Programmatic Environmental Assessment: Sand Placement for Emergency Beach Berms

FEMA-DR-4393-4465-4568-NC

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APPENDICES

LIST OF ACRONYMS

APE	Area of Potential Effect
BFE	Base Flood Elevation
BO	Biological Opinion
CAMA	Coastal Area Management Act
CBIA	Coastal Barrier Improvement Act
CBRA	Coastal Barrier Resources Act
CBRS	Coastal Barrier Resources System
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWA	Clean Water Act
CY	Cubic Yards
CZMA	Coastal Zone Management Act
DHS	Department of Homeland Security
EA	Environmental Assessment
EMA	Emergency Management Agency
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
IPaC	Information for Planning and Consultation
MBTA	Migratory Bird Treaty Act
MHW	Mean High Water
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NEPA	National Environmental Policy Act
NCDCM	North Carolina Division of Coastal Management
NCDEQ	North Carolina Department of Environmental Quality
NCDWR	North Carolina Division of Water Resources
NCSPBO	North Carolina Statewide Programmatic Biological Opinion
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
NTB	North Topsail Beach, Town of
NWI	National Wetlands Inventory
PA	Public Assistance
PBO	Programmatic Biological Opinion
PEA	Programmatic Environmental Assessment

PL	Public Law
SARBO	South Atlantic Regional Biological Opinion
SHPO	State Historic Preservation Office
SY	Square Yards
Stafford Act	Robert T. Stafford Disaster Relief and Emergency Assistance Act
SPEA	Statewide Programmatic Environmental Assessment
TOI	Town of Oak Island
TSC	Town of Surf City
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
WSS	Web Soil Survey

1.0 INTRODUCTION

Hurricane Florence, Hurricane Dorian, and Hurricane Isaias, each impacted North Carolina (NC) with strong winds, storm surge, and flooding. On September 14, 2018, and as amended on: September 17, 24, and 27, 2018; October 10, 12, 14, 22, 24, and 25, 2018; November 15, 2018; March 28, 2019, June 27, 2019, and October 13, 2020, the President declared a major disaster (FEMA-DR-4393-NC) for the State of NC due to Hurricane Florence. On October 4, 2019, and as amended on October 13, 2020, the President declared a major disaster (FEMA-DR-4465-NC) for the State of NC due to Hurricane Dorian. On August 2, 2020, and as amended on: January 14, 2021, the President declared a major disaster (FEMA-DR-4543-NC) for the State of NC due to Hurricane Isaias. All three disaster declarations authorized the Department of Homeland Security's Federal Emergency Management Agency (FEMA) to provide federal assistance to designated disaster areas of North Carolina. The assistance for both of these declared disasters is provided pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), and Public Law (PL) 93-288, as amended. Section 403 of the Stafford Act authorizes FEMA's Public Assistance (PA) Program to provide assistance essential to meeting immediate threats to life and property resulting from a major disaster. During this event, 31 counties across North Carolina were declared, including all 20 coastal counties which were impacted mostly by storm surge and wave action. Brunswick, Onslow, and Pender County were designated to receive federal assistance from FEMA's PA Program. Respectively within those counties, the Town of Oak Island, North Topsail Beach, and Surf City (Subapplicants), applied through the PA Program to receive funding to install emergency beach berms along their coastlines.

The Town of Oak Island's project is located in Brunswick County, North Carolina, along the Atlantic Coast, and is made up of two beach reaches, encompassing approximately 8.5 miles within a 10 mile stretch of coastline, located on Oak Island, between (33.9129, -78.2285) near 69th Place West on the West end and (33.9025, -78.0750) near Martin Lane on the East end. Brunswick County Road 1104 extends along a majority of the coast within Oak Island in a west-east direction and in most areas is roughly 130 to 300 feet inland from the dune system. The coast of the Town of Oak Island was damaged via storm surge and erosion incurred during Hurricane Florence in September 2018 and Hurricane Isaias in 2020.

The Town of North Topsail Beach's project is located in Onslow County, North Carolina, along the Atlantic Coast, encompassing approximately 7.8 miles within an 11 mile stretch of coastline, located on Topsail Island, between (34.5296, -77.3445) near River Drive on the North end and (34.4739, -77.4587) near Calinda Cay Court on the South end. Nearly the entire project area is located within Coastal Barrier Resource System (CBRS) Unit L06, established October 18, 1982. The coast of the Town of North Topsail Beach was damaged via storm surge and erosion incurred during Hurricane Florence in September 2018 and Hurricane Florence in 2020.

The Town of Surf City's project is located in Pender County, North Carolina, along the Atlantic Coast, encompassing the entire approximately 6.2 miles of coastline, located on Topsail Island, between (34.4459, - 77.51030) near E 9th Street on the North end and (34.390544, - 77.596456) near Hispaniola Lane on the South end. The coast of the Town of Surf City was damaged via storm surge and erosion incurred during Hurricane Florence in September 2018.

The Subapplicants will be coordinating with USACE and the North Carolina Department of Environmental Quality (NCDEQ) to obtain any necessary permits and will comply with applicable conditions.

This draft Programmatic Environmental Assessment (PEA) has been conducted in accordance with the National Environmental Policy Act (NEPA), the President's Council on Environmental Quality regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508) and regulations adopted pursuant to Department of Homeland Security Directive 023-01, Rev 01, and FEMA Directive 108-1.

2.0 PURPOSE AND NEED

The purpose of this project is to address erosion damage from Hurricane Florence to the existing eroded dune system along the coastlines of Brunswick, Onslow, and Pender Counties. The need for this project is to address concerns regarding the temporary protection of existing developed property, including public roads and residential homes, in the vicinity of the project area from immediate threat of flooding from a 5-year storm event. At all 3 project locations, residential homes are generally located about 50 to 200 feet inland. In North Topsail Beach and Surf City, NC Highway 210 and Onslow County Road 1568 extends along the coast within Topsail Island in a north-south direction and in most areas is roughly 40 to 500 feet inland from the dune system. Prior to the erosion of the coastline, the natural and engineered beach dunes served as inland flood protection barriers and minimized the loss of human life and property. Therefore, the need to repair the erosion of the dune system will temporarily improve the capacity of the shoreline to withstand future storm events, reduce the risks to human life and improved property and further lessen erosion of the coastal dune system. These berms were not completed within an emergency time frame; therefore, a statutory exclusion (STATEX) is not applicable. This PEA is to assess the impact of three emergency beach berm projects and document FEMA's determination as to whether providing federal assistance will have significant environmental impacts and evaluate the direct effects of the action along with those resulting from interrelated and interdependent actions. North Carolina has over 300 miles of coastline with 122 miles being managed, and that number is expected to grow to over 163 miles (NCSPBO, pg. 2). The state's shoreline and associated coastal dune systems have regularly sustained damages from tropical storms and hurricanes, with an expected 250% increase in average annual sand placement in years following major storm events (NCSPBO, pg. 2). The natural fluctuation in the topography of the existing beaches is compounded by previous and ongoing attempts to restore the areas through dredging and placing sand along the shoreline. Continued maintenance of engineered beaches as well as future construction of engineered beaches is certain, including all three project areas discussed within this PEA. Over the past four years, North Carolina has experienced repetitive damages from hurricanes to North Carolina's coastline which has resulted in multiple, simultaneous Federal disaster declarations. Furthermore, hurricane seasons are projected to continue being increasingly active and volatile (Kossin, J. P. (2020). *Global increase in major tropical cyclone exceedance probability has increased over the past four decades*). Proceedings of the National Academy of Sciences, 117(22)). In

proactiveness for future events and to review these emergency action projects as expeditiously as possible, this assessment is a Statewide PEA (SPEA) for emergency berms and includes all activities associated with the construction of emergency berms, using both upland and offshore sand sources, on the beaches of North Carolina 6 months post-event as an emergency protective measure that has been deemed eligible by FEMA's Public Assistance. The emergency beach berm construction activities covered in this SPEA encompass the following per the FEMA Public Assistance Program and Policy Guide (3.VI.B.19):

1. Eligible measures typically include the construction of emergency beach berms to protect against additional damage from a 5-year flood. Based on the average expected erosion for a 5-year flood, FEMA only provides PA funding for emergency beach berms constructed with up to 6 cubic yards per linear foot of sand above the 5-year stillwater elevation or the berm's pre-storm profile, whichever is less. Stillwater elevation is the maximum storm-induced water-surface elevation. If necessary, the placement of sand to provide a base for the emergency berm is also eligible as part of the emergency protective measure.

2. Placement of dune grass on an emergency beach berm is only eligible if it is required by permit and is an established, enforced, uniform practice that applies to the construction of all emergency beach berms within the Subapplicant's jurisdiction, regardless of the circumstance.

3.0 PROJECT LOCATION AND BACKGROUND

The Town of Oak Island's emergency beach berm projects as a result of Hurricanes Florence and Isaias, are anticipated for the winter of 2021-2022. The area is made up of two beach reaches, encompassing approximately 8.5 miles within a 10 mile stretch of coastline located on Oak Island. Both reaches are between (33.9129, -78.2285) near 69th Place West on the West end and (33.9025, -78.0750) near Martin Lane on the East end. The beach reaches are considered engineered, with a FEMA funded beach nourishment project occurring in 2000 after Hurricane Floyd. For the project completed in 2000, sand was placed from (33.9075, -78.1026) near SE 63rd Street on the West end and (33.9135, -78.1512) near 11th Place East on the East End. Since then, there have been two more sand placement projects. A FEMA funded emergency beach berm project was conducted after Hurricane Matthew in which sand was trucked in from an upland source and placed from (33.9137, -78.2084) near 51st Place West on the West end and (33.9078, -78.1041) near SE 61st Street on the East end. Work was partially conducted during Spring 2017 and completed the Spring of 2018. The United States Army Corps of Engineers (USACE) placed sand, during a routine inlet maintenance project, onto Oak Island's beachfront from (33.9081, -78.1069) near SE 58th Street on the West end to (33.904981, -78.088116) near SE 77th Street on the East end. The project was completed during the summer of 2018 and USACE had special permitting to be able to complete this work during sea turtle nesting season. Another beach renourishment project, made necessary by Hurricane Matthew, for the same area was submitted to FEMA and is currently out for bid and is pending permits; it is set to be conducted Winter 2020 or 2021.

The Town of North Topsail Beach's emergency beach berm projects as a result of Hurricanes Florence and Dorian are anticipated for the Winter of 2020-2021. The project area encompasses approximately 7.8 miles within an 11 mile stretch of coastline, located on Topsail Island, between (34.5296, -77.3445) on the North end and (34.4739, -77.4587) on the South end. The Town's beach template is divided into five sections with most of the beach being natural with no previous sand placement activities; the two exceptions are Section 1 and Section 5. The Section 1 project was conducted by USACE when 600,00 cubic yards (CY) of sand from an inlet channel realignment project in the winter of 2013 was placed along a 2 mile stretch of beach from (34.5305, -77.3449) adjacent to New River Inlet on the North end and (34.5148, -77.3704) near Marine Way to the south. The Section 5 beach renourishment was locally funded and included a U.S. Department of Agriculture (USDA) Rural Development Loan. The project occurred from the winter of 2014 into spring of 2015 and placed 1.5 million CY of sand along a 3.75 mile stretch of beach from (34.4748, -77.4563) at Sea Oaks Court near the northernmost town limit to (34.4739, -77.4587) at Seaside Lane near the southernmost town limit. During this project, incompatible material containing rocks was placed on the beach which led to updated permit conditions including the use of smaller size mesh, immediate removal of rocks, and future remediation. In addition, the discontinued use of that offshore borrow site was requested by USFWS, USACE, and NC Division of Coastal Management (NCDCM). After Hurricane Matthew, North Topsail Beach received $5.4 million in FEMA funding for a beach renourishment project which placed 156,000 CY of sand from a commercial upland source along 3.5 miles of dune line within Section 5; the work is scheduled to be completed Winter 2019 to 2020. The Town has a 30-year beach management and maintenance plan which calls for a renourishment interval of every 4 to 6 years. In January 2020, North Topsail Beach and the Town of Surf City were awarded $237 million dollars by USACE for storm damage reduction projects related to Hurricane Matthew and Florence.

The Town of Surf City's emergency beach berm project was completed in Winter 2019-2020. The project area encompasses the entire approximately 6.2 miles of coastline, located on Topsail Island, between (34.4459, -77.5103) at E 9th Street near the northernmost town limit and (34.3905, -77.5964) at Hispaniola Lane near the southern end of the island. The entire beach is natural with no previous sand placement activities. The Town has been working to develop a locally funded beach renourishment program which is expected to have their first project completed by placing sand from offshore dredging during Winter 2020/2021. In January 2020, Surf City and North Topsail Beach were awarded $237 million dollars by USACE for storm damage reduction projects related to Hurricane Matthew and Florence.

The Town of Oak Island's project is located in Brunswick County, North Carolina, along the Atlantic Coast, and is made up of two beach reaches, encompassing approximately 8.5 miles within a 10 mile stretch of coastline, located on Oak Island, between (33.9129, -78.2285) near 69th Place West on the West end and (33.9025, -78.0750) near Martin Lane on the East end. Brunswick County Road 1104 extends along a majority of the coast within Oak Island in a west-east direction and in most areas is roughly 130 to 300 feet inland from the dune system. Residential homes are generally located about 50 to 200 feet inland. The coast of the Town of Oak Island was damaged via storm surge and erosion incurred during Hurricane

Florence in September 2018 and Hurricane Isaias in 2020.

The Town of North Topsail Beach's project is located in Onslow County, North Carolina, along the Atlantic Coast, encompassing approximately 7.8 miles within an 11 mile stretch of coastline, located on Topsail Island, between (34.5296, -77.3445) near River Drive on the North end and (34.4739, -77.4587) near Calinda Cay Court on the South end. NC Highway 210 and Onslow County Road 1568 extends along the coast within Topsail Island in a north-south direction and in most areas is roughly 40 to 500 feet inland from the dune system. Residential homes are generally located within the dune system to 150 feet inland. Nearly the entire project area is located within Coastal Barrier Resource System (CBRS) Unit L06, established October 18, 1982. The coast of the Town of North Topsail Beach was damaged via storm surge and erosion incurred during Hurricane Florence in September 2018 and Hurricane Dorian in 2019.

The Town of Surf City's project is located in Pender County, North Carolina, along the Atlantic Coast, encompassing the entire approximately 6.2 miles of coastline, located on Topsail Island, between (34.4459, - 77.51030) near E 9th Street on the North end and (34.390544, - 77.596456) near Hispaniola Lane on the South end. NC Highway 210 and NC Highway 50 extend along the coast within Topsail Island in a north-south direction and in most areas is roughly 50 to 600 feet inland from the dune system. Residential homes are generally located within the dune system to 150 feet inland. The coast of the Town of Surf City was damaged via storm surge and erosion incurred during Hurricane Florence in September 2018.

4.0 ALTERNATIVES

The construction of hardened structures such as jetties or seawalls were briefly considered, however such structures are banned per North Carolina's General Assembly Section 1. G.S. 113A-115.1**.** Given this lack of legal practicability, the alternatives considered in addressing the purpose and need are the No Action Alternative and the Preferred Action Alternative, which is the placement of sand to construct an emergency beach berm along the coastline of the three above-mentioned municipalities.

4.1 Alternative 1: No Action Alternative

Under the No Action Alternative, the emergency beach berms would not be constructed. Consequently, the area and improved property in the vicinity of the shorelines would not be protected from future storm events. Additionally, ongoing erosion would continue from natural tides and storm events, the available habitat for listed threatened and endangered species would continue to degrade, and the recreational value created by the beaches would continue to decrease. Therefore, the No Action Alternative has the potential to negatively affect improved property, the environmental habitat, tourism and the economy in the vicinity of the coastlines.

4.2 Alternative 2: Sand Placement for Emergency Beach Berms (Proposed Action)

Under the Proposed Action Alternative, the emergency beach berm projects would proceed along portions

of Oak Island, North Topsail Beach, and Surf City. The proposed projects will increase the level of storm protection to the existing shoreline, available habitat, and existing improved property to withstand a 5-year flooding event. The proposed project will contribute to maintaining a viable beach and dune system for nesting habitat for threatened and endangered species, such as sea turtles and shorebird species, including the piping plover. The proposed projects will also restore the recreational value of the publicly accessible shorelines along the beaches within Brunswick, Onslow, and Pender Counties.

The Towns of Oak Island, North Topsail Beach, and Surf City have submitted applications to FEMA for funding under the PA program to repair damages incurred to their respective dune systems as a result of Hurricane Florence (FEMA-4393-DR-NC). The Town of North Topsail Beach has submitted application to FEMA for funding as a result of Hurricane Dorian (FEMA-4465-DR-NC) as well. The Town of Oak Island has submitted application to FEMA for funding as a result of Hurricane Isaias (FEMA-4568-DR-NC) as well. The proposed projects will construct an emergency beach berm along approximately 8.5 miles of beach in the Town of Oak Island, 7.8 miles in the Town of North Topsail Beach, and 6.2 miles in the Town of Surf City. In conjunction with Hurricane Florence, Oak Island is proposing to place 229,317 CY beach compatible sand from an offshore borrow source located approximately 1 mile off the southern end of Oak Island. The Subapplicant is also proposing to plant approximately 330,496 native dune plants across 82,624 SY (square yards) of berm area. In conjunction with Hurricane Isaias, the Town will be sifting and placing an estimated 40,000 CY of sand back onto the beach as an emergency berm. At the time of this writing, the exact scope of work for the project is unknown in regards to any vegetation planting. The project area is located between (33.9129, -78.2285) near 69th Place West on the West end and (33.9025, -78.0750) near Martin Lane on the East end. In conjunction with Hurricane Florence, North Topsail Beach is proposing to place 137,506 CY of beach compatible sand which will be trucked in from a commercial upland source. The Subapplicant is also proposing to plant approximately 365,508 native dune plants across 91,377 SY of berm area. In conjunction with Hurricane Dorian, the Subapplicant is proposing to place 7,613 CY of beach compatible sand which will be trucked in from a commercial upland source. The Subapplicant is also proposing to plant approximately 28,888 native dune plants across 7,222 SY of berm area. Both projects will be completed at the same time. The project area is located between (34.5296, -77.3445) near River Drive on the North end and (34.4739, -77.4587) near Calinda Cay Court on the South end. Surf City replaced 179,294 CY of beach compatible sand, which was sourced from ST Wooten Sand Mine, a commercial upland source located in Wilmington, NC. The Subapplicant also planted approximately 330,496 native dune plants across 128,260 SY of berm area. The project is located between (34.4459, -77.5103) near E 9th Street on the North end and (34.3905, -77.5964) near Hispaniola Lane on the South end.

5.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The Council on Environmental Quality (CEQ) notes: “Effects includes ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also

include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial" (40 CFR 1508.8).

When possible, quantitative information is provided to establish potential impacts; otherwise, the potential qualitative impacts are evaluated based on the criteria listed in Table 5.1:

5.1: Impact Significance and Context Evaluation Criteria for Potential Impacts

Impact Scale	**Criteria**
None/Negligible	The resource area would not be affected and there would be no impact, OR changes or benefits would either be non-detectable or, if detected, would have effects that would be slight and local. Impacts would be well below regulatory standards, as applicable.
Minor	Changes to the resource would be measurable, but the changes would be small and localized. Impacts or benefits would be within or below regulatory standards, as applicable. Mitigation measures would reduce any potential adverse effects.
Moderate	Changes to the resource would be measurable and have either localized or regional scale impacts/benefits. Impacts would be within or below regulatory standards, but historical conditions would be altered on a short-term basis. Mitigation measures would be necessary, and the measures would reduce any potential adverse effects.
Major	Changes to the resource would be readily measurable and would have substantial consequences/benefits on a local or regional level. Impacts would exceed regulatory standards. Mitigation measures to offset the adverse effects would be required to reduce impacts, though long-term changes to the resource would be expected.

5.2 The potential environmental impacts and required measures and permits required as a result of Alternatives 1 and 2 are summarized in Table 5.2.

Table 5.2

Resource	Environmental Consequences	Environmental Protection Measures and Required Permits
Geology and Soils	Alternative 1 – No impact. Alternative 2 – No long-term impacts. Beach compatible sand will be used during construction.	Under Alternative 2, the Subapplicants are responsible for coordinating with and obtaining any required permit(s) from NCDCM. The Subapplicant shall comply with all conditions of any required permits. All coordination pertaining to these activities should be documented and compliance maintained in their permanent files. Failure to comply with these conditions may jeopardize FEMA funding; verification of compliance will be required at project closeout.
Clean Air Act	Alternative 1 – No impact. Alternative 2 – Minor short-term impacts to air quality due to exhaust from construction equipment.	Not applicable.
Climate Change	Alternative 1 – No impact. Alternative 2 – Minor impact from construction equipment used.	Not applicable.
Clean Water Act	Alternative 1 – No impact. Alternative 2 – Short-term negative impacts to water quality may occur as dredging of placement of sand below MHW could increase turbidity.	The Subapplicants are responsible for coordinating with and obtaining any required Section 404 permit(s) from the United States Army Corps of Engineers (USACE) and 401 permit(s) from the responsible state or tribal agency prior to initiating work. The Subapplicants shall comply with all conditions and pre-construction notification requirements of the required permit(s), including any applicable regional conditions. All coordination pertaining to these activities or compliance with applicable permits must be documented and maintained in the Subapplicant's

		permanent files. Copies must be forwarded to the Applicant (state or tribal EMA) and FEMA as part of the permanent project file. Failure to comply with this requirement may jeopardize receipt of federal funds.
Floodplain Management (Executive Order 11988)	Alternative 1 – No impact. Risk to human life and improved property continues at the current level. Alternative 2 – Beneficial impact as the beach would reduce flood risk to adjacent improved property and preserve open space, one of the natural and beneficial values of the floodplain.	Based on the current FEMA Flood Insurance Rate Map (FIRM), the project areas are located within the coastal high hazard area (VE Zone) per their respective county's Flood Insurance Rate Map Panels (Appendix A). The Subapplicants must document coordination with the local floodplain administrator before work begins. Subapplicants must submit documentation to the State and FEMA documenting compliance with this condition. Failure to comply with these conditions may jeopardize FEMA funding; verification of compliance will be required at project closeout.
Protection of Wetlands (EO 11990)	Alternative 1 – No impact. Alternative 2 – Short term minor impacts from construction. No long-term impacts.	Construction activities and equipment storage are not to be in or impact any wetlands. All materials and equipment should be staged outside of the wetland on paved or previously disturbed areas.
Coastal Zone Management (CZMA)	Alternative 1 – No impact. Alternative 2 – Minor beneficial impact due to restoration of coastal dune system.	FEMA deems this work to be consistent with the NC Coastal Zone Management Program (CZMP) and work falls under current Programmatic Agreements between FEMA and NCDCM. CAMA permit or correspondence with NC Division of Coastal Management seeking determination of permit requirement must be provided. All coordination pertaining to these activities or compliance with applicable permits must be documented and maintained in the Subapplicant's permanent files. Copies must be forwarded to the Recipient (state or tribal EMA) and FEMA as part of the permanent project file. Failure to comply with this requirement may jeopardize receipt of federal funds.

Coastal Barrier Resources Act (CBRA)	Alternative 1 – No Impact. Alternative 2 – In order for a project occurring within a System Unit to be kept consistent with the purposes of the CBRA, the anticipated moderate impacts to Coastal Barrier Resources can be minimized by conditions listed in USFWS consultations.	In consultation initiated with USFW completed 05/08/2020 and 12/15/2020, FEMA determined that the proposed scopes of work for North Topsail Beach is an eligible exception to the Coastal Barrier Resource Act.
Fish & Wildlife Resources	Alternative 1 – No impact. Alternative 2 – Minor Impact due to loss of benthic softbottom communities in the project area. Short-term impacts would occur to species that live in, or utilize, beach habitat. After construction, these species would be expected to recover.	Under Alternative 2, Subapplicants will follow all applicable conditions for fish & wildlife under any USFWS issued BO or permits. Conditions for the projects analyzed in this EA are detailed in the Threatened & Endangered Species section of this PEA. The Subapplicant shall comply with all conditions of the required permits. All coordination pertaining to these activities should be documented and compliance maintained in their permanent files. Failure to comply with these conditions may jeopardize FEMA funding; verification of compliance will be required at project closeout.

Vegetation	Alternative 1 – No impact from construction. Continuing erosion could lead to ongoing dune vegetation loss. Alternative 2 – Beneficial moderate impact to dune vegetation as a result of dune planting incorporated into projects.	Under Alternative 2, Subapplicants will follow all applicable conditions for fish & wildlife under any USFWS issued BO or permits. Conditions for the projects analyzed in this EA are detailed in the Threatened & Endangered Species section of this EA. The Subapplicant shall comply with all conditions of the required permits. All coordination pertaining to these activities should be documented and compliance maintained in their permanent files. Failure to comply with these conditions may jeopardize FEMA funding; verification of compliance will be required at project closeout.
Threatened and Endangered Species	Alternative 1 – No impact, loss of suitable habitat for listed species. Alternative 2 – Potential for adverse effect during construction. Anticipated impacts will be minimized by application of measures set forth by U.S. Fish and Wildlife Service (USFWS) in their Biological Opinions.	Under Alternative 2, Subapplicants will follow all applicable conditions for fish & wildlife under any USFWS issued BOs or permits. Conditions for the projects analyzed in this EA are detailed in the Threatened & Endangered Species section of this EA. The Subapplicant shall comply with all conditions of the required permits. All coordination pertaining to these activities should be documented and compliance maintained in their permanent files. Failure to comply with these conditions may jeopardize FEMA funding; verification of compliance will be required at project closeout.

Migratory Bird Treaty Act	Alternative 1 – No impact. Alternative 2 – Potential for adverse effect during construction. Anticipated impacts will be minimized by application of measures set forth by U.S. Fish and Wildlife Service (USFWS) in their Biological Opinion/s.	Under Alternative 2, Subapplicants will follow all applicable conditions for fish & wildlife under any USFWS issued BOs or permits. Conditions for the projects analyzed in this EA are detailed in the Threatened & Endangered Species section of this EA. The Subapplicant shall comply with all conditions of the required permits. All coordination pertaining to these activities should be documented and compliance maintained in their permanent files. Failure to comply with these conditions may jeopardize FEMA funding; verification of compliance will be required at project closeout.
Magnusson-Stevens Fisheries Conservation Act (MSA)	Alternative 1 – No impact. Alternative 2 – Anticipated short-term impacts to species and hard-bottom resources due to projects that involve dredging.	Under Alternative 2, Subapplicants who are conducting offshore dredging are responsible for coordinating with and obtaining any required Section 404 permit(s) from the United States Army Corps of Engineers (USACE) prior to initiating work. The Subapplicant shall comply with all conditions and conservation measures provided by National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) within the issued Section 404 permit(s), including any applicable regional conditions. All coordination pertaining to these activities or compliance with applicable permits must be documented and maintained in the Subapplicant's permanent files. Copies must be forwarded to the Recipient (state or tribal EMA) and FEMA as part of the permanent project file. Failure to comply with this requirement may jeopardize receipt of federal funds.
Bald and Golden Eagle Protection Act	Alternative 1 – No impact. Alternative 2 – No impact.	Not applicable because no bald and golden eagles inhabit the project areas as there is no suitable nesting habitat.

Cultural Resources	Alternative 1 – No impact. Alternative 2 – Potential for effect during construction. Anticipated impacts will be avoided or minimized by consultation and application of any measures set forth by the SHPO office.	Alternative 2 would require the Subapplicant to comply with the conditions below set forth by the North Carolina State Historic Preservation Office (SHPO).
Land Use & Planning	Alternative 1 – No impact. Alternative 2 – No impact.	Not applicable.
Noise	Alternative 1 – No impact. Alternative 2 – Minor short-term impacts.	Not applicable.
Transportation	Alternative 1 – No impact. Alternative 2 – Minor short-term impacts.	Not applicable.
Environmental Justice (Executive Order 12898) / Socioeconomic	Alternative 1 – Impacts could result from future storm damage along the shoreline. Alternative 2 – Beneficial/negligible impact due to storm damage reduction to population along the shoreline, regardless of socio-economic status.	Not applicable.

Hazardous Materials / Waste and Solid Waste	Alternative 1 – No impact. Alternative 2 – Minor short-term impact due to potential for spills during construction. No long-term impact expected.	Under Alternative 2, all handling of hazardous materials and waste generated during construction activities would be handled with in accordance with applicable RCRA and state regulations. Potential for spills from construction equipment will be minimized and handled in accordance with applicable regulations.
Drinking Water	Alternative 1 – No impact. Alternative 2 – No impact.	Not applicable. There are no sole source aquifers in North Carolina.

5.3 Geology and Soils

According to the North Carolina Geological Survey (FGS), the coastal plain region in which the project areas are located is considered Coastal Plain and the North Carolina Stratigraphic Geology of the project area is Pleistocene Sediments. The Pleistocene sediments in North Carolina occur near the present coastline at elevations generally less than 6 feet (1.8 meters). The sediments include quartz sands, carbonate sands and muds, and organics.

According to Natural Resources Conservation Service (NRCS) soil data, soils underlying the project area consist of Newhan-Corolla complex, 2 to 30 percent slopes, Beaches, and Corolla fine sand, 1 to 5 percent slopes. These soil types are up to 80 inches deep. The depth to the water table is between 0 and 72 inches in the beaches series, between 18 and 36 inches in the Corolla series, and over 80 inches in the Newhan series. These map units are not classified as prime farmland by the NRCS. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is available for these uses.

5.3.1 Alternative 1- No Action Alternative

Alternative 1, the no-action alternative, will not involve any construction activities and regrading, thus there will be no impact to existing geology and soil conditions.

5.3.2 Alternative 2- Sand Placement for Emergency Beach Berms

Alternative 2, construction of the emergency beach berms, will have no long-term impacts on the geology and soils as beach compatible sand, meeting the engineering and aesthetic requirements put forth by the NCDCM and USFWS, will be used during construction.

5.4 Clean Air Act

The Clean Air Act requires the EPA to establish national ambient air quality standards for certain common and widespread pollutants based on standards set for the following six common “criteria pollutants:”

particle pollution, ozone, sulfur dioxide, nitrogen dioxide, carbon monoxide, and lead. Areas that meet the air quality standard for the criteria pollutants are designated as being in attainment. Areas that do not meet the air quality standard for one of the criteria pollutants are designated as being in nonattainment for that standard. All counties within North Carolina are classified as being in attainment for all criteria pollutants stipulated under NAAQS.

5.4.1 Alternative 1 – No Action Alternative

Alternative 1, the no-action alternative, will have no effect on air quality as no work will be done.

5.4.1 Alternative 2 – Sand Placement for Emergency Beach Berms

Alternative 2, construction of the emergency beach berms would have a negligible short-term impact on air quality due to the temporary use of construction equipment resulting in temporary air emissions due from fuel usage.

5.5 Climate Change

Greenhouse gases (GHGs) are emitted by both natural processes and human activities, and their accumulation in the atmosphere regulates temperature. GHGs include water vapor, carbon dioxide, methane, nitrous oxides, and other compounds. There are no established thresholds or standards for GHGs.

5.5.1 Alternative 1 – No Action Alternative

Alternative 1, the no-action alternative, would result in the emergency coastal dune system not being built and no construction activities taking place, and thus would not cause the emission of GHG.

5.5.2 Alternative 2 – Sand Placement for Emergency Beach Berms

Alternative 2, construction of the emergency beach berms, would result in minor short-term impacts from construction equipment resulting in temporary air emissions due to fuel usage. These temporary emissions would be below regulatory standards and would have a minor impact, below regulatory standards.

5.6 Clean Water Act

Section 401/404 of the Clean Water Act (CWA)/Section 10 of Rivers and Harbors Act (RHA) Existing Conditions: The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. (https://www.epa.gov/laws-regulations/summary-clean-water-act) Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Activities in waters of the United States regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports) and mining projects. Section 404 requires a permit before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from Section 404 regulation (e.g., certain farming and forestry activities).

5.6.1 Alternative 1 – No Action Alternative

Under the no-action alternative, no work would take place and there would be no potential impacts to waters of the United States.

5.6.2 Alternative 2 – Sand Placement for Emergency Beach Berms

Alternative 2, construction of the emergency beach berms, will consist of work that takes place above the annual high tide line, and thus there will be no impact to waters of the United States. Any projects, such as the Town of Oak Island, that utilize an offshore borrow area as a sand source, would result in short-term impacts from dredging resulting in temporary increased turbidity. The Subapplicants would be responsible for obtaining all necessary Section 401/ 404 permits from the USACE and shall be responsible for following all construction conditions, conservation measures, and monitoring requirements.

5.7 Floodplain Management (Executive Order 11988)

EO 11988, Floodplain Management, amended January 29, 2015, and as implemented in 44 CFR Part 9, requires federal agencies to "avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative." The 100-year floodplain is the area covered by water in the event of a 100-year flood, which is a flood that has a 1 percent chance of being equaled or exceeded in magnitude in any given year. The 500-year floodplain is the area covered by water in the event of a 500-year flood, which is a flood that has a 0.2 percent chance of being equaled or exceeded in magnitude in any given year. The VE zone is the coastal area subject to a velocity hazard (wave action) where BFEs are provided. The VE zones as well as the 100- and 500-year floodplains are mapped on FEMA Flood Insurance Rate Maps.

5.7.1 Alternative 1 – No Action Alternative

Under the no action alternative, no construction would occur and there would be no effect to the floodplain. Improved property adjacent to the project area would remain at risk from future flooding events.

5.7.2 Alternative 2 – Sand Placement for Emergency Beach Berms

Under Alternative 2, construction of the emergency beach berms would occur within the floodplain. The berms would serve to reduce the flood risk to the areas landward of the existing shoreline, including improved property and upland habitat. The project will maintain a viable beach environment for nesting habitat for threatened and endangered nesting sea turtles, as well as protect and maintain foraging habitat for shorebird species including the threatened piping plover and red knot. The coastal dunes are functionally dependent upon their location within the floodplain and also serve to facilitate open space use of the floodplain for recreational value, which is one of the natural and beneficial values of floodplains outlined in 44 CFR Part 9. The VE zones as well as the 100- and 500-year floodplains are mapped on FEMA Flood Insurance Rate Maps. An 8-step checklist, as required by 44 CFR Part 9, has been completed for this alternative (Appendix B).

5.8 Protection of Wetlands (Executive Order 11990)

Executive Order (EO) 11990, Protection of Wetlands, requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.

Information about the wetlands that could potentially be affected by the proposed project was gathered from USFWS National Wetlands Inventory Web Map Services. Coastal North Carolina beaches are identified under four main types of wetlands: marine, palustrine, riverine, and estuarine. According to the maps in Appendix A, the project areas are a compilation of all four types.

5.8.1 Alternative 1 – No Action Alternative

The criteria for this determination are if the project is outside of the wetland and has no effect on wetlands. Alternative 1, the no-action alternative, will have no construction activities therefore no work will occur in or and near wetlands and thus there will be no impact.

5.8.2 Alternative 2 – Sand Placement for Emergency Beach Berms

The criteria for the determination is if the projects could have a possible adverse effect associated with constructing in or near wetlands. According to the information above, the entire project area is classified as wetlands.

The proximity to the designated wetlands could cause temporary impacts to wetland adjacent areas from sand displacement during construction but have a beneficial impact long-term due to the construction of the emergency beach berms helping to restore the beach to a more natural topography. The proposed project will construct the emergency beach berms within the current coastal dune footprint while keeping a buffer around the designated wetlands, and thus should have a negligible impact on existing designated wetlands. An 8-step checklist, as required by 44 CFR Part 9, has been completed for this alternative (Appendix B).

5.9 Coastal Zone Management

The Coastal Zone Management Act provides for the management of the nation's coastal resources. The CZMA defines the coastal zones where development must be managed to protect areas of natural resources unique to coastal regions. States are required to define the area that will comprise coastal zone and develop management plans that will protect these unique resources through enforceable policies of state coastal zone management (CZM) programs. As defined in the Act, the coastal zone includes coastal waters extending to the outer limit of state submerged land title and ownership, adjacent shorelines, and land extending inward to the extent necessary to control shorelines.) Federal as well as local actions must be determined to be consistent with the CZM plans and policies before they can proceed.

5.9.1 Alternative 1 – No Action Alternative

Under the no action alternative, no work would occur and there would be no impact to the coastal zone.

5.9.2 Alternative 2 – Sand Placement for Emergency Beach Berms

Under the preferred alternative, activity and construction would occur in the coastal zone. The project would construct a series of emergency beach berms using beach compatible sand and be designed to mimic the natural coastal dune system. The Town of Surf City has obtained a CAMA General and Dredge & Fill Permit on September 28, 2018 (Permit #72219) which lists construction conditions and monitoring requirements. Subapplicants are responsible for obtaining all necessary CAMA permits from the NCDCM and shall be responsible for following all construction conditions, conservation measures, and monitoring requirements.

5.10 Coastal Barrier Resources Act (CBRA) / Coastal Barrier Improvement Act (CBIA)

The Coastal Barrier Resources Act of 1982 and subsequent amendments are designed to address problems caused by coastal barrier development by restricting most Federal expenditures and financial assistance that tend to encourage such development. Three important goals of CBRA are to minimize loss of human life by discouraging development in high risk areas, reduce wasteful expenditure of federal resources; and protect the natural resources associated with coastal barriers. The Coastal Barrier Improvement Act of 1990 reauthorized the CBRA and added new units. The CBIA, an addition to the CBRA, also designated a new category of lands called "otherwise protected areas" (OPAs). OPAs are based on areas established under federal, state, or local law, or held by a qualified organization, primarily for wildlife refuge, sanctuary, recreational, or natural resource conservation purposes.

North Carolina has 16 CBRS Units: 9 System Units and 7 OPA. Portions of North Topsail Beach's project would take place in CBRA System Unit L-05. This unit is the Onslow Beach Unit and was designated on 12/18/2018.

5.10.1 Alternative 1 – No Action Alternative

Under the no action alternative, no work would occur and there would be no impact to the coastal barrier or improvement zones.

5.10.2 Alternative 2 – Sand Placement for Emergency Berms

Alternative 2, the construction of the emergency beach berms, would involve work in a CBRA system unit. FEMA consulted with USFWS and received a response that the proposed action meets the following exceptions detailed in the CBRA consult in Appendix B: 16 U.S.C. 3505(a)(6)(E), regarding the assistance for emergency actions essential to the saving of lives and the protection of property and the public health and safety, if such actions are performed pursuant to sections 5170a, 5170b, and 5192 of title 42 and are limited to actions that are necessary to alleviate the emergency

5.11 Fish & Wildlife Resources

The natural sandy beaches on which the emergency beach berms are to be constructed serve as foraging and nesting habitat for numerous species, not just threatened and endangered ones. These include various species of shorebirds (discussed further in Section 5.14), wading birds, sea birds, crabs, mammals, and sea turtles (discussed further in Section 5.13).

5.11.1 Alternative 1 – No Action Alternative

Under the no action alternative, no work would occur and there would be no impacts to beach wildlife populations.

5.11.2 Alternative 2 – Sand Placement for Emergency Beach Berms

Alternative 2, construction of the emergency beach berms, would have short-term impacts to species living along the shoreline and coastal dune system. The sand placement activities will bury the majority of the existing benthic infauna, crustacean, and faunal wildlife that may live in the project area, which could have an impact to the foraging habitat of predator species, such as birds. However, the areas, and wildlife species are expected to recover over time and the long-term impacts will be minor.

5.12 Vegetation

Vegetation is a necessary component of a functioning coastal dune as the root systems serve to keep the dunes structure intact and resistant to erosion caused by wind and storm surge. In addition, dune vegetation provides foraging and nesting habitat to animals such as shorebirds.

5.12.1 Alternative 1 – No Action Alternative

Under the no-action alternative, the coastal emergency dunes would not be constructed and there would be no impact to coastal dune vegetation.

5.12.2 Alternative 2 – Sand Placement for Emergency Beach Berms

Alternative 2, construction of the emergency beach berms would have a moderate beneficial effect on dune vegetation. The Subapplicants will be required to follow the conditions of the USFWS Biological Opinions, listed in Section 9- Permits and Project Conditions, in order to mitigate the moderate short-term impacts to seabeach amaranth caused by this project to a level deemed acceptable to the USFWS. The Subapplicants will be required to follow the conditions of their individually issued CAMA permits. Coastal dune plantings will also serve to protect the integrity of the emergency berms, which will increase their resiliency to erosion and in turn protect improved property.

5.13 Threatened and Endangered Species

The Endangered Species Act (ESA) of 1973 provides for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The lead Federal agencies for implementing ESA are the USFWS and the U.S. National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS). As relevant to the proposed actions, the USFWS has regulatory authority for species occurring on land within the project areas and NMFS has regulatory authority for species occurring offshore should an offshore borrow area be utilized as a sand source. The law requires federal agencies to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. The law also prohibits any action that causes a “take” of any listed species of endangered fish or wildlife. A “take” includes the following actions: “harass, harm, pursue, hunt, shoot,

wound, kill, trap, capture, or collect, or attempt to engage in any such conduct."

In accordance with Section 7 of the Endangered Species Act (ESA) of 1973, the project was evaluated for the potential impact to federally listed threatened and endangered species that may be present in the project area identified by accessing the USFWS Information for Planning and Consultation (IPaC) database on July 16, 2020, and NOAA Fisheries Southeast Region NC Threatened and Endangered Species List..

The endangered species under USFWS regulatory authority likely to occur in the project areas are the roseate tern (*Sterna dougallii dougallii)*, green sea turtle (*Chelonia mydas*), hawksbill sea turtle (*Eretmochelys imbricate),* Kemp's ridley sea turtle (*Lepidochelys kempii*), and leatherback sea turtle (*Dermochelys coriacea*). The threatened species likely to occur in the project areas are the piping plover (*Charadrius melodus*), red knot (*Calidris canutus rufa*), loggerhead sea turtle (*Caretta caretta*), and seabeach amaranth (*Amaranthus pumilus*). The project area overlaps with critical habitat for the loggerhead sea turtle and piping plover. The shoreline and coastal dune system associated with the project area are suitable nesting habitat for the listed sea turtles, as well as foraging habitat for the piping plover and red knot.

The endangered species under NMFS regulatory authority likely to occur in the project areas are the blue whale (*Balaenoptera musculus),* fin whale (*Balaenoptera physalus),* humpback whale (*Megaptera novaeangliae),* North Atlantic right whale (*Eubalaena glacialis),* sei whale (*Balaenoptera borealis),* sperm whale (*Physeter macrocephalus),* green sea turtle (*Chelonia mydas),* hawksbill sea turtle (*Eretmochelys imbricate),* Kemp's ridley sea turtle (*Lepidochelys kempii),* leatherback sea turtle (*Dermochelys coriacea),* Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus),* and shortnose sturgeon (*Acipenser brevirostrum).* The threatened species likely to occur in the project areas is the loggerhead sea turtle (*Caretta caretta*). Along the coast of North Carolina, there is 1 North Atlantic right whale designated critical habitat unit, 6 Atlantic sturgeon critical habitat units, and multiple loggerhead sea turtle units for migratory overwintering, and nearshore reproductive habitats. The project area for the Town of Oak Island's project overlaps with the North Atlantic right whale unit and a loggerhead sea turtle nearshore reproductive habitat unit.

5.13.1 Alternative 1 – No Action Alternative

Alternative 1, the no-action alternative, would result in no construction activities taking place, and therefore there would be no potential for effects caused by the action. Nesting and foraging habitat for the seabirds and nesting habitat for the sea turtles, would continue to decline due to coastal erosion.

5.13.2 Alternative 2 – Sand Placement for Emergency Beach Berms

Under the preferred alternative, environmental impacts to species along the shoreline are anticipated due to construction of the emergency berms. Sand placement and associated activities may have an adverse effect on nesting sea turtles and turtle hatchlings. The Subapplicant will be required to follow all

reasonable and prudent measures, as well as the terms and conditions of the applicable Biological Opinion in order to mitigate the moderate short-term impacts to turtles, shorebirds, and seabeach amaranth caused by this projects to a level deemed acceptable to the USFWS. The Subapplicant will also be required to follow all conditions listed in any NCDCM issued CAMA permits.

The projects will also have moderate short-term adverse impacts to the piping plover, red knot, and other shorebird species due to the disruption in the foraging and nesting habitat caused by the construction activities. These adverse impacts can be mitigated by careful placement of berms to avoid existing bird habitat and roping off areas with birds. The projects will have potential adverse impacts to seabeach amaranth due to disruption to habitat or burial by the construction activities. These adverse impacts can be mitigated by careful placement of berms to avoid known areas.

Because of FEMA's determination that some the of the projects with actions occurring during sea turtle nesting season will likely adversely affect listed species, and are therefore not covered by the NCSPBO, FEMA has completed formal consultation with USFWS which will result in the issuance of a Biological Opinion. The Subapplicant will be required to follow all reasonable and prudent measures, as well as the terms and conditions of the appropriate Biological Opinion in order to mitigate the moderate short-term impacts to turtles, shorebirds, and seabeach amaranth caused by this projects to a level deemed acceptable to the USFWS. The terms and conditions of the USFWS NCSPBO and FEMA BO require, but are not limited to, the following: winter construction windows; installation of beach compatible sand; monitoring, surveying, and potential relocation of nests; escarpment monitoring; nighttime storage of equipment off the beach during nesting season; the compaction of sand; and post-construction monitoring.

Environmental impacts to marine and offshore species are anticipated due to dredging for projects that will utilize an offshore sand source. If dredging and associated activities occur, these actions may have an adverse effect sea turtles and whales. As such, the Subapplicant will be required to follow all reasonable and prudent measures, as well as terms and conditions within the NMFS SARBO, dated March 27, 2020. The terms and conditions of SARBO require, but are not limited to, the following: winter construction windows; NMFS certified observers; course alteration procedures; lighting ordinances; pre, during, and post construction monitoring; installation of beach quality sand; and sea turtle deflectors.

5.14 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 provides a program for the conservation of migratory birds that fly through lands of the United States. The lead Federal agency for implementing the MBTA is the USFWS. The law requires Federal agencies to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any migratory birds or result in the destruction or adverse modification of designated critical habitat of such species. The law makes it illegal for anyone to "take," possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or their parts, feathers, nests, or eggs. "Take" is defined as "to pursue, hunt, shoot, wound,

kill, trap, capture, or collect, or any attempt to carry out these activities." The entire state of North Carolina is considered a flyway zone for migratory birds. Approximately sixty-three (63) migratory bird species were identified as being potentially within the project areas by accessing the USFWS IPaC database on July 16, 2020. The listed migratory bird species have a varying range for probability of presence within the project vicinity throughout the year, and approximately half of the species have a designated breeding season which could occur within the project vicinity. The shoreline and coastal dune system associated with the project area is suitable foraging habitat for the species known to occur along the coast and near aquatic habitats.

5.14.1 Alternative 1 – No Action Alternative

Alternative 1, the no-action alternative, will have no effect on migratory birds as no construction activities will take place.

5.14.2 Alternative 2 - Sand Placement for Emergency Beach Berms

The criteria for this determination is if the project is located within a flyway zone and has potential to take migratory birds. The proposed scope of work will have a moderate impact on migratory birds as the 63 species have a varying range for probability to be present in the project areas throughout the year, with several of the species having a designated breeding season that could occur within the project timeline. The decline in the infaunal prey density due to the placement of sand and construction activities may contribute to the short-term decline in shorebird and seabird presence and usage of the project areas. Due to the moderate short-term impact, Subapplicants will be required to follow the conditions listed in the appropriate USFWS Biological Opinion (Appendix B), as well as any NCDCM CAMA permits. In the long-term, the construction of the emergency dunes will have a beneficial effect to migratory birds due to the increase in foraging and nesting habitat.

5.15 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act is the primary law governing marine fisheries management in U.S. federal waters and is meant to foster long-term biological and economic sustainability of our nation's marine fisheries. Key objectives of the MSA are to prevent overfishing, rebuild overfished stocks, increase long-term economic and social benefits, and ensure a safe and sustainable supply of seafood.

According to the NOAA Essential Fish Habitat mapping data, there are numerous habitats for coral and hard bottom along the North Carolina coast; there are no seagrass habitats.

5.15.1 Alternative 1 – No Action Alternative

Alternative 1, the no-action alternative, will not have any construction activities located in or near EFH and thus will have no impact on fisheries or breeding habitat.

5.15.2 Alternative 2 – Sand Placement for Emergency Beach Berms

Alternative 2, construction of the emergency beach berms, projects which utilizes an offshore borrow site as a sand source, as is the case for the Town of Oak Island, will potentially have an effect on essential fish habitat. Environmental impacts to various coastal and pelagic species of fishes, turtles, and marine mammals, as well as hard-bottom resources, are expected with dredging. The short-term impacts would be a decline in the density or presence of these species in the project area. The increase in turbidity of the water column may contribute to the short-term decline in organisms at the base of the food chain, such as planktonic species, and may lead to a short-term decline in the usage of the area for feeding species from fishes to baleen whales. The increased siltation could also result in the temporary covering of corals or other hardbottom resources adjacent to the dredge site or beach where sand is being piped. As water conditions return to normal, both the planktonic species and faunal species are expected to return. The dredging will increase the depths which could potentially decrease the productivity and habitat value of adjacent shallow water areas.

The Subapplicant shall comply with all conditions and conservation measures provided by NMFS within any issued Section 401/ 404 permit(s), including any applicable regional conditions. Due to the Town of Oak Island using an offshore borrow area that is partially located within Coral Essential Fish Habitat, and entirely within Spiny Lobster and Snapper-Grouper Essential Fish Habitat, FEMA completed consultation with NMFS' Southeast Habitat Conservation Division on December 11, 2019. The Town is required to follow all conditions within that consultation (Appendix B).

5.16 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668c), enacted in 1940, and amended several times since, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald or golden eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part*, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." "Disturb" means: "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

According to North Carolina Fish and Wildlife Conservation Commission mapping data, there are eagles' nests in the coastal counties of North Carolina, but none are in the area of potential impact.

5.116.1 Alternative 1 – No Action Alternative

Alternative 1, the no-action alternative will not involve any construction activity, so there will be no chance to take or disturb Bald or Golden Eagles.

5.16.2 Alternative 2 – Sand Placement for Emergency Beach Berms

Alternative 2, construction of the emergency beach berms, is not within the vicinity of any mapped eagle nests, so the project will not result in a take of the species and thus will have no effect.

5.17 Cultural Resources

Cultural resources include historic architectural properties (including buildings, structures, and objects), prehistoric and historic archaeological sites, historic districts, designed landscapes, and traditional cultural properties. The primary federal authorities that apply to cultural resources are NEPA and Section 106 of the National Historic Preservation Act (NHPA). Cultural resources are specifically included under one of the mandates of NEPA: to "preserve important historic, cultural, and natural aspects of our national heritage…." (42 USC 4331). The implementing regulation for the NHPA is the Protection of Historic Properties (36 CFR 800), which defines historic properties as any prehistoric or historic district, site, building, structure, or object that is included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) (36 CFR. 800.16). Under the NHPA, a property possesses significance if it meets the NRHP criteria listed in 36 CFR 60.4 and retains sufficient integrity to convey that significance. Generally, properties must be at least 50 years old to be eligible for the NRHP, unless they are proven to have exceptional importance. When historic properties are present, federal agencies must assess the effect of the undertaking and consider ways to minimize or mitigate potential adverse effects. No important non-NRHP cultural resources were identified under NEPA; therefore, impacts under NEPA and effects under Section 106 are discussed only for historic properties.

FEMA, the North Carolina State Historic Preservation Office (SHPO), the North Carolina Department of Public Safety, and the Advisory Council on Historic Preservation have executed a Statewide Programmatic Agreement dated May 8, 2020, to streamline the Section 106 review process.

There is a multitude of resources within the coastal counties of North Carolina. FEMA evaluated potential resources in the APE utilizing the North Carolina Master Site File (NCMSF) and in coordination with the NC SHPO, and there are no known resources within the project areas.

5.17.1 Alternative 1 – No Action Alternative

Under the no action alternative, no undertaking by FEMA and no construction would occur, therefore there would be no potential for effects and no further responsibility under Section 106.

5.17.2 Alternative 2 – Sand Placement for Emergency Beach Berms

Under the preferred alternative, the construction of emergency beach berms, would be constructed using a permitted upland sand source or authorized offshore borrow area. The projects are not anticipated to

have an impact on any known sites along the coast.

FEMA consulted with the NC SHPO and received a response back, see documentation in Appendix A, and the proposed actions are unlikely to affect historic properties listed, or eligible for listing, in the National Register of Historic Places (Appendix B).

5.18 Land Use and Planning

According to county land use data, the project areas consist of undeveloped coastal beach adjacent to a mixture of state-owned recreational park land, federal-owned National Seashore, as well as developed residential and mixed commercial/residential land.

5.18.1 Alternative 1 – No Action Alternative

Alternative 1, the no-action alternative, will not result in an alteration of the current land use as no construction will take place, thus it will have no impact on land use.

5.18.2 Alternative 2 – Sand Placement for Emergency Beach Berms

Alternative 2 will have no effect on land use and planning because the area is already a coastal dune system, so the use will not change with the proposed action.

5.19 Noise Control Act

The Noise Control Act of 1972 establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. The Act also serves to (1) establish a means for effective coordination of Federal research and activities in noise control; (2) authorize the establishment of Federal noise emission standards for products distributed in commerce; and (3) provide information to the public respecting the noise emission and noise reduction characteristics of such products.

5.19.1 Alternative 1 – No Action Alternative

Alternative 1, the no-action alternative, will not result in construction activities taking place and thus will have no effect on noise levels in the area.

5.19.2 Alternative 2 – Sand Placement for Emergency Beach Berms

Alternative 2 involves the construction of emergency beach berms and thus will have minor short-term impacts on noise levels resulting from the use of construction equipment in the project area.

5.20 Transportation

The scope of work provided by the Subapplicant doesn’t include the construction of any transportation features, as the work will be done using the existing roads.

5.20.1 Alternative 1 – No Action Alternative

Alternative 1, the no-action alternative, would not involve any construction activities and thus would have no impact on existing infrastructure.

5.20.2 Alternative 2 – Sand Placement for Emergency Beach Berms

Alternative 2, because it involves the construction of emergency beach berms, would have minor short-term impacts from construction equipment entering/leaving the project areas transporting sand and construction equipment to the project locations.

5.21 Environmental Justice (EO 12898) / Socioeconomic

On February 11, 1994, President Clinton signed EO 12898, entitled, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations". The EO directs federal agencies, "to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States."

5.21.1 Alternative 1 – No Action Alternative

Alternative 1, the no-action alternative, would involve no construction activities and thus would have no impact on minority or low-income populations.

5.21.2 Alternative 2 – Sand Placement for Emergency Beach Berms

Under the preferred alternative, no disproportionate impacts, adverse impacts to minority or low-income populations are anticipated. The project benefits would be to all population members as these areas are accessible to the public with no access fees. For the project area counties, the population of Onslow County was 177,772 (U.S. Census Bureau, 2010). Minorities (African American, Hispanic, Latino, American Indian, Asian, Native Hawaiian/Pacific Islanders, or a mix of these races) are 34.3 percent of the population; and persons below the poverty level are 12.5 percent of the population (U.S. Census Bureau, 2010). The population of Pender County was 52,217. Minorities are 24.6 percent of the population; and persons below the poverty level are 11.5 percent of the population. The population of Brunswick County was 107,431. Minorities are 17.7 percent of the population; and persons below the poverty level are 10.2 percent of the population.

5.22 Hazardous Materials/Waste and Solid Waste

The Resource Conservation and Recovery Act (RCRA) was passed to create the framework for the proper management of hazardous and non-hazardous solid waste. The law describes the waste management program mandated by Congress that gave the EPA authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage and disposal of hazardous waste. No known hazardous materials or solid waste is within the project area.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. Over five years, $1.6 billion was collected and the tax went to a trust fund for cleaning up abandoned or

uncontrolled hazardous waste sites. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) established prohibitions and requirements concerning closed and abandoned hazardous waste sites; provided for liability of persons responsible for releases of hazardous waste at these sites; and established a trust fund to provide for cleanup when no responsible party could be identified.

According to the Superfund National Priorities List (NPL) Where You Live Map (https://www.epa.gov/superfund/search-superfund-sites-where-you-live), there are 46 Superfund sites located within North Carolina; there are no Superfund sites located in or near the project areas. Additionally, since the majority of the project areas are coastal dune systems, there is a low likelihood of contamination.

5.22.1 Alternative 1 – No Action Alternative

Alternative 1, the no-action alternative, will not involve any construction and thus will have no potential to disturb hazardous materials or create any potential hazard to human health.

5.22.2 Alternative 2 – Sand Placement for Emergency Beach Berms

Alternative 2, construction of emergency beach berms, would have a minor short-term impact on the dunes due to construction activities. All handling of hazardous materials and waste generated during construction activities would be handled with in accordance with applicable RCRA and state regulations. Potential for spills from construction equipment will be minimized and handled in accordance with applicable regulations. The potential for any construction activities related to this project to impact hazardous waste sites designated under CERCLA as there are no designated superfund sites in any of the project areas.

5.23 Drinking Water

The Safe Water Drinking Act, passed in 1974, authorizes the EPA to set national health-based standards for drinking water to protect against both naturally occurring and man-made contaminants that may be found in drinking water. According to the EPA's Map of Sole Source Aquifer Locations (https://www.epa.gov/dwssa/map-sole-source-aquifer-locations), there are no Sole Source Aquifers located within North Carolina.

5.23.1 Alternative 1 – No Action Alternative

Alternative 1, the no-action alternative, will involve no construction activities and thus will have no impact on contaminated areas.

5.23.2 Alternative 2 – Sand Placement for Emergency Beach Berms

Alternative 2, construction of emergency beach berms would have no impact on drinking water as there are no sole source aquifers in North Carolina.

6.0 CUMULATIVE IMPACTS

Per the Council on Environmental Quality (CEQ) regulations, cumulative impacts are the impacts on the environment that "results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non- Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7). In accordance with NEPA, this Programmatic EA considered the combined effect of the preferred alternative and the no action alternative throughout coastal North Carolina, and specifically in the vicinity of the three proposed project areas.

As is true for the three project areas considered in this PEA, a majority of the shoreline in North Carolina is developed with residential housing and other improved property. The proposed action will temporarily increase the level of storm protection to the existing shoreline, available habitat, and existing improved property to withstand a 5-year flooding event. The overall impacts on the functionality of the floodplain is anticipated to be minor, as the action will facilitate temporary restoration of shorelines damaged by declared events and deemed eligible under FEMA's Public Assistance Program and Policy Guide. The proposed action is not anticipated to result in significant adverse impacts on floodplains, as the continued occupancy of the floodplain by existing residences should not result in long-term alteration of the natural beach dynamics and floodplain hydrology within the action areas. Federal and state permits, as applicable, will be obtained which will outline any possible compensatory mitigation for impacts to surface waters and wetlands incurred by the proposed projects.

North Carolina has over 300 miles of coastline with 122 miles being managed, and that number is expected to grow to over 163 miles (NCSPBO, pg. 2). The state's shoreline and associated coastal dune systems have regularly sustained damages from tropical storms and hurricanes, with an expected 250% increase in average annual sand placement in years following major storm events (NCSPBO, pg. 2). The natural fluctuation in the topography of the existing beaches is compounded by previous and ongoing attempts to restore the areas through dredging and placing sand along the shoreline. Continued maintenance of engineered beaches as well as future construction of engineered beaches is certain, including all three project areas discussed within this PEA. The Towns of North Topsail Beach and Surf City were approved for a $237 million USACE Coastal Storm Damage Reduction Project; four other communities on the island of Bogue Banks were also awarded funding for their engineered beach projects. For North Topsail Beach, this new funding will be in addition to the ongoing maintenance of the New River Inlet by USACE in which the dredged material is placed within the northern Section 1 portion of their beach. The Town of Oak Island will be completing a beach renourishment in 2021.

The project and anticipated future actions in the area will have short-term impacts to commercial and recreational usage of the shoreline and associated borrow areas due to construction efforts. However, it is anticipated there will be no long-term impact to benthic populations or commercial fisheries and beneficial long-term impacts to commercial and recreational usage of the shoreline as a result of the improved dune

system and protection from future flooding events. Tourism is an integral part of North Carolina's economy, with over $26.8 billion being spent within the state in 2019 and 1 in 45 jobs being directly tied to tourism. The North Carolina coast and its beaches are a large component of the state's tourism economy. A majority of counties in the top 20 list for tourism spending are coastal counties, including Brunswick, Pender, and Onslow – continued maintenance of the beaches will continue its benefit for tourism and recreational value. The proposed action to construct emergency beach berms is not expected to have significant adverse cumulative impacts on any resources based on the review conducted when added to past, present, and reasonably foreseeable future actions within the proposed action area of coastal North Carolina.

7.0 PUBLIC INVOLVEMENT

FEMA issued a disaster-wide initial public notice for Hurricane Florence on October 25, 2018, and for Hurricane Dorian on December 11, 2019, to notify the public of projects under the Public Assistance program that may be occurring within floodplains.

The public will be notified of the availability of the EA for review and comment by posting of the public notice on XX/XX/XXXX (Appendix A). The EA will be posted on FEMA's website, the Subapplicants' websites, and the NC Clearinghouse distribution. The public comment period ends after 30 days on Month/Day/Year.

8.0 AGENCY COORDINATION

The following agencies and organizations were contacted during the preparation of this EA:

- U.S. Fish and Wildlife Service, Raleigh Ecological Services Field Office (USFWS)
- U.S. National Marine Fisheries, Southeast Regional Office, Habitat Conservation Division/Atlantic & Caribbean Branch (NMFS)
- U.S. Army Corps of Engineers, Wilmington and Washington District Offices (USACE)
- North Carolina Department of Environmental Quality Division of Coastal Management (NCDCM)
- North Carolina Department of Environmental Quality Division of Water Quality
- North Carolina Department of Environmental Quality Wildlife Resources Commission
- North Carolina State Historic Preservation Office (SHPO)
- North Carolina Office of State Archaeology (OSA)

9.0 PERMITS AND PROJECT CONDITIONS

1) NCDEQ Coastal Area Management Act (CAMA) Permit, and associated conditions;

2) USACE Individual Permit, if required such as for dredging, and associated conditions;

3) USFWS NC Statewide Programmatic Biological Opinion for Sand Placement (dated August 28, 2017), and all Reasonable and Prudent Measures and Terms and Conditions;

The Service believes the following reasonable and prudent measures (RPMs) are necessary and appropriate to minimize take of piping plovers, red knots, seabeach amaranth, and sea turtles in the Action Area for the following sand placement activities:

A. Sand placement from beach nourishment activities; and
B. Sand placement from navigation channel maintenance.

If unable to comply with the RPMs and Terms and Conditions, the Corps, as the regulatory authority or construction agent may:

1. Inform the Service why the RPM or Term and Condition is not reasonable and prudent for the specific project or activity and request exception under the SPBO; or
2. Initiate consultation with the Service for the specific project or activity.

The Service may respond by either of the following:

1. Allowing an exception to the Terms and Conditions under the SPBO; or
2. Recommending or accepting initiation of consultation (if initiated by the Corps) for the specific project or activity.

REASONABLE AND PRUDENT MEASURES for:

A. Projects that include sand placement from beach nourishment activities, primarily for shore protection (these projects are usually larger scaled) shall include the following measures:

Post-construction requirements are listed in Reasonable and Prudent Measures A.13, A.16, A.17, A.18, A.19, and A.21. These post-construction requirements may be subject to congressional authorization and the allocation of funds. If the Corps or Permittee cannot fulfill these Reasonable and Prudent Measures, the Corps must reinitiate consultation.

RPMs – All Species

A.1. Conservation Measures included in the Corps' Programmatic Biological Assessment (PBA) that address protection of nesting sea turtles, piping plovers, red knots, and seabeach amaranth shall be implemented in the Corps federally authorized project or regulated activity. If a RPM and Term and Condition address the same requirement, the requirements of the RPM and Term and Condition take precedence over the Conservation Measure.

A.2. The Corps will notify the Service of the commencement of projects that utilize this SPBO for the purposes of tracking incidental take of all species.

A.3. For the life of the project, all sand placement activities above MHW must be conducted within the winter work window (November 16 to April 30).

A.4. Prior to sand placement, all derelict material, large amounts of rock, or other debris must be removed from the beach to the maximum extent possible.

A.5. During construction, trash and food items shall be disposed of properly either in predator-proof receptacles, or in receptacles that are emptied each night to minimize the potential for attracting predators of piping plovers, red knots, and sea turtles.

A.6. Pipeline placement must be coordinated with NCDCM, the Corps, the Service, and the NCWRC. Pipeline placement coordination may be accomplished through the permit application or Corps' contract processes utilizing appropriate GIS tools.

A.7. Access points for construction vehicles should be as close to the project site as possible. Construction vehicle travel down the beach should be limited to the maximum extent possible.

A.8. A meeting between representatives of the Permittee or Corps, the Service, NCWRC, and NCDCM, must be held prior to the commencement of work on each project.

A.9. The Corps shall facilitate an annual meeting with the Service to assess the effectiveness of the protection and minimization measures outlined in this SPBO.

RPMs - Piping Plovers and Red Knots

A.10. All personnel involved in the construction or sand placement process along the beach shall be aware of the potential presence of piping plovers and red knots. Before start of work each morning, a visual survey must be conducted in the area of work for that day, to determine if piping plovers and red knots are present.

A.11. If project-related activities will potentially adversely affect nesting shorebirds or active nesting habitat, the Corps or Permittee must coordinate with the Service and NCWRC prior to proceeding. If the project is ongoing and shorebirds begin territorial or other nesting behaviors within the project area, then the Corps or Permittee must contact the Service and NCWRC as soon as possible.

A.12. If project activities will be conducted in Optimal Piping Plover Areas (defined in Terms and Conditions A.13 and A.14), the Corps or the Permittee shall clearly delineate work areas within the Optimal Piping Plover Area such as pipeline corridors, travel corridors, and access points. Disturbance outside those delineated work areas must be limited to the maximum extent possible, thereby minimizing effects to sandy unvegetated habitat within the project footprint.

A.13. If project activities will be conducted in Optimal Piping Plover Areas (defined in Term and ConditionsA.13 and A.14), the Corps, the Permittee, or the local sponsor shall provide the mechanisms necessary to monitor impacts to the piping plovers from the project for two years post-construction.

RPMs – Loggerhead, Green, Leatherback, Hawksbill, and Kemp's Ridley Sea Turtles

A.14. Only beach quality sand suitable for sea turtle nesting, successful incubation, and hatchling emergence (defined in Term and Condition A.18) shall be used for sand placement.

A.15. During dredging operations, material placed on the beach shall be qualitatively inspected daily to ensure compatibility. If the inspection process finds that a significant amount of non-beach compatible material is on or has been placed on the beach, all work shall stop immediately and the NCDCM and the Corps will be notified by the Permittee or Corps to determine the appropriate plan of action.

A.16. Sea turtle nesting surveys must be conducted within the project area between May 1 and November 15 of each year, for at least two consecutive nesting seasons after completion, if the sand remains on the beach. Acquisition of readily available sea turtle nesting data from qualified sources (volunteer organizations, other agencies, etc.) is acceptable.

A.17. Visual surveys for escarpments along the Action Area must be made immediately after completion of sand placement, and within 30 days prior to May 1, for two subsequent years after any construction or sand placement event.

A.18. Sand compaction must be qualitatively evaluated at least twice after each sand placement event. Sand compaction must be inspected in the project area immediately after completion of any sand placement event and one time after project completion between October 1 and May 1.

A.19. A report describing the fate of observed sea turtle nests and hatchlings and any actions taken, must be submitted to the Service following completion of work for each year when a sand placement activity has occurred.

A.20. If a dune system is part of the project design, the placement and design of the dune must be coordinated with the Service.

RPMs – Seabeach Amaranth

A.21. The Corps Civil Works Program shall continue its annual seabeach amaranth monitoring program.

TERMS AND CONDITIONS FOR:

A. Sand placement from beach nourishment activities

All conservation measures described in the Corps' Programmatic Biological Assessment are hereby incorporated by reference as Terms and Conditions within this document pursuant to 50 CFR §402.14(I) with the addition of the following Terms and Conditions. In order to be exempt from the prohibitions of

section 9 of the Act, the Corps shall comply with the following Terms and Conditions, which implement the Reasonable and Prudent Measures, described above and outline reporting/monitoring requirements. These terms and conditions are non-discretionary.

Post-construction requirements are listed in Terms and Conditions A.13, A.14, A.17, A.18, A.19, A.20, A.22, A.23, A.24, A.25, and A.26. These post-construction requirements may be subject to congressional authorization and the allocation of funds. If the Corps or Permittee cannot fulfill these Terms and Conditions, the Corps must reinitiate consultation.

Terms and Conditions – All Species

A.1. Conservation Measures included in the Corps' PBA that address protection of nesting sea turtles, piping plover, red knot, and seabeach amaranth listed on pages 10-11 of the SPBO shall be implemented in the Corps federally authorized project or regulated activity.

A.2. The Corps or the Permittee must provide the following information to the Service at least 10 business days prior to the commencement of work:

a) Project location (include latitude and longitude coordinates, as well as mile markers, cross streets, or street addresses if available);
b) Project description (including linear feet of beach, actual fill template, access points, and borrow areas); and
c) Anticipated date of commencement and anticipated duration of construction.

A.3. For the life of the permit/project, all sand placement activities above MHW must be conducted within the winter work window (November 16 to April 30), unless a variance is approved after additional consultation with the Service.

A.4. Prior to sand placement, all derelict material, large amounts of rock, or other debris must be removed from the beach to the maximum extent possible. If debris removal activities take place during shorebird breeding season (April 1– August 31), the work shall be conducted during daylight hours only.

A.5. During construction, trash and food items shall be disposed of properly either in predatorproof receptacles, or in receptacles that are emptied each night to minimize the potential for attracting predators of piping plovers, red knots, and sea turtles.

A.6. Pipeline placement must be coordinated with NCDCM, the Corps, the Service, and the NCWRC. This may be accomplished through the permit application or Corps' contract processes utilizing appropriate GIS tools.

A.7. Access points for construction vehicles should be as close to the project site as possible. Construction vehicle travel down the beach should be limited to the maximum extent possible.

A.8. A meeting between representatives of the contractor(s), the Corps, the Service, the NCWRC, and NCDCM, must be held prior to the commencement of work. Advance notice (of at least 5 business days) must be provided prior to conducting this meeting. The meeting will provide an opportunity for explanation and/or clarification of the Conservation Measures and Terms and Conditions, and will include the following:

a) Staging locations, and storing of equipment, including fuel stations;
b) Coordination with the surveyors on required species surveys;
c) Pipeline placement;
d) Minimization of driving within and around the Action Area;
e) Follow up coordination during construction and post construction;
f) Direction of the work including progression of sand placement along the beach;
g) Plans for compaction monitoring;
h) Plans for escarpment surveys and
i) Names and qualifications of personnel involved in any required species surveys.

A.9. Following the preconstruction meeting, the Corps shall provide the Service with specific anticipated shoreline lengths and anticipated duration of the project, using the form on the following web link: https://www.fws.gov/northflorida/SeaTurtles/Docs/Corp%20of%20Engineers%20Sea%20Turtle%20Permit%20Information.pdf. Only the following information should be filled out: Corps permit number, FWS Log Number, Project Location, Construction Activity, Duration of Project, and Actual Take (linear feet of beach). This form shall be emailed to the Service at <seaturtle@fws.gov>.
The form should be filled out using information from the permit application or authorization. This form is in addition to the annual report, listed below.

A.10. The Corps shall meet with the Service, NCDCM, and NCWRC (and cooperating agencies such as BOEM, as appropriate) annually to discuss the effectiveness of the avoidance measures and additional measures to include for future projects. The agencies will also review the projects utilizing this SPBO the previous year to ensure that the reporting requirements for calculating the extent of take are adequate. This meeting will also explore:

a) The possibility of using dredged materials to enhance potential or existing piping plover habitat within and adjacent to the project area;
b) Methods for funding beneficial use opportunities for dredged materials that are not least-cost disposal to benefit piping plovers and their habitat;
c) The development of shore protection design guidelines that can be utilized during future project planning to protect and/or enhance piping plover habitat; and
d) Incorporating artificial lagoons or ephemeral pools into project designs adjacent to inlets where sand placement is proposed.

Terms and Conditions – Piping Plovers and Red Knots

A.11. All personnel involved in the construction or sand placement process along the beach shall be

aware of the potential presence of piping plovers and red knots. Before start of work each morning, a visual survey must be conducted in the area of work for that day, to determine if piping plovers and red knots are present. If shorebirds are present in the work area, careful movement of equipment in the early morning hours should allow those individuals to move out of the area. Construction operations shall be carried out at all times in a manner as to avoid negatively impacting shorebirds and allowing them to exit the area.

A.12. If project-related activities will potentially adversely affect nesting shorebirds or active nesting habitat, the Corps or Permittee must coordinate with the Service and NCWRC prior to proceeding. If the project is ongoing and shorebirds begin territorial or other nesting behaviors within the project area, then the Corps or Permittee must contact the Service and NCWRC as soon as possible.

A.13. If project activities will be conducted in Optimal Piping Plover Areas, piping plover habitat (sandy unvegetated habitat) within the Optimal Piping Plover Area shall be avoided to the maximum extent practicable when staging equipment, establishing travel corridors, and aligning pipeline. The Corps or the Permittee, to the maximum extent practicable, shall clearly delineate work areas within the Optimal Piping Plover Area such as pipeline corridors, travel corridors, and access points. Disturbance outside those delineated work areas must be limited, thereby minimizing effects to sandy unvegetated habitat. Driving on the beach for construction shall be limited to the minimum necessary within the designated travel corridor. The delineation of work corridors and work areas in authorized project plans will be sufficient to meet this term and condition. Optimal Piping Plover Areas are defined as having documented use by piping plovers, and they include coastal habitat features that function mostly unimpeded. Optimal Piping Plover Areas include:

a) Designated piping plover Critical Habitat Units (see **Appendix C**);
b) All Federal, State, and County publicly owned land where coastal processes are allowed to function, mostly unimpeded*, that have any of the following features in the Action Area:
    i. Located within 1 mile of an inlet;
    ii. Emergent nearshore sand bars;
    iii. Washover fans;
    iv. Emergent soundside and Ocean shoals and sand bars;
    v. Soundside mudflats, sand flats, and algal flats; or
    vi. Soundside shorelines.

[*Publicly owned land where coastal processes are allowed to function, mostly unimpeded, generally does not include public lands that are solely state-owned water bottoms, street ends, parking lots, piers, beach accesses, heavily-developed or highly-manipulated parks, or shoreline developed for commercial or residential purposes. It generally does include public lands consisting of undeveloped parks, preserves, and other natural undeveloped shoreline and dunes.]

A.14. If project related activities will be conducted in Optimal Piping Plover Areas, then the piping plover and red knot survey protocol in **Appendix D** must be followed. Two full years of post-construction monitoring is required. Optimal Piping Plover Areas include:

a) Designated piping plover Critical Habitat Units (see **Appendix C**);
b) All Federal, State, and County publicly owned land where coastal processes are allowed to function, mostly unimpeded*, that have any of the following features in the Action Area:
    i. Located within 1 mile of an inlet;
    ii. Emergent nearshore sand bars;
    iii. Washover fans;
    iv. Emergent soundside and Ocean shoals and sand bars;
    v. Soundside mudflats, sand flats, and algal flats; or
    vi. Soundside shorelines.

[*Publicly owned land where coastal processes are allowed to function, mostly unimpeded, generally does not include public lands that are solely state-owned water bottoms, street ends, parking lots, piers, beach accesses, heavily-developed or highly-manipulated parks, or shoreline developed for commercial or residential purposes. It generally does include public lands consisting of undeveloped parks, preserves, and other natural undeveloped shoreline and dunes.]

Terms and Conditions – Sea Turtles

A.15. Only beach compatible fill shall be placed on the beach or in any associated dune system. Beach compatible fill must be sand that is similar to a native beach in the vicinity of the site that has not been affected by prior sand placement activity. Beach compatible fill must be sand comprised solely of natural sediment and shell material, containing no construction debris, toxic material, large amounts of rock, or other foreign matter. The beach compatible fill must be similar in both color and grain size distribution (sand grain frequency, mean and median grain size and sorting coefficient) to the native material in the Action Area. Beach compatible fill is material that maintains the general character and functionality of the material occurring on the beach and in the adjacent dune and coastal system. In general, fill material that meets the requirements of the most recent version of the North Carolina Technical Standards for Beach Fill (15A NCAC 07H .0312) is considered compatible.

A.16. During dredging operations, material placed on the beach shall be qualitatively inspected daily to ensure compatibility. If the inspection process finds that a significant amount of non-beach compatible material is on or has been placed on the beach, all work shall stop immediately, and the NCDCM, Corps, and BOEM (as appropriate) will be notified by the permittee and/or its contractors to determine the appropriate plan of action. Required actions may include immediate removal of material and/or long-term remediation activities.

A.17. Daily sea turtle nesting surveys must be conducted within the project area between May 1 and November 15 of each year, for at least two consecutive nesting seasons after completion of sand placement (2 years post-construction monitoring). Acquisition of readily available sea turtle nesting data from qualified sources (volunteer organizations, other agencies, etc.) is acceptable. However, in the event that data from other sources cannot be acquired, the Corps or permittee will

be responsible to collect the data. Data collected for each nest should include, at a minimum, the information in the table, below. This information will be provided to the Service in the annual report, and will be used to periodically assess the cumulative effects of these projects on sea turtle nesting and hatchling production and monitor suitability of post construction beaches for nesting. Please see REPORTING REQUIREMENTS, below.

Parameter	**Measurement**	**Variable**
Number of False Crawls	Visual Assessment of all false crawls	Number/location of false crawls in nourished areas; any interaction of turtles with obstructions, such as sand bags or scarps, should be noted.
False Crawl Type	Categorization of the stage at which nesting was abandoned	Number in each of the following categories: a) Emergence - no digging; b) Preliminary body pit; c) Abandoned egg chamber.
Nests	Number	The number of sea turtle nests in nourished areas should be noted. If possible, the location of all sea turtle nests should be marked on a project map, and approximate distance to scarps or sandbags measured in meters. Any abnormal cavity morphologies should be reported as well as whether turtle touched sandbags or scarps during nest excavation.
Nests	Lost Nests	The number of nests lost to inundation or erosion or the number with lost markers.
Nests	Relocated nests	The number of nests relocated and a map of the relocation area(s). The number of successfully hatched eggs per relocated nest.
Lighting Impacts	Disoriented sea turtles	The number of disoriented hatchlings and adults.

A.18. Visual surveys for escarpments along the Action Area must be made immediately after completion of sand placement, and within 30 days prior to May 1, for two subsequent years after any construction or sand placement event. Escarpments that interfere with sea turtle nesting or that exceed 18 inches in height for a distance of 100 feet must be leveled and the beach profile must be reconfigured to minimize scarp formation by the dates listed above. Any escarpment removal must be reported by location. The Service must be contacted immediately if subsequent reformation of escarpments that interfere with sea turtle nesting or that exceed 18 inches in height for a distance of 100 feet occurs during the nesting and hatching season to determine the appropriate action to be taken. If it is determined that escarpment leveling is required during the nesting or hatching season, the Service or NCWRC will provide a brief written authorization

within 30 days that describes methods to be used to reduce the likelihood of impacting existing nests. An annual summary of escarpment surveys and actions taken must be submitted to the Service.

A.19. Sand compaction must be qualitatively evaluated at least twice after each sand placement event, once in the project area immediately after completion of any sand placement event and once after project completion between October 1 and May 1. Compaction monitoring and remediation are not required if the placed material no longer remains on the beach. Within 14 days of completion of sand placement and prior to any tilling (if needed), a field meeting shall be held with the Service, NCWRC, and the Corps to inspect the project area for compaction and determine whether tilling is needed.

a) If tilling is needed for sand suitability, the area must be tilled to a depth of 36 inches. All tilling activities shall be completed prior to May 1 of any year.
b) Tilling must occur landward of the wrack line and avoid all vegetated areas that are 3 square feet or greater, with a 3-foot buffer around all vegetation.
c) If tilling occurs during the shorebird nesting season or seabeach amaranth growing season (after April 1), shorebird surveys and/or seabeach amaranth surveys are required prior to tilling.
d) A summary of the compaction assessments and the actions taken shall be included in the annual report to NCDCM, the Corps, and the Service.
e) These conditions will be evaluated and may be modified if necessary to address and identify sand compaction problems.

A.20. A report describing the fate of observed sea turtle nests and hatchlings and any actions taken, must be submitted to the Service following completion of the proposed work for each year when a sand placement activity has occurred. Please see REPORTING REQUIREMENTS, below.

A.21. If a dune system is part of the project design, the placement and design of the dune must be coordinated with the Service.

Terms and Conditions – Seabeach Amaranth

A.22. The Corps Civil Works Program shall continue its annual seabeach amaranth monitoring program in accordance with April 19, 1993 Biological Opinion for various U.S. Army Corps of Engineers' projects and Terms and Conditions A.23 to A.26, below.

A.23. The Corps should survey beach sand placement areas for at least five years following each placement event, to determine the status of the seabeach amaranth populations in the project areas and the effects that beach disposal has on this species. Surveys should be conducted in August or September so that the number of plants reaching reproductive age can be determined.

A.24. Suitable habitat along shoreline reaches that have received sand within the previous five years should be surveyed for the occurrence of seabeach amaranth. Documentation for each seabeach amaranth plant should include location (using a handheld GPS unit), unique features,

abnormalities, or other relevant information. If multiple plants are observed in an area, a single representative GPS point may be logged with accompanying notes describing total plants associated with that point.

A.25. A Corps report describing the seabeach amaranth survey and results should be submitted to Service, the North Carolina Natural Heritage Program, and the North Carolina Plant Conservation Program, by December 31 of each year. The report should include a map showing locations of seabeach amaranth populations and the numbers of plants, with separate figures for those in flower or fruit, found in the sand placement areas.

A.26. If tilling of the beach is required due to high compaction levels resulting from beach disposal, surveys should be conducted in advance of the tilling for seabeach amaranth (see sea turtle section - Reasonable and Prudent Measures). No tilling should be conducted in the immediate areas where seabeach amaranth plants are growing.

REASONABLE AND PRUDENT MEASURES for:

B. Projects that are navigation maintenance dredging with beach placement shall include the following measures:

Historically, sand placement events associated with navigation maintenance dredging projects have no local sponsor, are smaller-scaled, conducted at closer time intervals, and the sand often does not remain on the beach for an extended period of time.

Post-construction requirements are listed in Reasonable and Prudent Measures B.11, B.12, B.13, B.15, and B.16. These post-construction requirements may be subject to congressional authorization and the allocation of funds. If the Corps or Permittee cannot fulfill these Terms and Conditions, the Corps must reinitiate consultation.

B.1. Conservation Measures included in the Corps' PBA that address protection of piping plovers, red knots, nesting sea turtles, and seabeach amaranth shall be implemented in the Corps' federally authorized project or regulated activity.

B.2. The Corps will notify the Service of the commencement of projects that utilize this SPBO for the purposes of tracking incidental take of all species.

B.3. For the life of the project, all sand placement activities above MHW must be conducted within the winter work window (November 16 to April 30).

B.4. Prior to sand placement, all derelict material, large amounts of rock, or other debris must be removed from the beach to the maximum extent possible.

B.5. During construction, trash and food items shall be disposed of properly either in predatorproof receptacles, or in receptacles that are emptied each night to minimize the potential for attracting predators of piping plovers, red knots, and sea turtles.

B.6. Pipeline placement must be coordinated with NCDCM, the Corps, the Service, and the NCWRC.

B.7. Access points for construction vehicles should be as close to the project site as possible. Construction vehicle travel down the beach should be limited to the maximum extent possible.

B.8. Beach quality sand suitable for sea turtle nesting, successful incubation, and hatchling emergence shall be used for sand placement.

B.9. A meeting between representatives of the Corps, Service, NCWRC, and NCDCM shall be held prior to the commencement of work on this project.

B.10. During dredging operations, material placed on the beach shall be inspected daily to ensure compatibility. If the inspection process finds that non-beach compatible material, including large amounts of shell or rock, is or has been placed on the beach, all work shall stop immediately and the NCDCM and the Corps will be notified by the permittee and/or its contractors to determine the appropriate plan of action.

B.11. For navigation projects with placement of at least 200,000 cubic yards of sand on the beach, sea turtle nesting surveys must be conducted within the project area between May 1 and November 15 of each year, for at least two consecutive nesting seasons after completion, if the sand remains on the beach. Acquisition of readily available sea turtle nesting data from qualified sources (volunteer organization, other agencies, etc.) is acceptable.

B.12. Sand compaction shall be monitored and tilling shall be conducted if needed to reduce the likelihood of impacting sea turtle nesting and hatching activities.

B.13. Escarpment formation shall be monitored and leveling shall be conducted if needed to reduce the likelihood of impacting nesting and hatchling sea turtles.

B.14. Construction equipment and materials shall be stored in a manner that will minimize impacts to piping plovers, red knots, and nesting shorebirds.

B.15. A report describing the actions taken shall be submitted to the Service work for each year when the activity has occurred.

B.16. The Corps Civil Works Program shall continue its annual seabeach amaranth monitoring program.

TERMS AND CONDITIONS for:

B. Projects that are navigation maintenance dredging with beach placement, or Corps civil works project shall include the following measures:

Historically, sand placement events associated with navigation maintenance dredging projects have no local sponsor, are smaller-scaled, conducted at closer time intervals, and the sand often does not remain on the beach for an extended period of time.

All conservation measures described in the Corps' Programmatic Biological Assessment are hereby incorporated by reference as Terms and Conditions within this document pursuant to 50 CFR §402.14(I) with the addition of the following Terms and Conditions. In order to be exempt from the prohibitions of section 9 of the Act, the Corps shall comply with the following Terms and Conditions, which implement the Reasonable and Prudent Measures, described above and outline reporting/monitoring requirements. These terms and conditions are non-discretionary.

Post-construction requirements are listed in Terms and Conditions B.11, B.12, B.13, B.15, B.16, B.17, B.18, and B.19. These post-construction requirements may be subject to congressional authorization and the allocation of funds. If the Corps or Permittee cannot fulfill these Terms and Conditions, the Corps must reinitiate consultation.

B.17. Conservation Measures included in the Corps' PBA that address protection of nesting sea turtles, piping plover, red knot, and seabeach amaranth listed on pages 10-11 of the SPBO shall be implemented in the Corps federally authorized project or regulated activity.

B.18. The Corps or the Permittee must provide the following information to the Service at least 10 business days prior to the commencement of work:

a) Project location (include latitude and longitude coordinates, as well as mile markers, cross streets, or street addresses if available);
b) Project description (including linear feet of beach, actual fill template, access points, and borrow areas);
c) Anticipated date of commencement and anticipated duration of construction

B.19. For the life of the permit/project, all sand placement activities above MHW must be conducted within the winter work window (November 16 to April 30), unless allowed after additional consultation with the Service.

B.20. Prior to sand placement, all derelict material, large amounts of rock, or other debris must be removed from the beach to the maximum extent possible. If debris removal activities take place during shorebird breeding season (April 1– August 31), the work shall be conducted during daylight hours only.

B.21. During construction, trash and food items shall be disposed of properly either in predatorproof receptacles, or in receptacles that are emptied each night to minimize the potential for attracting predators of piping plovers, red knots, and sea turtles.

B.22. Pipeline placement must be coordinated with NCDCM, the Corps, the Service, and the NCWRC.

B.23. Access points for construction vehicles should be as close to the project site as possible. Construction vehicle travel down the beach should be limited to the maximum extent possible.

B.24. Only beach compatible fill shall be placed on the beach or in any associated dune system. Beach compatible fill must be sand that is similar to a native beach in the vicinity of the site that has not been affected by prior sand placement activity. Beach compatible fill must be sand comprised solely of natural sediment and shell material, containing no construction debris, toxic material, large amounts of rock, or other foreign matter. The beach compatible fill must be similar in both color and grain size distribution (sand grain frequency, mean and median grain size and sorting coefficient) to the native material in the Action Area. Beach compatible fill is material that maintains the general character and functionality of the material occurring on the beach and in the adjacent dune and coastal system. In general, fill material that meets the requirements of the most recent version of the North Carolina Technical Standards for Beach Fill (15A NCAC 07H .0312) is considered compatible.

B.25. The Service must be invited to any pre-construction meetings held prior to the commencement of work. Advance notice (of at least 5 business days) must be provided prior to conducting this meeting. The meeting will provide an opportunity for explanation and/or clarification of the Conservation Measures and Terms and Conditions, and will include the following:

a) Staging locations, storing equipment including fuel stations;
b) Coordination with the surveyors on required species surveys;
c) Pipeline placement (between 5 to 10 feet from dune);
d) Minimizing driving;
e) Follow up coordination during construction and post construction;
f) Direction of the project including progression of sand placement along the beach;
g) Plans for compaction monitoring;
h) Plans for escarpment surveys; and
i) Names and qualifications of personnel involved in any required surveys.

B.26. During dredging operations, material placed on the beach shall be inspected daily to ensure compatibility. If the inspection process finds that non-beach compatible material, including large amounts of shell or rock exceeding the state sediment criteria (15A NCAC 07H .0312), is or has been placed on the beach, all work shall stop immediately, and the NCDCM and the Corps will be notified by the permittee and/or its contractors to determine the appropriate plan of action.

B.27. For navigation projects with placement of at least 200,000 cubic yards of sand on the beach, sea turtle nesting surveys must be conducted within the project area between May 1 and November 15 of each year, for at least two consecutive nesting seasons after completion of sand placement (2 years post-construction monitoring). Acquisition of readily available sea turtle nesting data from qualified sources (volunteer organizations, other agencies, etc.) is acceptable. Data collected for each nest should include, at a minimum, the information in the table, below. This information will be provided to the Raleigh Field Office in the annual report, and will be used to periodically assess the cumulative effects of these projects on sea turtle nesting and hatchling production and monitor suitability of post construction beaches for nesting. Please see REPORTING REQUIREMENTS, below.

Parameter	**Measurement**	**Variable**
Number of False Crawls	Visual Assessment of all false crawls	Number/location of false crawls in nourished areas; any interaction of turtles with obstructions, such as sand bags or scarps, should be noted.
False Crawl Type	Categorization of the stage at which nesting was abandoned	Number in each of the following categories: a) Emergence - no digging; b) Preliminary body pit; c) Abandoned egg chamber.
Nests	Number	The number of sea turtle nests in nourished areas should be noted. If possible, the location of all sea turtle nests should be marked on a project map, and approximate distance to scarps or sandbags measured in meters. Any abnormal cavity morphologies should be reported as well as whether turtle touched sandbags or scarps during nest excavation.
Nests	Lost Nests	The number of nests lost to inundation or erosion or the number with lost markers.
Nests	Relocated nests	The number of nests relocated and a map of the relocation area(s). The number of successfully hatched eggs per relocated nest.
Lighting Impacts	Disoriented sea turtles	The number of disoriented hatchlings and adults.

B.28. Sand compaction must be qualitatively evaluated at least twice after each sand placement event, once in the project area immediately after completion of any sand placement event and once after project completion between October 1 and May 1. Compaction monitoring and remediation are not required if the placed material no longer remains on the beach. Within 14 days of completion

of sand placement and prior to any tilling (if needed), a field meeting shall be held with the Service, NCWRC, and the Corps to inspect the project area for compaction and determine whether tilling is needed.

a) If tilling is needed for sand suitability, the area must be tilled to a depth of 36 inches. All tilling activities shall be completed prior to May 1 of any year.
b) Tilling must occur landward of the wrack line and avoid all vegetated areas that are 3 square feet or greater, with a 3-foot buffer around all vegetation.
c) If tilling occurs during the shorebird nesting season or seabeach amaranth growing season (after April 1), shorebird surveys and/or seabeach amaranth surveys are required prior to tilling.
d) A summary of the compaction assessments and the actions taken shall be included in the annual report to NCDCM, the Corps, and the Service.
e) These conditions will be evaluated and may be modified if necessary to address and identify sand compaction problems.

B.29. Visual surveys for escarpments along the Action Area must be made immediately after completion of sand placement, and within 30 days prior to May 1, for two subsequent years after any construction or sand placement event. Escarpments that interfere with sea turtle nesting or that exceed 18 inches in height for a distance of 100 feet must be leveled and the beach profile must be reconfigured to minimize scarp formation by the dates listed above. Any escarpment removal must be reported by location. The Service must be contacted immediately if subsequent reformation of escarpments that interfere with sea turtle nesting or that exceed 18 inches in height for a distance of 100 feet occurs during the nesting and hatching season to determine the appropriate action to be taken. If it is determined that escarpment leveling is required during the nesting or hatching season, the Service or NCWRC will provide a brief written authorization within 30 days that describes methods to be used to reduce the likelihood of impacting existing nests. An annual summary of escarpment surveys and actions taken must be submitted to the Service.

B.30. Piping plover habitat (sandy unvegetated habitat along inlet shoulders) shall be avoided to the maximum extent practicable when staging equipment, establishing travel corridors, and aligning pipeline.

B.31. A report describing the fate of observed sea turtle nests and hatchlings and any actions taken, must be submitted to the Service following completion of the proposed work for each year when a sand placement activity has occurred. Please see REPORTING REQUIREMENTS, below.

B.32. The Corps' annual seabeach amaranth monitoring program shall continue in accordance with April 19, 1993 Biological Opinion for various U.S. Army Corps of Engineers' projects.

B.33. The Corps should survey beach sand placement areas for at least five years following each placement event, to determine the status of the seabeach amaranth populations in the project

areas and the effects that beach disposal has on this species. Surveys should be conducted in August or September so that the number of plants reaching reproductive age can be determined.

B.34. Suitable habitat along shoreline reaches that have received sand within the previous five years should be surveyed for the occurrence of seabeach amaranth. Documentation for each seabeach amaranth plant should include location (using a handheld GPS unit), unique features, abnormalities, or other relevant information. If multiple plants are observed in an area, a single representative GPS point may be logged with accompanying notes describing total plants associated with that point.

B.35. A Corps report describing the seabeach amaranth survey and results should be submitted to Service, the North Carolina Natural Heritage Program, and the North Carolina Plant Conservation Program, by December 31 of each year. The report should include a map showing locations of seabeach amaranth populations and the numbers of plants, with separate figures for those in flower or fruit, found in the sand placement areas.

7.4 REPORTING REQUIREMENTS

An annual report detailing the monitoring and survey data collected during the preceding year (required in the above Terms and Conditions) and summarizing all piping plover, red knot, shorebird, and sea turtle data must be provided to the Service's Raleigh Field Office by January 31 of each year for review and comment. In addition, any information or data related to a conservation measure or recommendation that is implemented should be included in the annual report. As in the past, the Corps should submit a separate annual monitoring report detailing seabeach amaranth monitoring and survey data for the preceding year. The contact for these reporting requirements is:

Pete Benjamin, Supervisor
Raleigh Field Office
U.S. Fish and Wildlife Service
Post Office Box 33726
Raleigh, North Carolina 27636-3726
(919) 856-4520

Upon locating a dead, injured, or sick individual of an endangered or threatened species, initial notification must be made to the Service's Law Enforcement Office below. Additional notification must be made to the Raleigh Ecological Services Field Office identified above and to the NCWRC at (252) 241-7367. Care should be taken in handling sick or injured individuals and in the preservation of specimens in the best possible state for later analysis of cause of death or injury.

Jason Keith
U.S. Fish and Wildlife Service
551-F Pylon Drive
Raleigh, NC 27606
(919) 856-4786, extension 34

4) USFWS NC Statewide Programmatic Biological Opinion for FEMA Sand Placement (dated 01/27/2021), and all Reasonable and Prudent Measures and Terms and Conditions;

Reasonable and Prudent Measures for Sand Placement
The Service believes the following reasonable and prudent measures (RPMs) are necessary or appropriate to minimize the impact of incidental take caused by sand placement on listed wildlife species.

RPM #1. **Conservation Measures:** FEMA must ensure that the Subapplicant is aware of the proposed Conservation Measures for sand placement.

RPM #2. **Derelict Material:** Prior to sand placement, all derelict material, large amounts of rock, or other debris must be removed from the beach to the maximum extent possible.

RPM #3. **Pipeline Placement:** The pipeline route/pipeline placement must be coordinated with NCDCM, the Corps, the Service, and the NCWRC.

RPM #4. **Pre-Construction Meeting:** A meeting between representatives of the contractor(s), the Corps (as appropriate), the Service, the NCWRC, and NCDCM, must be held prior to the commencement of work.

RPM #5. Vehicle Access: Access points for construction vehicles should be as close to the project site as possible. Construction vehicle travel down the beach should be limited to the maximum extent possible.

RPM #6. **Escarpments:** Visual surveys for escarpments along the Action Area must be made immediately after completion of sand placement, and within 30 days prior to May 1, for two subsequent years after any construction or sand placement event.

RPM #7. Compaction Inspections: Sand compaction must be qualitatively evaluated at least once after each sand placement event. Sand compaction must be inspected in the project area immediately after completion of any sand placement event. If the Service or NCWRC determine that additional inspections are needed, a second inspection may be required prior to May 1 of the following year.

RPM #8. Shorebird Nesting Habitat: If project-related activities will potentially adversely affect nesting shorebirds or active nesting habitat, coordination with the Service and NCWRC is required.

RPM #9. Work in Piping Plover Critical Habitat: Work areas within piping plover critical habitat, such as dredge footprint(s), pipeline corridors, travel corridors, and access points must be clearly delineated. Disturbance within those delineated work areas must be limited to the maximum extent possible, thereby minimizing effects to sandy, sparsely-vegetated habitat within the project footprint.

RPM #10. Level Excavations: From May 1 through November 15, to the maximum extent practicable, excavations and temporary alteration of beach topography (outside of the active construction zone) will be filled or leveled to the natural beach profile prior to 9 pm each day.

RPM #11. Sea Turtle Sightings: If any nesting turtles are sighted on the beach during construction, construction activities must cease immediately until the turtle has returned to the water, and the sea turtle permit holder responsible for nest monitoring has marked for avoidance or relocated any nest(s) that may have been laid. If a nesting sea turtle is observed at night, all work on the beach will cease and all lights will be extinguished (except for those absolutely necessary for safety) until after the female has finished laying eggs and returned to the water.

RPM #12. Minimize Lighting: During the nesting season, lighting associated with the project must be minimized to reduce the possibility of disrupting and misdirecting nesting and/or hatchling sea turtles.

Terms and Conditions for Sand Placement

In order for the exemption from the take prohibitions of §9(a)(1) and of regulations issued under §4(d) of the ESA to apply to the Action, FEMA must comply with the terms and conditions (T&Cs) of this statement, provided below, which carry out the RPMs described in the previous section. These T&Cs are mandatory for funding of sand placement. As necessary and appropriate to fulfill this responsibility, FEMA must require any permittee, contractor, or grantee to implement these T&Cs through enforceable terms that are added to the permit, contract, or grant document.

T&C #1. **Conservation Measures:** FEMA must ensure that the Subapplicant is aware of the proposed Conservation Measures for sand placement.

T&C #2. **Derelict Material:** Prior to sand placement, all derelict material, large amounts of rock, or other debris must be removed from the beach to the maximum extent possible. If debris removal activities take place during shorebird breeding season (April 1– August 31), the work shall be conducted during daylight hours only.

T&C #3. **Pipeline Placement:** The pipeline route/pipeline placement must be coordinated with NCDCM, the Corps, the Service, and the NCWRC. Pipeline placement coordination may be accomplished through the NCDCM or Corps permit application process.

T&C #4. **Pre-Construction Meeting:** A meeting between representatives of the contractor(s), the Corps (as appropriate), the Service, the NCWRC, and NCDCM, must be held prior to the commencement of work. Advance notice (of at least 5 business days) must be provided prior to conducting this meeting. The meeting will provide an opportunity for explanation and/or clarification of the Conservation Measures and T&Cs, and will include the following, as appropriate:

a) Staging locations, and storing of equipment, including fuel stations;

b) Coordination with the surveyors on required species surveys;
c) Pipeline placement;
d) Minimization of driving within and around the Action Area;
e) Follow up coordination during construction and post construction;
f) Direction of the work including progression of sand placement along the beach;
g) Plans for compaction monitoring;
h) Plans for escarpment surveys and
i) Names and qualifications of personnel involved in any required species surveys.

T&C #5. Vehicle Access: Access points for construction vehicles should be as close to the project site as possible. Construction vehicle travel down the beach should be limited to the maximum extent possible.

T&C #6. Escarpments: Visual surveys for escarpments along the Action Area must be made immediately after completion of sand placement, and within 30 days prior to May 1, for two subsequent years after any construction or sand placement event. Escarpments that interfere with sea turtle nesting or that exceed 18 inches in height for a distance of 100 feet must be leveled and the beach profile must be reconfigured to minimize scarp formation by the dates listed above. Any escarpment removal must be reported by location. The Service must be contacted immediately if subsequent reformation of escarpments that interfere with sea turtle nesting or that exceed 18 inches in height for a distance of 100 feet occurs during the nesting and hatching season to determine the appropriate action to be taken. If it is determined that escarpment leveling is required during the nesting or hatching season, the Service or NCWRC will provide a brief written authorization within 30 days that describes methods to be used to reduce the likelihood of impacting existing nests. An annual summary of escarpment surveys and actions taken must be submitted to the Service.

T&C #7. Compaction Inspections: Sand compaction must be qualitatively evaluated at least once after each sand placement event. If the Service or NCWRC determine that additional inspections are needed, a second inspection may be required prior to May 1 of the following year. Compaction monitoring and remediation are not required if the placed material no longer remains on the beach. Within 14 days of completion of sand placement and prior to any tilling (if needed), a field meeting shall be held with the Service and/or NCWRC to inspect the project area for compaction and determine whether tilling is needed.

a) If tilling is needed for sand suitability, the area must be tilled to a depth of 36 inches. All tilling activities shall be completed prior to May 1 of any year.
b) Tilling must occur landward of the wrack line and avoid all vegetated areas that are 3 square feet or greater, with a 3-foot buffer around all vegetation.
c) If tilling occurs during the shorebird nesting season or seabeach amaranth growing season (after April 1), shorebird surveys and/or seabeach amaranth surveys are required prior to tilling.
d) A summary of the compaction assessments and the actions taken shall be included in the annual report to NCDCM, the Corps, and the Service.
e) These conditions will be evaluated and may be modified if necessary to address and identify sand compaction problems.

T&C #8. Shorebird Nesting Habitat: If project-related activities will potentially adversely affect nesting shorebirds or active nesting habitat, coordination with the Service and NCWRC is required prior to proceeding. If the project is ongoing and shorebirds begin territorial or other nesting behaviors within the project area, then the Service and NCWRC should be contacted as soon as possible.

T&C #9. Work in Piping Plover Critical Habitat: Piping plover habitat (sandy unvegetated habitat) within the critical habitat unit shall be avoided to the maximum extent practicable when staging equipment, establishing the dredge footprint, travel corridors, and aligning pipeline. The Corps or the Permittee, to the maximum extent practicable, shall clearly delineate work areas within the critical habitat unit such as pipeline corridors, dredge footprint, travel corridors, and access points. Disturbance outside those delineated work areas must be limited, thereby minimizing effects to sandy unvegetated habitat. Driving on the beach for construction shall be limited to the minimum necessary within the designated travel corridor.

T&C #10. Level Excavations: From May 1 through November 15, to the maximum extent practicable, excavations and temporary alteration of beach topography (outside of the active construction zone) will be filled or leveled to the natural beach profile prior to 9:00 p.m. each day.

T&C #11. Sea Turtle Sightings: If any nesting turtles are sighted on the beach during construction, construction activities must cease immediately until the turtle has returned to the water, and the sea turtle permit holder responsible for nest monitoring has marked for avoidance or relocated any nest(s) that may have been laid. If a nesting sea turtle is observed at night, all work on the beach will cease and all lights will be extinguished (except for those absolutely necessary for safety) until after the female has finished laying eggs and returned to the water.

T&C #12. Minimize Lighting: Direct lighting of the beach and nearshore waters must be limited to the immediate construction area during the nesting season and must comply with safety requirements. Lighting on all equipment must be minimized through reduction, shielding, lowering, and appropriate placement to avoid excessive illumination of the water's surface and nesting beach while meeting all Coast Guard, Corps EM 385-1-1, and OSHA requirements. Light intensity of lighting equipment must be reduced to the minimum standard required by OSHA for General Construction areas, in order to not misdirect sea turtles. Shields must be affixed to the light housing and be large enough to block light from all on-beach lamps from being transmitted outside the construction area or to the adjacent sea turtle nesting beach (Figure E-1).

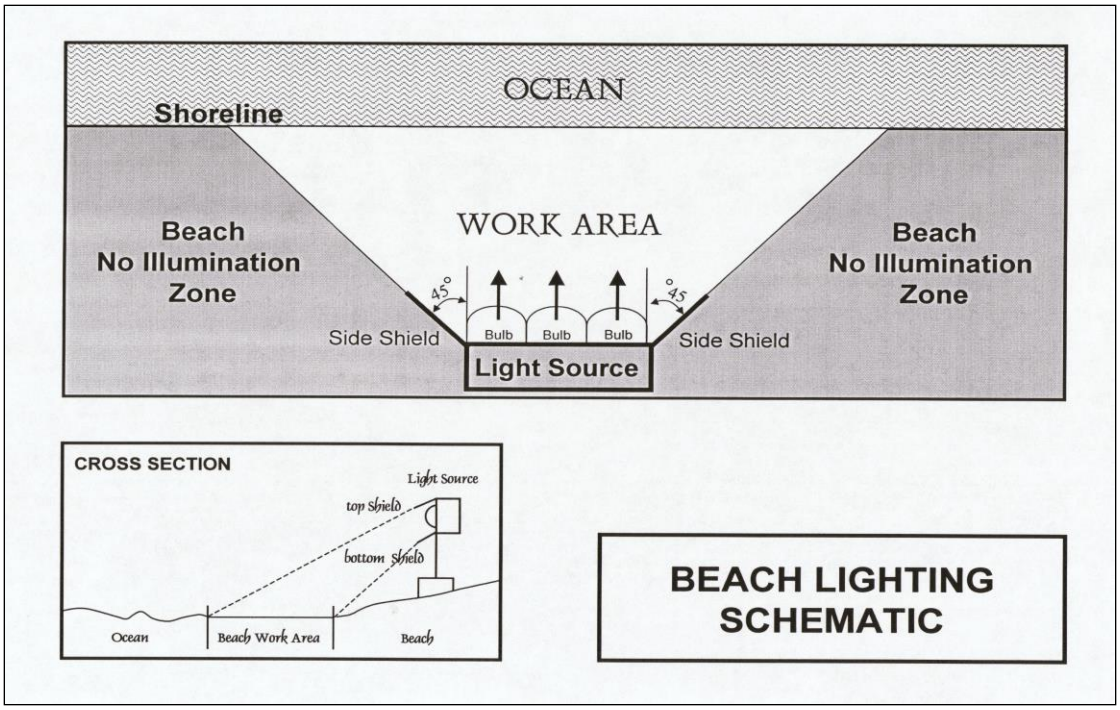

Figure E-1. Beach lighting schematic.

Reasonable and Prudent Measures and Terms and Conditions for Sand Fence Installation

Reasonable and Prudent Measures for Sand Fence Installation

The Service believes the following reasonable and prudent measures (RPMs) are necessary or appropriate to minimize the impact of incidental take caused by sand fence installation on listed wildlife species. RPMs are described for each listed wildlife species in the subsections below.

RPM #1. **Conservation Measures:** FEMA must ensure that the Subapplicant is aware of the proposed Conservation Measures for sand fence installation.

RPM #2. No Nest Relocations. Sea turtle nests must not be relocated for repair or replacement of structures, shoreline debris removal, or relocation of structures. If work is conducted between May 1 and November 15, the sea turtle permit holder shall mark nests for avoidance.

RPM #3. Nest Avoidance: If a sea turtle nest(s) cannot be safely avoided during construction, all activity within that portion of affected project area should be delayed until complete hatching and emergence of the nest.

RPM #4. Survey Coordination: During the sea turtle nesting season, vehicles and equipment should not enter the beach until after sea turtle patrol has confirmed nesting/false crawls within the designated work area. Daily coordination should be conducted between sea turtle volunteers,

the dune planting contractor, and NCWRC to ensure that the beach has been adequately surveyed and nests marked, prior to beginning of work.

RPM #5. Nest Buffers: A buffer distance of 20 feet should be marked at all nests and false crawls identified within the work area, in which no heavy equipment or other vehicles should be used.

Terms and Conditions for Sand Fence Installation

In order for the exemption from the take prohibitions of §9(a)(1) and of regulations issued under §4(d) of the ESA to apply to the Action, FEMA must comply with the T&Cs of this statement, provided below, which carry out the RPMs described in the previous section. These T&Cs are mandatory for funding of sand fence installation. As necessary and appropriate to fulfill this responsibility, FEMA must require any permittee, contractor, or grantee to implement these T&Cs through enforceable terms that are added to the permit, contract, or grant document.

T&C #1. **Conservation Measures:** FEMA must ensure that the Subapplicant is aware of the proposed Conservation Measures for sand fence installation.

T&C #2. No Nest Relocations. Sea turtle nests must not be relocated for repair or replacement of structures, shoreline debris removal, or relocation of structures. If work is conducted between May 1 and November 15, the sea turtle permit holder shall mark nests for avoidance.

T&C #3. Nest Avoidance: If a sea turtle nest(s) cannot be safely avoided during construction, all activity within that portion of affected project area should be delayed until complete hatching and emergence of the nest.

T&C #4. Survey Coordination: During the sea turtle nesting season, vehicles and equipment should not enter the beach until after sea turtle patrol has confirmed nesting/false crawls within the designated work area. Daily coordination should be conducted between sea turtle volunteers, the dune planting contractor, and NCWRC to ensure that the beach has been adequately surveyed and nests marked, prior to beginning of work. Coordinate with Maria Dunn (maria.dunn@ncwildlife.org) or Matthew Godfrey (matt.godfrey@ncwildlife.org) at NCWRC to establish the procedures for each project. Work should not be conducted at night.

T&C #5. Nest Buffers: A buffer distance of 20 feet should be marked at all nests and false crawls identified within the work area, in which no power equipment or vehicles should be used.

Reasonable and Prudent Measures and Terms and Conditions for Dune Vegetation Planting

Reasonable and Prudent Measures for Dune Vegetation Planting

The Service believes the following reasonable and prudent measures (RPMs) are necessary or appropriate to minimize the impact of incidental take caused by dune vegetation planting on

listed wildlife species. RPMs are described for each listed wildlife species in the subsections below.

RPM #1. **Conservation Measures:** FEMA must ensure that the Subapplicant is aware of the proposed Conservation Measures for dune vegetation planting.

RPM #2. No Nest Relocations: Sea turtle nests must not be relocated for dune vegetation planting. If work is conducted between May 1 and November 15, the sea turtle permit holder shall mark nests for avoidance.

RPM #3. Mark Project Limits: During the sea turtle nesting season, the limits of the expected planting area for each day should be marked on the beach the night before, to inform the sea turtle patrol of the limits of the day's work.

RPM #4. Survey Coordination: During the sea turtle nesting season, vehicles and equipment should not enter the beach until after sea turtle patrol has confirmed nesting/false crawls within the designated work area.

RPM #5. Nest Buffers: A buffer distance of 50 feet should be marked at all nests and false crawls identified within the work area, in which no power equipment or vehicles should be used. A buffer distance of 20 feet should be marked at all sea turtle nests and false crawls identified within the work area, in which no hand planting should be completed.

RPM #6. Watering: To the extent possible, during sea turtle nesting season, watering should be accomplished from the landward side of dunes.

RPM #7. Irrigation: An irrigation system should not be installed.

RPM #8. Project Completion: Between May 1 and November 15, once an area of beach is completed with planting, all equipment should be prohibited from that area.

RPM #9. Remove Ruts: Between May 1 and November 15, sand ruts created by traveling or parking on the beach should be removed by the end of each day.

Terms and Conditions for Dune Vegetation Planting

In order for the exemption from the take prohibitions of §9(a)(1) and of regulations issued under §4(d) of the ESA to apply to the Action, FEMA must comply with the T&Cs of this statement, provided below, which carry out the RPMs described in the previous section. These T&Cs are mandatory for funding of dune vegetation planting. As necessary and appropriate to fulfill this responsibility, FEMA must require any permittee, contractor, or grantee to implement these T&Cs through enforceable terms that are added to the permit, contract, or grant document.

T&C #1. **Conservation Measures:** FEMA must ensure that the Subapplicant is aware of the proposed Conservation Measures for dune vegetation planting.

T&C #2. No Nest Relocations: Sea turtle nests must not be relocated for dune vegetation planting. If work is conducted between May 1 and November 15, the sea turtle permit holder shall mark nests for avoidance. If a nest(s) cannot be safely avoided during construction, all activity within the affected project area should be delayed until complete hatching and emergence of the nest.

T&C #3. Mark Project Limits: Between May 1 and November 15, the limits of the expected planting area for each day should be marked on the beach the night before, to inform the sea turtle patrol of the limits of the day's work. Physical markings may consist of a flagged stake at each end of the designated planting area.

T&C #4. Survey Coordination: During the sea turtle nesting season, vehicles and equipment should not enter the beach until after sea turtle patrol has confirmed nesting/false crawls within the designated work area. Daily coordination should be conducted between sea turtle volunteers, the dune planting contractor, and NCWRC to ensure that the beach has been adequately surveyed and nests marked, prior to beginning of work. Coordinate with Maria Dunn (maria.dunn@ncwildlife.org) or Matthew Godfrey (matt.godfrey@ncwildlife.org) at NCWRC to establish the procedures for each project. Work should not be conducted at night.

T&C #5. Nest Buffers: A buffer distance of 50 feet should be marked at all nests and false crawls identified within the work area, in which no power equipment or vehicles should be used. A buffer distance of 20 feet should be marked at all sea turtle nests and false crawls identified within the work area, in which no hand planting should be completed.

T&C #6. Watering: To the extent possible, during sea turtle nesting season, watering should be accomplished from the landward side of dunes.

T&C #7. Irrigation: An irrigation system should not be installed.

T&C #8. Project Completion: Between May 1 and November 15, once an area of beach is completed with planting, all equipment should be prohibited from that area.

T&C #9. Remove Ruts: Between May 1 and November 15, sand ruts created by traveling or parking on the beach should be removed by the end of each day.

Reasonable and Prudent Measures and Terms and Conditions for Sand Scraping

Reasonable and Prudent Measures for Sand Scraping

The Service believes the following reasonable and prudent measures (RPMs) are necessary or appropriate to minimize the impact of incidental take caused by sand scraping on listed wildlife species. RPMs are described for each listed wildlife species in the subsections below.

RPM #1. **Conservation Measures:** FEMA must ensure that the Subapplicant is aware of the proposed Conservation Measures for sand scraping.

RPM #2. No Nest Relocations: Sea turtle nests must not be relocated for sand scraping. If work is conducted between May 1 and November 15, the sea turtle permit holder shall mark nests for avoidance.

RPM #3. Nest Avoidance: If a sea turtle nest(s) cannot be safely avoided during construction, all activity within that portion of affected project area should be delayed until complete hatching and emergence of the nest.

RPM #4. Survey Coordination: During the sea turtle nesting season, vehicles and equipment should not enter the beach until after sea turtle patrol has confirmed nesting/false crawls within the designated work area. Daily coordination should be conducted between sea turtle volunteers, the dune planting contractor, and NCWRC to ensure that the beach has been adequately surveyed and nests marked, prior to beginning of work.

RPM #5. Nest Buffers: A buffer distance of 50 feet should be marked at all nests and false crawls identified within the work area, in which no heavy equipment or other vehicles should be used.

Terms and Conditions for Sand Scraping

In order for the exemption from the take prohibitions of §9(a)(1) and of regulations issued under §4(d) of the ESA to apply to the Action, FEMA must comply with the T&Cs of this statement, provided below, which carry out the RPMs described in the previous section. These T&Cs are mandatory for funding of sand scraping. As necessary and appropriate to fulfill this responsibility, FEMA must require any permittee, contractor, or grantee to implement these T&Cs through enforceable terms that are added to the permit, contract, or grant document.

T&C #1. **Conservation Measures:** FEMA must ensure that the Subapplicant is aware of the proposed Conservation Measures for sand scraping.

T&C #2. No Nest Relocations. Sea turtle nests must not be relocated for sand scraping. If work is conducted between May 1 and November 15, the sea turtle permit holder shall mark nests for avoidance.

T&C #3. Nest Avoidance: If a sea turtle nest(s) cannot be safely avoided during construction, all activity within that portion of affected project area should be delayed until complete hatching and emergence of the nest.

T&C #4. Survey Coordination: During the sea turtle nesting season, vehicles and equipment should not enter the beach until after sea turtle patrol has confirmed nesting/false crawls within the designated work area. Daily coordination should be conducted between sea turtle volunteers, the dune planting contractor, and NCWRC to ensure that the beach has been adequately surveyed and nests marked, prior to beginning of work. Coordinate with Maria Dunn (maria.dunn@ncwildlife.org) or Matthew Godfrey (matt.godfrey@ncwildlife.org) at NCWRC to establish the procedures for each project. Work should not be conducted at night.

T&C #5. Nest Buffers: A buffer distance of 50 feet should be marked at all nests and false crawls identified within the work area, in which no power equipment or vehicles should be used.

Reasonable and Prudent Measures and Terms and Conditions for Repair/Replacement of Structures, Shoreline Debris Removal, and/or Relocation of Structures

Reasonable and Prudent Measures for Repair/Replacement of Structures, Shoreline Debris Removal, and/or Relocation of Structures

The Service believes the following reasonable and prudent measures (RPMs) are necessary or appropriate to minimize the impact of incidental take caused by repair or replacement of structures, shoreline debris removal, and/or relocation of structures on listed wildlife species. RPMs are described for each listed wildlife species in the subsections below.

RPM #1. No Nest Relocations. Sea turtle nests must not be relocated for repair or replacement of structures, shoreline debris removal, or relocation of structures. If work is conducted between May 1 and November 15, the sea turtle permit holder shall mark nests for avoidance.

RPM #2. Nest Avoidance: If a sea turtle nest(s) cannot be safely avoided during construction, all activity within that portion of affected project area should be delayed until complete hatching and emergence of the nest.

RPM #3. Survey Coordination: During the sea turtle nesting season, vehicles and equipment should not enter the beach until after sea turtle patrol has confirmed nesting/false crawls within the designated work area. Daily coordination should be conducted between sea turtle volunteers, the dune planting contractor, and NCWRC to ensure that the beach has been adequately surveyed and nests marked, prior to beginning of work.

RPM #4. Nest Buffers: A buffer distance of 20 feet should be marked at all nests and false crawls identified within the work area, in which no heavy equipment or other vehicles should be used.

Terms and Conditions for Repair/Replacement of Structures, Shoreline Debris Removal, and/or Relocation of Structures

In order for the exemption from the take prohibitions of §9(a)(1) and of regulations issued under §4(d) of the ESA to apply to the Action, FEMA must comply with the T&Cs of this statement, provided below, which carry out the RPMs described in the previous section. These T&Cs are mandatory for funding of repair or replacement of structures, shoreline debris removal, and/or relocation of structures. As necessary and appropriate to fulfill this responsibility, FEMA must require any permittee, contractor, or grantee to implement these T&Cs through enforceable terms that are added to the permit, contract, or grant document.

T&C #1. No Nest Relocations. Sea turtle nests must not be relocated for repair or replacement of structures, shoreline debris removal, or relocation of structures. If work is conducted between May 1 and November 15, the sea turtle permit holder shall mark nests for avoidance.

T&C #2. Nest Avoidance: If a sea turtle nest(s) cannot be safely avoided during construction, all activity within that portion of affected project area should be delayed until complete hatching and emergence of the nest.

T&C #3. Survey Coordination: During the sea turtle nesting season, vehicles and equipment should not enter the beach until after sea turtle patrol has confirmed nesting/false crawls within the designated work area. Daily coordination should be conducted between sea turtle volunteers, the dune planting contractor, and NCWRC to ensure that the beach has been adequately surveyed and nests marked, prior to beginning of work. Coordinate with Maria Dunn (maria.dunn@ncwildlife.org) or Matthew Godfrey (matt.godfrey@ncwildlife.org) at NCWRC to establish the procedures for each project. Work should not be conducted at night.

T&C #4. Nest Buffers: A buffer distance of 20 feet should be marked at all nests and false crawls identified within the work area, in which no power equipment or vehicles should be used.

Monitoring and Reporting (M&R) Requirements

In order to monitor the impacts of incidental take, FEMA must report the progress of the Action and its impact on the species to the USFWS as specified in the incidental take statement (50 CFR §402.14(i)(3)). This section provides the specific instructions for such monitoring and reporting (M&R). As necessary and appropriate to fulfill this responsibility, FEMA must require any permittee, contractor, or grantee to accomplish the monitoring and reporting through enforceable terms that are added to the permit, contract, or grant document. Such enforceable terms must include a requirement to immediately notify FEMA and the Service if the amount or extent of incidental take specified in this ITS is exceeded during Action implementation.

M&R Requirements for Sand Placement, Sand Fence Installation, Dune Vegetation Planting, and Sand Scraping

All Proposed Monitoring and Reporting Conditions listed in **Sections 2.1 and 2.2** for beach sand placement are required to be conducted and reported to the Service. FEMA has proposed Monitoring and Reporting in the Conservation Measures, including the following:

M&R #1. Sea Turtle Nest Survey Reports: Sea turtle nesting surveys must be conducted within the project area between May 1 and November 15 of each year, for at least two consecutive nesting seasons after completion of each sand placement activity (2 years post-construction monitoring after initial construction and each maintenance event). Acquisition of readily available sea turtle nesting data from qualified sources (volunteer organizations, other agencies, etc.) is acceptable. However, in the event that data from other sources cannot be acquired, the permittee will be responsible to collect the data. Data collected by the permittee for

each nest should include, at a minimum, the information in **Table 2-4**. This information will be provided to the Service's Raleigh Field Office in an annual report and will be used to periodically assess the cumulative effects of these types of projects on sea turtle nesting and hatchling production and monitor suitability of post construction beaches for nesting. Please see reporting requirement in the table below.

Table. In the event that sea turtle nest monitoring data from other sources cannot be acquired, the Subapplicant will be responsible to collect the data below.

Parameter	Measurement	Variable
Number of False Crawls	Visual Assessment of all false crawls	Number/location of false crawls in nourished areas; any interaction of turtles with obstructions, such as sand bags or scarps, should be noted.
False Crawl Type	Categorization of the stage at which nesting was abandoned	Number in each of the following categories: a) Emergence - no digging; b) Preliminary body pit; c) Abandoned egg chamber.
Nests	Number	The number of sea turtle nests in nourished areas should be noted. If possible, the location of all sea turtle nests should be marked on a project map, and approximate distance to scarps or sandbags measured in meters. Any abnormal cavity morphologies should be reported as well as whether turtle touched sandbags or scarps during nest excavation.
Nests	Lost Nests	The number of nests lost to inundation or erosion or the number with lost markers.
Nests	Relocated nests	The number of nests relocated and a map of the relocation area(s). The number of successfully hatched eggs per relocated nest.
Lighting Impacts	Disoriented sea turtles	The number of disoriented hatchlings and adults

M&R #2. Reports on Activities: A report describing any actions taken to implement the Conservation Measures (**section 2.1**) and the T&Cs (**section 10.2**) must be submitted to the Service's Raleigh Field Office following completion of the proposed work for each year when a sand placement activity has occurred. The report must include the following information:

a) Project location (latitude and longitude)
b) Project description (linear feet of beach, actual fill template, access points, and borrow areas)

c) Dates of actual construction activities
d) Names and qualifications of personnel involved in sea turtle nesting surveys and relocation activities
e) Descriptions and locations of self-release beach sites (if applicable)
f) Sand compaction and escarpment formation surveys and activities
g) A description of the fate of sea turtle nests and hatchlings and any actions taken (as appropriate)

Information required in the above Conservation Measures and/or these Reporting Requirements should be submitted by January 31 of the following year to the following address:

Raleigh Field Office
U.S. Fish and Wildlife Service
Post Office Box 33726
Raleigh, North Carolina 27636-3726
(919) 856-4520

Upon locating a dead, injured, or sick individual of an endangered or threatened species, initial notification must be made to the Service's Law Enforcement Office below. Additional notification must be made to the Service's Ecological Services Field Office identified above and to the NCWRC at (252) 241-7367. Care should be taken in handling sick or injured individuals and in the preservation of specimens in the best possible state for later analysis of cause of death or injury.

Jason Keith
U.S. Fish and Wildlife Service
551-F Pylon Drive
Raleigh, NC 27606
919-856-4786, extension 34

M&R Requirements for Structure Repair/Replacement, Debris Removal, and Structure Relocation

M&R #1. Notification: If work is conducted during the sea turtle nesting season (May 1 to November 15), a notification of commencement of work and a notification of completion should be provided to the Service and NCWRC. Notifications should include the general location and a general description of the activity. Areas should be identified using street addresses, latitude/longitude, or landmarks, as available. Notification may be by email to raleigh@fws.gov or mailed to the address below.

Raleigh Field Office
U.S. Fish and Wildlife Service
Post Office Box 33726
Raleigh, North Carolina 27636-3726
(919) 856-4520

Upon locating a dead, injured, or sick individual of an endangered or threatened species, initial notification must be made to the Service's Law Enforcement Office below. Additional notification must be made to the Service's Ecological Services Field Office identified above and to the NCWRC at (252) 241-7367. Care should be taken in handling sick or injured individuals and in the preservation of specimens in the best possible state for later analysis of cause of death or injury.

Jason Keith
U.S. Fish and Wildlife Service
551-F Pylon Drive
Raleigh, NC 27606
919-856-4786, extension 34

CONSERVATION RECOMMENDATIONS

§7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by conducting conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary activities that an action agency may undertake to avoid or minimize the adverse effects of a proposed action, implement recovery plans, or develop information that is useful for the conservation of listed species. The USFWS offers the following recommendations that are relevant to the listed species addressed in this BO and that we believe are consistent with the authorities of FEMA.

The Service recommends the following conservation recommendations:

1. For activities that utilize vehicles and other equipment on the beach, work should be completed during the winter work window (November 16 to April 30), particularly if the work is not associated with a beach sand placement project.

2. If a vehicle is required during the sea turtle nesting season, we recommend an ATV/UTV, to avoid and minimize impacts to sea turtles, seabeach amaranth, and shorebirds.

3. Use of sand fences and sand scraping should be limited.

4. Only plant native dune species. Hosier (2018), Rogers and Nash (2003), and the U.S. Department of Agriculture (USDA)(Shadow 2007; Lamphere 2006) recommend the following planting seasons for three commonly planted species:

    - American beachgrass (*Ammophila breviligulata*): Plant plugs from fall through spring.
    - Seaside panicum (*Panicum amarum*): Sprig in late winter, spring, or fall.
    - Sea Oats (*Uniola paniculata*): Plant in spring or fall.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

5) USFWS ESA Section 7 Consultations for Town of Oak Island Planting of Dune Vegetation (11/20/2019), and all Conservation Measures and Conditions;

6) USFWS CBRA Consultation for North Topsail Beach (05/08/2020 and 12/15/2020);

7) NMFS Southeast Regional Office Interim Biological Opinion (dated April 9, 1997), and all Reasonable and Prudent Measures, Terms and Conditions, and Project Design Criteria;

8) MSA Consultation for Town of Oak Island dredging (06/29/2020), and applicable conditions;

9) Disaster CZMA Programmatic Agreements with NCDCM;

10) State Historic Preservation Office (SHPO)/ National Historic Preservation Act (NHPA) conditions

10.0 List of Preparers

Name	Organization	Title
Stephanie Everfield	FEMA	Region 4, Environmental Officer
Chelsea Klein	FEMA	Environmental and Historic Preservation Advisor
Kristin Morris	FEMA	Environmental Specialist
Jeffrey Royal	FEMA	Historic Preservation Specialist

11.0 References

- "§ 113A-115.1. Limitations on erosion control structures." *NC General Statutes*, 9 Sept. 2019, https://www.ncleg.net/EnactedLegislation/Statutes/PDF/BySection/Chapter_113A/GS_113A-115.1.pdf.
- "Permit Program under CWA Section 404." *EPA*, Environmental Protection Agency, 14 May 2019, https://www.epa.gov/cwa-404/permit-program-under-cwa-section-404.
- "Clean Air Act Requirements and History." *EPA*, Environmental Protection Agency, 10 Jan. 2017, https://www.epa.gov/clean-air-act-overview/clean-air-act-requirements-and-history.
- "Green Book | US EPA." *EPA*, Environmental Protection Agency, 31 Jan. 2020, https://www3.epa.gov/airquality/greenbook/ancl.html.

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- "Coastal Management Permits." *NCDCM*, North Carolina Division of Coastal Management, 17 Aug. 2020, https://deq.nc.gov/about/divisions/coastal-management/coastal-management-permits.
- "Summary of the Noise Control Act." *EPA*, Environmental Protection Agency, 6 Nov. 2019, www.epa.gov/laws-regulations/summary-noise-control-act.
- "Map of Sole Source Aquifer Locations." *EPA*, Environmental Protection Agency, 19 Aug. 2019, https://www.epa.gov/dwssa/map-sole-source-aquifer-locations.
- "Loggerhead Turtle – Northwest Atlantic Ocean DPS Critical Habitat Map." *NMFS*, National Marine Fisheries, 6 June 2020, https://www.fisheries.noaa.gov/resource/map/loggerhead-turtle-northwest-atlantic-ocean-dps-critical-habitat-map.
- "North Atlantic Right Whale Critical Habitat Map and GIS Data." *NMFS*, National Marine Fisheries, 18 Oct. 2019, https://www.fisheries.noaa.gov/resource/map/north-atlantic-right-whale-critical-habitat-map-and-gis-data.
- "Atlantic Sturgeon Critical Habitat Map and GIS Data." *NMFS*, National Marine Fisheries, 21 Oct. 2020, https://www.fisheries.noaa.gov/resource/map/atlantic-sturgeon-critical-habitat-map-and-gis-data.