Draft

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

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3.9 BIRDS AND BATS

BIRDS AND BATS SYNOPSIS

The Action Proponents considered the stressors to birds and bats that could result from the Proposed Action in the Study Area. The following conclusions have been reached for the Preferred Alternative (Alternative 1):

- Acoustics: Unless very close to an intense sound source, responses by birds to acoustic stressors would likely be limited to short-term behavioral responses. Some birds may be temporarily displaced and there may be temporary increases in stress levels. Although individual birds may be impacted, no population-level impacts are expected to occur. Unlike other mammals, bats are not susceptible to temporary and permanent threshold shifts. Though bats are less likely than birds to be exposed to noise from the proposed activities, because of their infrequent presence above open water, they too may be temporarily displaced during foraging but would return shortly after the noise ceases. Although individual bats may be impacted, no population-level impacts are expected to occur.
- Explosives: Birds and bats could be exposed to in-air explosions. Sounds generated by most small underwater explosions are unlikely to disturb birds or bats above the water surface. However, a sufficiently large detonation near the water surface, could result in injury or mortality of birds and bats above the water surface. Detonations in air could injure birds or bats while either in flight or birds at the water surface; however, detonations in air during anti-air warfare training and testing would typically occur at much higher altitudes where seabirds, migrating birds, and bats are less likely to be present. Detonations can result in fish kills, which may attract birds. If this occurred in training or testing where multiple detonations take place, bird mortalities or injuries are possible. An explosive detonation would likely cause a startle reaction, as the exposure would be brief, and any reactions are expected to be short term. Although a few individuals may experience long-term impacts and potential mortality, no population-level impacts are expected to occur.
- Energy: The impact of energy stressors on birds and bats is expected to be negligible based on (1) the limited geographic area in which they are used, (2) the rare chance that an individual bird or bat would be exposed to these devices while in use, and (3) the tendency of birds and bats to temporarily avoid areas of activity when and where the devices are in use. The impacts of energy stressors would be limited to individual cases where a bird or bat might become temporarily disoriented or be injured. Although a small number of individuals may be impacted, no population-level impacts are expected to occur.
- Physical disturbance and strikes: There is the potential for individual birds to be injured or killed by physical disturbance and strikes during training and testing. However, there would not be long-term species or population-level impacts due to the vast area over which training and testing activities occur and the small size of birds and their ability to flee disturbance. Impacts to bats would be similar to, but less than, those described for birds since bats rarely occur in the Study Area compared to birds and because bats are most active from dusk through dawn when training and testing is limited.

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BIRDS AND BATS SYNOPSIS

- Entanglement: Entanglement stressors have the potential to impact birds. However, the likelihood is low because the relatively small quantities of materials that could cause entanglement would be dispersed over very wide areas, often in locations or depth zones outside the range or foraging abilities of most birds. A small number of individuals may be impacted, but no effects at the population level would be expected to occur. Since bats do not occur in the water column and rarely occur at the water surface in the Study Area, no impacts to bats are anticipated from entanglement stressors.
- Ingestion: It is possible that persistent expended materials could be accidentally ingested by birds while they were foraging for natural prey items, though the probability of this event is low as (1) foraging depths of diving birds is generally restricted to the surface of the water or shallow depths, (2) the material is unlikely to be mistaken for prey, and (3) most of the material remains at or near the sea surface for a short length of time. No population-level effect to any bird species would be expected to occur. Since bats do not occur in the water column and rarely feed at the water surface in the Study Area, no impacts to bats are anticipated from ingestion stressors.

3.9.1 Introduction

The following sections provide an overview of the birds and bats in the Study Area and the potential impacts of the proposed training and testing activities on them. Impacts to birds and bats from the Proposed Action were analyzed in the *2018 Final Atlantic Fleet Training and Testing Environmental Impact Statement/Overseas Environmental Impact Statement* (hereinafter referred to as the 2018 Final EIS/OEIS). The primary changes from the analysis are provided in subsequent sections.

3.9.2 Affected Environment

The affected environment provides the context for evaluating the effects of the proposed military readiness (training and testing) activities on birds and bats. With noted exceptions, the affected environment for birds and bats in the Study Area is not meaningfully different from what is described in the 2018 Final EIS/OEIS. See Appendix F (Biological Resources Supplemental Information) for detailed information on the affected environment of resources.

The Study Area is generally consistent with that analyzed in the 2018 Final EIS/OEIS. Additions to the Study Area include pierside training and testing events and transit along established navigation channels from pierside locations to offshore range complexes in the Gulf of Mexico. United States (U.S.) Coast Guard activities are similar in nature to Navy activities and fall under the same stressor categories.

3.9.2.1 General Background

Much of the general background for birds and bats has not changed from that which was described in the 2018 Final EIS/OEIS. Exceptions include newer studies and information on bat records and migration offshore in the Study Area, additional research on seabird hearing and underwater sound, and updates to lists of threatened and endangered species and migratory birds. This updated information is described in Appendix F (Biological Resources Supplemental Information).

3.9.2.1.1 Group Size

A variety of bird group sizes may be encountered throughout the Study Area, ranging from the solitary migration of an individual to thousands of birds in single-species and mixed-species flocks. Group size varies based on species, location, weather conditions, time of year and time of day and can also fluctuate from year to year. Bats could occur in the Study Area as individuals or small groups foraging nearshore or migrating and this presence would vary with season, location, time of day, and weather, as well as among species.

3.9.2.1.2 Habitat Use

Habitat use by birds is described in terms of water column, shoreline, nearshore, and airspace of the Study Area. Habitat use by bats includes the shoreline and airspace. A description of taxonomic groups and their location/habitat use in the Study Area is provided in Appendix F (Biological Resources Supplemental Information).

Birds use the Study Area for all life history requirements including migration. Portions of the Atlantic, Mississippi, and Central flyways occur within the Study Area. These are used by a large number of seabird species as well shorebirds and songbirds. Birds forage in a variety of habitats in the Study Area including nearshore (immediately adjacent to the coastline) and on the open ocean. While all bats are terrestrial, some species forage or migrate over marine environments, sometimes at considerable distances from shore. Following a review of recent literature, the general information presented on the habitat use of birds and bats described in the 2018 Final EIS/OEIS has not changed.

3.9.2.1.3 Movement and Behavior

Seabird species dive, skim, plunge, pursue, and grasp prey at the water's surface or in the water column, some feed on the bottom at depths greater than 100 feet, and some obtain food by pursuing other birds in the air. Some seabirds aerial plunge, and others dive from the surface. Bats do not dive but may forage above water, typically adjacent to land.

3.9.2.1.4 Hearing and Vocalization

Following a review of recent literature, the general information presented on the hearing and vocalization of birds described in the 2018 Final EIS/OEIS (see Section 3.9.2.1.4, Hearing and Vocalization) had not changed; however, several studies of seabird hearing have been published since the 2018 Final EIS/OEIS that support previous work. Bats vocalize to communicate and to produce echolocation signals to better understand their surroundings and to find prey. The understanding of hearing and vocalization in bats has not changed since the publication of the 2018 Final EIS/OEIS.

3.9.2.1.5 General Threats

General threats to birds and bats are the same as those discussed in the 2018 Final EIS/OEIS (see Section 3.9.2.1.5, General Threats) including interaction with fishing gear; predation and competition with introduced species; degradation and disturbance of nesting areas; pollution; noise and light from human activities; collisions with structures and aircraft; and climate change. Bats are threatened by disease, habitat loss and degradation, human industry., and climate change. New research and updates regarding general threats to resources are provided in Appendix F (Biological Resources Supplemental Information).

3.9.2.2 Endangered Species Act-Listed Species

Table 3.9-1 shows the bird and bat species listed under the Endangered Species Act (ESA) and occurring in the Study Area. No critical habitat for these species occurs in the Study Area; however, piping plover critical habitat and red knot proposed critical habitat occur near the Study Area and are

shown in Figure 3.9-1 through Figure 3.9-8. Detailed species descriptions, including status and management, habitat and geographic range, population trends, predator and prey interactions, species-specific threats, as well as designated critical habitat are provided in Appendix F (Biological Resources Supplemental Information). Changes in the ESA listings and critical habitat designations since the 2018 Final EIS/OEIS include:

- listing of the black-capped petrel as endangered in 2024
- listing of northern long-eared bat as endangered in 2023
- proposed listing of tricolored bat as endangered in 2021
- proposed establishment of red knot critical habitat in 2021 and 2023

Table 3.9-1: Status and Occurrence of Endangered Species Act-Listed Bird and Bat Species in the Study Area

Species Name and Regulatory Status			*Location in the Study Area*		
Common Name	***Scientific Name***	***ESA Status/Critical Habitat***	***Range Complex/ Testing Range***	***Range Complex Inshore Areas***	***Piers/Ports/Coast Guard Stations***
Piping plover	*Charadrius melodus*	Threatened/ Designated*	All locations	All locations	All locations
Red knot	*Calidris canutus rufa*	Threatened/ Proposed*	All locations	All locations	All locations
Roseate tern[1]	*Sterna dougallii dougallii*	Endangered[1] Threatened[2]/ None	Northeast RC; VACAPES RC; Navy Cherry Point RC; JAX RC; Key West RC	Northeast RC Inshore; VACAPES RC Inshore; JAX RC Inshore; Key West RC Inshore	Pierside Portsmouth Naval Shipyard; NSB New London; NS Newport; NS Norfolk; JEB Little Creek; Norfolk Naval Shipyard Civilian Ports Bath, ME; Boston, MA; Earle, NJ; Delaware Bay, DE; Hampton Roads, VA; Morehead City, NC; Wilmington, NC Coast Guard Stations Boston, MA; New London, CT; Newport, RI; Virginia Beach, VA; Portsmouth, VA; Elizabeth City, NC; Charleston, SC; Key West, FL
Bermuda petrel	*Pterodroma cahow*	Endangered/ None	Northeast RC; VACAPES RC; Navy Cherry Point RC; SINKEX Box; Other AFTT Areas	None	None

Table 3.9-1: Status and Occurrence of Endangered Species Act-Listed Bird and Bat Species in the Study Area (continued)

Species Name and Regulatory Status			*Location in the Study Area*		
Common Name	***Scientific Name***	***ESA Status/Critical Habitat***	***Range Complex/ Testing Range***	***Range Complex Inshore Areas***	***Piers/Ports/Coast Guard Stations***
Black- capped petrel	*Pterodroma hasitata*	Endangered/ None[3]	Northeast RC; VACAPES RC; Navy Cherry Point RC; JAX RC; Key West RC; GOMEX RC; SINKEX Box; Other AFTT Areas	None	None
Indiana bat	*Myotis sodalis*	Endangered/ None	Northeast RC; NUWC Division, Newport Testing Range	Northeast RC Inshore	Pierside NSB New London Civilian Ports Earle, NJ Coast Guard Stations New London, CT; Montauk, NY; Atlantic City, NJ
Northern long-eared bat	*Myotis septentrionalis*	Endangered/ None	Northeast RC; NUWC Division, Newport Testing Area; VACAPES RC; Navy Cherry Point RC; JAX RC	Northeast RC Inshore; VACAPES RC Inshore	Pierside Portsmouth Naval Shipyard, NSB New London NS Newport, NS Norfolk, JEB Little Creek, Norfolk Naval Shipyard Civilian Ports Bath, ME; Boston, MA; Earle, NJ; Delaware Bay, DE; Hampton Roads, VA; Morehead City, NC; Wilmington, NC Coast Guard Stations Boston, MA; New London, CT; Newport, RI; Montauk, NY; Atlantic City, NJ; Virginia Beach, VA; Portsmouth, VA; Elizabeth City, NC; Charleston, SC

Table 3.9-1: Status and Occurrence of Endangered Species Act-Listed Bird and Bat Species in the Study Area (continued)

Species Name and Regulatory Status			*Location in the Study Area*		
Common Name	***Scientific Name***	***ESA Status/Critical Habitat***	***Range Complex/ Testing Range***	***Range Complex Inshore Areas***	***Piers/Ports/Coast Guard Stations***
Tricolored bat	*Perimyotis subflavus*	Proposed Endangered/ None	Northeast RC; NUWC Division, Newport Testing Range; VACAPES RC; Navy Cherry Point Range; JAX RC; GOMEX RC; NSWC Panama City, Division Testing Range	Northeast RC Inshore, VACAPES RC Inshore, JAX RC Inshore, GOMEX RC Inshore	<u>Pierside</u> Portsmouth Naval Shipyard, NSB New London, Naval Station Newport, NS Norfolk JEB Little Creek, Norfolk Naval Shipyard, NSB Kings Bay <u>Civilian Ports</u> Bath, ME; Boston, MA; Earle, NJ; Delaware Bay, DE; Hampton Roads, VA; Morehead City, NC; Wilmington, NC; Kings Bay, GA; Savannah, GA; Beaumont, TX; Corpus Christi, TX; Gulfport, MS; Pascagoula, MS <u>Coast Guard Stations</u> Southwest Harbor, ME; Boston, MA; New London, CT; Newport, RI; Montauk, NY; Atlantic City, NJ; Virginia Beach, VA; Portsmouth, VA; Elizabeth City, NC; Charleston, SC; Pensacola, FL; Corpus Christi, TX

Notes**:** AFTT = Atlantic Fleet Training and Testing; ESA = Endangered Species Act; GOMEX = Gulf of Mexico; JAX = Jacksonville; JEB = Joint Expeditionary Base; NS = Naval Station; NSB = Naval Submarine Base; NSWC = Naval Surface Warfare Center; NUWC = Naval Undersea Warfare Center; RC = Range Complex; SINKEX = Sinking Exercise; VACAPES = Virginia Capes

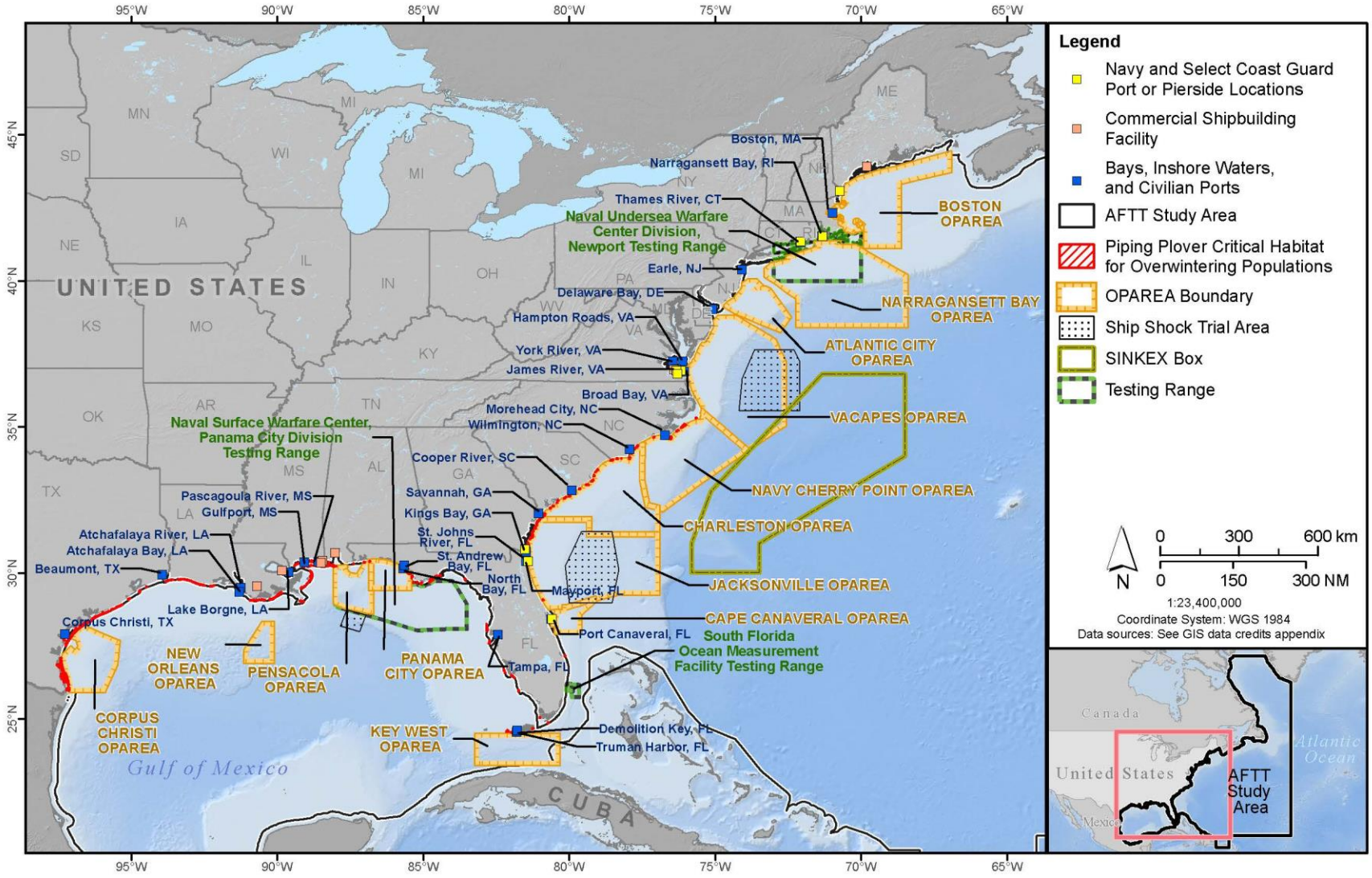
[1] The roseate tern is listed as endangered under the ESA along the Atlantic coast south to North Carolina, Canada (Newfoundland, Nova Scotia, Quebec), and Bermuda.

[2] The roseate tern is listed as threatened under the ESA in the Western Hemisphere and adjacent oceans, including Florida, Puerto Rico, and the Virgin Islands.

[3] USFWS anticipates proposing critical habitat for the black-capped petrel in 2024 (88 *Federal Register* 89611)

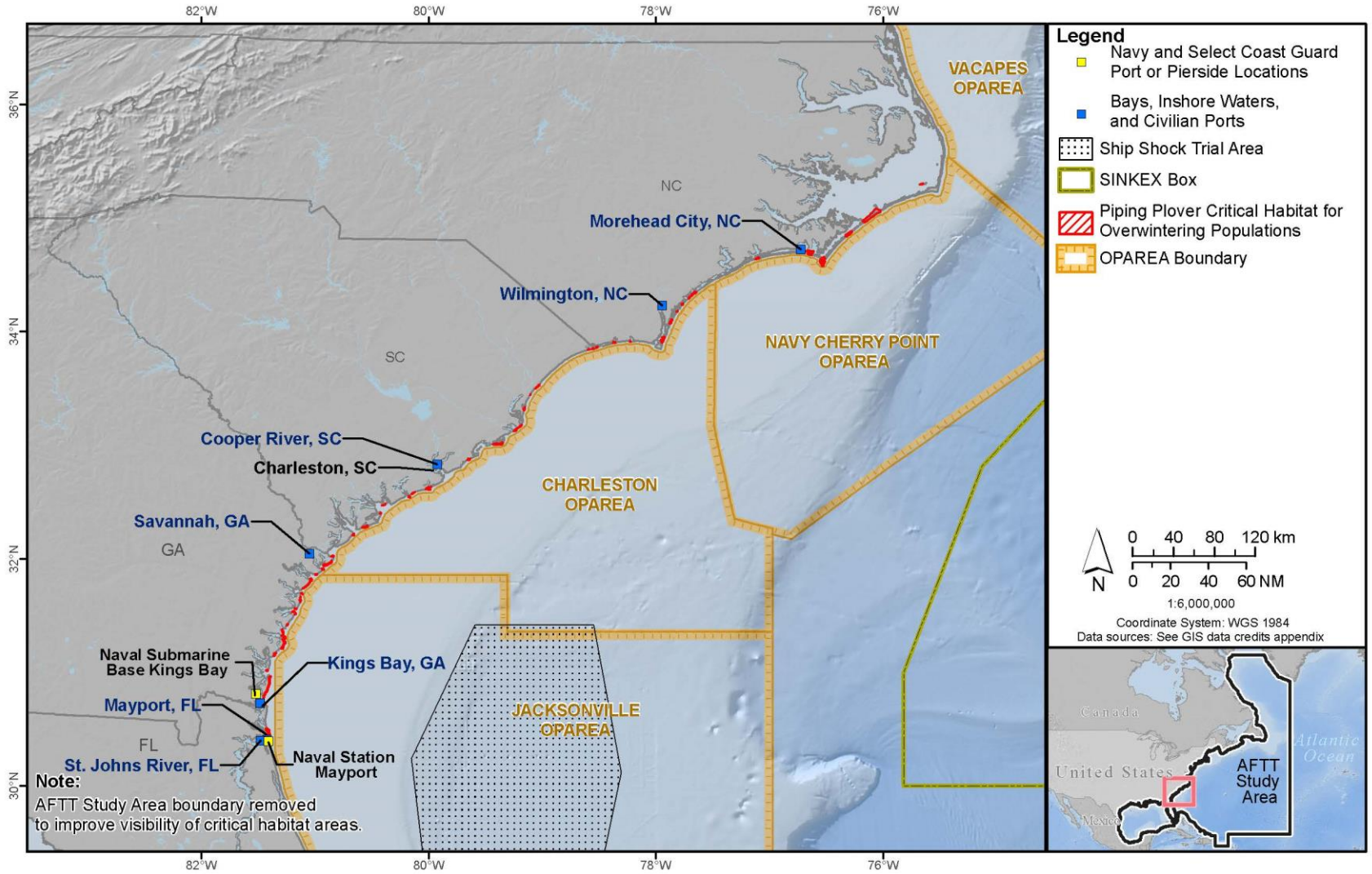
* Critical habitat is adjacent to the Study Area

Source: U.S. Fish and Wildlife Service (2023) for ESA Status.



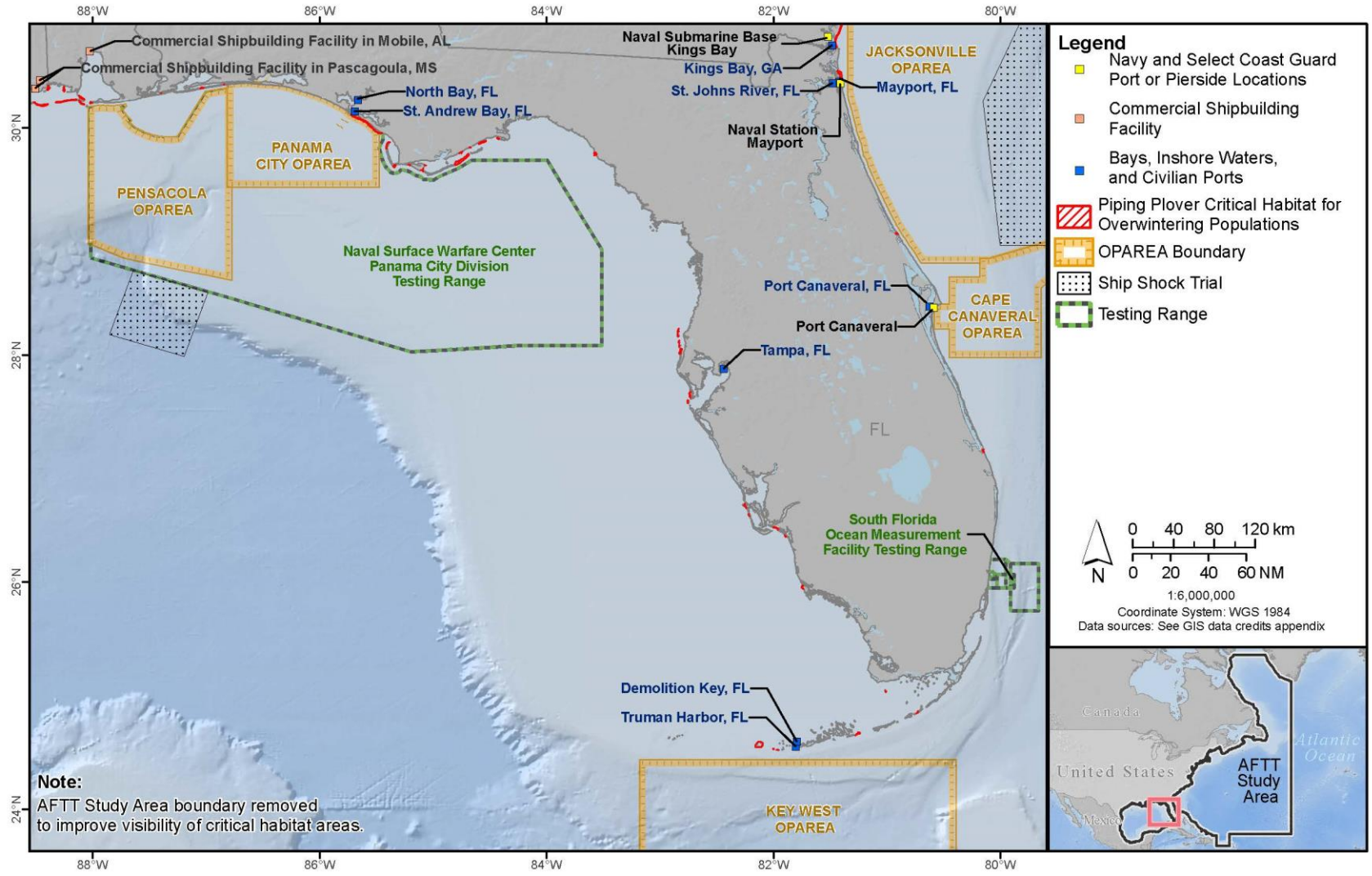
Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area; SINKEX = Sinking Exercise

Figure 3.9-1: Piping Plover Critical Habitat near the Study Area



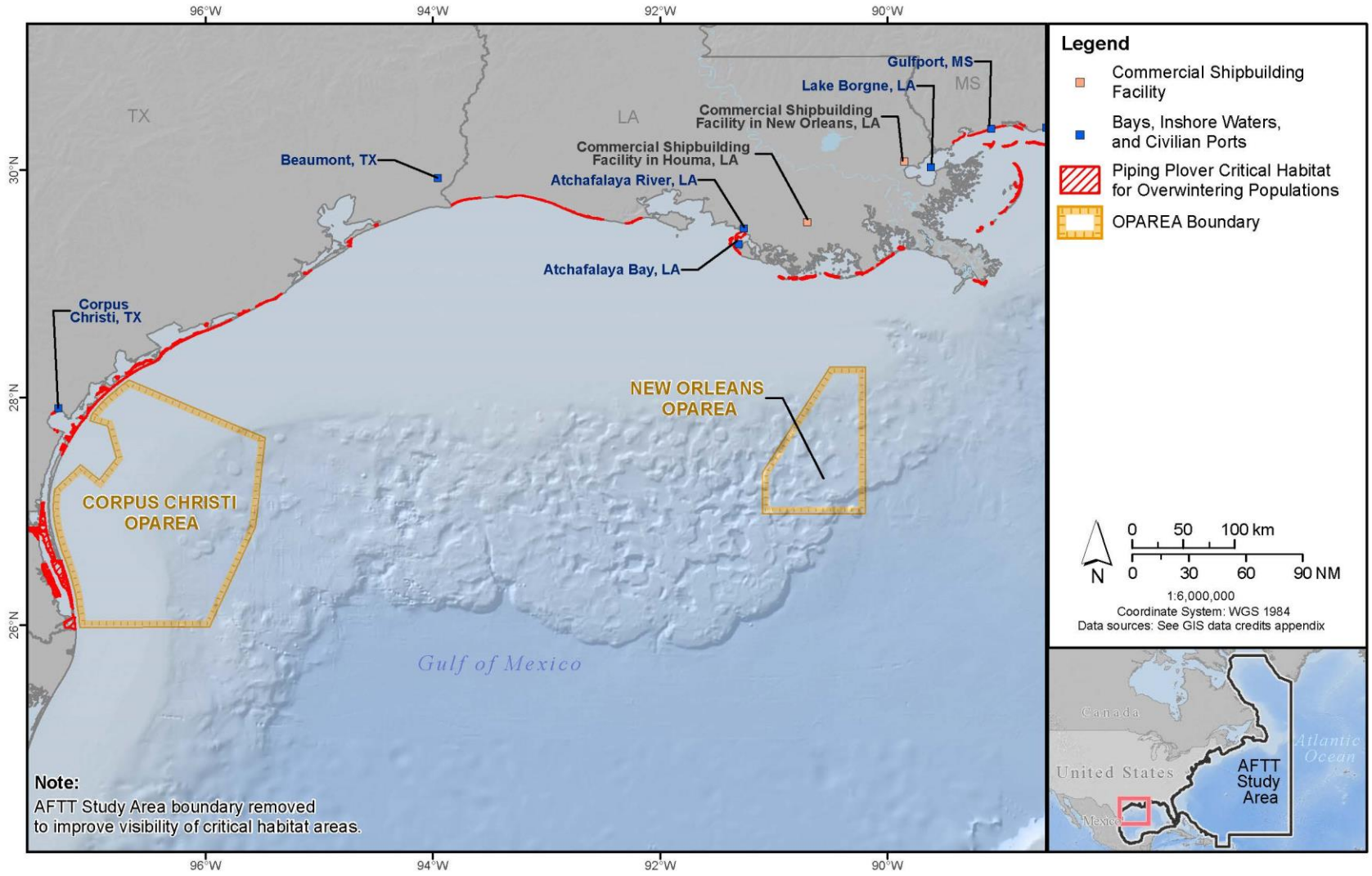
Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area; SINKEX = Sinking Exercise

Figure 3.9-2: Piping Plover Critical Habitat near the Southeast Portion of the Study Area



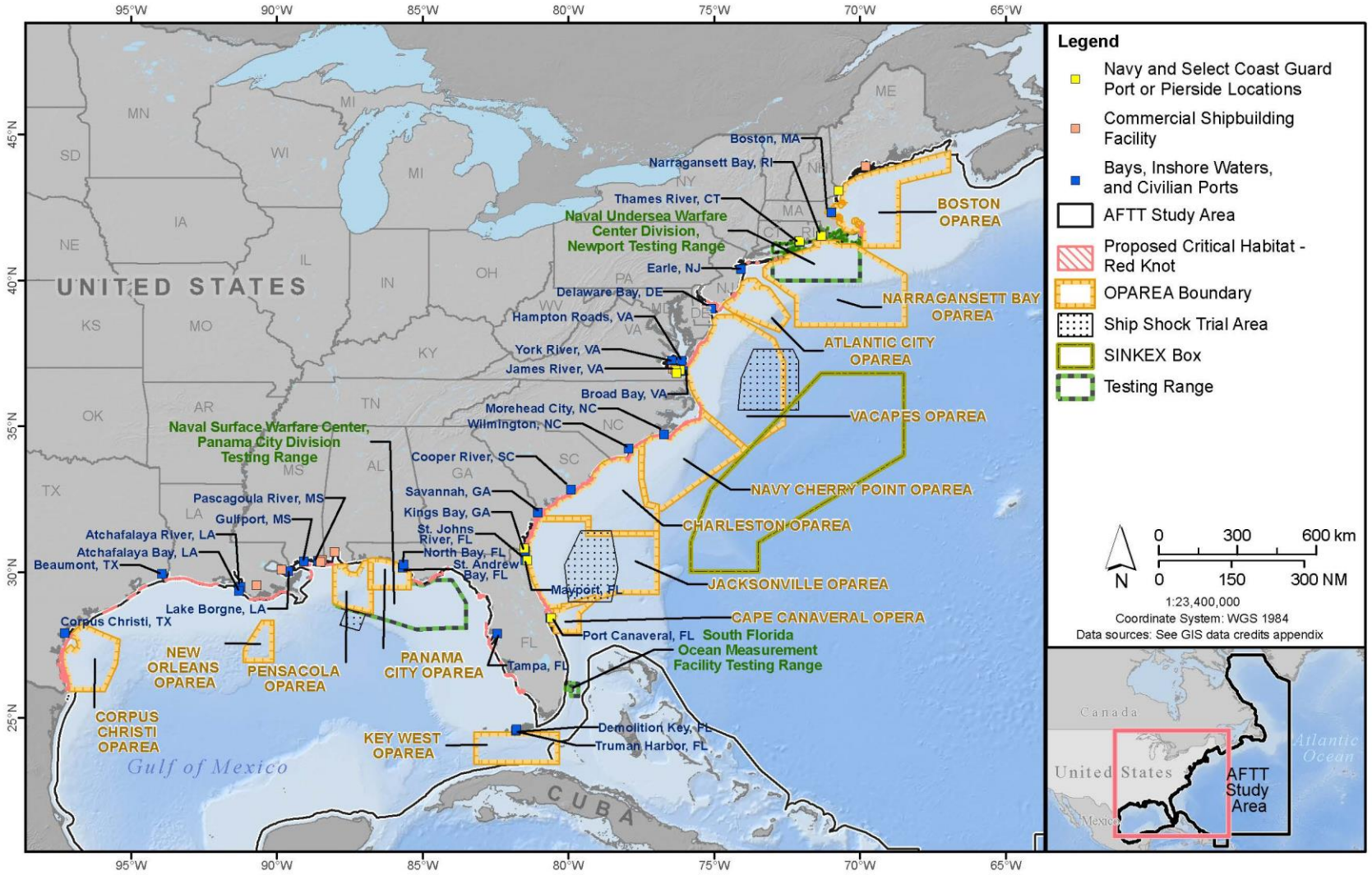
Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area

Figure 3.9-3: Piping Plover Critical Habitat near the Eastern Gulf of Mexico Portion of the Study Area



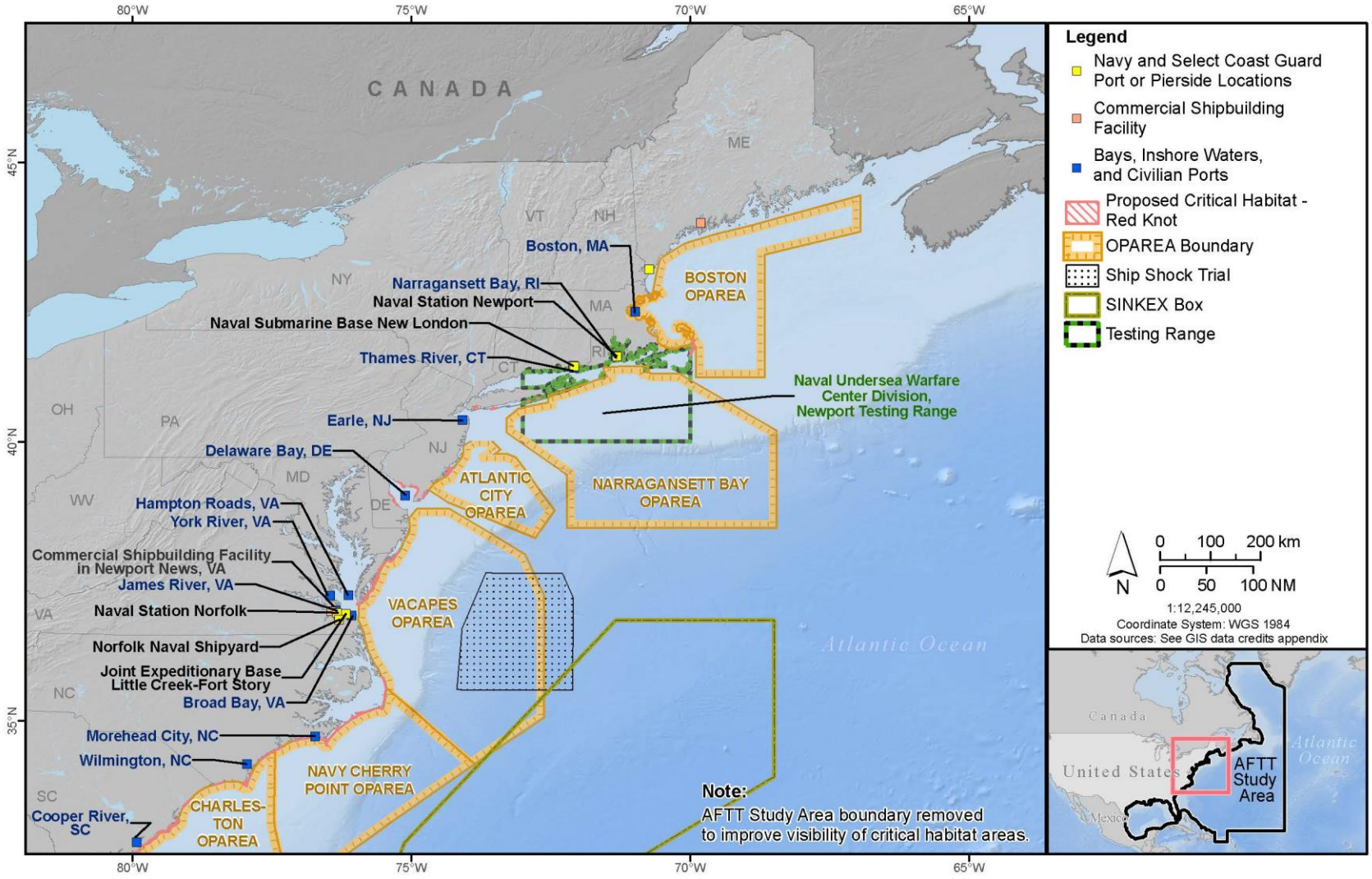
Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area

Figure 3.9-4: Piping Plover Critical Habitat near the Western Gulf of Mexico Portion of the Study Area



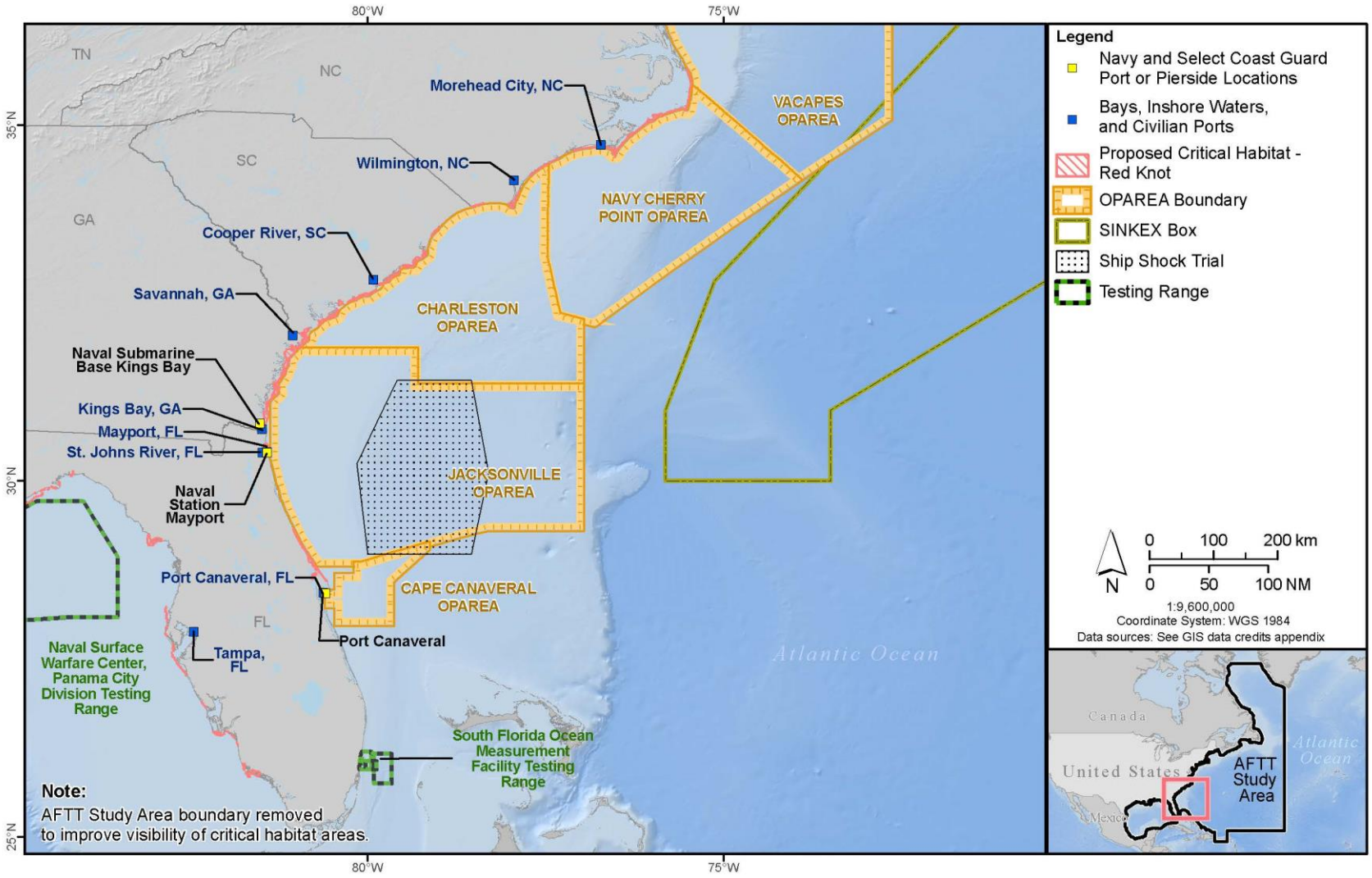
Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area; SINKEX = Sinking Exercise

Figure 3.9-5: Red Knot Proposed Critical Habitat near the Study Area



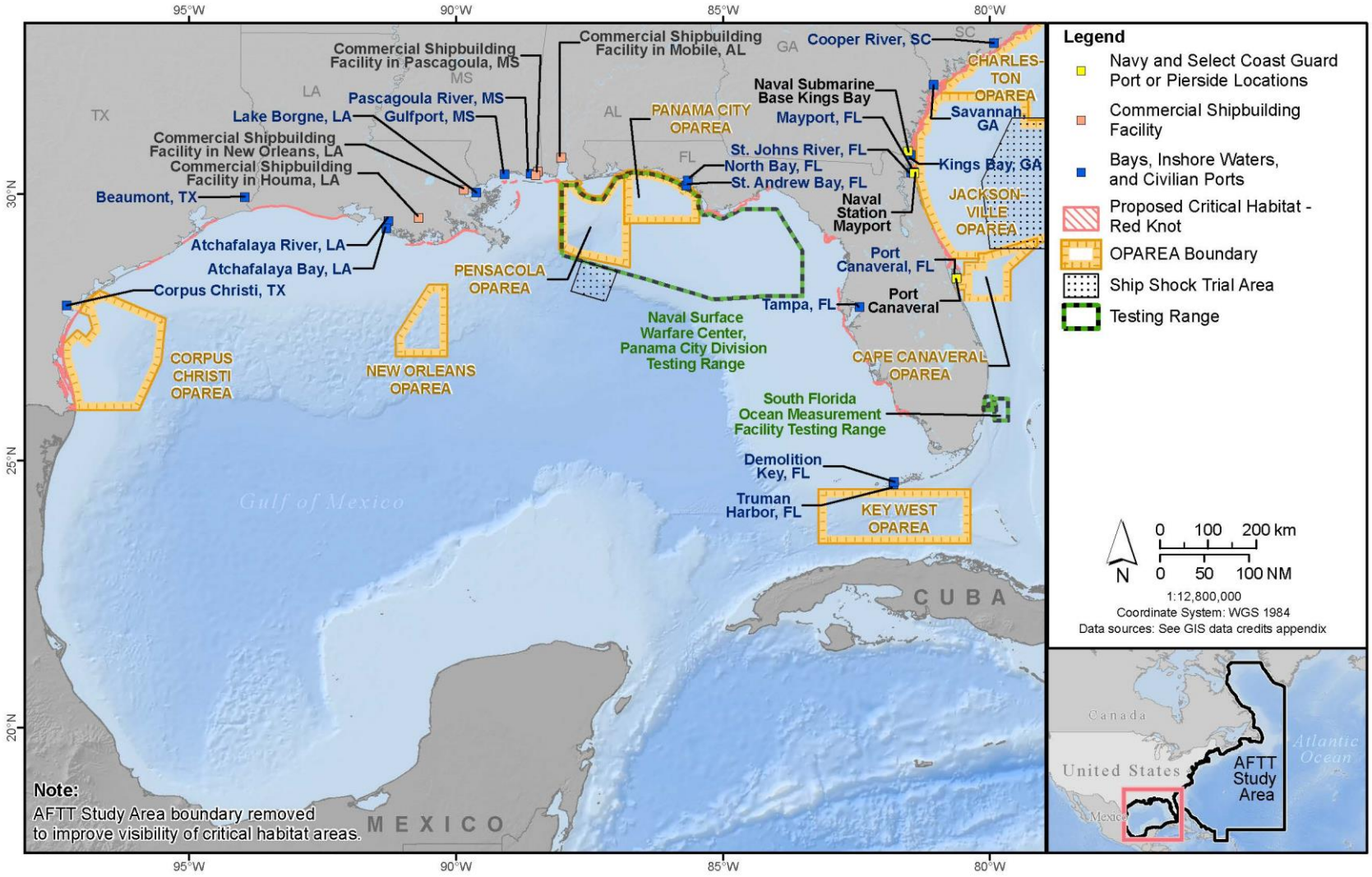
Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area; SINKEX = Sinking Exercise

Figure 3.9-6: Red Knot Proposed Critical Habitat near the Northeast Portion of the Study Area



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

Figure 3.9-7: Red Knot Proposed Critical Habitat near the Southeast Portion of the Study Area



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

Figure 3.9-8: Red Knot Proposed Critical Habitat near the Gulf of Mexico Portion of the Study Area

3.9.2.3 Species Not Listed under the Endangered Species Act

There are at least 160 species of birds and 24 species of bats found in the Study Area that are not listed under the ESA. Table 3.9-2 and Table 3.9-3 provide general descriptions of the bird taxonomic groups and bat species and their location/habitat use in the Study Area. Specific habitats (e.g., shallow-water coral reefs, live hard bottom, seagrass beds, and coastal wetlands) are defined and mapped in Section 3.3 (Habitats). Additional information on each taxonomic group is provided in Appendix F (Biological Resources Supplemental Information). Bats are terrestrial but may be found within the Study Area transiting between islands, migrating along the coast, or searching for prey offshore; therefore, they may be found airborne above inshore training areas as well as ports/piers.

Table 3.9-2: Description and Occurrence of Major Taxonomic Groups of Birds in the Study Area

Birds Groups		*Occurrence in the Study Area*		
Name	***Description***	***Range Complex/Testing Range***	***Range Complex Inshore***	***Piers/Ports/ Coast Guard Stations***
Order Anseriformes: geese, swans, dabbling and diving ducks	Diverse group of birds that inhabit shallow waters, coastal areas, and deeper waters. Feed at the surface by dabbling or by diving in deeper water. Often occur in large flocks.	All locations: Airborne, surface, water column	All Locations: Airborne, surface, water column	All locations: Airborne, surface, water column
Order Gaviiformes: loons	Duck-like, fish-eating birds that capture prey by diving and underwater pursuit.	All locations: Airborne, surface, water column	All locations: Airborne, surface, water column	All locations: Airborne, surface, water column
Order Podicipediformes: grebes	Small diving birds, duck-like. May occur in small groups.	All locations: Airborne, surface, water column	All locations: Airborne, surface, water column	All locations: Airborne, surface, water column
Order Procellariiformes: albatrosses, fulmars, petrels, shearwaters, and storm-petrels	Group of largely pelagic seabirds. Fly nearly continuously when at sea. Soar low over the water surface to find prey. Some species dive below the surface.	All locations: Airborne, surface, water column	All locations: Airborne, surface, water column	None
Order Suliformes: boobies, gannets, cormorants, anhingas, and frigatebirds	Diverse group of large, fish-eating seabirds with four toes joined by webbing. Often occur in large flocks near high concentrations of bait fish.	All locations: Airborne, surface, water column	All locations: Airborne, surface, water column	All locations: airborne, surface, water column

Table 3.9-2: Description and Occurrence of Major Taxonomic Groups of Birds in the Study Area (continued)

Birds Groups		*Occurrence in the Study Area*		
Name	***Description***	***Range Complex/Testing Range***	***Range Complex Inshore***	***Piers/Ports/ Coast Guard Stations***
Order Pelecaniformes: pelicans, herons, egrets, ibis, and spoonbills	Large wading birds with dagger-like, down-curved, or spoon-shaped bills used to capture prey in water or mud.	All locations: airborne, surface, water column	All locations: Airborne, surface, water column	All locations: Airborne, surface, water column
Order Phoenicopteriformes: flamingos	Large, wading birds with unique angled bill to filter invertebrates from water or mud.	JAX RC, Key West Range RC: Airborne, surface, water column	Jacksonville and Key West Range Complexes Inshore: Airborne, surface, water column	<u>Pierside</u> Port Canaveral <u>Civilian Ports</u> Port Canaveral, FL; Tampa, FL <u>Coast Guard Stations</u> Cape Canaveral, FL; Fort Pierce, FL; Dania, FL; Miami, FL: Key West, FL, St. Petersburg, FL
Orders Accipitriformes and Falconiformes: osprey, eagles, falcons	Large raptors that inhabit habitats with open water, including coastal areas. Feed on fish, waterfowl, or other mammals. Migrate and forage over open water.	All locations: airborne, surface, water column	All locations: Airborne, surface	All locations: Airborne, surface
Order Gruiformes: Coots, Cranes, Rails	This order is a highly variable assemblage of wading and terrestrial birds. In the Study Area, members would be coots, cranes and rails, which generally inhabit and forage in coastal areas along shorelines.	All locations: airborne, surface	All locations: Airborne, surface	All locations: Airborne, surface

Table 3.9-2: Description and Occurrence of Major Taxonomic Groups of Birds in the Study Area (continued)

Birds Groups		*Occurrence in the Study Area*		
Name	***Description***	***Range Complex/Testing Range***	***Range Complex Inshore***	***Piers/Ports/ Coast Guard Stations***
Order Caprimulgiformes: Nightjars	Nightjars are nocturnal or crepuscular birds that inhabit open country where they feed on insects on the wing and nest on the ground.	All locations: Airborne	All locations: Airborne	All locations: Airborne
Order Charadriiformes: shorebirds, phalaropes, gulls, noddies, terns, skua, jaegers, and alcids	Diverse group of small- to medium-sized shorebirds, seabirds and allies inhabiting coastal, nearshore, and open-ocean waters.	All locations: Airborne, surface, water column	All locations: Airborne, surface, water column	All locations: Airborne, surface, water column
Orders Passeriformes Cuculiformes, Strigiformes, and Apodiformes: neotropical migrant songbirds, warblers, thrushes, cuckoos, owls, swifts	Largest and most diverse group of birds in North America, primarily occur in coastal, and inland areas, but occur in large numbers over the open ocean (particularly over the Gulf of Mexico) during annual spring and fall migration periods.	All locations: Airborne	All locations: Airborne	All locations: Airborne

Notes**:** JAX = Jacksonville; RC = Range Complex

As shown in Table 3.9-3, the range of some of the bat species in the Study Area is highly limited (e.g., to Puerto Rico), whereas the range of other bat species includes the vast portions of the Study Area. Most of these bat species eat insects, but some eat fruit and one species eats fish.

Table 3.9-3: Description and Occurrence of Bats in the Study Area

Bat Species		*Occurrence in the Study Area*		
Common Name	***Scientific Name***	***Range Complex/ Testing Range***	***Range Complex Inshore***	***Piers/Ports/Coast Guard Stations***
Big brown bat	*Eptesicus fuscus*	Northeast RC; NUWC Division, Newport Testing Range; VACAPES RC; Navy Cherry Point Range; JAX RC; GOMEX RC; NSWC Panama City, Division Testing Range: Airborne	Northeast RC Inshore, VACAPES RC Inshore, JAX RC Inshore, GOMEX RC Inshore: Airborne	All locations: Airborne
Silver-haired bat	*Lasionycteris noctivagans*	Northeast RC; NUWC Division, Newport Testing Range; VACAPES RC; Navy Cherry Point Range; JAX RC; GOMEX RC; NSWC Panama City, Division Testing Range: Airborne	Northeast RC Inshore, VACAPES RC Inshore, JAX RC Inshore, GOMEX RC Inshore: Airborne	All locations: Airborne
Eastern red bat	*Lasiurus borealis*	Northeast RC; NUWC Division, Newport Testing Range; VACAPES RC; Navy Cherry Point Range; JAX RC; GOMEX RC; NSWC Panama City, Division Testing Range: Airborne	Northeast RC Inshore, VACAPES RC Inshore, JAX RC Inshore, GOMEX RC Inshore: Airborne	All locations: Airborne
Hoary bat	*Lasiurus cinereus*	Northeast RC; NUWC Division, Newport Testing Range; VACAPES RC; Navy Cherry Point Range; JAX RC; GOMEX RC; NSWC Panama City, Division Testing Range: Airborne	Northeast RC Inshore, VACAPES RC Inshore, JAX RC Inshore, GOMEX RC Inshore: Airborne	All locations: Airborne
Northern yellow bat	*Lasiurus intermedius*	Northeast RC; NUWC Division, Newport Testing Range; VACAPES RC; Navy Cherry Point Range; JAX RC; GOMEX RC; NSWC Panama City, Division Testing Range: Airborne	Northeast RC Inshore, VACAPES RC Inshore, JAX RC Inshore, GOMEX RC Inshore: Airborne	All locations: Airborne

Table 3.9-3: Description and Occurrence of Bats in the Study Area (continued)

Bat Species		*Occurrence in the Study Area*		
Common Name	***Scientific Name***	***Range Complex/ Testing Range***	***Range Complex Inshore***	***Piers/Ports/Coast Guard Stations***
Seminole bat	*Lasiurus seminolus*	Northeast RC; NUWC Division, Newport Testing Range; VACAPES RC; Navy Cherry Point Range; JAX RC; GOMEX RC; NSWC Panama City, Division Testing Range: Airborne	Northeast RC Inshore, VACAPES RC Inshore, JAX RC Inshore, GOMEX RC Inshore: Airborne	All locations: Airborne
Pallas's mastiff bat or Pallas's free-tailed bat	*Molossus molossus*	Key West RC: Airborne	Key West RC Inshore: Airborne	Coast Guard Stations Key West, FL Airborne
Leach's single leaf bat	*Monophyllus redmani*	Key West RC: Airborne	None	None
Antillean ghostfaced bat	*Mormoops blainvillei*	GOMEX RC; NSWC Panama City, Division Testing Range: Airborne	None	None
Ghostfaced bat	*Mormoops megalophylla*	GOMEX RC: Airborne	GOMEX RC Inshore: Airborne	Civilian Ports Beaumont, TX; Corpus Christi, TX Coast Guard Stations Corpus Christi, TX Airborne
Southeastern myotis bat	*Myotis austroriparius*	GOMEX RC; NSWC Panama City, Division Testing Range: Airborne	GOMEX RC Inshore: Airborne	Pierside NSB Kings Bay; NS Mayport: Port Canaveral Civilian Ports Kings Bay, GA; Savannah, GA; Mayport, FL; Port Canaveral, FL; Tampa, FL; Mobile, AL; Gulfport, MS; Pascagoula, MS Coast Guard Stations Mayport, FL; Cape Canaveral, FL; Fort Pierce, FL; St. Petersburg, FL; Pensacola, FL; New Orleans, LA Airborne

Table 3.9-3: Description and Occurrence of Bats in the Study Area (continued)

Bat Species		*Occurrence in the Study Area*		
Common Name	***Scientific Name***	***Range Complex/ Testing Range***	***Range Complex Inshore***	***Piers/Ports/Coast Guard Stations***
Eastern small-footed bat	*Myotis leibii*	Northeast RC; NUWC Division, Newport Testing Range: Airborne	Northeast RC Inshore: Airborne	Pierside Portsmouth Naval Shipyard; NSB New London; NS Newport Civilian Ports Bath, ME; Boston, MA; Earle, NJ; Delaware Bay, DE Coast Guard Stations Southwest Harbor, ME; Boston, MA; New London, CT; Newport, RI; Montauk, NY; Atlantic City, NJ Airborne
Little brown bat	*Myotis lucifugus*	Northeast RC; NUWC Division, Newport Testing Range; VACAPES RC; Navy Cherry Point Range; JAX RC: Airborne	Northeast RC Inshore; VACAPES RC Inshore; JAX RC Inshore: Airborne	Pierside Portsmouth Naval Shipyard; NSB New London; NS Newport; NS Norfolk; JEB Little Creek Fort Story; Norfolk Naval Shipyard; NSB Kings Bay Civilian Ports Bath, ME; Boston, MA; Earle, NJ; Delaware Bay, DE; Hampton Roads, VA; Morehead City, NC; Wilmington, NC; Kings Bay, GA; Savannah, GA; Mayport, FL; Mobile, AL; Gulfport, MS; Pascagoula, MS Coast Guard Stations Southwest Harbor, ME; Boston, MA; New London, CT; Newport, RI; Montauk, NY; Atlantic City, NJ; Virginia Beach, VA; Portsmouth, VA; Elizabeth City, NC; Charleston, SC; Mayport, FL; Pensacola, FL; New Orleans, LA Airborne

Table 3.9-3: Description and Occurrence of Bats in the Study Area (continued)

Bat Species		*Occurrence in the Study Area*		
Common Name	***Scientific Name***	***Range Complex/ Testing Range***	***Range Complex Inshore***	***Piers/Ports/Coast Guard Stations***
Evening bat	*Nycticeius humeralis*	VACAPES RC; Navy Cherry Point Range; JAX RC; GOMEX RC; NSWC Panama City, Division Testing Range: Airborne	VACAPES RC Inshore; JAX RC Inshore; GOMEX RC Inshore: Airborne	Pierside NS Norfolk; JEB Little Creek Fort Story; Norfolk Naval Shipyard; NSB Kings Bay; NS Mayport; Port Canaveral Civilian Ports Hampton Roads, VA; Morehead City, NC; Wilmington, NC; Kings Bay, GA; Savannah, GA; Mayport, FL; Port Canaveral, FL; Tampa, FL; Beaumont, TX; Corpus Christi, TX; Mobile, AL; Gulfport, MS; Pascagoula, MS Coast Guard Stations Virginia Beach, VA; Portsmouth, VA; Elizabeth City, NC; Charleston, SC; Mayport, FL; Cape Canaveral, FL; Fort Pierce, FL; Dania, FL; Miami, FL; Key West, FL; St. Petersburg, FL; Pensacola, FL; New Orleans, LA; Corpus Christi, TX Airborne
Mexican free-tailed bat	*Tadarida brasiliensis*	JAX RC; GOMEX RC; NSWC Panama City, Division Testing Range: Airborne	JAX RC Inshore; GOMEX RC Inshore: Airborne	Pierside NSB Kings Bay; NS Mayport; Port Canaveral Civilian Ports Kings Bay, GA; Savannah, GA; Mayport, FL; Port Canaveral, FL; Tampa, FL; Beaumont, TX; Corpus Christi, TX; Mobile, AL; Gulfport, MS; Pascagoula, MS Coast Guard Stations Charleston, SC; Mayport, FL; Cape Canaveral, FL; Fort Pierce, FL; Dania, FL; Miami, FL; Key West, FL; St.

Table 3.9-3: Description and Occurrence of Bats in the Study Area (continued)

Bat Species		*Occurrence in the Study Area*		
Common Name	***Scientific Name***	***Range Complex/ Testing Range***	***Range Complex Inshore***	***Piers/Ports/Coast Guard Stations***
				Petersburg, FL; Pensacola, FL; New Orleans, LA; Corpus Christi, TX Airborne
Mexican bulldog bat or greater bulldog bat	*Noctilio leporinus*	GOMEX RC: Airborne	None	None
Rafinesque's big-eared bat	*Plecotus rafinesquii*	VACAPES RC; Navy Cherry Point Range; JAX RC; GOMEX RC; NSWC Panama City, Division Testing Range: Airborne	VACAPES RC Inshore; JAX RC Inshore; GOMEX RC Inshore: Airborne	<u>Pierside</u> NS Norfolk; JEB Little Creek Fort Story; Norfolk Naval Shipyard; NSB Kings Bay; NS Mayport; Port Canaveral <u>Civilian Ports</u> Hampton Roads, VA; Morehead City, NC; Wilmington, NC; Kings Bay, GA; Savannah, GA; Mayport, FL; Port Canaveral, FL; Tampa, FL; Beaumont, TX; Corpus Christi, TX; Mobile, AL; Gulfport, MS; Pascagoula, MS <u>Coast Guard Stations</u> Virginia Beach, VA; Portsmouth, VA; Elizabeth City, NC; Charleston, SC; Mayport, FL; Cape Canaveral, FL; Fort Pierce, FL; Dania, FL; Miami, FL; Key West, FL; St. Petersburg, FL; Pensacola, FL; New Orleans, LA; Corpus Christi, TX Airborne
Sooty mustached bat	*Pteronotus quadridens*	GOMEX RC: Airborne	GOMEX RC Inshore: Airborne	None

Sources: Constantine (2003); International Union for Conservation of Nature (2017); Placer (1998); Tetra Tech Inc (2016).
Notes: GOMEX = Gulf of Mexico; JAX = Jacksonville; JEB = Joint Expeditionary Base; NS = Naval Station; NSB = Naval Submarine Base; NSWC = Naval Surface Warfare Center; NUWC = Naval Undersea Warfare Center; RC = Range Complex; VACAPES = Virginia Capes

3.9.2.3.1 Migratory Birds

Migratory birds are those that undertake periodic seasonal movement from one region to another, typically coinciding with available food supplies, breeding requirements, and seasonal changes. A variety of bird species would be encountered in the Study Area including those listed under the Migratory Bird Treaty Act, which protects nearly all migratory species of birds, eggs, and nests and establishes federal responsibilities for protecting these species.

Of the 1,106 species protected under the Migratory Bird Treaty Act, over 100 species occur in the Study Area (88 *Federal Register* 49310). For the analysis of impacts, these species are not analyzed individually but are grouped based on taxonomic or behavioral similarities based on the stressor that is being analyzed. Determinations of potential impacts on species protected under the Migratory Bird Treaty Act are presented in Section 3.9.5 (Migratory Bird Treaty Act Determinations).

Birds of Conservation Concern are species, subspecies, and populations of migratory birds that the U.S. Fish and Wildlife Service (USFWS) determined to be the highest priority for conservation actions to prevent the need to list birds under the ESA (U.S. Fish and Wildlife Service, 2021). The USFWS updated the list of Birds of Conservation Concern in 2021 after preparation of the 2018 Final EIS/OEIS. Table 3.9-4 lists the species with potential to occur in the Study Area.

Table 3.9-4: Birds of Conservation Concern with Potential to Occur in the Study Area

Order/Family	*Common Name*	*Scientific Name*
Order Procellariiformes		
Family Procellariidae	Black-capped petrel	*Pterodroma hasitata*
	Fea's petrel	*Pterodroma feae*
	Cory's shearwater	*Calonectris borealis*
	Manx shearwater	*Puffinus puffinu*
	Audubon's shearwater	*Puffinus lherminieri*
Family Hydrobatidae	Band-rumped storm petrel	*Oceanodroma castro*
Order Sulifromes		
Family Sulidae	Masked booby	*Sula dactylatra*
	Red-footed booby	*Sula sula sula*
Family Frigatidae	Magnificent frigatebird	*Fregata magnificens*
Order Pelecaniformes		
Family Ardeidae	Reddish egret	*Egretta rufescens*
	Great blue heron	*Ardea herodias*
Order Falconiformes		
Family Falconidae	Swallow-tailed kite	*Elanoides forficatus*
Order Gruiformes		
Family Rallidae	King rail	*Rallus elegans*
	Yellow rail	*Coturnicops noveboracensis*
Order Charadriiformes		
Family Haematopodidae	American oystercatcher	*Haematopus palliatus*
Family Charadriidae	American golden plover	*Pluvialis dominica*
	Wilson's plover	*Charadrius wilsonia*
	Mountain plover	*Charadrius montanus*
	Snowy plover	*Charadrius nivosus*
Family Scolopacidae	Whimbrel	*Numenius phaeopus*

Table 3.9-4: Birds of Conservation Concern with Potential to Occur in the Study Area (continued)

Order/Family	*Common Name*	*Scientific Name*
Subfamily Scolopacinae	Long-billed curlew	*Numenius americanus*
	Hudsonian godwit	*Limosa haemastica*
	Marbled godwit	*Limosa fedoa*
	Ruddy turnstone	*Arenaria interpres morinella*
	Dunlin	*Calidris alpina*
	Red knot	*Calidris canutus*
	Buff-breasted sandpiper	*Calidris subruficollis*
	Purple sandpiper	*Calidris maritima*
	Pectoral sandpiper	*Calidris melanotos*
	Semipalmated sandpiper	*Calidris pusilla*
	Short-billed dowitcher	*Limnodromus griseus*
	Lesser yellowlegs	*Tringa flavipes*
	Willet	*Tringa semipalmata*
Family Laridae Subfamily Rynchopinae	Black skimmer	*Rynchops niger*
Family Laridae Subfamily Sterninae	Gull-billed tern	*Gelochelidon nilotica*
	Least tern	*Sternula antillarum*
	Sandwich tern	*Thalasseus sandvicensis*
	Forster's tern	*Sterna forster*
Order Caprimulgiformes		
Family Caprimulgidae	Chuck-will's-widow	*Antrostomus carolinensis*
	Eastern whip-poor-will	*Antrostomus vociferus*
Order Passeriformes		
Family Turdidae	Wood thrush	*Hylocichla mustelina*
Family Parulidae	Bay-breasted warbler	*Dendroica castanea*
	Blue-winged warbler	*Vermivora pinus*
	Canada warbler	*Wilsonia canadensis*
	Cerulean warbler	*Dendroica cerulea*
	Black-throated green warbler	*Setophaga virens*
	Kentucky warbler	*Oporornis formosus*
	Prairie warbler	*Dendroica discolor*
	Prothonotary warbler	*Protonotaria citrea*
Family Cardinalidae	Dickcissel	*Spiza americana*
	Scarlet tanager	*Piranga olivacea*
	Painted bunting	*Passerina ciris*
Family Troglodytidae	Marsh wren	*Cistothorus palustris*
Family Passerellidae	Grasshopper sparrow	*Ammodramus savannarum*
Family Icteriidae	Yellow-breasted chat	*Icteria virens*
	Bobolink	*Dolichonyx oryzivorus*
Order Cuculiformes		
Family Cuculidae	Mangrove cuckoo	*Coccyzus minor*
	Black-billed cuckoo	*Coccyzus erythropthalmus*
Order Apodiformes		
Family Apodidae	Chimney swift	*Chaetura pelagica*

Source: U.S. Fish and Wildlife Service (2021)

3.9.3 Environmental Consequences

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

This section describes and evaluates how and to what degree the activities described in Chapter 2 (Description of Proposed Action and Alternatives) and Section 3.0.3.3 (Identifying Stressors for Analysis) could potentially impact birds and bats known to occur in the Study Area.

Designated critical habitat for the piping plover and proposed critical habitat for red knot are near, but not within the Study Area, and the Proposed Action would not affect the physical and biological features of the critical habitat. Bermuda petrels and roseate terns do not have designated critical habitat. Therefore, impacts from the Proposed Action would not be applicable to any ESA-listed bird critical habitat.

The stressors vary in intensity, frequency, duration, and location in the Study Area. General characteristics of all stressors were introduced in the 2018 Final EIS/OEIS Section 3.0.3.3 (Identifying Stressors for Analysis) and living resources' general susceptibilities to stressors were introduced in Section 3.0.3.6 (Biological Resource Methods) in this Supplemental EIS/OEIS. The stressors and substressors analyzed for birds and bats include the following:

- **acoustics** (sonar and other transducers; air guns; pile driving; aircraft noise; vessel noise; and weapons noise)
- **explosives** (explosions in-air and in-water)
- **energy** (in-water electromagnetic devices; in-air electromagnetic devices; high-energy lasers)
- **physical disturbance and strike** (vessels and in-water devices; aircraft and aerial targets; military expended materials)
- **entanglement** (wires and cables; decelerators/parachutes)
- **ingestion** (military expended materials other than munitions)

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

The analysis of potential impacts considers standard operating procedures and mitigation measures that would potentially provide protection to birds and bats. Standard operating procedures are detailed in Appendix A (Section A.2.7, Standard Operating Procedures). Mitigation measures relevant to birds and bats are referenced in Table 3.9-5. Details on all mitigation measures are provided in Chapter 5 (Mitigation).

The criteria for determining the significance of Proposed Action stressors on birds and bats are described in

Table 3.9-6. The abbreviated analysis under each substressor and alternative provides the technical support for these determinations, with reference to supporting appendices for details.

Table 3.9-5: Mitigation Requirements Summary by Stressor

Applicable Stressor	*Protection Focus*	*Section Reference*
Acoustics (Aircraft Noise)	Piping plover nesting habitat	Chapter 5 (Mitigation) Section 5.7 (Geographic Mitigation)
Acoustics (Aircraft Noise)	Roseate tern nesting habitat	Chapter 5 (Mitigation) Section 5.7 (Geographic Mitigation)
Explosives (Ship Shock Trials)	Large flocks of seabirds (any species)[1]	Chapter 5 (Mitigation) Section 5.6 (Visual Observations)
Physical Disturbance and Strike (Aircraft)	Large flocks of birds and bats (any species)	Appendix A (Activity Descriptions) Section A.2.7 (Standard Operating Procedures)

[1] The mitigation was developed to protect possible indicators of marine mammal presence, which includes large flocks of seabirds.

Table 3.9-6: Criteria for Determining the Significance of Proposed Action Stressors on Birds and Bats

Impact Descriptor	*Context and Intensity*	*Significance Conclusion*
Negligible	Impacts to birds or bats would be limited to temporary (lasting several hours) behavioral disturbances to individuals located in the project area. No mortality or debilitating injury to any individual bird or bat would occur. There would be no displacement of birds or bats from preferred breeding and feeding areas, nest sites, nursery grounds, or migratory routes. Impacts on bird or bat habitat would be temporary (e.g., temporary displacement of finfish prey) with no lasting damage or alteration.	Less than significant
Minor	Impacts to birds or bats would be temporary or short term (lasting several days to several weeks) and in the natural range of variability of species' populations, habitats, and the natural processes sustaining them. This could include non-life-threatening injury to individual birds or bats and small disruptions of time-sensitive behaviors such as breeding. Displacement of birds or bats from preferred breeding and feeding areas, nursery grounds, or migratory routes would be short term and limited to the project area. Any resulting increased competition, additional energy expenditure, or loss of young would not affect overall bird or bat population numbers or demographic structure. Impacts on habitat (e.g., short-term displacement of finfish prey, increased turbidity, trampled vegetation) would be easily recoverable with no long-term or permanent damage or alteration.	Less than significant
Moderate	Impacts to birds or bats would be short term or long term (lasting several months or longer) and outside the natural range of variability of species' populations, habitats, and the natural processes sustaining them. This could include debilitating injury or mortality and disruptions of time-sensitive behaviors such as breeding. Behavioral responses and displacement would be expected from individuals in the project area, its immediate surroundings, or beyond. Long-term displacement of individuals from preferred breeding and feeding areas, nursery grounds, or migratory routes would occur. Resulting increased competition and energy expenditure would cause a loss of breeding or egg-bearing adults and young at large enough scales to negatively impact overall bird or bat population numbers or demographic structure but would not threaten the continued existence of any species. Habitat would be damaged or altered potentially over the long term but would continue to support dependent species.	Less than significant

Table 3.9-6: Criteria for Determining the Significance of Proposed Action Stressors on Birds and Bats (continued)

Impact Descriptor	*Context and Intensity*	*Significance Conclusion*
Major	Impacts to birds or bats would be short term or long term and well outside the natural range of variability of species' populations, habitats, or the natural processes sustaining them. This could include extensive (i.e., affecting a large proportion of the local population), life-threatening, or debilitating injury and mortality and substantial disruption of time-sensitive behaviors such as breeding. Displacement of birds or bats from preferred breeding or feeding areas, nursery grounds, or migratory routes would occur in project areas, their immediate surroundings, and beyond. Behavioral disruptions and displacement would result in the loss of breeding (or egg-bearing adults) and young due to increased competition or energy expenditure at scales large enough to affect overall bird or bat population numbers or demographic structure. Impacts would also be considered major if they threatened the continued existence of any bird or bat species. Full recovery of bird or bat populations would not be expected to occur in a reasonable time. Habitat would be degraded over the long term or permanently such that it would no longer be able to support dependent populations of birds or bats.	Significant

With noted exceptions, the stressor background information and environmental consequences are not meaningfully different from what is described in the 2018 Final EIS/OEIS (Section 3.9.3, Environmental Consequences).

3.9.3.1 Acoustic Stressors

Table 3.9-7 contains brief summaries of background information that is relevant to the analysis of impacts for each acoustic substressor. Detailed information on acoustic impact categories as well as effects specific to each substressor are provided in Appendix D (Acoustic and Explosive Impacts Supporting Information).

While each of these substressors could affect birds and bats, the following analysis focuses on those substressors that would occur in new areas and those that would occur more often than what was analyzed in the 2018 Final EIS/OEIS.

Table 3.9-7: Acoustic Stressors Background Information Summary

Substressor	*Background Information Summary*
Sonar and other transducers	• Bats would not be affected by sonar and other transducers as bats are not found in the water column. • Pursuit-diving bird species may be exposed to sonar and other transducers while foraging underwater; however, diving occurs for only for a few minutes at a time. • Injury of the lungs from sonar and other transducers is unlikely in birds. • Hearing loss would only occur if a bird were close to a sound source of sufficient intensity and duration. It is unlikely that a diving bird would experience underwater exposure to sonar or other transducers that would impact hearing.

Table 3.9-7: Acoustic Stressors Background Information Summary (continued)

Substressor	*Background Information Summary*
Air guns	• Bats would not be affected by air guns as they are not found in the water column. • Sound from military air guns lack the strong shock wave and rapid pressure increases of explosions that can cause primary blast injury or barotraumas. Generated impulses would have short durations, typically a few hundred milliseconds. Noise may result in hearing loss, masking, physiological stress, or behavioral reaction. However, the intermittent nature of this noise is unlikely to result in masking and is likely to cause startle or avoidance responses. • The exposure to these sounds by birds, other than pursuit-diving species, would be negligible because they spend a very short time underwater. • Pursuit divers may experience underwater sound exposure. However, exposure is unlikely because of the short duration of an air gun pulse; relatively low source (exposure would require a bird to be very close to the source at the moment of discharge); and generally, air guns are used at depths greater than birds forage.
Pile driving	• Impact pile driving produces repetitive, impulsive, broadband sound. Vibratory pile removal produces nearly continuous sound. Sounds are emitted both in the air and in the water in nearshore areas where some birds and bats forage. Noise may result in hearing loss, masking, physiological stress, or behavioral reaction. However, the intermittent nature of most pile driving noise is unlikely to result in masking and is likely to cause startle or avoidance responses. • Rapid large pressure change near impulsive sound sources may cause physical injury (barotrauma). • Most individuals would avoid the locations during pile driving and removal activities. However, if prey species such as fishes are killed or injured as a result of pile driving, some birds may be attracted to the area for foraging and be exposed to noise. • Behavioral responses and displacement from the area are expected to be temporary for the duration of the pile driving and extraction activities.
Vessel noise	• Birds respond to vessels in various ways; some follow vessels while others avoid vessels. • Bats are attracted to vessels as roosting habitat and, if lighted, may be attracted to them for foraging purposes. • Vessel noise could elicit short-term behavioral or physiological responses but is not likely to disrupt migrating, breeding, feeding, and sheltering, or result in serious injury to any birds and bats. • Harmful bird/vessel interactions are commonly associated with commercial fishing vessels because birds are attracted to concentrated food sources. Such concentrations are not present around military vessels. • While bats may be attracted to military vessels, they are expected to be able to detect and avoid bat/vessel interactions utilizing their echolocation capabilities. • Given the rare occurrence of bats in areas where vessels operate, acoustic disturbance of bats in the Study Area is not expected to occur.
Aircraft noise	• Birds and bats could be exposed to noise associated with subsonic and supersonic fixed-wing aircraft and rotary-wing aircraft overflights. • Exposure to fixed-wing aircraft noise would be brief and infrequent and repeated exposure of individuals in a short period of time (hours or days) is unlikely. • Common behavioral responses to aircraft noise include no response or stationary alert behavior, startle response, flight, and changes in vocalization. • There is also the potential for noise to mask calls. • In some instances of frequent exposure or exposure to intense noise, behavioral responses could affect breeding, foraging, habitat use, and energy budgets.

Table 3.9-7: Acoustic Stressors Background Information Summary (continued)

Substressor	*Background Information Summary*
Weapons noise	• Sounds produced by weapons are potential stressors to birds and bats. • Large-caliber weapons firing occurs generally greater than 12 nautical miles from shore and medium and small caliber could occur closer to shore and inshore waters. • Sound generated by a muzzle blast is intense, but very brief. A bird or bat very close to a large weapons blast could be injured or experience hearing loss. Birds could also experience threshold shift due to acoustic trauma. • Sound generated by a projectile travelling at speeds greater than the speed of sound can produce a low amplitude bow shock wave in a narrow area around its flight path, which may disturb birds and bats. • Inert objects hitting the water surface would generate a splash and the noise may disturb nearby birds and bats. • Bird and bat responses to weapons firing and projectile travel noise may include short-term behavioral or physiological responses such as alert responses, startle responses, or temporary increases in heart rate. • Studies of impacts of weapons noise on raptors show that these birds show little reaction (e.g., head turn) and do not alter behavior in the presence of noise from weapons testing (Brown et al., 1999; Schueck et al., 2001; Stalmaster & Kaiser, 1997). • Once surface weapons firing activities begin, birds and bats would likely disperse away from the area around the ship and the path of projectiles.

3.9.3.1.1 Impacts from Sonar and Other Transducers

Table 3.9-7 contains a summary of the background information used to analyze the potential impacts of sonar and other transducers on birds and bats. For information on sonar and other transducers hours or counts proposed for each alternative, see Table 3.0-2 (Sonar and Transducer Sources Quantitatively Analyzed).

3.9.3.1.1.1 Impacts from Sonar and Other Transducers under Alternative 1

As discussed, in Section 3.0.3.3.1 (Acoustic Stressors), a detailed comparison of sonar quantities analyzed in the 2018 Final EIS/OEIS with sonar quantities under this Proposed Action is not feasible due to changes in the source binning process. However, the overall use of sonar and other transducers would decrease from the 2018 Final EIS/OEIS for both training and testing activities.

Under Alternative 1, changes from the 2018 Final EIS/OEIS for training activities using low-frequency sonar (in addition to other types of sonar) would include the following:

- There would be a small increase in unit-level Anti-Submarine Warfare activities in the Gulf of Mexico Range Complex.

Under Alternative 1, changes from the 2018 Final EIS/OEIS for testing activities using low-frequency sonars would include the following:

- Under Anti-Submarine Warfare testing activities, there would be new events in the high seas, Gulf of Mexico Range Complex Inshore, Joint Expeditionary Base Little Creek, Naval Station Mayport, Naval Station Norfolk, Naval Submarine Base King Bay, and Naval Submarine Base New London.
- There would also be a notable increase in Anti-Submarine Warfare activities in Bath, Maine, and Pascagoula, Mississippi.

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

Pursuit-diving birds could be exposed to low-, mid-, and high-frequency sonar and sound produced by sonar and other transducers during military readiness activities. The greatest potential for measurable effects would be near the sources of low-frequency and high-intensity sonar. For Alternative 1 activities this would occur mostly in the offshore marine environment and would therefore only impact seabirds. Sonar and other transducers would not be regularly used in nearshore areas that could be used by foraging shorebirds, except during maintenance and for navigation in areas around ports. Therefore, seabirds that forage in open-ocean areas would have a greater chance of underwater sound exposure than birds that forage in coastal areas. Sonar and other transducer sounds associated with Alternative 1 activities may result in brief, intermittent impacts to individual birds. The analysis conclusions for the use of sonar and other transducers during training and testing activities under Alternative 1 are consistent with a minor impact on bird and bat populations.

Under the ESA, the use of sonar and other transducers during training and testing activities described under Alternative 1 may affect Bermuda petrels and black-capped petrels. The use of sonar and other transducers would have no effect on piping plovers, red knots, or roseate terns. The use of sonar and other transducers would not be applicable to Indiana bats, northern long-eared bats, or tricolored bats.

The use of sonar and transducers during training and testing is not applicable to designated critical habitat for piping plover or proposed critical habitat for red knot. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA.

3.9.3.1.1.2 Impacts from Sonar and Other Transducers under Alternative 2

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

- The maximum number of composite training exercises would occur each year, and an additional composite training exercise would occur in the Gulf of Mexico Range Complex.

Impacts from sonar and other transducers under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing. The quantities of sonar and other transducer activity (e.g., hours, counts) under Alternative 2 would increase only slightly over Alternative 1.

3.9.3.1.2 Impacts from Air Guns

Refer to Table 3.9-7 for a summary of the background information used to analyze the potential impacts of air guns on birds and bats. For information on air gun counts proposed for each alternative, see Table 3.0-3 (Training and Testing Air Gun and Non-Explosive Impulsive Sources Quantitatively Analyzed in the Study Area).

3.9.3.1.2.1 Impacts from Air Guns under Alternative 1

Air guns would not be used for training activities. The proposed use of air guns for testing would decrease as compared to the 2018 Final EIS/OEIS. Small air guns would be fired over a limited period within a single day. Air gun use would only occur during two testing activities: semi-stationary equipment testing and acoustic and oceanographic research. While air gun use during semi-stationary equipment testing may occur nearshore at Newport, Rhode Island, air gun use during acoustic and oceanographic research may occur in the Northeast, Virginia Capes, Jacksonville, and Gulf of Mexico Range Complexes.

Pursuit-diving birds could be exposed to sound produced by air guns during testing activities. Sounds produced by air guns are described in Appendix D (Acoustic and Explosive Impacts Supporting

Information). Sound caused by air gun events would be brief, intermittent, and localized. Although multiple firings would occur per event, activities would be conducted infrequently. Although some individuals would be exposed to noise, the numbers of individuals would be small. Impacts could include behavioral and physiological responses (startle, alert, increased heart rate, dispersal), and activities would be unlikely to impact populations or individual survival, growth, or reproduction. The analysis conclusions for air gun use during testing activities under Alternative 1 are consistent with a negligible impact on bird and bat populations.

Under the ESA, the use of air guns during testing activities as described under Alternative 1 may affect Bermuda petrels and black-capped petrels. The use of air guns would have no effect on piping plovers, red knots, or roseate terns. The use of air guns during testing activities would not be applicable to Indiana bats, northern long-eared bats, or tricolored bats.

The use of air guns is not applicable to designated critical habitat for piping plover and proposed critical habitat for red knot. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA.

3.9.3.1.2.2 Impacts from Air Guns under Alternative 2

Air guns would not be used during training activities. Alternative 2 includes the maximum number of air gun blasts (the upper end of the range of blasts under Alternative 1). Impacts from air guns under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for testing activities.

3.9.3.1.3 Impacts from Pile Driving

Refer to Table 3.9-7 for a summary of the background information used to analyze the potential impacts of pile driving on birds and bats. Only port damage repair training includes pile driving. For information on pile driving quantities proposed for each alternative, see Table 3.0-4 (Number of Piles/Sheets Quantitatively Analyzed under Pile Driving and Removal Training Activities).

3.9.3.1.3.1 Impacts from Pile Driving under Alternative 1

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

Under Alternative 1 for training:

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

Although some individual birds or bats could be exposed to noise from pile driving, the activities would occur intermittently (one event occurring intermittently over approximately 30 days per year) in very limited areas and would be of short duration (maximum of 90 minutes per 24-hour period). The activity would occur in highly disturbed estuarine habitats. Birds and bats in the vicinity are expected to avoid the area and these are disturbed areas where nesting is not expected to occur. The analysis conclusions for pile driving during training activities under Alternative 1 are consistent with a negligible impact on bird and bat populations.

Under the ESA, the use of pile driving during training activities as described under Alternative 1 may affect piping plovers, red knots, roseate tern, and tricolored bats. Pile driving would not be applicable to Bermuda petrels, black-capped petrels, Indiana bats, or northern long-eared bats.

Pile driving is not applicable to designated critical habitat for piping plover and proposed critical habitat for red knot. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA.

3.9.3.1.3.2 Impacts from Pile Driving under Alternative 2

There would be no pile driving or removal associated with testing activities. Impacts from pile driving during training under Alternative 2 are the same as Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same.

3.9.3.1.4 Impacts from Vessel Noise

Refer to Table 3.9-7 for a summary of the background information used to analyze the potential impacts of vessel noise on birds and bats. For information on the number of activities including vessel noise, see Table 3.0-9 (Number and Location of Activities Including Vessels) and Table 3.0-10 (Number and Location of Activities Including In-Water Devices).

3.9.3.1.4.1 Impacts from Vessel Noise under Alternative 1

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

Under Alternative 1 for training:

- Vessel noise would occur in two locations that are new or not previously analyzed (Gulfport and Pascagoula, Mississippi, respectively). For all other locations, there would either be a decrease or similar events including vessel activity.

Under Alternative 1 for testing:

- Vessel noise would occur in locations not previous analyzed (inshore locations of the Northeast, Virginia Capes, and Gulf of Mexico Range Complexes; Other AFTT Areas; Hampton Roads, Virginia). There would also be notable increases in vessel activity at the Naval Surface Warfare Center Panama City Division Testing Range, Naval Station Norfolk, and Pascagoula, Mississippi. For all other locations, there would either be a decrease or similar amount of vessel activity.

Vessel noise produced during testing and training activities may briefly impact some individuals, but exposures would be brief, localized, and intermittent and would not be expected to impact populations or to impact survival, growth, or reproduction. Birds and bats in the open ocean, foraging or migrating, could be exposed to vessel noise as the vessel passes and may respond by avoiding areas of temporarily concentrated vessel noise. Individual exposure to noise would be infrequent. If a bird or bat responds to vessel noise, only short-term behavioral responses such as startle, head turning, or avoidance would be expected. There is little likelihood of repeated exposures because of the transient nature of vessels and regular movement of birds and bats. The analysis conclusions for vessel noise during training and testing activities under Alternative 1 are consistent with a negligible impact on bird and bat populations.

Under the ESA, vessel noise generated during training and testing activities as described under Alternative 1 may affect piping plovers, red knots, roseate terns, Bermuda petrels, black-capped petrels, Indiana bats, northern long-eared bats, and tricolored bats.

Vessel noise is not applicable to designated critical habitat for piping plover and proposed critical habitat for red knot. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA.

3.9.3.1.4.2 Impacts from Vessel Noise under Alternative 2

Impacts from vessel noise under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing. The number of activities including vessels or in-water devices increases only slightly over that of Alternative 1.

3.9.3.1.5 Impacts from Aircraft Noise

Refer to Table 3.9-7 for a summary of the background information used to analyze the potential impacts of aircraft noise on birds and bats. For information on the number of activities including aircraft noise, see Table 3.0-16 (Number and Location of Activities with Aircraft).

Detailed information on mitigation that the Action Proponents will implement during training activities to reduce aircraft noise exposure on ESA-listed piping plover and roseate tern nesting habitats is provided in Chapter 5 (Mitigation).

The Action Proponents will implement mitigation tailored to reducing aircraft noise from military readiness activities in the ESA-listed bird nesting habitats identified in Table 3.9-8 and shown in Figure 3.9-9 through Figure 3.9-12. The Coastal Virginia Bird Mitigation Area will reduce aircraft noise exposure where the highest concentration of rotary-wing aircraft training is located adjacent to ESA-listed piping plover nesting habitat. The Dry Tortugas Bird and Cultural Resource Mitigation Area will reduce aircraft noise exposure to nesting ESA-listed roseate terns in a location where they would otherwise be exposed to sonic booms and other high levels of noise disturbance.

Table 3.9-8: Important Resource Features for Birds in Mitigation Areas

Species	*Important Resource Feature*	*Coastal Virginia Bird Mitigation Area (Year-Round)*	*Dry Tortugas Bird and Cultural Resource Mitigation Area (Year-Round)*
Piping plover	ESA-Nesting habitat along Virginia Beaches and in the Fisherman Island National Wildlife Refuge (year-round)	X	
Red knot	Proposed critical habitat along Virginia beaches (year-round)	X	
Roseate tern	ESA-listed species nesting habitat (year-round)		X

Note: ESA = Endangered Species Act

3.9.3.1.5.1 Impacts from Aircraft Noise under Alternative 1

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

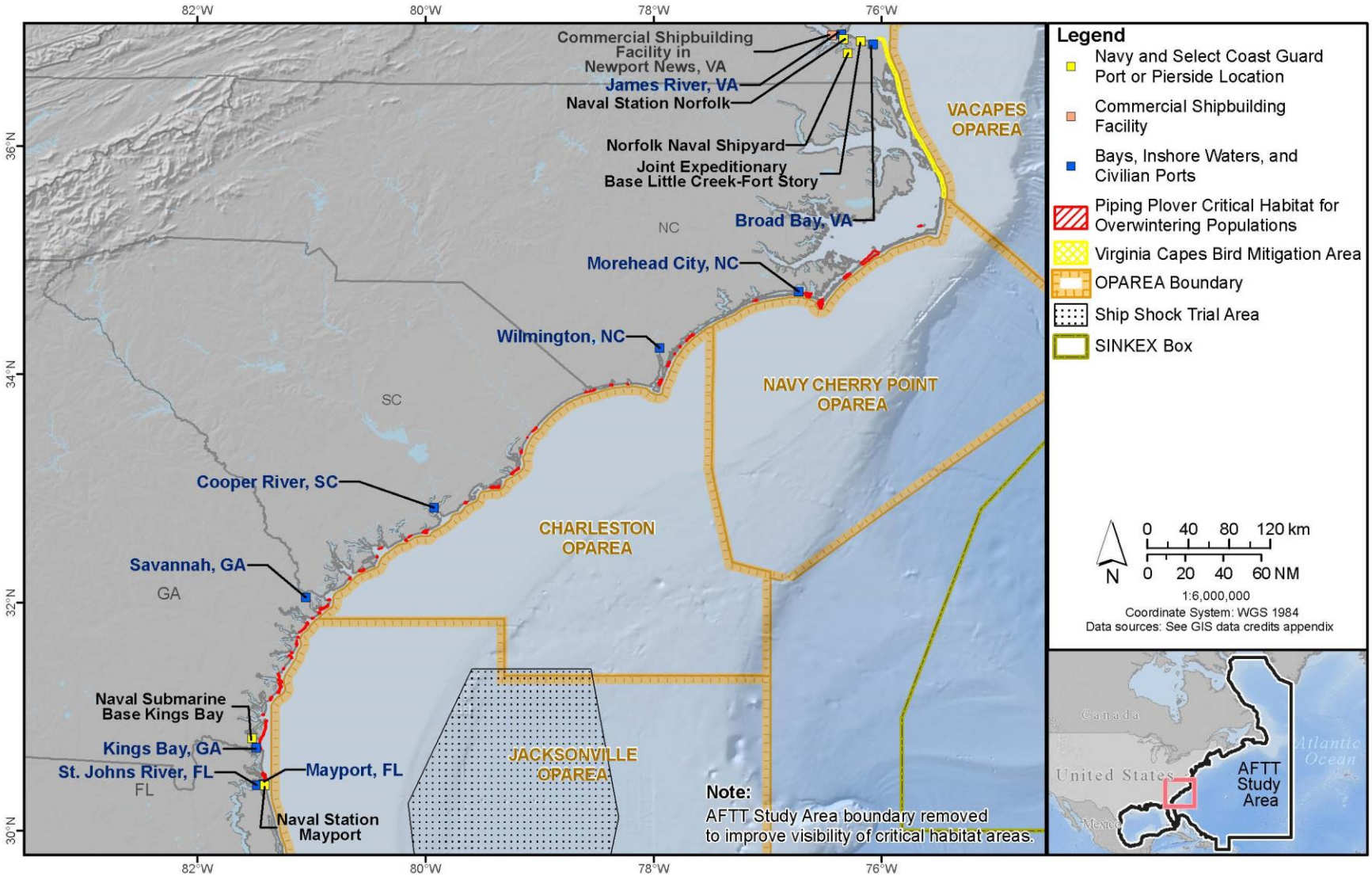
Under Alternative 1, the following changes exist from the 2018 Final EIS/OEIS for training activities:

- A notable increase in the Navy Cherry Point Range Complex.

Under Alternative 1, the following changes exist from the 2018 Final EIS/OEIS for testing activities:

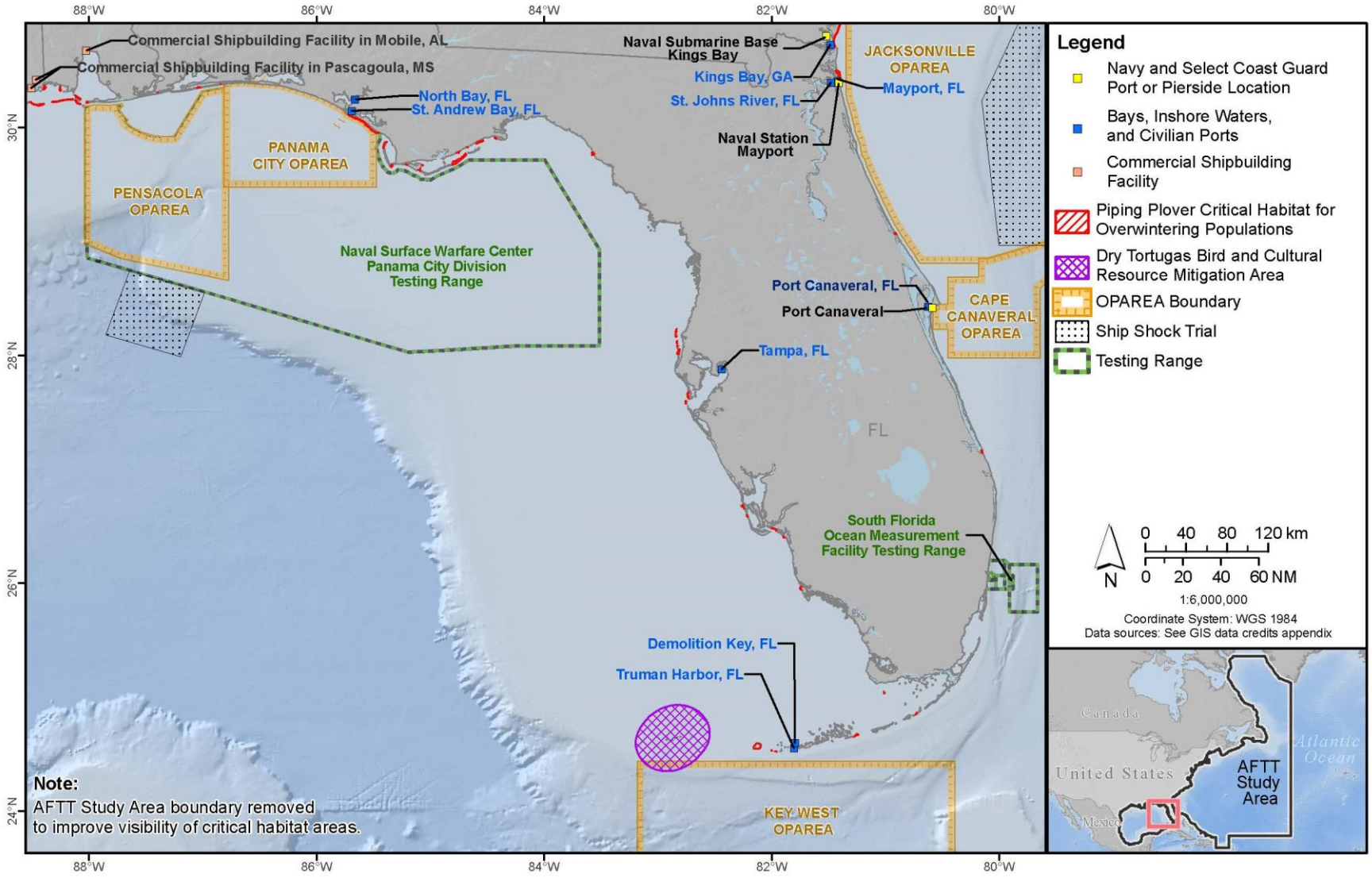
- Aircraft use in the following area that was not previously analyzed: Other AFTT Areas.

For all other locations, there is either a decrease or a similar amount of use, therefore the analysis from the 2018 Final EIS/OEIS remains valid for these areas.



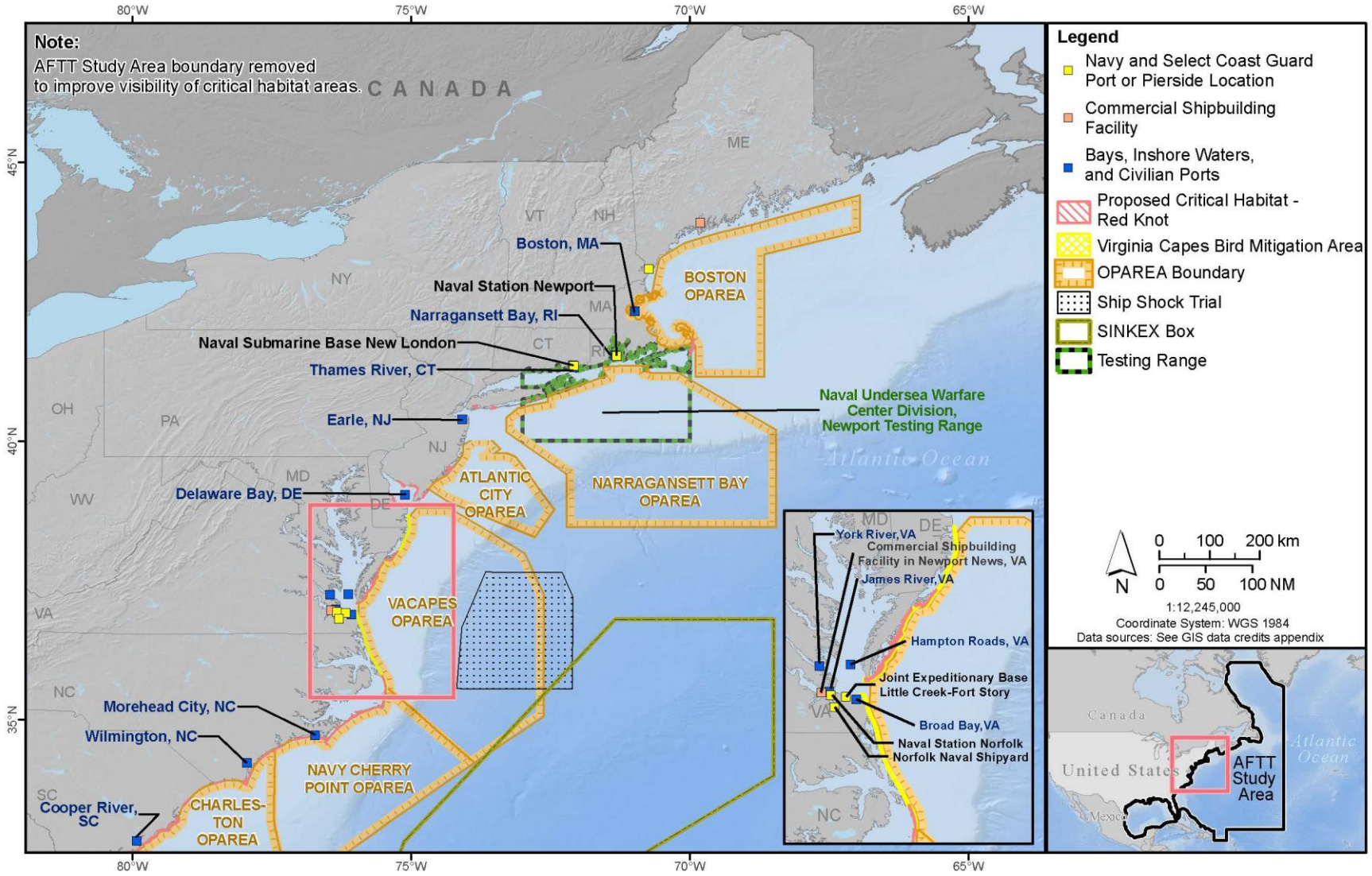
Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area; SINKEX = Sinking Exercise

Figure 3.9-9: Mitigation Areas and Critical Habitat for Piping Plover in the Southeast Portion of the Study Area



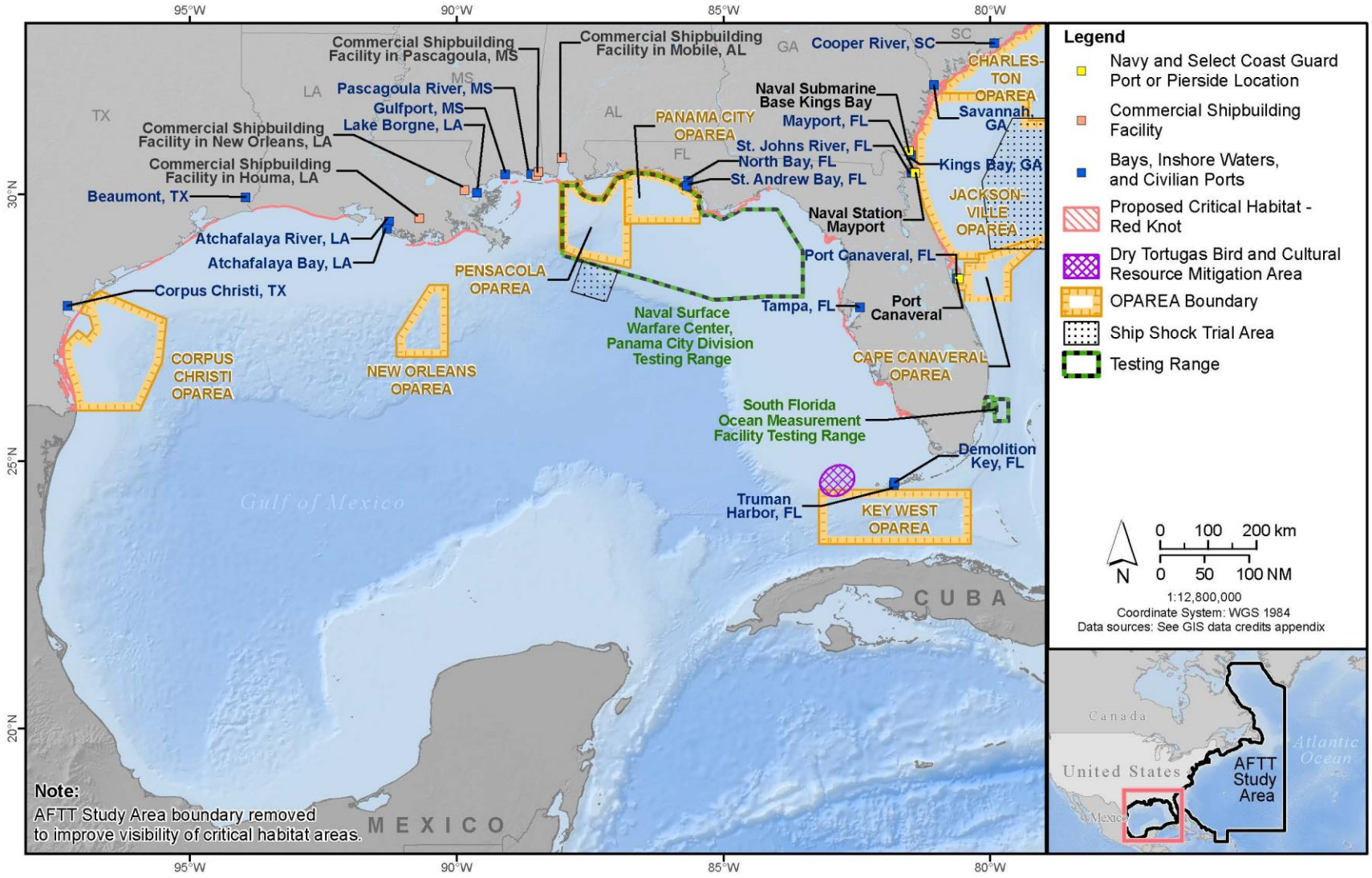
Notes: AFTT = Atlantic Fleet Training and Testing; OPAREA = operating area

Figure 3.9-10: Mitigation Areas and Critical Habitat for Piping Plover in the Gulf of Mexico Portion of the Study Area



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

Figure 3.9-11: Mitigation Areas and Proposed Critical Habitat for Red Knot in the Northeast Portion of the Study Area



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

Figure 3.9-12: Mitigation Areas and Proposed Critical Habitat for Red Knot in the Gulf of Mexico Portion of the Study Area

A bird or bat could be exposed to transient noise from aircraft passing overhead and may respond by avoiding areas where aircraft operations are temporarily concentrated. Aircraft activity would be dispersed, and exposures would be infrequent and brief. This is true of fixed- or rotary-winged aircraft though helicopters could hover for longer periods and helicopter activities would also occur closer to the coast and inshore, increasing the potential to expose birds and bats to aircraft noise. Most training activities would occur during the day, reducing the potential to expose bats in flight. Exposures to aircraft noise, particularly those of longer duration, could result in behavioral responses and physiological stress. However, it is likely that birds or bats present at the beginning of training, would leave the area to avoid exposure to aircraft noise, human presence, and other training-associated stressors. Any reactions are expected to be short term and minor. Repeated exposures of individuals would be unlikely. The analysis conclusions for aircraft noise during training and testing activities under Alternative 1 are consistent with a minor impact on bird and bat populations.

Under the ESA, aircraft noise during training and testing activities as described under Alternative 1 may affect piping plovers, red knots, roseate terns, Bermuda petrels, black-capped petrels, Indiana bats, northern long-eared bats, and tricolored bats.

Aircraft noise is not applicable to designated critical habitat for piping plover and proposed critical habitat for red knot. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA.

3.9.3.1.5.2 Impacts from Aircraft Noise under Alternative 2

Impacts from aircraft noise under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing. The number of activities including aircraft under Alternative 2 would increase only slightly over Alternative 1.

3.9.3.1.6 Impacts from Weapons Noise

Refer to Table 3.9-7 for a summary of the background information used to analyze the potential impacts of weapons noise on birds and bats. For information on the number of activities including weapons noise, see Table 3.0-11 (Number and Location of Non-Explosive Practice Munitions Expended during Military Readiness Activities).

3.9.3.1.6.1 Impacts from Weapons Noise under Alternative 1

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

Most sounds would be brief, lasting from less than a second for a blast or inert impact to a few seconds for other launch and object travel sounds. Most incidents of impulsive sounds produced by weapons firing, launch, or inert object impacts would be single events, with the exception of gunfire activities.

Because most large-caliber weapon firing would occur more than 12 nautical miles offshore, birds and bats that migrate or forage in open-ocean areas could be exposed to large-caliber weapons noise. All species could be exposed to small- and medium-caliber weapons noise that may occur closer to shore. Because weapon firing occurs at varying locations over a short time period and bird and bat presence changes seasonally and on a short-term basis, individual birds and bats would not be expected to be repeatedly exposed to weapons firing, launch, or projectile noise. Any impacts on migratory or breeding birds and bats related to startle reactions, displacement from a preferred area, or reduced foraging success in offshore waters would likely be short term and infrequent. Because impacts to individual

birds and bats, if any, are expected to be minor and limited. The analysis conclusions for weapons noise during training and testing activities under Alternative 1 are consistent with a minor impact on bird and bat populations.

Under the ESA, weapons noise during training and testing activities as described under Alternative 1 may affect piping plovers, red knots, roseate terns, Bermuda petrels, black-capped petrels, Indiana bats, northern long-eared bats, and tricolored bats.

Weapons noise is not applicable to designated critical habitat for piping plover and proposed critical habitat for red knot. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA.

3.9.3.1.6.2 Impacts from Weapons Noise under Alternative 2

Impacts from weapons noise under Alternative 2 are no different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing. The number of items generating weapons firing noise (e.g., non-explosive and explosive practice munitions) under Alternative 2 is the same as Alternative 1.

3.9.3.2 Explosive Stressors

Table 3.9-9 contains brief summaries of background information that is relevant to the analyses of impacts for each explosive substressor. Detailed information on acoustic impact categories in general, as well as effects specific to each substressor, is provided in Appendix D (Acoustic and Explosive Impacts Supporting Information).

While each of these substressors could affect birds and bats, the following analysis focuses on those substressors that would occur in new areas, areas not previously analyzed, and those that would occur more often than what was analyzed in the 2018 Final EIS/OEIS.

Table 3.9-9: Explosives Stressors Background Information Summary

Substressor	*Background Information Summary*
In-air explosives	• Detonations in-air during anti-air warfare training would typically occur at much higher altitudes (greater than 3,000 feet [914 meters] above sea level) where seabirds, migrating birds, and bats are not likely to be present. • Explosives detonated at or just above the water surface, such as those used in anti-surface warfare, would create blast waves that would propagate through both the water and air. • Detonations in-air could also result in mortality or injury to birds and bats. • If prey species (e.g., fishes) are killed or injured as a result of detonations, some birds may be attracted to forage in the area and be exposed to subsequent detonations. • A fleeing response to an initial explosion may reduce bird and bat exposure to any additional explosions that occur in a short time. • Detonations either in-air or underwater have the potential to cause a permanent or temporary hearing loss or auditory threshold shift, which could affect the ability of a bird or bat to communicate or detect biologically relevant sounds. • An explosive detonation would likely cause a startle reaction, as the exposure would be brief, and any reactions are expected to be short term. Startle impacts range from altering behavior (e.g., stop feeding or preening), minor behavioral changes (e.g., head turning), or a flight response. The range of impacts could depend on the charge size, distance from the charge, and the animal's behavior at the time of the exposure. Any impacts related to startle reactions, displacement from a preferred area, or reduced foraging success in offshore waters would likely be short term and infrequent.

Table 3.9-9: Explosives Stressors Background Information Summary (continued)

Substressor	*Background Information Summary*
	• Because most events would consist of a limited number of detonations, exposures would not occur over long durations; and since events occur at varying locations, it is expected there would be an opportunity to recover from an incurred energetic cost and individual birds and bats would not be repeatedly exposed to explosive detonations.
In-water explosives	• The majority of underwater explosions occur on the surface and typically in offshore locations with depths greater than 100 feet (30 meters). • Sound and energy generated by most small underwater explosions are unlikely to disturb birds and bats at or above the water surface. If a detonation is sufficiently large or is near the water surface, however, pressure would be released at the air-water interface, which could result in injury or mortality of birds and bats. • If prey species (e.g., fishes) are killed or injured as a result of detonations, some birds may be attracted to forage in the area and be exposed to subsequent detonations.

3.9.3.2.1 Impacts from In-Air Explosives

Table 3.9-9 contains a summary of the background information used to analyze the potential impacts of in-air explosives on birds and bats. For information on explosive sizes and quantities for each alternative, see Table 3.0-5 (Explosive Sources Quantitatively Analyzed that Could Be Used Underwater or at the Water Surface).

The Action Proponents will implement mitigation that would reduce the potential for large flocks of seabirds to be exposed to explosives during Ship Shock Trials. The mitigation relies on the presence of indicators, such as large flocks of birds, to indicate the presence of and protect marine mammals, which in turn also protects seabirds.

3.9.3.2.1.1 Impacts from In-Air Explosives under Alternative 1

The use of explosives would decrease overall from the 2018 Final EIS/OEIS for both training and testing activities. Table 3.0-5 (Explosive Sources Quantitatively Analyzed that Could Be Used Underwater or at the Water Surface) provides the explosive sources quantitatively analyzed.

Because most events would consist of a limited number of detonations, exposures would not occur over long durations; and since events occur at varying locations, it is expected there would be an opportunity to recover from an incurred energetic cost and individual birds and bats would not be repeatedly exposed to explosive detonations. Although a few individuals may experience impacts (including injury, hearing impacts, masking, startle response) and potential mortality, population-level impacts are not expected, and explosives would not have a significant adverse effect on populations of birds and bats. The analysis conclusions for in-air explosives use during training and testing activities under Alternative 1 are consistent with a moderate impact on bird and bat populations.

Under the ESA, the use of in-air explosives during training and testing activities as described under Alternative 1 may affect piping plovers, red knots, roseate terns, Bermuda petrels, black-capped petrels, Indiana bats, northern long-eared bats, and tricolored bats.

The use of in-air explosives is not applicable to designated critical habitat for piping plover and proposed critical habitat for red knot. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA.

3.9.3.2.1.2 Impacts from In-Air Explosives under Alternative 2

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

3.9.3.2.2 Impacts from In-Water Explosives

Table 3.9-9 contains a summary of the background information used to analyze the potential impacts of explosives on resources. For information on explosive sizes and quantities for each alternative, see Table 3.0-5 (Explosive Sources Quantitatively Analyzed that Could Be Used Underwater or at the Water Surface).

3.9.3.2.2.1 Impacts from In-Water Explosives under Alternative 1

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

Most activities involving large-caliber naval gunfire, or the launching of targets, missiles, bombs, or other munitions are conducted more than three nautical miles from shore. Very few detonations would occur at inshore locations and would involve the use of smaller charge sizes (E5 or below). Additionally, small ship shock trials could occur in Virginia Capes, Jacksonville, or the Gulf of Mexico Range Complexes. Because most events would consist of a limited number of detonations, exposures would not occur over long durations; and since events occur at varying locations, it is expected there would be an opportunity to recover from an incurred energetic cost and individual birds and bats would not be repeatedly exposed to explosive detonations. Although a few individuals may experience long-term impacts and potential mortality, population-level impacts are not expected, and explosives would not have a significant adverse effect on populations of migratory bird species. The analysis conclusions for in-water explosives use during training and testing activities under Alternative 1 are consistent with a moderate impact on bird and bat populations.

Under the ESA, the use of in-water explosives during training and testing activities as described under Alternative 1 may affect piping plovers, red knots, roseate terns, Bermuda petrels, black-capped petrels, and tricolored bats. The use of in-water explosives would have no effect on Indiana bats and northern long-eared bats.

The use of in-water explosives is not applicable to designated critical habitat for piping plover and proposed critical habitat for red knot. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA.

3.9.3.2.2.2 Impacts from In-Water Explosives under Alternative 2

Impacts from explosives in water under Alternative 2 are no different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing. The explosive sizes and numbers under Alternative 2 are the same as Alternative 1.

3.9.3.3 Energy Stressors

Table 3.9-10 contains brief summaries of background information that is relevant to the analyses of impacts for each energy substressor.

Following a review of recent literature, the background information for energy stressor effects on birds and bats in the Study Area as described in Section 3.9.3.3 (Energy Stressors) of the 2018 Final EIS/OEIS has not appreciably changed. As such, the information presented in the 2018 Final EIS/OEIS remains valid.

While each of these substressors could affect birds and bats, the following analysis focuses on those substressors that would occur in new areas and those that would occur more often than what was analyzed in the 2018 Final EIS/OEIS.

Table 3.9-10: Energy Stressors Background Information Summary

Substressor	*Background Information Summary*
In-water electromagnetic devices	• Towed in-water electromagnetic devices could impact diving bird species or species on the surface in the immediate area where the device is deployed. There is no information available on how birds react to electromagnetic fields underwater. • Since bats do not dive into water, in-water electromagnetic devices would not affect bats.
In-air electromagnetic devices	• Several different types of in-air electromagnetic devices are used during military readiness activities, including an array of communications transmitters, radars, and electronic countermeasures transmitters. In-air electromagnetic effects can be categorized as thermal (i.e., capable of causing damage by heating tissue) or non-thermal. • Thermal effects are most likely to occur when near high-power systems. Should such effects occur, they would likely cause birds and bats to temporarily avoid the area receiving the electromagnetic radiation until the stressor ceases (Ahlén et al., 2009; Manville, 2016; Nicholls & Racey, 2007, 2009). • Currently, questions exist about the non-thermal effects from low power, in-air electromagnetic devices that occur at a distance from the source. Manville (2016) performed a literature review of this topic. Although findings are not always consistent, the review of several peer-reviewed studies have shown non-thermal effects can include (1) affecting behavior by preventing birds from using their magnetic compass, which may in turn affect migration; (2) fragmenting the DNA of reproductive cells, decreasing the reproductive capacity of living organisms; (3) increasing the permeability of the blood-brain barrier; (4) other behavioral effects; (5) other molecular, cellular, and metabolic changes; and (6) increasing cancer risk. • Cucurachi et al. (2013) also performed a literature review of 113 studies and reported that (1) few field studies were performed (the majority were conducted in a laboratory setting); (2) 65% of the studies reported ecological effects both at high as well as low dosages (i.e., those that are compatible with real field situations, at least on land); (3) no clear dose-effect relationship could be discerned but that studies finding an effect applied higher durations of exposure and focused more on mobile phone frequency ranges; and (4) a lack of standardization and a limited number of observations limited the possibility of generalizing results from an organism to an ecosystem level. • Any temporary disorientation experienced by birds from electromagnetic changes caused by in-air electromagnetic devices may be considered a short-term impact and would not hinder bird navigation abilities due to their use of other orientation cues such as the sun and moon, visual cues, wind direction, infrasound, and scent. • Given the infrequent and seasonal use of the Study Area by bats, the localized nature of the area affected by in-air electromagnetic radiation, and that impacts would be limited to temporary behavioral responses and displacement from the affected area, few, if

Table 3.9-10: Energy Stressors Background Information Summary (continued)

Substressor	*Background Information Summary*
	any, individual bats would be affected, and exposure would not have persistent or accumulating effects. • Given the dispersed nature of military readiness activities at sea and the relatively low-level and dispersed use of these systems at sea, it is unlikely that birds or bats would be affected by these activities and population-level impacts are not expected. • Similarly, the potential to affect ESA-listed birds and bats is low based on the low numbers of individuals and the transient and brief nature of the use of these devices. No effects are anticipated.
High-energy lasers	• Impacts would occur if individuals were struck directly with a laser beam, which could result in injury or mortality resulting from the thermal effects of radiation exposure. • Birds or bats could be exposed to a laser only if they fly through the beam, a very unlikely occurrence because of the limited use of high-energy lasers and small area, the small area, and the time that the beam would be present.

Notes: % = percent; DNA = deoxyribonucleic acid; ESA = Endangered Species Act

3.9.3.3.1 Impacts from In-Water Electromagnetic Devices

Table 3.9-10 contains a summary of background information used to analyze the potential impacts of in-water electromagnetic devices on birds and bats.

3.9.3.3.1.1 Impacts from In-Water Electromagnetic Devices under Alternative 1

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

Under Alternative 1 for training:

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

Under Alternative 1 for testing:

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

For locations without a notable increase in activity, the impact analysis that was conducted in the 2018 Final EIS/OEIS remains valid; the updates to the affected environment noted in Section 3.9.2 (Affected Environment) do not alter the analysis because the general distribution and sensitivity of birds and bats has not changed.

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

For the locations not previously analyzed, introduction of in-water electromagnetic device use has the potential to impact birds that may be exposed in those areas.

Exposure of birds would be limited to those foraging at or below the surface (e.g., terns, cormorants, loons, petrels, or grebes) because that is where the devices are used. The in-water electromagnetic fields generated would be distributed over time and any influence on the surrounding environment would be temporary and localized. In-water electromagnetic devices are typically towed by a helicopter, surface ship, or unmanned vehicle. It is likely that any birds in the vicinity of an approaching vehicle towing an in-water electromagnetic device would be dispersed by the sound and disturbance generated by the vehicle and therefore move away from the vehicle and device before any exposure could occur.

Impacts on birds from potential exposure to in-water electromagnetic devices would be temporary and negligible based on the (1) relatively low intensity of the magnetic fields generated (0.2 microtesla at 656 feet [200 meters] from the source), (2) very localized potential impact area, (3) temporary duration of the activities (hours), (4) occurrence only underwater, and (5) the likelihood that any birds in the vicinity of the approaching vehicles towing an in-water electromagnetic devices would move away from the vehicle and device before any exposure could occur. Bats would not be affected by in-water electromagnetic devices. The analysis conclusions for in-water electromagnetic device use during training and testing activities under Alternative 1 are consistent with a negligible impact on bird and bat populations.

Under the ESA, the use of in-water electromagnetic devices during training and testing activities as described under Alternative 1 may affect roseate terns, Bermuda petrels, and black-capped petrels. The use of in-water electromagnetic devices would not be applicable to piping plovers, red knots, Indiana bats, northern long-eared bats, and tricolored bats.

The use of in-water electromagnetic devices is not applicable to designated critical habitat for piping plover and proposed critical habitat for red knot. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA.

3.9.3.3.1.2 Impacts from In-Water Electromagnetic Devices under Alternative 2

Impacts from in-water electromagnetic devices under Alternative 2 are no different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing. The number of activities including use of in-water electromagnetic devices under Alternative 2 is the same as Alternative 1.

3.9.3.3.2 Impacts from In-Air Electromagnetic Devices

Refer to Table 3.9-10 for a summary of background information used to analyze the potential impacts of in-air electromagnetic devices on birds and bats. Detailed information is provided in Appendix G (Non-Acoustic Impacts Supporting Information).

3.9.3.3.2.1 Impacts from In-Air Electromagnetic Devices under Alternative 1

The training and testing activities involving in-air electromagnetic devices would occur in all of the training and testing areas both inshore and offshore. Given the dispersed nature of training and testing activities, and the relatively low-level and dispersed use of these systems, the chance that in-air electromagnetic devices would cause thermal damage to an individual bird is low. It is possible, although unlikely, that some individuals would be exposed to levels of electromagnetic radiation that would cause discomfort, in which case they would likely avoid the immediate vicinity of the activity. Possible non-thermal effects could include (1) affecting behavior by preventing birds from using their magnetic

compass, which may in turn affect migration; (2) fragmenting the DNA of reproductive cells, decreasing the reproductive capacity of living organisms; (3) increasing the permeability of the blood-brain barrier; (4) other behavioral effects; (5) other molecular, cellular, and metabolic changes; and (6) increasing cancer risk (Manville, 2016). These strong effects would likely only occur as a result of direct, close field exposure to strong electromagnetic radiation. The strength of any avoidance response would also decrease with increasing distance from the in-air electromagnetic devices. The analysis conclusions for in-air electromagnetic device use during training and testing activities under Alternative 1 are consistent with a negligible impact on bird and bat populations.

Under the ESA, the use of in-air electromagnetic devices during training and testing activities as described under Alternative 1 may affect piping plovers, red knots, roseate terns, Bermuda petrels, black-capped petrels, Indiana bats, northern long-eared bats, and tricolored bats.

The use of in-air electromagnetic devices is not applicable to designated critical habitat for piping plover and proposed critical habitat for red knot. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA.

3.9.3.3.2.2 Impacts from In-Air Electromagnetic Devices under Alternative 2

Impacts from in-air electromagnetic devices under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing. The number of activities including aircraft under Alternative 2 would increase only slightly over Alternative 1.

3.9.3.3.3 Impacts from High-Energy Lasers

Refer to Table 3.9-10 for a summary of background information used to analyze the potential impacts of high-energy lasers on birds and bats. For information on the number of activities including high energy lasers, see Table 3.0-7 (Number and Location of Activities Using High-Energy Lasers).

3.9.3.3.3.1 Impacts from High-Energy Lasers under Alternative 1

Under Alternative 1 for training:

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

Under Alternative 1 for testing:

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

For all other locations, there is either a decrease or a similar amount of use, therefore the analysis from the 2018 Final EIS/OEIS remains valid for these areas.

Due to changes in the understanding of how high-energy lasers operate during military readiness activities (i.e., that the high-energy lasers are used in short ranges and the laser shuts off when it loses contact with the target), the analysis has been updated from the 2018 Final EIS/OEIS.

Impacts would occur if individuals were struck directly with a laser beam, which could result in injury or mortality resulting from the thermal effects of radiation exposure. However, impacts from high-energy lasers are unlikely based on the: (1) relatively low number of activities, (2) very localized potential

impact area of the laser beam, (3) temporary duration of potential impact (seconds), and (4) the features of the system that further reduce the potential for impacts.

As in the 2018 Final EIS/OEIS, neither birds nor bats are likely to be exposed to high-energy lasers and no population-level impacts are expected. The analysis conclusions for high-energy laser use during training and testing activities under Alternative 1 are consistent with a negligible impact on bird and bat populations.

High-energy laser activities would not overlap with the occurrence of the piping plover or red knot. The likelihood of a roseate tern, Bermuda petrel, or black-capped petrel being present in these areas at the time of these events and crossing the laser beam at the instant the laser is fired is remote but possible. The likelihood that an ESA-listed bird would be struck by a high-energy laser beam is so small as to be discountable.

Under the ESA, the use of high-energy lasers during training and testing activities as described under Alternative 1 may affect roseate terns, Bermuda petrels, black-capped petrels, Indiana bats, northern long-eared bats, and tricolored bats. The use of high-energy lasers would not be applicable to piping plovers and red knots.

The use of high-energy lasers is not applicable to designated critical habitat for piping plover and proposed critical habitat for red knot. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA.

3.9.3.3.3.2 Impacts from High-Energy Lasers under Alternative 2

Impacts from high-energy lasers under Alternative 2 are no different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing. The number of activities including high-energy lasers under Alternative 2 would be the same as Alternative 1.

3.9.3.4 Physical Disturbance and Strike Stressors

Table 3.9-11 contains brief summaries of background information that is relevant to the analyses of impacts for each physical disturbance and strike substressor. Following a review of recent literature, the background information for physical disturbance and strike stressor effects on birds and bats in the Study Area as described in Section 3.9.3.4 (Physical Disturbance and Strike Stressors) of the 2018 Final EIS/OEIS has not appreciably changed.

For birds and bats, it is not expected that seafloor devices or pile driving would cause physical disturbance or strike. Therefore, this analysis focuses on vessels, in-water devices, aircraft and aerial targets, and military expended materials. Additionally, the following analysis focuses on those substressors that would occur in new areas, areas not previously analyzed, and those that have a notable increase from what was analyzed in the 2018 Final EIS/OEIS.

Table 3.9-11: Physical Disturbance and Strike Stressors Background Information Summary

Substressor	*Background Information Summary*
Vessels and in-water devices	• Vessel strike and collision with in-water devices has the potential to impact all taxonomic groups found in the Study Area and could cause injury or mortality. • There would be a higher likelihood of vessel and in-water device disturbance or strike in the coastal areas than in the open ocean because of the concentration of activities and higher numbers of birds and bats closer to shore. • Direct collisions of birds with vessels and in-water devices are unlikely but may occur, especially at night when birds can become disoriented by or attracted to

Table 3.9-11: Physical Disturbance and Strike Stressors Background Information Summary (continued)

Substressor	*Background Information Summary*
	artificial light (Favero et al., 2011; Hamilton, 1958; Hyrenbach, 2001, 2006; Merkel & Johansen, 2011). • Though collisions of bats with vessels and in-water devices is unlikely, bats are known to collide with buildings and communication towers (Cryan & Brown, 2007; Hatch et al., 2013) and therefore may also collide with vessels.
Aircraft and aerial targets	• Bird or bat strikes could occur during military readiness activities that use aircraft, particularly in nearshore areas, where birds and bats are more concentrated in the Study Area. • Bird or bat strike potential is greatest in foraging or resting areas, in migration corridors at night, and at low altitudes during the periods around dawn and dusk. • Bird-aircraft strikes are a serious concern for the Navy because these incidents can result in injury to aircrews and damage equipment as well as injure or kill birds (Bies et al., 2006). Pilots have safety procedures they follow to reduce potential bird strikes. • While wildlife strikes can occur anywhere aircraft are operated, Navy data indicate that they occur most often in the airfield environment (Naval Air Station Jacksonville, 2012). • Unmanned drones could also strike birds or bats; however, evidence from returned drones indicates the probability is low.
Military expended materials	• Exposure of birds or bats to military expended materials during military readiness activities could result in physical injury or behavioral disturbances to birds or bats in-air, at the surface, or underwater during foraging dives. • The large area where materials would be used, coupled with the patchy distribution of seabirds and the infrequent use of the Study Area by foraging bats suggests that the probability of these types of ordnance striking a seabird or bat would be low. • Human activity associated with training and testing could cause birds or bats to flee a target area before the onset of firing, thus avoiding harm. • The potential likelihood of individual birds or bats being struck by munitions is very low; thus, impacts on bird or bat populations would not be expected.
Seafloor devices	• Neither birds nor bats are likely to encounter seafloor devices therefore this substressor is not applicable to birds and bats.
Pile driving	• Neither birds nor bats are likely to be physically affected by pile driving therefore this substressor is not applicable to birds and bats.

3.9.3.4.1 Impacts from Vessels and In-Water Devices

Table 3.9-11 contains a summary of background information used to analyze the potential impacts of vessels and in-water devices on birds and bats. For information on the number of activities including vessels and in-water devices, see Table 3.0-9 (Number and Location of Activities Including Vessels) and Table 3.0-10 (Number and Location of Activities Including In-Water Devices).

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

For both training and testing activities, vessel and in-water device activity would decrease overall from the 2018 Final EIS/OEIS (Table 3.0-9, Number and Location of Activities Including Vessels).

Under Alternative 1 for training:

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

Under Alternative 1 for testing:

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

Under Alternative 1, vessel and in-water device use would generally continue as described in the 2018 Final EIS/OEIS. Overall, the area exposed to vessel and in-water device disturbance would be a very small portion of the surface and water column in the Study Area.

For locations without a notable increase in activity, the impact analysis that was conducted in the 2018 Final EIS/OEIS remains valid; the updates to the affected environment noted in Section 3.9.2 (Affected Environment) do not alter the analysis because the general distribution and sensitivity of birds and bats has not changed.

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

For the locations not previously analyzed, introduction of vessel and in-water device use has the potential to impact birds and bats that may be exposed in those areas.

The potential for these activities to affect birds and bats is greater in coastal areas than open ocean areas where vessel use is less concentrated. However, even in areas of concentrated vessel use, the probability of bird or bat interaction with a vessel is low because of the dispersed nature of activities and ability of the animals to leave the area. Flushing of birds is expected to be greatest when vessels, towed devices, and unmanned surface vehicles are operated at relatively high speeds. Amphibious vessels and especially amphibious landings could impact birds that nest and forage at the shoreline. These activities also have a greater probability of temporarily displacing bats than offshore activities since bats occur more frequently above nearshore portions of the Study Area where they may forage. The analysis conclusions for vessel and in-water device use during training and testing activities under Alternative 1 are consistent with a negligible impact on bird and bat populations.

In-water devices are typically towed by a boat or helicopter, unmanned vehicles, or fired from a ship. It is likely that any birds or bats in the vicinity of the approaching boat, helicopter, unmanned vehicle, or ship firing torpedoes would be dispersed by their sound and move away from the in-water device before

any exposure occurs. Therefore, the use of in-water devices is expected to have only short-term negligible impacts on individual birds and bats.

Under the ESA, the use of vessels and in-water devices during training and testing activities as described under Alternative 1 may affect piping plovers, red knots, roseate terns, Bermuda petrels, black-capped petrels, Indiana bats, northern long-eared bats, and tricolored bats.

The use of vessels and in-water devices is not applicable to designated critical habitat for piping plover and proposed critical habitat for red knot. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA.

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

Impacts from vessels and in-water device activities under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing. The number of activities including vessels or in-water devices increases only slightly over that of Alternative 1.

3.9.3.4.2 Impacts from Aircraft and Aerial Targets

Refer to Table 3.9-11 for a summary of background information used to analyze the potential impacts of aircraft and aerial targets on birds and bats. For information on the number of activities including aircraft and aerial targets, see Table 3.0-16 (Number and Location of Activities with Aircraft) and Table 3.0-13 (Number and Location of Targets Expended during Military Readiness Activities).

The Action Proponents' standard operating procedures will reduce manned aircraft strike hazards from large flocks of birds and bats. Based on a total of 38,961 strike reports from 1990 to 2004, 74 percent (28,806) of bird strikes occurred below 500 feet above ground level, 19 percent (5,448) between 501 and 3,500 feet above ground level, and 7 percent (2,355) above 3,500 feet above ground level (Dolbeer, 2006).

3.9.3.4.2.1 Impacts from Aircraft and Aerial Targets under Alternative 1

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

Under Alternative 1 for training:

- Aircraft and aerial targets would have a notable increase in the Navy Cherry Point Range Complex from the 2018 Final EIS/OEIS. For all other locations, there would either be a decrease, similar amount, or cessation of aircraft and aerial target use.

Under Alternative 1 for testing:

- Aircraft and aerial targets would occur in one location not previously analyzed (Other AFTT Areas) in the 2018 Final EIS/OEIS. For all other locations, there would either be a decrease, similar amount, or cessation of aircraft and aerial target use.

For locations without a notable increase in aircraft and aerial target activity, the analysis from the 2018 Final EIS/OEIS remains valid, and the updates to the affected environment noted in Section 3.9.2 (Affected Environment) do not alter the analysis because the general distribution and sensitivity of birds and bats has not changed.

For locations not previously analyzed and with notable increases in activity, the impact analysis that was conducted in the 2018 Final EIS/OEIS would not change because the risk of strike would remain low.

As a result of Standard Operating Procedures and Navy Bird Aircraft Strike Hazard policies, for aircraft safety, strikes of large flocks of birds and bats by manned aircraft are avoided and would be expected to occur infrequently. The analysis conclusions for aircraft and aerial target use during training and testing activities under Alternative 1 are consistent with a moderate impact on bird and bat populations.

Under the ESA, the use of aircraft and aerial targets during training and testing activities as described under Alternative 1 may affect piping plover, red knot, roseate terns, Bermuda petrels, black-capped petrels, Indiana bats, northern long-eared bats, and tricolored bats.

The use of aircraft and aerial targets is not applicable to designated critical habitat for piping plover and proposed critical habitat for red knot. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA.

3.9.3.4.2.2 Impacts from Aircraft and Aerial Targets under Alternative 2

Impacts from aircraft and aerial target activities under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing. The number of activities including aircraft and aerial targets under Alternative 2 would increase only slightly over Alternative 1.

3.9.3.4.3 Impacts from Military Expended Materials

Refer to Table 3.9-11 for a summary of background information used to analyze the potential impacts of military expended materials on birds and bats. For information on the type, number, and location of military expended materials, see Table 3.0-11 (Number and Location of Non-Explosive Practice Munitions Expended during Military Readiness Activities), Table 3.0-12 (Number and Location of Explosives that May Result in Fragments during Military Readiness Activities), Table 3.0-13 (Number of Location of Targets Expended during Military Readiness Activities), Table 3.0-14 (Number and Location of Other Military Materials Expended during Military Readiness Activities), Table 3.0-17 (Number and Location of Wires and Cables Expended during Military Readiness Activities), and Table 3.0-18 (Number and Location of Activities Including Biodegradable Polymers during Testing).

3.9.3.4.3.1 Impacts from Military Expended Materials under Alternative 1

For both training and testing activities, the number of military expended materials would decrease overall from the 2018 Final EIS/OEIS (Table 3.0-11 through Table 3.0-14, and Table 3.0-17 through Table 3.0-18).

Under Alternative 1 for training:

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

Under Alternative 1 for testing:

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

For locations without a notable increase in activity, the impact analysis that was conducted in the 2018 Final EIS/OEIS remains valid; the updates to the affected environment noted in Section 3.9.2 (Affected Environment) do not alter the analysis because the general distribution and sensitivity of birds and bats has not changed.

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

For the locations not previously analyzed, introduction of military expended materials has the potential to impact birds and bats that may be exposed in those areas.

The potential impact of military expended materials on birds or bats in the Study Area is dependent on the probability that birds or bats are present in areas where such materials are used as well as the ability of birds or bats to detect and avoid foreign objects. The amount of materials expended over the vast area over which military readiness activities occur, combined with the ability of birds and bats to flee disturbance and the infrequent use of the Study Area by foraging bats (Ahlén et al., 2009; Johnson et al., 2011; Pelletier et al., 2013; U.S. Department of Energy, 2016), would make direct strikes unlikely. Individual birds or bats may be impacted, but strikes would have no impact on species or populations. Since bats occur in the Study Area much less frequently than birds, it is expected that the likelihood of a bat strike is proportionally less than that for a bird strike. The analysis conclusions for military expended materials during training and testing activities under Alternative 1 are consistent with a negligible impact on bird and bat populations.

Under the ESA, the use of military expended materials during training and testing activities as described under Alternative 1 may affect piping plovers, red knots, roseate terns, Bermuda petrels, black-capped petrels, Indiana bats, northern long-eared bats, and tricolored bats.

The use of military expended material is not applicable to designated critical habitat for piping plover and proposed critical habitat for red knot. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA.

3.9.3.4.3.2 Impacts from Military Expended Materials under Alternative 2

Impacts from military expended materials under Alternative 2 are not meaningfully different from Alternative 1 and therefore the impact conclusions are the same for both training and testing. The increase in footprint from Alternative 1 to 2 is only 0.026 acres and located mostly in the Gulf of Mexico Range Complex, with relatively small footprints in the other range complexes.

3.9.3.5 Entanglement Stressors

The evaluation of entanglement stressors on birds identified for analysis in this Supplemental EIS/OEIS are the same as those in Section 3.9.3.5 (Entanglement Stressors) of the 2018 Final EIS/OEIS (wires and cables, decelerators/parachutes). Because bats do not use these habitats, bats would not be affected by entanglement stressors.

Table 3.9-12 contains brief summaries of background information that is relevant to the analyses of impacts for each entanglement substressor. Following a review of recent literature, the background information for entanglement stressor effects on birds and bats in the Study Area as described in the 2018 Final EIS/OEIS has not appreciably changed. As such, the information presented in the 2018 Final EIS/OEIS remains valid.

Table 3.9-12: Entanglement Stressors Background Information Summary

Substressor	*Background Information Summary*
Wires and cables	• Given the limited time that wires and cables would remain suspended in-air and the ability of birds and bats to detect and avoid parachutes in-air, the likelihood that a bird or bat would become entangled in-air is considered remote and discountable. • This analysis is focused on the potential for entanglement at the water surface, in the water column, or on the seafloor.

Table 3.9-12: Entanglement Stressors Background Information Summary (continued)

Substressor	*Background Information Summary*
	• Wires and cables are readily avoidable by birds foraging or resting in the water. • The entanglement risk from these components would only occur when a bird and these components were in close proximity at the water surface, in the water column, or on the seafloor. • However, these materials would be readily avoided by birds that may be foraging or resting in the water and do not pose the same entanglement risks as fishing gear because they are relatively conspicuous in contrast to fishing lines, do not form long loops of line that are hard to break, do not tend to snag animals that swim through them, and do not persist for a long time in the water column. • Once on the bottom, it is unlikely that bottom feeding birds would encounter these items, which are used far offshore and would sink to depths deeper than the bird foraging depths. • Some components, once they sink to the bottom, may be transported by bottom currents or active tidal influence, and can present an enduring entanglement risk. In the benthic environment, however, subsequent colonization by encrusting organisms, burying by sediment, and chemical breakdown of the various materials would further reduce the potential for entanglement.
Decelerators and parachutes	• Given the limited time that parachutes and decelerators would remain suspended in-air and the ability of birds and bats to detect and avoid parachutes in-air, the likelihood that a bird or bat would become entangled in-air is considered remote and discountable. • This analysis is focused on the potential for entanglement at the water surface, in the water column, or on the seafloor. • As with wires and cables, these materials would be readily avoided on the surface, in the water column, and on the bottom by visually oriented seabirds and do not pose the same entanglement risks as fishing gear because they are relatively conspicuous in contrast to fishing lines, do not form long loops of line that are hard to break, do not tend to snag animals that swim through them, and do not persist for a long time in the water column. • Once on the bottom, it is unlikely that bottom feeding birds would encounter these items, which are used far offshore and would sink to depths deeper than the bird foraging depths. • Similarly, the potential for a bird to encounter an expended decelerator/parachute at the surface or in the water column is extremely low.
Biodegradable polymer	• The possibility of entanglement in the biodegradable polymer is considered remote and discountable given that the material is deployed on a small scale, is short-lived in the water, and that diving birds routinely navigate through floating vegetation without becoming entangled. Therefore, this substressor will not be further analyzed.

3.9.3.5.1 Impacts from Wires and Cables

Table 3.9-12 contains a summary of the background information used to analyze the potential impacts of wires and cables on birds and bats. Table 3.0-17 indicates the number and location of wires and cables expended during military readiness activities for Alternatives 1 and 2.

3.9.3.5.1.1 Impacts from Wires and Cables under Alternative 1

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

Under Alternative 1 for training:

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

Under Alternative 1 for testing:

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

For locations without a notable increase in activity, the impact analysis that was conducted in the 2018 Final EIS/OEIS remains valid; the updates to the affected environment noted in Section 3.9.2 (Affected Environment) do not alter the analysis because the general distribution and sensitivity of birds and bats has not changed.

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

For the locations not previously analyzed, introduction of wires and cables has the potential to impact birds that may be exposed in those areas.

Given that these stressors are widely dispersed over vast areas and do not persist or accumulate at the surface or in the water column where seabirds forage, encounters with seabirds would be infrequent. This is coupled with a remote likelihood that a bird encountering the expended material would become entangled. The analysis conclusions for wire and cable use during training and testing activities under Alternative 1 are consistent with a negligible impact on bird and bat populations.

Under the ESA, the use of wires and cables during training and testing activities as described under Alternative 1 would have no effect on piping plovers, red knots, roseate terns, Bermuda petrels, and black-capped petrels. The use of wires and cables would not be applicable to Indiana bats, northern long-eared bats, and tricolored bats.

The use of wires and cables is not applicable to designated critical habitat for piping plover and proposed critical habitat for red knot. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA.

3.9.3.5.1.2 Impacts from Wires and Cables under Alternative 2

Impacts from wires and cables under Alternative 2 are not meaningfully different from Alternative 1 and therefore the conclusions for significance, ESA-listed species, and critical habitat are the same for both training and testing. The number of wires and cables used under Alternative 2 would increase only slightly over Alternative 1.

3.9.3.5.2 Impacts from Decelerators/Parachutes

Table 3.9-12 contains a summary of the background information used to analyze the potential impacts of decelerators/parachutes on resources. Table 3.0-13 (Number and Location of Targets Expended

during Military Readiness Activities) indicates the number and location of decelerators/parachutes expended during military readiness activities for Alternatives 1 and 2.

3.9.3.5.2.1 Impacts from Decelerators/Parachutes under Alternative 1

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

Under Alternative 1 for training:

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

Under Alternative 1 for testing:

- Decelerators/parachutes would be used in one area (Other AFTT Areas) that was not previously analyzed, and there would be notable increases in the Northeast, Virginia Capes, and Key West Range Complexes. For all other locations, there would either be a decrease or similar amount of decelerators/parachutes.

For locations without a notable increase in activity, the impact analysis that was conducted in the 2018 Final EIS/OEIS remains valid; the updates to the affected environment noted in Section 3.9.2 (Affected Environment) do not alter the analysis because the general distribution and sensitivity of birds and bats has not changed.

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

For the locations not previously analyzed, introduction of decelerators/parachutes has the potential to impact birds that may be exposed in those areas.

Given that decelerators and parachutes would be widely dispersed over vast areas and do not persist or accumulate at the surface or in the water column where seabirds forage, encounters with seabirds would be infrequent. This is coupled with a remote likelihood that a bird encountering the expended material would become entangled, as described above. The analysis conclusions for decelerator/parachute use during training and testing activities under Alternative 1 are consistent with a negligible impact on bird and bat populations.

Under the ESA, the use of decelerators/parachutes during training and testing activities as described under Alternative 1 would have no effect on piping plovers, red knots, roseate terns, Bermuda petrels, or black-capped petrels. The use of decelerators/parachutes would not be applicable to Indian bats, northern long-eared bats, and tricolored bats.

The use of wires and cables is not applicable to designated critical habitat for piping plover and proposed critical habitat for red knot. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA.

3.9.3.5.2.2 Impacts from Decelerators/Parachutes under Alternative 2

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

the same for both training and testing. The number of decelerators/parachutes used under Alternative 2 would increase only slightly over Alternative 1.

3.9.3.6 Ingestion Stressors

Table 3.9-13 contains brief summaries of background information that is relevant to the analyses of impacts for each ingestion substressor. Following a review of recent literature, the background information for ingestion stressor effects on birds and bats in the Study Area as described in Section 3.9.3.6 (Ingestion Stressors) of the 2018 Final EIS/OEIS has not appreciably changed. As such, the information presented in the 2018 Final EIS/OEIS remains valid. Ingestions stressors would not affect bats, and they will not be discussed further.

It is not expected that birds would ingest munitions or target fragments, as these are too large to be mistaken for food and are dense enough to sink rapidly and bury in the bottom, being both inaccessible and not attractive as sources of food. The types of expended materials that are potential ingestion stressors include: fragments from chaff, plastic end caps from chaff cartridges, the plastic compression pads, and end caps from pistons and flares. Additionally biodegradable polymer could theoretically be ingested by birds; however, the likelihood is low because the material degrades and dissolves rapidly (within an hour). Accordingly, this analysis will focus on other military expended materials, which could be ingested by birds. Additionally, the following analysis focuses on those substressors that would occur in new areas and those that would occur more often than what was analyzed in the 2018 Final EIS/OEIS.

Table 3.9-13: Ingestion Stressors Background Information Summary

Substressor	*Background Information Summary*
Military expended materials - munitions	• Birds are not expected to ingest munitions, as these are too large to be mistaken for food and are dense enough to sink rapidly and bury in the bottom, being both inaccessible and not attractive as sources of food. Therefore, this substressor will not be further analyzed.
Military expended materials (other than munitions)	• Ingestion of expended materials by birds could occur in any training or testing area at the surface or just below the surface portion of the water column. • Floating material of ingestible size could be eaten by birds that feed at or near the water surface, while materials that sink pose a potential risk to diving birds that feed just below the water's surface (Titmus & Hyrenbach, 2011). • Physiological impacts to birds from ingestion include blocked digestive tracts, blockage of digestive enzymes, lowered hormone levels, delayed ovulation, reproductive failure, nutrient dilution, exposure to indirect effects from harmful chemicals found in and on the plastic material, and altered appetite satiation, which can lead to starvation (Azzarello & Van Vleet, 1987; Provencher et al., 2014). • While ingestion of marine debris has been linked to bird mortalities, sublethal impacts are more common (Moser & Lee, 1992).

3.9.3.6.1 Impacts from Military Expended Materials Other Than Munitions

Table 3.9-13 contains a summary of background information used to analyze the potential impacts of military expended materials (other than munitions) on birds. For more information on the location and number of military expended materials other than munitions see Table 3.0-14, (Number and Location of Other Military Materials Expended during Military Readiness Activities).

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

For both training and testing activities, military expended materials other than munitions, would decrease from the 2018 Final EIS/OEIS (Table 3.0-14).

Under Alternative 1 for training:

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

Under Alternative 1 for testing:

- Ingestible military expended materials other than munitions would occur in one location not previously analyzed (Other AFTT Areas). For all other locations, there would either be a decrease or similar amount of military expended materials other than munitions.

For locations without a notable increase in activity, the impact analysis that was conducted in the 2018 Final EIS/OEIS remains valid; the updates to the affected environment noted in Section 3.9.2 (Affected Environment) do not alter the analysis because the general distribution and sensitivity of birds and bats has not changed.

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

For the locations not previously analyzed, introduction of military expended materials has the potential to impact birds that may be exposed in those areas.

Although the overall concentration of military expended materials would be low, military expended materials would not be evenly distributed. There is some potential for expended materials that float (e.g., some types of target fragments or chaff end caps or flare compression pads and pistons) to become concentrated along frontal zones, along with food resources that tend to attract foraging birds, resulting in the incidental ingestion of such materials, most likely as very small fragments. Military expended materials would constitute a minute portion of the floating debris but could nevertheless contribute to harmful effects of manmade debris on some birds. The likelihood that individual birds would be negatively impacted by ingestion of military expended materials in the Study Area under Alternative 1 for training is considered low, but not discountable. Population-level effects would be very unlikely given the relatively small quantities and limited persistence of military expended materials in habitats where birds are most likely to forage. The analysis conclusions for military expended materials other than munitions during training and testing activities under Alternative 1 are consistent with a negligible impact on bird and bat populations.

Under the ESA, the use of military expended materials other than munitions during training and testing activities as described under Alternative 1 may affect piping plovers, red knots, roseate terns, Bermuda petrels, and black-capped petrels. The use of military expended materials other than munitions would not be applicable to Indiana bats, northern long-eared bats, and tricolored bats.

The use of military expended material other than munitions is not applicable to designated critical habitat for piping plover and proposed critical habitat for red knot. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA.

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

Impacts from military expended materials other than munitions under Alternative 2 are no different from Alternative 1 and therefore the conclusions for significance impacts, ESA-listed species and critical habitat are the same for both training and testing. The number of ingestible non-munitions under Alternative 2 is the same as Alternative 1.

3.9.3.7 Secondary Stressors

This section analyzes the potential impacts to birds exposed to stressors indirectly through impacts to habitat and prey availability. Since bats considered in this analysis do not occur in the water column and rarely feed at the water surface in the Study Area, no secondary stressors impacts to bats are anticipated. Table 3.9-14 contains brief summaries of background information that is relevant to the analysis of impacts for each substressor. No secondary stressors would result in significant impacts.

Table 3.9-14: Secondary Stressor Background Information Summary

Indirect Links	*Substressors*	*Background Information Summary*
Habitat	Explosives	• Explosions would not result in loss of bird or bat habitat.
	Explosive byproducts and unexploded munitions	• Explosions consume most of the explosive material, and byproducts would therefore not degrade sediment or water quality or result in indirect stressors to birds. • Low-order detonations and unexploded munitions may result in the presence of explosive material in sediments or the water column. However, toxicity and other effects are generally associated with exposure to higher concentrations than those expected to occur due to military readiness activities. • Munitions constituents and degradation products in sediments would likely be detectable only within a few feet, and the range of toxic sediment conditions could be less (inches). Due to low solubility and dilution, it is unlikely that birds would be exposed.
	Chemicals	• Potentially harmful chemicals introduced into the marine environment consist mostly of propellants and combustion products, other fuels, polychlorinated biphenyls in target vessels, other chemicals associated with munitions, and simulants. • Ammonium perchlorate (a rocket and missile propellant) is the most common chemical used. Other representative chemicals with potential to affect invertebrates include propellant combustion products such as hydrogen cyanide and ammonia. • Most propellants are consumed during normal operations, and the failure rate of munitions using propellants and other combustible materials is low. • Most byproducts occur naturally in seawater and are readily degraded by biotic and abiotic processes. All chemicals are quickly diluted by water movement. • Overall, concentrations of chemicals in sediment and water are not likely to cause injury or mortality to birds.

Table 3.9-14: Secondary Stressor Background Information Summary (continued)

Indirect Links	*Substressors*	*Background Information Summary*
	Metals	• Metals are introduced into seawater and sediments as a result of military readiness activities involving vessel hulls, targets, munitions, and other military expended materials. • Concentrations of metals in sea water are unlikely to be high enough to cause injury or mortality to birds.
Prey availability	All stressors	The potential for primary stressors to impact prey quality and availability is directly related to their impacts on biological resources consumed by birds (e.g., invertebrates and fishes), which are analyzed in Section 3.5 and Section 3.6 of this document. Overall impacts to invertebrates are considered negligible and from minor to moderate for fish, but are not expected to meaningfully impact fish availability for birds as a prey item.

3.9.3.7.1 Impact of Secondary Stressors

3.9.3.7.1.1 Impacts from Secondary Stressors Under Alternative 1

The impacts of explosives and military expended materials in terms of abiotic substrate disturbance are described in Section 3.3 (Habitats). The assessment of potential sediment and water quality degradation on aquatic life, including representative marine invertebrates, is covered in Section 3.2 (Sediment and Water Quality). Impacts to invertebrates and fishes, which could be prey for birds, are presented in Section 3.5 (Invertebrates) and Section 3.6 (Fishes).

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

Under the ESA, the secondary stressors associated with training and testing activities as described under Alternative 1 may affect piping plovers, red knots, roseate terns, Bermuda petrels, and black-capped petrels. Secondary stressors during training and testing activities would have no effect on Indiana bats, northern long-eared bats, and tricolored bats.

Secondary stressors would not be applicable to designated critical habitat for piping plover and proposed critical habitat for red knot. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA.

3.9.3.7.1.2 Impacts from Secondary Stressors Under Alternative 2

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

3.9.3.8 Combined Stressors

As described in Section 3.0.3.5 (Resource-Specific Impacts Analysis for Multiple Stressors), this section evaluates the potential for combined impacts of all stressors from the Proposed Action. The analysis and conclusions for the potential impacts from each of the individual stressors are discussed in the sections above. Stressors associated with proposed military readiness activities do not typically occur in isolation but rather occur in some combination. For example, mine neutralization activities include elements of acoustic, physical disturbance and strike, entanglement, ingestion, and secondary stressors that are all coincident in space and time. An analysis of the combined impacts of all stressors considers the

potential consequences of additive and synergistic stressors from the Proposed Action, as described below.

There are generally two ways that a bird or bat could be exposed to multiple additive stressors. The first would be exposure to multiple sources of stress from a single event or activity (e.g., a mine warfare event may include the use of a sound source and a vessel). The potential for a combination of these impacts from a single activity would depend on the range of effects of each of the stressors and the response or lack of response to that stressor. Secondly, a bird or bat could be exposed to multiple military readiness activities over the course of its life, however, military readiness activities are generally separated in space and time in such a way that it would be unlikely that any individuals would be exposed to stressors from multiple activities. However, animals with a home range intersecting an area of concentrated activity have elevated exposure risks relative to animals that simply transit the area through a migratory corridor.

Multiple stressors may also have synergistic effects. For example, individuals that experience temporary hearing loss or injury from acoustic stressors could be more susceptible to physical strike and disturbance stressors via a decreased ability to detect and avoid threats. Individuals that experience behavioral and physiological consequences of ingestion stressors could be more susceptible to entanglement and physical strike stressors via malnourishment and disorientation. These interactions are speculative, and without data on the combination of multiple stressors, the synergistic impacts from the combination of stressors are difficult to predict in any meaningful way.

The following analysis makes the reasonable assumption that the majority of exposures to individual stressors are non-lethal, and instead focuses on consequences potentially impacting fitness (e.g., physiology, behavior, reproductive potential).

3.9.3.8.1 Combined Impacts of All Stressors under Alternative 1

Most of the activities proposed under Alternative 1 generally involve the use of moving platforms (e.g., ships, torpedoes) that may produce one or more stressors; therefore, if birds or bats were in the range of those activities, they may be introduced to multiple stressors. The minimal effects of far-reaching stressors (e.g., sound pressures, particle motion) may also trigger some animals to leave the area ahead of a more damaging impact (e.g., physical disturbance or strike). Individual stressors that would otherwise have minimal to no impact may combine to have a measurable effect. Due to the wide dispersion of stressor sources, speed of the platforms, and general dynamic movement of many military readiness activities, it is unlikely that highly mobile birds and bats would occur in the potential effects range of multiple sources or sequential exercises.

Although potential impacts on birds and bats from military readiness activities under Alternative 1 may include injury and mortality, in addition to other effects such as physiological stress, masking, and behavioral effects, the combined impacts are not expected to lead to long-term consequences to populations. Based on the general description of impacts, the number of individuals impacted is expected to be small relative to overall population sizes and would not be expected to yield any lasting effects on the survival, growth, recruitment, or reproduction of any species. The combined impact of all stressors from Alternative 1 are considered moderate for bird and bat populations.

3.9.3.8.2 Combined Impacts of All Stressors under Alternative 2

Impacts under Alternative 2 are not meaningfully different from Alternative 1 and therefore the impacts conclusions are the same for both training and testing.

3.9.4 Endangered Species Act Determinations

The Action Proponents have concluded that military readiness activities may affect piping plovers, red knots, roseate terns, Bermuda petrels, black-capped petrels, Indiana bats, northern long-eared bats, and tricolored bats. The Action Proponents have also concluded that military readiness activities would not be applicable to designated critical habitat for piping plovers or proposed critical habitat for red knots. The Action Proponents are consulting with the USFWS as required by section 7(a)(2) of the ESA. The summary of effects determinations for each ESA-listed species is provided in Table 3.9-15 for training and testing.

3.9.5 Migratory Bird Treaty Act Determinations

The Action Proponents have determined that the Proposed Action may result in "take" of migratory birds, however the Proposed Action is a military readiness activity; therefore, "take" is in compliance with the Migratory Bird Treaty Act. Under the Migratory Bird Treaty Act regulations applicable to military readiness activities (50 CFR part 21), the USFWS has promulgated a rule that authorizes the incidental take of migratory birds provided they do not result in a significant adverse effect on a population of a migratory species. As discussed in Section 3.9.3 (Environmental Consequences), the proposed military readiness activities would not result in a significant adverse impact on any migratory bird species.

Table 3.9-15: Effects Determinations for ESA-Listed Species and Critical Habitats for Military Readiness Activities under Alternative 1 (Preferred Alternative)

Species	*DPS/Critical Habitat*	*Effect Determinations by Stressor*																						
		Acoustic						*Explosives*		*Energy*			*Physical Disturbance and Strike*						*Entanglement*			*Ingestion*		
		Sonar and Other Transducers	*Air Guns*	*Pile Driving*	*Vessel Noise*	*Aircraft Noise*	*Weapons Noise*	*In-Water Explosives*	*In-Air Explosives*	*In-Water Electromagnetic Devices*	*In-Air Electromagnetic Devices*	*High-Energy Lasers*	*Vessels*	*In-Water Devices*	*Aircraft and Aerial Targets*	*Military Expended Materials*	*Seafloor Devices*	*Pile Driving*	*Wires and Cables*	*Decelerators/Parachutes*	*Biodegradable Polymer*	*Military Expended Materials-Munitions*	*Military Expended Materials Other Than Munitions*	*Indirect/Secondary*
Training																								
Piping plover	Atlantic Coast	NE	N/A	MA	MA	MA	MA	MA	MA	N/A	MA	N/A	MA	MA	MA	MA	N/A	N/A	NE	NE	N/A	N/A	MA	MA
	Designated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Red knot	Throughout range	NE	N/A	MA	MA	MA	MA	MA	MA	N/A	MA	N/A	MA	MA	MA	MA	N/A	N/A	NE	NE	N/A	N/A	MA	MA
	Proposed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roseate tern	Throughout range	NE	N/A	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	N/A	N/A	NE	NE	N/A	N/A	MA	MA
Bermuda petrel	Throughout range	MA	N/A	N/A	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	N/A	N/A	NE	NE	N/A	N/A	MA	MA
Black-capped petrel*	Throughout range	MA	N/A	N/A	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	N/A	N/A	NE	NE	N/A	N/A	MA	MA
Indiana bat	Throughout range	N/A	N/A	N/A	MA	MA	MA	N/A	MA	N/A	MA	N/A	MA	MA	MA	MA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NE
Northern long-eared bat	Throughout range	N/A	N/A	N/A	MA	MA	MA	N/A	MA	N/A	MA	MA	MA	MA	MA	MA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NE
Tricolored bat	Throughout range	N/A	N/A	MA	MA	MA	MA	MA	MA	N/A	MA	MA	MA	MA	MA	MA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NE
Testing																								
Piping plover	Atlantic Coast	NE	NE	N/A	MA	MA	MA	MA	MA	N/A	MA	N/A	MA	MA	MA	MA	N/A	N/A	NE	NE	NE	N/A	MA	MA
	Designated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Red knot	Throughout range	NE	NE	N/A	MA	MA	MA	MA	MA	N/A	MA	N/A	MA	MA	MA	MA	N/A	N/A	NE	NE	NE	N/A	MA	MA
	Proposed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roseate tern	Throughout range	NE	NE	N/A	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	N/A	N/A	NE	NE	NE	N/A	MA	MA
Bermuda petrel	Throughout range	MA	MA	N/A	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	N/A	NE	NE	NE	N/A	MA	MA
Black-capped petrel*	Throughout range	MA	MA	N/A	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	N/A	NE	NE	NE	N/A	MA	MA
Indiana bat	Throughout range	N/A	N/A	N/A	MA	MA	MA	N/A	N/A	N/A	MA	MA	MA	MA	MA	MA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NE
Northern long-eared bat	Throughout range	N/A	N/A	N/A	MA	MA	MA	N/A	N/A	N/A	MA	MA	MA	MA	MA	MA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NE
Tricolored bat	Throughout range	N/A	N/A	N/A	MA	MA	MA	MA	N/A	N/A	MA	MA	MA	MA	MA	MA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NE

Notes: MA = may affect; N/A = not applicable; NE = no effect

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