

Draft
**Supplemental Environmental Impact Statement/
Overseas Environmental Impact Statement**
Atlantic Fleet Training and Testing
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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 military 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* (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 Mexico. 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 in 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.

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 in 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	<i>Eubalaena glacialis</i>	Western North Atlantic	Endangered, strategic, depleted	338 (325–350) / 332 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	<u>Civilian Ports</u> Boston, MA; Earle, NJ; Delaware Bay, DE; Hampton Roads, VA; Morehead City, NC; Wilmington, NC; Kings Bay, GA; Savannah, GA; Mayport, FL <u>Coast Guard Stations</u> Boston, MA; Virginia Beach, VA; Charleston, SC; Mayport, FL
Family Balaenopteridae (rorquals)							
Blue whale	<i>Balaenoptera musculus</i>	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	<i>Balaenoptera edeni</i>	Atlantic (only expected outside of U.S. EEZ)	–	Unknown	Other AFTT Areas	–	–
Fin whale	<i>Balaenoptera physalus</i>	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	–	–
Fin whale	<i>Balaenoptera physalus</i>	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, GOMEX RC (extralimital), NSWC Panama City Testing Range (extralimital), Other AFTT Areas	Northeast Range Complexes Inshore, VACAPES Inshore	–
Humpback whale	<i>Megaptera novaeangliae</i>	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, GOMEX RC, Other AFTT Areas	Northeast Range Complexes Inshore, VACAPES Inshore, Jacksonville Range Complex (JAX RC) Inshore	<u>Civilian Ports</u> Boston, MA; Earle, NJ; Delaware Bay, DE; Hampton Roads, VA; Morehead City, NC; Wilmington, NC <u>Coast Guard Stations</u> 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

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 Atlantic and Gulf of Mexico 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
Minke whale	<i>Balaenoptera acutorostrata</i>	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, GOMEX RC, Other AFTT Areas	Northeast Range Complexes Inshore, VACAPES Inshore, Jacksonville Range Complex (JAX RC) Inshore	<u>Civilian Ports</u> Boston, MA; Earle, NJ; Delaware Bay, DE; Hampton Roads, VA; Morehead City, NC; Wilmington, NC; Kings Bay; GA, Savannah, GA <u>Coast Guard Stations</u> 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	–	<u>Civilian Ports</u> Boston, MA; Earle, NJ; Delaware Bay, DE; Hampton Roads, VA; Morehead City, NC; Wilmington, NC
Rice’s whale	<i>Balaenoptera ricei</i>	Northern Gulf of Mexico	Endangered, depleted, strategic stock	51 (.05) / 34	GOMEX RC** Key West RC, NSWC Panama City Testing Range*	Gulf of Mexico Range Complex (GOMEX RC) Inshore	<u>Civilian Ports</u> Tampa, FL; Beaumont, TX; Corpus Christi, TX; Gulfport, MS
Sei whale	<i>Balaenoptera borealis</i>	Nova Scotia	Endangered, depleted, strategic stock	6,282 (1.02) / 3,098	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, GOMEX RC, Other AFTT Areas	–	–
		Labrador Sea	Endangered, depleted	Unknown ¹⁰	Other AFTT Areas	–	–
Suborder Odontoceti (toothed whales)							
Family Physeteridae (sperm whale)							
Sperm whale	<i>Physeter macrocephalus</i>	North Atlantic	Endangered, depleted, strategic stock	4,349 (0.28) / 3,451	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, GOMEX RC, SINKEX Box, Other AFTT Areas	–	–
		Northern Gulf of Mexico	Endangered, depleted, strategic stock	1,180 (.22) / 983	GOMEX RC	–	–
		Puerto Rico and U.S. Virgin Islands	Endangered, depleted, strategic stock	Unknown	Other AFTT Areas	–	–
Family Kogiidae (sperm whales)							
Pygmy and dwarf sperm whales	<i>Kogia breviceps and Kogia sima</i>	Western North Atlantic	–	7,750 (0.38) / 5,689	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, GOMEX RC, Other AFTT Areas	–	–
	<i>Kogia breviceps and Kogia sima</i>	Gulf of Mexico	–	336 (0.35) / 253	GOMEX 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
Family Ziphiidae (beaked whales)							
Blainville’s beaked whale	Mesoplodon densirostris	Western North Atlantic ¹¹	–	10,107 (0.27) / 8,085	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, GOMEX RC, Other AFTT Areas	–	–
		Northern Gulf of Mexico	–	98 (0.46) / 68	GOMEX RC	–	–
Goose-beaked whale (formerly Cuvier’s beaked whale)	Ziphius cavirostris	Western North Atlantic	–	5,744 (0.36) / 4,282	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Other AFTT Areas	–	–
		Northern Gulf of Mexico	–	18 (0.75) / 10	GOMEX RC	–	–
		Puerto Rico and U.S. Virgin Islands	Strategic	Unknown	Other AFTT Areas	–	–
Gervais’ beaked whale	Mesoplodon europaeus	Western North Atlantic	–	10,107 (0.27) / 8,085 ¹²	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, GOMEX RC, Other AFTT Areas	–	–
		Northern Gulf of Mexico	–	20 (0.98) / 10	GOMEX RC	–	–
Northern bottlenose whale	Hyperoodon ampullatus	Western North Atlantic	–	Unknown	Other AFTT Areas	–	–
Sowerby’s beaked whale	Mesoplodon bidens	Western North Atlantic	–	10,107 (0.27) / 8,085	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, GOMEX RC, Other AFTT Areas	–	–
True’s beaked whale	Mesoplodon mirus	Western North Atlantic	–	10,107 (0.27) / 8,085	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, GOMEX RC, Other AFTT Areas	–	–
Family Delphinidae (dolphins)							
Atlantic spotted dolphin	Stenella frontalis	Western North Atlantic	–	93,233 (0.71) / 54,443	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, GOMEX RC, Other AFTT Areas	–	–
Atlantic spotted dolphin (continued)	Stenella frontalis	Gulf of Mexico	–	21,506 (0.26) / 17,339	GOMEX RC, Other AFTT Areas	–	–
		Puerto Rico and U.S. Virgin Islands	Strategic	Unknown	Other AFTT Areas	–	–
Atlantic white-sided dolphin	Lagenorhynchus acutus	Western North Atlantic	–	93,233 (0.71) / 54,443	Northeast RC, VACAPES RC, Other AFTT Areas	–	<u>Civilian Ports</u> Boston, MA <u>Coast Guard Stations</u> Boston, MA
Clymene dolphin	Stenella clymene	Western North Atlantic	–	4,237 (1.03) / 2,071	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, GOMEX RC, Other AFTT Areas	–	–
		Gulf of Mexico	Strategic	513 (1.3) / 250	GOMEX RC, 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
Common bottlenose dolphin	<i>Tursiops truncatus</i>	Western North Atlantic, Offshore	–	62,851 (0.23) / 51,914 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	<u>Civilian Ports</u> Earle, NJ; Delaware Bay, DE; Hampton Roads, VA; Morehead City, NC <u>Coast Guard Stations</u> 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	<u>Civilian Ports</u> Hampton Roads, VA; Morehead City, NC; Wilmington, NC; Kings Bay, GA; Savannah, GA <u>Coast Guard Stations</u> Virginia Beach, VA
		Western North Atlantic South Carolina / Georgia Coastal	Depleted, strategic stock	6,027 (0.34) / 4,569	Other AFTT Areas	Jacksonville Range Complex (JAX RC) Inshore	<u>Civilian Ports</u> Kings Bay, GA; Savannah, GA
		Northern North Carolina Estuarine System	Strategic	823 (0.06) / 782	Other AFTT Areas	–	<u>Civilian Ports</u> Morehead City, NC; Wilmington, NC
		Southern North Carolina Estuarine System	Strategic	Unknown	Other AFTT Areas	–	<u>Civilian Ports</u> 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	<u>Civilian Ports</u> Kings Bay, GA; Savannah, GA
		Western North Atlantic, Northern Florida Coastal	Depleted, strategic stock	877 (0.49) / 595	Other AFTT Areas	Jacksonville Range Complex (JAX RC) Inshore	<u>Civilian Ports</u> Kings Bay, GA; Savannah, GA
		Jacksonville Estuarine System	Strategic	Unknown	JAX RC	Jacksonville Range Complex (JAX RC) Inshore	<u>Civilian Ports</u> Kings Bay, GA; Savannah, GA
		Western North Atlantic, Central Florida Coastal	Depleted, strategic stock	1,218 (0.35) / 913	JAX RC	Jacksonville Range Complex (JAX RC) Inshore	<u>Civilian Ports</u> Port Canaveral, FL
		Indian River Lagoon Estuarine System	Strategic	1,032 (0.03) / 1,004	Other AFTT Areas	Jacksonville Range Complex (JAX RC) Inshore	<u>Civilian Ports</u> Port Canaveral, FL
		Biscayne Bay	Strategic	Unknown	Other AFTT Areas	–	–
		Florida Bay	–	Unknown	Other AFTT Areas	–	–
		Gulf of Mexico Continental Shelf	–	63,289 (0.11) / 57,917	GOMEX RC	–	–
		Gulf of Mexico Eastern Coastal	–	16,407 (0.17) / 14,199	GOMEX RC	Gulf of Mexico Range Complex (GOMEX RC) Inshore	–
		Gulf of Mexico Northern Coastal	–	11,543 (0.19) / 9,881	GOMEX RC	Gulf of Mexico Range Complex (GOMEX RC) Inshore	Gulfport, MS
		Gulf of Mexico Western Coastal	–	20,759 (0.13) / 18,585	GOMEX RC	Gulf of Mexico Range Complex (GOMEX RC) Inshore	<u>Civilian Ports</u> Beaumont, TX; Corpus Christi, TX; Pascagoula, MS; Gulfport, MS <u>Coast Guard Stations</u> Corpus Christi, TX
		Gulf of Mexico Oceanic	–	7,462 (0.31) / 5,769	GOMEX RC	–	–
		Laguna Madre	Strategic	80 (1.57) / unknown	GOMEX RC	–	–
		Neuces Bay, Corpus Christi Bay	Strategic	58 (0.61) / unknown	GOMEX RC	–	<u>Civilian Ports</u> Corpus Christi, TX

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)	<i>Tursiops truncatus</i>	Copano Bay, Aransas Bay, San Antonio Bay, Redfish Bay, Espiritu Santo Bay	Strategic	55 (0.82) / unknown	GOMEX RC	–	Civilian Ports Corpus Christi, TX
		Matagorda Bay, Tres Palacios Bay, Lavaca Bay	Strategic	61(0.45) / unknown	GOMEX RC	–	–
		Gulf of Mexico Bay, Sound, and Estuaries	Strategic	–	GOMEX RC	Gulf of Mexico Range Complex (GOMEX RC) Inshore	–
		West Bay	–	37 (0.05) / 35	GOMEX RC	–	–
		Galveston Bay/ East Bay/ Trinity Bay	–	842 (0.08) / 787	GOMEX RC	–	–
		Sabine Lake	–	122 (0.19)/104	GOMEX RC	–	Civilian Ports Beaumont, TX
		Calcasieu Lake	Strategic	Unknown	GOMEX RC	–	–
		Vermillion Bay, West Cote Blanche Bay, Atchafalaya Bay	Strategic	Unknown	GOMEX RC	Gulf of Mexico Range Complex (GOMEX RC) Inshore	–
		Terrebonne Timbalier Bay Estuarine System	–	3,870 (0.15) / 3,426	GOMEX RC	–	–
		St. Andrew Bay	–	199 (0.09) / 185	GOMEX RC	Gulf of Mexico Range Complex (GOMEX RC) Inshore	–
		Barataria Bay Estuarine System	Strategic	2,071 (0.06) / 1,971	GOMEX RC	–	–
		Mississippi River Delta	–	1,446 (0.19) / 1,238	GOMEX RC	–	–
		Mississippi Sound, Lake Borgne, Bay Boudreau	Strategic	1,265 (0.35) / 947	GOMEX RC	Gulf of Mexico Range Complex (GOMEX RC) Inshore	–
		Mobile Bay, Bonsecour Bay	Strategic	122 (0.34) / unknown	GOMEX RC	–	–
		Perdido Bay	Strategic	Unknown	GOMEX RC	–	–
		Pensacola Bay, East Bay	Strategic	33 (0.80) / unknown	GOMEX RC	–	–
		St. Joseph Bay	Strategic	142 (0.17) / 123	GOMEX RC	–	–
		Choctawhatchee Bay	Strategic	179 (0.04) / unknown	GOMEX RC	–	–
		St. Vincent Sound, Apalachicola Bay, St. George Sound	Strategic	439 (0.14) / unknown	GOMEX RC	–	–
		Apalachee Bay	Strategic	491 (0.39) / unknown	GOMEX RC	–	–
		Waccasassa Bay, Withlacoochee Bay, Crystal Bay	Strategic	Unknown	GOMEX RC	–	–
		St. Joseph Sound, Clearwater Harbor	Strategic	Unknown	GOMEX RC	–	–
		Tampa Bay	Strategic	Unknown	GOMEX RC	–	Civilian Ports Tampa, FL
		Sarasota Bay, Little Sarasota Bay	–	158 (0.27) / 126	GOMEX RC	–	–
		Pine Island Sound, Charlotte Harbor, Gasparilla Sound, Lemon Bay	Strategic	826 (0.09) / unknown	GOMEX RC	–	–
		Caloosahatchee River	Strategic	Unknown	GOMEX RC	–	–
		Estero Bay	Strategic	Unknown	GOMEX RC	–	–
		Chokoloskee Bay, Ten Thousand Islands, Gullivan Bay	Strategic	Unknown	GOMEX RC	–	–
		Whitewater Bay	Strategic	Unknown	GOMEX RC	–	–
		Florida Keys (Bahia Honda to Key West)	Strategic	Unknown	GOMEX RC	Key West Range Complex Inshore	–
		Puerto Rico and U.S. Virgin Islands	Strategic	Unknown	Other AFTT Areas	–	–
False killer whale	<i>Pseudorca crassidens</i>	Western North Atlantic	–	1,791 (0.56) / 1,154	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, GOMEX RC, Other AFTT Areas	–	–
		Gulf of Mexico	–	494 (0.79) / 276	GOMEX RC, Other AFTT Areas	–	–

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
Fraser’s dolphin	<i>Lagenodelphis hosei</i>	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, GOMEX RC, Other AFTT Areas	–	–
		Northern Gulf of Mexico	–	213 (1.03) / 104	GOMEX RC	–	–
Killer whale	<i>Orcinus orca</i>	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, GOMEX RC, Other AFTT Areas	–	–
		Gulf of Mexico	–	267 (0.75) / 152	GOMEX RC	–	–
Long-finned pilot whale	<i>Globicephala melas</i>	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, GOMEX RC, Other AFTT Areas	–	–
Melon-headed whale	<i>Peponocephala electra</i>	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, GOMEX RC, Other AFTT Areas	–	–
		Northern Gulf of Mexico	–	1,749 (0.68) / 1,039	GOMEX RC	–	–
Pantropical spotted dolphin	<i>Stenella attenuata</i>	Western North Atlantic	–	6,593 (0.52) / 4,367	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, GOMEX RC, Other AFTT Areas	–	–
		Northern Gulf of Mexico	–	37,195 (0.24) / 30,377	GOMEX RC	–	–
Pygmy killer whale	<i>Feresa attenuata</i>	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, GOMEX RC, Other AFTT Areas	–	–
		Northern Gulf of Mexico	–	613 (1.15) / 283	GOMEX RC	–	–
Risso’s dolphin	<i>Grampus griseus</i>	Western North Atlantic	–	35,215 (0.19) / 30,051	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, GOMEX RC, Other AFTT Areas	–	–
		Northern Gulf of Mexico	–	1,974 (0.46) / 1,368	GOMEX 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
Rough-toothed dolphin	<i>Steno bredanensis</i>	Western North Atlantic	–	136 (1.0) / 67	Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Naval Surface Warfare Center Panama City Testing Range, GOMEX RC, Other AFTT Areas	–	–
		Northern Gulf of Mexico	–	Unknown	GOMEX RC	–	–
Short-beaked common dolphin	<i>Delphinus delphis</i>	Western North Atlantic	–	172,974 (0.21) / 145,216	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, GOMEX RC, Other AFTT Areas	–	–
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	Western North Atlantic	Strategic	28,924 (0.24) / 23,637	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, GOMEX RC, Other AFTT Areas	–	–
		Northern Gulf of Mexico	–	1,321 (0.43) / 934	GOMEX RC	–	–
		Puerto Rico and U.S. Virgin Islands	Strategic	Unknown	Other AFTT Areas	–	–
Spinner dolphin	<i>Stenella longirostris</i>	Western North Atlantic	–	4,102 (0.99) / 2,045	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, GOMEX RC, Other AFTT Areas	–	–
		Northern Gulf of Mexico	Strategic	2,991 (0.54) / 1,954	GOMEX RC	–	–
		Puerto Rico and U.S. Virgin Islands	Strategic	Unknown	Other AFTT Areas	–	–
Striped dolphin	<i>Stenella coeruleoalba</i>	Western North Atlantic	–	67,036 (0.29) / 52,939	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, GOMEX RC, Other AFTT Areas	–	–
		Northern Gulf of Mexico	Strategic	1,817 (0.56) / 1,172	GOMEX RC	–	–
White-beaked dolphin	<i>Lagenorhynchus albirostris</i>	Western North Atlantic	–	536,016 (0.31) / 415,344	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC	–	–
Family Phocoenidae (porpoises)							
Harbor porpoise	<i>Phocoena phocoena</i>	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	–	95,542 (0.31) / 74,034	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

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
Order Carnivora							
Family Phocidae (earless seals)							
Gray seal	<i>Halichoerus grypus atlantica</i>	Western North Atlantic	–	27,300 (0.22) / 22,785	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC	Northeast Range Complexes Inshore, Virginia Capes Range Complex (VACAPES RC) Inshore	Civilian Ports 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	<i>Phoca vitulina</i>	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	<i>Pagophilus groenlandicus</i>	Western North Atlantic	–	7.6M (0.12) / 7.1M	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC	–	–
Hooded seal	<i>Cystophora cristata</i>	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
Family Trichechidae (manatees)							
West Indian manatee ²⁰	<i>Trichechus manatus latirostris</i> (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 of Mexico Range Complex Other AFTT Areas	Virginia Capes Range Complex (VACAPES RC) Inshore, Jacksonville Range Complex (JAX RC) Inshore, Key West Range Complex Inshore, Gulf of Mexico Range Complex (GOMEX 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 <u>Coast Guard Stations</u> 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
	<i>Trichechus manatus manatus</i> (Antillean subspecies)	Puerto Rico	Threatened	386 (.23) / 318	Other AFTT Areas	–	–

¹⁷The 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; GOMEX = Gulf of Mexico; 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

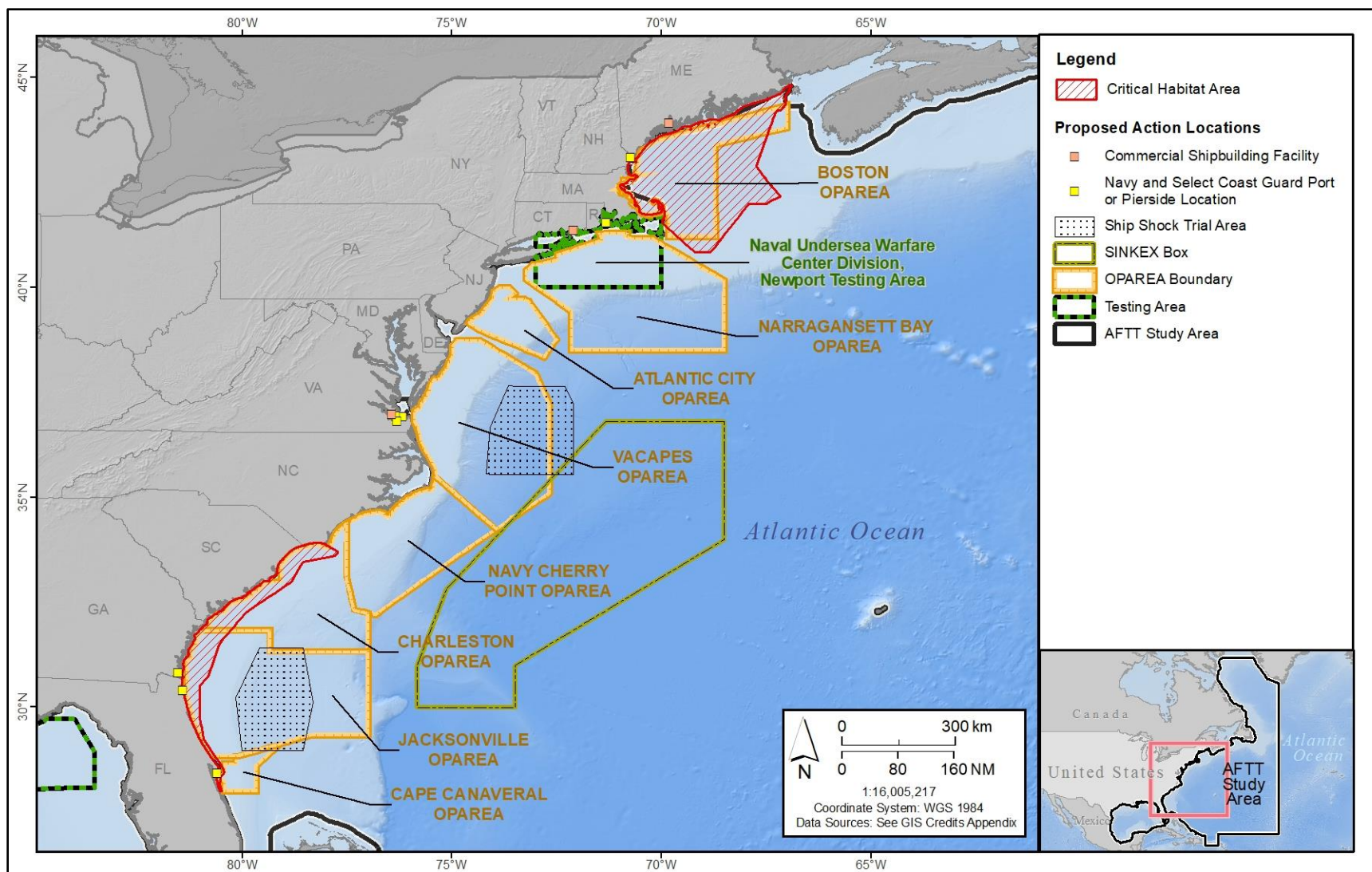
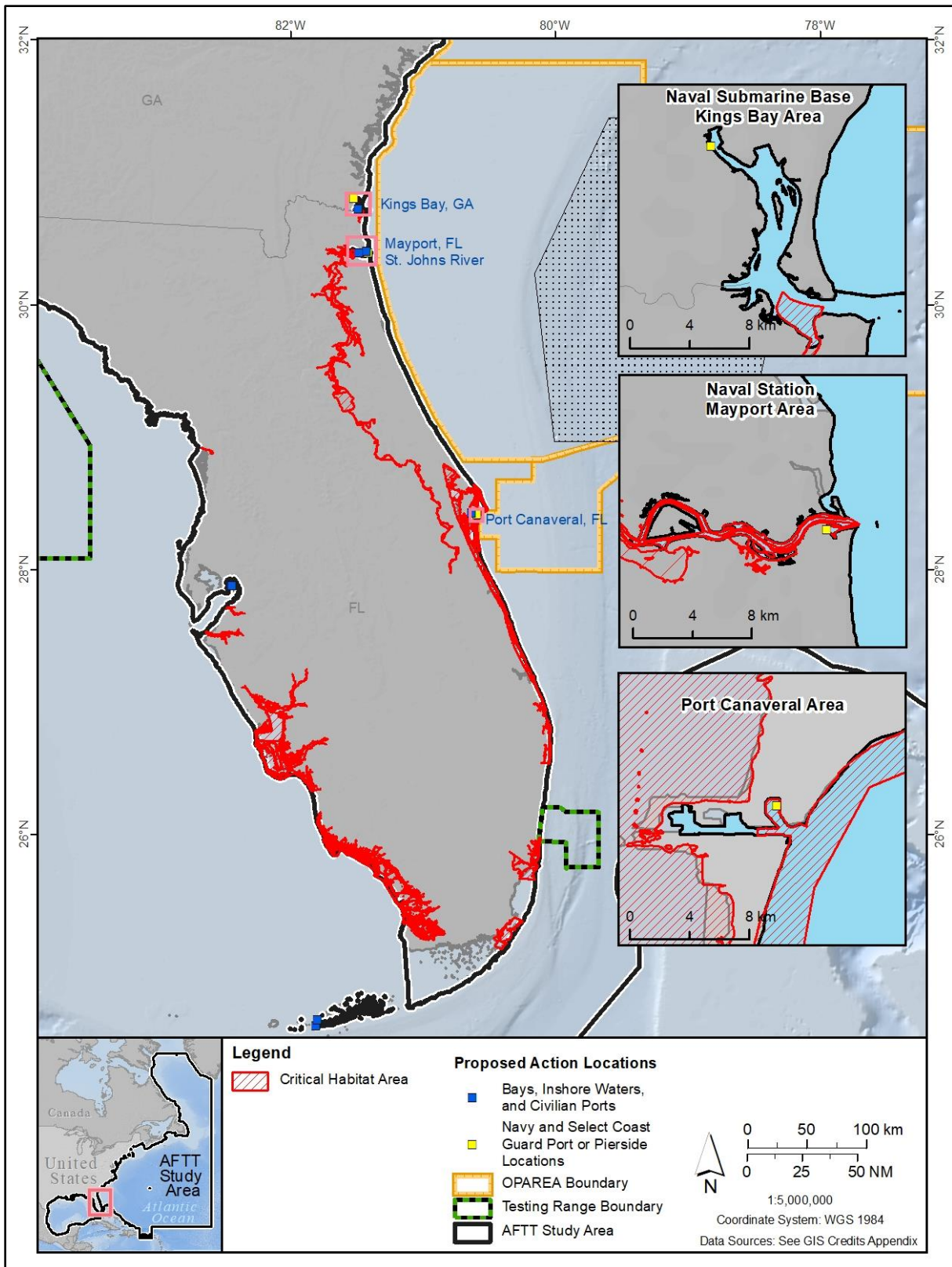
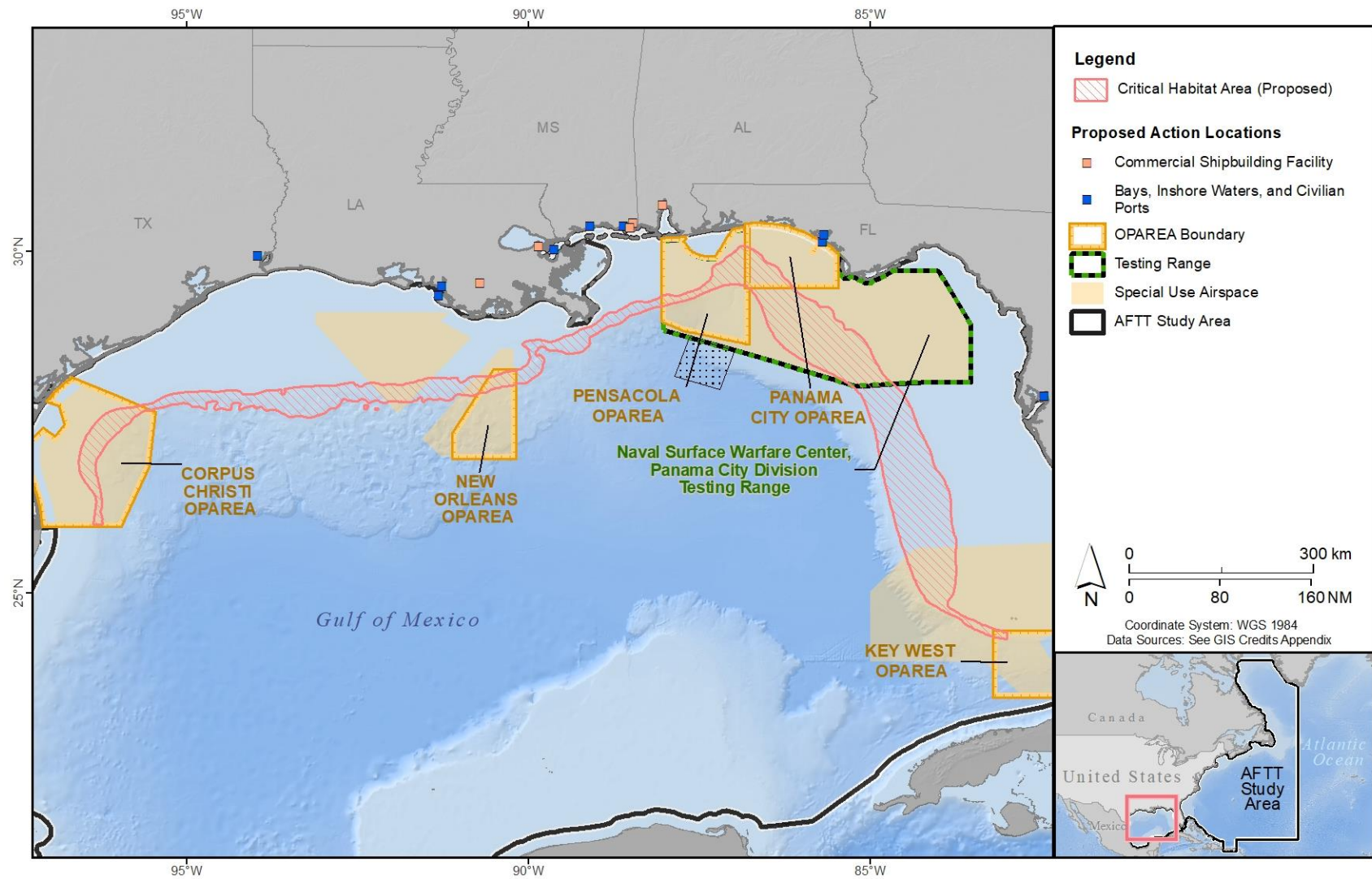


Figure 3.7-1: Designated Critical Habitat for North Atlantic Right Whales in the Study Area



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.

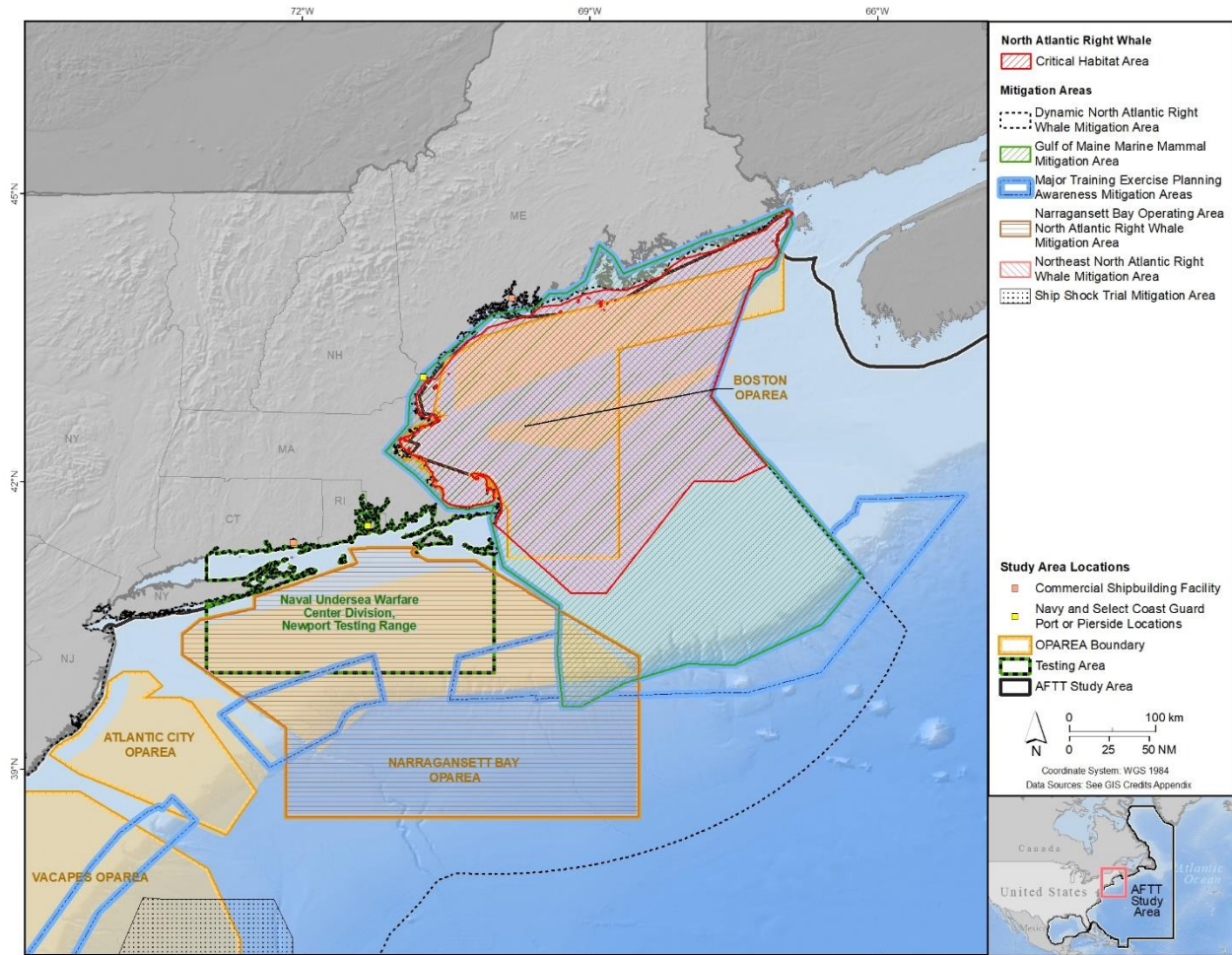
The analysis of potential impacts to marine mammals considers the standard operating procedures and mitigation measures that the Action Proponents will implement under Alternative 1 and Alternative 2 of the Proposed Action. Standard operating procedures relevant to marine mammals are detailed in [Appendix 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 visual observation mitigation.

Table 3.7-2: Mitigation Requirements Summary by Stressor

<i>Applicable Stressor</i>	<i>Requirements Summary and Protection Focus</i>	<i>Section Reference</i>
Acoustics	Conduct visual observations for events involving active acoustic sources, pile driving, and weapons firing noise.	Section 5.6 (Visual Observations)
	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 5.7.12 (Jacksonville Operating Area North Atlantic Right Whale Mitigation Area) Section 5.7.13 (Southeast North Atlantic Right Whale Mitigation Area) Section 5.7.15 (Dynamic North Atlantic Right Whale Mitigation Areas) Section 5.7.39 (Gulf of Maine Marine Mammal Mitigation Area) Section 5.7.16 (Gulf of Mexico Rice's Whale Mitigation Area)
Explosives	Conduct visual observations for events involving 10 explosive mitigation categories.	Section 5.6 (Visual Observations)
	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 5.7.12 (Jacksonville Operating Area North Atlantic Right Whale Mitigation Area) Section 5.7.13 (Southeast North Atlantic Right Whale Mitigation Area) Section 5.7.15 (Dynamic North Atlantic Right Whale Mitigation Areas) Section 5.7.16 (Gulf of Mexico Rice's Whale Mitigation Area)
Physical disturbance and strike	Conduct visual observations for events involving six mitigation categories.	Section 5.6 (Visual Observations)
	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 (Jacksonville Operating Area North Atlantic Right Whale Mitigation Area) Section 5.7.13 (Southeast North Atlantic Right Whale Mitigation Area) Section 5.7.15 (Dynamic North Atlantic Right Whale Mitigation Areas)

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).



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

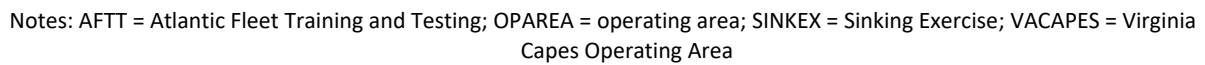
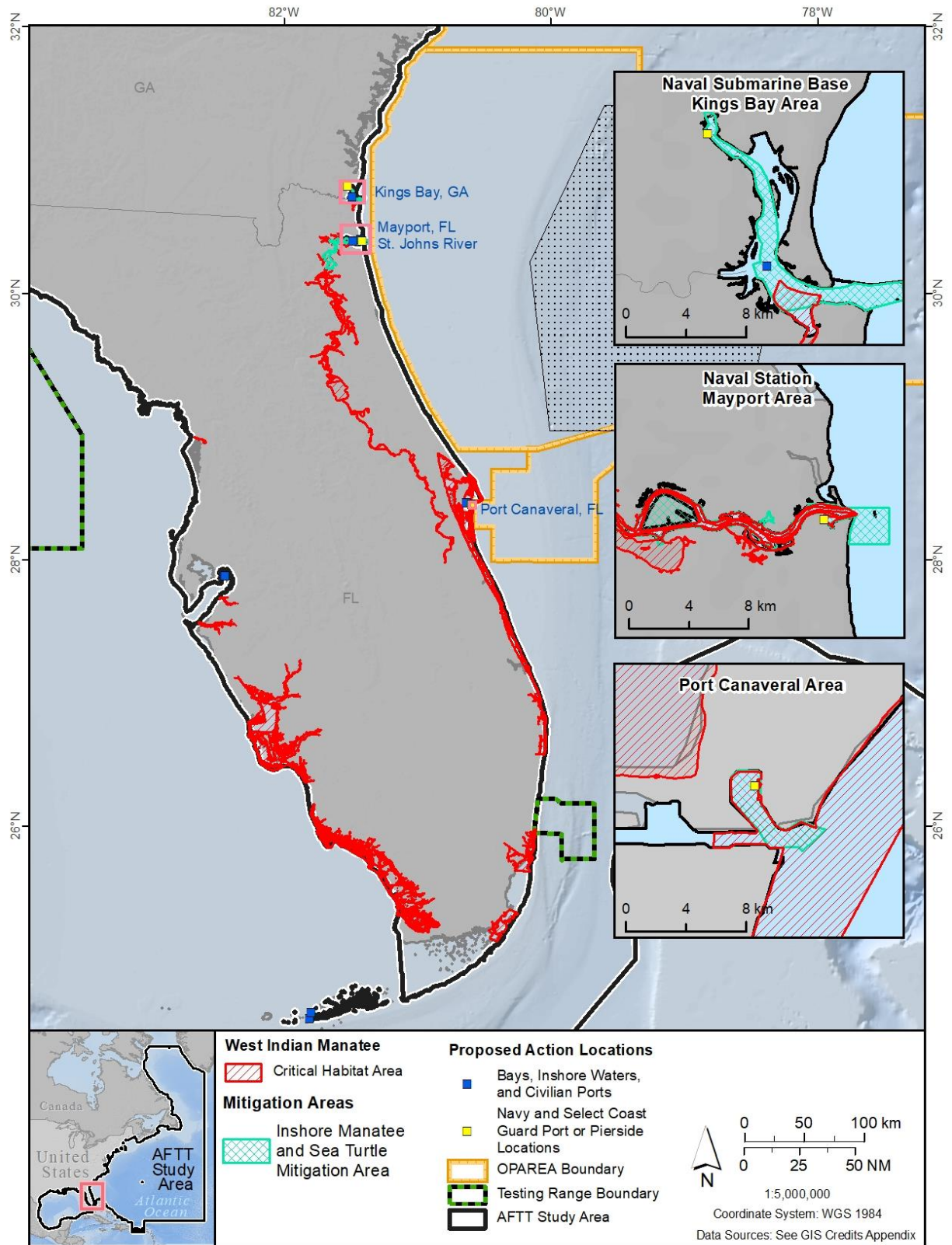
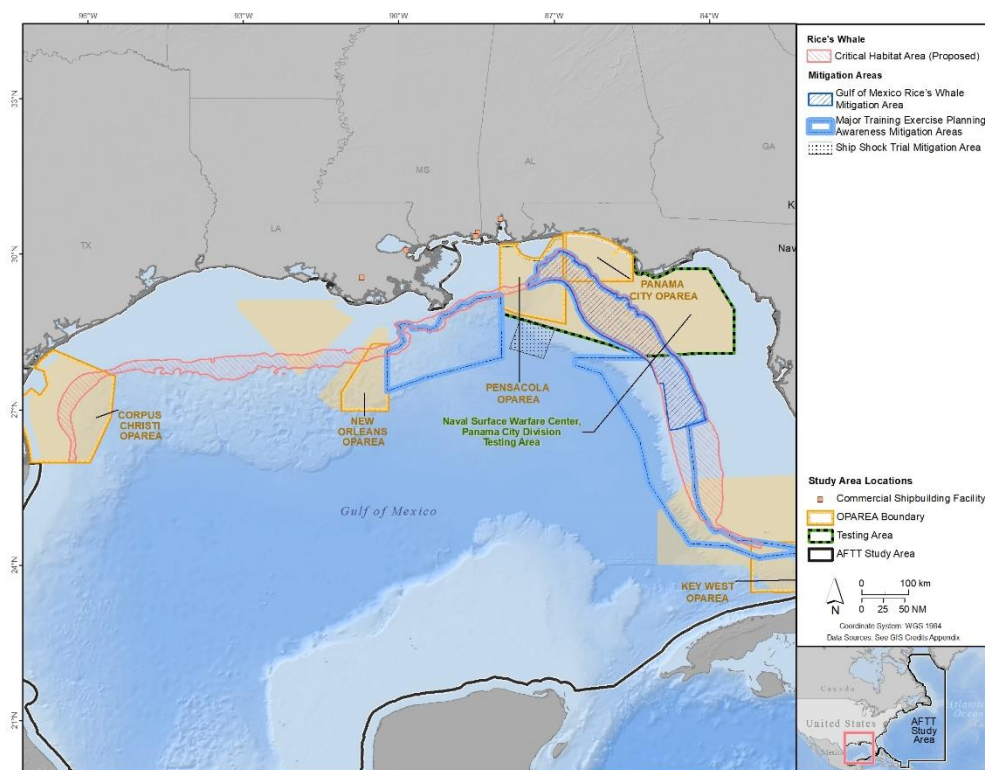


Figure 3.7-5: Southeast Mitigation Areas for North Atlantic Right Whale in the Study Area



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

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,	

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

<i>Impact Descriptor</i>	<i>Context and Intensity</i>	<i>Significance Conclusions</i>
	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 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

<i>Substressor</i>	<i>Background Information Summary</i>
Sonar and other transducers	<p>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:</p> <ul style="list-style-type: none"> • Mysticetes: species are within the Low Frequency (LF) and Very Low Frequency (VLF) hearing groups. Low-frequency and mid-frequency active 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)	<p>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.</p> <ul style="list-style-type: none"> • 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. Stress hormones in North Atlantic right whales may be negatively affected by increased ship traffic and ocean noise. • 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. • 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

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

<i>Substressor</i>	<i>Background Information Summary</i>
	in shallow water and are more likely to avoid if given more time from slower moving vessels.
Aircraft disturbance (including aircraft noise)	<p>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.</p> <ul style="list-style-type: none"> • 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 towards 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)	<p>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:</p> <ul style="list-style-type: none"> • 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 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 action 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 visual observation 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 [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 that make comparing the predicted behavioral responses in this analysis to the prior analyses challenging.

As discussed in Section 3.7.3 (Environmental Consequences), the Action Proponents will implement visual observation 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 visual observation 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.

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

<i>Geographic Mitigation Section Reference</i>	<i>Reflected in Modeling Results?</i>	<i>Summary of Relevant Mitigation</i>
Section 5.1.3 (Major Training Exercise Planning Mitigation Areas)	Yes	<ul style="list-style-type: none"> Limits on the annual number of Major Training Exercises
Section 5.1.4 (Northeast North Atlantic Right Whale Mitigation Area)	No	<ul style="list-style-type: none"> Minimization of low-frequency active sonar, mid-frequency active sonar, and high-frequency active sonar
Section 5.1.5 (Gulf of Maine Marine Mammal Mitigation Area)	Yes	<ul style="list-style-type: none"> Limit of 200 hours of surface ship hull-mounted mid-frequency active sonar annually
Section 5.1.7 (Southeast North Atlantic Right Whale Mitigation Area)	No	<ul style="list-style-type: none"> No use of, or minimization of, certain active sonar sources from November 15 to April 15
Section 5.1.9 (Gulf of Mexico Rice's Whale Mitigation Area)	Yes	<ul style="list-style-type: none"> Limit of 200 hours of surface ship hull-mounted mid-frequency active sonar annually

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.

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 of Mexico, 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 of Mexico Range Complex.
- There would be a notable increase in Mine Warfare testing events in the Gulf of Mexico 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 seven 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. 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 are requesting authorization from NMFS to take marine mammals incidental to the use of sonar and other transducers during military readiness activities.

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

<i>Species</i>	<i>Stock</i>	<i>Alternative 1</i>			<i>Alternative 2</i>		
		<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>	<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>
Atlantic spotted dolphin	Northern Gulf of Mexico	7,066	5,705	18	7,367	6,717	20
	Western North Atlantic	51,765	68,898	78	59,410	78,980	87
Atlantic white-sided dolphin	Western North Atlantic	7,160	3,719	6	7,297	3,907	6
Blainville's beaked whale	Northern Gulf of Mexico	126	0	-	178	2	-
	Western North Atlantic	25,549	151	0	29,890	169	0
Blue whale	North Atlantic	10	57	1	12	66	1
Bottlenose dolphin	Central GA Estuarine System	0	-	-	0	-	-
	Gulf of Mexico Eastern Coastal	74	3	-	74	3	-
	Gulf of Mexico Northern Coastal	4,543	503	-	5,018	3,335	4
	Gulf of Mexico Oceanic	4,759	1,508	3	5,508	2,490	3
	Gulf of Mexico Western Coastal	1,771	1,557	-	1,773	1,558	-
	Indian River Lagoon Estuarine System	1,438	138	0	1,438	138	0
	Jacksonville Estuarine System	269	91	0	269	91	0
	MS Sound, Lake Borgne, and Bay Boudreau	151	43	1	153	44	1
	Northern GA/Southern SC Estuarine System	2	-	-	2	-	-
	Northern Gulf of Mexico Continental Shelf	46,413	24,331	21	49,521	40,591	27
	Northern NC Estuarine System	8,578	1,953	6	8,578	1,953	6
	Nueces and Corpus Christi Bays	4	-	-	4	-	-
	Sabine Lake	1	-	-	1	-	-
	Southern GA Estuarine System	85	38	1	85	38	1
	Southern NC Estuarine System	81	80	-	81	80	-
	St. Andrew Bay	44	0	0	44	0	0
	St. Joseph Bay	42	-	-	42	-	-
	Tampa Bay	163	187	-	163	187	-
	Western North Atlantic Central FL Coastal	7,899	2,560	1	7,915	2,560	1
	Western North Atlantic Northern FL Coastal	17,048	4,327	3	17,049	4,327	3
	Western North Atlantic Northern Migratory Coastal	57,194	16,460	53	57,195	16,460	53
	Western North Atlantic Offshore	91,136	95,683	89	105,281	109,625	93
	Western North Atlantic SC GA Coastal	1,412	3,526	4	1,492	3,690	4
	Western North Atlantic Southern Migratory Coastal	2,908	7,212	3	2,972	7,340	3
Bryde's whale	Primary	2	9	-	3	17	-

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

<i>Species</i>	<i>Stock</i>	<i>Alternative 1</i>			<i>Alternative 2</i>		
		<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>	<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>
Clymene dolphin	Northern Gulf of Mexico	389	208	1	517	440	2
	Western North Atlantic	60,202	72,475	95	75,253	91,153	97
Goose-beaked whale	Northern Gulf of Mexico	457	2	-	647	5	-
	Western North Atlantic	111,449	607	0	128,625	653	0
Dwarf sperm whale	Northern Gulf of Mexico	21	132	5	41	320	7
	Western North Atlantic	1,266	4,955	164	1,409	6,243	175
False killer whale	Northern Gulf of Mexico	167	61	0	325	349	0
	Western North Atlantic	317	254	1	410	373	1
Fin whale	Western North Atlantic	547	1,843	18	569	2,029	18
Fraser's dolphin	Northern Gulf of Mexico	167	72	0	310	256	0
	Western North Atlantic	1,360	1,540	2	1,619	1,866	3
Gervais' beaked whale	Northern Gulf of Mexico	123	1	-	179	6	-
	Western North Atlantic	50,216	668	-	59,124	754	-
Gray seal	Western North Atlantic	9,725	5,850	19	9,744	5,902	20
Harbor porpoise	Gulf of ME/Bay of Fundy	80,932	5,655	54	83,039	5,749	54
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
Humpback whale	Gulf of ME	184	617	11	184	659	14
Killer whale	Northern Gulf of Mexico	84	26	0	159	170	0
	Western North Atlantic	99	79	1	113	89	1
Long-finned pilot whale	Western North Atlantic	12,760	8,883	8	15,085	10,573	9
Melon-headed whale	Northern Gulf of Mexico	578	191	1	1,136	1,172	2
	Western North Atlantic	1,992	2,605	3	2,695	3,518	3
Minke whale	Canadian Eastern Coastal	642	3,908	54	659	4,621	57
North Atlantic right whale	Western	89	292	2	89	296	2
Northern bottlenose whale	Western North Atlantic	1,641	9	-	1,792	9	-
Pantropical spotted dolphin	Northern Gulf of Mexico	4,586	1,715	3	8,133	8,152	5
	Western North Atlantic	6,434	6,631	4	9,040	10,128	5

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

<i>Species</i>	<i>Stock</i>	<i>Alternative 1</i>			<i>Alternative 2</i>		
		<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>	<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>
Pygmy killer whale	Northern Gulf of Mexico	203	80	0	402	430	0
	Western North Atlantic	216	260	0	285	357	0
Pygmy sperm whale	Northern Gulf of Mexico	22	115	5	41	302	7
	Western North Atlantic	1,301	4,889	157	1,449	6,139	164
Rice's whale	Northern Gulf of Mexico	81	210	2	84	268	2
Risso's dolphin	Northern Gulf of Mexico	154	47	0	243	178	0
	Western North Atlantic	20,203	16,987	19	23,117	19,862	20
Rough-toothed dolphin	Northern Gulf of Mexico	981	649	1	1,222	1,241	2
	Western North Atlantic	1,871	2,876	5	2,239	3,457	5
Sei whale	Western North Atlantic	114	618	7	117	716	8
Short-beaked common dolphin	Western North Atlantic	136,482	132,189	133	152,777	155,566	139
Short-finned pilot whale	Northern Gulf of Mexico	628	390	2	743	514	2
	Western North Atlantic	16,957	16,040	12	20,150	18,939	12
Sowerby's beaked whale	Western North Atlantic	25,255	363	-	29,763	417	-
Sperm whale	North Atlantic	8,871	3,705	4	10,727	4,341	4
	Northern Gulf of Mexico	246	25	-	515	158	0
Spinner dolphin	Northern Gulf of Mexico	478	177	0	1,027	1,140	1
	Western North Atlantic	2,606	2,748	2	3,501	3,986	2
Striped dolphin	Northern Gulf of Mexico	1,727	637	0	3,031	3,298	1
	Western North Atlantic	107,566	101,182	156	129,433	127,852	167
True's beaked whale	Western North Atlantic	25,215	363	-	29,702	417	-
White-beaked dolphin	Western North Atlantic	10	6	-	11	7	-

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 no estimation of take (true zero).

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

Species	Stock	Alternative 1			Alternative 2		
		BEH	TTS	AINJ	BEH	TTS	AINJ
Atlantic spotted dolphin	Northern Gulf of Mexico	46,568	37,048	113	50,358	46,637	131
	Western North Atlantic	343,556	452,484	532	403,701	534,476	603
Atlantic white-sided dolphin	Western North Atlantic	46,480	25,069	32	47,779	26,636	35
Blainville's beaked whale	Northern Gulf of Mexico	812	0	-	1,183	8	-
	Western North Atlantic	171,529	1,043	0	203,382	1,170	0
Blue whale	North Atlantic	69	387	2	80	452	2
Bottlenose dolphin	Central GA Estuarine System	0	-	-	0	-	-
	Gulf of Mexico Eastern Coastal	449	14	-	449	14	-
	Gulf of Mexico Northern Coastal	31,749	3,519	-	35,070	23,337	22
	Gulf of Mexico Oceanic	30,904	9,650	9	36,580	16,901	14
	Gulf of Mexico Western Coastal	10,195	8,704	-	11,329	9,605	-
	Indian River Lagoon Estuarine System	9,804	958	0	9,804	958	0
	Jacksonville Estuarine System	1,861	624	0	1,861	624	0
	MS Sound, Lake Borgne, and Bay Boudreau	832	238	1	842	242	1
	Northern GA/Southern SC Estuarine System	8	-	-	8	-	-
	Northern Gulf of Mexico Continental Shelf	318,775	158,707	132	344,480	283,650	182
	Northern NC Estuarine System	59,194	13,060	37	59,194	13,060	37
	Nueces and Corpus Christi Bays	15	-	-	15	-	-
	Sabine Lake	3	-	-	3	-	-
	Southern GA Estuarine System	521	227	1	521	227	1
	Southern NC Estuarine System	332	350	-	332	350	-
	St. Andrew Bay	301	0	0	301	0	0
	St. Joseph Bay	287	-	-	287	-	-
	Tampa Bay	654	747	-	654	747	-
	Western North Atlantic Central FL Coastal	52,973	14,231	1	53,126	14,529	1
	Western North Atlantic Northern FL Coastal	117,010	26,456	11	118,342	28,113	12
	Western North Atlantic Northern Migratory Coastal	397,269	110,561	343	397,339	110,660	344
	Western North Atlantic Offshore	608,650	636,604	601	715,038	744,470	645
	Western North Atlantic SC GA Coastal	8,993	21,872	16	9,750	23,913	17
	Western North Atlantic Southern Migratory Coastal	19,033	46,009	20	19,750	48,422	21
Bryde's whale	Primary	7	63	-	10	119	-

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

Species	Stock	Alternative 1			Alternative 2		
		BEH	TTS	AINJ	BEH	TTS	AINJ
Clymene dolphin	Northern Gulf of Mexico	2,304	1,266	2	3,312	3,006	4
	Western North Atlantic	403,174	498,843	653	513,098	631,792	674
Goose-beaked whale	Northern Gulf of Mexico	2,959	2	-	4,316	25	-
	Western North Atlantic	748,316	4,192	0	875,568	4,539	0
Dwarf sperm whale	Northern Gulf of Mexico	126	875	32	266	2,198	47
	Western North Atlantic	8,406	33,508	1,111	9,496	42,805	1,205
False killer whale	Northern Gulf of Mexico	1,035	386	0	2,162	2,420	0
	Western North Atlantic	2,143	1,728	1	2,821	2,578	1
Fin whale	Western North Atlantic	3,649	12,279	114	3,848	13,852	120
Fraser's dolphin	Northern Gulf of Mexico	1,030	455	0	2,042	1,764	0
	Western North Atlantic	9,128	10,293	12	11,034	12,740	17
Gervais' beaked whale	Northern Gulf of Mexico	798	1	-	1,191	36	-
	Western North Atlantic	340,058	4,611	-	405,215	5,238	-
Gray seal	Western North Atlantic	66,112	38,555	121	66,539	40,113	132
Harbor porpoise	Gulf of ME/Bay of Fundy	546,168	37,180	338	564,842	38,344	367
Harbor seal	Western North Atlantic	90,567	56,544	164	91,034	58,849	176
Harp seal	Western North Atlantic	111,493	63,006	23	111,541	63,086	24
Hooded seal	Western North Atlantic	6,736	4,242	5	6,760	4,286	6
Humpback whale	Gulf of ME	1,227	4,054	73	1,247	4,434	90
Killer whale	Northern Gulf of Mexico	521	159	0	1,060	1,173	0
	Western North Atlantic	657	535	1	757	612	1
Long-finned pilot whale	Western North Atlantic	85,407	60,382	49	102,522	72,640	53
Melon-headed whale	Northern Gulf of Mexico	3,599	1,203	1	7,559	8,117	2
	Western North Atlantic	13,542	17,543	12	18,554	24,145	12
Minke whale	Canadian Eastern Coastal	4,308	26,175	366	4,484	31,624	397
North Atlantic right whale	Western	589	1,885	8	597	2,015	8
Northern bottlenose whale	Western North Atlantic	10,821	57	-	12,021	58	-
Pantropical spotted dolphin	Northern Gulf of Mexico	29,007	10,896	13	54,122	56,199	34
	Western North Atlantic	44,263	44,901	24	62,677	69,942	33
Pygmy killer whale	Northern Gulf of Mexico	1,262	509	0	2,677	2,979	0
	Western North Atlantic	1,471	1,754	0	1,959	2,456	0
Pygmy sperm whale	Northern Gulf of Mexico	136	754	24	271	2,072	41
	Western North Atlantic	8,645	33,035	1,063	9,775	42,072	1,131

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

<i>Species</i>	<i>Stock</i>	<i>Alternative 1</i>			<i>Alternative 2</i>		
		<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>	<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>
Rice's whale	Northern Gulf of Mexico	544	1,428	5	567	1,855	8
Risso's dolphin	Northern Gulf of Mexico	966	284	0	1,603	1,211	0
	Western North Atlantic	132,910	112,684	124	155,506	134,720	136
Rough-toothed dolphin	Northern Gulf of Mexico	6,493	4,257	3	8,283	8,589	5
	Western North Atlantic	12,509	19,034	24	15,257	23,465	29
Sei whale	Western North Atlantic	754	4,139	44	778	4,893	52
Short-beaked common dolphin	Western North Atlantic	921,721	894,423	862	1,045,137	1,066,153	968
Short-finned pilot whale	Northern Gulf of Mexico	3,768	2,407	12	4,793	3,509	13
	Western North Atlantic	113,770	108,022	75	137,252	129,618	76
Sowerby's beaked whale	Western North Atlantic	171,025	2,504	-	203,967	2,894	-
Sperm whale	North Atlantic	59,161	25,438	16	72,719	30,042	17
	Northern Gulf of Mexico	1,505	144	-	3,398	1,076	0
Spinner dolphin	Northern Gulf of Mexico	3,241	1,217	0	7,085	7,957	4
	Western North Atlantic	17,786	18,720	10	24,142	27,584	12
Striped dolphin	Northern Gulf of Mexico	11,261	4,119	0	20,426	22,796	7
	Western North Atlantic	707,993	689,502	1,071	869,671	878,964	1,166
True's beaked whale	Western North Atlantic	170,795	2,502	-	203,585	2,892	-
White-beaked dolphin	Western North Atlantic	65	39	-	67	43	-

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 no estimation of take (true zero).

Under the MMPA, 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 are consulting 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 of Mexico 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 seven years of activities.

Due to the addition of a Composite Training Unit Exercise in the Gulf of Mexico, impacts due to sonar under Alternative 2 would primarily increase for stocks located in the Gulf of Mexico, particularly delphinid stocks in the northern Gulf of Mexico. 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 Mexico 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 Mexico, 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 [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 visual observation 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 of Mexico 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 seven 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.

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 are requesting 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 are consulting with NMFS and USFWS as required by section 7(a)(2) of the ESA.

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

Species	Stock	Alternative 1			Alternative 2		
		BEH	TTS	AINJ	BEH	TTS	AINJ
Atlantic spotted dolphin	Northern Gulf of Mexico	0	-	-	0	-	-
	Western North Atlantic	0	-	-	1	-	-
Atlantic white-sided dolphin	Western North Atlantic	0	-	-	0	-	-
Bottlenose dolphin	Gulf of Mexico Oceanic	0	-	-	0	-	-
	Gulf of Mexico Western Coastal	0	-	-	0	-	-
	Northern Gulf of Mexico Continental Shelf	1	0	-	1	0	-
	Western North Atlantic Central FL Coastal	0	-	-	0	-	-
	Western North Atlantic Northern FL Coastal	0	-	-	0	-	-
	Western North Atlantic Northern Migratory Coastal	0	0	-	0	0	-
	Western North Atlantic Offshore	1	-	-	1	-	-
	Western North Atlantic SC GA Coastal	0	-	-	0	-	-
	Western North Atlantic Southern Migratory Coastal	0	-	-	0	-	-
Dwarf sperm whale	Northern Gulf of Mexico	1	-	-	1	-	-
	Western North Atlantic	1	1	0	1	1	0
Fin whale	Western North Atlantic	1	-	-	1	-	-
Gervais' beaked whale	Western North Atlantic	0	-	-	0	-	-
Gray seal	Western North Atlantic	1	0	-	1	0	-
Harbor porpoise	Gulf of ME/Bay of Fundy	2	3	1	2	3	1
Harbor seal	Western North Atlantic	1	0	-	1	0	-
Harp seal	Western North Atlantic	0	-	-	0	-	-
Killer whale	Western North Atlantic	0	-	-	0	-	-
Minke whale	Canadian Eastern Coastal	-	0	-	-	0	-
North Atlantic right whale	Western	0	-	-	0	-	-
Pantropical spotted dolphin	Northern Gulf of Mexico	0	-	-	0	-	-
	Western North Atlantic	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 Mexico	0	-	-	0	-	-
Short-beaked common dolphin	Western North Atlantic	1	-	-	1	-	-
Short-finned pilot whale	Northern Gulf of Mexico	0	-	-	0	-	-
	Western North Atlantic	0	-	-	0	-	-
Sperm whale	North Atlantic	0	-	-	0	-	-

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

<i>Species</i>	<i>Stock</i>	<i>Alternative 1</i>			<i>Alternative 2</i>		
		<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>	<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>
Striped dolphin	Western North Atlantic	1	-	-	1	-	-

Notes: AINJ = Auditory Injury; BEH = Significant Behavioral Response; FL = Florida; GA = Georgia; ME = Maine; SC = South Carolina; TTS = Temporary Threshold Shift
A dash (-) indicates no estimation of take (true zero).

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

<i>Species</i>	<i>Stock</i>	<i>Alternative 1</i>			<i>Alternative 2</i>		
		<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>	<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>
Atlantic spotted dolphin	Northern Gulf of Mexico	0	-	-	0	-	-
	Western North Atlantic	0	-	-	1	-	-
Atlantic white-sided dolphin	Western North Atlantic	0	-	-	0	-	-
Bottlenose dolphin	Gulf of Mexico Oceanic	0	-	-	0	-	-
	Gulf of Mexico Western Coastal	0	-	-	0	-	-
	Northern Gulf of Mexico Continental Shelf	1	0	-	1	0	-
	Western North Atlantic Central FL Coastal	0	-	-	0	-	-
	Western North Atlantic Northern FL Coastal	0	-	-	0	-	-
	Western North Atlantic Northern Migratory Coastal	0	0	-	0	0	-
	Western North Atlantic Offshore	1	-	-	1	-	-
	Western North Atlantic SC GA Coastal	0	-	-	0	-	-
	Western North Atlantic Southern Migratory Coastal	0	-	-	0	-	-
	Western North Atlantic	0	-	-	0	-	-
Dwarf sperm whale	Northern Gulf of Mexico	1	-	-	1	-	-
	Western North Atlantic	3	2	0	3	2	0
Fin whale	Western North Atlantic	1	-	-	1	-	-
Gervais' beaked whale	Western North Atlantic	0	-	-	0	-	-
Gray seal	Western North Atlantic	7	0	-	7	0	-
Harbor porpoise	Gulf of ME/Bay of Fundy	12	15	1	14	17	1
Harbor seal	Western North Atlantic	5	0	-	5	0	-
Harp seal	Western North Atlantic	0	-	-	0	-	-
Killer whale	Western North Atlantic	0	-	-	0	-	-
Minke whale	Canadian Eastern Coastal	-	0	-	-	0	-
North Atlantic right whale	Western	0	-	-	0	-	-

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

<i>Species</i>	<i>Stock</i>	<i>Alternative 1</i>			<i>Alternative 2</i>		
		<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>	<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>
Pantropical spotted dolphin	Northern Gulf of Mexico	0	-	-	0	-	-
	Western North Atlantic	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 Mexico	0	-	-	0	-	-
Short-beaked common dolphin	Western North Atlantic	4	-	-	4	-	-
Short-finned pilot whale	Northern Gulf of Mexico	0	-	-	0	-	-
	Western North Atlantic	0	-	-	0	-	-
Sperm whale	North Atlantic	0	-	-	0	-	-
Striped dolphin	Western North Atlantic	2	-	-	2	-	-

Notes: AINJ = Auditory Injury; BEH = Significant Behavioral Response; FL = Florida; GA = Georgia; ME = Maine; SC = South Carolina; TTS = Temporary Threshold Shift
A dash (-) indicates no estimation of take (true zero).

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 seven 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 [Appendix E](#) (Acoustic and Explosives Impact Analysis).

As discussed in Section 3.7.3 (Environmental Consequences), the Action Proponents will implement visual observation 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 seven 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 so 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 are requesting 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 are consulting 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 seven 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.

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 are consulting with NMFS and USFWS as required by section 7(a)(2) of the ESA.

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

<i>Species</i>	<i>Stock</i>	<i>Alternative 1</i>			<i>Alternative 2</i>		
		<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>	<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>
Bottlenose dolphin	Gulf of Mexico Northern Coastal	1,894	0	-	1,894	0	-
	MS Sound, Lake Borgne, and Bay Boudreau	1,564	0	-	1,564	0	-

Notes: AINJ = Auditory Injury; BEH = Significant Behavioral Response; MS = Mississippi; TTS = Temporary Threshold Shift
A dash (-) indicates no estimation of take (true zero).

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

<i>Species</i>	<i>Stock</i>	<i>Alternative 1</i>			<i>Alternative 2</i>		
		<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>	<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>
Bottlenose dolphin	Gulf of Mexico Northern Coastal	13,255	0	-	13,255	0	-
	MS Sound, Lake Borgne, and Bay Boudreau	10,944	0	-	10,944	0	-

Notes: AINJ = Auditory Injury; BEH = Significant Behavioral Response; MS = Mississippi; TTS = Temporary Threshold Shift
A dash (-) indicates no estimation of take (true zero).

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. Aircrafts 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 are consulting 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 visual observation 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 are consulting 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

<i>Substressor</i>	<i>Background Information Summary</i>
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.

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 visual observation 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 visual observation 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, Section 2.3.2).

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

<i>Geographic Mitigation Section Reference</i>	<i>Reflected in Modeling Results?</i>	<i>Summary of Relevant Mitigation</i>
Section 5.1.2 (Ship Shock Trial Mitigation Areas)	Yes	Repositioning of the northern Gulf of Mexico ship shock trial box outside of Rice's whale core distribution as identified by NMFS in 2019 (84 <i>Federal Register</i> 15446) and updated in 2021 (86 <i>Federal Register</i> 47022). <ul style="list-style-type: none"> No ship shock trials overlapping the Jacksonville OPAREA from November 15 through April 15
Section 5.1.3 (Major Training Exercise Planning Mitigation Areas)	Not Applicable ¹	<ul style="list-style-type: none"> Limits on the annual number of Major Training Exercises
Section 5.1.4 (Northeast North Atlantic Right Whale Mitigation Area)	Yes	<ul style="list-style-type: none"> No in-water explosives
Section 5.1.7 (Southeast North Atlantic Right Whale Mitigation Area)	No	<ul style="list-style-type: none"> No in-water explosives from November 15 to April 15.
Section 5.1.9 (Gulf of Mexico Rice's Whale Mitigation Area)	Yes	<ul style="list-style-type: none"> 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 of Mexico 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 seven 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.

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 Virginia Capes, Jacksonville, or Gulf of Mexico Range Complexes. The Action Proponents conduct extensive visual observations 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 are requesting 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 are consulting with NMFS and USFWS as required by section 7(a)(2) of the ESA.

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

Species	Stock	Alternative 1					Alternative 2				
		BEH	TTS	AINJ	INJ	MORT	BEH	TTS	AINJ	INJ	MORT
Atlantic spotted dolphin	Northern Gulf of Mexico	19	14	2	0	0	20	14	2	0	0
	Western North Atlantic	75	65	8	4	1	76	66	8	4	1
Atlantic white-sided dolphin	Western North Atlantic	12	10	2	1	0	13	10	2	1	0
Blainville's beaked whale	Northern Gulf of Mexico	0	0	-	-	-	0	0	-	-	-
	Western North Atlantic	2	3	2	1	0	2	3	2	1	0
Blue whale	North Atlantic	2	3	-	-	-	2	3	-	-	-
Bottlenose dolphin	Central GA Estuarine System	0	-	-	-	-	0	-	-	-	-
	Gulf of Mexico Eastern Coastal	1	2	0	-	-	1	2	0	-	-
	Gulf of Mexico Northern Coastal	87	119	17	-	-	87	119	17	-	-
	Gulf of Mexico Oceanic	5	2	1	0	0	5	2	1	0	0
	Gulf of Mexico Western Coastal	2	1	1	0	-	2	1	1	0	-
	Northern Gulf of Mexico Continental Shelf	387	199	6	2	0	390	200	6	2	0
	Northern NC Estuarine System	1	0	0	-	-	1	0	0	-	-
	Northern SC Estuarine System	0	-	-	-	-	0	-	-	-	-
	Southern NC Estuarine System	1	-	-	-	-	1	-	-	-	-
	St. Andrew Bay	1	1	-	-	-	1	1	-	-	-
	Western North Atlantic Central FL Coastal	22	13	2	1	0	22	13	2	1	0
	Western North Atlantic Northern FL Coastal	6	4	2	0	-	6	5	2	0	-
	Western North Atlantic Northern Migratory Coastal	23	43	6	1	0	23	43	6	1	0
	Western North Atlantic Offshore	118	130	20	3	2	120	131	20	3	2
	Western North Atlantic SC GA Coastal	14	8	2	0	1	15	8	2	0	1
	Western North Atlantic Southern Migratory Coastal	28	32	5	1	0	29	32	5	1	0
Bryde's whale	Primary	0	0	-	-	-	0	0	-	-	-
Clymene dolphin	Northern Gulf of Mexico	1	1	1	1	0	1	1	1	1	0
	Western North Atlantic	21	27	7	2	2	22	28	7	2	2
Goose-beaked whale	Northern Gulf of Mexico	0	1	0	-	-	0	1	0	-	-
	Western North Atlantic	8	13	3	0	0	9	13	3	0	0
Dwarf sperm whale	Northern Gulf of Mexico	5	30	17	0	-	5	30	17	0	-
	Western North Atlantic	41	65	28	0	0	43	67	28	0	0
False killer whale	Northern Gulf of Mexico	1	1	0	-	-	1	1	0	-	-
	Western North Atlantic	0	1	-	-	-	0	1	-	-	-

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

<i>Species</i>	<i>Stock</i>	<i>Alternative 1</i>					<i>Alternative 2</i>				
		<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>	<i>INJ</i>	<i>MORT</i>	<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>	<i>INJ</i>	<i>MORT</i>
Fin whale	Western North Atlantic	141	168	12	-	-	143	169	12	-	-
Fraser's dolphin	Northern Gulf of Mexico	1	1	0	0	-	1	1	0	0	-
	Western North Atlantic	2	3	1	0	-	2	3	1	0	-
Gervais' beaked whale	Northern Gulf of Mexico	0	1	-	-	-	0	1	-	-	-
	Western North Atlantic	4	4	2	0	-	4	4	2	0	-
Gray seal	Western North Atlantic	85	64	5	0	-	93	67	5	0	-
Harbor porpoise	Gulf of ME/Bay of Fundy	171	379	100	0	0	185	394	103	0	0
Harbor seal	Western North Atlantic	128	94	7	0	0	139	98	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	-	-
Humpback whale	Gulf of ME	28	23	1	-	-	29	24	1	-	-
Killer whale	Northern Gulf of Mexico	0	0	0	-	-	0	0	0	-	-
	Western North Atlantic	1	1	0	-	0	1	1	0	-	0
Long-finned pilot whale	Western North Atlantic	23	29	9	3	1	23	29	9	3	1
Melon-headed whale	Northern Gulf of Mexico	1	1	0	0	0	1	1	0	0	0
	Western North Atlantic	1	0	0	0	0	1	0	0	0	0
Minke whale	Canadian Eastern Coastal	51	49	2	0	-	53	50	2	0	-
North Atlantic right whale	Western	20	14	1	-	-	20	14	1	-	-
Northern bottlenose whale	Western North Atlantic	1	0	1	-	-	1	0	1	-	-
Pantropical spotted dolphin	Northern Gulf of Mexico	3	12	3	3	2	3	12	3	3	2
	Western North Atlantic	2	1	1	0	0	2	1	1	0	0
Pygmy killer whale	Northern Gulf of Mexico	1	1	0	0	0	1	1	0	0	0
	Western North Atlantic	0	1	1	0	-	0	1	1	0	-
Pygmy sperm whale	Northern Gulf of Mexico	6	32	17	-	-	6	33	17	-	-
	Western North Atlantic	39	64	28	0	-	41	66	28	0	-
Rice's whale	Northern Gulf of Mexico	7	5	1	-	-	8	5	1	-	-
Risso's dolphin	Northern Gulf of Mexico	1	1	0	0	0	1	1	0	0	0
	Western North Atlantic	23	37	4	2	1	25	38	4	2	1
Rough-toothed dolphin	Northern Gulf of Mexico	7	5	1	1	0	7	5	1	1	0
	Western North Atlantic	3	3	1	0	-	3	3	1	0	-
Sei whale	Western North Atlantic	11	6	0	-	-	12	6	0	-	-
Short-beaked common dolphin	Western North Atlantic	437	370	38	19	5	445	373	38	19	5

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

<i>Species</i>	<i>Stock</i>	<i>Alternative 1</i>					<i>Alternative 2</i>				
		<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>	<i>INJ</i>	<i>MORT</i>	<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>	<i>INJ</i>	<i>MORT</i>
Short-finned pilot whale	Northern Gulf of Mexico	1	2	1	0	0	1	2	1	0	0
	Western North Atlantic	21	27	7	1	1	22	27	7	1	1
Sowerby's beaked whale	Western North Atlantic	2	2	1	0	0	2	2	1	0	0
Sperm whale	North Atlantic	7	11	3	1	0	7	11	3	1	0
	Northern Gulf of Mexico	2	2	0	0	0	2	2	0	0	0
Spinner dolphin	Northern Gulf of Mexico	0	1	0	0	-	0	1	0	0	-
	Western North Atlantic	1	2	0	0	-	1	2	0	0	-
Striped dolphin	Northern Gulf of Mexico	1	11	5	2	1	1	11	5	2	1
	Western North Atlantic	29	92	19	16	6	32	93	20	16	6
True's beaked whale	Western North Atlantic	2	2	1	-	0	2	2	1	-	0
White-beaked dolphin	Western North Atlantic	0	-	-	-	-	0	-	-	-	-

Notes: AINJ = Auditory Injury; BEH = Significant Behavioral Response; FL = Florida; GA = Georgia; INJ = Non-Auditory Injury; ME = Maine; MORT = Mortality; MS = Mississippi; NC = North Carolina; SC = South Carolina; TTS = Temporary Threshold Shift
A dash (-) indicates no estimation of take (true zero).

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

<i>Species</i>	<i>Stock</i>	<i>Alternative 1</i>					<i>Alternative 2</i>				
		<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>	<i>INJ</i>	<i>MORT</i>	<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>	<i>INJ</i>	<i>MORT</i>
Atlantic spotted dolphin	Northern Gulf of Mexico	125	93	10	0	0	130	94	10	0	0
	Western North Atlantic	468	390	42	11	2	478	396	43	12	2
Atlantic white-sided dolphin	Western North Atlantic	71	60	8	3	0	78	63	9	3	0
Blainville's beaked whale	Northern Gulf of Mexico	0	0	-	-	-	0	0	-	-	-
	Western North Atlantic	6	10	3	1	0	6	11	3	1	0
Blue whale	North Atlantic	4	8	-	-	-	4	9	-	-	-

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

Species	Stock	Alternative 1					Alternative 2				
		BEH	TTS	AINJ	INJ	MORT	BEH	TTS	AINJ	INJ	MORT
Bottlenose dolphin	Central GA Estuarine System	0	-	-	-	-	0	-	-	-	-
	Gulf of Mexico Eastern Coastal	4	8	0	-	-	4	8	0	-	-
	Gulf of Mexico Northern Coastal	604	823	114	-	-	604	823	114	-	-
	Gulf of Mexico Oceanic	19	11	2	0	0	20	11	3	0	0
	Gulf of Mexico Western Coastal	10	4	1	0	-	13	6	1	0	-
	Northern Gulf of Mexico Continental Shelf	2,697	1,384	31	2	0	2,718	1,394	33	2	0
	Northern NC Estuarine System	1	0	0	-	-	1	0	0	-	-
	Northern SC Estuarine System	0	-	-	-	-	0	-	-	-	-
	Southern NC Estuarine System	1	-	-	-	-	1	-	-	-	-
	St. Andrew Bay	1	1	-	-	-	1	1	-	-	-
	Western North Atlantic Central FL Coastal	132	82	8	2	0	132	82	8	2	0
	Western North Atlantic Northern FL Coastal	29	24	2	0	-	31	25	2	0	-
	Western North Atlantic Northern Migratory Coastal	157	294	31	1	0	157	294	31	1	0
	Western North Atlantic Offshore	747	721	89	9	3	762	729	90	9	3
	Western North Atlantic SC GA Coastal	87	52	6	0	1	88	52	6	0	1
	Western North Atlantic Southern Migratory Coastal	188	220	28	4	0	189	221	28	4	0
Bryde's whale	Primary	0	0	-	-	-	0	0	-	-	-
Clymene dolphin	Northern Gulf of Mexico	4	3	1	1	0	4	3	1	1	0
	Western North Atlantic	142	170	42	5	5	149	176	43	5	5
Goose-beaked whale	Northern Gulf of Mexico	0	1	0	-	-	0	1	0	-	-
	Western North Atlantic	44	51	8	0	0	45	51	8	0	0
Dwarf sperm whale	Northern Gulf of Mexico	21	89	41	0	-	23	91	41	0	-
	Western North Atlantic	277	360	104	0	0	291	373	105	0	0
False killer whale	Northern Gulf of Mexico	1	1	0	-	-	1	1	0	-	-
	Western North Atlantic	0	2	-	-	-	0	2	-	-	-
Fin whale	Western North Atlantic	876	704	40	-	-	887	710	40	-	-
Fraser's dolphin	Northern Gulf of Mexico	1	1	0	0	-	1	1	0	0	-
	Western North Atlantic	7	7	2	0	-	7	8	2	0	-
Gervais' beaked whale	Northern Gulf of Mexico	0	1	-	-	-	0	1	-	-	-
	Western North Atlantic	4	8	1	0	-	4	9	2	0	-

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

Species	Stock	Alternative 1					Alternative 2				
		BEH	TTS	AINJ	INJ	MORT	BEH	TTS	AINJ	INJ	MORT
Gray seal	Western North Atlantic	591	432	31	0	-	642	453	32	0	-
Harbor porpoise	Gulf of ME/Bay of Fundy	1,158	2,472	635	0	0	1,254	2,575	657	0	0
Harbor seal	Western North Atlantic	879	630	41	0	0	952	659	42	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	-	-
Humpback whale	Gulf of ME	177	105	1	-	-	182	108	1	-	-
Killer whale	Northern Gulf of Mexico	0	0	0	-	-	0	0	0	-	-
	Western North Atlantic	2	2	0	-	0	2	2	0	-	0
Long-finned pilot whale	Western North Atlantic	138	120	28	6	1	141	120	29	6	1
Melon-headed whale	Northern Gulf of Mexico	1	3	0	0	0	1	3	0	0	0
	Western North Atlantic	1	0	0	0	0	1	0	0	0	0
Minke whale	Canadian Eastern Coastal	330	214	9	0	-	344	222	9	0	-
North Atlantic right whale	Western	127	87	1	-	-	130	90	1	-	-
Northern bottlenose whale	Western North Atlantic	1	0	1	-	-	1	0	1	-	-
Pantropical spotted dolphin	Northern Gulf of Mexico	18	38	7	8	5	19	38	7	8	5
	Western North Atlantic	8	6	1	0	0	8	6	1	0	0
Pygmy killer whale	Northern Gulf of Mexico	1	1	0	0	0	1	1	0	0	0
	Western North Atlantic	0	1	1	0	-	0	1	1	0	-
Pygmy sperm whale	Northern Gulf of Mexico	27	100	41	-	-	29	102	42	-	-
	Western North Atlantic	260	359	116	0	-	272	373	118	0	-
Rice's whale	Northern Gulf of Mexico	49	26	1	-	-	50	27	1	-	-
Risso's dolphin	Northern Gulf of Mexico	1	1	0	0	0	1	1	0	0	0
	Western North Atlantic	145	165	18	4	1	157	171	19	4	1
Rough-toothed dolphin	Northern Gulf of Mexico	40	24	1	1	0	41	24	1	1	0
	Western North Atlantic	10	11	1	0	-	10	11	1	0	-
Sei whale	Western North Atlantic	68	25	0	-	-	72	26	0	-	-
Short-beaked common dolphin	Western North Atlantic	2,686	1,986	177	50	12	2,745	2,012	180	51	12
Short-finned pilot whale	Northern Gulf of Mexico	3	5	1	0	0	3	5	1	0	0
	Western North Atlantic	124	116	26	3	1	127	116	26	3	1
Sowerby's beaked whale	Western North Atlantic	8	10	1	0	0	8	10	1	0	0
Sperm whale	North Atlantic	35	51	9	1	0	36	52	9	1	0
	Northern Gulf of Mexico	2	2	0	0	0	2	2	0	0	0
Spinner dolphin	Northern Gulf of Mexico	0	1	0	0	-	0	1	0	0	-

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

<i>Species</i>	<i>Stock</i>	<i>Alternative 1</i>					<i>Alternative 2</i>				
		<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>	<i>INJ</i>	<i>MORT</i>	<i>BEH</i>	<i>TTS</i>	<i>AINJ</i>	<i>INJ</i>	<i>MORT</i>
	Western North Atlantic	2	6	0	0	-	3	6	0	0	-
Striped dolphin	Northern Gulf of Mexico	5	29	10	5	2	5	29	10	5	2
	Western North Atlantic	189	320	68	44	16	211	331	70	44	16
True's beaked whale	Western North Atlantic	2	3	1	-	0	2	3	1	-	0
White-beaked dolphin	Western North Atlantic	0	-	-	-	-	0	-	-	-	-

Notes: AINJ = Auditory Injury; BEH = Significant Behavioral Response; FL = Florida; GA = Georgia; INJ = Non-Auditory Injury; ME = Maine; MORT = Mortality; MS = Mississippi;
NC = North Carolina; SC = South Carolina; TTS = Temporary Threshold Shift
A dash (-) indicates no estimation of take (true zero).

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

<i>Substressor</i>	<i>Background Information Summary</i>
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. <ul style="list-style-type: none"> 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. <ul style="list-style-type: none"> 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 of Mexico 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 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 will have no effect on the blue whale, fin whale, North Atlantic right whale, sei whale, sperm whale, Rice's whale, and West Indian manatee, 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 designated critical habitat for the North Atlantic right whale and West Indian manatee, nor on proposed Rice's whale critical habitat.

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 the Draft 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 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 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 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

<i>Substressor</i>	<i>Background Information Summary</i>
Vessels and in-water devices	<p>Vessel strikes may impact marine mammal species, but mitigation measures are in place that reduce the potential for a strike to occur.</p> <ul style="list-style-type: none"> 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.

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

<i>Substressor</i>	<i>Background Information Summary</i>
	<ul style="list-style-type: none"> 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.
Military expended materials	<p>While no strike from military expended materials has ever been reported or recorded, military expended materials may impact marine mammal species.</p> <ul style="list-style-type: none"> 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	<p>Seafloor devices are not likely to impact marine mammals.</p> <ul style="list-style-type: none"> 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	<p>Pile driving will not affect marine mammals.</p> <ul style="list-style-type: none"> 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

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

<i>Substressor</i>	<i>Background Information Summary</i>
	(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 Mexico, 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.

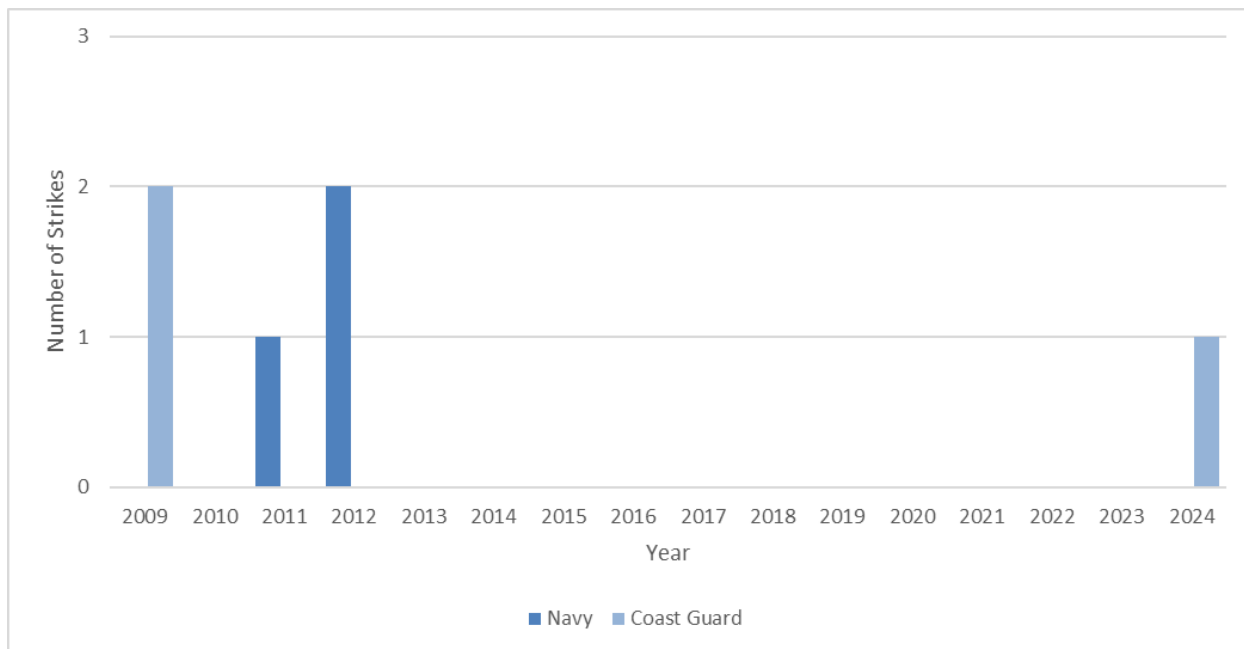


Figure 3.7-8: Large Whale Strikes in the Study Area by Year (2009 to 2024)

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.

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 of Mexico 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 of Mexico 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 of Mexico 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:

$$P(n|\mu) = \frac{e^{-\mu} \cdot \mu^n}{n!}$$

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

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.

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.

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

<i>Number of Whales</i>	<i>Percent Probability of Strike in a Seven-Year Period – 2018 Final EIS/OEIS (Navy)</i>	<i>Percent Probability of Strike in a Seven-Year Period – Supplemental EIS/OEIS (Navy)</i>	<i>Percent Probability of Strike in a Seven-Year Period – Supplemental EIS/OEIS (Coast Guard)</i>
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

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 of Mexico 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 of Mexico 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 Complex 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 GOMEX 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 are consulting 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 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 are consulting 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 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 training 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 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 are consulting 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

<i>Substressor</i>	<i>Background Information Summary</i>
Wires and cables	<p>Wires and cables are unlikely to impact marine mammals.</p> <ul style="list-style-type: none"> 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	<p>Entanglement of a marine mammal in a decelerator/parachute assembly at the surface or within the water column would be unlikely.</p> <ul style="list-style-type: none"> 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	<p>It is unlikely a marine mammal would become entangled in a biodegradable polymer.</p> <ul style="list-style-type: none"> 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. 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 a 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 training 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 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 Mexico, 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 Mexico 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 are consulting 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 five 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 of Mexico, 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 of Mexico 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 training 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.

Fourteen large and six extra-large decelerator/parachutes are expected to be expended in the Gulf of Mexico 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. Twelve 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 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 are consulting 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 of Mexico Range Complex. Rice's whales are restricted to tropical and subtropical waters and do not generally occur beyond latitude 40° in either the northern or southern hemisphere (Jefferson et al., 2015; Kato & Perrin, 2009). Rice's whales generally occur over the shelf break. LaBrecque et al. (2015a) identified one year-round small and resident area for Rice's whales that overlaps with the Gulf of Mexico Range Complex. Testing activities that involve biodegradable polymer use in the Gulf of Mexico 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 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 would have no effect on 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 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

<i>Substressor</i>	<i>Background Information Summary</i>
Military expended materials – munitions	<p>Ingestion of military expended materials - munitions is not expected in most species of marine mammal, unless they are species that feed on the bottom.</p> <ul style="list-style-type: none"> 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

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

<i>Substressor</i>	<i>Background Information Summary</i>
	<p>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.</p> <ul style="list-style-type: none"> 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	<p>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.</p> <ul style="list-style-type: none"> 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. <p>It is unlikely a marine mammal would ingest biodegradable polymer or bio-inspired slime.</p> <ul style="list-style-type: none"> 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 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 are consulting 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 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 are consulting 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 military readiness.

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

<i>Substressor</i>	<i>Background Information Summary</i>
Explosives	<p>Underwater explosions could impact other species in the food web, including prey species that marine mammals feed upon.</p> <ul style="list-style-type: none"> 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	<p>Explosion byproducts associated with high order detonations present no indirect stressors to marine mammals through sediment or water.</p> <ul style="list-style-type: none"> 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).

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

<i>Substressor</i>	<i>Background Information Summary</i>
Chemicals	<p>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.</p> <ul style="list-style-type: none"> 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.
Transmission of disease and parasites	<p>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.</p> <ul style="list-style-type: none"> 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, or the proposed Rice's whale 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 are consulting 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 Sections 3.7.3.1 (Acoustic Stressors) through 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 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 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, and 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 are consulting 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		Indirect/Secondary	
		Sonar and Other Transducers	Air Guns	Pile Driving	Vessel Noise	Aircraft Noise	Weapons Noise	Explosives in Air	Explosives in Water	In-Water Electromagnetic Devices	In-Air Electromagnetic Devices	High-Energy Lasers	Aircraft and Aerial Targets	Vessels	In-Water Devices	Military Expended Materials	Seafloor Devices	Pile Driving	Wires and Cables	Decelerators/Parachutes	Biodegradable Polymer	Military Expended Materials – Munitions	Military Expended Materials – Other Than Munitions		
Training Activities																									
North Atlantic right whale	Throughout range	MA	N/A	N/A	MA	MA	MA	NE	MA	N/A	MA	NE	MA	MA	N/A	MA	MA	N/A	MA	MA	N/A	MA	MA	MA	
	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	MA	N/A	N/A	MA	MA	MA	NE	MA	N/A	MA	NE	MA	MA	N/A	MA	MA	N/A	MA	MA	N/A	MA	MA	MA	
Rice’s whale	Throughout range	MA	N/A	N/A	MA	MA	MA	NE	MA	N/A	MA	NE	MA	MA	N/A	MA	MA	N/A	MA	MA	N/A	MA	MA	MA	
	Proposed Critical Habitat	MA	N/A	N/A	MA	MA	MA	NE	MA	N/A	NE	NE	NE	NE	N/A	NE	NE	N/A	NE	NE	N/A	NE	NE	NE	
Fin whale	Throughout range	MA	N/A	N/A	MA	MA	MA	NE	MA	N/A	MA	NE	MA	MA	N/A	MA	MA	N/A	MA	MA	N/A	MA	MA	MA	
Sei whale	Throughout range	MA	N/A	N/A	MA	MA	MA	NE	MA	N/A	MA	NE	MA	MA	N/A	MA	MA	N/A	MA	MA	N/A	MA	MA	MA	
Sperm whale	Atlantic Stock	MA	N/A	N/A	MA	MA	MA	NE	MA	N/A	MA	NE	MA	MA	N/A	MA	MA	N/A	MA	MA	N/A	MA	MA	MA	
	Gulf of Mexico Stock	MA	N/A	N/A	MA	MA	MA	NE	MA	N/A	MA	NE	MA	MA	N/A	MA	MA	N/A	MA	MA	N/A	MA	MA	MA	

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			Indirect/Secondary
		Sonar and Other Transducers	Air Guns	Pile Driving	Vessel Noise	Aircraft Noise	Weapons Noise	Explosives in Air	Explosives in Water	In-Water Electromagnetic Devices	In-Air Electromagnetic Devices	High-Energy Lasers	Aircraft and Aerial Targets	Vessels	In-Water Devices	Military Expended Materials	Seafloor Devices	Pile Driving	Wires and Cables	Decelerators/Parachutes	Biodegradable Polymer	Military Expended Materials – Munitions	Military Expended Materials – Other Than Munitions	
West Indian manatee	Throughout range	MA	N/A	MA	MA	MA	MA	NE	MA	N/A	MA	NE	MA	MA	N/A	MA	MA	NE	MA	MA	N/A	MA	MA	MA
	Critical habitat	NE	N/A	N/A	NE	NE	NE	NE	NE	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
Testing Activities																								
North Atlantic right whale	Throughout range	MA	MA	N/A	MA	MA	MA	NE	MA	N/A	MA	NE	MA	MA	N/A	MA	MA	N/A	MA	MA	MA	MA	MA	MA
	Critical habitat	NE	NE	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	MA	MA	N/A	MA	MA	MA	NE	MA	N/A	MA	NE	MA	MA	N/A	NA	MA	N/A	MA	MA	MA	MA	MA	MA
Rice’s whale	Throughout range	MA	MA	N/A	NE	MA	MA	NE	MA	N/A	MA	NE	MA	MA	N/A	NA	MA	N/A	MA	MA	MA	MA	MA	MA
	Proposed Critical Habitat	MA	MA	N/A	MA	MA	MA	NE	MA	N/A	NE	NE	NE	NE	N/A	NE	NE	NE	NE	NE	NE	NE	NE	NE
Fin whale	Throughout range	MA	MA	N/A	MA	MA	MA	NE	MA	N/A	MA	NE	MA	MA	N/A	MA	MA	N/A	MA	MA	MA	MA	MA	MA
Sei whale	Throughout range	MA	MA	N/A	MA	MA	MA	NE	MA	N/A	MA	NE	MA	MA	N/A	MA	MA	N/A	MA	MA	MA	MA	MA	MA

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-Water Electromagnetic Devices	In-Air Electromagnetic Devices	High-Energy Lasers	Aircraft and Aerial Targets	Vessels	In-Water Devices	Military Expended Materials	Seafloor Devices	Pile Driving	Wires and Cables	Decelerators/Parachutes	Biodegradable Polymer	Military Expended Materials – Munitions		Military Expended Materials – Other Than Munitions	
Sperm whale	Atlantic Stock	MA	MA	N/A	MA	MA	MA	NE	MA	N/A	MA	NE	MA	MA	N/A	MA	MA	N/A	MA	MA	MA	MA	MA	MA	
	Gulf of Mexico Stock	MA	MA	N/A	MA	MA	MA	NE	MA	N/A	MA	NE	MA	MA	N/A	MA	MA	N/A	MA	MA	MA	MA	MA	MA	
West Indian manatee	Throughout range	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	NE	N/A	N/A	N/A	N/A	NE	
	Critical habitat	NE	N/A	N/A	NE	NE	NE	NE	NE	NE	N/A	N/A	N/A	NE	N/A	NE	NE	NE	N/A	NE	N/A	N/A	N/A	NE	

*The use of air guns during military readiness activities may 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: MA = may affect; N/A = not applicable; NE = no effect

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