REQUEST FOR REGULATIONS AND LETTERS OF AUTHORIZATION FOR THE INCIDENTAL TAKING OF MARINE MAMMALS RESULTING FROM MILITARY READINESS ACTIVITIES IN THE ATLANTIC FLEET TRAINING AND TESTING STUDY AREA

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Abbreviations and Acronyms

Acronym	Definition
µPa	micropascal
AFTT	Atlantic Fleet Training and Testing
AINJ	auditory injury
ASW	Anti-Submarine Warfare
CFR	Code of Federal Regulations
CI	Confidence Interval
CV	coefficient of variation
dB	decibel(s)
EIS	Environmental Impact Statement
ESA	Endangered Species Act
EEZ	Exclusive Economic Zone
EWS	Early Warning System
ft.	foot/feet
FR	Federal Register
GOMEX	Gulf of Mexico
Hz	hertz
HF	high-frequency
in.	inch
JAX	Jacksonville
kHz	kilohertz
lb.	pound(s)
LF	low-frequency
LMR LE	Living Marine Resources Law Enforcement
LOA	Letter of Authorization
m	meter(s)
MF	mid-frequency
MMPA	Marine Mammal Protection Act
MPA	Marine Protected Area
MTE	Major Training Exercise

Acronym	Definition
NAVAIR	Naval Air Systems Command
NAVSEA	Naval Sea Systems Command
Navy	United Stated Department of the Navy
NDAA	National Defense Authorization Act
NEW	net explosive weight
NM	nautical mile(s)
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NS	Naval Station
NSB	Naval Submarine Base
NSWC	Naval Surface Warfare Center
OEIS	Overseas Environmental Impact Statement
ONR	Office of Naval Research
OPAREA	operating area
PCA	Phocid in air
PCW	Phocid in water
R	acoustic release
RC	Range Complex
rms	root mean square
SEL	sound exposure level
SPL	sound pressure level
TORP	torpedo
TTS	temporary threshold shift
VACAPES	Virginia Capes
VHF	very-high frequency
VLF	very-low frequency
U.S.C.	United States Code
yd	yard

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1 DESCRIPTION OF SPECIFIED ACTIVITY

1.1 INTRODUCTION

The United States (U.S.) Department of the Navy (including the U.S. Navy and the U.S. Marine Corps) and the U.S. Coast Guard (hereinafter jointly referred to as the Action Proponents), have prepared this consolidated Request for Regulations and three Letters of Authorization (LOAs) for the incidental taking (as defined in Section 5, Type of Incidental Take Authorization Requested) of marine mammals during the conduct of training and testing activities (collectively referred to as "military readiness activities"), within the Atlantic Fleet Training and Testing (AFTT) Study Area (Figure 1.1-1). The Study Area includes areas of the western Atlantic Ocean along the east coast of North America, the Gulf of Mexico, and portions of the Caribbean Sea. It also includes Navy and Coast Guard pierside locations and port transit channels, bays, harbors, inshore waterways, and civilian ports where training and testing activities occur as well as transits between homeports and operating areas. Military readiness activities prepare the Action Proponents to fulfill their mission to protect and defend the U.S. and its allies but have the potential to affect the environment. This application supports the request for a 7-year LOA for Navy training activities, a 7-year LOA for Navy testing activities, and a 7-year LOA for the U.S. Coast Guard (hereinafter referred to as Coast Guard) training activities; all LOAs are requested for the years 2025-2032. Although the Coast Guard is a new Action Proponent in the AFTT Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS), their training activities are similar to Navy training activities. Therefore, the proposed activities in this request for three LOAs are generally consistent with those authorized for 2019 through 2025 in 84 *Federal Register* 70712 (December 23, 2019) and are representative of the activities that the Action Proponents have been conducting in the Study Area for decades.

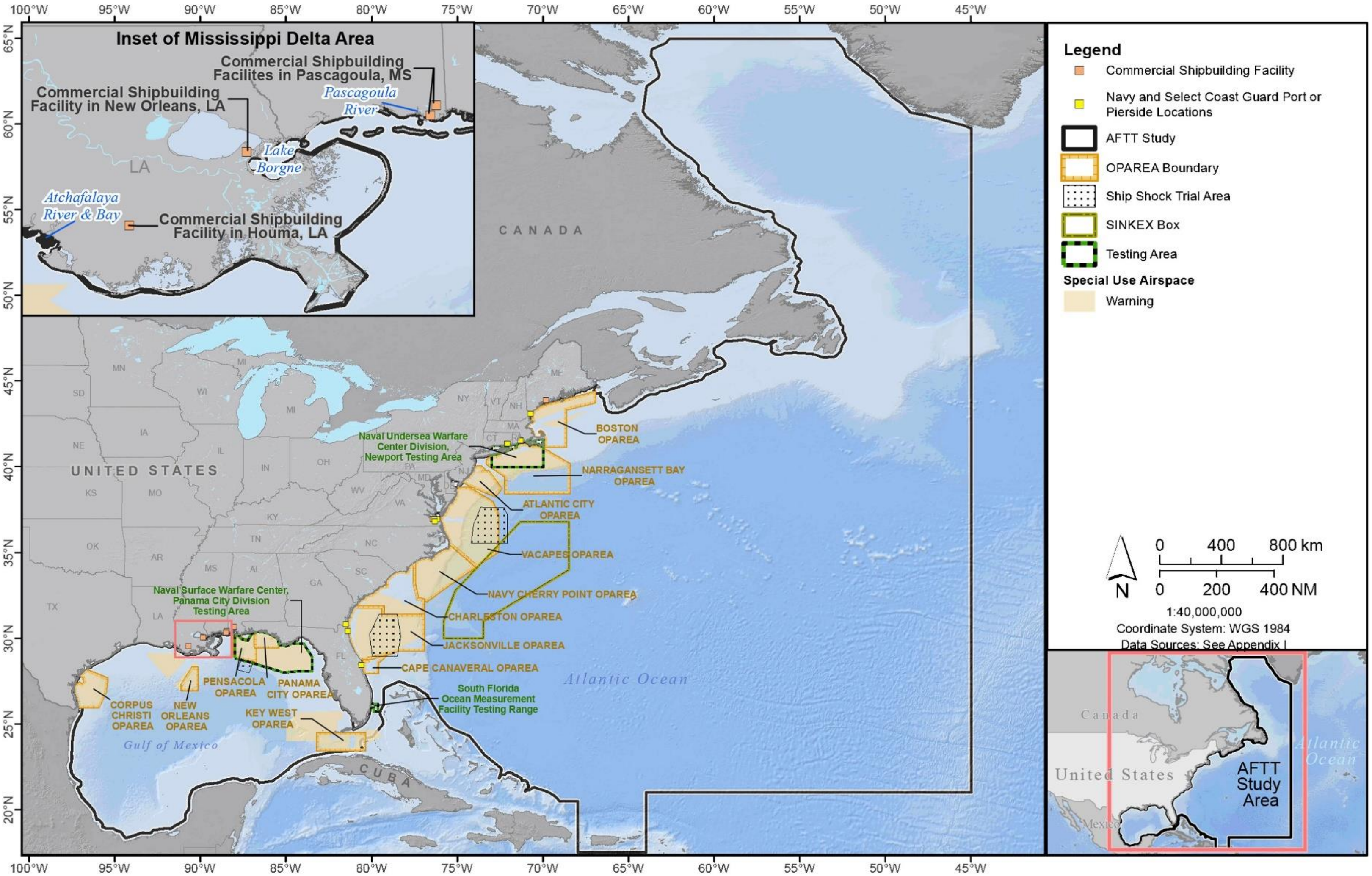
The Marine Mammal Protection Act (MMPA) of 1972, as amended (16 United States Code [U.S.C.] Section [§] 1371(a)(5)), authorizes the issuance of regulations for the incidental, but not intentional, taking of marine mammals by a specified activity. The issuance occurs when the Secretary of Commerce, after notice has been published in the *Federal Register* and opportunity for comment has been provided, finds that such taking will have a negligible impact on the species and stocks of marine mammals and will not have an unmitigable adverse impact on their availability for subsistence uses.

This Request for Regulations and LOAs for the Incidental Taking of Marine Mammals has been prepared in accordance with the applicable regulations of the MMPA, as amended by the National Defense Authorization Act (NDAA) for Fiscal Year 2004 (Public Law 108–136). The regulations must set forth the permissible methods of taking, other means of effecting the least practicable adverse impact on the species or stock(s), and requirements pertaining to the monitoring and reporting of such taking. On August 13, 2018, the John S. McCain NDAA for Fiscal Year 2019 was signed into law, effectively amending 16 U.S.C. section 1371 to extend the period the Secretary of Commerce may authorize the incidental taking of marine mammals by military readiness activities from five years to seven years if the Secretary finds that such takings will have a negligible impact on any marine mammal species.

A description of the military readiness activities for which the Action Proponents are requesting incidental take authorizations is provided in Section 1.3 (Overview of Military Readiness Activities) through Section 1.5 (Proposed Action). A description of the AFTT Study Area is provided in Section 2 (Dates, Duration and Specified Geographic Region). The Action Proponents are preparing a Supplemental EIS/OEIS for the AFTT Study Area to evaluate all components of the proposed military readiness activities. The proposed activities are generally consistent with those analyzed in the Final Atlantic Fleet Training and Testing Environmental Impact Statement/Overseas Environmental Impact Statement (hereinafter referred to as the 2018 Final AFTT EIS/OEIS*)* (U.S. Department of the Navy, 2018) and are representative of military readiness activities that the Action Proponents have been conducting in the Study Area for decades. The Supplemental EIS/OEIS will analyze modifications to the Proposed Action while considering best available science. This request for three LOAs is based on the proposed activities of the Action Proponents' Preferred Alternative (Alternative 1 in the AFTT Supplemental EIS/OEIS), referred to in this document as the Proposed Action.

This request for LOAs is based on: (1) the analysis of spatial and temporal distributions of protected marine mammals in the AFTT Study Area (hereinafter to as the Study Area), (2) the review of military readiness activities that have the potential to incidentally take marine mammals, and (3) an analysis to determine the likelihood of effects. This section describes those military readiness activities that could result in Level B harassment, Level A harassment, or mortality under the MMPA. Of the activities analyzed in the AFTT Supplemental EIS/OEIS, the Action Proponents have determined that only the use of sonar and other transducers, in-water detonations, air guns, pile driving/extraction (impact and vibratory), have the potential to affect marine mammals in a manner which rises to the level of take. In addition to these potential impacts from specific activities, the Action Proponents will also request takes from vessel strikes that may occur during any training or testing activities. These takes, however, are not specific to any particular military readiness activity.

In addition, in accordance with section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. section 1536(c)), the Action Proponents are required to consult with NMFS for those actions they have determined the actions may affect ESA-listed species or critical habitat. The Action Proponents are preparing Biological Assessments as part of that consultation.



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

Figure 1.1-1: Atlantic Fleet Training and Testing Study Area

1.2 Background

In conjunction with this Request for Regulations and LOAs, the Action Proponents, as joint lead agencies, are preparing a Supplemental EIS/OEIS to update the potential environmental impacts associated with proposed military readiness activities in the Study Area. The Supplemental EIS/OEIS represents the fourth phase of the analysis of potential environmental impacts from similar types of military readiness activities in the AFTT Study Area. The previous analysis can be found in the 2018 Final AFTT EIS/OEIS (U.S. Department of the Navy, 2018).

The Navy and Marine Corps must continue to ensure that the Department of the Navy meets its statutory mission to organize, train, and equip naval forces for peacetime promotion of the national security interests and prosperity of the U.S. and for prompt and sustained combat incident to operations at sea. This mission is achieved in part by conducting military readiness activities within the Study Area in accordance with established Department of the Navy military readiness requirements (10 USC section 8062 and 10 USC section 8063). The Coast Guard has four major national defense missions: maritime intercept operations, deployed port operations/security and defense, peacetime engagement, and environmental defense operations. These missions are essential military tasks assigned to the Coast Guard as a component of joint and combined forces in peacetime, crisis, and war. The Coast Guard must continue to ensure Coast Guard personnel can qualify and train jointly with, and independently of, the Navy and other services in the effective and safe operational use of Coast Guard vessels, aircraft, and weapons under realistic conditions. These activities help ensure that the Coast Guard can safely protect our Nation's maritime safety, security, and natural resources in accordance with its national defense mission under the authority of 14 U.S.C. section 102.

1.3 Overview of Military Readiness Activities

1.3.1 Primary Mission Areas

The Action Proponents categorize their functional warfare activities into seven primary mission areas:

- air warfare
- amphibious warfare
- anti-submarine warfare
- electronic warfare
- expeditionary warfare
- mine warfare
- surface warfare

Most activities addressed in the AFTT Supplemental EIS/OEIS are categorized under one of these primary mission areas (including proposed Coast Guard activities); the testing community has three additional categories of activities for vessel evaluation, unmanned systems, and acoustic and oceanographic science and technology. Activities that do not fall within these areas are listed as "other activities." Each warfare community (surface, subsurface, aviation, expeditionary, and special warfare) may train in some or all of these primary mission areas. The research and acquisition community also categorizes most, but not all, of its testing activities under these primary mission areas.

The Action Proponents describe and analyze the impacts of their military readiness activities within the AFTT Supplemental EIS/OEIS. In their assessment, the Action Proponents concluded that sonar and other transducers, in-water detonations, air guns, pile driving/extraction, and vessel movement were the stressors that would result in impacts on marine mammals that could rise to the level of harassment or injury as defined in the MMPA. Many of the stressors identified in the Draft SEIS/OEIS do not apply to the Coast Guard's analysis because the systems or warfare areas that cause these impacts are not within the Coast Guard inventory due to different mission requirements. This request provides the Action Proponents' assessment of potential effects from the stressors associated with the following warfare mission areas:

- amphibious warfare (in-water detonations)
- anti-submarine warfare (sonar and other transducers, in-water detonations)
- expeditionary warfare (in-water detonations, pile driving/extraction)
- surface warfare (in-water detonations)
- mine warfare (sonar and other transducers, in-water detonations)
- other (sonar and other transducers, air guns, vessel movement)

The Action Proponents' military readiness activities in air warfare and electronic warfare do not involve sonar or other transducers, in-water detonations, pile driving/extraction, air guns or any other stressors that could result in harassment of marine mammals. The activities in these warfare areas are therefore not considered further in this application but are analyzed fully in the Action Proponents' AFTT Supplemental EIS/OEIS.

1.3.1.1 Amphibious Warfare

The mission of amphibious warfare is to project military power from the sea to the shore (i.e., attack a threat on land by a military force embarked on ships) through the use of naval firepower and expeditionary landing forces. Amphibious warfare operations include small unit reconnaissance or raid missions to large-scale amphibious exercises involving multiple ships and aircraft combined into a strike group.

Amphibious warfare training ranges from individual, crew, and small unit events to large task force exercises. Individual and crew training include amphibious vehicles and naval gunfire support training. Such training includes shore assaults, boat raids, airfield or port seizures, reconnaissance, and disaster relief. Large-scale amphibious exercises involve ship-to-shore maneuvers, naval fire support such as shore bombardment, air strikes, and attacks on targets that are in close proximity to friendly forces.

Testing of guns, munitions, aircraft, ships, and amphibious vessels and vehicles used in amphibious warfare are often integrated into training activities and, in most cases, the systems are used in the same manner in which they are used for training activities. Amphibious warfare tests, when integrated with training activities or conducted separately as full operational evaluations on existing amphibious vessels and vehicles following maintenance, repair, or modernization, may be conducted independently or in conjunction with other amphibious ship and aircraft activities. Testing is performed to ensure effective ship-to-shore coordination and transport of personnel, equipment, and supplies. Tests may also be conducted periodically on other systems, vessels, and aircraft intended for amphibious operations to assess operability and to investigate efficacy of new technologies.

1.3.1.2 Anti-Submarine Warfare

The mission of anti-submarine warfare is to locate, neutralize, and defeat hostile submarine forces that threaten Navy forces. Anti-submarine warfare is based on the principle that surveillance and attack aircraft, ships, and submarines all search for hostile submarines. These forces operate together or independently to gain early warning and detection and to localize, track, target, and attack submarine threats.

Anti-submarine warfare training addresses basic skills such as detecting and classifying submarines, as well as evaluating sounds to distinguish between enemy submarines and friendly submarines, ships, and marine life. More advanced training integrates the full spectrum of anti-submarine warfare from detecting and tracking a submarine to attacking a target using either exercise torpedoes (i.e., torpedoes that do not contain a warhead) or simulated weapons. These integrated anti-submarine warfare training exercises are conducted in coordinated, at-sea training events involving submarines, ships, and aircraft.

Testing of anti-submarine warfare systems is conducted to develop new technologies and assess weapon performance and operability with new systems and platforms, such as unmanned systems. Testing uses ships, submarines, and aircraft to demonstrate capabilities of torpedoes, missiles, countermeasure systems, and underwater surveillance and communications systems. Tests may be conducted as part of a large-scale fleet training event involving submarines, ships, fixed-wing aircraft, and helicopters. These integrated training events offer opportunities to conduct research and acquisition activities and to train aircrew in the use of new or newly enhanced systems during a large-scale, complex exercise.

1.3.1.3 Expeditionary Warfare

The mission of expeditionary warfare is to provide security and surveillance in the littoral (at the shoreline), riparian (along a river), or coastal environments. Expeditionary warfare is wide ranging and includes defense of harbors, operation of remotely operated vehicles, defense against swimmers, and boarding/seizure operations.

Expeditionary warfare training activities include underwater construction team training, dive and salvage operations, and insertion/extraction via air, surface, and subsurface platforms.

1.3.1.4 Mine Warfare

The mission of mine warfare is to detect, classify, and avoid or neutralize (disable) mines to protect Navy ships and submarines and to maintain free access to ports and shipping lanes. Mine warfare training falls into two primary categories: mine detection and classification, and mine countermeasure and neutralization. Mine warfare also includes offensive mine laying to gain control of or deny the enemy access to sea space. Naval mines can be laid by ships, submarines, unmanned underwater vehicles or aircraft.

Mine warfare neutralization training includes exercises in which aircraft, ships, submarines, underwater vehicles, unmanned vehicles, or marine mammal detection systems search for mine shapes. Personnel train to destroy or disable mines by attaching underwater explosives to or near the mine or using remotely operated vehicles to destroy the mine.

Mine warfare testing is similar to training but focuses on the development of mine warfare systems to improve sonar, laser, and magnetic detectors intended to hunt, locate, and record the positions of mines for avoidance or subsequent neutralization. Mine detection and classification testing involves the use of air, surface, and subsurface platforms using a variety of systems to locate and identify objects underwater. Mine countermeasure and neutralization testing includes the use of air, surface, and subsurface platforms to evaluate the effectiveness of tracking devices, countermeasure and neutralization systems, and explosive munitions to neutralize mine threats. Most neutralization tests use mine shapes, or non-explosive practice mines, to evaluate a new or enhanced capability, however a small percentage require the use of high-explosive mines to evaluate and confirm effectiveness of various systems.

1.3.1.5 Surface Warfare

The mission of surface warfare is to obtain control of sea space from which naval forces may operate and entails offensive action against other surface and subsurface targets while also defending against enemy forces. In surface warfare, aircraft use cannons, air-launched cruise missiles, or other precision-guided munitions; ships employ torpedoes, naval guns, and surface-to-surface missiles; and submarines attack surface ships using torpedoes or submarine-launched, anti-ship cruise missiles.

Surface warfare training includes surface-to-surface gunnery and missile exercises, air-to-surface gunnery and missile exercises, and submarine missile or torpedo launch events, and other munitions against surface targets.

Testing of weapons used in surface warfare is conducted to develop new technologies and to assess weapon performance and operability with new systems and platforms, such as unmanned systems. Tests include various air-to-surface guns and missiles, surface-to-surface guns and missiles, and bombing tests. Testing events may be integrated into training activities to test aircraft or aircraft systems in the delivery of ordnance on a surface target. In most cases the tested systems are used in the same manner in which they are used for training activities.

1.3.2 Overview of Training Activities within the Study Area

The Action Proponents routinely train in the AFTT Study Area in preparation for national defense missions. Training activities and exercises covered in this request for LOAs are briefly described below, and in more detail within the AFTT Supplemental EIS/OEIS, Appendix A (Activity Descriptions). The description, annual number of activities, and location of each training activity are provided by stressor category in Section 1.5.1. Each training activity described meets a requirement that can be traced ultimately to requirements set forth by the National Command Authority.[1]

A major training exercise is comprised of multiple "unit-level" exercises conducted by several units operating together while commanded and controlled by a single commander (these units are collectively referred to as carrier and expeditionary strike groups). These exercises typically employ an exercise scenario developed to train and evaluate the strike group in tactical naval tasks. In a major training exercise (MTE), most of the operations and activities being directed and coordinated by the strike group commander are identical in nature to the operations conducted during individual, crew, and smaller unit-level training events. However, in MTEs, these disparate training tasks are conducted in concert rather than in isolation. Some integrated or coordinated anti-submarine warfare exercises are similar in that they are composed of several unit-level exercises but are generally on a smaller scale than a major training exercise, are shorter in duration, use fewer assets, and use fewer hours of hull-mounted sonar per exercise. Coordinated training exercises involve multiple units working together to meet unit-level training requirements, whereas integrated training exercises involve multiple units working together for deployment. Coordinated exercises involving the use of sonar are presented under the category of anti-submarine warfare. The anti-submarine warfare portions of these exercises are considered together in coordinated activities for the sake of acoustic modeling. When other training objectives are being met, those activities are described via unit-level training in each of the relevant primary mission areas below.

[1] National Command Authority (NCA) is a term used by the United States military and government to refer to the ultimate lawful source of military orders. The term refers collectively to the President of the United States (as commander-in-chief) and the United States Secretary of Defense.

With a smaller fleet of approximately 250 cutters, Coast Guard activities are not as extensive as the Navy activities due to differing mission requirements. However, the Coast Guard does train with the Navy and does conduct some of the same training as the Navy. The Coast Guard manages six major operational mission programs: maritime law enforcement, maritime response, maritime prevention, marine transportation system management, maritime security operations, and defense operations. Within these 6 mission programs are 11 statutory missions: Marine Environmental Protection, Living Marine Resources, Ports and Waterway Security, Other Law Enforcement, Drug Interdiction, Migrant Interdiction, Aids to Navigation, Ice Operations, Marine Safety, Search and Rescue, and Defense Readiness. The Coast Guard does not conduct any exercises similar in scale to Navy MTEs/integrated exercises, and the use of mid- or low-frequency sonar, missiles, and underwater detonations are examples of actions that are not a part of the Coast Guard's mission requirements. Due to the size of Coast Guard cutters (and boats less than 65 feet, of which there are approximately 1600), Coast Guard training generally occurs close to the vessel homeport or close to shore, on established Navy ranges, or quite frequently, Coast Guard training commonly occurs enroute to a scheduled patrol/mission. The largest cutters could be underway for 3-4 months, whereas the smaller cutters could be underway from a few days to four weeks. The busiest regions for the Coast Guard are the Gulf of Mexico due to the number of busy commercial ports, and Hampton Roads due to many of the cutters being based there.

The MTEs and integrated/coordinated training activities analyzed for this Request for Regulations and LOA's are described in Table 1.3-1. The training exercises included in this table are Navy-led exercises and Coast Guard may participate. For additional information on these activities see AFTT Supplemental EIS/OEIS, Appendix A (Activity Descriptions).

Table 1.3-1: Major Training Exercises and Integrated/Coordinated Training Analyzed for this Request for Regulations and LOAs

	Exercise Group	*Description*	*Scale*	*Duration*	*Location (Range Complex)*	*Exercise Examples*	*Typical Hull-Mounted Sonar per Event*
Major Training Exercise	Large Integrated ASW	Larger-scale, longer duration integrated ASW exercises	Greater than 6 surface ASW units (up to 30 with the largest exercises), 2 or more submarines, multiple ASW aircraft	Generally greater than 10 days	Jacksonville Range Complex Navy Cherry Point Range Complex Virginia Capes Range Complex	COMPTUEX	<500 hours
Major Training Exercise	Medium Integrated ASW	Medium-scale, medium duration integrated ASW exercises	Approximately 3-8 surface ASW units, at least 1 submarine, multiple ASW aircraft	Generally 4–10 days	Jacksonville Range Complex Navy Cherry Point Range Complex Virginia Capes Range Complex	SUSTEX	100-300 hours
Integrated/Coordinated Training	Small Integrated ASW	Small-scale, short duration integrated ASW exercises	Approximately 3-6 surface ASW units, 2 dedicated submarines, 2-6 ASW aircraft	Generally less than 5 days	Jacksonville Range Complex Navy Cherry Point Range Complex Virginia Capes Range Complex	SWATT, NUWTAC	50-100 hours
Integrated/Coordinated Training	Medium Coordinated ASW	Medium-scale, medium duration, coordinated ASW exercises	Approximately 2-4 surface ASW units, possibly a submarine, 2-5 ASW aircraft	Generally 3-10 days	Jacksonville Range Complex Navy Cherry Point Range Complex Virginia Capes Range Complex	ASW Tactical Development Exercise	Less than 100 hours
Integrated/Coordinated Training	Small Coordinated ASW	Small-scale, short duration, coordinated ASW exercises	Approximately 2-4 surface ASW units, possibly a submarine, 1-2 ASW aircraft	Generally 2-4 days	Jacksonville Range Complex Navy Cherry Point Range Complex Virginia Capes Range Complex	ARG/MEU COMPTUEX	Less than 50 hours

Notes: ASW: anti-submarine warfare; COMPTUEX: Composite Training Unit Exercise; SUSTEX: Sustainment Exercise; SWATT: Surface Warfare Advanced Tactical Training Exercise; NUWTAC: Navy Undersea Warfare Training Assessment Course; ARG/MEU: Amphibious Ready Group/Marine Expeditionary Unit

1.3.3 Overview of Testing Activities within the Study Area

Testing activities covered in this LOA request are briefly described below, and in more detail within the AFTT Supplemental EIS/OEIS. The description, annual number of activities, and location of each testing activity are provided by stressor category in Section 1.5.2. Each military testing activity described meets a requirement that can be traced ultimately to requirements set forth by the National Command Authority.

The Navy's research and acquisition community engages in a broad spectrum of testing activities. These activities include, but are not limited to, basic and applied scientific research and technology development; testing, evaluation, and maintenance of systems (e.g., missiles, radar, and sonar) and platforms (e.g., surface ships, submarines, and aircraft); and acquisition of systems and platforms to support Navy missions and give a technological edge over adversaries. The individual commands within the research and acquisition community included in this LOA application are Naval Air Systems Command (NAVAIR), Naval Sea Systems Command (NAVSEA), and the Office of Naval Research.

The Navy and Coast Guard operate in an ever-changing strategic, tactical, financially-constrained, and time-constrained environment. Testing activities occur in response to emerging science or fleet operational needs. For example, future Navy experiments to develop a better understanding of ocean currents may be designed based on advancements made by non-government researchers not yet published in the scientific literature. Similarly, future but yet unknown Navy and Coast Guard operations within a specific geographic area may require development of modified Navy assets to address local conditions. Such modifications must be tested in the field to ensure they meet fleet needs and requirements. Accordingly, generic descriptions of some of these activities are the best that can be articulated in a long-term, comprehensive document.

Some testing activities are similar to training activities conducted by the fleet. For example, both the fleet and the research and acquisition community fire torpedoes. While the firing of a torpedo might look identical to an observer, the difference is in the purpose of the firing. The fleet might fire the torpedo to practice the procedures for such a firing, whereas the research and acquisition community might be assessing a new torpedo guidance technology or testing it to ensure the torpedo meets performance specifications and operational requirements.

1.3.3.1 Naval Air Systems Command Testing Activities

NAVAIR testing activities support its mission to provide full life cycle support of naval aviation aircraft, weapons, and systems to be operated by the Navy and Coast Guard. NAVAIR activities closely follow fleet primary mission areas, such as the testing of airborne mine warfare and anti-submarine warfare weapons and systems. NAVAIR activities include, but are not limited to, the testing of new aircraft platforms, weapons, and systems that have not yet been integrated into the fleet and Coast Guard. In addition to testing new platforms and weapon systems, most aircraft and weapon systems that have been integrated into the fleet also require follow-on testing throughout their lifecycle in conjunction with maintenance and upgrades, such as software revisions, to ensure that they function as designed. While these types of activities do not fall within one of the fleet primary mission areas, most NAVAIR testing activities can be easily correlated to fleet training activities. Some testing activities may be conducted in different locations and in a different manner than similar fleet training activities and, therefore, the analysis for those events and the potential environmental effects may differ. Systems and platforms delivered to the fleet and Coast Guard that will be used in training activities within the timeframe of this LOA request are analyzed in the training sections.

1.3.3.2 Naval Sea Systems Command Testing Activities

NAVSEA activities are aligned with its mission of new ship construction, life cycle management, and weapon systems development. NAVSEA activities include pierside and at-sea testing of ship systems, including sonar, acoustic countermeasures, radars, launch systems, weapons, unmanned systems, and radio equipment; tests to determine how the ship or Coast Guard Cutter performs at sea (sea trials); developmental and operational test and evaluation programs for new technologies and systems; and testing on all ships and systems that have undergone overhaul or maintenance. In this LOA request, pierside testing at Navy contractor shipyards will consist only of system testing. At-sea test firing of shipboard weapon systems, including guns, torpedoes, and missiles, is also conducted. Testing activities are conducted throughout the life of a ship, from construction to verification of performance and mission capabilities, and further to deactivation from the fleet.

One ship of each new class (or major upgrade) of combat ships constructed for the Navy typically undergoes an at-sea ship shock trial. A ship shock trial consists of a series of underwater detonations that send shock waves through the ship's hull to simulate near misses during combat. A shock trial allows the Navy to assess the survivability of the hull and ship's systems in a combat environment as well as the capability of the ship to protect the crew.

1.3.3.3 Office of Naval Research Testing Activities

As the Department of the Navy's science and technology provider, the Office of Naval Research provides technology solutions for Navy and Marine Corps needs. The Office of Naval Research's mission, defined by law, is to plan, foster, and encourage scientific research in recognition of its paramount importance as related to the maintenance of future naval power and the preservation of national security. The Office of Naval Research manages the Navy's basic, applied, and advanced research to foster transition from science and technology to higher levels of research, development, test, and evaluation. The Office of Naval Research is also a parent organization for the Naval Research Laboratory, which operates as the Navy's corporate research laboratory and conducts a broad multidisciplinary program of scientific research and advanced technological development. Testing activities conducted by the Office of Naval Research and the Naval Research Laboratory include activities such as acoustic and oceanographic research, unmanned underwater vehicle research, and next generation mine countermeasures research.

1.4 DESCRIPTION OF ACOUSTIC AND EXPLOSIVE STRESSORS

The Action Proponents use a variety of sensors, platforms, weapons, and other devices, including ones used to ensure the safety of Sailors, Marines, and Coast Guardsmen to meet their mission. Military readiness activities with these systems may introduce sound and energy into the environment. The proposed military readiness activities were evaluated to identify specific components that could act as stressors by having direct or indirect impacts on the environment. This analysis included identification of the spatial variation of the identified stressors. The following subsections describe the acoustic and explosive stressors for biological resources within the Study Area in detail. A preliminary analysis identified the stressor/resource interactions that warrant further analysis in the LOA request based on public comment received during scoping, previous National Environmental Policy Act analyses, previous consultation documents, and opinions of subject matter experts. Stressor/resource interactions that were determined to have negligible or no impacts (i.e., vessel, aircraft, or weapons noise) were not carried forward for analysis in this LOA request.

1.4.1 ACOUSTIC STRESSORS

This section describes the characteristics of sounds produced during military readiness activities and the relative magnitude of these sound-producing activities. This provides the basis for analysis of acoustic impacts on resources in the remainder of Section 6 (Take Estimates for Marine Mammals). Explanations of the terminology and metrics used when describing sound in this LOA request are in Appendix D (Acoustic and Explosive Impacts supporting Information) of the AFTT Supplemental EIS/OEIS.

Acoustic stressors include acoustic signals emitted into the water for a specific purpose, such as sonar, other transducers (devices that convert energy from one form to another – in this case, to sound waves), and air guns, as well as incidental sources of broadband sound produced as a byproduct of impact pile driving and vibratory extraction. Explosives also produce broadband sound but are characterized separately from other acoustic sources due to their unique characteristics (see Section

1.4.2, Explosive Stressors). Characteristics of each of these sound sources are described in the following sections.

1.4.1.1 Sonar and Other Transducers

Active sonar and other transducers emit non-impulsive sound waves into the water to detect objects, safely navigate, and communicate. Passive sonars differ from active sound sources in that they do not emit acoustic signals; rather, they only listen, or receive acoustic information about the environment. In this LOA request, the term "sonar(s)" will be used to indicate active sound sources unless otherwise specified.

The Action Proponents employ a variety of sonars and other transducers to obtain and transmit information about the undersea environment. Some examples are mid-frequency hull-mounted sonars used by the Navy to find and track enemy submarines, high-frequency object detection sonars used to detect mines, high-frequency underwater modems used to transfer data over short ranges, and extremely high-frequency Doppler sonars used for navigation, like those used on commercial and private vessels. The characteristics of these sonars and other transducers, such as source level, beam width, directivity, and frequency, depend on the purpose of the source. Higher frequencies can carry more information or provide more information about objects off which they reflect, but attenuate more rapidly. Lower frequencies attenuate less rapidly, so they may detect objects over a longer distance, but with less detail.

Propagation of sound produced underwater is highly dependent upon environmental characteristics such as bathymetry, bottom type, water depth, temperature, and salinity. The sound received at a particular location will be different than near the source due to the interaction of many factors, including propagation loss; how the sound is reflected, refracted, or scattered; the potential for reverberation; and interference due to multi-path propagation. In addition, absorption greatly affects the distance over which higher-frequency sounds propagate. The effects of these factors are explained in Appendix D (Acoustic and Explosive Impacts Supporting Information) of the AFTT Supplemental EIS/OEIS. Because of the complexity of analyzing sound propagation in the ocean environment, the Action Proponents rely upon acoustic models in their environmental analyses that consider sound source characteristics and varying ocean conditions across the Study Area.

1.4.1.1.1 Anti-Submarine Warfare

Sonar used during anti-submarine warfare would impart the greatest amount of acoustic energy of any category of sonar and other transducers analyzed in this LOA request. Types of sonars used to detect enemy vessels include hull-mounted, towed, line array, sonobuoy, helicopter dipping, and torpedo sonars. Most anti-submarine warfare sonars are mid frequency (1–10 kilohertz (kHz)) because mid-frequency sound balances sufficient resolution to identify targets with distance over which threats can be identified. However, some sources may use higher or lower frequencies. Duty cycles can vary widely, from rarely used to continuously active. For example, a submarine's mission revolves around its stealth; therefore, submarine sonar is used infrequently because its use would also reveal a submarine's location. Anti-submarine warfare sonars can be wide-ranging in a search mode or highly directional in a track mode. Most anti-submarine warfare activities involving submarines or submarine targets would occur in waters greater than 600 feet (ft.) deep due to safety concerns about running aground at shallower depths. Sonars used for anti-submarine warfare activities would typically be used beyond 12 nautical miles (NM) from shore. Exceptions include use of dipping sonar by helicopters, maintenance of systems while in port, and system checks while transiting to or from port.

1.4.1.1.2 Mine Warfare, Object Detection, and Imaging

Sonars used to locate mines and other objects, as well as those used in imaging (e.g., for hull inspections or imaging of the seafloor), are typically high frequency or very high frequency. Higher frequencies allow for greater resolution and, due to their greater attenuation, are most effective over shorter distances. Mine detection sonar can be deployed (towed or vessel hull-mounted) at variable depths on moving platforms (ships, helicopters, or unmanned vehicles) to sweep a suspected mined area. Hull-mounted anti-submarine sonars can also be used in an object detection mode known as “Kingfisher” mode (denoted by a “K” in the sonar bin list, i.e. MF1K). Sonars used for imaging are usually used in close proximity to the area of interest, such as pointing downward near the seafloor. Mine detection sonar use would be concentrated in areas where practice mines are deployed, typically in water depths less than 200 ft. and at established training or testing minefields or temporary minefields close to strategic ports and harbors. Kingfisher mode on vessels is most likely to be used when transiting to and from port. Sound sources used for imaging could be used throughout the Study Area.

1.4.1.1.3 Navigation and Safety

Similar to commercial and private vessels, Navy vessels employ navigational acoustic devices including speed logs, Doppler sonars for ship positioning, and fathometers. These may be in use at any time for safe vessel operation. These sources are typically highly directional to obtain specific navigational data.

1.4.1.1.4 Communication

Sound sources used to transmit data (such as underwater modems), provide location (pingers), or send a single brief release signal to bottom-mounted devices (acoustic release) may be used throughout the Study Area. These sources typically have low duty cycles and are usually only used when it is desirable to send a detectable acoustic message.

1.4.1.1.5 Classification of Sonar and Other Transducers

In order to better organize and facilitate the analysis of hundreds of individual sources of underwater sound produced by the Action Proponents, including sonars and explosives, a schema of source bins was developed. A detailed description of the schema and the benefits of using this method are found in the Technical Report *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase IV Training and Testing.*

For modeling, sources were binned by their acoustic properties. Each non-impulsive, narrowband bin was modeled using the (1) highest source level, (2) geometric mean frequency, (3) highest duty cycle, and (4) largest horizontal and vertical beam patterns. The combination of these four parameters allowed for over 1,000 potential unique bins. While AFTT training and testing only uses sources falling into 83 of these potential bins, the binning construct allows for easy addition of bins as required. For this LOA request, non-impulsive narrowband bins are grouped by their frequency category (low, medium, high, or very high) and their source level category (low, medium, or high), resulting in 12 source categories. An exception to this was retention of “MF1” to represent the hull-mounted surface ship sonar.

For modeling, broadband sources were divided into 27 bins, with AFTT training and testing only using sources falling into 16 of them. For this LOA request, broadband bins are grouped by the frequency categories they span (e.g., LF, LF to MF, etc.). Some sources were removed from quantitative analysis because they are not anticipated to result in take of protected species or are required for ship safety and navigation. These sources, categorized as de minimis, include those with low source level, narrow beamwidth, downward-directed transmission, short pulse lengths, frequencies above known hearing ranges of marine mammals, or some combination of these factors, as well as sources used for safety of navigation.

The use of source bins provides the following benefits:

- provides the ability for new sensors or munitions to be covered under existing authorizations, as long as those sources fall within the parameters of an authorized bin;
- improves efficiency of source utilization data collection and reporting requirements anticipated under the MMPA authorizations;
- ensures a conservative approach to impact estimates, as bins are modeled using the most impactful parameters of the sources they contain "(e.g. highest source level, longest duty cycle, largest net explosive weight);
- allows analyses to be conducted in a more efficient manner, without any compromise of analytical results; and
- provides a framework to support the reallocation of source usage between different source bins, as long as the total numbers of takes remain within the overall analyzed and authorized limits. This flexibility is required to support evolving military readiness activities requirements, which are linked to real world events.

Table 1.4-1 shows the acoustic sources that could be used during any year for military readiness activities. A range of annual use indicates that occurrence is anticipated to vary annually, consistent with the variation in the number of annual activities described in Section 2 (Description of Proposed Action and Alternatives) of the AFTT Supplemental EIS/OEIS. The 7-year total takes that variability into account.

Table 1.4-1: Sonar and Transducers Quantitatively Analyzed

Source Category	*Description*	*Unit*	*Navy Training*		*Coast Guard Training*		*Testing*	
			Annual	*7-year total*	*Annual*	*7-year total*	*Annual*	*7-year total*
Broadband Sources								
LF	<205 dB	H	-	-	-	-	206-252	1,580
LF to MF		H	-	-	-	-	1,501-1,503	10,519
LF to HF		C	-	-	-	-	791-1,020	5,101
		H					2,367-2,571	16,356
MF to HF		C	133	931	-	-	-	-
		H	935-951	6,595	280	1,960	2,749-2,950	19,308
HF to VHF		H	10	70	-	-	-	-
Low-Frequency Acoustic Sources								
LFL	160 dB to 185 dB	H	-	-	-	-	1,969	13,783
LFM	185 dB to 205 dB	C	-	-	-	-	360	2,520
		H	746	5,219	-	-	5,386-6,106	39,862
LFH	>205 dB	C	1,920-2,020	13,760	-	-	6,078-6,084	42,588
		H	144	1,008	-	-	414-479	3,101
Mid-Frequency Acoustic Sources								
MFL	160 dB to 185 dB	H	-	-	-	-	3,238-3,582	22,336
MFM	185 dB to 205 dB	C	6,825-6,964	48,196	-	-	16,017-16,040	111,849
		H	2	14	-	-	3,081-3,509	23,012
MFH	>205 dB	H	2,343-2,466	16,794	-	-	7,203-7,943	52,542
High-Frequency Acoustic Sources								
HFL	160 dB to 185 dB	H	169	1,183	-	-	96	672
HFM	185 dB to 205 dB	C	-	-	-	-	860-1,660	8,420
		H	1,253-1,255	8,777	210	1,470	4,125-4,489	29,941
HFH	>205 dB	C	138	966	-	-	1,621-1,858	11,684
		H	3,892-3,940	27,436	-	-	3,779-4,580	28,383

Table 1.4-1: Sonar and Transducers Quantitatively Analyzed (continued)

Source Category	***Description***	***Unit***	***Navy Training***		***Coast Guard Training***		***Testing***	
			Annual	***7-year total***	***Annual***	***7-year total***	***Annual***	***7-year total***
Very High-Frequency Acoustic Sources								
VHFL	160 dB to 185 dB	H	12	84	-	-	-	-
VHFM	185 dB to 205 dB	H	918	6,426	-	-	120	840
VHFH	>205 dB	C	-	-	-	-	69-103	520
		H	579	4,051	140	980	5,584	39,088
Hull-Mounted Surface Ship Sonar								
MF1C	Hull-mounted surface ship sonar with duty cycle >80% (previously MF11)	H	661-722	4,811	-	-	1,139	7,974
MF1K	Hull-mounted surface ship sonar in Kingfisher mode	H	280	1,957	-	-	108	759
MF1	Hull-mounted surface ship sonar	H	3,498-3,870	25,602	-	-	1,102-1,390	8,464

Notes: C = Count; dB = decibel; H = Hours; - = Not Applicable

1.4.1.2 Air Guns

Air guns are essentially stainless steel tubes charged with high-pressure air via a compressor. An impulsive sound is generated when the air is almost instantaneously released into the surrounding water. Small air guns with capacities up to 60 cubic inches would be used during testing activities in various offshore areas in the AFTT Study Area.

Generated impulses would have short durations, typically a few hundred milliseconds, with dominant frequencies below 1 kHz. The root-mean-square sound pressure level (SPL) and peak pressure (SPL peak) at a distance 1 meter (m) from the air gun would be approximately 215 decibels (dB) referenced to a pressure of 1 microPascal (re 1 micropascal (µPa)) and 227 dB re 1 µPa, respectively, if operated at the full capacity of 60 cubic inches. The size of the air gun chamber can be adjusted, which would result in lower SPLs and sound exposure level (SEL) per shot.

Table 1.4-2: Testing Air Gun and Non-Explosive Impulsive Sources Quantitatively Analyzed in the Study Area

Source Class Category	*Description*	*Unit*	*Testing*	
			Annual	*7-Year Total*
NEI	Non-explosive impulsive	C	192-240	1,488
AG	Air gun	C	4,400-5,400	33,800

Notes: C = Count

1.4.1.3 Pile Driving

Impact and vibratory pile driving and removal could occur during Expeditionary Warfare, Port Damage Repair training in Gulfport, MS. The pile driving method, pile type and size, and assumptions for acoustic impact analysis are presented in Table 1.4-3. This training activity could occur up to four times a year. Training events are typically five days each, for a total of 20 days per year. The training would involve the installation and removal 27-inch steel sheets, installation of timber or plastic round 16-inch piles using impact and vibratory methods, and the removal of timber or plastic round 16-inch piles. When training events are complete, all piles and sheets are removed using vibratory or dead pull methods. Crews could remove up to 12 piles in a 24-hour period, each taking up to 30 minutes to remove.

Table 1.4-3: Number of Piles / Sheets Quantitatively Analyzed under Pile Driving and Removal Training Activities

Method	*Pile Size and Type*	*Number of Piles*	
		Annual	*7-Year Total*
Impact[1]	16-inch Timber or Plastic Round Piles	80	560
Vibratory	16-inch Timber or Plastic Round Piles	160	1,120
Vibratory	27-inch Steel Sheet	240	1,680

[1] Installation only

Regardless of pile type, full-power impact pile driving incorporates a soft start procedure that would "warn" nearby marine species and reduce the initial noise exposure. Only one hammer would be used at any given point in time; there would not be any instances where multiple piles would be driven simultaneously. All piles and sheets would be removed using the vibratory hammer. Timber or plastic piles could also be removed using a dead pull method.

Impact pile driving would involve the use of an impact hammer with both it and the pile held in place by a crane. When the pile driving starts, the hammer part of the mechanism is raised up and allowed to fall, transferring energy to the top of the pile. The pile is thereby driven into the sediment by a repeated series of these hammer blows. Each blow results in an impulsive sound emanating from the length of the pile into the water column as well as from the bottom of the pile through the sediment. Broadband impulsive signals are produced by impact pile driving methods, with most of the acoustic energy concentrated below 1,000 hertz (Hz) (Hildebrand, 2009). For the purposes of this analysis, the Navy assumes that the impact pile driver would generally operate on average 35 strikes per minute, or 1,800 strikes per pile.

Vibratory installation and extraction would involve the use of a vibratory hammer suspended from the crane and attached to the top of a pile. The pile is then vibrated by hydraulic motors rotating eccentric weights in the mechanism, causing a rapid up and down vibration in the pile, driving the pile into the sediment. During removal, the vibration causes the sediment particles in contact with the pile to lose frictional grip on the pile. The crane slowly lifts the vibratory driver and pile until the pile is free of the sediment. In some cases, the crane may be able to lift the pile and vibratory driver without vibrations from the driver (dead pull), in which case no noise would be introduced into the water. Vibratory driving and removal create broadband, continuous, non-impulsive noise at low source levels, for a short duration with most of the energy dominated by lower frequencies.

Port Damage Repair training would occur in shallower water, and sound could be transmitted on direct paths through the water, be reflected at the water surface or bottom, or travel through bottom substrate. Soft substrates such as sand bottom would absorb or attenuate the sound more readily than hard substrates (rock), which may reflect the acoustic wave.

The predicted sound levels produced by pile driving by method, pile size and type for Port Damage Repair training are presented in Table 1.4-4.

Table 1.4-4: Port Damage Repair Training Pile Driving and Removal Underwater Sound Levels

Method	*Pile Size and Type*	*Unattenuated Levels*			*Reference*
		Peak SPL (dB re 1 μPa)	*SEL (single strike; (dB re 1 $\mu Pa^2 \cdot s$)*	*RMS SPL (dB re 1 μPa)*	
Impact[1]	16 inch Timber or Plastic Round Piles	180	160	170	Caltrans (2020) – Table I.2-1d [Ballena Isle Marina]
Vibratory	25 inch Steel Sheets	-	-	159	Naval Facilities Engineering Command Southwest (2020)
Vibratory	16 inch Timber or Plastic Round Piles	-	-	162	Caltrans (2020) – Table I.2-1d [Norfolk Naval Station]

[1] Installation only

In addition to underwater noise, the installation and removal of piles also results in airborne noise in the environment. Impact pile driving creates in-air impulsive sound about 100 dBA re 20 µPa at a range of 15 m (Illingworth and Rodkin, 2016). During vibratory extraction, the three aspects that generate airborne noise are the crane, the power plant, and the vibratory extractor. The average sound level recorded in air during vibratory extraction was about 85 dBA re 20 µPa (94 dB re 20 µPa) within a range of 10 – 15 m (Illingworth and Rodkin, 2015).

1.4.2 Explosive Stressors

This section describes the characteristics of explosions during military readiness activities. The activities analyzed in this LOA request that use explosives are described in Appendix A (Activity Descriptions) of the AFTT Supplemental EIS/OEIS, and terminology and metrics used when describing explosives in this LOA request are in Appendix D (Acoustic and Explosive Impacts supporting Information) of the AFTT Supplemental EIS/OEIS.

1.4.2.1 Explosions in Water

Explosive detonations during military readiness activities are associated with high-explosive munitions, including, but not limited to bombs, missiles, rockets, naval gun shells, torpedoes, mines, demolition charges, and explosive sonobuoys. Explosive detonations during military readiness activities involving the use of high-explosive munitions, including bombs, missiles, and naval gun shells, could occur in the air or near the water's surface. Explosive detonations associated with torpedoes and explosive sonobuoys would occur in the water column; mines and demolition charges could be detonated in the water column or on the ocean bottom. The Coast Guard usage of explosives is limited to medium and large-caliber munitions used during Gunnery Exercises. Most detonations would occur in waters greater than 200 ft. in depth and greater than 3 NM from shore, although mine warfare, demolition, and some testing detonations would occur in shallow water close to shore.

In order to better organize and facilitate the analysis of explosives used by the Action Proponents during military readiness activities that could detonate in water or at the water surface, explosive classification bins were developed. Explosives were divided into bins E0-E17, with AFTT training and testing only using explosives falling into 15 of these bins; this is the same binning schema for explosives as used in the 2018 LOA request. The use of explosive classification bins provides the same benefits as described for acoustic source classification bins in Section 1.4.1.1 (Sonar and Other Transducers).

Explosives detonated in water are binned by net explosive weight. Table 1.4-5 shows the bins of explosives that could occur in any year for military readiness activities. A range of annual use indicates that occurrence is anticipated to vary annually, consistent with the variation in the number of annual activities described in Section 2 (Description of Proposed Action and Alternatives) of the AFTT Supplemental EIS/OEIS. The 7-year total takes that variability into account.

Table 1.4-5: Explosive Sources Quantitatively Analyzed that Could Be Used Underwater or at the Water Surface

Bin	*Net Explosive Weight*	*Example Explosive Source*	*Navy Training*		*Coast Guard Training*		*Navy Testing*	
			Annual	*7-Year*	*Annual*	*7-year*	*Annual*	*7-Year*
E1	0.1–0.25	Medium-caliber projectile	3,002	21,014	-	-	1,825	12,775
E2	> 0.25–0.5	Medium-caliber projectile	60	420	-	-	-	-
E3	> 0.5–2.5	2.75" Rocket	5,078	35,546	180	1,260	1,069-1,971	8,705
E4	> 2.5–5	Mine neutralization charge	82	574	-	-	2,893-4,687	30,889
E5	> 5–10	5 in. projectile	1,109	7,763	-	-	1,268-1,860	11,540
E6	> 10–20	Hellfire missile	508	3,556	-	-	17-25	125
E7	> 20–60	Demo block/ shaped charge	10	70	-	-	8-22	62
E8	> 60–100	Lightweight torpedo	20	140	-	-	10-13	41
E9	> 100–250	500 lb. bomb	138	966	-	-	5	35
E10	> 250–500	Harpoon missile	71	497	-	-	4	28
E11	> 500–675	650 lb. mine	1	7	-	-	1-2	8
E12	> 650–1,000	2,000 lb. bomb	20	140	-	-	-	-
E16	> 7,250–14,500	Small ship shock trial	-	-	-	-	0-6	15

Notes: > = greater than; in. = inch; lb. = pound; - = Not Applicable

Propagation of explosive pressure waves in water is highly dependent on environmental characteristics such as bathymetry, bottom type, water depth, temperature, and salinity, which affect how the pressure waves are reflected, refracted, or scattered; the potential for reverberation; and interference due to multi-path propagation. In addition, absorption greatly affects the distance over which higher frequency components of explosive broadband noise can propagate. Appendix D (Acoustic and Explosive Impacts supporting Information) of the AFTT Supplemental EIS/OEIS explains the characteristics of explosive detonations and how the above factors affect the propagation of explosive energy in the water. Because of the complexity of analyzing sound propagation in the ocean environment, the Action Proponents rely on acoustic models in its environmental analyses that consider sound source characteristics and varying ocean conditions across the Study Area.

1.5 PROPOSED ACTION

The Action Proponents propose to conduct military readiness activities within the AFTT Study Area and have been conducting military readiness activities in in the Study Area for well over a century and with active sonar for over 70 years. The tempo and types of military readiness activities have fluctuated because of the introduction of new technologies, the evolving nature of international events, advances in warfighting doctrine and procedures, and changes in force structure (organization of ships, weapons, and personnel). Such developments influenced the frequency, duration, intensity, and location of required military readiness activities. This LOA request reflects the most up to date compilation of military readiness activities deemed necessary to accomplish military readiness requirements. The types and numbers of activities included in the Proposed Action account for fluctuations in military readiness activities in order to meet evolving or emergent military readiness requirements.

1.5.1 TRAINING ACTIVITIES

The proposed training activities that will be conducted in the Study Area and covered under this authorization are described in Table 1.5-1 and Table 1.5-2 of this request. The tables are organized according to primary mission areas and include the activity name, associated stressors applicable to this LOA request, number of proposed activities, and locations of those activities in the AFTT Study Area. For further information regarding the primary platform used (e.g., ship or aircraft type) and duration of activity, see Appendix A (Activity Descriptions) of the AFTT Supplemental EIS/OEIS.

The requirements for the types of activities to be conducted, as well as the frequency at which they need to occur, have been validated by senior Action Proponent leadership. Specifically, training activities are based on the requirements of the Optimized Fleet Response Plan as well as changing world events, advances in technology, and Action Proponents' tactical and strategic priorities. These activities account for force structure changes and include training with new aircraft, vessels, unmanned/autonomous systems, and weapon systems that will be introduced to the Fleet after November 2025.

The Action Proponents first considered a reasonably foreseeable maximum number of training activities that could occur within a given year and the maximum level of activities that could occur over a 7-year period. Basing the Proposed Action on this framework would allow for the greatest capacity to maintain readiness in response to potential changes in the national security environment, fluctuations in training and deployment schedules, and potential in-theater demands.

However, the Proposed Action reflects a representative year of training that (1) accounts for the natural fluctuation of training cycles and deployment schedules that influence the level of training that occurs from year to year in any 7-year period, and (2) assumes that some unit-level training requirements are met during integrated, coordinated and major training exercises vice discrete unit level training events. Using a representative level of activity rather than a maximum level of training activity in every year has reduced the amount of hull-mounted mid-frequency active sonar estimated to be necessary to meet training requirements. The numbers of both unit-level training and major training exercises are adjusted to meet this representative year.

By using a representative level of training activity rather than a maximum level of training activity in every year, the Action Proponents accept a degree of risk that if global events necessitated a rapid expansion of military training, they may not have sufficient capacity in their MMPA authorizations to carry out those training requirements.

Table 1.5-1: Proposed Navy Training Activities Analyzed for this LOA Request within the Study Area

Stressor Category	Activity Name	Description	Source Bin	Number of Activities		Location
				1-year	7-year	
Major Training Exercise - Large Integrated ASW						
Acoustic	Composite Training Unit Exercise	Aircraft carrier and carrier air wing integrate with surface and submarine and Coast Guard units in a challenging multi-threat operational environment that certifies them ready to deploy.	LFH, MFM, MFH, MF1, MF1C, Broadband (MF to HF)	2-3	17	Jacksonville Range Complex Navy Cherry Point Range Complex Virginia Capes Range Complex
Major Training Exercise - Medium Integrated ASW						
Acoustic	Sustainment Exercise	Aircraft carrier and carrier air wing integrates with surface and submarine units in a challenging multi-threat operational environment to maintain ability to deploy.	LFH, MFM, MFH, MF1, MF1C, Broadband (MF to HF)	2	14	Jacksonville Range Complex Navy Cherry Point Range Complex Virginia Capes Range Complex
Small Integrated ASW Training						
Acoustic	Navy Undersea Warfare Training Assessment Course	Multiple ships, aircraft, and submarines integrate the use of their sensors, including sonobuoys, to search for, detect, classify, localize, and track a threat submarine.	LFH, MFM, MFH, MF1, MF1C, Broadband (MF to HF)	2	14	Jacksonville Range Complex Navy Cherry Point Range Complex Virginia Capes Range Complex
Acoustic	Surface Warfare Advanced Tactical Training	Multiple ships and aircraft coordinate the use of sensors, including sonobuoys, to search, detect, and track a threat submarine. Surface Warfare Advanced Tactical Training (SWATT) exercises are not dedicated anti-submarine warfare exercises and involve multiple warfare areas.	LFH, MFM, MFH, MF1, MF1C, Broadband (MF to HF)	2	14	Jacksonville Range Complex Navy Cherry Point Range Complex Virginia Capes Range Complex

Table 1.5-1: Proposed Navy Training Activities Analyzed for this LOA Request within the Study Area (continued)

Stressor Category	*Activity Name*	*Description*	*Source Bin*	*Number of Activities*		*Location*
				1-year	*7-year*	
Medium Coordinated ASW Training						
Acoustic	Tactical Development Exercise	Multiple ships, aircraft, and submarines coordinate their efforts to search for, detect, and track submarines with the use of all sensors. Anti-Submarine Warfare Tactical Development Exercise is a dedicated anti-submarine warfare exercise.	MFM, MFH, MF1, MF1C, Broadband (MF to HF)	1	7	Jacksonville Range Complex
				1	7	Virginia Capes Range Complex
Small Coordinated ASW Training						
Acoustic	Group Sail	Surface ships, Coast Guard Cutters, and helicopters integrate to search for, detect, and track threat submarines. Group Sails are not dedicated anti-submarine warfare exercises and involve multiple warfare areas.	MFM, MFH, MF1, MF1C, Broadband (MF to HF)	5	35	Jacksonville Range Complex
				4	28	Navy Cherry Point Range Complex
				5	35	Virginia Capes Range Complex
Acoustic	Amphibious Ready Group Marine Expeditionary Unit Composite Training Unit Exercise	Amphibious Ready Group exercises are conducted to validate the Marine Expeditionary Unit's readiness for deployment and include small boat raids; visit, board, search, and seizure training; helicopter and mechanized amphibious raids; and non-combatant evacuation operations.	LFH, MFM, MFH, MF1, Broadband (MF to HF)	1	7	Navy Cherry Point Range Complex
Amphibious Warfare						
Explosive	Amphibious Operations in a Contested Environment	Navy and Marine Corps forces conduct operations in coastal and offshore waterways against air, surface, and subsurface threats.	E1, E2, E3, E6, E9, E10	45*	315*	Navy Cherry Point Range Complex
				12*	84*	Virginia Capes Range Complex

Table 1.5-1: Proposed Navy Training Activities Analyzed for this LOA Request within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Number of Activities		Location
				1-year	7-year	
Anti-Submarine Warfare						
Acoustic	Anti-Submarine Warfare Torpedo Exercise - Helicopter	Helicopter crews search for, track, and detect submarines. Recoverable air launched torpedoes are employed against submarine targets.	MFM, MFH, HFH, Broadband (MF to HF)	14	98	Jacksonville Range Complex
				4	28	Virginia Capes Range Complex
Acoustic	Anti-Submarine Warfare Torpedo Exercise – Maritime Patrol Aircraft	Maritime patrol aircraft crews search for, track, and detect submarines. Recoverable air launched torpedoes are employed against submarine targets.	MFM, HFH, Broadband (MF to HF)	14	98	Jacksonville Range Complex
				4	28	Virginia Capes Range Complex
Acoustic	Anti-Submarine Warfare Torpedo Exercise – Ship	Surface ship crews search for, track, and detect submarines. Exercise torpedoes are used during this exercise.	MF1, HFH, Broadband (MF to HF)	16	112	Jacksonville Range Complex
				5	35	Virginia Capes Range Complex
Acoustic	Anti-Submarine Warfare Torpedo Exercise – Submarine	Submarine crews search for, track, and detect submarines. Exercise torpedoes are used during this exercise.	HFH, Broadband (MF to HF)	12	84	Jacksonville Range Complex
				6	42	Northeast Range Complexes
				2	14	Virginia Capes Range Complex
Acoustic	Anti-Submarine Warfare Tracking Exercise – Helicopter	Helicopter crews search for, track, and detect submarines.	MFM, MFH	3	21	Gulf of Mexico Range Complex
				370	2,590	Jacksonville Range Complex
				12	84	Navy Cherry Point Range Complex
				24	168	Other AFTT Areas
				8	56	Virginia Capes Range Complex
Acoustic	Anti-Submarine Warfare Tracking Exercise – Maritime Patrol Aircraft	Maritime patrol aircraft crews search for, track, and detect submarines.	LFM, LFH, MFM	475	3,325	Jacksonville Range Complex
				35	245	Navy Cherry Point Range Complex
				80	560	Northeast Range Complexes
				155	1,085	Virginia Capes Range Complex

Table 1.5-1: Proposed Navy Training Activities Analyzed for this LOA Request within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Number of Activities		Location
				1-year	7-year	
Acoustic	Anti-Submarine Warfare Tracking Exercise – Ship	Surface ship crews search for, track, and detect submarines. Exercise torpedoes may be used during this event.	MFH, MF1, MF1C, Broadband (MF to HF)	5	35	Gulf of Mexico Range Complex
				290	2,030	Jacksonville Range Complex
				33	231	Navy Cherry Point Range Complex
				5	35	Northeast Range Complexes
				55	385	Other AFTT Areas
				120	840	Virginia Capes Range Complex
Acoustic	Anti-Submarine Warfare Tracking Exercise – Submarine	Submarine crews search for, track, and detect submarines.	LFH, MFH, HFH	13	91	Jacksonville Range Complex
				1	7	Navy Cherry Point Range Complex
				18	126	Northeast Range Complexes
				46	308	Other AFTT Areas
				6	42	Virginia Capes Range Complex
Expeditionary Warfare						
Acoustic	Port Damage Repair	Navy and Coast Guard Expeditionary forces train to repair critical port facilities.	Pile Driving	4	28	Gulfport, Mississippi
Mine Warfare						
Acoustic	Airborne Mine Countermeasures - Mine Detection	Helicopter aircrew detect mines using towed or laser mine detection systems.	HFH	290	2,030	Gulf of Mexico Range Complex
				275	1,925	Jacksonville Range Complex
				187	1,309	Key West Range Complex
				321	2,247	Navy Cherry Point Range Complex
				1,420	9,940	Virginia Capes Range Complex

Table 1.5-1: Proposed Navy Training Activities Analyzed for this LOA Request within the Study Area (continued)

Stressor Category	*Activity Name*	*Description*	*Source Bin*	*Number of Activities*		*Location*
				1-year	*7-year*	
Acoustic	Civilian Port Defense – Homeland Security Anti-Terrorism/Force Protection Exercises	Coast Guard and Navy Maritime security personnel train to protect civilian ports and harbors against enemy efforts to interfere with access to those ports.	MFH, HFM, HFH	0 – 1	4	Boston, MA Beaumont, TX Corpus Christi, TX Delaware Bay, DE Earle, NJ Hampton Roads, VA Kings Bay, GA Mayport, FL Morehead City, NC Port Canaveral, FL Savannah, GA Tampa, FL Wilmington, NC
Acoustic & Explosive	Mine Countermeasures – Mine Neutralization – Remotely Operated Vehicles	Ship, small boat, and helicopter crews locate and disable mines using remotely operated underwater vehicles. All events include acoustic sources, only a fraction involve explosives (denoted in parentheses).	HFM, E4	66*	462*	Gulf of Mexico Range Complex
				36	252	Jacksonville Range Complex
				10	70	Key West Range Complex
				36*	252*	Navy Cherry Point Range Complex
				315*	2,205*	Virginia Capes Range Complex
Acoustic	Mine Countermeasures – Ship Sonar	Ship crews detect and avoid mines while navigating restricted areas or channels using active sonar.	HFH	66*	462*	Gulf of Mexico Range Complex
				36	252	Jacksonville Range Complex
				10	70	Key West Range Complex
Explosive	Mine Neutralization Explosive Ordnance Disposal	Personnel disable threat mines using explosive charges.	E5, E6, E7	96*	672*	Gulf of Mexico Range Complex
				100*	700*	Jacksonville Range Complex
				30*	210*	Key West Range Complex
				176*	1,232*	Key West Range Complex Inshore
				86*	602*	Navy Cherry Point Range Complex
				325*	2,275*	Virginia Capes Range Complex
				96*	672*	Gulf of Mexico Range Complex

Table 1.5-1: Proposed Navy Training Activities Analyzed for this LOA Request within the Study Area (continued)

Stressor Category	*Activity Name*	*Description*	*Source Bin*	*Number of Activities*		*Location*
				1-year	*7-year*	
Acoustic	Submarine Mine Laying	Submarine crews or UUVs deploy exercise mobile mines or mines.	MFM, HFL, HFM, VHFL	2	14	Jacksonville Range Complex
Acoustic	Surface Ship Object Detection	Ship crews detect and avoid mines while navigating restricted areas or channels using active sonar.	MF1K	76	532	Jacksonville Range Complex
				162	1,134	Virginia Capes Range Complex
Surface Warfare						
Explosive	Bombing Exercise Air-to-Surface	Fixed-wing aircrew deliver bombs against surface targets.	E9, E10, E12	47*	329*	Gulf of Mexico Range Complex
				260*	1,820*	Jacksonville Range Complex
				73*	511*	Navy Cherry Point Range Complex
				272*	1,904*	Virginia Capes Range Complex
Explosive	Gunnery Exercise Surface-to-Surface Boat Medium-Caliber	Small boat crews fire medium-caliber guns at surface targets.	E1	404	2,828	Virginia Capes Range Complex
Explosive	Gunnery Exercise Surface-to-Surface Ship Large-Caliber	Surface ship crews fire large-caliber guns at surface targets.	E3, E5	8*	56*	Gulf of Mexico Range Complex
				46*	322*	Jacksonville Range Complex
				34*	238*	Navy Cherry Point Range Complex
				9*	63*	Other AFTT Areas
				63*	441*	Virginia Capes Range Complex
Explosive	Integrated Live Fire Exercise	Naval forces defend against a swarm of surface threats (ships or small boats) with bombs, missiles, rockets, and small-, medium- and large-caliber guns.	E10	2*	14*	Jacksonville Range Complex
				2*	14*	Virginia Capes Range Complex
Explosive	Missile Exercise Air-to-Surface - Rocket	Helicopter aircrew fire both precision-guided and unguided rockets at surface targets	E3	10*	70*	Gulf of Mexico Range Complex
				115*	805*	Jacksonville Range Complex
				15*	105*	Navy Cherry Point Range Complex
				100*	700*	Virginia Capes Range Complex

Table 1.5-1: Proposed Navy Training Activities Analyzed for this LOA Request within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Number of Activities 1-year	Number of Activities 7-year	Location
Explosive	Missile Exercise Air-to-Surface	Fixed-wing and helicopter aircrew fire air-to-surface missiles at surface targets.	E6, E8, E9	81*	567*	Jacksonville Range Complex
				8*	56*	Key West Range Complex
				72*	504*	Navy Cherry Point Range Complex
				83*	581*	Virginia Capes Range Complex
Explosive	Missile Exercise Surface-to-Surface	Surface ship crews defend against surface threats (ships or small boats) and engage them with missiles.	E6, E9	19*	133*	Jacksonville Range Complex
				15*	105*	Virginia Capes Range Complex
Acoustic and Explosive	Sinking Exercise	Aircraft, ship, cutter, and submarine crews deliberately sink a seaborne target, usually a decommissioned ship made environmentally safe for sinking according to U.S. Environmental Protection Agency standards, with a variety of ordnance.	HFH E5, E8, E9, E11	1*	7*	SINKEX Box
Other Training Activities						
Acoustic	Submarine Navigation	Submarine crews operate sonar for navigation and detection while transiting into and out of port during reduced visibility.	MFH	29	203	Jacksonville Range Complex
				169	1,183	Northeast Range Complexes
				84	588	Virginia Capes Range Complex Virginia Capes Range Complex Inshore
Acoustic	Submarine Sonar Maintenance and Systems Checks	Maintenance of submarine sonar and other system checks are conducted pierside or at sea.	MFH	4	28	Jacksonville Range Complex
				2	14	Port Canaveral, FL
				2	14	NSB Kings Bay
				66	462	Northeast Range Complexes
				66	462	NSB New London
				12	84	Other AFTT Areas
				34	238	Virginia Capes Range Complex
				34	238	NS Norfolk

Table 1.5-1: Proposed Navy Training Activities Analyzed for this LOA Request within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Number of Activities		Location
				1-year	7-year	
Acoustic	Submarine Under Ice Certification	Submarine crews operate sonar while transiting under ice. Ice conditions are simulated during training and certification events.	HFH	3	21	Jacksonville Range Complex
				3	21	Navy Cherry Point Range Complex
				9	63	Northeast Range Complexes
				9	63	Virginia Capes Range Complex
Acoustic	Surface Ship Sonar Maintenance and Systems Checks	Maintenance of surface ship sonar and other system checks are conducted pierside or at sea.	MF1, MF1K	50	350	Jacksonville Range Complex
				50	350	NS Mayport
				120	840	Navy Cherry Point Range Complex
				175	1,225	NS Norfolk
				18	126	Other AFTT Areas
				175	1,225	Virginia Capes Range Complex
Acoustic	Unmanned Underwater Vehicle Training - Certification and Development	Unmanned underwater vehicle certification involves training with unmanned platforms to ensure submarine crew proficiency. Tactical development involves training with various payloads, for multiple purposes to ensure that the systems can be employed effectively in an operational environment.	MFH, HFL, HFM, VHFL, VHFM, VHFH, Broadband (MF to HF), Broadband (HF to VHF)	10	70	Gulf of Mexico Range Complex
				22	154	Jacksonville Range Complex
				10	70	Navy Cherry Point Range Complex
				12	84	Northeast Range Complexes
				32	224	Virginia Capes Range Complex
				21	147	Virginia Capes Range Complex Inshore

Notes: AFTT = Atlantic Fleet Training and Testing; DE = Delaware; FL = Florida; GA = Georgia; JEB = Joint Expeditionary Base; MA = Massachusetts; MS = Mississippi; NC = North Carolina; NJ = New Jersey; NS = Naval Station; NSB = Naval Submarine Base; SINKEX = Sinking Exercise; TX = Texas; VA = Virginia

*Only a small subset of these activities include explosives ordnance.

Table 1.5-2: Proposed Coast Guard Training Activities Analyzed for this LOA Request within the Study Area

Stressor Category	*Activity Name*	*Description*	*Source Bin*	*Number of Activities*		*Location*
				1-year	*7-year*	
Surface Warfare						
Explosive	Gunnery Exercise Surface-to-Surface Ship Large-Caliber	Surface ship crews fire large-caliber guns at surface targets.	E3	29*	203	Gulf of Mexico Range Complex
				15	105	Jacksonville Range Complex
				10	70	Navy Cherry Point Range Complex
				15*	105	Northeast Range Complexes
				20*	140	Virginia Capes Range Complex
Acoustic	Unmanned Underwater Vehicle Training - Certification and Development	Unmanned underwater vehicle certification involves training with unmanned platforms to ensure submarine crew proficiency. Tactical development involves training with various payloads, for multiple purposes to ensure that the systems can be employed effectively in an operational environment.	MFH, HFL, HFM, VHFL, VHFM, VHFH, Broadband (MF to HF), Broadband (HF to VHF)	10	70	Gulf of Mexico Range Complex
				10	70	Jacksonville Range Complex
				10	70	Navy Cherry Point Range Complex
				20	140	Virginia Capes Range Complex
				20	140	Virginia Capes Range Complex Inshore

*Only a small subset of these activities include explosives ordnance.

1.5.2 TESTING ACTIVITIES

Testing activities included in this LOA request are described in Table 1.5-3 through Table 1.5-5. The tables are organized by primary mission area and include the activity name, associated stressors applicable to this LOA request, number of annual activities, and locations of those activities in the AFTT Study Area. For further information on the primary platforms used (e.g., ship or aircraft type) and duration of an event, see Appendix A (Activity Descriptions) of the AFTT Supplemental EIS/OEIS. The Proposed Action entails a level of testing activities to be conducted into the reasonably foreseeable future, with adjustments that account for changes in the types and tempo (increases or decreases) of testing activities to meet current and future military readiness requirements. The majority of testing activities that would be conducted under the Proposed Action are the same as, or similar to, those conducted currently or in the past. The Proposed Action also includes the testing of platforms and systems using new technologies and accounts for the inherent uncertainties in this type of testing.

Under the Proposed Action, the Navy proposes an annual level of testing that reflects the fluctuations in testing programs by recognizing that the maximum level of testing will not be conducted each year. The Proposed Action contains a more realistic annual representation of activities, but includes years of a higher maximum amount of testing to account for these fluctuations.

1.5.2.1 Naval Air Systems Command

Table 1.5-3: Proposed NAVAIR Activities Analyzed for this LOA Request within the Study Area

Stressor Category	Activity Name	Description	Source Bin	Number of Activities		Location
				1-year	7-year	
Anti-Submarine Warfare						
Acoustic	Anti-Submarine Warfare Tracking Test (Fixed-Wing)	The test evaluates the sensors and systems used by fixed-wing aircraft to detect and track submarines and to ensure that aircraft systems used to deploy the tracking systems perform to specifications and meet operational requirements.	LFM, LFH, MFM, HFM	15	105	Gulf of Mexico Range Complex
				19	133	Jacksonville Range Complex
				12	84	Key West Range Complex
				15	105	Navy Cherry Point Range Complex
				45	315	Northeast Range Complexes
				25	175	SINKEX Box
				25	175	Virginia Capes Range Complex
Acoustic	Anti-Submarine Warfare Torpedo Test	This event is similar to the training event torpedo exercise. Test evaluates anti-submarine warfare systems onboard rotary-wing and fixed-wing aircraft and the ability to search for, detect, classify, localize, track, and attack a submarine or similar target.	HFH	20 - 43	209	Jacksonville Range Complex
				40 - 121	523	Virginia Capes Range Complex
Acoustic	Anti-Submarine Warfare Tracking Test (Rotary-wing)	This event is similar to the training event anti-submarine tracking exercise–helicopter. The test evaluates the sensors and systems used to detect and track submarines and to ensure that helicopter systems used to deploy the tracking systems perform to specifications.	MFM, MFH	6	42	Gulf of Mexico Range Complex
				23	161	Jacksonville Range Complex
				27	189	Key West Range Complex
				110	770	Northeast Range Complexes
				280	1,960	Virginia Capes Range Complex
Acoustic	Kilo Dip Test	Functional check of a helicopter deployed dipping sonar system prior to conducting a testing or training event using the dipping sonar system.	MFH	6	42	Gulf of Mexico Range Complex
				6	42	Jacksonville Range Complex
				6	42	Key West Range Complex
				4	28	Northeast Range Complexes
				40	280	Virginia Capes Range Complex

Table 1.5-3: Proposed NAVAIR Activities Analyzed for this LOA Request within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Number of Activities 1-year	Number of Activities 7-year	Location
Acoustic and Explosive	Sonobuoy Lot Acceptance Test	Sonobuoys are deployed from surface vessels and aircraft to verify the integrity and performance of a lot or group of sonobuoys in advance of delivery to the fleet for operational use.	LFM, LFH, MFM, HFM E1, E3	186*	1,302*	Key West Range Complex
Mine Warfare						
Acoustic	Airborne Dipping Sonar Minehunting Test	A mine-hunting dipping sonar system that is deployed from a helicopter and uses high-frequency sonar for the detection and classification of bottom and moored mines.	HFH	32	224	NSWC Panama City Testing Range
				40	280	Virginia Capes Range Complex
Explosive	Airborne Mine Neutralization System Test	A test of the airborne mine neutralization system evaluates the system's ability to detect and destroy mines from an airborne mine countermeasures capable helicopter. The airborne mine neutralization system uses up to four unmanned underwater vehicles equipped with high-frequency sonar, video cameras, and explosive and non-explosive neutralizers	E4	27*	189*	NSWC Panama City Testing Range
				25*	175*	Virginia Capes Range Complex
Acoustic	Airborne Minehunting Test - Sonobuoy	A mine-hunting system made up of sonobuoys is deployed from a helicopter. A field of sonobuoys, using high-frequency sonar, is used for detection and classification of bottom and moored mines.	MFM	26	182	NSWC Panama City Testing Range
				12	84	Virginia Capes Range Complex

Table 1.5-3: Proposed NAVAIR Activities Analyzed for this LOA Request within the Study Area (continued)

Stressor Category	*Activity Name*	*Description*	*Source Bin*	*Number of Activities*		*Location*
				1-year	*7-year*	
Surface Warfare						
Explosive	Air-to-Surface Gunnery Test	This event is similar to the training event gunnery exercise air-to-surface. Fixed-wing and rotary-wing aircrew evaluate new or enhanced aircraft guns against surface maritime targets to test that the gun, gun ammunition, or associated systems meet required specifications or to train aircrew in the operation of a new or enhanced weapons system.	E1	55	385	Jacksonville Range Complex
				140*	980*	Virginia Capes Range Complex
Explosive	Air-to-Surface Missile Test	This event is similar to the training event missile exercise air-to-surface. Test may involve both fixed-wing and rotary-wing aircraft launching missiles at surface maritime targets to evaluate the weapons system or as part of another systems integration test.	E6	5*	35*	Gulf of Mexico Range Complex
				29*	203*	Jacksonville Range Complex
				117*	819*	Virginia Capes Range Complex
Explosive	Rocket Test	Rocket tests are conducted to evaluate the integration, accuracy, performance, and safe separation of guided and unguided 2.75-inch rockets fired from a hovering or forward flying helicopter or tilt rotor aircraft.	E3	19	133	Jacksonville Range Complex
				35*	245*	Virginia Capes Range Complex
Other Testing Activities						
Acoustic	Undersea Range System Test	Following installation of a Navy underwater warfare training and testing range, tests of the nodes (components of the range) will be conducted to include node surveys and testing of node transmission functionality	MFM, HFM	4 – 20	176	Jacksonville Range Complex

Note: NAVAIR= Naval Air Systems Command; NSWC= Naval Surface Warfare Center
*Only a small subset of these activities include explosives ordnance.

1.5.2.2 Naval Sea Systems Command

Table 1.5-4: Proposed Naval Sea Systems Command Activities Analyzed for this LOA Request within the Study Area

Stressor Category	***Activity Name***	***Description***	***Source Bin***	***Number of Activities***		***Location***
				1-year	***7-year***	
Acoustic and Oceanographic Science and Technology						
Acoustic and Explosive	Acoustic and Oceanographic Research	Research using active transmissions from sources deployed from ships, aircraft, and unmanned underwater vehicles. Research sources can be used as proxies for current and future Navy systems.	LFM, Broadband (LF to HF), E7	0 - 1	1	Gulf of Mexico Range Complex Jacksonville Range Complex Key West Range Complex
				3	21	Northeast Range Complexes
				0 – 1*	3*	Key West Range Complex
				0 - 1	2	Other AFTT Areas
Anti-Submarine Warfare						
Acoustic	Anti-Submarine Warfare Mission Package Testing	Ships and their supporting platforms (e.g., rotary-wing aircraft and unmanned aerial systems) detect, localize, and prosecute submarines.	MFH, MF1	1 - 2	11	Gulf of Mexico Range Complex
				2	14	Jacksonville Range Complex
				1 - 2	11	Northeast Range Complexes
Acoustic	At-Sea Sonar Testing	At-sea testing to ensure systems are fully functional in an open ocean environment.	MFL, MFM, MFH, MF1, MF1K, HFL, HFM, HFH, Broadband (LF to HF), Broadband (LF to MF), Broadband (MF to HF)	7 - 9	49	Gulf of Mexico Range Complex Jacksonville Range Complex Navy Cherry Point Range Complex Northeast Range Complexes SFOMF Virginia Capes Range Complex
				7 - 14	77	Gulf of Mexico Range Complex
				4	28	Jacksonville Range Complex
				2	14	Navy Cherry Point Range Complex
				8 - 15	84	Northeast Range Complexes
				16-22	58	Virginia Capes Range Complex
				2	14	SFOMF

Table 1.5-4: Proposed Naval Sea Systems Command Activities Analyzed for this LOA Request within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Number of Activities		Location
				1-year	7-year	
Acoustic	Pierside Sonar Testing	Pierside testing to ensure systems are fully functional in a controlled pierside environment prior to at-sea test activities and complete any required troubleshooting.	MFM, MFH, HFM, HFH, Broadband (MF to HF)	5 - 10	64	NSB New London Gulf of Mexico Range Complex Inshore Jacksonville Range Complex NSB Kings Bay Newport, RI NS Norfolk Northeast Range Complexes Port Canaveral, FL Virginia Capes Range Complex
				10 - 20	110	Bath, ME
				10 - 18	94	NS Mayport
				63 - 84	455	NS Norfolk
				10 - 20	110	Pascagoula, MS
				16 - 24	152	Portsmouth Naval Shipyard
Acoustic	Surface Ship Sonar Testing/Maintenance	Pierside and at-sea testing of ship systems occurs periodically following major maintenance periods and for routine maintenance.	LFL, MFM, MF1, MF1K, Broadband (MF to HF)	1	7	Jacksonville Range Complex
				4	28	Virginia Capes Range Complex
Acoustic and Explosive	Torpedo (Explosive) Testing	Air, surface, or submarine crews employ explosive and non-explosive torpedoes against artificial targets.	MFM, MFH, MF1, HFH, Broadband (MF to HF) E8, E11	1-5*	17*	Gulf of Mexico Range Complex Jacksonville Range Complex Key West Range Complex Navy Cherry Point Range Complex Northeast Range Complexes Virginia Capes Range Complex

Table 1.5-4: Proposed Naval Sea Systems Command Activities Analyzed for this LOA Request within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Number of Activities		Location
				1-year	7-year	
Acoustic	Torpedo (Non-Explosive) Testing	Air, surface, or submarine crews employ non-explosive torpedoes against targets, submarines, or surface vessels.	MFL, MFM, MFH, MF1, HFM, HFH, VHFH, Broadband (LF to HF), Broadband (MF to HF)	13 - 17	82	Gulf of Mexico Range Complex Jacksonville Range Complex Key West Range Complex Navy Cherry Point Range Complex Northeast Range Complexes SFOMF Virginia Capes Range Complex Jacksonville Range Complexes Inshore
				30	210	NUWC Newport Testing Range
Mine Warfare						
Explosive	Mine Countermeasure and Neutralization Testing	Air, surface, and subsurface vessels neutralize threat mines and mine-like objects.	E4, E11	18 – 45*	315*	Gulf of Mexico Range Complex
				24 – 48*	288*	Virginia Capes Range Complex
Acoustic & Explosive	Mine Countermeasure Mission Package Testing	Vessels and associated aircraft conduct mine countermeasure operations.	MFH, HFM, HFH, E4	15	105	Gulf of Mexico Range Complex
				8	56	Jacksonville Range Complex
				11	77	NSWC Panama City Testing Range
				2	14	SFOMF
				3	21	Virginia Capes Range Complex
Acoustic	Mine Detection and Classification Testing	Air, surface, and subsurface vessels and systems detect and classify mines and mine-like objects. Vessels also assess their potential susceptibility to mines and mine-like objects.	HFH	0 - 1	1	Jacksonville Range Complex NSWC Panama City Testing Range
				0 - 1	4	Jacksonville Range Complex
				286 - 287	2,005	NSWC Panama City Testing Range

Table 1.5-4: Proposed Naval Sea Systems Command Activities Analyzed for this LOA Request within the Study Area (continued)

Stressor Category	*Activity Name*	*Description*	*Source Bin*	*Number of Activities*		*Location*
				1-year	*7-year*	
Other Testing Activities						
Acoustic	Acoustic Component Testing	Various surface vessels, moored equipment, and materials are tested to evaluate performance in the marine environment.	LFL, MFL, MFH, HFM, HFH, VHFH, Broadband (LF to HF), Broadband (MF to HF)	33	231	SFOMF
				1	7	Jacksonville Range Complex
Acoustic	Countermeasure Testing	Countermeasure testing involves the testing of systems that will detect, localize, track, and engage incoming weapons, including marine vessel targets and airborne missiles. Testing includes surface ship torpedo defense systems, marine vessel stopping payloads, and airborne decoys against air targets.	MFM, MFH, HFH, VHFH, Broadband (LF to HF), Broadband (MF to HF)	16 - 20	116	Gulf of Mexico Range Complex Jacksonville Range Complex Key West Range Complex Navy Cherry Point Range Complex Northeast Range Complexes Virginia Capes Range Complex JEB Little Creek Fort Story
				8 - 10	63	Gulf of Mexico Range Complex
				6	42	NUWC Newport Testing Range
				6 - 10	13	Virginia Capes Range Complex
Acoustic	Insertion/Extraction	Testing of submersibles capable of inserting and extracting personnel and payloads into denied areas from strategic distances.	LFH, HFM, Broadband (LF to MF)	501 - 502	3,514	Key West Range Complex NSWC Panama City Testing Range
Explosive	Line Charge Testing	Surface vessels deploy line charges to test the capability to safely clear an area for expeditionary forces.	E14	4*	28*	NSWC Panama City Testing Range

Table 1.5-4: Proposed Naval Sea Systems Command Activities Analyzed for this LOA Request within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Number of Activities 1-year	Number of Activities 7-year	Location
Explosive	Semi-Stationary Equipment Testing	Semi-stationary equipment (e.g., hydrophones) is deployed to determine functionality.	E4, AG230	8 – 14*	74*	NSB New London NS Mayport NS Norfolk Port Canaveral, FL Virginia Capes Range Complex Inshore Key West Range Complex Inshore
				4	28	Newport, RI
				30	210	NSWC Panama City Testing Range
				155 – 173*	1,139*	NUWC Newport Testing Range
Acoustic	Towed Equipment Testing	Surface vessels or unmanned surface vehicles deploy and tow equipment to determine functionality of towed systems.	MFM, Broadband (LF)	43 - 49	319	NUWC Newport Testing Range
Surface Warfare						
Explosive	Gun Testing - Large-Caliber	Surface crews test large-caliber guns to defend against surface targets. Demonstration of large-caliber guns including the MK 45 5-inch gun and MK 41 Vertical Launch Systems using surface to air missiles.	E3, E5	1 – 15*	20*	Jacksonville Range Complex Virginia Capes Range Complex
				1 - 2	11	Gulf of Mexico Range Complex
				2 – 4*	23*	Jacksonville Range Complex
				1 - 2	11	Northeast Range Complexes
				15*	105*	NSWC Panama City Testing Range
Explosives	Missile and Rocket Testing	Missile and rocket testing includes various missiles or rockets fired from submarines and surface combatants. Testing of the launching system and ship defense is performed.	E6, E7, E8, E9, E10	6 – 18*	49*	Gulf of Mexico Range Complex Jacksonville Range Complex Navy Cherry Point Range Complex Virginia Capes Range Complex
				20 – 30*	78*	Virginia Capes Range Complex

Table 1.5-4: Proposed Naval Sea Systems Command Activities Analyzed for this LOA Request within the Study Area (continued)

Stressor Category	*Activity Name*	*Description*	*Source Bin*	*Number of Activities*		*Location*
				1-year	*7-year*	
Unmanned Systems						
Acoustic and Explosive	Unmanned Underwater Vehicle Testing	Testing involves the production or upgrade of unmanned underwater vehicles. This may include testing of mine detection capabilities, evaluating the basic functions of individual platforms, or complex events with multiple vehicles.	LFL, MFL, MFM, MFH, HFM, HFH, VHFH, Broadband (LF to HF), Broadband (MF to HF), E8	208 - 209	1,459	NSWC Panama City Testing Range
				138	966	NUWC Newport Testing Range
				1	7	SFOMF
Vessel Evaluation						
Acoustic	In-Port Maintenance Testing	Each combat system is tested to ensure they are functioning in a technically acceptable manner and are operationally ready to support at-sea testing.	MF1	2	4	NS Mayport NS Norfolk
				2	14	NS Mayport
				4	28	NS Norfolk
Acoustic	Signature Analysis Operations	Surface ship and submarine testing of electromagnetic, acoustic, optical, and radar signature measurements.	LFM, LFH, MFM, HFM, Broadband (LF)	0 - 1	4	Hampton Roads, VA
				79 - 94	579	SFOMF
Explosive	Small Ship Shock Trial	Underwater detonations are used to test new ships or major upgrades.	E16	0 – 2*	5*	Jacksonville Range Complex Virginia Capes Range Complex Gulf of Mexico Range Complex

Table 1.5-4: Proposed Naval Sea Systems Command Activities Analyzed for this LOA Request within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Number of Activities 1-year	Number of Activities 7-year	Location
Acoustic	Submarine Sea Trials – Weapons System Testing	Submarine weapons and sonar systems are tested at-sea to meet the integrated combat system certification requirements.	MFL, MFH, HFM, HFH, Broadband (LF to HF)	3 - 7	22	Gulf of Mexico Range Complex Jacksonville Range Complex NSB Kings Bay Northeast Range Complexes Port Canaveral, FL Virginia Capes Range Complex
				2 - 4	28	Northeast Range Complexes
				1	6	Northeast Range Complexes Inshore
				2 - 4	28	Virginia Capes Range Complex
Acoustic and Explosive	Surface Warfare Testing	Tests the capabilities of shipboard sensors to detect, track, and engage surface targets. Testing may include ships defending against surface targets using explosive and non-explosive rounds, gun system structural test firing and demonstration of the response to Call for Fire against land-based targets (simulated by sea-based locations).	HFH, E1, E3, E5, E6, E7, E8	17 – 76*	206*	Jacksonville Range Complex Virginia Capes Range Complex
				0 – 2*	6*	Gulf of Mexico Range Complex
				4 – 6*	37*	Jacksonville Range Complex
				5 – 7*	42*	Virginia Capes Range Complex
Acoustic and Explosive	Undersea Warfare Testing	Ships demonstrate capability of countermeasure systems and underwater surveillance, weapons engagement and communications systems. This tests ships ability to detect, track, and engage undersea targets.	MFM, MFH, MF1, HFM, HFH, Broadband (LF to HF), E4, E8	6 - 24	105	Jacksonville Range Complex Navy Cherry Point Range Complex Northeast Range Complexes SFOMF Virginia Capes Range Complex
				4 – 6*	30*	Jacksonville Range Complex

Table 1.5-4: Proposed Naval Sea Systems Command Activities Analyzed for this LOA Request within the Study Area (continued)

Stressor Category	*Activity Name*	*Description*	*Source Bin*	*Number of Activities*		*Location*
				1-year	*7-year*	
Acoustic	Vessel Signature Evaluation	Surface ship, submarine, and auxiliary system signature assessments. This may include electronic, radar, acoustic, infrared and magnetic signatures.	MFM, HFM, HFH	1 - 4	9	Jacksonville Range Complex Virginia Capes Range Complex
				0 - 1	2	Gulf of Mexico Range Complex
				1 - 3	6	Hampton Roads, VA
				0 - 1	3	NUWC Newport Testing Range
				0 - 1	3	SFOMF
				0 - 1	4	Virginia Capes Range Complex

Notes: FL = Florida; GA = Georgia; JEB = Joint Expeditionary Base; LA = Louisiana; MS = Mississippi; NS = Naval Station; NSB = Naval Submarine Base; NSWC = Naval Surface Warfare Center; NUWC = Naval Undersea Warfare Center; RI = Rhode Island; SFOMF = South Florida Ocean Measurement Facility; VA = Virginia

*Only a small subset of these activities include explosives ordnance.

1.5.2.3 Office of Naval Research

Table 1.5-5: Proposed Office of Naval Research Activities Analyzed for this LOA Request within the Study Area

Stressor Category	*Activity Name*	*Description*	*Source Bin*	*Number of Activities*		*Location*
				1-year	*7-year*	
Acoustic and Oceanographic Science and Technology						
Acoustic & Explosive	Acoustic and Oceanographic Research	Research using active transmissions from sources deployed from ships, aircraft, and unmanned vehicles. Research sources can be used as proxies for current and future Navy systems.	LFM, LFH, MFM, MFH, HFM, HFH E1, E3, 3S3, AG232	12-15*	93*	Gulf of Mexico Range Complex Jacksonville Range Complex Northeast Range Complexes Virginia Capes Range Complex
Acoustic	Mine Countermeasure Technology Research	Test involves the use of broadband acoustic sources on unmanned underwater vehicles.	MFH	4-5	35	Gulf of Mexico Range Complex Jacksonville Range Complex Northeast Range Complexes Virginia Capes Range Complex

*Only a small subset of these activities include explosives ordnance.

1.5.3 VESSEL MOVEMENTS

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 operates 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 in size 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).

Large ships greater than 60 ft. (18 m) generally operate at speeds in the range of 10 to 15 knots for fuel conservation. Submarines generally operate at lower speeds in transit and even lower speeds for certain tactical maneuvers. Small craft (for purposes of this discussion – less than 60 ft. [18 m] in length) have much more variable speeds (dependent on the mission). While these speeds are representative of most events, some vessels need to temporarily operate outside of these parameters. For example, to produce the required relative wind speed over the flight deck, an aircraft carrier vessel group engaged in flight operations must adjust its speed through the water accordingly. Conversely, there are other instances such as launch and recovery of a small rigid hull inflatable boat, vessel boarding, search and seizure training events or retrieval of a target when vessels will be dead in the water or moving slowly ahead to maintain steerage. Additionally, there are specific events including high speed tests of newly constructed vessels. High speed ferries may also be used to support Navy testing in Narragansett Bay.

The number of vessels used in the Study Area varies based on military readiness requirements, deployment schedules, annual budgets, and other unpredictable factors. Most military readiness activities involve the use of vessels. These activities could be widely dispersed throughout the Study Area, but would typically be conducted near naval ports, piers, and range areas. Activities involving vessel movements occur intermittently and are variable in duration, ranging from a few hours to multiple weeks.

Action Proponent vessel traffic would be especially concentrated near Naval Station Norfolk in Norfolk, Virginia, and Naval Station Mayport in Jacksonville, Florida. There is no seasonal differentiation in Navy vessel use. Large vessel movement primarily occurs with the majority of the traffic flowing between the installations and the Operating Areas (OPAREAS). Support craft would be more concentrated in the coastal waters in the areas of naval installations, ports and ranges.

The number of testing activities that include the use of vessels is around 12% 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 vessel that was also conducting a training activity. Vessel movement in conjunction with testing activities could occur throughout the Study Area, but would typically be conducted near naval ports, piers, and within range complexes.

Additionally, a variety of smaller craft will be operated within the Study Area. Small craft types, sizes, and speeds vary. During military readiness activities, speeds generally range from 10 to 14 knots; however, vessels can and will, on occasion, operate within the entire spectrum of their specific operational capabilities. In all cases, the vessels/craft will be operated in a safe manner consistent with the local condition

2 DATES, DURATION, AND SPECIFIED GEOGRAPHIC REGION

This LOA request is for military readiness activities conducted within the Atlantic Fleet Training and Testing Study Area from 2025 to 2032. The Study Area includes areas of the western Atlantic Ocean along the east coast of North America, the Gulf of Mexico, and portions of the Caribbean Sea. Land components associated with the range complexes and testing ranges are not included in the Study Area and no activities on these land areas are included as part of the Proposed Action. The Study Area begins at the mean high tide line along the U.S. coast and extends east to the 45-degree west longitude line, north to the 65-degree north latitude line, and south to approximately the 20-degree north latitude line. It also includes Navy and Coast Guard pierside locations and port transit channels, bays, harbors, inshore waterways (bays, channels, rivers), and civilian ports where military readiness activities occur as well as vessel and aircraft transit routes between homeports and operating areas (OPAREAs). New to the Study Area for this LOA request are inshore waters adjacent to the Gulf of Mexico, and changes to ship shock trial areas. The Gulf of Mexico ship shock trial area was moved to the south, the Jacksonville ship shock area expanded, and the Key West ship shock trial area was removed. The vast majority of military readiness activities occur within appropriately designated range complexes and testing ranges that fall within the confines of the Study Area.

2.1 SUMMARIES OF AFTT LOCATIONS

A summary of the AFTT Range Complexes, Inshore Areas, and Ports are provided in Table 2.1-1 through Table 2.1-3 and Figure 2.1-1 through Figure 2.1-5.

Table 2.1-1: AFTT Study Area – Training and Testing Ranges

Name	*Basic Location*	*Sea and Undersea Space*	*Air Space*
Northeast Range Complexes	750 miles along the coast from Maine to New Jersey	46,000 NM² of sea and undersea space Includes three OPAREAs: Boston, Narragansett Bay, and Atlantic City	29,000 NM² of special use airspace
Naval Undersea Warfare Center Division, Newport Testing Range	Includes the waters of Narragansett Bay, Rhode Island Sound, Block Island Sound, Buzzards Bay, Vineyard Sound, and Long Island Sound	11,000 NM² of sea and undersea space Includes three Restricted Areas: Coddington Cove, Narragansett Bay, and Rhode Island Sound	Minimal testing occurs in airspace within the test area
Virginia Capes Range Complex (VACAPES RC)	250 miles along the coast from Delaware to North Carolina, from the shoreline to 150 NM seaward	30,000 NM² of sea and undersea space Includes one OPAREA: Virginia Capes	30,000 NM² of special use airspace
Navy Cherry Point Range Complex	Off the coast of North and South Carolina, from the shoreline to 120 NM seaward	19,000 NM² of sea and undersea space Includes one OPAREA: Navy Cherry Point	19,000 NM² of special use airspace
Jacksonville Range Complex (JAX RC)	520 miles along the coast from North Carolina to Florida, from the shoreline to roughly 250 NM seaward	50,000 NM² of sea and undersea space. Includes three OPAREAs: Charleston, Jacksonville and Cape Canaveral Includes the Undersea Warfare Training Range	64,000 NM² of special use airspace
Naval Surface Warfare Center, Carderock Division, South Florida Ocean Measurement Facility Testing Range (SFOMF)	Located adjacent to the Port Everglades entrance channel in Fort Lauderdale, Florida; out to roughly 25 NM from shore	500 NM² of sea and undersea space	No associated special use airspace
Key West Range Complex	Off the southwestern coast of mainland Florida and along the southern Florida Keys, extending into the Gulf of Mexico and the Straits of Florida	8,000 NM² of sea and undersea space south of Key West. Includes one OPAREA: Key West	23,000 NM² of special use airspace
Naval Surface Warfare Center, Panama City Division Testing Area	Off the panhandle of Florida and Alabama, extending from the shoreline 120 NM seaward and includes St. Andrew Bay	23,000 NM² of sea and undersea space Includes two OPAREAs: Panama City and Pensacola	23,000 NM² of special use airspace
Gulf of Mexico Range Complex (GOMEX RC)	Includes geographically separated areas throughout the Gulf of Mexico	20,000 NM² of sea and undersea space Includes four OPAREAs: Panama City, Pensacola, New Orleans, & Corpus Christi	43,000 NM² of special use airspace

[1]Areas and distances of locations, sea and undersea space, and airspace are approximations.
Notes: NM = nautical miles; NM² = square nautical miles;

Table 2.1-2: AFTT Study Area – Training Ranges Inshore Locations

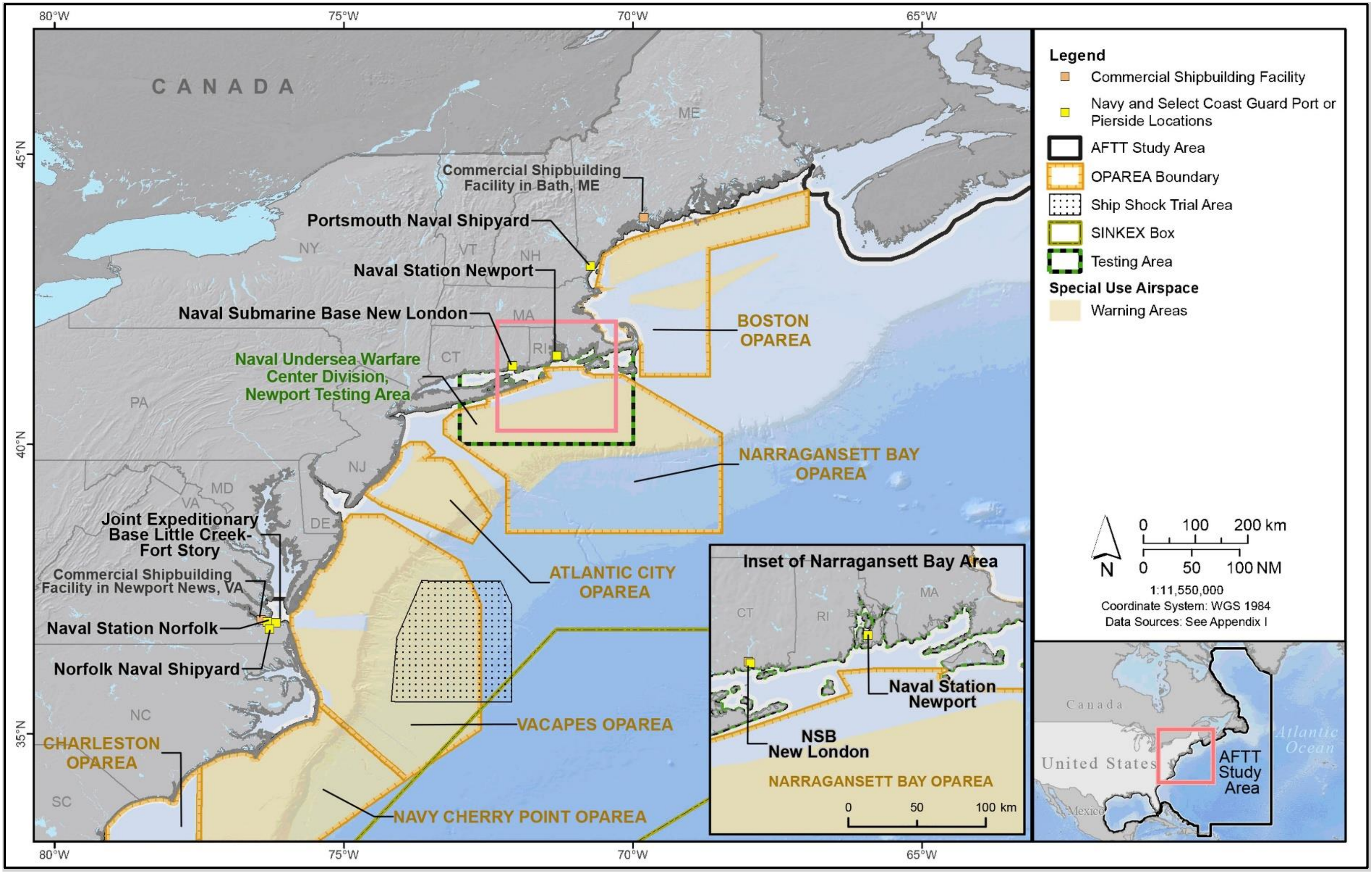
Name	***Associated Inshore Waters***
Northeast Range Complexes Inshore	Thames River Narragansett Bay Rhode Island Sound Block Island Sound
Virginia Capes Range Complex (VACAPES RC) Inshore	Lower Chesapeake Bay James River and tributaries Broad Bay York River
Jacksonville Range Complex (JAX RC) Inshore	Blount's Island Southeast Kings Bay Cooper River St. Johns River Port Canaveral
Key West Range Complex Inshore	Truman Harbor Demolition Key
Gulf of Mexico Range Complex (GOMEX RC) Inshore	St. Andrew Bay Atchafalaya Bay Atchafalaya River Lake Borgne Pascagoula River

Table 2.1-3: AFTT Study Area – Ports and Piers

Pierside Locations	*Civilian Ports*	*Coast Guard Locations*
Portsmouth Naval Shipyard	Bath, ME	Southwest Harbor, ME
Naval Submarine Base New London	Boston, MA	Boston, MA
Naval Station Newport	Earle, NJ	Cape Cod, MA
Naval Station Norfolk	Delaware Bay, DE	New London, CT[1]
Joint Expeditionary Base Little Creek	Hampton Roads, VA	Newport, RI[1]
Norfolk Naval Shipyard	Morehead City, NC	Montauk, NY
Naval Submarine Base Kings Bay	Wilmington, NC	Sector NY
Naval Station Mayport	Kings Bay, GA	Sector Long Island
Port Canaveral	Savannah, GA	Atlantic City, NJ
	Mayport, FL	Chesapeake, VA
	Port Canaveral, FL	Virginia Beach, VA[1]
	Tampa, FL	Portsmouth, VA[1]
	Beaumont, TX	Elizabeth City, NC
	Corpus Christi, TX	Charleston, SC[1]
	Gulfport, MS	Mayport, FL[1]
	Pascagoula, MS	Cape Canaveral, FL[1]
		Fort Pierce, FL[1]
		Dania, FL[1]
		Miami, FL[1]
		Key West, FL[1]
		St. Petersburg, FL[1]
		Pensacola, FL[1]
		Opa Locka, FL
		New Orleans, LA
		Houston, TX
		Corpus Christi, TX
		Borinquen Aquadilla, PR

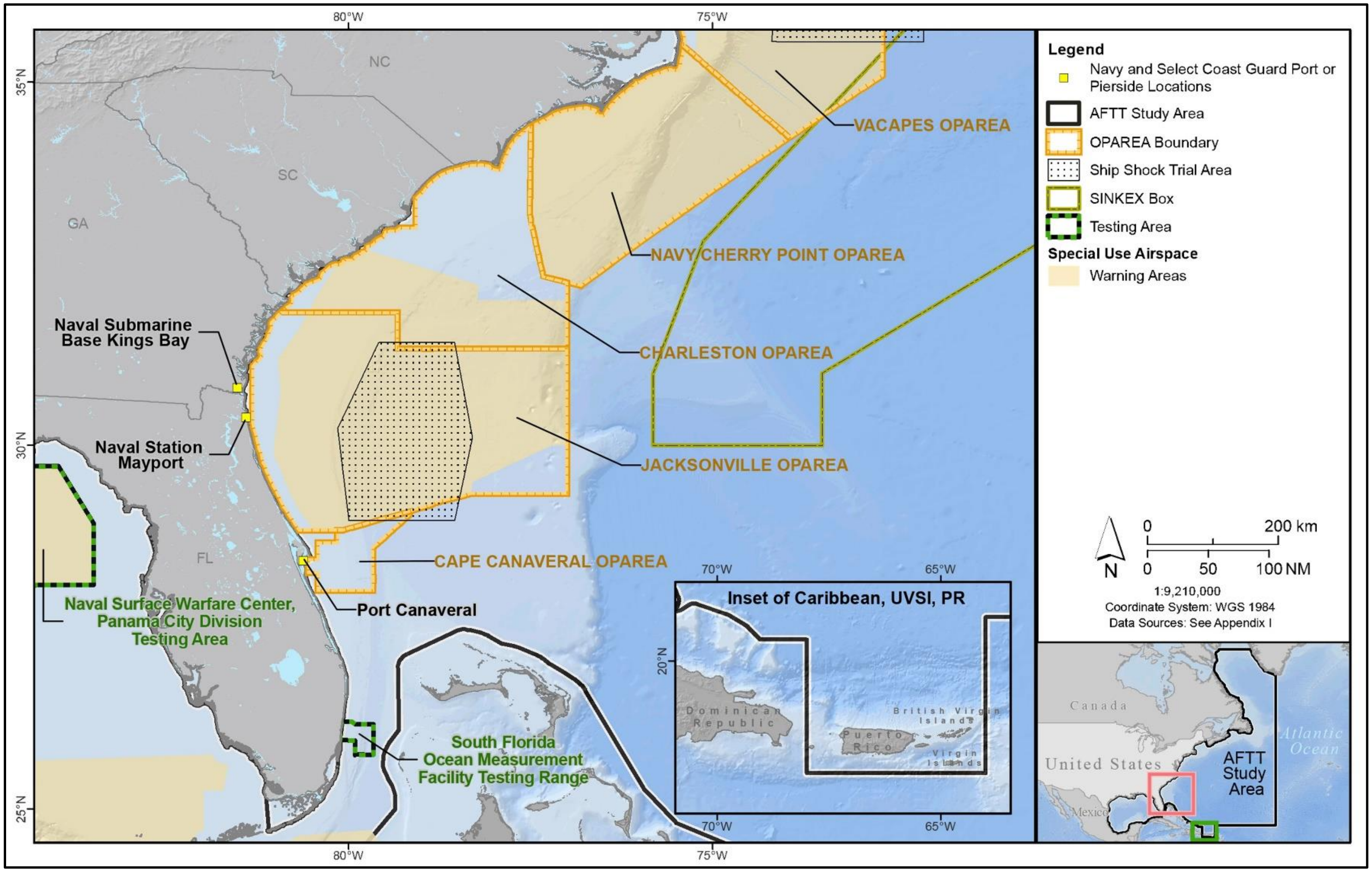
Notes: FL = Florida; GA = Georgia; LA = Louisiana; MA = Massachusetts; ME = Maine; MS = Mississippi; NC = North Carolina; N = New Jersey; NY = New York; PR = Puerto Rico; RI = Rhode Island; SC = South Carolina; TX = Texas; VA = Virginia

[1] Coast Guard cutter stations



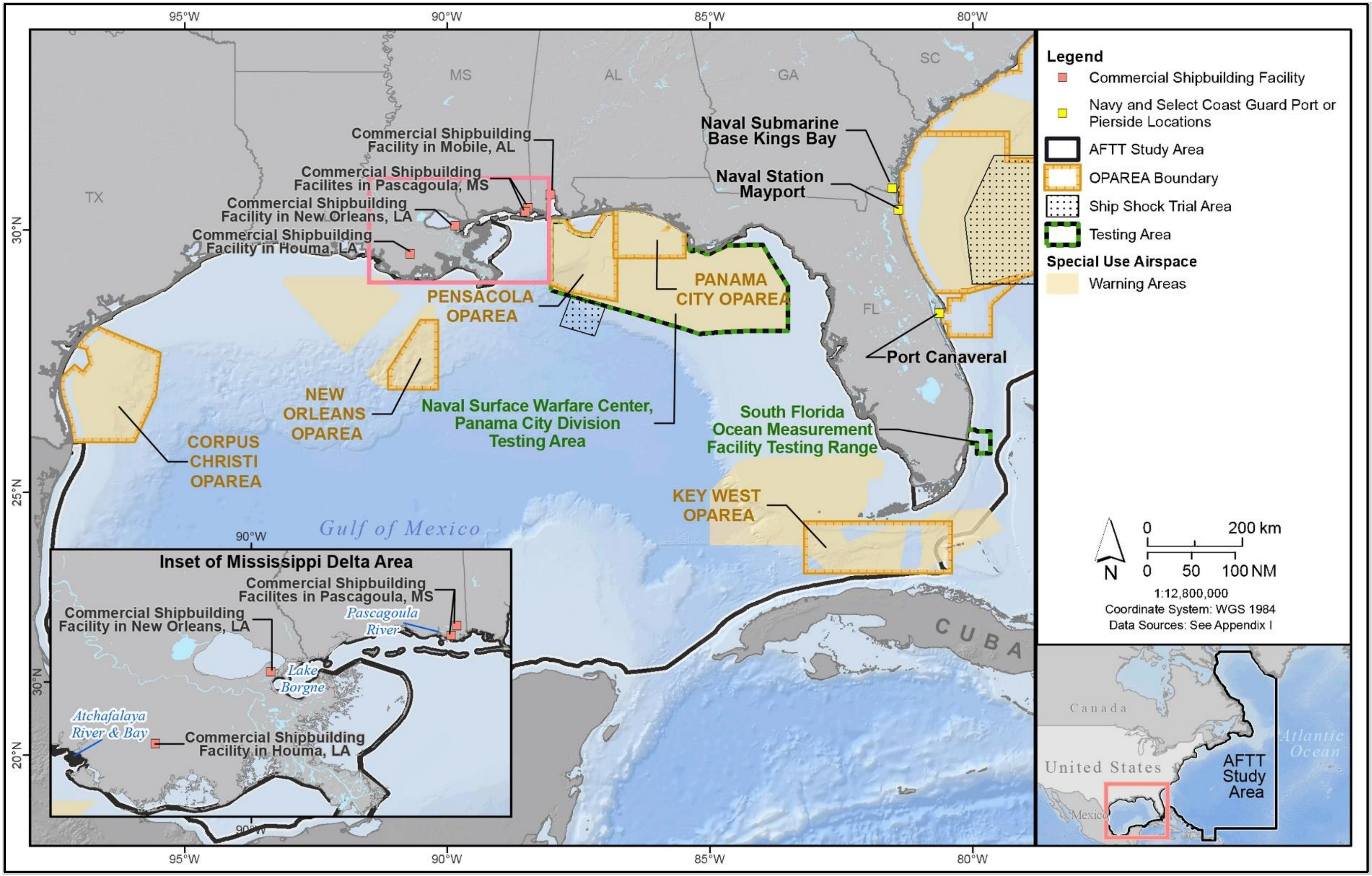
Notes: AFTT = Atlantic Fleet Training and Testing; NSB = Naval Submarine Base; OPAREA = operating area; SINKEX = Sinking Exercise

Figure 2.1-1: Atlantic Fleet Training and Testing Study Area – Northeast and Mid-Atlantic Region



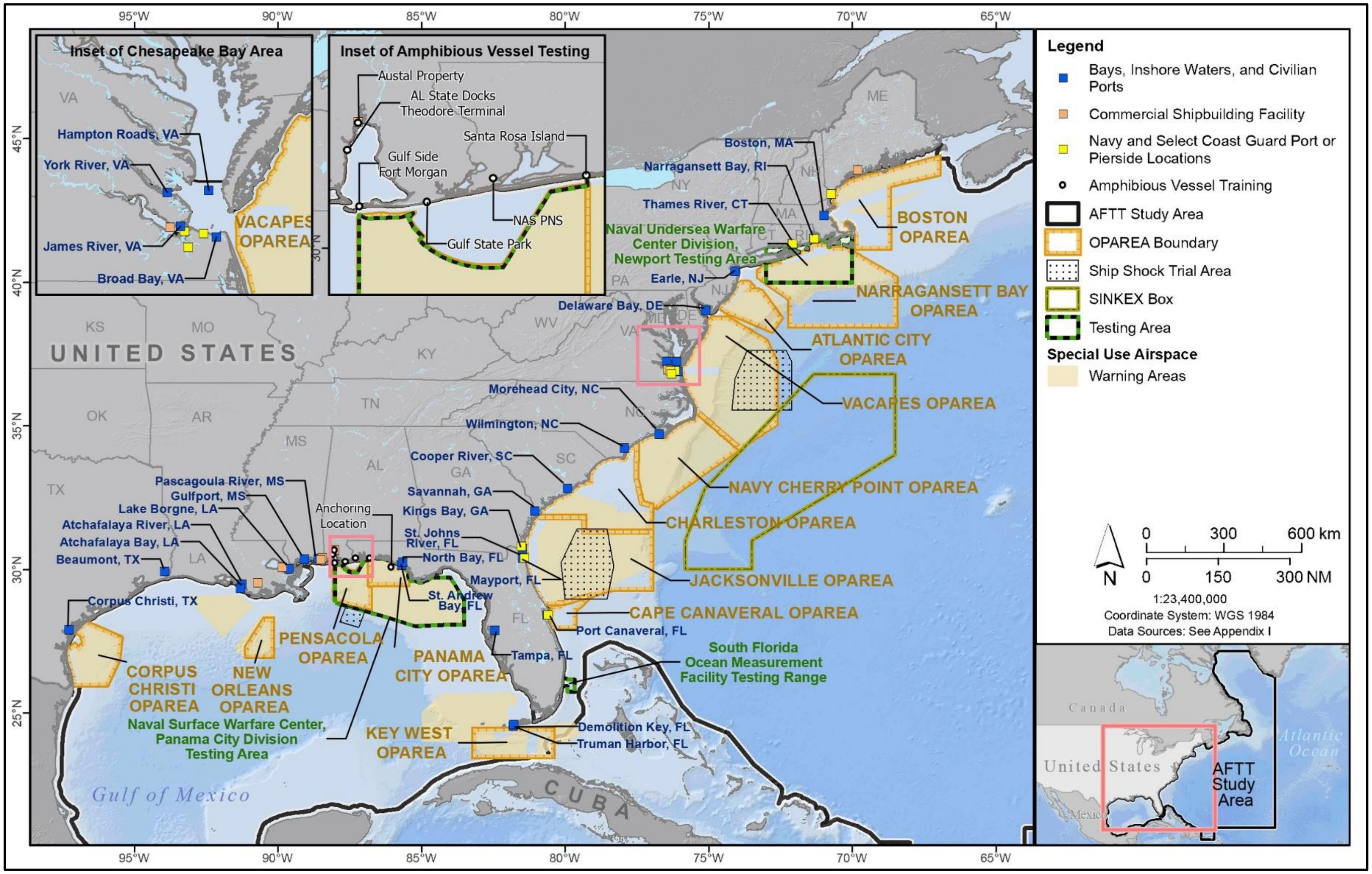
Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area; PR = Puerto Rico; SINKEX = Sinking Exercise; USVI = U.S. Virgin Islands; VACAPES = Virginia Capes

Figure 2.1-2: Atlantic Fleet Training and Testing Study Area – Southeast Region and Caribbean Sea



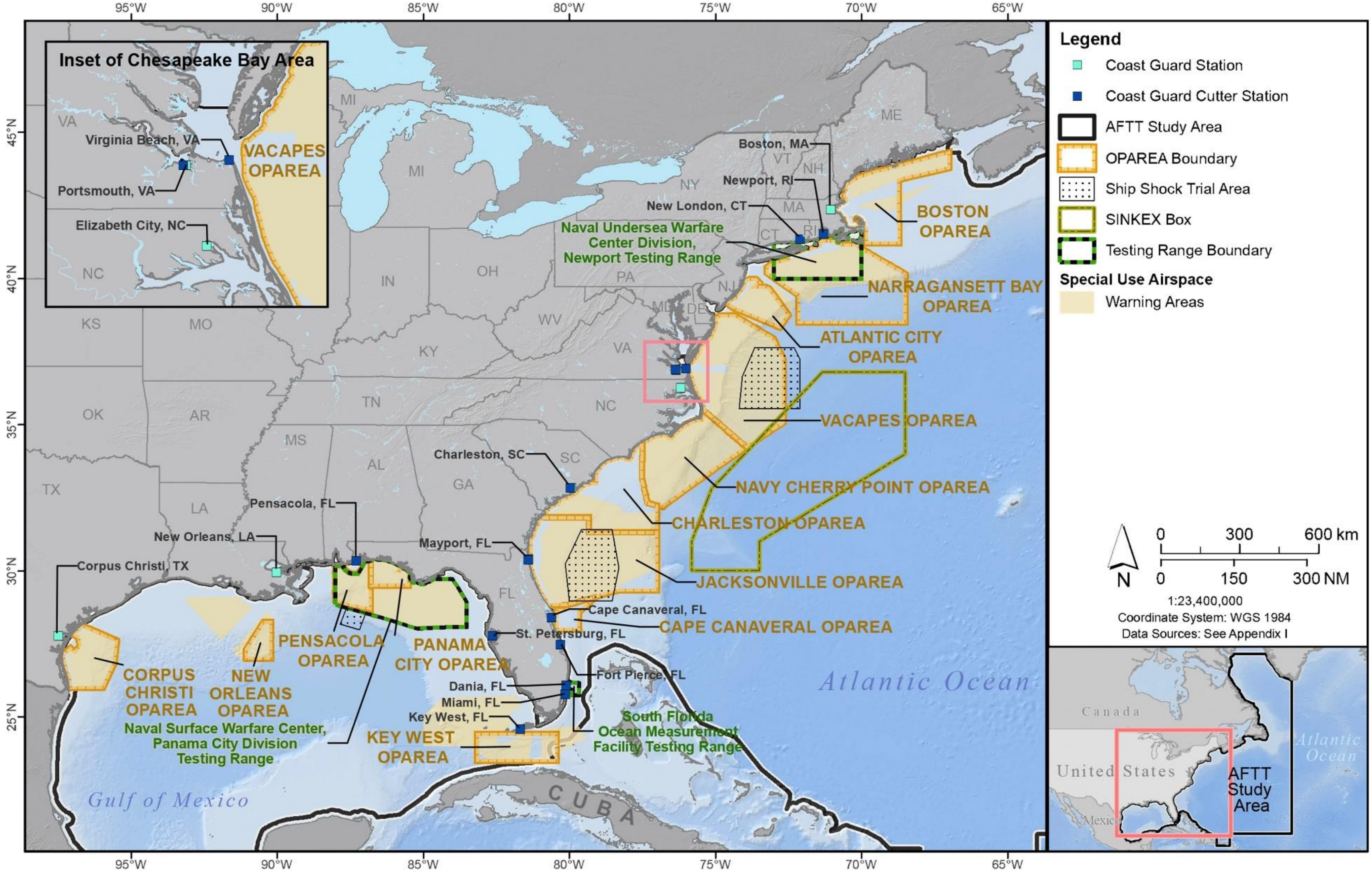
Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area; SINKEX = Sinking Exercise

Figure 2.1-3: Atlantic Fleet Training and Testing Study Area – Gulf of Mexico Region



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

Figure 2.1-4: Atlantic Fleet Training and Testing Study Area – Inshore Locations



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

Figure 2.1-5: Representative U.S. Coast Guard Stations in the Study Area

3 SPECIES AND NUMBERS OF MARINE MAMMALS

Forty-eight marine mammal species are known to occur in the Study Area, 45 of which are managed by NMFS. Extralimital marine mammal species to the Study Area, such as the bowhead whale, narwhal, beluga whale, ringed seal, and bearded seal are not part of the analysis of potential impacts because they would not be exposed to stressors from the Proposed Action.

3.1 MARINE MAMMALS MANAGED BY NMFS WITHIN THE AFTT STUDY AREA

The species managed by National Marine Fisheries Service (NMFS) within the AFTT Study Area covered under this request are presented in Table 3.1-1 along with their stock information, population status, abundance estimates, associated coefficient of variation value, minimum population estimate, and the range complexes, inshore waters, and port and pierside areas where each species may occur. Relevant information on their status and management, habitat and range, and population and abundance is presented in Section 4, Affected Species Status and Distribution, incorporating the best available science. For more detailed descriptions of marine mammal species and associated stocks, please refer to the information provided in the most recent U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment Reports (Hayes et al., 2021).

Table 3.1-1: Marine Mammal Occurrence within the Study Area

Species	*Scientific Name[1]*	*Stock[2]*	*Population Status[3]*	*Stock Abundance[4] Best (CV)/Min. Population Estimate*	*Occurrence in the Study Area*		
					Range Complex	*Associated Inshore Waters*	*Port and Pierside*
Order Cetacea							
Suborder Mysticeti (baleen whales)							
Family Balaenidae (right whales and bowhead whales)							
North Atlantic right whale	*Eubalaena glacialis*	Western North Atlantic	Endangered, strategic, depleted	338 (325–350) / 332[5]	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC (extralimital), NSWC Panama City Division Testing Range (extralimital), GOMEX RC (extralimital), SINKEX Box, Other AFTT Areas	Northeast RC Inshore, Jacksonville RC Inshore	Civilian Ports Boston, MA, Earle, NJ, Delaware Bay, DE, Hampton Roads, VA Morehead City, NC, Wilmington, NC, Kings Bay, GA, Savannah, GA, Mayport, FL, Port Canaveral, FL (extralimital) Coast Guard Stations Boston, MA, Virginia Beach, VA Charleston, SC, Mayport, FL, Cape Canaveral, FL (extralimital)

[1] Taxonomy follows Committee on Taxonomy (2016) and Perrin et al. (2009a).
[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).

Table 3.1-1: Marine Mammal Occurrence within 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 Balaenopteridae (rorquals)							
Blue whale	*Balaenoptera musculus*	Western North Atlantic (Gulf of St. Lawrence)	Endangered, depleted, strategic stock	Unknown / 402; 39 (.64)[6]	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SINKEX Box, Other AFTT Areas	–	–
Bryde's whale	*Balaenoptera edeni*	Atlantic (only expected outside of U.S. EEZ)	–	Unknown	Other AFTT Areas	–	–
Fin whale	*Balaenoptera physalus*	West Greenland	Endangered, depleted	4,468 (1,343–14,871)[7]	Other AFTT Areas	–	–
		Gulf of St. Lawrence	Endangered, depleted	328 (306–350)[8]	Other AFTT Areas	–	–
Fin whale	*Balaenoptera physalus*	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), SINKEX Box, Other AFTT Areas	–	–

[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 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).

Table 3.1-1: Marine Mammal Occurrence within the Study Area (continued)

Species	*Scientific Name[1]*	*Stock[2]*	*Population Status[3]*	*Stock Abundance[4] Best (CV)/Min. Population Estimate*	*Occurrence in the Study Area*		
					Range Complex	*Associated Inshore Waters*	*Port and Pierside*
Humpback whale	*Megaptera novaeangliae*	Gulf of Maine	–	1,396 (0) / 1,380	Northeast RC, NUWC Division, Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Panama City Division Testing Range, GOMEX RC, SINKEX Box, Other AFTT Areas	Northeast RC Inshore, VACAPES Inshore, Jacksonville RC Inshore	Civilian Ports Boston, MA, Earle, NJ, Delaware Bay, DE, Hampton Roads, VA, Morehead City, NC, Wilmington, NC Coast Guard Stations Boston, MA, Newport, RI, Virginia Beach, VA, Charleston, SC, Mayport, FL, Cape Canaveral, FL, Fort Pierce, FL, Dania, FL, Miami, FL, Key West, FL, St. Petersburg, FL, Pensacola, FL, New Orleans, LA, Corpus Christi, TX

Table 3.1-1: Marine Mammal Occurrence within 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	*Balaenoptera acutorostrata*	Canadian East Coast	–	21,968 (0.31) / 17,002	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Panama City Division Testing Range, GOMEX RC, SINKEX Box, Other AFTT Areas	Northeast RC Inshore, VACAPES Inshore, Jacksonville RC Inshore	Civilian Ports Boston, MA, Earle, NJ, Delaware Bay, D, Hampton Roads, VA, Morehead City, NC, Wilmington, NC, Kings Bay, GA, Savannah, GA Coast Guard Stations Boston, MA, Newport, RI, Virginia Beach, VA, Charleston, SC, Mayport, FL, Cape Canaveral, FL, Fort Pierce, FL, Dania, FL, Miami, FL, Key West, FL, St. Petersburg, FL, Pensacola, FL, New Orleans, LA, Corpus Christi, TX
		West Greenland	–	16,609 (7,172–38,461) / NA[9]	Other AFTT Areas	–	Civilian Ports Boston, MA, Earle, NJ, Delaware Bay, DE, Hampton Roads, VA, Morehead City, NC, Wilmington, NC

[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).

Table 3.1-1: Marine Mammal Occurrence within 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
Rice's whale	*Balaenoptera ricei*	Northern Gulf of Mexico	Endangered, depleted, strategic stock	51 (.05) / 34	GOMEX RC Key West RC NSWC Panama City Testing Range	Gulf of Mexico RC Inshore	Civilian Ports Tampa, FL, Beaumont, TX, Corpus Christi, TX
Sei whale	*Balaenoptera borealis*	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, SINKEX Box, Other AFTT Areas	–	–
		Labrador Sea	Endangered, depleted	Unknown[10]	Other AFTT Areas	–	–
Suborder Odontoceti (toothed whales)							
Family Physeteridae (sperm whale)							
Sperm whale	*Physeter macrocephalus*	North Atlantic	Endangered, depleted, strategic stock	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 NSWC Panama City Testing Range	–	–
		Puerto Rico and U.S. Virgin Islands	Endangered, depleted, strategic stock	Unknown	Other AFTT Areas	–	–

[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).

Table 3.1-1: Marine Mammal Occurrence within 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 Kogiidae (sperm whales)							
Pygmy and dwarf sperm whales	*Kogia breviceps and Kogia sima*	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 Panama City Division Testing Range, GOMEX RC, Other AFTT Areas	–	–
	Kogia breviceps and Kogia sima	Gulf of Mexico	–	336 (0.35) / 253	GOMEX RC	–	–
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	–	–
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	–	–

[11] Estimate includes undifferentiated *Mesoplodon* species.

Table 3.1-1: Marine Mammal Occurrence within 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*
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 Panama City Division Testing Range, GOMEX RC, Other AFTT Areas	–	–

[12] Estimate includes Gervais' and Blainville's beaked whales.

Table 3.1-1: Marine Mammal Occurrence within the Study Area (continued)

Species	*Scientific Name*[1]	*Stock*[2]	*Population Status*[3]	*Stock Abundance*[4] *Best (CV)/Min. Population Estimate*	*Occurrence in the Study Area*		
					Range Complex	*Associated Inshore Waters*	*Port and Pierside*
Atlantic 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	–	Civilian Ports Boston, MA Coast Guard Stations 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 Panama City Division Testing Range, GOMEX RC, Other AFTT Areas	–	–
		Gulf of Mexico	Strategic	513 (1.3) / 250	GOMEX RC, Other AFTT Areas	–	–
Common bottlenose dolphin	*Tursiops truncatus*	Western North Atlantic, Offshore	–	62,851 (0.23) / 51,914[13]	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Other AFTT Areas	–	–

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

Table 3.1-1: Marine Mammal Occurrence within the Study Area (continued)

Species	*Scientific Name*[1]	*Stock*[2]	*Population Status*[3]	*Stock Abundance*[4] *Best (CV)/Min. Population Estimate*	*Occurrence in the Study Area*		
					Range Complex	*Associated Inshore Waters*	*Port and Pierside*
Common bottlenose dolphin (continued)	*Tursiops truncatus*	Western North Atlantic Northern 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	VACAPES RC Inshore	Civilian Ports Earle, NJ, Delaware Bay, DE, Hampton Roads, VA, Morehead City, NC Coast Guard Stations Virginia Beach, VA
		Western North Atlantic Southern Migratory Coastal	Depleted, strategic stock	3,751 (0.06) / 2,353	Navy Cherry Point RC, JAX RC, Key West RC, Other AFTT Areas	JAX RC Inshore	Civilian Ports Hampton Roads, VA, Morehead City, NC, Wilmington, NC, Kings Bay, GA, Savannah, GA Coast Guard Stations Virginia Beach, VA
		Western North Atlantic South Carolina / Georgia Coastal	Depleted, strategic stock	6,027 (0.34) / 4,569	Other AFTT Areas	JAX RC Inshore	Civilian Ports Kings Bay, GA, Savannah, GA
		Northern North Carolina Estuarine System	Strategic	823 (0.06) / 782	Other AFTT Areas	–	Civilian Ports Morehead City, NC, Wilmington, NC
		Southern North Carolina Estuarine System	Strategic	Unknown	Other AFTT Areas	–	Civilian Ports Morehead City, NC, Wilmington, NC

Table 3.1-1: Marine Mammal Occurrence within the Study Area (continued)

Species	*Scientific Name*[1]	*Stock*[2]	*Population Status*[3]	*Stock Abundance*[4] *Best (CV)/Min. Population Estimate*	*Occurrence in the Study Area*		
					Range Complex	*Associated Inshore Waters*	*Port and Pierside*
Common bottlenose dolphin (continued)	*Tursiops truncatus*	Northern South Carolina Estuarine System	Strategic	453 (0.28) / 359	Other AFTT Areas	JAX RC Inshore	–
		Charleston Estuarine System	Strategic	Unknown	Other AFTT Areas	JAX RC Inshore	–
		Northern Georgia /Southern South Carolina Estuarine System	Strategic	Unknown	Other AFTT Areas	JAX RC Inshore	–
		Central Georgia Estuarine System	Strategic	Unknown	Other AFTT Areas	–	–
		Southern Georgia Estuarine System	Strategic	Unknown	Other AFTT Areas	JAX RC Inshore	Civilian Ports Kings Bay, GA, Savannah, GA
		Western North Atlantic, Northern Florida Coastal	Depleted, strategic stock	877 (0.49) / 595	Other AFTT Areas	JAX RC Inshore	Civilian Ports Kings Bay, GA, Savannah, GA
		Jacksonville Estuarine System	Strategic	Unknown	JAX RC	JAX RC Inshore	Civilian Ports Kings Bay, GA, Savannah, GA
		Western North Atlantic, Central Florida Coastal	Depleted, strategic stock	1.218 (0.35) / 913	JAX RC	JAX RC Inshore	Civilian Ports Port Canaveral, FL
		Indian River Lagoon Estuarine System	Strategic	1,032 (0.03) / 1,004	Other AFTT Areas	JAX RC Inshore	Civilian Ports Port Canaveral, FL
		Biscayne Bay	Strategic	Unknown	Other AFTT Areas	–	–

Table 3.1-1: Marine Mammal Occurrence within the Study Area (continued)

Species	Scientific Name[1]	Stock[2]	Population Status[3]	Stock Abundance[4] Best (CV)/Min. Population Estimate	Occurrence in the Study Area		
					Range Complex	Associated Inshore Waters	Port and Pierside
Common bottlenose dolphin (continued)	*Tursiops truncatus*	Florida 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	GOMEX RC Inshore	–
		Gulf of Mexico Northern Coastal	–	11,543 (0.19) / 9,881	GOMEX RC	GOMEX RC Inshore	–
		Gulf of Mexico Western Coastal	–	20,759 (0.13) / 18,585	GOMEX RC	GOMEX RC Inshore	Civilian Ports Beaumont, TX, Corpus Christi, TX, Pascagoula, MS Coast Guard Stations 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	–	Civilian Ports Corpus Christi, TX

Table 3.1-1: Marine Mammal Occurrence within the Study Area (continued)

Species	*Scientific Name*[1]	*Stock*[2]	*Population Status*[3]	*Stock Abundance*[4] *Best (CV)/Min. Population Estimate*	*Occurrence in the Study Area*		
					Range Complex	*Associated Inshore Waters*	*Port and Pierside*
Common bottlenose dolphin (continued)	*Tursiops truncatus*	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	GOMEX 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	GOMEX Inshore	–
		Terrebonne Timbalier Bay Estuarine System	–	3,870 (0.15) / 3,426	GOMEX RC	–	–

Table 3.1-1: Marine Mammal Occurrence within the Study Area (continued)

Species	*Scientific Name[1]*	*Stock[2]*	*Population Status[3]*	*Stock Abundance[4] Best (CV)/Min. Population Estimate*	*Occurrence in the Study Area*		
					Range Complex	*Associated Inshore Waters*	*Port and Pierside*
Common bottlenose dolphin (continued)	*Tursiops truncatus*	St. Andrew Bay	–	199 (0.09) / 185	GOMEX RC	GOMEX 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	GOMEX 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	–	–

Table 3.1-1: Marine Mammal Occurrence within the Study Area (continued)

Species	*Scientific Name*[1]	*Stock*[2]	*Population Status*[3]	*Stock Abundance*[4] *Best (CV)/Min. Population Estimate*	*Occurrence in the Study Area*		
					Range Complex	*Associated Inshore Waters*	*Port and Pierside*
Common bottlenose dolphin (continued)	*Tursiops truncatus*	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	–	–

Table 3.1-1: Marine Mammal Occurrence within 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
False killer whale	*Pseudorca crassidens*	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 Panama City Division Testing Range, GOMEX RC, Other AFTT Areas	–	–
		Gulf of Mexico	–	494 (0.79) / 276	GOMEX RC, Other AFTT Areas	–	–
Fraser's dolphin	*Lagenodelphis hosei*	Western North Atlantic	–	Unknown	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Panama City Division Testing Range, GOMEX RC, Other AFTT Areas	–	–
		Northern Gulf of Mexico	–	213 (1.03) / 104	GOMEX RC	–	–

Table 3.1-1: Marine Mammal Occurrence within 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*
Killer whale	*Orcinus orca*	Western North Atlantic	–	Unknown	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Panama City Division Testing Range, GOMEX RC, Other AFTT Areas	–	–
		Gulf of Mexico	–	267 (0.75) / 152	GOMEX RC	–	–
Long-finned pilot whale	*Globicephala melas*	Western North Atlantic	–	39,215 (0.30) / 30,627	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Panama City Division Testing Range, GOMEX RC, Other AFTT Areas	–	–
Melon-headed whale	*Peponocephala electra*	Western North Atlantic	–	Unknown	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Panama City Division Testing Range, GOMEX RC, Other AFTT Areas	–	–
		Northern Gulf of Mexico	–	1,749 (0.68) / 1,039	GOMEX RC	–	–

Table 3.1-1: Marine Mammal Occurrence within 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
Pantropical spotted dolphin	*Stenella attenuata*	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 Panama City Division Testing Range, GOMEX RC, Other AFTT Areas	–	–
		Northern Gulf of Mexico	–	37,195 (0.24) / 30,377	GOMEX RC	–	–
Pygmy killer whale	*Feresa attenuata*	Western North Atlantic	–	Unknown	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Panama City Division Testing Range, GOMEX RC, Other AFTT Areas	–	–
		Northern Gulf of Mexico	–	613 (1.15) / 283	GOMEX RC	–	–
Risso's dolphin	*Grampus griseus*	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 Panama City Division Testing Range, GOMEX RC, Other AFTT Areas	–	–
		Northern Gulf of Mexico	–	1,974 (0.46) / 1,368	GOMEX RC	–	–

Table 3.1-1: Marine Mammal Occurrence within 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	*Steno bredanensis*	Western North Atlantic	–	136 (1.0) / 67	Navy Cherry Point RC, JAX RC, SFOMF, Key West RC, NSWC Panama City Division Testing Range, GOMEX RC, Other AFTT Areas	–	–
		Northern Gulf of Mexico	–	Unknown	GOMEX RC	–	–
Short-finned pilot whale	*Globicephala macrorhynchus*	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 Panama City Division 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	–	–

Table 3.1-1: Marine Mammal Occurrence within 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
Spinner dolphin	*Stenella longirostris*	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 Panama City Division 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	*Stenella coeruleoalba*	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 Panama City Division Testing Range, GOMEX RC, Other AFTT Areas	–	–
		Northern Gulf of Mexico	Strategic	1,817 (0.56) / 1,172	GOMEX RC	–	–
Short-beaked common dolphin	*Delphinus delphis*	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 Panama City Division Testing Range, GOMEX RC, Other AFTT Areas	–	–

Table 3.1-1: Marine Mammal Occurrence within 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*
White-beaked dolphin	*Lagenorhynchus albirostris*	Western North Atlantic	–	536,016 (0.31) / 415,344	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC	–	–
Family Phocoenidae (porpoises)							
Harbor porpoise	*Phocoena phocoena*	Gulf of St. Lawrence[14]	–	Unknown[14]	Other AFTT Areas	–	–
		Newfoundland[15]	–	Unknown[15]	Other AFTT Areas	–	–
		Greenland[16]	–	Unknown[16]	Other AFTT Areas	–	–
		Gulf of Maine/ Bay of Fundy	–	95,542 (0.31) / 74,034	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC	Northeast RC Inshore, VACAPES RC Inshore, JAX RC Inshore	Civilian Ports Boston, MA, Earle, NJ Delaware Bay, DE, Hampton Roads, VA Coast Guard Stations 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 3.1-1: Marine Mammal Occurrence within 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	*Halichoerus grypus atlantica*	Western North Atlantic	–	27,300 (0.22) / 22,785	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC	Northeast RC Inshore, VACAPES RC Inshore, JAX RC Inshore	Civilian Ports Boston, MA, Earle, NJ, Delaware Bay, DE, Hampton Roads, VA Morehead City, NC Coast Guard Stations Boston, MA, Virginia Beach, VA
Harbor seal	*Phoca vitulina*	Western North Atlantic	–	61,336 (0.08) / 57,637	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC	Northeast RC Inshore, VACAPES RC Inshore, JAX RC Inshore	Civilian Ports Boston, MA, Earle, NJ Delaware Bay, DE, Hampton Roads, VA, Morehead City, NC Coast Guard Stations Boston, MA, Virginia Beach, VA
Harp seal	*Pagophilus groenlandicus*	Western North Atlantic	–	7.6M (0.12) / 7.1M	Northeast RC, NUWC Division Newport Testing Range, VACAPES RC, Navy Cherry Point RC	–	–
Hooded seal	*Cystophora cristata*	Western North Atlantic	–	Unknown	Northeast RC, NUWC Division Newport Testing Range	–	Civilian Ports Boston, MA

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 = Naval Surface Warfare Center, Carderock Division, South Florida Ocean Measurement Facility Testing Range; U.S. = United States; USFWS = U.S. Fish and Wildlife Service; VACAPES = Virginia Capes

4 AFFECTED SPECIES STATUS AND DISTRIBUTION

Four main types of marine mammals are generally recognized: cetaceans (whales, dolphins, and porpoises), pinnipeds (seals, sea lions, and walruses), sirenians (manatees, dugongs, and sea cows), and other marine carnivores (sea otters and polar bears) (Jefferson et al., 2008; Rice, 1998). The order Cetacea is divided into two suborders – Odontoceti and Mysticeti. The toothed whales, dolphins, and porpoises (suborder Odontoceti) range in size from slightly longer than 3.3 ft. (1 m) to more than 60 ft. (18 m) and have teeth, which they use to capture and consume individual prey. The baleen whales (suborder Mysticeti) are universally large (more than 15 ft. [5 m] as adults). They are called baleen whales because, instead of teeth, they have fibrous structures made of keratin, a type of protein like that found in human fingernails, in their mouths which enables them to filter or extract food from the water for feeding. They are batch feeders that use this baleen instead of teeth to engulf, suck, or skim large numbers of prey, such as small schooling fish, shrimp, or microscopic sea animals (i.e. plankton) from the water or out of ocean floor sediments (Heithaus & Dill, 2008). The baleen whales are further divided into two families – right whales and rorquals. Rorquals have a series of longitudinal folds of skin, often referred to as throat grooves, running from below the mouth back towards the navel. Rorquals are slender and streamlined in shape, compared with their relatives the right whales, and most have narrow, elongated flippers. Detailed reviews of the different groups of cetaceans can be found in Perrin et al. (2009b). Most pinnipeds can be divided into two families: phocids (true seals) and the otariids (fur seals and sea lions). Species managed by the U.S. Fish and Wildlife Service, including the walrus, West Indian manatee, and polar bear, are not discussed in this document.

Marine mammals in the Study Area occur from coastal and inland waters to the open pelagic Atlantic Ocean and Gulf of Mexico. For most cetaceans, prey distribution, abundance, and quality largely determine where they occur at any specific time (Heithaus & Dill, 2008). Most of the baleen whales are migratory, but many of the toothed whales do not migrate in the strictest sense. Instead, they undergo seasonal dispersal or shifts in density. Pinnipeds occur mostly in coastal habitats or within those regions over the continental shelf because they require land or shallow coastal waters for reproducing and resting.

4.1 CETACEANS

4.1.1 MYSTICETES

4.1.1.1 North Atlantic Right Whale (*Eubalaena glacialis*)

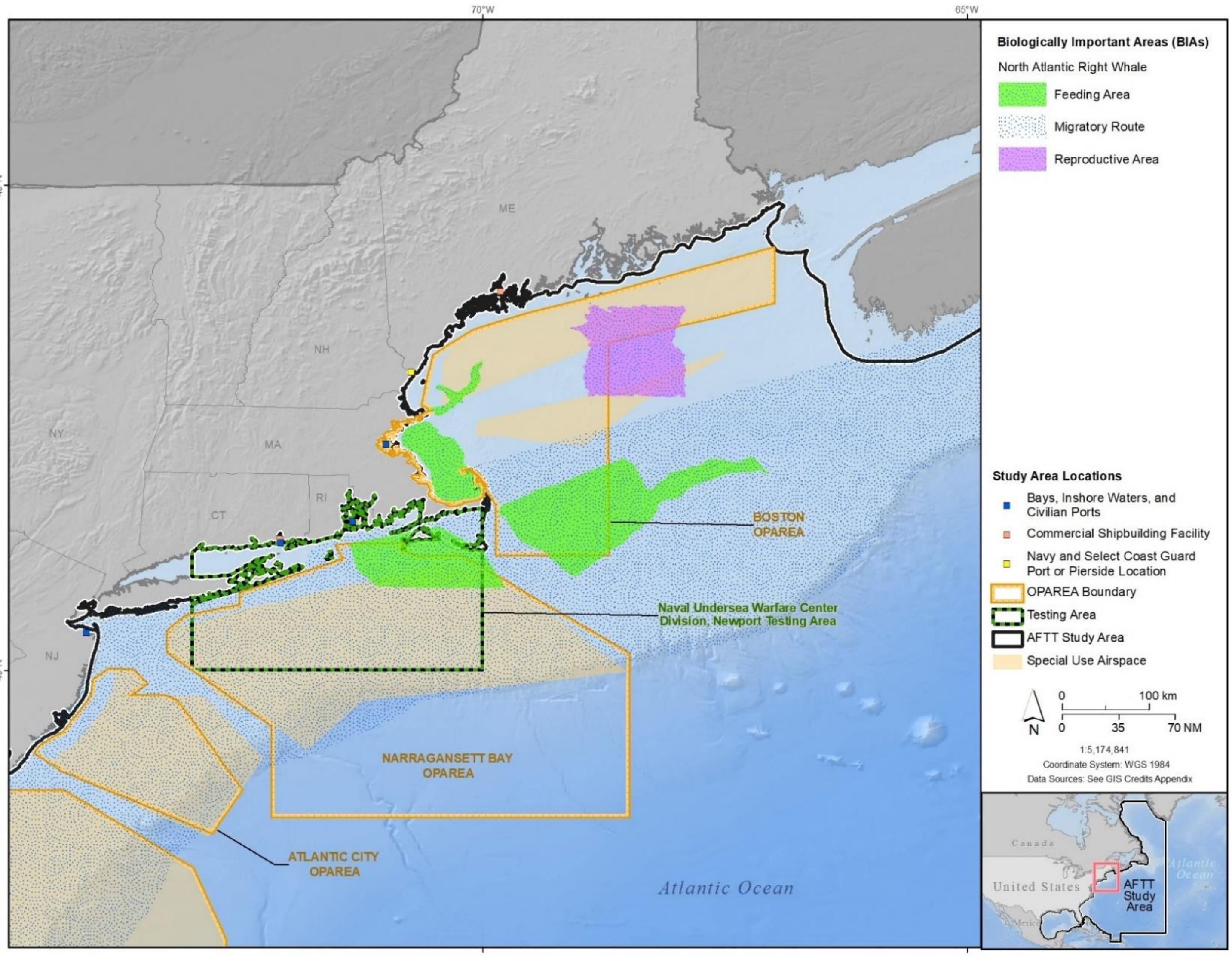
4.1.1.1.1 Status and Management

The North Atlantic right whale is considered one of the most critically endangered populations of marine mammals in the world (Clapham et al., 1999; National Marine Fisheries Service, 2017). The size of this stock is considered extremely low relative to the Optimum Sustainable Population in the U.S. Atlantic Exclusive Economic Zone (EEZ), and this species is listed as endangered under the ESA. A recovery plan for the North Atlantic right whale is in effect (National Marine Fisheries Service, 2005). The North Atlantic right whale has been protected from commercial whaling since 1949 by the International Convention for the Regulation of Whaling (62 Stat. 1716; 161 United Nations Treaty Series 72), to which the U.S. has been a party since its inception under the Whaling Convention Act (16 U.S.C. § 916 - 916l). An ESA status review by the National Marine Fisheries Service in 2017 concluded that the western North Atlantic stock remains endangered and has been declining since 2011 (Pace III et al., 2017). Relative to populations of southern right whales, there are also concerns about growth rate, percentage of reproductive females, and calving intervals in the North Atlantic right whale population. The total level of human-caused mortality and serious injury is unknown, but average annual detected (i.e., observed) human-caused mortality from 2014 through 2018 was 8.15 (Hayes et al., 2021; Henry et al., 2021). Any mortality or serious injury to individuals within this stock should be considered significant. This is a strategic stock because the average annual human-related mortality and serious injury rates exceed potential biological removal and because the North Atlantic right whale is an endangered species.

4.1.1.1.2 Habitat and Geographic Range

The western North Atlantic right whale population ranges primarily from calving grounds in coastal waters of the southeastern U.S. to summer feeding grounds in the Great South Channel, Jordan Basin, Georges Bank along its northeastern edge, Cape Cod and Massachusetts Bays, the Bay of Fundy, and the Roseway Basin on the Scotian Shelf. However, recent acoustic data suggests broad-scale use of the U.S. eastern seaboard during much of the year (Davis et al., 2017). Movements within and between habitats are extensive. Telemetry data show lengthy and somewhat distant excursions, including into deep water off the continental shelf (Baumgartner & Mate, 2005; Mate et al., 1997).

LaBrecque et al. (2015a) identified three seasonal right whale feeding areas located in or near the Study Area (Figure 4.1-1) based on vessel and aerial survey efforts: (1) February to April in Cape Cod Bay and Massachusetts Bay, (2) April to June in the Great South Channel and on the northern edge of Georges Bank, and (3) June to July and October to December on Jeffreys Ledge in the western Gulf of Maine. A potential mating area was identified in the central Gulf of Maine (from November through January) based on a demographic study of North Atlantic right whale habitats, and the migratory corridor area along the U.S. east coast between the southern calving grounds and northern feeding areas. The migratory corridor was substantiated through vessel- and aerial-based survey data, photo-identification data, radio-tracking data, and expert judgment. Reproductive female North Atlantic right whales generally migrate south to calving grounds in November and December and migrate north to the feeding areas in March and April.

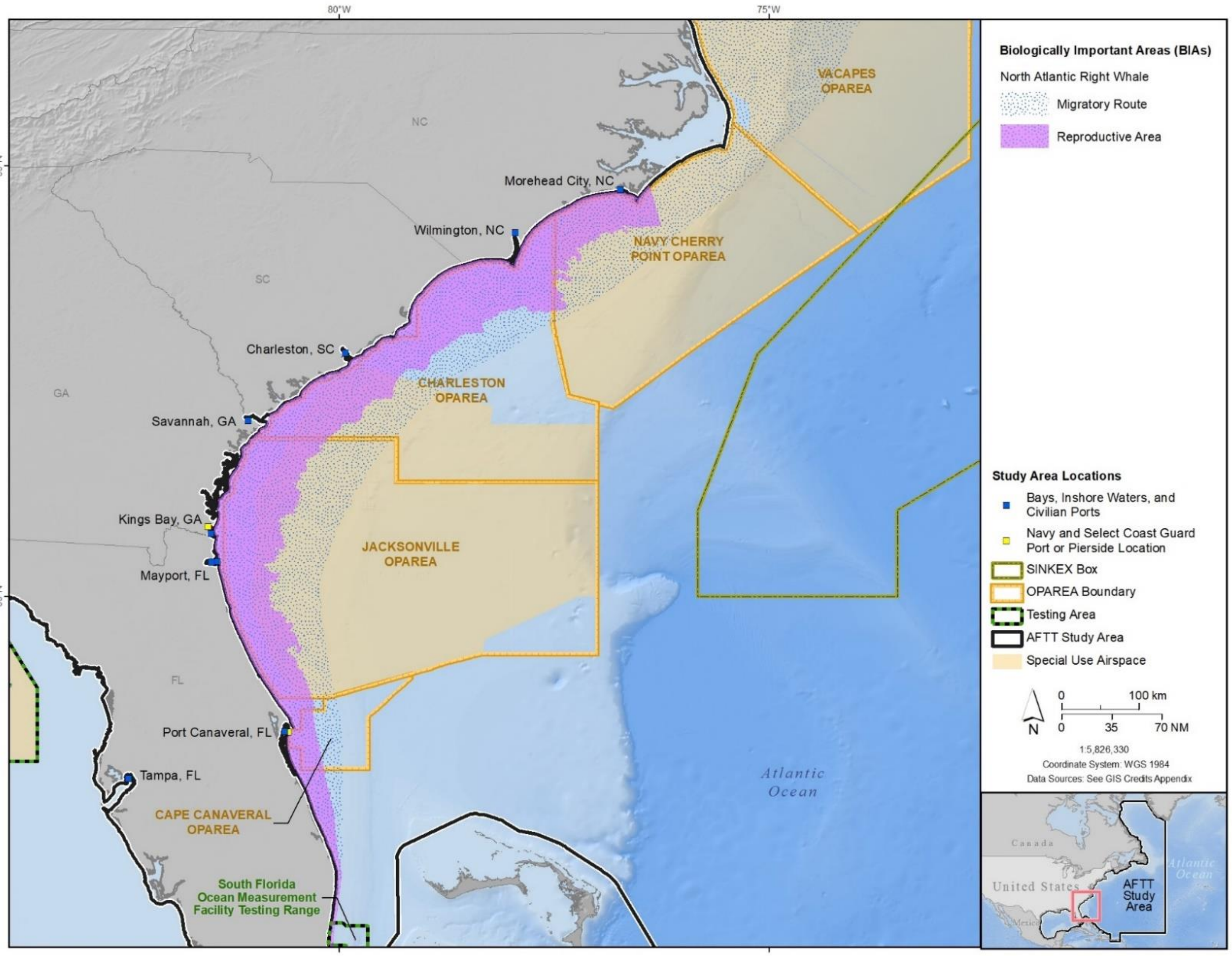


Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area; VACAPES = Virginia Capes

Figure 4.1-1: Biologically Important Areas for North Atlantic Right Whales in the Study Area – Northeast

An important shift in habitat use patterns in 2010 was highlighted in an analysis of right whale acoustic presence along the U.S. Eastern seaboard from 2004 to 2014 (Davis et al., 2017). This shift was also reflected in visual survey data in the greater Gulf of Maine region. Between 2012 and 2016, visual surveys detected fewer individuals in the Great South Channel and the Bay of Fundy (Davies et al., 2019) (Davies et al., 2019), while the number of individuals using Cape Cod Bay in spring (Mayo et al., 2018). In addition, right whales abandoned the Jordan Basin in the central Gulf of Maine in (Cole et al., 2013) but have since been seen in large numbers in a region south of Martha's Vineyard and Nantucket Islands (Leiter et al., 2017), an area outside of the 2016 Northeastern U.S. Foraging Area Critical Habitat. Since 2013, increased detections and survey effort in the Gulf of St. Lawrence indicate right whale presence in late spring through early fall (Cole, 2016; Khan et al., 2016; Khan et al., 2018; Simard et al., 2019). Aerial surveys of the Gulf of St. Lawrence between 2015 and 2019 showed that 40 percent of the population now utilizes this habitat area with potential residencies up to 5 months (Crowe et al., 2021).

The winter range for North Atlantic right whales includes the Southeast U.S. Continental Shelf Large Marine Ecosystem. LaBrecque et al. (2015a) used habitat analyses of sea surface temperature, water depth, and aerial sighting data to delineate a calving area in the southeast Atlantic, extending from Cape Lookout, North Carolina, to Cape Canaveral, Florida, that overlaps with the Study Area (Figure 4.1-2). This area, identified as biologically important, encompasses waters from the shoreline to the 25-m isobath from mid-November through late April. Passive acoustic monitoring conducted offshore of Cape Hatteras and in Onslow Bay, North Carolina, in 2011 and 2007, respectively, confirmed winter occurrence of North Atlantic right whales in these areas (McLellan et al., 2014).



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

Figure 4.1-2: Biologically Important Areas for North Atlantic Right Whales in the Study Area – Southeast

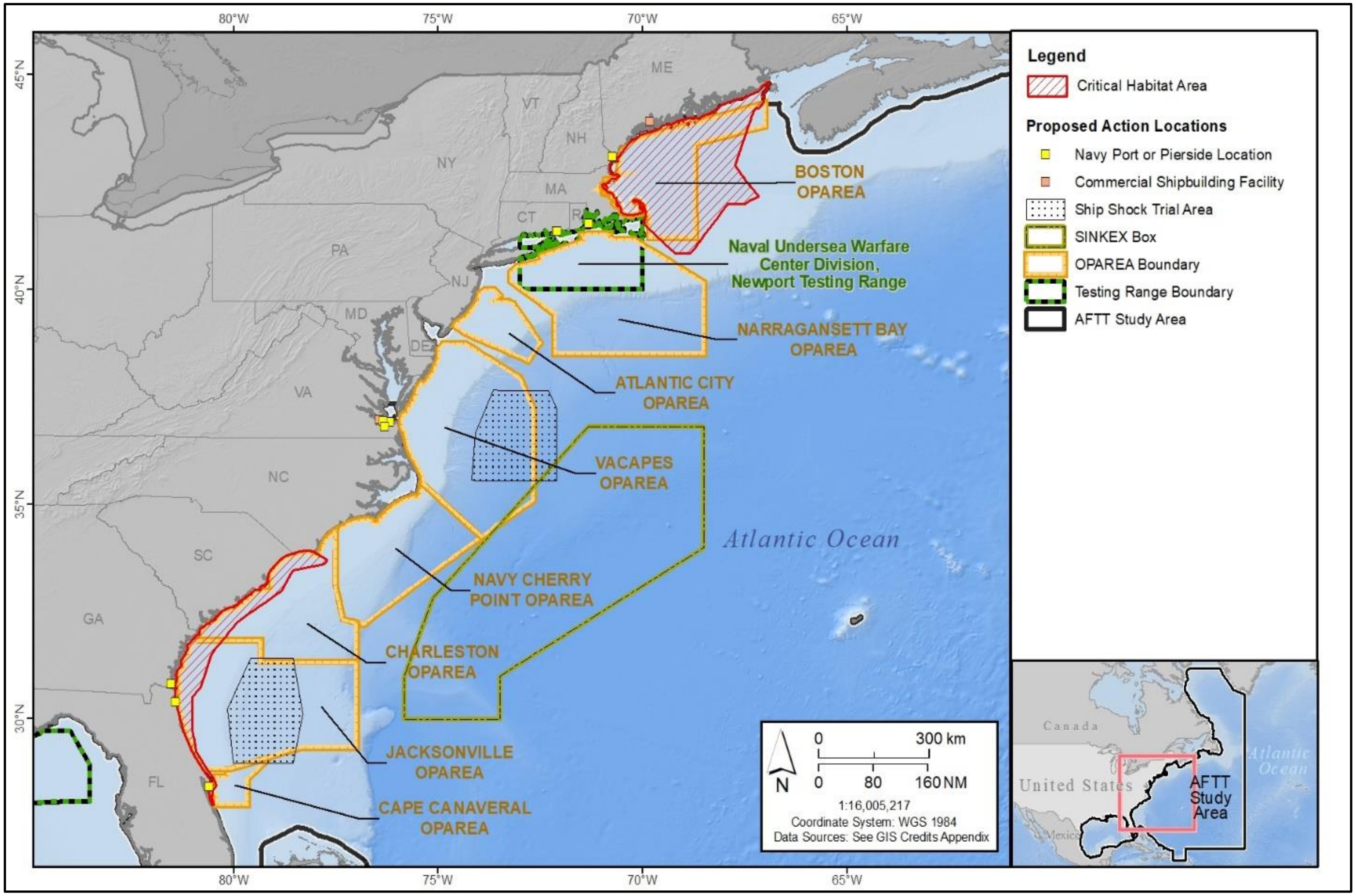
Four right whale sightings were documented during monthly aerial surveys approximately 50 miles (80 km) offshore of Jacksonville, Florida, from 2009 to May 2016, including a female that was observed giving birth in 2010 (Foley et al., 2011). These sightings occurred well outside existing ESA-designated critical habitat (Foley et al., 2011; U.S. Department of the Navy, 2011). While sightings have generally occurred within nearshore continental shelf waters off northeastern Florida and southeastern Georgia, detections of North Atlantic right whales were recorded in deeper waters during these monitoring efforts (Davis & Murphy, 2015; Kumar et al., 2013; Norris et al., 2012), suggesting that distribution of this species extends further offshore than sighting data previously indicated (Oswald et al., 2016). A noteworthy number of right whales (36 unique individuals, or approximately 10% of the estimated population at the time) were seen mid-shelf and offshore of Virginia during the 2022-2023 winter months and were sighted in the same areas on multiple days of survey effort (Aschettino et al. 2024), indicating that the whales are not simply migrating through the area. Recent studies have indicated that migration in North Atlantic right whales is "condition-dependent partial migration", where full migration to the breeding grounds can be skipped if tradeoffs such as reproductive costs or foraging opportunities are present for an individual whale (Gowan et al. 2019). Habitat shifts such as ocean warming are influencing right whale movement overall (Meyer-Gutbrod et al. 2021).

Right whales have occasionally been recorded in the Gulf of Mexico Large Marine Ecosystem (Moore & Clark, 1963; Ward-Geiger et al., 2011), but their occurrence there is likely extralimital. The few published records from the Gulf of Mexico represent either distributional anomalies, normal wanderings of occasional animals, or a more extensive historical range beyond the currently known calving and wintering ground in the waters of the southeastern U.S (Moore & Clark, 1963; Ward-Geiger et al., 2011).

Two critical habitats (Figure 4.1-3) are designated by NMFS for North Atlantic right whales to encompass physical oceanographic and biological features essential to conservation of the species (81 *Federal Register* 4838). The northern foraging unit includes the Gulf of Maine and Georges Bank region where oceanographic and bathymetric conditions favor the distribution and aggregation of *Calanus finmarchicus*, a fundamental prey source. The southern calving unit includes the coast of North Carolina, South Carolina, Georgia, and Florida. The essential features for this unit include calm sea surface conditions, a sea surface temperature range between 7 to 17 degrees Celsius, and depths of 6 to 28 meters (81 *Federal Register 4838*). These two ESA-designated critical habitats were designated in January 2016 to replace three smaller previously designated critical habitats (Cape Cod Bay/Massachusetts Bay/Stellwagen Bank, Great South Channel, and the coastal waters of Georgia and Florida in the southeastern U.S.) that had been designated by NMFS in 1994 (81 *Federal Register* 4838). Two additional critical habitat areas in Canadian waters, Grand Manan Basin and Roseway Basin, were identified in Canada's final recovery strategy for the North Atlantic right whale (Brown et al., 2009).

4.1.1.1.3 Population Trends

Examination of the abundance estimates for the years 1990–2011 (see Hayes et al. (2022), Figures 2a, 2b) suggests that abundance increased at about 2.8 percent per annum from posterior median point estimates of 270 individuals in 1990 to 481 in 2011, but that there was a 100 percent chance that abundance declined from 2011 to 2019 when the final estimate was 368 individuals (Hayes et al., 2022). The overall abundance decline between 2011 and 2019 was 23.5 percent (Confidence Interval (CI)=21.4 percent to 26.0 percent) (Hayes et al., 2022). As stated in 4.1.1.1.2, there has been a considerable change in right whale habitat use patterns in areas where most of the population had been observed in previous years (Davies et al., 2019), exposing the population to new anthropogenic (Hayes et al., 2018). Pace III et al. (2021) found a significant decrease in mean survival rates since 2010, correlating with the observed change in area-use patterns. There were 17 right whale mortalities reported in 2017 (Daoust et al., 2018). This number exceeds the largest estimated mortality rate during the past 25 years. Further, despite high survey effort, only five and zero calves were detected in 2017 and 2018, respectively. In 2019, seven calves were identified (Pettis et al., 2022). Calf numbers slightly improved in 2020, 2021, and 2022 with 10, 20, and 15 calves, respectively (National Oceanic and Atmospheric Administration Fisheries, 2023).



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

Figure 4.1-3: Designated Critical Habitat for North Atlantic Right Whales in the Study Area

4.1.1.2 Blue Whale (*Balaenoptera musculus*)

4.1.1.2.1 Status and Management

Western North Atlantic blue whales are listed as endangered under the ESA and designated as a depleted and strategic stock under the MMPA. A final recovery plan was published for the blue whale in U.S. waters in November 2020 (National Marine Fisheries Service, 2020). Blue whales in the western North Atlantic are classified as a single stock (Hayes et al., 2021).

Widespread whaling over the last century is believed to have decreased the worldwide population to approximately 1 percent of its pre-whaling population size, although some authors have concluded that their pre-whaling population size was about 200,000 animals (Branch et al., 2007; Širović et al., 2004). There was a documented increase in the blue whale population size in some areas between 1979 and 1994, but there is no evidence to suggest an increase in the population since then (Barlow, 1994; Barlow & Taylor, 2001; Carretta et al., 2010).

4.1.1.2.2 Habitat and Geographic Range

The distribution of the blue whale in the western North Atlantic generally extends from the Arctic to at least mid-latitude waters. Blue whales are most frequently sighted in the waters off eastern Canada, with the majority of recent records from the Gulf of St. Lawrence. Members of the North Atlantic population spend much of their time in continental shelf waters from eastern Canada (near the Quebec north shore) to the St. Lawrence Estuary and Strait of Belle Isle. Sightings were reported along the southern coast of Newfoundland during late winter and early spring (Reeves et al., 2004). Blue whales may be found in Labrador Current, North Atlantic Gyre, and Gulf Stream open-ocean areas. Migratory movements in the western North Atlantic Ocean are largely unknown. Acoustic data indicate that blue whales winter as far north as Newfoundland and as far south as Bermuda and Florida, and they have been sighted along the mid-Atlantic ridge (Ryan et al., 2013).

The blue whale is best considered as an occasional visitor in U.S. Atlantic EEZ waters, which may represent the current southern limit of its feeding range (Cetacean and Turtle Assessment Program, 1982). Using the United States Navy's Sound Surveillance System, blue whales were detected and tracked acoustically in much of the North Atlantic, including in subtropical waters north of the West Indies and in deep water east of the U.S. Atlantic Exclusive Economic Zone, indicating the potential for long-distance movements (Clark, 1995). Most of the acoustic detections were around the Grand Banks area of Newfoundland and west of the British Isles. Historical blue whale observations collected by Reeves et al. (2004) show a broad longitudinal distribution in tropical and warm temperate latitudes during the winter months, with a narrower, more northerly distribution in summer. Blue whales tagged in the Gulf of St. Lawrence in late fall left the St. Lawrence Estuary and used habitat more than 1,000 km offshore, as well as shelf and coastal waters of the eastern United States and Canada (Lesage et al., 2016).

Although the exact extent of their southern boundary and wintering grounds are not well understood, blue whales are occasionally found in waters off the U.S. Atlantic coast (Waring et al., 2013). Yochem and Leatherwood (1985) summarized records that suggested an occurrence of this species south to Florida and the Gulf of Mexico. Blue whale stranding's have been recorded as far south as the Caribbean and the Gulf of Mexico (Waring et al., 2010). Monthly aerial surveys were conducted offshore of Cape Hatteras (2011 to 2017) and Onslow Bay (2007 to 2011), North Carolina, with no documented visual sightings of blue whales (McLellan, 2017). Engelhaupt et al. (2020) reported two sightings of blue whales off the coast of Virginia in April 2018 and February 2019, between 100 and 135 km offshore; the whale sighted in February was seen feeding with a congregation of fin whales. Acoustic monitoring has also been conducted in the same region since 2011 and resulted in the detections of blue whales on bottom-mounted high-frequency acoustic recording packages (McLellan et al., 2014; Read et al., 2014). Davis et al. (2020) documented acoustic detections of blue whales from North Carolina north to the Davis Straight region year-round between 2004 and 2014, with a shift northward in years after 2010.

Critical habitat has not been designated for this species at this time.

4.1.1.2.3 Population Trends

There are insufficient data to determine population trends for this species (Waring et al., 2010) .

4.1.1.3 Bryde's Whale (*Balaenoptera brydei/edeni*)

4.1.1.3.1 Status and Management

Bryde's whales are among the least known of the baleen whales. The species-level taxonomy remains unresolved as well as the number of species or subspecies (Alves et al., 2010; Jefferson et al., 2015; Kato & Perrin, 2009; Rosel et al., 2021). The Society for Marine Mammalogy's Committee on Taxonomy (2016) recognizes two subspecies of Bryde's whale: (1) *B. edeni* (Eden's whale) and (2) *B. brydei* (offshore Bryde's whale). In addition, a Bryde's whale's "pygmy form" known as Omura's whale (Kato & Perrin, 2009; Rice, 1998) has been described. Rosel et al. (2021) determined that Bryde's whales found in the Gulf of Mexico are in fact a distinct species, now designated Rice's whale (*Balaenoptera ricei*) (Section 4.1.1.8). The International Whaling Commission continues to use the name *Balaenoptera edeni* for all Bryde's-like whales, although at least three species are recognized.

Current genetic research confirms that gene flow among Bryde's whale populations is low and suggests that management actions treat each as a distinct entity to ensure survival of the species (Kanda et al., 2007).

4.1.1.3.2 Habitat and Geographic Range

Unlike other baleen whale species, Bryde'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). The primary range of Bryde's whales in the Atlantic is in tropical waters south of the Caribbean, outside the Study Area although may range as far north as Virginia (Kato & Perrin, 2009). Long migrations are not typical of Bryde's whales, although limited shifts in distribution toward and away from the equator in winter and summer have been observed (Best, 1996; Cummings, 1985).

4.1.1.3.3 Population Trends

A trend analysis has not been conducted for this stock.

4.1.1.4 Fin Whale (*Balaenoptera physalus*)

The fin whale is found in all of the world's oceans and is the second largest species of (Jefferson et al., 2015). Fin whales have three recognized subspecies: the North Atlantic fin whale (*Balaenoptera physalus physalus)* occurs in the North Atlantic Ocean, while the North Pacific subspecies (*B. p. velifera*) is found in the North Pacific Ocean, and the southern fin whale (*B. p. quoyi)* occurs only in the southern hemisphere (Committee on Taxonomy, 2022). Only the North Atlantic subspecies is expected to occur within the Study Area.

4.1.1.4.1 Status and Management

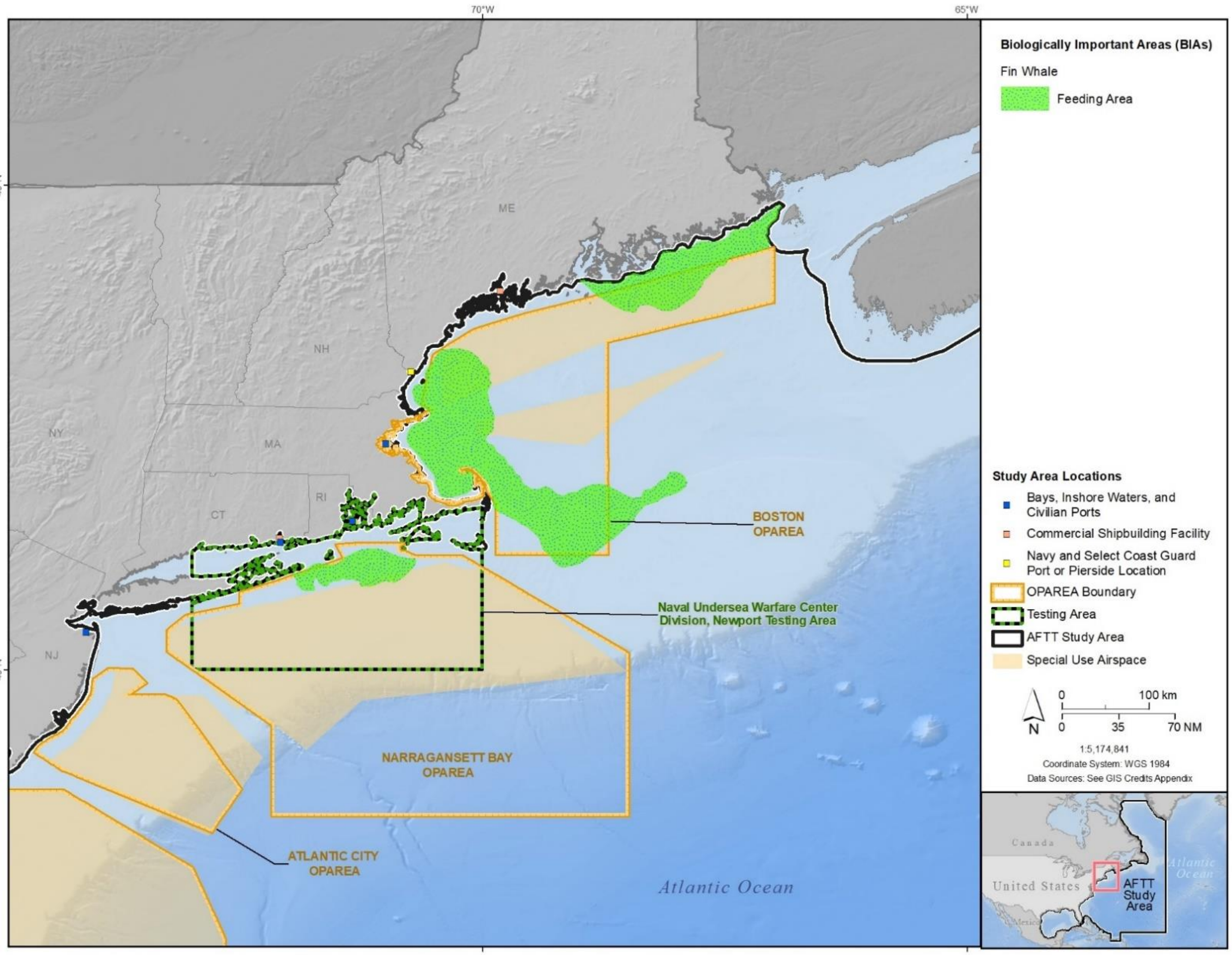
Fin whales in the Northwest Atlantic are listed as endangered under the ESA and the species is considered a depleted and strategic stock under the MMPA. A final recovery plan was published in August 2010 for fin whales in U.S. waters (75 *Federal Register* 47538). The International Whaling Commission recognizes seven management stocks of fin whales in the North Atlantic Ocean: (1) Nova Scotia, (2) Newfoundland-Labrador, (3) West Greenland, (4) East Greenland-Iceland, (5) North Norway, (6) West Norway-Faroe Islands, and (7) British Isles-Spain-Portugal. NMFS assumes management of the western North Atlantic stock, which is likely equivalent to the Nova Scotia management stock. The stock identity of North Atlantic fin whales has received relatively little attention, and whether the current stock boundaries define biologically isolated units has long been uncertain (Hayes et al., 2021). Fin whales in the Gulf of St. Lawrence may be a separate stock (Ramp et al., 2014).

4.1.1.4.2 Habitat and Geographic Range

Fin whales prefer temperate and polar waters and are rarely seen in warm tropical waters (Reeves et al., 2002). They typically congregate in areas of high productivity and spend most of their time in coastal and shelf waters but can also be found in waters to approximately 2,000 m deep (Aissi et al., 2008; Reeves et al., 2002). Fin whales are often seen closer to shore after periodic patterns of upwelling (underwater motion) and the resultant increased krill density (Azzellino et al., 2008). This species is highly adaptable, following prey, typically off the continental shelf (Azzellino et al., 2008; Panigada et al., 2008). Fin whales are likely common in Labrador Current, North Atlantic Gyre, and Gulf Stream open-ocean areas while undergoing seasonal migrations. However, some fin whales remain in higher latitudes during colder months and in lower latitudes during warmer months, indicating that seasonal fin whale movements differ from the seasonal migrations of other mysticetes, such as blue whales and humpback whales (Edwards et al., 2015). Fin whales are also common off the Atlantic coast of the U.S. seaward to the continental shelf edge (at about the 1,000-fathom contour). In the mid-Atlantic region, they tend to occur north of Cape Hatteras where they accounted for about 46 percent of the large whales observed in surveys conducted between 1978 and 1982 (National Marine Fisheries Service, 2010). Recent surveys under the Atlantic Marine Assessment Program for Protected Species have shown that fin whale density increases along the shelf break from Cape Hatteras northward during summer months and decreases during winter and spring (Palka et al., 2021). During the summer, fin whales in this region tend to congregate in feeding areas between 41°20’ north and 51°00’ north, from the shore seaward to the 1,000-fathom contour. In the western Atlantic, they winter from the edge of sea ice (near the Gulf of St. Lawrence) south to the Gulf of Mexico and the West Indies (National Marine Fisheries Service, 2010).

Fin whale sightings and acoustic detections are greatest in New England waters during spring and summer, with scattered sightings over the northeast shelf in winter, indicating that some fin whales are present during the non-feeding season (Hain et al., 1992; Morano et al., 2012; Waring et al., 2014). Fin whales are also observed in the Gulf of Maine, the Bay of Fundy, the Gulf of St. Lawrence, and in offshore areas of Nova Scotia (Coakes et al., 2005; Johnston et al., 2005). Near the Bay of Fundy, fin whales are known to congregate close to the tip of Campobello Island, where they feed within localized upwellings and fronts in the Northeast U.S. Continental Shelf Large Marine Ecosystem (Johnston et al., 2005).

New England waters are considered a major feeding ground for fin whales, and there is evidence that females continually return to this area (Waring et al., 2010). Forty-nine percent of fin whales sighted on the feeding grounds of Massachusetts Bay were sighted again within the same year, and 45 percent were sighted again in multiple years (Waring et al., 2010). LaBrecque et al. (2015b) identified three feeding areas for fin whales in the North Atlantic within the Study Area: (1) June to October in the northern Gulf of Maine, (2) year-round in the southern Gulf of Maine, and (3) March to October east of Montauk Point, as substantiated through vessel-based survey data, photo-identification data, and expert judgment (Figure 4.1-4).



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

Figure 4.1-4: Biologically Important Areas for Fin Whales in the Study Area

Results from the Navy's Sound Surveillance System (Clark, 1995) indicate a substantial deep-ocean distribution of fin whales. It is likely that fin whales occurring in the U.S. EEZ in the Atlantic Ocean undertake migrations into Canadian waters, open-ocean areas, and perhaps even subtropical or tropical regions. However, the popular notion that entire fin whale populations make distinct annual migrations like some other mysticetes has questionable support from the data. Acoustic data from the Navy's Sound Surveillance System arrays suggest that animals undertaking southward migrations in the fall generally travel south past Bermuda to the West Indies (Clark, 1995); however, a migration corridor for fin whales in the U.S. Atlantic EEZ is not known LaBrecque et al. (2015b).

Visual and acoustic surveys between 2014 and 2020 have documented fin whale presence in the mid-Atlantic region (U.S. Department of the Navy, 2021a). Biopsy samples and satellite tagging data have also been collected, including re-sights of several individuals over the continental shelf. Vessel based surveys and satellite tagging efforts in recent years have also shown fin whales frequently occur off the coast of Virginia during winter months; observations included foraging behavior as well as adult and juvenile pairs (Aschettino et al., 2024).

Fin whales have been detected frequently throughout the winter months during passive acoustic monitoring efforts conducted from 2007 through 2015 within the continental shelf break and slope waters off Onslow Bay, North Carolina (Hodge et al., 2014, 2015, 2016; U.S. Department of the Navy, 2013b). Visual surveys and passive acoustic monitoring conducted from 2007 to 2011 in Onslow Bay, North Carolina, indicate fin whale occurrence in this area between late fall and early spring (Hodge, 2011). High-frequency recording packages deployed between November 2007 and April 2010 in Onslow Bay detected 20-Hz pulses from fin whales primarily in the winter months, starting in November and continuing through mid-April, suggesting that fin whales are migrating past Onslow Bay during this time (Hodge, 2011). In the western Atlantic, limited data indicate that some fin whales winter from the edge of sea ice (near the Gulf of St. Lawrence) south to the Gulf of Mexico and the West Indies (Clark, 1995).

Critical habitat has not been designated for this species at this time.

4.1.1.4.3 Population Trends

A population trend analysis has not been conducted for this stock (Hayes et al., 2021).

4.1.1.5 Humpback Whale (*Megaptera novaeangliae*)

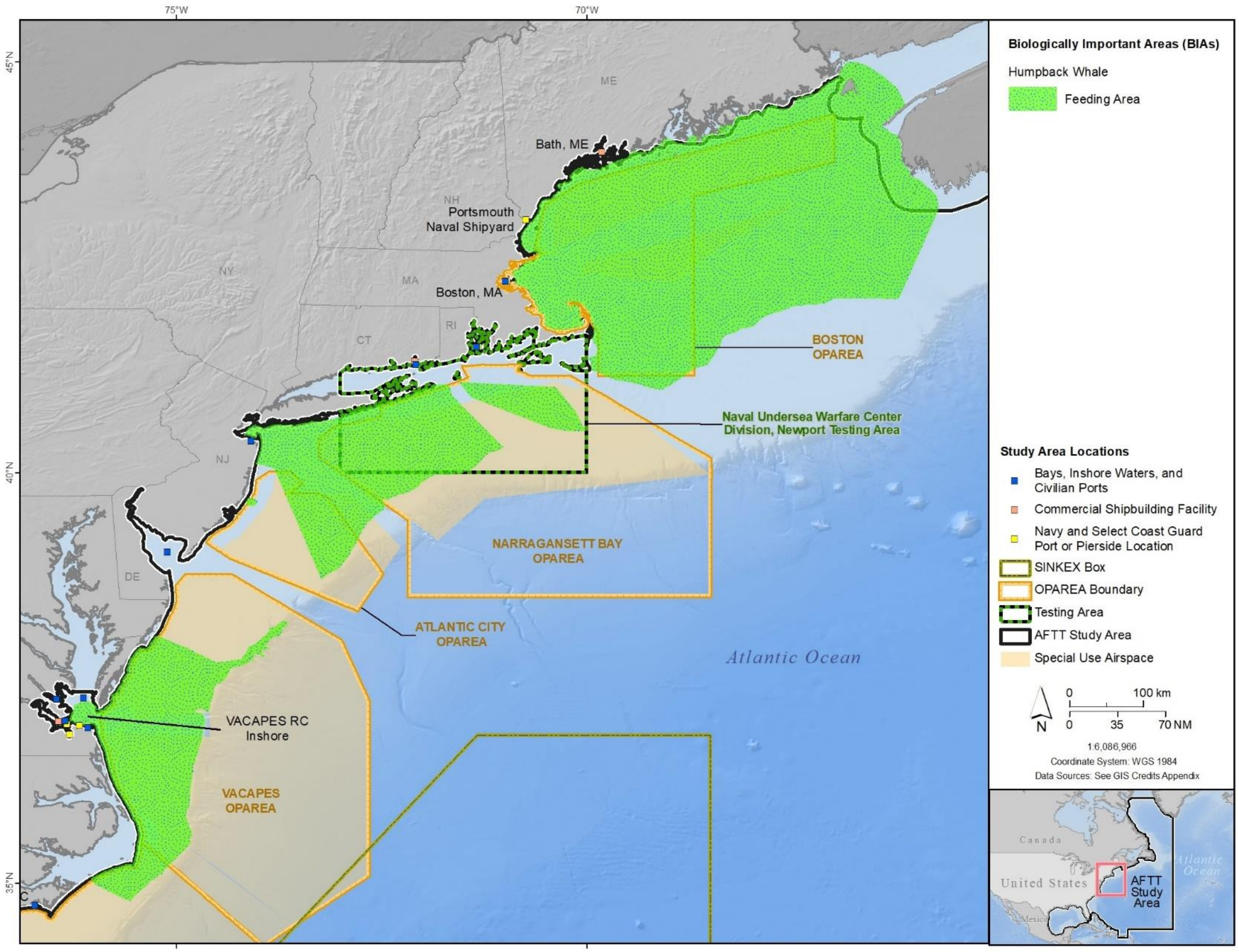
4.1.1.5.1 Status and Management

Humpback whales, as a globally distributed species, are divided into 14 distinct population segments and NMFS revised the listing status of each breeding population in 2016 (81 *Federal Register* 62259). The West Indies distinct population segment that occurs within the Study Area did not warrant listing under the ESA, as they are neither in danger of extinction nor likely to become so in the foreseeable future. All humpback whales feeding in the North Atlantic are considered part of the West Indies distinct population segment (Bettridge et al., 2015), including the Gulf of Maine stock. The West Indies distinct population segment feeding range primarily includes the Gulf of Maine, eastern Canada, and western Greenland, and breeding grounds include waters of the Dominican Republic and Puerto Rico (81 *Federal Register* 62259).

For management purposes in U.S. waters, NMFS identified stocks that are based on feeding areas. Although the western North Atlantic population was once treated as a single management stock, the Gulf of Maine stock has been identified as a discrete subpopulation based on strong fidelity of humpbacks feeding in that region (Hayes et al., 2021). The Gulf of Maine stock is the only stock of humpbacks in the Atlantic managed under NMFS jurisdiction. However, it should be noted that several other discrete humpback whale subpopulations, based on feeding grounds, are in the western North Atlantic, including the Gulf of St. Lawrence, Newfoundland/Labrador, and western Greenland (Hayes et al., 2021), though all belong to the West Indies distinct population segment.

4.1.1.5.2 Habitat and Geographic Range

Humpback whales are distributed worldwide in all major oceans and most seas. Most humpback whale sightings are in nearshore and continental shelf waters; however, humpback whales frequently travel through deep oceanic waters during migration (Calambokidis et al., 2001; Clapham & Mattila, 1990). Humpback whales of the western North Atlantic are typically found in Labrador Current, North Atlantic Gyre and Gulf Stream open-ocean areas during seasonal migrations from northern latitude feeding grounds, occupied during the summer, to southern latitude calving and breeding grounds occupied in the winter (Hayes et al., 2021). The Gulf of St. Lawrence, Newfoundland Grand Banks, West Greenland, and Scotian Shelf are summer feeding grounds for (Cetacean and Turtle Assessment Program, 1982; Kenney & Winn, 1986; Stevick et al., 2006; Whitehead, 1982). The Gulf of Maine is also one of the principal summer feeding grounds for humpback whales in the North Atlantic. The largest numbers of humpback whales are present from mid-April to mid-November. Other feeding locations in this ecosystem are Stellwagen Bank, Jeffreys Ledge, the Great South Channel, the edges and shoals of Georges Bank, Cashes Ledge, and Grand Manan Banks (Cetacean and Turtle Assessment Program, 1982; Kenney & Winn, 1986; Stevick et al., 2006; Weinrich et al., 1997; Whitehead, 1982). LaBrecque et al. (2015a) delineated a humpback whale feeding area in the Gulf of Maine, Stellwagen Bank, and Great South Channel, substantiated through vessel-and aerial-based survey data, photo-identification data, radio-tracking data, and expert judgment (Figure 4.1-5). Humpback whales feed in this area from March through December. Humpback feeding habitats are typically shallow banks or ledges with high seafloor relief (Hamazaki, 2002; Payne et al., 1990).



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

Figure 4.1-5: Biologically Important Areas for Humpback Whales in the Study Area

Additionally, as the West Indies population increases and is no longer considered at risk for extinction, their distribution has expanded outside of their known primary feeding areas into nearshore urban waterways such as the New York-New Jersey Harbor estuary and New York Bight apex (Brown et al., 2018; Brown et al., 2019; King et al., 2021; Smith et al., 2022; Zoidis et al., 2021), which increases exposure to heavy commercial and recreational vessel presence (Brown et al., 2019; King et al., 2021; Zoidis et al., 2021). Using opportunistic sighting data and known catalogued individuals that feed in the Gulf of Maine, a study by Brown et al. (2022), showed site fidelity of predominately juvenile individuals in the New York Bight apex with a 31.3 percent annual return rate, while the presence of adults and mother-calf pairs were rare. Long-term data for humpback whale presence in this area is lacking, and therefore more research is needed to infer conclusions regarding population trends, sighting increases, and additional factors driving shifts in distribution throughout the northwest Atlantic (Brown et al., 2022).

Individual variability in the timing of migrations may result in the presence of individuals in high-latitude areas throughout the year (Straley, 1990). Records of humpback whales off the U.S. mid-Atlantic coast (New Jersey to North Carolina) from November through March suggest these waters may represent a supplemental winter-feeding ground used by juvenile and mature humpback whales of U.S. and Canadian North Atlantic stocks (LaBrecque et al., 2015a).

Humpbacks are most likely to occur near the mouth of the Chesapeake Bay and coastal waters of Virginia Beach between November and March; however, they could be found in the area year-round, based on sighting and stranding data in both mid-Atlantic waters and the Chesapeake Bay itself (Aschettino et al., 2020; Barco et al., 2002). Photo-identification data support the repeated use of the mid-Atlantic region by individual humpback whales (Aschettino et al., 2020; Barco et al., 2002). Vessel surveys offshore of Virginia show site fidelity in the winter months for some individuals, and hierarchical state-space modeling of humpback whale tag data shows a high level of occurrence (82 percent of all modeled whale locations) within the shipping channels—an important high-use area by both the Action Proponents and commercial traffic (Aschettino et al., 2020).

Aerial and vessel monitoring conducted offshore of Cape Hatteras, North Carolina, in Onslow Bay, North Carolina, and offshore of Jacksonville, Florida confirmed winter occurrence of humpback whales in these three areas of the Atlantic(Surrey-Marsden et al., 2018; U.S. Department of the Navy, 2013a; Zoodsma et al., 2016), as well as observations in Onslow Bay during the spring (U.S. Department of the Navy, 2013a).

There are occasional reports of humpback whales in the Gulf of Mexico, but those sightings should be considered extralimital.

4.1.1.5.3 Population Trends

Current data suggest that the Gulf of Maine humpback whale stock is steadily increasing in numbers (Hayes et al., 2021). This is consistent with an estimated average growth trend of 3.1 percent (SE=0.005) in the North Atlantic population overall for the period between 1979 through (Stevick et al., 2003).

4.1.1.6 Minke Whale (*Balaenoptera acutorostrata*)

4.1.1.6.1 Status and Management

Minke whales are the smallest species of mysticete in the Study Area and are classified as a single species with three subspecies recently recognized: *Balaenoptera acutorostrata* in the North Atlantic, *Balaenoptera acutorostrata scammoni* in the North Pacific, and a subspecies that is not formally but generally called the dwarf minke whale, which mainly occurs in the southern (Hayes et al., 2022; Jefferson et al., 2015).

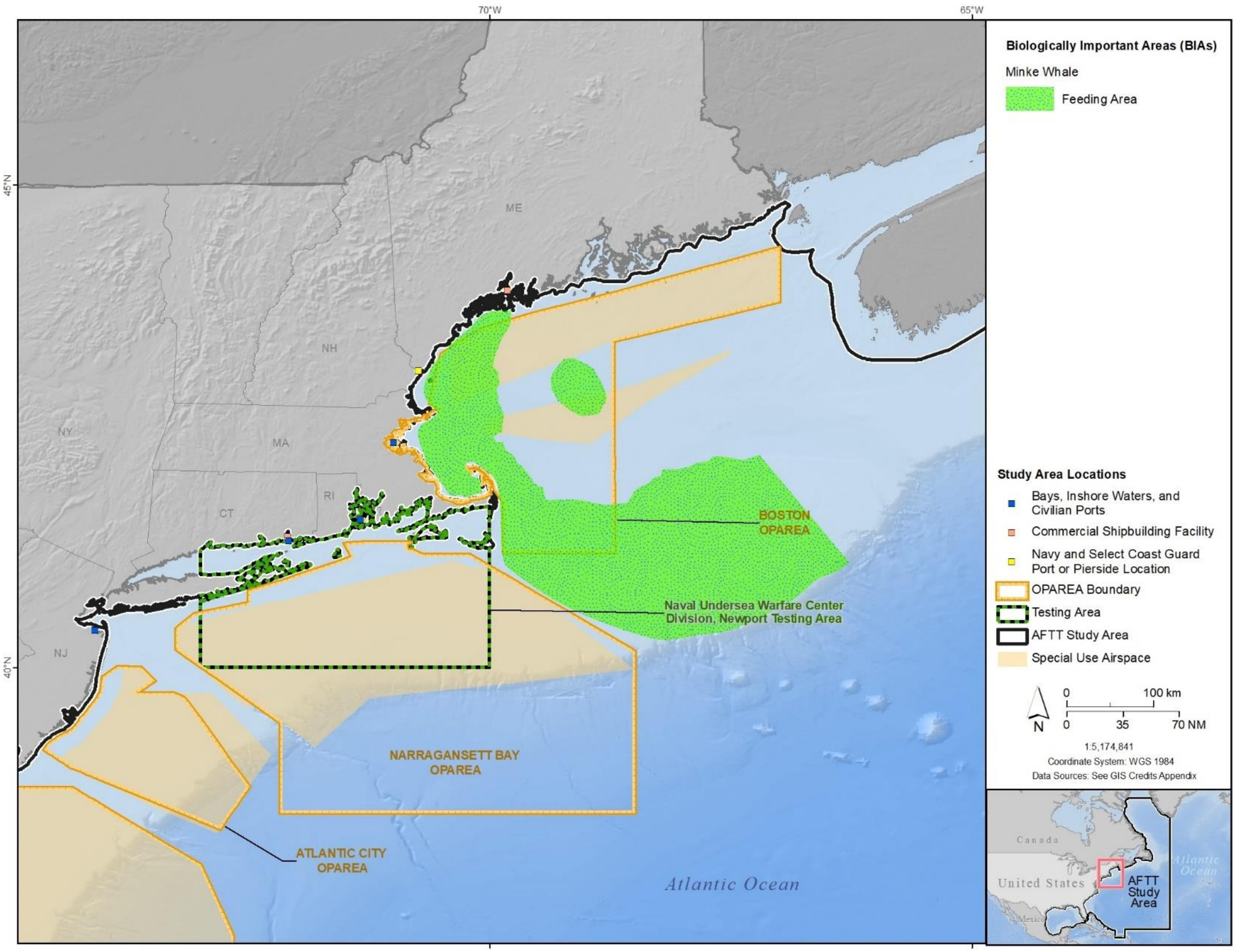
There are four recognized populations in the North Atlantic: Canadian east coast, west Greenland, central North Atlantic, and northeastern North Atlantic (Donovan, 1991). As stock structure is still being researched, minke whales off the eastern coast of the U.S. are considered, for now, to be part of the Canadian east coast stock, which inhabits the area from the western half of the Davis Strait (45° West) to the Gulf of Mexico (Hayes et al., 2022). The relationship between this stock and the other three stocks is uncertain.

4.1.1.6.2 Habitat and Geographic Range

Minke whales have a cosmopolitan distribution in temperate and tropical waters and generally occupy waters over the continental shelf, including inshore bays and even occasionally estuaries (Hayes et al., 2020). There appears to be a strong seasonal component to minke whale distribution on both the continental shelf and in deeper, off-shelf waters. Spring to fall are times of relatively widespread and common acoustic occurrence on the shelf (Risch et al., 2013), while September through April is the period of highest acoustic occurrence in deep-ocean waters throughout most of the western North Atlantic (Clark & Gagnon, 2002; Risch et al., 2014). The minke whale is common and widely distributed within the U.S. EEZ in the Atlantic Ocean (Cetacean and Turtle Assessment Program, 1982).

During summer and early fall, minke whales are found throughout the lower Bay of Fundy (Ingram et al., 2007). Spring and summer are times of relatively widespread and common occurrence and are the seasons when the whales are most abundant in New England waters. In New England waters during fall there are fewer minke whales, while during winter the species appears to be largely absent.

LaBrecque et al. (2015a) delineated two minke whale feeding areas: (1) waters less than 200 m in the southern and southwestern section of the Gulf of Maine, including Georges Bank, the Great South Channel, Cape Cod Bay, Massachusetts Bay, and Stellwagen Bank, and (2) shallow waters around Parker Ridge and Cashes Ledges in the central Gulf of Maine (Figure 4.1-6). These feeding areas were substantiated by vessel- and aerial-based surveys, sightings from whale-watching vessels, and expert judgment. Minke whales would be expected in both feeding areas from March through November.



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

Figure 4.1-6: Biologically Important Areas for Minke Whales in the Study Area

Minke whales occur in the warmer waters of the southern U.S. during winter. While no minke whale mating or calving grounds have been found in U.S. Atlantic waters (LaBrecque et al., 2015a), some data suggest a potential winter breeding area offshore of the southeastern U.S. and the Caribbean based on seasonal migration patterns, acoustic survey results, calf-stranding records, and sightings of mother-calf pairs in Onslow Bay, North Carolina, and offshore of Jacksonville, Florida (Risch et al., 2014). Acoustic monitoring using marine autonomous recording units deployed between 60 and 150 km offshore of Jacksonville, Florida, revealed continuous vocalizations at the deep-water sites during the winter, while vocalization events were completely absent during the fall suggesting a strong seasonal pattern of occurrence in this area (Oswald et al., 2016). Between 2015 and 2021, 12 minke whales were sighted during Navy visual surveys off the coast of Virginia Beach, Virginia. Ongoing acoustic monitoring efforts offshore of Cape Hatteras since March 2012 in water depths of 950 m resulted in frequent detections of minke whales (Debich et al., 2016; Stanistreet et al., 2013), suggesting spring occurrence in this area as minke whales begin to migrate to northern feeding grounds for the summer months.

Mitchell (1991) summarized several winter records of minke whale sightings off the southeast U.S., Cuba, Puerto Rico, and the Antilles, hinting at a possible winter distribution in the West Indies, and in the mid-ocean south and east of Bermuda. Although they are not typically expected to occur within the Gulf of Mexico, observation records also exist for mostly immature individuals in the Gulf of Mexico and Florida Keys (Stewart & Leatherwood, 1985; Waring et al., 2013).

4.1.1.6.3 Population Trends

A trend analysis has not been conducted for this stock (Hayes et al., 2021).

4.1.1.7 Sei Whale (*Balaenoptera borealis*)

4.1.1.7.1 Status and Management

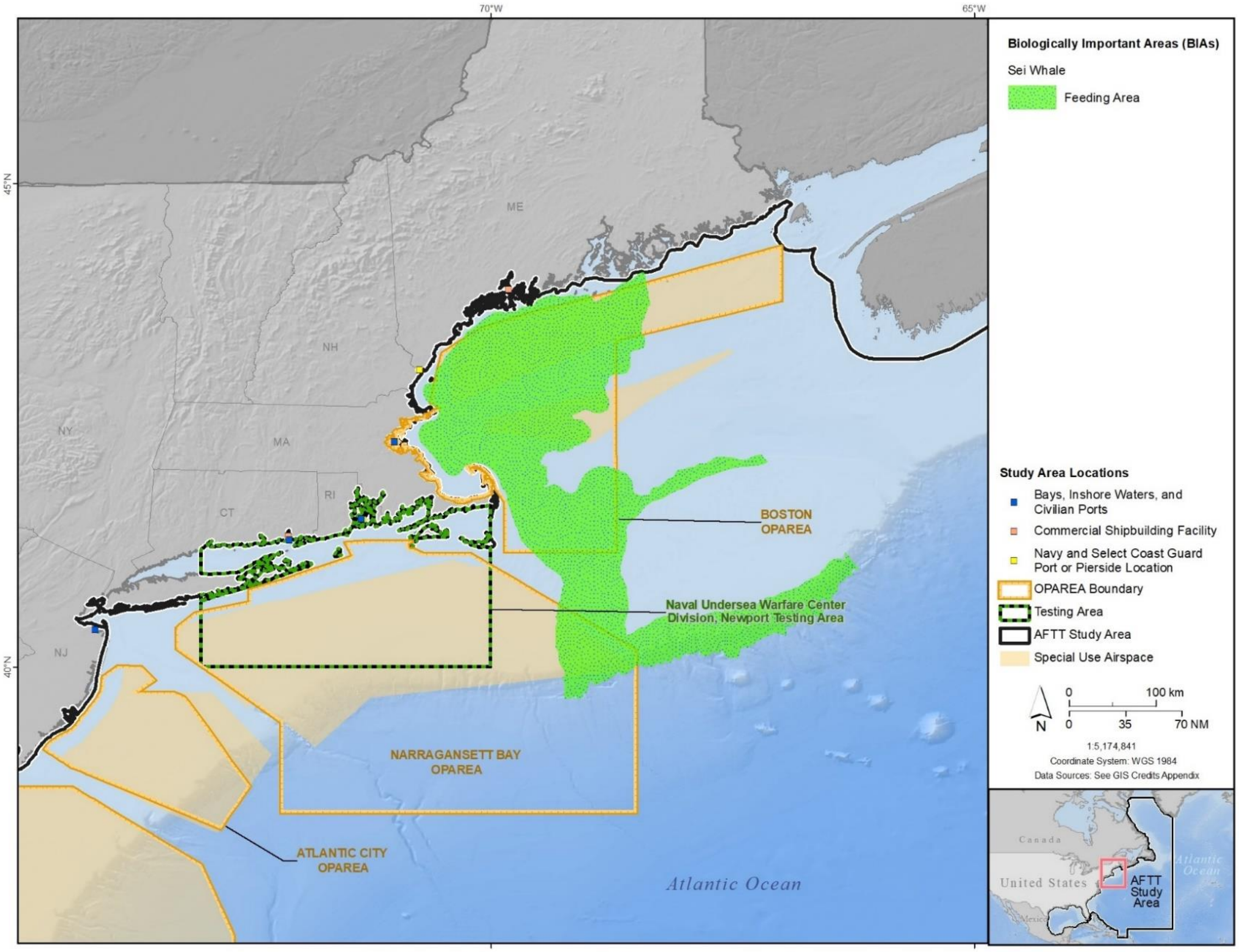
The sei whale is listed as endangered under the ESA and is considered a depleted and strategic stock under the MMPA. A recovery plan for the sei whale was finalized in 2011 (National Marine Fisheries Service, 2011). There are two stocks of sei whale in the Northwest Atlantic: a Nova Scotia stock and a Labrador Sea stock (Waring et al., 2013; Hayes et al., 2021). The Nova Scotia stock is considered in the management unit under NMFS jurisdiction; it includes the continental shelf waters of the northeastern U.S. and extends northeastward to south of Newfoundland. The Labrador Sea stock is outside of NMFS jurisdiction but occurs within the Study Area.

4.1.1.7.2 Habitat and Geographic Range

Sei whales have a worldwide distribution and are found primarily in cold temperate to subpolar latitudes. Sei whales are typically found in the open ocean and are rarely observed near the coast (Horwood, 2009; Jefferson et al., 2015). During the winter, sei whales are found from 20° N to 23° N and during the summer from 35° North to 50° North (Horwood, 2009; Masaki, 1976, 1977; Smultea et al., 2010). They are considered absent or at very low densities in most equatorial areas and in the Arctic Ocean. Satellite tagging data indicate sei whales feed and migrate east to west across large sections of the North Atlantic (Olsen et al., 2009); however, they are not often seen within the equatorial Atlantic. In the Study Area, the open-ocean range includes the Labrador Current, North Atlantic Gyre, and Gulf Stream open-ocean areas. Habitat suitability analyses suggest that the recent distribution patterns of sei whales in U.S. waters appear to be related to waters that are cool (less than 10° C), with high levels of chlorophyll and inorganic carbon, and where the mixed layer depth is relatively shallow (less than 50 m) (Chavez-Rosales et al., 2019; Palka et al., 2017).

Sei whales spend the summer feeding in subpolar high latitudes and return to lower latitudes to calve in winter. However, no migratory corridor for sei whales has been identified in U.S. Atlantic waters (LaBrecque et al., 2015a). There are no known sei whale mating or calving grounds in U.S. Atlantic waters (LaBrecque et al., 2015a).

LaBrecque et al. (2015a) delineated a feeding area for sei whales in the northeast Atlantic between the 25-m contour off coastal Maine and Massachusetts to the 200-m contour in the central Gulf of Maine, including the northern shelf break area of Georges Bank (Figure 4.1-7). The feeding area also includes the southern shelf break area of Georges Bank from 100 to 2,000 m and the Great South Channel. Feeding activity in the U.S. Atlantic waters is concentrated from May through November with a peak in July and August. Spring is the period of greatest abundance in Georges Bank and into the Northeast Channel area, along the Hydrographer Canyon (Waring et al., 2010) (Cetacean and Turtle Assessment Program, 1982). Although uncommon near the coastline, two strandings of sei whales have been reported on the Virginia coast in 2003 and 2011 (King, 2011; Swingle et al., 2014).



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

Figure 4.1-7: Biologically Important Areas for Sei Whales in the Study Area

Passive acoustic monitoring conducted offshore of Cape Hatteras, North Carolina, since 2011 resulted in the detections of sei whales on bottom-mounted high-frequency acoustic recording packages that were not observed during visual surveys (McLellan et al., 2014). Passive acoustic monitoring conducted offshore of Jacksonville, Florida, from 2009 through 2020 also included detections of sei whales on marine acoustic recording units (Oswald et al., 2016) and detections on high-frequency acoustic recording packages (Hodge & Read, 2013).

Critical habitat has not been designated for this species at this time.

4.1.1.7.3 Population Trends

Commercial whaling in the 19th and 20th centuries depleted populations in all areas throughout the species' range. While they appear to be recovering in the northern hemisphere as a result of protective legislation, a trend analysis has not been conducted for this stock (Hayes et al., 2020).

4.1.1.8 Rice's Whale (*Balaenoptera ricei*)

4.1.1.8.1 Status and Management

Rice's whale was formerly known as the Northern Gulf of Mexico stock of Bryde's whale. It was designated a separate species in 2021 based on genetic and morphometric data distinguishing it from other subspecies of Bryde's whale (Rosel et al., 2021).

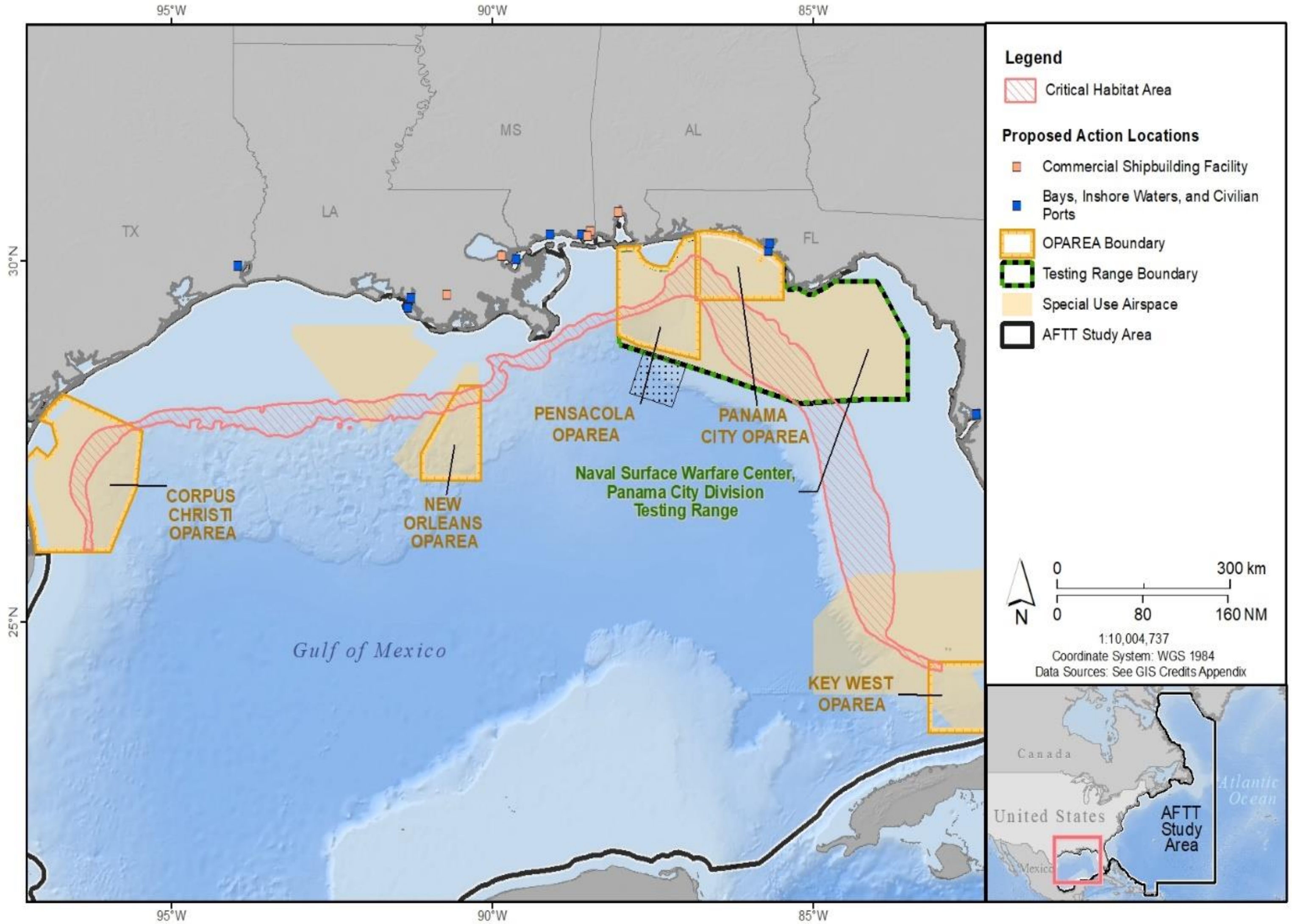
Rice's whale is listed as endangered under the ESA and considered depleted under the MMPA. The population is very small (fewer than 100 animals), exhibits very low genetic diversity, and has a restricted range, which places the stock at great risk of demographic and environmental stochasticity. There was no statistically significant trend in population size for this species.

4.1.1.8.2 Habitat and Geographic Range

Referred to as the core distribution area by the National Marine Fisheries Service, Rice's whales occur almost exclusively in the northeastern Gulf of Mexico in the De Soto Canyon area, along the continental shelf break between 100 m and 400 m depth, with a single sighting at 408 m (Hansen et al., 1996; Maze-Foley & Mullin, 2006; Mullin & Fulling, 2004; Mullin & Hoggard, 2000; Rice et al., 2014; Rosel et al., 2016; Rosel & Wilcox, 2014; Širović et al., 2014; Soldevilla et al., 2017) Rice's whales have been sighted in all seasons within the De Soto Canyon area (Maze-Foley & Mullin, 2006; Mullin, 2007; Mullin & Hoggard, 2000). Two strandings from the southeastern U.S. Atlantic coast share the same genetic characteristics with those from the northern Gulf of Mexico (Rosel & Wilcox, 2014; Rosel et al., 2021), but it is unclear whether these are extralimital strays (Mead, 1977) or whether they indicate the population extends from the northeastern Gulf of Mexico to the Atlantic coast of the southern United States (Rosel & Wilcox, 2014; Rosel et al., 2021). There have been no confirmed sightings of Rice's whales along the U.S. East Coast during NMFS cetacean surveys (Rosel et al., 2016). Between 2000 and 2021, data in OBIS-SEAMAP indicated there were 8 sightings of Rice's whales in the Gulf of Mexico portion of the Study Area, totaling 21 individuals (Halpin et al., 2009).

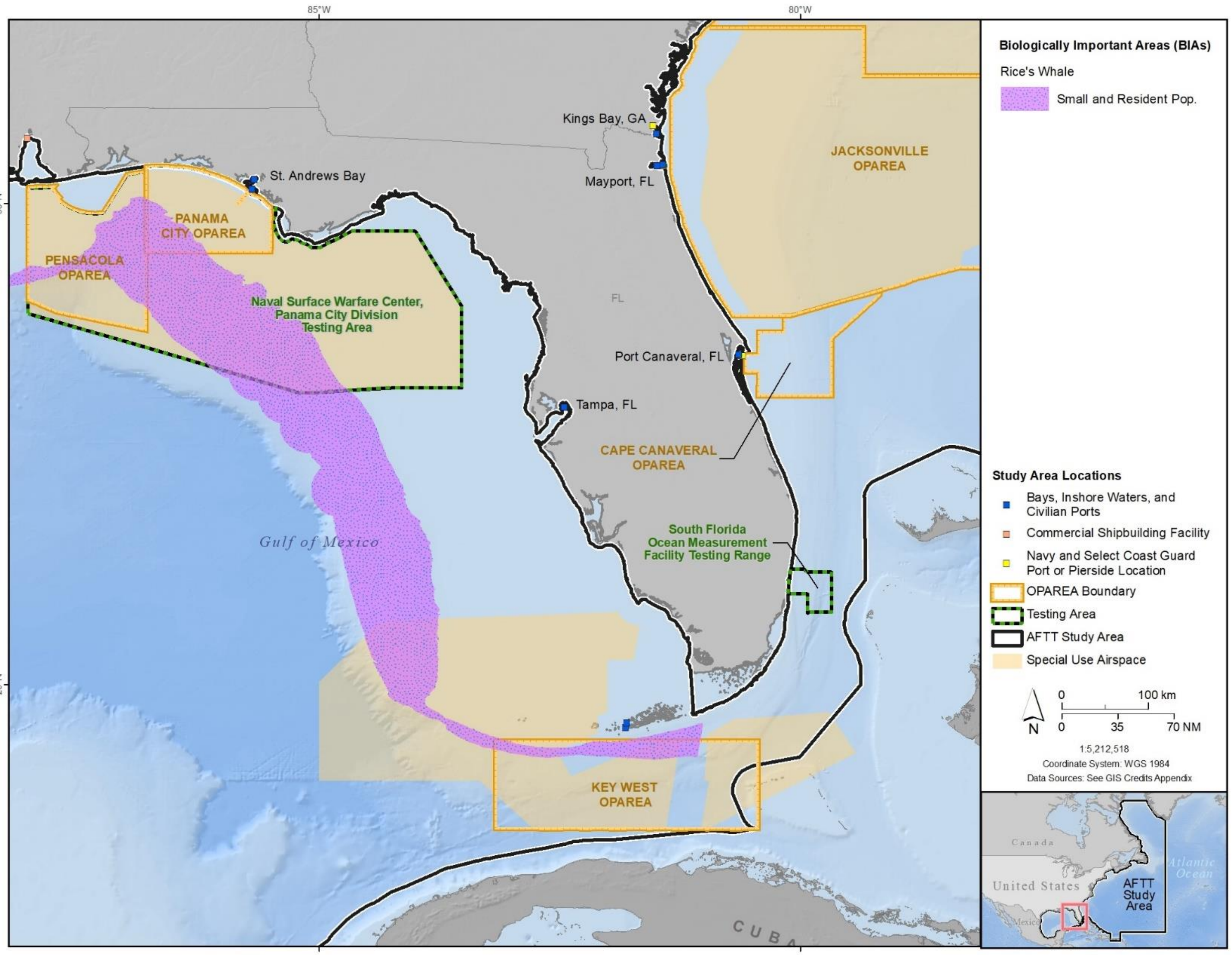
While their core distribution primarily lies within continental U.S. waters, research by Soldevilla et al. (2024) provides the first evidence of Rice's whale presence in Mexican waters using autonomous passive acoustic recording devices in the Mexican continental slope from 2020 to 2022. Rice's whales were detected 14.9 percent of days across a period of 680 days throughout the year, with a total of 579 western long-moan calls detected. These new findings suggest Rice's whales have a broader distribution than previously understood, and have a transboundary range throughout the Gulf of Mexico beyond U.S. waters (Soldevilla et al., 2024).

On July 24, 2023, NMFS released the Proposed Rule for the designation of critical habitat for the Rice's whale in the Gulf of Mexico (Figure 4.1-8) in accordance with section 4(b)(2) of the ESA (88 *Federal Register* 47453). The proposed area covers 28,270.65 square miles along continental shelf and slope waters between 100 m and 400 m isobaths; spanning from the U.S. EEZ boundary off the southwestern coast of Texas, to the boundary between the South Atlantic Fishery Management Council and the Gulf of Mexico Fishery Management Council off the southeastern coast of Florida (88 *Federal Register* 47453). This continental shelf and slope region (Figure 4.1-9 and Figure 4.1-10) is the critical habitat feature deemed biologically important and essential for Rice's whale conservation due to prey density, favorable oceanographic conditions, and productivity, as well as noise conditions sufficient for communication, navigation, foraging, and threat detection (88 *Federal Register* 47453). The area proposed for Rice's whale critical habitat overlaps with the Study Area in the Gulf of Mexico. During the evaluation process, interference with mission-essential Department of Defense operations for military readiness activities was one of the many factors included when determining the critical habitat area. NMFS has proposed GOMEX continental shelf and slope associated waters between the 100-400m 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). A final critical habitat designation has not been assigned for this species at this time.



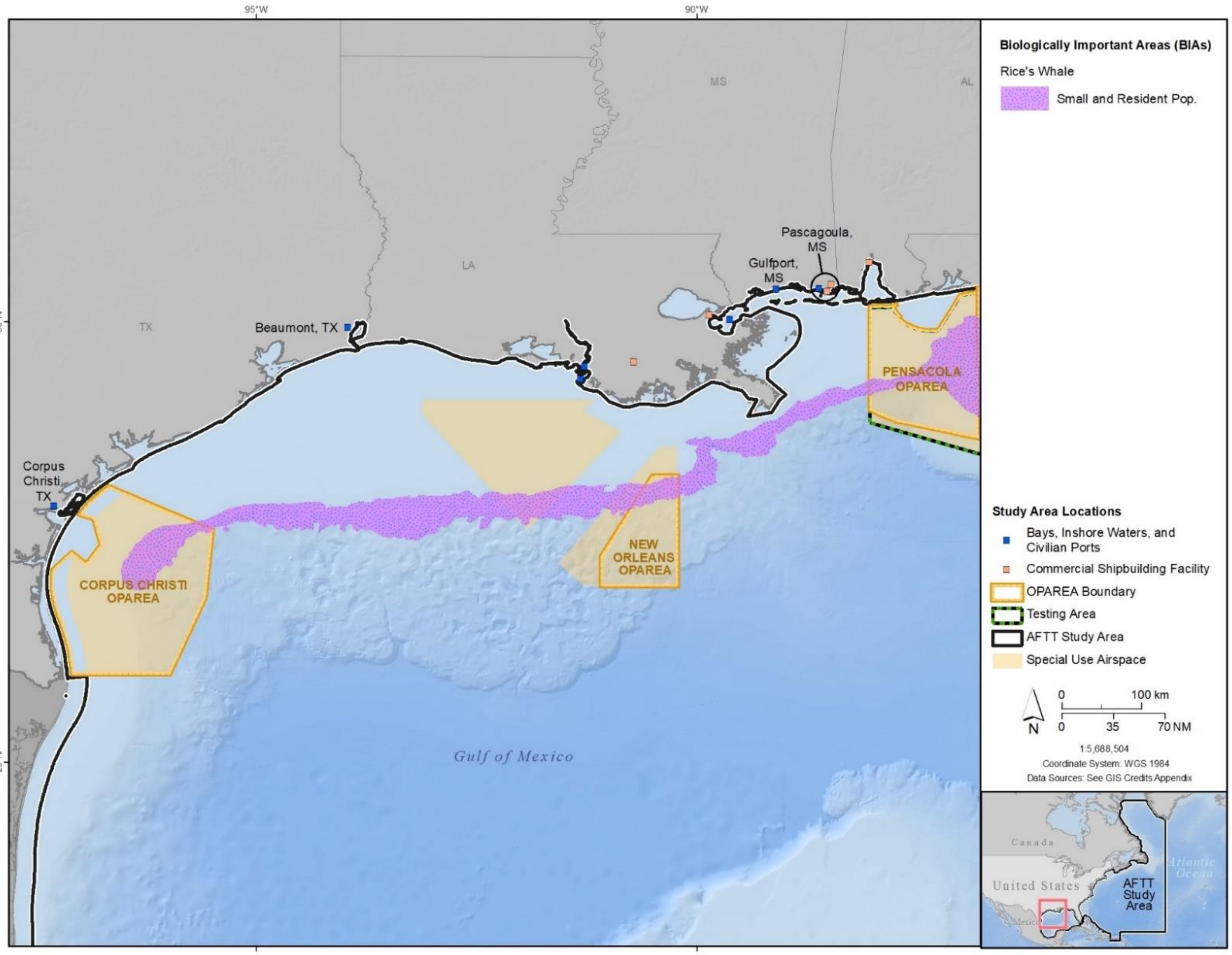
Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area

Figure 4.1-8: Proposed Critical Habitat for Rice's Whales in the Study Area



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

Figure 4.1-9: Biologically Important Areas for Rice's Whales in the Study Area – Eastern Gulf of Mexico



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

Figure 4.1-10: Biologically Important Areas for Rice's Whales in the Study Area – Western Gulf of Mexico

4.1.1.8.3 Population Trends

The best abundance estimate available for Rice's whale is 51 (coefficient of variation = 0.50). This estimate is from summer 2017 and summer/fall 2018 oceanic surveys covering waters from the 200-m isobath to the seaward extent of the U.S. EEZ (Garrison et al., 2020). The statistical power to detect a trend in abundance for this stock is poor due to the relatively imprecise abundance estimates and long intervals between surveys. In addition, because these surveys are restricted to U.S. waters, it is not possible to distinguish between changes in population size and Gulf-wide shifts in spatial distribution. However, the potential for biological removal for the Rice's whale is 0.1. The mean modeled annual human-caused mortality and serious injury due to the *Deepwater Horizon* oil spill exceeds potential biological removal for this species (National Oceanic and Atmospheric Administration Fisheries, 2021).

4.1.2 ODONTOCETES

4.1.2.1 Sperm Whale (*Physeter macrocephalus*)

4.1.2.1.1 Status and Management

The sperm whale has been listed as an endangered species since 1970 under the precursor to the ESA (National Marine Fisheries Service, 2009) and is listed as depleted and strategic under the MMPA. Whether the northwestern Atlantic population is discrete from northeastern Atlantic is currently unresolved. The International Whaling Commission recognizes one stock for the North Atlantic, based on reviews of many types of studies (e.g., tagging, genetics, catch data, mark and recapture, biochemical markers). A recovery plan is in place for the sperm whale in U.S. waters (National Marine Fisheries Service, 1998). There are currently two stocks of sperm whales recognized within the Study Area managed under NMFS jurisdiction: the western North Atlantic and the Gulf of Mexico stocks. In 2013, NMFS determined that a petition to list the Gulf of Mexico stock as a distinct population segment was not warranted based on a review of best available information on physical, physiological, ecological, and behavioral factors (78 *Federal Register*, November 13, 2013). A 5-year review for sperm whales was initiated in 2021 (86 *Federal Register* 28577).

4.1.2.1.2 Habitat and Geographic Range

Sperm whales are found throughout the world's oceans in deep waters to the edge of the ice at both poles (Leatherwood & Reeves, 1983; Rice, 1989; Whitehead, 2002). Sperm whales show a strong preference for deep waters (Rice, 1989; Whitehead, 2002). Their distribution is typically associated with waters over the continental shelf break, continental slope, and into deeper mid-ocean regions. However, in some areas, adult males are reported to consistently frequent waters with depths less than 100 m and as shallow as 40 m (Jefferson et al., 2008; Jefferson et al., 2015; Romero et al., 2001). Typically, sperm whale concentrations correlate with areas of high productivity. These areas are generally near drop-offs and areas with strong currents and steep topography (Gannier & Praca, 2007; Jefferson et al., 2015). Sperm whale migration is not well understood and is not as seasonally based as that observed in mysticete whales. Sperm whales may be found in Labrador Current, North Atlantic Gyre, and Gulf Stream open-ocean areas. Recent surveys under the Atlantic Marine Assessment Program for Protected Species between 2010 and 2020 have shown that the density of sperm whales is higher north of Cape Hatteras, with infrequent sightings south of Cape Hatteras, and had peak average abundance estimates during summer (Palka et al., 2021).

The nature of linkages of the U.S. habitat with those to the south, north, and offshore is unknown, but sperm whales that occur in the eastern U.S. EEZ in the Atlantic Ocean likely represent only a fraction of the total stock. Historical whaling records compiled by Schmidly (1981a) suggested an offshore distribution off the southeast U.S., over the Blake Plateau, and into deep ocean waters. Distribution along the East Coast of the U.S. is centered along the shelf break and over the slope. In winter, sperm whales are concentrated east and northeast of Cape Hatteras, North Carolina. In spring, the center of distribution shifts northward to east of Delaware and Virginia and is widespread throughout the central portion of the mid-Atlantic Bight and the southern portion of Georges Bank. In summer, the distribution is similar but now also includes the area east and north of Georges Bank and into the Northeast Channel region, as well as the continental shelf (inshore of the 100-m isobath) south of New England. In fall, sperm whale occurrence south of New England on the continental shelf is at its highest level, and there remains a continental shelf edge occurrence in the mid-Atlantic Bight. Similar inshore (less than 200 m) observations were made on the southwestern and eastern Scotian Shelf, particularly in the region of "the Gully" (Whitehead & Weilgart, 1991).

Aerial surveys conducted offshore of Cape Hatteras, North Carolina, from 2011 through 2017 have resulted in a common occurrence of sperm whales, primarily in the spring and summer months (McLellan et al., 2014; Rafter et al., 2018).

Passive acoustic monitoring conducted in Onslow Bay, North Carolina, between 2007 and 2013 confirmed year-round occurrence of sperm whales, along with a nocturnal increase in occurrence of clicks and greater vocal activity on recorders located in deeper waters of the monitoring area (Hodge, 2011; Read et al., 2014; U.S. Department of the Navy, 2013a). Researchers confirmed occurrence of sperm whale vocalizations in Onslow Bay on a recorder deployed at water depths of 230 m and 366 m, along with regular nocturnal occurrence of sperm whale clicks near the shelf break, suggesting that foraging activities were occurring at that time (Hodge et al., 2013). This diel pattern contrasts with what was recorded offshore of Cape Hatteras (Stanistreet et al., 2013). Habitat models also support findings of sperm whale occurrence in the U.S. Economic Exclusion Zone waters offshore of Onslow Bay (Best et al., 2012). Visual surveys in Onslow Bay and analysis of remotely sensed oceanographic data were used to determine the effects of dynamic oceanography. The findings from this study indicate that the presence of Gulf Stream frontal eddies and the location of the Gulf Stream Front influenced sperm whale vocalization rates, among other species (Thorne et al., 2012).

The sperm whale is the most common large cetacean in the northern Gulf of Mexico (Palka & Johnson, 2007). The distribution of sperm whales in the Gulf of Mexico is strongly linked to surface oceanography, such as Loop Current eddies that locally increase production and availability of prey (O'Hern & Biggs, 2009). Most sperm whale groups were found within regions of enhanced sea surface chlorophyll abundance (O'Hern & Biggs, 2009). Ship-based and aerial-based surveys indicate that sperm whales are widely distributed only in waters deeper than 200 m in the northern Gulf of Mexico (Waring et al., 2014), specifically inhabiting the continental slope and oceanic waters (Fulling et al., 2003; Maze-Foley & Mullin, 2006; Mullin & Fulling, 2004; Mullin & Hoggard, 2000; Mullin et al., 2004). Seasonal aerial surveys confirm that sperm whales are present in the northern Gulf of Mexico in all seasons (Hansen et al., 1996; Mullin & Hoggard, 2000; Mullin et al., 1994b). Sperm whales aggregate at the mouth of the Mississippi River and along the continental slope in or near cyclonic cold-core eddies (counterclockwise water movements in the northern hemisphere with a cold center) or anticyclone eddies (clockwise water movements in the northern hemisphere) (Davis et al., 2007). Habitat models for sperm whale occurrence indicate a high probability of suitable habitat along the shelf break off the Mississippi delta, Desoto Canyon, and western Florida (Best et al., 2012).

NMFS winter ship surveys of waters surrounding Puerto Rico and the U.S. Virgin Islands indicate that sperm whales inhabit continental slope and oceanic waters (Roden & Mullin, 2000; Swartz & Burks, 2000; Swartz et al., 2002). Earlier sightings from the northeastern Caribbean were reported by Erdman (1970); Erdman et al. (1973); Taruski and Winn (1976), where these and additional sightings from Puerto Rican waters are summarized by Mignucci-Giannoni (1988). For years up to 1989, Mignucci-Giannoni found 43 records for sperm whales in waters of Puerto Rico, U.S. Virgin Islands, and British Virgin Islands and suggested these whales occur from late fall through winter and early spring but are rare from April to September. In addition, sperm whales are one of the most common species to strand in Puerto Rico and the Virgin Islands (Mignucci-Giannoni et al., 1999). In the southeast Caribbean, both large and small adults, as well as calves and juveniles of different sizes, are reported (Watkins et al., 1985).

Critical habitat has not been designated for this species at this time.

4.1.2.1.3 Population Trends

There is no reliable estimate of total sperm whale abundance, and no trend analysis has been conducted for the North Atlantic stock of sperm whales (Hayes et al., 2022).

There has been considerable variation in point estimates of northern Gulf of Mexico sperm whale abundance based on data collected from 1991 to 2018. Differences in temporal abundance will be difficult to interpret without a Gulf of Mexico-wide (including waters belonging to Mexico and Cuba) understanding of sperm whale abundance, and the statistical power to detect a trend in abundance for this stock is poor due to the relatively imprecise abundance estimates and long intervals between surveys.

4.1.2.2 Dwarf/Pygmy Sperm Whale (*Kogia sima* and *Kogia breviceps*)

4.1.2.2.1 Status and Management

Before 1966, dwarf and pygmy sperm whales were thought to be a single species, until form and structure distinction were shown (Handley, 1966); misidentifications of these two species are still common (Jefferson et al., 2015). Dwarf and pygmy sperm whales are not often observed at sea, but they are among the more frequently stranded cetaceans (Caldwell & Caldwell, 1989; Jefferson et al., 2015; McAlpine, 2009). Rare sightings indicate they may avoid human activity, and they are rarely active at the sea surface. They usually appear slow and sluggish, often resting motionless at the surface with no visible blow (Baird, 2005; Jefferson et al., 2015). Because of the scarcity of biological information available for individual dwarf and pygmy sperm whales, the difficulty of species-level identifications, and the lack of data on individual stock structure and abundance estimates, dwarf and pygmy sperm whales are presented collectively here with species-specific information if available.

Although virtually nothing is known of population status for these species, stranding frequency suggests they may not be as uncommon as sighting records would indicate (Jefferson et al., 2015; Maldini et al., 2005). The western North Atlantic population(s) and the northern Gulf of Mexico population(s) are considered separate stocks for management purposes, but there is no genetic evidence that these two populations differ (Hayes et al., 2021).

4.1.2.2.2 Habitat and Geographic Range

Dwarf and pygmy sperm whales appear to be distributed worldwide from temperate to tropical waters (Caldwell & Caldwell, 1989; McAlpine, 2002). Both species may be found in the Gulf Stream and North Atlantic Gyre open-ocean areas. Most sightings are in the Gulf Stream, perhaps an artifact of survey effort rather than a reflection of actual distribution. Dwarf and pygmy sperm whales can occur close to shore and occasionally over the outer continental shelf. However, several studies show that they may also occur beyond the continental shelf edge (Bloodworth & Odell, 2008; MacLeod et al., 2004). The pygmy sperm whale may frequent more temperate habitats than the dwarf sperm whale, which is more of a tropical species. The dwarf sperm whale may also have a more pelagic distribution, and dive deeper during feeding bouts, than pygmy sperm whales (Barros & Wells, 1998). Hodge et al. (2016) used passive acoustic monitoring to determine that dwarf and pygmy sperm whales are common in deep waters along the continental shelf break and slope between Virginia and Florida, and more common than suggested by visual sightings. Passive acoustics have also been used to estimate density of dwarf/pygmy sperm whales in the Gulf of Mexico, finding that densities derived from acoustic data are substantially higher than those developed from visual sighting data (Hildebrand et al., 2018). At these recording sites, vocalizations were detected more during the day than night hours, and some level of seasonality was evident in the recordings (Hildebrand et al., 2018). A relative lack of oceanic sightings may have more to do with the difficulty of detecting and identifying these animals at sea and lack of effort, in comparison to any real distributional preferences.

In the Study Area, dwarf and pygmy sperm whales are found primarily in the Northeast and Southeast U.S. Continental Shelf Large Marine Ecosystems, the Gulf of Mexico, and Caribbean Sea (Bloodworth & Odell, 2008; Caldwell & Caldwell, 1989; Cardona-Maldonado & Mignucci-Giannoni, 1999). A stranded pygmy sperm whale on the north shore of the Gulf of St. Lawrence represents the northernmost record for this species in the western Atlantic (Measures et al., 2004).

Despite the difficulty of sighting these species visually, aerial surveys of mid-Atlantic portions of the Study Area (near Norfolk Canyon) in 2018 and 2019 resulted in 10 observations totaling 17 individuals; 4 encounters involved mother-calf pairs (Cotter, 2019).

Pygmy sperm whales were one of the most sighted species in the northern Gulf of Mexico from 1992 to 1994 and from 1996 to 2001 (Mullin & Fulling, 2004). Fulling and Fertl (2003) noted a concentration of sightings in continental slope waters near the Mississippi River Delta. The delta is considered an important area for cetaceans in the northern Gulf of Mexico because of its high levels of productivity associated with oceanographic features. Data from the Gulf of Mexico suggest that dwarf and pygmy sperm whales may associate with frontal regions along the continental shelf break and upper continental slope, where squid densities are higher (Baumgartner et al., 2001; Jefferson et al., 2015).

4.1.2.2.3 Population Trends

Trend analyses have been conducted for dwarf/pygmy sperm whales in both the Gulf of Mexico and Western North Atlantic stocks. However, for both regions, there is high uncertainty in the abundance estimates, and methodological factors make it difficult to compare across years. While there appears to be an increasing trend in the Western North Atlantic stock, this should be interpreted with caution (Hayes et al., 2021).

4.1.2.3 Beaked Whales (Various Species)

Six species of beaked whales are known in the western North Atlantic Ocean: Cuvier's beaked whale (*Ziphius cavirostris*), northern bottlenose whale (*Hyperoodon ampullatus)* discussed in Section 4.1.2.4, and four members of the genus *Mesoplodon* — True's (*M. mirus*), Gervais' (*M. europaeus*), Blainville's (*M. densirostris*), and Sowerby's (*M. bidens*) beaked whales. Cuvier's, Blainville's, and Gervais' beaked whales are also known to regularly occur in the Gulf of Mexico based on stranding or sighting data (Hansen et al., 1995; Würsig et al., 2000). Sowerby's beaked whale in the Gulf of Mexico is considered extralimital because there is only one known stranding of this species (Bonde & O'Shea, 1989) and occurrence is normally in northern temperate waters of the North Atlantic (Mead, 1989a). With the exception of the Cuvier's beaked whale and northern bottlenose whale, beaked whales are nearly indistinguishable at sea (Coles, 2001). Because of the scarcity of biological information available for individual species, the difficulty of species-level identifications for *Mesoplodon*, and the lack of data on individual stock structure and abundance estimates, Cuvier's, True's, Gervais', Blainsville's, and Sowerby's beaked whales are presented collectively here with species-specific information if available.

4.1.2.3.1 Status and Management

Stock structure of beaked whales in the Atlantic, Gulf of Mexico, and U.S. Virgin Islands is unknown; however, these are assumed to be separate for management purposes.

4.1.2.3.2 Habitat and Geographic Range

Cuvier's, True's, Gervais', Blainville's, and Sowerby's beaked whales are found in Labrador Current, North Atlantic Gyre, and Gulf Stream open-ocean areas and are also known to occur in the Northeast U.S. Continental Shelf, Scotian Shelf, and Newfoundland-Labrador Shelf Large Marine Ecosystems. The continental shelf margins from southern Nova Scotia to Cape Hatteras have been identified as key areas for beaked whales in a global review by MacLeod et al. (2006). Cuvier's, Gervais', Blainville's, and True's beaked whales may also occur in the Southeast U.S. Continental Shelf Large Marine Ecosystem, while Cuvier's, Gervais' and Blainville's beaked whales may occur in the Gulf of Mexico and Caribbean Sea Large Marine Ecosystems.

Cuvier's beaked whale is one of the more commonly seen and the best known. Similar to other beaked whale species, this oceanic species generally occurs in waters past the edge of the continental shelf and occupies almost all temperate, subtropical, and tropical waters of the world, as well as subpolar and even polar waters in some areas (Waring et al., 2014). The distribution of Cuvier's beaked whales is poorly known and is based mainly on stranding records (Leatherwood et al., 1976). Strandings were reported from Nova Scotia along the eastern U.S. coast south to Florida, around the Gulf of Mexico, and within the Caribbean (Cetacean and Turtle Assessment Program, 1982; Heyning, 1989; Houston, 1990; Leatherwood et al., 1976; MacLeod, 2006; Mignucci-Giannoni et al., 1999). Cuvier's beaked whale sightings have occurred principally along the continental shelf edge in the mid-Atlantic region off the northeast U.S. coast (Cetacean and Turtle Assessment Program, 1982; Hamazaki, 2002; Palka, 2006; Waring et al., 1992; Waring et al., 2001) in late spring or summer, although strandings and sightings were reported in the Caribbean Sea and the Gulf of Mexico as well (Dalebout et al., 2006). Cuvier's beaked whales are generally sighted in waters with a bottom depth greater than 200 m and are frequently recorded in waters with bottom depths greater than 1,000 m (Falcone et al., 2009; Jefferson et al., 2008; Jefferson et al., 2015).

True's beaked whales appear to occur only in temperate waters, and possibly only in warm temperate waters. Most records of them occurring in the northwest Atlantic suggest a probable relation with the Gulf Stream (MacLeod, 2000; Mead, 1989b).

Gervais' beaked whale occurs only in the Atlantic Ocean and Gulf of Mexico, within a range both north and south of the equator to a latitude of 40° (Jefferson et al., 2008; Jefferson et al., 2015; MacLeod, 2006). Although the distribution seems to range across the entire temperate and tropical Atlantic, most records are from the western North Atlantic waters from New York to Texas (more than 40 published records), and they are the most common species of *Mesoplodon* to strand along the U.S. Atlantic coast (Waring et al., 2014).

Sowerby's beaked whales appear to inhabit more temperate waters than many other members of the genus. They are the most northerly distributed of Atlantic species of *Mesoplodon*, and are found in cold temperate waters of the North Atlantic Ocean, generally north of 30° N. In the Study Area, they range from Massachusetts to Labrador (MacLeod et al., 2006; Mead, 1989a). There were several at-sea sightings off Nova Scotia and Newfoundland, from New England waters north to the ice pack (MacLeod et al., 2006; Waring et al., 2010). Sowerby's beaked whale occurrence in the Gully Marine Protected Area (east of Nova Scotia) increased during the period from 1988 to 2011 (Whitehead, 2013).

Blainville's beaked whales are one of the most widely distributed of the distinctive toothed whales in the *Mesoplodon* genus (Jefferson et al., 2008; MacLeod et al., 2006). In the Study Area, this species is known to occur in enclosed deep-water seas, such as the Gulf of Mexico and Caribbean Sea. There are records for this species from the eastern coast of the U.S. and Canada, from as far north as Nova Scotia and south to Florida and the Bahamas (MacLeod & Mitchell, 2006; Mead, 1989a).

Starting January 2015, aerial surveys conducted in the offshore area from Wilmington, North Carolina to near Norfolk Canyon and have resulted in sightings of True's (Number [N] = 2), Sowerby's (N = 1), and Gervais' (N = 8) beaked whales, in addition to sightings only identified to *Mesoplodon* species (N = 27) (Cotter, 2019). Aerial sightings of Cuvier's beaked whale were more common (N = 69). Vessel-based surveys offshore of Norfolk, Virginia, sighted True's (N = 3), Sowerby's (N = 3), and Cuvier's (N = 5) beaked whales, as well as unidentified *Mesoplodons* (N = 4) and unidentified beaked whales (N = 4) between 2016 and 2021 (OBIS-SEAMAP 2024).

McLellan et al., (2018) determined that Cape Hatteras is an exceptionally important habitat area for both Cuvier's and *Mesoplodon* species, while Foley et al. (2021) noted that satellite-tagged Cuvier's beaked whales demonstrate high site fidelity in small core areas in this region. During aerial surveys conducted between May 2011 and December 2014, beaked whales were observed in every month of the year offshore of Cape Hatteras, with Cuvier's beaked whale being the most commonly encountered beaked whale species (McLellan et al., 2015). The highest number of beaked whale sightings occurred between May and August and all sightings occurred along the continental shelf break (McLellan et al., 2015). These results suggest some degree of residency for beaked whales in this area (McLellan et al., 2015). Median water depths at tagging locations ranged from 1,725 to 2,274 m, with a maximum water depth of 3,015 m. Diving data captured by the tags showed a maximum dive depth of 2,800 m suggesting that many of the dives were likely to, or close to, the seafloor (McLellan et al., 2015).

Passive acoustic monitoring conducted between 2007 and 2013 in Onslow Bay, North Carolina resulted in detections of multiple beaked whale vocalization events. Beaked whale detections were documented throughout the monitoring period with no specific diel pattern (Hodge & Read, 2015). Gervais' beaked whales were detected significantly more than any other beaked whale species. Cuvier's beaked whale clicks were detected in November 2012 and Blainville's beaked whale clicks were detected primarily in April and May 2013 (Hodge & Read, 2015). True's and Sowerby's beaked whales were not detected during this effort, but there were two detections in December 2012 of a click type assigned to an unidentified beaked whale species. Passive acoustic monitoring conducted offshore of Cape Hatteras between March and April 2012 recorded beaked whale clicks on nearly 40 percent of the recording days (Stanistreet et al., 2013). Closer examination of these beaked whale click events suggested they belonged to Cuvier's and Gervais' beaked whales (Stanistreet et al., 2012).

MacLeod and Mitchell (2006) described the northern Gulf of Mexico continental shelf margin as "a key area" for beaked whales. Beaked whales were seen in all seasons during GulfCet aerial surveys of the northern Gulf of Mexico (i.e., U.S. Gulf of Mexico) (Hansen et al., 1996; Mullin & Hoggard, 2000). Some of the aerial survey sightings may have included Cuvier's beaked whale, although identification of beaked whale species from aerial surveys is problematic. Beaked whale sightings made during spring and summer vessel surveys were widely distributed in waters greater than 500 m deep. Between 2000 and 2021, vessel surveys in the Gulf of Mexico documented 14 sightings of beaked whales (1 Gervais and 13 Cuvier's) (OBIS-SEAMAP 2024). While these survey data include large temporal gaps, they indicate a regular and recurring presence of Cuvier's beaked whales in the Gulf of Mexico.

4.1.2.3.3 Population Trends

A trend analysis has not been conducted for the western North Atlantic Cuvier's beaked whale stock. Additionally, trend analyses have not been conducted for any of the four species of *Mesoplodon* in the western North Atlantic (Waring et al., 2014).

A trend analysis for Cuvier's beaked whale was conducted for data from 2003 to 2018, but the statistical power of this analysis is limited due to the available data (Hayes et al., 2021). Further analysis and additional data are required to determine a true change in abundance versus a distributional shift across the Gulf of Mexico (Hayes et al., 2020). There are insufficient data to determine population trends for Blainville's and Gervais' beaked whales in the northern Gulf of Mexico.

4.1.2.4 Northern Bottlenose Whale (*Hyperoodon ampullatus*)

4.1.2.4.1 Status and Management

There are two populations of northern bottlenose whales in the western North Atlantic: one on the Scotian Shelf in the area referred to as the Gully and a second in Davis Strait off northern Labrador. The Gully is a unique ecosystem that appears to have long provided a stable year-round habitat for a distinct population of bottlenose whales (Dalebout et al., 2006). The Scotian Shelf population of northern bottlenose whales is listed as endangered by the Committee on the Status of Endangered Wildlife in Canada and the Davis Strait-Baffin Bay-Labrador Sea population is designated as a population of special concern (Committee on the Status of Endangered Wildlife in Canada, 2011).

4.1.2.4.2 Habitat and Geographic Range

Northern bottlenose whales are largely a deep-water species and seldom found in waters less than 2,000 m deep (Mead, 1989b). Distribution is concentrated in areas of high relief, including shelf breaks and submarine canyons.

Northern bottlenose whales are commonly found in the Labrador Current and likely occur in the Gulf Stream open-ocean areas. The Gully straddles the Scotian Shelf and Gulf Stream areas.

Northern bottlenose whales are distributed in the North Atlantic primarily from Nova Scotia to about 70° in the Davis Strait, along the east coast of Greenland to 77°, and from England to the west coast of Spitzbergen (Waring et al., 2015). There are two main centers of bottlenose whale distribution in the western North Atlantic: the Scotian Shelf (including the Gully), and Davis Strait off northern Labrador (Reeves et al., 1993). Genetic studies have shown that these two populations are likely distinct from one another (Dalebout et al., 2006). Northern bottlenose whales have been sighted in deep waters off New England but are uncommon in U.S. waters. Strandings have occurred as far south as North Carolina, although that is outside of the natural range or at the edge of the southern range for this more subarctic species (Jefferson et al., 2008; Jefferson et al., 2015; MacLeod et al., 2006).

4.1.2.4.3 Population Trends

There is insufficient data to determine the population trends for this species (Waring et al., 2015).

4.1.2.5 Atlantic Spotted Dolphin (*Stenella frontalis*)

4.1.2.5.1 Status and Management

The Atlantic spotted dolphin occurs in two forms that may be distinct subspecies (Perrin, 2008a; Perrin et al., 1987; Rice, 1998): the large, heavily spotted form, which inhabits the continental shelf and is usually found inside or near the 200-m isobath; and the smaller, less spotted island and offshore form, which occurs in the Atlantic Ocean but is not known to occur in the Gulf of Mexico (Fulling et al., 2003; Mullin & Fulling, 2003, 2004). The western North Atlantic population is considered a separate stock from the Gulf of Mexico stock(s) for management purposes based on genetic analysis (Waring et al., 2014; Hayes et al., 2021). The Puerto Rico and U.S. Virgin Islands population is also considered a separate stock, although there is currently no information to differentiate this stock from the Atlantic Ocean and Gulf of Mexico stocks.

4.1.2.5.2 Habitat and Geographic Range

The Atlantic spotted dolphin is found in tropical to warm-temperate waters, predominantly over the continental shelf and upper slope (Waring et al., 2013, 2014). In the eastern Gulf of Mexico, for instance, the species often occurs over the mid-shelf (Griffin & Griffin, 2003). In the western Atlantic, this species is distributed from New England to Brazil and is found in the Gulf of Mexico as well as the Caribbean Sea (Perrin, 2008a). Atlantic spotted dolphins may occur in the Gulf Stream open-ocean area.

The large, heavily spotted coastal form of the Atlantic spotted dolphin typically occurs over the continental shelf but is often at least several miles offshore (Davis et al., 1998; Perrin, 2002, 2008a). Atlantic spotted dolphin sightings have been concentrated in the slope waters north of Cape Hatteras, but in the shelf waters south of Cape Hatteras, sightings extend into the deeper slope and offshore waters of the mid-Atlantic (Mullin & Fulling, 2003; Waring et al., 2014). Vessel surveys conducted between January 2009 and December 2014 offshore of Cape Hatteras, North Carolina resulted in multiple sightings of Atlantic spotted dolphins annually (Foley et al., 2015). Vessel surveys conducted from 2016 to 2021 offshore of Virginia Beach, VA sighted this species a total of 36 times, with 2 to 12 sightings annually (OBIS-SEAMAP 2024). Aerial surveys in the Norfolk Canyon area detected Atlantic spotted dolphins between April and October of 2016 through 2019, with sightings of both inshore and offshore ecotypes (Cotter, 2019). Aerial and shipboard surveys conducted between 2007 and 2010 in offshore waters of Onslow Bay, North Carolina, indicate that spotted dolphins have a strong preference for waters over the continental shelf and do not typically occur beyond the shelf break (Read et al., 2014). Numerous re-sightings of multiple individuals over several years and across seasons supports the existence of considerable fine-scale population structure and a degree of residency for Atlantic spotted dolphins in Onslow Bay (Swaim et al., 2014).

Photo-identification catalogs of Atlantic spotted dolphins from Cape Hatteras, Onslow Bay, and Jacksonville survey areas have been compared, but no matches have been identified (Foley et al., 2015; Swaim et al., 2014) suggesting a high degree of residency to these areas. Atlantic spotted dolphins were one of the dominant species sighted during vessel surveys conducted along the continental shelf break and pelagic waters offshore of Jacksonville, Florida from July 2009 through December 2013 (Swaim et al., 2014). Sightings were restricted to the relatively shallow shelf waters of the survey area.

Higher numbers of spotted dolphins are reported over the west Florida continental shelf from November to May than during the rest of the year, suggesting that this species may migrate seasonally (Griffin & Griffin, 2003).

In the Gulf of Mexico, Atlantic spotted dolphins occur primarily from continental shelf waters 10-200 m deep to slope waters greater than 500 m deep (Fulling et al., 2003; Maze-Foley & Mullin, 2006; Mullin & Fulling, 2004). Atlantic spotted dolphins were seen in all seasons during GulfCet aerial surveys of the northern Gulf of Mexico from 1992 to 1998 (Hansen et al., 1996; Mullin & Hoggard, 2000).

4.1.2.5.3 Population Trends

A trend analysis has been conducted for the North Atlantic stock of Atlantic spotted dolphins, using data from surveys in 2004, 2011, and 2016 (Hayes et al., 2020). A significant decrease in population size was detected; however, the analysts noted uncertainty in whether interannual abundance changes are related to the population size or changes in spatial distribution due to environmental variation.

There are insufficient data to determine the population trends for the Northern Gulf of Mexico stock of Atlantic spotted dolphins (Waring et al., 2013) and for the Puerto Rico and U.S. Virgin Islands stock of Atlantic spotted dolphins (Waring et al., 2012).

4.1.2.6 Atlantic White-Sided Dolphin (*Lagenorhynchus acutus*)

4.1.2.6.1 Status and Management

Three population units of Atlantic white-sided dolphins in the western North Atlantic Ocean are suggested for conservation management of this stock: Gulf of Maine, Gulf of St. Lawrence, and Labrador Sea (Palka et al., 1997; Waring et al., 2004). Evidence for stock differentiation between the Gulf of Maine and Gulf of St. Lawrence comes from reduced summer sightings along the eastern side of Nova Scotia (Hayes et al., 2020). No genetic analysis has been done to confirm this separation. The species is considered abundant in the North Atlantic (Jefferson et al., 2008; Waring et al., 2013).

A proposed taxonomic revision for this species is in progress (Hayes et al., 2020; Vollmer et al., 2019). However, until the new classification is officially accepted, the current species names will be used.

4.1.2.6.2 Habitat and Geographic Range

This species is found primarily in cold temperate to subpolar continental shelf waters to the 328 ft. (100 m) depth contour (Cetacean and Turtle Assessment Program, 1982; Mate et al., 1994; Selzer & Payne, 1988). Occurrence of Atlantic white-sided dolphins in the northeastern U.S. probably reflects fluctuations in food availability as well as oceanographic conditions (Palka et al., 1997; Selzer & Payne, 1988). Before the 1970s, Atlantic white-sided dolphins were found primarily offshore in waters over the continental slope; however, since then, they occur primarily in waters over the continental shelf, replacing white-beaked dolphins, which were previously sighted in the area. This shift may have been the result of an increase in sand lance and a decline in herring in continental shelf waters (Payne et al., 1990). Areas of feeding importance are around Cape Cod and on the northwest edge of Georges Bank, in an area defined as the Great South Channel-Jeffreys Ledge corridor (Cetacean and Turtle Assessment Program, 1982; Palka et al., 1997). Selzer and Payne (1988) sighted white-sided dolphins more frequently in areas of high seafloor relief and where sea surface temperatures and salinities were low, although these environmental conditions might be only secondarily influencing dolphin distribution; seasonal variation in sea surface temperature and salinity as well as local nutrient upwelling in areas of high seafloor relief may affect preferred prey abundances, which in turn might affect dolphin distribution (Selzer & Payne, 1988).

Atlantic white-sided dolphins would be expected to occur in the Labrador Current and possibly in the northern extent of the Gulf Stream open-ocean area. Atlantic white-sided dolphins are common in waters of the continental slope from New England to southern Greenland (Cipriano, 2008; Jefferson et al., 2008; Jefferson et al., 2015). Along the Canadian and U.S. Atlantic coast, this species is most common from Hudson Canyon north to the Gulf of Maine (Palka et al., 1997). From January to May, low numbers of white-sided dolphins may be found from Georges Bank to Jeffreys Ledge. Even lower numbers are found south of Georges Bank (Palka et al., 1997; Payne et al., 1990; Waring et al., 2004). From June through September, large numbers of white-sided dolphins are found from Georges Bank to the lower Bay of Fundy (Payne et al., 1990; Waring et al., 2004). During this time, strandings occur from New Brunswick to New York (Palka et al., 1997). From October to December, white-sided dolphins occur at intermediate densities from southern Georges Bank to the southern Gulf of Maine. Sightings occur year-round south of Georges Bank, particularly around Hudson Canyon, but in low densities (Cetacean and Turtle Assessment Program, 1982; Palka, 1997; Payne et al., 1990; Waring et al., 2004). A few strandings were collected on Virginia and North Carolina beaches, which appear to represent the southern edge of the range for this species (Cipriano, 2008).

4.1.2.6.3 Population Trends

A trend analysis has not been conducted for the western North Atlantic stock of Atlantic white-sided dolphins (Waring et al., 2015).

4.1.2.7 Clymene Dolphin (*Stenella clymene*)

4.1.2.7.1 Status and Management

The Clymene dolphin has an extensive range in the tropical Atlantic Ocean. The western North Atlantic and Northern Gulf of Mexico populations are managed as separate stocks.

4.1.2.7.2 Habitat and Geographic Range

Clymene dolphins are a tropical to subtropical species, primarily sighted in deep waters well beyond the edge of the continental shelf (Fertl et al., 2003). Clymene dolphins likely occur in the Gulf Stream open-ocean area.

In the western North Atlantic, Clymene dolphins were observed as far north as New Jersey, although sightings were primarily in offshore waters east of Cape Hatteras over the continental slope and are likely to be strongly influenced by oceanographic features of the Gulf Stream (Fertl et al., 2003; Moreno et al., 2005; Mullin & Fulling, 2003). Vessel and aerial surveys conducted offshore of Cape Hatteras from 2011 through 2017 have resulted in 18 Clymene dolphin sightings during summer and fall, including one sighting of Clymene dolphins in a mixed group of spinner dolphins within the northern offshore waters of the survey area in 2011 (U.S. Department of the Navy, 2013a). Vessel-based surveys offshore of Virginia Beach between 2016 and 2021 did not identify any sightings of this species (OBIS-SEAMAP 2024).

Clymene dolphins in the Gulf of Mexico are observed most frequently on the lower slope and deep-water areas, primarily west of the Mississippi River, in regions of cyclonic or confluent circulation (Davis et al., 2002; Mullin et al., 1994a). Clymene dolphins were seen in the winter, spring, and summer during GulfCet aerial surveys of the northern Gulf of Mexico during 1992 to 1998 (Hansen et al., 1996; Mullin & Hoggard, 2000).

4.1.2.7.3 Population Trends

There are insufficient data to determine population trends for the western North Atlantic stock of Clymene dolphins (Waring et al., 2013, 2014). In the Gulf of Mexico, a trend analysis documented significant differences between abundance estimates in 2004, 2009, and 2017 (Hayes et al., 2021). However, the statistical power in this analysis is low due to lack of annual survey data, and it is not possible to determine whether the results indicate a change in abundance versus a change in distribution of the animals throughout the Gulf of Mexico (Hayes et al., 2021).

4.1.2.8 Common Bottlenose Dolphin (*Tursiops truncatus*)

4.1.2.8.1 Status and Management

There are currently 53 management stocks identified by NMFS in the western North Atlantic and Gulf of Mexico, including oceanic, coastal, and estuarine stocks (Hayes et al., 2021). Most stocks in the Study Area are designated as strategic or depleted under the MMPA. For a complete listing of currently identified stocks within the Study Area, see Table 3.1-1 (Marine Mammal Occurrence Within the Study Area).

4.1.2.8.2 Habitat and Geographic Range

The bottlenose dolphin occurs in tropical to temperate waters of the Atlantic Ocean as well as inshore, nearshore, and offshore waters of the Gulf of Mexico and U.S. east coast (Hayes et al., 2021). They generally do not range north or south of 45° latitude (Jefferson et al., 2008; Jefferson et al., 2015; Wells & Scott, 2008). They occur in most enclosed or semi-enclosed seas in habitats ranging from shallow, murky, estuarine waters to deep, clear offshore waters in oceanic regions (Jefferson et al., 2008; Jefferson et al., 2015; Wells et al., 2009). Open-ocean populations occur far from land; however, population density appears to be highest in nearshore areas (Scott & Chivers, 1990). Bottlenose dolphins occur in the North Atlantic Gyre and Gulf Stream open-ocean areas.

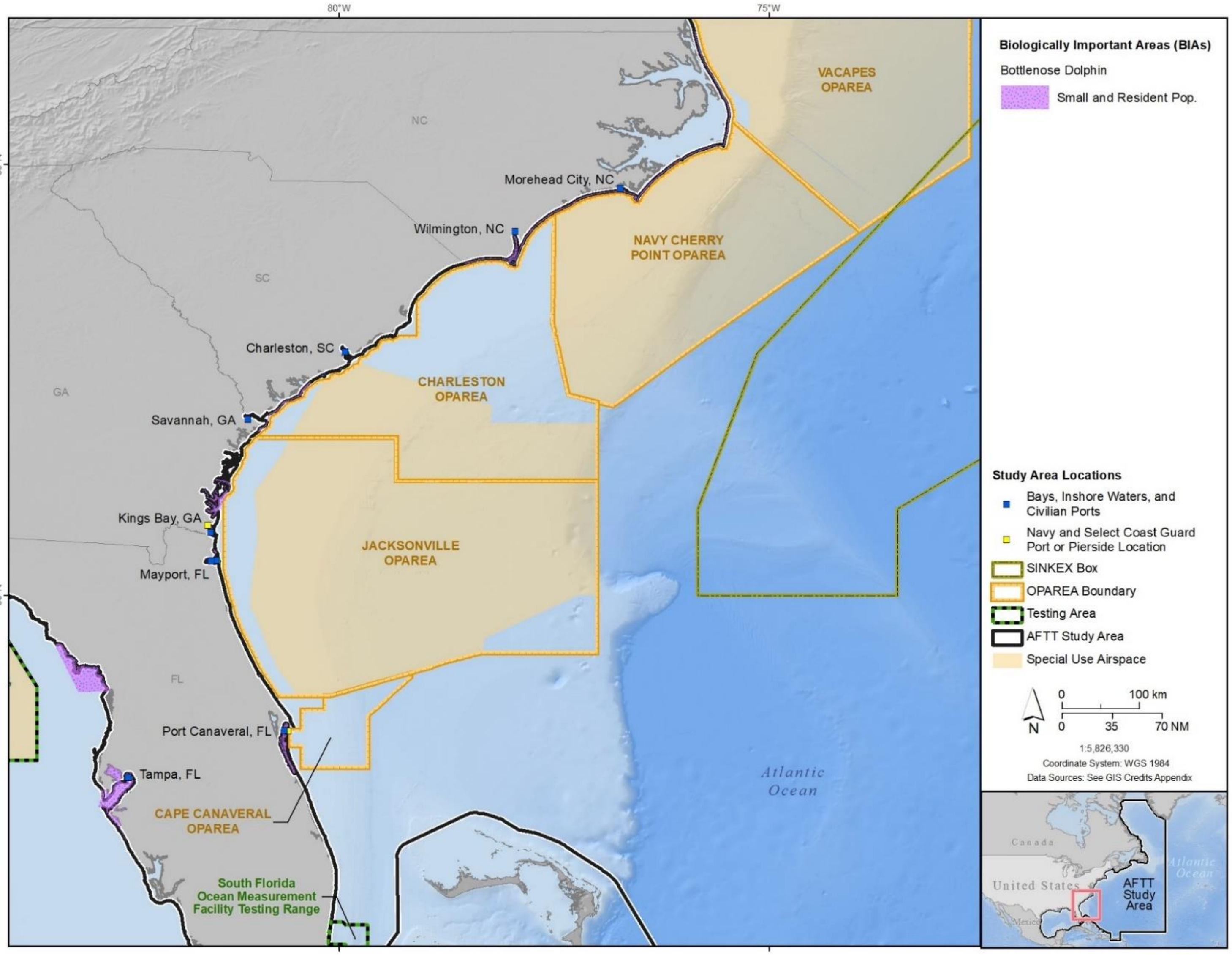
There are two morphologically and genetically distinct bottlenose dolphin morphotypes (distinguished by physical differences) (Duffield et al., 1983) described as coastal and offshore forms. In a decade-long collaborative study using DNA and morphological data, it has recently been proposed that the coastal form is a separate species than their offshore counterparts, and are more closely related to coastal populations from the Gulf of Mexico and Caribbean. While a definitive distinction as a separate species has yet to be codified, the coastal form are currently being referred to as a Tamaend's bottlenose dolphin (*Tursiops erebennus*) (Costa et al., 2022). Both inhabit waters in the western North Atlantic Ocean and Gulf of Mexico (Curry & Smith, 1997; Hersh & Duffield, 1990; Mead & Potter, 1995) along the U.S. Atlantic coast. The coastal morphotype of bottlenose dolphin is continuously distributed along the Atlantic coast south of Long Island, New York, around the Florida peninsula, and along the Gulf of Mexico coast. The range of the offshore bottlenose dolphin includes waters beyond the continental slope (Kenney, 1990), and offshore bottlenose dolphins may transit between the Gulf of Mexico and the Atlantic (Wells et al., 1999). Dolphins with characteristics of the offshore ecotype have stranded as far south as the Florida Keys.

In Canadian waters, bottlenose dolphins were occasionally sighted on the Scotian Shelf, particularly in the Gully (Gowans & Whitehead, 1995). Seasonally, bottlenose dolphins occur over the outer continental shelf and inner slope as far north as Georges Bank (Cetacean and Turtle Assessment Program, 1982; Kenney, 1990). Sightings occurred along the continental shelf break from Georges Bank to Cape Hatteras during spring and summer (Cetacean and Turtle Assessment Program, 1982; Kenney, 1990).

Several lines of evidence support a distinction between coastal stock dolphins and those present primarily in the inshore waters of the bays, sounds, and estuaries (LaBrecque et al., 2015b). Photo-identification and genetic studies support the existence of more than 40 stock populations in bays, sounds, and estuaries. These populations inhabit estuaries and bays from North Carolina to the Gulf of

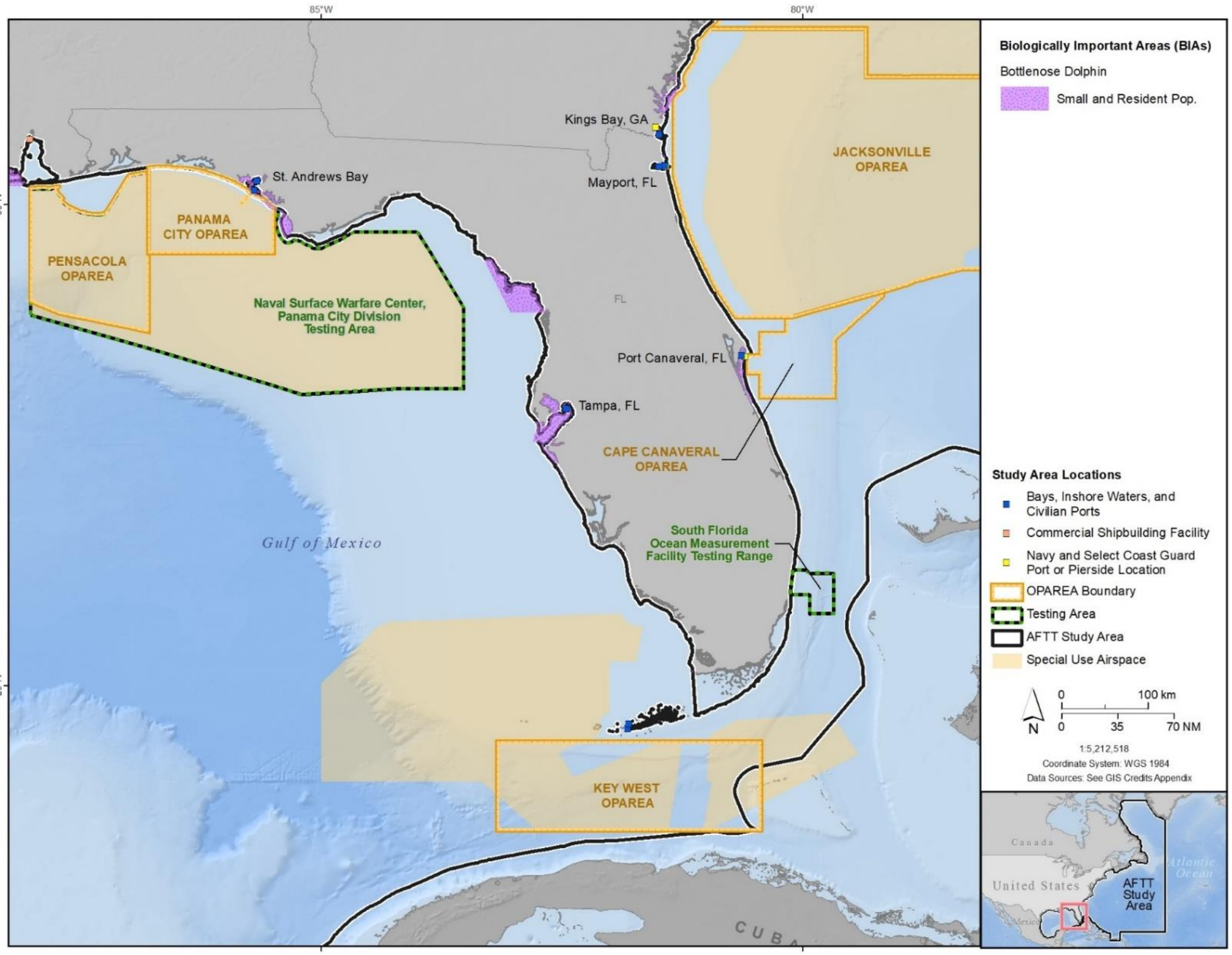
Mexico coast (Caldwell, 2001; Gubbins, 2002; Gubbins et al., 2003; Litz, 2007; Mazzoil et al., 2005; Zolman, 2002).

LaBrecque et al. (2015a) identified nine small and resident bottlenose dolphin population ranges within estuarine areas along the U.S. east coast (Figure 4.1-11 and Figure 4.1-12). These ranges include estuarine and nearshore areas extending from Pamlico Sound, North Carolina down to Florida Bay, Florida and were substantiated through vessel- and aerial-based survey data, photo-identification data, genetic analyses, and expert judgment (LaBrecque et al., 2015a). The Northern North Carolina, Southern North Carolina, and Charleston Harbor Populations partially overlap with nearshore portions of the Navy Cherry Point Range Complex, while the Jacksonville Estuarine System Populations partially overlap with nearshore portions of the Jacksonville Range Complex. The Southern Georgia Estuarine System Population also overlaps with the Jacksonville Range Complex, specifically within Naval Submarine Base Kings Bay, Georgia and includes estuarine and intracoastal waterways from Altamaha Sound to the Cumberland River (LaBrecque et al., 2015a). The remaining four biologically important areas are outside but adjacent to the Study Area boundaries.



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

Figure 4.1-11: Biologically Important Areas for Bottlenose Dolphins in the Study Area - Southeast



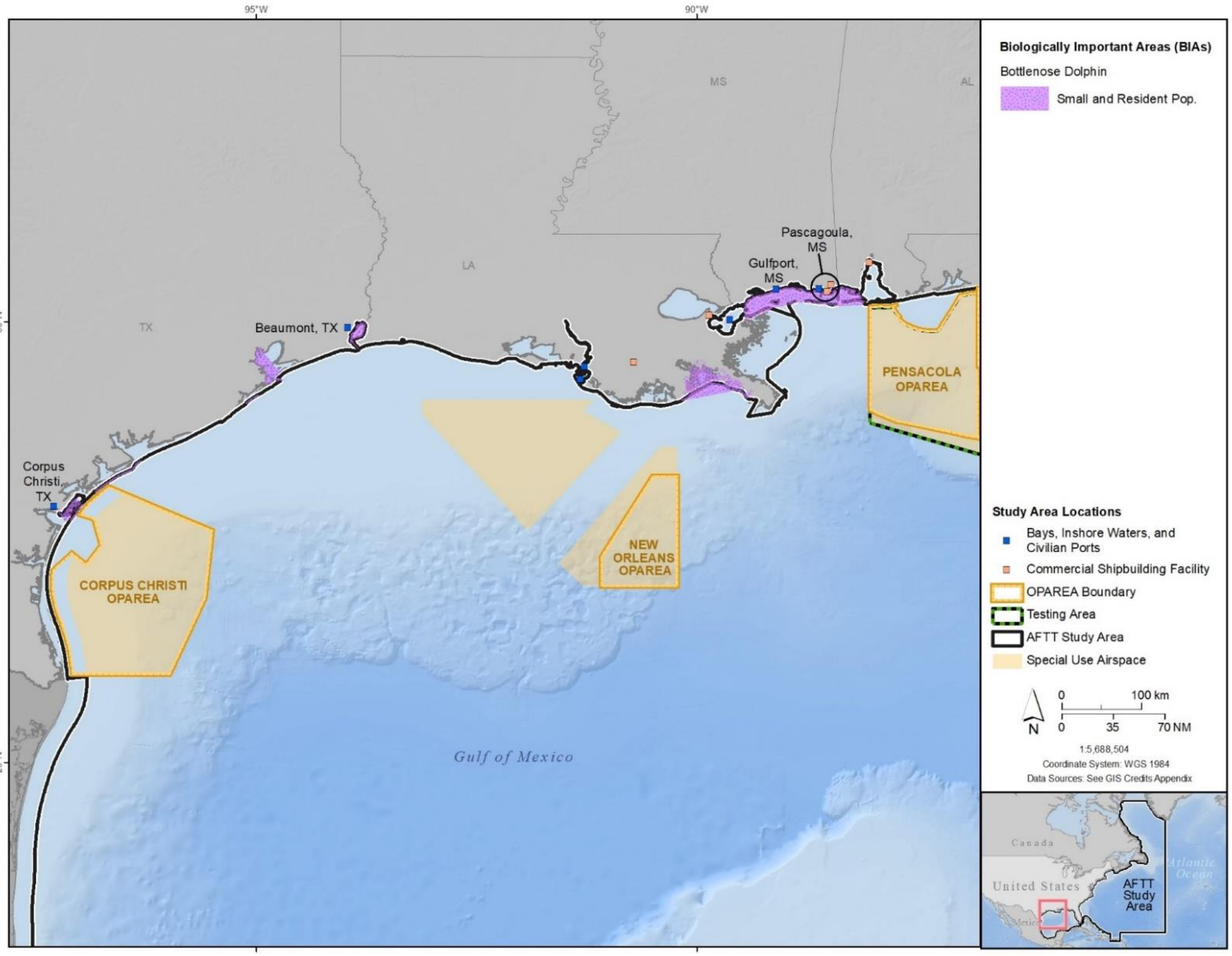
Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area

Figure 4.1-12: Biologically Important Areas for Bottlenose Dolphins in the Study Area – South Florida and Gulf of Mexico

Off the coast of Virginia within the Study Area, three stocks of bottlenose dolphins are common in the waters of Chesapeake Bay and along the state's coastline. Engelhaupt et al. (2022) established dolphin density was highest inshore during the warmer months from June to November, although more than 200 individuals remained present during the winter and spring months, which had not been previously considered or reported (Barco et al., 1999; Winn, 1982). Photo identification results indicate bottlenose dolphin presence in this area consist of short-term visits, with 82.9 percent of individuals sighted only once, while re-sightings in the Cape Henry region show clear indication of localized site fidelity with overlapping ranges of individual stocks (Engelhaupt et al., 2022).

In the Gulf of Mexico alone, 32 distinct stocks are recognized, although the structure of these stocks is uncertain but appears to be complex. Residency patterns of dolphins in bays, sounds, and estuaries range from transient, seasonally migratory, and stable resident communities, where various stocks may overlap at times. Year-round residency patterns of some individual bottlenose dolphins in bays, sounds, and estuaries have been reported for almost every survey area where photo-identification or tagging studies have been conducted.

LaBrecque et al. (2015b) delineated 11 small and resident population areas for bottlenose dolphins within the Gulf of Mexico (Figure 4.1-13). These areas include bays, sounds, and estuaries ranging from Aransas Pass, Texas to the Florida Keys, Florida and were substantiated through a combination of extensive photo-identification data, genetic analyses, radio-tracking data, and expert knowledge (LaBrecque et al., 2015b). Of the 11 biologically important areas identified for bottlenose dolphins in the Gulf of Mexico, three overlap with the Gulf of Mexico Range Complex (Aransas Pass Area, Texas; Mississippi Sound Area, Mississippi; and St. Joseph Bay Area, Florida) and eight are located adjacent to the Study Area boundaries.



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

Figure 4.1-13: Biologically Important Areas for Bottlenose Dolphins in the Study Area – Gulf of Mexico

4.1.2.8.3 Population Trends

Trend analyses have been conducted for the Western North Atlantic Northern and Southern Migratory Coastal stocks. While power is limited to detect a trend in either stock separately, a combined analysis indicates a potential decline in population over the last two decades (Hayes et al., 2021).

A trend analysis has not been conducted for the following stocks of bottlenose dolphins: Northern North Carolina Estuarine System stock; Southern North Carolina Estuarine System stock; Western North Atlantic Offshore stock and Northern Gulf of Mexico Oceanic (Waring et al., 2015).

There are insufficient data to determine the population trends for the following stocks of bottlenose dolphins: Northern Gulf of Mexico Continental Shelf stock; Northern South Carolina Estuarine System stock; Charleston Estuarine System stock; Northern Georgia/Southern South Carolina Estuarine System stock; Central Georgia Estuarine System stock; Southern Georgia Estuarine System stock; Jacksonville Estuarine System stock; Indian River Lagoon Estuarine System stock; Biscayne Bay stock; Florida Bay stock; Gulf of Mexico Eastern Coastal stock; Gulf of Mexico Northern Coastal stock; Gulf of Mexico Western Coastal stock; most of the Northern Gulf of Mexico Bay, Sound, and Estuary stocks; Barataria Bay Estuarine System stock; Mississippi Sound stock; Lake Borgne Bay Boudreau stock; St. Joseph Bay stock; Choctawhatchee Bay stock; and Puerto Rico and U.S. Virgin Islands stock (Waring et al., 2012; Waring et al., 2015).

There are limited data available to assess population trends for the following stocks of bottlenose dolphins: Western North Atlantic South Carolina-Georgia Coastal stock, Western North Atlantic Northern Florida Coastal stock, and Western North Atlantic Central Florida Coastal stock (Waring et al., 2013, 2014).

4.1.2.9 Common Dolphin (*Delphinus delphis/capensis*)

4.1.2.9.1 Status and Management

A discrete population of long-beaked common dolphins is known from the east coast of South America in the western Atlantic (Jefferson et al., 2008; Jefferson et al., 2015) however, only the short-beaked common dolphin (*D. delphis delphis*) is found within the Study Area: the western North Atlantic stock (Jefferson et al., 2009; Waring et al., 2013).

4.1.2.9.2 Habitat and Geographic Range

In the North Atlantic, common dolphins occur over the continental shelf along the 100- to 2,000-m isobaths and over prominent underwater topography and east to the mid-Atlantic Ridge (29°W) (Doksaeter et al., 2008; Waring et al., 2008). There is a well-studied population of short-beaked common dolphins in the western North Atlantic associated with the Gulf Stream (Jefferson et al., 2009). It occurs mainly in offshore waters, ranging from Canada maritime provinces to the Florida/Georgia border (Waring et al., 2010).

In waters off the northeastern U.S. coast, common dolphins are distributed along the continental slope and are associated with Gulf Stream features (Cetacean and Turtle Assessment Program, 1982; Hamazaki, 2002; Selzer & Payne, 1988). They primarily occur from Cape Hatteras northeast to Georges Bank (35° to 42°N) during mid-January to May (Cetacean and Turtle Assessment Program, 1982; Hain et al., 1981). Common dolphins move onto Georges Bank and the Scotian Shelf from mid-summer to autumn. Selzer and Payne (1988) reported very large aggregations (greater than 3,000 animals) on Georges Bank in autumn. Common dolphins are occasionally found in the Gulf of Maine (Selzer & Payne, 1988). Migration onto the Scotian Shelf and continental shelf off Newfoundland occurs during summer and autumn when water temperatures exceed 11°Celsius (C) (Gowans & Whitehead, 1995). The species is less common south of Cape Hatteras, although schools were reported as far south as the Georgia/South Carolina border (32° N) (Jefferson et al., 2009).

A single location-only satellite telemetry tag was deployed on a short-beaked common dolphin offshore of Cape Hatteras in June 2014, and location data were obtained over a 40-day period. This individual was observed to remain primarily over the continental shelf break and continental slope, and traveled north away from the tagging location to shallower continental shelf waters off New England during the mid-summer (Baird et al., 2015). The median depth of tagged animal locations over the 40-day span was 297 m (Baird et al., 2015).

Vessel based surveys offshore of Virginia Beach between 2016 and 2021 detected common dolphins frequently; as many as 46 encounters were reported annually (Engelhaupt et al., 2022). This was the third most common species encountered during these surveys, with 154 total sightings over the survey period. Aerial surveys of the Norfolk Canyon area detected common dolphins frequently between 2016 and 2019 (Cotter, 2019), with sightings of large groups (> 500 individuals) in waters beyond the shelf break.

4.1.2.9.3 Population Trends

A trend analysis has not been conducted for the western North Atlantic stock of common dolphins (Hayes et al., 2021).

4.1.2.10 False Killer Whale (*Pseudorca crassidens*)

4.1.2.10.1 Status and Management

Little is known of the status of most false killer whale populations around the world. While the species is not considered rare, few areas of high density are known. The population found in the Gulf of Mexico is considered a separate stock from the western North Atlantic stock for management purposes; however, there are no genetic data to differentiate between the two stocks (Waring et al., 2013).

4.1.2.10.2 Habitat and Geographic Range

False killer whales occur worldwide throughout warm temperate and tropical oceans in deep open-ocean waters and around oceanic islands and only rarely come into shallow coastal waters (Baird et al., 2008; Leatherwood & Reeves, 1983; Odell & McClune, 1999). Occasional inshore movements are associated with movements of prey and shoreward flooding of warm ocean currents.

False killer whales have been sighted in U.S. Atlantic waters from southern Florida to Maine (Schmidly, 1981b), with periodic records (primarily stranding) from southern Florida to Cape Hatteras dating back to 1920 (Schmidly, 1981b). There are 28 records of false killer whale sightings in the western North Atlantic (Halpin et al., 2009) dating back to 1971 (Halpin et al., 2009), with group sizes ranging from 1 to 30 animals. Nine of these sightings occurred between 2000 and 2021 (Halpin et al., 2009). One additional sighting of 11 animals occurred during a shipboard survey conducted in summer 2011 (Hayes et al., 2021). Deployment of high frequency acoustic recording packages offshore of Cape Hatteras, Onslow Bay, Jacksonville and the offshore areas near Norfolk Canyon from 2009 through 2015 have resulted in zero false killer whale detections.

Sightings of this species in the northern Gulf of Mexico (i.e., U.S. Gulf of Mexico) occur in oceanic waters, primarily in the eastern Gulf (Maze-Foley & Mullin, 2006; Mullin & Fulling, 2004). False killer whales were seen only in the spring and summer during GulfCet aerial surveys of the northern Gulf of Mexico between 1992 and 1998 (Hansen et al., 1996; Mullin & Hoggard, 2000) and in the spring during vessel surveys (Mullin et al., 2004). There are 17 records of false killer whale sightings in the Gulf of Mexico in

OBIS- SEAMAP, dating back to 1987 (Halpin et al., 2009), with group sizes ranging from 3 to 70 individuals. Six of these sightings occurred between 2000 and 2021 (Halpin et al., 2009).

4.1.2.10.3 Population Trends

There are insufficient data to determine population trends for the western North Atlantic stock of false killer whales (Hayes et al., 2021). While a trend analysis has been conducted for the northern Gulf of Mexico stock of false killer whales, the confidence is low due to imprecise abundance estimates and long intervals between surveys (Waring et al., 2013). Additionally, a Gulf-wide assessment of false killer whale abundance has not been made (Waring et al., 2013).

4.1.2.11 Fraser's Dolphin (*Lagenodelphis hosei*)

4.1.2.11.1 Status and Management

The Gulf of Mexico population of Fraser's dolphin is provisionally being considered a separate stock for management purposes, although there are no genetic data to differentiate this stock from the western North Atlantic stock (Waring et al., 2013).

4.1.2.11.2 Habitat and Geographic Range

Fraser's dolphin is a tropical, oceanic species, except where deep water approaches the coast (Dolar, 2008). Fraser's dolphins likely occur in the Gulf Stream open ocean area.

This species is assumed to occur in the tropical western North Atlantic, although only a single sighting of approximately 250 individuals was recorded in waters 3,300 m deep off Cape Hatteras during a 1999 vessel survey. Monthly aerial surveys offshore of Cape Hatteras from 2011 to 2017 resulted in only one sighing of Fraser's dolphins offshore of the 1,500 m isobaths (U.S. Department of the Navy, 2013a). The first record for the Gulf of Mexico was a mass stranding in the Florida Keys in 1981 (Hersh & Odell, 1986; Leatherwood et al., 1993). Since then, there have been documented strandings on the west coast of Florida and in southern Texas (Yoshida et al., 2010). Sightings of Fraser's dolphin in the northern Gulf of Mexico typically occur in oceanic waters greater than 200 m. This species was observed in the northern Gulf of Mexico during all seasons.

4.1.2.11.3 Population Trends

There are insufficient data to determine population trends for the western North Atlantic stock of Fraser's dolphins (Waring et al., 2007).

There are also insufficient data to determine population trends for the northern Gulf of Mexico stock of Fraser's dolphins. The large relative changes in the total abundances of Fraser's dolphin are probably due to a number of factors. Fraser's dolphin is most certainly a resident species in the Gulf of Mexico but probably occurs in low numbers, and the survey effort is not sufficient to estimate the abundance of uncommon or rare species with precision. Also, these temporal abundance estimates are difficult to interpret without a Gulf of Mexico-wide understanding of Fraser's dolphin abundance. Studies based on abundance and distribution surveys restricted to U.S. waters are unable to detect temporal shifts in distribution beyond U.S. waters that might account for any changes in abundance (Waring et al., 2013).

4.1.2.12 Killer Whale (*Orcinus orca*)

4.1.2.12.1 Status and Management

Although some populations of killer whales, particularly in the Pacific Northwest, are extremely well studied, little is known about killer whale populations in most areas including the northwest Atlantic and Gulf of Mexico. Killer whales are apparently not highly abundant anywhere but are observed in higher concentration in Antarctic waters. For management purposes, the western North Atlantic population and Gulf of Mexico population are considered separate stocks (Waring et al., 2010, 2013; Hayes et al., 2021).

4.1.2.12.2 Habitat and Geographic Range

Killer whales are found in all marine habitats, from the coastal zone (including most bays and inshore channels) to deep oceanic basins and from equatorial regions to the polar pack ice zones of both hemispheres. Although killer whales are also found in tropical waters and the open ocean, they are generally most numerous in coastal waters and at higher latitudes (Dahlheim & Heyning, 1999). Killer whales are likely found in Labrador Current, Gulf Stream, and North Atlantic Gyre open ocean areas.

Killer whales are considered rare and uncommon in waters of the U.S. EEZ in the Atlantic Ocean (Katona et al., 1988; Waring et al., 2010, 2013). During the 1978 to 1981 Cetacean and Turtle Assessment Program surveys, there were 12 killer whale sightings, which made up 0.1 percent of the 11,156 cetacean sightings in the surveys (Cetacean and Turtle Assessment Program, 1982; Waring et al., 2010, 2013). Nearshore observations are rare. Forty animals were observed in the southern Gulf of Maine in September 1979 and 29 animals in Massachusetts Bay in August 1986 (Katona et al., 1988). Deployment of high frequency acoustic recording packages offshore of Cape Hatteras, Onslow Bay, Jacksonville and the offshore areas near Norfolk Canyon from 2007 through 2022 have resulted in zero killer whale detections (Hildebrand et al., 2018; Van Parijs et al., 2023).

Sightings of killer whales in the Gulf of Mexico on surveys from 1921 to 1995 were in water depths ranging from 840 to 8,700 ft., with an average of 4,075 ft., and were most frequent in the north-central region of the Gulf of Mexico (Waring et al., 2010, 2013). Killer whales were seen only in the summer during GulfCet aerial surveys of the northern Gulf of Mexico between 1992 and 1998 (Hansen et al., 1996; Mullin & Hoggard, 2000), were reported from May through June during vessel surveys (Maze-Foley & Mullin, 2006; Mullin & Fulling, 2004) and recorded in May, August, September and November by earlier opportunistic ship-based sources (O'Sullivan & Mullin, 1997).

4.1.2.12.3 Population Trends

There are insufficient data to determine population trends for the western North Atlantic and Gulf of Mexico stocks of killer whales (Waring et al., 2013).

4.1.2.13 Long-Finned Pilot Whale (*Globicephala melas*)

4.1.2.13.1 Status and Management

The structure of the Western North Atlantic stock of long-finned pilot whales is uncertain (Fullard et al., 2000; International Council of the Exploration of the Sea, 1993). Morphometric (Bloch & Lastein, 1993) and genetic (Fullard et al., 2000) studies have provided little support for stock structure across the Atlantic (Fullard et al., 2000). However, Fullard et al. (2000) have proposed a stock structure that is related to sea-surface temperature: (1) a cold-water population west of the Labrador/North Atlantic Current and (2) a warm-water population that extends across the Atlantic in the Gulf Stream. The area of overlap between the long-finned and short-finned pilot whales occurs primarily along the shelf break off the coast of New Jersey between 38°N and 40°N latitude (Hayes et al., 2021).

4.1.2.13.2 Habitat and Geographic Range

Long-finned pilot whales occur along the continental shelf break, in continental slope waters, and in areas of high topographic relief, inhabiting temperate and subpolar zones from North Carolina to North Africa (and the Mediterranean) and north to Iceland, Greenland and the Barents Sea (Abend & Smith, 1999; Buckland et al., 1993; Leatherwood et al., 1976). Long-finned pilot whales are likely found in the Gulf Stream and Labrador Current open ocean areas, and might be found in the North Atlantic Gyre.

In U.S. Atlantic waters, pilot whales (*Globicephala* spp.) are distributed principally along the continental shelf edge off the northeastern U.S. coast in winter and early spring, moving onto Georges Bank and into the Gulf of Maine and more northern waters in late spring (Abend & Smith, 1999; Cetacean and Turtle Assessment Program, 1982; Hamazaki, 2002; Payne & Heinemann, 1993). They remain in these areas through late autumn (Cetacean and Turtle Assessment Program, 1982; Payne & Heinemann, 1993). Pilot whales tend to occupy areas of high relief or submerged banks. They are also associated with the Gulf Stream wall and thermal fronts along the continental shelf edge. Long- and short-finned pilot whales overlap spatially along the mid-Atlantic shelf break between Cape Hatteras, North Carolina, and New Jersey (Payne & Heinemann, 1993).

4.1.2.13.3 Population Trends

A trend analysis has not been conducted for the western North Atlantic stock of long-finned pilot whales (Hayes et al., 2021)

4.1.2.14 Melon-Headed Whale (*Peponocephala electra*)

4.1.2.14.1 Status and Management

For management purposes, the western North Atlantic population and Gulf of Mexico population of melon-headed whales are considered separate stocks, although genetic data that differentiate these two stocks is lacking (Waring et al., 2007; Waring et al., 2010, 2013).

4.1.2.14.2 Habitat and Geographic Range

Melon-headed whales are found worldwide in tropical and subtropical waters. They are occasionally reported at higher latitudes, but these movements are considered to be beyond their typical range because the records indicate these movements occurred during incursions of warm water currents (Perryman et al., 1994). Melon-headed whales are most often found in offshore deep waters, and could occur in the southern parts of the Gulf Stream and North Atlantic Gyre open ocean areas.

Sightings of whales from the Western North Atlantic stock are rare, but a group of 20 whales was sighted during surveys in 1999 offshore of Cape Hatteras, and a group of 80 whales was also sighted off Cape Hatteras in 2002, in waters greater than 2,500 m deep (Waring et al., 2013). Deployment of high frequency acoustic recording packages offshore of Cape Hatteras, Onslow Bay, Jacksonville and the offshore areas near Norfolk Canyon from 2009 through 2015 have resulted in zero melon-headed whale detections.

This species was observed in deep waters of the Gulf of Mexico, well beyond the edge of the continental shelf and in waters over the abyssal plain, primarily west of Mobile Bay, Alabama (Davis & Fargion, 1996; Mullin et al., 1994c; Waring et al., 2010, 2013). Sightings of melon-headed whales in the northern Gulf of Mexico were documented in all seasons during GulfCet aerial surveys 1992 and 1998 (Hansen et al., 1996; Mullin & Hoggard, 2000).

4.1.2.14.3 Population Trends

There are insufficient data to determine the population trends for the Western North Atlantic stock of melon-headed whales (Waring et al., 2007).

While abundance estimates for the Gulf of Mexico exist, there were no significant differences between survey years (Garrison et al., 2020), and the statistical power to detect a trend in abundance for this stock is poor due to the relatively imprecise abundance estimates and long intervals between surveys.

4.1.2.15 Pantropical Spotted Dolphin (*Stenella attenuata*)

4.1.2.15.1 Status and Management

The western North Atlantic and northern Gulf of Mexico populations are considered separate stocks for management purposes, although there is currently not enough information to distinguish them (Hayes et al., 2021).

4.1.2.15.2 Habitat and Geographic Range

The pantropical spotted dolphin is distributed in offshore tropical and subtropical waters of the Atlantic Ocean between about 40° N and 40° S (Baldwin et al., 1999; Perrin, 2008b). The species is much more abundant in the lower latitudes of its range. It is found mostly in deeper offshore waters but does approach the coast in some areas (Jefferson et al., 2008; Jefferson et al., 2015; Perrin, 2001). Pantropical spotted dolphins may occur in the Gulf Stream open ocean area.

The pantropical spotted dolphin is the most commonly sighted species of cetacean in the oceanic waters of the northern Gulf of Mexico. Pantropical spotted dolphins were seen in all seasons during GulfCet aerial surveys of the northern Gulf of Mexico between 1992 and 1998 (Hansen et al., 1996; Mullin & Hoggard, 2000). Most sightings of this species in the Gulf of Mexico and Caribbean occur over the lower continental slope (Mignucci-Giannoni et al., 2003; Moreno et al., 2005). Pantropical spotted dolphins in the offshore Gulf of Mexico do not appear to have a preference for any one specific habitat type, such as within the Loop Current, inside cold-core eddies, or along the continental slope (Baumgartner et al., 2001). Along the U.S. Atlantic coast, sightings have been concentrated in the slope waters east of New England and Florida (Waring et al., 2014). Sightings during surveys in the Atlantic north of Cape Hatteras have been along the continental slope while in waters south of Cape Hatteras sightings were recorded over the Blake Plateau and in deeper offshore waters of the mid-Atlantic (Hayes et al., 2020).

4.1.2.15.3 Population Trends

There are insufficient data to determine population trends for the western North Atlantic stock of pantropical spotted dolphins, because while there are available coast wide abundance estimates for pantropical spotted dolphins, the high uncertainty in these estimates limits the ability to detect a population trend. In addition, interannual variation in abundance may be caused by either changes in spatial distribution associated with environmental variability or changes in the population size of the stock.

Further analysis of Gulf of Mexico pantropical spotted dolphin survey data from 1991–2009 is required in order to determine whether changes in abundance have occurred (Waring et al., 2015). Additionally, a Gulf-wide assessment of pantropical spotted dolphin abundance has not been made (Waring et al., 2015).

4.1.2.16 Pygmy Killer Whale (*Feresa attenuata*)

4.1.2.16.1 Status and Management

For management purposes, the Gulf of Mexico population of pygmy killer whale is considered a separate stock although there is not yet sufficient genetic information to differentiate this stock from the western North Atlantic stocks (Waring et al., 2007; Waring et al., 2013).

4.1.2.16.2 Habitat and Geographic Range

Although the pygmy killer whale has an extensive global distribution, it is not known to occur in high densities in any region and is, therefore, probably one of the least abundant pantropical delphinids (Waring et al., 2013). The pygmy killer whale is generally an open ocean deepwater species (Davis et al., 2000; Würsig et al., 2000). This species has a worldwide distribution in tropical and subtropical oceans and generally does not range poleward of 40° N or of 35° S (Donahue & Perryman, 2008; Jefferson et al., 2015). This species occurs in the North Atlantic Gyre and the Gulfstream, although sightings are rare. Most observations outside the tropics are associated with strong, warm western boundary currents that effectively extend tropical conditions into higher latitudes (Ross & Leatherwood, 1994).

A group of 6 pygmy killer whales was sighted during a 1992 vessel survey of the western North Atlantic off of Cape Hatteras, North Carolina, in waters greater than 1,500 m deep, but this species was not sighted during subsequent surveys (Waring et al., 2007). Deployment of high frequency acoustic recording packages offshore of Cape Hatteras, Onslow Bay, Jacksonville and the offshore areas near Norfolk Canyon from 2007 through 2022 have resulted in zero pygmy killer whale detections. Strandings are recorded from primarily South Carolina and Georgia, with two from North Carolina and one from Massachusetts (Hayes et al., 2020).

In the northern Gulf of Mexico, the pygmy killer whale is found primarily in deeper waters off the continental shelf and in waters over the abyssal plain (Davis et al., 2000; Würsig et al., 2000). The majority of sightings are in the eastern oceanic Gulf of Mexico in waters ranging from 200 to 1,200 m in depth.

4.1.2.16.3 Population Trends

There are insufficient data to determine population trends for the western North Atlantic stock of pygmy killer whales (Waring et al., 2007).

A trend analysis has not been conducted for the northern Gulf of Mexico stock of pygmy killer whales (Waring et al., 2013). Further analysis of northern Gulf of Mexico pygmy killer whale survey data from 1991–2009 is required in order to determine whether changes in abundance have occurred over this period. Additionally, a Gulf-wide assessment of pygmy killer whale abundance has not been made (Waring et al., 2010, 2013).

4.1.2.17 Risso's Dolphin (*Grampus griseus*)

4.1.2.17.1 Status and Management

For management purposes, Risso's dolphins in the Gulf of Mexico and the Atlantic Ocean are currently considered two separate stocks (Hayes et al., 2021).

4.1.2.17.2 Habitat and Geographic Range

Risso's dolphins are distributed worldwide in tropical and temperate waters along the continental shelf break and over the continental slope and outer continental shelf (Baumgartner, 1997; Canadas et al., 2002; Cetacean and Turtle Assessment Program, 1982; Davis et al., 1998; Green et al., 1992; Kruse et al., 1999; Mignucci-Giannoni, 1998). Risso's dolphins were also found in association with submarine canyons (Mussi et al., 2004). The range of the Risso's dolphin distribution in open-ocean waters of the North Atlantic is known to include the Gulf Stream and the southwestern portions of the North Atlantic Gyre.

In the northwest Atlantic, Risso's dolphins occur from Florida to eastern Newfoundland (Baird & Stacey, 1991; Leatherwood et al., 1976). Off the northeast U.S. coast, Risso's dolphins are distributed along the continental shelf edge from Cape Hatteras northward to Georges Bank during spring, summer, and autumn (Cetacean and Turtle Assessment Program, 1982). In winter, the range is in the mid-Atlantic Bight and extends outward into oceanic waters. In general, the population occupies the mid-Atlantic continental shelf edge year-round and is rarely seen in the Gulf of Maine. During 1990, 1991, and 1993, spring/summer surveys conducted along the continental shelf edge and in deeper oceanic waters sighted Risso's dolphins associated with strong bathymetric features, Gulf Stream warm core rings, and the Gulf Stream north wall, and along the shelf break (Hamazaki, 2002; Waring et al., 1992, 1993)

Monthly aerial survey efforts began in January 2015 in the offshore area near Norfolk Canyon and have resulted in seven Risso's dolphin sightings to date.

Monthly aerial surveys offshore of Cape Hatteras since May 2011 have documented 24 Risso's dolphin sightings, primarily during the summer months. Risso's dolphins were sighted from inside the 100 m isobath out to 2,000 m water depth (McAlarney et al., 2014).

Risso's dolphins were also one of the most commonly encountered pelagic dolphins found during surveys conducted in Onslow Bay, North Carolina and offshore of Jacksonville, Florida (McLellan et al., 2014). Risso's dolphins observed during aerial and vessel surveys conducted monthly between June 2007 and June 2010 offshore of Onslow Bay, North Carolina were exclusively found over the continental shelf break and in deeper waters of the survey area (Read et al., 2014; U.S. Department of the Navy, 2013a).

Vessel surveys conducted offshore of Jacksonville, Florida have resulted in a few Risso's dolphin sightings (Swaim et al., 2015). Aerial surveys documented higher numbers of Risso's dolphin encounters, with 16 sightings occurring within deeper waters of the survey area (U.S. Department of the Navy, 2013a).

Risso's dolphins in the northern Gulf of Mexico occur throughout oceanic waters but are concentrated in continental slope waters (Baumgartner, 1997; Maze-Foley & Mullin, 2006).

4.1.2.17.3 Population Trends

A trend analysis has not been conducted for the western North Atlantic stock of Risso's dolphins (Waring et al., 2015).

While abundance estimates for the Gulf of Mexico exist, there were no significant differences between survey years (Garrison et al., 2020), and the statistical power to detect a trend in abundance for this stock is poor due to the relatively imprecise abundance estimates and long intervals between surveys.

4.1.2.18 Rough-Toothed Dolphin (*Steno bredanensis*)

4.1.2.18.1 Status and Management

Rough-toothed dolphins are among the most widely distributed species of tropical dolphins, but little information is available on population status (Jefferson, 2009; Jefferson et al., 2008; Jefferson et al., 2015). The Western North Atlantic and Gulf of Mexico populations of the rough-toothed dolphin are considered two separate stocks for management purposes, but there is insufficient genetic information to differentiate these stocks (Waring et al., 2013; Wimmer & Whitehead, 2004).

4.1.2.18.2 Habitat and Geographic Range

The distribution of the rough-toothed dolphin is poorly understood worldwide. These dolphins are thought to be a tropical to warm-temperate species and historically have been reported in deep oceanic waters in the Atlantic, Pacific, and Indian Oceans and the Mediterranean and Caribbean Seas (Gannier & West, 2005; Leatherwood & Reeves, 1983; Perrin & Walker, 1975; Reeves et al., 2003). Rough-toothed dolphins occur in the Gulf Stream and North Atlantic Gyre open ocean areas.

Rough-toothed dolphins were observed in both shelf and oceanic waters in the northern Gulf of Mexico (Fulling et al., 2003; Mullin & Fulling, 2003) and off the U.S. East Coast from North Carolina to Delaware (Waring et al., 2014). In the western North Atlantic, tracking of five rough-toothed dolphins that were rehabilitated and released following a mass stranding on the east coast of Florida in 2005 demonstrated a variety of ranging patterns (Wells et al., 2008). All tagged rough-toothed dolphins moved through a large range of water depths averaging greater than 100 ft. (30 m), though each of the five tagged dolphins transited through very shallow waters at some point, with most of the collective movements recorded over a gently sloping seafloor. Monthly aerial surveys conducted offshore of Cape Hatteras, North Carolina since 2011 have only resulted in one sighting of four individual rough-toothed dolphins just beyond the 100 meter isobaths (U.S. Department of the Navy, 2013a).

Aerial surveys conducted between 2009 and 2017 offshore of Jacksonville, Florida resulted in nine sightings of rough-toothed dolphins primarily in the summer and fall months. Sightings from aerial surveys have been documented inside the 100 meter isobaths in continental shelf waters (Cummings et al., 2016; U.S. Department of the Navy, 2013a).

Rough-toothed dolphins have been observed in all seasons in the Gulf of Mexico (Hansen et al., 1996; Mullin & Hoggard, 2000) but are not seen every survey year attesting to their low density in this region.

4.1.2.18.3 Population Trends

A trend analysis has not been conducted for the Western North Atlantic stock of rough-toothed dolphins.

Further analysis of Gulf of Mexico rough-toothed dolphin survey data from 2003–2004 and 2009 is required in order to determine whether changes in abundance have occurred (Waring et al., 2013). Additionally, a Gulf-wide assessment of rough-toothed dolphin abundance has not been made (Waring et al., 2013).

4.1.2.19 Short-Finned Pilot Whale (*Globicephala macrorhynchus*)

4.1.2.19.1 Status and Management

Studies are currently being conducted at the NMFS Southeast Fisheries Science Center to evaluate genetic population structure in short-finned pilot whales (Waring et al., 2014; Hayes et al., 2021). The short-finned pilot whale population is managed as three stocks: Western North Atlantic stock, Puerto Rico and U.S. Virgin Islands stock, and Gulf of Mexico Oceanic stock.

4.1.2.19.2 Habitat and Geographic Range

Short-finned pilot whales range throughout warm temperate to tropical waters of the world, generally in deep offshore areas (Hayes et al., 2021). Thus, the species occupies waters over the continental shelf break, in slope waters, and in areas of high topographic relief (Olson, 2009). While pilot whales are typically distributed along the continental shelf break, movements over the continental shelf are commonly observed in the northeastern U.S. Genetic analysis of stranded pilot whales, evaluated as a function of sea surface temperature and water depth, indicated that short-finned pilots whales were not likely to be found at water temperatures less than 22°C and highly likely to occur where water temperatures were greater than 25°C. Probability of a short-finned pilot whale also increased with increasing water depth. The area of overlap between short-finned and long-finned pilot whales occurs primarily along the shelf break off the coast of New Jersey between 38°N and 40°N latitude (Waring et al., 2014). Short-finned pilot whales are likely found in the Gulf Stream open ocean area.

Sightings of pilot whales (*Globicephala* spp.) in the western North Atlantic occur primarily near the continental shelf break ranging from Florida to the Nova Scotian Shelf (Mullin & Fulling, 2003). Long-finned and short-finned pilot whales overlap spatially along the mid-Atlantic shelf break between Cape Hatteras, North Carolina, and New Jersey (Payne & Heinemann, 1993). Long-finned pilot whales have occasionally been observed stranded as far south as Florida, and short-finned pilot whales have occasionally been observed stranded as far north as Massachusetts (Pugliares et al., 2016).

Pilot whales are one of the most common cetacean species observed off Cape Hatteras during aerial surveys, specifically from the 100 meter isobaths out to water depths greater than 2,000 m (U.S. Department of the Navy, 2013a). While photo-identification work suggests that short-finned pilot whales display a high degree of residence off Cape Hatteras, satellite tagging demonstrates that these animals cover a significant range up and down the continental slope, from Georges Bank in the north, down to Cape Lookout Shoals in the south, with movements at least occasionally into waters beyond the U.S. EEZ (Baird et al., 2015, 2016). Thirty-nine satellite telemetry tags were deployed on short-finned pilot whales off the coast of Cape Hatteras during the summers of 2014 and 2015. This study provided the first information on long-term and long-distance movements of short-finned pilot whales in the area, other than information obtained from tags on previously stranded and rehabilitated individuals.

Deployment of high frequency acoustic recording packages offshore of Cape Hatteras, Onslow Bay, Jacksonville and the offshore areas near Norfolk Canyon from 2007 through 2022 has resulted in zero short-finned pilot whale detections. Passive acoustic data were collected from marine autonomous recording units deployed on the continental shelf, just beyond the shelf, and offshore from the shelf break off Jacksonville, Florida in late 2009 and early 2010. These deployments resulted in detections of the blackfish group of cetaceans, which includes short-finned pilot whales, along with melon-headed whales, pygmy killer whales, false killer whales, and killer whales. Blackfish were detected every day during deployments but there were no obvious or consistent differences in the occurrence of blackfish vocalizations relative to water depth or time of day (Oswald et al., 2016). The fact that five species are combined into the blackfish category may have masked any patterns in vocal behaviors (Oswald et al., 2016).

Short-finned pilot whales are also documented along the continental shelf and continental slope in the northern Gulf of Mexico (Hansen et al., 1996; Mullin & Fulling, 2003; Mullin & Hoggard, 2000), and in the Caribbean. Short-finned pilot whales were seen in all seasons during GulfCet aerial surveys of the northern Gulf of Mexico between 1992 and 1998 (Hansen et al., 1996; Mullin & Hoggard, 2000).

4.1.2.19.3 Population Trends

A trend analysis has not been conducted for the western North Atlantic stock of short-finned pilot whales (Hayes et al., 2021).

While abundance estimates for the Gulf of Mexico exist, there were no significant differences between survey years (Garrison et al., 2020), and the statistical power to detect a trend in abundance for this stock is poor due to the relatively imprecise abundance estimates and long intervals between surveys.

4.1.2.20 Spinner Dolphin (*Stenella longirostris*)

4.1.2.20.1 Status and Management

For management purposes, the western North Atlantic and Gulf of Mexico populations of spinner dolphins are considered separate stocks, although there is currently insufficient data to differentiate them (Waring et al., 2014).

4.1.2.20.2 Habitat and Geographic Range

This is presumably an offshore, deep-water species (Perrin & Gilpatrick, 1994; Schmidly, 1981b), although its distribution in the Atlantic is poorly known. Spinner dolphins likely occur in the Gulf Stream and North Atlantic Gyre open ocean areas, based on their preference for waters greater than 2,000 m deep.

In the western North Atlantic, these dolphins occur in deep water along most of the U.S. coast south to the West Indies and Venezuela, including the Gulf of Mexico (Waring et al., 2014). Spinner dolphin sightings have occurred exclusively in deeper (greater than 2,000 m) oceanic waters of the northeast U.S. coast (Cetacean and Turtle Assessment Program, 1982; Waring et al., 1992). Stranding records exist from North Carolina, South Carolina, Florida, and Puerto Rico in the Atlantic and in Texas and Florida in the Gulf of Mexico, and there was one recent sighting during summer 2011 in oceanic waters off North Carolina. Monthly aerial surveys offshore of Cape Hatteras conducted from 2011 to 2017 have only resulted in one sighing of spinner dolphins in a mixed group of Clymene dolphins within the northern offshore waters of the survey area (U.S. Department of the Navy, 2013a). Although spinner dolphins were sighted and stranded off the southeastern U.S. coast, they are not common in those waters, except perhaps off southern Florida (Waring et al., 2010). In the northern Gulf of Mexico, spinner dolphins are found mostly in offshore waters beyond the edge of the continental shelf and primarily east of the Mississippi River (Waring et al., 2013). This species was seen during all seasons in the northern Gulf of Mexico during aerial surveys between 1992 and 1998 (Waring et al., 2013).

4.1.2.20.3 Population Trends

Due to imprecise abundance estimates and long periods of time between surveys, a trend analysis has not been conducted for the western North Atlantic Stock of spinner dolphins (Waring et al., 2014).

While abundance estimates for the Gulf of Mexico exist, there were no significant differences between survey years (Garrison et al., 2020), and the statistical power to detect a trend in abundance for this stock is poor due to the relatively imprecise abundance estimates and long intervals between surveys.

There are insufficient data to determine the population trends for the Puerto Rico and U.S. Virgin Islands stock of spinner dolphins (Waring et al., 2012).

4.1.2.21 Striped Dolphin (*Stenella coeruleoalba*)

4.1.2.21.1 Status and Management

For management purposes, the Gulf of Mexico population of striped dolphin is provisionally considered a separate stock, although there are not sufficient genetic data to differentiate the Gulf of Mexico stock from the western North Atlantic stock (Waring et al., 2010). There is very little information on stock structure in the western North Atlantic (Hayes et al., 2020).

4.1.2.21.2 Habitat and Geographic Range

The striped dolphin is one of the most common and abundant dolphin species, with a worldwide range that includes both tropical and temperate waters (Waring et al., 2014). Although primarily a warm-water species, the range of the striped dolphin extends higher into temperate regions than those of any other species in the genus *Stenella* (spotted, spinner, Clymene, and striped dolphins). Striped dolphins are found in the western North Atlantic from Nova Scotia south to at least Jamaica as well as in the Gulf of Mexico. In general, striped dolphins appear to prefer continental slope waters offshore to the Gulf Stream (Leatherwood et al., 1976; Perrin et al., 1994; Schmidly, 1981b).

Striped dolphins are relatively common in the cooler offshore waters of the U.S. East Coast. Along the mid-Atlantic ridge in oceanic waters of the North Atlantic Ocean, striped dolphins are sighted in significant numbers south of 50° N (Waring et al., 2010). In waters off the northeastern U.S. coast, striped dolphins are distributed along the continental shelf edge from Cape Hatteras to the southern margin of Georges Bank and also occur offshore over the continental slope and rise in the mid-Atlantic region (Cetacean and Turtle Assessment Program, 1982; Mullin & Fulling, 2003). Continental shelf edge sightings in the Cetacean and Turtle Assessment Program (1982) were generally centered along the 1,000-m depth contour in all seasons. During 1990 and 1991 cetacean habitat-use surveys, striped dolphins were associated with the Gulf Stream north wall and warm-core ring features (Waring et al., 1992). Striped dolphins seen in a survey of the New England Sea Mounts (Palka, 1997) were in waters that were between 20°C and 27°C and deeper than about 3,000 ft. (900 m).

Regular periodic aerial surveys in the offshore area near Norfolk Canyon from 2015 to 2019 resulted in six striped dolphin sightings (McAlarney et al., 2016). Aerial surveys offshore of Cape Hatteras from 2011 to 2017 have resulted in a total of five striped dolphin sightings, primarily in late winter and early spring.

Striped dolphins are also found throughout the deep, offshore waters of the northern Gulf of Mexico. Sightings of striped dolphins in the northern Gulf of Mexico typically occur in oceanic waters and during all seasons (Waring et al., 2010).

4.1.2.21.3 Population Trends

A trend analysis has not been conducted for the western North Atlantic stock of striped dolphins (Waring et al., 2014).

While abundance estimates for the Gulf of Mexico exist, there were no significant differences between survey years (Garrison et al., 2020), and the statistical power to detect a trend in abundance for this stock is poor due to the relatively imprecise abundance estimates and long intervals between surveys.

4.1.2.22 White-Beaked Dolphin (*Lagenorhynchus albirostris*)

4.1.2.22.1 Status and Management

There are at least two separate stocks of the white-beaked dolphin in the North Atlantic: one in the eastern and another in the western North Atlantic, although the genus *Lagenorhynchus* is currently proposed to be revised (Vollmer et al., 2019).

4.1.2.22.2 Habitat and Geographic Range

White-beaked dolphins are found in cold-temperate and subarctic waters of the North Atlantic (Waring et al., 2007). In the western North Atlantic Ocean, the white-beaked dolphin occurs throughout northern waters of the Atlantic of the U.S. and eastern Canada, from eastern Greenland through the Davis Strait and south to Massachusetts (Lien et al., 2001). White-beaked dolphins would be expected to occur in the Labrador Current.

Within the Study Area, white-beaked dolphins are concentrated in the western Gulf of Maine and around Cape Cod (Cetacean and Turtle Assessment Program, 1982; Palka et al., 1997). Before the 1970s, these dolphins were found primarily in waters over the continental shelf of the Gulf of Maine and Georges Bank. Since then, they have been replaced by large numbers of Atlantic white-sided dolphins and now occur mainly in waters over the continental slope (Katona et al., 1993; Palka et al., 1997). This habitat shift might be a result of an increase in sand lance and a decline in herring in continental shelf waters (Payne et al., 1990). Sightings are common in nearshore waters of Newfoundland and Labrador (Lien et al., 2001). They also occur in the Gulf of St. Lawrence (Waring et al., 2010). During Cetacean and Turtle Assessment Program (1982) surveys, white-beaked dolphins were typically sighted in shallow coastal waters near Cape Cod and along Stellwagen Bank, with a bottom depth ranging from 43 to 2,454 ft. (Palka et al., 1997).

4.1.2.22.3 Population Trends

Abundance has declined in some areas, such as the Gulf of Maine, but this may be more closely related to habitat shifts than to direct changes in population size. However, there are insufficient data to determine population trends for this species (Waring et al., 2007).

4.1.2.23 Harbor Porpoise (*Phocoena phocoena*)

4.1.2.23.1 Status and Management

The Gulf of Maine–Bay of Fundy stock is the only stock of harbor porpoise under NMFS management within the Study Area. There are three additional harbor porpoise populations that also occur within the Study Area: Gulf of St. Lawrence, Newfoundland, and Greenland (Gaskin, 1992).

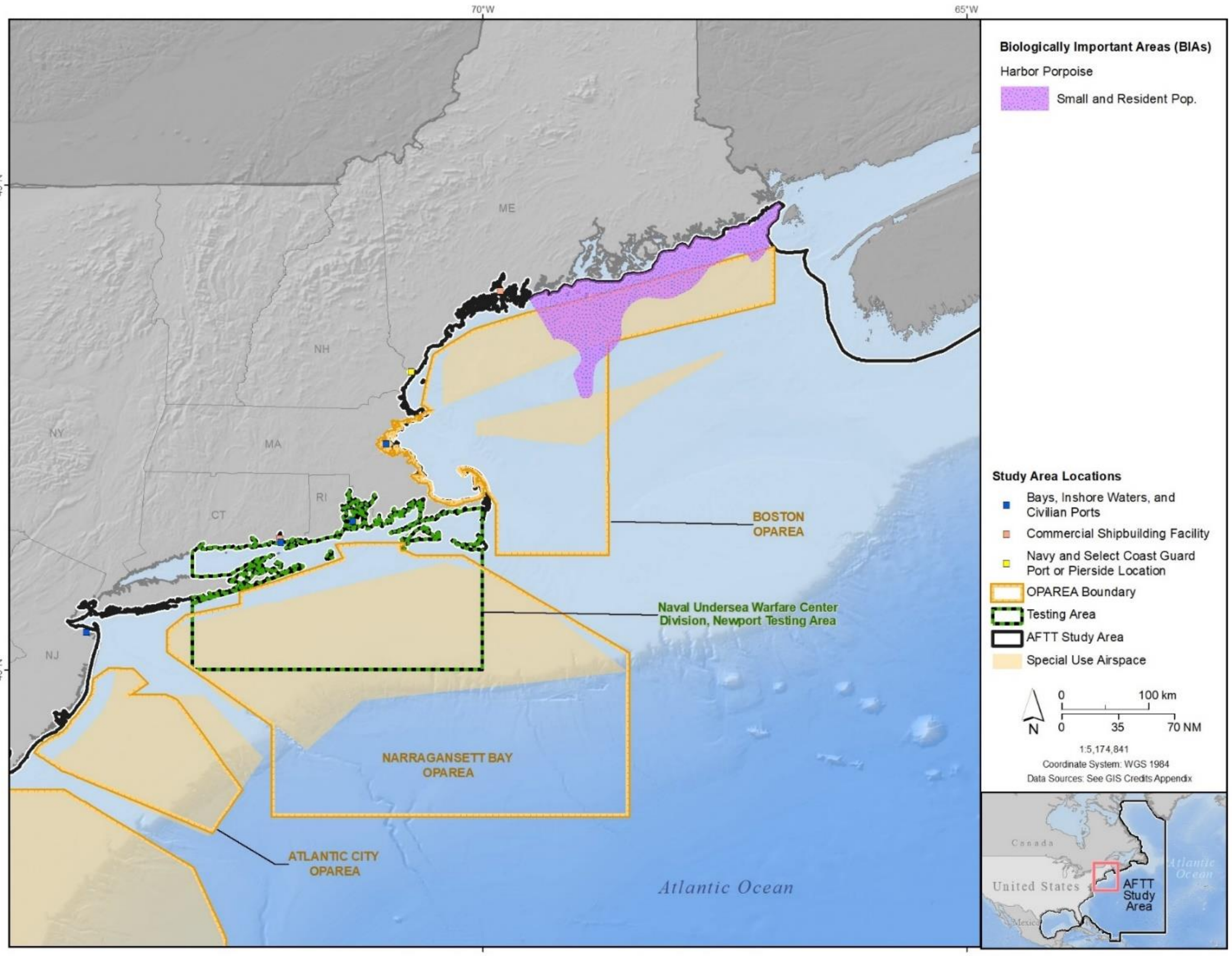
4.1.2.23.2 Habitat and Geographic Range

Harbor porpoises inhabit cool temperate-to-subpolar waters, often where prey aggregations are concentrated (Watts & Gaskin, 1985). Thus, they are frequently found in shallow waters, most often near shore, but they sometimes move into deeper offshore waters. Harbor porpoises are rarely found in waters warmer than 17°C (Read, 1999) and closely follow the movements of their primary prey, Atlantic herring (Gaskin, 1992).

Harbor porpoises would likely be found only in the Labrador Current open-ocean area. In the western North Atlantic, harbor porpoises range from Cumberland Sound on the east coast of Baffin Island, southeast along the eastern coast of Labrador to Newfoundland and the Gulf of St. Lawrence, and southwest to about 34° N on the coast of North Carolina (Hayes et al., 2021). Harbor porpoises are also found in waters off southwest Greenland. During summer (July to September), harbor porpoises are concentrated in the northern Gulf of Maine and southern Bay of Fundy region, generally in waters less than 150 ft. deep (Gaskin, 1977; Kraus et al., 1983; Palka, 1995a; Palka, 1995b), with a few sightings in the upper Bay of Fundy and on the northern edge of Georges Bank (Palka, 2000).

During winter (January to March), intermediate densities of harbor porpoises can be found in waters off New Jersey to North Carolina, while lower densities are found in waters off New York to New Brunswick, Canada (Hayes et al., 2021). Harbor porpoises sighted off the mid-Atlantic states during winter include porpoises from other western North Atlantic populations (Rosel et al., 1999). There does not appear to be a temporally coordinated migration or a specific migratory route to and from the Bay of Fundy region (Hayes et al., 2021).

LaBrecque et al. (2015a) identified a small and resident population area for harbor porpoise in the Gulf of Maine (Figure 4.1-14) based on sightings documented by the National Oceanic and Atmospheric Administration Fisheries ship and aerial surveys, strandings, and animals taken incidental to fishing reported by NMFS observers. From July to September, harbor porpoises are concentrated in waters less than 150 m deep in the northern Gulf of Maine and southern Bay of Fundy. During fall (October to December) and spring (April to June), harbor porpoises are widely dispersed from New Jersey to Maine, with lower densities farther north and south (LaBrecque et al., 2015a).



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

Figure 4.1-14: Biologically Important Areas for Harbor Porpoises in the Study Area

4.1.2.23.3 Population Trends

A trend analysis has not been conducted for the Gulf of Maine- Bay of Fundy stock of harbor porpoises (Palka, 2012). Since there are no population estimates available for the Gulf of St. Lawrence, Newfoundland, or Greenland stocks, trend analyses have not been conducted for these populations either (Hayes et al., 2021).

4.2 PINNIPEDS

4.2.1.1 Gray Seal (*Halichoerus grypus*)

4.2.1.1.1 Status and Management

There are three main populations of gray seal in the North Atlantic, including the Northeast Atlantic, Northwest Atlantic, and the Baltic Sea (Katona et al., 1993; Waring et al., 2010; Hayes et al., 2021). These stocks are separated by geography, different breeding seasons, and genetic variation (Waring et al., 2010). Genetic research indicates that gray seals found in U.S. waters along the coasts of Maine and Massachusetts are descended from the Canadian population and are members of the Northeast Atlantic stock (Hayes et al., 2021). The percentage of time that individuals are resident in U.S. waters is unknown (Hayes et al., 2021).

4.2.1.1.2 Habitat and Geographic Range

The Western North Atlantic management stock corresponds to the eastern Canada population, and generally ranges from Labrador to New Jersey (Hayes et al., 2021). This gray seal population is centered in the Canadian Maritimes, including the Gulf of St. Lawrence and the Atlantic coasts of Nova Scotia, Newfoundland, and Labrador. In the Study Area, the primary range of this species includes the northwestern waters of the Newfoundland-Labrador Shelf, the Scotian Shelf, and the Northeast U.S. Continental Shelf (Davies, 1957; Hall & Thompson, 2008).

The gray seal is considered a coastal species and may forage far from shore but does not appear to leave the continental shelf regions (Lesage & Hammill, 2001). Gray seals haul out on land-fast ice, exposed reefs, or beaches of undisturbed islands (Hall & Thompson, 2008; Lesage & Hammill, 2001). Remote uninhabited islands tend to have the largest gray seal haul-outs (Reeves et al., 1992).

The Canadian population is divided into three groups for management purposes: Sable Island, Gulf of St. Lawrence, and Coastal Nova Scotia (Hammill et al., 2014). The largest pupping site of gray seals in the world is located at Sable Island (Bowen et al., 2007). In the Gulf of St. Lawrence, gray seals pup on the pack-ice (Davies, 1957; Hammill & Gosselin, 1995; Hammill et al., 1998); this is second largest breeding colony in eastern Canada (Hammill et al., 2014). Smaller numbers of seals pup on islands along the coast of Nova Scotia (Hammill et al., 2014).

Gray seals range south into the northeastern U.S., with strandings and sightings as far south as North Carolina (Hammill et al., 1998; Waring et al., 2004). Gray seal distribution along the U.S. Atlantic coast has shifted in recent years, with an increased number of seals reported in southern New England (Kenney, 2014; Hayes et al., 2021). Recent surveys in coastal Virginia indicate that gray seals are occasional visitors to this area with 24 observations at haul-out sites since 2014 (Guins et al., 2023; Jones & Rees, 2018, 2020, 2021, 2022, 2023; Rees et al., 2016).

Along the coast of the U.S., gray seals are known to pup at three or more colonies, including Muskeget Island, Massachusetts, which is the southernmost breeding site (Rough, 1995; Waring et al., 2004), and Green and Seal Islands, Maine (Hayes et al., 2021). Pupping has also been reported at Matinicus Rock and Mount Desert Rock in Maine (Hayes et al., 2021). Gray seals are observed in New England outside of the pupping season on Muskeget Island and Monomoy and locations along the shoreline between southern Maine and Woods Hole, Massachusetts.

4.2.1.1.3 Population Trends

Gray seal abundance is likely increasing in U.S. waters, but the rate of increase is unknown (Hayes et al., 2021). Single-day pup counts at three U.S. established colonies detected an increase from the 2001-2002 through the 2007-2008 pupping season (Wood LaFond, 2009). However, no recent surveys or modeling of gray seal abundance in U.S. Atlantic waters are available (Hayes et al., 2021).

4.2.1.2 Harbor Seal (*Phoca vitulina*)

4.2.1.2.1 Status and Management

Western Atlantic harbor seals (*P. v. vitulina*) that occur along the coast of the eastern U.S. and Canada represent a single population (Temte et al., 1991; Waring et al., 2010; Hayes et al., 2021), though there is some uncertainty in the stock structure in the Atlantic Ocean.

4.2.1.2.2 Habitat and Geographic Range

The harbor seal is one of the most widely distributed seals, found in temperate to polar coastal waters of the northern hemisphere (Jefferson et al., 2008; Jefferson et al., 2015). Harbor seals occur in nearshore waters and are rarely found more than 20 km from shore; they frequently occupy bays, estuaries, and inlets (Baird, 2001). Individual seals have been observed several kilometers upstream in coastal rivers (Baird, 2001). Haul-out sites vary but include intertidal and subtidal rock outcrops, sandbars, sandy beaches, and even peat banks in salt marshes (Burns, 2008; Gilbert & Guldager, 1998; Prescott, 1982; Schneider & Payne, 1983; Wilson, 1978). Harbor seals occur in the cold and temperate nearshore waters of the northwest Atlantic, typically north of 35° N (Hayes et al., 2021). In the Study Area, their approximate range includes the Gulf of St. Lawrence, Scotian Shelf, Gulf of Maine, Bay of Fundy, and northeast U.S. continental shelf down to the Virginia/North Carolina border.

Harbor seals are found year-round in the coastal waters of eastern Canada and Maine; from September to May they also occur from southern New England to North Carolina although there have been rare sightings and strandings recorded as far south as Florida (Katona et al., 1993). A general southward movement from the Bay of Fundy to southern New England waters occurs in autumn and early winter (Barlas, 1999; Jacobs & Terhune, 2000; Rosenfeld et al., 1988; Waring et al., 2010; Whitman & Payne, 1990). A northward movement from southern New England to Maine and eastern Canada occurs before the pupping season, which takes place from mid-May through June along the Maine coast (DeHart, 2002; Kenney, 1994; Richardson et al., 1995; Whitman & Payne, 1990; Wilson, 1978). In the northeastern U.S., breeding and pupping normally occur north of the New Hampshire and Maine borders, although breeding has been recorded historically as far south as Cape Cod (Katona et al., 1993). Several thousand seals overwinter between New Hampshire and Massachusetts (Waring et al., 2010).

Harbor seal distribution along the U.S. Atlantic coast has shifted in recent years, with an increased number of seals reported in southern New England to the mid-Atlantic region. Harbor seals have been consistently detected in the mid-Atlantic region from November through March, with as many as 45 individuals observed during a single day (Jones & Rees, 2023).

4.2.1.2.3 Population Trends

The number of harbor seals in U.S. Atlantic waters increased from the 1980s to 2010 (Waring et al., 2010). There is some evidence that the population may be declining and a trend analysis for the North Atlantic stock is currently underway, however it is not possible at this time to discriminate between population decline and geographic redistribution (Hayes et al., 2021).

4.2.1.3 Harp Seal (*Pagophilus groenlandicus*)

4.2.1.3.1 Status and Management

Three distinct populations or stocks of harp seals are generally recognized, including one in the Barents Sea that breeds on the "East Ice" in the White Sea, a population off eastern Greenland that breeds on the "West Ice" near Jan Mayen, and a third population in the northwest Atlantic off eastern Canada (Lavigne, 2008). The Western North Atlantic stock is the largest and is divided into two breeding herds: the Front herd, which breeds off the coast of Newfoundland and Labrador, and the Gulf herd, which breeds near the Magdalen Islands in the Gulf of St. Lawrence (Reeves et al., 2002; Waring et al., 2014; Waring et al., 2004).

4.2.1.3.2 Habitat and Geographic Range

The primary range of harp seals is throughout the Arctic, but the secondary range includes the western waters of the Scotian Shelf and the Northeast U.S. Continental Shelf. Harp seals are closely associated with drifting pack ice, where they breed, molt, and forage in the surrounding waters (Lydersen & Kovacs, 1993; Ronald & Healey, 1981). Harp seals make extensive movements over much of the continental shelf within their winter range in the waters off Newfoundland (Bowen & Siniff, 1999).

Typically, harp seals are distributed in the pack ice of the North Atlantic segment of the Arctic Ocean and through Newfoundland and the Gulf of St. Lawrence (Reeves et al., 2002). Most western North Atlantic harp seals congregate off the east coast of Newfoundland-Labrador (the Front herd) to pup and breed; the remainder (the Gulf herd) gathers to pup near the Magdalen Islands in the Gulf of St. Lawrence (Morissette et al., 2006; Ronald & Dougan, 1982).

The number of sightings and strandings of harp seals off the northeastern U.S. has been increasing since the 1990s, based on records from Maine to New Jersey, primarily during the months of January to May (Harris et al., 2002; McAlpine & Walker, 1999). A few sightings and strandings are also reported annually for Virginia and North Carolina (Lloyd, 2015; Soulen et al., 2013; Swingle et al., 2016). Most recently, two young harp seals stranded separately in Norfolk, Virginia in early 2022. An increase in strandings along the U.S. East Coast has been correlated with poor ice conditions in the Gulf of St. Lawrence whelping area (Soulen et al., 2013).

4.2.1.3.3 Population Trends

Currently available data are insufficient to determine a minimum population estimate for U.S. waters (Waring et al., 2013); thus, population trends are also unknown.

4.2.1.4 Hooded Seal (*Cystophora cristata*)

4.2.1.4.1 Status and Management

The International Council for the Exploration of the Sea/Northwest Atlantic Fisheries Organization Working Group on Harp and Hooded Seals currently recognizes three separate stocks of hooded seals: the Northwest Atlantic, Greenland Sea, and White Sea stocks (International Council for the Exploration of the Sea, 2014). None of these stocks are under U.S. jurisdiction, but individuals are found in U.S. waters. The western North Atlantic stock (synonymous with the Northwest Atlantic stock) pups off the coast of eastern Canada; the whelping area for the Greenland Sea stock is in the "West Ice" near Jan Mayen Island, east of Greenland (Kovacs, 2009); the White Sea stock is in the "East Ice" near the Barents Sea/Russia. The Western North Atlantic Stock is divided further into three whelping areas: Newfoundland/Labrador, Gulf of St. Lawrence, and David Strait.

4.2.1.4.2 Habitat and Geographic Range

Hooded seals are distributed in the Arctic and the cold temperate North Atlantic Ocean (Bellido et al., 2007). At sea, hooded seals stay primarily near continental coastlines but are known to wander widely. This species follows the seasonal movement of pack ice, on which it breeds. In the Study Area, its primary range is around the Newfoundland-Labrador, West Greenland, and Scotian Shelf.

Most hooded seals occur in the western Atlantic (Stenson et al., 1996). They migrate between winter/spring pupping areas along the Canadian coast, and summer and molting areas off Greenland. The western North Atlantic stock breeds and pups at three main areas around Canada, including the Gulf of St. Lawrence, north of Newfoundland in an area that is known as the Front, and Davis Strait (Hammill et al., 1997; Jefferson et al., 2008; Kovacs, 2008). Based on data from satellite relay data loggers deployed on hooded seals during 2004–2008, males appeared to prefer areas with complex seabed relief such as Davis Strait and the Flemish cap, whereas females preferred the Labrador Shelf (Andersen et al., 2013).

Hooded seals are highly migratory and may wander as far south as Puerto Rico (Mignucci-Giannoni & Odell, 2001), with more frequent occurrences from Maine to Florida in winter-spring and summer-fall respectively (Harris et al., 2001; McAlpine et al., 1999; Mignucci-Giannoni & Odell, 2001).

4.2.1.4.3 Population Trends

The number of hooded seals in the western North Atlantic is relatively well known and total Northwest Atlantic population size is reported to have increased from 1965 to 2005 (Hammill & Stenson, 2006). However, uncertainty about the relationship among whelping areas and lack of reproductive and mortality data makes it difficult to reliably assess the population trend.

5 TYPE OF INCIDENTAL TAKE AUTHORIZATION REQUESTED

The Action Proponents request regulations and three LOAs for the take of marine mammals incidental to proposed activities in the AFTT Study Area for the period from 2025 through 2032: (1) a 7-year LOA for Navy training activities, (2) a 7-year LOA for Navy testing activities, and (3) a 7-year LOA for Coast Guard training activities. The term "take," as defined in Section 3 (16 U.S.C. § 1362(13)) of the MMPA, means "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal." "Harassment" was further defined in the 1994 amendments to the MMPA, which provided two levels of harassment: Level A (potential injury) and Level B (potential behavioral disturbance).

The NDAA of Fiscal Year 2004 (PL 108-136) amended the definition of "harassment" as applied to military readiness activities or scientific research activities conducted by or on behalf of the federal government, consistent with Section 104(c)(3) [16 U.S.C. § 1374(c)(3) of the MMPA]. The Fiscal Year 2004 NDAA adopted the definition of "military readiness activity" as set forth in the Fiscal Year 2003 NDAA (PL 107-314). Military training and testing activities within the AFTT Study Area are composed of military readiness activities as that term is defined in PL 107-314 because training and testing activities constitute "training and operations of the Armed Forces that relate to combat" and "adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use." For military readiness activities, the relevant definition of harassment is any act that:

- injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild ("Level A harassment"); or
- disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering to a point where such behavioral patterns are abandoned or significantly altered ("Level B harassment") [16 U.S.C. § 1362(18)(B)(i) and (ii)].

Although the statutory definition of Level B harassment for military readiness activities requires that the natural behavior patterns of a marine mammal be significantly altered or abandoned, the current state of science makes it difficult to determine those thresholds, if at all in some cases. Given the limitations of the underlying data, the Navy is taking an approach that is likely to overestimate the number of behavioral takes for species, especially those with a paucity of behavioral response data (e.g., pinnipeds, delphinids).

Many of the responses estimated using the Navy's quantitative analysis are most likely to be moderate severity. Moderate severity responses would be considered significant if they were sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion. The behavioral response functions used within the Navy's quantitative analysis were primarily derived from experiments using short-duration sound exposures lasting, in many cases, for less than 30 minutes. If animals exhibited moderate severity reactions for the duration of the exposure or longer, then it was conservatively assumed that the animal experienced a significant behavioral reaction.

It is likely that many of the estimated behavioral reactions within the Navy's quantitative analysis would not constitute significant behavioral reactions; however, the numbers of significant verses non-significant behavioral reactions are currently impossible to predict. Consequently, it is likely that some marine mammals estimated to exhibit a behavioral response under the Navy's behavioral response criteria (i.e., behavioral response functions and cutoff conditions) would not significantly alter or abandon their natural behavior patterns.

The Action Proponents considered all training and testing activities proposed to occur in the Study Area that have the potential to result in the MMPA defined take of marine mammals; and determined that the following three stressors could result in the incidental taking of marine mammals:

- **Acoustics** (sonar and other transducers; air guns; pile driving/extraction)
- **Explosives** (explosive shock wave and sound; explosive fragments)
- **Physical Disturbance and Strike** (vessel strike)

Acoustic sources have the potential to result in incidental takes of marine mammals by behavioral disturbance or injury. Explosive sources have the potential to result in incidental takes of marine mammals by behavioral disturbance, injury, or mortality. Vessel strikes have the potential to result in incidental take from direct injury and/or mortality.

5.1 Incidental Take Request from Acoustic and Explosive Sources

A detailed analysis of effects due to marine mammal exposures to acoustic and explosive sources in the AFTT Study Area from Navy training, Navy testing, and Coast Guard training activities is in Appendix A of this request and summarized in Section 6 (Take Estimates for Marine Mammals). Based on the results of the analysis, Table 5.1-1 summarizes the total incidental take request due to acoustic and explosive sources for all activities annually (based on the maximum number of activities per 12-month period) and over a 7-year period. Table 5.1-2 through Table 5.1-4 shows the take request for Navy Training, Navy Testing, and Coast Guard Training activities for each species and stock annually (based on the maximum number of activities per 12-month period) and over a 7-year period.

The following incidental take requests for acoustics and explosives are based on model-predicted impacts without consideration of visual observation mitigation. When a marine mammal (and in some instances, indicators of marine mammal presence) is sighted within or entering a mitigation zone, sound-producing activities are delayed, relocated, powered down, or ceased. Thus, the below incidental take requests likely over-predict potential impacts near some stressors.

Table 5.1-1: Summary of the Annual and 7-Year Incidental Take Requests due to Acoustic and Explosive Sources during AFTT Navy Training, Navy Testing, and Coast Guard Training Activities

MMPA Category	*Source*	*Maximum Annual*			*7-Year Total*		
		Navy Training	*Navy Testing[a]*	*USCG Training*	*Navy Training*	*Navy Testing[a]*	*USCG Training*
Mortality	Explosive	3	20	0	5	44	0
Level A	Acoustic & Explosive	443	1,290	10	2,758	7,523	34
Level B	Acoustic & Explosive	997,608	733,345	4,251	6,911,555	4,706,332	29,351

Annual take estimates for acoustic and explosive sources are based on the maximum number of activities in a 12-month period.
[a]All Navy Testing estimated mortalities are due to ship shock trials without consideration of extensive mitigation measures.
Species specific information is shown in Table 5.1-2 through Table 5.1-4.
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Table 5.1-2: Incidental Take Request by Stock due to Acoustic and Explosive Sources during Navy Training Activities

Species	Stock	Maximum Annual			7-Year Total		
		Level B	Level A	Mort	Level B	Level A	Mort
Atlantic spotted dolphin	Northern Gulf of Mexico	792	1	0	5,522	4	0
	Western North Atlantic	74,649	27	0	508,197	179	0
Atlantic white-sided dolphin	Western North Atlantic	3,233	4	0	22,600	18	0
Blainville's beaked whale	Northern Gulf of Mexico	12	0	0	79	0	0
	Western North Atlantic	15,267	1	0	106,751	1	0
Blue whale	North Atlantic	40	0	0	265	0	0
Bottlenose dolphin	Central GA Estuarine System	0	0	0	0	0	0
	Gulf of Mexico Eastern Coastal	29	0	0	146	0	0
	Gulf of Mexico Northern Coastal	2,094	1	0	14,645	2	0
	Gulf of Mexico Oceanic	517	1	0	3,611	1	0
	Gulf of Mexico Western Coastal	791	0	0	3,162	0	0
	Indian River Lagoon Estuarine System	1,422	0	0	9,688	0	0
	Jacksonville Estuarine System	348	0	0	2,416	0	0
	MS Sound, Lake Borgne, and Bay Boudreau	1,564	0	0	10,944	0	0
	Northern GA/Southern SC Estuarine System	2	0	0	8	0	0
	Northern Gulf of Mexico Continental Shelf	4,665	3	0	32,132	13	0
	Northern NC Estuarine System	9,181	3	0	63,610	20	0
	Northern SC Estuarine System	0	0	0	0	0	0
	Nueces and Corpus Christi Bays	4	0	0	15	0	0
	Sabine Lake	1	0	0	3	0	0
	Southern GA Estuarine System	122	1	0	747	1	0
	Southern NC Estuarine System	162	0	0	683	0	0
	St. Andrew Bay	14	0	0	92	0	0
	St. Joseph Bay	7	0	0	47	0	0
	Tampa Bay	350	0	0	1,401	0	0
	Western North Atlantic Central FL Coastal	7,692	3	0	50,762	7	0
	Western North Atlantic Northern FL Coastal	17,003	2	0	117,276	4	0
	Western North Atlantic Northern Migratory Coastal	64,712	34	0	450,964	227	0
	Western North Atlantic Offshore	120,151	27	1	818,676	173	1
	Western North Atlantic SC GA Coastal	3,867	3	1	24,631	11	1
	Western North Atlantic Southern Migratory Coastal	8,868	7	0	57,500	44	0
Bryde's whale	Primary	10	0	0	69	0	0

Table 5.1-2: Incidental Take Request by Stock due to Acoustic and Explosive Sources during Navy Training Activities (continued)

Species	*Stock*	*Maximum Annual*			*7-Year Total*		
		Level B	*Level A*	*Mort*	*Level B*	*Level A*	*Mort*
Clymene dolphin	Northern Gulf of Mexico	66	0	0	459	0	0
	Western North Atlantic	69,460	15	1	486,205	94	3
Cuvier's beaked whale	Northern Gulf of Mexico	41	0	0	281	0	0
	Western North Atlantic	66,011	1	0	461,356	3	0
Dwarf sperm whale	Northern Gulf of Mexico	14	1	0	87	1	0
	Western North Atlantic	3,678	32	0	25,551	221	0
False killer whale	Northern Gulf of Mexico	24	0	0	160	0	0
	Western North Atlantic	406	0	0	2,821	0	0
Fin whale	Western North Atlantic	1,089	6	0	7,585	38	0
Fraser's dolphin	Northern Gulf of Mexico	25	0	0	159	0	0
	Western North Atlantic	1,904	2	0	12,826	8	0
Gervais' beaked whale	Northern Gulf of Mexico	14	0	0	90	0	0
	Western North Atlantic	31,522	0	0	220,396	0	0
Gray seal	Western North Atlantic	7,862	14	0	54,706	93	0
Harbor porpoise	Gulf of ME/Bay of Fundy	36,396	73	0	254,114	505	0
Harbor seal	Western North Atlantic	11,207	18	0	78,047	125	0
Harp seal	Western North Atlantic	14,632	2	0	102,380	12	0
Hooded seal	Western North Atlantic	460	1	0	3,209	1	0
Humpback whale	Gulf of ME	341	7	0	2,351	41	0
Killer whale	Northern Gulf of Mexico	13	0	0	82	0	0
	Western North Atlantic	110	0	0	759	0	0
Long-finned pilot whale	Western North Atlantic	13,501	5	0	94,499	18	0
Melon-headed whale	Northern Gulf of Mexico	81	0	0	561	0	0
	Western North Atlantic	3,517	1	0	23,968	2	0
Minke whale	Canadian Eastern Coastal	2,606	18	0	17,681	120	0
North Atlantic right whale	Western	97	1	0	647	2	0
Northern bottlenose whale	Western North Atlantic	828	0	0	5,789	0	0
Pantropical spotted dolphin	Northern Gulf of Mexico	720	3	0	5,036	5	0
	Western North Atlantic	10,976	3	0	75,624	12	0
Pygmy killer whale	Northern Gulf of Mexico	29	0	0	198	0	0
	Western North Atlantic	368	1	0	2,512	1	0
Pygmy sperm whale	Northern Gulf of Mexico	15	2	0	96	2	0
	Western North Atlantic	3,625	34	0	25,175	231	0
Rice's whale	Northern Gulf of Mexico	8	1	0	49	1	0
Risso's dolphin	Northern Gulf of Mexico	23	0	0	155	0	0
	Western North Atlantic	22,128	5	0	150,830	24	0

Table 5.1-2: Incidental Take Request by Stock due to Acoustic and Explosive Sources during Navy Training Activities (continued)

Species	*Stock*	*Maximum Annual*			*7-Year Total*		
		Level B	*Level A*	*Mort*	*Level B*	*Level A*	*Mort*
Rough-toothed dolphin	Northern Gulf of Mexico	128	0	0	872	0	0
	Western North Atlantic	3,365	3	0	22,649	10	0
Sei whale	Western North Atlantic	356	3	0	2,430	17	0
Short-beaked common dolphin	Western North Atlantic	165,863	39	0	1,160,631	261	0
Short-finned pilot whale	Northern Gulf of Mexico	88	0	0	611	0	0
	Western North Atlantic	21,745	3	0	149,080	18	0
Sowerby's beaked whale	Western North Atlantic	15,846	0	0	110,804	0	0
Sperm whale	North Atlantic	7,189	3	0	50,266	5	0
	Northern Gulf of Mexico	38	0	0	254	0	0
Spinner dolphin	Northern Gulf of Mexico	20	0	0	135	0	0
	Western North Atlantic	4,185	1	0	28,962	3	0
Striped dolphin	Northern Gulf of Mexico	244	1	0	1,696	1	0
	Western North Atlantic	121,279	26	0	848,940	178	0
True's beaked whale	Western North Atlantic	15,892	0	0	111,111	0	0
White-beaked dolphin	Western North Atlantic	4	0	0	28	0	0

Mort = Mortality

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Table 5.1-3: Incidental Take Request by Stock due to Acoustic and Explosive Source during Navy Testing Activities

Species	*Stock*	*Maximum Annual*			*7-Year Total*		
		Level B	*Level A*	*Mort[a]*	*Level B*	*Level A*	*Mort[a]*
Atlantic spotted dolphin	Northern Gulf of Mexico	11,976	19	0	78,071	119	0
	Western North Atlantic	46,122	63	1	288,496	406	2
Atlantic white-sided dolphin	Western North Atlantic	7,662	5	0	49,053	25	0
Blainville's beaked whale	Northern Gulf of Mexico	114	0	0	733	0	0
	Western North Atlantic	10,431	2	0	65,791	3	0
Blue whale	North Atlantic	32	1	0	203	2	0
Bottlenose dolphin	Central GA Estuarine System	0	0	0	0	0	0
	Gulf of Mexico Eastern Coastal	51	0	0	329	0	0
	Gulf of Mexico Northern Coastal	5,052	16	0	35,305	112	0
	Gulf of Mexico Oceanic	5,755	3	0	36,970	10	0
	Gulf of Mexico Western Coastal	2,540	1	0	15,751	1	0
	Indian River Lagoon Estuarine System	154	0	0	1,074	0	0
	Jacksonville Estuarine System	12	0	0	69	0	0
	MS Sound, Lake Borgne, and Bay Boudreau	194	1	0	1,070	1	0
	Northern GA/Southern SC Estuarine System	0	0	0	0	0	0
	Northern Gulf of Mexico Continental Shelf	66,581	25	0	448,847	151	0
	Northern NC Estuarine System	851	3	0	5,151	17	0
	Northern SC Estuarine System	0	0	0	0	0	0
	Nueces and Corpus Christi Bays	0	0	0	0	0	0
	Sabine Lake	0	0	0	0	0	0
	Southern GA Estuarine System	1	0	0	1	0	0
	Southern NC Estuarine System	0	0	0	0	0	0
	St. Andrew Bay	32	0	0	211	0	0
	St. Joseph Bay	35	0	0	240	0	0
	Tampa Bay	0	0	0	0	0	0
	Western North Atlantic Central FL Coastal	2,797	1	0	16,626	4	0
	Western North Atlantic Northern FL Coastal	4,382	3	0	26,243	9	0
	Western North Atlantic Northern Migratory Coastal	6,236	26	0	37,917	148	0
	Western North Atlantic Offshore	66,811	85	1	427,324	526	2
	Western North Atlantic SC GA Coastal	1,092	3	0	6,372	11	0
	Western North Atlantic Southern Migratory Coastal	1,015	2	0	5,874	8	0
Bryde's whale	Primary	1	0	0	1	0	0

Table 5.1-3: Incidental Take Request by Stock due to Acoustic and Explosive Source during Navy Testing Activities (continued)

Species	***Stock***	***Maximum Annual***			***7-Year Total***		
		Level B	***Level A***	***Mort[a]***	***Level B***	***Level A***	***Mort[a]***
Clymene dolphin	Northern Gulf of Mexico	533	3	0	3,118	4	0
	Western North Atlantic	63,264	89	1	416,123	606	2
Cuvier's beaked whale	Northern Gulf of Mexico	419	0	0	2,681	0	0
	Western North Atlantic	46,024	2	0	290,970	5	0
Dwarf sperm whale	Northern Gulf of Mexico	173	21	0	1,023	72	0
	Western North Atlantic	2,643	159	0	16,960	993	0
False killer whale	Northern Gulf of Mexico	206	0	0	1,263	0	0
	Western North Atlantic	165	1	0	1,051	1	0
Fin whale	Western North Atlantic	1,608	24	0	9,921	116	0
Fraser's dolphin	Northern Gulf of Mexico	216	0	0	1,328	0	0
	Western North Atlantic	1,000	1	0	6,602	6	0
Gervais' beaked whale	Northern Gulf of Mexico	111	0	0	710	0	0
	Western North Atlantic	19,356	2	0	124,195	1	0
Gray seal	Western North Atlantic	7,814	10	0	50,649	59	0
Harbor porpoise	Gulf of ME/Bay of Fundy	50,648	78	0	332,214	441	0
Harbor seal	Western North Atlantic	10,816	13	0	70,078	79	0
Harp seal	Western North Atlantic	11,156	3	0	72,257	15	0
Hooded seal	Western North Atlantic	1,264	1	0	7,777	4	0
Humpback whale	Gulf of ME	508	5	0	3,205	33	0
Killer whale	Northern Gulf of Mexico	97	0	0	598	0	0
	Western North Atlantic	69	1	0	436	1	0
Long-finned pilot whale	Western North Atlantic	8,192	15	1	51,545	65	1
Melon-headed whale	Northern Gulf of Mexico	690	1	0	4,245	1	0
	Western North Atlantic	1,078	2	0	7,099	10	0
Minke whale	Canadian Eastern Coastal	2,039	38	0	13,332	255	0
North Atlantic right whale	Western	317	2	0	2,037	7	0
Northern bottlenose whale	Western North Atlantic	823	1	0	5,090	1	0
Pantropical spotted dolphin	Northern Gulf of Mexico	5,596	6	2	34,923	23	5
	Western North Atlantic	2,087	2	0	13,525	13	0
Pygmy killer whale	Northern Gulf of Mexico	256	0	0	1,575	0	0
	Western North Atlantic	108	0	0	712	0	0
Pygmy sperm whale	Northern Gulf of Mexico	158	20	0	919	63	0
	Western North Atlantic	2,664	150	0	17,099	947	0
Rice's whale	Northern Gulf of Mexico	294	2	0	1,997	5	0
Risso's dolphin	Northern Gulf of Mexico	180	0	0	1,097	0	0
	Western North Atlantic	15,114	20	1	95,031	122	1

Table 5.1-3: Incidental Take Request by Stock due to Acoustic and Explosive Source during Navy Testing Activities (continued)

Species	*Stock*	*Maximum Annual*			*7-Year Total*		
		Level B	*Level A*	*Mort[a]*	*Level B*	*Level A*	*Mort[a]*
Rough-toothed dolphin	Northern Gulf of Mexico	1,510	3	0	9,920	5	0
	Western North Atlantic	1,386	3	0	8,901	15	0
Sei whale	Western North Atlantic	391	4	0	2,554	27	0
Short-beaked common dolphin	Western North Atlantic	103,597	150	5	660,062	827	12
Short-finned pilot whale	Northern Gulf of Mexico	933	3	0	5,572	13	0
	Western North Atlantic	11,285	17	1	72,859	86	1
Sowerby's beaked whale	Western North Atlantic	9,770	1	0	62,706	1	0
Sperm whale	North Atlantic	5,399	5	0	34,383	21	0
	Northern Gulf of Mexico	237	0	0	1,399	0	0
Spinner dolphin	Northern Gulf of Mexico	636	0	0	4,324	0	0
	Western North Atlantic	1,169	1	0	7,537	7	0
Striped dolphin	Northern Gulf of Mexico	2,132	6	1	13,718	14	2
	Western North Atlantic	87,589	165	6	549,062	1,005	16
True's beaked whale	Western North Atlantic	9,684	1	0	62,152	1	0
White-beaked dolphin	Western North Atlantic	12	0	0	76	0	0

Mort = Mortality; Table created: 16 May 2024 10:59:16 AM
[a]All Navy Testing estimated mortalities are due to ship shock trials without consideration of extensive mitigation measures.

Table 5.1-4: Incidental Take Request by Stock due to Acoustic and Explosive Sources during Coast Guard Training Activities

Species	Stock	Maximum Annual			7-Year Total		
		Level B	Level A	Mort	Level B	Level A	Mort
Atlantic spotted dolphin	Northern Gulf of Mexico	36	0	0	241	0	0
	Western North Atlantic	32	0	0	205	0	0
Atlantic white-sided dolphin	Western North Atlantic	6	0	0	27	0	0
Blainville's beaked whale	Northern Gulf of Mexico	0	0	0	0	0	0
	Western North Atlantic	7	0	0	46	0	0
Blue whale	North Atlantic	0	0	0	0	0	0
Bottlenose dolphin	Central GA Estuarine System	0	0	0	0	0	0
	Gulf of Mexico Eastern Coastal	0	0	0	0	0	0
	Gulf of Mexico Northern Coastal	0	0	0	0	0	0
	Gulf of Mexico Oceanic	2	0	0	3	0	0
	Gulf of Mexico Western Coastal	0	0	0	0	0	0
	Indian River Lagoon Estuarine System	0	0	0	0	0	0
	Jacksonville Estuarine System	0	0	0	0	0	0
	MS Sound, Lake Borgne, and Bay Boudreau	0	0	0	0	0	0
	Northern GA/Southern SC Estuarine System	0	0	0	0	0	0
	Northern Gulf of Mexico Continental Shelf	85	1	0	585	1	0
	Northern NC Estuarine System	500	0	0	3,494	0	0
	Northern SC Estuarine System	0	0	0	0	0	0
	Nueces and Corpus Christi Bays	0	0	0	0	0	0
	Sabine Lake	0	0	0	0	0	0
	Southern GA Estuarine System	0	0	0	0	0	0
	Southern NC Estuarine System	0	0	0	0	0	0
	St. Andrew Bay	0	0	0	0	0	0
	St. Joseph Bay	0	0	0	0	0	0
	Tampa Bay	0	0	0	0	0	0
	Western North Atlantic Central FL Coastal	5	0	0	30	0	0
	Western North Atlantic Northern FL Coastal	0	0	0	0	0	0
	Western North Atlantic Northern Migratory Coastal	2,772	0	0	19,400	0	0
	Western North Atlantic Offshore	106	0	0	723	0	0
	Western North Atlantic SC GA Coastal	1	0	0	1	0	0
	Western North Atlantic Southern Migratory Coastal	297	0	0	2,076	0	0
Bryde's whale	Primary	0	0	0	0	0	0

Table 5.1-4: Incidental Take Request by Stock due to Acoustic and Explosive Sources during Coast Guard Training Activities (continued)

Species	*Stock*	*Maximum Annual*			*7-Year Total*		
		Level B	*Level A*	*Mort*	*Level B*	*Level A*	*Mort*
Clymene dolphin	Northern Gulf of Mexico	0	0	0	0	0	0
	Western North Atlantic	1	0	0	1	0	0
Cuvier's beaked whale	Northern Gulf of Mexico	0	0	0	0	0	0
	Western North Atlantic	42	0	0	277	0	0
Dwarf sperm whale	Northern Gulf of Mexico	2	0	0	2	0	0
	Western North Atlantic	8	1	0	45	1	0
False killer whale	Northern Gulf of Mexico	0	0	0	0	0	0
	Western North Atlantic	1	0	0	1	0	0
Fin whale	Western North Atlantic	3	0	0	3	0	0
Fraser's dolphin	Northern Gulf of Mexico	0	0	0	0	0	0
	Western North Atlantic	1	0	0	7	0	0
Gervais' beaked whale	Northern Gulf of Mexico	0	0	0	0	0	0
	Western North Atlantic	14	0	0	90	0	0
Gray seal	Western North Atlantic	49	0	0	342	0	0
Harbor porpoise	Gulf of ME/Bay of Fundy	98	4	0	677	28	0
Harbor seal	Western North Atlantic	74	1	0	500	1	0
Harp seal	Western North Atlantic	4	1	0	27	1	0
Hooded seal	Western North Atlantic	2	0	0	3	0	0
Humpback whale	Gulf of ME	3	0	0	7	0	0
Killer whale	Northern Gulf of Mexico	0	0	0	0	0	0
	Western North Atlantic	1	0	0	1	0	0
Long-finned pilot whale	Western North Atlantic	2	0	0	3	0	0
Melon-headed whale	Northern Gulf of Mexico	0	0	0	0	0	0
	Western North Atlantic	3	0	0	19	0	0
Minke whale	Canadian Eastern Coastal	5	0	0	14	0	0
North Atlantic right whale	Western	1	0	0	4	0	0
Northern bottlenose whale	Western North Atlantic	0	0	0	0	0	0
Pantropical spotted dolphin	Northern Gulf of Mexico	0	0	0	0	0	0
	Western North Atlantic	5	0	0	29	0	0
Pygmy killer whale	Northern Gulf of Mexico	0	0	0	0	0	0
	Western North Atlantic	1	0	0	2	0	0
Pygmy sperm whale	Northern Gulf of Mexico	2	0	0	2	0	0
	Western North Atlantic	6	1	0	31	1	0
Rice's whale	Northern Gulf of Mexico	1	0	0	1	0	0
Risso's dolphin	Northern Gulf of Mexico	0	0	0	0	0	0
	Western North Atlantic	8	0	0	43	0	0

Table 5.1-4: Incidental Take Request by Stock due to Acoustic and Explosive Sources during Coast Guard Training Activities (continued)

Species	*Stock*	*Maximum Annual*			*7-Year Total*		
		Level B	*Level A*	*Mort*	*Level B*	*Level A*	*Mort*
Rough-toothed dolphin	Northern Gulf of Mexico	4	0	0	22	0	0
	Western North Atlantic	2	0	0	14	0	0
Sei whale	Western North Atlantic	2	0	0	2	0	0
Short-beaked common dolphin	Western North Atlantic	19	1	0	127	1	0
Short-finned pilot whale	Northern Gulf of Mexico	0	0	0	0	0	0
	Western North Atlantic	15	0	0	93	0	0
Sowerby's beaked whale	Western North Atlantic	6	0	0	37	0	0
Sperm whale	North Atlantic	6	0	0	36	0	0
	Northern Gulf of Mexico	0	0	0	0	0	0
Spinner dolphin	Northern Gulf of Mexico	0	0	0	0	0	0
	Western North Atlantic	3	0	0	15	0	0
Striped dolphin	Northern Gulf of Mexico	0	0	0	0	0	0
	Western North Atlantic	2	0	0	4	0	0
True's beaked whale	Western North Atlantic	6	0	0	39	0	0
White-beaked dolphin	Western North Atlantic	0	0	0	0	0	0

Mort = Mortality; Table created: 16 May 2024 10:59:16 AM

5.2 INCIDENTAL TAKE REQUEST FROM VESSEL STRIKES

A detailed analysis of strike data is contained in Section 6.3, Estimated Take of Marine Mammals by Vessel Strike. Vessel strike to marine mammals is not associated with any specific military readiness activity but rather a limited, sporadic, and incidental result of vessel movement within the Study Area. Based on the probabilities of whale strikes suggested by an analysis of past strike data and anticipated future vessel movements provided in Section 6.3 (Estimated Take of Marine Mammals by Vessel Strike) of this application, the Navy is requesting authorization for take of 3 large whales by injury or mortality, resulting from vessel strike incidental to the Navy's training and testing activities, within any portion of the AFTT Study Area over the course of the 7 years of the regulations. The Coast Guard is requesting authorization for take of 3 large whales by injury or mortality, resulting from vessel strike incidental to training activities within any portion of the AFTT Study Area over the course of the 7 years of the regulations.

Incidents of past vessel strike have not always resulted in the ability to identify the animal to the level of species. Therefore, Action Proponents cannot quantifiably predict that the proposed takes will be of any particular species, and seek take authorization for any combination of the following marine mammal stocks in the AFTT Study Area:

- Gulf of Maine humpback whale
- Western North Atlantic fin whale
- Nova Scotia sei whale
- Canadian East Coast minke whale
- Northwest Atlantic blue whale
- North Atlantic sperm whale

Based on the broad distribution of military readiness activities and the relative distribution and abundances of large whale species within the AFTT Study Area, it is anticipated that vessel strikes would not exceed 2 from any individual stock.

In addition to standard operating procedures, the Action Proponents will implement measures in mitigation areas used by North Atlantic right whales for foraging, calving, and migration (Section 11, Mitigation Measures). These measures (e.g., funding of and communication with sightings systems, awareness of slow zones and dynamic management areas for North Atlantic right whales) have helped the Action Proponents avoid striking a North Atlantic right whale during military readiness activities in the past, and therefore, would continue to minimize the potential for future strikes to occur.

6 TAKE ESTIMATES FOR MARINE MAMMALS

6.1 ACOUSTIC STRESSORS

This section summarizes the potential impacts of acoustic stressors used during military readiness activities within the Study Area. The acoustic stressors that are predicted to result in incidental take are (1) sonar and other transducers (hereinafter referred to as sonars), (2) air guns, and (3) pile driving. Table 6.1-1 contains brief summaries of background information relevant to the analyses of impacts for each acoustic sub-stressor. 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 sub-stressor, are provided in Appendix D (Acoustic and Explosive Impacts Supporting Information) of the Draft Supplemental EIS/OIS. The detailed assessment of these acoustic stressors under this proposed action is in Appendix A of this request.

The Action Proponents will implement visual observation mitigation to reduce potential impacts from acoustic stressors on marine mammals. The Action Proponents will also implement geographic mitigation to reduce potential acoustic impacts within important marine mammal habitats as identified in Section 11.6 (Geographic Mitigation).

Table 6.1-1: Acoustic Stressors Background Information Summary

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

Table 6.1-1: Acoustic Stressors Background Information Summary (continued)

Substressor	*Background Information Summary*
Impulsive noise (includes air guns and pile driving)	Impulsive noise may result in hearing loss, masking, physiological stress, or behavioral reaction. The intermittent nature of most impulsive sounds would result in very limited probability of any masking effects. Due to the rapid rise time and higher instantaneous peak pressure of impulsive noise, nearby noise is more likely to cause startle or avoidance responses. Different groups of marine mammals may respond in different ways to impulsive noise: • Mysticetes: LF and VLF species are likely impacted since low-frequency explosive noise propagates long distances and overlaps with the range of best hearing for mysticetes. They have shown a variety of responses to impulsive noise, including avoidance, habitat displacement, reduced surface intervals, altered swimming behavior, and changes in vocalization rates. • Odontocetes: Impulsive noise can result in hearing loss for VHF and HF odontocetes, with the VHF group exhibiting greater sensitivity. Masking effects are possible but release from masking during the silent period between sounds is likely. Most odontocetes are behaviorally less sensitive to impulsive noise than mysticetes, with responses occurring at much 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.

Notes: HF = high frequency; LF = low frequency; PCA = phocid carnivores in water; PCW = phocid carnivores in water; VHF = very high frequency; VLF = very low frequency

6.1.1 Impacts from Sonar and Other Transducers

The activities that use sonars are identified in Section 1.5 of this request. Other transducers include items such as acoustic projectors and countermeasure devices. The types and quantities of sonar sources under the Proposed Action are shown in Table 1.4-1: Sonar and Transducers Quantitatively Analyzed. As discussed, in Section 1.4.1 (Acoustic Stressors), a detailed comparison of sonar quantities in the previous analysis 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, including impact analyses for each stock, is in Appendix A of this request.

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

Sonars with higher source levels, longer durations, higher duty cycles, and frequencies near the best range of hearing are more likely to affect hearing. Due to their high source levels and low transmission loss (compared to higher frequency sources), anti-submarine warfare sonar sources, including hull-mounted sonar (MF1) and high duty cycle hull-mounted sonar (MF1C), have large zones of effects. The ranges to auditory effects for MF1, MF1C, and other selected sonars are in in Appendix A of this request.

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.

Some modeling areas encompassed or overlapped the geographic mitigation areas described in Section 11 (Mitigation). Depending on how well the mitigation requirements can be incorporated into the model, the modeling results may or may not reflect the Action Proponents' geographic mitigation requirements, as shown in Table 6.1-2. In instances where geographic mitigation requirements are not reflected in the modeling results, mitigation is expected to reduce the number or severity of impacts for all marine mammal species with associated model-estimated effects. Table 6.1-2 lists geographic mitigation that could potentially affect the modeling results for sonar. It does not list other geographic mitigation that may still reduce impacts but cannot be quantified in the impact modeling, such as pre-event planning, awareness notification messages, or obtaining Early Warning System North Atlantic right whale sighting data.

Table 6.1-2: Geographic Mitigation Reflected in the Sonar Modeling Results

Geographic Mitigation Section Reference	*Reflected in Modeling Results?*	*Summary of Relevant Mitigation*
Section 11.6.2 (Major Training Exercise Planning Awareness Mitigation Areas)	Yes	Limits on the annual number of Major Training Exercises
Section 11.6.3 (Northeast North Atlantic Right Whale Mitigation Area)	No	Minimization of low-frequency active sonar, mid-frequency active sonar, and high-frequency active sonar
Section 11.6.4 (Gulf of Maine Marine Mammal Mitigation Area)	Yes	Limit of 200 hours of surface ship hull-mounted mid-frequency active sonar annually
Section 11.6.6 (Southeast North Atlantic Right Whale Mitigation Area)	No	No use of, or minimization of, certain active sonar sources from November 15 to April 15
Section 11.6.9 (Gulf of Mexico Rice's Whale Mitigation Area)	Yes	Limit of 200 hours of surface ship hull-mounted mid-frequency active sonar annually

Appendix A of this request provides a detailed analysis of 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 overlap with biologically important areas and critical habitats, where applicable. The number of impacts (AINJ, TTS, and behavioral responses) to each stock due to exposure to sonar under the Proposed Action for a maximum year and 7 years of activities, are shown in Table 6.1-3 through Table 6.1-8 for Navy training activities, Navy testing activities, and Coast Guard training activities, respectively.

Depending on the stock, impacts to individuals may be permanent (auditory injury) 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.

Table 6.1-3: Estimated Effects to Marine Mammal Stocks from Sonar and Other Active Transducers over One Year of Maximum Navy Training

Species	*Stock*	*BEH*	*TTS*	*AINJ*
Atlantic spotted dolphin	Northern Gulf of Mexico	508	280	0
	Western North Atlantic	34,866	39,711	22
Atlantic white-sided dolphin	Western North Atlantic	2,051	1,172	2
Blainville's beaked whale	Northern Gulf of Mexico	12	0	-
	Western North Atlantic	15,211	53	-
Blue whale	North Atlantic	6	32	0
Bottlenose dolphin	Central GA Estuarine System	0	-	-
	Gulf of Mexico Eastern Coastal	27	-	-
	Gulf of Mexico Northern Coastal	197	-	-
	Gulf of Mexico Oceanic	432	83	1
	Gulf of Mexico Western Coastal	359	432	-
	Indian River Lagoon Estuarine System	1,421	1	0
	Jacksonville Estuarine System	264	84	-
	MS Sound, Lake Borgne, and Bay Boudreau	-	-	-
	Northern GA/Southern SC Estuarine System	2	-	-
	Northern Gulf of Mexico Continental Shelf	4,268	364	0
	Northern NC Estuarine System	7,653	1,527	3
	Northern SC Estuarine System	-	-	-
	Nueces and Corpus Christi Bays	4	-	-
	Sabine Lake	1	-	-
	Southern GA Estuarine System	84	38	1
	Southern NC Estuarine System	81	80	-
	St. Andrew Bay	14	-	-
	St. Joseph Bay	7	-	-
	Tampa Bay	163	187	-
	Western North Atlantic Central FL Coastal	6,517	1,157	1
	Western North Atlantic Northern FL Coastal	15,287	1,711	1

Table 6.1-3: Estimated Effects to Marine Mammal Stocks from Sonar and Other Active Transducers over One Year of Maximum Navy Training (continued)

Species	Stock	BEH	TTS	AINJ
	Western North Atlantic Northern Migratory Coastal	52,040	12,610	28
	Western North Atlantic Offshore	62,316	57,732	20
	Western North Atlantic SC GA Coastal	1,172	2,685	2
	Western North Atlantic Southern Migratory Coastal	2,345	6,475	2
Bryde's whale	Primary	1	9	-
Clymene dolphin	Northern Gulf of Mexico	35	31	0
	Western North Atlantic	39,694	29,729	8
Cuvier's beaked whale	Northern Gulf of Mexico	40	1	-
	Western North Atlantic	65,767	234	-
Dwarf sperm whale	Northern Gulf of Mexico	2	8	0
	Western North Atlantic	743	2,875	25
False killer whale	Northern Gulf of Mexico	15	9	-
	Western North Atlantic	236	170	-
Fin whale	Western North Atlantic	218	833	6
Fraser's dolphin	Northern Gulf of Mexico	17	6	-
	Western North Atlantic	1,000	902	1
Gervais' beaked whale	Western North Atlantic	15,616	143	-
	Northern Gulf of Mexico	13	1	-
	Western North Atlantic	15,616	143	-
Gray seal	Western North Atlantic	5,241	2,531	11
Harbor porpoise	Gulf of ME/Bay of Fundy	34,065	2,022	6
Harbor seal	Western North Atlantic	7,331	3,737	14
Harp seal	Western North Atlantic	7,813	6,819	2
Hooded seal	Western North Atlantic	343	117	1
Humpback whale	Gulf of ME	56	264	6
Killer whale	Northern Gulf of Mexico	8	5	-
	Western North Atlantic	68	42	0
Long-finned pilot whale	Western North Atlantic	8,540	4,954	2
Melon-headed whale	Northern Gulf of Mexico	53	28	-
	Western North Atlantic	1,684	1,833	1
Minke whale	Canadian Eastern Coastal	239	2,332	17
North Atlantic right whale	Western	17	56	1
Northern bottlenose whale	Western North Atlantic	824	4	-
Pantropical spotted dolphin	Northern Gulf of Mexico	498	220	1
	Western North Atlantic	5,641	5,332	2
Pygmy killer whale	Northern Gulf of Mexico	18	11	-
	Western North Atlantic	185	183	0

Table 6.1-3: Estimated Effects to Marine Mammal Stocks from Sonar and Other Active Transducers over One Year of Maximum Navy Training (continued)

Species	Stock	BEH	TTS	AINJ
Pygmy sperm whale	Northern Gulf of Mexico	2	9	1
	Western North Atlantic	774	2,792	25
Rice's whale	Northern Gulf of Mexico	1	6	1
Risso's dolphin	Northern Gulf of Mexico	16	7	0
	Western North Atlantic	12,425	9,694	3
Rough-toothed dolphin	Northern Gulf of Mexico	89	37	-
	Western North Atlantic	1,444	1,917	2
Sei whale	Western North Atlantic	38	313	3
Short-finned pilot whale	Northern Gulf of Mexico	54	33	0
	Western North Atlantic	12,319	9,414	2
Short-beaked common dolphin	Western North Atlantic	83,926	81,845	33
Sowerby's beaked whale	Western North Atlantic	15,679	165	-
Sperm whale	North Atlantic	5,692	1,487	1
	Northern Gulf of Mexico	32	4	-
Spinner dolphin	Northern Gulf of Mexico	12	8	0
	Western North Atlantic	2,193	1,991	1
Striped dolphin	Northern Gulf of Mexico	186	57	0
	Western North Atlantic	69,973	51,282	22
True's beaked whale	Western North Atlantic	15,721	169	-
White-beaked dolphin	Western North Atlantic	3	1	-

Table Created: 2024-05-16 10:58:40; BEH = Behavioral Response, TTS = Temporary Threshold Shift, AINJ = Auditory Injury; Zero (0) impacts indicate total less than 0.5 and a dash (-) is a true zero.

Table 6.1-4: Estimated Effects to Marine Mammal Stocks from Sonar and Other Active Transducers over Seven Years of Navy Training

Species	Stock	BEH	TTS	AINJ
Atlantic spotted dolphin	Northern Gulf of Mexico	3,547	1,952	0
	Western North Atlantic	241,402	266,293	151
Atlantic white-sided dolphin	Western North Atlantic	14,340	8,193	8
Blainville's beaked whale	Northern Gulf of Mexico	79	0	-
	Western North Atlantic	106,367	371	-
Blue whale	North Atlantic	42	220	0
Bottlenose dolphin	Central GA Estuarine System	0	-	-
	Gulf of Mexico Eastern Coastal	135	-	-
	Gulf of Mexico Northern Coastal	1,379	-	-
	Gulf of Mexico Oceanic	3,024	580	1
	Gulf of Mexico Western Coastal	1,435	1,727	-
	Indian River Lagoon Estuarine System	9,685	3	0

Table 6.1-4: Estimated Effects to Marine Mammal Stocks from Sonar and Other Active Transducers over Seven Years of Navy Training (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*
	Jacksonville Estuarine System	1,831	585	-
	MS Sound, Lake Borgne, and Bay Boudreau	-	-	-
	Northern GA/Southern SC Estuarine System	8	-	-
	Northern Gulf of Mexico Continental Shelf	29,494	2,411	0
	Northern NC Estuarine System	53,164	10,445	20
	Northern SC Estuarine System	-	-	-
	Nueces and Corpus Christi Bays	15	-	-
	Sabine Lake	3	-	-
	Southern GA Estuarine System	520	227	1
	Southern NC Estuarine System	332	350	-
	St. Andrew Bay	92	-	-
	St. Joseph Bay	47	-	-
	Tampa Bay	654	747	-
	Western North Atlantic Central FL Coastal	44,666	5,978	1
	Western North Atlantic Northern FL Coastal	106,412	10,839	3
	Western North Atlantic Northern Migratory Coastal	363,805	86,729	196
	Western North Atlantic Offshore	431,146	386,818	131
	Western North Atlantic SC GA Coastal	7,509	17,055	8
	Western North Atlantic Southern Migratory Coastal	15,313	41,852	14
Bryde's whale	Primary	6	63	-
Clymene dolphin	Northern Gulf of Mexico	242	217	0
	Western North Atlantic	277,855	208,097	54
Cuvier's beaked whale	Northern Gulf of Mexico	280	1	-
	Western North Atlantic	459,656	1,636	-
Dwarf sperm whale	Northern Gulf of Mexico	14	55	0
	Western North Atlantic	5,191	19,945	174
False killer whale	Northern Gulf of Mexico	99	61	-
	Western North Atlantic	1,647	1,174	-
Fin whale	Western North Atlantic	1,520	5,810	38
Fraser's dolphin	Northern Gulf of Mexico	119	38	-
	Western North Atlantic	6,872	5,948	6
Gervais' beaked whale	Northern Gulf of Mexico	89	1	-
	Western North Atlantic	218,391	1,999	-
Gray seal	Western North Atlantic	36,456	17,624	73
Harbor porpoise	Gulf of ME/Bay of Fundy	237,914	14,041	41
Harbor seal	Western North Atlantic	51,184	25,896	97
Harp seal	Western North Atlantic	54,677	47,703	12
Hooded seal	Western North Atlantic	2,399	810	1

Table 6.1-4: Estimated Effects to Marine Mammal Stocks from Sonar and Other Active Transducers over Seven Years of Navy Training (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*
Humpback whale	Gulf of ME	387	1,827	40
Killer whale	Northern Gulf of Mexico	51	31	-
	Western North Atlantic	476	283	0
Long-finned pilot whale	Western North Atlantic	59,774	34,676	8
Melon-headed whale	Northern Gulf of Mexico	366	195	-
	Western North Atlantic	11,682	12,286	2
Minke whale	Canadian Eastern Coastal	1,666	15,775	113
North Atlantic right whale	Western	114	374	2
Northern bottlenose whale	Western North Atlantic	5,765	24	-
Pantropical spotted dolphin	Northern Gulf of Mexico	3,486	1,538	1
	Western North Atlantic	39,264	36,346	11
Pygmy killer whale	Northern Gulf of Mexico	125	73	-
	Western North Atlantic	1,283	1,229	0
Pygmy sperm whale	Northern Gulf of Mexico	14	61	1
	Western North Atlantic	5,409	19,359	171
Rice's whale	Northern Gulf of Mexico	7	41	1
Risso's dolphin	Northern Gulf of Mexico	109	46	0
	Western North Atlantic	86,042	64,728	21
Rough-toothed dolphin	Northern Gulf of Mexico	619	249	-
	Western North Atlantic	9,949	12,683	9
Sei whale	Western North Atlantic	264	2,136	17
Short-beaked common dolphin	Western North Atlantic	587,311	572,687	228
Short-finned pilot whale	Northern Gulf of Mexico	377	231	0
	Western North Atlantic	85,503	63,500	11
Sowerby's beaked whale	Western North Atlantic	109,639	1,153	-
Sperm whale	North Atlantic	39,824	10,380	1
	Northern Gulf of Mexico	224	28	-
Spinner dolphin	Northern Gulf of Mexico	80	55	0
	Western North Atlantic	15,284	13,673	3
Striped dolphin	Northern Gulf of Mexico	1,300	394	0
	Western North Atlantic	489,808	358,968	153
True's beaked whale	Western North Atlantic	109,931	1,178	-
White-beaked dolphin	Western North Atlantic	21	7	-

Table Created: 2024-05-16 10:58:41; BEH = Behavioral Response, TTS = Temporary Threshold Shift, AINJ = Auditory Injury; Zero (0) impacts indicate total less than 0.5 and a dash (-) is a true zero.

Table 6.1-5: Estimated Effects to Marine Mammal Stocks from Sonar and Other Active Transducers over a Maximum Year of Navy Testing

Species	*Stock*	*BEH*	*TTS*	*AINJ*
Atlantic spotted dolphin	Western North Atlantic	16,887	29,106	56
	Northern Gulf of Mexico	6,523	5,425	18
Atlantic white-sided dolphin	Western North Atlantic	5,134	2,431	3
Blainville's beaked whale	Western North Atlantic	10,404	96	0
	Northern Gulf of Mexico	114	0	-
Blue whale	North Atlantic	4	26	1
Bottlenose dolphin	Central GA Estuarine System	-	-	-
	Gulf of Mexico Eastern Coastal	47	3	-
	Gulf of Mexico Northern Coastal	4,346	503	-
	Gulf of Mexico Oceanic	4,326	1,425	2
	Gulf of Mexico Western Coastal	1,412	1,125	-
	Indian River Lagoon Estuarine System	17	137	0
	Jacksonville Estuarine System	5	7	0
	MS Sound, Lake Borgne, and Bay Boudreau	151	43	1
	Northern GA/Southern SC Estuarine System	-	-	-
	Northern Gulf of Mexico Continental Shelf	42,067	23,967	21
	Northern NC Estuarine System	436	415	3
	Northern SC Estuarine System	-	-	-
	Nueces and Corpus Christi Bays	0	-	-
	Sabine Lake	-	-	-
	Southern GA Estuarine System	1	-	-
	Southern NC Estuarine System	-	-	-
	St. Andrew Bay	30	0	0
	St. Joseph Bay	35	-	-
	Tampa Bay	-	-	-
	Western North Atlantic Central FL Coastal	1,377	1,403	0
	Western North Atlantic Northern FL Coastal	1,761	2,616	2
	Western North Atlantic Northern Migratory Coastal	2,442	3,790	25
	Western North Atlantic Offshore	28,778	37,771	67
	Western North Atlantic SC GA Coastal	239	841	2
	Western North Atlantic Southern Migratory Coastal	269	734	1
Bryde's whale	Primary	1	-	-
Clymene dolphin	Northern Gulf of Mexico	354	177	1
	Western North Atlantic	20,507	42,746	87
Cuvier's beaked whale	Western North Atlantic	45,846	369	0
	Northern Gulf of Mexico	417	1	-
Dwarf sperm whale	Western North Atlantic	521	2,058	133
	Northern Gulf of Mexico	19	124	5

Table 6.1-5: Estimated Effects to Marine Mammal Stocks from Sonar and Other Active Transducers over a Maximum Year of Navy Testing (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*
False killer whale	Northern Gulf of Mexico	152	52	0
	Western North Atlantic	80	81	1
Fin whale	Western North Atlantic	328	1,056	11
Fraser's dolphin	Northern Gulf of Mexico	150	66	0
	Western North Atlantic	359	638	1
Gervais' beaked whale	Northern Gulf of Mexico	110	0	-
	Western North Atlantic	9,548	188	-
Gray seal	Western North Atlantic	4,461	3,261	6
Harbor porpoise	Gulf of ME/Bay of Fundy	46,756	3,415	32
Harbor seal	Western North Atlantic	5,912	4,777	7
Harp seal	Western North Atlantic	8,813	2,310	2
Hooded seal	Western North Atlantic	738	521	1
Humpback whale	Gulf of ME	127	358	5
Killer whale	Northern Gulf of Mexico	76	21	0
	Western North Atlantic	30	37	1
Long-finned pilot whale	Western North Atlantic	4,238	3,876	6
Melon-headed whale	Northern Gulf of Mexico	525	163	1
	Western North Atlantic	305	772	2
Minke whale	Canadian Eastern Coastal	401	1,587	36
North Atlantic right whale	Western	71	285	1
Northern bottlenose whale	Western North Atlantic	828	5	-
Pantropical spotted dolphin	Northern Gulf of Mexico	4,088	1,495	2
	Western North Atlantic	788	1,299	2
Pygmy killer whale	Western North Atlantic	30	77	0
	Northern Gulf of Mexico	185	69	0
Pygmy sperm whale	Western North Atlantic	525	2,078	126
	Northern Gulf of Mexico	20	106	4
Rice's whale	Northern Gulf of Mexico	79	204	1
Risso's dolphin	Western North Atlantic	7,822	7,128	13
	Northern Gulf of Mexico	138	40	0
Rough-toothed dolphin	Northern Gulf of Mexico	888	612	1
	Western North Atlantic	425	958	3
Sei whale	Western North Atlantic	75	309	4
Short-finned pilot whale	Western North Atlantic	4,638	6,586	9
	Northern Gulf of Mexico	574	357	2
Short-beaked common dolphin	Western North Atlantic	52,975	49,130	72
Sowerby's beaked whale	Western North Atlantic	9,632	195	-
Sperm whale	Northern Gulf of Mexico	214	21	-
	North Atlantic	3,180	2,197	3

Table 6.1-5: Estimated Effects to Marine Mammal Stocks from Sonar and Other Active Transducers over a Maximum Year of Navy Testing (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*
Spinner dolphin	Northern Gulf of Mexico	466	169	-
	Western North Atlantic	415	754	1
Striped dolphin	Northern Gulf of Mexico	1,541	580	0
	Western North Atlantic	37,728	49,517	125
True's beaked whale	Western North Atlantic	9,551	190	-
White-beaked dolphin	Western North Atlantic	7	5	-

Table Created: 2024-05-13 17:17:49
BEH = Behavioral Response, TTS = Temporary Threshold Shift, AINJ = Auditory Injury
Zero (0) impacts indicate total less than 0.5 and a dash (-) is a true zero.

Table 6.1-6: Estimated Effects to Marine Mammal Stocks from Sonar and Other Active Transducers over Seven Years of Navy Testing

Species	*Stock*	*BEH*	*TTS*	*AINJ*
Atlantic spotted dolphin	Northern Gulf of Mexico	42,782	35,096	113
	Western North Atlantic	102,720	185,723	376
Atlantic white-sided dolphin	Western North Atlantic	32,292	16,151	16
Blainville's beaked whale	Northern Gulf of Mexico	733	0	-
	Western North Atlantic	65,530	659	0
Blue whale	North Atlantic	27	172	2
Bottlenose dolphin	Central GA Estuarine System	-	-	-
	Gulf of Mexico Eastern Coastal	314	14	-
	Gulf of Mexico Northern Coastal	30,370	3,519	-
	Gulf of Mexico Oceanic	27,878	9,070	8
	Gulf of Mexico Western Coastal	8,760	6,977	-
	Indian River Lagoon Estuarine System	119	955	0
	Jacksonville Estuarine System	30	39	0
	MS Sound, Lake Borgne, and Bay Boudreau	832	238	1
	Northern GA/Southern SC Estuarine System	-	-	-
	Northern Gulf of Mexico Continental Shelf	288,739	156,296	132
	Northern NC Estuarine System	2,607	2,544	17
	Northern SC Estuarine System	-	-	-
	Nueces and Corpus Christi Bays	0	-	-
	Sabine Lake	-	-	-
	Southern GA Estuarine System	1	-	-
	Southern NC Estuarine System	-	-	-
	St. Andrew Bay	209	0	0
	St. Joseph Bay	240	-	-
	Tampa Bay	-	-	-
	Western North Atlantic Central FL Coastal	8,277	8,253	0
	Western North Atlantic Northern FL Coastal	10,834	15,625	8

Table 6.1-6: Estimated Effects to Marine Mammal Stocks from Sonar and Other Active Transducers over Seven Years of Navy Testing (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*
	Western North Atlantic Northern Migratory Coastal	14,480	23,416	147
	Western North Atlantic Offshore	177,661	248,701	452
	Western North Atlantic SC GA Coastal	1,483	4,817	8
	Western North Atlantic Southern Migratory Coastal	1,664	4,137	6
Bryde's whale	Primary	1	-	-
Clymene dolphin	Northern Gulf of Mexico	2,062	1,049	2
	Western North Atlantic	124,819	290,746	599
Cuvier's beaked whale	Northern Gulf of Mexico	2,679	1	-
	Western North Atlantic	289,403	2,532	0
Dwarf sperm whale	Northern Gulf of Mexico	112	820	32
	Western North Atlantic	3,199	13,419	898
False killer whale	Northern Gulf of Mexico	936	325	0
	Western North Atlantic	495	535	1
Fin whale	Western North Atlantic	2,127	6,753	73
Fraser's dolphin	Northern Gulf of Mexico	911	417	0
	Western North Atlantic	2,257	4,345	6
Gervais' beaked whale	Northern Gulf of Mexico	709	0	-
	Western North Atlantic	61,134	1,287	-
Gray seal	Western North Atlantic	29,477	20,574	37
Harbor porpoise	Gulf of ME/Bay of Fundy	307,529	21,786	200
Harbor seal	Western North Atlantic	39,119	30,135	47
Harp seal	Western North Atlantic	56,848	15,196	9
Hooded seal	Western North Atlantic	4,352	3,394	2
Humpback whale	Gulf of ME	838	2,258	31
Killer whale	Northern Gulf of Mexico	470	128	0
	Western North Atlantic	181	247	1
Long-finned pilot whale	Western North Atlantic	25,705	25,376	37
Melon-headed whale	Northern Gulf of Mexico	3,233	1,008	1
	Western North Atlantic	1,846	5,258	10
Minke whale	Canadian Eastern Coastal	2,636	10,477	248
North Atlantic right whale	Western	471	1,817	7
Northern bottlenose whale	Western North Atlantic	5,125	30	-
Pantropical spotted dolphin	Northern Gulf of Mexico	25,521	9,358	12
	Western North Atlantic	4,982	8,555	13
Pygmy killer whale	Northern Gulf of Mexico	1,137	436	0
	Western North Atlantic	186	525	0
Pygmy sperm whale	Northern Gulf of Mexico	122	693	23
	Western North Atlantic	3,220	13,543	855

Table 6.1-6: Estimated Effects to Marine Mammal Stocks from Sonar and Other Active Transducers over Seven Years of Navy Testing (continued)

Species	Stock	BEH	TTS	AINJ
Rice's whale	Northern Gulf of Mexico	536	1,387	4
Risso's dolphin	Northern Gulf of Mexico	857	238	0
	Western North Atlantic	47,236	46,940	88
Rough-toothed dolphin	Northern Gulf of Mexico	5,852	4,008	3
	Western North Atlantic	2,571	6,343	15
Sei whale	Western North Atlantic	489	2,025	26
Short-beaked common dolphin	Western North Atlantic	336,874	314,209	460
Short-finned pilot whale	Northern Gulf of Mexico	3,391	2,176	12
	Western North Atlantic	28,239	44,278	63
Sowerby's beaked whale	Western North Atlantic	61,694	1,333	-
Sperm whale	North Atlantic	19,303	14,928	15
	Northern Gulf of Mexico	1,281	116	-
Spinner dolphin	Northern Gulf of Mexico	3,161	1,162	-
	Western North Atlantic	2,516	5,031	7
Striped dolphin	Northern Gulf of Mexico	9,961	3,725	0
	Western North Atlantic	218,210	328,159	859
True's beaked whale	Western North Atlantic	61,182	1,304	-
White-beaked dolphin	Western North Atlantic	44	32	-

Table Created: 2024-05-13 17:17:49
BEH = Behavioral Response, TTS = Temporary Threshold Shift, AINJ = Auditory Injury
Zero (0) impacts indicate total less than 0.5 and a dash (-) is a true zero.

Table 6.1-7: Estimated Effects to Marine Mammal Stocks from Sonar and Other Active Transducers over a Maximum Year of Coast Guard Training

Species	Stock	BEH	TTS	AINJ
Atlantic spotted dolphin	Western North Atlantic	29	1	-
	Northern Gulf of Mexico	35	-	-
Atlantic white-sided dolphin	Western North Atlantic	3	-	-
Blainville's beaked whale	Western North Atlantic	7	-	-
	Northern Gulf of Mexico	-	-	-
Blue whale	North Atlantic	0	-	-
Bottlenose dolphin	Central GA Estuarine System	-	-	-
	Gulf of Mexico Eastern Coastal	-	-	-
	Gulf of Mexico Northern Coastal	-	-	-
	Gulf of Mexico Oceanic	1	-	-
	Gulf of Mexico Western Coastal	-	-	-
	Indian River Lagoon Estuarine System	-	-	-
	Jacksonville Estuarine System	-	-	-
	MS Sound, Lake Borgne, and Bay Boudreau	-	-	-

Table 6.1-7: Estimated Effects to Marine Mammal Stocks from Sonar and Other Active Transducers over a Maximum Year of Coast Guard Training (continued)

Species	Stock	BEH	TTS	AINJ
	Northern GA/Southern SC Estuarine System	-	-	-
	Northern Gulf of Mexico Continental Shelf	78	-	-
	Northern NC Estuarine System	489	11	-
	Northern SC Estuarine System	-	-	-
	Nueces and Corpus Christi Bays	-	-	-
	Sabine Lake	-	-	-
	Southern GA Estuarine System	-	-	-
	Southern NC Estuarine System	-	-	-
	St. Andrew Bay	-	-	-
	St. Joseph Bay	-	-	-
	Tampa Bay	-	-	-
	Western North Atlantic Central FL Coastal	5	-	-
	Western North Atlantic Northern FL Coastal	0	-	-
	Western North Atlantic Northern Migratory Coastal	2,712	60	-
	Western North Atlantic Offshore	103	1	-
	Western North Atlantic SC GA Coastal	1	-	-
	Western North Atlantic Southern Migratory Coastal	294	3	-
Bryde's whale	Primary	-	-	-
Clymene dolphin	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	1	-	-
Cuvier's beaked whale	Western North Atlantic	40	-	-
	Northern Gulf of Mexico	-	-	-
Dwarf sperm whale	Western North Atlantic	2	4	-
	Northern Gulf of Mexico	0	-	-
False killer whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	1	-	-
Fin whale	Western North Atlantic	1	-	-
Fraser's dolphin	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	1	-	-
Gervais' beaked whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	7	-	-
Gray seal	Western North Atlantic	46	1	-
Harbor porpoise	Gulf of ME/Bay of Fundy	46	6	-
Harbor seal	Western North Atlantic	68	2	-
Harp seal	Western North Atlantic	-	-	-
Hooded seal	Western North Atlantic	-	-	-
Humpback whale	Gulf of ME	1	-	-

Table 6.1-7: Estimated Effects to Marine Mammal Stocks from Sonar and Other Active Transducers over a Maximum Year of Coast Guard Training (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*
Killer whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	1	-	-
Long-finned pilot whale	Western North Atlantic	-	-	-
Melon-headed whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	3	-	-
Minke whale	Canadian Eastern Coastal	2	1	-
North Atlantic right whale	Western	1	-	-
Northern bottlenose whale	Western North Atlantic	-	-	-
Pantropical spotted dolphin	Northern Gulf of Mexico	0	-	-
	Western North Atlantic	5	-	-
Pygmy killer whale	Western North Atlantic	1	-	-
	Northern Gulf of Mexico	-	-	-
Pygmy sperm whale	Western North Atlantic	2	2	-
	Northern Gulf of Mexico	0	-	-
Rice's whale	Northern Gulf of Mexico	1	-	-
Risso's dolphin	Western North Atlantic	6	-	-
	Northern Gulf of Mexico	0	-	-
Rough-toothed dolphin	Northern Gulf of Mexico	4	-	-
	Western North Atlantic	2	-	-
Sei whale	Western North Atlantic	1	-	-
Short-finned pilot whale	Western North Atlantic	13	0	-
	Northern Gulf of Mexico	-	-	-
Short-beaked common dolphin	Western North Atlantic	13	-	-
Sowerby's beaked whale	Western North Atlantic	6	-	-
Sperm whale	Northern Gulf of Mexico	-	-	-
	North Atlantic	5	-	-
Spinner dolphin	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	3	-	-
Striped dolphin	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	0	-	-
True's beaked whale	Western North Atlantic	6	-	-
White-beaked dolphin	Western North Atlantic	-	-	-

Table Created: 2024-05-13 17:17:57
BEH = Behavioral Response, TTS = Temporary Threshold Shift, AINJ = Auditory Injury
Zero (0) impacts indicate total less than 0.5 and a dash (-) is a true zero.

Table 6.1-8: Estimated Effects to Marine Mammal Stocks from Sonar and Other Active Transducers over Seven Years of Coast Guard Training

Species	*Stock*	*BEH*	*TTS*	*AINJ*
Atlantic spotted dolphin	Northern Gulf of Mexico	239	-	-
	Western North Atlantic	200	2	-
Atlantic white-sided dolphin	Western North Atlantic	16	-	-
Blainville's beaked whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	46	-	-
Blue whale	North Atlantic	0	-	-
Bottlenose dolphin	Central GA Estuarine System	-	-	-
	Gulf of Mexico Eastern Coastal	-	-	-
	Gulf of Mexico Northern Coastal	-	-	-
	Gulf of Mexico Oceanic	2	-	-
	Gulf of Mexico Western Coastal	-	-	-
	Indian River Lagoon Estuarine System	-	-	-
	Jacksonville Estuarine System	-	-	-
	MS Sound, Lake Borgne, and Bay Boudreau	-	-	-
	Northern GA/Southern SC Estuarine System	-	-	-
	Northern Gulf of Mexico Continental Shelf	542	-	-
	Northern NC Estuarine System	3,423	71	-
	Northern SC Estuarine System	-	-	-
	Nueces and Corpus Christi Bays	-	-	-
	Sabine Lake	-	-	-
	Southern GA Estuarine System	-	-	-
	Southern NC Estuarine System	-	-	-
	St. Andrew Bay	-	-	-
	St. Joseph Bay	-	-	-
	Tampa Bay	-	-	-
	Western North Atlantic Central FL Coastal	30	-	-
	Western North Atlantic Northern FL Coastal	0	-	-
	Western North Atlantic Northern Migratory Coastal	18,984	416	-
	Western North Atlantic Offshore	716	1	-
	Western North Atlantic SC GA Coastal	1	-	-
	Western North Atlantic Southern Migratory Coastal	2,056	20	-
Bryde's whale	Primary	-	-	-
Clymene dolphin	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	1	-	-
Cuvier's beaked whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	275	-	-
Dwarf sperm whale	Northern Gulf of Mexico	0	-	-
	Western North Atlantic	10	23	-

Table 6.1-8: Estimated Effects to Marine Mammal Stocks from Sonar and Other Active Transducers over Seven Years of Coast Guard Training (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*
False killer whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	1	-	-
Fin whale	Western North Atlantic	1	-	-
Fraser's dolphin	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	7	-	-
Gervais' beaked whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	45	-	-
Gray seal	Western North Atlantic	322	7	-
Harbor porpoise	Gulf of ME/Bay of Fundy	321	40	-
Harbor seal	Western North Atlantic	474	8	-
Harp seal	Western North Atlantic	-	-	-
Hooded seal	Western North Atlantic	-	-	-
Humpback whale	Gulf of ME	4	-	-
Killer whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	1	-	-
Long-finned pilot whale	Western North Atlantic	-	-	-
Melon-headed whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	19	-	-
Minke whale	Canadian Eastern Coastal	11	1	-
North Atlantic right whale	Western	4	-	-
Northern bottlenose whale	Western North Atlantic	-	-	-
Pantropical spotted dolphin	Northern Gulf of Mexico	0	-	-
	Western North Atlantic	29	-	-
Pygmy killer whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	2	-	-
Pygmy sperm whale	Northern Gulf of Mexico	0	-	-
	Western North Atlantic	10	11	-
Rice's whale	Northern Gulf of Mexico	1	-	-
Risso's dolphin	Northern Gulf of Mexico	0	-	-
	Western North Atlantic	41	-	-
Rough-toothed dolphin	Northern Gulf of Mexico	22	-	-
	Western North Atlantic	14	-	-
Sei whale	Western North Atlantic	1	-	-
Short-beaked common dolphin	Western North Atlantic	91	-	-
Short-finned pilot whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	91	0	-
Sowerby's beaked whale	Western North Atlantic	37	-	-
Sperm whale	North Atlantic	35	-	-
	Northern Gulf of Mexico	-	-	-

Table 6.1-8: Estimated Effects to Marine Mammal Stocks from Sonar and Other Active Transducers over Seven Years of Coast Guard Training (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*
Spinner dolphin	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	15	-	-
Striped dolphin	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	0	-	-
True's beaked whale	Western North Atlantic	39	-	-
White-beaked dolphin	Western North Atlantic	-	-	-

Table Created: 2024-05-13 17:17:57
BEH = Behavioral Response, TTS = Temporary Threshold Shift, AINJ = Auditory Injury
Zero (0) impacts indicate total less than 0.5 and a dash (-) is a true zero.

6.1.2 Impacts from Air Guns

The activities that may use air guns are identified in Section 1.5. The types and quantities of air gun usage under the Proposed Action are shown in Table 1.4-2 of this request.

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 A of this request.

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 A of this request.

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.

Air guns would not be used during training activities. 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, it would not occur within 3 NM of shore. Acoustic and oceanographic research may occur in the Northeast, Virginia Capes, Jacksonville, and Gulf of Mexico Range Complexes.

Appendix A of this request 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. The number of impacts (AINJ, TTS, and behavioral responses) to each stock due to exposure to air guns under the Proposed Action, for a maximum year and 7 years of activities, are shown in Table 6.1-9 and Table 6.1-10 for Navy testing activities.

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 extremely low. Impacts due to air guns are unlikely to impact survival, growth, recruitment, or reproduction of any marine mammal populations.

Table 6.1-9: Estimated Effects to Marine Mammal Stocks from Air Guns over a Maximum Year of Navy Testing

Species	*Stock*	*BEH*	*TTS*	*AINJ*
Atlantic spotted dolphin	Western North Atlantic	0	-	-
	Northern Gulf of Mexico	0	-	-
Atlantic white-sided dolphin	Western North Atlantic	0	-	-
Blainville's beaked whale	Western North Atlantic	-	-	-
	Northern Gulf of Mexico	-	-	-
Blue whale	North Atlantic	-	-	-
Bottlenose dolphin	Central GA Estuarine System	-	-	-
	Gulf of Mexico Eastern Coastal	-	-	-
	Gulf of Mexico Northern Coastal	-	-	-
	Gulf of Mexico Oceanic	0	-	-
	Gulf of Mexico Western Coastal	0	-	-
	Indian River Lagoon Estuarine System	-	-	-
	Jacksonville Estuarine System	-	-	-
	MS Sound, Lake Borgne, and Bay Boudreau	-	-	-
	Northern GA/Southern SC Estuarine System	-	-	-
	Northern Gulf of Mexico Continental Shelf	1	0	-
	Northern NC Estuarine System	-	-	-
	Northern SC Estuarine System	-	-	-
	Nueces and Corpus Christi Bays	-	-	-
	Sabine Lake	-	-	-
	Southern GA Estuarine System	-	-	-
	Southern NC Estuarine System	-	-	-
	St. Andrew Bay	-	-	-
	St. Joseph Bay	-	-	-
	Tampa Bay	-	-	-
	Western North Atlantic Central FL Coastal	0	-	-
	Western North Atlantic Northern FL Coastal	0	-	-
	Western North Atlantic Northern Migratory Coastal	0	0	-
	Western North Atlantic Offshore	1	-	-
	Western North Atlantic SC GA Coastal	0	-	-
	Western North Atlantic Southern Migratory Coastal	0	-	-

Table 6.1-9: Estimated Effects to Marine Mammal Stocks from Air Guns over a Maximum Year of Navy Testing (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*
Bryde's whale	Primary	-	-	-
Clymene dolphin	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	-	-	-
Cuvier's beaked whale	Western North Atlantic	-	-	-
	Northern Gulf of Mexico	-	-	-
Dwarf sperm whale	Western North Atlantic	1	1	0
	Northern Gulf of Mexico	1	-	-
False killer whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	-	-	-
Fin whale	Western North Atlantic	1	-	-
Fraser's dolphin	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	-	-	-
Gervais' beaked whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	0	-	-
Gray seal	Western North Atlantic	1	0	-
Harbor porpoise	Gulf of ME/Bay of Fundy	2	3	1
Harbor seal	Western North Atlantic	1	0	-
Harp seal	Western North Atlantic	0	-	-
Hooded seal	Western North Atlantic	-	-	-
Humpback whale	Gulf of ME	-	-	-
Killer whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	0	-	-
Long-finned pilot whale	Western North Atlantic	-	-	-
Melon-headed whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	-	-	-
Minke whale	Canadian Eastern Coastal	-	0	-
North Atlantic right whale	Western	0	-	-
Northern bottlenose whale	Western North Atlantic	-	-	-
Pantropical spotted dolphin	Northern Gulf of Mexico	0	-	-
	Western North Atlantic	0	-	-
Pygmy killer whale	Western North Atlantic	-	-	-
	Northern Gulf of Mexico	-	-	-
Pygmy sperm whale	Western North Atlantic	1	1	-
	Northern Gulf of Mexico	-	-	-
Rice's whale	Northern Gulf of Mexico	-	-	-
Risso's dolphin	Western North Atlantic	0	-	-
	Northern Gulf of Mexico	-	-	-
Rough-toothed dolphin	Northern Gulf of Mexico	0	-	-
	Western North Atlantic	-	-	-

Table 6.1-9: Estimated Effects to Marine Mammal Stocks from Air Guns over a Maximum Year of Navy Testing (continued)

Species	Stock	BEH	TTS	AINJ
Sei whale	Western North Atlantic	-	-	-
Short-finned pilot whale	Western North Atlantic	0	-	-
	Northern Gulf of Mexico	0	-	-
Short-beaked common dolphin	Western North Atlantic	1	-	-
Sowerby's beaked whale	Western North Atlantic	-	-	-
Sperm whale	Northern Gulf of Mexico	-	-	-
	North Atlantic	0	-	-
Spinner dolphin	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	-	-	-
Striped dolphin	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	1	-	-
True's beaked whale	Western North Atlantic	-	-	-
White-beaked dolphin	Western North Atlantic	-	-	-

Table Created: 2024-05-13 17:17:38
BEH = Behavioral Response, TTS = Temporary Threshold Shift, AINJ = Auditory Injury
Zero (0) impacts indicate total less than 0.5 and a dash (-) is a true zero.

Table 6.1-10: Estimated Effects to Marine Mammal Stocks from Air Guns over Seven Years of Navy Testing

Species	Stock	BEH	TTS	AINJ
Atlantic spotted dolphin	Northern Gulf of Mexico	0	-	-
	Western North Atlantic	0	-	-
Atlantic white-sided dolphin	Western North Atlantic	0	-	-
Blainville's beaked whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	-	-	-
Blue whale	North Atlantic	-	-	-
Bottlenose dolphin	Central GA Estuarine System	-	-	-
	Gulf of Mexico Eastern Coastal	-	-	-
	Gulf of Mexico Northern Coastal	-	-	-
	Gulf of Mexico Oceanic	0	-	-
	Gulf of Mexico Western Coastal	0	-	-
	Indian River Lagoon Estuarine System	-	-	-
	Jacksonville Estuarine System	-	-	-
	MS Sound, Lake Borgne, and Bay Boudreau	-	-	-
	Northern GA/Southern SC Estuarine System	-	-	-
	Northern Gulf of Mexico Continental Shelf	1	0	-
	Northern NC Estuarine System	-	-	-
	Northern SC Estuarine System	-	-	-
	Nueces and Corpus Christi Bays	-	-	-

Table 6.1-10: Estimated Effects to Marine Mammal Stocks from Air Guns over Seven Years of Navy Testing (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*
	Sabine Lake	-	-	-
	Southern GA Estuarine System	-	-	-
	Southern NC Estuarine System	-	-	-
	St. Andrew Bay	-	-	-
	St. Joseph Bay	-	-	-
	Tampa Bay	-	-	-
	Western North Atlantic Central FL Coastal	0	-	-
	Western North Atlantic Northern FL Coastal	0	-	-
	Western North Atlantic Northern Migratory Coastal	0	0	-
	Western North Atlantic Offshore	1	-	-
	Western North Atlantic SC GA Coastal	0	-	-
	Western North Atlantic Southern Migratory Coastal	0	-	-
Bryde's whale	Primary	-	-	-
Clymene dolphin	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	-	-	-
Cuvier's beaked whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	-	-	-
Dwarf sperm whale	Northern Gulf of Mexico	1	-	-
	Western North Atlantic	3	2	0
False killer whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	-	-	-
Fin whale	Western North Atlantic	1	-	-
Fraser's dolphin	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	-	-	-
Gervais' beaked whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	0	-	-
Gray seal	Western North Atlantic	7	0	-
Harbor porpoise	Gulf of ME/Bay of Fundy	12	15	1
Harbor seal	Western North Atlantic	5	0	-
Harp seal	Western North Atlantic	0	-	-
Hooded seal	Western North Atlantic	-	-	-
Humpback whale	Gulf of ME	-	-	-
Killer whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	0	-	-
Long-finned pilot whale	Western North Atlantic	-	-	-
Melon-headed whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	-	-	-
Minke whale	Canadian Eastern Coastal	-	0	-

Table 6.1-10: Estimated Effects to Marine Mammal Stocks from Air Guns over Seven Years of Navy Testing (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*
North Atlantic right whale	Western	0	-	-
Northern bottlenose whale	Western North Atlantic	-	-	-
Pantropical spotted dolphin	Northern Gulf of Mexico	0	-	-
	Western North Atlantic	0	-	-
Pygmy killer whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	-	-	-
Pygmy sperm whale	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	2	4	-
Rice's whale	Northern Gulf of Mexico	-	-	-
Risso's dolphin	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	0	-	-
Rough-toothed dolphin	Northern Gulf of Mexico	0	-	-
	Western North Atlantic	-	-	-
Sei whale	Western North Atlantic	-	-	-
Short-beaked common dolphin	Western North Atlantic	4	-	-
Short-finned pilot whale	Northern Gulf of Mexico	0	-	-
	Western North Atlantic	0	-	-
Sowerby's beaked whale	Western North Atlantic	-	-	-
Sperm whale	North Atlantic	0	-	-
	Northern Gulf of Mexico	-	-	-
Spinner dolphin	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	-	-	-
Striped dolphin	Northern Gulf of Mexico	-	-	-
	Western North Atlantic	2	-	-
True's beaked whale	Western North Atlantic	-	-	-
White-beaked dolphin	Western North Atlantic	-	-	-

Table Created: 2024-05-13 17:17:38
BEH = Behavioral Response, TTS = Temporary Threshold Shift, AINJ = Auditory Injury
Zero (0) impacts indicate total less than 0.5 and a dash (-) is a true zero.

6.1.3 Impacts from Pile Driving

Impact and vibratory pile driving and removal, including quantities of piles and durations of pile driving, is discussed in Section 1.4.1.3 of this request. The pile driving method, pile type and size, and assumptions for acoustic impact analysis are presented in Table 1.4-3. Additional information on the assessment of these acoustic stressors under this Proposed Action is in Appendix A of this request.

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 A of this request.

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 the National Marine Fisheries Service's recommended thresholds for behavioral responses to impact and vibratory pile driving. The ranges to auditory effects and behavioral responses for pile driving are in in Appendix A of this request.

Only the port damage repair training activity includes pile driving. Pile driving would not occur during testing activities. Under the Proposed Action for training:

- Pile driving would occur up to 20 days each year as part of port damage repair activities in Gulfport, Mississippi.

Only two stocks of bottlenose dolphins are expected to be present in the nearshore waters by Gulfport. The pile driving mitigation zone encompasses the relatively short ranges to auditory injuries and TTS for the HF hearing group 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 at Gulfport, 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 the Proposed Action, for a maximum year and 7 years of activities, are shown in Table 6.1-11 – Table 6.1-12.

Table 6.1-11: Estimated Effects to Marine Mammal Stocks from Pile Driving over a Maximum Year of Navy Training

Species	*Stock*	*BEH*	*TTS*	*AINJ*
Bottlenose dolphin	Gulf of Mexico Northern Coastal	1,894	0	-
	MS Sound, Lake Borgne, and Bay Boudreau	1,564	0	-

Table Created: 2024-05-13 17:18:01
BEH = Behavioral Response, TTS = Temporary Threshold Shift, AINJ = Auditory Injury
Zero (0) impacts indicate total less than 0.5 and a dash (-) is a true zero.

Table 6.1-12: Estimated Effects to Marine Mammal Stocks from Pile Driving over Seven Years of Navy Training

Species	*Stock*	*BEH*	*TTS*	*AINJ*
Bottlenose dolphin	Gulf of Mexico Northern Coastal	13,255	0	-
	MS Sound, Lake Borgne, and Bay Boudreau	10,944	0	-

Table Created: 2024-05-13 17:18:01
BEH = Behavioral Response, TTS = Temporary Threshold Shift, AINJ = Auditory Injury
Zero (0) impacts indicate total less than 0.5 and a dash (-) is a true zero.

6.2 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 10 m of the water surface, which are analyzed as in-water explosives. Table 6.2-1 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) of the AFTT Supplemental EIS/OEIS.

The detailed assessment of explosive stressors under this Proposed Action is in Appendix A of this request.

Table 6.2-1: Explosive Stressors Background Information Summary

Sub-Stressor	*Background Information Summary*
Explosives	Explosives may cause auditory effects (auditory injuries and TTS), non-auditory injury (including mortality), and behavioral responses. Susceptibility to auditory effects differs by auditory group. Non-auditory injury depends on the charge size, the geometry of the exposure (e.g., distance and depth), and the size of the animal. The intermittent nature of most impulsive sounds would result in very limited probability of any masking effects. Few studies on reactions to explosives exist, but responses to other impulsive noises have been recorded. 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.

As discussed in Section 11.5 (Visual Observations), the Action Proponents will implement visual observation mitigation under the Proposed Action to reduce potential impacts from explosives on marine mammals. The Action Proponents will also implement geographic mitigation to reduce potential explosive impacts within important marine mammal habitats. Information on which geographic mitigation requirements are reflected in the modeling results is provided in Section 11 (Mitigation).

6.2.1 Impacts from Explosives

For information on the size and quantity of explosives under the Proposed Action, see Table 1.4-5. Section 1.5 (Proposed Action) identifies activities that may use explosives and identifies the explosive bins that are associated with certain activities.

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 A of this request.

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 injury and TTS), behavioral reactions, physiological response, and masking. Ranges to effects for mortality, non-auditory injury, and behavioral responses are shown in Appendix A of this request.

Explosive noise is very brief and intermittent, and 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 small numbers of clusters may be limited to startle responses.

Some modeling areas encompassed or overlapped the geographic mitigation areas described in Section 11 (Mitigation Measures). Depending on how well the mitigation requirements can be incorporated into the model, the modeling results may or may not reflect the Action Proponents' geographic mitigation requirements, as shown in Table 6.2-. In instances where geographic mitigation requirements are not reflected in the modeling results, mitigation is expected to reduce the number or severity of impacts for all marine mammal species with associated model-estimated effects**.** Table 6.2-2 only lists geographic mitigation that could potentially affect the modeling results. It does not list other geographic mitigation that may still reduce impacts but cannot be quantified in the impact modeling, such as pre-event planning, awareness notification messages, or obtaining Early Warning System North Atlantic right whale sighting data.

Table 6.2-2: Applicable Geographic Mitigation Reflected in the Explosive Modeling Results

Geographic Mitigation Section Reference	***Reflected in Modeling Results?***	***Summary of Relevant Mitigation***
Section 11.6.1 (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 *Federal Register* 15446) and updated in 2021 (86 *Federal Register* 47022). No ship shock trials overlapping the Jacksonville OPAREA from November 15 through April 15.
Section 11.6.2 (Major Training Exercise Planning Mitigation Areas)	Not Applicable[1]	Limits on the annual number of Major Training Exercises.
Section 11.6.3 (Northeast North Atlantic Right Whale Mitigation Area)	Yes	No in-water explosives.
Section 11.6.6 (Southeast North Atlantic Right Whale Mitigation Area)	No	No in-water explosives from November 15 to April 15.
Section 11.6.9 (Gulf of Mexico Rice's Whale Mitigation Area)	Yes	No in-water explosives (except mines).

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

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 Section 1.5. Activities involving medium and large caliber naval gunfire, missiles, bombs, or other munitions are conducted more than 12 NM from shore. Certain activities with explosives may be conducted closer to shore at locations identified in Section 1.5, including the training activity Mine Neutralization Explosive Ordnance Disposal and testing activities Semi-Stationary Equipment Testing and Line Charge Testing.

Appendix A of this request 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 overlap with biologically important areas and critical habitats, where applicable. The number of impacts to each stock due to exposure to underwater and near surface explosions under the Proposed Action, for a maximum year and 7 years of activities, are shown in Tables 6.2-3 and 6.2-4, Tables 6.2-5 through 6.2-7, and Tables 6.2-8 and 6.2-9 for Navy training activities, Navy testing activities, and Coast Guard training activities, respectively.

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 (see Table 6.2-). The Action Proponents conduct extensive visual observations for ship shock trials in accordance with NMFS-reviewed event-specific mitigation and monitoring plans [see Section 11 (Mitigation Measures)]. 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 injury 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 occur 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.

Table 6.2-3: Estimated Effects to Marine Mammal Stocks from Explosives over a Maximum Year of Navy Training

Species	*Stock*	*BEH*	*TTS*	*AINJ*	*INJ*	*MORT*
Atlantic spotted dolphin	Northern Gulf of Mexico	1	3	1	0	-
	Western North Atlantic	35	37	4	1	0
Atlantic white-sided dolphin	Western North Atlantic	4	6	1	1	-
Blainville's beaked whale	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	1	2	1	-	-
Blue whale	North Atlantic	1	1	-	-	-
Bottlenose dolphin	Central GA Estuarine System	-	-	-	-	-
	Gulf of Mexico Eastern Coastal	1	1	-	-	-
	Gulf of Mexico Northern Coastal	1	2	1	-	-
	Gulf of Mexico Oceanic	1	1	0	-	-
	Gulf of Mexico Western Coastal	0	0	-	-	-
	Indian River Lagoon Estuarine System	-	-	-	-	-
	Jacksonville Estuarine System	-	-	-	-	-
	MS Sound, Lake Borgne, and Bay Boudreau	-	-	-	-	-
	Northern GA/Southern SC Estuarine System	-	-	-	-	-
	Northern Gulf of Mexico Continental Shelf	14	19	2	1	0
	Northern NC Estuarine System	1	-	-	-	-
	Northern SC Estuarine System	-	-	-	-	-
	Nueces and Corpus Christi Bays	-	-	-	-	-
	Sabine Lake	-	-	-	-	-
	Southern GA Estuarine System	-	-	-	-	-

Table 6.2-3: Estimated Effects to Marine Mammal Stocks from Explosives over a Maximum Year of Navy Training (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*	*INJ*	*MORT*
	Southern NC Estuarine System	1	-	-	-	-
	St. Andrew Bay	-	-	-	-	-
	St. Joseph Bay	-	-	-	-	-
	Tampa Bay	-	-	-	-	-
	Western North Atlantic Central FL Coastal	10	8	1	1	-
	Western North Atlantic Northern FL Coastal	2	3	1	0	-
	Western North Atlantic Northern Migratory Coastal	21	41	5	1	0
	Western North Atlantic Offshore	50	53	6	1	1
	Western North Atlantic SC GA Coastal	5	5	1	0	1
	Western North Atlantic Southern Migratory Coastal	19	29	4	1	0
Bryde's whale	Primary	0	0	-	-	-
Clymene dolphin	Northern Gulf of Mexico	0	0	0	-	-
	Western North Atlantic	16	21	6	1	1
Cuvier's beaked whale	Northern Gulf of Mexico	0	-	-	-	-
	Western North Atlantic	6	4	1	-	-
Dwarf sperm whale	Northern Gulf of Mexico	2	2	1	0	-
	Western North Atlantic	27	33	7	-	-
False killer whale	Northern Gulf of Mexico	-	0	0	-	-
	Western North Atlantic	0	0	-	-	-
Fin whale	Western North Atlantic	30	8	0	-	-
Fraser's dolphin	Northern Gulf of Mexico	1	1	0	-	-
	Western North Atlantic	1	1	1	0	-
Gervais' beaked whale	Western North Atlantic	1	1	-	-	-
	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	1	1	-	-	-
Gray seal	Western North Atlantic	46	44	3	0	-
Harbor porpoise	Gulf of ME/Bay of Fundy	74	235	67	0	-
Harbor seal	Western North Atlantic	72	67	4	0	-
Harp seal	Western North Atlantic	-	-	-	-	-
Hooded seal	Western North Atlantic	-	-	-	-	-
Humpback whale	Gulf of ME	14	7	1	-	-
Killer whale	Northern Gulf of Mexico	0	-	0	-	-
	Western North Atlantic	0	0	-	-	-
Long-finned pilot whale	Western North Atlantic	4	3	2	1	-
Melon-headed whale	Northern Gulf of Mexico	0	0	0	-	-
	Western North Atlantic	0	0	0	0	-
Minke whale	Canadian Eastern Coastal	24	11	1	-	-
North Atlantic right whale	Western	14	10	0	-	-

Table 6.2-3: Estimated Effects to Marine Mammal Stocks from Explosives over a Maximum Year of Navy Training (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*	*INJ*	*MORT*
Northern bottlenose whale	Western North Atlantic	-	-	-	-	-
Pantropical spotted dolphin	Northern Gulf of Mexico	1	1	1	1	0
	Western North Atlantic	2	1	1	0	0
Pygmy killer whale	Northern Gulf of Mexico	0	0	-	-	-
	Western North Atlantic	0	-	1	0	-
Pygmy sperm whale	Northern Gulf of Mexico	2	2	1	-	-
	Western North Atlantic	26	33	9	-	-
Rice's whale	Northern Gulf of Mexico	0	1	-	-	-
Risso's dolphin	Northern Gulf of Mexico	0	0	0	-	-
	Western North Atlantic	4	5	1	1	0
Rough-toothed dolphin	Northern Gulf of Mexico	1	1	0	-	-
	Western North Atlantic	2	2	1	0	-
Sei whale	Western North Atlantic	4	1	0	-	-
Short-finned pilot whale	Northern Gulf of Mexico	0	1	-	-	-
	Western North Atlantic	7	5	1	0	0
Short-beaked common dolphin	Western North Atlantic	50	42	5	1	-
Sowerby's beaked whale	Western North Atlantic	1	1	0	-	-
Sperm whale	North Atlantic	4	6	1	1	-
	Northern Gulf of Mexico	1	1	0	-	-
Spinner dolphin	Northern Gulf of Mexico	-	0	-	-	-
	Western North Atlantic	0	1	0	-	-
Striped dolphin	Northern Gulf of Mexico	0	1	1	0	-
	Western North Atlantic	11	13	3	1	0
True's beaked whale	Western North Atlantic	1	1	0	-	-
White-beaked dolphin	Western North Atlantic	-	-	-	-	-

Table Created: 2024-05-16 10:58:31; BEH = Behavioral Response, TTS = Temporary Threshold Shift, AINJ = Auditory Injury, INJ = Non Auditory Injury, MORT = Mortality; For BEH, TTS, AINJ, INJ, and MORT annual estimated impacts: Zero (0) impacts indicate total less than 0.5 and a dash (-) is a true zero.

Table 6.2-4: Estimated Effects to Marine Mammal Stocks from Explosives over Seven Years of Navy Training

Species	*Stock*	*BEH*	*TTS*	*AINJ*	*INJ*	*MORT*
Atlantic spotted dolphin	Northern Gulf of Mexico	4	19	4	0	-
	Western North Atlantic	245	257	23	5	0
Atlantic white-sided dolphin	Western North Atlantic	26	41	7	3	-
Blainville's beaked whale	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	5	8	1	-	-
Blue whale	North Atlantic	2	1	-	-	-

Table 6.2-4: Estimated Effects to Marine Mammal Stocks from Explosives over Seven Years of Navy Training (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*	*INJ*	*MORT*
Bottlenose dolphin	Central GA Estuarine System	-	-	-	-	-
	Gulf of Mexico Eastern Coastal	4	7	-	-	-
	Gulf of Mexico Northern Coastal	3	8	2	-	-
	Gulf of Mexico Oceanic	3	4	0	-	-
	Gulf of Mexico Western Coastal	0	0	-	-	-
	Indian River Lagoon Estuarine System	-	-	-	-	-
	Jacksonville Estuarine System	-	-	-	-	-
	MS Sound, Lake Borgne, and Bay Boudreau	-	-	-	-	-
	Northern GA/Southern SC Estuarine System	-	-	-	-	-
	Northern Gulf of Mexico Continental Shelf	95	132	12	1	0
	Northern NC Estuarine System	1	-	-	-	-
	Northern SC Estuarine System	-	-	-	-	-
	Nueces and Corpus Christi Bays	-	-	-	-	-
	Sabine Lake	-	-	-	-	-
	Southern GA Estuarine System	-	-	-	-	-
	Southern NC Estuarine System	1	-	-	-	-
	St. Andrew Bay	-	-	-	-	-
	St. Joseph Bay	-	-	-	-	-
	Tampa Bay	-	-	-	-	-
	Western North Atlantic Central FL Coastal	65	53	4	2	-
	Western North Atlantic Northern FL Coastal	8	17	1	0	-
	Western North Atlantic Northern Migratory Coastal	147	283	30	1	0
	Western North Atlantic Offshore	347	365	39	3	1
	Western North Atlantic SC GA Coastal	32	35	3	0	1
	Western North Atlantic Southern Migratory Coastal	133	202	26	4	0
Bryde's whale	Primary	0	0	-	-	-
Clymene dolphin	Northern Gulf of Mexico	0	0	0	-	-
	Western North Atlantic	112	141	37	3	3
Cuvier's beaked whale	Northern Gulf of Mexico	0	-	-	-	-
	Western North Atlantic	36	28	3	-	-
Dwarf sperm whale	Northern Gulf of Mexico	8	10	1	0	-
	Western North Atlantic	188	227	47	-	-

Table 6.2-4: Estimated Effects to Marine Mammal Stocks from Explosives over Seven Years of Navy Training (continued)

Species	Stock	BEH	TTS	AINJ	INJ	MORT
False killer whale	Northern Gulf of Mexico	-	0	0	-	-
	Western North Atlantic	0	0	-	-	-
Fin whale	Western North Atlantic	205	50	0	-	-
Fraser's dolphin	Northern Gulf of Mexico	1	1	0	-	-
	Western North Atlantic	4	2	2	0	-
Gervais' beaked whale	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	1	5	-	-	-
Gray seal	Western North Atlantic	322	304	20	0	-
Harbor porpoise	Gulf of ME/Bay of Fundy	515	1,644	464	0	-
Harbor seal	Western North Atlantic	499	468	28	0	-
Harp seal	Western North Atlantic	-	-	-	-	-
Hooded seal	Western North Atlantic	-	-	-	-	-
Humpback whale	Gulf of ME	94	43	1	-	-
Killer whale	Northern Gulf of Mexico	0	-	0	-	-
	Western North Atlantic	0	0	-	-	-
Long-finned pilot whale	Western North Atlantic	28	21	9	1	-
Melon-headed whale	Northern Gulf of Mexico	0	0	0	-	-
	Western North Atlantic	0	0	0	0	-
Minke whale	Canadian Eastern Coastal	167	73	7	-	-
North Atlantic right whale	Western	93	66	0	-	-
Northern bottlenose whale	Western North Atlantic	-	-	-	-	-
Pantropical spotted dolphin	Northern Gulf of Mexico	5	7	2	2	0
	Western North Atlantic	8	6	1	0	0
Pygmy killer whale	Northern Gulf of Mexico	0	0	-	-	-
	Western North Atlantic	0	-	1	0	-
Pygmy sperm whale	Northern Gulf of Mexico	9	12	1	-	-
	Western North Atlantic	182	225	60	-	-
Rice's whale	Northern Gulf of Mexico	0	1	-	-	-
Risso's dolphin	Northern Gulf of Mexico	0	0	0	-	-
	Western North Atlantic	28	32	2	1	0
Rough-toothed dolphin	Northern Gulf of Mexico	1	3	0	-	-
	Western North Atlantic	8	9	1	0	-
Sei whale	Western North Atlantic	27	3	0	-	-
Short-beaked common dolphin	Western North Atlantic	345	288	29	4	-

Table 6.2-4: Estimated Effects to Marine Mammal Stocks from Explosives over Seven Years of Navy Training (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*	*INJ*	*MORT*
Short-finned pilot whale	Northern Gulf of Mexico	0	3	-	-	-
	Western North Atlantic	45	32	7	0	0
Sowerby's beaked whale	Western North Atlantic	7	5	0	-	-
Sperm whale	North Atlantic	26	36	3	1	-
	Northern Gulf of Mexico	1	1	0	-	-
Spinner dolphin	Northern Gulf of Mexico	-	0	-	-	-
	Western North Atlantic	0	5	0	-	-
Striped dolphin	Northern Gulf of Mexico	0	2	1	0	-
	Western North Atlantic	77	87	20	5	0
True's beaked whale	Western North Atlantic	1	1	0	-	-
White-beaked dolphin	Western North Atlantic	-	-	-	-	-

Table Created: 2024-05-16 10:58:31; BEH = Behavioral Response, TTS = Temporary Threshold Shift, AINJ = Auditory Injury, INJ = Non Auditory Injury, MORT = Mortality; For BEH, TTS, AINJ, INJ, and MORT annual estimated impacts: Zero (0) impacts indicate total less than 0.5 and a dash (-) is a true zero

Table 6.2-5: Estimated Effects to Marine Mammal Stocks from Explosives over a Maximum Year of Navy Testing (includes Small Ship Shock Trials)

Species	*Stock*	*BEH*	*TTS*	*AINJ*	*INJ*	*MORT*
Atlantic spotted dolphin	Western North Atlantic	39	27	4	3	1
	Northern Gulf of Mexico	17	11	1	0	0
Atlantic white-sided dolphin	Western North Atlantic	6	3	1	0	0
Blainville's beaked whale	Western North Atlantic	1	1	1	1	0
	Northern Gulf of Mexico	0	0	-	-	-
Blue whale	North Atlantic	1	2	-	-	-
Bottlenose dolphin	Central GA Estuarine System	0	-	-	-	-
	Gulf of Mexico Eastern Coastal	-	1	0	-	-
	Gulf of Mexico Northern Coastal	86	117	16	-	-
	Gulf of Mexico Oceanic	3	1	1	0	0
	Gulf of Mexico Western Coastal	2	1	1	0	-
	Indian River Lagoon Estuarine System	-	-	-	-	-
	Jacksonville Estuarine System	-	-	-	-	-
	MS Sound, Lake Borgne, and Bay Boudreau	-	-	-	-	-
	Northern GA/Southern SC Estuarine System	-	-	-	-	-
	Northern Gulf of Mexico Continental Shelf	369	177	3	1	0
	Northern NC Estuarine System	-	0	0	-	-
	Northern SC Estuarine System	0	-	-	-	-
	Nueces and Corpus Christi Bays	-	-	-	-	-
	Sabine Lake	-	-	-	-	-
	Southern GA Estuarine System	-	-	-	-	-
	Southern NC Estuarine System	0	-	-	-	-

Table 6.2-5: Estimated Effects to Marine Mammal Stocks from Explosives over a Maximum Year of Navy Testing (includes Small Ship Shock Trials)(continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*	*INJ*	*MORT*
	St. Andrew Bay	1	1	-	-	-
	St. Joseph Bay	-	-	-	-	-
	Tampa Bay	-	-	-	-	-
	Western North Atlantic Central FL Coastal	12	5	1	0	0
	Western North Atlantic Northern FL Coastal	4	1	1	-	-
	Western North Atlantic Northern Migratory Coastal	2	2	1	-	-
	Western North Atlantic Offshore	67	76	14	2	1
	Western North Atlantic SC GA Coastal	9	3	1	0	0
	Western North Atlantic Southern Migratory Coastal	9	3	1	0	-
Bryde's whale	Primary	-	-	-	-	-
Clymene dolphin	Northern Gulf of Mexico	1	1	1	1	0
	Western North Atlantic	5	6	1	1	1
Cuvier's beaked whale	Western North Atlantic	1	8	2	0	0
	Northern Gulf of Mexico	0	1	0	-	-
Dwarf sperm whale	Western North Atlantic	13	31	20	0	0
	Northern Gulf of Mexico	2	27	16	-	-
False killer whale	Northern Gulf of Mexico	1	1	0	-	-
	Western North Atlantic	-	1	-	-	-
Fin whale	Western North Atlantic	110	159	12	-	-
Fraser's dolphin	Northern Gulf of Mexico	0	0	0	0	-
	Western North Atlantic	1	2	0	0	-
Gervais' beaked whale	Northern Gulf of Mexico	0	1	-	-	-
	Western North Atlantic	1	1	1	0	-
Gray seal	Western North Atlantic	38	19	2	0	-
Harbor porpoise	Gulf of ME/Bay of Fundy	75	120	29	0	0
Harbor seal	Western North Atlantic	54	25	2	0	0
Harp seal	Western North Atlantic	13	8	1	0	-
Hooded seal	Western North Atlantic	1	1	0	-	-
Humpback whale	Gulf of ME	13	15	0	-	-
Killer whale	Northern Gulf of Mexico	-	0	0	-	-
	Western North Atlantic	1	1	0	-	0
Long-finned pilot whale	Western North Atlantic	18	25	7	2	1
Melon-headed whale	Northern Gulf of Mexico	1	1	0	0	0
	Western North Atlantic	1	0	0	0	0
Minke whale	Canadian Eastern Coastal	26	37	1	0	-
North Atlantic right whale	Western	6	4	1	-	-
Northern bottlenose whale	Western North Atlantic	1	0	1	-	-
Pantropical spotted dolphin	Northern Gulf of Mexico	2	11	2	2	2

Table 6.2-5: Estimated Effects to Marine Mammal Stocks from Explosives over a Maximum Year of Navy Testing (includes Small Ship Shock Trials)(continued)

Species	Stock	BEH	TTS	AINJ	INJ	MORT
	Western North Atlantic	0	0	0	0	0
Pygmy killer whale	Western North Atlantic	0	1	0	-	-
	Northern Gulf of Mexico	1	1	0	0	0
Pygmy sperm whale	Western North Atlantic	12	30	18	0	-
	Northern Gulf of Mexico	3	29	16	-	-
Rice's whale	Northern Gulf of Mexico	7	4	1	-	-
Risso's dolphin	Western North Atlantic	18	31	3	1	1
	Northern Gulf of Mexico	1	1	0	0	0
Rough-toothed dolphin	Northern Gulf of Mexico	6	4	1	1	0
	Western North Atlantic	1	1	0	0	-
Sei whale	Western North Atlantic	6	5	0	-	-
Short-finned pilot whale	Western North Atlantic	13	21	6	1	1
	Northern Gulf of Mexico	1	1	1	0	0
Short-beaked common dolphin	Western North Atlantic	384	325	32	18	5
Sowerby's beaked whale	Western North Atlantic	1	1	1	0	0
Sperm whale	Northern Gulf of Mexico	1	1	0	0	0
	North Atlantic	2	5	2	0	0
Spinner dolphin	Northern Gulf of Mexico	0	1	0	0	-
	Western North Atlantic	1	1	0	0	-
Striped dolphin	Northern Gulf of Mexico	1	10	4	2	1
	Western North Atlantic	17	78	16	15	6
True's beaked whale	Western North Atlantic	1	1	1	-	0
White-beaked dolphin	Western North Atlantic	-	-	-	-	-

Table Created: 2024-05-13 17:17:41

BEH = Behavioral Response, TTS = Temporary Threshold Shift, AINJ = Auditory Injury, INJ = Non-Auditory Injury, MORT = Mortality
For BEH, TTS, AINJ, INJ, and MORT annual estimated impacts: Zero (0) impacts indicate total less than 0.5 and a dash (-) is a true zero.

Table 6.2-6: Estimated Effects to Marine Mammal Stocks from Small Ship Shock Trials over a Maximum Year of Navy Testing (2 Events)

Species	Stock	TTS	AINJ	INJ	MORT
Atlantic spotted dolphin	Western North Atlantic	6	1	2	1
Atlantic white-sided dolphin	Western North Atlantic	1	0	0	0
Blainville's beaked whale	Western North Atlantic	1	1	1	0
Blue whale	North Atlantic	2	-	-	-
Bottlenose dolphin	Western North Atlantic Offshore	26	9	2	1
	Western North Atlantic SC GA Coastal	0	-	-	-
Clymene dolphin	Northern Gulf of Mexico	0	-	0	-
	Western North Atlantic	2	1	1	1

Table 6.2-6: Estimated Effects to Marine Mammal Stocks from Small Ship Shock Trials over a Maximum Year of Navy Testing (2 Events) (continued)

Species	Stock	TTS	AINJ	INJ	MORT
Cuvier's beaked whale	Northern Gulf of Mexico	1	0	-	-
	Western North Atlantic	6	1	0	-
Dwarf sperm whale	Northern Gulf of Mexico	24	15	-	-
	Western North Atlantic	17	18	0	0
False killer whale	Northern Gulf of Mexico	0	0	-	-
	Western North Atlantic	1	-	-	-
Fin whale	Western North Atlantic	86	9	-	-
Fraser's dolphin	Western North Atlantic	2	0	0	-
Gervais' beaked whale	Northern Gulf of Mexico	1	-	-	-
	Western North Atlantic	0	0	0	-
Gray seal	Western North Atlantic	2	1	-	-
Harbor porpoise	Gulf of ME/Bay of Fundy	23	8	-	-
Harbor seal	Western North Atlantic	2	1	-	-
Humpback whale	Gulf of ME	9	-	-	-
Killer whale	Northern Gulf of Mexico	-	0	-	-
	Western North Atlantic	0	-	-	0
Long-finned pilot whale	Western North Atlantic	15	6	2	1
Melon-headed whale	Northern Gulf of Mexico	1	0	0	0
Minke whale	Canadian Eastern Coastal	24	1	0	-
North Atlantic right whale	Western	1	0	-	-
Northern bottlenose whale	Western North Atlantic	0	-	-	-
Pantropical spotted dolphin	Northern Gulf of Mexico	9	1	2	2
Pygmy killer whale	Northern Gulf of Mexico	0	0	0	0
	Western North Atlantic	1	-	-	-
Pygmy sperm whale	Northern Gulf of Mexico	26	15	-	-
	Western North Atlantic	15	15	-	-
Risso's dolphin	Western North Atlantic	15	1	1	1
Rough-toothed dolphin	Northern Gulf of Mexico	1	0	1	0
	Western North Atlantic	1	-	0	-
Sei whale	Western North Atlantic	3	-	-	-
Short-beaked common dolphin	Western North Atlantic	74	11	18	5
Short-finned pilot whale	Northern Gulf of Mexico	1	1	0	0
	Western North Atlantic	11	4	1	1
Sowerby's beaked whale	Western North Atlantic	1	0	0	0
Sperm whale	North Atlantic	4	2	0	0
	Northern Gulf of Mexico	0	0	0	0

Table 6.2-6: Estimated Effects to Marine Mammal Stocks from Small Ship Shock Trials over a Maximum Year of Navy Testing (2 Events) (continued)

Species	Stock	TTS	AINJ	INJ	MORT
Spinner dolphin	Northern Gulf of Mexico	0	-	0	-
	Western North Atlantic	1	-	0	-
Striped dolphin	Northern Gulf of Mexico	10	3	2	1
	Western North Atlantic	67	14	15	6
True's beaked whale	Western North Atlantic	1	1	-	0

Table Created: 2024-04-25 16:02:57
BEH = Behavioral Response, TTS = Temporary Threshold Shift, AINJ = Auditory Injury, INJ = Non-Auditory Injury, MORT = Mortality
For BEH, TTS, AINJ, INJ, and MORT annual estimated impacts: Zero (0) impacts indicate total less than 0.5 and a dash (-) is a true zero.

Table 6.2-7: Estimated Effects to Marine Mammal Stocks from Explosives over Seven Years of Navy Testing (includes Small Ship Shock Trials)

Species	Stock	BEH	TTS	AINJ	INJ	MORT
Atlantic spotted dolphin	Northern Gulf of Mexico	119	74	6	0	0
	Western North Atlantic	221	132	19	6	2
Atlantic white-sided dolphin	Western North Atlantic	37	16	1	0	0
Blainville's beaked whale	Northern Gulf of Mexico	0	0	-	-	-
	Western North Atlantic	1	2	2	1	0
Blue whale	North Atlantic	2	7	-	-	-
Bottlenose dolphin	Central GA Estuarine System	0	-	-	-	-
	Gulf of Mexico Eastern Coastal	-	1	0	-	-
	Gulf of Mexico Northern Coastal	601	815	112	-	-
	Gulf of Mexico Oceanic	15	7	2	0	0
	Gulf of Mexico Western Coastal	10	4	1	0	-
	Indian River Lagoon Estuarine System	-	-	-	-	-
	Jacksonville Estuarine System	-	-	-	-	-
	MS Sound, Lake Borgne, and Bay Boudreau	-	-	-	-	-
	Northern GA/Southern SC Estuarine System	-	-	-	-	-
	Northern Gulf of Mexico Continental Shelf	2,577	1,234	18	1	0
	Northern NC Estuarine System	-	0	0	-	-
	Northern SC Estuarine System	0	-	-	-	-
	Nueces and Corpus Christi Bays	-	-	-	-	-
	Sabine Lake	-	-	-	-	-
	Southern GA Estuarine System	-	-	-	-	-
	Southern NC Estuarine System	0	-	-	-	-
	St. Andrew Bay	1	1	-	-	-
	St. Joseph Bay	-	-	-	-	-
	Tampa Bay	-	-	-	-	-
	Western North Atlantic Central FL Coastal	67	29	4	0	0
	Western North Atlantic Northern FL Coastal	21	7	1	-	-

Table 6.2-7: Estimated Effects to Marine Mammal Stocks from Explosives over Seven Years of Navy Testing (includes Small Ship Shock Trials) (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*	*INJ*	*MORT*
	Western North Atlantic Northern Migratory Coastal	10	11	1	-	-
	Western North Atlantic Offshore	396	354	50	6	2
	Western North Atlantic SC GA Coastal	55	17	3	0	0
	Western North Atlantic Southern Migratory Coastal	55	18	2	0	-
Bryde's whale	Primary	-	-	-	-	-
Clymene dolphin	Northern Gulf of Mexico	4	3	1	1	0
	Western North Atlantic	30	29	5	2	2
Cuvier's beaked whale	Northern Gulf of Mexico	0	1	0	-	-
	Western North Atlantic	7	22	5	0	0
Dwarf sperm whale	Northern Gulf of Mexico	12	78	40	-	-
	Western North Atlantic	82	128	56	0	0
False killer whale	Northern Gulf of Mexico	1	1	0	-	-
	Western North Atlantic	-	2	-	-	-
Fin whale	Western North Atlantic	670	653	40	-	-
Fraser's dolphin	Northern Gulf of Mexico	0	0	0	0	-
	Western North Atlantic	3	5	0	0	-
Gervais' beaked whale	Northern Gulf of Mexico	0	1	-	-	-
	Western North Atlantic	1	2	1	0	-
Gray seal	Western North Atlantic	262	122	11	0	-
Harbor porpoise	Gulf of ME/Bay of Fundy	493	662	143	0	0
Harbor seal	Western North Atlantic	370	154	12	0	0
Harp seal	Western North Atlantic	88	50	4	0	-
Hooded seal	Western North Atlantic	4	4	0	-	-
Humpback whale	Gulf of ME	81	61	0	-	-
Killer whale	Northern Gulf of Mexico	-	0	0	-	-
	Western North Atlantic	2	2	0	-	0
Long-finned pilot whale	Western North Atlantic	108	98	19	5	1
Melon-headed whale	Northern Gulf of Mexico	1	3	0	0	0
	Western North Atlantic	1	0	0	0	0
Minke whale	Canadian Eastern Coastal	162	140	2	0	-
North Atlantic right whale	Western	34	21	1	-	-
Northern bottlenose whale	Western North Atlantic	1	0	1	-	-
Pantropical spotted dolphin	Northern Gulf of Mexico	13	31	5	6	5
	Western North Atlantic	0	0	0	0	0
Pygmy killer whale	Northern Gulf of Mexico	1	1	0	0	0
	Western North Atlantic	0	1	0	-	-
Pygmy sperm whale	Northern Gulf of Mexico	17	87	40	-	-
	Western North Atlantic	73	129	55	0	-

Table 6.2-7: Estimated Effects to Marine Mammal Stocks from Explosives over Seven Years of Navy Testing (includes Small Ship Shock Trials) (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*	*INJ*	*MORT*
Rice's whale	Northern Gulf of Mexico	49	25	1	-	-
Risso's dolphin	Northern Gulf of Mexico	1	1	0	0	0
	Western North Atlantic	116	132	16	3	1
Rough-toothed dolphin	Northern Gulf of Mexico	39	21	1	1	0
	Western North Atlantic	2	2	0	0	-
Sei whale	Western North Atlantic	40	22	0	-	-
Short-beaked common dolphin	Western North Atlantic	2,320	1,683	147	46	12
Short-finned pilot whale	Northern Gulf of Mexico	3	2	1	0	0
	Western North Atlantic	78	83	19	3	1
Sowerby's beaked whale	Western North Atlantic	1	5	1	0	0
Sperm whale	North Atlantic	8	15	6	0	0
	Northern Gulf of Mexico	1	1	0	0	0
Spinner dolphin	Northern Gulf of Mexico	0	1	0	0	-
	Western North Atlantic	2	1	0	0	-
Striped dolphin	Northern Gulf of Mexico	5	27	9	5	2
	Western North Atlantic	109	232	48	39	16
True's beaked whale	Western North Atlantic	1	2	1	-	0
White-beaked dolphin	Western North Atlantic	-	-	-	-	-

Table Created: 2024-05-13 17:17:41

BEH = Behavioral Response, TTS = Temporary Threshold Shift, AINJ = Auditory Injury, INJ = Non-Auditory Injury, MORT = Mortality

For BEH, TTS, AINJ, INJ, and MORT annual estimated impacts: Zero (0) impacts indicate total less than 0.5 and a dash (-) is a true zero.

Table 6.2-8: Estimated Effects to Marine Mammal Stocks from Explosives over a Maximum Year of U.S. Coast Guard Training

Species	*Stock*	*BEH*	*TTS*	*AINJ*	*INJ*	*MORT*
Atlantic spotted dolphin	Western North Atlantic	1	1	-	-	-
	Northern Gulf of Mexico	1	0	-	-	-
Atlantic white-sided dolphin	Western North Atlantic	2	1	0	-	-
Blainville's beaked whale	Western North Atlantic	0	-	-	-	-
	Northern Gulf of Mexico	-	-	-	-	-
Blue whale	North Atlantic	-	-	-	-	-
Bottlenose dolphin	Central GA Estuarine System	-	-	-	-	-
	Gulf of Mexico Eastern Coastal	-	-	-	-	-
	Gulf of Mexico Northern Coastal	-	-	-	-	-
	Gulf of Mexico Oceanic	1	0	-	-	-
	Gulf of Mexico Western Coastal	-	-	-	-	-
	Indian River Lagoon Estuarine System	-	-	-	-	-
	Jacksonville Estuarine System	-	-	-	-	-

Table 6.2-8: Estimated Effects to Marine Mammal Stocks from Explosives over a Maximum Year of U.S. Coast Guard Training (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*	*INJ*	*MORT*
	MS Sound, Lake Borgne, and Bay Boudreau	-	-	-	-	-
	Northern GA/Southern SC Estuarine System	-	-	-	-	-
	Northern Gulf of Mexico Continental Shelf	4	3	1	-	-
	Northern NC Estuarine System	-	-	-	-	-
	Northern SC Estuarine System	-	-	-	-	-
	Nueces and Corpus Christi Bays	-	-	-	-	-
	Sabine Lake	-	-	-	-	-
	Southern GA Estuarine System	-	-	-	-	-
	Southern NC Estuarine System	-	-	-	-	-
	St. Andrew Bay	-	-	-	-	-
	St. Joseph Bay	-	-	-	-	-
	Tampa Bay	-	-	-	-	-
	Western North Atlantic Central FL Coastal	-	-	-	-	-
	Western North Atlantic Northern FL Coastal	-	-	-	-	-
	Western North Atlantic Northern Migratory Coastal	-	-	-	-	-
	Western North Atlantic Offshore	1	1	-	0	-
	Western North Atlantic SC GA Coastal	-	-	-	-	-
	Western North Atlantic Southern Migratory Coastal	-	-	-	-	-
Bryde's whale	Primary	-	-	-	-	-
Clymene dolphin	Northern Gulf of Mexico	-	0	-	-	-
	Western North Atlantic	-	0	0	-	-
Cuvier's beaked whale	Western North Atlantic	1	1	-	-	-
	Northern Gulf of Mexico	-	-	-	-	-
Dwarf sperm whale	Western North Atlantic	1	1	1	-	-
	Northern Gulf of Mexico	1	1	-	-	-
False killer whale	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	-	-	-	-	-
Fin whale	Western North Atlantic	1	1	0	-	-
Fraser's dolphin	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	-	-	-	-	-
Gervais' beaked whale	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	-	-	-	-	-
Gray seal	Western North Atlantic	1	1	0	-	-
Harbor porpoise	Gulf of ME/Bay of Fundy	22	24	4	-	-
Harbor seal	Western North Atlantic	2	2	1	-	-
Harp seal	Western North Atlantic	2	2	1	-	-
Hooded seal	Western North Atlantic	1	1	0	-	-
Humpback whale	Gulf of ME	1	1	0	-	-

Table 6.2-8: Estimated Effects to Marine Mammal Stocks from Explosives over a Maximum Year of U.S. Coast Guard Training (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*	*INJ*	*MORT*
Killer whale	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	-	-	-	-	-
Long-finned pilot whale	Western North Atlantic	1	1	0	-	-
Melon-headed whale	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	-	-	-	-	-
Minke whale	Canadian Eastern Coastal	1	1	0	-	-
North Atlantic right whale	Western	0	0	-	-	-
Northern bottlenose whale	Western North Atlantic	-	-	-	-	-
Pantropical spotted dolphin	Northern Gulf of Mexico	0	0	0	-	-
	Western North Atlantic	-	-	-	-	-
Pygmy killer whale	Western North Atlantic	-	-	-	-	-
	Northern Gulf of Mexico	-	-	-	-	-
Pygmy sperm whale	Western North Atlantic	1	1	1	-	-
	Northern Gulf of Mexico	1	1	-	-	-
Rice's whale	Northern Gulf of Mexico	-	-	-	-	-
Risso's dolphin	Western North Atlantic	1	1	0	-	-
	Northern Gulf of Mexico	-	-	-	-	-
Rough-toothed dolphin	Northern Gulf of Mexico	0	0	-	-	-
	Western North Atlantic	-	-	-	-	-
Sei whale	Western North Atlantic	1	0	-	-	-
Short-finned pilot whale	Western North Atlantic	1	1	0	-	-
	Northern Gulf of Mexico	-	-	-	-	-
Short-beaked common dolphin	Western North Atlantic	3	3	1	-	-
Sowerby's beaked whale	Western North Atlantic	-	0	-	-	-
Sperm whale	Northern Gulf of Mexico	0	-	-	-	-
	North Atlantic	1	0	-	-	-
Spinner dolphin	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	-	-	-	-	-
Striped dolphin	Northern Gulf of Mexico	0	-	-	-	-
	Western North Atlantic	1	1	0	-	-
True's beaked whale	Western North Atlantic	0	-	-	-	-
White-beaked dolphin	Western North Atlantic	0	-	-	-	-

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BEH = Behavioral Response, TTS = Temporary Threshold Shift, AINJ = Auditory Injury, INJ = Non-Auditory Injury, MORT = Mortality

For BEH, TTS, AINJ, INJ, and MORT annual estimated impacts: Zero (0) impacts indicate total less than 0.5 and a dash (-) is a true zero.

Table 6.2-9: Estimated Effects to Marine Mammal Stocks from Explosives over Seven Years of Coast Guard Training

Species	Stock	BEH	TTS	AINJ	INJ	MORT
Atlantic spotted dolphin	Northern Gulf of Mexico	2	0	-	-	-
	Western North Atlantic	2	1	-	-	-
Atlantic white-sided dolphin	Western North Atlantic	8	3	0	-	-
Blainville's beaked whale	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	0	-	-	-	-
Blue whale	North Atlantic	-	-	-	-	-
Bottlenose dolphin	Central GA Estuarine System	-	-	-	-	-
	Gulf of Mexico Eastern Coastal	-	-	-	-	-
	Gulf of Mexico Northern Coastal	-	-	-	-	-
	Gulf of Mexico Oceanic	1	0	-	-	-
	Gulf of Mexico Western Coastal	-	-	-	-	-
	Indian River Lagoon Estuarine System	-	-	-	-	-
	Jacksonville Estuarine System	-	-	-	-	-
	MS Sound, Lake Borgne, and Bay Boudreau	-	-	-	-	-
	Northern GA/Southern SC Estuarine System	-	-	-	-	-
	Northern Gulf of Mexico Continental Shelf	25	18	1	-	-
	Northern NC Estuarine System	-	-	-	-	-
	Northern SC Estuarine System	-	-	-	-	-
	Nueces and Corpus Christi Bays	-	-	-	-	-
	Sabine Lake	-	-	-	-	-
	Southern GA Estuarine System	-	-	-	-	-
	Southern NC Estuarine System	-	-	-	-	-
	St. Andrew Bay	-	-	-	-	-
	St. Joseph Bay	-	-	-	-	-
	Tampa Bay	-	-	-	-	-
	Western North Atlantic Central FL Coastal	-	-	-	-	-
	Western North Atlantic Northern FL Coastal	-	-	-	-	-
	Western North Atlantic Northern Migratory Coastal	-	-	-	-	-
	Western North Atlantic Offshore	4	2	-	0	-
	Western North Atlantic SC GA Coastal	-	-	-	-	-
	Western North Atlantic Southern Migratory Coastal	-	-	-	-	-
Bryde's whale	Primary	-	-	-	-	-
Clymene dolphin	Northern Gulf of Mexico	-	0	-	-	-
	Western North Atlantic	-	0	0	-	-
Cuvier's beaked whale	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	1	1	-	-	-
Dwarf sperm whale	Northern Gulf of Mexico	1	1	-	-	-
	Western North Atlantic	7	5	1	-	-

Table 6.2-9: Estimated Effects to Marine Mammal Stocks from Explosives over Seven Years of Coast Guard Training (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*	*INJ*	*MORT*
False killer whale	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	-	-	-	-	-
Fin whale	Western North Atlantic	1	1	0	-	-
Fraser's dolphin	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	-	-	-	-	-
Gervais' beaked whale	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	-	-	-	-	-
Gray seal	Western North Atlantic	7	6	0	-	-
Harbor porpoise	Gulf of ME/Bay of Fundy	150	166	28	-	-
Harbor seal	Western North Atlantic	10	8	1	-	-
Harp seal	Western North Atlantic	14	13	1	-	-
Hooded seal	Western North Atlantic	2	1	0	-	-
Humpback whale	Gulf of ME	2	1	0	-	-
Killer whale	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	-	-	-	-	-
Long-finned pilot whale	Western North Atlantic	2	1	0	-	-
Melon-headed whale	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	-	-	-	-	-
Minke whale	Canadian Eastern Coastal	1	1	0	-	-
North Atlantic right whale	Western	0	0	-	-	-
Northern bottlenose whale	Western North Atlantic	-	-	-	-	-
Pantropical spotted dolphin	Northern Gulf of Mexico	0	0	0	-	-
	Western North Atlantic	-	-	-	-	-
Pygmy killer whale	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	-	-	-	-	-
Pygmy sperm whale	Northern Gulf of Mexico	1	1	-	-	-
	Western North Atlantic	5	5	1	-	-
Rice's whale	Northern Gulf of Mexico	-	-	-	-	-
Risso's dolphin	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	1	1	0	-	-
Rough-toothed dolphin	Northern Gulf of Mexico	0	0	-	-	-
	Western North Atlantic	-	-	-	-	-
Sei whale	Western North Atlantic	1	0	-	-	-
Short-beaked common dolphin	Western North Atlantic	21	15	1	-	-
Short-finned pilot whale	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	1	1	0	-	-
Sowerby's beaked whale	Western North Atlantic	-	0	-	-	-
Sperm whale	North Atlantic	1	0	-	-	-
	Northern Gulf of Mexico	0	-	-	-	-

Table 6.2-9: Estimated Effects to Marine Mammal Stocks from Explosives over Seven Years of Coast Guard Training (continued)

Species	*Stock*	*BEH*	*TTS*	*AINJ*	*INJ*	*MORT*
Spinner dolphin	Northern Gulf of Mexico	-	-	-	-	-
	Western North Atlantic	-	-	-	-	-
Striped dolphin	Northern Gulf of Mexico	0	-	-	-	-
	Western North Atlantic	3	1	0	-	-
True's beaked whale	Western North Atlantic	0	-	-	-	-
White-beaked dolphin	Western North Atlantic	0	-	-	-	-

Table Created: 2024-05-13 17:17:46
BEH = Behavioral Response, TTS = Temporary Threshold Shift, AINJ = Auditory Injury, INJ = Non-Auditory Injury, MORT = Mortality
For BEH, TTS, AINJ, INJ, and MORT annual estimated impacts: Zero (0) impacts indicate total less than 0.5 and a dash (-) is a true zero.

6.3 Estimated Take of Marine Mammals by Vessel Strike

6.3.1 Background on Vessel Strikes

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., 2010a; 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 59 ft. or 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 ft. or 15.24 m 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 in size 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:

- There are several standard operating procedures for vessel safety that will benefit marine mammals through a reduction in the potential for vessel strike, as discussed in Appendix A (Activity Descriptions) of the AFTT Supplemental EIS/OEIS. 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 Section 11, Mitigation Measures).

The history of Navy and Coast Guard large whale strikes reported in the Study Area from 2009 to early 2024 is provided in Figure 6.3-1. 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.

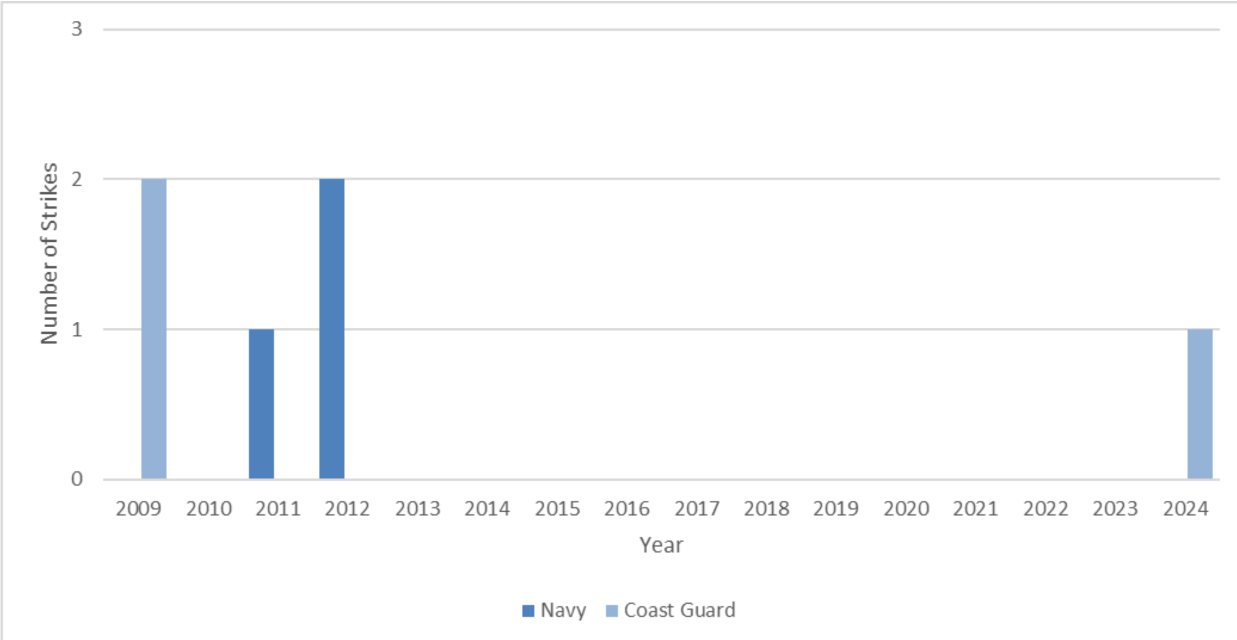

Figure 6.3-1: Large Whale Strikes in AFTT by Year (2009 to early 2024)

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.

6.3.1.1 Mysticetes

Vessel strikes have been documented for almost all of the mysticete species (Van der Hoop et al., 2012). This includes blue whales (Berman-Kowalewski et al., 2010b; Calambokidis, 2012; Van Waerebeek et al., 2007), fin whales (Douglas et al., 2008; Van Waerebeek et al., 2007), North Atlantic right whales (Firestone, 2009; Fonnesbeck et al., 2008; Vanderlaan et al., 2009; Wiley et al., 2016), sei whales (Felix & Van Waerebeek, 2005; Van Waerebeek et al., 2007), Bryde's whales (Felix & Van Waerebeek, 2005; Van Waerebeek et al., 2007), minke whales (Van Waerebeek et al., 2007), and humpback whales (Douglas et al., 2008; Lammers et al., 2003; Van Waerebeek et al., 2007).

Research suggests that the increasing noise in the ocean has made it difficult for whales to detect approaching vessels, which has indirectly raised the risk of vessel strike (Elvin & Taggart, 2008). Some individuals may become habituated to low-frequency sounds from shipping and fail to respond to an approaching vessel (National Marine Fisheries Service, 2008). For example, North Atlantic right whales are documented to show little overall reaction to the playback of sounds of approaching vessels, suggesting that some whales perform only a last-second flight response (Nowacek et al., 2004). Because surface activity includes feeding, breeding, and resting, whales may be engaged in this activity and not notice an approaching vessel. On the other hand, the lack of an acoustic cue of vessel presence can be detrimental as well. One study documented multiple cases where humpback whales struck anchored or drifting vessels; in one case a humpback whale punched a 1.5 meter hole through the hull of an anchored 22 m wooden sailboat, and another instance a humpback whale rammed a powered down 10 meter fiberglass sailboat (Neilson et al., 2012). These results suggest that either the whales did not detect the vessel, or they intentionally struck it. In this study, vessel strikes to multiple cetacean species were included in the investigation; however, humpback whales were the only species that displayed this type of interaction with an unpowered vessel. Another study found that 79 percent of reported collisions between sailing vessels and cetaceans occurred when the vessels were under sail, suggesting it may be difficult for whales to detect the faint sound of sailing vessels (Ritter, 2012).

Vessel strikes are considered a primary threat to North Atlantic right whale survival (Firestone, 2009; Fonnesbeck et al., 2008; Knowlton & Brown, 2007; Nowacek et al., 2004; Vanderlaan et al., 2009). Studies of North Atlantic right whales tagged in April 2009 on the Stellwagen Bank feeding grounds found that right whales spent most of their time at a depth of 6.5 ft., which makes them less visible at the water's surface (Bocconcelli, 2009; Parks & Wiley, 2009). Also, while North Atlantic right whales have been documented to show little overall reaction to the playback of sounds of approaching vessels, they did respond to an alert signal by swimming strongly to the surface, which may increase their risk of collision (Nowacek et al., 2004).

In addition to visual observation for vessel movement, the Navy will implement mitigation measures in mitigation areas used by North Atlantic right whales for foraging, calving, and migration (Section 11, Mitigation Measures). These measures include funding of and communication with sightings systems, and implementation of speed reductions during applicable circumstances in certain areas (Section 11, Mitigation Measures). Generally, mysticetes are larger than odontocetes and are not able maneuver as well as odontocetes to avoid vessels. In addition, mysticetes do not typically aggregate in large groups and are therefore difficult to visually detect from the water surface. Mysticetes that occur within the AFTT Study Area have varying patterns of occurrence and distribution, which overlap with areas where vessel use associated with military readiness activities would occur.

6.3.1.2 Odontocetes

In general, odontocetes move quickly and seem to be less vulnerable to vessel strikes than other cetaceans; however, most small whale and dolphin species have at least occasionally suffered from vessel strikes, including killer whale (Van Waerebeek et al., 2007; Visser & Fertl, 2000), short-finned and long-finned pilot whales (Aguilar et al., 2000; Van Waerebeek et al., 2007), bottlenose dolphin (Bloom & Jager, 1994; Van Waerebeek et al., 2007; Wells & Scott, 1997), white-beaked dolphin (Van Waerebeek et al., 2007), short-beaked common dolphin (Van Waerebeek et al., 2007), spinner dolphin (Camargo & Bellini, 2007; Van Waerebeek et al., 2007), striped dolphin (Van Waerebeek et al., 2007), Atlantic spotted dolphin (Van Waerebeek et al., 2007), and pygmy sperm whales (Kogia breviceps) (Van Waerebeek et al., 2007). Beaked whales documented in vessel strikes include Arnoux's beaked whale (Van Waerebeek et al., 2007), Cuvier's beaked whale (Aguilar et al., 2000; Van Waerebeek et al., 2007), and several species of Mesoplodon (Van Waerebeek et al., 2007). However, evidence suggests that beaked whales may be able to hear the low-frequency sounds of large vessels and thus potentially avoid collision (Ketten, 1998). Sperm whales may be particularly vulnerable to vessel strikes as they spend extended periods of time "rafting" at the surface to restore oxygen levels within their tissues after deep dives (Jaquet & Whitehead, 1996; Watkins et al., 1999). Overall, collision avoidance success is dependent on a marine mammal's ability to identify and locate the vessel from its radiated sound and the animal's ability to maneuver away from the vessel in time. Based on hearing capabilities and dive behavior, sperm whales may not be capable of successfully completing an escape maneuver, such as a dive, in the time available after perceiving a fast-moving vessel. This supports the suggestion that vessel speed is a critical parameter for sperm whale collision risks (Gannier & Marty, 2015). There were also instances in which sperm whales approached vessels too closely and were cut by the propellers (Aguilar de Soto et al., 2006).

Odontocetes that occur within the AFTT Study Area have varying patterns of occurrence and distribution, which overlap with areas where vessel use associated with military readiness activities would occur. Available literature suggests based on their smaller body size, maneuverability, larger group sizes, and hearing capabilities, most small and medium odontocete species (e.g. dolphins and small whales) are not as likely to be struck by a Navy vessel as sperm whales and mysticetes. When generally compared to mysticetes, odontocetes are more capable of physically avoiding a vessel strike and since some species occur in large groups, they are more easily seen when they are closer to the water surface.

6.3.2 Probability of Vessel Strike of Large Whale species

Between 2007 and 2009, the Navy developed and distributed additional training, mitigation, and reporting tools to Navy operators to improve marine mammal protection and to ensure compliance with upcoming permit requirements. In 2007, the Navy implemented the Marine Species Awareness Training, which is designed to improve the effectiveness of visual observations for marine resources, including marine mammals and sea turtles. In subsequent years, the Navy issued refined policy guidance regarding marine mammal incidents (e.g., ship strikes) in order to collect the most accurate and detailed data possible in response to a possible incident. For over a decade, the Navy has implemented the Protective Measures Assessment Protocol software tool, which provides operators with notification of the required mitigation and a visual display of the planned training or testing activity location overlaid with relevant environmental data.

Similar mitigation, reporting, and monitoring requirements have been in place for the Action Proponents since 2009 and are expected to continue into the future. Therefore, the conditions affecting the potential for ship strikes are the most consistent across this time frame. As a result, data from 2009 to early 2024 are used to calculate the probability of striking a whale during proposed military readiness activities in the Study Area. The level of vessel use and the manner in which the Action Proponents train and test in the future is expected to be consistent with this time period.

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

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

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

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

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

Based on the annual steaming days average from 2009 to early 2024, the Action Proponents estimates that 18,702 Navy and 11,706 Coast Guard steaming days will occur over the 7-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 7-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 6.3-1.

Table 6.3-1: Probability of Whale Strike in a 7-Year Period

Number of Whales	*Percent Probability of Strike in a 7-Year Period – 2025 to 2032 (Navy)*	*Percent Probability of Strike in a 7-year Period – 2025 to 2032 (Coast Guard)*
0	27	27
1	35	35
2	23	23
3	10	10
4	4	4
5	1	1

Most 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 training or testing activities over the continental shelf portion of the Study Area. The number of takes requested by species stock are indicated in Section 5.2.

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7 ANTICIPATED IMPACT OF THE ACTIVITY

For NMFS to authorize incidental take of marine mammal species, it must determine that the requested take will have a negligible impact to the species or stock. By definition, an activity has a 'negligible impact' on a species or stock when its resulting impact "cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival" (50 CFR 216.103).

The Action Proponents have concluded that the proposed military readiness activities in the AFTT Study Area would result in Level B harassment, Level A harassment, or mortality takes, as summarized in Section 5.1 (Incidental Take Request from Acoustic and Explosive Sources) and Section 5.2 (Incidental Take Request from Vessel Strikes). Based on best available science, the Action Proponents have concluded that exposures of marine mammal species and stocks to the proposed military readiness activities would result in only short-term effects on most individuals exposed and would not affect annual rates of recruitment or survival for the following reasons:

- Most acoustic exposures are within the non-injurious TTS or behavioral effects zones (Level B harassment).
- Where information was limited, conservative assumptions were applied in the methods used to estimate harassment. The mitigation measures described in Section 11 (Mitigation Measures) are designed to avoid or reduce the potential for injury from acoustic, explosive, and physical disturbance stressors to the maximum extent practicable. The predicted impacts in this request are not reduced to account for mitigation measures. It is likely that mitigation measures would reduce the number of injuries and mortalities below the number of predicted instances.
- Range complexes and testing ranges where intensive military readiness activities have been occurring for decades continue to have populations of multiple species with strong site fidelity (including resident beaked whales at some locations) and increases in the number of some species.

Although the statutory definition of Level B harassment for military readiness activities requires that the natural behavior patterns of a marine mammal be significantly altered or abandoned, there is no established scientific correlation between short-term use of sonars, explosives, pile driving/extraction, or air guns, and long-term abandonment or significant alteration of behavioral patterns in marine mammals. As such, this request for LOAs assumes that short-term, non-injurious sound exposure levels predicted to cause TTS or temporary behavioral disruptions (non-TTS) qualify as Level B harassment. Therefore, this analysis overestimates reactions qualifying as harassment for military readiness activities under MMPA.

An analysis of the potential impacts of the proposed activities on recruitment or survival is presented in Appendix A of this request for each individual species, species group, or stock based on life history information, estimated take levels, an analysis of estimated take levels in comparison to the overall population, and identified geographic areas that may be particularly important for activities such as feeding and breeding. The species-specific analyses, in combination with the mitigation measures provided in Section 11 (Mitigation Measures) support the conclusion that proposed military readiness activities would have a negligible impact on marine mammal species or stocks within the Study Area.

7.1 Long-term Consequences to Species and Stocks

A sound-producing activity can cause a variety of behavioral reactions in animals ranging from very minor and brief, to more severe reactions such as aggression or prolonged flight. The acoustic stimuli can cause a stress reaction (i.e., startle or annoyance); they may act as a cue to an animal that has experienced a stress reaction in the past to similar sounds or activities, or that acquired a learned behavioral response to the sounds from conspecifics. An animal may choose to deal with these stimuli or ignore them based on the severity of the stress response, the animal's past experience with the sound, and the other stimuli that are present in the environment. If an animal chooses to react to the acoustic stimuli, then the behavioral responses fall into two categories: alteration of natural behavior patterns and avoidance. The specific type and severity of these reactions helps determine the costs and ultimate consequences to the individual and population.

The importance of the disruption and degree of consequence for individual marine mammals often has much to do with the frequency, intensity, and duration of the disturbance. Isolated acoustic disturbances such as sonar use, underwater detonation, and pile driving and pile removal events within the Study Area usually have minimal consequences or no lasting effects for marine mammals. Marine mammals regularly cope with occasional disruption of their activities caused by predators, adverse weather, and other natural phenomena. It is reasonable to assume that they can tolerate occasional or brief disturbances by anthropogenic sound without significant consequences. However, prolonged disturbance, as might occur if a stationary and noisy activity were established near a concentrated area, is a more important concern. The long-term implications would depend on the degree of habituation within the population. If the marine mammals fail to habituate or become sensitized to disturbance and, as a consequence, are excluded from an important area or are subject to stress while at the important area, long-term effects could occur to individuals or the population.

The potential costs to a marine mammal from an involuntary or behavioral response may range from no measurable cost, to expended energy reserves, increased stress, reduced social contact, missed opportunities to secure resources or mates, displacement, severe evasive behavior (potentially leading to secondary trauma or death), or stranding. Animals suffer costs on a daily basis from a host of natural situations such as dealing with predator or competitor pressure. If the costs to the animal from an acoustic-related activity fall outside of its normal daily variations, then individuals must recover from the totality of these costs to avoid long-term consequences.

The potential long-term consequences from behavioral responses are difficult to discern. Animals displaced from their normal habitat due to an avoidance reaction may return over time and resume their typical normal behaviors. This is likely to depend upon the severity of the reaction and how often the activity is repeated in the area. In areas of repeated and frequent acoustic disturbance, some animals may habituate to the new baseline; conversely, species that are more sensitive may not return, or return but not resume use of the habitat in the same manner. For example, an animal may return to an area to feed but no longer rest in that area. Long-term abandonment or a change in the utilization of an area by enough individuals can change the distribution of the population. Frequent disruptions to natural behavior patterns may not allow an animal to recover between exposures, which increase the probability of causing long-term consequences to individuals.

Animals that recover quickly and completely are unlikely to suffer reductions in their health or reproductive success, or experience changes in habitat utilization. No population-level effects would be expected if individual animals do not suffer reductions in their lifetime reproductive success or change their habitat utilization. Any long-term consequences to the individual can potentially lead to consequences for the population, although population dynamics and abundance play a role in determining how many individuals would need to experience long-term consequences before there was an effect on the population. Abundant or stable populations that suffer consequences on a few individuals may not be affected overall.

7.2 The Context of Behavioral Disruption and TTS- Biological Significance to Populations

The exposure estimates calculated by predictive models currently available reliably predict propagation of sound and received levels and predict a short-term, immediate response of an individual based on established criteria. Consequences to populations are much more difficult to predict and empirical measurement of population effects from anthropogenic stressors is limited (National Research Council, 2005). To predict indirect, long-term, and cumulative effects, the processes must be well understood and the underlying data available for models. In response to the National Research Council review (2005), the Office of Naval Research founded a working group to formalize the Population Consequences of Acoustic Disturbance framework. The long-term goal is to improve the understanding of how effects of marine sound on marine mammals transfer between behavior and life functions and between life functions and vital rates. This understanding will facilitate assessment of the population level effects of anthropogenic sound on marine mammals. This field of research is evolving and development of a state-space model is ongoing.

Based on each species' life history information, expected behavioral patterns in the Study Area, and the implementation of the mitigation measures outlined in Section 11 (Mitigation Measures), AFTT military readiness activities are anticipated to have a negligible impact on marine mammal stock or populations within the Study Area.

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8 ANTICIPATED IMPACTS ON SUBSISTENCE USE

Potential marine mammal impacts resulting from the Proposed Action will be limited to individuals located in the Study Area that have no subsistence requirements. Therefore, no impacts on the availability of species or stocks for subsistence use are considered.

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9 ANTICIPATED IMPACTS ON HABITAT

Activity components with the potential to impact marine mammal habitat as a result of the Proposed Action include: (1) changes in water quality, (2) the introduction of sound into the water column, and (3) temporary changes to prey distribution and abundance. Each of these components was considered in the AFTT Supplemental EIS/OEIS and was determined to have no impact on marine mammal habitat. A summary of the conclusions are included below.

The North Atlantic right whale has designated critical habitat in the Study Area, and the Rice's whale has proposed critical habitat in the Study Area. After an assessment of the potential impacts of military readiness activities on marine mammal critical habitat in the Study Area, the Action Proponents have determined that acoustic sources, energy sources, physical disturbances and strikes, entanglement, ingestion, and indirect stressors will have no effect on the assumed primary constituent elements of the North Atlantic right whale critical habitat (i.e., water temperature and depth in the southeast and copepods in the northeast).

Water Quality. The AFTT Supplemental EIS/OEIS analyzed the potential effects on water quality from military expended materials. Military readiness activities may introduce water quality constituents into the water column. Based on the analysis of the AFTT Supplemental EIS/OEIS, military expended materials (e.g., undetonated explosive materials) would be released in quantities and at rates that would not result in a violation of any water quality standard or criteria. High-order explosions consume most of the explosive material, creating typical combustion products. For example, in the case of Royal Demolition Explosive, 98 percent of the products are common seawater constituents and the remainder is rapidly diluted below threshold effect level. Explosion by-products associated with high order detonations present no secondary stressors to marine mammals through sediment or water. However, low order detonations and unexploded ordnance present elevated likelihood of impacts on marine mammals.

Indirect effects of explosives and unexploded ordnance to marine mammals via sediment is possible in the immediate vicinity of the ordnance. Degradation products of Royal Demolition Explosive are not toxic to marine organisms at realistic exposure levels (Rosen & Lotufo, 2010). Relatively low solubility of most explosives and their degradation products means that concentrations of these contaminants in the marine environment are relatively low and readily diluted. Furthermore, while explosives and their degradation products were detectable in marine sediment approximately 6–12 in. (0.15–0.3 m) away from degrading ordnance, the concentrations of these compounds were not statistically distinguishable from background beyond 3–6 ft. (1–2 m) from the degrading ordnance. Taken together, it is possible that marine mammals could be exposed to degrading explosives, but it would be within a very small radius of the explosive (1–6 ft. [0.3–2 m]).

Equipment used by the Navy within the Study Area, including ships and other marine vessels, aircraft, and other equipment, are also potential sources of by-products. All equipment is properly maintained in accordance with applicable Navy or legal requirements. All such operating equipment meets federal water quality standards, where applicable.

Sound in the Water Column. Various activities and events, both natural and anthropogenic, above and below the water's surface contribute to oceanic ambient or background noise. Anthropogenic noise attributable to training and testing activities in the Study Area emanates from multiple sources including hull-mounted sonars operating at low, mid and high-frequencies, as well as non-hull-mounted mid-frequency active sonar, explosives, and other impulsive sounds. Such sound sources include, but are not limited to, improved extended echo ranging sonobuoys; mine countermeasure and neutralization activities; ordnance testing; gunnery, missile, and bombing exercises; torpedo testing, sinking exercises;

ship shock trials; vessels; and aircraft. Sounds produced from military readiness activities in the Study Area are temporary and transitory, and can be widely dispersed or concentrated in small areas for varying periods. Any anthropogenic noise attributed to military readiness activities in the Study Area would be temporary and the affected area would be expected to immediately return to the original state when these activities cease.

Prey Distribution and Abundance. The stressors that may impact the prey species of marine mammals—primarily fish and marine invertebrates—are explosives and impulsive sound sources, vessels and in-water devices, and military expended materials.

Physical effects from pressure waves generated by underwater sounds (e.g., underwater explosions) could potentially affect fish within proximity of training or testing activities. The shock wave from an underwater explosion is lethal to fish at close range, causing massive organ and tissue damage and internal bleeding (Keevin & Hempen, 1997). At greater distance from the detonation point, the extent of mortality or injury depends on a number of factors including fish size, body shape, orientation, and species (Keevin & Hempen, 1997; Wright, 1982). At the same distance from the source, larger fish are generally less susceptible to death or injury, elongated forms that are round in cross-section are less at risk than deep-bodied forms, and fish oriented sideways to the blast suffer the greatest impact (Edds-Walton & Finneran, 2006; O'Keeffe, 1984; O'Keeffe & Young, 1984; Wiley et al., 1981; Yelverton et al., 1975). Species with gas-filled organs have higher mortality than those without them.

Animals that experience hearing loss (AINJ or TTS) as a result of exposure to explosions and impulsive sound sources may have a reduced ability to detect relevant sounds such as predators, prey, or social vocalizations. It is uncertain whether some permanent hearing loss over a part of a fish’s hearing range would have long-term consequences for that individual.

Besides being driven from a location by explosions and impulsive sound sources, fish might change their behavior, feeding pattern, or distribution. Changes in behavior of fish have been observed as a result of sound produced by explosives, with effect intensified in areas of hard substrate (Wright, 1982). Stunning from pressure waves could also temporarily immobilize fish, making them more susceptible to predation. The abundances of various fish and invertebrates near the detonation point could be altered for a few hours before animals from surrounding areas repopulate the area; however these populations would likely be replenished as waters near the detonation point are mixed with adjacent waters. Repeated exposure of individual fish to sounds from underwater explosions is not likely and most acoustic effects are expected to be short-term and localized. Long-term consequences for fish populations would not be expected.

Vessels and in-water devices do not normally collide with adult fish, most of which can detect and avoid them. Exposure of fishes to vessel strike stressors is limited to those fish groups that are large, slow-moving, and may occur near the surface, such as sturgeon, ocean sunfish, whale sharks, basking sharks, and manta rays. With the exception of sturgeon, these species are distributed widely in offshore portions of the Study Area. Any isolated cases of a Navy vessel striking an individual could injure that individual, impacting the fitness of an individual fish. Vessel strikes would not pose a risk to most of the other marine fish groups, because many fish can detect and avoid vessel movements, making strikes rare and allowing the fish to return to their normal behavior after the ship or device passes. As a vessel approaches a fish, they could have a detectable behavioral or physiological response (e.g., swimming away and increased heart rate) as the passing vessel displaces them. However, such reactions are not expected to have lasting effects on the survival, growth, recruitment, or reproduction of these marine fish groups at the population level.

In addition to fish, prey sources such as marine invertebrates could potentially be impacted by sound stressors as a result of the proposed activities. However, most marine invertebrates' ability to sense sounds is very limited. In most cases, marine invertebrates would not respond to impulsive and non-impulsive sounds, although they may detect and briefly respond to nearby low-frequency sounds. These short-term responses would likely be inconsequential to invertebrate populations. Explosions and pile driving would likely kill or injure nearby marine invertebrates. Vessels also have the potential to impact marine invertebrates by disturbing the water column or sediments, or directly striking organisms (Bishop, 2008). The propeller wash (water displaced by propellers used for propulsion) from vessel movement and water displaced from vessel hulls can potentially disturb marine invertebrates in the water column and is a likely cause of zooplankton mortality (Bickel et al., 2011). The localized and short-term exposure to explosions or vessels could displace, injure, or kill zooplankton, invertebrate eggs or larvae, and macro-invertebrates. But, mortality or long-term consequences for a few animals is unlikely to have measurable effects on overall stocks or populations. Long-term consequences to marine invertebrate populations would not be expected as a result of exposure to sounds or vessels in the Study Area.

Military expended materials resulting from training and testing activities could potentially result in minor long-term changes to benthic habitat. Military expended materials may be colonized over time by benthic organisms that prefer hard substrate and would provide structure that could attract some species of fish or invertebrates. Overall, the combined impacts of sound exposure, explosions, pile driving, vessel strikes, and military expended materials resulting from the proposed activities would not be expected to have measurable effects on populations of marine mammal prey species.

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10 ANTICIPATED EFFECTS OF HABITAT IMPACTS ON MARINE MAMMALS

The Proposed Action is not expected to have any habitat-related effects that could cause significant or long-term consequences for individual marine mammals or their populations. Based on the discussions in Section 9 (Anticipated Impacts on Habitat), there will be no impacts on marine mammals resulting from loss or modification of marine mammal habitat.

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11 MITIGATION MEASURES

11.1 INTRODUCTION

This section summarizes the mitigation the Action Proponents will implement under the Proposed Action. The terms "mitigation" and "mitigation measures" mean actions taken to completely avoid, partially reduce, or minimize the potential for a stressor to impact a resource. Mitigation included in this section is designed to ensure that the Proposed Action has a negligible impact on marine mammal species and stocks, and effects the least practicable adverse impact on marine mammal species or stocks and their habitat (as required under the MMPA). The Action Proponents analyzed potential mitigation measures individually and then collectively as a holistic mitigation package to determine if mitigation would meet the appropriate balance between being environmentally beneficial and practical to implement. A complete discussion of the mitigation assessment and development processes can be found in Section 5 (Mitigation) of the AFTT Supplemental EIS/OEIS. Table 11.7-1 summarizes new or substantively modified mitigation measures included in this document (as compared to the 2018 Final EIS/OEIS).

11.2 MITIGATION DISSEMINATION

The Action Proponents will publish, broadcast, disseminate, or distribute mitigation instructions through pre-event briefs, governing instructions, broadcast messages, the Protective Measures Assessment Protocol, or other established internal processes. The Protective Measures Assessment Protocol is a software program accessed by appointed personnel during pre-event planning. The program provides operators with notification of the required mitigation measures applicable to a particular training or testing event, as well as a visual display of the planned event location overlaid with relevant environmental data. Its text and mapping data will be updated to align with best available science and the final mitigation that results from this consultation.

Mitigation requirements are mandatory for the Action Proponents when conducting activities under the Proposed Action. In furtherance of national security objectives, foreign militaries may participate in multinational training and testing events in the Study Area. Foreign military participation is not part of the federal action unless the U.S. military exercises substantial control and responsibility over those foreign military activities. Foreign military vessels operate pursuant to their own national authorities and have independent rights under customary international law, embodied in the principle of sovereign immunity, to engage in various activities on the world's oceans and seas. During U.S.-led training events within the U.S. territorial seas (0 to 12 NM from shore), the Action Proponents will request a foreign military unit's voluntary compliance with the applicable mitigations. When a foreign military unit participates in a training event with the Action Proponents beyond the U.S. territorial seas but within the U.S. EEZ (12 to 200 NM from shore), the Action Proponents will encourage that unit's voluntary compliance with the mitigation when practical.

11.3 PERSONNEL TRAINING

As a standard operating procedure, underway surface ships operated by or for the Action Proponents have personnel assigned to stand watch at all times (day and night) for safety of navigation, collision avoidance, range clearance, and man-overboard precautions. Personnel on underway small boats (e.g., crewmembers responsible for navigation) fulfill similar watch standing responsibilities to those positioned on surface ships. To qualify to stand watch as a Navy Lookout, personnel undertake a training program that includes computer-based training, on-the-job instruction, and a formal qualification program. Lookouts are trained in accordance with the *U.S. Navy Lookout Training Handbook* or equivalent to use correct scanning procedures while monitoring assigned sectors, to estimate the relative bearing, range, position angle, and target angle of sighted objects, and to rapidly communicate accurate sighting reports. The *U.S. Navy Lookout Training Handbook* was updated in 2022 to include a more robust chapter on environmental compliance, mitigation, and marine species observation tools and techniques (NAVEDTRA 12968-E). Environmental awareness and education training is also provided to personnel through the Afloat Environmental Compliance Training program (described below) or equivalent. Training is designed to help personnel gain an understanding of their personal environmental compliance roles and responsibilities (including mitigation implementation). Upon reporting aboard and annually thereafter, appointed personnel must complete training identified in their career path training plan.

- **Introduction to Afloat Environmental Compliance.** Developed in 2014, the introduction module provides information on at-sea environmental laws, regulations, and compliance roles.
- **Marine Species Awareness Training.** This module was developed by civilian marine biologists employed by the Navy, and was reviewed and approved by NMFS. It provides information on marine species sighting cues, visual observation tools and techniques, and sighting notification procedures. It is a video-based complement to the *U.S. Navy Lookout Training Handbook* or equivalent. Since 2007, this module has been required for commanding officers, executive officers, equivalent civilian personnel, and personnel who will stand watch as a Navy Lookout.
- **Protective Measures Assessment Protocol.** This module provides information on how personnel should access and operate the Protective Measures Assessment Protocol. Since 2014, this module has been required for Navy personnel tasked with generating mitigation reports.
- **Sonar Positional Reporting System and Marine Mammal Incident Reporting.** This module provides information on sonar reporting requirements and marine mammal incident reporting procedures, which are described in Section 11.4 (Incident Reporting). Since 2014, this module has been required for Navy personnel tasked with preparing, approving, or submitting applicable reports.

11.4 Incident Reporting

As needed, the Action Proponents will follow established internal communication methods directed by Office of Chief of Naval Operations Instruction 3100.6 (series) if reportable incidents applicable to their activities are observed. Further, the Action Proponents will:

- Notify NMFS immediately (or as soon as operational security considerations allow) if a vessel strike, injury, or mortality of a marine mammal occurs that is (or may be) attributable to activities conducted under the Proposed Action.
- Comply with the communication protocol for incidents involving marine mammals under NMFS' jurisdiction as outlined in the Notification and Reporting Plan.

11.5 Visual Observations

Visual observations have a primary objective of reducing overlap of individual marine mammals in real time with stressors that have the potential to cause injury or mortality. Observations for "indicator species" are also conducted to offer an additional layer of protection for marine mammals. For mitigation purposes, the term "floating vegetation" refers specifically to floating concentrations of detached kelp paddies and S*argassum*. For events with the largest net explosive weights (NEW; described in pounds [lb.]), indicator species also include other prey species or co-feeding species, such as jellyfish aggregations, large schools of fish, or flocks of seabirds, depending on the event and observation platforms involved.

Visual observations will be conducted by trained Lookouts. For mitigation purposes, the minimum number of Lookouts required is provided in Table 1.5-1 through Table 1.5-4. Some events may have additional personnel (beyond the minimum number of required Lookouts) who are already standing watch in or on the platform conducting the event or additional participating platforms, and would have eyes on the water for all or part of an event. For example, Bridge Watch Teams on underway surface ships typically include numerous personnel on the bridge, bridge wings, and aft deck. These additional personnel will serve as members of the “Lookout Team” for all acoustic, explosive, and physical disturbance and strike stressor mitigation categories. While performing their primary duties, the Lookout Team will perform ad hoc visual observations before, during, or after events as a secondary task when doing so is compatible with, and does not compromise, safety and primary duty performance.

Lookouts may be positioned on surface vessels, aircraft, piers, or the shore. Lookouts positioned on U.S. Navy surface vessels (including surfaced submarines) will be solely dedicated to visually observing their assigned sectors. On platforms with limited crew, Lookouts may also fulfill other duties. For example, a Lookout on a small boat may also be responsible for navigation or personnel supervision. A Lookout in an aircraft is typically an existing crewmember such as a pilot or Flight Officer whose primary duty is navigation or other mission-essential tasks. Observation platforms will be positioned according to safety, mission, and environmental conditions. For example, small boats observing explosive mine events would always be positioned outside of the detonation plume and human safety zone.

Lookouts will employ standard visual search techniques using naked-eye scanning, potentially in combination with the use of handheld binoculars, high-powered “big-eye” binoculars mounted on the deck of a surface ship (depending on the event and observation platform), and night search techniques (e.g., the use of night vision devices) if events occur after sunset or prior to sunrise. Lookouts will be advised that personal use of polarized sunglasses, when available, may help reduce sea surface glare, which could improve the sightability of marine resources. Prior to the start of an event (or use of a stressor) and throughout the duration of the event (or stressor use), Lookouts will observe a “mitigation zone” and the sea space surrounding the mitigation zone; within the direct path of underway vessels, unmanned surface or underwater vehicles that are already being escorted and operated under positive control by manned surface vessels, or towed in-water devices; and throughout the range of visibility (e.g., to the horizon, depending on weather and observation platform characteristics). Mitigation zones are distances from a stressor (typically a radius measured in yards [yd]), as specified in Table 1.5-1 through Table 1.5-4. The specified mitigation zones are the largest areas Lookouts can reasonably be expected to observe during typical activity conditions and that are practical to implement from an operational standpoint. Lookouts may be responsible for observing multiple mitigation zones. For example, a Lookout positioned on a surface ship during an explosive large-caliber gunnery event may be responsible for observing both the weapon firing noise mitigation zone and the mitigation zone around the intended detonation location.

Lookouts will immediately relay relevant sightings information (e.g., animal or indicator species type, bearing, distance, direction of travel or drift, position relative to the mitigation zone) to the appropriate watch station through established communication methods. Lookouts will continue to observe for new sightings while maintaining situational awareness of the originally sighted animal or indicator species’ position relative to the mitigation zone (to the extent possible). Lookouts will immediately relay any relevant new or updated information to the watch station. The watch station will disseminate relevant information to other participating assets as needed for their situational awareness. When passive acoustic devices are already being used in an event, sonar technicians will relay information about any passive acoustic detections of marine mammals to Lookouts prior to or during an event (when applicable, as indicated in Table 11.5-1 and Table 11.5-2) using established communication methods. Lookouts will use the information received to help inform their visual observations.

11.5.1 Mitigation Specific to Acoustic Stressors, Explosives, and Non-Explosive Ordnance

The mitigation measures described below will be implemented (as appropriate) in response to an applicable sighting within or entering the relevant mitigation zone for acoustic stressors, explosives, and non-explosive practice munitions:

- Prior to the initial start of an event (or stressor use), the Action Proponents will: (1) relocate the event to a location where applicable species are not observed, or (2) delay the initial start of the event (or stressor use) until one of the “Mitigation Zone All-Clear Conditions” has been met.
- During the event (i.e., during use of a stressor) the Action Proponents will (until one of the Mitigation Zone All-Clear Conditions has been met): (1) power down or shut down active acoustic transmissions, (2) cease air gun use, (3) cease pile driving or pile removal, (4) cease weapon firing or ordnance deployment, (5) or cease explosive detonations or fuse initiations.

Mitigation Zone All-Clear Conditions indicate that the mitigation zone is determined to be free of applicable species. The conditions include (1) a Lookout observes the applicable species exiting the mitigation zone, (2) a Lookout determines the applicable species has exited the mitigation zone based on its observed course and speed relative to the mitigation zone, (3) a Lookout affirms the mitigation zone has been clear from additional sightings for an applicable “wait period,” or (4) for mobile events, the stressor has transited a distance equal to double the mitigation zone size beyond the location of the last sighting. Wait periods were established because events cannot be delayed or ceased indefinitely for the purpose of mitigation due to impacts on safety, sustainability, and the ability to meet mission requirements. Wait periods are designed to allow animals the maximum amount of time practical to resurface (i.e., become available to be observed) before activities resume. The assumption that mitigation may need to be implemented more than once was factored when developing wait period durations. Wait periods are 10 minutes when events involve aircraft that are typically fuel constrained, or 30 minutes when events involve only vessels or aircraft that are not typically fuel constrained.

11.5.1.1 Additional Details for Acoustic Stressors

Additional details on the visual observation requirements for acoustic stressors are described in Table 11.5-1. Visual observation mitigation will not apply to:

- sources not operated under positive control;
- sources used for safety of navigation;
- sources used or deployed by aircraft operating at high altitudes;
- sources used, deployed, or towed by unmanned platforms except when escort vessels are already participating in the event and have positive control over the source;
- sources used by submerged submarines;
- *de minimis* sources;
- long-duration sources, including those used for acoustic and oceanographic research; and
- vessel-based, unmanned vehicle-based, or towed in-water sources when marine mammals (e.g., dolphins) are determined to be intentionally swimming at the bow or alongside or directly behind the vessel, vehicle, or device (e.g., to bow-ride or wake-ride).

11.5.1.2 Additional Details for Explosives

Additional details on the visual observation requirements for explosives are described in Table 11.5-2. Mitigation will not apply to explosives (1) deployed by aircraft operating at high altitudes, (2) deployed by submerged submarines, (3) deployed against aerial targets, (4) during vessel-launched missile or rocket events, (5) used at or below the *de minimis* threshold and (6) deployed by unmanned platforms except when escort vessels are already participating in the event and have positive control over the explosive. Post-event observations are intended to aid incident reporting requirements for marine mammals. Practicality and the duration of post-event observations will be determined on site by fuel restrictions and mission-essential follow-on commitments.

11.5.1.3 Additional Details for Non-Explosive Ordnance

Additional details on the visual observation requirements for non-explosive ordnance are described in Table 11.5-3. Explosive aerial-deployed mines do not detonate upon contact with the water surface and are therefore considered non-explosive when mitigating the potential for a mine shape to strike a marine mammal at the water surface. Mitigation for the explosive component of aerial-deployed mines is described in Table 11.5-2. Mitigation does not apply to non-explosive ordnance deployed (1) by aircraft operating at high altitudes, (2) against aerial targets, (3) during vessel-launched missile or rocket events, and (4) by unmanned platforms except when escort vessels are already participating in the event and have positive control over ordnance deployment.

Table 11.5-1: Visual Observations for Acoustic Stressors

Mitigation Category	*Mitigation Zones*	*Lookouts*	*Mitigation Requirement Timing*	*Wait Period*
Active Acoustic Sources				
• Active acoustic sources with power down and shut down capabilities: – Low-frequency active sonar ≥200 dB – Mid-frequency active sonar sources that are hull mounted on a surface ship (including surfaced submarines) – Broadband and other active acoustic sources >200 dB	• 200 yd from active acoustic sources (shut down) • 500 yd from active acoustic sources (power down of 10 dB total) • 1,000 yd from active acoustic sources (power down of 6 dB total)	• One Lookout in/on one of the following: – Aircraft – Pierside, moored, or anchored vessel – Underway vessel with space/crew restrictions (including small boats) – Underway vessel already participating in the event that is escorting (and has positive control over sources used, deployed, or towed by) an unmanned platform • Two Lookouts on an underway vessel without space/crew restrictions • Lookouts would use information from passive acoustic detections to inform visual observations when passive acoustic devices are already being used in the event	• Immediately prior to the initial start of using active acoustic sources (e.g., while maneuvering on station) for: – Marine mammals – Floating vegetation • During use of active acoustic sources for: – Marine mammals	• 10 or 30 minutes
• Active acoustic sources with shut down (but not power down) capabilities: – Low-frequency active sonar <200 dB – Mid-frequency active sonar sources that are not hull mounted on a surface ship (e.g., dipping sonar, towed arrays) – High-frequency active sonar – Air guns – Broadband and other active acoustic sources <200 dB	• 200 yd from active acoustic sources (shut down)			
Pile Driving and Pile Removal				
• Vibratory and impact pile driving and removal	• 100 yd from piles being driven or removed (cease pile driving or removal)	• One Lookout on one of the following: – Shore – Pier – Small boat	• 30 minutes prior to the initial start of pile driving or pile removal for: – Marine mammals – Floating vegetation • During pile driving or removal for: – Marine mammals	• 15 minutes
Weapon Firing Noise				
• Explosive and non-explosive large-caliber gunnery firing noise (surface-to-surface and surface-to-air)	• 30 degrees on either side of the firing line out to 70 yd from the gun muzzle (cease fire)	• One Lookout on a vessel	• Immediately prior to the initial start of large-caliber gun firing (e.g., during target deployment) for: – Marine mammals – Floating vegetation • During large-caliber gun firing for: – Marine mammals	• 30 minutes

Table 11.5-2: Visual Observations for Explosives

Mitigation Category	*Mitigation Zones*	*Lookouts*	*Mitigation Requirement Timing*	*Wait Period*
Explosive Bombs				
• Any NEW	• 2,500 yd from the intended target (cease fire)	• One Lookout in an aircraft	• Immediately prior to the initial start of bomb delivery (e.g., when arriving on station) for: – Marine mammals – Floating vegetation • During bomb delivery for: – Marine mammals • After the event, when practical, observe the detonation vicinity for incidents involving: – Marine mammals	• 10 minutes
Explosive Gunnery				
• Air-to-surface medium-caliber	• 200 yd from the intended impact location (cease fire)	• One Lookout on a vessel or in an aircraft	• Immediately prior to the initial start of gun firing (e.g., while maneuvering on station) for: – Marine mammals – Floating vegetation • During gunnery firing for: – Marine mammals • After the event, when practical, observe the detonation vicinity for incidents involving: – Marine mammals	• 10 or 30 minutes (depending on fuel constraints of the platform)
• Surface-to-surface medium-caliber	• 600 yd from the intended impact location (cease fire)			
• Surface-to-surface large-caliber	• 1,000 yd from the intended impact location (cease fire)			
Explosive Line Charges				
• Any NEW	• 900 yd from the detonation site (cease fire)	• One Lookout on a vessel	• Immediately prior to the initial start of detonations (e.g., while maneuvering on station) for: – Marine mammals – Floating vegetation • During detonations for: – Marine mammals • After the event, when practical, observe the detonation vicinity for incidents involving: – Marine mammals	• 30 minutes

Table 11.5-2: Visual Observations for Explosives (continued)

<table>
<tr><th>Mitigation Category</th><th>Mitigation Zones</th><th>Lookouts</th><th>Mitigation Requirement Timing</th><th>Wait Period</th></tr>
<tr><td colspan="5">Explosive Mine Countermeasure and Neutralization (No Divers)</td></tr>
<tr><td>• 0.1–5 lb. NEW</td><td>• 600 yd from the detonation site (cease fire)</td><td>• One Lookout on a vessel or in an aircraft</td><td rowspan="2">• Immediately prior to the initial start of detonations (e.g., while maneuvering on station; typically, 10 or 30 minutes depending on fuel constraints) for:
– Marine mammals
– Sea turtles
– Floating vegetation
• During detonations or fuse initiation for:
– Marine mammals
– Sea turtles
• After the event, observe the detonation vicinity for 10 or 30 minutes (depending on fuel constraints), for incidents involving:
– Marine mammals
– Sea turtles</td><td rowspan="2">• 10 or 30 minutes (depending on fuel constraints of the platform)</td></tr>
<tr><td>• >5 lb. NEW</td><td>• 2,100 yd from the detonation site (cease fire)</td><td>• Two Lookouts: one on a small boat and one in an aircraft</td></tr>
<tr><td colspan="5">Explosive Mine Neutralization (With Divers)</td></tr>
<tr><td>• 0.1–20 lb. NEW (positive control)</td><td>• 500 yd from the detonation site (cease fire)</td><td>• Two Lookouts in two small boats (one Lookout per boat), or one small boat and one rotary-wing aircraft (with one Lookout each)</td><td rowspan="2">• Time-delay devices will be set not to exceed 10 minutes
• Immediately prior to the initial start of detonations or fuse initiation for positive control events (e.g., while maneuvering on station) or for 30 minutes prior for time-delay events for:
– Marine mammals
– Sea turtles
– Floating vegetation
• During detonations or fuse initiation for:
– Marine mammals
– Sea turtles
• When practical based on mission, safety, and environmental conditions:
– Boats will observe from the mitigation zone radius mid-point
– When two are used, boats will observe from opposite sides of the mine location
– Platforms will travel a circular pattern around the mine location
– Boats will have one Lookout observe inward toward the mine location and one observe outward toward the mitigation zone perimeter
– Divers will be part of the Lookout Team
• After the event, observe the detonation vicinity for 30 minutes for incidents involving:
– Marine mammals
– Sea turtles</td><td rowspan="2">• 10 or 30 minutes (depending on fuel constraints of the platform)</td></tr>
<tr><td>• 0.1–20 lb. NEW (time-delay)
• >20–60 lb. NEW (positive control)</td><td>• 1,000 yd from the detonation site (cease fire)</td><td>• Four Lookouts in two small boats (two Lookouts per boat), and one additional Lookout in an aircraft if used in the event</td></tr>
</table>

Table 11.5-2: Visual Observations for Explosives (continued)

Mitigation Category	Mitigation Zones	Lookouts	Mitigation Requirement Timing	Wait Period
Explosive Missiles and Rockets				
• 0.6–20 lb. NEW (air-to-surface)	• 900 yd from the intended impact location (cease fire)	• One Lookout in an aircraft	• Immediately prior to the initial start of missile or rocket delivery (e.g., during a fly-over of the mitigation zone) for: – Marine mammals – Sea turtles – Floating vegetation • During missile or rocket delivery for: – Marine mammals – Sea turtles • After the event, when practical, observe the detonation vicinity for incidents involving: – Marine mammals – Sea turtles	• 10 or 30 minutes (depending on fuel constraints of the platform)
• >20–500 lb. NEW (air-to-surface)	• 2,000 yd from the intended impact location (cease fire)			
Explosive Sonobuoys and Research-Based Sub-Surface Explosives				
• Any NEW of sonobuoys • 0.1–5 lb. NEW for other types of sub-surface explosives used in research applications	• 600 yd from the device or detonation site (cease fire)	• One Lookout on a small boat or in an aircraft • Lookouts would use information from passive acoustic detections to inform visual observations when passive acoustic devices are already being used prior to the initial start of detonations	• Immediately prior to the initial start of detonations (e.g., during sonobuoy deployment, which typically lasts 20 to 30 minutes) for: – Marine mammals – Floating vegetation • During detonations for: – Marine mammals • After the event, when practical, observe the detonation vicinity for incidents involving: – Marine mammals	• 10 or 30 minutes (depending on fuel constraints of the platform)
Explosive Torpedoes				
• Any NEW	• 2,100 yd from the intended impact location (cease fire)	• One Lookout in an aircraft • Lookouts would use information from passive acoustic detections to inform visual observations when passive acoustic devices are already being used prior to the initial start of detonations	• Immediately prior to the initial start of detonations (e.g., during target deployment) for: – Marine mammals – Sea turtles – Floating vegetation – Jellyfish aggregations • During torpedo launches for: – Marine mammals – Sea turtles – Jellyfish aggregations • After the event, when practical, observe the detonation vicinity for incidents involving: – Marine mammals – Sea turtles	• 10 or 30 minutes (depending on fuel constraints of the platform)

Table 11.5-2: Visual Observations for Explosives (continued)

Mitigation Category	*Mitigation Zones*	*Lookouts*	*Mitigation Requirement Timing*	*Wait Period*
Ship Shock Trials				
• Any NEW	• 3.5 NM from the target ship hull (cease fire)	• On the day of the event, 10 observers (Lookouts and third-party observers combined), spread between aircraft or multiple vessels as specified in the event-specific mitigation plan	• The Navy will develop a detailed event-specific monitoring and mitigation plan in the year prior to the event and provide it to NMFS for review • Beginning at first light on days of detonation, until the moment of detonation (as allowed by safety measures), for: – Marine mammals – Sea turtles – Floating vegetation – Jellyfish aggregations – Large schools of fish – Flocks of seabirds • If an incident involving a marine mammal or sea turtle is observed after an individual detonation, the Navy will follow established incident reporting procedures and halt any remaining detonations until the Navy can consult with NMFS and review or adapt the event-specific mitigation plan, if necessary • During the 2 days following the event at a minimum and up to 7 days at a maximum, and as specified in the event-specific mitigation plan, observe the detonation vicinity for incidents involving: – Marine mammals – Sea turtles	• 30 minutes
SINKEX				
• Any NEW	• 2.5 NM from the target ship hull (cease fire)	• Two Lookouts: one on a vessel and one in an aircraft • Lookouts would use information from passive acoustic detections to inform visual observations when passive acoustic devices are already being used during weapon firing	• During aerial observations for 90 minutes prior to the initial start of weapon firing for: – Marine mammals – Sea turtles – Floating vegetation – Jellyfish aggregations • From the vessel during weapon firing, and from the aircraft and vessel immediately after planned or unplanned breaks in weapon firing of more than 2 hours for: – Marine mammals – Sea turtles • Observe the detonation vicinity for 2 hours after sinking the vessel or until sunset, whichever comes first, for incidents involving: – Marine mammals – Sea turtles	• 30 minutes

Table 11.5-3: Visual Observations for Non-Explosive Ordnance

Mitigation Category	*Mitigation Zones*	*Lookouts*	*Mitigation Requirement Timing*	*Wait Period*
Aerial-Deployed Mines and Non-Explosive Bombs				
• Explosive aerial-deployed mines • Non-explosive aerial-deployed mines – Non-explosive bombs	• 1,000 yd from the intended target (cease fire)	• One Lookout in an aircraft	• Immediately prior to the initial start of mine or bomb delivery (e.g., when arriving on station) for: – Marine mammals – Floating vegetation • During mine or bomb delivery for: – Marine mammals	• 10 minutes
Non-Explosive Gunnery				
• Non-explosive surface-to-surface large-caliber ordnance • Non-explosive surface-to-surface and air-to-surface medium-caliber ordnance • Non-explosive surface-to-surface and air-to-surface small-caliber ordnance	• 200 yd from the intended impact location (cease fire)	• One Lookout on a vessel or in an aircraft	• Immediately prior to the initial start of gun firing (e.g., while maneuvering on station) for: – Marine mammals – Floating vegetation • During gunnery firing for: – Marine mammals	• 10 or 30 minutes
Non-Explosive Missiles and Rockets				
• Non-explosives (air-to-surface)	• 900 yd from the intended impact location (cease fire)	• One Lookout in an aircraft	• Immediately prior to the start of missile or rocket delivery (e.g., during a fly-over of the mitigation zone) for: – Marine mammals – Floating vegetation • During missile or rocket delivery for: – Marine mammals	• 10 or 30 minutes

11.5.2 Mitigation Specific to Vessels, Vehicles, and Towed In-Water Devices

Additional details on the visual observation requirements for vessels, unmanned vehicles, and towed in-water devices are described in Table 11.5-4. For ship classes required to maintain more than one Lookout, the specific requirement is subject to change over time in accordance with the applicable navigation instruction, such as the Surface Ship Navigation Department Organization and Regulations Manual (U.S. Department of the Navy, 2021b). The Action Proponents will notify NMFS should their Lookout policies change, including in the Surface Ship Navigation Department Organization and Regulations Manual. Mitigation will be implemented to the maximum extent practical based on the prevailing circumstances, including consideration of safety of vessels, unmanned vehicles, towing platforms, and crews, as well as maneuverability restrictions. Mitigation will not be implemented (1) by submerged submarines, (2) by unmanned vehicles except when escort vessels are already participating in the event and have positive control over the unmanned vehicle movements, (3) when marine mammals (e.g., dolphins) are determined to be intentionally swimming at the bow, alongside the vessel or vehicle, or directly behind the vessel or vehicle (e.g., to bow-ride or wake-ride), (4) when pinnipeds are hauled out on man-made navigational structures, port structures, and vessels, and (5) when impractical based on mission requirements (e.g., during certain aspects of amphibious exercises).

Table 11.5-4: Visual Observations for Vessels, Vehicles, and Towed In-Water Devices

Mitigation Category	*Lookouts*	*Mitigation Zones and Requirements*
Manned Surface Vessels		
• Manned surface vessels, including surfaced submarines	• One or more Lookouts on manned underway surface vessels in accordance with the most recent navigation safety instruction	• Immediately prior to manned surface vessels getting underway and while underway, the Lookout(s) will observe for: ─ Marine mammals • Underway manned surface vessels will maneuver themselves (which may include reducing speed) to maintain the following distances as mission and circumstances allow: ─ 500 yd from whales ─ 200 yd from other marine mammals
Unmanned Vehicles		
• Unmanned Surface Vehicles and Unmanned Underwater Vehicles already being escorted (and operated under positive control) by a manned surface vessel	• One Lookout on a support vessel that is already participating in the event, and has positive control over the unmanned vehicle	• Immediately prior to unmanned vehicles getting underway and while underway, the Lookout will observe for: ─ Marine mammals • A support vessel that is already participating in the event, and has positive control over the unmanned vehicle, will maneuver the unmanned vehicle (which may include reducing its speed) to ensure it maintains the following distances as mission and circumstances allow: ─ 500 yd from whales ─ 200 yd from other marine mammals
Towed In-Water Devices		
• In-water devices towed by an aircraft, a manned surface vessel, or an Unmanned Surface Vehicle or Unmanned Underwater Vehicle already being escorted (and operated under positive control) by a manned surface vessel	• One Lookout on the manned towing vessel, or on a support vessel that is already participating in the event and has positive control over an unmanned vehicle that is towing an in-water device	• Immediately prior to and while in-water devices are being towed, the Lookout will observe for: ─ Marine mammals • Manned towing platforms, or support vessels already participating in the event that have positive control over an unmanned vehicle that is towing an in-water device, will maneuver itself or the unmanned vehicle (which may include reducing speed) to ensure towed in-water devices maintain the following distances as mission and circumstances allow: ─ 250 yd from marine mammals

11.5.3 Visual Observation Effectiveness

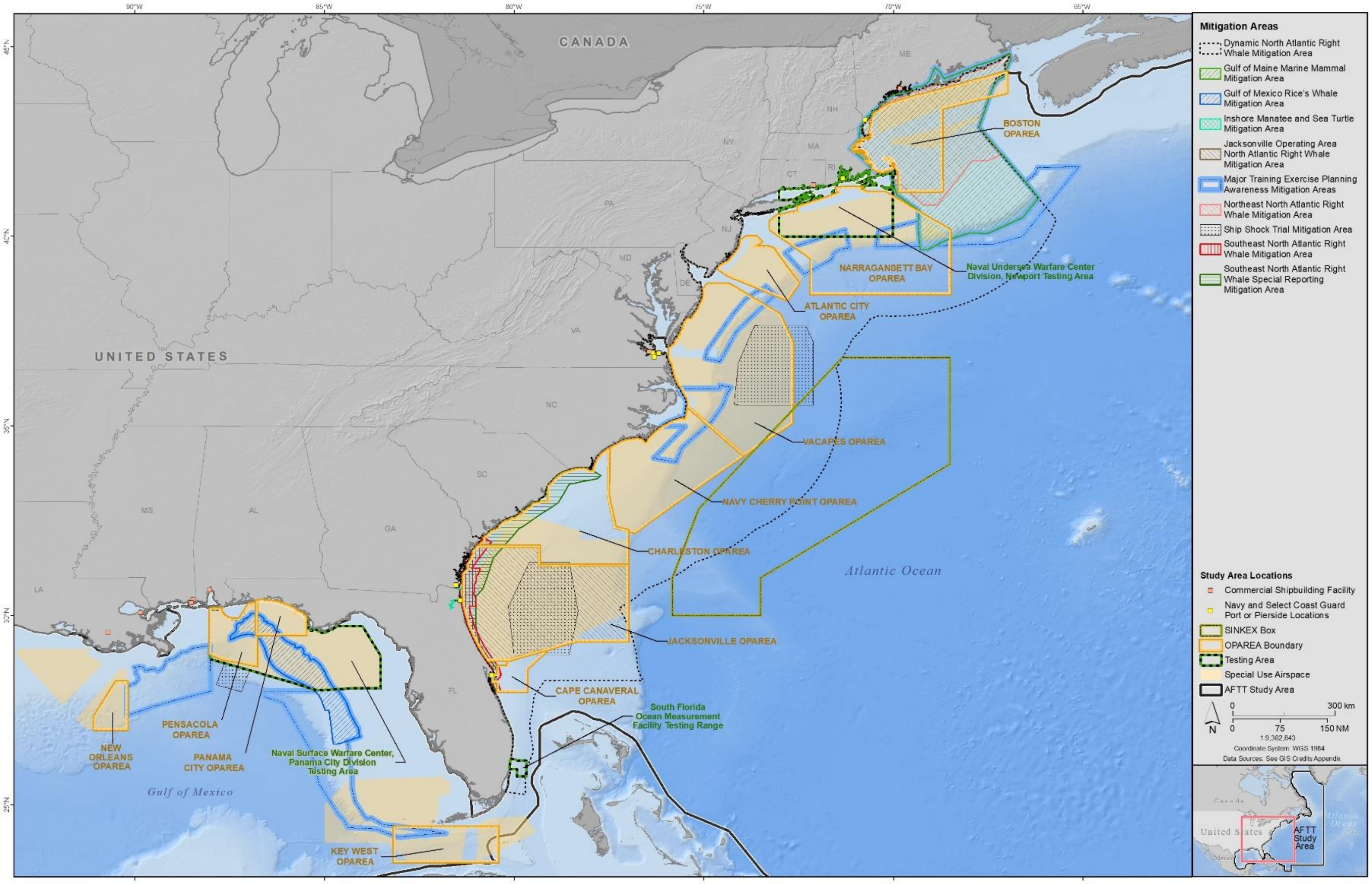
Oedekoven and Thomas (2022) evaluated the effectiveness of Navy Lookout Teams at detecting marine mammals before they entered a defined set of mitigation zones (i.e., 200, 500, and 1,000 yard (yd)). The study analyzed sighting data collected by the Navy over 27 embarks from 2010 to 2019. Results indicated that the effectiveness of Navy Lookout Teams was generally less than that of trained biologist observer teams, and varied by sighted species, group size, and distance. The Navy reviewed the same dataset used by Oedekoven and Thomas (2022), plus sonar use data, and found that sonar status (i.e., on versus off) was an important factor in evaluating how species availability may influence the prevalence of marine mammal sightings for Navy Lookouts and biologists alike. Sighting rates near vessels using hull-mounted active sonar were lower when sonar was on versus off, suggesting that a portion of marine mammals were not available to be sighted when the sonar was on (due to changed surfacing behavior or avoiding close exposures to sonar) (Navy, 2023). Table 11.5-5 provides a summary of the factors that could potentially influence the real-time effectiveness of the Action Proponents' visual observations (Barlow, 2015; Jefferson et al., 2015; Navy, 2023; Oedekoven & Thomas, 2022). The quantitative analysis for this document does not reduce model-estimated impacts to account for visual observation mitigation.

Table 11.5-5: Potential Factors Influencing Visual Observation Effectiveness

Factor	***Description of Influence on Sightability***
Species dive behavior Species group size	Long-duration and deep-diving species are not at the surface often or for long periods of time, which limits the amount of time they are available to be seen by Lookouts. Group size also influences sightability. Species that travel in groups or large pods (e.g., delphinids, sperm whales, fin whales) are generally easier to detect than solitary individuals or pairs. Information on dive behaviors and group sizes for species that occur in the Study Area is provided in the technical reports titled *Dive Distribution for Marine Species Occurring in the U.S. Navy's Atlantic and Hawaii and California Training and Testing Study Areas* the *U.S. Navy Marine Species Density Database Phase IV for the Atlantic Fleet Training and Testing Study Area*.
Species physical traits and surface behaviors	Larger-bodied species (e.g., baleen and sperm whales) or species with tall dorsal fins (e.g., killer whales) would generally be easier to detect relative to small-bodied species and species without dorsal fins (e.g., pinnipeds, sea turtles). Similarly, species with highly conspicuous surface-active behaviors (e.g., breaching, leaping, bow-riding) are generally easier to detect than cryptic species. For example, whales that fluke regularly (e.g., humpback and North Atlantic right whales) or variably (e.g., blue and fin whales) before they dive may be easier to detect than those that fluke rarely (e.g., sei, common minke, and Bryde's whales). Similarly, species that are active at the surface (e.g., bottlenose and spinner dolphins) or remain at the surface for extended periods of time as they forage or socialize (e.g., sperm and North Atlantic right whales) would be easier to detect than cryptic species that surface inconspicuously (e.g., harbor porpoises, beaked whales, dwarf and pygmy sperm whales, sea turtles). Prominent blows, such as those exhibited by many species of baleen whales (e.g., humpback whales) are easier to detect than small or less visible blows (e.g., Bryde's and common minke whales). Some species do not exhibit a blow when they surface to breathe (e.g., pinnipeds).
Observation conditions	Weather conditions, such as clear daytime skies, low sea states, low winds (i.e., low prevalence of white caps), and low glare are optimal for marine species observations. Animal sightability generally declines as viewing conditions decline.
Observation area and platform	Marine mammal and sea turtle sightability may be influenced by the mitigation zone size, observation platform, and distance between the two. Aircraft (when not operating at high altitudes) generally have the best vantage point for observing throughout an entire mitigation zone due to their height and speed over the water, and ability to conduct close-approach flyovers (depending on the event). Aircraft Lookouts are typically existing crewmembers responsible for other essential tasks (e.g., navigation), and some types of aircraft may have windows that are small or positioned in a way that partially obstruct views of the sea space directly beneath the aircraft. Due to their low vantage point on the water, Lookouts in small boats may be more likely to detect animals in close proximity to the boat or that display conspicuous visual cues (e.g., blows, splashes, flukes, travel in groups) than animals at further distances (e.g., near a mitigation zone perimeter) or that display inconspicuous visual cues (e.g., solitary animals surfacing without a splash). The bridges of surface ships offer a higher vantage point relative to small boats. For certain events, such as hull-mounted active sonar, the mitigation zone is located directly around the hull of the ship on which the Lookout is positioned. Species sightability would generally decrease with distance, particularly for mitigation zones located far from the observation platform (e.g., a gunnery mitigation zone several NM down range). The use of hand-held or big-eye binoculars can help compensate for the difficulty of sighting animals at distance (depending on the event).

11.6 GEOGRAPHIC MITIGATION

Designated portions of the Study Area where the Action Proponents will implement geographic mitigation for physical habitats, marine species habitats, or cultural resources are referred to as “mitigation areas” (see Figure 11.6-1). This section provides the geographic mitigation requirements and a qualitative discussion of their environmental benefits. Mitigation areas apply year-round unless specified otherwise, and do not apply to *de minimis* sources. If there should be any need to modify the geographic mitigation described in this section during the conduct of training or testing, event participants will be required to obtain permission from the appropriate designated point of contact (e.g., Naval Command Authority) prior to commencement of the applicable event. The Action Proponents would provide NMFS with advance notification and include relevant information about the event (e.g., sonar hours, use of explosives) in their annual training and testing activity reports.



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

Figure 11.6-1: Marine Mammal Mitigation Areas in the Study Area

11.6.1 Ship Shock Trial Mitigation Areas

Table 11.6-1 details geographic mitigation related to ship shock trials, which involve the use of explosives. Ship shock trials are conducted only within established ship shock trial boxes within the Gulf of Mexico and overlapping the Jacksonville and Virginia Capes OPAREAs. The boundaries of the mitigation areas match the boundaries of each ship shock trial box. Mitigation is a continuation of existing measures, except for new mitigation related to the location of the northern Gulf of Mexico ship shock trial box as described in Table 11.6-1.

Table 11.6-1: Ship Shock Trial Mitigation Area Requirements

Category	*Mitigation Requirements*	*Mitigation Benefits*
Explosives	• The Action Proponents will reposition the northern Gulf of Mexico ship shock trial box so it is situated outside of the Rice's whale core distribution area identified by NMFS in 2019 (84 *Federal Register* 15446) and updated in 2021 (86 *Federal Register* 47022). • The Action Proponents will not conduct ship shock trials within the portion of the ship shock trial box that overlaps the Jacksonville OPAREA from November 15 through April 15. • Pre-event planning for ship shock trials will include the selection of one primary and two secondary sites (within one of the ship shock trial boxes) where marine mammal abundance is expected to be the lowest during an event, with the primary and secondary locations located more than 2 NM from the western boundary of the Gulf Stream for events planned within the portion of the ship shock trial boxes that overlap the Virginia Capes or Jacksonville OPAREAs. • If the Action Proponents determine during pre-event visual observations that the primary site is environmentally unsuitable (e.g., continuous observations of marine mammals), it would evaluate the potential to move the event to one of the secondary sites in accordance with the event-specific mitigation and monitoring plan (see Table 11.5-2 for additional information).	• Prior to being repositioned, the northern Gulf of Mexico ship shock trial box overlapped the ESA-listed Bryde's whale core distribution area identified by NMFS in 2019 (84 *Federal Register* 15446) and updated in 2021 to distinguish Rice's whale as a subspecies distinct from Bryde's whale (86 *Federal Register* 47022). Preliminary Navy Acoustic Effects Model data indicated that Rice's whales would have potentially been exposed to auditory injury, temporary threshold shift, and behavioral impacts from explosives if events were to occur at that location. The Action Proponents determined it would be practical to reposition the ship shock trial box outside of the Rice's whale core distribution area, and into a new location that would avoid potential exposure of Rice's whales to injurious levels of sound. The repositioned ship shock trial box is now located off the Naval Surface Warfare Center, Panama City Division Testing Range's southern boundary. • Mitigation to not conduct ship shock trials in the Jacksonville OPAREA from November 15 through April 15 is designed to avoid potential injurious and behavioral impacts on North Atlantic right whales during calving season. • Mitigation to consider marine mammal abundance during pre-event planning, to prioritize locations that are more than 2 NM from the western boundary of the Gulf Stream (where marine mammals would be expected in greater concentrations for foraging and migration) when conducting ship shock trials in the boxes that overlap the Virginia Capes or Jacksonville OPAREAs, and to evaluate the environmental suitability of the selected site based on pre-event observations, are collectively designed to reduce the number of individual marine mammals exposed, as well as the level of impact that could potentially be received by each animal. • The benefits of the mitigation for Rice's whales, North Atlantic right whales, and other marine mammal species would be substantial because ship shock trials use the largest NEW of any explosive activity conducted under the Proposed Action.

11.6.2 Major Training Exercise Planning Awareness Mitigation Areas

Table 11.6-2 details geographic mitigation related to major training exercises (i.e., Composite Training Unit Exercises and Sustainment Exercises). Mitigation is a continuation of existing measures.

Table 11.6-2: Major Training Exercise Planning Awareness Mitigation Area Requirements

Category	*Mitigation Requirements*	*Mitigation Benefits*
Acoustic	• **Northeast:** Within Major Training Exercise Planning Awareness Mitigation Areas located in the Northeast (i.e., the combined areas within the Gulf of Maine, over the continental shelves off Long Island, Rhode Island, Massachusetts, and Maine), the Action Proponents will not conduct any (or a portion of any) major training exercises. • **Mid-Atlantic:** Within Major Training Exercise Planning Awareness Mitigation Areas located in the Mid-Atlantic (i.e., the combined areas off Maryland, Delaware, and North Carolina), the Action Proponents will avoid conducting any (or a portion of any) major training exercises to the maximum extent practical, and will not conduct more than four (or a portion of more than four) major training exercises per year.	• Mitigation to prohibit or limit major training exercises within regional planning mitigation areas is collectively designed to reduce the number of marine mammal species, and individuals within each species, that are exposed to potential impacts from active sonar during major training exercises. The mitigation areas are situated among highly productive environments and persistent oceanographic features associated with upwellings, steep bathymetric contours, and canyons. The areas have high marine mammal densities, abundance, or concentrated use for feeding, reproduction, or migration. Mitigation benefits would be substantial because major training exercises are conducted on a larger scale and with more hours of active sonar use than other types of active sonar events. • Mitigation for the Northeast planning areas (including in the Gulf of Maine) is designed to prevent major training exercises from occurring within North Atlantic right whale foraging critical habitat, across the shelf break in the northeast, on Georges Bank, and in areas that contain underwater canyons (e.g., Hydrographer Canyon). These locations (including within a portion of the Northeast Canyons and Seamounts National Marine Monument) have been associated with high occurrences of marine mammal feeding, abundance, or mating for harbor porpoises and humpback, minke, sei, fin, and North Atlantic right whales. • Mitigation for the Mid-Atlantic planning areas is designed to limit the number of major training exercises that could occur within large swaths of shelf break that contain underwater canyons or other habitats (e.g., Norfolk Canyon, part of the Cape Hatteras Special Research Area) associated with high marine mammal diversity in this region, including blue, fin, minke, sei, sperm, beaked, dwarf sperm, pygmy sperm, and humpback whales, as well as Risso's dolphins and other delphinid species. The planning areas also overlap North Atlantic right whale migration habitats.

11.6.3 Northeast North Atlantic Right Whale Mitigation Area

Table 11.6-3 details geographic mitigation related to active sonar and explosives (and special reporting for their use), and physical disturbance and strike stressors off the northeastern U.S. The mitigation area extent matches that of the North Atlantic right whale foraging critical habitat designated by NMFS in 2016 (81 *Federal Register* 4838). Mitigation is a continuation of existing measures, with clarification that requirements pertain to in-water stressors (i.e., not activities with no potential marine mammal impacts, such as air-to-air activities). Mitigation is designed to protect individual North Atlantic right whales within their foraging critical habitat. Mitigation will also protect individuals of other species whose biologically significant habitats overlap the mitigation area, including harbor porpoises and humpback, minke, sei, and fin whales.

Table 11.6-3: Northeast North Atlantic Right Whale Mitigation Area Requirements

Category	*Mitigation Requirements*	*Mitigation Benefits*
Acoustic	• The Action Proponents will minimize the use of low-frequency active sonar, mid-frequency active sonar, and high-frequency active sonar in the mitigation area to the maximum extent practical.	• Mitigation is designed to minimize exposure of North Atlantic right whales to sounds with potential for injury or behavioral impacts.
Explosives	• The Action Proponents will not detonate in-water explosives (including underwater explosives and explosives deployed against surface targets) within the mitigation area. • The Action Proponents will not detonate explosive sonobuoys within 3 NM of the mitigation area.	• Mitigation is designed to prevent exposure of North Atlantic right whales to explosives with potential for injury, mortality, or behavioral impacts. • Mitigation to prohibit explosive sonobuoys within 3 NM is designed to further prevent exposure to large and dispersed explosive sonobuoy fields.
Physical disturbance and strike	• The Action Proponents will not use non-explosive bombs within the mitigation area. • During non-explosive torpedoes events within the mitigation area: – The Action Proponents will conduct activities during daylight hours in Beaufort sea state 3 or less. – In addition to Lookouts required as described in Section 11.5 (Visual Observations), the Action Proponents will post two Lookouts in an aircraft during dedicated aerial surveys, and one Lookout on the submarine participating in the event (when surfaced). Lookouts will begin conducting visual observations immediately prior to the start of an event. If floating vegetation or marine mammals are observed in the event vicinity, the event will not commence until the vicinity is clear or the event is relocated to an area where the vicinity is clear. Lookouts will continue to conduct visual observations during the event. If marine mammals are observed in the vicinity, the event will cease until one of the Mitigation Zone All-Clear Conditions has been met as described in Section 11.5 (Visual Observations). – During transits and normal firing, surface ships will maintain a speed of no more than 10 knots; during submarine target firing, surface ships will maintain speeds of no more than 18 knots; and during vessel target firing, surface ship speeds may exceed 18 knots for brief periods of time (e.g., 10 to 15 minutes). • For vessel transits within the mitigation area: – The Action Proponents will conduct a web query or e-mail inquiry to the North Atlantic Right Whale Sighting Advisory System to obtain the latest sightings data prior to transiting the mitigation area. The Action Proponents will provide Lookouts the sightings data prior to standing watch. Lookouts will use that data to help inform visual observations during vessel transits. • Surface ships will implement speed reductions after observing a North Atlantic right whale, if transiting within 5 NM of a sighting reported to the North Atlantic Right Whale Sighting Advisory System within the past week, and when transiting at night or during periods of reduced visibility.	• Mitigation to prohibit use of non-explosive bombs is designed to reduce the potential for North Atlantic right whales to be struck by non-explosive ordnance. • Mitigation to conduct non-explosive torpedo activities during daylight hours in Beaufort sea state 3 or less, and to post additional Lookouts from aircraft (and submarines, when surfaced), is designed to improve marine mammal sightability during visual observations. • Mitigation for vessels to obtain sightings information from the North Atlantic Right Whale Sighting Advisory System and implement speed reductions in certain circumstances is designed to reduce the potential for vessels to encounter North Atlantic right whales. The North Atlantic Right Whale Sighting Advisory System is a National Oceanographic and Atmospheric Administration Northeast Fisheries Science Center program that collects sightings information off the northeastern United States from aerial surveys, shipboard surveys, whale watching vessels, and opportunistic sources, such as the Coast Guard, commercial ships, fishing vessels, and the public.
Special reporting for the use of acoustics and explosives	• The Action Proponents will report the total annual hours and counts of active sonar and in-water explosives (including underwater explosives and explosives deployed against surface targets) used in the mitigation area in their training and testing activity reports submitted to NMFS.	• Special reporting requirements are designed to aid the Action Proponents and NMFS in continuing to analyze potential impacts of training and testing in the mitigation area.

11.6.4 Gulf of Maine Marine Mammal Mitigation Area

Table 11.6-4 details geographic mitigation related to active sonar and special reporting for the use of active sonar and in-water explosives within the Gulf of Maine. Mitigation is a continuation of existing measures.

Table 11.6-4: Gulf of Maine Marine Mammal Mitigation Area Requirements

Category	***Mitigation Requirements***	***Mitigation Benefits***
Acoustic	• The Action Proponents will not use more than 200 hours of surface ship hull-mounted mid-frequency active sonar annually within the mitigation area.	• Mitigation is designed to reduce exposure of North Atlantic right whales to potentially injurious levels of sound from the type of active sonar with the highest source power used in the Study Area within foraging critical habitat designated by NMFS in 2016 (81 *Federal Register* 4838) and additional sea space southward over Georges Bank.
Special reporting for the use of acoustics and explosives	• The Action Proponents will report the total annual hours and counts of active sonar and in-water explosives (including underwater explosives and explosives deployed against surface targets) used in the mitigation area in their training and testing activity reports submitted to NMFS.	• Special reporting requirements are designed to aid the Action Proponents and NMFS in continuing to analyze potential impacts of training and testing in the mitigation area.

11.6.5 Jacksonville Operating Area North Atlantic Right Whale Mitigation Area

Table 11.6-5 details geographic mitigation related to active sonar and explosives (and special reporting for their use), and physical disturbance and strike stressors in the Jacksonville OPAREA. Mitigation is a continuation of existing measures, with clarification that requirements pertain to in-water stressors (i.e., not activities with no potential marine mammal impacts, such as air-to-air activities).

Table 11.6-5: Jacksonville Operating Area North Atlantic Right Whale Mitigation Area Requirements

<table>
<tr><th>Category</th><th>Mitigation Requirements</th><th>Mitigation Benefits</th></tr>
<tr><td>Acoustic</td><td rowspan="3">• From November 15 to April 15 within the mitigation area, prior to vessel transits or military readiness activities involving active sonar, in-water explosives (including underwater explosives and explosives deployed against surface targets), or non-explosive ordnance deployed against surface targets (including aerial-deployed mines), the Action Proponents will initiate communication with Fleet Area Control and Surveillance Facility, Jacksonville to obtain Early Warning System data. The facility will advise of all reported North Atlantic right whale sightings in the vicinity of planned vessel transits and military readiness activities.
– Sightings data will be used when planning event details (e.g., timing, location, duration) to minimize interactions with North Atlantic right whales to the maximum extent practical.
• The Action Proponents will provide Lookouts the sightings data prior to standing watch to help inform visual observations.</td><td rowspan="3">• Mitigation is designed to minimize potential North Atlantic right whale vessel interactions and exposure to stressors with the potential for mortality, injury, or behavioral disturbance within the portions of the reproduction (calving) critical habitat designated by NMFS in 2016 (81 Federal Register 4838) and important migration habitat that overlaps the Jacksonville OPAREA.
• The benefits of the mitigation would be substantial because the Jacksonville OPAREA is an Action Proponent concentration area within the southeastern region.</td></tr>
<tr><td>Explosives</td></tr>
<tr><td>Physical disturbance and strike</td></tr>
</table>

11.6.6 SOUTHEAST NORTH ATLANTIC RIGHT WHALE MITIGATION AREA

Table 11.6-6 details geographic mitigation related to active sonar and explosives (and special reporting for their use), and physical disturbance and strike stressors off the Southeastern U.S. Mitigation is a continuation of existing measures, with clarification that requirements pertain to the use of in-water stressors (i.e., not activities with no potential marine mammal impacts, such as air-to-air activities). The mitigation area is the largest area practical to implement within the North Atlantic right whale reproduction critical habitat designated by NMFS in 2016 (81 *Federal Register* 4838). Mitigation is designed to protect reproductive mothers, calves, and mother–calf pairs within the only known North Atlantic right whale calving habitat. Mitigation benefits would be substantial because the mitigation area encompasses the Georgia and northeastern Florida coastlines (where the highest seasonal concentrations occur) and coastal extent of the Jacksonville OPAREA (an Action Proponent concentration area).

Table 11.6-6: Southeast North Atlantic Right Whale Mitigation Area Requirements

Category	*Mitigation Requirements*	*Mitigation Benefits*
Acoustic	• From November 15 to April 15 within the mitigation area, the Action Proponents will not use high-frequency active sonar; or low-frequency or mid-frequency active sonar except: – To the maximum extent practical, the Action Proponents will minimize use of (1) helicopter dipping sonar (a mid-frequency active sonar source) and (2) low-frequency or surface ship hull-mounted mid-frequency active sonar during navigation training or object detection.	• Mitigation is designed to minimize exposure to levels of sound that have the potential to cause injurious or behavioral impacts.
Explosives	• From November 15 to April 15 within the mitigation area, the Action Proponents will not detonate in-water explosives (including underwater explosives and explosives deployed against surface targets).	• Mitigation is designed to prevent exposure to explosives with the potential for injury, mortality, or behavioral disturbance.
Physical disturbance and strike	• From November 15 to April 15 within the mitigation area, the Action Proponents will not deploy non-explosive ordnance against surface targets (including aerial-deployed mines). • From November 15 to April 15 within the mitigation area, surface ships will minimize north-south transits to the maximum extent practical, and will implement speed reductions after they observe a North Atlantic right whale, if they are within 5 NM of an Early Warning System sighting reported within the past 12 hours, and at night and in poor visibility.	• Mitigation is designed to prevent strikes by non-explosive ordnance, and to decrease the potential for vessel strikes (which could result in mortality or serious injury). North-south transit restrictions are designed to reduce the time ships spend in the highest seasonal occurrence areas to further decrease vessel strike risk.
Acoustic Explosives Physical disturbance and strike	• From November 15 to April 15 within the mitigation area, prior to vessel transits or military readiness activities involving active sonar, in-water explosives (including underwater explosives and explosives deployed against surface targets), or non-explosive ordnance deployed against surface targets (including aerial-deployed mines), the Action Proponents will initiate communication with Fleet Area Control and Surveillance Facility, Jacksonville to obtain Early Warning System sightings data. The facility will advise of all reported North Atlantic right whale sightings in the vicinity of planned vessel transits and military readiness activities. • The Action Proponents will provide Lookouts the sightings data prior to standing watch to help inform visual observations.	• Mitigation is designed to minimize potential vessel interactions and exposure to stressors with the potential for mortality, injury, or behavioral disturbance.
Special reporting for the use of acoustics and explosives	• The Action Proponents will report the total annual hours and counts of active sonar and in-water explosives (including underwater explosives and explosives deployed against surface targets) used in the mitigation area from November 15 to April 15 in their training and testing activity reports submitted to NMFS.	• Special reporting requirements are designed to aid the Action Proponents and NMFS in continuing to analyze potential impacts of training and testing in the mitigation area.

11.6.7 Southeast North Atlantic Right Whale Special Reporting Mitigation Area

Table 11.6-7 details geographic mitigation related to special reporting requirements for the use of active sonar and explosives off the southeastern U.S. Mitigation is a continuation of existing measures.

Table 11.6-7: Southeast North Atlantic Right Whale Special Reporting Mitigation Area Requirements

Category	*Mitigation Requirements*	*Mitigation Benefits*
Special reporting for the use of acoustics and explosives	• From November 15 to April 15, the Action Proponents will report the total annual hours and counts of active sonar and in-water explosives (including underwater explosives and explosives deployed against surface targets) used within the mitigation area in their training and testing activity reports submitted to NMFS.	• The mitigation area extent aligns with the boundaries of the North Atlantic right whale critical habitat for reproduction designated by NMFS in 2016 (81 *Federal Register* 4838). • Special reporting requirements are designed to aid the Action Proponents and NMFS in continuing to analyze potential impacts of training and testing in the mitigation area.

11.6.8 Dynamic North Atlantic Right Whale Mitigation Areas

Table 11.6-8 details geographic mitigation related to active sonar, explosives and physical disturbance and strike stressors off the southeastern U.S. Mitigation is a continuation of existing measures, with clarification that requirements pertain to the use of in-water stressors (i.e., not activities with no potential marine mammal impacts, such as air-to-air activities).

Table 11.6-8: Dynamic North Atlantic Right Whale Mitigation Area Requirements

<table>
<tr><th>Category</th><th>Mitigation Requirements</th><th>Mitigation Benefits</th></tr>
<tr><td>Acoustic</td><td rowspan="3">• The applicable dates and locations of this mitigation area will correspond with NMFS' Dynamic Management Areas, which fluctuate throughout the year based on the locations and timing of confirmed North Atlantic right whale detections.
• The Action Proponents will provide North Atlantic right whale Dynamic Management Area information (e.g., location and dates) to applicable assets transiting and training or testing in the vicinity of the Dynamic Management Area.
– The broadcast awareness notification messages will alert assets (and their Lookouts) to the possible presence of North Atlantic right whales in their vicinity.
• Lookouts will use the information to help inform visual observations during military readiness activities that involve vessel movements, active sonar, in-water explosives (including underwater explosives and explosives deployed against surface targets), or non-explosive ordnance deployed against surface targets in the mitigation area.</td><td rowspan="3">• The mitigation area extent matches the boundary of the U.S. Exclusive Economic Zone on the East Coast, which is the full extent of where Dynamic Management Areas could potentially be established year-round. NMFS manages the Dynamic Management Areas program off the U.S. East Coast with the primary goal of reducing the likelihood of North Atlantic right whale vessel strikes from all mariners.
• Mitigation is designed to minimize potential North Atlantic right whale vessel interactions and exposure to acoustic stressors, explosives, and physical disturbance and strike stressors that have the potential to cause mortality, injury, or behavioral disturbance.</td></tr>
<tr><td>Explosives</td></tr>
<tr><td>Physical disturbance and strike</td></tr>
</table>

11.6.9 Gulf of Mexico Rice's Whale Mitigation Area

Table 11.6-9 details geographic mitigation related to active sonar and explosives (and special reporting for their use) in the northeastern Gulf of Mexico. Mitigation is a continuation of existing measures. The mitigation area extent aligns with this species' small and resident population area identified by NMFS in its 2016 status review (Rosel et al., 2016).

Table 11.6-9: Gulf of Mexico Rice's Whale Mitigation Area Requirements

Category	*Mitigation Requirements*	*Mitigation Benefits*
Acoustic	• The Action Proponents will not use more than 200 hours of surface ship hull-mounted mid-frequency active sonar annually within the mitigation area.	• Mitigation is designed to reduce exposure of individuals within the small and resident population of Rice's whales to potentially injurious levels of sound by the type of active sonar with the highest source power used in the Study Area.
Explosives	• Except during mine warfare activities, the Action Proponents will not detonate in-water explosives (including underwater explosives and explosives deployed against surface targets) within the mitigation area.	• Mitigation is designed to reduce exposure of individuals within the small and resident population of Rice's whales to explosives that have the potential to cause injury, mortality, or behavioral disturbance.
Special reporting for the use of acoustics and explosives	• The Action Proponents will report the total annual hours and counts of active sonar and in-water explosives (including underwater explosives and explosives deployed against surface targets) used in the mitigation area in their training and testing activity reports submitted to NMFS.	• Special reporting requirements are designed to aid the Action Proponents and NMFS in continuing to analyze potential impacts of training and testing in the mitigation area.

11.7 Summary of New or Modified Mitigation Requirements

Table 11.7-1 summarizes new mitigation measures and substantive modifications to existing measures.

Table 11.7-1: Summary of New or Modified Mitigation Requirements

Category	*New or Modified Mitigation Requirements for this Draft EIS/OEIS*
Visual Observations	
Lookout Teams	This document includes a requirement for additional personnel on the platform conducting the event, or on additional participating platforms, to serve as part of the Lookout Team for all acoustic, explosive, and physical disturbance and strike stressor mitigation categories. In the 2018 Final EIS/OEIS, additional personnel were required to assist Lookouts for explosive events only. The Action Proponents have also been, in practice, implementing this for active sonar and non-explosive events, and are now formalizing their current practice as a mitigation requirement. Additionally, the *U.S. Navy Lookout Training Handbook* was updated in 2022 to include a more robust chapter on environmental compliance, mitigation, and marine species observation tools and techniques (NAVEDTRA 12968-E). These changes are collectively designed to improve the effectiveness of visual observations.
Broadband and Other Active Acoustic Sources	For this document, a 200-yd shut down mitigation zone would apply to broadband and other active acoustic sources less than 200 dB, while the tiered 1,000-yd power down/500-yd power down/200-yd shut down mitigation zones would apply to those sources greater than or equal to 200 dB. This requirement is meant to encompass new acoustic sources (e.g., sources used for oceanographic and acoustic research) that use a range of frequencies. Broadband source mitigation zones were not specified in the 2018 Final EIS/OEIS.
Air Guns	For this document, the air gun mitigation zone size has been increased from 150 yd to 200 yd for consistency with other active acoustic sources.
High-Altitude Aircraft	This document clarifies that aircraft operating at high altitudes (e.g., Maritime Patrol Aircraft) are exempt from requirements to conduct visual observations. When operating at high altitudes, observations for marine mammals or sea turtles would not be effective.
Vessel Movements	This document clarifies that one or more Lookouts will be posted in accordance with the most recent navigation guidance, which is subject to change over time. The 2018 Final EIS/OEIS required one Lookout on underway vessels.

Table 11.7-1: Summary of New or Modified Mitigation Requirements (continued)

Category	*New or Modified Mitigation Requirements for this Draft EIS/OEIS*
Unmanned Vehicles	This document includes new visual observation requirements for applicable events that involve Unmanned Surface Vehicles and Unmanned Underwater Vehicles (and the sources they use, tow, or deploy) that are already being escorted and operated under positive control by a manned surface vessel. In the 2018 Final EIS/OEIS, visual observations were not required for unmanned vehicles or sources they used, towed, or deployed.
Research-Based Sub-Surface Explosives	This document includes requirements for “research-based sub-surface explosives” to account for new explosive events with research applications (e.g., acoustic and oceanographic research) that would use 0.1 to 5-lb. NEW. These requirements are grouped within the explosive sonobuoy mitigation category because of their similarities between the charge sizes, detonation locations within the water column, and platforms that would be conducting visual observations.
Geographic Mitigation	
Ship Shock Trial Mitigation Areas	For this document, the Action Proponents repositioned the ship shock trial box outside of the Rice’s whale core distribution area, and into a new location that would avoid potential exposure of Rice’s whales to injurious levels of sound.

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12 ARCTIC PLAN OF COOPERATION

Subsistence use is the traditional exploitation of marine mammals by native peoples (i.e., for their own consumption). In terms of this request for LOAs, none of the proposed training or testing activities in the AFTT Study Area occur in or near the Arctic. Based on the discussions and conclusions in Section 7 (Anticipated Impact of the Activity) and Section 8 (Anticipated Impacts on Subsistence Use), there are no anticipated impacts on any species or stocks migrating through the Study Area that might be available for subsistence use.

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13 MONITORING AND REPORTING

The Action Proponents are committed to demonstrating environmental stewardship while executing their national defense mission and complying with the suite of federal environmental laws and regulations. As a complement to the Action Proponents' commitment to avoiding and reducing impacts of the Proposed Action through mitigation (Section 11, Mitigation Measures), the Action Proponents will undertake reporting efforts to track compliance with take authorizations and help investigate the effectiveness of implemented mitigation measures. Taken together, mitigation and monitoring comprise an integrated approach for reducing and understanding environmental impacts from the Proposed Action. The overall monitoring approach will seek to leverage and build on existing research efforts whenever possible.

Consistent with the cooperating agency agreement with NMFS, monitoring measures presented here, as well as mitigations discussed in Section 11 (Mitigation Measures), focus on the requirements for protection and management of marine resources. A well-designed monitoring program can provide important feedback for validating assumptions made in analyses and allow for adaptive management of marine resources. Since monitoring will be required for compliance with the final rule issued for the Proposed Action under the MMPA, details of the monitoring program will be developed in coordination with NMFS through the regulatory process.

13.1 MARINE SPECIES RESEARCH AND MONITORING STRATEGIC FRAMEWORK

The initial structure for U.S. Navy's marine species monitoring efforts was developed in 2009 with the Integrated Comprehensive Monitoring Program (ICMP). The intent of the ICMP was to provide an overarching framework for coordination of the U.S. Navy's monitoring efforts during the early years of the program's establishment. A Strategic Planning Process (DoN 2013) was subsequently developed and together with the ICMP framework serves as a planning tool to focus marine species monitoring priorities defined by ESA and MMPA requirements, and to coordinate monitoring efforts across regions based on a set of common objectives. Using an underlying conceptual framework incorporating a progression of knowledge from occurrence to exposure/response, and ultimately consequences, the Strategic Planning Process was developed as a tool to help guide the investment of resources to address top level objectives and goals of the monitoring program most efficiently. Intermediate Scientific Objectives form the basis of evaluating, prioritizing, and selecting new monitoring projects or investment topics and serve as the basis for developing and executing new monitoring projects across the U.S. Navy's training and testing ranges (both Atlantic and Pacific).

The Navy's Marine Species Monitoring Program investments are evaluated through the Adaptive Management Review (AMR) process to 1) assess overall progress, 2) review goals and objectives, and 3) make recommendations for refinement and evolution of the monitoring program's focus and direction. The Marine Species Monitoring Program has developed and matured significantly since its inception and now supports a portfolio several dozen active projects across a range of geographic areas and protected species taxa addressing both regional priorities (i.e. particular species of concern), and Navywide needs such as the behavioral response of beaked whales to training and testing activities.

A Research and Monitoring Summit was held in early 2023 to evaluate the current state of the Marine Species Monitoring Program in terms of progress, objectives, priorities, and needs, and to solicit valuable input from meeting participants including NMFS, Marine Mammal Commission, and scientific experts. The overarching goal of the summit was to facilitate updating the ICMP framework for guiding marine species research and monitoring investments, and to identify data gaps and priorities to be addressed over the next 5-10 years across a range of basic research through applied monitoring. One of the outcomes of this summit meeting is a refreshed strategic framework effectively replacing the ICMP which will provide increased coordination and synergy across the Navy's protected marine species investment programs. This will contribute to the collective goal of supporting improved assessment of effects from training and testing activities through development of first in class science and data.

13.2 Marine Species Monitoring Program Objectives

Monitoring activities relating to the effects of Navy training and testing activities on marine species are generally designed address one or more of the following top-level goals:

- An increase in the understanding of the likely occurrence of marine mammals and ESA-listed marine species in the vicinity of the action (i.e., presence, abundance, distribution, and density);
- An increase in the understanding of the nature, scope, or context of the likely exposure of marine mammals and ESA-listed species to any of the potential stressors associated with the action (e.g., sound, explosive detonation, or military expended materials), through better understanding of one or more of the following:
    1) the nature of the action and its surrounding environment (e.g., sound-source characterization, propagation, and ambient noise levels),
    2) the affected species (e.g., life history or dive patterns),
    3) the likely co-occurrence of marine mammals and ESA-listed marine species with the action (in whole or part),
    4) the likely biological or behavioral context of exposure to the stressor for the marine mammal and ESA-listed marine species (e.g., age class of exposed animals or known pupping, calving, or feeding areas).
- An increase in the understanding of how individual marine mammals or ESA-listed marine species respond (behaviorally or physiologically) to the specific stressors associated with the action (in specific contexts, where possible [e.g., at what distance or received level]).
- An increase in the understanding of how anticipated individual responses, to individual stressors or anticipated combinations of stressors, may impact either: (1) the long-term fitness and survival of an individual; or (2) the population, species, or stock (e.g., through impacts on annual rates of recruitment or survival).
- An increase in the understanding of the effectiveness of mitigation and monitoring measures.
- A better understanding and record of the manner in which the authorized entity complies with the Incidental Take Authorization and Incidental Take Statement.
- An increase in the probability of detecting marine mammals (through improved technology or methods), both specifically within the mitigation zone (thus allowing for more effective implementation of the mitigation) and in general, to better achieve the above goals.

13.3 Adaptive Management and Reporting

Within the natural resource management community, adaptive management involves ongoing, real-time learning and knowledge creation, both in a substantive sense and in terms of the adaptive process itself. The adaptive management review process serves as the basis for evaluating performance and compliance and involves technical review meetings, annual reporting, and ongoing discussions between the Navy, NMFS, the Marine Mammal Commission, and scientific experts. Progress and results from all monitoring activity conducted within the AFTT Study Area, as well as required Major Training Event exercise activity, will be summarized in an annual report. A draft of these annual reports will be submitted to NMFS for review in April of each year prior to being finalized and made available to the public within 3 months. Reports from individual projects, results of analyses, publications, and periodic progress reports for specific monitoring projects will be posted to the U.S. Navy Marine Species Monitoring Program website as they become available.

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14 SUGGESTED MEANS OF COORDINATION

The Navy provides a significant amount of funding and support to marine research, investing over $20 million each year in technology development, research, and monitoring. This work is conducted in coordination with universities, research institutions, federal laboratories, private companies, and independent researchers around the world. This research is directly applicable to the AFTT activities analysis, particularly with respect to the investigations of the potential impacts of underwater noise sources on marine mammals and other protected marine resources.

Major topics of Navy-supported research include the following:

- better understanding of marine species distribution and important habitat areas;
- developing methods to detect and monitor marine species before and during training and testing; and
- understanding the impacts of sound on marine mammals, sea turtles, fish, and birds; and developing tools to model and estimate potential impacts of sound.

The Office of Naval Research Marine Mammals and Biology program currently supports basic and early applied research as well as technology development related to understanding the effects of sound on marine mammals, including physiological, behavioral, ecological and population-level effects. The Living Marine Resources Program supports demonstration and validation of applied research methods and technologies, with focus areas including hearing studies, technology development, response studies, and data analysis tools and standards development. The Navy Marine Species Monitoring Program implements validated tools and techniques to support Navy environmental compliance, with focus areas in species distribution, abundance, habitat use, ecology and behavioral response. Leaders and representatives from these three programs work together to review work accomplished, introduce emerging science, address new issues or areas of concern, and adjust research needs or goals to ensure successful transitions from basic research to the monitoring program. The main goal of all three programs is to support the Navy in collecting data and information necessary to obtain or comply with environmental permits to ensure uninterrupted training and testing.

Overall, the U.S. Navy will continue to support and fund ongoing marine mammal research and long-term monitoring and research of marine mammals throughout the AFTT Study Area. The Navy will continue to research and contribute to university and external research to improve the state of the science regarding marine species biology and acoustic effects. These efforts include mitigation and monitoring programs; data sharing with NMFS and via the literature for research and development efforts; and future research as described previously.

The Coast Guard directly supports marine mammals through several programs including its Living Marine Resources Law Enforcement (LMR LE) program. The Coast Guard is responsible for enforcing LMR regulations on mariners and commercial, recreational, and charter fishing vessels. Fisheries in the U.S. are a $20 billion per year industry. The Coast Guard, in concert with the Department of State, National Oceanic and Atmospheric Administration Office for Law Enforcement (NOAA OLE), as well as other federal, state, and local agencies, have a long history of close cooperation and support in support of the LMR LE program. As outlined in COMDINST 16247.1h, the purpose of the Coast Guard's LMR LE program is to ensure compliance with domestic fisheries, protected living marine resources (such as marine mammals), and marine protected area (MPA) laws, regulations and international agreements. The objectives that support this goal are:

1. Preventing illegal encroachment of the U.S. EEZ and territorial waters by foreign fishing vessels;

2. Ensuring compliance with domestic federal living marine resource (LMR) laws and regulations by U.S. fishers; and
3. Ensuring compliance with international LMR agreements.

The specific statutory authority for the Coast Guard Law Enforcement mission is given in 14 U.S.C. section 2, "The Coast Guard shall enforce or assist in the enforcement of all applicable laws on, under, and over the high seas and waters subject to the jurisdiction of the U.S.." In addition, 14 U.S.C. section 89 provides the authority for Coast Guard active duty commissioned, warrant and petty officers to enforce applicable U.S. law. It authorizes Coast Guard personnel to enforce federal law on waters subject to U.S. jurisdiction and in international waters, as well as on all vessels subject to U.S. jurisdiction (including U.S., foreign and stateless vessels). The Coast Guard's area of responsibility is defined by the U.S. EEZ and by international agreement. The U.S. has the largest EEZ in the world, encompassing over 2.25 million square miles and 90,000 miles of coastline.

Specific to marine protected resources, Coast Guard’s Ocean Steward Framework conveys its commitment to both enforcement and conservation. Its priorities are to protect and recover healthy populations of marine protected species and support sustainable management of Federal marine protected areas. It does this by advancing three goals:

1. Effective presence: Enforcing marine protected resource laws and regulations;
2. Enhanced engagement: Leveraging the expertise and capabilities of partner agencies to craft sound, enforceable regulations and provide consistent, assertive external messaging; and
3. Exemplary Execution: Supporting at-sea conservation activities and maintaining best practices to avoid adverse impacts to protected resources resulting from at-sea operations.

The Coast Guard implements some programs dedicated to marine mammals, and in particular heightened efforts for the North Atlantic right whale. Through collaboration with NOAA, the Coast Guard implemented the Right Whale Mandatory Ship Reporting System (33 CFR Part 169 Subpart B) to assist in reducing ships over 300 gross tons from whale/vessel interactions. Since July 1999, the Coast Guard has taken an aggressive approach in educating vessel owners, operators and crew on the proper reporting procedures that must be followed when entering the WHALESNORTH and WHALESSOUTH areas.

In collaboration with NOAA Southeast Region, Navy, and the U.S. Army Corps of Engineers, the Coast Guard partners to fund North Atlantic right whale detection efforts in its calving area through the Early Warning System (EWS) in the southeast Atlantic. Coast Guard also partners with NOAA Northeast Fisheries Science Center to fund North Atlantic right whale detection efforts through the Sighting Advisory System in the northeast Atlantic. Sightings flow into WHALEMAP which is accessible to mariners to help inform their routing decisions to reduce their likelihood of whale/vessel interactions.

The Coast Guard helps marine protected resources through stranding and disentanglement responses requested through NOAA Fisheries and the USFWS. Stranded and entangled animals may be dead or alive, and live animals may be in need of medical attention or assistance in order to return to their natural habitat. Both live and dead animals (and any entangling gear) may also be law enforcement evidence for “take” cases. Both agencies have delegated some authorities to stranding network partners and federal partners. Coast Guard units in the Atlantic Area Area Of Responsibility are authorized to assist via:

- Endangered Species Act Listed Marine Mammals: Permit No. 24359. Permit valid until 31DEC27.
- Non-listed whales, dolphins, porpoises, seals: MMPA Sec. 1069, 16.U.S.C. 1379, no expiration.

- Sea Turtles: 50 CFR Part 222.310, 50 CFR Part 223.206, no expiration.
- Birds: USFWS provides written authority on a case-by-case basis.
- Manatees: Memorandum of Agreement dated 24JUL12, no expiration.

Authorized responses generally include temporarily restraining, transporting, disentangling, tagging, euthanizing, salvaging, data sampling, disposal of, and towing. Sample activities that the Coast Guard assists with tracking include towing floating dead marine protected species, including whales, when requested by NOAA or the U.S. Fish and Wildlife Service. This assistance may include running the Search and Rescue Operations Planning (SAROPS) program to conduct drift analyses to determine potential drift patterns of dead marine protected species and deploying a Self-Locating Datum Marking Buoy (SLDMB) to determine the on-scene surface current to assist in the re-location of a floating dead whale.

The Coast Guard plans to continue to support and fund the enforcement and protection efforts to ensure protection of all living marine resources subject to the jurisdiction of the U.S. and international agreements.

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