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

TABLE OF CONTENTS

List of Figures

List of Tables

2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

The United States (U.S.) Department of the Navy (Navy) proposes to conduct military readiness training activities, and research, development, testing, and evaluation (hereinafter referred to as "testing") activities in the Atlantic Fleet Training and Testing (AFTT) Study Area, as represented in Figure 2.1-1. These military readiness activities include the use of active sonar and explosives within existing range complexes and testing ranges and additional areas located in the Atlantic Ocean along the eastern coast of North America, in portions of the Caribbean Sea and the Gulf of Mexico, at Navy pierside locations, within port transit channels, near civilian ports, and in bays, harbors, and inland waterways (e.g., lower Chesapeake Bay). These military readiness activities are generally consistent with those analyzed in the AFTT Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) completed in August 2013 and are representative of training and testing that the Navy has been conducting in the AFTT Study Area for decades.

In this chapter, the Navy builds upon the purpose and need to train and test by describing the Study Area and identifying the primary mission areas under which these military readiness activities are conducted. Each warfare community, e.g., aviation, surface, submarine, expeditionary, conducts activities that contribute to the success of a primary mission area (described in Section 2.2, Primary Mission Areas). Each primary mission area requires unique skills, sensors, weapons, and technologies to accomplish the mission. For example, under the anti-submarine warfare primary mission area, surface, submarine, and aviation warfare communities each utilize different skills, sensors, and weapons to locate, track, and eliminate submarine threats. The testing community contributes to the success of anti-submarine warfare by anticipating and identifying technologies and systems that respond to the needs of the warfare communities. As each warfare community develops its basic skills and integrates them into combined units and strike groups, the problems of communication, coordination and planning, movement, and positioning of naval forces and targeting/delivery of weapons become increasingly complex. This complexity creates a need for coordinated training and testing between the fleets and systems commands.

This chapter describes the training and testing activities, which compose the Proposed Action, necessary to meet military readiness requirements. These activities are then analyzed for their potential effects on the environment in the following chapters of this EIS/OEIS. For further details regarding specific training and testing activities, please see Appendix A (Navy Activity Descriptions). In accordance with the Marine Mammal Protection Act (MMPA), the Navy plans to submit to the National Marine Fisheries Service (NMFS) an application requesting authorization for the take of marine mammals incidental to training and testing activities described in this EIS/OEIS. NMFS' proposed action will be a direct outcome of responding to the Navy's request for an incidental take authorization pursuant to the MMPA.

2.1 DESCRIPTION OF THE ATLANTIC FLEET TRAINING AND TESTING STUDY AREA

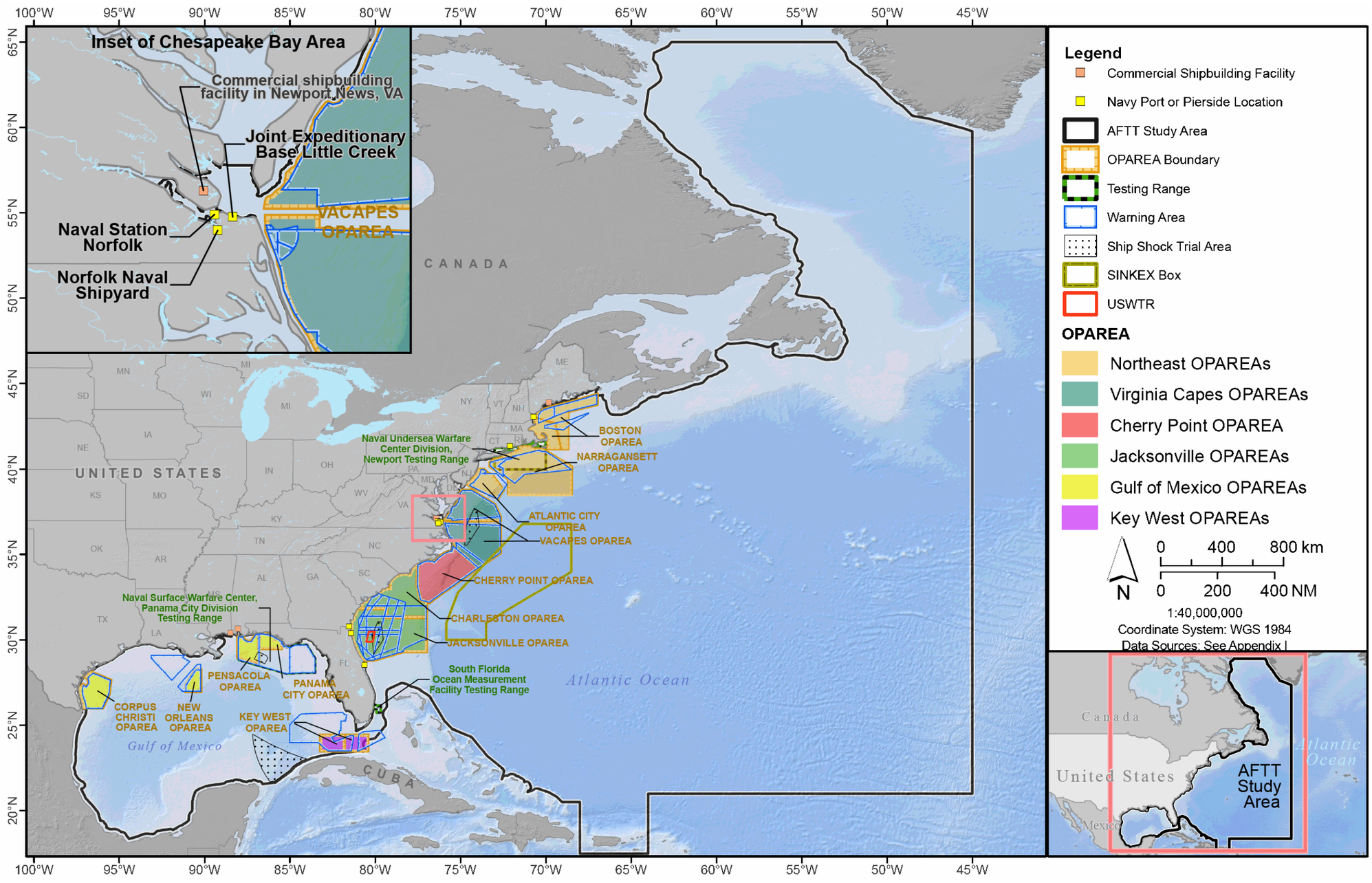
The AFTT EIS/OEIS Study Area includes areas of the western Atlantic Ocean along the east coast of North America, portions of the Caribbean Sea, and the Gulf of Mexico. The Study Area begins at the mean high tide line along the U.S. coast and extends east to the 45-degree west longitude line, north to the 65 degree north latitude line, and south to approximately the 20-degree north latitude line. The Study Area also includes Navy pierside locations and port transit channels, bays, harbors, and inland waterways, and civilian ports where training and testing occurs (Section 2.1.10, Inshore Locations). The Study Area generally follows the Commander Task Force 80 area of operations, covering approximately

2.6 million square nautical miles (NM^2) of ocean area, and includes designated Navy range complexes and associated operating areas (OPAREAs) and special use airspace. While the AFTT Study Area itself is very large, it is important to note that the vast majority of Navy training and testing occurs in designated range complexes and testing ranges, as explained in Section 1.4 (Purpose of and Need for Proposed Military Readiness Training and Testing Activities).

A Navy range complex consists of geographic areas that encompasses a water component (above and below the surface) and airspace, and may encompass a land component where training and testing of military platforms, tactics, munitions, explosives, and electronic warfare systems occur. Range complexes include established operating areas and special use airspace, which may be further divided to provide better control of the area for safety reasons. The terms used to describe the components of the range complexes are described below:

- **Airspace**
    - **Special Use Airspace**. Airspace of defined dimensions where activities must be confined because of their nature or where limitations may be imposed upon aircraft operations that are not part of those activities (Federal Aviation Administration Order 7400.8). Types of special use airspace most commonly found in range complexes include the following:
        - **Restricted Areas**. Airspace where aircraft are subject to restriction due to the existence of unusual, often invisible hazards (e.g., release of ordnance) to aircraft. Some areas are under strict control of the Department of Defense (DoD) and some are shared with non-military agencies.
        - **Warning Areas**. Areas of defined dimensions, extending from 3 nautical miles (NM) outward from the coast of the United States, which serve to warn non-participating aircraft of potential danger.
        - **Air Traffic Control Assigned Airspace**. Airspace of defined vertical/lateral limits, assigned by Air Traffic Control, for the purpose of providing air traffic segregation between the specified activity being conducted within the assigned airspace and other instrument flight rules traffic.
- **Sea and Undersea Space**
    - **Operating Areas**. An ocean area defined by geographic coordinates with defined surface and subsurface areas and associated special use airspace. OPAREAs include the following:
        - **Restricted Areas**. A restricted area is a defined water area for the purpose of prohibiting or limiting public access to the area. Restricted areas generally provide security for government property and also provide protection to the public from the risks of damage or injury arising from the government's use of that area (Title 33 Code of Federal Regulations [CFR] part 334).

The Study Area includes only the in-water components of the range complexes and testing ranges; 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 also includes various bays, harbors, inland waterways, and pierside locations, which are within the boundaries of the range complexes, but are detailed separately in Section 2.1.10 (Inshore Locations).



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

Figure 2.1-1: Atlantic Fleet Training and Testing Study Area

This page intentionally left blank.

The Study Area is depicted in Figure 2.1-1. Regional maps contained in Figure 2.1-2 through Figure 2.1-4 are provided for additional detail of the range complexes and testing ranges. The range complexes and testing ranges are described in the following sections.

2.1.1 NORTHEAST RANGE COMPLEXES

The Northeast Range Complexes include the Boston Range Complex, Narragansett Bay Range Complex, and Atlantic City Range Complex (Figure 2.1-2). These range complexes span 761 miles (mi.) along the coast from Maine to New Jersey. The Northeast Range Complexes include special use airspace with associated warning areas and surface and subsurface sea space of the Boston OPAREA, Narragansett Bay OPAREA, and Atlantic City OPAREA.

2.1.1.1 Airspace

The Northeast Range Complexes include over 25,000 NM^2 of special use airspace. The altitude at which aircraft may fly varies from just above the surface to 60,000 feet (ft.), except for one specific warning area (W-107A) in the Atlantic City Range Complex, which is 18,000 ft. to unlimited altitudes. Six warning areas are located within the Northeast Range Complexes.

2.1.1.2 Sea and Undersea Space

The Northeast Range Complexes include three OPAREAs—Boston, Narragansett Bay, and Atlantic City. These OPAREAs encompass over 45,000 NM^2 of sea space and undersea space. The Boston, Narragansett Bay, and Atlantic City OPAREAs are offshore of the states of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, and New Jersey. The OPAREAs of the three complexes are outside 3 NM but within 200 NM from shore.

2.1.2 NAVAL UNDERSEA WARFARE CENTER DIVISION, NEWPORT TESTING RANGE

The 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 (Figure 2.1-2).

2.1.2.1 Airspace

A portion of Naval Undersea Warfare Center Division, Newport Testing Range is under restricted area R-4105A, known as No Man's Land Island. A minimal amount of testing occurs in the airspace within Naval Undersea Warfare Center Division, Newport Testing Range.

2.1.2.2 Sea and Undersea Space

Three restricted areas are located within the Naval Undersea Warfare Center Division, Newport Testing Range:

- Coddington Cove Restricted Area (0.5 NM^2 adjacent to Naval Undersea Warfare Center Division, Newport)
- Narragansett Bay Restricted Area (6.1 NM^2 area surrounding Gould Island), including the Hole Test Area and the North Test Range
- Rhode Island Sound Restricted Area, a rectangular box (27.2 NM^2) located in Rhode Island and Block Island Sounds

2.1.3 VIRGINIA CAPES RANGE COMPLEX

The Virginia Capes Range Complex spans 270 mi. along the coast from Delaware to North Carolina from the shoreline to 155 NM seaward (Figure 2.1-2). The Virginia Capes Range Complex includes special use airspace with associated warning and restricted areas, and surface and subsurface sea space of the Virginia Capes OPAREA. The Virginia Capes Range Complex also includes established mine warfare training areas located within the lower Chesapeake Bay and off the coast of Virginia.

2.1.3.1 Airspace

The Virginia Capes Range Complex includes over 28,000 NM^2 of special use airspace. Flight altitudes range from surface to ceilings of 18,000 ft. to unlimited altitudes. Five warning areas are located within the Virginia Capes Range Complex. Restricted airspace extends from the shoreline to approximately the 3 NM state territorial sea limit within the Virginia Capes Range Complex and is designated as R-6606.

2.1.3.2 Sea and Undersea Space

The Virginia Capes Range Complex shore boundary roughly follows the shoreline from Delaware to North Carolina; the seaward boundary extends 155 NM into the Atlantic Ocean proximate to Norfolk, Virginia. The Virginia Capes OPAREA encompasses over 27,000 NM^2 of sea space and undersea space. The Virginia Capes OPAREA is offshore of the states of Delaware, Maryland, Virginia, and North Carolina.

2.1.4 NAVY CHERRY POINT RANGE COMPLEX

The Navy Cherry Point Range Complex, off the coast of North Carolina and South Carolina, encompasses the sea space from the shoreline to 120 NM seaward. The Navy Cherry Point Range Complex includes special use airspace with associated warning areas and surface and subsurface sea space of the Cherry Point OPAREA (Figure 2.1-3). The Navy Cherry Point Range Complex is adjacent to the U.S. Marine Corps Cherry Point and Camp Lejeune Range Complexes associated with Marine Corps Air Station Cherry Point and Marine Corps Base Camp Lejeune.

2.1.4.1 Airspace

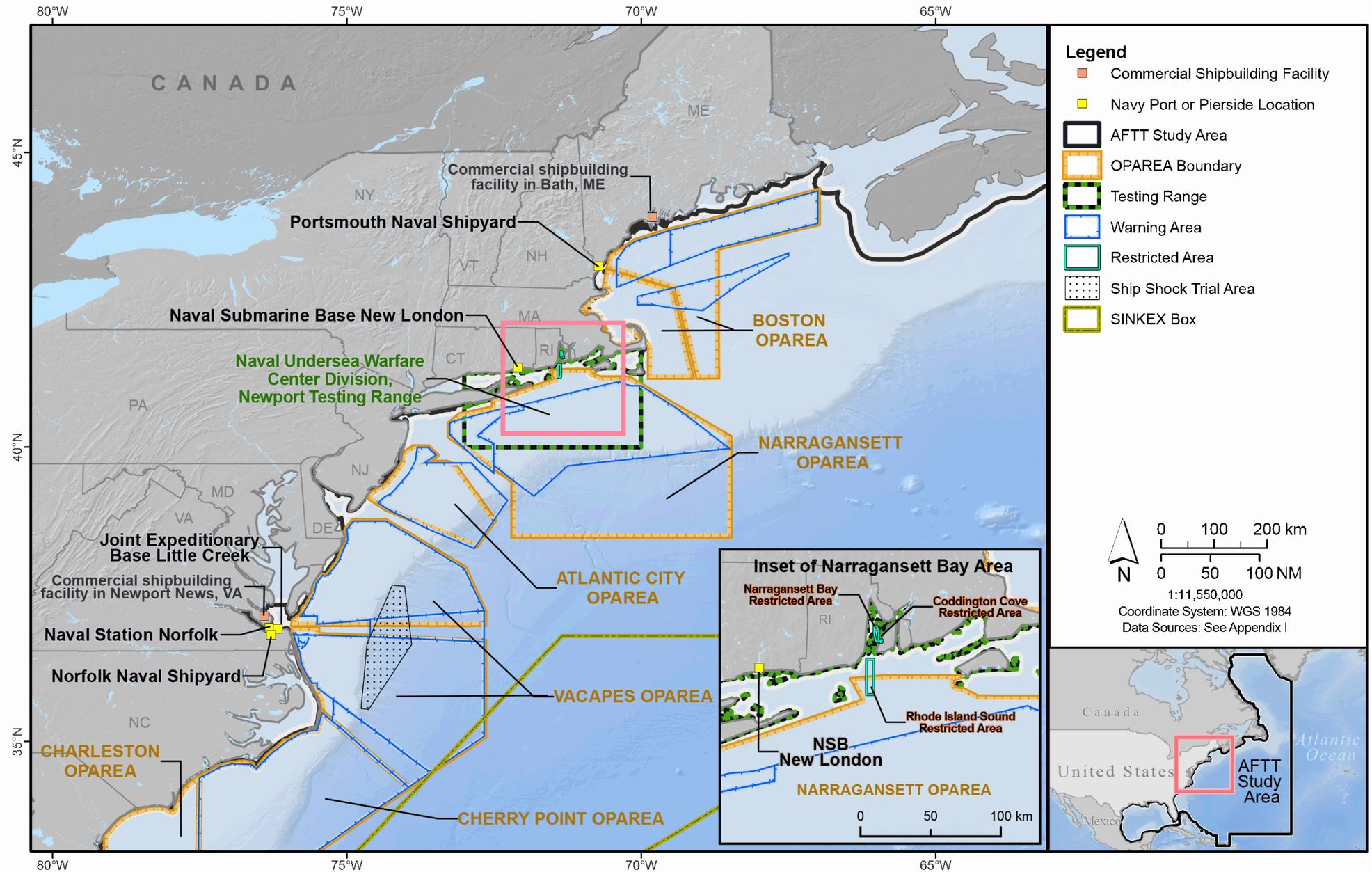
The Navy Cherry Point Range Complex includes over 18,000 NM^2 of special use airspace. The airspace varies from the surface to unlimited altitudes. A single warning area is located within the Navy Cherry Point Range Complex.

2.1.4.2 Sea and Undersea Space

The Navy Cherry Point Range Complex is roughly aligned with the shoreline and extends out 120 NM into the Atlantic Ocean. The Navy Cherry Point OPAREA encompasses over 18,000 NM^2 of sea space and undersea space.

2.1.5 JACKSONVILLE RANGE COMPLEX

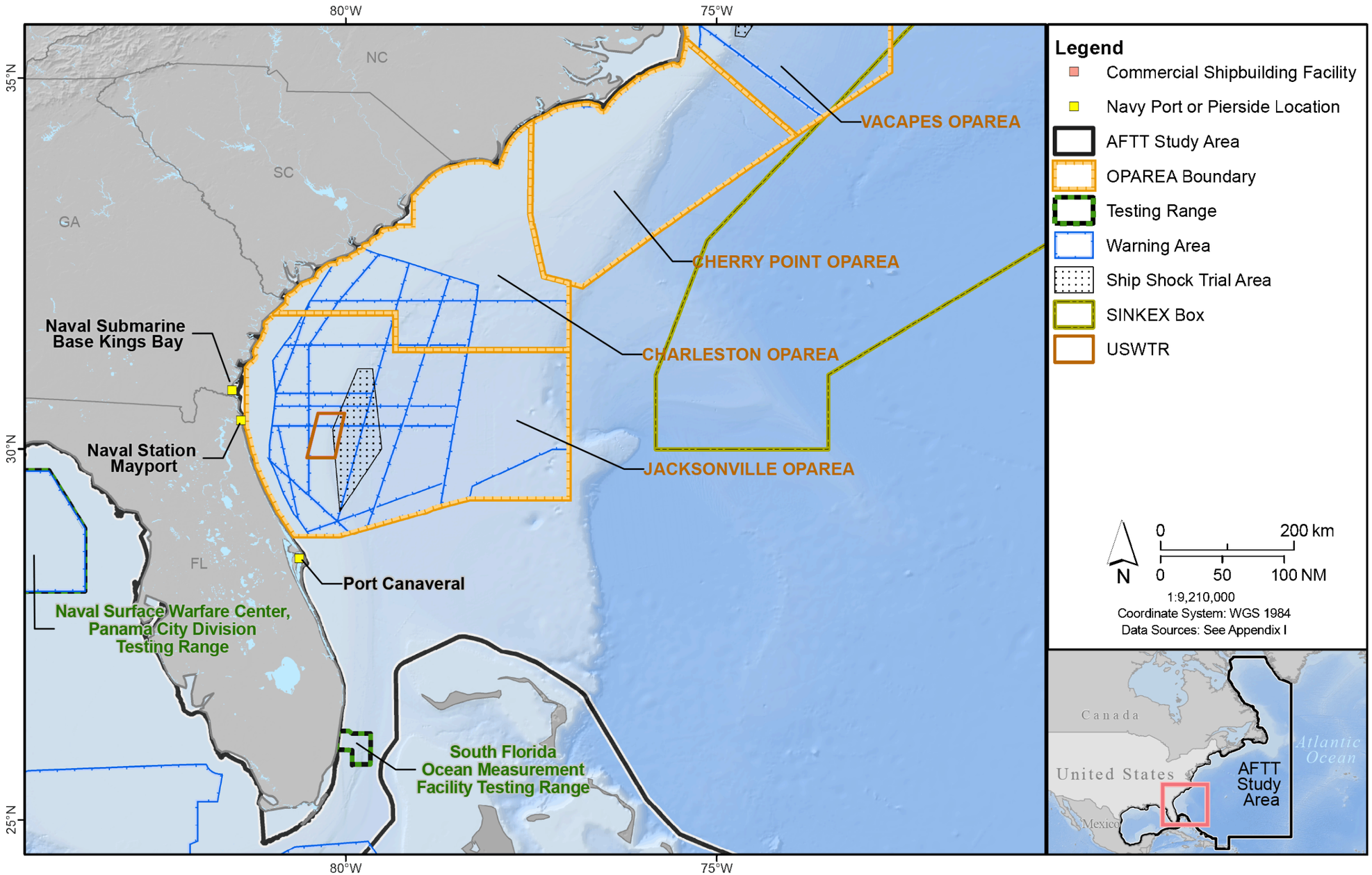
The Jacksonville Range Complex spans 520 mi. along the coast from North Carolina to Florida from the shoreline to 250 NM seaward. The Jacksonville Range Complex includes special use airspace with associated warning areas and surface and subsurface sea space of the Charleston and Jacksonville OPAREAs. The Undersea Warfare Training Range is located within the Jacksonville Range Complex (Figure 2.1-3).



Notes: AFTT: Atlantic Fleet Training and Testing; OPAREA: Operating Area; VACAPES: Virginia Capes; NSB: Naval Submarine Base

Figure 2.1-2: Study Area, Mid-Atlantic Region

This page intentionally left blank.



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

Figure 2.1-3: Study Area, Southeast Region

This page intentionally left blank.

2.1.5.1 Airspace

The Jacksonville Range Complex includes approximately 40,000 NM^2 of special use airspace. Flight altitudes range from the surface to unlimited altitudes. Nine warning areas are located within the Jacksonville Range Complex.

2.1.5.2 Sea and Undersea Space

The Jacksonville Range Complex shore boundary roughly follows the shoreline and extends out 250 NM into the Atlantic Ocean proximate to Jacksonville, Florida. The Jacksonville Range Complex includes two OPAREAs: Charleston and Jacksonville. Combined, these OPAREAs encompass over 50,000 NM^2 of sea space and undersea space. The Charleston and Jacksonville OPAREAs are offshore of the states of North Carolina, South Carolina, Georgia, and Florida. The Undersea Warfare Training Range is located within the Jacksonville Range Complex.

2.1.6 Naval Surface Warfare Center Carderock Division, South Florida Ocean Measurement Facility Testing Range

The Naval Surface Warfare Center Carderock Division operates the South Florida Ocean Measurement Facility Testing Range, an offshore testing area in support of various Navy and non-Navy programs. The South Florida Ocean Measurement Facility Testing Range is located adjacent to the Port Everglades entrance channel in Fort Lauderdale, Florida (Figure 2.1-3). The test area at the South Florida Ocean Measurement Facility Testing Range includes an extensive cable field located within a restricted anchorage area and two designated submarine OPAREAs.

2.1.6.1 Airspace

The South Florida Ocean Measurement Facility Testing Range does not have associated special use airspace. The airspace adjacent to the South Florida Ocean Measurement Facility Testing Range is managed by the Fort Lauderdale International Airport. Air operations at the South Florida Ocean Measurement Facility Testing Range are coordinated with Fort Lauderdale International Airport by the air units involved in the testing events.

2.1.6.2 Sea and Undersea Space

The South Florida Ocean Measurement Facility Testing Range is divided into four subareas:

- The Port Everglades Shallow Submarine OPAREA is a 120-NM^2 area that encompasses nearshore waters from the shoreline to 900 ft. deep and 8 NM offshore.
- The Training Minefield is a 41-NM^2 area used for special purpose surface ship and submarine operations where the test vessels are restricted from maneuvering and require additional protection. This Training Minefield encompasses waters from 60 to 600 ft. deep and from 1 to 3 NM offshore.
- The Port Everglades Deep Submarine OPAREA is a 335-NM^2 area that encompasses the offshore range from 900 to 2,500 ft. in depth and from 9 to 25 NM offshore.
- The Port Everglades Restricted Anchorage Area is an 11-NM^2 restricted anchorage area ranging in depths from 60 to 600 ft. where the majority of the South Florida Ocean Measurement Facility Testing Range cables run from offshore sensors to the shore facility and where several permanent measurement arrays are used for vessel signature acquisition.

2.1.7 KEY WEST RANGE COMPLEX

The Key West Range Complex lies off the southwestern coast of mainland Florida and along the southern Florida Keys, extending seaward into the Gulf of Mexico 150 NM and south into the Straits of Florida 60 NM. The Key West Range Complex includes special use airspace with associated warning areas and surface and subsurface sea space of the Key West OPAREA (Figure 2.1-4).

2.1.7.1 Airspace

The Key West Range Complex includes over 20,000 NM^2 of special use airspace. Flight altitudes range from the surface to unlimited altitudes. Eight warning areas, Bonefish Air Traffic Control Assigned Airspace, and Tortugas Military OPAREA are located within the Key West Range Complex.

2.1.7.2 Sea and Undersea Space

The Key West OPAREA is over 8,000 NM^2 of sea space and undersea space south of Key West, Florida.

2.1.8 NAVAL SURFACE WARFARE CENTER, PANAMA CITY DIVISION TESTING RANGE

The Naval Surface Warfare Center, Panama City Division Testing Range is located off the panhandle of Florida and Alabama, extending from the shoreline to 120 NM seaward, and includes St. Andrew Bay. Naval Surface Warfare Center, Panama City Division Testing Range also includes special use airspace and offshore surface and subsurface waters of offshore OPAREAs (Figure 2.1-4).

2.1.8.1 Airspace

Special use airspace associated with Naval Surface Warfare Center, Panama City Division Testing Range includes three warning areas.

2.1.8.2 Sea and Undersea Space

The Naval Surface Warfare Center, Panama City Division Testing Range includes the waters of St. Andrew Bay and the sea space within the Gulf of Mexico from the mean high tide line to 120 NM offshore. The Panama City OPAREA covers just over 3,000 NM^2 of sea space and lies off the coast of the Florida panhandle. The Pensacola OPAREA lies off the coast of Alabama and Florida west of the Panama City OPAREA and totals just under 5,000 NM^2.

2.1.9 GULF OF MEXICO RANGE COMPLEX

Unlike most of the range complexes previously described, the Gulf of Mexico Range Complex includes geographically separated areas throughout the Gulf of Mexico. The Gulf of Mexico Range Complex includes special use airspace with associated warning areas and restricted airspace and surface and subsurface sea space of the Panama City, Pensacola, New Orleans, and Corpus Christi OPAREAs (Figure 2.1-4).

2.1.9.1 Airspace

The Gulf of Mexico Range Complex includes approximately 20,000 NM^2 of special use airspace. Flight altitudes range from the surface to unlimited altitudes. Six warning areas are located within the Gulf of Mexico Range Complex. Restricted airspace associated with the Pensacola OPAREA, designated R-2908, extends from the shoreline to approximately 3 NM offshore.

2.1.9.2 Sea and Undersea Space

The Gulf of Mexico Range Complex encompasses approximately 17,000 NM^2 of sea and undersea space and includes 285 NM of coastline. The OPAREAs span from the eastern shores of Texas to the western panhandle of Florida. They are described as follows:

- Panama City OPAREA lies off the coast of the Florida panhandle and totals approximately 3,000 NM^2.
- Pensacola OPAREA lies off the coast of Florida west of the Panama City OPAREA and totals approximately 4,900 NM^2.
- New Orleans OPAREA lies off the coast of Louisiana and totals approximately 2,600 NM^2.
- Corpus Christi OPAREA lies off the coast of Texas and totals approximately 6,900 NM^2.

2.1.10 INSHORE LOCATIONS

Although within the boundaries of the range complexes detailed in Section 2.1.1 (Northeast Range Complex) through Section 2.1.9 (Gulf of Mexico Range Complex), various inshore locations, including piers, bays, and civilian ports, are identified in Appendix A (Navy Activity Descriptions) for various activities (Figure 2.1-5).

2.1.10.1 Pierside Locations

For purposes of this EIS/OEIS, pierside locations include channels and transit routes in ports and facilities associated with the following Navy ports and naval shipyards:

- Portsmouth Naval Shipyard, Kittery, Maine
- Naval Submarine Base New London, Groton, Connecticut
- Naval Station Norfolk, Norfolk, Virginia
- Joint Expeditionary Base Little Creek-Fort Story, Virginia Beach, Virginia
- Norfolk Naval Shipyard, Portsmouth, Virginia
- Naval Submarine Base Kings Bay, Kings Bay, Georgia
- Naval Station Mayport, Jacksonville, Florida
- Port Canaveral, Cape Canaveral, Florida

Navy-contractor shipyards in the following cities are also in the Study Area:

- Bath, Maine
- Groton, Connecticut
- Newport News, Virginia
- Mobile, Alabama
- Pascagoula, Mississippi

2.1.10.2 Bays, Harbors, and Inland Waterways

Inland waterways used for training and testing activities include:

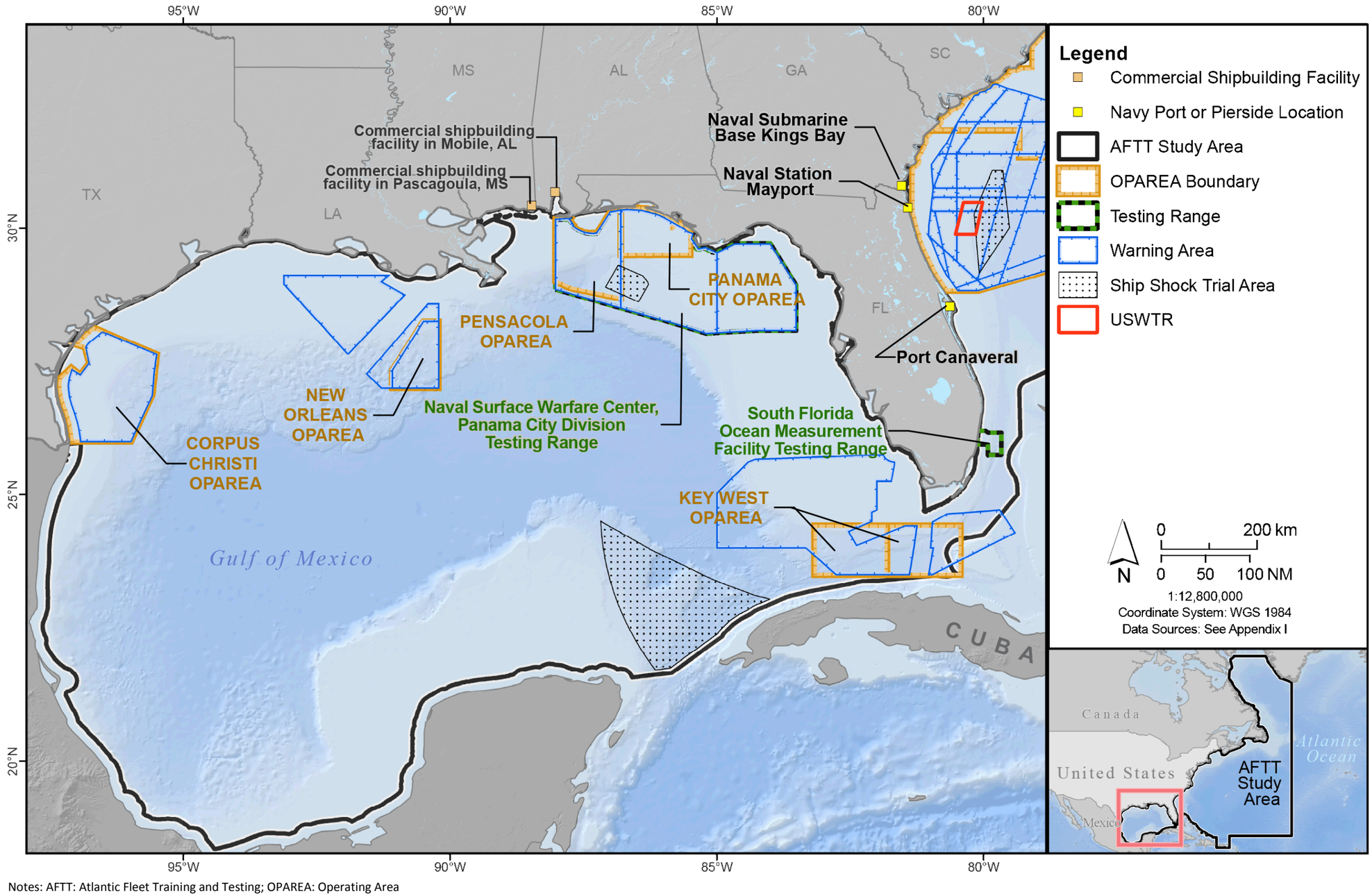
- Narragansett Bay Range Complex/Naval Undersea Warfare Center Division, Newport Testing Range: Thames River, Narragansett Bay
- Virginia Capes Range Complex: James River and tributaries, Broad Bay, York River
- Jacksonville Range Complex: southeast Kings Bay, Cooper River, St. Johns River
- Gulf of Mexico Range Complex/Naval Surface Warfare Center, Panama City Division: St. Andrew Bay

2.1.10.3 Civilian Ports

Civilian ports included for civilian port defense training events are listed in Section A.2.7.3 of Appendix A (Navy Activity Descriptions) and include:

- Boston, Massachusetts
- Earle, New Jersey
- Kings Bay, Georgia
- Mayport, Florida
- Savannah, Georgia

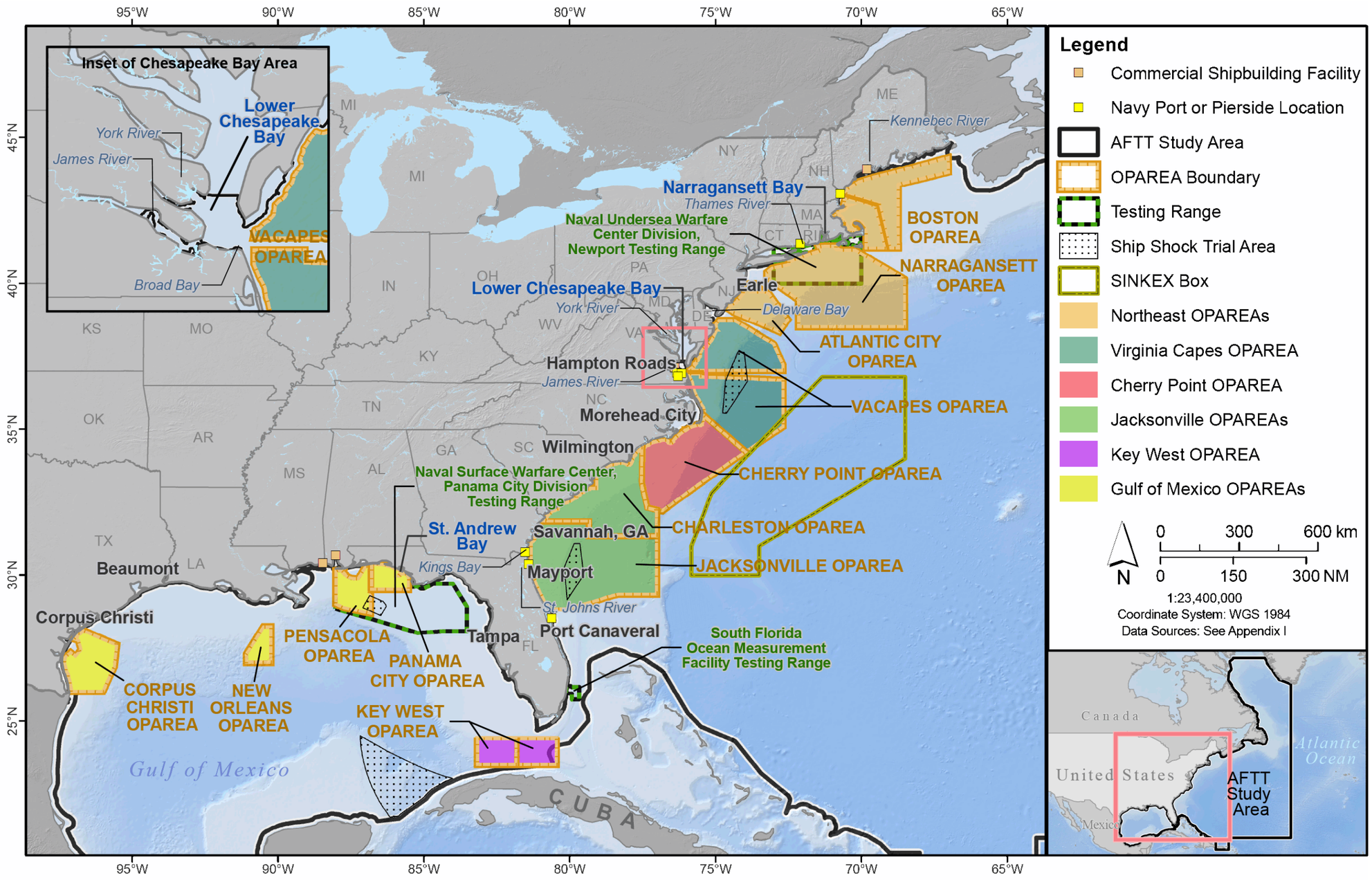
- Delaware Bay, Delaware
- Hampton Roads, Virginia
- Morehead City, North Carolina
- Wilmington, North Carolina
- Port Canaveral, Florida
- Tampa, Florida
- Beaumont, Texas
- Corpus Christi, Texas



Notes: AFTT: Atlantic Fleet Training and Testing; OPAREA: Operating Area

Figure 2.1-4: Study Area, Gulf of Mexico Region

This page intentionally left blank.



Notes: AFTT: Atlantic Fleet Training and Testing; OPAREA: Operating Area

Figure 2.1-5: Study Area, Inshore Locations

This page intentionally left blank.

2.2 PRIMARY MISSION AREAS

The Navy categorizes its activities into functional warfare areas called primary mission areas. These activities generally fall into the following seven primary mission areas:

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

Most activities addressed in this EIS/OEIS are categorized under one of these primary mission areas; 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, 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. A description of the sonar, munitions, targets, systems and other material used during training and testing activities within these primary mission areas is provided in Appendix A (Navy Activity Descriptions).

2.2.1 AIR WARFARE

The mission of air warfare is to destroy or reduce enemy air and missile threats (including unmanned airborne threats) and serves two purposes: to protect U.S. forces from attacks from the air and to gain air superiority. Air warfare provides U.S. forces with adequate attack warnings, while denying hostile forces the ability to gather intelligence about U.S. forces.

Aircraft conduct air warfare through radar search, detection, identification, and engagement of airborne threats. Surface ships conduct air warfare through an array of modern anti-aircraft weapon systems such as aircraft detecting radar, naval guns linked to radar-directed fire-control systems, surface-to-air missile systems, and radar-controlled cannons for close-in point defense.

Testing of air warfare systems is required to ensure the equipment is fully functional under the conditions in which it will be used. Tests may be conducted on radar and other early warning detection and tracking systems, new guns or gun rounds, and missiles. Testing of these systems may be conducted on new ships and aircraft, and on existing ships and aircraft following maintenance, repair, or modification. For some systems, tests are conducted periodically to assess operability. Additionally, tests may be conducted in support of scientific research to assess new and emerging technologies.

2.2.2 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, and reconnaissance. Large-scale amphibious exercises involve ship-to-shore maneuver, 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 fleet 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.

2.2.3 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.

2.2.4 ELECTRONIC WARFARE

The mission of electronic warfare is to degrade the enemy's ability to use electronic systems, such as communication systems and radar, and to confuse or deny them the ability to defend their forces and assets. Electronic warfare is also used to detect enemy threats and counter their attempts to degrade the electronic capabilities of the Navy.

Typical electronic warfare training activities include threat avoidance, signals analysis for intelligence purposes, and use of airborne and surface electronic jamming devices to defeat tracking and communications systems.

Testing of electronic warfare systems is conducted to improve the capabilities of systems and ensure compatibility with new systems. Testing involves the use of aircraft, surface ships, and submarine crews to evaluate the effectiveness of electronic systems. Similar to training activities, typical electronic warfare testing activities include the use of airborne and surface electronic jamming devices (including testing chaff and flares, see Appendix A, Navy Activity Descriptions, for a description of these devices) to

defeat tracking and communications systems. Chaff tests evaluate newly developed or enhanced chaff, chaff dispensing equipment, or modified aircraft systems' use against chaff deployment. Flare tests evaluate deployment performance and crew competency with newly developed or enhanced flares, flare dispensing equipment, or modified aircraft systems' use against flare deployment.

2.2.5 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, diver propulsion device training and testing, and parachute insertion.

2.2.6 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 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, or aircraft.

Mine warfare neutralization training includes exercises in which ships, aircraft, 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.

Testing and development of mine warfare systems is conducted to improve sonar, laser, and magnetic detectors intended to hunt, locate, and record the positions of mines for avoidance or subsequent neutralization. Mine warfare testing and development falls into two primary categories: mine detection and classification, and mine countermeasure and neutralization. Mine detection and classification testing involves the use of air, surface, and subsurface vessels and uses sonar, including towed and side-scan sonar, and unmanned vehicles to locate and identify objects underwater. Mine detection and classification systems are sometimes used in conjunction with a mine neutralization system. Mine countermeasure and neutralization testing includes the use of air, surface, and subsurface units to evaluate the effectiveness of tracking devices, countermeasure and neutralization systems, and general purpose bombs to neutralize mine threats. Most neutralization tests use mine shapes, or non-explosive practice mines, to evaluate a new or enhanced capability. For example, during a mine neutralization test, a previously located mine is destroyed or rendered nonfunctional using a helicopter or manned/unmanned surface vehicle based system that may involve the deployment of a towed neutralization system.

A small percentage of mine warfare tests require the use of high-explosive mines to evaluate and confirm the ability of the system to neutralize a high-explosive mine under operational conditions. The majority of mine warfare systems are deployed by ships, helicopters, and unmanned vehicles. Tests may also be conducted in support of scientific research to support these new technologies.

2.2.7 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, subsurface, and air 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 fleet training activities.

2.3 PROPOSED ACTIVITIES

The Navy has been conducting military readiness activities in the Study Area for well over a century and with active sonar for over 70 years. The tempo and types of training and testing 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 training and testing activities. This EIS/OEIS (Phase III) reflects the most up to date compilation of training and testing activities deemed necessary to accomplish military readiness requirements. The types and numbers of activities included in the Proposed Action accounts for fluctuations in training and testing in order to meet evolving or emergent military readiness requirements. For the purposes of this EIS/OEIS, the term “ship” is inclusive of surface ships and surfaced submarines. The term “vessel” is inclusive of ships and small boats (e.g., rigid-hull inflatable boats). In the following sections, the proposed training and testing activities are detailed.

2.3.1 PROPOSED TRAINING ACTIVITIES

A major training exercise comprises several “unit level” type exercises conducted by several units operating together while commanded and controlled by a single commander. These exercises typically employ an exercise scenario developed to train and evaluate the strike group in naval tactical tasks. In a major training exercise, 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. In a major training exercise, however, 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 to certify for deployment. These coordinated exercises are conducted under anti-submarine warfare. Three key factors used to identify and group the exercises are the scale of the exercise, duration of the exercise, and amount of hull-mounted sonar hours modeled/used for the exercise.

Table 2.3-1 provides the differences between major ASW training events and smaller integrated/coordinated anti-submarine exercises based on scale, duration, and sonar hours for the purposes of exercise reporting requirements.

The training activities proposed by the Navy are described in Table 2.3-2, which include the activity name and a short description of the activity. Appendix A (Navy Activity Descriptions) has more detailed descriptions of the activities.

Table 2.3-1: Major ASW Training Exercises and Integrated/Coordinated Training

	Exercise Group	*Description*	*Scale*	*Duration*	*Location*	*Exercise Examples*	*Modeled Hull-Mounted Sonar per Exercise*
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	JAX RC Navy Cherry Point RC VACAPES RC	COMPTUEX	>500 hours
	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	JAX RC Navy Cherry Point RC VACAPES RC	FLEETEX/ SUSTEX	100–500 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	JAX RC Navy Cherry Point RC VACAPES RC	SWATT, NUWTAC	50–100 hours
	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	JAX RC Navy Cherry Point RC VACAPES RC	TACDEVEX	Less than 100 hours
	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	JAX RC Navy Cherry Point RC VACAPES RC	ARG/MEU, Group Sail	Less than 50 hours

Notes: ASW: anti-submarine warfare; JAX: Jacksonville; RC: Range Complex; VACAPES: Virginia Capes; COMTUEX: Composite Training Unit Exercise; FLEETEX/SUSTEX: Fleet Exercise/Sustainment Exercise; SWATT: Surface Warfare Advanced Tactical Training Exercise; NUWTAC: Navy Undersea Warfare Training Assessment Course; TACDEVEX: Tactical Development Exercise; ARG/MEU: Amphibious Ready Group/Marine Expeditionary Unit

Table 2.3-2: Proposed Training Activities

Activity Name	*Activity Description*
Major Training Exercises – Large Integrated Anti-Submarine Warfare	
Composite Training Unit Exercise	Aircraft carrier and its associated aircraft integrate with surface and submarine units in a challenging multi-threat operational environment in order to certify them for deployment. Only the anti-submarine warfare portion of a Composite Training Unit Exercises is included in this activity; other training objectives are met via unit level training described in each of the primary mission areas below.
Major Training Exercises – Medium Integrated Anti-Submarine Warfare	
Fleet Exercises/Sustainment Exercise	Aircraft carrier and its associated aircraft integrate with surface and submarine units in a challenging multi-threat operational environment in order to maintain their ability to deploy. Fleet Exercises and Sustainment Exercises are similar to Composite Training Unit Exercises, but are shorter in duration.
Integrated/Coordinated Training – Small Integrated Anti-Submarine Warfare Training	
Naval Undersea Warfare Training Assessment Course	Multiple ships, aircraft, and submarines integrate the use of their sensors to search for, detect, classify, localize, and track a threat submarine in order to launch an exercise torpedo.
Surface Warfare Advanced Tactical Training	Multiple ships and aircraft use sensors, including sonobuoys, to search, detect, and track a threat submarine. Surface Warfare Advanced Tactical Training exercises are not dedicated anti-submarine warfare events and involve multiple warfare areas.
Integrated/Coordinated Training – Medium Coordinated Anti-Submarine Warfare Training	
Anti-Submarine Warfare Tactical Development Exercise	Surface ships, aircraft, and submarines coordinate to search for, detect, and track submarines.
Integrated/Coordinated Training – Small Coordinated Anti-Submarine Warfare Training	
Amphibious Ready Group/Marine Expeditionary Unit Exercise	Navy and Marine Corps forces conduct advanced training at sea in preparation for deployment.
Group Sail	Surface ships and helicopters search for, detect, and track threat submarines. Group Sails are not dedicated anti-submarine warfare events and involve multiple warfare areas; non-anti-submarine warfare training objectives are met via unit level training described in the primary mission areas below.
Air Warfare	
Air Combat Maneuver	Fixed-wing aircrews aggressively maneuver against threat aircraft to gain tactical advantage.
Air Defense Exercises	Aircrews and ship crews conduct defensive measures against threat aircraft or simulated missiles.
Gunnery Exercise Air-to-Air Medium-Caliber	Fixed-wing aircraft fire medium-caliber guns at air targets.
Gunnery Exercise Surface-to-Air Large-Caliber	Surface ship crews fire large-caliber guns at air targets.
Gunnery Exercise Surface-to-Air Medium-Caliber	Surface ship crews fire medium-caliber guns at air targets.
Missile Exercise Air-to-Air	Fixed-wing and helicopter aircrews fire air-to-air missiles at air targets.
Missile Exercise Surface-to-Air	Surface ship crews fire surface-to-air missiles at air targets.

Table 2.3-2: Proposed Training Activities (continued)

Activity Name	*Activity Description*
Missile Exercise Man-Portable Air Defense System	Personnel employ shoulder-fired surface-to-air missiles at air targets.
Amphibious Warfare	
Amphibious Marine Expeditionary Unit Integration Exercise	Navy and Marine Corps forces conduct integration training at sea in preparation for deployment certification.
Amphibious Assault	Large unit forces move ashore from amphibious ships at sea for the immediate execution of inland objectives.
Amphibious Raid	Small unit forces move from amphibious ships at sea to shore locations for a specific short-term mission. These are quick operations with as few personnel as possible.
Amphibious Vehicle Maneuvers	Personnel operate amphibious vehicles for driver training.
Humanitarian Assistance Operations	Navy and Marine Corps forces evacuate noncombatants from hostile or unsafe areas or provide humanitarian assistance in times of disaster.
Marine Expeditionary Unit Certification Exercise	Amphibious Ready Group exercises are conducted to validate the Marine Expeditionary Unit's readiness for deployment and includes small boat raids; visit, board, search, and seizure training; helicopter and mechanized amphibious raids; and a non-combatant evacuation operations.
Naval Surface Fire Support Exercise – At Sea	Surface ship crews use large-caliber guns to support forces ashore; however, the land target is simulated at sea. Rounds are scored by passive acoustic buoys located at or near the target area.
Naval Surface Fire Support Exercise – Land-Based Target	Surface ship crews fire large-caliber guns at land-based targets to support forces ashore.
Anti-Submarine Warfare	
Anti-Submarine Warfare Torpedo Exercise – Helicopter	Helicopter aircrews search for, track, and detect submarines. Recoverable air launched torpedoes are employed against submarine targets.
Anti-Submarine Warfare Torpedo Exercise – Maritime Patrol Aircraft	Maritime patrol aircraft aircrews search for, track, and detect submarines. Recoverable air launched torpedoes are employed against submarine targets.
Anti-Submarine Warfare Torpedo Exercise – Ship	Surface ship crews search for, track, and detect submarines. Exercise torpedoes are used.
Anti-Submarine Warfare Torpedo Exercise – Submarine	Submarine crews search for, track, and detect submarines. Exercise torpedoes are used.
Anti-Submarine Warfare Tracking Exercise – Helicopter	Helicopter aircrews search for, track, and detect submarines.
Anti-Submarine Warfare Tracking Exercise – Maritime Patrol Aircraft	Maritime patrol aircraft aircrews search for, track, and detect submarines.
Anti-Submarine Warfare Tracking Exercise – Ship	Surface ship crews search for, track, and detect submarines.
Anti-Submarine Warfare Tracking Exercise – Submarine	Submarine crews search for, track, and detect submarines.
Electronic Warfare	
Counter Targeting Chaff Exercise – Aircraft	Fixed-winged aircraft and helicopter aircrews deploy chaff to disrupt threat targeting and missile guidance radars.
Counter Targeting Chaff Exercise – Ship	Surface ship crews deploy chaff to disrupt threat targeting and missile guidance radars.
Counter Targeting Flare Exercise	Fixed-winged aircraft and helicopter aircrews deploy flares to disrupt threat infrared missile guidance systems.

Table 2.3-2: Proposed Training Activities (continued)

Activity Name	*Activity Description*
Electronic Warfare Operations	Aircraft and surface ship crews control the electromagnetic spectrum used by enemy systems to degrade or deny the enemy's ability to take defensive actions.
High-Speed Anti-Radiation Missile Exercise	Aircrews launch a High-Speed Anti-Radiation Missile against threat radar sites.
Expeditionary Warfare	
Dive and Salvage Operations	Navy divers perform dive operations and salvage training.
Maritime Security Operations – Anti-Swimmer Grenades	Small boat crews engage in force protection activities by using anti-swimmer grenades to defend against hostile divers.
Personnel Insertion/Extraction – Air	Personnel are inserted into and extracted from an objective area by airborne platforms.
Personnel Insertion/Extraction – Surface and Subsurface	Personnel are inserted into and extracted from an objective area by small boats or subsurface platforms.
Personnel Insertion/Extraction Training – Swimmer/Diver	Divers and swimmer infiltrate harbors, beaches, or moored vessels and conduct a variety of tasks.
Underwater Construction Team Training	Navy divers conduct underwater repair and construction.
Mine Warfare	
Airborne Mine Countermeasures – Mine Detection	Helicopter aircrews detect mines using towed or laser mine detection systems.
Airborne Mine Countermeasures – Towed Mine Neutralization	Helicopter crews tow systems through the water, which are designed to disable or trigger mines.
Civilian Port Defense – Homeland Security Anti-Terrorism/Force Protection Exercise	Maritime security personnel train to protect civilian ports against enemy efforts to interfere with access to those ports.
Coordinated Unit-Level Helicopter Airborne Mine Countermeasure Exercise	A detachment of helicopter aircrews train as a unit in the use of airborne mine countermeasures, such as towed mine detection and neutralization systems.
Mine Countermeasures – Mine Neutralization – Remotely Operated Vehicles	Ship, small boat, and helicopter crews locate and disable mines using remotely operated underwater vehicles.
Mine Countermeasures – Ship Sonar	Ship crews detect and avoid mines while navigating restricted areas or channels using active sonar.
Mine Laying	Fixed-winged aircraft drop non-explosive mine shapes.
Mine Neutralization – Explosive Ordnance Disposal	Personnel disable threat mines using explosive charges.
Underwater Mine Countermeasures Raise, Tow, Beach, and Exploitation Operations	Personnel locate mines, perform mine neutralization, raise and tow the mines to the beach, and conduct exploitation operations for intelligence gathering.
Surface Warfare	
Bombing Exercise Air-to-Surface	Fixed-wing aircrews deliver bombs against surface targets.
Fast Attack Craft and Fast Inshore Attack Craft Exercise	Navy surface ship and helicopter crews defend against small boat attacks.
Gunnery Exercise Air-to-Surface Medium-Caliber	Fixed-wing and helicopter aircrews fire medium-caliber guns at surface targets.
Gunnery Exercise	Helicopter and tilt-rotor aircrews use small-caliber guns to engage surface

Table 2.3-2: Proposed Training Activities (continued)

Activity Name	*Activity Description*
Air-to-Surface Small-Caliber	targets.
Gunnery Exercise Surface-to-Surface Boat Medium-Caliber	Small boat crews fire medium-caliber guns at surface targets.
Gunnery Exercise Surface-to-Surface Boat Small-Caliber	Small boat crews fire small-caliber guns at surface targets.
Gunnery Exercise Surface-to-Surface Ship Large-Caliber	Surface ship crews fire large-caliber guns at surface targets.
Gunnery Exercise Surface-to-Surface Ship Medium-Caliber	Surface ship crews fire medium-caliber guns at surface targets.
Gunnery Exercise Surface-to-Surface Ship Small-Caliber	Surface ship crews fire small-caliber guns at surface targets.
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.
Laser Targeting – Aircraft	Fixed-wing and helicopter aircrews illuminate targets with targeting and directed energy lasers.
Laser Targeting – Ship	Surface ship crews illuminate air and surface targets with targeting and directed energy lasers.
Maritime Security Operations	Helicopter, surface ship, and small boat crews conduct a suite of maritime security operations.
Missile Exercise Air-to-Surface	Fixed-wing and helicopter aircrews fire air-to-surface missiles at surface targets.
Missile Exercise Air-to-Surface Rocket	Helicopter aircrews fire both precision-guided and unguided rockets at surface targets.
Missile Exercise Surface-to-Surface	Surface ship crews defend against surface threats (ships or small boats) and engage them with missiles.
Sinking Exercise	Aircraft, ship, 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 munitions.
Other Training Activities	
Elevated Causeway System	A temporary pier is constructed off the beach. Supporting pilings are driven into the sand and then later removed.
Precision Anchoring	Anchors are released in designated locations or moored to a buoy.
Search and Rescue	Surface ships, small boats, and helicopter rescue personnel at sea.
Submarine Navigation	Submarine crews operate sonar for navigation and object detection while transiting into and out of port during reduced visibility.
Submarine Sonar Maintenance and Systems Checks	Maintenance of submarine sonar systems is conducted pierside or at sea.
Submarine Under Ice Certification	Submarine crews train to operate under ice. Ice conditions are simulated during training and certification events.
Surface Ship Object Detection	Surface ship crews operate sonar for navigation and object detection while transiting in and out of port during reduced visibility.

Table 2.3-2: Proposed Training Activities (continued)

Activity Name	*Activity Description*
Surface Ship Sonar Maintenance and Systems Checks	Maintenance of surface ship sonar systems is conducted pierside or at sea.
Waterborne Training	Small boat crews conduct a variety of training, including launch and recovery, mooring to buoys, anchoring, and maneuvering. Small boats include rigid hull inflatable boats, and riverine patrol, assault and command boats up to approximately 50 feet in length.

2.3.2 PROPOSED TESTING ACTIVITIES

The Navy's research and acquisition community engages in a broad spectrum of testing activities in support of the fleet. 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 EIS/OEIS are Naval Air Systems Command, Naval Sea Systems Command, and the Office of Naval Research.

The Navy operates 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 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, like this EIS/OEIS.

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.

2.3.2.1 Naval Air Systems Command Testing Activities

Naval Air Systems Command testing activities generally fall in the primary mission areas used by the fleets. Naval Air Systems Command activities include, but are not limited to, the testing of new aircraft platforms (e.g., the F-35 Joint Strike Fighter aircraft), weapons, and systems (e.g., newly developed sonobuoys) that will ultimately be integrated into fleet training activities. In addition to the testing of new platforms, weapons, and systems, Naval Air Systems Command also conducts lot acceptance testing of weapons and systems, such as sonobuoys.

The majority of testing activities conducted by Naval Air Systems Command are similar to fleet training activities, and many platforms and systems currently being tested are already being used by the fleet or will ultimately be integrated into fleet training activities. However, 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. Training with systems and platforms delivered to the fleet within the timeframe of this document are analyzed in the training sections of this EIS/OEIS. Table 2.3-3 addresses Naval Air Systems Command's proposed testing activities.

Table 2.3-3: Naval Air Systems Command's Proposed Testing Activities

Activity Name	*Activity Description*
Air Warfare	
Air Combat Maneuver Test	Aircrews engage in flight maneuvers designed to gain a tactical advantage during combat.
Air Platform Weapons Integration Test	Test performed to quantify the compatibility of weapons with the aircraft from which they would be launched or released. Non-explosive weapons or shapes are used.
Air Platform-Vehicle Test	Test performed to quantify the flying qualities, handling, airworthiness, stability, controllability, and integrity of an air platform or vehicle. No explosive weapons are released during an air platform/vehicle test.
Air-to-Air Weapons System Test	Test to evaluate the effectiveness of air-launched weapons against designated air targets.
Air-to-Air Gunnery Test – Medium-Caliber	Test performed to evaluate the effectiveness of air-to-air guns against designated airborne targets. Fixed-wing aircraft may be used.
Air-to-Air Missile Test	Test performed to evaluate the effectiveness of air-launched missiles against designated airborne targets. Fixed-wing aircraft will be used.
Intelligence, Surveillance, and Reconnaissance Test	Aircrews use all available sensors to collect data on threat vessels.
Anti-Submarine Warfare	
Anti-Submarine Warfare Torpedo Test	This event is similar to the training event torpedo exercise. Test evaluates anti-submarine warfare systems onboard rotary-wing (e.g., helicopter) and fixed-wing aircraft and the ability to search for, detect, classify, localize, track, and attack a submarine or similar target.
Anti-Submarine Warfare Tracking Test – Helicopter	This event is similar to the training event anti-submarine warfare 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 system perform to specifications.
Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft	The test evaluates the sensors and systems used by maritime patrol 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.
Kilo Dip	Functional check of a helicopter deployed dipping sonar system prior to conducting a testing or training event using the dipping sonar system.
Sonobuoy Lot Acceptance Test	Sonobuoys are deployed from surface vessels and aircraft to verify the integrity and performance of a production lot or group of sonobuoys in advance of delivery to the fleet for operational use.
Electronic Warfare	
Chaff Test	This event is similar to the training event chaff exercise. Chaff tests evaluate newly developed or enhanced chaff, chaff dispensing equipment, or modified aircraft systems against chaff deployment. Tests may also train pilots and aircrews in the use of new chaff dispensing equipment. Chaff tests are often conducted with flare tests and air combat maneuver events, as well as other test events, and are not typically conducted as standalone tests.
Electronic Systems Evaluation	Test that evaluates the effectiveness of electronic systems to control,

Table 2.3-3: Naval Air Systems Command's Proposed Testing Activities (continued)

Activity Name	*Activity Description*
	deny, or monitor critical portions of the electromagnetic spectrum. In general, electronic warfare testing will assess the performance of three types of electronic warfare systems: electronic attack, electronic protect, and electronic support.
Flare Test	This event is similar to the training event flare exercise. Flare tests evaluate newly developed or enhanced flares, flare dispensing equipment, or modified aircraft systems against flare deployment. Tests may also train pilots and aircrews in the use of newly developed or modified flare deployment systems. Flare tests are often conducted with chaff tests and air combat maneuver events, as well as other test events, and are not typically conducted as standalone tests.
Mine Warfare	
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.
Airborne Laser Based Mine Detection System Test	An airborne mine hunting test of a laser based mine detection system that is operated from a helicopter and evaluates the system's ability to detect, classify, and fix the location of floating mines and mines moored near the surface. The system uses a low-energy laser to locate mines.
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.
Airborne Sonobuoy Minehunting Test	A mine-hunting system made up of a field of sonobuoys deployed by a helicopter. A field of sonobuoys, using high-frequency sonar, is used to detect and classify bottom and moored mines.
Mine Laying Test	Fixed-wing aircraft evaluate the performance of mine laying equipment and software systems to lay mines. A mine test may also train aircrews in laying mines using new or enhanced mine deployment system.
Surface Warfare	
Air-to-Surface Bombing Test	This event is similar to the training event bombing exercise air-to-surface. Fixed-wing aircraft test the delivery of bombs against surface maritime targets with the goal of evaluating the bomb, the bomb carry and delivery system, and any associated systems that may have been newly developed or enhanced.
Air-to-Surface Gunnery Test	This event is similar to the training event gunnery exercise air-to-surface. Fixed-wing and rotary-wing aircrews evaluate new or enhanced aircraft guns against surface maritime targets to test that the guns, gun ammunition, or associated systems meet required specifications or to train aircrews in the operation of a new or enhanced weapon system.
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 weapon system or as part of another system's integration test.
High-Energy Laser Weapons Test	High-energy laser weapons tests evaluate the specifications, integration, and performance of an aircraft-mounted, approximately 25 kilowatt,

Table 2.3-3: Naval Air Systems Command's Proposed Testing Activities (continued)

Activity Name	*Activity Description*
	high-energy laser used to disable small surface vessels.
Laser Targeting Test	Aircrews illuminate enemy targets with lasers.
Rocket Test	Rocket tests evaluate the integration, accuracy, performance, and safe separation of guided and unguided 2.75-inch rockets fired from a hovering or forward-flying helicopter.
Other Testing Activities	
Acoustic and Oceanographic Research	Active transmissions within the band 10 hertz–100 kilohertz from sources deployed from ships and aircraft.
Air Platform Shipboard Integrate Test	Fixed-wing and rotary-wing aircraft are tested to determine operability from shipboard platforms, performance of shipboard physical operations, and to verify and evaluate communications and tactical data links.
Maritime Security	Maritime patrol aircraft participate in maritime security activities and fleet training events. Aircraft identify, track, and monitor foreign merchant vessels suspected of non-compliance with United Nations-allied sanctions or conflict rules of engagement.
Shipboard Electronic Systems Evaluation	Tests measure ship antenna radiation patterns and test communication systems with a variety of aircraft.
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.

2.3.2.2 Naval Sea Systems Command Testing Activities

Naval Sea Systems Command activities are generally aligned with the primary missions areas used by the fleets. Additional activities include, but are not limited to, vessel evaluation, unmanned systems, and other testing activities. In this EIS/OEIS, pierside testing at Navy and contractor shipyards consists only of system testing.

Testing activities are conducted throughout the life of a Navy ship, from construction through deactivation from the fleet, to verification of performance and mission capabilities. 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 performs at sea (sea trials); development and operational test and evaluation programs for new technologies and systems; and testing on all ships and systems that have undergone overhaul or maintenance.

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. Table 2.3-4 describes Naval Sea Systems Command's proposed testing activities.

Table 2.3-4: Naval Sea Systems Command's Proposed Testing Activities

Activity Name	*Activity Description*
Anti-Submarine Warfare	
Anti-Submarine Warfare Mission Package Testing	Ships and their supporting platforms (e.g., helicopters, unmanned aerial systems) detect, localize, and attack submarines.
At-Sea Sonar Testing	At-sea testing to ensure systems are fully functional in an open ocean environment.
Countermeasure Testing	Countermeasure testing involves the testing of systems that will detect, localize, track, and attack incoming weapons including marine vessel targets. Testing includes surface ship torpedo defense systems and marine vessel stopping payloads.
Pierside Sonar Testing	Pierside testing to ensure systems are fully functional in a controlled pierside environment prior to at-sea test activities.
Submarine Sonar Testing/ Maintenance	Pierside testing of submarine systems occurs periodically following major maintenance periods and for routine maintenance.
Surface Ship Sonar Testing/ Maintenance	Pierside and at-sea testing of ship systems occur periodically following major maintenance periods and for routine maintenance.
Torpedo (Explosive) Testing	Air, surface, or submarine crews employ explosive and non-explosive torpedoes against artificial targets.
Torpedo (Non-Explosive) Testing	Air, surface, or submarine crews employ non-explosive torpedoes against submarines or surface vessels. When performed on a testing range, these torpedoes may be launched from a range craft or fixed structures and may use artificial targets.
Electronic Warfare	
Radar and Other System Testing	Test may include radiation of military or commercial radar communication systems (or simulators), or high-energy lasers. Testing may occur aboard a ship against drones, small boats, rockets, missiles, or other targets.
Mine Warfare	
Mine Countermeasure and Neutralization Testing	Air, surface, and subsurface vessels neutralize threat mines and mine-like objects.
Mine Countermeasure Mission Package Testing	Vessels and associated aircraft conduct mine countermeasure operations.
Mine Detection and Classification Testing	Air, surface, and subsurface vessels and systems detect, classify, and avoid mines and mine-like objects. Vessels also assess their potential susceptibility to mines and mine-like objects.
Surface Warfare	
Gun Testing – Large-Caliber	Crews defend against targets with large-caliber guns.
Gun Testing – Medium-Caliber	Airborne and surface crews defend against targets with medium-caliber guns.
Gun Testing – Small-Caliber	Airborne and surface crews defend against targets with small-caliber guns.
Kinetic Energy Weapon Testing	A kinetic energy weapon uses stored energy released in a burst to accelerate a projectile.
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.
Unmanned Systems	
Underwater Search, Deployment, and Recovery	Various underwater, bottom crawling, robotic vehicles are utilized in underwater search, recovery, installation, and scanning activities.
Unmanned Aerial System Testing	Unmanned aerial systems are launched from a platform (e.g., fixed platform or submerged submarine) to test the capability to extend the

Table 2.3-4: Naval Sea Systems Command's Proposed Testing Activities (continued)

Activity Name	*Activity Description*
	surveillance and communications range of unmanned underwater vehicles, manned and unmanned surface vehicles, and submarines.
Unmanned Surface Vehicle System Testing	Testing involves the development or upgrade of unmanned surface vehicles. This may include testing of mine detection capabilities, evaluating the basic functions of individual platforms, or complex events with multiple vehicles.
Unmanned Underwater Vehicle Testing	Testing involves the development 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.
Vessel Evaluation	
Aircraft Carrier Sea Trials – Propulsion Testing	Ship is run at high speeds in various formations (e.g., straight-line and reciprocal paths).
Air Defense Testing	Test the ship's capability to detect, identify, track, and successfully engage live and simulated targets. Gun systems are tested using explosive or non-explosive rounds.
Hydrodynamic and Maneuverability Testing	Submarines maneuver in the submerged operating environment.
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.
Large Ship Shock Trial	Underwater detonations are used to test new ships or major upgrades.
Propulsion Testing	Ship is run at high speeds in various formations (e.g., straight-line and reciprocal paths).
Signature Analysis Operations	Surface ship and submarine testing of electromagnetic, acoustic, optical, and radar signature measurements.
Small Ship Shock Trial	Underwater detonations are used to test new ships or major upgrades.
Submarine Sea Trials – Propulsion Testing	Submarine is run at high speeds in various formations and depths.
Submarine Sea Trials – Weapons System Testing	Submarine weapons and sonar systems are tested at-sea to meet integrated combat system certification requirements.
Surface Warfare Testing	Tests capability 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).
Total Ship Survivability Trials	Series of simulated "realistic" weapon hit scenarios with resulting damage and recoverability exercises against an aircraft carrier.
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 underwater targets.
Vessel Signature Evaluation	Surface ship, submarine, and auxiliary system signature assessments. This may include electronic, radar, acoustic, infrared, and magnetic signatures, refueling capabilities.
Other Testing Activities	
Acoustic Component Testing	Various surface vessels, moored equipment, and materials are tested to evaluate performance in the marine environment.

Table 2.3-4: Naval Sea Systems Command's Proposed Testing Activities (continued)

Activity Name	*Activity Description*
Chemical and Biological Simulant Testing	Chemical-biological agent simulants are deployed against surface ships.
Insertion/Extraction	Testing of submersibles capable of inserting and extracting personnel and payloads into denied areas from strategic distances.
Line Charge Testing	Surface vessels deploy line charges to test the capability to safely clear an area for expeditionary forces.
Non-Acoustic Component Testing	Tests of towed or floating buoys for communications through radio-frequencies or two-way optical communications between an aircraft and underwater system(s).
Payload Deployer Testing	Launcher systems are tested to evaluate performance.
Semi-Stationary Equipment Testing	Semi-stationary equipment (e.g., hydrophones) is deployed to determine functionality.
Towed Equipment Testing	Surface vessels or unmanned surface vehicles deploy and tow equipment to determine functionality of towed systems.

2.3.2.3 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 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 conducted by the Office of Naval Research in the AFTT Study Area includes acoustic and oceanographic research, large displacement unmanned underwater vehicle (innovative naval prototype) research, and emerging mine countermeasure technology research. Table 2.3-5 describes the Office of Naval Research's proposed testing activities.

Table 2.3-5: Office of Naval Research Proposed Testing Activities

Activity Name	*Activity Description*
Acoustic and Oceanographic Science and Technology	
Acoustic and Oceanographic Research	Research using active transmissions from sources deployed from ships and unmanned underwater vehicles. Research sources can be used as proxies for current and future Navy systems.
Emerging Mine Countermeasure Technology Research	Test involves the use of broadband acoustic sources on unmanned underwater vehicles.
Large Displacement Unmanned Underwater Vehicle Testing	Autonomy testing and environmental data collection with Large Displacement Unmanned Underwater Vehicles.

2.3.3 Standard Operating Procedures

For training and testing to be effective, units must be able to safely use their sensors and weapon systems as they are intended to be used in a real-word situation and to their optimum capabilities. While standard operating procedures are designed for the safety of personnel and equipment and to

ensure the success of training and testing activities, their implementation often yields additional benefits on environmental, socioeconomic, public health and safety, and cultural resources.

Navy standard operating procedures have been developed and refined over years of experience and are broadcast via numerous naval instructions and manuals, including, but not limited to:

- ship, submarine, and aircraft safety manuals
- ship, submarine, and aircraft standard operating manuals
- Fleet Area Control and Surveillance Facility range operating instructions
- fleet exercise publications and instructions
- Naval Sea Systems Command test range safety and standard operating instructions
- Navy instrumented range operating procedures
- naval shipyard sea trial agendas
- research, development, test, and evaluation plans
- naval gunfire safety instructions
- Navy planned maintenance system instructions and requirements
- Federal Aviation Administration regulations
- International Regulations for Preventing Collisions at Sea

Because standard operating procedures are essential to safety and mission success, the Navy considers them to be part of the proposed activities under each alternative and has included them in the Chapter 3 (Affected Environment and Environmental Consequences) environmental analysis for each resource. Standard operating procedures that are recognized as providing a potential secondary benefit on environmental, socioeconomic, public health and safety, or cultural resources during training and testing activities are discussed in the sections below. Standard operating procedures (which are implemented regardless of their secondary benefits) are different from mitigation measures (which are designed entirely for the purpose of avoiding potential impacts of the Proposed Action). Information on mitigation measures is provided in Chapter 5 (Mitigation), and activities associated with these mitigation measures are provided in Section 2.3.4 (Mitigation Measures).

2.3.3.1 Sea Space and Airspace Deconfliction

The Navy schedules training and testing activities to minimize sea space and airspace conflicts within ranges and throughout the Study Area and to avoid interaction with established commercial air traffic routes and commercial vessel shipping lanes. Navy events may change mid-stream based on evaluators' assessments of performance and other conditions (such as weather or mechanical issues), which often precludes the use of a permission scheme for access to sea space. The Navy deconflicts the sea space and airspace used during training and testing activities to allow for the necessary separation of multiple Navy units to ensure safety for civilian personnel, commercial aircraft, commercial vessels, Sailors, and Navy assets (and to prevent interference with equipment sensors).

The standard operating procedures for sea space and airspace deconfliction could result in a secondary benefit to socioeconomic resources and public health and safety through a reduction in the potential for interactions with civilians and commercial vessels and aircraft.

2.3.3.2 Vessel Safety

Ships operated by or for the Navy have personnel assigned to stand watch at all times, day and night, when moving through the water (underway). Watch personnel undertake extensive training in accordance with the U.S. Navy Lookout Training Handbook or civilian equivalent. Training includes on-the-job instruction and a formal Personal Qualification Standard program (or equivalent program for supporting contractors or civilians), to certify that they have demonstrated all necessary skills. Skills include detection and reporting of floating or partially submerged objects. Watch personnel include officers, enlisted men and women, and civilians operating in similar capacities. Their duties as watchstanders may be performed in conjunction with other job responsibilities, such as navigating the ship or supervising other personnel. While on watch, personnel employ visual search techniques, including the use of binoculars and scanning techniques in accordance with the U.S. Navy Lookout Training Handbook or civilian equivalent. After sunset and prior to sunrise, watch personnel employ night visual search techniques, which could include the use of night vision devices.

A primary duty of watch personnel is to ensure safety of the ship, and this includes the requirement to detect and report all objects and disturbances sighted in the water that may be indicative of a threat to the ship and its crew, such as debris, a periscope, surfaced submarine, or surface disturbance. Per safety requirements, watch personnel also report any marine mammals sighted that have the potential to be in the direct path of the ship as a standard collision avoidance procedure. Because watch personnel are primarily posted for safety of navigation, range clearance, and man-overboard precautions, they are not normally posted while ships are moored to a pier. When anchored or moored to a buoy, a watch team is still maintained but with fewer personnel than when underway. When moored or at anchor, watch personnel may maintain security and safety of the ship by scanning the water for any indications of a threat (as described above).

Navy vessels operate in accordance with the navigation rules established by the U.S. Coast Guard. All vessels operating on the water are required to follow the International Navigation Rules (Commandant Instruction M16672.2D). Navigation rules are 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. For more information about general vessel operating speeds, see Section 3.0.3.3.4.1 (Vessels and In-Water Devices).

The standard operating procedures for vessel safety could result in a secondary benefit to public health and safety and marine mammals through a reduction in the potential for vessel strike.

2.3.3.3 Aircraft Safety

Pilots of Navy aircraft make every attempt to avoid large flocks of birds to reduce the safety risk involved with a potential bird strike. Since 2011, the Navy has required that all Navy flying units report all bird strikes through the Web-Enabled Safety System Aviation Mishap and Hazard Reporting System.

The standard operating procedures for aircraft safety could result in a secondary benefit to birds through a reduction in the potential for aircraft strike.

2.3.3.4 High-Powered Laser Safety

The Navy operates laser systems approved for fielding by the Laser Safety Review Board or service equivalent. Only properly trained and authorized personnel operate high-powered laser devices in OPAREAs in accordance with authorized standard operating procedures. Prior to commencing activities involving lasers, the operator ensures that the area is clear of unauthorized persons in the laser impact area by performing a search of the area. Ranges where lasers are used are required to have a Laser Range Safety Certification Report that is updated every 3 years.

The standard operating procedures for laser safety could result in a secondary benefit to public health and safety through a reduction in the potential for interaction with lasers.

2.3.3.5 Weapons Firing Safety

A Notice to Mariners is usually issued in advance of gunnery activities, the exception being for small-caliber crew-served weapons training when the immediate area around the ship is cleared visually. A notice is also issued in advance of explosive bombing activities when they are conducted in an area that does not already have a standing Notice to Mariners. More information on Notices to Mariners is found in Section 3.12.2.1.1 (Sea Space).

Most weapons firing activities that involve the use of explosive ordnance are conducted during daylight hours. All missile and rocket firing activities are carefully planned in advance and conducted under strict procedures that place the ultimate responsibility for range safety on the Officer Conducting the Exercise or civilian equivalent. The weapons firing hazard range must be clear of non-participating vessels and aircraft before firing activities will commence. The size of the firing hazard range is based on the farthest firing range capability of the weapon being used. All weapons firing stops when the Range Safety Officer receives a cease fire order or when the line of fire is endangering any object other than the designated target.

Pilots of Navy aircraft are not authorized to expend ordnance, fire missiles, or drop other airborne devices through extensive cloud cover where visual clearance of the air and surface area is not possible. The two exceptions to this requirement are: (1) when operating in the open ocean, clearance of the air and surface through radar surveillance is acceptable and (2) when the Officer Conducting the Exercise or civilian equivalent accepts responsibility for the safeguarding of airborne and surface traffic.

During activities that involve recoverable targets (e.g., aerial drones), the Navy recovers the target and any associated parachutes to the maximum extent practicable consistent with personnel and equipment safety. Recovery of these items helps minimize materials that remain, which could potentially alert enemy forces to the presence of U.S. Navy assets during real world situations.

The standard operating procedures for weapons firing safety could result in a secondary benefit to public health and safety through a reduction in the potential for interaction with weapons firing activities and expended materials. The standard operating procedure for conducting activities in daylight hours and recovering targets and parachutes could result in a secondary benefit to biological resources through a reduction in the potential for impacts from explosives and military expended materials (by increasing the effectiveness of visual observations for mitigation) and physical disturbance and strike stressors.

2.3.3.6 Target Deployment Safety

The deployment of targets is dependent upon environmental conditions. The Beaufort sea state scale is a standardized measurement of the weather conditions, based primarily on wind speed. The scale is divided into levels from 0 to 12, with 12 indicating the most severe weather conditions (e.g., hurricane force winds). At Beaufort sea state number 4, wave heights typically range from 3.5 to 5 ft. Firing exercises involving the integrated maritime portable acoustic scoring and simulation system are typically conducted in daylight hours in Beaufort sea state number 4 conditions or better to ensure safe operating conditions during buoy deployment and recovery.

The standard operating procedures for target deployment safety could result in a secondary benefit to public health and safety, and to marine mammals and sea turtles (by increasing the effectiveness of visual observations for mitigation) through a reduction in the potential for interaction with the weapons firing activities associated with the use of the deployed targets.

2.3.3.7 Swimmer Defense Activity Safety

A Notice to Mariners is issued in advance of all swimmer defense activities. A daily in situ calibration of the sound source levels is used to establish a clearance area to the 145 decibels referenced to 1 micropascal (dB re 1 µPa) sound pressure level threshold for non-participant personnel safety. A hydrophone is used during the calibration sequences in order to confirm the clearance area. Small boats patrol the 145 dB re 1 µPa sound pressure level area during all activities. Boat crews are equipped with binoculars and remain vigilant for non-participant divers and boats, swimmers, snorkelers, and dive flags. If a non-participating swimmer, snorkeler, or diver is observed entering into the area of the swimmer defense system, the power levels of the defense system are reduced. An additional 100-yard buffer is applied to the initial sighting location of the non-participant as an additional precaution, and this buffer area is used to determine if the non-participant is within the 145 dB re 1 µPa zone. If the area cannot be maintained free of non-participating swimmers, snorkelers, and divers, the activity will cease until the non-participant has moved outside the area.

The standard operating procedures for swimmer defense safety could result in a secondary benefit to public health and safety and socioeconomic resources through a reduction in the potential for interaction with swimmer defense activities.

2.3.3.8 Pierside Testing Safety

The *U.S. Navy Dive Manual* (U.S. Department of the Navy, 2011) prescribes safe distances for divers from active sonar sources and underwater explosions. Safety precautions for use of electromagnetic energy are specified in DoD Instruction 6055.11 (U.S. Department of Defense, 2009) and Military Standard 464A (U.S. Department of Defense, 2002). These distances are used as the standard safety buffers for underwater energy to protect Navy divers. If unauthorized personnel were detected within the exercise area, the activity would be temporarily halted until the area was again cleared and secured.

The standard operating procedures in place for sonar use, electromagnetic energy, and underwater explosions around diving activities could result in secondary benefits to public safety by reducing the potential for pierside testing to impact commercial or civilian divers.

2.3.3.9 Underwater Detonation Safety

Underwater detonation training takes place in specially designated areas, and Notice to Mariners are issued when the events are scheduled. These areas are not near popular dive sights; however, if divers are present, the training or testing activity would be postponed or cancelled.

The standard operating procedures for underwater detonation safety could result in a secondary benefit to public health and safety, cultural resources, protected species, and socioeconomic resources through a reduction in the potential for interaction with underwater detonation activities.

2.3.3.10 Sonic Booms

As a general policy, sonic booms shall not be intentionally generated below 30,000 ft. of altitude unless over water and more than 30 mi. from inhabited land areas or islands. Deviations from this policy may be authorized only under one of the following conditions:

- tactical missions
- phases of formal training syllabus flights
- research, test, and operational suitability test flights

The standard operating procedures for sonic booms could result in a secondary benefit to public health and safety through a reduction in the potential for exposure to sonic booms.

2.3.3.11 Unmanned Aerial, Surface, and Subsurface Vehicle Safety

For activities involving unmanned aerial, surface, and subsurface vehicles, the Navy evaluates the need to publish a Notice to Airmen or Mariners based on the scale, location, and timing of the activity. Notices to Mariners or Airmen are issued, when necessary, to inform the public of training and testing activities so that they may stay clear of these areas and safety will be ensured. Unmanned aerial systems are operated in accordance with Federal Aviation Administration air traffic organization policy as specified in Office of the Chief of Naval Operations Instructions 3710, 3750, and 4790.

The standard operating procedures for unmanned aerial, surface, and subsurface vehicle safety could result in a secondary benefit to public health and safety through a reduction in the potential for interaction with these platforms.

2.3.3.12 Towed In-Water Device Safety

Prior to deploying a towed in-water device from a manned platform, the Navy searches the intended path of the device for any floating debris (e.g., driftwood) and other objects (e.g., concentrations of floating vegetation), which have the potential to obstruct or damage the device.

The standard operating procedure for towed in-water device safety could result in a secondary benefit to marine mammals and vegetation through a reduction in the potential for physical disturbance and strike of a towed in-water device.

2.3.3.13 Ship Shock Trial Safety

The Navy may conduct ship shock trials in three distinct areas within the Study Area (Figure 2.3-1). Notices to Mariners and Airmen are issued in advance of all ship shock trial activities to alert the public to stay clear of the area. An area with a 5-NM radius is established around the detonation point to exclude all non-participating vessels and aircraft. This area will be established 5 to 6 hours prior to each detonation and may continue post-detonation for a total of exclusionary time of up to 12 hours. This area is an electronic emissions control zone that virtually eliminates the possibility of an inadvertent detonation caused by a radio or radar-induced electrical current in the explosive firing circuit. This area also provides for safe maneuvering of the explosive-laden operations vessel. Since the ship being tested and the operations vessel are not stationary during the ship shock trial activities, the associated area around the detonation point moves with the vessel. If a non-participating vessel or aircraft is detected

within a 10-NM radius of ship shock trial activities, the non-participant is warned to alter course. This is necessary for operational security and to allow large vessels sufficient time to change course to avoid entering the clearance area. Ship shock trial testing is immediately stopped when a non-participating vessel or aircraft enters or is detected within the 5-NM clearance area. These security measures continue until the area is clear of non-participating vessels and aircraft.

In the unlikely event a charge fails to explode, additional attempts to detonate the charge would be made. If detonation fails, the explosive would be recovered and disarmed. If the explosive cannot be detonated or disarmed, to safeguard human life, the explosive is disposed at sea in accordance with established Ammunition and Explosives Safety Afloat requirements. The location of any disposal is recorded.

The standard operating procedures for ship shock trial safety could result in a secondary benefit to public health and safety through a reduction in the potential for interaction with ship shock trial activities.

2.3.3.14 Pile Driving Safety

Due to pile driving system design and operation, the Navy performs soft starts during impact installation of each pile to ensure proper operation of the diesel impact hammer. During a soft start, an initial set of strikes from the impact hammer at reduced energy are performed before it can be operated at full power and speed. The energy reduction of an individual hammer cannot be quantified because they vary by individual drivers. Also, the number of strikes will vary at reduced energy because raising the hammer at less than full power and then releasing it results in the hammer "bouncing" as it strikes the pile resulting in multiple "strikes."

The standard operating procedures for pile driving safety could result in a secondary benefit to marine mammals, sea turtles, and fish because soft starts may "warn" these resources and cause them to move away from the sound source before impact pile driving increases to full operating capacity.

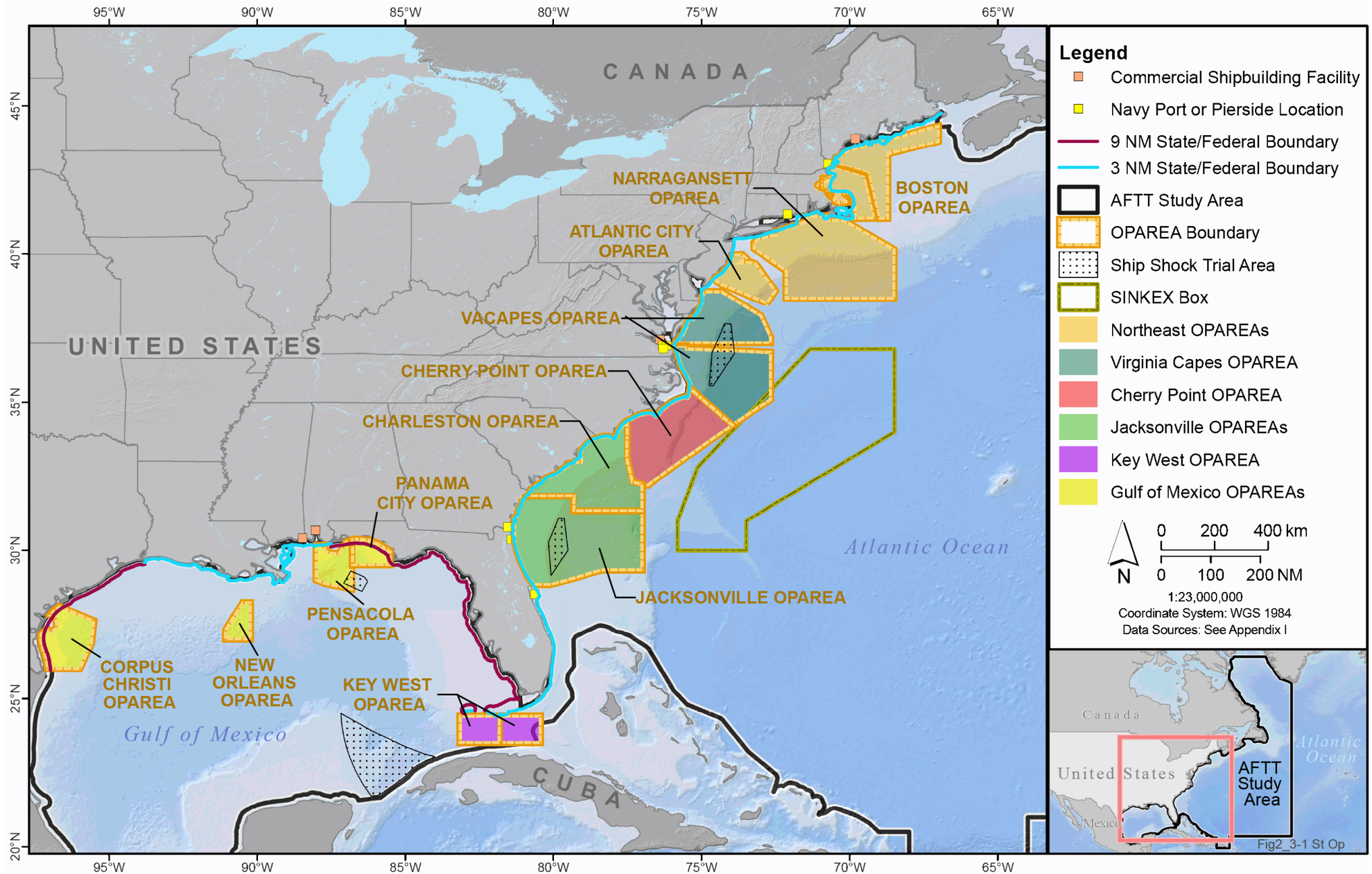
2.3.3.15 Sinking Exercise Safety

The Navy is required to conduct sinking exercises greater than 50 NM from land and in waters at least 6,000 ft. deep (40 CFR section 229.2). Within the Study Area, the Navy conducts sinking exercises only within a designated sinking exercise area (Figure 2.3-1). The Navy selected the sinking exercise area to avoid established commercial air traffic routes, commercial vessel shipping lanes, and areas used for recreational activities, and to allow for the necessary separation of Navy units to ensure safety for civilian personnel, commercial aircraft, commercial vessels, Sailors, and Navy assets.

The standard operating procedures for sinking exercise safety could result in a secondary benefit to public health and safety and socioeconomics through a reduction in the potential for interaction with sinking exercise activities.

2.3.3.16 Coastal Zone

As a matter of practice, the Navy typically does not conduct certain activities in coastal areas due to specific mission requirements. By deciding not to conduct certain activities in these coastal areas, potential impacts can be avoided in those areas. The coastal zone is 3 NM from shore for all states but Texas, the Florida Gulf coast, and Puerto Rico, which have a 9-NM limit. Training and testing activities that typically do not occur in the coastal zone are listed in Table 2.3-6 and Table 2.3-7, respectively.



Notes: AFTT: Atlantic Fleet Training and Testing; OPAREA: Operating Area; SINKEX: Ship Sinking Exercises; VACAPES: Virginia Capes

Figure 2.3-1: Ship Shock Trial and Sinking Exercise Areas with Standard Operating Procedures

This page intentionally left blank.

Table 2.3-6: Training Activities Typically Not Occurring in the Coastal Zone[1]

Air Warfare	*Mine Warfare*
• Air Combat Maneuver • Air Defense Exercise • Gunnery Exercises ○ all Air-to-Air ○ all Surface-to-Air • Missile Exercises ○ Air-to-Air ○ Surface-to-Air	• Mine Detection ○ Mine Countermeasure Exercise – Ship Sonar • Mine Laying ○ Aircraft ○ Submarine launched
Amphibious Warfare	*Surface Warfare*
• Naval Surface Fire Support Exercise-At Sea • Naval Surface Fire Support Exercise-Land Based Target	• Gunnery Exercises ○ All Air-to-Surface ○ All Surface-to-Surface • Missile Exercise ○ Air-to-Surface (Missile and Rocket) ○ Surface-to-Surface • Laser Targeting ○ Aircraft ○ Ship • Integrated Live Fire • Bombing Exercise • Sinking Exercise[2]
Anti-Submarine Warfare	*Major Training Exercise*
• Torpedo Exercise ○ Helicopter ○ Maritime Patrol Aircraft ○ Submarine ○ Ship • Tracking Exercise ○ Helicopter ○ Maritime Patrol Aircraft ○ Submarine ○ Ship	• Composite Training Unit Exercise • Fleet Exercise/Sustainment Exercise
Integrated/Coordinated Anti-Submarine Warfare	*Other Training Activities*
• Anti-Submarine Warfare Tactical Development Exercise • Group Sail • Navy Undersea Warfare Training Assessment Course • Surface Warfare Advanced Tactical Training	• Submarine Navigation • Submarine Under Ice Certification
	Electronic Warfare
	• Counter Targeting ○ Chaff-Aircraft ○ Chaff-Ship ○ Flare-Aircraft

[1] Coastal Zone is 3 nautical miles everywhere in the Study Area with the exceptions of the Gulf coast of Florida, Texas, and Puerto Rico where the coastal zone is 9 nautical miles.

[2] This activity cannot occur in the coastal zone.

Table 2.3-7: Testing Activities Typically Not Occurring in the Coastal Zone[1]

Air Warfare	*Surface Warfare*
• Air Combat Maneuver Test • Air Platform Weapons Integration Test • Air Platform-Vehicle Test • Air-to-Air Weapons System Test ○ Air-to-Air Gunnery Test – Medium-Caliber ○ Air-to-Air Missile Test • Intelligence, Surveillance, and Reconnaissance Test	• Air-to-Surface Bombing Test • Air-to-Surface Gunnery Test • Air-to-Surface Missile Test • High-Energy Laser Weapons Test • Laser Targeting Test • Rocket Test • Gun Testing – Large-Caliber • Gun Testing – Medium-Caliber • Gun Testing – Small-Caliber • Kinetic Energy Weapon Testing • Missile and Rocket Testing
Anti-Submarine Warfare	*Other Testing Activities*
• Anti-Submarine Warfare Torpedo Test • Anti-Submarine Warfare Tracking Test – Helicopter Kilo Dip • Sonobuoy Lot Acceptance Test • Torpedo (Explosive) Testing[2]	• Air Platform Shipboard Integrate Test

Table 2.3-7: Testing Activities Typically Not Occurring in the Coastal Zone (continued)

Air Warfare	*Surface Warfare*
Integrated/Coordinated Anti-Submarine Warfare	• Maritime Security • Shipboard Electronic Systems Evaluation • Acoustic Component Testing • Chemical and Biological Simulant Testing (coastal zone of Maine only) • Hydrodynamic and Maneuverability Testing • Non-Acoustic Component Testing • Signature Analysis Operations • Underwater Search, Deployment, and Recovery • Acoustic and Oceanographic Research • Emerging Mine Countermeasure Technology Research • Large Displacement Unmanned Underwater Vehicle Testing
• At-Sea Sonar Testing • Anti-Submarine Warfare Tactical Development Exercise • Group Sail • Navy Undersea Warfare Training Assessment Course • Surface Warfare Advanced Tactical Training	
Electronic Warfare	
• Chaff Test • Electronic Systems Evaluation • Flare Test	
Mine Warfare	
• Mine Laying Test	
Vessel Evaluation	
• Aircraft Carrier Sea Trials – Propulsion Testing • Air Defense Testing • Propulsion Testing • Surface Warfare Testing • Small Ship Shock Trial[2] • Large Ship Shock Trial[2] • Submarine Sea Trials – Propulsion Testing • Submarine Sea Trials – Weapons System Testing • Total Ship Survivability Trials	

[1] Coastal Zone is 3 nautical miles everywhere in the Study Area with the exceptions of the Gulf coast of Florida, Texas, and Puerto Rico where the coastal zone is 9 nautical miles.

[2] This activity cannot occur in the coastal zone.

2.3.4 MITIGATION MEASURES

The Navy implements mitigation to avoid potential impacts from the Proposed Action on biological, cultural, and socioeconomic resources. The Navy will implement procedural mitigation (which is mitigation that is applied whenever and wherever an applicable activity takes place in the Study Area) or mitigation within mitigation areas (which are geographic locations within the Study Area where the Navy will implement additional mitigation during all or part of the year) for the stressors and geographic locations listed in Table 2.3-8 and in Appendix A (Navy Activity Descriptions). Figure 2.4-1 provides an overview of the areas in which the Navy will implement geographic mitigations. See Chapter 5 (Mitigation) for a full discussion of how the Navy developed mitigation, and a complete presentation of the procedural mitigation and mitigation areas that will be implemented under Alternative 1 or Alternative 2 of the Proposed Action. The final suite of mitigation measures resulting from the ongoing planning, consultation, and permitting processes will be documented in the Final EIS/OEIS, the Navy's Record of Decision, and all applicable authorizations or consultation documents.

Table 2.3-8: Summary of Mitigation for Stressors and Geographic Locations

Chapter 5 (Mitigation) Section	*Activity Category, Stressor, or Geographic Location that Incorporates Procedural Mitigation or Mitigation Areas*
Section 5.3.2, Acoustic Stressors	Low-Frequency Active Sonar Mid-Frequency Active Sonar

Table 2.3-8: Summary of Mitigation for Activity Categories, Stressors, and Geographic Locations (continued)

Chapter 5 (Mitigation) Section	*Activity Category, Stressor, or Geographic Location that Incorporates Procedural Mitigation or Mitigation Areas*
	High-Frequency Active Sonar Air Guns Pile Driving Weapons Firing Noise Aircraft Overflight Noise
Section 5.3.3, Explosive Stressors	Explosive Sonobuoys Explosive Torpedoes Explosive Medium- and Large-Caliber Projectiles Explosive Missiles Explosive Bombs Sinking Exercises Mine Countermeasure and Neutralization Activities Using Towed Influence Mine Sweep Systems and Unmanned/Remotely Operated Mine Neutralization Systems Mine Neutralization Activities Using Explosive Ordnance Disposal Maritime Security Operations – Anti-Swimmer Grenades Line Charge Testing Ship Shock Trials
Section 5.3.4, Physical Disturbance and Strike Stressors	Vessel Movement Towed In-Water Devices Small-, Medium-, and Large-Caliber Non-Explosive Practice Munitions Non-Explosive Missiles Non-Explosive Bombs
Section 5.4, Mitigation Areas to be Implemented	Areas with Seafloor Resources Areas off the Northeastern United States Areas off the Mid-Atlantic and Southeastern United States Areas in the Gulf of Mexico

2.4 ACTION ALTERNATIVE DEVELOPMENT

The identification, consideration, and analysis of alternatives are critical components of the National Environmental Policy Act (NEPA) process and contribute to the goal of objective decision-making. The Council on Environmental Quality developed regulations to implement NEPA and these regulations require the decision maker to consider the environmental effects of the proposed action and a range of alternatives (including the no action alternative) to the proposed action (40 CFR section 1502.14). Council on Environmental Quality guidance further provides that an EIS must rigorously and objectively explore all reasonable alternatives for implementing the proposed action and, for alternatives eliminated from detailed study, briefly discuss the reasons for having been eliminated. To be reasonable, an alternative, except for the no action alternative, must meet the stated purpose of and need for the proposed action. An alternative that does not meet the stated purpose of and need for the proposed action is not considered reasonable.

The Navy developed the alternatives considered in this EIS/OEIS after careful assessment by subject matter experts, including military commands that utilize the ranges, military range management professionals, and Navy environmental managers and scientists. The Navy also used new or updated military policy and historical data in developing alternatives.

For example, one military policy used to inform the alternatives development was the Optimized Fleet Response Plan, discussed in Section 1.4.2 (Optimized Fleet Response Plan), which changed how the Navy meets its readiness requirements. The data developed from the Optimized Fleet Response Plan informs the level of training, including the use of sonar sources and explosives, required by the Navy to meet its Title 10 responsibilities, which includes to maintain, train, and equip combat ready forces. Additionally, during prior phases of comprehensive environmental planning, the Navy assumed that all unit-level sonar training requirements were met through independent training events, meaning each active sonar training requirement was analyzed as a discrete event. This was done for two reasons. First, there was insufficient data to determine if training requirements were being met through means other than live at-sea training, such as through the use of simulated training. Second, since this data was unavailable during prior phases of environmental planning, the Navy wanted to ensure it did not underestimate the potential effects of these activities when seeking MMPA/Endangered Species Act (ESA) permits, resulting in permits with insufficient authority to support the Navy's requirements. This could have resulted in the possibility of exceeding permit limits and resulted in non-compliance with the law.

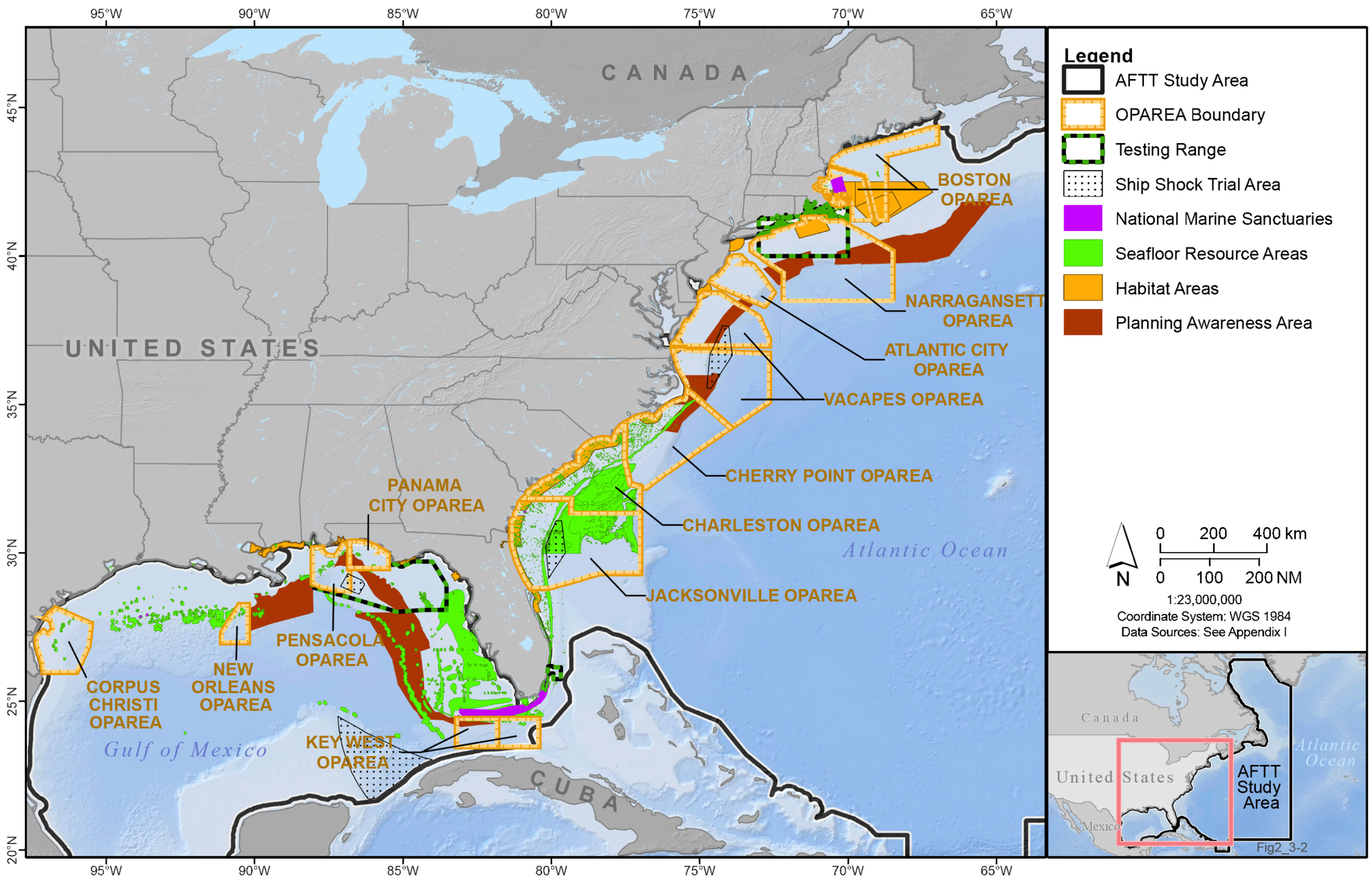
Through the collection of several years of classified sonar use data, the Navy produced a more refined analysis of the amount of sonar usage that the Navy anticipates will be necessary to meet its training and testing requirements, which underlie the development of the action alternatives.

With regards to testing activities, as previously stated, the level of activity in any given year is highly variable and is dependent on technological advancements, emergent requirements identified during operations, and fiscal fluctuations. Therefore, the environmental analysis must consider all testing activities that could possibly occur to ensure that the analysis fully captures the potential environmental effects. These factors were considered in alternatives carried forward for consideration and analyses as described in Section 2.5 (Alternatives Carried Forward).

2.4.1 TRAINING

The analysis of sonar use showed that ships are meeting their active sonar training requirements through a variety of methods. Ships are limited in the number of underway days that are available to conduct at-sea training during the training cycle due to training schedules and constrained fuel resources. Sailors are required to conduct a variety of unit-level training events, throughout all training phases to maintain readiness and conduct this training through a variety of methods, including simulators, unit-level live training at sea, and unit-level training accomplished in conjunction with other training exercises.

Simulators are sufficient to develop basic operator efficiency and can also be used for basic training of watch teams. While this does build proficiency, it cannot replicate the real world complexities sailors will have to deal with while deployed. Operating active sonar in the ocean is extremely complex due to numerous environmental factors that affect how sound travels through water, which cannot be realistically replicated. Only by training in the actual ocean environment can ship crews learn how to deal with these rapidly changing parameters and optimize their sensors to locate underwater objects such as submarines and mines. In summary, while simulators are an important tool for attaining and maintaining readiness, they cannot completely replace live training at sea.



Notes: AFTT: Atlantic Fleet Training and Testing; OPAREA: Operating Area; SINKEX: Ship Sinking Exercises; VACAPES: Virginia Capes

Figure 2.4-1: Geographic Areas Where Navy Proposes to Conduct Mitigation Measures

This page intentionally left blank.

To maximize training effectiveness during limited at-sea opportunities, the Navy takes advantage of training events that can meet multiple training requirements. For example, during an integrated or major training exercise that tracks a submarine with active sonar, units can also take credit for their unit level training requirement to maintain proficiency in tracking submarines with active sonar. In previous environmental analyses, the Navy assumed that each requirement was met through independent training events. However, Navy's analysis has found that, in some instances, multiple requirements (i.e., unit level, integrated, and major training requirements) could be met during one activity. This ability to meet multiple requirements during one activity effectively reduces the number of times the activity needs to be conducted and, therefore, the sound energy transmitted into the water.

The Optimized Fleet Response Plan also influences the amount of active sonar transmitted during training. Under the prior Fleet Response Plan, as discussed in Section 1.4.2 (Optimized Fleet Response Plan), the Navy was required to be prepared to deploy eight carrier strike groups within 6 months. This meant that Navy units had to accomplish all training requirements from the basic phase through the integrated phase in a 6-month period. Although this level of training would occur if the Navy had to respond to a major national security crisis, this level of training has not been conducted in recent years. Instead, the Navy has been responding to significant but more regional challenges through routine deployments while still maintaining a stabilizing and continuous presence around the globe. From an environmental planning and permitting perspective, the combination of analyzing a year where world events require certification and deployment of eight carrier strike groups and repeating the maximum certification and deployment requirement every year resulted in the Navy's analyses and permits overestimating the number of training requirements. This also then overestimated the potential effects of that training over the 5-year MMPA incidental take authorization period. Up until this point, the current force structure (the number of ships, submarines, and aircraft) has resulted in significantly less active sonar use than what was analyzed in the previous environmental planning compliance documents and as reflected in the 2013–2018 permits. The Navy considered this data in developing the action alternatives.

2.4.2 TESTING

As described in Section 1.4.3 (Why the Navy Tests), there are multiple factors that make it challenging for the Navy to accurately predict future testing requirements. Testing conducted on past systems is not a reliable predictor of future testing duration and tempo, since testing requirements and funding can change. Also, testing of a given system does not occur on a predictable annual cycle but rather in discrete test phases that differ in duration and frequency. Some test phases are relatively short, up to a year, while others can take multiple years. The duration and timing of testing will vary depending on federal funding cycles and the success of past test events. The time, place, and details of future testing depend on scientific developments that are not easy to predict, and experimental designs may evolve with emerging science and technology. Even with these challenges, the Navy makes every effort to accurately forecast all future testing requirements.

In order to adequately support Navy testing requirements that are driven by the need to support fleet readiness, alternatives must have an annual capacity to conduct the research, development, and testing to support the following:

- new systems and new technologies
- upgrades to existing systems

- testing of existing systems after repair and maintenance activities
- routine lot acceptance testing of systems

Depending on emerging national security interests or threats to U.S. forces, the Navy may begin rapid development projects that were unanticipated at the time of initial environmental planning. Additionally, the potential that naval forces may need to quickly respond to world conflict or evolving threats may mean that sometimes technical evaluation and operational evaluation of a system could be expedited and occur in the same year. Therefore, the planning for future testing must accommodate these emergent requirements as much as possible. Based on these many uncertainties, the Navy's projected testing requirements and requested authorizations for testing within the AFTT Study Area provides the Navy the ability to test to a potential foreseeable annual maximum level. The maximum level is used in the analysis and authorization to ensure that Navy does not underestimate the potential impacts during the analysis. Consequently, Navy testing during any given year of an authorization timeframe can be less than the levels analyzed.

2.4.3 Alternatives Eliminated from Further Consideration

Alternatives eliminated from further consideration are described below. The Navy determined that these alternatives did not meet the purpose of and need for the Proposed Action after a thorough consideration of each.

2.4.3.1 Alternative Training and Testing Locations

Navy ranges have evolved over the decades and, considered together, allow for the entire spectrum of training and testing to occur in a given range complex or testing range. While some unit-level training and some testing activities may require only one training element (airspace, sea surface space, or undersea space), more advanced training and testing events may require a combination of air, surface, and undersea space as well as access to land ranges. The ability to utilize the diverse and multi-dimensional capabilities of each range complex or testing range allows the Navy to develop and maintain high levels of readiness. The Study Area, and the range complexes and testing ranges it contains, has attributes necessary to support effective training and testing. No other locations match the Study Area attributes, which are as follows:

- proximity of range complexes and testing ranges off the east coast of the United States and within the Gulf of Mexico to each other
- proximity to the homeport regions of Norfolk, Virginia; Camp Lejeune in Jacksonville, North Carolina; and Jacksonville, Florida, as well as the Navy command headquarters, training schools, ships, submarines, aircraft squadrons, and Marine Corps forces located in each of those locations
- proximity to shore-based facilities, infrastructure, and the logistical support provided for testing activities
- proximity to military families, minimizing the length of time Sailors and Marines spend deployed away from home and benefitting overall readiness
- presence of unique training and testing ranges, which include the established mine warfare capabilities in the Virginia Capes Range Complex, the instrumented water ranges located at the South Florida Ocean Measurement Facility Testing Range, and naval training beaches located at Marine Corps Base Camp Lejeune capable of supporting large-scale amphibious training events

- environmental conditions (i.e., bathymetry, topography, and weather) found in the Study Area that maximize the training realism and testing effectiveness

The uniquely interrelated nature of the features and attributes of the range complexes and testing ranges located within the Study Area (as detailed in Section 2.1, Description of the Atlantic Fleet Training and Testing Study Area) provides the training and testing support needed for complex military activities. There is no other series of integrated ranges in the Atlantic Ocean that affords this level of operational support and comprehensive integration for range activities. There are no other potential locations in the Atlantic, where roughly half of the U.S. Navy's fleet is located, where land ranges, OPAREAs, undersea terrain and ranges, testing ranges, and military airspace combine to provide the venues necessary for the training and testing realism and effectiveness required to train and certify naval forces ready for combat operations.

2.4.3.2 Simulated Training and Testing Only

The Navy currently uses simulation for training and testing whenever possible (e.g., command and control exercises are conducted without operational forces); however, there are significant limitations, and its use cannot replace live training or testing.

To detect and counter mine shapes and hostile submarines, the Navy uses both passive and active sonar. Sonar proficiency is a complex and perishable skill that requires regular, hands-on training in realistic and diverse conditions. More than 300 extremely quiet, newer-generation submarines are operated by more than 40 nations worldwide, and these numbers are growing. These difficult-to-detect submarines, as well as torpedoes and underwater mines, are true threats to global commerce, national security, and the safety of military personnel. As a result, defense against enemy submarines is a top priority for the Navy. Anti-submarine warfare training and testing activities include the use of active and passive sonar systems and small explosive charges, which prepare and equip Sailors for countering threats. Inability to train with sonar would eliminate or diminish anti-submarine warfare readiness. Failure to detect and defend against hostile submarines can cost lives, such as the 46 Sailors who lost their lives when a Republic of Korea frigate (CHEONAN) was sunk by a North Korean submarine in March 2010.

There are limits to the realism that current simulation technology can presently provide. Unlike live training, computer-based training does not provide the requisite level of realism necessary to attain combat readiness. Today's simulation technology does not permit anti-submarine warfare training with the level of detail required to maintain proficiency. While simulators are used for the basic training of sonar technicians, they are of limited value beyond basic training. A simulator cannot match the dynamic nature of the environment, such as bathymetry and sound propagation properties, or the training activities involving several units with multiple crews interacting in a variety of acoustic environments.

Computer simulation can provide familiarity and complement live training; however, it cannot provide the fidelity and level of training necessary to prepare naval forces for deployment. Sonar operators must train regularly and frequently to develop and maintain the skills necessary to master the process of identifying underwater threats in the complex subsurface environment. Sole reliance on simulation would deny service members the ability to develop battle-ready proficiency in the employment of active sonar in the following areas:

- Bottom bounce and other environmental conditions. Sound hitting the ocean floor (bottom bounce) reacts differently depending on the bottom type and depth. Likewise, sound passing

through changing currents, eddies, or across differences in ocean temperature, pressure, or salinity is also affected. Both of these are extremely complex and difficult to simulate, and both are common in actual sonar operations.

- Mutual sonar interference. When multiple sonar sources are operating in the vicinity of each other, interference due to similarities in frequency can occur. Again, this is a complex variable that must be recognized by sonar operators but is difficult to simulate with any degree of fidelity.
- Interplay between ship and submarine target. Ship crews, from the sonar operator to the ship's Captain, must react to the changing tactical situation with a real, thinking adversary (a Navy submarine for training purposes). Training in actual conditions with actual submarine targets provides a challenge that cannot be duplicated through simulation.
- Interplay between anti-submarine warfare teams in the strike group. Similar to the interplay required between ships and submarine targets, a ship's crew must react to all changes in the tactical situation, including changes from cooperating ships, submarines, and aircraft.

Similar to the challenges presented in the training situations above, operational testing cannot be based exclusively on computer modeling or simulation either (see 10 U.S.C. sections 2366 and 2399). At-sea testing provides the critical information on operability and supportability needed by the Navy to make decisions on the procurement of platforms and systems, ensuring that what is purchased performs as expected and that tax dollars are not wasted. This testing requirement is also critical to protecting the Sailors and Marines who depend on these technologies to execute their mission with minimal risk to themselves.

As the acquisition authority for the Navy, the Systems Commands are responsible for administering large contracts for the Navy's procurement of platforms and systems. These contracts include performance criteria and specifications that must be verified to ensure that the Navy accepts platforms and systems that support the warfighter's needs. Although simulation is a key component in platform and systems development, it does not adequately provide information on how a system will perform or whether it will be available to meet performance and other specification requirements because of the complexity of the technologies in development and marine environments in which they will operate. For this reason, at some point in the development process, platforms and systems must undergo at-sea or in-flight testing. Therefore, simulation as an alternative that replaces training and testing in the field does not meet the purpose of and need for the Proposed Action and has been eliminated from detailed study.

2.4.3.3 Training and Testing Without the Use of Active Sonar

As explained in Section 2.4.3.2 (Simulated Training and Testing Only), in order to detect and counter submerged mines and hostile submarines, the Navy uses both passive and active sonar. Sonar proficiency is a complex and perishable skill that requires regular, hands-on training in realistic and diverse conditions. Active sonar is needed to find and counter newer-generation submarines around the world, which are growing in number, as are torpedoes and underwater mines, which are true threats to global commerce, national security, and the safety of military personnel. As a result, defense against enemy submarines is a top priority for the Navy.

2.5 ALTERNATIVES CARRIED FORWARD

The Navy's anticipated level of training and testing activity evolves over time based on numerous factors as discussed in the preceding paragraphs in Section 2.4 (Action Alternative Development). Additionally,

over the past several years, the Navy's ongoing sonar reporting program has gathered classified data regarding the number of hull-mounted mid-frequency sonar hours used to meet anti-submarine warfare requirements, which has increased understanding of how sonar training hours are generated. This data allows for a more accurate projection of the number of active sonar hours required to meet anti-submarine warfare training requirements into the reasonably foreseeable future.

In light of this information, the Navy was able to better formulate a range of reasonable alternatives that meet Navy training requirements while reflecting a lower, and more realistic, impact on the environment. This analysis of ongoing activities also provides a more accurate assessment of the Navy's current impact on the environment from ongoing Navy training and testing when compared to the currently permitted activities.

2.5.1 NO ACTION ALTERNATIVE

As mentioned above in Section 2.4 (Action Alternative Development), the Council on Environmental Quality implementing regulations require that a range of alternatives to the proposed action, including a No Action Alternative, be analyzed to provide a clear basis for choice among options by the decision maker and the public (40 CFR 1502.14). Council on Environmental Quality guidance identifies two approaches in developing the No Action Alternative (46 *Federal Register* 18026). One approach for activities that have been ongoing for long periods of time is for the No Action Alternative to be thought of in terms of continuing the present course of action, or current management direction or intensity, such as the continuation of Navy training and testing at sea in the AFTT Study Area at current levels, even if separate legal authorizations under the MMPA and ESA are required. Under this approach, which was used in Phases I and II of the Navy's environmental planning and compliance program for training and testing activities at sea, the analysis compares the effects of continuing current activity levels (i.e., the "status quo") with the effects of the Proposed Action. The second approach depicts a scenario where no authorizations or permits are issued, the Navy's training and testing activities do not take place, and the resulting environmental effects from taking no action are compared with the effects of the Proposed Action. This approach is being applied in Phase III of the Navy's environmental planning and compliance program, including in this EIS/OEIS.

Under the No Action Alternative analyzed in this EIS/OEIS, the Navy would not conduct the proposed training and testing activities in the AFTT Study Area. Consequently, the No Action Alternative of not conducting the proposed live, at-sea training and testing in the AFTT Study Area is inherently unreasonable in that it does not meet the Navy's purpose and need (see Section 1.4, Purpose and Need for Proposed Military Readiness Training and Testing Activities) for the reasons noted in the next four paragraphs. However, the analysis associated with the No Action Alternative is carried forward in order to compare the magnitude of the potential environmental effects of the Proposed Action with the conditions that would occur if the Proposed Action did not occur (see Section 3.0, Introduction).

From NMFS' perspective, pursuant to its obligation to grant or deny permit applications under the MMPA, the No Action Alternative involves NMFS denying Navy's application for an incidental take authorization under Section 101(a)(5)(A) of the MMPA. If NMFS were to deny the Navy's application, the Navy would not be authorized to incidentally take marine mammals in the AFTT Study Area, and under the No Action Alternative, as explained above, the Navy would not conduct the proposed training and testing activities in the AFTT Study Area.

Cessation of proposed Navy at-sea training and testing activities would mean that the Navy would not meet its statutory requirements and would be unable to properly defend itself and the United States

from enemy forces, unable to successfully detect enemy submarines, and unable to effectively use its weapons systems or defensive countermeasures. Navy personnel would essentially not be taught how to use Navy systems in any realistic scenario. For example, sonar proficiency, which is a complex and perishable skill, requires regular, hands-on training in realistic and diverse conditions in order to detect and counter hostile submarines. Inability to train with active sonar would result in no or greatly diminished anti-submarine warfare capability.

Additionally, without proper training, individual Sailors and Marines serving onboard Navy vessels would not be taught how to properly operate complex equipment in inherently dynamic and dangerous environments. Thus, even during routine non-combat operations, it is likely that there would be an increase in the number of mishaps, potentially resulting in the death or serious injury of Sailors and Marines. As it stands, even with high levels of training and a culture of safety, injuries and death do occur. Failing to allow our Sailors and Marines to achieve and maintain the skills necessary to defend the United States and its interests will result in an unacceptable increase in the danger they willingly face.

Finally, the lack of live training and testing would require a higher reliance on simulated training and testing. While the Navy continues to research new ways to provide realistic training through simulation, there are limits to the realism that current technology can provide. While simulators are used for the basic training of sonar technicians, they are of limited utility beyond basic training. A simulator cannot match the dynamic nature of the environment, such as bathymetry and sound propagation properties, or the training activities involving several units with multiple crews interacting in a variety of acoustic environments. Sole reliance on simulation would deny service members the ability to develop battle-ready proficiency in the employment of active sonar (Section 2.4.3.2, Simulated Training and Testing Only).

2.5.2 ALTERNATIVE 1

Alternative 1 is the Preferred Alternative.

2.5.2.1 Training

Under this alternative, the Navy proposes to conduct military readiness training activities into the reasonably foreseeable future, as necessary to meet current and future readiness requirements. These military readiness training activities include new activities as well as activities subject to previous analysis that are currently ongoing and have historically occurred in the Study Area. The requirements for the types of activities to be conducted, as well as the intensity at which they need to occur, have been validated by senior Navy leadership. Specifically, training activities are based on the requirements of the Optimized Fleet Response Plan and on changing world events, advances in technology, and Navy 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 fleets after November 2018. The numbers and locations of all proposed training activities are provided in Section 2.6.1 (Proposed Training Activities).

Alternative 1 reflects a representative year of training to account for the natural fluctuation of training cycles and deployment schedules that generally influences the maximum level of training that may occur year after year in any 5-year period. Using a representative level of activity rather than a maximum tempo 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, as discussed below. Both unit-level training and major training exercises are adjusted to meet this representative year, as discussed below.

Under Alternative 1, the Navy assumes that some unit-level training would be conducted using synthetic means (e.g., simulators). Additionally, this alternative assumes that some unit-level active sonar training will be completed through other training exercises. By using a representative level of training activity rather than a maximum level of training activity in every year, this alternative accepts a degree of risk that if global events necessitated a rapid expansion of military training that Navy would not have sufficient capacity in its MMPA and ESA authorizations to carry out those training requirements.

The Optimized Fleet Response Plan and various training plans identify the number and duration of training cycles that could occur over a 5-year period. Alternative 1 considers fluctuations in training cycles and deployment schedules that do not follow a traditional annual calendar but instead are influenced by in-theater demands and other external factors. Similar to unit-level training, this alternative does not analyze a maximum number carrier strike group Composite Training Unit Exercises (one type of major exercise) every year, but instead assumes a maximum number of exercises would occur during 2 years of any 5-year period. As a result, Alternative 1 will analyze a maximum of 3 Composite Training Unit Exercises in any given year and not more than 12 over any 5-year period. This alternative does not provide for the conduct of a contingency Composite Training Unit Exercise in the Gulf of Mexico and, hence, incorporates a degree of risk that the Navy will not have sufficient capacity in potential MMPA permits to support the full spectrum of training potentially necessary to respond to a future national emergency crisis.

2.5.2.2 Testing

Alternative 1 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. This alternative includes the testing of new platforms, systems, and related equipment that will be introduced after November 2018. The majority of testing activities that would be conducted under this alternative are the same as or similar as those conducted currently or in the past. This alternative includes the testing of some new systems using new technologies and takes into account inherent uncertainties in this type of testing.

Under Alternative 1, 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. This alternative contains a more realistic annual representation of activities, but includes years of a higher maximum amount of testing to account for these fluctuations. This alternative would not include the contingency for augmenting some weapon system tests, which would increase levels of annual testing of anti-submarine warfare and mine warfare systems, and presumes a typical level of readiness requirements. The numbers and locations of all proposed testing activities are provided in Section 2.6.2 (Proposed Testing Activities).

2.5.2.3 Mitigation Measures

In addition to standard operating procedures, the Navy proposes to implement procedural and geographic/temporal mitigation measures for Alternative 1, in addition to changes or additions to those mitigation measures as discussed in Chapter 5 (Mitigation). The final suite of mitigation measures resulting from the ongoing planning, consultation, and permitting processes will be documented in the Final EIS/OEIS, the Navy's Record of Decision, and all applicable authorizations or consultation documents. These measures apply to both training and testing activities.

2.5.3 ALTERNATIVE 2

2.5.3.1 Training

As under Alternative 1, this alternative includes new and ongoing activities. Under Alternative 2, training activities are based on requirements established by the Optimized Fleet Response Plan. Under this alternative, the Navy would be enabled to meet the highest levels of required military readiness by conducting the majority of its training live at sea, and by meeting unit level training requirements using dedicated, discrete training events, instead of combining them with other training activities as described in alternative 1. The numbers and locations of all proposed training activities are provided in Table 2.6 1, in Section 2.6.1 (Proposed Training Activities).

Alternative 2 reflects the maximum number of training activities that could occur within a given year, and assumes that the maximum level of activity would occur every year over any 5-year period. This allows for the greatest capacity for the Navy to maintain readiness when considering potential changes in the national security environment, fluctuations in training and deployment schedules, and potential in-theater demands. Both unit-level training and major training exercises are assumed to occur at a maximum level every year.

Additionally, this alternative will analyze 3 Composite Training Unit Exercises each year along with a contingency Composite Training Unit Exercise in the Gulf of Mexico each year, for a total number of 20 Composite Training Unit Exercises, including the Gulf of Mexico contingency Composite Training Unit Exercise, over any 5-year period.

2.5.3.2 Testing

Like Alternative 1, Alternative 2 entails a level of testing activities to be conducted into the reasonably foreseeable future and includes the testing of new platforms, systems, and related equipment that will be introduced beginning in November 2018. The majority of testing activities that would be conducted under this alternative are the same as or similar as those conducted currently or in the past.

Alternative 2 would include the testing of some new systems using new technologies, taking into account the potential for delayed or accelerated testing schedules, variations in funding availability, and innovations in technology development. To account for these inherent uncertainties in testing, this alternative assumes that the maximum annual testing efforts predicted for each individual system or program could occur concurrently in any given year. This alternative also includes the contingency for augmenting some weapon systems tests in response to potential increased world conflicts and changing Navy leadership priorities as the result of a direct challenge from a naval opponent that possesses near-peer capabilities. Therefore, this alternative includes the provision for higher levels of annual testing of certain anti-submarine warfare and mine warfare systems to support expedited delivery of these systems to the fleet. All proposed testing activities are listed in Table 2.6-2 through Table 2.6-4, in Section 2.6 (Proposed Training and Testing Activities for Both Alternatives).

2.5.3.3 Mitigation Measures

In addition to standard operating procedures, the Navy proposes to implement procedural and geographic/temporal mitigation measures for Alternative 2, in addition to changes or additions to those mitigation measures as discussed in Chapter 5 (Mitigation). The final suite of mitigation measures resulting from the ongoing planning, consultation, and permitting processes will be documented in the Final EIS/OEIS, the Navy's Record of Decision, and all applicable authorizations or consultation documents. These measures apply to both training and testing activities.

2.5.4 Comparison of Proposed Sonar and Explosive Use in the Action Alternatives to the 2013–2018 MMPA Permit Allotment

2.5.4.1 Training

As a comparison to the amount of training analyzed in the previous environmental planning compliance documents and as reflected in the 2013–2018 MMPA permit (Phase II), the Navy considered the type of sonar source that resulted in the greatest number of exposures to marine mammals, which was identified as hull-mounted mid-frequency active sonar. The differences between use of this system from Phase II to Phase III are best identified in three ways: (1) completion of unit-level training via synthetic means or through other training exercises, (2) reduction of sonar hours associated with a Composite Training Unit Exercise, and (3) reduction in the number of Composite Training Unit Exercises expected over a 5-year period.

During Phase II, all unit-level training using hull-mounted mid-frequency sonar was assumed to be conducted during discrete training events. However, current practice indicates that some unit-level training is completed through synthetic training, as well as concurrent with other training exercises (e.g., unit-level training can be completed simultaneously during the conduct of an integrated training exercise). Alternative 1 accounts for the use of synthetic training and concurrent unit-level training within other exercises, although this assumes risk in the event additional live training is necessary. To preserve the ability for the Navy to conduct all unit-level sonar training as discrete, at-sea exercises, Alternative 2 does not provide for the reduction in hours for this type of activity.

Composite Training Unit Exercises are major exercises that involve multiple platforms and numerous hours of sonar to meet mission objectives. During Phase II, each Composite Training Unit Exercise was assumed to require 1,000 hours of hull-mounted mid-frequency sonar. Through analysis of data collected during the Phase II permit period, the Navy determined that this assumption overestimated the amount of hull-mounted mid-frequency sonar that was typically used in a Composite Training Unit Exercise by 400 hours. As such, for both Alternatives 1 and 2, an estimated 600 hours of hull-mounted mid-frequency sonar is included for each Composite Training Unit Exercise.

Comparisons of proposed hull-mounted mid-frequency sonar hours to the hours permitted from 2013 to 2018 are depicted in Figure 2.5-1 and Figure 2.5-2.

The Fleet Response Plan, in place during Phase II, identified a requirement to conduct four Composite Training Unit Exercises per year along the U.S. East Coast, and a contingency Composite Training Unit Exercise in the Gulf of Mexico was also included, resulting in a total of five exercises analyzed per year. For Phase III, the number of Composite Training Unit Exercises to be conducted is reduced, with fewer proposed exercises in Alternative 1 and Alternative 2. Alternative 1 reduces (from the 2013–2018 permitted level) the number of Composite Training Unit Exercises to be conducted during any 5-year period along the east coast by analyzing representative years (in addition to maximum planned years) of training activity to account for the variability of training cycles and deployment schedules. Alternative 1 analyzes 2 years of three Composite Training Unit Exercises (maximum years) and 3 years of two Composite Unit Training Exercises (representative years) occurring along the east coast. Alternative 2 analyzes a maximum number of Composite Training Unit Exercises planned per year (three) along the east coast and a contingency exercise in the Gulf of Mexico every year in a 5-year period. As such, Alternative 2 provides for 4 Composite Training Unit Exercises each year, for a total of 20 over the 5-year period. A comparison of the number of Composite Training Unit Exercises from the 2013–2018 permitted levels to the action alternatives is provided in Figure 2.5-3.

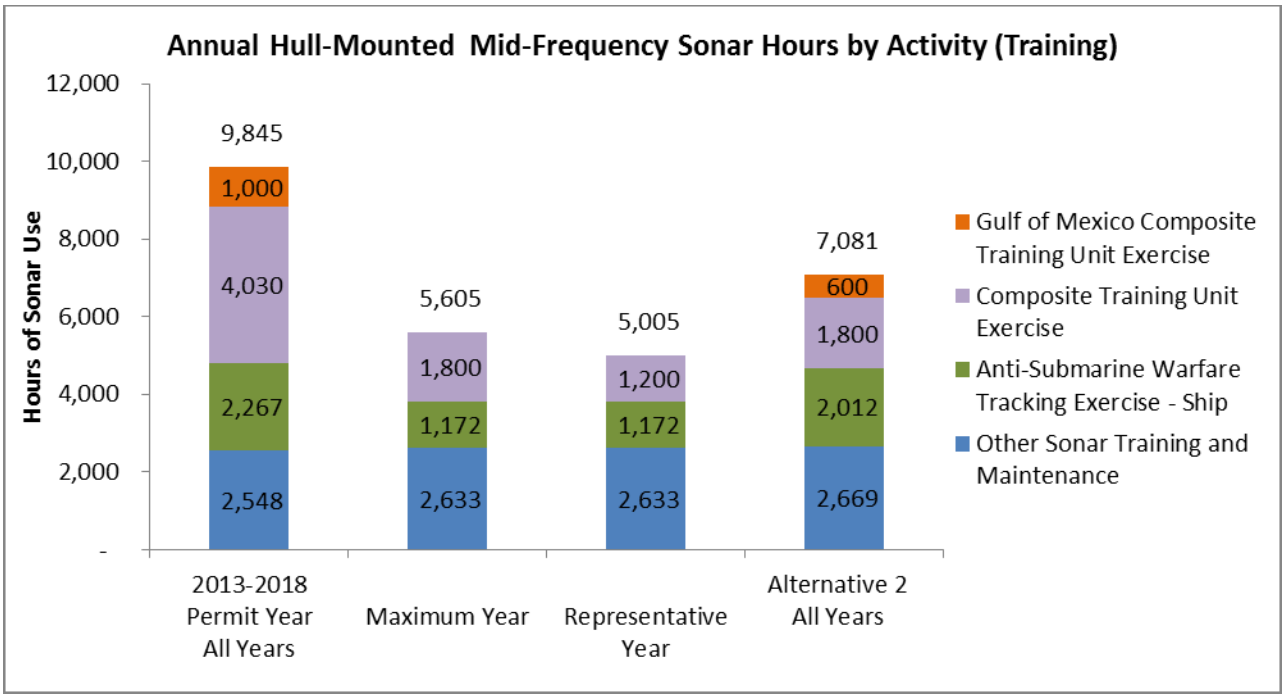


Figure 2.5-1: Proposed Maximum Year of Hull-Mounted Mid-Frequency Sonar Hour Use by Activity During Training Compared to the Number Authorized in the 2013–2018 Marine Mammal Protection Act Permit

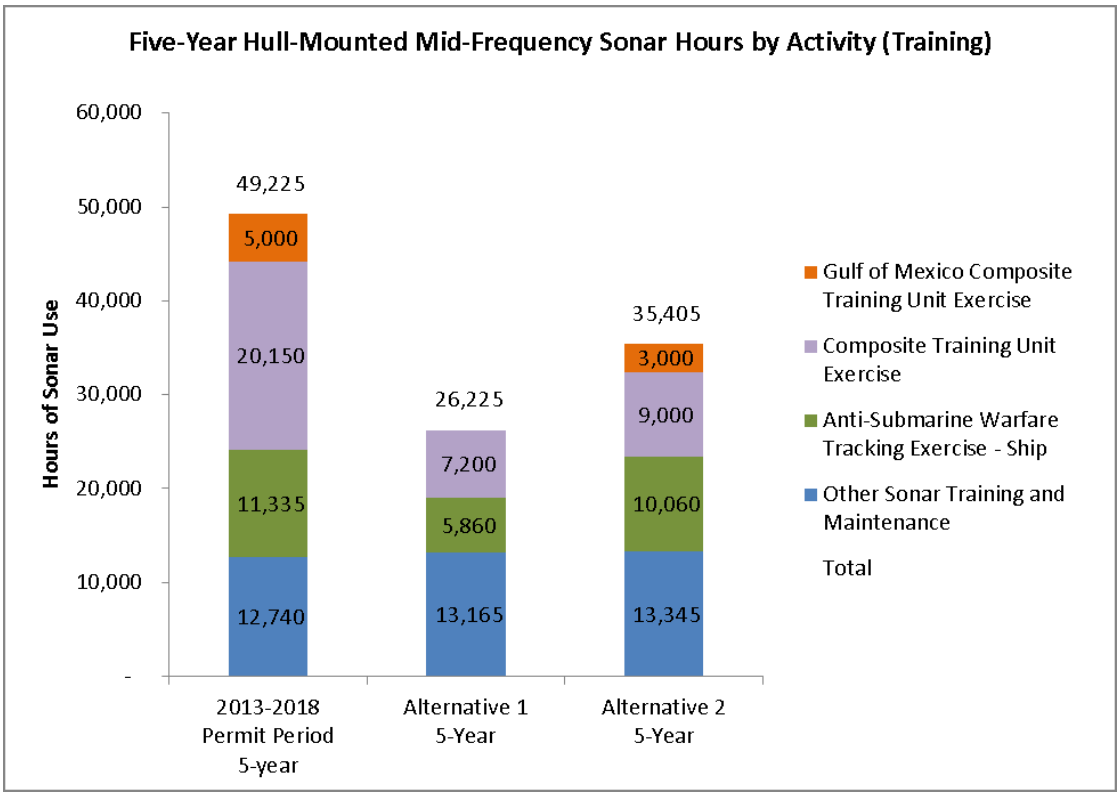


Figure 2.5-2: Proposed Five-Year Total Hull-Mounted Mid-Frequency Sonar Hour Use by Activity During Training Compared to the Number Authorized in the 2013–2018 Marine Mammal Protection Act Permit

After analyzing the level of explosive activities conducted during Phase II, the Navy identified that some explosive sources were incorrectly classed into bins with greater net explosive weights (see Appendix A, Navy Activity Descriptions, for a discussion of bins) than actually is present in the munition. For example, 20-millimeter rounds were considered in bin E1 during Phase II, but have less than 0.1 pounds of net explosive weight (defined as bin E0), and are therefore analyzed qualitatively (instead of quantitatively) for Phase III. Additionally in Phase II, munitions within the same category were all analyzed with the highest net explosive weight for all munitions in that category. For example, most bombs were analyzed as bin E12 (to account for the largest potential for environmental impact), whereas many fall within bins E9 and E10. For Phase III, munitions were divided into more appropriate bins based on current and anticipated weapon inventory. Due to the re-binning of multiple munitions, comparing the use of a single bin or type of explosive (similar to the comparison above for sonar) is not prudent. Figure 2.5-4 provides the change in explosive use per bin for all training activities between the 2013–2018 permitted level and the two action alternatives.

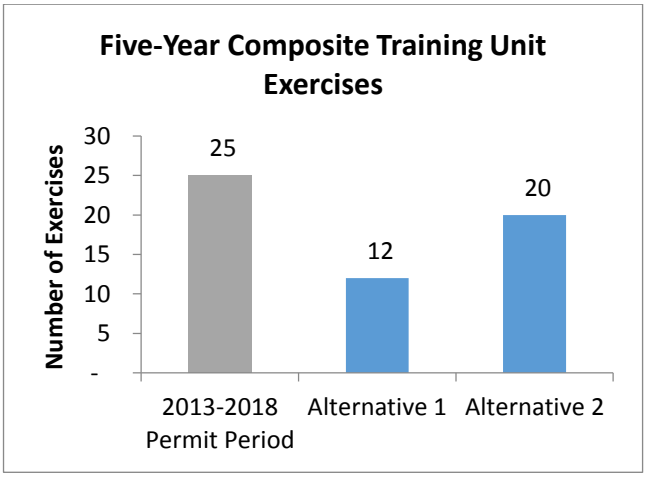
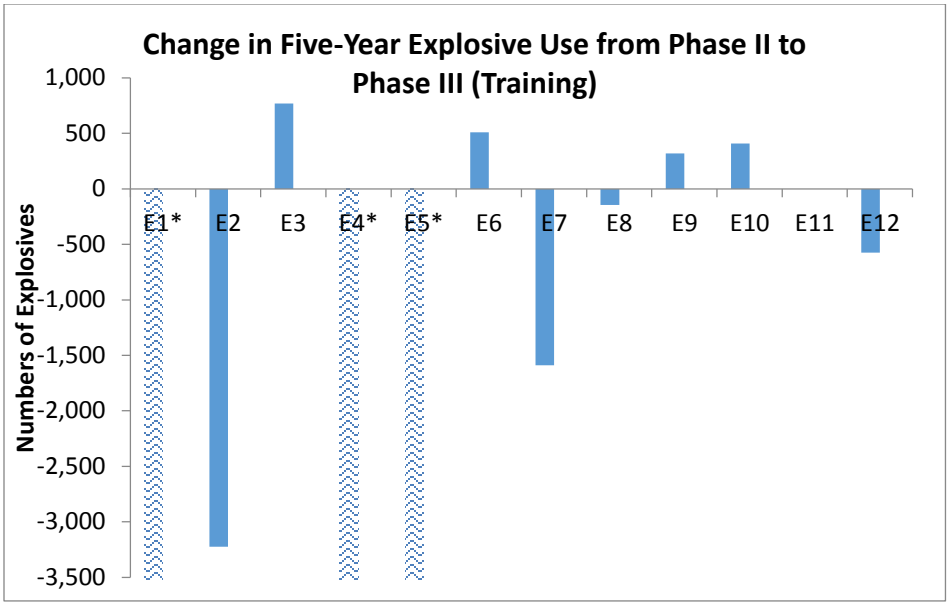


Figure 2.5-3: Proposed Number of Composite Training Unit Exercises over a Five-Year Period Compared to Number Authorized in the 2013–2018 Marine Mammal Protection Act Permit



* Bin E1 decreased by 571,060 explosives, bin E4 decreased by 10,303 explosives, and bin E5 decreased by 51,150 explosives. These bins cannot be represented in this graph without distorting the scale.

[1] Alternative 1 and Alternative 2 would use the same number of explosives in Phase III; bar graph depicts both alternatives.

[2] As the graph indicates the change in explosive use, the 2013–2018 permitted level is represented as the "0" line, to which the change for Phase III is compared, such that positive values are an increase in use of the bin, and negative values are a decrease in use of that bin.

Figure 2.5-4: Change in Explosive Use (for Both Action Alternatives) During Training Activities Compared to the 2013–2018 Marine Mammal Protection Act Permit[1, 2]

2.5.4.2 Testing

As described in Sections 1.4.3.2 (Methods of Testing), 2.5.2.2 (Testing) and 2.5.3.2 (Testing), the Navy's testing community faces a number of challenges in accurately defining future testing requirements. These challenges include varying funding availability, changes in Congressional and DoD/Navy priorities in responses to emerging threats in the world and the acquisition of new technologies that introduce increased uncertainties in the timeline, tempo or success of a system's testing schedule because the system is new and untested. As it does now, the Navy testing community took into account these same challenges in projecting requirements for the 2013–2018 (Phase II) testing timeframe. Although the best information available to the Navy has always been taken into account, as a result of the implementation of Phase II, the Navy testing community has improved its ability to obtain and define that information and, consequently, its ability to project future testing needs. It is expected that over time, the Navy's ability to project future testing requirements will continue to improve with increasing refinement of the process and more/better historical data. Nonetheless, the inherent challenges and uncertainties in testing, as described previously, will continue to make projection of future testing requirements challenging.

The majority of platforms, weapons, and systems that were proposed for testing during the Phase II timeframe are the same or very similar to those proposed to be tested in the future. However, the Navy projects that the need to test some platforms, weapons, and systems will increase, while others will decrease, as compared to the testing requirements that were proposed for the Phase II timeframe. Overall, the Navy is projecting a net increase in the need to test systems that use sonar and a net decrease for explosives use, as proposed under Alternative 1, and as compared to the proposed testing requirements of the Phase II timeframe. These future projections are based on improvements in the

Navy's understanding of requirements, the completion of test phases of certain projects since Phase II, the addition of test phases anticipated to start after December 2018, and the projected testing of new types of equipment since the 2013–2018 timeframe.

2.6 Proposed Training and Testing Activities for Both Alternatives

2.6.1 Proposed Training Activities

All proposed training activities are listed in Table 2.6-1. It should be noted that many of the activities listed occur the same number of time annually under both alternatives. These activities can be thought of as meeting individual training requirements. Although the number of some activities may be the same, the difference between the alternatives is manifest in how these activities are conducted. This difference is explained above in Section 2.5 (Alternatives Carried Forward) and represented in Figure 2.5-1 and Figure 2.5-2.

Table 2.6-1: Proposed Training Activities per Alternative

Activity Name	*Annual # of Activities[1]*		*5-Year # of Activities*		*Location[2]*
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
Major Training Exercise – Large Integrated Anti-Submarine Warfare					
Composite Training Unit Exercise	2–3	3	12	15	VACAPES RC Navy Cherry Point RC JAX RC
	0	1	0	5	GOMEX
Major Training Exercise – Medium Integrated Anti-Submarine Warfare					
Fleet Exercise/Sustainment Exercise	4		20		VACAPES RC JAX RC
Integrated/Coordinated Training					
Small Integrated Anti-Submarine Training	6		30		JAX RC
	3		15		Navy Cherry Point RC
	3		15		VACAPES RC
Medium Coordinated Anti-Submarine Warfare Training	2		10		JAX RC
	1		5		Navy Cherry Point RC
	1		5		VACAPES RC
Small Coordinated Anti-Submarine Warfare Training	4		20		JAX RC
	5		25		Navy Cherry Point RC
	5		25		VACAPES RC
Air Warfare					
Air Combat Maneuver	1,270		6,350		JAX RC
	6,300		31,500		Key West RC
	1,155		5,775		Navy Cherry Point RC
	1,200		6,000		VACAPES RC
Air Defense Exercise	85		425		GOMEX RC
	5,157		25,785		JAX RC
	5,166		25,830		Navy Cherry Point RC
	3,425		17,125		VACAPES RC
Gunnery Exercise Air-to-Air Medium-Caliber	75		375		JAX RC
	70		350		Key West RC
	40		200		Navy Cherry Point RC
	120		600		VACAPES RC

Table 2.6-1: Proposed Training Activities per Alternative (continued)

Activity Name	*Annual # of Activities[1]*		*5-Year # of Activities*		*Location[2]*
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
Gunnery Exercise Surface-to-Air Large Caliber	7		35		JAX RC
	25		125		VACAPES RC
Gunnery Exercise Surface-to-Air Medium Caliber	10		50		Other AFTT Areas
	31		155		JAX RC
	23		115		Navy Cherry Point RC
	59		295		VACAPES RC
Missile Exercise Air-to-Air	48		240		JAX RC
	8		40		Key West RC
	48		240		Navy Cherry Point RC
	40		200		VACAPES RC
Missile Exercise Surface-to-Air	2		10		GOMEX RC
	5		20		JAX RC
	2		10		Navy Cherry Point RC
	2		10		Northeast RC
	30		50		VACAPES RC
Missile Exercise – Man-Portable Air Defense System	5		25		Navy Cherry Point RC
Amphibious Warfare					
Amphibious Assault	5		25		Navy Cherry Point RC
Amphibious Marine Expeditionary Unit Integration Exercise	1		5		Navy Cherry Point RC
Amphibious Raid	20		100		JAX RC
	34		162		Navy Cherry Point RC
Amphibious Ready Group Marine Expeditionary Unit Exercise	1		5		Navy Cherry Point RC
Amphibious Vehicle Maneuvers	186		930		VACAPES RC
	2		10		JAX RC
Humanitarian Assistance Operations	1		5		Navy Cherry Point RC
Marine Expeditionary Unit Certification Exercise	5		25		Navy Cherry Point RC
Naval Surface Fire Support Exercise – At Sea	2		10		GOMEX
	6		30		JAX RC
	2		10		Navy Cherry Point RC
	19		95		VACAPES RC
Naval Surface Fire Support Exercise - Land–Based Target	7		35		Navy Cherry Point RC
Anti-Submarine Warfare					
Anti-Submarine Warfare Torpedo Exercise – Helicopter	14		70		JAX RC
	4		20		VACAPES RC
Anti-Submarine Warfare Torpedo Exercise – Maritime Patrol Aircraft	14		70		JAX RC
	4		20		VACAPES RC

Table 2.6-1: Proposed Training Activities per Alternative (continued)

Activity Name	*Annual # of Activities*[1]		*5-Year # of Activities*		*Location*[2]
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
Anti-Submarine Warfare Torpedo Exercise –Ship	16		80		JAX RC
	5		25		VACAPES RC
Anti-Submarine Warfare Torpedo Exercise – Submarine	12		60		JAX RC
	6		30		Northeast RC
	2		10		VACAPES RC
Anti-Submarine Warfare Tracking Exercise – Helicopter	24		120		Other AFTT Areas
	370		1,850		JAX RC
	12		60		Navy Cherry Point RC
	8		40		VACAPES RC
Anti-Submarine Warfare Tracking Exercise – Maritime Patrol Aircraft	90		450		Northeast RC
	176		880		VACAPES RC
	525		2,625		JAX RC
	46		230		Navy Cherry Point RC
Anti-Submarine Warfare Tracking Exercise – Ship	5*	5	25*	25	Northeast RC
	110*	110	550*	550	Other AFTT Areas
	5*	5	25*	25	GOMEX RC
	440*	440	2,200*	2,200	JAX RC
	55*	55	275*	275	Navy Cherry Point RC
	220*	220	1,100*	1,100	VACAPES RC
Anti-Submarine Warfare Tracking Exercise – Submarine	44		220		Other AFTT Areas
	13		65		JAX RC
	1		5		Navy Cherry Point RC
	18		90		Northeast RC
	6		30		VACAPES RC
Electronic Warfare					
Counter Targeting Chaff Exercise – Aircraft	18		90		GOMEX RC
	2,990		14,950		JAX RC
	3,000		15,000		Key West RC
	1,610		8,050		Navy Cherry Point RC
	130		650		VACAPES RC
Counter Targeting Chaff Exercise – Ship	5		25		GOMEX RC
	5		25		JAX RC
	5		25		Navy Cherry Point RC
	10		50		VACAPES RC
Counter Targeting Flare Exercise	92		460		GOMEX RC
	1,900		9,500		JAX RC
	1,550		7,750		Key West RC
	1,115		5,575		Navy Cherry Point RC
	50		250		VACAPES RC
Electronic Warfare Operations	181		905		JAX RC
	2,620		13,100		Navy Cherry Point RC
	302		1,510		VACAPES RC
High-Speed Anti-Radiation Missile Exercise	4		20		JAX RC
	10		50		Navy Cherry Point RC
	11		55		VACAPES RC

Table 2.6-1: Proposed Training Activities per Alternative (continued)

Activity Name	*Annual # of Activities[1]*		*5-Year # of Activities*		*Location[2]*
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
Expeditionary Warfare					
Dive and Salvage Operations	16		80		GOMEX RC
	60		300		JAX RC
	8		40		Key West RC
	16		80		Navy Cherry Point RC
	30		150		VACAPES RC
Maritime Security Operations – Anti-Swimmer Grenades	2		10		GOMEX RC
	2		10		JAX RC
	2		10		Navy Cherry Point RC
	4		20		Northeast RC
	5		25		VACAPES RC
Personnel Insertion/ Extraction - Air	10		50		JAX RC
	10		50		Key West
	198		990		VACAPES RC
Personnel Insertion/ Extraction – Surface and Subsurface	2		10		Northeast RC
	5		25		GOMEX RC
	1		5		JAX RC
	360		1,800		VACAPES RC
Personnel Insertion/ Extraction – Swimmer/Diver	42		210		VACAPES RC
Underwater Construction Team Training	8		40		GOMEX RC
	4		20		JAX RC
	4		20		Key West RC
	8		40		VACAPES RC
Mine Warfare					
Airborne Mine Countermeasure - Mine Detection	66		330		GOMEX RC
	317		1,585		JAX RC
	371		1,855		Navy Cherry Point RC
	244		1,220		NSWC Panama City
	1,540		7,700		VACAPES RC
Airborne Mine Countermeasures – Towed Mine Neutralization	50		250		GOMEX RC
	100		500		JAX RC
	108		540		Navy Cherry Point RC
	510		2,550		VACAPES RC
Civilian Port Defense – Homeland Security Anti-Terrorism/Force Protection Exercise	1		3		Beaumont, TX Boston, MA Corpus Christi, TX Delaware Bay, DE Earle, NJ GOMEX RC Hampton Roads, VA JAX RC Kings Bay, GA NS Mayport Morehead City, NC Port Canaveral, FL

Table 2.6-1: Proposed Training Activities per Alternative (continued)

Activity Name	*Annual # of Activities[1]*		*5-Year # of Activities*		*Location[2]*
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
					Savannah, GA Tampa, FL VACAPES RC Wilmington, DE
Coordinated Unit Level Helicopter Airborne Mine Countermeasure Exercise	2		10		GOMEX RC
	2		10		JAX RC
	2		10		Navy Cherry Point RC
	2		10		VACAPES RC
Mine Countermeasures – Mine Neutralization – Remotely Operated Vehicle	132		660		GOMEX RC
	71		355		JAX RC
	71		355		Navy Cherry Point RC
	630		3,150		VACAPES RC
Mine Countermeasures – Ship Sonar	22		110		GOMEX RC
	53		265		JAX RC
	53		265		VACAPES RC
Mine Laying	1		5		JAX RC
	2		10		Navy Cherry Point RC
	4		20		VACAPES RC
Mine Neutralization – Explosive Ordnance Disposal	6		30		Lower Chesapeake Bay
	16		80		GOMEX RC
	20		100		JAX RC
	17		85		Key West RC
	16		80		Navy Cherry Point RC
	524		2,620		VACAPES RC
Underwater Mine Countermeasures Raise, Tow, Beach, and Exploitation Operations	56		280		GOMEX RC
	78		390		JAX RC
	8		40		Key West RC
	24		120		Navy Cherry Point RC
	446		2,230		VACAPES RC
Surface Warfare					
Bombing Exercise Air-to-Surface	67		335		GOMEX RC
	437		2,185		JAX RC
	108		540		Navy Cherry Point RC
	359		1,795		VACAPES RC
Fast Attack Craft and Fast Inshore Attack Craft Exercise	25		125		JAX RC
	25		125		VACAPES RC
Gunnery Exercise Air-to-Surface Medium-Caliber	30		150		GOMEX RC
	495		2,475		JAX RC
	395		1,975		Navy Cherry Point RC
	720		3,600		VACAPES RC
Gunnery Exercise Air-to-Surface Small-Caliber	200		1,000		JAX RC
	130		650		Navy Cherry Point RC
	560		2,800		VACAPES RC
Gunnery Exercise Surface-to-Surface Boat	6		30		GOMEX RC
	26		130		JAX RC

Table 2.6-1: Proposed Training Activities per Alternative (continued)

Activity Name	*Annual # of Activities*[1]		*5-Year # of Activities*		*Location*[2]
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
Medium-Caliber	128		640		Navy Cherry Point RC
	2		10		Northeast RC
	264		1,320		VACAPES RC
Gunnery Exercise Surface-to-Surface Boat Small-Caliber	67		335		GOMEX RC
	84		420		JAX RC
	92		460		Navy Cherry Point RC
	18		90		Northeast RC
	330		650		VACAPES RC
Gunnery Exercise Surface-to-Surface Ship Large-Caliber	10		5		Other AFTT Areas
	9		45		GOMEX RC
	47		235		JAX RC
	35		175		Navy Cherry Point RC
	71		355		VACAPES RC
Gunnery Exercise Surface-to-Surface Ship Medium-Caliber	42		210		Other AFTT Areas
	26		130		GOMEX RC
	119		595		JAX RC
	41		205		Navy Cherry Point RC
	245		1,225		VACAPES RC
Gunnery Exercise Surface-to-Surface Ship Small-Caliber	50		250		Other AFTT Areas
	10		50		GOMEX RC
	300		1,500		JAX RC
	20		100		Navy Cherry Point RC
	450		2,250		VACAPES RC
Integrated Live Fire Exercise	4		20		JAX RC
	4		20		VACAPES RC
Laser Targeting – Aircraft	315		1,575		JAX RC
	272		1,360		VACAPES RC
Laser Targeting – Ship	4		20		JAX RC
	4		20		VACAPES RC
Maritime Security Operations	59		245		GOMEX RC
	210		1,050		JAX RC
	75		375		Navy Cherry Point RC
	13		65		Northeast RC
	895		4,475		VACAPES RC
Missile Exercise Air-to-Surface	102		510		JAX RC
	52		260		Navy Cherry Point RC
	88		440		VACAPES RC
Missile Exercise Air-to-Surface – Rocket	10		50		GOMEX RC
	110		550		JAX RC
	10		50		Navy Cherry Point RC
	100		500		VACAPES RC
Missile Exercise Surface-to-Surface	15		75		JAX RC
	7		35		VACAPES RC
Sinking Exercise	1		5		SINKEX Box

Table 2.6-1: Proposed Training Activities per Alternative (continued)

Activity Name	*Annual # of Activities[1]*		*5-Year # of Activities*		*Location[2]*
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
Other Training Activities					
Elevated Causeway System	1		5		Lower Chesapeake Bay
	1		5		Navy Cherry Point RC
Precision Anchoring	9		45		GOMEX RC
	231		1,155		JAX RC
	710		3,550		VACAPES RC
Search and Rescue	776		3,880		JAX RC
	1,176		5,880		VACAPES RC
Submarine Navigation	169		845		NSB New London
	3		15		NSB Kings Bay
	3		15		NS Mayport
	84		420		NS Norfolk
	23		115		Port Canaveral, FL
Submarine Sonar Maintenance	12		60		Other AFTT Areas
	66		330		NSB New London
	4		20		JAX RC
	2		10		NSB Kings Bay
	34		170		NS Norfolk
	66		330		Northeast RC
	2		10		Port Canaveral, FL
	34		170		VACAPES RC
Submarine Under Ice Certification	3		15		JAX RC
	3		15		Navy Cherry Point RC
	9		45		Northeast RC
	9		45		VACAPES RC
Surface Ship Object Detection	74		370		NS Mayport
	160		800		NS Norfolk
Surface Ship Sonar Maintenance	0	18	0	90	Other AFTT Areas
	50		250		JAX RC
	50		250		NS Mayport
	120		600		Navy Cherry Point RC
	235		1,175		NS Norfolk
	120		600		VACAPES RC

Table 2.6-1: Proposed Training Activities per Alternative (continued)

Activity Name	*Annual # of Activities*[1]		*5-Year # of Activities*		*Location*[2]
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
Waterborne Training	42		210		GOMEX RC
	55		275		JAX RC
	141		705		Northeast RC
	110		550		VACAPES RC

[1] For activities where the maximum number of events varies between years, a range is provided to indicate the "representative–maximum" number of events. For activities where no variation is anticipated, only the maximum number of events within a single year is provided.

[2] Locations given are areas where activities typically occur. However, activities could be conducted in other locations within the Study Area. Where multiple locations are provided within a single cell, the number of activities could occur in any of the locations, not in each of the locations.

* For anti-submarine warfare tracking exercise – Ship, Alternative 1, 50 percent of requirements are met through synthetic training or other training exercises

AFTT: Atlantic Fleet Training and Testing; NS: Naval Station; NSB: Naval Submarine Base; NSWC: Naval Surface Warfare Center; GOMEX: Gulf of Mexico; JAX: Jacksonville; RC: Range Complex; SINKEX: sinking exercises; VACAPES: Virginia Capes

2.6.2 PROPOSED TESTING ACTIVITIES

All proposed testing activities are listed in Table 2.6-2 through Table 2.6-4.

Table 2.6-2: Naval Air Systems Command Proposed Testing Activities per Alternative

Activity Name	*Annual # of Activities[1]*		*5-Year # of Activities*		*Location[2]*
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
Air Warfare					
Air Combat Maneuver Test	550		2,750		VACAPES RC
Air Platform Weapons Integration Test	40		200		VACAPES RC
Air Platform-Vehicle Test	12		60		GOMEX RC
	9		45		JAX RC
	9		45		Key West RC
	9		45		Navy Cherry Point RC
	190		950		VACAPES RC
Air-to-Air Weapons System Test	10		50		GOMEX RC
Air-to-Air Gunnery Test – Medium-Caliber	55		275		VACAPES RC
Air-to-Air Missile Test	83		415		VACAPES RC
Intelligence, Surveillance, and Reconnaissance Test	7		35		JAX RC
	9		45		Navy Cherry Point RC
	406		2,030		VACAPES RC
Anti-Submarine Warfare					
Anti-Submarine Warfare Torpedo Test	20–43	43	146	215	JAX RC
	40–121	121	362	605	VACAPES RC
Anti-Submarine Warfare Tracking Test – Helicopter	4–6	6	24	30	GOMEX RC
	0–12	12	24	60	JAX RC
	3–27	27	39	135	Key West RC
	28–110	110	304	550	Northeast RC
	137–280	280	951	1,400	VACAPES RC
Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft	10–15	15	60	75	GOMEX RC
	19	24	95	120	JAX RC
	10–12	12	54	60	Key West RC
	14–15	16	72	80	Navy Cherry Point RC
	36–45	48	198	240	Northeast RC
	25	26	125	130	VACAPES RC
Kilo Dip	2–6	6	14	30	GOMEX RC
	0–6	6	6	30	JAX RC
	0–6	6	6	30	Key West RC
	0–4	4	8	20	Northeast RC
	20–40	40	140	200	VACAPES RC
Sonobuoy Lot Acceptance Test	160		800		Key West RC
Electronic Warfare					
Chaff Test	20		100		GOMEX RC
	4		20		JAX RC
	24		120		VACAPES RC

Table 2.6-2: Naval Air Systems Command Proposed Testing Activities per Alternative (continued)

Activity Name	*Annual # of Activities[1]*		*5-Year # of Activities*		*Location[2]*
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
Electronic Systems Evaluation	2		10		JAX RC
	61		305		VACAPES RC
Flare Test	10		50		GOMEX RC
	20		100		VACAPES RC
Mine Warfare					
Airborne Dipping Sonar Minehunting Test	16–32	32	96	160	NSWC Panama City
	6–18	18	42	90	VACAPES RC
Airborne Laser Based Mine Detection System Test	40		200		NSWC Panama City
	50		250		VACAPES RC
Airborne Mine Neutralization System Test	20–27	32	107	160	NSWC Panama City
	25–45	50	145	250	VACAPES RC
Airborne Sonobuoy Minehunting Test	52		260		NSWC Panama City
	24		120		VACAPES RC
Mine Laying Test	1		5		JAX RC
	2		10		VACAPES RC
Surface Warfare					
Air-to-Surface Bombing Test	20		100		VACAPES RC
Air-to-Surface Gunnery Test	25–55	55	215	275	JAX RC
	110–140	140	640	700	VACAPES RC
Air-to-Surface Missile Test	0–10	10	20	50	GOMEX RC
	29–38	38	167	190	JAX RC
	117–148	148	663	740	VACAPES RC
High Energy Laser Weapons Test	108		540		VACAPES RC
Laser Targeting Test	5		25		VACAPES RC
Rocket Test	15–19	19	87	95	JAX RC
	31–35	35	167	175	VACAPES RC
Other Testing Activities					
Undersea Range System Test	4–20		42		JAX RC
Acoustic and Oceanographic Research	1		5		GOMEX RC
	1		5		JAX RC
	1		5		Key West RC
	1		5		Northeast RC
	1		5		VACAPES RC
Air Platform Shipboard Integrate Test	126		630		VACAPES RC
Maritime Security	12		60		JAX RC
	12		60		Navy Cherry Point RC
	20		100		VACAPES RC

Table 2.6-2: Naval Air Systems Command Proposed Testing Activities per Alternative (continued)

Activity Name	*Annual # of Activities*[1]		*5-Year # of Activities*		*Location*[2]
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
Shipboard Electronic Systems Evaluation	24		120		GOMEX RC
	24		120		JAX RC
	24		120		Key West RC
	26		130		VACAPES RC

[1] For activities where the maximum number of events varies between years, a range is provided to indicate the "representative–maximum" number of events. For activities where no variation is anticipated, only the maximum number of events within a single year is provided.

[2] Locations given are areas where activities typically occur. However, activities could be conducted in other locations within the Study Area.

GOMEX: Gulf of Mexico; JAX: Jacksonville; NSWC: Naval Surface Warfare Center; RC: Range Complex; VACAPES: Virginia Capes

Table 2.6-3: Naval Sea Systems Command Proposed Testing Activities per Alternative

Activity Name	*Annual # of Activities*[1]		*5-Year # of Activities*		*Location*[2]
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
Anti-Submarine Warfare					
Anti-Submarine Warfare Mission Package Testing	42		210		JAX RC
	4		20		Newport, RI
	4		20		NUWC Newport
	26		130		VACAPES RC
At-Sea Sonar Testing	2		10		JAX RC Navy Cherry Point RC Northeast RC VACAPES RC
	1		5		JAX RC Navy Cherry Point RC VACAPES RC
	2		10		Offshore Fort Pierce, FL GOMEX RC JAX SFOMF Northeast RC VACAPES
	4		20		JAX RC
	2		10		Navy Cherry Point RC
	8		40		NUWC Newport
	12		60		VACAPES RC
Pierside Sonar Testing	1		5		NSB New London NS Norfolk Port Canaveral, FL
	11		55		Bath, ME
	5		25		NSB New London
	4		20		NSB Kings Bay
	8		40		Newport, RI

Table 2.6-3: Naval Sea Systems Command Proposed Testing Activities per Alternative (continued)

Activity Name	*Annual # of Activities*[1]		*5-Year # of Activities*		*Location*[2]
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
	13		65		NS Norfolk
Pierside Sonar Testing (continued)	2		10		Pascagoula, MS
	3		15		Port Canaveral, FL
	2		10		PNS
Submarine Sonar Testing/Maintenance	16		80		Norfolk, VA
	24		120		PNS
Surface Ship Sonar Testing/Maintenance	1		5		JAX RC
	1		5		NS Mayport
	3		15		NS Norfolk
	3		15		VACAPES RC
Torpedo (Explosive) Testing	4		20		GOMEX RC offshore Fort Pierce, FL Key West RC Navy Cherry Point RC Northeast RC VACAPES RC
	2		10		GOMEX RC JAX RC Northeast RC VACAPES RC
Torpedo (Non-Explosive) Testing	8		40		GOMEX RC
	11		55		Offshore Fort Pierce, FL
	8		40		Navy Cherry Point RC
	8		40		Northeast RC
	30		150		NUWC Newport
	11		55		VACAPES RC
Countermeasure Testing	5		25		GOMEX RC Key West RC JAX RC NUWC Newport VACAPES RC
	2–4		14		GOMEX RC JAX RC Northeast RC VACAPES RC
Electronic Warfare					
Radar and Other System Testing	6–10		34		GOMEX RC JAX RC Key West RC Navy Cherry Point RC Northeast RC NSWC Panama City NUWC Newport SFOMF

Table 2.6-3: Naval Sea Systems Command Proposed Testing Activities per Alternative (continued)

Activity Name	*Annual # of Activities*[1]		*5-Year # of Activities*		*Location*[2]
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
					VACAPES RC
	4		20		NSB New London
	0–3		3		JEB LC-FS NS Norfolk
	2		10		NS Norfolk
	2		10		Northeast RC
	21–45		129		VACAPES RC
Mine Warfare					
Mine Countermeasure and Neutralization Testing	13		65		NSWC Panama City
	6		30		VACAPES RC
Mine Countermeasure Mission Package Testing	19		95		GOMEX RC
	10		50		JAX RC
	11		55		NSWC Panama City
	2		10		SFOMF
	5		25		VACAPES RC
Mine Detection and Classification Testing	6		30		GOMEX RC
	10		50		Navy Cherry Point RC
	47–52		250		NSWC Panama City
	7–12		43		Riviera Beach, FL
	4		20		SFOMF
	3		15		VACAPES RC
Surface Warfare					
Gun Testing – Large-Caliber	12		60		GOMEX RC JAX RC Key West RC Navy Cherry Point RC Northeast RC VACAPES RC
	1		5		GOMEX RC
	1		5		JAX RC
	1		5		Key West RC
	1		5		Navy Cherry Point RC
	1		5		Northeast RC
	33		165		NSWC Panama City
	5		25		VACAPES RC
Gun Testing – Medium-Caliber	12		60		GOMEX RC JAX RC Key West RC Navy Cherry Point RC Northeast RC VACAPES RC
	102		510		NSWC Panama City
	5		24		VACAPES RC

Table 2.6-3: Naval Sea Systems Command Proposed Testing Activities per Alternative (continued)

Activity Name	*Annual # of Activities[1]*		*5-Year # of Activities*		*Location[2]*
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
Gun Testing – Small-Caliber	24		120		GOMEX RC JAX RC Key West RC Navy Cherry Point RC Northeast RC VACAPES RC
	13		65		GOMEX RC
	7		35		NSWC Panama City
	8		40		VACAPES RC
Kinetic Energy Weapon Testing	61		301		GOMEX RC JAX RC Key West RC Navy Cherry Point RC Northeast RC VACAPES RC
Missile and Rocket Testing	13		65		GOMEX RC JAX RC Key West RC Navy Cherry Point RC Northeast RC VACAPES RC
	1		5		GOMEX RC
	2		10		JAX RC
	5		25		Northeast RC
	22		110		VACAPES RC
Unmanned Systems					
Unmanned Aerial System Testing	15		75		Northeast RC
	17		85		NUWC Newport
	15		75		VACAPES RC
Unmanned Surface Vehicle System Testing	132		660		NUWC Newport
Unmanned Underwater Vehicle Testing	16		80		GOMEX RC JAX RC NUWC Newport
	41		205		GOMEX RC
	25		125		JAX RC
	145–146		727		NSWC Panama City
	308–309		1,541		NUWC Newport
	9		45		Riviera Beach, FL
	42		210		SFOMF
Vessel Evaluation					
Aircraft Carrier Sea Trials – Propulsion Testing	2		10		VACAPES RC

Table 2.6-3: Naval Sea Systems Command Proposed Testing Activities per Alternative (continued)

Activity Name	*Annual # of Activities[1]*		*5-Year # of Activities*		*Location[2]*
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
Large Ship Shock Trial	1		1		GOMEX RC JAX RC VACAPES RC
In-Port Maintenance Testing	24		120		NS Mayport NS Norfolk
	2		10		NS Mayport
	5		25		NS Norfolk
Air Defense Testing	1		5		GOMEX RC
	2		10		JAX RC
	1		5		Northeast RC
	5		25		VACAPES RC
Propulsion Testing	34		170		GOMEX RC JAX RC Key West RC Navy Cherry Point RC Northeast RC VACAPES RC
	86		430		Gulf of Mexico
	2		10		JAX RC
	6		30		Navy Cherry Point RC
	5		25		Northeast RC
	7		35		VACAPES RC
Surface Warfare Testing	2		10		GOMEX RC
	13		65		JAX RC
	1		5		Key West RC
	10		50		Northeast RC
	9		45		VACAPES RC
Underwater Warfare Testing	2		10		JAX RC Northeast RC VACAPES RC
	0–2		4		JAX RC Navy Cherry Point RC Northeast RC SFOMF VACAPES RC
	2		10		GOMEX RC
	6		30		JAX RC
	3		15		Northeast RC
	2		10		VACAPES RC
Small Ship Shock Trial	0–3		3		JAX RC VACAPES RC
Submarine Sea Trials – Propulsion Testing	1		5		JAX RC
	1		5		Northeast RC
	1		5		VACAPES RC

Table 2.6-3: Naval Sea Systems Command Proposed Testing Activities per Alternative (continued)

Activity Name	*Annual # of Activities[1]*		*5-Year # of Activities*		*Location[2]*
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
Submarine Sea Trials – Weapons System Testing	2		10		Offshore Fort Pierce, FL GOMEX RC JAX SFOMF Northeast VACAPES
	4		20		JAX RC
	4		20		Northeast RC
	4		20		VACAPES RC
Total Ship Survivability Trials	0–1		1		JAX RC VACAPES RC
Vessel Signature Evaluation	9		45		JAX RC VACAPES RC
	2		10		GOMEX RC
	16		80		JAX RC
	5		25		JEB LC-FS
	18		90		VACAPES RC
Hydrodynamic and Maneuverability Testing	2		10		GOMEX RC JAX RC Key West RC Navy Cherry Point RC Northeast RC VACAPES RC
Signature Analysis Operations	1		5		JAX RC
	59		295		SFOMF
Underwater Search, Deployment, and Recovery	33		165		SFOMF
Other Testing Activities					
Insertion/Extraction	4		20		Key West RC
	264		1,320		NSWC Panama City
Line Charge Testing	4		20		NSWC Panama City
Acoustic Component Testing	33		165		SFOMF
Chemical and Biological Simulant Testing	80		400		JAX RC
	80		400		Navy Cherry Point RC
	80		400		Northeast RC
	80		400		VACAPES RC
Non-Acoustic Component Testing	4		20		GOMEX RC
	4		20		VACAPES RC
Payload Deployer Testing	1		5		GOMEX RC
	1		5		Northeast RC
	39		195		NUWC Newport

Table 2.6-3: Naval Sea Systems Command Proposed Testing Activities per Alternative (continued)

Activity Name	*Annual # of Activities*[1]		*5-Year # of Activities*		*Location*[2]
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
Semi-Stationary Equipment Testing	4		20		Newport, RI
	11		55		NSWC Panama City
	190		950		NUWC Newport
Towed Equipment Testing	36		180		NUWC Newport

[1] For activities where the maximum number of events could vary between years, the information is presented as a "representative-maximum" number of events per year. For activities where no variation is anticipated, only the maximum number of events within a single year is provided.

[2] Locations given are areas where activities typically occur. However, activities could be conducted in other locations within the Study Area. Where multiple locations are provided within a single cell, the number of activities could occur in any of the locations, not in each of the locations.

Notes: JEB LC-FS: Joint Expeditionary Base Little Creek-Fort Story; GOMEX: Gulf of Mexico; JAX: Jacksonville; NS: Naval Station; NSB: Naval Submarine Base; NSWC: Naval Surface Warfare Center; NUWC: Naval Undersea Warfare Center; PNS: Portsmouth Naval Shipyard; RC: Range Complex; SFOMF: South Florida Ocean Measurement Facility Testing Range; VACAPES: Virginia Capes

Table 2.6-4: Office of Naval Research Proposed Testing Activities per Alternative

Activity Name	*Annual # of Activities*		*5-Year # of Activities*		*Location*
	Alt 1	*Alt 2*	*Alt 1*	*Alt 2*	
Acoustic and Oceanographic Science and Technology					
Acoustic and Oceanographic Research	4		20		GOMEX RC
	7		35		Northeast RC
	2		10		VACAPES RC
Emerging Mine Countermeasure Technology Research	1		5		JAX RC
	2		10		Northeast RC
	1		5		VACAPES RC
Large Displacement Unmanned Underwater Vehicle Testing	4		20		GOMEX RC
	12		60		JAX RC
	4		20		Navy Cherry Point RC
	16		80		Northeast RC
	8		40		VACAPES RC

Notes: GOMEX: Gulf of Mexico; JAX: Jacksonville, Florida; RC: Range Complex; VACAPES: Virginia Capes

This page intentionally left blank.

References

U.S. Department of Defense. (2002). *Electromagnetic Environmental Effects: Requirements for Systems*. (MIL-STD-464A).

U.S. Department of Defense. (2009). *Protecting Personnel from Electromagnetic Fields*. (DoD Instruction 6055.11).

U.S. Department of the Navy. (2011). *U.S. Navy Dive Manual*.

This page intentionally left blank.