summarized in Section 3.7.4 (Endangered Species Act Determinations). Stressors associated with military readiness activities do not typically occur in isolation but rather occur in some combination. For example, mine neutralization activities include elements of acoustic, physical disturbance and strike, entanglement, ingestion, and secondary stressors that are all coincident in space and time. An analysis of the combined impacts of all stressors considers the potential consequences of additive stressors as described below. This analysis makes the reasonable assumption that the majority of exposures to stressors are non-lethal, and instead focuses on consequences potentially impacting marine mammal fitness (e.g., physiology, behavior, reproductive potential).

There are generally two ways that a marine mammal could be exposed to multiple additive stressors. The first would be if a marine mammal were exposed to multiple sources of stress from a single event or activity within a single testing or training event (e.g., a mine warfare event may include the use of a sound source and a vessel). The potential for a combination of these impacts from a single activity would depend on the range to effects (see Appendix E, [Acoustic and Explosives Impact Analysis] for further details on ranges to effects for marine mammals) of each of the stressors and the response or lack of response to that stressor. Most of the activities proposed under Alternative 1 generally involve the use of moving platforms (e.g., ships, torpedoes, aircraft) that may produce one or more stressors; therefore, it is likely that if a marine mammal were within the potential impact range of those activities, it may be impacted by multiple stressors simultaneously. Individual stressors that would otherwise have minimal to no impact may combine to have a measurable response. However, due to the wide dispersion of stressors, speed of the platforms, general dynamic movement of many military readiness activities, and behavioral avoidance exhibited by many marine mammal species, it is very unlikely that a marine mammal would remain in the potential impact range of multiple sources or sequential exercises. Exposure to multiple stressors is more likely to occur at an instrumented range where military readiness activities using multiple platforms may be concentrated during a particular event. In such cases involving a relatively small area on an instrumented range, a behavioral reaction resulting in avoidance of the immediate vicinity of the activity would reduce the likelihood of exposure to additional stressors. Nevertheless, the majority of the proposed activities are unit-level training and small testing activities which are conducted in the open ocean. Unit-level exercises occur over a small spatial scale (one to a few square miles) and with few participants (usually one or two) or short duration (the order of a few hours or less).

Secondly, a marine mammal could be exposed to multiple military readiness activities over the course of its life, however, military readiness activities are generally separated in space and time in such a way that it would be unlikely that any individual marine mammal would be exposed to stressors from multiple activities within a short timeframe. However, animals with a home range intersecting an area of concentrated activity have elevated exposure risks relative to animals that simply transit the area through a migratory corridor.

Multiple stressors may also have synergistic effects. For example, marine mammals that experience temporary hearing loss or injury from acoustic stressors could be more susceptible to physical strike and disturbance stressors via a decreased ability to detect and avoid threats. Marine mammals that experience behavioral and physiological consequences of ingestion stressors could be more susceptible to entanglement and physical strike stressors via malnourishment and disorientation. These interactions are speculative, and without data on the combination of multiple stressors, the synergistic impacts from the combination of stressors are difficult to predict in any meaningful way. Research and monitoring efforts have included: before, during, and after-event observations and surveys; data collection through conducting long-term studies in areas of military readiness activity; occurrence surveys over large geographic areas; biopsy of animals occurring in areas of military readiness activity; and tagging studies where animals are exposed to military readiness stressors. These efforts are intended to contribute to the overall understanding of what impacts may be occurring overall to animals in these areas. To date, the findings from the research and monitoring and the regulatory conclusions from previous analyses by NMFS (National Oceanic and Atmospheric Administration, 2013, 2015) are that majority of impacts from military readiness activities are not expected to have deleterious impacts on the fitness of any individuals or long-term consequences to populations of marine mammals.

Although potential impacts on certain marine mammal species from military readiness activities under Alternative 1 may include behavioral responses, or injury to individuals, those injuries are not expected to lead to long-term consequences for populations. The potential impacts anticipated from Alternative 1 are summarized in Sections 3.7.4 (Endangered Species Act Determinations) and Section 3.7.5 (Marine Mammal Protection Act Determinations) for each regulation applicable to marine mammals. For a discussion of mitigation, see Chapter 5 (Mitigation).

The combined impact of all stressors from Alternative 1 is considered moderate (due to limited potential for injury/mortality) for both action alternatives.

3.7.3.8.2 Combined Impacts of All Stressors under Alternative 2

The combined maximum quantities of direct and indirect stressors from military readiness activities under Alternative 2 (at the same locations as Alternative 1) would still be characterized as a moderate impact on marine mammal populations, including ESA-listed species.

3.7.4 Endangered Species Act Determinations

The Action Proponents have concluded that military readiness activities may affect the North Atlantic right whale, blue whale, fin whale, Rice's whale, sei whale, sperm whale, West Indian manatee, the North Atlantic right whale critical habitat, and the proposed Rice's whale critical habitat. The Action Proponents have also concluded that military readiness activities would have no effect on designated critical habitat for the West Indian manatee. The Action Proponents have consulted with NMFS and USFWS as required by section 7(a)(2) of the ESA regarding potential impacts to those ESA-listed species that may be affected by the proposed military readiness activities.

The summary of effects determinations for each ESA-listed species is provided in Table 3.7-22.

3.7.5 Marine Mammal Protection Act Determinations

The Action Proponents are seeking Letters of Authorization in accordance with the MMPA from NMFS for certain military readiness activities (the use of sonar and other transducers, air guns, pile driving, vessels, and explosives), as described under the Preferred Alternative (Alternative 1). The use of sonar and other transducers may result in Level A and Level B harassment of certain marine mammals. The use of air guns and pile driving may result in Level B harassment of certain marine mammal species. The use of explosives may result in Level A harassment, Level B harassment, and mortality of certain marine mammals. The use of vessels may result in Level A harassment or potential mortality due to physical strike.

Weapons noise, vessel noise, aircraft noise, the use of in-water electromagnetic devices, high-energy lasers, in-water devices, seafloor devices, wires and cables, decelerators/parachutes, biodegradable polymers and bio-inspired slime, and military expended materials are not expected to result in Level A or Level B harassment of any marine mammals.

Table 3.7-22: Marine Mammal ESA Effect Determinations for Military Readiness Activities under Alternative 1 (Preferred Alternative)

Species	***Designation Unit/Critical Habitat***	***Effect Determinations by Stressor***																						
		Acoustic						***Explosives***		***Energy***			***Physical Disturbance and Strike***						***Entanglement***			***Ingestion***		
		Sonar and Other Transducers	***Air Guns***	***Pile Driving***	***Vessel Noise***	***Aircraft Noise***	***Weapons Noise***	***Explosives in Air***	***Explosives in Water***	***In-Air Electromagnetic Devices***	***In-Water Electromagnetic Devices***	***High-Energy Lasers***	***Vessels***	***In-Water Devices***	***Aircraft and Air Targets***	***Military Expended Materials***	***Seafloor Devices***	***Pile Driving***	***Wires and Cables***	***Decelerators/Parachutes***	***Biodegradable Polymer***	***Military Expended Materials – Munitions***	***Military Expended Materials – Other Than Munitions***	***Indirect/Secondary***
Training Activities																								
North Atlantic right whale*	Throughout range	LAA	N/A	N/A	NLAA	NLAA	NLAA	NE	LAA	N/A	NLAA	NE	NLAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	NLAA
	Critical habitat	NE	N/A	N/A	NE	NE	NE	NE	NE	N/A	NE	NE	NE	NE	N/A	NE	NE	N/A	NE	NE	N/A	NE	NE	NE
Blue whale	Throughout range	LAA	N/A	N/A	NLAA	NLAA	NLAA	NE	LAA	N/A	NLAA	NE	LAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	NLAA
Rice's whale	Throughout range	LAA	N/A	N/A	NLAA	NLAA	NLAA	NE	LAA	N/A	NLAA	NE	NLAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	NLAA
	Proposed Critical Habitat	NLAA	N/A	N/A	NLAA	NLAA	NLAA	NE	NLAA	N/A	NE	NE	NE	NE	N/A	NE	NE	N/A	NE	NE	N/A	NE	NE	NE
Fin whale	Throughout range	LAA	N/A	N/A	NLAA	NLAA	NLAA	NE	LAA	N/A	NLAA	NE	LAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	NLAA
Sei whale	Throughout range	LAA	N/A	N/A	NLAA	NLAA	NLAA	NE	LAA	N/A	NLAA	NE	LAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	NLAA
Sperm whale	Atlantic Stock	LAA	N/A	N/A	NLAA	NLAA	NLAA	NE	LAA	N/A	NLAA	NE	LAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	NLAA
	Gulf of America Stock	LAA	N/A	N/A	NLAA	NLAA	NLAA	NE	LAA	N/A	NLAA	NE	NLAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	NLAA
West Indian manatee	Throughout range	NLAA	N/A	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	N/A	NLAA	NE	NLAA	NLAA	N/A	NLAA	NLAA	NE	NLAA	NLAA	N/A	NLAA	NLAA	NLAA
	Critical habitat	NE	N/A	N/A	NE	NE	N/A	N/A	N/A	N/A	NE	N/A	NE	NE	N/A	N/A	NE	N/A	N/A	N/A	N/A	N/A	N/A	NE

Table 3.7-22: Marine Mammal ESA Effect Determinations for Military Readiness Activities under Alternative 1 (Preferred Alternative) (continued)

Species	Designation Unit/Critical Habitat	*Effect Determinations by Stressor*																						
		Acoustic						*Explosives*		*Energy*			*Physical Disturbance and Strike*						*Entanglement*			*Ingestion*		
		Sonar and Other Transducers	*Air Guns*	*Pile Driving*	*Vessel Noise*	*Aircraft Noise*	*Weapons Noise*	*Explosives in Air*	*Explosives in Water*	*In-Air Electromagnetic Devices*	*In-Water Electromagnetic Devices*	*High-Energy Lasers*	*Vessels*	*In-Water Devices*	*Aircraft and Air Targets*	*Military Expended Materials*	*Seafloor Devices*	*Pile Driving*	*Wires and Cables*	*Decelerators/Parachutes*	*Biodegradable Polymer*	*Military Expended Materials – Munitions*	*Military Expended Materials – Other Than Munitions*	*Indirect/Secondary*
Testing Activities																								
North Atlantic right whale	Throughout range	LAA	NLAA	N/A	NLAA	NLAA	NLAA	NE	LAA	N/A	NLAA	NE	NLAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
	Critical habitat	NE	NLAA	N/A	NE	NE	NE	NE	NE	N/A	NE	NE	NE	NE	N/A	NE	NE	N/A	NE	NE	NE	NE	NE	NE
Blue whale	Throughout range	LAA	NLAA	N/A	NLAA	NLAA	NLAA	NE	LAA	N/A	NLAA	NE	LAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Rice's whale	Throughout range	LAA	NLAA	N/A	NLAA	NLAA	NLAA	NE	LAA	N/A	NLAA	NE	NLAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
	Proposed Critical Habitat	NLAA	NLAA	N/A	NLAA	NLAA	NLAA	NE	NLAA	N/A	NE	NE	NE	NE	N/A	NE	NE	N/A	NE	NE	NE	NE	NE	NE
Fin whale	Throughout range	LAA	LAA	N/A	NLAA	NLAA	NLAA	NE	LAA	N/A	NLAA	NE	LAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Sei whale	Throughout range	LAA	NLAA	N/A	NLAA	NLAA	NLAA	NE	LAA	N/A	NLAA	NE	LAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Sperm whale	Atlantic Stock	LAA	NLAA	N/A	NLAA	NLAA	NLAA	NE	LAA	N/A	NLAA	NE	LAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
	Gulf of America Stock	LAA	NLAA	N/A	NLAA	NLAA	NLAA	NE	LAA	N/A	NLAA	NE	NLAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
West Indian manatee	Throughout range	NLAA	NLAA	N/A	NLAA	NLAA	NLAA	NLAA	NLAA	N/A	NLAA	NE	NLAA	NLAA	N/A	NLAA	NLAA	N/A	NLAA	NLAA	NE	NLAA	NLAA	NLAA
	Critical habitat	NE	N/A	N/A	N/A	N/A	N/A	N/A	NE	N/A	N/A	N/A	NE	N/A	N/A	NE	NE	N/A	N/A	N/A	N/A	N/A	N/A	NE

*The use of air guns during military readiness activities may affect, but is not likely to affect, designated foraging critical habitat in the Northeast and would have no effect on calving critical habitat in the Southeast for North Atlantic right whales.

Notes: ESA = Endangered Species Act; LAA = may affect, likely to adversely affect; N/A = not applicable; NE = no effect; NLAA = may affect, not likely to adversely affect

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