FINAL

ENVIRONMENTAL ASSESSMENT

FOR

NAVAL SEA SYSTEMS COMMAND

UNDERWAY TOWING, BOW RAMP, AND ANCHOR DEMONSTRATIONS FOR LANDING CRAFT UTILITY VESSELS IN ALABAMA

AUGUST 2025

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Abstract

EAXX-007-17-USN-1734531658

Designation:	Environmental Assessment
Title of Proposed Action:	Naval Sea Systems Command Underway Towing, Bow Ramp, and Anchor Demonstrations for Landing Craft Utility Vessels in Alabama
Project Location:	Mobile Bay, Alabama, and Gulf of America[1]
Lead Agency for the EA:	Department of the Navy
Affected Region:	Mobile Bay, Alabama, and Gulf of America off the coast of Alabama
Action Proponent:	Naval Sea Systems Command Amphibious Assault and Connectors Program Office (PMS 317)
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Date:	August 2025

The United States (U.S.) Department of the Navy (Navy), Naval Sea Systems Command has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) and Navy regulations for implementing NEPA. The Proposed Action is to conduct underway towing, bow ramp, and anchor demonstrations for the Landing Craft Utility (LCU) 1700 class vessels (all three demonstrations may occur once for each vessel constructed; approximately 12 vessels) in and around Mobile Bay, Alabama, and in nearshore waters off the Gulf coast of Alabama. The Proposed Action is anticipated to begin in summer/fall 2025 once construction of the first vessel is complete and may recur for each vessel within the LCU 1700 class (any time of year with approximately one to two vessels constructed per year). This EA evaluates the potential environmental effects associated with the Proposed Action, two action alternatives (Alternatives 1 and 2), and the No Action Alternative to the following resource areas: benthic sediments, birds, fish, reptiles, mammals, essential fish habitat, commercial fishing, commercial shipping, and recreational activities.

[1] The Gulf of America is the body of water formerly known as the Gulf of Mexico and renamed by Executive Order 14172 of January 20, 2025

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EXECUTIVE SUMMARY

ES.1 Proposed Action

The United States (U.S.) Department of the Navy (Navy), Naval Sea Systems Command (NAVSEA), Amphibious Assault and Connectors Program Office (PMS 317) Landing Craft, Utility (LCU) Program is developing the replacement class for the existing fleet of LCU vessels, which are past their planned design service life. The LCU vessel is a surface connector whose mission is to transport equipment and troops to the shore, along the shore, and from the shore back to the amphibious warships. LCUs may also be used to support civilian humanitarian and maritime operations. The Proposed Action is to conduct underway towing, bow ramp, and anchor demonstrations of the LCU 1700 class vessels (approximately 12 vessels) within Mobile Bay, Alabama, and in nearshore waters off the Gulf coast of Alabama. Specific testing would be conducted by the builder, Austal United States of America (herein referred to as Austal), and includes the following: (1) underway towing demonstrations; (2) bow ramp demonstrations and; (3) anchor demonstrations.

ES.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to demonstrate that, as built, each LCU 1700 vessel meets the requirements of the contract specification by evaluating the performance of all installed equipment and systems. The need for the Proposed Action is to ensure each new LCU vessel was built in accordance with contract specifications and can meet mission requirements.

ES.3 Alternatives Considered

In addition to the Proposed Action, the Navy is considering two action alternatives that meet the purpose and need for the Proposed Action and a No Action Alternative. The Proposed Action includes conducting bow ramp demonstrations at either a location in Mobile Bay, Alabama (i.e., Alabama State Docks Theodore Terminal) or a location on the Alabama Gulf coast (i.e., Gulf Shores State Park). Alternative 1 would conduct the bow ramp demonstrations at Alabama State Docks Theodore Terminal. Alternative 2 would conduct bow demonstrations at Gulf Shores State Park. Under the No Action Alternative, the testing and trials of each LCU would not occur, but the No Action Alternative does not meet the purpose and need of the action.

ES.4 Summary of Environmental Resources Evaluated in this Environmental Assessment

The National Environmental Policy Act (NEPA), and Navy instructions for implementing NEPA specify that an Environmental Assessment (EA) should address those resource areas potentially subject to effects. In addition, the level of analysis should be commensurate with the anticipated level of environmental effects.

The following resource areas have been addressed in this EA: physical resources (benthic sediments), biological resources (birds, fish, essential fish habitat, sea turtles, and mammals) and socioeconomic resources (commercial fishing, commercial shipping, and recreational activities).

Environmental Assessment

Naval Sea Systems Command: Underway Towing, Bow Ramp, and Anchor Demonstrations for Landing Craft Utility Vessels in Alabama

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Abbreviations and Acronyms

Acronym	Definition
°C	degrees Celsius
°F	degrees Fahrenheit
°N	degrees North latitude
°S	degrees South latitude
°W	Degrees West longitude
µPa	microPascal
ABR	Auditory Brainstem Response
BOEM	Bureau of Ocean Energy Management
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CZMA	Coastal Zone Management Act
dB	Decibel
dBA	A-weighted decibels
DPS	Distinct Population Segment
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
FR	Federal Register
ft	Feet
HAPC	habitat areas of particular concern
Hz	Hertz
kHz	Kilohertz
km	kilometer(s)
lb(s)	pound(s)
LCU	Landing Craft, Utility
m	meter(s)
MBCA	Migratory Bird Conservation Act
MBTA	Migratory Bird Treaty Act
mi	mile(s)
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NAVSEA	Naval Systems Command
NEPA	National Environmental Policy Act
NM	nautical mile(s)
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
PBFs	Physical or Biological Features
PCEs	Primary Constituent Elements
PMS 317	Amphibious Assault and Connectors Program Office
re µPa	referenced to microPascals
SAV	submerged aquatic vegetation
SOPs	Standard Operation Procedures
U.S.	United States
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
yds	Yards

1 Proposed Action, Purpose, and Need

1.1 Introduction

The United States (U.S.) Department of the Navy (Navy), Naval Sea Systems Command (NAVSEA), Amphibious Assault and Connectors Program Office (PMS 317; herein referred to as the Navy) proposes to conduct underway towing, bow ramp, and anchor demonstrations of the Landing Craft Utility (LCU) 1700 class vessels (approximately 12 vessels) within Mobile Bay, Alabama, and in nearshore waters off the Gulf coast of Alabama. Exact delivery schedule of each LCU is not set, but underway towing, bow ramp, and anchor demonstrations (i.e., Proposed Action) for the first vessel of the LCU 1700 class is anticipated to occur in summer/fall 2025. LCU construction would be completed at the Austal USA, LLC (herein referred to as Austal) facility in Mobile, Alabama. The Proposed Action is anticipated to occur any time of year for each newly constructed LCU vessel. Once the contract requirements for the first LCU 1700 vessel(s) are confirmed through testing, the other vessels would be constructed and likely tested the same way.

The Navy has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) and Navy regulations for implementing NEPA.

1.2 Proposed Action

The Proposed Action is to conduct underway towing, bow ramp, and anchor demonstrations of the LCU 1700 class vessels (approximately 12 vessels) within Mobile Bay, Alabama and in nearshore waters off the Gulf coast of Alabama. The Proposed Action includes confirmation of the design of each new LCU vessel and evaluates performance for installed equipment and systems in accordance with the U.S. Navy's Board of Inspection and Survey, Navy vessel inspection and certification requirements. Specific testing would be conducted by Austal before delivery to the Navy and includes the following: (1) underway towing demonstrations, (2) bow ramp demonstrations, and (3) anchor demonstrations. Each demonstration is specific testing conducted to validate/demonstrate the vessel design is in accordance with contract specifications and can meet mission requirements.

Platforms built as part of this Proposed Action are designated as LCU 1700 class vessels (Figure 1-1; herein referred to as LCUs). The LCU, measuring 139 ft (42.4 m) in length, with a draft of 6.8 ft (2.1 m), is designed to provide for the rapid buildup of combat power ashore by transporting vehicles, cargo, equipment, and troops to the shore, along the shore, and from the shore back to amphibious warships. The LCU is a heavy lift displacement craft capable of independent transits to support and sustain operations from the sea. Capabilities of the LCU would include carrying a 170 short ton (154 metric ton) payload at a maximum speed of 11 knots. It can hold a crew of 14 members and can transport two tanks, 350 combat troops with their individual combat equipment or up to 400 individuals. Each LCU is propelled by two Caterpillar main propulsion diesel engines, with two Caterpillar craft service generator diesel engines providing electrical power. Additionally, the LCU has a bow ramp and stern gate for onload/offload from the sea to the shore.

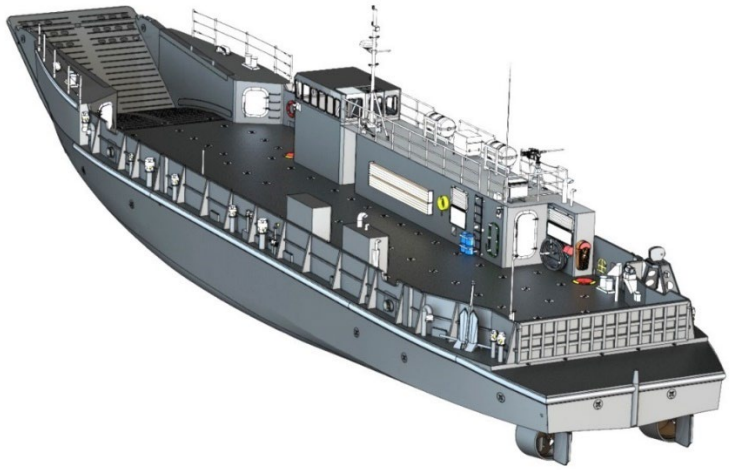

Figure 1-1. LCU 1700 (artist rendered image)

Underway towing, bow ramp, and anchor demonstrations (i.e., Proposed Action) for the LCU are anticipated to commence in summer/fall 2025. LCU testing would be short in duration. Exact delivery time of the craft is not set, but it is anticipated that approximately two LCUs may be tested per year. The Proposed Action may occur year-round as testing for each vessel occurs when construction is completed. Once operational requirements for the first LCUs are confirmed, the other vessels would be constructed and tested the same way. Details for the underway towing, bow ramp, and anchor demonstrations are provided below.

1.2.1 Underway Towing Demonstrations

The LCU would tow another vessel of similar size for at least 15 minutes within the proposed action area. The LCU would also be towed by another vessel of a similar size for at least 15 minutes. The minimum speed utilized during this demonstration would be that sufficient to maintain steerage while towing. The maximum speed would be less than 10 knots. The underway towing demonstrations would occur once per LCU.

1.2.2 Bow Ramp Demonstrations

Before bow ramp demonstrations commence and during bow ramp demonstrations up to 15 personnel (safety observers, test directors, and Navy supervisor witnesses) would be on the beach at the amphibious landing locations to ensure the landing locations are clear, safe, and to witness the demonstrations. Personnel may also use up to four marking flags to establish a landing zone for the test. These flags would be planted on the beach at an approximate depth of 1 ft (3.3 m).

The LCU would demonstrate operation of the bow ramp in open water and on a beach. For the open water test, the LCU would be stationary, open the ramp to its lowest position, and then return the ramp to the stowed position.

Testing is required to ensure the LCU can land on a beach that has a 1:40[2] or steeper bank slope of sand, gravel, or pebbles while carrying a load of up to 170 short tons. The LCU would conduct amphibious landing testing at either Alabama State Docks Theodore Terminal (hereafter referred to as Theodore Terminal) or Gulf Shores State Park (hereafter referred to as Gulf Shores). Depending on the tides, the LCU would land no further inshore than the foreshore of the beach (Figure 1-2). The LCU would approach the unoccupied shore at a speed of approximately 10 knots, dropping an anchor off the shore to maintain stability of the craft while on the beach, and aid the vessel in retraction from the beach by maintaining stern stability. The anchor would be dropped perpendicular to the shore with up to 600 ft (183 m) of anchor wire rope paid out. Upon landing on the beach, the vessel would lower the bow ramp in a controlled manner near or on the shore in waters no deeper than 4 ft (1.2 m). The vessel maintains constant tension in the anchor cable, to prevent the vessel from broaching due to wave action. Once the bow ramp demonstration has been completed, the vessel raises the bow ramp and take strain on the anchor to retract off the shore. If necessary, propulsion may aid this process. A tow vessel would not be on station for this demonstration but would be on call. This vessel would assist in the removal of the LCU from the beach only in the event the determination has been made that the LCU cannot be removed from the beach under its own power without significant risk to personnel safety or vessel damage. Requirements state that the bow ramp demonstration/landing would take place five times to ensure operability. Each shoreside bow ramp demonstration would not last more than five hours.

There would be no offloading of personnel or equipment if testing is successful. In the event of an unsatisfactory demonstration personnel may disembark if determined reasonably safe and necessary to resolve the unsatisfactory event.

1.2.1 Anchor Demonstrations

Separate from bow ramp demonstrations, standalone anchor testing may also occur within the proposed action area. During anchor demonstrations the LCU would pay out the entire length of anchor line (no more than 900 ft) at 600 feet per minute to demonstrate satisfactory operation of payout device. Once complete, the anchor line would be hauled in at an average speed of at least 300 feet per minute. The maximum speed for anchor testing would be less than 10 knots. The full anchor demonstration process would take no more than 1.5 hours to complete. The anchor demonstrations would occur once per LCU.

1.3 Purpose and Need for the Proposed Action

The purpose of the Proposed Action is to demonstrate that, as built, each LCU 1700 vessel meets the requirements of the contract specification by evaluating the performance of all installed equipment and systems. This includes a series of tests and at-sea demonstrations

[2] 1:40 is the slope ratio of the beach, specifically for every 40 meters along the benthic sediment the slope height increases 1 meter

conducted by the builder to prepare each vessel for final presentation to the Navy and the Navy's Board of Inspection and Survey.

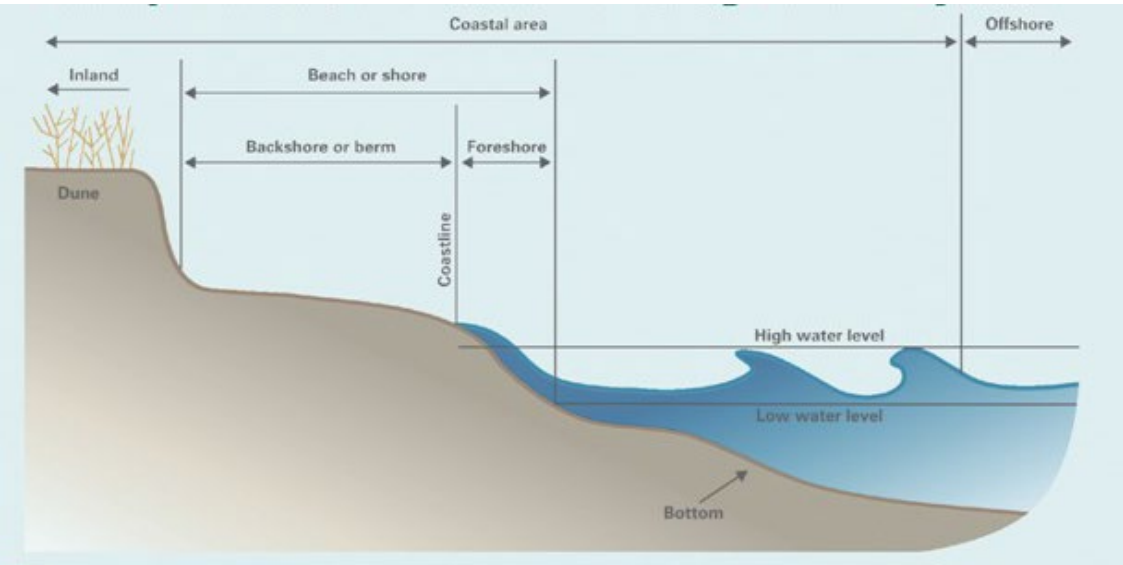

Figure 1-2. Generalized Beach Profile Diagram (U.S. Army Corps of Engineers 2015)

The need for the Proposed Action is to ensure each new LCU vessel was built in accordance with contract specifications and can meet mission requirements. The Navy is developing the replacement class for the existing fleet of LCU vessels, which are past their planned design service life. LCU vessels make rapid buildup of forces ashore possible by moving troops, vehicles, cargo, and equipment to the shore, along the shore, and back to the amphibious warship. LCUs may also be used to support civilian, humanitarian, and maritime operations. Vessels with these capabilities are necessary for training and equipping combat-capable naval forces for worldwide deployment. In this regard, the Proposed Action furthers the Navy's execution of its congressionally-mandated roles and responsibilities under 10 United States Code (U.S.C.) section 8062.

1.4 Location

The Proposed Action would occur in Mobile Bay, Alabama, and in a portion of nearshore waters off the Gulf coast of Alabama (Figure 1-3). Water depth within the proposed action area is less than 4 feet (ft; 1.2 meters [m]) to potentially 164 ft (50 m).

1.5 Scope of Environmental Analysis

This EA includes an analysis of potential environmental effects associated with three action alternatives (i.e., Proposed Action, Alternative 1 and Alternative 2), and the No Action Alternative. The environmental resources analyzed in this EA include physical resources (bottom sediments), biological resources (aquatic vegetation, invertebrates, birds, fish, reptiles, mammals, and essential fish habitat [EFH]), and socioeconomic resources (commercial fishing, commercial shipping, and recreational activities). Resources dismissed from analysis are included in Table 3-1.

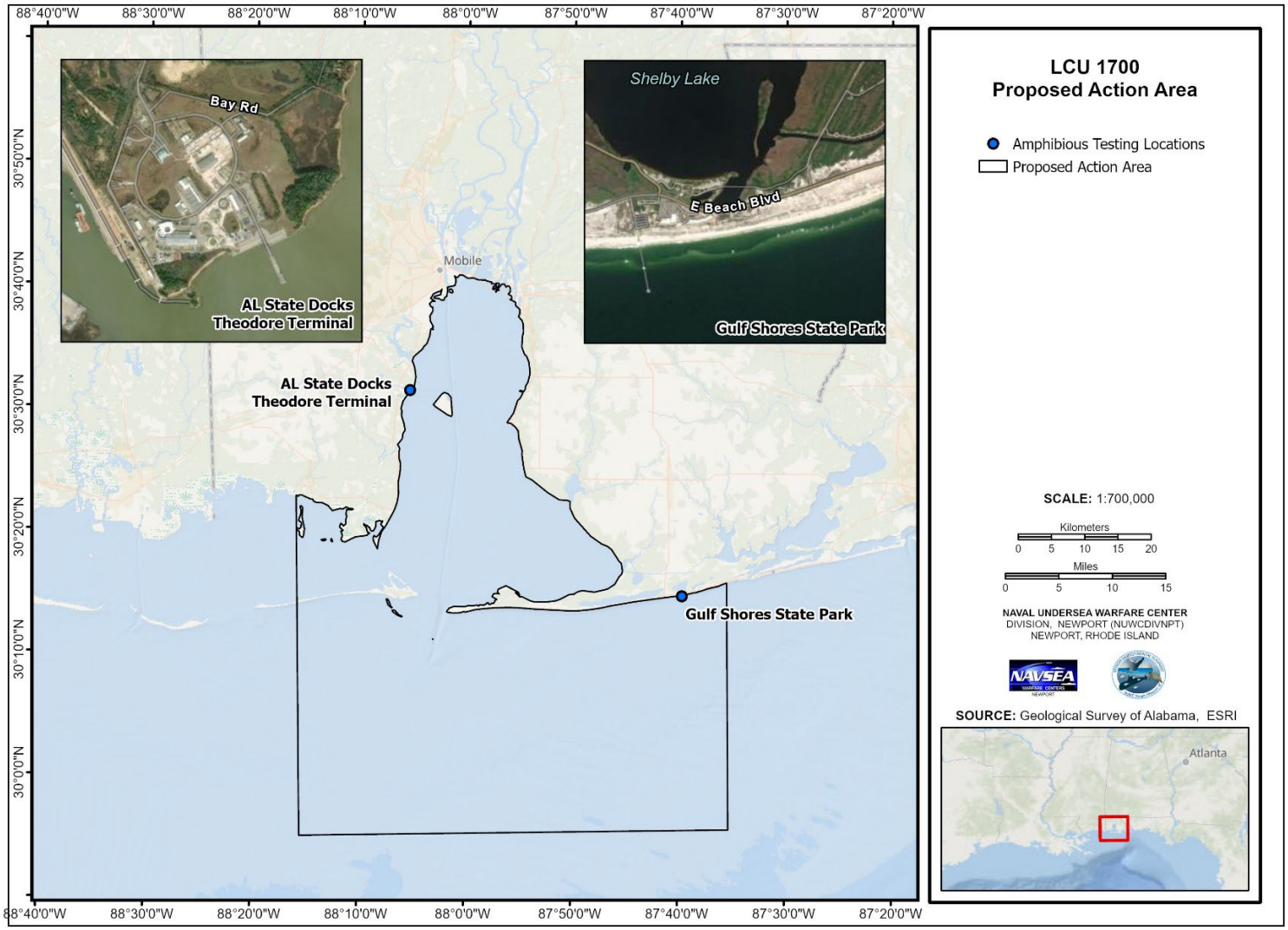

Figure 1-3. LCU 1700 Proposed Action Area

1.6 Relevant Laws and Regulations

The Navy has prepared this EA based upon federal and state laws, statutes, regulations, and policies that are pertinent to the implementation of the Proposed Action, including the following:

- NEPA (42 U.S.C. sections 4321–4370h), which requires an environmental analysis for major federal actions that have the potential to significantly affect the quality of the human environment
- Navy regulations for implementing NEPA (32 CFR part 775), which provides Navy policy for implementing NEPA[3]
- Clean Air Act (42 U.S.C. section 7401 et seq.)
- Clean Water Act (33 U.S.C. section 1251 et seq.)
- Coastal Zone Management Act (CZMA) (16 U.S.C. sections 1451 et seq.)
- Endangered Species Act (ESA) (16 U.S.C. sections 1531 et seq.)
- Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (MSA; 16 U.S.C. sections 1801 et seq.)
- Marine Mammal Protection Act (MMPA) (16 U.S.C. sections 1361 et seq.)
- Migratory Bird Treaty Act (MBTA) (16 U.S.C. sections 703–712)
- National Historical Preservation Act (54 U.S.C. section 3001018 et seq.)
- Rivers and Harbors Act (33 U.S.C. section 401 et seq.)

A description of the Proposed Action's consistency with these laws, policies, and regulations, as well as the names of regulatory agencies responsible for their implementation, is presented in Section 6. Refer to Appendix A for a more in-depth description of the federal and state statutes and regulations that are potentially applicable to the Proposed Action and alternatives presented.

1.7 Public and Agency Participation and Intergovernmental Coordination

The EA was available for public comment from June 25, 2025, to July 16, 2025. No public comments were received. The Navy will publish the Finding of No Significant Impact (FONSI) at https://www.nepa.navy.mil/lcu-ea/.

The Navy consulted with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) for their applicable species regarding the Proposed Action's compliance with the ESA. On January 25, 2025 USFWS issued concurrence on the Navy's

[3] On July 3, 2025, the Navy published an interim final rule to rescind the Navy's NEPA regulations at 32 CFR Part 775. Comments to interim final rule closed on August 4, 2025.

conclusions in the ESA section 7 informal consultation submitted through the Information for Planning and Consultation tool. On April 22, 2025, NMFS concurred with the Navy's conclusions in the ESA expediated informal section 7 consultation. In compliance with the CZMA, a General Negative Determination has been prepared and submitted to the State of Alabama. The Alabama Department of Environmental Management concurred with the General Negative Determination on January 27, 2025. Concurrence letters can be found in Appendix C.

2 Alternatives Considered

The following subsections detail the screening factors and alternative considerations.

2.1 Screening Factors

NEPA and Navy's implementing regulations provide guidance on the consideration of alternatives to a federally proposed action and require rigorous exploration and objective evaluation of reasonable alternatives. Only those alternatives determined to be reasonable, and that meet the purpose and need, require detailed analysis.

Potential alternatives that meet the purpose and need were evaluated against the following screening factors:

- Proximity to the Austal facility in Mobile, Alabama for the following reasons: to allow for testing to occur within a single day due to limited berthing on the vessel; in case of vessel failure during underway towing, bow ramp, and anchor demonstrations; and to reduce unnecessary travel to and from testing sites;
- Access to in-water areas for conducting underway towing and anchor demonstrations and shore areas for bow ramp demonstrations; and
- A beaching location that has a 1:40 or steeper bank slope of sand, gravel, or pebbles for the bow ramp demonstration.

2.2 Alternatives Carried Forward for Analysis

Based on the reasonable alternative screening factors and meeting the purpose and need for the Proposed Action, two action alternatives and a No Action Alternative were identified and are analyzed within this EA along with the Proposed Action. The action alternatives would not differ in volume and frequency from the Proposed Action for underway towing, bow ramp, and anchor demonstrations.

2.2.1 Proposed Action

Under the Proposed Action, the Navy would conduct underway towing and anchor demonstrations in the proposed action area, including Mobile Bay and in nearshore waters off the Gulf coast of Alabama (Figure 1-3). The Proposed Action would include bow ramp demonstrations at either Theodore Terminal or Gulf shores amphibious landing locations.

2.2.2 Action Alternative 1: Bow Ramp Demonstrations at Theodore Terminal Only

Under Alternative 1, the Navy would conduct underway towing and anchor demonstrations in the proposed action area, including the Mobile Bay and in nearshore waters off the Gulf coast of Alabama (Figure 1-3). Alternative 1 would include bow ramp demonstrations only at Theodore Terminal. No activities would occur at the Gulf Shores amphibious landing location.

2.2.3 Action Alternative 2: Bow Ramp Demonstrations at Gulf Shores Only

Under Alternative 2, the Navy would conduct underway towing and anchor demonstrations in the proposed action area, including the Mobile Bay and in the nearshore waters off the Gulf coast of Alabama (Figure 1-3). Under this alternative, bow ramp demonstrations would only occur at Gulf Shores. No activities would occur at the Theodore Terminal amphibious landing location.

2.2.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur within Mobile Bay, Alabama, or in nearshore waters off the Gulf coast of Alabama. The No Action Alternative would not meet the purpose and need for the Proposed Action; however, as required by NEPA, the No Action Alternative is carried forward for analysis in this EA and provides a baseline for measuring the environmental consequences of the action alternatives.

2.3 Alternatives Considered but not Carried Forward for Detailed Analysis

The following alternatives were considered, but they were not carried forward for detailed analysis in this EA as they did not meet the purpose and need for the project nor satisfy the reasonable alternative screening factors presented in Section 2.1.

2.3.1 Seasonal Testing

During seasonal testing, underway towing, bow ramp, and anchor demonstrations would not be conducted during the summer and fall months. Trials would be conducted only during winter and spring when the surrounding areas have less vessel traffic and less wildlife present. This alternative could substantially delay vessel delivery and would not meet Navy requirements for acceptance of vessels from the builder/manufacturer.

2.3.2 Alternate Bow Ramp Demonstration Testing Locations

Under this alternative, bow ramp demonstrations would occur at amphibious landing locations within or inshore of the Jacksonville Range Complex covered under the Atlantic Fleet Training and Testing Environmental Impact Statement/Overseas Environmental Impact Statement. However, conducting bow ramp demonstrations on the east coast of Florida would put the demonstrations far from Austal requiring a long transit to the testing area (multi-day round trip transit). This would increase the cost of testing (e.g., increased fuel costs) and there is not enough berthing to support the testing and oversight staff that would be onboard the vessel during the testing.

3 Affected Environment

This section presents a description of the environmental resources and baseline conditions that may be affected from implementing the Proposed Action or the action alternatives.

All potentially relevant environmental resource areas were initially considered for analysis in this EA. In compliance with NEPA, and Department of Navy regulations and guidelines, the discussion of the affected environment (i.e., existing conditions) focuses only on those resource areas potentially subject to effects. Additionally, the level of detail used in describing a resource is commensurate with the anticipated level of potential environmental effect.

As part of the process to determine the potential effects from the Proposed Action, the Navy identified potential resources and stressors to analyze. Resource areas that have been eliminated from further analysis in this document and the rationale for eliminating them are presented in Table 3-1.

Mobile Bay

Mobile Bay is heavily influenced by river discharge and is characterized as a shallow and stratified estuary (Du et al. 2018). The underway towing demonstration may occur within the ship channel, along with any other region of the Bay that is deep enough where the LCU vessel would not run aground and where shipping traffic is low.

Nearshore Waters off the Gulf Coast of Alabama

Mobile Bay drains into the Gulf of America[1]. In general, the Gulf of America is highly influenced by the waterbodies that drain into it, along with the sediment and nutrients they transport. Approximately 0.7 mi (1 km) would be utilized for the Proposed Action at Gulf Shores State Park (hereafter referred to as Gulf Shores) (Figure 1-3). Gulf Shores is within approximately 20 nautical miles (NM) of Mobile Bay.

3.1 Physical Resources

Benthic sediment is the only physical resource that has the potential to be affected by the Proposed Action. The sediment in the center of the Bay is predominantly composed of fine-grained material, such as silt and clay, due to the Bay's structure, water flow, and wave patterns (Brynes et al. 2013) (Figure 3-1). In areas closer to the shore, where the bow ramp demonstration would occur (i.e., Theodore Terminal and Gulf Shores), the dominant sediment type is sand due to shoreline erosion (Brynes et al. 2013; Folger 1972).

Mobile Bay is heavily influenced by river discharge and is characterized as a shallow and stratified estuary (Du et al. 2018). In addition to high river discharge contributing freshwater to the Bay, this discharge also brings large quantities of sediment, which can increase the turbidity of the Bay.

[1] The Gulf of America is the body of water formerly known as the Gulf of Mexico and renamed by Executive Order 14172 of January 20, 2025.

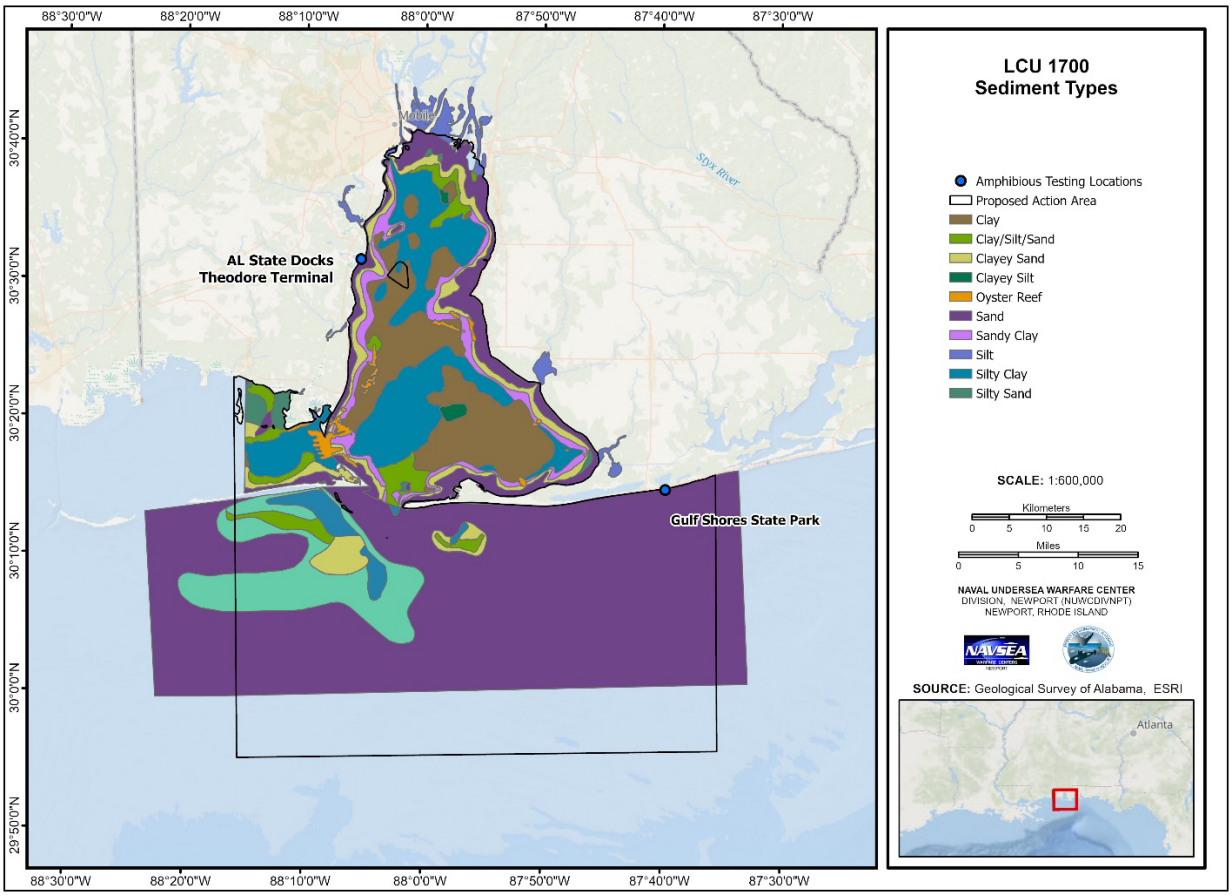

Figure 3-1. Sediment Types within the Proposed Action Area

Mobile Bay has a mean depth of 10 ft (3 m), but there is a narrow (394 ft [120 m]) ship channel that is maintained at a depth of 39–46 ft (12–14 m) (Du et al. 2018). Theodore Terminal is located in the middle region of Mobile Bay, adjacent to the mouth of Deer River. Theodore Terminal is on the shore of a wooded area that is surrounded by an industrial park and has a maximum depth around 6 ft (2 m) (Brynes et al. 2013; Du et al. 2018). Seafloor sediments are primarily composed of sand (Hummell and Smith 1995). Additionally, Theodore Terminal does not have hardbottom, shellfish beds, or submerged aquatic vegetation.

Gulf Shores is a public recreation area (GSP 2024) and has a depth up to approximately 33 ft (10 m) (Du et al. 2018). Gulf Shores has seafloor sediments primarily composed of sand (Hummell and Smith 1995). Additionally, Gulf Shores does not have hardbottom, shellfish beds, or submerged aquatic vegetation.

Table 3-1. Resources Eliminated from Analysis

Resource	Justification for Removal from Further Consideration
Physical Environment	
Air Quality	Since the Proposed Action would occur in an attainment area (EPA 2024) and would not generate emissions in nonattainment areas, the Proposed Action is not subject to analysis under the General Conformity Rule. Additionally, as the Proposed Action consists of conducting trials for one LCU at a time, air quality would not be altered in any measurable way.
Airspace	The Proposed Action would not utilize or alter airspace in any way.
Land Use	The Proposed Action would occur no further than the foreshore of the beach and in the water. While there may be personnel on the beach to ensure the landing locations are clear, safe, and to witness the demonstrations, personnel would not alter land use in any way. Therefore, the Proposed Action would not alter land use in any way.
Visual Resources	The Proposed Action would involve only temporary vessel presence and not alter the viewshed within the proposed action area.
Water Resources	The Proposed Action would involve only temporary vessel presence and would not significantly alter any chemical, physical, biological, or radiological characteristics of water in the proposed action area.
Biological Resources	
Aquatic Vegetation	Aquatic vegetation may be found near the surface or along the benthic habitat within the proposed action area. Vegetation includes diverse taxonomic/ecological groups such as microalgae (e.g., phytoplankton), macroalgae (e.g., seaweed), and submerged aquatic vegetation (SAV). Factors that influence the distribution and abundance of vegetation are the availability of light, nutrients, salinity, substrate type (for attached vegetation), storms and currents, temperature, and grazing by herbivores (Short et al. 2007). The Proposed Action has no potential to cause significant effects to aquatic vegetation due to the low speed of the vessel, short periods of testing, the infrequency of testing, and the health of the populations. Additionally, there is no known benthic aquatic vegetation where bow ramp and anchor demonstrations would occur. Additional details can be found in Appendix B.
Invertebrates	Aquatic invertebrates may be categorized as zooplankton (i.e., small floating or weakly swimming organisms that drift with water currents), larger pelagic invertebrates living in the water column, and benthic invertebrates that live on the bottom or in the sediment. Benthic and pelagic invertebrates that are likely to occur in the proposed action area include single-celled organisms, cnidarians, amphipods, copepods, benthic worms, cephalopods, bivalves, sea snails, moss animals (bryozoans), chitons, crustaceans, echinoderms, sponges, and tunicates (Jacquot et al. 2018; Landers et al. 2013; Nelson and Pattillo 1992; Perry and Larsen 2004). The Proposed Action has no potential to cause significant effects to invertebrates due to the low speed of the vessel, short periods of testing, the infrequency of testing, and the health of the populations. Additional details can be found in Appendix B.
Socioeconomic Resources	
Cultural Resources	There are no known cultural resources within the proposed action area.
Infrastructure	The Proposed Action would involve only vessel operation on water and in the intertidal zone and would not affect or alter infrastructure in any way.
Research	The Proposed Action would not result in the disruption of research. The Proposed Action and research within the area occur sporadically and LCUs would avoid research activities. Therefore, research would not be affected.
Transportation	While there may be transport vessels operating on the waterways utilized by the Proposed Action, LCUs would avoid these vessels. Additionally, testing is brief and would occur as each LCU vessel is constructed (i.e., only one vessel tested at a time with approximately one to two vessels tested per year). Therefore, transportation would not be affected.

3.2 Biological Resources

Descriptions of the existing conditions for biological resources in the proposed action area are included in the subsections below. Due to their listing status, ESA-listed species that may occur within the proposed action area are discussed in more detail.

3.2.1 Birds

The Gulf is a vital region for bird migration and serves as a stopover and wintering ground. Bird species that may be present within the proposed action area largely fall into two groups: (1) those that are distributed mainly on land but may forage in marine habitats, and (2) those that are distributed and forage in marine habitats. There are 12 orders of bird species that may occur within the proposed action area (Table 3-2). ESA-listed birds that may occur within the proposed action area are discussed below.

Table 3-2. Bird Orders Found Within the Proposed Action Area

Taxonomic Order (Representative Species Present)	Distribution Within or Near the Proposed Action Area and Foraging Behavior
Accipitriformes (Ospreys, Kites, Eagles, Hawks)	May be near coastal areas as they occur year-round along the Gulf Coast Prey on aquatic species (not exclusively). Plunge dive to feed on fish.
Anseriformes (Ducks, Mergansers, Teals, Scoters)	Coastal bays, estuaries, and lagoons May dive or dabble; omnivorous
Charadriiformes (Sandpipers, Snipes, Oystercatchers, Terns)	Commonly winter along the Gulf Coast along beaches, sandflats, and other coastal areas. May forage intertidally, feeding primarily on freshwater and marine invertebrates and small fish
Ciconiiformes (Storks)	Commonly frequents salt marshes and tidal creeks of Mobile Bay Forages by walking slowly in shallow water
Coraciiformes (Kingfishers)	Follows shorelines of major waterways during migration. Favors estuaries or calm marine waters not overgrown by vegetation for feeding. Dive or hover over water in search for prey
Falconiformes (Kestrels, Falcons)	Strictly terrestrial but may fly over Mobile Bay May rarely prey on aquatic species
Gaviiformes (Loons)	Occurs close to shore in Mobile Bay Feed by peering into water while swimming on the water's surface and searching or probing while swimming underwater
Gruiformes (Rails, Gallinules, Cranes)	Primarily in coastal marine and estuarine waters of Mobile Bay Glean the surface for prey and will probe shallow water areas. Gallinules occasionally dive in submerged vegetation.
Pelecaniformes (Pelicans, Bitterns, Herons, Egrets, Spoonbills)	Primarily in coastal marine and estuarine environments of Mobile Bay Wade through water while searching for prey in shallow areas. Pelicans capture prey mainly by surface plunging/diving.
Podicipediformes (Grebes)	Winters along coasts in a variety of wetland types in brackish water; non-breeding. Mostly close range foraging dives, occasionally picks or lunges at insects on the water's surface
Procellariiformes (Shearwaters, Petrels)	These species are highly pelagic and widely distributed, coming to land only to breed. Forage by diving for fish and invertebrates.
Suliformes (Frigatebirds, Gannets, Cormorants, Anhinga)	Breeding (Jun–Aug) for frigatebirds, non-breeding for gannet and cormorant, year-round presence for anhinga. Dive for or pick off prey while swimming; feed primarily on fish, crustaceans, invertebrates, and insects.

The only ESA-listed birds that may be found within the proposed action are the piping plover (*Charadrius melodus*) and the rufa red knot (*Calidris canutus rufa*). The rufa red knot and piping plover are shore birds that would mainly be found during winter in the proposed action area.

Piping Plover

USFWS listed the Atlantic Coast and Northern Great Plains piping plover populations as threatened under the ESA in 1985 (50 FR 50726; December 11, 1985), both populations winter along the coast in the proposed action area. Critical habitat for wintering plovers has been designated in coastal areas within the proposed action area (66 FR 36038; July 10, 2001) and is discussed below.

Piping plovers winter on the Gulf coast of Alabama, including Gulf Shores, where they roost and forage (Johnson and Baldassarre 1988; Koczur et al. 2020; USFWS 2024). Piping plovers arrive on their nonbreeding wintering grounds as early as late July and remain there until mid-February to mid-May (Harris 2023; Johnson and Baldassarre 1988). In winter, the species is only found in coastal areas using a wide variety of habitats, including mudflats and dredge spoil areas and, most commonly, sandflats (Gratto-Trevor and Abbott 2011; O'Brien et al. 2006). Plovers appear to prefer sandflats adjacent to inlets or passes, sandy mudflats along spits (beaches formed by currents), and overwash areas as foraging habitats. Piping plovers nest outside of the proposed action area in the Great Lakes, Northern Great Plains, or along the Atlantic Coast (USFWS 2006).

Piping plovers forage for food in the intertidal zone typically within 16 ft (5 m) of the water's edge (Haig and Elliott-Smith 2004). Prey items for the piping plover include terrestrial and benthic invertebrates as well as freshwater and marine invertebrates that have washed up on shore.

Rufa Red Knot

Red knots that overlap the proposed action area belong to the subspecies rufa red knot (*C. canutus rufa*) (USFWS and GSMFC 1995). Rufa red knots are designated as threatened under the ESA (79 FR 73705; December 11, 2014). Critical habitat is proposed for the rufa red knot (88 FR 22530; April 13, 2023) and is discussed below.

Red knots migrate south to winter along the Atlantic and Gulf Coasts from southern New England to Florida and as far south as South America. Red knots use Mobile Bay and the Gulf coastline of Alabama as their non-breeding wintering range (Koczur et al. 2020; USFWS 2024). They primarily occur in intertidal surf-zone habitats, particularly near coastal inlets, estuaries, and bays. Rufa red knots breed during the summer months and nest on the central Canadian Arctic tundra (Baker et al. 2013), outside of the proposed action area.

Red knots forage in the intertidal zone in tidal sandflats, mudflats, and beaches following the shoreline. Red knots on non-breeding grounds feed on marine invertebrates. Their preferred prey is small mollusks.

Piping Plover and Rufa Red Knot Critical Habitat

Piping plover critical habitat within the proposed action area is located on Dauphin, Little Dauphin, and Pelican Islands; and Fort Morgan. Rufa red knot critical habitat is located on Dauphin Island. While both critical habitats fall within the proposed action area, they are located on the terrestrial coastline and all primary constituent elements (PCEs)/physical and biological features (PBFs) essential for the conservation of wintering piping plovers and rufa red knots are terrestrial. The only part of the Proposed Action that would overlap terrestrial areas is bow ramp demonstrations. Since bow ramp demonstrations would only occur at the Theodore Terminal and Gulf Shores amphibious landing locations, there would be no overlap with piping plover critical habitat. Therefore, piping plover and rufa red knot critical habitat are not further discussed.

3.2.2 Fish

The proposed action area includes regions within Mobile Bay and nearshore waters off the Gulf coast of Alabama, which include a variety of marine and estuarine habitats. These habitats include shallow coastal environments as well as neritic (nearshore) pelagic environments. A summary of the taxonomic diversity of fish species present in the proposed action area is presented in Table 3-3.

Table 3-3. Major Groups of Fish Found within the Proposed Action Area

Taxonomic Order	Representative Species Present	Water Column Distribution
Acanthuriformes	Spot (Leiostomus xanthurus), American stardrum (Stellifer lanceolatus)	Demersal
Anguilliformes	American eel (Anguilla rostrata)	Demersal
Atheriniformes	Silversides (Menidia berylina)	Pelagic, coastal
Aulopiformes	Lizardfish (*Synodus poeyi*)	Demersal
Beloniformes	Atlantic needlefish (*Strongylura marina*)	Pelagic, coastal
Carangiformes	Atlantic bumper (Chloroscombus chrysurus), Bay whiff (*Citharichthys spilopterus*)	Pelagic
Carcharhiniformes	Scalloped hammerhead shark (*Sphyrna lewini*), bull sharks (*Carcharhinus leucas*), dusky sharks (*Carcharhinus obscurus*)	Pelagic
Clupeiformes	Anchovy (*Anchoa spp*.), gulf menhaden (*Brevoortia patronus*), scaled herring (*Harengula jaguana*)	Pelagic
Cyprinodontiformes	Gulf killifish (*Fundulus grandis*), Mosquitofish (*Gambusia affinis*)	Demersal
Elopiformes	Tarpon, northern ladyfish	Pelagic, coastal
Gobiiformes	Darter goby (Gobionellus boleosoma), naked goby (Gobiosoma bosci)	Demersal
Lamniformes	Sand tiger shark (*Carcharias taurus*)	Pelagic
Mugiliformes	Striped mullet (*Mugil cephalus)*, White mullet *(Mugil curema)*	Pelagic
Myliobatiformes	Southern stingray (*Dasyatis americana*)	Demersal, coastal and offshore
Perciformes	Approximately 40 percent of all known bony fish, including drum, pinfish, croaker, mojarra, butterfish, cutlassfish	All portions of water column
Pleuronectiformes	Five species of flounder, tonguefish (*Symphurus plagiusa)*	Demersal
Rajiformes	Clearnose skate (*Raja eglanteria)*	Demersal, coastal and offshore

Taxonomic Order	Representative Species Present	Water Column Distribution
Scorpaeniformes	Northern sea robin (*Prionotus caroliuns*)	Demersal
Siluriformes	Hardhead catfish *(Arius felis)*	Demersal
Syngnathiformes	Gulf pipefish (Syngnathus scovelli)	Pelagic, coastal
Tetradontiformes	Least puffer (Sphoerodies parvus)	Demersal
Torpediniformes	Atlantic torpedo ray (*Torpedo nobiliana*)	Demersal, coastal and offshore
Trachiniformes	American sand lance (*Ammodytes americanus*)	Demersal, coastal

The only ESA-listed fish that may occur within the proposed action area are the Gulf sturgeon (*Acipenser oxyrinchus desotoi*) and the giant manta ray (*Mobula birostris*) which are discussed in further detail below.

Giant Manta Ray

The giant manta ray is listed as threatened throughout its entire range under ESA (83 FR 2916; January 22, 2018). There is no critical habitat designated for this species.

The giant manta ray is considered a rare species throughout most of its range except in limited aggregation areas, which are outside of the proposed action area (Miller and Klimovich 2017). Manta rays are typically solitary species, but during feeding they aggregate in shallow waters less than 33 ft (10 m) in depth during the day (NOAA 2023a). Regional populations are small (i.e., less than 1,000 individuals) and commonly show a degree of site fidelity to specific locations, such as cleaning stations and feeding sites (Marshall et al. 2011).

Rays are commonly found in offshore waters and inhabit productive coastlines, sandy bottom habitat, seagrass beds, and shallow reefs. Giant manta ray have been observed near Mobile Bay and off the coast of Alabama (Farmer et al. 2022).

Manta rays primarily feed on planktonic organisms, such as euphausiids, copepods, mysids, decapod larvae, and shrimp, but some studies have noted their consumption of small and moderately-sized fish as well (Couturier et al. 2012).

Gulf Sturgeon

The Gulf sturgeon is listed as threatened under the ESA (56 FR 49653; September 30, 1991). Critical habitat for Gulf sturgeon is designated (68 FR 13370; March 19, 2003); however, no critical habitat overlaps with the proposed action area.

The Gulf sturgeon is an anadromous species found in rivers, estuaries, and marine environments within the northern Gulf of America (Greenheck et al. 2023; NOAA 2022; Pfleger et al. 2016). In the Mobile Bay watershed, adults migrate up rivers to spawn in spring (March to May), remain in the rivers through the summer, and then migrate to estuarine and marine habitats for fall and winter (Greenheck et al. 2023; NOAA 2022; Pfleger et al. 2016). Juveniles similarly move down river and would remain in estuarine environments throughout their first winter (NOAA 2022). Adults may winter in estuarine or marine environments, typically found in shallow shoals (5 to 7 ft [1.5 to 2 m]), deep holes near passes, unvegetated sand habitats (e.g., sandbars), and intertidal and subtidal energy zones (NOAA 2022).

Tagged Gulf sturgeon have been recorded by receivers entering and exiting the Deer River adjacent to Theodore Terminal (Greenheck et al. 2023). Greenheck et al. (2023) detected them in the Mobile Bay Estuary from October to early June consistent with alongshore movements between the mouth of Mobile Bay proper and Gulf Shores, Alabama.

Gulf sturgeon are bottom feeders and feed primarily in estuarine and marine systems on benthic invertebrates including branchiopods, mollusks, annelids, and crustaceans (NOAA 2022; Wilber et al. 2019) typically from October to April. They are opportunistic foragers, so their diets are heavily influenced by their location and the local water depth and seafloor type (Peterson et al. 2013).

3.2.3 Essential Fish Habitat

The Gulf of Mexico Fishery Management Council (GMFMC) is responsible for the conservation and management of fish stocks within the U.S. exclusive economic zone in the Gulf of America. This includes the designation of EFH and habitat areas of particular concern (HAPC). However, there are no HAPC designated within the proposed action area and they are not further discussed within this document. EFH may be designated within the water column, in benthic habitat, or both. Table 3-4 presents Management Units with EFH designations that overlap with the proposed action area and may be affected by the Proposed Action.

Table 3-4. Essential Fish Habitat in the Proposed Action Area

Management Unit	Species Complex	Description of EFH that May be Affected by the Proposed Action
Gulf of Mexico Fishery Management Council		
Coastal Migratory Pelagics	Cobia (*Rachycentron* canadum)	Eggs: Water column in estuarine and nearshore waters of the Gulf of America during the summer that have temperatures of 82.6-85.5 °F (28.1-29.7 °C) and salinities of 30.5-34.1 ppt. Larvae: At the surface of estuarine, nearshore, and offshore Gulf of America waters with depths of 10 ft (3 m) to depths and waters outside of the proposed action area that have temperatures of 76-90 °F (24.2-32 °C) and salinities of 18.9-37.7 ppt. Juvenile: Water column in nearshore and offshore waters of the Gulf of America with depths of 3 ft (1 m) to depths outside of the proposed action area. Adults/Spawning Adults: Water column in nearshore and offshore waters on bank/shoals (hard bottom) of the Gulf of America with depths of 3 ft (1 m) to depths outside of the proposed action area that have temperatures of 73-82 °F (23-28 °C), and salinities of 24.6-30 ppt.
	King Mackerel (*Scomberomorus cavalla*)	Eggs: Water column of offshore waters with depths of 115 ft (35 m) to depths outside of the proposed action area with temperatures of 81 °F (21 °C). Larvae: Water column of offshore waters with depths of 115 ft (35 m) to depths outside of the proposed action area with temperatures of 68-88 °F (20-31 °C). Juveniles: Nearshore waters with depths less than or equal to 30 ft (9 m). Adults/Spawning Adults: Adults occur in water column in nearshore and offshore waters throughout the Gulf of America at depths of 0 ft (0 m) to waters outside of the proposed action area and at temperatures greater than 68 °F (20 °C). Spawning adults occur in offshore waters with depths of 115 ft (35 m) to depths outside of the proposed action area and temperatures greater than 68 °F (20 °C) from May to October.
	Spanish Mackerel (Scomberomorus maculatus)	Eggs: Water column associated in nearshore and offshore waters in depths less than 164 ft (50 m) at temperatures of 79 °F (26 °C). Larvae: Nearshore and offshore waters throughout the Gulf of America with temperatures from 68-90 °F (20-32 °C) and depths of 30 ft (9 m) to waters outside of the proposed action area. Juveniles: Estuaries and nearshore waters with temperatures from 60-93 °F (15.5-34 °C), depths of 6-30 ft (1.8-9 m) to waters outside of the proposed action area, salinities of 0-31 ppt, and DO concentrations of 2.8-10.8 ppm. Adults/Spawning Adults: Estuarine, nearshore, and offshore waters in northern Gulf of America with depths of 10 ft (3 m) to waters outside of the proposed action area, water temperatures from 60-93 °F (15.5-34 °C), salinities of 0-31 ppt, and DO concentrations of 2.8-10.8 ppm. Adults spawn in waters with temperatures greater than 77 °F (25 °C) and depths less than 164 ft (50 m).
Red Drum	Red Drum (*Sciaenops ocellatus*)	Eggs: Water column outside of estuaries in temperatures of 68-86 °F (20-30 °C) with salinities of 10-40 ppt. Larvae: Estuaries with or without submerged aquatic vegetation, tidal flats, and open bays with benthic sediments 0.25-0.3 in (6-8 mm) total length, temperatures of 65-88 °F (18.3-31 °C), and salinities of 8-36.4 ppt.

Management Unit	Species Complex	Description of EFH that May be Affected by the Proposed Action
		Juveniles: Quiet, shallow, protected waters with grassy or muddy bottoms and around the perimeter of marshes in estuaries with temperatures from 40-86 °F (5-30 °C) and salinities from 20-40 ppt[1].
Reef Fish	Almaco Jack (Seriola rivoliana)	Juveniles: Gulf of America in *Sargassum* habitats in nearshore and offshore areas at depths of 22-55 ft (6.7-16.8 m).
	Gray Snapper (*Lutjanus griseus*)	Adults: Estuarine or nearshore waters with hard bottom, soft bottom, reef, sand/shell, bank/shoal, or emergent marsh habitats; depths of 0 ft (0 m) to waters outside of the proposed action area; and temperatures of 56-91 °F (13.4-32.5 °C).
	Gray Triggerfish (*Balistes capriscus*)	Eggs: Gulf of America benthic nearshore and offshore waters at depths of 33 ft (10 m) to depths outside of the proposed action area. Larvae: Water column and *Sargassum* habitats in the Gulf of America. Juveniles: Gulf of America waters with *Sargassum*, hard bottom, mangroves, and reefs. Late juveniles occupy depths from 33 ft (10 m) to outside the proposed action area. Adults/Spawning Adults: Nearshore and offshore Gulf of America waters at depths of 33 ft (10 m) to outside the proposed action area on reef and hard bottom habitats. Spawning adults are found at water with 29.8-35.6 ppt and dissolved oxygen concentrations of 4.9-6.8 ppm.
	Greater Amberjack (Seriola dumerili)	Eggs: Water column associated. Larvae: Water column or on drifting algae in offshore waters. Juveniles: A variety of nearshore waters and offshore waters in water column, drifting algae, and hard bottom habitats. Adults/Spawning adults: Nearshore waters and offshore waters in water column, hard bottom, bank/shoals, and reef habitats at depths of 15 ft (4.6 m) to depths outside of the proposed action area. Spawning adults are found in the water column.
	Hogfish (Lachnolaimus maximus)	Juveniles: Estuarine and nearshore waters with submerged aquatic vegetation. Adults/Spawning Adults: Nearshore and offshore waters with depths less than 100 ft (30 m), salinities from 29-36 ppt, and DO concentrations of 6-9.6 ppm. Spawning adults occur in nearshore waters with depths of 3 ft (1 m) to depths outside of the proposed action area on reef, sand, or hard bottom habitats.
	Lane Snapper (*Lutjanus synagris*)	Eggs: Water column of offshore waters at depths of 13 ft (4 m) to depths outside of the proposed action area. Larvae: Water column or submerged aquatic vegetation at depths of 0-164 ft (0-50 m) with average temperatures of 83-87 °F (28.4-30.4 °C). Juveniles: Submerged aquatic vegetation, sand/shell, reef, soft bottom, and bank/shoal habitats with temperatures of 82-85 °F (28-29.5 °C), depths from 0-79 ft (0-24 m) to waters outside of the proposed action area, salinities of 30-35.5 ppt, and DO of 4.4-5.7 ppm. Adults/Spawning Adults: Nearshore waters of the Gulf of America with sand/shell, hard bottom, reef, and bank/shoals with temperatures of 61-84 °F (16-29 °C), and depths from 13 ft (4 m) to waters beyond the proposed

Management Unit	Species Complex	Description of EFH that May be Affected by the Proposed Action
		action area. Adults spawn in offshore waters on reefs and shelf edge/slope habitats with depths of 98 ft (30 m) to depths outside of the proposed action area.
	Lesser Amberjack (*Seriola fasciata*)	Eggs and Larvae: Occur throughout the Gulf of America.
	Red Grouper (*Epinephelus morio*)	Eggs: Offshore waters with depths of 65 ft (20 m) to depths outside of the proposed action area with salinities of at least 32 ppt. Larvae: Offshore waters with depths of 65 ft (20 m) to depths outside of the proposed action area from May to June with temperatures of 81-83 °F (27.4-28.5 °C). Juveniles: Estuarine, nearshore, and offshore waters with depths of 0-50 ft (0-15 m) on submerged aquatic vegetation or hard bottom with temperatures of 61-88 °F (16.1-31.2 °C) and salinities of 20.7-35.5 ppt for early juveniles[1]. Adults/Spawning Adults: Adults are found in nearshore and offshore waters on hard bottom or reef habitats at depths of 10 ft (3 m) to depths outside of the proposed action area at temperatures of 59-86 °F (15-30 °C). Spawning adults occur in offshore waters on shelf edge/slope or hard bottom habitats from March through June at depths of 65 ft (20 m) to depths outside of the proposed action area.
	Red Snapper (*Lutjanus campechanus*)	Eggs: Offshore Gulf of America water column at depths of 60 ft (18 m) to depths outside of the proposed action area. Juveniles: Nearshore and offshore Gulf of America reefs, hard bottom, banks/shoals, soft bottom, and sand/shell habitats at temperatures of 63-85 °F (17.3-29.7 °C), salinities of 30-35 ppt, DO concentrations greater than 0.4 ppm, and depths from 56 ft (17 m) to depths outside of the proposed action area. Adults/Spawning Adults: Adults are found in nearshore and offshore Gulf of America waters with reef, hard bottom, and banks/shoal habitats at depth of 23 ft (7 m) to waters outside of the proposed action area with temperatures of 57-86 °F (14-30 °C) and salinities of 33-37 ppt. Spawning adults occur in offshore waters on sand/shell and bank/shoal habitats at temperatures of 61-84 °F (16-29 °C) and depths of 60 ft (18 m) to depths outside of the proposed action area.
	Vermilion Snapper (*Rhomboplites aurorubens*)	Eggs: Offshore Gulf of America waters and water column at depths of 60 ft (18 m) to depths outside of the proposed action area. Larvae: Offshore Gulf of America waters and water column. Adults/Spawning Adults: Gulf of America nearshore and offshore waters at depths of 60 ft (18 m) to depths outside of the proposed action area on bank/shoal, reef, and hard bottom habitats. Spawning occurs from May to September.
	Warsaw Grouper (*Epinephelus nigritus*)	Eggs and Larvae: Water column of offshore Gulf of America waters at depths of 131 ft (40 m) to depths outside of the proposed action area. Juveniles: Offshore waters in the Gulf of America at depths of 65-100 ft (20-30 m) in the water column and reefs.

Management Unit	Species Complex	Description of EFH that May be Affected by the Proposed Action
	Wenchman (*Pristopomoides aquilonaris*)	Juveniles: Offshore waters at depths of 62 ft (19 m) to depths outside of the proposed action area.
	Yellowedge Grouper (*Hyporthodus flavolimbatus*)	Eggs: Offshore Gulf of America waters in depths of 115 ft (35 m) to depths outside of the proposed action area. Juveniles: Gulf of America nearshore waters to waters outside of the proposed action area of 30 ft (9 m) and greater on hard bottom. Adults/Spawning Adults: Offshore Gulf of America waters at depths of 115 ft (35 m) to depths outside of the proposed action area on hard bottom and soft bottom habitats.
Shrimp	Brown Shrimp (*Farfantepenaeus aztecus*)	Eggs: Offshore waters at depths of 60 ft (18 m) on soft bottom or sand/shell habitats with temperatures greater than 75 °F (24 °C). Larvae and Pre-settlement Post-larvae less than 0.6 in (14 mm): Estuarine and nearshore waters with depths of 0 ft (0 m) to waters outside of the proposed action area and salinities of 24-36 ppt. They have been collected at temperatures of 82-86 °F (28-30 °C). Larvae and Pre-settlement Post-larvae 0.6-3 in (14-80 mm): Estuarine environments including submerged aquatic vegetation, emergent marsh, oyster reef, soft bottom, and sand/shell with water less than 3 ft (1 m) deep, temperatures 45-95 °F (7-35 °C), salinities of 2-40 ppt, and DO concentrations greater than 1 ppm. Sub-adults: Estuarine and nearshore waters on soft bottom and sand/shell habitats at depths of 3-60 ft (1-18 m), temperatures of 64-82 °F (18-28 °C), salinities of 0.9-30.8 ppt, and DO concentrations greater than 1 ppm. Adults/Spawning Adults: Adults occur on soft bottom and sand/shell habitats in offshore waters with salinities of 2-35 ppt and DO concentrations greater than 2 ppm. Non-spawning adults occur at 50-99 °F (10-37 °C) at 46 ft (14 m) to depths outside of the proposed action area. Spawning adults occur at 60 ft (18 m) to depths outside of the proposed action area.
	Pink Shrimp (*Farfantepenaeus duorarum*)	Eggs: Offshore waters at depths of 30-157 ft (9-48 m) in sand/shell habitats at temperatures higher than 81 °F (27 °C). Larvae and Pre-Settlement Post-larvae: Water column in estuarine and nearshore waters 3-164 ft (1-50 m) deep to waters outside of the proposed action area with temperatures of 60-95 °F (15-35 °C) and salinities of 0-43 ppt (optimum 10-22 ppt). Late Post-larvae and Juveniles: Submerged aquatic vegetation, soft bottom, and sand/shell in estuarine and nearshore waters 0 to 10 ft (0 to 3 m) deep in temperatures from 43 to 100 °F (6 to 38 °C), salinities from 0 to 65 ppt (optimum greater than 30 ppt) and DO concentrations of 2.5 to 6 ppm. Sub-adults: Submerged aquatic vegetation, soft bottom, and sand/shell in estuarine, nearshore, and offshore waters 3 ft (1 m) to waters outside of the proposed action area with temperatures from 43 to 100 °F (6 to 38 °C), salinities from 10 to 45 ppt, and DO concentrations of 2.5 to 5 ppm. Adults/Spawning adults: Nearshore and offshore waters with sand/shell bottoms with a depth of 3 ft (1 m) to waters outside the proposed action area at temperatures from 61 to 88 °F (16 to 31 °C) and salinities from 25 to 45 ppt.

Management Unit	Species Complex	Description of EFH that May be Affected by the Proposed Action
	White Shrimp (*Litopenaeus setiferus*)	Fertilized eggs: Estuarine, nearshore, and offshore waters at depths of 30-112 ft (9-34 m). Larvae and Pre-settlement Post-larvae: Estuarine, nearshore, and offshore waters at depths of 0 ft (0 m) to waters outside of the proposed action area and temperatures of 63-83 °F (17.0-28.5 °C). Late Post-larvae and Juveniles: Estuarine and nearshore environments including emergent marsh, submerged aquatic vegetation, oyster reef, soft bottom, and mangroves in waters at depths less than 3 ft (1 m), temperatures 55-88 °F (13-31 °C, post-larvae) or 48-91 °F (9-33 °C, juveniles), salinities of 0.4-37 ppt, and DO concentrations greater than 1.0 ppm. Sub-adults: Estuarine, nearshore, and offshore waters with soft bottom and sand/shell habitats at depths of 3-98 ft (1-30 m), temperatures of 45-100 °F (7.0-38 °C), DO concentrations greater than 2 ppm, and salinities of 2-35 ppt. Adults/Spawning adults: Adults are found in estuarine, nearshore, and offshore waters with soft bottom habitats in waters less than 90 ft (27 m) deep, temperatures greater than 43 °F (6 °C), and salinities of 1-21 ppt. Spawning adults occur in estuarine, nearshore and offshore waters from spring through late fall, peaking from June to July, at depths of 30-112 ft (9-34 m) and salinities greater than or equal to 27 ppt.
National Marine Fisheries Service		
AHMS Large Coastal Sharks	Blacktip Shark (*Carcharhinus limbatus*)	Neonates/Year of the Young: Coastal areas, including estuaries, with silt, sand, mud, and seagrass habitats that have depths of 2.9-98 ft (0.9-30 m), temperatures from 69-90 °F (20.8-32.3°C), salinities from 22.4-36.4 ppt, and DO from 4.32-7.7 ppm. Juveniles: Coastal areas that contain silt, sand, mud, and seagrass habitats with depths of 2.3 ft (0.7 m) to depths outside of the proposed action area, water temperatures of 68-90 °F (19.8-32.3 °C), salinities of 7-36.8 ppt, and DO of 4.28-8.3 ppm. Adults: Coastal areas with water temperatures ranging from 71-88 °F (21.5-31.1 °C), salinities ranging from 22.3-34.7 ppt, water depths ranging from 2.9 ft (0.9 m) to depths outside of the proposed action area, and DO levels ranging from 5.22-7.49 ppm in silt, sand, mud, and seagrass habitats.
	Bull Shark (*Carcharhinus leucas*)	Neonates/Year of the Young: Areas of shallow depth (less than 30 ft [9 m]) in lower salinity estuaries and river mouths (as low as 0.9 ppt) until water temperatures reach 70 °F (21 °C). Juveniles and Adults: Mobile Bay of the coast of Alabama.
	Sandbar Shark (*Carcharhinus plumbeus*)	Adult: Coastal areas between the Apalachiocola and Mississippi River which includes the Alabama coast and extends to regions outside of the proposed action area.
	Scalloped Hammerhead (*Sphyrna lewini*)	Juveniles and Adults: Northern Gulf of America from eastern Louisiana to Pensacola Florida (Mississippi Delta to DeSoto Canyon) which includes and extends beyond the proposed action area.
	Spinner Shark (*Carcharhinus brevipinna*)	Neonate/Year of the Young: Gulf of America coastal areas along Alabama extending to regions outside of the proposed action area with sandy bottoms, sea surface temperatures from 76-87 °F (24.5-30.5 °C) and mean salinity around 36 ppt.

Management Unit	Species Complex	Description of EFH that May be Affected by the Proposed Action
		Juveniles and Adults: Gulf of America coastal areas along Alabama extending to regions outside of the proposed action area with depths from shore to outside of the proposed action area for adults and from shore to 65 ft (20 m) for juveniles.
	Tiger Shark (*Galeocerdo cuvi*)	Neonate/Year of the Young: Gulf of America coastal areas along Alabama extending to regions outside of the proposed action area. Juveniles and Adults: Gulf of America coastal and pelagic waters along Alabama and grass flats.
AHMS Prohibited Sharks	Whale Shark (*Rhincodon typus*)	Neonates/Year of the Young, Juveniles, and Adults: Central Gulf of America from Florida panhandle to Texas, which includes and extends beyond the proposed action area.
AHMS Small Coastal Sharks	Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*)	Neonates/Year of the Young: Gulf of America coastal areas between Mobile Bay and regions outside of the proposed action area. Juveniles and Adults: Gulf of America coastal areas along Alabama to regions outside of the proposed action area, coastal Alabama off Dauphin Island, and Mobile Point (temperatures of 76-89 °F [24.5-31.5 °C], DO of 0.3-7.2 ppm, salinity of 28.6-36.3 ppt, depth of 9-46 ft [2.7-14 m]).
	Blacknose Shark (*Carcharhinus acronotus*)	Juveniles and Adults: Gulf of America coastal areas along Alabama extending to regions outside of the proposed action area.
	Bonnethead Shark (*Sphyrna tiburo*)	Neonates/Year of the Young: Gulf of America coastal areas along Alabama extending to regions outside of the proposed action area with average temperatures of 82-84 °F (28-29 °C), salinity of 17.2-26.2 ppt, and depth of approximately 15 ft (4.6 m). Juveniles: Gulf of America coastal areas along Alabama and extending to regions outside of the proposed action area. Water with temperatures of 82-88 °F (28-31.1 °C), salinity of 15.5-24 ppt, and depth of 10-11 ft (3-3.4 m). Adults: Gulf of America coastal areas along Alabama extending to regions outside of the proposed action area.
	Finetooth Shark (*Carcharhinus isodon*)	Neonates/Year of the Young, Juveniles, and Adults: Lower Mobile Bay and shallow coastal waters of the Gulf of America, that are to the west, but not including, Gulf Shores, that have muddy bottoms (temperatures of 67-90 °F [19.5-31.4 °C]; salinities of 19-38 ppt; and depths of 7.5-17 ft [2.3-5.3 m]).

°F = degrees Fahrenheit; °C = degrees Celsius; AHMS = Atlantic highly migratory species; DO = dissolved oxygen; estuarine = barrier islands and estuaries; ft = feet; in = inches; m = meter; mm = millimeter; nearshore = 60 ft (18 m) or less in depth; offshore = greater than 60 ft; ppm = parts per million; ppt = parts per thousand

[1]While marshes and submerged aquatic vegetation exist in the proposed action area, the Proposed Action would not occur near these habitats.

References: (GMFMC and NMFS 2016; NOAA 2017; 2004)

1

3.2.4 Sea Turtles

Sea turtles are the only reptiles that may be found within the proposed action area which are all listed under the ESA. The USFWS and NMFS share federal jurisdiction for sea turtles with the USFWS having lead responsibility on the nesting beaches and NMFS for the marine environment. ESA-listed reptiles within the proposed action area are further detailed in Table 3-5. Sea turtles and critical habitat within the proposed action area are described in further detail below.

Table 3-5. ESA-Listed Sea Turtles within the Proposed Action Area

Common Name (Scientific Name)	*ESA-Listing Status*	*Critical Habitat within the Proposed Action Area*	*Occurrence within the Proposed Action Area*
Green Sea Turtle (*Chelonia mydas*)	T, North Atlantic DPS	Yes*	Rare in Mobile Bay and the Gulf of America
Hawksbill Sea Turtle (*Eretmochelys imbricata*)	E	No	Rare in Mobile Bay and the Gulf of America
Kemp's Ridley Sea Turtle (*Lepidochelys kempii*)	E	No	Potential in Mobile Bay and the Gulf of America
Leatherback Sea Turtle (*Dermochelys coriacea*)	E	No	Rare in Mobile Bay and the Gulf of America
Loggerhead Sea Turtle (*Caretta caretta*)	T, Northwest Atlantic Ocean DPS	Yes	Potential in Mobile Bay and the Gulf of America; Primarily in the Gulf of America from May to October

*Critical habitat for the green sea turtle has been proposed by the National Marine Fisheries Service (88 FR 46572; July 19, 2023)

DPS = Distinct Population Segment, T = Threatened, E = Endangered

Green Sea Turtle

The green sea turtle (*Chelonia mydas*) has 11 distinct population segments (DPS) designated as either endangered or threatened under the ESA (81 Federal Register [FR] 20057; April 6, 2016). Only the North Atlantic DPS, which is listed as threatened under the ESA, is found within the proposed action area. *Sargassum* critical habitat has been proposed for the green sea turtle North Atlantic Ocean DPS (88 FR 46572; July 19, 2023) and is discussed in further detail below.

Green sea turtle nesting occurs in the Gulf coast on the Alabama's beach-front coastline, including on Gulf Shores, from May 1 through October 31 (ACF 2024). Stranding and nesting data suggest that green turtles are rare along the Alabama coastline (ACF 2024; Ingram et al. 2014; NMFS and NOAA 2023; Valverde and Holzwart 2017). The number of green sea turtle nests reported for 2003 to 2023 for the whole coastline (exact location not reported) ranged from zero to six nests annually (ACF 2024; Ingram et al. 2014). Nesting is not considered to occur in the Mobile Bay (Seminoff et al. 2015a). From 2020 to July 2024 there were 25 green sea turtles reported stranded on Alabama beaches, including on the Gulf Shores (NOAA 2024b). Green sea turtles may occur within the proposed action area, but their occurrence would be rare.

Juvenile green sea turtles mostly eat mangrove leaves, seagrass and algae (Balazs 1986; Mayumi Nagaoka et al. 2012) and herbivorous adults forage primarily on sea grasses and algae in the neritic zone (Balazs 1980; Bjorndal 1997b; Bolten et al. 2003; Hirth 1971; Limpus 2008). Adult green sea turtles in the open-ocean environment, and even in coastal waters, also consume jellyfish, sponges, and sea pens (Godley et al. 1998; Hatase et al. 2006; Heithaus et al. 2002; NMFS and USFWS 2007; Parker and Balazs 2008; Russell et al. 2011).

Proposed Green Sea Turtle Critical Habitat

The proposed action area overlaps NA01 *Sargassum* proposed critical habitat of the green sea turtle North Atlantic Ocean DPS (Figure 3-2). The physical and biological features essential for the conservation of the species ("essential feature"), which are present in *Sargassum* proposed critical habitat, include the following: Convergence zones, frontal zones, surface-water downwelling areas, the margins of major boundary currents, and other areas that result in concentrated components of the *Sargassum*-dominated drift community, as well as the currents which carry turtles to *Sargassum*-dominated drift communities, which provide sufficient food resources and refugia to support the survival, growth, and development of post-hatchlings and surface-pelagic juveniles, and which are located in sufficient water depth (at least 10 m) to ensure offshore transport via ocean currents to areas which meet forage and refugia requirements.

Figure 3-2. Affected Critical Habitat Overlapping the Proposed Action Area

Hawksbill Sea Turtle

The hawksbill sea turtle (*Eretmochelys imbricata*) was listed as endangered under the Endangered Species Conservation Act of 1969 (35 FR 8491; June 2, 1970), the predecessor to the ESA. Critical habitat has been designated (63 FR 46693; September 2, 1998) outside of the proposed action area in the Caribbean Sea.

Hawksbill sea turtles typically occur in tropical and subtropical waters of the Atlantic, rarely occurring above 35 °N or below 30 °S, and they are mostly encountered in shallow waters less than 60 ft (18 m) (COTERC 2008; Gaos et al. 2020; NMFS and USFWS 2013; Stokes et al. 2023; Witzell 1983). Hawksbill sea turtles are rare along the Gulf coast of Alabama (ACF 2024; Valverde and Holzwart 2017). In 2020, there were two strandings reported on Gulf Shores (NOAA 2024b). From 1986 to 2009, and 2021 to 2024 there were no strandings reported for hawksbill sea turtles (National Oceanic and Atmospheric Administration 2024c; Valverde and Holzwart 2017), suggesting turtles are not common along the Alabama coast. While hawksbill sea turtles may occur within the proposed action area, their occurrence would be rare.

Kemp's Ridley Sea Turtle

The Kemp's ridley sea turtle (*Lepidochelys kempii*) was listed as endangered under the Endangered Species Conservation Act of 1969 (35 FR 18320; December 2, 1970), the predecessor to the ESA. No critical habitat has been designated for this species.

Kemp's ridley sea turtles are the most common turtles in the waters of Alabama (Raines 2010). From 2020 to 2024, there were 107 Kemp's ridley turtles reported as stranded along the coastline of Alabama, including Gulf Shores and Mobile Bay (with some near Theodore Terminal) (NOAA 2024b). Turtles have been recorded transversing towards or near the coastline of Alabama (Lyn et al. 2012). They are also known to nest on Alabama beaches, likely including Gulf Shores (Valverde and Holzwart 2017), although nesting is more common elsewhere in other Gulf coast states (ACF 2024; Guyer et al. 2015; Ingram et al. 2014; NOAA and USFWS 2015; Valverde and Holzwart 2017). From 2010 to 2023 there were zero to four nests laid annually on the beaches of Alabama (ACF 2024; Valverde and Holzwart 2017). Mobile Bay is an important foraging ground for Kemp's ridley sea turtles, especially juvenile turtles (Handley et al. 2013; Raines 2010). However, juvenile sea turtles are not abundant in many areas of the Alabama bays (Nelson and Pattillo 1992). Kemp's ridley sea turtles may occur year-round within the proposed action area.

Kemp's ridley sea turtles feed on both benthic and pelagic prey (Robinson et al. 2020). Kemp's ridley turtles feed primarily on crabs but also are known to prey on mollusks, shrimp, fish, jellyfish, and (incidentally) plant material (Frick et al. 1999; Robinson et al. 2020; Seney 2016).

Leatherback Sea Turtle

The leatherback sea turtle (*Dermochelys coriacea*) was listed as endangered under the Endangered Species Conservation Act of 1969 (35 FR 8491; June 2, 1970), the predecessor to the ESA. When the ESA was passed in 1973, the leatherback was listed as endangered throughout its range. Critical habitat is designated for the leatherback sea turtle (77 FR 4170;

January 26, 2012; 44 FR 17710; March 23, 1979), but it occurs outside of the proposed action area.

Leatherback sea turtles regularly inhabit deep offshore waters in the vicinity of DeSoto Canyon (about 60 mi [96.6 km] offshore in the Gulf) for feeding, resting, and migrating (Davis et al. 2000; Landry and Costa 1999). Leatherback sea turtles may also occur in shallow waters on the continental shelf in the Gulf and have been observed feeding on dense aggregations of jellyfish (Collard 1990; O'Connell et al. 2005).

During 2020 to 2024, there were no leatherback sea turtles reported as stranded on the beaches of Alabama (NOAA 2024b); however stranded adult leatherback sea turtles have been observed (rarely) (Guyer et al. 2015). There is a possibility of nesting on Alabama beaches, although nesting activity has not been confirmed within the state (Guyer et al. 2015). The National Centers for Environmental Information's (2014) *Gulf of Mexico Data Atlas* indicates that Mobile Bay's shores are only marginally suitable nesting habitat for leatherback sea turtles.

Satellite-tracked leatherback sea turtles have been recorded foraging off the Alabama coast (Evans et al. 2021). Leatherback sea turtles feed on soft-bodied animals, such as salps and jellyfish (Heaslip et al. 2012; NOAA 2023b). Based on the information above, leatherback sea turtles may occur within the proposed action area, although occurrence would be rare.

Loggerhead Sea Turtle

Under the ESA, nine loggerhead sea turtle (*Caretta caretta*) DPSs have been identified and designated worldwide as endangered or threatened (76 FR 58868; September 22, 2011). The Northwest Atlantic Ocean DPS (threatened) is the only DPS that would occur within the proposed action area. Critical habitat has been designated within the proposed action area (79 FR 39855; July 10, 2014) and is discussed in further detail below. Loggerhead sea turtles can be found during all seasons in both continental shelf and slope waters (Conant et al. 2009; Davis et al. 2000). Juvenile loggerheads appear to primarily use the developmental habitats found in the northwestern Gulf, including coastal inlets, sounds, bays, estuaries, and lagoons with depths less than 328 ft (100 m) (Bolten 2003; Bowen et al. 1995; Musick and Limpus 1997; Pitman 1990; Zug et al. 1995). The occurrence of loggerhead sea turtles during winter is likely concentrated in the northeastern Gulf, in Alabama and Florida Panhandle shelf waters, and, to a lesser extent, in the deeper off-shelf waters from Texas to Florida. Satellite tracked loggerheads have been found to use habitat from the Alabama coast to waters 655 ft (200 m) deep off the coast (USGS 2018).

Although nesting is considered infrequent (Valverde and Holzwart 2017), loggerhead sea turtle nests are the most common sea turtle nests found in Alabama. From 2010 to 2023, 41 to 233 nests were found annually on Alabama's coastline beaches (ACF 2024). Gulf Shores is also a potential nesting site for loggerhead sea turtles (Valverde and Holzwart 2017). From 2020 to 2024, there were 107 loggerhead sea turtles recorded as stranded along the Gulf coast of Alabama and one sea turtle reported as stranded in a contiguous bay on the eastern edge of Mobile Bay (NOAA 2024b). Loggerhead sea turtles are known to occur within Mobile Bay (Guyer et al. 2015; Handley et al. 2013; USGS 2018).

Loggerhead sea turtles are primarily carnivorous in both open-ocean and nearshore habitats, although they also consume some plant matter (Bjorndal 1997a; Conant et al. 2009). Adult loggerheads feed on a variety of gelatinous prey (e.g., jellyfish) and bottom-dwelling animals, such as crabs, sea urchins, and sponges (Fukuoka et al. 2016; Pajuelo et al. 2016). Loggerhead sea turtles may be present year-round at the proposed action area.

Loggerhead Sea Turtle Critical Habitat

There are two units of loggerhead nearshore reproductive critical habitat of the Northwest Atlantic Ocean DPS that overlap the proposed action area: LOGG-N-33 and LOGG-N-34 (Figure 3-2). The physical and biological features essential for the conservation of the species ("essential feature"), which are present in LOGG-N-33 and LOGG-N-34 Nearshore Reproductive habitat include the following: a portion of the nearshore waters adjacent to nesting beaches that are used by hatchlings to egress to the open-water environment as well as by nesting females to transit between beach and open water during the nesting season. There are three PCEs that support this essential feature:

(i) Nearshore waters directly off the highest density nesting beaches and their adjacent beaches as identified in 50 CFR 17.95(c) to 1 mi (1.6 km) offshore;

(ii) Waters sufficiently free of obstructions or artificial lighting to allow transit through the surf zone and outward toward open water; and

(iii) Waters with minimal manmade structures that could promote predators (i.e., nearshore predator concentration caused by submerged and emergent offshore structures), disrupt wave patterns necessary for orientation, and/ or create excessive longshore currents (79 FR 39856).

3.2.5 Mammals

Non-ESA-listed marine mammals that may be found in the proposed action area are listed in Table 3-6. The West Indian manatee (*Trichechus manatus latirostris*) is the only ESA-listed mammal that may be found within the proposed action area and is described in the subsection below.

Table 3-6. Non-ESA Listed Marine Mammals within the Proposed Action Area

Common Name (Scientific Name)	***Stock***	***Distribution Within or Near the Proposed Action Area***	***Diet***
Atlantic bottlenose dolphin (*Tursiops truncatus*)	*Mobile Bay*	These dolphins occur throughout the bays, estuaries, and sounds of the Gulf of America, such as Mobile Bay. Year-round residency patterns of some individual bottlenose dolphins in bays, sounds, and estuaries have been reported for almost every survey area where photo-identification or tagging studies have been conducted (Balmer et al. 2008; Bassos-Hull et al. 2013; Bräger 1993; Bräger et al. 1994; Hubard et al. 2004; Irvine et al. 1981; Irwin and Würsig 2004; Lynn and Würsig 2002; Maze-Foley and Würsig 1999; Scott 1990; Shane 2004; Shane 1990; Urian et al.	Feeding primarily on fish, marine invertebrates, and squid, estuarine areas are often considered nurseries for these species, resulting in higher densities of prey and dolphins (Miller and Baltz

Common Name (Scientific Name)	*Stock*	*Distribution Within or Near the Proposed Action Area*	*Diet*
		2009; Weller 1998; Wells et al. 1996a; Wells et al. 1996b; Wells ; Wells et al. 1987).	2010)
Atlantic spotted dolphin (*Stenella frontalis*)	*Northern Gulf of Mexico*	Inhabits the continental shelf and is usually found inside or near the 200-m isobath of the Gulf of America just outside of Mobile Bay	Feed on small fish, invertebrates, and cephalopods (squid and octopus)

West Indian Manatee

West Indian manatees are listed as threatened under the ESA (82 FR 16668; April 5, 2017); however, the USFWS issued a proposed rule to reclassify the West Indian manatee from threatened to endangered under the ESA (88 FR 70634; October 12, 2023). The West Indian manatee is divided into the Florida (*Trichechus manatus latirostris*) and Antillean (*Trichechus manatus manatus*) subspecies (Lefebvre et al. 2001). Only the Florida subspecies may be found in the proposed action area, as the Antillean manatee exclusively occurs in the Caribbean Sea (Bonde and Lefebvre 2001). Critical habitat is proposed for the West Indian manatee outside of the proposed action area in Florida and Puerto Rico (89 FR 78134; September 24, 2024).

Manatees are a subtropical species with little tolerance for cold, and they are generally restricted to inland and coastal waters (68 °F [20 °C] or warmer) during the winter, where they shelter in or near warm-water springs, industrial effluents, and other warm-water sites (Bonde and Lefebvre 2001; Hartman 1979; Stith et al. 2006). Small population sizes of manatees are found in Alabama waters mainly from May to November (Cloyed et al. 2021; 2022). Cloyed et al. (2021) tagged 11 manatees from 2009 to 2015 and found that Mobile Bay was the most frequently migrated to location in the spring (10 manatees) from their overwintering sites in Florida. From 2010 to 2019 manatee abundance was estimated in coastal Alabama waters to be between 25 and 34 manatees at any time during May to November (Cloyed et al. 2022). Manatees mainly inhabit the Mobile-Tensaw River Delta and Dog River areas (Cloyed et al. 2022; Hieb et al. 2017; Pabody et al. 2009) which are outside of the proposed action area. Although not as abundant in these locations, manatees have historically inhabited the Gulf coast of Alabama, including near Gulf Shores, and river systems near Theodore Terminal (Pabody et al. 2009) and manatees have been sighted at these locations in recent years (Cloyed et al. 2022; Hieb et al. 2017).

Manatees generally remain close to the coast and are found in nearshore shallow waters near SAV on which they feed (Cloyed et al. 2022; Lefebvre et al. 1999).

3.2.6 Hearing Ranges for Biological Resources

Hearing ranges for biological resource groups that overlap the proposed action area are included in Table 3-7 below.

Table 3-7. Hearing Ranges for Biological Resources

Biological Resource Group	Frequency
Birds[1]	In-air: 1-5 kHz Underwater: 1-4 kHz
Fish[2]	50 Hz - 1 kHz
Sea Turtles[3]	In-air: 50-800 Hz Underwater: 50 Hz – 1.6 kHz
Marine Mammals[4]	Manatee: 400 Hz – 46 kHz Dolphins: 150 Hz – 160 kHz

[1] (Crowell et al. 2015; Hansen et al. 2017; Johansen et al. 2016; Larsen et al. 2020; McGrew et al. 2022; Therrien 2014; Therrien et al. 2012)
[2] (Casper and Mann 2009; Mickle and Higgs 2022; Mickle et al. 2020; Popper 2003; Popper 2005; Popper 2008, 2014; Popper and Calfee 2023; Slabbekoorn et al. 2010)
[3] (Bartol and Ketten 2006a; Bartol and Ketten 2006b; Eckert 2012; Harms et al. 2014; Ketten and Bartol 2006; Lavender et al. 2014; Martin et al. 2012; Piniak et al. 2016; Ridgway et al. 1969)
[4] (Au et al. 2007; Azevedo et al. 2010; Bittencourt et al. 2020; Gerstein et al. 1999; Janik et al. 2013; Mann et al. 2009; National Marine Fisheries Service (NMFS) 2024)

3.3 Socioeconomic Resources

Socioeconomic resources include those that provide economic value to the communities within the proposed action area. The two Alabama counties (Baldwin and Mobile) adjacent to the proposed action area are home to approximately 608,000 people (U.S. Census Bureau 2023, 2024). The following sections provide an overview of the predominant socioeconomic resources in the proposed action area that may be affected by the Proposed Action (i.e., commercial fishing, commercial shipping, and recreational activities). While there are other socioeconomic activities that occur within the proposed action area such as aquaculture, tourism, and oil and gas extraction, these socioeconomic resources are not expected to be affected by the Proposed Action.

Oyster farming is the major aquaculture in Alabama. Since oysters are farmed near the seafloor, the anchor and bow ramp demonstrations would be the only activity that may potentially affect aquaculture. Oyster farming is prohibited around Theodore Terminal and unclassified (i.e., harvest of shellfish is prohibited) in the Gulf of America (ADPH 2024; Lewis A. Byrd et al. 2020). Therefore, aquaculture would not be affected by the Proposed Action, and it is not further discussed.

Commercial Fishing

Commercial fishing is a major industry in the Mobile Bay region. Alabama commercial fishermen land a variety of species, including shrimp (*Panaeus* spp.), blue crabs *(Calinectes sapidus)*, eastern oysters *(Crassostrea virginica)*, red snapper (*Lutjanus campechanus)*, vermillion snapper *(Rhomboplites aurorubens)*, Spanish mackerel *(Scomberomorus maculatus)*, menhaden *(Brevoortia tyrannus)*, and striped mullet *(Mugil cephalus)* (MBNEP 2021). In 2022, the Alabama seafood industry generated 6,971 jobs and $442.9 million in sales (Alabama A&M & Auburn Universities Extension 2024). Overall, Alabama's commercial fishermen land over 30 million pounds (lbs) of fish annually (NOAA 2024).

Commercial Shipping

A wide variety of vessels transit throughout the proposed action area. These vessels may include container ships bringing products to markets; tankers and dry bulk vessels bringing ore, oil, gas, and other commodities to and from their points of production; fishing vessels; passenger and tourism vessels; and research vessels. While many smaller vessels (e.g., fishing, passenger, and research vessels) use a variety of ports throughout the proposed action area, commercial cargo vessels, especially those that operate in international trade, utilize the Port of Mobile.

Mobile Harbor Shipping Channel; a commercial shipping channel; runs from the Port of Mobile to Gulf of America. The Port of Mobile is the only major shipping port in Mobile Bay and is a center for global trade (Alabama Port Authority 2022, 2024a). The Port of Mobile is very important to the economic growth of Alabama and the Gulf Coast. Activity at the ports public and private terminals generates one in seven jobs statewide (Alabama Port Authority 2022, 2024a). 55 million tons (49.9 million metric tons) of international and domestic cargo traveled through Mobile Bay in 2022, delivering $98.3 billion in economic value to Alabama (Alabama Port Authority 2022).

The Port of Mobile's Marine Liquid Bulk Terminal is in Theodore, Alabama, and provides quick access to the Gulf of America. The public-use facility has a 1,100 ft (335.3 m) pier that handles one million tons of liquid bulk annually. Theodore is also home to several chemical plants, making the Marine Liquid Bulk Terminal an ideal location to serve this industry (Alabama Port Authority 2024b).

Recreational Activities

Recreational activities within the proposed action area occur on the waters and beaches of Gulf Shores, Mobile Bay, and the Gulf of America. These activities include beach outings, fishing, and boating. During the 2022–2023 boating season, there were approximately 2.8 million recreational vessels registered in the Gulf states, and nine percent of these were registered in Alabama (USCG 2024). Recreational fishermen in the Mobile Bay region commonly fish for red drum *(Sciaenops ocellatus)*, flounder *(Paralichthys dentatus)*, Spanish mackerel, striped mullet, and kingfish *(Menticirrhus* spp.), as well as blue crabs and eastern oysters. The Gulf of America accounts for approximately 30 percent of recreational fishing in the United States and Alabama recreational fisheries landings totaled 13.6 million lbs in 2023 (NOAA 2022, 2024).

4 Environmental Consequences

This section presents an analysis of the potential direct and indirect effects of each alternative on the affected environment. Effects are analyzed to determine if they rise to the level of significance. "Significantly" as used in NEPA, required considerations of both context and intensity of environmental effects of an action. Factors that should be considered in evaluating an action's significance are: geographic extent of the action, duration of the action's effects, risk of controversial or highly uncertain or unique and unknown environmental impacts, whether the action is related to other reasonably foreseeable actions, and whether the action threatens a violation of Federal, State, or local laws and regulations.

Vessel noise (Section 4.1), vessel movement (Section 4.2), and bottom and beach disturbance (Section 4.3) are the only stressors associated with the Proposed Action and are described in the subsections below.

4.1 Vessel Noise

Sound generated by an LCU vessel is analyzed for both underwater and in-air effects[1]. Although the exact noise characteristics generated by the LCU 1700 class vessel have not been measured directly, the LCU would likely be powered by two Caterpillar main propulsion diesel engines, with two Caterpillar craft service generator diesel engines providing electrical power. Given the size (139 ft [42.3 m]) and speed (maximum of 11 knots) of the LCU, it is estimated that the noise levels would be similar to the support and supply ships (lengths roughly 180–278 ft [55–85 m]) with comparable engines listed in Richardson et al. (1995). For the purpose of this analysis, a representative broadband frequency range (20 Hz–1 kHz) was used for the LCU 1700 class vessels. A source level of 170 dB re 1 µPa at 1 m is used for analysis of underwater sound (Navy 2011), to estimate the sound level closer to the vessel.

A high volume of recreational vessels and cargo ships transverse the Mobile Bay and nearshore waters off the Gulf coast of Alabama whose frequencies overlap with expected underwater noise produced by LCU vessels. Since LCU testing would be infrequent and short-lived, further reducing potential acoustic effects, the contribution from LCU vessel noise in the proposed action area would not be meaningfully detected except close to the vessels due to the overlap in frequencies with the recreational and cargo vessels.

Due to the small size of the LCU compared to the large proposed action area and mobile nature of species; the likelihood of a species being in the exact area and time as an LCU for an extended period is low. This likelihood is lessened as animals that may hear an approaching

[1] Sound levels are normally expressed in decibels (dB). The dB value is given with reference to ("re") the value and unit of the reference pressure. The standard reference pressures are 1 microPascal (1 µPa) for water and 20 µPa for air. It is important to note that because of the difference in reference units between air and water, the same absolute pressure would result in different decibel values for each medium. In air, sound levels are frequently "A-weighted" and seen in units of A-weighted decibels (dBA), to account for sensitivity of the human ear. Many in-air sound measurements are A-weighted because the sound levels are most frequently used to determine the potential noise effect to humans.

vessel would likely move away rather than towards it. Therefore, although exposure to 170 dB is unlikely, it is used as a more conservative metric for analysis. While the source level has not been measured directly, it is assumed the in-air vessel noise would measure between 70 and 90 dBA depending on vessel speed and load, based on measurements of vessel noise created by similar engines taken at the vessel's helm (McDonald 2012).

Vessel noise as a result of the Proposed Action would be below the threshold that has the potential to result in injury to biological resources. Therefore, temporary threshold shift or auditory injury would not result from the Proposed Action and would not be further discussed herein. Only behavioral responses would be expected as a potential effect of the Proposed Action and are discussed in further detail in the subsections below.

It is difficult to differentiate between behavioral responses to vessel sound and visual cues associated with the presence of a vessel; thus, it is assumed both could play a role in prompting reactions from animals. The response of an animal to an anthropogenic sound would depend on the frequency, duration, temporal pattern, and amplitude of the sound as well as the animal's prior experience with the sound and the context in which the sound is encountered (i.e., what the animal is doing at the time of the exposure). Other variables such as the animal's sex, age, the distance from the sound source, and whether it is perceived as approaching or moving away can also affect the way an animal responds to a sound (Wartzok et al. 2003).

4.1.1 Potential Effects to Birds

Best hearing capabilities of birds are from 1 to 3 kHz in air (Crowell et al. 2015) and 1 to 4 kHz in water (Hansen et al. 2017; Johansen et al. 2016; Larsen et al. 2020; McGrew et al. 2022; Therrien 2014). With a limited ability to detect the sounds of vessels, any impacts to birds would be limited to short term startle responses, which may cause temporary displacement from the location where the vessel is conducting testing, and masking (may make it difficult for birds to hear important sounds).

In general, birds would be expected closer to shore. Underwater exposure to birds from vessel noise would be very rare, limited to instances where a bird is diving in close proximity to a LCU vessel to perceive vessel noise above ambient noise. Due to the swimming and diving capabilities of birds, underwater impacts from vessel noise would be short-term and temporary as the vessel moves through the proposed action area and/or the bird exits the water (either after feeding or in response to the vessel's presence).

Since birds are visual predators, it is assumed that vessel noise would have little to no impact on a seabird's ability to hunt for prey. Exposure of birds to in-air vessel noise would be temporary and localized. Birds are either not likely to respond to vessel noise or are not likely to respond in ways that would significantly disrupt normal behavior patterns which include, but are not limited to, migration, breeding, feeding, or sheltering. LCU testing would be expected to only temporarily increase in-air noise for short periods of time. At most, birds would be expected to have a minor behavioral reaction to vessel noise but would be expected to quickly resume normal activities. No population-level impacts would be expected.

4.1.2 Potential Effects to Fish

Potential effects to fish from vessel noise include behavioral responses and masking of biologically important sounds. Dominant tones in noise spectra from LCU vessels are from 20 Hz to 1 kHz and are likely detectable to fish, including the ESA-listed gulf sturgeon and giant manta ray. Behavioral reactions of fish may include changing direction of travel, changing position within the water column, avoidance of the disturbance, and startle response. Fish use sounds for schooling, mating, navigating, and detecting predators and prey (Popper et al. 2003). Masking of sounds associated with these behaviors could affect fish by reducing their ability to perform these essential functions (Popper et al. 2003). However, long-term consequences to fish species are not expected as any masking would be localized and short-term as the vessel passes through the area.

Direct and prolonged exposure to vessel noise associated with the Proposed Action would be extremely low because most fish can detect vessels and move away from the area of operation. Gulf sturgeon are a benthic dwelling anadromous species. Solitary manta rays may be transiting through the proposed action area. Based on the habitat preferences of these species, the small size of the LCU, and infrequency of testing the likelihood of a fish being located directly below an LCU in the area of greatest noise intensity is minimal. In addition, any noise from infrequent LCU testing would likely not be distinguishable from other vessels due to the ambient noise in the proposed action area.

4.1.3 Potential Effects to Sea Turtles and Marine Mammals

Vessel noise overlaps the hearing range of sea turtles, manatees, and dolphins (Table 3-7). Only loggerhead and Kemp's ridley sea turtles are common in the waters of Alabama. When sea turtles are found, they are mainly concentrated in the Gulf region of the proposed action area. Testing that occurs within Mobile Bay would have limited vessel noise exposure for sea turtles.

Although, sea turtles would be exposed to in-air vessel noise, hatchlings and females laying eggs would not be affected by this sound. While it is hypothesized that noise may mask acoustic cues on beaches for some turtles, hatchling green and leatherback sea turtles were found to have little response to experimental wave sounds/anthropogenic sounds when navigating to the sea (Holtz et al. 2024; 2021). Females actively laying eggs would not be affected by vessel noise as they enter a "trance" when laying eggs and are unlikely to abandon nests (Chattopadhyay et al. 2018; Ripple 1996). Therefore, in-air noise effects to sea turtles are not further discussed due to the unlikely response from hatchlings and females laying eggs.

Potential behavioral responses of sea turtles and marine mammals to vessel noise could include startle reactions, disruption of current behavior, changes in respiration, increase in vigilance (i.e., scanning behavior), alteration of swim speed or direction, diving, and area avoidance (DeRuiter and Doukara 2012; Díaz et al. 2024; Fouda et al. 2018; Kastelein et al. 2023; Mann et al. 2009; Marley et al. 2017; Miksis-Olds et al. 2007; Pirotta et al. 2015). Auditory masking may also occur, but due to the infrequent and transitive nature of the testing would be temporary and insignificant. Sea turtles and marine mammals behavioral response to sound is assumed to be variable and context specific. For each potential

behavioral change, the magnitude of the change ultimately would determine the severity of the response. Any response, such as changing the direction of travel or submerging/diving, is expected to be short-term and temporary. Sea turtles and marine mammals would be expected to return to normal behavior with the departure of the vessel.

4.1.4 Summary of Vessel Noise Consequences

Under the **Proposed Action**, LCU testing activities would increase the baseline in-air and underwater noise conditions within the proposed action area. Vessel noise associated with the Proposed Action would be short-term (five hours or less for each demonstration) and temporary. Due to the delivery schedule of each LCU, multiple vessels would not be tested simultaneously. Vessel noise would be only marginally elevated above ambient noise levels in the proposed action area. Shorebirds (including ESA-listed piping plovers and rufa red knots) likely would only experience an increase of in-air noise from bow ramp demonstrations as these birds only utilize the shoreline and would not be expected on the open water where the underway towing demonstrations would occur.

There would be no auditory effects and minimal potential for non-auditory behavioral effects on biological resources within the proposed action area. These effects would be brief in nature as the Proposed Action would only increase the baseline noise conditions while a vessel is in close proximity. Birds are mobile and can fly away from the sound source, lowering their chances of exposure. Therefore, effects to birds from the Proposed Action are considered negligible.

As testing would be intermittent, the ambient acoustic environment would not be elevated in any lasting way. Sea turtles would likely only be affected by testing that occurs in the Gulf region of the proposed action area as sea turtles do not concentrate within Mobile Bay. Effects to green, hawksbill, and leatherback sea turtles are discountable, as occurrence is rare within the proposed action area. Overall, there are not expected to be any long-term consequences to individuals due to the short duration of testing. Any disturbance would be expected to be temporary, and any exposed species would be expected to return to its normal behavior shortly after the exposure.

Given the slow speed of the vessel associated with the Proposed Action (11 knots or less) and the short period of time biological resources would spend in the vicinity of the LCU, vessel noise associated with the Proposed Action may affect individual fish, sea turtles, or marine mammals within the proposed action area; however, behavioral responses to vessel noise, which is the most likely response, would be short-term and insignificant.

Under **Alternative 1,** bow ramp demonstrations would only occur at Theodore Terminal. Therefore, no vessel noise from bow ramp demonstrations would be introduced at Gulf Shores. While effects from vessel noise would be similar for most biological resources to the Proposed Action since there is potential occurrence in either location, Alternative 1 potentially would lessen the vessel noise exposure to sea turtles compared to the Proposed Action as sea turtles are mainly in the Gulf of America and not Mobile Bay where Theodore Terminal is located.

Under **Alternative 2,** bow ramp demonstrations would only occur at Gulf Shores. Therefore, no vessel noise from bow ramp demonstrations would be introduced at Theodore Terminal. Effects under Alternative 2 from vessel noise would be similar to the Proposed Action for biological resources.

Under the **No Action Alternative,** the Navy would not conduct the proposed testing activities in the proposed action area. Vessel noise would remain at baseline levels within the proposed action area.

Conclusion statements under each applicable law or regulation are included in Table 4-2.

4.2 Vessel Movement

The LCU vessel would have a low maximum speed of 11 knots. The LCU would be transiting at 10 knots during bow ramp demonstrations. LCU testing would be five hours or less for a given test.

It is difficult to differentiate between behavioral responses to vessel sound and visual cues associated with the presence of a vessel (Hazel et al. 2007); thus, it is assumed both could play a role in prompting reactions from animals. Reactions to vessels from animals often include changes in general activity (e.g., from resting or feeding to active avoidance), changes in surfacing-respiration-dive cycles or flight patterns, and changes in speed and direction of movement. Past experiences of the animals with vessels are important in determining the degree and type of response elicited during an animal-vessel encounter. Some species have been noted to tolerate slow-moving vessels within several hundred meters, especially when the vessel is not directed toward the animal and when there are no sudden changes in direction or engine speed (Nowacek et al. 2004; Richardson et al. 1995).

4.2.1 Potential Effects to Birds

The probability of a collision between a LCU and any bird species is extremely low due to the following factors: maneuverability of aquatic birds in water and on land, slow speed of the vessel (maximum of 11 knots), keen eyesight, and hearing the vessel as it approaches (although vessel noise is outside of the best range of bird hearing). The most likely response of a bird to vessel movement is flushing from the area; however, birds would be expected to return to normal behavior soon after the vessel has left the immediate area. As the Proposed Action is short in duration (five hours or less for each demonstration), vessel movement is not expected to cause more than short-term behavioral responses in birds. No long-term changes to behaviors, such as feeding or sheltering, are likely to occur.

4.2.2 Potential Effects to Fish and EFH

The probability of collision between a LCU and adult or juvenile fish is extremely low because fish are highly mobile and can detect and avoid approaching objects. During bow ramp demonstrations the LCU would operate in shallow waters and both the bow ramp and vessel would contact the bottom for a brief period in waters no deeper than 4 ft (1.2 m). Gulf sturgeon likely would not be found at this depth as they commonly inhabit water with a depth of 5 to 13 ft (1.5 to 4 m) in estuaries and the Gulf (Fox et al. 2002; NOAA 2024a). Giant manta

rays would not be expected to overlap with bow ramp demonstrations as they do not commonly inhabit shallow waters. The risk of behavioral reactions would be insignificant, as fish would quickly resume normal behavior once the vessel has moved through the area. Ichthyoplankton (fish eggs and larvae) in the upper portions of the water column could potentially be displaced, injured, or killed by vessel and propeller movements. However, no measurable effects to fish recruitment would occur because the number of eggs and larvae exposed to vessel movements would be low relative to total ichthyoplankton biomass.

EFH within the proposed action area can be broadly divided into three categories: water column, benthic habitat, and biogenic habitat. Water column includes any habitat within the water from the surface to just above the benthic substrate. Benthic substrate is inorganic seafloor habitat. Biogenic habitats include organisms and their byproducts that create physical structure for other organisms to utilize as habitat, such as seagrass beds or coral reefs (Tyrrell 2005). Table 4-1 denotes overall which habitat types (i.e., water column, benthic substrate, or biogenic habitat) are designated for management units with EFH overlapping the proposed action area.

Table 4-1. Types of Habitat Designated as EFH for Management Units within the Proposed Action Area

Management Unit	*Water Column*	*Benthic Substrate*	*Biogenic Habitat*
Coastal Migratory Pelagics	X		
Red Drum	X	X	X
Reef Fish	X	X	X
Shrimp	X	X	X
AHMS Large Coastal Sharks	X	X	X
AHMS Prohibited Sharks	X		
AHMS Small Coastal Sharks	X	X	X

AHMS = Atlantic highly migratory species

Vessel movement may result in temporary, minor, and localized disturbance to the water column. There would be no impacts to benthic or biogenic habitat from vessel movement. Physical disturbance to the water column would be minimized with the use of slow speeds (maximum speed of 11 knots) and the short-term use of vessels (each demonstration is five hours or less) for the Proposed Action. As the water column would not be altered in any measurable or lasting manner, there would be no adverse effect to water column EFH. This would result in minimal potential for effects to water column EFH.

4.2.3 Potential Effects to Sea Turtles and Marine Mammals

While the LCU vessel would move through green sea turtle *Sargassum* proposed critical habitat none of the essential features would be affected by vessel movement. Even if an LCU passes through *Sargassum* mats, it would not change its ability to function as a habitat. None of the essential features of loggerhead sea turtle critical habitat would be affected by vessel movement, therefore it is not discussed further.

Within the proposed action area Atlantic bottlenose dolphins, Atlantic spotted dolphins, West Indian manatees, Loggerhead and Kemp's ridley sea turtles would be the most likely species to occur. Densities of sea turtles expected within the proposed action area are low for most sea turtle species compared densities found in other regions of the Gulf of America. Sea turtles are more common in the Gulf than in Mobile Bay, further limiting their exposure to vessels.

The species most vulnerable to collisions with the LCU are sea turtles and marine mammals. Accordingly, the Navy has adopted measures to reduce the potential for collisions with surfaced sea turtles and marine mammals. These measures (see Section 5) include the use of lookouts trained to detect objects on the surface of the water, including marine species, and protective measures to reduce the risk of collision with a LCU. West Indian manatees would be expected mainly in shallow waters with abundant vegetation for feeding, though they may occur infrequently in deeper waters if traveling between feeding areas. A collision between West Indian manatees and LCU vessels would be unlikely due to minimal SAV in the proposed action area, infrequent testing, and slow vessel speed (11 knots or less). Neither of these locations have any known SAV, so would not be a preferred feeding area for manatees. Due to the SOPs and protective measures outlined in Section 5, collision of the LCU with sea turtles or marine mammals is not likely. It is expected that due to the infrequent and transitive nature of testing, any potential vessel strike would be discountable.

Sea turtles and marine mammals may exhibit a behavioral response during the Proposed Action including avoidance reactions, alarm/startle responses, alteration of swimming speed or direction of travel, vocalizations, foraging, or diving activity. Any avoidance during the short duration of vessel testing is unlikely to cause abandonment or significant alteration of behavioral patterns. Additionally, the risk of behavioral reactions would be low, as sea turtles and marine mammals would be expected to quickly resume normal behavior once the vessel has moved through the area. Short-term behavioral reactions to vessels are not expected to result in long-term effects on individuals (such as chronic stress), particularly given the short-term nature of the testing.

4.2.4 Potential Effects to Socioeconomic Resources

Analysis of effects to socioeconomics is focused on income-generating activities such as commercial and recreational fishing, recreational boating, and commercial shipping. Potential effects would be related to accessibility, including vessel movement. Though vessel noise from LCU vessel testing could result in an avoidance response of fish, the transient nature of the vessel would result in short-term exposure; noise would dissipate quickly after the passing of the vessel, and fish would be expected to return to typical behavior in the area. No effects to the socioeconomic environment would occur from vessel noise or bottom and beach disturbance; therefore, only the analysis of vessel movement is included in this section.

The proposed action area is an area of commercial and recreational fishing for the following: crabs, mackerel, menhaden, mullet, shrimp, snapper, oysters, and other species. Fishing activities may be interrupted by the Proposed Action if an LCU passes nearby a commercial or recreational fishing vessel (each demonstration is five hours or less). While an LCU could pass by commercial or recreational fishing vessels, fishing activity would continue, and an LCU

would operate within the confines of applicable Navigation Rules, as established by the U.S. Coast Guard. This compliance with Navigation Rules also would apply when a LCU is transiting or operating near any recreational boats and commercial shipping vessels in the proposed action area. LCU testing would be for a limited duration in the proposed action area. Therefore, any potential effects to commercial and recreational fishing, recreational boating, and commercial shipping would be short-term and localized.

4.2.5 Summary of Vessel Movement Consequences

Under the **Proposed Action**, vessel movement would occur while the vessel is transiting during the underway towing, bow ramp, and anchor demonstrations. Vessel movement associated with the Proposed Action would be short-term (five hours or less for each demonstration) and temporary.

Due to the short-term presence of the vessel within the proposed action area (five hours or less for each demonstration) and the limited/seasonal presence of biological resources within the proposed action area, the likelihood of co-occurrence between biological resources and a LCU vessel would be low. Species may exhibit a behavioral response (e.g., swimming away or flushing from the area), but would be expected to return to their normal behavior once the vessel has moved through the area or biological resources (e.g., fish, sea turtles) have departed the immediate vicinity. Additionally, the implementation of SOPs and protective measures (Section 5) would further reduce the likelihood of effects to marine species. Socioeconomic resources would not be affected as activities would not cease as the LCU passes by. As the water column would not be altered in any measurable or lasting manner, there would be no adverse effect to water column EFH. Additionally, there would be no effect to critical habitat for both the green sea turtle (proposed) and loggerhead sea turtle.

Under **Alternative 1,** bow ramp demonstrations would only occur at Theodore Terminal. Therefore, no vessel movement, from bow ramp demonstrations would be introduced at Gulf Shores. While effects from vessel movement would be similar for most biological resources to the Proposed Action since there is potential occurrence in either location, Alternative 1 potentially would lessen the vessel noise exposure to sea turtles compared to the Proposed Action as sea turtles are mainly in the Gulf of America and not Mobile Bay where Theodore Terminal is located. For socioeconomic resources vessel movement under Alternative 1, would have the same effects as the Proposed Action.

Under **Alternative 2,** bow ramp demonstrations would only occur at Gulf Shores. Therefore, no vessel movement from bow ramp demonstrations would be introduced at Theodore Terminal. Effects under Alternative 2 from vessel movement would be similar to the Proposed Action for biological resources.

Under the **No Action Alternative**, the Navy would not conduct the proposed testing activities in the proposed action area. Vessel movement would remain at baseline levels within the proposed action area.

Conclusion statements under each applicable law or regulation are included in Table 4-2.

4.3 Bottom and Beach Disturbance

Bottom and beach disturbance within the proposed action area would occur during bow ramp and anchor demonstrations. Anchor demonstrations may occur consecutively after bow ramp demonstrations or as a standalone test. Beach disturbance would only occur from bow ramp demonstrations at Theodore Terminal or Gulf Shores.

The anchor demonstration, bow ramp deployment, and amphibious landing of a LCU during the demonstration would temporarily cause bottom disturbance. Beach disturbance may occur from personnel on the beach ensuring the landing location is safe, and to witness demonstrations. During anchor demonstrations the anchor and wire rope would move quickly through the water column from the vessel and settle on the bottom. Localized disturbance on the bottom in the footprint of the anchor and attached wire rope would occur. During the bow ramp deployment (no further inshore than the foreshore of the beach; Figure 1-2), both the LCU vessel and bow ramp would contact shallow bottom and exposed sand substrate. The LCU would cause some locally-elevated turbidity during amphibious landings, as the LCU vessel would be contacting the seafloor. Additionally, the propeller wash could cause elevated levels of suspended sediment in shallow waters.

4.3.1 Potential Effects to Physical Resources

Bottom and beach disturbance would be temporary (each demonstration is five hours or less) and would only occur within a small, localized portion of the proposed action area. Soft bottom habitat (predominantly sand) would be displaced temporarily causing increased turbidity in the localized area where the LCU, bow ramp, and anchor would be on the seafloor. The turbidity in Mobile Bay and nearshore waters off the Gulf coast of Alabama naturally change with tide stage, wind speed, river/estuarine discharge, precipitation, and more (EPA 2001; Kennicutt 2017; McCarthy et al. 2018; Spies et al. 2016). Sediments are constantly moving and shifting in these nearshore environments. Due to constant wave action at Gulf Shores sediment is continually moving to and from shorelines (Dally 2006; NPS 2019). Disturbed sediment from testing is expected to shift back as it normally would following a natural disturbance. No long-term increases in turbidity would be anticipated. Due to the low speed of the vessel, the short periods of testing, the infrequency of testing, and the minimal amount of overlap with benthic habitat, there would be no potential for significant effects to physical resources.

4.3.2 Potential Effects to Birds

Effects to birds from bottom and beach disturbance would only occur during bow ramp demonstrations at Theodore Terminal or Gulf Shores. Bottom and beach disturbance have the potential to affect piping plovers, rufa red knots, or other bird species that are foraging at the water's edge. The birds may flush due to vessel noise and movement, especially when the vessel approaches the shore during amphibious landing. While the food sources that birds are foraging may be covered during the bow ramp demonstration, by either the LCU during amphibious landing or the bow ramp when deployed; this is expected to be temporary (each demonstration is five hours or less). The region covered by the bow ramp and LCU vessel (in

contact with the seafloor) would only be a small portion of the larger foraging habitat. There would be no change to breeding or nesting behaviors as these behaviors do not occur within the proposed action area.

4.3.3 Potential Effects to Fish and EFH

Although unlikely, the lowering/raising of the anchor and bow ramp has the potential to strike a fish. Fish possess a specialized tactile sense organ called the lateral line, which detects movement and vibration in the water. The lateral line senses pressure changes that help fish avoid collisions, elude predators, and more. If an anchor or bow ramp was lowered near them, fish would sense a pressure wave through the water (Hawkins and Johnstone 1978) and have the ability to swim away from the oncoming object. Due to the maneuverability of the fish that may occur in the proposed action area, it is extremely unlikely that any species would be struck by the anchor or bow ramp as they move through the proposed action area.

Bottom and beach disturbance resulting from the amphibious landing and from the deployment of anchors and the bow ramp, may result in effects to the sand/shell bottom benthic substrate designated as EFH for Red Drum, Reef Fish, Shrimp, AHMS Large Coastal Sharks, and AHMS Small Coastal Sharks (Table 3-4). Additionally, the amphibious landing and deployment of anchors and bow ramp may result in localized bottom disturbance to biogenic habitats. The biogenic habitat with the potential to be within the proposed action area is vegetation (e.g., SAV, grassy bottoms, emergent marsh) for the following management units: Red drum, Reef fish, Shrimp, AHMS Large Coastal Sharks, and AHMS Small Coastal Sharks. While the Navy did not perform an independent survey, data from the geological survey of Alabama shows both amphibious landing locations (i.e., Theodore Terminal and Gulf Shores) are sandy bottoms with no submerged aquatic vegetation (City of Mobile 2023). Bow ramp and anchor demonstrations may affect bottom EFH within the footprint of the anchor, anchor wire rope, and bow ramp by temporarily suspending sediments within and just outside of the footprint of these objects. Amphibious landing would potentially disturb bottom EFH when approaching the unoccupied shore and contacting the seafloor. The temporary suspension of sediments may locally increase the turbidity within the area surrounding the anchor, wire rope, bow ramp, and vessel. Suspended sediments would likely dissipate quickly due to a small area being affected. The areas of disturbance from the Proposed Action would already be subject to regular bottom disturbance due to tidal and wave action in the nearshore/intertidal zone (EPA 2001; Kennicutt 2017; McCarthy et al. 2018; Spies et al. 2016).

Disturbance to biogenic habitats would be limited to the immediate area in contact with the anchor, anchor wire rope, bow ramp, and LCU. The biogenic habitats potentially would be temporarily covered or crushed by the deployment of the anchor, or bow ramp. Additionally, the LCU vessel during the amphibious landing potentially would cover biogenic habitats as the vessel would be contacting the seafloor. The Proposed Action is brief as each demonstration is less than 5 hours.

Overall, bottom and beach disturbance would not permanently affect EFH within the proposed action area due to the temporary nature of the increased turbidity from the Proposed Action. Therefore, there are no adverse impacts to EFH from the Proposed Action.

4.3.4 Potential Effects to Sea Turtles and Marine Mammals

Sea turtles, dolphins, and manatees have well-developed underwater vision with the ability to detect an object descending through the water column and have an avoidance response (Gaspard et al. 2017; Southwood et al. 2008). Avoidance behavior by sea turtles and marine mammals would be short and of low intensity, such as moving a short distance away (Hazel et al. 2007). Due to the maneuverability of sea turtles and marine mammals, strike by the anchor or bow ramp as they move through the proposed action area is extremely unlikely.

Sea turtles and manatees forage on SAV. While the Navy did not perform an independent survey, data from the geological survey of Alabama shows both amphibious landing locations (i.e., Theodore Terminal and Gulf Shores) are sandy bottoms with no SAV (City of Mobile 2023). The bow ramp demonstrations would only occur at Theodore Terminal or Gulf Shores and bottom habitat would only be temporarily covered as each demonstration is five hours or less. Therefore, the effect of the Proposed Action on foraging habitat would be minimal.

The bow ramp and associated anchor demonstrations would only overlap the loggerhead nearshore critical habitat (LOGG-N-33; Figure 3-2) when the Gulf Shores amphibious landing location is used. The turbidity produced from anchor demonstration, bow ramp deployment, and amphibious landing may temporarily disturb a section of the nearshore waters off high density and adjacent beaches (PCE [i]) or waters that allow transit through the surf zone and outward to the open ocean (PCE [ii]) for loggerhead sea turtles (Section 3.2.4). However, the potential for these effects to occur would only be during the nesting season from May 1 through October 31 (ACF 2024; Seminoff et al. 2015a; Seminoff et al. 2015b), since that is when sea turtles transit through the surf zone to come ashore. The increase in turbidity would be brief as each bow ramp demonstration would be five hours or less. While there would be a localized increase in turbidity due to the amphibious landing of the vessel at Gulf Shores, turbidity within the surf zone naturally changes with tide stage, wind speed, precipitation, and more (EPA 2001; Kennicutt 2017; McCarthy et al. 2018; Spies et al. 2016).

Sea turtles would not be expected to occur at Theodore Terminal. Effects to sea turtles and marine mammals would be inconsequential due to variations in the natural turbidity of the water, and the short-term duration of the Proposed Action. As the Proposed Action would not occur further than the foreshore of the beach (Figure 1-2) there would be no effects to sea turtle nests. Additionally, sea turtles and marine mammals would have to be swimming close to the vessel to encounter the propeller wash or increased suspended sediment when the vessel contacts the seafloor during amphibious landing. Bottom and beach disturbance from bow ramp demonstrations would only occur within a small area of the critical habitat, so a LCU vessel would not alter the transiting pathway in any meaningful way. The turbidity created from bow ramp demonstrations would lead to minimal effects to loggerhead critical habitat, since it would be localized and short-term. Given the 200 yard (183 m) mitigation zone around any observed marine mammal (Section 5) and the limited duration of testing, the likelihood of disturbance is extremely low.

4.3.5 Summary of Bottom and Beach Disturbance Consequences

Bottom and beach disturbance from the **Proposed Action** would be limited to short-term disturbance of sediment. The bottom and beach disturbance would be brief (each demonstration would be five hours or less). Beach disturbance would only occur within a small portion of the proposed action area (i.e., Theodore Terminal or Gulf Shores), while bottom disturbance would also have the potential to occur during anchor demonstrations throughout the proposed action area. Disturbed sediment from testing is expected to shift back as it normally would following a natural disturbance. No long-term increases in turbidity or disturbance to sediment would be anticipated.

The likelihood of co-occurrence between biological resources and an LCU vessel would be low due to the short-term presence of the vessel within the proposed action area; the limited and seasonal presence of most biological resources within the proposed action area; and the implementation of SOPs and protective measures (Section 5). The mobile nature of biological resources would further reduce the potential for strike or negative behavioral reactions from the bow ramp, anchor, or vessel. Biological resources are highly mobile and would likely show a behavioral reaction by swimming away from the anchor, bow ramp, and vessel during amphibious landing. Birds may flush from the area or forage in a different location. The increase in turbidity is not expected to affect biological resources, as it would be localized and short-term. Additionally, there is already natural turbidity at the amphibious landing locations.

As a result of the brief nature of bow ramp and anchor demonstrations and the dynamic character of the testing locations; benthic substrate and biogenic habitat EFH would not be permanently affected. The footprint of the anchor, bow ramp, and vessel are small and the proposed action area over which these would be deployed constitutes only a very small percentage of total habitat. Therefore, there are no adverse impacts to EFH from the Proposed Action.

Under **Alternative 1,** bow ramp demonstrations would only occur at Theodore Terminal. Therefore, no bottom and beach disturbance from bow ramp demonstrations would be introduced at Gulf Shores. While effects from bottom and beach disturbance would be similar for most physical and biological resources to the Proposed Action since the benthic habitat and species are similar at both locations, Alternative 1 potentially would lessen the effects from bottom and beach disturbance to sea turtles compared to the Proposed Action as sea turtles are mainly in the Gulf and not Mobile Bay where Theodore Terminal is located.

Under **Alternative 2,** bow ramp demonstrations would only occur at Gulf Shores. Therefore, no bottom and beach disturbance from bow ramp demonstrations would be introduced at Theodore Terminal. Effects under Alternative 2 from bottom and beach disturbance would be similar to the Proposed Action for physical and biological resources.

Under the **No Action Alternative,** the Navy would not conduct the proposed testing activities in the proposed action area. Any bottom and beach disturbance would remain at baseline levels within the proposed action area.

Conclusion statements under each applicable law or regulation are included in Table 4-2.

4.4 Conclusions

A summary of the conclusions for all resources from each of the action alternatives (Table 4-2) is below.

Table 4-2. Summary of Conclusions

Resource	*Stressors Analyzed*	*Potential Effects*	*Conclusion(s)* *Proposed Action, Alternative 1, and Alternative 2**
Benthic Sediments	Bottom and Beach Disturbance	Sediment disturbance	**NEPA:** No significant effects
Birds	Vessel Noise	Masking or behavioral response	**NEPA:** No significant effects. **MBTA:** No take of migratory birds; no significant adverse effects to populations; no effect to migratory birds. **ESA:** May affect, but not likely to adversely affect the piping plover or rufa red knot.
	Vessel Movement	Behavioral response	**NEPA:** No significant effects. **MBTA:** No take of migratory birds; no significant adverse effects to populations; no effect to migratory birds. **ESA:** May affect, but not likely to adversely affect the piping plover or rufa red knot.
	Bottom and Beach Disturbance	Behavioral response	**NEPA:** No significant effects. **MBTA:** No take of migratory birds; no significant adverse effects to populations; no effect to migratory birds. **ESA:** May affect, but not likely to adversely affect, piping plover or rufa red knot.
Fish	Vessel Noise	Masking or behavioral response	**NEPA:** No significant effects. **ESA:** May affect, but not likely to adversely affect the Gulf sturgeon and giant manta ray.
	Vessel Movement	Masking or behavioral response	**NEPA:** No significant effects. **ESA:** May affect, but not likely to adversely affect the Gulf sturgeon and giant manta ray.
	Bottom and Beach Disturbance	Disturbance, increased turbidity	**NEPA:** No significant effects. **ESA:** May affect, but not likely to adversely affect the Gulf sturgeon and giant manta ray.
Sea Turtles	Vessel Noise	Masking or behavioral response	**NEPA:** No significant effects. **ESA:** May affect, but not likely to adversely affect the green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, or loggerhead sea turtle. There would be no effect to loggerhead critical habitat or proposed green sea turtle critical habitat.
	Vessel Movement	Behavioral response	**NEPA**: No significant effects. **ESA**: May affect, but not likely to adversely affect the green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, or loggerhead sea turtle. There would be no effect to loggerhead critical habitat or proposed green sea turtle critical habitat.

Resource	*Stressors Analyzed*	*Potential Effects*	*Conclusion(s)* *Proposed Action, Alternative 1, and Alternative 2**
	Bottom and Beach Disturbance	Disturbance, increased turbidity	**NEPA:** No significant effects. **ESA:** May affect, but not likely to adversely affect the green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, or loggerhead sea turtle. Loggerhead critical habitat would not be adversely modified. No effect to proposed green sea turtle critical habitat.
Marine Mammals	Vessel Noise	Masking or behavioral response	**NEPA:** No significant effects. **ESA:** May affect, but not likely to adversely affect the West Indian manatee. **MMPA:** No reasonably foreseeable takes.
	Vessel Movement	Behavioral response	**NEPA:** No significant effects. **ESA:** May affect, but not likely to adversely affect the West Indian manatee. **MMPA:** No reasonably foreseeable takes.
	Bottom and Beach Disturbance	Disturbance, increased turbidity	**NEPA:** No significant effects. **ESA:** May affect, but not likely to adversely affect the West Indian manatee. **MMPA:** No reasonably foreseeable takes.
Essential Fish Habitat (EFH)	Vessel movement	Temporary and localized disturbances to the water column and benthic substrate	**NEPA:** No significant effects. **MSA:** No reduction in the quality and/or quantity of water column EFH for the following management units: Coastal Migratory Pelagics, Red Drum, Reef Fish, Shrimp, AHMS Large Coastal Sharks, AHMS Prohibited Sharks, and AHMS Small Coastal Sharks.
	Bottom and Beach Disturbance		**NEPA:** No significant effects. **MSA:** Minimal temporary and localized reduction in the quantity and/or quality of the benthic substrate EFH and biogenic habitat EFH designated for Red Drum, Reef Fish, Shrimp, AHMS Large Coastal Sharks, and AHMS Small Coastal Sharks.
Socio-economics	Vessel Movement	Temporary disruption	**NEPA:** No significant effects.

[1]Although effects would be concentrated over a smaller geographic area in Alternative 1 and 2, conclusions from both Alternative 1 and 2 would be the same as the Proposed Action.

4.5 Reasonably Foreseeable Effects

This section: (1) describes past, present, and reasonably foreseeable future actions, (2) analyzes the incremental interaction the Proposed Action may have with other actions, and (3) evaluates reasonably foreseeable effects potentially resulting from these interactions.

To determine the scope of environmental effect analyses, agencies shall consider reasonably foreseeable actions, which when viewed with other proposed actions, may have significant effects and should therefore be discussed in the same effect analysis document.

Reasonably foreseeable effects are most likely to arise when a relationship or synergism exists between a proposed action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in close proximity to the Proposed Action would be expected to have more potential for a relationship than those more geographically separated. Similarly, relatively concurrent actions would tend to offer a higher potential for effects. To identify reasonably foreseeable effects, the analysis needs to address the following three fundamental questions:

- Does a relationship exist such that affected resource areas of the Proposed Action might interact with the affected resource areas of past, present, or reasonably foreseeable actions?
- If one or more of the affected resource areas of the Proposed Action and another action could be expected to interact, would the Proposed Action affect or be affected by effects of the other action?
- If such a relationship exists, then does an assessment reveal any potentially significant effects not identified when the Proposed Action is considered alone?

4.5.1 Scope of Analysis

The scope of the reasonably foreseeable effects analysis involves both the geographic extent of the effects and the timeframe in which the effects could be expected to occur. For this EA, the geographic extent of the reasonably foreseeable effects analysis includes Mobile Bay and nearshore waters off the Gulf coast of Alabama. In general, the analysis encompasses the proposed action area and analyzes the stressors previously identified in Section 4 for the respective resource areas. The timeframe for reasonably foreseeable effects centers on the timing of the Proposed Action which could take place anytime throughout the year.

Another factor influencing the scope of analysis involves identifying other actions to consider. Beyond determining that the geographic scope and timeframe for the actions interrelated to the Proposed Action, the analysis employs the measure of “reasonably foreseeable” to include or exclude other actions. For the purposes of this analysis, public documents prepared by federal, state, and local government agencies form the primary sources of information regarding reasonably foreseeable actions and activities. Documents used to identify other actions and activities include notices of intent for EISs and EAs, management plans, land use plans, and other planning related studies.

4.5.2 Past, Present, and Reasonably Foreseeable Actions

This section focuses on past, present, and reasonably foreseeable future projects at and near the proposed action area, which encompasses the waters of Mobile Bay and nearshore waters off the Gulf coast of Alabama including the shorelines at Theodore Terminal and Gulf Shores. In determining which projects to include in the reasonably foreseeable effect analysis, a preliminary determination was made regarding the past, present, or reasonably foreseeable future actions. Specifically, it was determined if a relationship exists such that the affected resource areas of the Proposed Action (included in this EA) might interact with the affected resource area of a past, present, or reasonably foreseeable action. If no such potential relationship exists, the project was not carried forward into the analysis. These actions considered but excluded from further effects analysis are not catalogued here as the intent is to focus the analysis on the meaningful actions relevant to inform decision-making. Projects included in this analysis are listed in Table 4-3. Past, present, and reasonably foreseeable future actions that would have reasonably foreseeable effects on the environment due to the overlapping action of LCU testing include, but are not limited to, the following: fishing (commercial and recreational), shipping, recreation and tourism, scientific research, military, oil and gas exploration and production, navigation maintenance, aquaculture, and marine pollution.

Table 4-3. Past, Present, and Reasonably Foreseeable Future Actions for Evaluation

Action Project	Location	Description	Federal Agency	Analysis
Coastal Management				
Dauphin Island Bay Federal Navigation Project	Terrestrial, inshore, coastal	The USACE proposed dredging two federal navigation channels and using material from existing beaches to fill the Pass Drury breach, aiming to reduce breaches during storm events.	USACE	DEA (2023)
Deepwater Horizon Oil Spill Alabama Trustee Implementation Group Final Restoration Plan	Terrestrial, inland waters, inshore, coastal, offshore	The Alabama Trustee Implementation Group has initiated this restoration planning effort to restore natural resources and services harmed by the Deepwater Horizon oil spill. The Proposed Action aims to implement compensatory restoration projects that will provide the public with enhanced recreational shoreline use services in Alabama.	N/A	EA (2024), (2019); EIS (2017)
Habitat Restoration Activities Implemented throughout the Coastal United States (Programmatic)	Terrestrial, inland waters, inshore, coastal	NOAA's Office of Habitat Conservation Restoration Center carries out hundreds of projects throughout the United States related to restoration, such as fish passage, shellfish restoration, coral recovery, marsh and shoreline restoration, or other topics. Approximately 31 of these projects are in the vicinity of Mobile Bay, Alabama. This programmatic EIS analyzes restoration activities and promotes an efficient NEPA compliance process for these projects.	NOAA	PEIS (2015)
Military Training and Testing Activities				
Atlantic Fleet Training and Testing	Inshore, coastal, offshore	The Navy conducts training and testing activities at sea and in associated airspace to support military readiness requirements. This includes, but is not limited to, the use of active sonar, explosives, and a variety of vessels and aircrafts to simulate real-world situations and test all equipment and systems.	USN	EIS/OEIS (2018) DSEIS/SOEIS (2024)
USCG	Inland waters, inshore, coastal, offshore	The USCG performs maritime humanitarian, law enforcement, and safety services in estuarine, coastal, and offshore waters.	USCG	N/A
Navigation and Construction				
Aids to Navigation (ATON)	Terrestrial, inland waters, inshore, coastal, offshore	Coast Guard activities to service and repair floating and land-based federal ATONs to maintain safe navigation signals within the proposed action area.	USCG	N/A

Action Project	Location	Description	Federal Agency	Analysis
Mobile Harbor Navigation Project	Terrestrial, inland waters, inshore, coastal	Navigation improvements in recent years, as part of the *Mobile Harbor Navigation Project*, include widening the shipping lane to allow for a two-way traffic area for passing, expanding basins to accommodate for safer turning of large vessels, deepening portions of the Bay, and more.	USACE	N/A
Dismantling and Disposal of Ships				
Disposal of Decommissioned, Defueled, Ex-Enterprise (CVN 65) and Its Associated Naval Reactor Plants	Inland waters, inshore, coastal, offshore	The Navy proposed the disposal of the decommissioned, defueled ex-Enterprise, including its reactor plants. This includes towing the entire ex-Enterprise from Newport News Shipbuilding, along the coastline to an authorized commercial dismantlement facility in the Hampton Roads Metropolitan Area, Virginia; Brownsville, Texas; or Mobile, Alabama, where it would be partially dismantled.	USN	EIS/OEIS (2023)
Offshore Energy Development				
Oil and Gas Exploration and Production	Inshore, coastal, offshore	The Gulf of America is the nation's primary offshore source of oil and gas, generating about 97 percent of all U.S. oil and gas production. Most oil and gas leases within the proposed action area occur within state waters just outside of Mobile Bay, including 35 oil and gas structures (Geological Survey of Alabama 2024).	N/A	N/A
General Actions				
Recreational Fishing	Inland waters, inshore, coastal, offshore	Recreational fishing is fishing primarily for enjoyment. It can be conducted from the shoreline or vessel, and hook and line is the most common gear used, though this may vary based on target species and location (e.g., rake or hand for shellfish).	N/A	N/A
Commercial Fishing	Terrestrial, inland waters, inshore, coastal, offshore	Commercial fishing is fishing for profit. Alabama's commercial fishermen land over 30 million pounds of fish annually, with shrimp alone accounting for 85 percent of the total landings in 2023 (NOAA Fisheries 2024).	N/A	N/A
Marine Aquaculture	Inshore	Marine aquaculture is the cultivation of seafood largely for commercial purposes. The primary taxa grown in the proposed action area are oyster species. In 2023, ten commercial oyster aquaculture operations reported harvests around Dauphin Island, Grand Bay, and Mobile Bay with a total of 4.5 million oysters harvested for a value of 3.2 million dollars (Alabama A&M & Auburn Universities Extension 2023; Alabama Seafood Marketing Commission 2024a, 2024b).	N/A	N/A

Action Project	Location	Description	Federal Agency	Analysis
Transportation and Shipping	Inland waters, inshore, coastal, offshore	Various modes of transportation in coastal areas, including marine vessel movements, transport of equipment for oil and gas exploration and production, cargo transport, and transport of industrial materials. 55 million tons (49.9 million metric tons) of international and domestic cargo traveled through Mobile Bay in 2022 (Alabama Port Authority 2022). The Port of Mobile's Marine Liquid Bulk Terminal is in Theodore, Alabama and handles one million tons of liquid bulk annually.	N/A	N/A
Construction	Terrestrial, inland waters, inshore	In-water construction activities including, but not limited to, beach nourishment and dredging.	N/A	N/A
Mineral Extraction	Coastal, offshore	In-water mineral extraction, limited primarily to sand and gravel mining.	N/A	N/A
Tourism	Terrestrial, inland waters, inshore, coastal	Visitation to areas in and adjacent to the proposed action area, including associated recreational activities.	N/A	N/A
On-water Recreation	Inland waters, inshore, coastal, offshore	Recreational activities including, but not limited to, boating, paddling, windsurfing, and kite surfing.	N/A	N/A
Resource Management and Conservation	Terrestrial, inland waters, inshore, coastal, offshore	Resource management and conservation activities Including, but not limited to, local, tribal, state, and federal management programs and planning processes (e.g., fisheries, habitat, or coastal management).	N/A	N/A
Pollution	Terrestrial, inland waters, inshore, coastal, offshore	Point and non-point source pollutants from coastal and agricultural runoff, offshore mineral and gravel mining, at-sea disposal of dredged materials, oil spills, and sewage effluent (from shore and vessels).	N/A	N/A

Action Project	Location	Description	Federal Agency	Analysis
Scientific Research	Terrestrial, inland waters, inshore, coastal, offshore	Scientific research Including, but not limited to, field-based, vessel-based, and remote sensing research in and adjacent to the proposed action area, is expected to continue at levels similar to the present or increase in the reasonably foreseeable future.	N/A	N/A

Definitions: ATON = Aids to Navigation; BO = Biological Opinion; BOEM = Bureau of Offshore Energy Management; DEA= Draft Environmental Assessment; DSEIS = Draft Supplemental Environmental Impact Statement; EA = Environmental Assessment; EIS = Environmental Impact Statement; FHA = Federal Highway Administration; NMFS = National Marine Fisheries Service; NOAA = National Oceanic and Atmospheric Administration; PEIS = Programmatic Environmental Impact Statement; RFCI = Request for Competitive Interest; SOEIS = Supplemental Overseas Environmental Impact Statement; USACE = U.S. Army Corps of Engineers; USAF = U.S. Air Force; USCG = U.S. Coast Guard; USN = U.S. Navy

[1]Location definitions: Terrestrial = land-based; Inland Waters = rivers, lakes, and ponds; Inshore = bays, harbors, and estuaries; Coastal = 0-12 nm offshore; Offshore = beyond 12 nm offshore

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4.5.3 Reasonably Foreseeable Effects Analysis

Quantifiable data related to past, present, and reasonably foreseeable actions within the proposed action area are geographically and temporally diverse with limited usefulness to a discussion of reasonably foreseeable effects relevant to the Proposed Action. Accordingly, a qualitative analysis was undertaken. The analytical methodology presented in Section 4, which was used to determine potential effects to the various resources analyzed in this document, was also used to determine reasonably foreseeable effects. A summary of all potential reasonably foreseeable effects is detailed below.

4.5.3.1 Physical Resources

The only physical resource that could be affected by the Proposed Action are the bottom sediments nearshore and at the two amphibious landing locations (i.e., Theodore Terminal and Gulf Shores). Past, present, and future navigation maintenance (i.e., dredging), boating, and various military activities could also affect bottom sediments. Fishing techniques, such as bottom trawling would not be expected to affect bottom sediments as trawling occurs in the deeper parts of the Gulf of America. Aquaculture is also not expected to affect bottom sediments as the oyster cages are elevated off the seafloor.

Reasonably foreseeable effects to physical resources from past, present, and reasonably foreseeable future actions within the region of interest would not be significant because the testing for each LCU would be short in duration and would occur infrequently. The Proposed Action would not significantly contribute to turbidity, erosion, and bottom sediment disturbance in comparison to the commercial and recreational boating traffic, fishing activities, oil and gas exploration and production, and dredging. Bottom sediments are often disturbed by recreational motorboats aground, which may occur nearby at the Gulf Shores location, but would not overlap the areas of bow ramp demonstrations as those locations are not next to any piers. These activities are unlikely to occur at Theodore Terminal due to the industrial location of this area. Effects from bottom and beach disturbance would be temporary and localized and would not degrade the physical environment. Implementation of the Proposed Action, combined with the past, present, and reasonably foreseeable future actions, would not result in any significant effects to physical resources within the region of interest.

4.5.3.2 Biological Resources

Biological resources that may be affected by the Proposed Action include birds, fish, sea turtles, marine mammals, and EFH. Overall, vessel noise, vessel movement, and bottom and beach disturbance associated with the Proposed Action would have at most, minor effects on biological resources as detailed in Section 4.

A variety of activities take place within the proposed action area, and several past, current, and reasonably foreseeable actions can affect biological resources in the proposed action area. Most present and reasonably foreseeable actions are ongoing rather than discrete projects (e.g., fishing, shipping, recreation, oil and gas production). Growth of these activities in the future would be likely, but any growth would be relatively limited.

In contrast to the Proposed Action, other present and reasonably foreseeable actions potentially would have significant effects on biological resources. For example, commercial fishing can affect the populations of targeted fish species and non-targeted bycatch species. If an oil spill were to occur in the future, it would have the potential to affect the abundance and distribution of marine species and their habitat. More generally, rising ocean temperatures may have significant effects on biological resources, contributing, for example, to shifts in species' ranges or fitness.

Although some present and reasonably foreseeable actions may have significant effects on biological resources in the proposed action area, it is unlikely that the Proposed Action would appreciably increase any of those effects. The stressors associated with the Proposed Action are minor, intermittent, and localized near the LCU vessels involved in the Proposed Action. They would have no synergistic effects with other activities, which would be spread wide throughout the proposed action area. Overall, the Proposed Action would not significantly alter the effects on biological resources from past, present, or reasonably foreseeable actions.

4.5.3.3 Socioeconomic Resources

Socioeconomic resources that may be affected by the Proposed Action include commercial fishing, commercial shipping, and recreational activities (e.g. boating, fishing). The effects of the Proposed Action itself would be minimal, as it involves testing one LCU at a time, with testing spread out over time as each vessel is built. This would constitute a negligible change in overall vessel traffic throughout the proposed action area.

The past, present, and reasonably foreseeable actions anticipated within or adjacent to the proposed action area could have a range of effects on socioeconomic resources. However, these changes would occur over the course of years or decades, accompanied by environmental and other planning processes. It is unlikely that the addition or expansion of new activities would have significant synergistic effects with the Proposed Action. Therefore, implementation of the Proposed Action, combined with the past, present, and reasonably foreseeable future actions, would not result in significant socioeconomic effects within the region of interest.

5 Standard Operating Procedures and Protective Measures

The Navy has identified multiple measures that would further reduce and avoid potential effects resulting from the Proposed Action. Standard Operating Procedures and Protective Measures would be implemented during the Proposed Action. Standard Operating Procedures are implemented for the primary purpose of providing for safety and mission success, but they may also provide secondary benefits, including benefits to natural resources. Protective measures are used specifically to avoid or reduce potential harm to a resource. The Standard Operating Procedures and Protective Measures for all Navy vessels operating underway are provided below and would be implemented during the Proposed Action.

Standard Operating Procedures

- While on watch, personnel shall employ visual search techniques, including the use of binoculars, using a scanning method in accordance with the Lookout Training Handbook.
- While in transit, naval vessels shall be alert at all times, use extreme caution, and proceed at a 'safe speed' so that the vessel can take proper and effective action to avoid a collision with any sighted object or disturbance, including any marine mammal or sea turtle, and can be stopped within a distance appropriate to the prevailing circumstances and conditions.

Protective Measures

- All bridge watch personnel and Lookouts shall successfully complete the Introduction to the U.S. Navy Afloat Environmental Compliance Training Series and the U.S. Navy Marine Species Awareness Training prior to standing watch or serving as a Lookout.
- While underway, the LCU shall have one or more Lookouts with the most recent navigation safety instruction. These Lookouts must be watchstanders fulfilling lookout duties (can be fulfilling all lookout responsibilities, not only marine species mitigation). Lookouts already posted for safety of navigation and man-overboard precautions satisfy this requirement. Immediately prior to getting underway and while underway, the Lookout(s) will observe for marine mammals and sea turtles. Visual observations of applicable marine species shall be communicated immediately to the appropriate watch station for information dissemination and appropriate action.
- Vessels will maneuver themselves (which may include reducing speed) to maintain the following distances as mission and circumstances allow:
    - 500 yards (457 m) from whales
    - 200 yards (183 m) from other marine mammals
    - Vicinity of sea turtles
- No further action is necessary if a non-whale marine mammal continues to close after the vessel has made one course and/or speed change (e.g., bow riding dolphins). This

mitigation will not be applied if the vessel's safety is threatened or the vessel is restricted in its ability to maneuver (e.g., during towing activities).

- Floating weeds, algal mats, *Sargassum* rafts, clusters of seabirds, and jellyfish are good indicators of sea turtles and marine mammals. Therefore, increased vigilance in watching for sea turtles and marine mammals shall be taken where these are present.
- In-water lines (rope, chain, and cable) shall be stiff, taut, and non-looping. Examples of such lines are heavy metal chains or heavy cables that do not readily loop and tangle. In all instances, no excess line shall be allowed in the water.
- Demonstrations would only occur during daylight hours.

6 Other Considerations Required by NEPA

6.1 Consistency with Other Federal Laws, Plans, Policies, and Regulations

In accordance with 42 U.S.C. 4332(H) and 32 CFR 773.3(b), analysis of environmental consequences shall include discussion of possible conflicts between the Proposed Action and the objectives of federal, regional, state, and local land use plans, policies, and controls. Table 6-1 identifies the principal federal laws and regulations that are applicable to the Proposed Action and describes briefly how compliance with these laws and regulations would be accomplished.

Table 6-1. Principal Federal Laws Applicable to the Proposed Action

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	***Status of Compliance***
National Environmental Policy Act (42 U.S.C. section 4321 et seq.); Navy procedures for Implementing NEPA (32 CFR part 775 and OPNAVINST 5090.1E)	This EA has been prepared in accordance with NEPA, and Navy NEPA procedures. Public participation and review are being conducted in compliance with NEPA.
Clean Air Act (42 U.S.C. section 7401 et seq.)	Since the Proposed Action would occur in an attainment area and would not generate emissions in nonattainment areas, the Proposed Action is not subject to analysis under the General Conformity Rule.
Clean Water Act (33 U.S.C. section 1251 et seq.)	Since the Proposed Action would not discharge any pollutants into the water, permits under the Clean Water Act are not required.
Coastal Zone Management Act (16 U.S.C. section 1451 et seq.)	A General Negative Determination for the Proposed Action has been prepared and submitted to the Alabama Department of Environmental Management. The General Negative Determination considers effects on water uses and natural resources of the coastal zone. The Proposed Action would have no reasonably foreseeable effect on coastal resources of the State of Alabama and would not be subject to the enforceable policies outlined in the Alabama Coastal Area Management Program. The Alabama Department of Environmental Management concurred with the General Negative Determination on January 27, 2025 (Appendix C).
Endangered Species Act (16 U.S.C. section 1531 et seq.)	This EA considers effects on species listed as threatened or endangered pursuant to this act and their designated critical habitat. In accordance with the ESA, informal consultation with the USFWS was initiated based on the determination that the Proposed Action may affect, but is not likely to adversely affect, the ESA-listed piping plover, rufa red knot, Gulf Sturgeon, West Indian manatee, green sea turtle, Kemp's ridley sea turtle, and loggerhead sea turtle. The Proposed Action would have no effect on the eastern black rail, Alabama red-bellied turtle, alligator snapping turtle, gopher tortoise, black pinesnake, eastern indigo snake, and Alabama beach mouse. There would be no effect to Alabama beach mouse, rufa red knot, and piping plover critical habitats. Concurrence was received from the USFWS on the Navy's determinations on January 23, 2025 (Appendix C). The Navy also determined the Proposed Action may affect, but is not likely to adversely affect, the green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, loggerhead sea turtle, Gulf sturgeon, and giant manta ray. There would be no effect on proposed green sea turtle critical

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	*Status of Compliance*
	habitat. The Proposed Action may affect, but is not likely to adversely affect, the loggerhead critical habitat. Concurrence was received from NMFS on the Navy's determinations on April 22, 2025 (Appendix C).
Marine Mammal Protection Act (16 U.S.C. section 1361 et seq.)	This EA considers effects on protected marine mammal species pursuant to this act. Based on the analysis contained within this EA, the Navy is not required to submit an application for an Incidental Harassment Authorization with the USFWS or NMFS as take of marine mammals are not expected.
Migratory Bird Treaty Act (16 U.S.C. sections 703-712)	This EA considers effects on migratory birds under this act. Based on the analysis contained within this EA, the Navy is not required to consult with the USFWS as there would be no take of migratory birds and no significant adverse effects on migratory bird populations.
Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. section 1801 et seq.)	This EA considers effects on fish and wildlife and EFH under this act. Based on the analysis contained within this EA, the Navy is not required to submit an EFH Assessment to NMFS as the Proposed Action would not adversely affect EFH because there is no effect to the quantity or quality of EFH.
National Historical Preservation Act (54 U.S.C. section 3001018 et seq.)	This EA analyzed the proposed action area for cultural resources. Since no known cultural resources are present in the proposed action area, no consultation is required with the State Historic Preservation Office.
Rivers and Harbors Act (33 U.S.C. section 401 et seq.)	Since the Proposed Action would not involve construction of a structure in or over any navigable water, or dredging, excavation, filling, rechannelization, or other modification of navigable water on the United States, no consultation is required with the U.S. Army Corps of Engineers.

6.2 Irreversible or Irretrievable Commitments of Resources

Resources that are irreversibly or irretrievably committed to a project are those that are used on a long-term or permanent basis. This includes the use of non-renewable resources, such as metal and fuel, and natural or cultural resources. These resources are irretrievable in that they would be used for this project when they could have been used for other purposes. Human labor is also considered an irretrievable resource. Another effect that falls under this category is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment.

Implementation of the Proposed Action would involve human labor and the consumption of fuel, oil, and lubricants for the vessel. Implementation of the Proposed Action would not result in significant irreversible or irretrievable commitment of resources.

6.3 Relationship between Short-Term Use of the Environment and Long-Term Productivity

NEPA requires an analysis of the relationship between a project's short-term effects on the environment and the consequences that these effects may have on the maintenance and enhancement of the long-term productivity of the affected environment. Effects that narrow the range of beneficial uses of the environment are of particular concern, such as choosing one development site that reduces future flexibility in pursuing other options or using a parcel of land that eliminates the possibility of other uses at that site.

In the short-term, the Proposed Action would result in temporary effects to physical, biological, and socioeconomic resources. No long-term effects are anticipated. The Proposed Action would not result in any effects that would significantly reduce environmental productivity or permanently narrow the range of beneficial uses of the environment.

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This EA was prepared collaboratively between the Navy and contractor preparers.

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APPENDIX A APPLICABLE LAWS AND POLICIES

This appendix is a summary of the federal and state statutes and regulations that are potentially applicable to the Proposed Action and alternatives presented in this EA. This list includes statutes and regulations that have been followed and require no further action, as well as those for which permits or authorizations have been, or may be at a future date, requested.

A.1. Endangered Species Act

The purpose of the ESA (16 U.S.C. §§ 1531–1544) is to conserve the ecosystems upon which threatened and endangered species depend and to conserve and recover listed species. Section 7 of the ESA requires action proponents to consult with the USFWS or NMFS to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species or result in the destruction or adverse modification of designated critical habitat (16 U.S.C. § 1536 (a)(2)). Regulations implementing the ESA include a requirement for consultation on those actions that "may affect" a listed species or adversely modify critical habitat.

If an agency's Proposed Action would "take" a listed species, then the agency must obtain an incidental take authorization from the responsible wildlife agency. The ESA defines the term "take" to mean "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt any such conduct" (16 U.S.C. § 1532(19)). The regulatory definitions of "harm" and "harass" are relevant to the Navy's determination as to whether the Proposed Action would result in adverse effects on listed species.

- Harm is defined by regulation as "an act which actually kills or injures" fish or wildlife (50 CFR §§ 17.3, 222.102; 64 FR 60727, Nov 8 1999).
- Harass is defined by USFWS regulation to mean an "intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering" (50 CFR § 17.3). NMFS has not defined the term in its regulations.

In accordance with the ESA, informal consultation with USFWS was initiated based on the determination that the Proposed Action may affect but is not likely to adversely affect the Gulf sturgeon (*Acipenser oxyrinchus desotoi*), piping plover (*Charadrius melodus*), rufa red knot (*Calidris canutus rufa*),West Indian manatee (*Trichechus manatus latirostris*), green sea turtle (*Chelonia mydas*), Kemp's ridley sea turtle (*Lepidochelys kempii*), and loggerhead sea turtle (*Caretta caretta*). The Proposed Action would have no effect on the Alabama beach mouse (*Peromyscus polionotus ammobates*), Alabama red-bellied turtle (*Pseudemys alabamensis*), alligator snapping turtle (*Macrochelys temminckii*), black pinesnake (*Pituophis melanoleucus lodingi*), eastern indigo snake (*Drymarchon couperi*), gopher tortoise (*Gopherus polyphemus*), Alabama beach mouse critical habitat, red knot critical habitat, and piping plover critical habitat. Concurrence was received from USFWS on January 23, 2025. Informal consultation with NMFS was initiated based on the determination that the Proposed Action may affect but

is not likely to adversely affect the Gulf sturgeon, giant manta ray (*Mobula birostris*), green sea turtle, hawksbill sea turtle (*Eretmochelys imbricata*), Kemp's ridley sea turtle, leatherback sea turtle (*Dermochelys coriacea*), loggerhead sea turtle, and loggerhead critical habitat. There would be no effect on green sea turtle proposed critical habitat. Concurrence was received from NMFS on April 22, 2025.

A.2. Marine Mammal Protection Act

All marine mammals are protected under the provisions of the MMPA (16 U.S.C. §§ 1361–1407). The MMPA prohibits any person or vessel from "taking" marine mammals in U.S. waters without authorization. The act further regulates "takes" of marine mammals by U.S. citizens on the high seas. The term "take," as defined in Section 3 (16 U.S.C. § 1362) of the MMPA, means "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal."

The MMPA defines harassment as applied to military readiness activities. The Proposed Action constitutes a military readiness activity as defined in Public Law 107–314 (16 U.S.C. § 703) because these activities constitute "training operations of the Armed Forces that relate to combat, as well as adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use." For military readiness activities, such as the Proposed Action, the relevant definition of harassment is any act that:

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

The Proposed Action would not result in any "take" of marine mammals, and therefore, an Incidental Harassment Authorization or Letter of Authorization under the MMPA was not required.

A.3. Migratory Bird Treaty Act

The MBTA (16 U.S.C. §§ 703–712) is the primary law in the U.S. established to conserve migratory birds. The MBTA prohibits the taking, killing, or possessing of any migratory bird or their parts, nests, or eggs, unless permitted by regulation.

The 2003 National Defense Authorization Act provided interim authority to members of the Armed Forces to incidentally take migratory birds during approved military readiness activities without violating the MBTA. The National Defense Authorization Act provided this interim authority to give the Secretary of the Interior time to exercise his/her authority under section 704(a) of the MBTA to prescribe regulations authorizing such incidental take. The Secretary of the Interior delegated this task to the USFWS. On February 28, 2007, the USFWS issued a final military readiness rule authorizing members of the Armed Forces to incidentally take migratory birds during military readiness activities.

The definition of military readiness activities applies to the MBTA in the same way that it applies to the MMPA, and the Proposed Action is considered a military readiness activity for the purposes of this Act. Under this regulation, the Navy must consider the potential environmental effects of its actions and assess the adverse effects of military readiness activities on migratory birds. If a Proposed Action may result in significant adverse effects on a population of migratory bird species, the Navy shall consult with the USFWS to develop and implement appropriate conservation measures to minimize or mitigate those effects. A significant adverse effect on a population is defined as an effect that could, within a reasonable period of time, diminish the capacity of a population of a migratory bird species to sustain itself at a biologically viable level (50 CFR § 21.3). Conservation measures, as defined in 50 CFR § 21.3, include project designs or mitigation activities that are reasonable from a scientific, technological, and economic standpoint and are necessary to avoid, minimize, or mitigate the take of migratory birds or other potentially adverse effects.

Since the Proposed Action did not result in any significant adverse effects on populations of migratory bird species or takes of migratory bird species consultation with USFWS under the MBTA was not required.

A.4. Magnuson-Stevens Fishery Conservation and Management Act

The MSA (16 U.S.C. §§ 1801 – 1822), enacted to conserve and restore the nation's fisheries, includes a requirement for NMFS and regional fishery management councils to describe and identify EFH for all species that are federally managed. EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. Under the MSA, federal agencies must consult with the Secretary of Commerce regarding any activity or proposed activity that is authorized, funded, or undertaken by the agency that may adversely affect EFH. An adverse effect is any effect that may reduce the quantity or quality of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH.

Since the Proposed Action did not result in any adverse effects to EFH an EFH Assessment under the MSA was not required.

A.5. Coastal Zone Management Act

The CZMA (16 U.S.C. §§ 1451 – 1466) provides assistance to states, in cooperation with federal and local agencies, for developing land and water use programs in coastal zones. The CZMA defines the coastal zone as extending "to the outer limit of State title and ownership under the Submerged Lands Act," which is 3 NM or 9 NM from the shoreline, depending on the location (16 U.S.C. § 1453(1)). The extent of the coastal zone inland varies from state to state. Section 307 of the CZMA stipulates that where a federal project initiates reasonably foreseeable effects to any coastal use or resource (land or water use, or natural resource), the action must be consistent to the maximum extent practicable with the enforceable policies of the affected state's federally approved coastal management plan. The Alabama Department of Environmental Management is the lead agency for coastal management for Alabama and is

responsible for enforcing Alabama's federally approved coastal management plan, the Alabama Coastal Area Management Program. However, federal lands, which are "lands the use of which is by law subject solely to the discretion of…the Federal Government, its officers or agents," are statutorily excluded from the State's "coastal zone" (16 U.S.C. § 1453(1)). If, however, the proposed federal activity affects coastal resources or uses beyond the boundaries of the federal property (i.e., has spillover effects), the CZMA Section 307 federal consistency requirement applies, as described below. As a federal agency, the Navy is required to determine whether its proposed activities would affect the coastal zone.

A Consistency Determination, or a Negative Determination, may be submitted for review of federal agency activities. A federal agency submits a consistency determination when it determines that its activity may have either a direct or an indirect effect on a state coastal use or resource. In accordance with 15 CFR section 930.39, the consistency determination would include a brief statement indicating whether the proposed activity would be undertaken in a manner consistent to the maximum extent practicable with the enforceable policies of the management program. The consistency determination should be based on evaluation of the relevant enforceable policies of the management program. In accordance with 15 CFR section 930.35,

> if a Federal agency determines that there would not be coastal effects, then the Federal agency shall provide the State agencies with a negative determination for a Federal agency activity: (1) Identified by a State agency on its list, as described in § 930.34(b), or through case-by-case monitoring of unlisted activities; or (2) Which is the same as or is similar to activities for which consistency determinations have been prepared in the past; or (3) For which the Federal agency undertook a thorough consistency assessment and developed initial findings on the coastal effects of the activity.

Thus, a Negative Determination must be submitted to a state if the agency determines no coastal effects and one or more of the triggers above is met.

The Proposed Action would have no reasonably foreseeable effect on coastal resources of the State of Alabama and would not be subject to the enforceable policies outlined in the Alabama Coastal Area Management Program. As a result, a General Negative Determination for the Proposed Action consistent with 15 CFR section 930.35(a)(2) was submitted to the Alabama Department of Environmental Management on January 27, 2025. This analysis supports the finding that the Proposed Action would have no reasonably foreseeable effects to the State's coastal zone or its resources.

APPENDIX B RESOURCES DISMISSED DUE TO NO SIGNIFICANT EFFECTS FROM THE PROPOSED ACTION

Both physical and biological resources were dismissed due to having no significant effects from the Proposed Action. When analyzing the biological resources that are found within the proposed action area, there were several factors that were considered as to whether detailed analysis was needed on that species or biological resource group. The status of the population (e.g., healthy, stable), the prevalence of the species within the proposed action area, and the potential for effects for the species from the Proposed Action were all considered. When assessing the potential for effects for each species the following factors were taken into account: speed of the LCU (maximum speed of 11 knots), longevity of testing (each demonstration is five hours or less), and infrequency of testing (due to the LCU construction schedule, testing of multiple vessels is likely spread out over a longer period of time). Taking all of the above factors into account the Navy determined that there would be no potential for significant effects to non ESA-listed species because of the health of these populations and the very minimal and temporary effects anticipated from the Proposed Action. The following subsections describe both the physical and biological resources that were dismissed from analysis within the EA because there is no potential for significant effects from the Proposed Action.

B.1. Aquatic Vegetation

Vegetation in the proposed action area includes diverse taxonomic/ecological groups of vascular and marine vegetation. The basic taxonomic groupings of marine vegetation include microalgae (e.g., phytoplankton), macroalgae (e.g., seaweed), and submerged vegetation (e.g., seagrass and benthic macroalgae). Table B-1 lists the major aquatic vegetation groups and where they are found within the proposed action area.

B.2. Invertebrates

Table B-2 lists the major invertebrate groups that may be found within the proposed action area. Vertical distribution information is generally shown for adults; the larval stages of most of the species occur in the water column.

Table B-1. Major Aquatic Vegetation Groups Found within the Proposed Action Area

Aquatic Vegetation Group			***Presence in Proposed Action Area***	
Common Name (Taxonomic Group)	***Representative Species or Groups***	***Description***	***Pelagic***	***Benthic***
Algae and Phytoplankton				
Blue-green algae *(phylum Cyanobacteria)*	*Anabaena sp., Aphanizomenon sp.*	Photosynthetic bacteria that are abundant constituents of phytoplankton and benthic algal communities; existing as single cells or filaments, the latter forming mats or crusts on sediments and reefs.	✓	✓
Brown algae *(phylum Phaeophyta [Ochrophyta])*	*Sargassum spp.*	Large multi-celled seaweeds that include vast floating mats of Sargassum.	✓	✓
Dinoflagellates *(Phylum Dinoflagellata)*	*Heterocapsa triquetra, Karenia brevis, Gymnodinium sanguineum, Dinophysis caudata*	Most are single-celled, marine species of algae with two whip-like appendages (flagella). Some live inside other organisms, and some produce toxins that can result in red tide or ciguatera poisoning.	✓	✓
Diatoms *(Bacillariophyta, Fragilariophyta, Coscinodiscophyta)*	*Asterionella sp., Melosira sp., Skeletonema sp.*	Single-celled algae with a cylindrical cell wall (frustule) composed of silica. Diatoms are a primary constituent of phytoplankton.	✓	✓
Green algae *(phylum Chlorophyta)*	*Oocystis spp., Scenedesmus spp., Schroederia setigeria*	May occur as single-celled algae, filaments, and seaweeds.	✓	✓
Red algae *(phylum Rhodophyta)*	N/A	Single-celled algae and multi-celled large seaweeds; some form calcium deposits.	✓	✓
Vascular Plants				
Submerged aquatic vegetation, (phylum Tracheophyta)	Shoal grass (*Halodule wrightii*), Manatee grass (*Cymodocea manatorum*), Turtle grass (*Thalassia testudinum*)	Submerged aquatic vegetation may occur in subtidal and lower intertidal areas and provide food and habitat for many species in Mobile Bay.		✓

Table B-2. Major Invertebrate Groups Found within the Proposed Action Area

Invertebrate Group		***Presence in Proposed Action Area***	
		Vertical Distribution	
Common Name (Taxonomic Group)	***Description***	***Pelagic***	***Benthic***
Foraminifera, radiolarians, ciliates *(kingdom Protozoa)*	Benthic and planktonic single-celled organisms; shells typically made of calcium carbonate or silica.	✓	✓
Flatworms *(phylum Platyhelminthes)*	Simplest form of marine worm with a flattened body.		✓
Ribbon worms (phylum Nemertea)	Worms with a long extension from the mouth (proboscis) that helps capture food.		✓
Roundworms *(phylum Nematoda)*	Small worms; many live in close association with other animals (typically as parasites).	✓	✓
Sponges *(phylum Porifera)*	Large species have calcium carbonate or silica structures embedded in cells to provide structural support.		✓
Anemones, hydroids, jellyfish *(phylum Cnidaria)*	Benthic and pelagic animals with stinging cells; sessile corals are main builders of coral reef frameworks.	✓	✓
Segmented worms *(phylum Annelida)*	Highly mobile marine worms; many tube-dwelling species.		✓
Bryozoans *(phylum Bryozoa)*	Lace-like animals that exist as filter feeding colonies. Form either encrusting or bushy tuft-like lacy colonies.		✓
Cephalopods, bivalves, sea snails, chitons *(phylum Mollusca)*	Mollusks are a diverse group of soft-bodied invertebrates with a specialized layer of tissue called a mantle. Mollusks such as squid are active swimmers and predators, others such as sea snails are predators or grazers, and clams are filter feeders.	✓	✓
Shrimp, crab, crayfish, barnacles, copepods (*phylum Arthropoda – Crustacea*)	Diverse group of animals, some of which are immobile. Most have an external skeleton. All feeding modes from predator to filter feeder.	✓	✓
Sea stars, sea urchins, sea cucumbers *(phylum Echinodermata)*	Predators and filter feeders with tube feet.		✓

APPENDIX C REGULATORY CONCURRENCE

Concurrence letters from NMFS, USFWS, and the State of Alabama are shown in the subsections below.

C.1. NMFS ESA Concurrence Letter

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
https://www.fisheries.noaa.gov/region/southeast

04/22/2025

F/SER31:ML
SERO-2025-00013

Angela M. Bonner
PMS 317 Program Manager (Acting)
United States Department of the Navy
Department of Defense
1333 Isaac Hull Avenue, Southeast
Washington Navy Yard, District of Columbia 20376-0001

Ref.: PMS 317 Alabama Underway Demonstrations, Theodore, Mobile County, Alabama, and Gulf Shores, Baldwin County, Alabama– EXPEDITED TRACK

Dear Angela Bonner,

This letter responds to your letter dated April 16, 2025, request pursuant to Section 7 of the Endangered Species Act (ESA) for consultation with the National Marine Fisheries Service (NMFS) on the subject action.

We reviewed the action agency's consultation request document and related materials. Based on our knowledge, expertise, and the action agency's materials, we concur with the action agency's conclusions that the proposed action is not likely to adversely affect the NMFS ESA-listed species and/or designated critical habitat.

Updates to the regulations governing interagency consultation (50 CFR part 402) were effective on May 6, 2024 (89 Fed. Reg. 24268). We are applying the updated regulations to this consultation. The 2024 regulatory changes, like those from 2019, were intended to improve and clarify the consultation process, and, with one exception from 2024 (offsetting reasonable and prudent measures), were not intended to result in changes to the Services' existing practice in implementing section 7(a)(2) of the Act. 84 Fed. Reg. at 45015; 89 Fed. Reg. at 24268. We have considered the prior rules and affirm that the substantive analysis and conclusions articulated in this letter of concurrence would not have been any different under the 2019 regulations or pre-2019 regulations.

This concludes your consultation responsibilities under the ESA for species and/or designated critical habitat under NMFS's purview. Reinitiation of consultation is required and shall be requested by the action agency where discretionary Federal action agency involvement or control over the action has been retained or is authorized by law and: (a) take occurs; (b) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in this consultation; (c) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not previously considered in this consultation; or (d) if a new species is listed or critical habitat designated that may be affected by the action.

We look forward to further cooperation with you on other projects to ensure the conservation of our threatened and endangered marine species and designated critical habitat. If you have any questions on this consultation, please contact Mitchell Lovell, Consultation Biologist, by email at mitchell.lovell@noaa.gov.

Sincerely,

Digitally signed by FARMER.NICHOLAS.ALEXANDER.1003865367
Date: 2025.04.22 13:25:40 -04'00'

for David Bernhart
Assistant Regional Administrator
for Protected Resources

File: 1514-22.g

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C.2. USFWS ESA Concurrence Letter

~~CUI~~

DEPARTMENT OF THE NAVY
PROGRAM EXECUTIVE OFFICER SHIPS
1333 ISAAC HULL AVE, SE
WASHINGTON NAVY YARD, DC 20376-0001

SL

RECEIVED
JAN 10 2025
BY

IN REPLY REFER TO
5090
Ser 317/003
08 Jan 2025

From: Program Manager, Amphibious Assault and Connectors Program (PMS 317)
To: U.S. Fish and Wildlife Service – Alabama Ecological Services Field Office
1208 B Main Street Daphne, AL 36526-4419

Subj: LANDING CRAFT, UTILITY, ENDANGERED SPECIES ACT SECTION 7 INFORMAL CONSULTATION FOR UNDERWAY TOWING, BOW RAMP, AND ANCHOR DEMONSTRATIONS IN ALABAMA

1. The Amphibious Assault and Connectors Program Office (PMS 317) has contracted for a fleet of up to 12 Landing Craft, Utility (LCU) 1700 vessels to be constructed at the Austal United States of America facility in Mobile, Alabama. The LCU 1700 is a replacement vessel for the existing class of LCU vessels currently operated by the United States (U.S.) Navy.

2. PMS 317 is proposing to conduct underway demonstrations which confirm compliance with operational and technical requirements. The proposed action involves the conduct of underway towing, bow ramp, and anchor demonstrations within the geographical area of Mobile Bay and within nearshore Gulf of Mexico off the coast of Alabama. The proposed action would begin in spring/summer 2025 and continue until all 12 vessels are tested. In order to comply with the requirements established in Section 7 of the Endangered Species Act (ESA), an informal consultation was completed through the U.S. Fish and Wildlife Service's Information for Planning and Consultation online tool.

3. The Navy has determined that the proposed action may affect, but is not likely to adversely affect, the green sea turtle (*Chelonia mydas*), Kemp's ridley sea turtle (*Lepidochelys kempii*), loggerhead sea turtle (*Caretta caretta*), loggerhead sea turtle critical habitat, gulf sturgeon (*Acipenser oxyrinchus desotoi*), West Indian manatee (*Trichechus manatus*), rufa red knot (*Calidris canutus rufa*), and piping plover (*Charadrius melodus*).

4. It is requested that U.S. Fish and Wildlife Service provide written concurrence with these determinations and that the Navy's obligations under Section 7 of the ESA have been addressed in regards to this matter.

DECONTROLLED
Date: 08/04/2025
Authority: Information's Originator, DON
POC: Nicholas Gioino, 202-781-4258

Controlled by: Department of the Navy
Controlled by: PMS 317
CUI Category(ies): CTI
Dissemination Control: FEDCON
POC: Nicholas Gioino, 202-781-4258

~~CUI~~

~~CUI~~

Subj: LANDING CRAFT, UTILITY, ENDANGERED SPECIES ACT SECTION 7 INFORMAL CONSULTATION FOR UNDERWAY TOWING, BOW RAMP, AND ANCHOR DEMONSTRATIONS IN ALABAMA

5. The technical point of contact regarding this Proposed Action is Mr. Douglas Johnson, PMS 317T. He can be reached by phone at (202) 781-2980 or by email at douglas.d.johnson7.civ@us.navy.mil. The environmental point of contact regarding this analysis is Ms. Jocelyn Borcuk, Naval Undersea Warfare Division Newport. She can be reached by phone at (401) 832-7318 or by email at jocelyn.r.borcuk.civ@us.navy.mil.

ANGELA M. BONNER
(Acting)

Copy to:
PMS317 (T, J, X)

U.S. Fish and Wildlife Service
1208-B Main Street – Daphne, Alabama 36526
Phone: 251-441-5181 Fax: 251-441-6222

Based upon our records and the information provided in your letter, we concur with your findings that no federally listed species/critical habitat will be adversely affected by your project. **If project design changes are made, please submit new plans for review.** For specific techniques on how to minimize impacts to aquatic systems, please visit this website: https://www.fws.gov/project/best-management-practices-alabama .

William J. Pearson
Alabama Ecological Services Field Office

JAN 2 3 2025
Date

FWS

2

~~CUI~~

C.3. State of Alabama CZMA Concurrence Letter

LANCE R. LEFLEUR
DIRECTOR

KAY IVEY
GOVERNOR

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1400 Coliseum Blvd. 36110-2400 • Post Office Box 301463
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January 27, 2025

Jocelyn Borcuk
Douglas Johnson
Environmental Branch, NUWC Newport
Department of the Navy
1176 Howell St Building 990
Newport, Road Island 02841

RE: State of Alabama Coastal Negative Determination Concurrence
Mobile Bay and Nearshore Gulf of Mexico, Alabama
Alabama Department of Environmental Management (ADEM) Tracking Code: ACAMP-2025-071-FC-FAA-ND

Dear Ms. Borcuk and Mr. Johnson:

On January 10, 2025, the ADEM received the United States Department of the Navy's Naval Sea Systems Command Amphibious Assault and Connectors Program's (PMS 317) Negative Determination that the proposed federal action, referenced above, will have no reasonably foreseeable effects on Alabama coastal uses or resources governed by the Alabama Coastal Area Management Program. Pursuant to Title 15 C.F.R. §930.35, by this letter the ADEM hereby notifies US Department of the Navy, Naval Sea Systems Command Amphibious Assault and Connectors Program of its **concurrence** with the Negative Determination.

Any correspondence related to this decision should be sent to the email inbox coastal@adem.alabama.gov. Always reference the ADEM tracking code located at the top of this document when corresponding.

Sincerely,

Anthony Scott Hughes, Chief
Field Operations Division

ASH/jsb/sm

cc: DCNR.Coastal@dcnr.alabama.gov
USN | Nicholas Gioino – (nicholas.s.gioino.civ@us.navy.mil)
USN | Andrew May – (andrew.j.may6.civ@us.navy.mil)

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