US Army Corps of Engineers ®
Wilmington District

HATTERAS FERRY CHANNEL REALIGNMENT DRAFT ENVIRONMENTAL ASSESSMENT

October 2021

Wilmington District – U.S. Army Corps of Engineers

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Table of Contents

List of Figures

List of Tables

Appendices

1.0 INTRODUCTION.

The National Environmental Policy Act of 1969 (NEPA), as amended, requires consideration of the environmental impacts for major federal actions. The purpose of this Environmental Assessment (EA) is to ensure the environmental consequences of the proposed action are considered and that environmental and project information is available to the public. The United States Army Corps of Engineers (USACE) has prepared this EA in accordance with the NEPA, the Council on Environmental Quality regulations (40 Code of Federal Regulations (CFR) parts 1500-1508,1515-1518) updated in 2020, and Engineering Regulation (ER) 200-2-2.

The subject of this EA is a portion of the Hatteras Ferry Channel, which is located within waters of Pamlico Sound on the backside of Hatteras Island, Dare and Hyde Counties, North Carolina. Historically, the channel connected Hatteras Village Harbor to the Hatteras Inlet gorge by a direct route that ran behind and parallel to the islands. This route provides mariners, fishermen, and the U.S. Coast Guard (USCG) access to the Atlantic Ocean, as well as safe ferry transportation between Ocracoke Island and Hatteras Island (Figure 1).

The Navigation mission of the USACE is to provide safe, reliable, efficient, effective, and environmentally sustainable waterborne transportation systems (i.e., channels, harbors, and waterways). As part of the navigation mission, the USACE is responsible for maintenance of the federally authorized Rollinson Channel project, which includes Rollinson Channel and the Hatteras Ferry Channel. This navigation project allows mariners to safely access the open ocean through Hatteras Inlet and provides a navigation channel between Ocracoke Island and Hatteras Island.

Due to the dynamic nature of the Hatteras Inlet complex, the surface and subsurface environment is constantly shifting and changing. Extensive erosion has significantly increased the width of Hatteras Inlet. In 1993, Hatteras Inlet was about one-third of a mile wide; now that distance has increased to over two miles, making it impossible to maintain the historic route efficiently and safely. As more erosion and shoaling continues to occur every year, significant challenges to local navigation escalate.

This EA explores a reasonable range of alternatives to reestablishing a safe and navigable channel between Hatteras and Ocracoke Islands. The No Action alternative focuses on directing efforts towards reopening the historic route; the other two alternatives focus on an alternate route which follows natural deep water. Having a channel that follows natural deep water to the extent practicable, given the natural dynamic nature of sediment movement, will allow for a safer, more reliable channel, reduced dredging effort, and an associated reduction in maintenance dredging costs, as well as having the least impact to the environment. Therefore, the proposed action is to abandon the historic direct route to the Hatteras Inlet gorge and to re-route the channel to follow natural deep water along what is commonly known as, the “horseshoe route.” This is the only way for USACE to economically maintain access to Hatteras Inlet and

will allow transportation of passengers, goods, and services to continue from the mainland, as well as allow safe access to open ocean waters (Figure 2).

The horseshoe route is officially marked by the USCG and has been utilized by mariners and the North Carolina Ferry Division vessels since 2013. This natural deep-water route has never been dredged except for a portion of the channel located near the Hatteras/Ocracoke ferry terminal that connects to the Hatteras Inlet gorge. This area is referred to as South Ferry Channel. Pursuant to River and Harbor Act of 1962 PL87-874, as amended, USACE has the authority to adopt the horseshoe route and assume responsibility for future maintenance along the entire route. This authority is further discussed in Section 1.1.

The portion of Hatteras Ferry Channel's authorized dimensions are 100 feet wide and 10 feet deep plus 2 feet of allowable over depth. The proposed horseshoe channel realignment will have the same dimensions; however, the location will differ from the original channel by following the best, naturally deep water. A corridor has been identified (approximately 1,580 acres) in the vicinity of the horseshoe route to allow for deep water to shift naturally while maintaining the authorized 100-foot-wide channel (Figure 2). The USACE would not maintain the entire corridor, but rather only the area (approximately 110 acres) that provides a channel of the same width as the existing authorization (100 ft width). The exact location of the channel may shift over time within this wider corridor to take advantage of naturally occurring deep water. It is the USACE's goal to minimize dredging and achieve establishment of a navigation corridor that will provide flexibility and cost savings in maintaining the federal navigation channel. The maintenance dredging of the authorized channel dimensions would occur within the greatest shoaled areas. Maintenance dredging will only be performed in shoaled areas to sustain the authorized channel dimensions.

Maintenance dredging of the realignment is proposed by both contracted hydraulic cutter suction (pipeline) dredge and government-owned plant, and the preferred alternative is to dredge as-needed using the government side cast and special purpose hopper dredges, thereby allowing for year-round safe navigation. The previously maintained historic route does not have dredging window restrictions; therefore, USACE's position is that the realignment should also not have dredging window restrictions. However, when a contract pipeline dredge is employed, the USACE plans to abide by the established placement windows that protect nesting shorebirds and sea turtles on bird islands and beaches. Based on sampling, the identified corridor consists of beach quality material (≥90% sand).

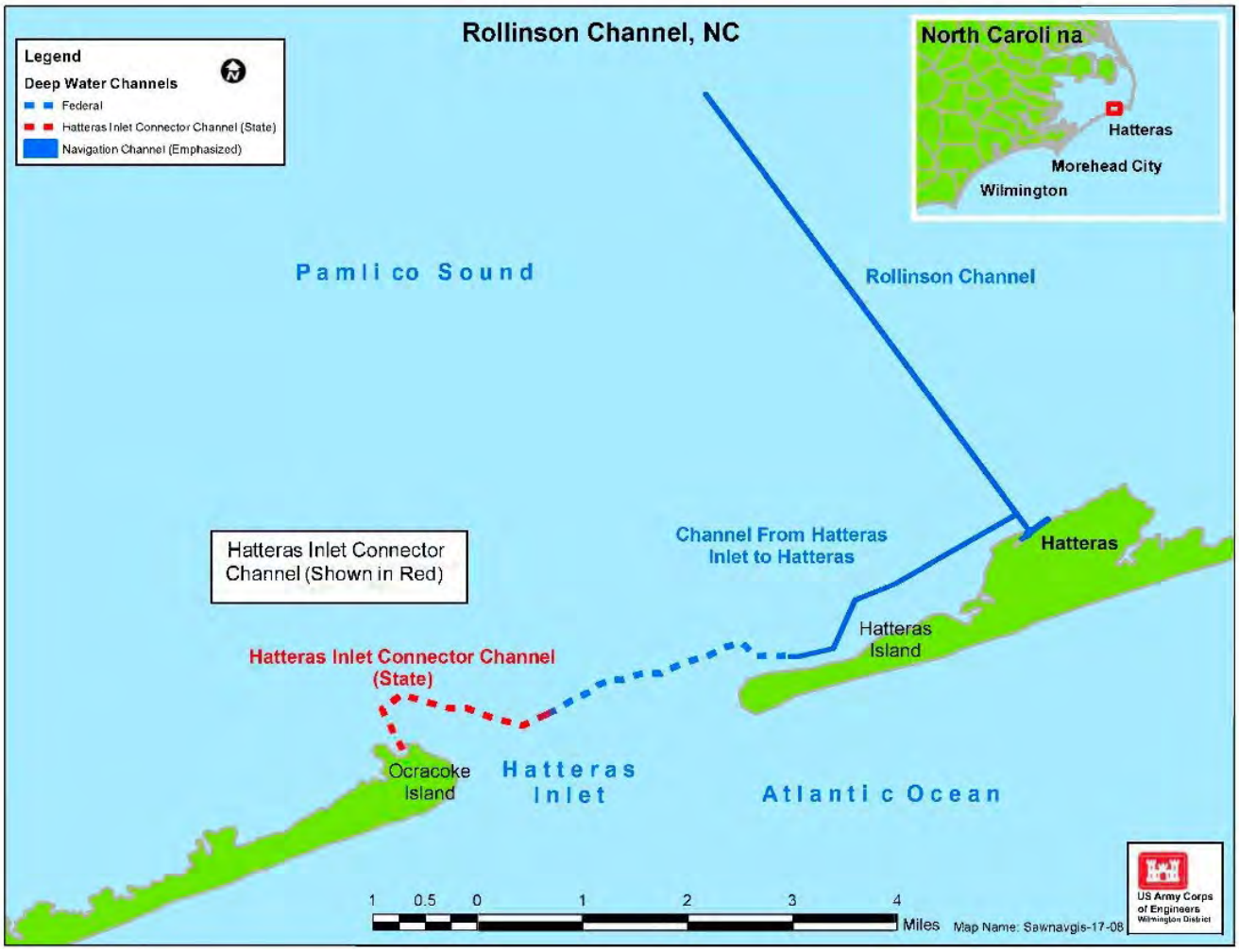


Figure 1. Hatteras Inlet area map showing historic route (pre-2013)

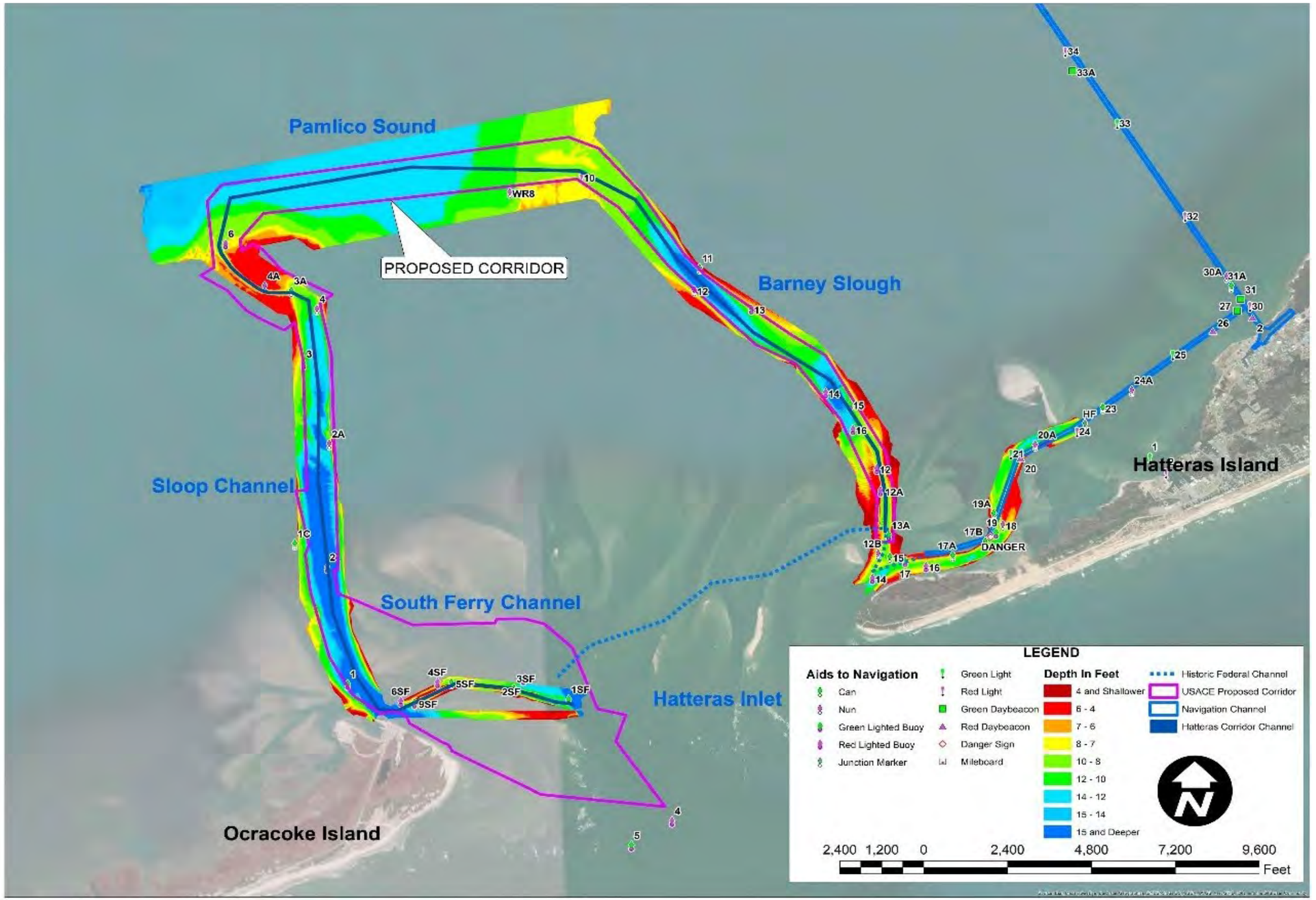


Figure 2. Proposed Corridor with 2020 Hydrographic Survey

1.1 Authority.

The Rollinson Channel Project, which includes Rollinson Channel and the Hatteras Ferry Channel, was authorized on October 23, 1962 under authority of the River and Harbor Acts of 1935, 1945, 1954, and 1962, as amended. The Hatteras Ferry Channel includes two sections, (1) a 100-foot-wide fixed channel with an authorized depth of -12 feet mean lower low water (MLLW) + 2 feet allowable over depth extending from Rollinson Channel toward the Hatteras Inlet gorge and (2) a 100-foot-wide channel with an authorized depth of -10 feet mean lower low water (MLLW) + 2 feet allowable over depth that follows the best deep-water route to the Hatteras Inlet gorge. The USACE is realigning the portion of the Hatteras Ferry Channel that follows deep water due to the changes in shoaling patterns caused by the dynamic nature of the Hatteras Inlet system.

1.2 Background.

The southwest end of Hatteras Island began receding dramatically around 1993, when the inlet was only 0.35 miles wide. Running parallel on the backside of the island, the traditional “direct route” to the inlet gorge was maintained by the USACE until winter/spring 2013 when it became impossible for the USACE to safely maintain. During that time a USACE-contracted pipeline dredge was overwhelmed while performing dredging operations. The shoaling occurred faster than the dredge could remove the material, resulting in treacherous conditions that nearly sank the vessel. Government-owned dredges (sidecast and special purpose) worked from June 2013 to August 2013 to reestablish safe navigation. To maintain operations and access, NC Department of Transportation (NCDOT) ferry service and local mariners began utilizing the horseshoe route to access Ocracoke Island.

In 2014, USACE began assessing advanced maintenance options for the direct route, proposing the dredging of 50-foot wideners on both sides of the channel to slow the shoaling process; however, in 2017 these efforts ceased when it became apparent that the maintenance dredging needs would exceed available funding ($765,000 in FY17). Additionally, the USACE did not have adequate funding to conduct the cultural resources surveys required for wideners. Hatteras Island continued to erode and by 2019 approximately 1.7 miles (~9,000 feet) of shoreline and approximately 315 acres of dry land were lost. Likewise, approximately 2,000 feet of shoreline (roughly 130 acres) were lost on Ocracoke Island (Figure 3). The significant erosion in both locations has transformed upland beach into subtidal shoals resulting in an inlet that is now over two miles wide.

Since 2013, regular vessel traffic has used the horseshoe route and the channel has remained relatively stable; however, there are areas that naturally shoal more than others. In pinch-point areas such as the north end of Sloop Channel (Figure 2), the channel width has narrowed so much that two passenger ferries cannot pass at the same time. After the horseshoe route was first established, 72 passenger ferry runs would occur per day between Hatteras and Ocracoke Islands during the height of

season; however, since 2018 this number was reduced to 60 to allow ferries to pass safely and remain on schedule.

In 2016, the North Carolina Department of Transportation (NCDOT) and Dare County began coordinating with federal and state resource agencies to assess the effects of maintenance dredging where needed. Dare County obtained permits to maintain the portion of channel from the mid-point at Sloop Channel, south beyond the Hatteras/Ocracoke Ferry landing to the Hatteras Inlet gorge (known as the South Ferry Channel) (Figure 2). Cultural resources have been identified, and restricted areas established to avoid impacts to cultural resources. NCDOT has applied for permits for the northern portion of Sloop Channel where it meets Pamlico Sound. No dredging has occurred within this portion of the channel to date; however, the northwest corner of the horseshoe route at greenlight Buoy 3A is in immediate need of maintenance (Figure 4).

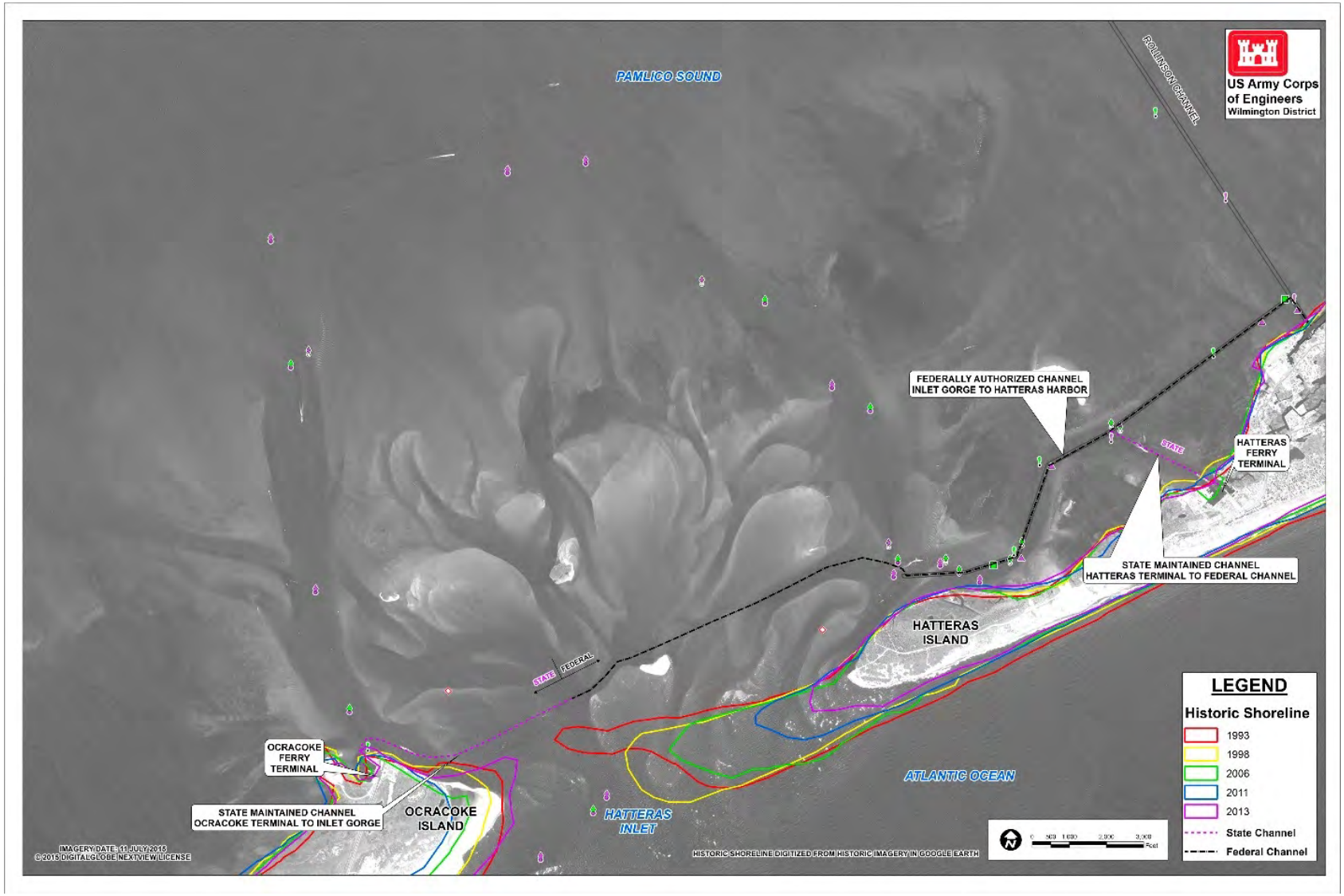


Figure 3. Erosion on Ocracoke and Hatteras 2013-2016

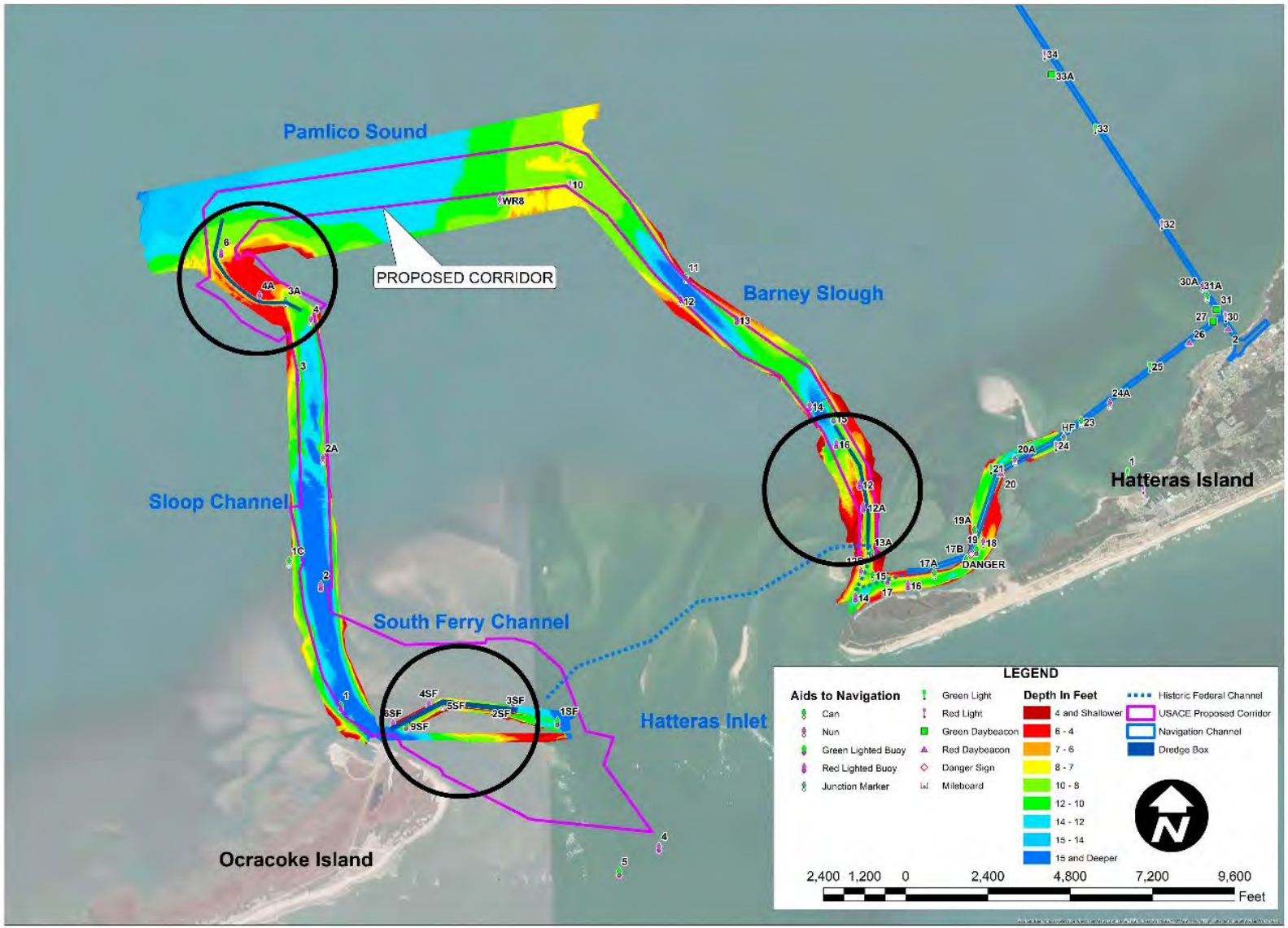


Figure 4. Proposed Corridor Identifying Hot Spot Shoaling Areas

1.3 Project Area (Dredging and Placement).

The proposed project area consists of the horseshoe corridor and relevant dredged material placement areas to include beachfront and nearshore areas of Ocracoke Island and Hatteras Island, nearby Cora June and DOT bird nesting islands, adjacent open water, and a scour hole located next to the Ocracoke Ferry Terminal to protect the sheet pile wall (Figure 5). Nearshore, bird island and beachfront placement areas have been previously approved for use; however, placement in open water (sidecasting) and into the identified scour hole have not. The USACE is proposing to dredge and maintain the channel realignment using three different methods of dredging: contracted hydraulic cutter-suction (pipeline), government-owned special purpose hopper, and government-owned sidecast dredges. The type of dredge plant used will depend on the location of the shoaling, quantity and depth of shoaled material, plant availability, and project funding.

The 8.5-mile-long corridor is in the Hatteras Inlet complex between Ocracoke Island (Hyde County) and Hatteras Island (Dare County). The Hatteras Island side begins at greenlight Buoy 15 (approximately) and includes Barney Slough, a small portion of Pamlico Sound, Sloop Channel and South Ferry Channel (Figures 2, 4). The proposed corridor varies in width, allowing the channel to shift while following naturally deep water. The authorized channel within the corridor will be 100 feet wide by 10 feet deep plus 2 feet of allowable over depth, and 3:1 side slope. The total area of the channel would equate to approximately 7% of the total area of the corridor.

Placement of material will be dependent on dredged material composition. Sediment sampling and analysis in Sloop Channel and South Ferry Channel has been performed by Dare County and NCDOT, and the USACE has recently completed the sampling and analysis process in Barney Slough and shallower areas of Pamlico Sound. All material within the corridor to a depth of 12 feet (10 feet of depth plus 2 feet of allowable over depth) consists of ≥90% beach quality sand, making it suitable for beach placement, bird island placement, nearshore placement, and sidecasting. Within the proposed corridor, only South Ferry Channel has been previously dredged. Since 2017 most dredge events have been by sidecast dredge. All dredging to date has been completed using government-owned special purpose hopper and sidecast dredges.

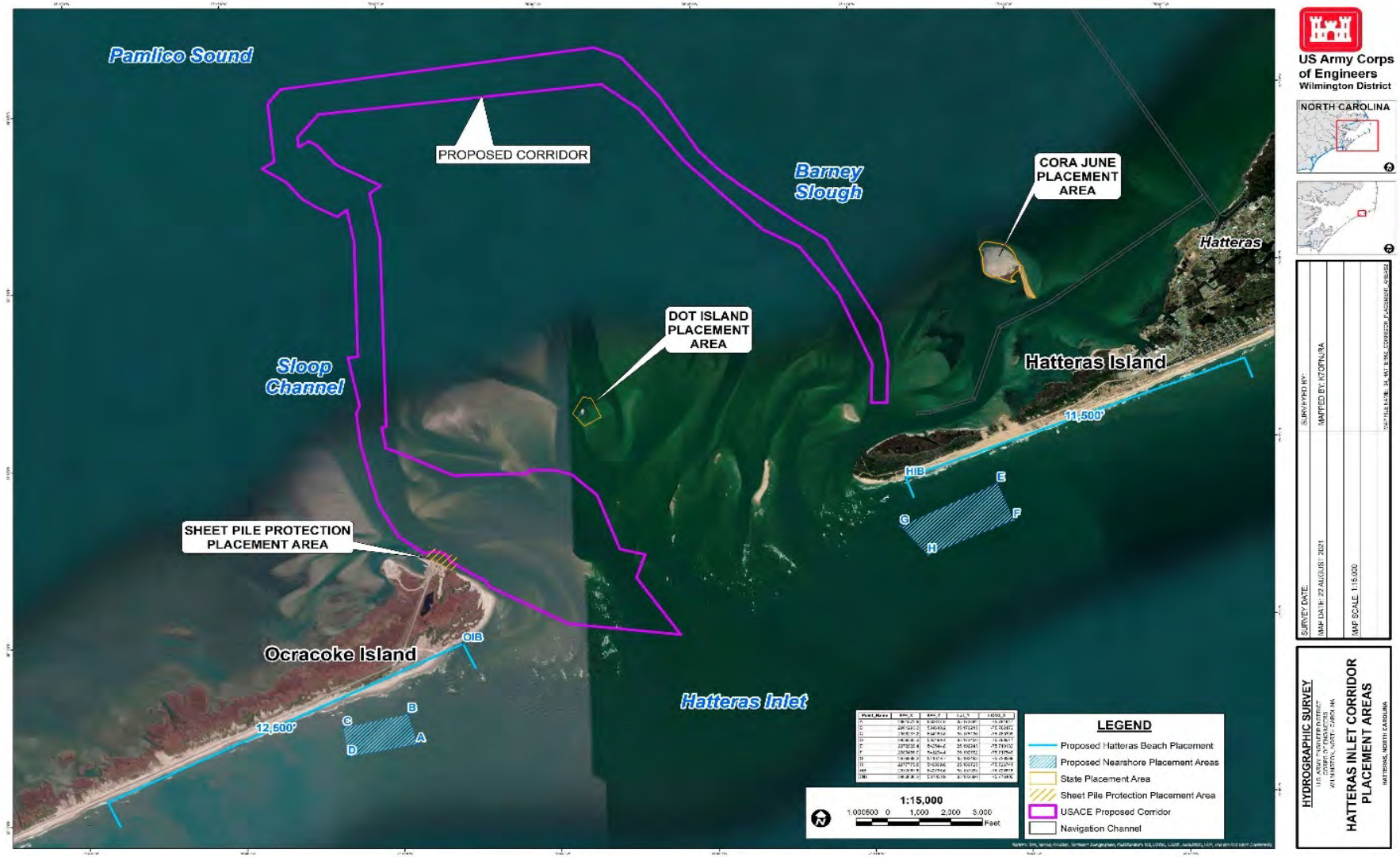


Figure 5. Proposed Corridor Showing Placement Areas

2.0 PURPOSE AND NEED.

The purpose of realigning the Hatteras Ferry Channel to follow the horseshoe route is (1) to provide a safe, reliable navigation channel for residents, visitors, supplies, and services to and from Ocracoke and Hatteras Islands and (2) for the U.S. Coast Guard and commercial and recreational fishermen to access the open ocean through Hatteras Inlet.

The NCDOT ferry service is a lifeline to this area, connecting the mainland from Cedar Island and Swan Quarter to the Ocracoke ferry terminal on the south end of Ocracoke Island. Another ferry on the north end of Ocracoke takes passengers and supplies over to Hatteras Island by way of the Hatteras Ferry Channel. The only other access to Hatteras Island is a single route, NC Highway 12, which takes approximately two hours to reach the next barrier island to the north.

Since the direct parallel route to the inlet gorge is no longer navigable and cannot be maintained safely and efficiently, following natural deep water is the only way to economically maintain access to Hatteras Inlet. Hatteras Inlet is the only access to the Atlantic Ocean for many miles; Ocracoke Inlet is 18 miles to the south, and Oregon Inlet is approximately 55 miles to the north. The U.S. Coast Guard (USCG) search and rescue operations from the Oregon Inlet boat ramp would take hours to respond to a distressed mariner off the coast of Hatteras or Ocracoke Islands. It is critical for the USCG Station Hatteras Inlet to access the open ocean year-round to support life-safety missions and effectively protect these U.S. coastal waters and the mariners who use them.

Local commercial and recreational fishing, as well as tourism, are the lifeblood of the Outer Banks economy. Nearshore and offshore fishing have provided generations of income to residents and tourism dollars to the entire state. Access to offshore fishing areas has been strained for the last 20+ years due to the eroding adjacent shorelines and increased shoaling in Hatteras Inlet. The USCG is constantly monitoring and adjusting safe navigation routes for fishermen so they do not become stranded or worse. A stable and maintainable channel is needed to reduce the risks to fishermen to navigate Hatteras Inlet. The likely outcome is increased use by the local fishing fleet due to the improved safety and thus economic stimulation.

Beneficial use of dredged material will help to keep valuable sediments within the system and potentially decrease rates of erosion and habitat loss. By placing the beach quality material in the nearshore, on beaches and bird islands, USACE can protect and buffer existing shorelines and infrastructure and rebuild upland habitat areas to reduce risks to inshore areas from the effects of storm surge and high tides.

Since there is no way to predict when a shoaling event will require maintenance dredging, the USACE needs the ability to dredge any time of year. Ferry services operate year-round, but the number of operational ferries and their frequency peaks

during May – August, so it's critical that USACE can dredge the channel during this timeframe.

Given the natural dynamic nature of sediment movement within the Hatteras Inlet complex, following natural deep water to the extent practicable, and having the ability to dredge any time of year would result in a safer, more reliable channel, a reduced dredging effort and the associated reduction in maintenance costs.

3.0 INCORPORATION BY REFERENCE.

The proposed work will be conducted by dredging and placement methods previously used for maintenance dredging of federally authorized channels in the project area. The environmental acceptability of these methods has been addressed in previous National Environmental Policy Act (NEPA) documents that were circulated for public and environmental agency review between 1977 and 2014. Incorporated by reference, these documents are available for review at the Wilmington District Library, 69 Darlington Avenue, Wilmington, North Carolina 28403. They include the following:

a. Manteo (Shallowbag) Bay North Carolina, Final Environmental Statement. 1977, U.S. Army Corps of Engineers.

b. Maintenance of Rollinson Channel, Hatteras to Hatteras Inlet Channel Section, Dare and Hyde Counties, North Carolina. Environmental Assessment and Finding of No Significant Impact. 2000, U.S. Army Corps of Engineers.

c. Use of Government Plant to Dredge in Federally Authorized Navigation Projects in North Carolina. Environmental Assessment. March 2004, U.S. Army Corps of Engineers.

d. Use of Government Plant to Dredge in Federally Authorized Navigation Projects in North Carolina. Finding of No Significant Impact. September 2004, U.S. Army Corps of Engineers.

e. Sidecast Maintenance Dredging of a Portion of Hatteras-to-Hatteras Inlet Channel Pamlico Sound, North Carolina. Environmental Assessment. November 2013, U.S. Army Corps of Engineers.

f. Sidecast Maintenance Dredging of a Portion of Hatteras-to-Hatteras Inlet Channel Pamlico Sound, North Carolina. Finding of No Significant Impact. February 2014, U.S. Army Corps of Engineers.

4.0 ALTERNATIVES.

In addition to the alternatives discussed in detail below at Section 4.2, the implementation of 50-foot advanced maintenance wideners for the direct route to the Hatteras Inlet gorge were explored in 2017. The objective was to dredge an additional 50 feet on both sides of the channel to maintain the 100-foot channel width for longer periods; however, the costs of cultural resources' surveys in areas had not been

previously dredged proved to be cost prohibitive and this effort was abandoned. This alternative is not carried forward in the detailed analysis in Section 5.

4.1 Dredge Types and Placement Options.
Various dredge types may be used to maintain the Hatteras Ferry Channel, depending on dredge availability and channel conditions like shoaling locations and controlling water depths. Dredge type and placement options are described immediately below and would be applicable to any of the three alternatives described next in Section 4.2.

4.1.1 Pipeline Dredge.
To maintain the horseshoe route, a contracted hydraulic cutter-suction (pipeline) dredge will be used approximately every 3-5 years, depending upon shoaling rates and available funding. These cutter suction dredges, typically use pipelines of 18-24 inches, operate 24 hours per day and have the capability to remove larger volumes of material (≥150,000 CYs) per contract. Cutterhead suction horsepower of small non-ocean certified dredges usually ranges between 1,300 – 2,000 HP whereas larger pipeline dredges range from 3,000 – 4,500 HP. Beneficial use of dredged material may occur with placement of beach quality sand on Hatteras and Ocracoke Island beaches and/or onto Cora June and DOT Island bird islands for the purpose of restoring habitat for nesting sea turtles and shorebirds, respectively.

Historically, pipeline dredging in the vicinity of the project area has occurred outside of bird nesting season (1 September – 31 March) with dredged material pumped onto nearby Cora June Island, a well-known bird nesting habitat site in the area. Presently, the island has reached maximum size (25 acres) and will not hold additional material until it naturally erodes to a smaller footprint. DOT Island is located centrally inside the corridor and has almost completely eroded away. Authorizations are currently in place to pump dredged material there by control-of-effluent and expand its footprint to a maximum size of 25 acres.

Pipeline dredging may also place dredged material directly onto adjacent Ocracoke and Hatteras Island beaches for purposes of habitat restoration and to combat shoreline erosion. Placement windows for dredged material are driven by the presence of bird nesting habitat (16 November – 31 March). The National Park Service (NPS) has declared areas of beachfront within the Cape Hatteras National Seashore as eligible for receiving sand through the process of obtaining a Special Use Permit (SUP) between 16 November and 31 March.

4.1.2 Special Purpose Hopper Dredge.
The Wilmington District has two shallow-draft special purpose hopper dredges, the “Murden” and the “Currituck”. These vessels typically operate during daylight hours approximately 300 out of 365 days per year, 12 hours per day. Both dredges are capable of dredging at a minimum depth of 5.5 feet of water partially loaded and 8 feet

fully loaded, and both have two dragarms with dragheads that pump material at 100-110 HP into a hopper that can overflow to obtain an economic load. Once the hopper is full (~300 to 500 CYs) the dredged material would be taken to nearshore ocean waters where the split-hull hopper would be opened, and the material placed (typically at 10 feet or more below mean low water (MLW)). These dredges are used to remove small and/or isolated, regularly occurring shoals when contract dredging is not scheduled.

Nearshore placement areas previously established under the 2004 Government Plant EA have been utilized in the past by special purpose hopper dredges. The nearshore location on the Ocracoke side of the inlet is currently in use by Dare County to place material from South Ferry Channel. However, the established nearshore area on the Hatteras side is now located in the inlet (due to erosion); therefore, the proposed nearshore location on the Hatteras side is a new site. It is believed that placement in both locations will help to protect the adjacent beaches by acting as a wave energy dissipator and/or to distribute the beach quality dredged material onto the beaches, offering erosion protection.

In addition to the nearshore placement locations, special purpose dredges can place material into scour hole sites such as the area directly adjacent to the Hatteras/Ocracoke Ferry Terminal sheet pile wall. The purpose of this effort would be to provide sediment protection for the sheet pile wall which was installed to decrease the erosion occurring at the Hatteras/Ocracoke Ferry Terminal facility. Smaller amounts of material (typically ≤5,000 cubic yards) would be placed in this location when specifically requested by NCDOT.

4.1.3 Sidecast Dredge.

The Wilmington District presently has one sidecast dredge, the “Merritt.” The Merritt is capable of dredging in a minimum depth of 5 feet of water, has two adjustable dragarms with dragheads, has a 12-inch discharge pipe that is 80 feet long, and has an available 10-foot pipe extension. The suction pump horsepower is 110 HP. The Merritt casts material approximately 100 feet from the centerline of the vessel into adjacent open waters where the predominant currents carry the sediments away from the channel. As with the special purpose hopper, the sidecaster operates only during daylight hours (12 hours/day).

Due to its shallow draft capability, the sidecast dredge is often the only method of dredging available for shoal removal. The Merritt is often used for digging pilot channels for the special purpose dredges or contract dredge to deepen to project depth. Sidecast dredging takes less time than special purpose dredging since transit time for dredged material placement is not required. When maintenance dredging is required and other dredge types are not available, USACE proposes to sidecast dredge.

Sidecast activity in the vicinity of the corridor has been previously authorized to occur as needed (2014 Sidecast Dredge EA).

4.2 Alternative 1 – No Action.

The No Action alternative refers to the USACE's on-going pursuit of maintaining the historical route (parallel to the islands) to the Hatteras Inlet gorge. This route had been maintained by USACE since the 1960s, with dredged material sidecast away from the channel, placed in nearshore areas using special purpose hopper dredges, or pumped by pipeline dredge to adjacent beaches and/or Cora June and DOT bird islands. There was no dredging window established for this maintenance since dredging was limited to only the areas of shoaling and no over depth dredging was proposed. Furthermore, government plant dredges have much less of an impact on resources due to their smaller size and lower suction power as compared to the commercial fleet. To avoid dredging windows, the USACE committed to coordinating with agencies prior to dredging to avoid potential impacts to aquatic habitat, an effort it will continue to practice. Therefore, only placement windows for pipeline dredging have been established for the protection of shorebird and sea turtle nesting habitat.

The historical route is not currently navigable and re-establishing it would require a dual effort of sidecast dredging and commercial pipeline dredging almost continuously since it is a high shoaling area. The government sidecast dredge is operable 300 days per year, however it is only certified to operate during daylight hours. Constant dredging over a ten-year period is expected to cost over $60 million with the sidecast dredge alone. For USACE to continue pursuing methods to maintain the historical channel would be expensive and dangerous. Without the protection of the barrier islands, sediments continue to shift and change the path of deep water, making it nearly impossible to maintain. Having a government dredge onsite continuously may keep the channel open part of the time, but due to weather patterns storms would likely adversely affect channel dredging on a regular basis, making this option economically unfeasible.

The USCG, NCDOT ferries and local mariners have been using the horseshoe route for the past 8 years, which is twice the distance and nearly double the transit time from Hatteras Village (location of the USCG station) to the Hatteras/Ocracoke ferry landing. Shoaling within certain hot spots has driven Dare County and NCDOT to obtain their own maintenance dredging permits. Dare County has acquired authorization to maintenance dredge from the ferry landing to the inlet gorge (South Ferry Channel) between October 1 – March 31, and NCDOT permits are expected to be issued by November 2021 for Sloop Channel. The dredging of Barney Slough is not currently covered by any permits and is experiencing significant shoaling.

If the USACE does not obtain clearances to maintain the horseshoe route, excessive strain would be placed on the State and local municipalities to independently maintain the channel. It is USACE's responsibility to maintain access to the Hatteras Inlet gorge

as part of the Rollinson Channel federal navigation project. Although, the No Action alternative is not a viable option, it is carried forward for comparison purposes in the detailed analysis of Affected Environments and Potential Impacts in Section 5.

4.3 Alternative 2 – Maintenance of the horseshoe route between 1 October and 31 March (with agency approval required for dredging between 1 April and 30 September).

Based on input from resource agencies during project scoping, a dredging window of 1 October – 31 March has been recommended to protect sensitive stages of marine life that use the estuarine habitat for spawning and development. This window is also consistent with the windows included in the Dare County (and soon-to-be NCDOT) dredging permits with use of government plant dredges.

When a contract pipeline dredge is employed, the USACE would abide by the placement windows established to protect nesting shorebirds and sea turtles on the bird islands and adjacent beaches. Pipeline placement of dredged material onto Cora June and DOT bird islands would be restricted to 1 October – 31 March, and 16 November – 31 March for Hatteras and Ocracoke Island beachfronts. That is true unless bird nesting habitat exists within the placement area, then beach placement activities must cease by 31 March.

Under this alternative, USACE would be required to conduct regular maintenance with government plant dredges between 1 October and 31 March but would have the option to request relief from the window when severe shoaling occurs outside that window. Coordination with the resource agencies is required prior to every dredging event outside of the window, no matter how minimal the dredging. Since pipeline dredging would be restricted to the windows for placement onto beaches and bird islands, respectively, only sidecast and special purpose hopper dredging events would be coordinated with agencies during the months of April through September.

Government plant dredging only during the 1 October – 31 March environmental window is not practicable given the dynamic nature of the inlet and high shoaling rates. Weather in the Outer Banks in the wintertime is tumultuous and the most dangerous time to dredge because heavy winds and high seas common during December – February result in constant sediment transport. Inclement weather is the number one reason for dredge delays, making wintertime dredging very expensive and inefficient.

Implementing a dredging window will not decrease the overall amount of dredging needed to maintain the channel, and it will not lessen the amount of dredging that would be needed outside of the window. As seen with recent dredging events in South Ferry Channel, numerous requests for relief from the dredging window have been necessary to keep the channel navigable year-round. Since 2017, 50% of shoaling that resulted in the need for dredging occurred during the moratorium. Maintaining navigability in the

summer months is most important since tourism triples the population on Ocracoke and Hatteras islands between the months of May and September. Based on past experience, performing maintenance of the channel immediately prior to the tourist season does not guarantee the channel will remain open throughout this period.

The environmental agency coordination process results in increased costs and time for federal and state agencies to coordinate, and that coordination has the potential to delay dredging of the shoaled areas. In the first half of 2021, South Ferry Channel required four relief requests resulting in the need for immediate dredging action that required many federal and state agencies to drop what they were doing to review and provide input on the emergency dredging request. When severe shoaling occurs and the ferry service is affected, as occurred in May 2021, hundreds of travelers may become stranded, and delivery of important supplies may be delayed. Having to rely on emergency dredging requests to maintain the channel is a very reactive approach that is inefficient, inflexible, and not sustainable.

The numerous moratorium relief needed over the past 3 years substantiates the ineffectiveness of trying to maintain such dynamic channels during a limited, 6-month period of the year. The various environmental agencies have never denied any of the moratorium requests, which is an indication that agencies do not view the impacts of dredging any time of year as significant. For the reasons described above, this alternative does not provide a safe, reliable navigation channel; however, it is carried forward for comparison purposes in the detailed analysis in Section 5.

4.4 Alternative 3 (Proposed Action) – Maintenance of the horseshoe route any time of year.

The proposed action is dredging of the realigned horseshoe route in a proactive manner by monitoring shoals through routine survey efforts and planning for scheduled maintenance events. Shoaling is not predictable and dredge availability is uncertain unless planned ahead of time. Government-owned dredges are scheduled to perform channel maintenance up and down the east coast. Heavy southwest winds in July are common, resulting in shifting sands and narrowing channels. Delays in travel and delivery, as well as assistance and rescue, would occur regularly during the summer months if coordination is required prior to dredging. Therefore, the proposed action of maintenance any time of year with government plant is in the best interest of the project.

Contract pipeline dredging can be resourced and funded in advance to occur approximately every 3-5 years. The goal of using a pipeline dredge would be to remove as much material within the authorized dimensions as possible to make effective use of equipment mobilization costs, while at the same time beneficially using the material. Timing of pipeline dredging would be driven by placement options, with most of the material being placed on oceanfront beaches and bird islands. Therefore, all pipeline

dredging would occur within the restricted placement timeframes of 16 November – 31 March on beaches, and 1 October – 31 March on bird islands.

Only the high shoaling areas, hot spots, within the project area will be dredged. The anticipated hot spots encompass a very small percentage of the corridor area, only 33 of the total 1,580 acres or 2% of the total area. The intent is to remove these isolated shoals before emergency conditions occur, thereby, lessening the severity of potential navigational hazards and eliminating the need for numerous, short notice, emergency dredging events. The use of the special purpose and sidecast dredges allows for prompt and economical responses to quickly address developing shoaling situations.

In between the contract dredging events, the USACE would utilize a government plant as needed to maintain hot spots any time of year. It's anticipated that maintenance of the hot spots would be needed quarterly to ensure safe navigation without delays in ferry transportation, groundings, lost wages for fishermen, etc. Based on the 2004 Government Plant EA/FONSI, special purpose hopper and sidecast dredging are authorized to occur in the nearby portions of Rollinson Channel any time of year with no environmental window. As documented in the 2004 EA/FONSI, some portions of Rollinson channel are restricted from sidecast dredging to protect submerged aquatic vegetation (SAVs) that occurred in the vicinity of the channel. However, as the islands have retreated over the past 20 years, SAV beds have become negatively impacted by the natural currents and dynamics of the inlet, causing the constant shifting of sands to cover the beds and prevent them from growing back. Historically, to avoid impacts to SAVs, the USACE has assessed SAV locations prior to conducting dredging events outside of moratorium timeframes. These efforts would continue preceding each dredging event in proximity to SAV habitat areas.

The current practice of declaring emergencies after shoals become a problem and then coordinating with agencies has proven to be burdensome, time consuming and inefficient. The issue is especially burdensome over a weekend or during a holiday. Due to environmental concerns expressed during the NEPA scoping process for this EA, the USACE plans to implement certain conditions to allow small quantities of regular maintenance dredging to occur any time of year without coordination. Environmental Commitments are listed in Section 7 of this document. Dredging as needed along the horseshoe route would dramatically reduce ferry service delays, improve the safety of USCG rescues, and benefit the economy.

Currently, shoaling is most prevalent in the lower portion of Barney Slough, the upper portion of Sloop Channel and South Ferry Channel. The last hydrographic survey of the entire corridor was completed in October 2020 (Figure 5) identifying hot spots and areas of concern. Approximate volumes were based on this survey to estimate future dredging volumes and shoaling rates. It is suggested that each hot spot area be dredged at least 3-4 times per year in between contract dredging events. Table 1

shows the annual dredging events estimated to maintain each reach within the horseshoe corridor.

4.4.1 Barney Slough.
Barney Slough is the local name for the natural deep-water channel that developed on the backside of Hatteras Island running north-south connecting the Hatteras Ferry Channel with deep water of Pamlico Sound. The channel begins at greenlight Buoy 15 (approximately), and shoaling is most prevalent in the lower portion of Barney Slough near Red Buoy 12.

Dredging within Barney Slough has never occurred and is not currently covered by any permits. The ideal dredge type to maintain this portion of the horseshoe route would be the sidecast dredge, as transit distance would be too far for the Murden to travel to reach the Ocracoke nearshore for placement. It is estimated that 36 days of dredging over 3-4 dredging events per year (approximately 50,000 CYs annually) would be needed to maintain the channel. Neither Dare County nor NCDOT are currently pursuing permits to dredge Barney Slough.

4.4.2 Pamlico Sound.
The Pamlico Sound portion of the horseshoe corridor is the deepest and would require the least maintenance. As with Barney Slough, this portion has never been dredged nor are there any submitted requests to do so. Shallow areas on the eastern side near Red Buoy 10 have been identified and will need to be addressed in the future. Approximately, 32,000 CYs will need to be removed per year to maintain navigability. This is estimated to take a total of 24 days over the course of 3-4 dredge events, using either the sidecast or special purpose hopper dredge.

4.4.3 Sloop Channel.
Sloop Channel runs north south from Pamlico Sound to the Hatteras/Ocracoke ferry landing. Significant shoaling has occurred in the northern portion near Red Buoy 6, allowing only enough water for one ferry to travel at a time. Continuous vessel traffic is the only reason this portion of channel stays navigable, however today there are fewer ferry departures than 3 years ago (60 out of 72 during peak season) as a result.

Dredging of Sloop Channel is critical at this time and is currently pending Department of the Army permits. Maintenance dredging would occur 3-4 times per year using either the sidecast or special purpose hopper dredges to remove a total of about 50,000 CYs annually over approximately 42 days per year.

4.4.4 South Ferry Channel.
South Ferry Channel connects Sloop Channel to the Hatteras Inlet gorge and, despite the name, isn't utilized by ferry vessels. This portion of the horseshoe corridor is frequently traveled by commercial and recreational fishermen accessing the Atlantic

Ocean and occasionally by the USCG for search and rescue operations. South Ferry Channel experiences the highest amount of shoaling; the entire area is considered a hot spot since natural deep water is continuously shifting.

Dare County obtained permits to maintain South Ferry Channel and since 2017 there have been a total of 16 dredging events. Dare County funds the USACE to complete these dredging events. Thus far, 14 used the Merritt and 2 used the Murden. Initial dredging occurred between May 11 – June 1 and again September 12 – 23, removing a total of 80,600 CYs. Since then, six maintenance dredging events during the April 1 – September 30 NCDMF/NMFS-imposed moratorium have been needed, with four of these occurring in 2021. All these events required environmental agency coordination prior to the start of dredging.

Under the proposed action, 3-4 maintenance events per year are expected with removal of approximately 45,000 CYs annually. A total of 30 days of dredging per year would be needed to maintain the channel, barring any major storms.

Table 1. Annual dredging events estimated to maintain each portion of the horseshoe route.

Channel	Dredge Type	Amt/year (CYs)	Dredging Days/year
Barney Slough	Sidecast only	50,000	36
Pamlico Sound	Sidecast & Hopper	32,000	24
Sloop Channel	Sidecast & Hopper	50,000	42
South Ferry Channel	Sidecast & Hopper	45,000	30
Totals		**177,000**	**132**

5.0 AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS.

The environmental effects from the placement of dredged material from a cutterhead suction/hydraulic pipeline dredge will not be analyzed in this EA as these impacts have been addressed in past NEPA documents. All material proposed for dredging consists of beach quality sand (≥90% sand) and placement on beaches or bird islands will be done in accordance with the designated windows for the protection of nesting birds and sea turtles. Existing clearances and conditions that allow placement by control-of-effluent onto Cora June and DOT islands will be implemented. Placement onto National Park Service (NPS) National Seashore beaches of Hatteras and Ocracoke Islands will occur only after a Special Use Permit (SUP) is obtained. Additionally, placement will

abide by the 2021 Cape Hatteras National Seashore Sediment Management Framework FEIS and the terms and conditions and conservation recommendations described in the 2017 U.S. Fish and Wildlife Service (USFWS) Statewide Programmatic Biological Opinion.

Hydraulic pipeline dredging within the proposed corridor will be assessed for environmental effects since this is considered a new area of dredging; however, pipeline dredging will be limited to the cold weather months (16 November – 31 March) based on placement restrictions protecting sea turtle and bird nesting areas.

Dredging and placement with government-owned special purpose hopper and sidecast dredges are the prevalent activities being analyzed in this EA. Special purpose hopper dredging suctions bottom material into the hopper and transits to an approved nearshore area for placement. Sidecast dredging suctions bottom material and redistributes it into adjacent waters, atop existing sandy sediments. Material is cast approximately 80 feet from the port or starboard side of the vessel into waters flowing away from the channel being dredged.

The impacts of these activities will be addressed for the three alternatives, described above as 1) No Action; 2) Maintenance of the horseshoe route between 1 October and 31 March; and 3) Maintenance of the horseshoe route any time of year (proposed action). It should be noted that the impact assessments, below, for alternative 2 do **not** assume that dredging would only occur between 1 October and 31 March. Historically, shoaling in the project vicinity occurs throughout the year so in the discussion of impacts, the assumption is this pattern will continue and dredging will be required regularly throughout the year even with an environmental window. However, unlike alternative 3 (proposed action), alternative 2 would require the USACE to coordinate with environmental agencies prior to each dredging event needed outside the window of 1 October and 31 March.

5.1 Sediments.

The Wilmington District conducted geotechnical investigations of the project area in 2021 to properly characterize material in the proposed corridor to determine the most suitable placement options. Seventeen (17) vibracores borings were drilled into material lying above the maximum dredging elevation of -12 feet Mean Lower Low Water (MLLW). This includes a project elevation of -10 feet MLLW plus -2 feet of over depth for periodic maintenance dredging. All 17 vibracores were advanced to a depth of 12 feet below the channel bottom to ensure that all strata that may be encountered during dredging operations were properly characterized.

Results of all vibracore borings collected to date in the project area, including drilling logs and gradation testing, are included as Appendix A. Once all the vibracores were collected, they were split open. The sampled soils were logged and designated for testing, and the vertical shoal strata between the channel bottom and -12 feet MLLW was characterized using the drilling logs and cross-sections presented in Appendix A.

Most of the sampled material consists of poorly graded sand (SP), which has a fines content that ranges from 0 to 5%. The maximum allowable fines content for USACE beach placement projects is 10% fines, composited vertically through the strata-datapoint. Throughout the project area, the material is ≥90% sand (grain-size between 0.075 mm and 4.75mm); none of the individual test samples within the corridor, to project depth, exceed this 10% fines criteria.

Material exceeding the 10% fines criteria has been identified in areas within the Sloop Channel corridor at depths below the -12 feet MLLW. Dredging will not exceed -12 MLLW within this area as it would lower the quality of material being dredged. Observations of dredging events will be conducted to reverify the type of sediments present; additional grain-size analyses will be accomplished, if warranted.

No dangerous debris, including unexploded ordnance, is anticipated to be encountered during any portion of the corridor. However, should such debris be found, procedures would be followed to dispose of the debris appropriately to avoid injury to the dredge crew and the public, as well as damage to property or the environment.

Environmental Impacts.

Alternative 1 - No Action: Under the No Action alternative, the USACE would attempt to maintain the historic route, which would require almost continuous dredging, 12 hours per day, 300 days per year, with the government plant and/or 24 hours per day with contracted pipeline dredge to keep the channel navigable. Doing so would result in constant manipulation of sediments within a very dynamic area; however, impacts would be minor since this is such a dynamic area.

Alternative 2 - Maintenance of the horseshoe route between 1 October and 31 March with permission required for hot spot dredging outside of that window: Dredging of the realignment (horseshoe route) will remove shoaled dredged material to the authorized project width and depth. Initial dredging along the horseshoe route is anticipated to remove approximately 150,000 CYs of beach quality sand that would be beneficially used by redistributing it within the littoral system. The dredged material would be sidecast into adjacent waters, placed in the nearshore areas by hopper dredge or placed on adjacent beaches and bird islands when a pipeline dredge is used. Pipeline dredging with placement on beachfronts would be limited to 16 November – 31 March and placement onto bird islands from 1 October – 31 March. Most of the material to be dredged is continually being redistributed by normal tidal processes and storm events. Significant erosion of the Ocracoke and Hatteras Island shorelines has occurred since 1993 and continues to result in shifting sediments, carried by strong currents. Redistribution of sediments is, therefore, a natural and continuous phenomenon.

Once the new navigation alignment has been established, periodic maintenance dredging would remove future shoaled sediments, which is not expected to adversely impact the project area's geology or sediments. Since the channel would follow

naturally deep water, less dredging events and volumes are expected, in comparison to the initial channel establishment.

Alternative 3 - Maintenance of the horseshoe route any time of year (Proposed Action): Proposed dredging without time-of-year restrictions will have the same effect on sediments as dredging with time of year restrictions, with the exception that redistribution of sediments within the littoral system could occur any time of year. The same amount of material would be moved (dredging and placement) regardless of when dredging occurs. As with Alternative 2, initial channel dredging would have the largest impact on sediment movement and smaller maintenance events will result in less impacts since sediment quantities removed would be expected to be less.

5.2 Water Resources.

5.2.1 Hydrology.
Tides in the project area are semidiurnal and the mean tidal range (difference between mean high water and mean low water) is approximately 3.5 feet. Wind is a noticeable factor in tide level. The estuarine waters of Hatteras Inlet and the surrounding area display considerable daily variation in current and salinity conditions due to freshwater inflow, tides, and wind. Regular reversals of flow occur with each tidal cycle. The salinity of the area is 35 parts per thousand (ppt) due to the proximity to the inlet and the ocean.

Environmental Impacts.

Alternative 1 - No Action: Under the No Action alternative, the USACE would continuously dredge the historic route by government dredge any time of year since the need exists and there are no dredging windows. Dredging-related impacts on hydrology (changes to salinity, tides, etc.) within the inlet would be minor and localized to the historic route. Due to the dynamic nature of the inlet, these changes are not expected to be detectable.

Alternative 2 - Maintenance of the horseshoe route between 1 October and 31 March: Dredging within the proposed corridor will be minimized by allowing natural deep water to dictate where the channel is, and most of the dredging will occur within the hot spots during the 6-month window. During spring and summer (outside of the window), any required dredging would be coordinated with resource agencies before proceeding. Where shoaling is apparent, dredging will result in increases to water depths within the channel, possibly having minor effects on salinity and flow; however, in comparison to the size of the inlet complex, impacts within the minimal area of impact would be minor, temporary, and not affect the overall hydrology of the area.

Alternative 3 - Maintenance of the horseshoe route any time of year (Proposed Action): The proposed action would have the same effects as dredging the horseshoe route with a window, since dredge quantity is not expected to change with or without windows.

Therefore, the proposed action is not expected to result in changes to hydrology or salinity, regardless of the time of year dredging occurs.

5.2.2 Water Quality and Characteristics.
The project area is in North Carolina Division of Water Resources (NCDWR) Pasquotank River basin and U.S. Geologic Survey (USGS) Hydrologic Unit 03020105.

The Clean Water Act (CWA) of 1972 requires that the surface waters of each state be classified according to designated uses. North Carolina's tidal salt waters are classified with the following categories:

- Class SC: Secondary Recreation (i.e., fishing, boating) and Aquatic Life Propagation
- Class SB: Primary Recreation (swimming) plus SC uses
- Class SA: Commercial Shellfish Harvesting plus SC/SB uses
- HQW: High Quality Waters (all SA waters; excellent quality)
- OWR: Outstanding Resource Waters (all HQWs; outstanding fish habitat/fisheries)

NCDWR classifies Pamlico Sound (index # 30-22) and Hatteras Inlet (index # 30-22-33) at the project site as SA and HQW. SA waters are protected for commercial shell fishing along with all designated SB and SC uses. Class SA commercial shell fishing waters are assigned a Shellfish Growing Area Status of Approved, Conditional, or Prohibited based on North Carolina Division of Marine Fisheries (NCDMF) Shellfish Sanitation fecal coliform criteria. Ocean waters beyond the Hatteras inlet mouth are classified as SB waters (15 NC Administrative Code 2B .0311).

If a waterbody does not meet the state designated use standards, it is considered impaired and is placed on the 303(d) list. There are no designated 303(d) waters within the project area.

The potential water quality impacts of dredging include minor and short-term suspended sediment plumes and the release of soluble trace constituents from the sediment. Suspended sediments also affect turbidity, an optical property of water (measured in nephelometric turbidity units, or NTUs) that affects light penetration into the water column. During dredging, turbidity increases outside the dredging area should be less than 25 NTUs to be considered insignificant. In the case of overflowing government-owned hopper dredges to obtain economic loading, sediment that is ≥90% sand is not likely to produce significant turbidity or other water quality impacts since material is expected to dissipate from the water column relatively rapidly. (USACE 1997).

North Carolina Division of Water Resources (NCDWR) Section 401 Water Quality Certification (WQC) under the Clean Water Act of 1977 (PL 95-217) are issued for projects that result in a regulated discharge of material. Pursuant to 33 C.F.R. § 335.7, and meeting the environmental standards established by the Clean Water Act Section 404(b)(1) evaluation process, a 404(b)(1) analysis will be included as Appendix B prior to conclusion of the NEPA process.

Environmental Impacts.

Alternative 1 - No Action: With the No Action plan, dredging within the historic route with government plant would occur 12 hours per day, approximately 300 days per year. Turbidity within the localized area of the dredge would be constant during daylight hours, however it is still expected to stay within the 25 NTU criteria since the material is ≥90% sand and sediments would settle out completely every night. Therefore, effects on water quality would be minor and localized.

Alternative 2 - Maintenance of the horseshoe route between 1 October and 31 March: Initial dredging and maintenance dredging of the horseshoe route will create minor and short-term impacts on water quality. Sediments within the corridor have been sampled and tested and all material to be dredged has less than 10% fines and therefore is not likely to produce significant turbidity.

The implementation of the channel realignment will not require a 401 WQC for the dredging portion, since there is no regulated discharge, pursuant to the Clean Water Act, however, dredged material placement will require a 401 WQC, since this is considered a regulated activity. Placement onto Cora June Island and DOT Island are covered under WQC #4152 and placement within the preauthorized beachfront and nearshore areas is covered under WQC #4146.

Alternative 3 - Maintenance of the horseshoe route any time of year (Proposed Action): The proposed action of dredging within the corridor any time of year would have the same effects on water quality as dredging with windows; dredged material stirred up during dredging and placement would settle out quickly and be localized to the dredge area. However, these minor and short-term impacts could occur any time of year, including spring and summer when sensitive stages of ecologically and commercially important species are present and dependent on good water quality. The most impact would occur where these species are abundant and cannot avoid the disturbance of the dredge (i.e., sidecasting in areas of eggs, larvae, SAVs). Sidecasting material into the direction of an ebb tide is most efficient, and it also helps to carry the material away from shallower areas where most eggs and larvae may be. Therefore, minimal impacts to those eggs and larvae may be expected. This is discussed further under the Environmental Impacts Section of 5.6 Fish Resources and Fish Habitat.

The same Water Quality Certifications for dredged material placement apply to the proposed action, as noted above, for dredging of the horseshoe route with an environmental window and the USACE will obtain authorization from DWR to utilize WQCs 4152 and 4146 prior to any dredging or placement activity.

5.2.3 Wetlands and Floodplains.
Coastal wetlands of the vicinity include tidal salt marshes that occur along the shorelines and the island fringes in the area. These marshes are comprised mainly of

smooth cordgrass (*Spartina alterniflora*) and are generally more extensive where they are protected from wind and wave action. Intertidal wetlands of the area are very important ecologically due to their high primary productivity, their role as nursery areas for larvae and juveniles of many marine species, and their refuge/forage value to wildlife. In addition, they provide esthetically valuable natural areas.

Executive Order 11988 (Floodplain Management) states that federal agencies shall 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, federal agencies shall take action to reduce the risk of flood loss, and minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains.

Under Executive Order 11990 (Protection of Wetlands), Federal policy recognizes that wetlands have unique and significant public values and calls for the protections of wetlands. Policy directives set forth in Executive Order 11990 are (a) avoid long and short-term adverse impacts associated with the destruction or modification of wetlands; (b) avoid direct or indirect support of new construction in wetlands; (c) minimize the destruction, loss, or degradation of wetlands; (d) preserve and enhance the natural and beneficial values served by wetlands; and (e) involve the public throughout the wetlands protection decision-making process.

Wetlands and floodplains are not found within the proposed areas to be dredged. Placement areas where wetlands may be present in the vicinity would be coordinated with resource agencies appropriately prior to dredged material placement. There may be fringing wetlands within the pipeline alignment from the dredge to the placement area, and any wetlands would be identified and avoided to the maximum extent practicable. Placement of beach quality sand within these areas would reduce risks to shorelines from erosion and sea level rise. Uplands created by sand placement would not be subject to development.

Environmental Impacts.

Due to the lack of wetlands or floodplains in the proposed dredging and placement areas, no alternatives considered would adversely affect wetlands or floodplains or alter their function; and work would be in full compliance with Executive Orders 11990 and 11988 following completion of the NEPA process. Likewise, no alternatives considered would result in placement of fill in wetlands or result in hydrologic or salinity changes affecting wetlands.

5.3 Air Quality.

Section 176(c)(1) of the Clean Air Act (CAA) requires Federal agencies to assure that their actions conform to applicable implementation plans for achieving and maintaining the National Ambient Air Quality Standards for criteria pollutants.

The N.C. Division of Air Quality (DAQ) website (http://daq.state.nc.us) indicates that Dare and Hyde Counties are in attainment for fine particles, ozone, and sulfur dioxide pursuant to the National Ambient Air Quality Standards. The Washington Regional Office of the DAQ has air quality jurisdiction for the project area. According to 2018 data presented on the Division's website, both Dare, and Hyde Counties reported 1 pollutant facility and a total of less than 0.1 tons of emissions per year.

Alternative 1 - No Action: The No Action alternative would result in almost constant dredging and may have an adverse effect on the air quality. Although dredging equipment would follow Section 176 (c) of the CAA, as amended, emissions may increase slightly above de minimis levels if dredging occurred 300 out of 365 days a year indefinitely.

Alternative 2 - Maintenance of the horseshoe route between 1 October and 31 March: Dredging between October and March is not expected to result in adverse effects on the air quality within the project area. Annual dredging volumes are estimated to be 177,000 CYs and take approximately 132 days a year to complete. These short-term impacts would be like those impacts occurring during routine maintenance dredging in other nearby locations. Accordingly, the long-term air quality conditions would be like existing conditions.

Alternative 3 - Maintenance of the horseshoe route any time of year (Proposed Action): Dredging without a window would have the same effect on air quality as dredging with a window since the number of days the dredge would be in operation would be the same. Dredging any time of year is not expected to create any adverse effect on the air quality within the project area

5.4 Noise.
Noise levels below the water surface within the project area vary throughout the year and often include state, commercial and recreational boat traffic, in particular daily passenger ferry and vehicle barge transport between the months of May - August.

Dredging operations generally produce low levels of low-frequency sound energy that, although audible over considerable distances from the source, are of short duration (Michel 2013). Sound from a dredge is generated from the drag arm sliding along the bottom, the pumps moving the material, and operation of the ship engine/propeller. The significance of the noise generated by the equipment dissipates with increasing distance from the noise source. The effects of noise from dredging have been determined to have no lethal or injurious effects and minimal behavioral effects.

Environmental Impacts.

Alternative 1 - No Action: If maintenance dredging of the historic route to the inlet gorge were to be pursued by the USACE then almost constant dredging with government plant would be necessary to keep the channel navigable. Noise levels from sidecast

and special purpose hopper dredges would only occur during daylight hours but would be long-term, which may disturb feeding, mating, spawning, and other behaviors within sea turtles, porpoises, and blue crabs; but noise would not be significant since these species are expected to avoid the disturbance. Affects would only occur within a very localized area around the dredge. Same would be true for pipeline dredging, which would occur less frequently than government plant dredging, but would operate 24 hours per day for several weeks at a time.

Likewise, the impacts of underwater sound on fish populations are expected to be minor and temporary because duration of exposure to dredging noise is short-term and species can easily flee from the area. Migrating and spawning fish species are expected to pass the dredge unharmed, as had occurred in the James River, Virginia during a pipeline dredge event while Atlantic sturgeon were migrating. (Balazik, 2020).

Sound from dredging within the Hatteras Inlet area is not expected to impact marine mammals in the area, the critically endangered North Atlantic Right Whale that migrates offshore during the winter months. Noise levels associated with dredging and placement activities are expected to comply with Section 6-28 and Section 22-33, NC code of ordinances, thereby having little to no effects on the natural environment.

Alternative 2 - Maintenance of the horseshoe route between 1 October and 31 March: While dredging would elevate noise levels somewhat, under Alternative 2 each dredging event is expected to be of short duration (24-42 days, Table 1) and any elevated noise levels would be a disturbance only within a very localized area around the dredge. Affects would be like the No Action alternative but noise disturbance would be less as dredging would be limited to 3-4 events per year.

Alternative 3 - Maintenance of the horseshoe route any time of year (Proposed Action): The amounts and levels of dredging-related noise are expected to be the same as Alternative 2 (maintenance of the horseshoe route with a window). Under the proposed action, dredging may occur during warmer months when species are more abundant, however, additional noise resulting from dredging would be negligible as compared to the continuous noise derived from vessel traffic. During summer months, at the height of tourist season, as many as 7 ferries are in constant motion within the corridor. That's in addition to commercial and recreational fishing boats, private pleasure cruises, and other recreational boats. Added noise related to dredging between 1 April and 30 September, which may equate to two 14-day dredging events, is not expected to adversely affect marine species physically or behaviorally.

5.5 Marine and Estuarine Resources.

5.5.1 Nekton.

Nekton collectively refers to aquatic organisms capable of controlling their location through active movement rather than depending upon water currents or gravity for passive movement. Nekton of the nearshore Atlantic Ocean along the northeastern North Carolina coast can be grouped into three categories: estuarine dependent

species; permanent resident species; and seasonal migrant species. The most abundant nekton of these waters are the estuarine dependent species that inhabit the estuary as larvae and the ocean as juveniles or adults. This group includes species which spawn offshore, such as the Atlantic croaker (*Micropogon undulatus*), spot (*Leiostomus xanthurus*), Atlantic menhaden (*Brevoortia tyrannus*), flounders (*Paralichthys* spp.), mullets (*Mugil* spp.), anchovies (*Anchoa* spp.), blue crab (*Callinectes sapidus*), and penaeid shrimp (*Penaeus* spp.), as well as species that spawn in the estuary, such as red drum (*Sciaenops ocellatus*) and weakfish (*Cynoscion regalis*). Species that are permanent residents of the nearshore marine waters include the black sea bass (*Centropristis striata*), longspine porgy (*Stenotomus caprinus*), Atlantic bumper (*Chloroscombrus chrysurus*), inshore lizardfish (*Synodus foetens*), and searobins (*Prionotus* spp.). Common warm water migrant species include the bluefish (*Pomatomus saltatrix*), Spanish mackerel (*Scomberomorus maculatus*), king mackerel (*Scomberomorus cavalla*), cobia (*Rachycentron canadum*), and spiny dogfish (*Squalus acanthias*).

Hatteras Inlet is a passageway for the larvae of many species of commercially and ecologically important fish. Spawning grounds for many marine fishes are believed to occur on the continental shelf with immigration to estuaries, including Pamlico Sound, during the juvenile stage. The shelter provided by the marshes and shallow water habitats within the project area's estuarine waters serves as nursery habitat where young fish undergo rapid growth before returning to the offshore environment.

Marine mammals also occur in North Carolina's coastal waters. The federally listed North Atlantic right whale (*Eubaleana glacialis*) and humpback whale *(Megaptera novaeangliae*) are winter migrants off the coast. Several other whale and dolphin species normally inhabit deeper waters offshore, while the bottlenose dolphin (*Tursiops truncatus*) and the harbor porpoise (*Phocoena phocoena*) utilize nearshore waters. The bottlenose dolphin is common in the project area. The federally endangered manatee (*Trichechus manatus*) is a rare but occasional visitor to the northeastern North Carolina coast.

Five species of federally listed sea turtles are known to nest on the beaches of Cape Hatteras National Seashore and/or occasionally enter Hatteras Inlet. These are the green (*Chelonia mydas*) and loggerhead (*Caretta caretta*), hawksbill (*Eretmochelys imbricata)*, Kemp's ridley (*Lepidochelys kempii*), and leatherback (*Dermochelys coriacea*) sea turtles.

Environmental Impacts.

Alternative 1 - No Action: The almost constant dredging required to maintain the historic route may result in negative effects on marine species by disturbing feeding, mating, spawning, and other behaviors, however this would only occur within the localized area of the dredge. The surrounding habitat of the Hatteras Inlet area would remain unaffected by the dredge and is expected to provide sufficient shelter, feeding areas, and spawning grounds for species to thrive.

Alternative 2 - Maintenance of the horseshoe route between 1 October and 31 March: Each dredging event during the months of October and March is expected to be short term: for pipeline dredges, contracts would occur once every 3-5 years and last for approximately 30-45 days; for government-owned dredges, events would last from 3 days to 3 weeks and would occur multiple times of year, even in the summer months with agency coordination. Disturbances would be minor within a very localized area around the dredging and placement areas, of which nekton can avoid. Areas expected to require regular dredging would consist of only about 2% of the overall corridor. Therefore, these disturbance events are not expected to adversely impact fish, marine mammals, or marine reptiles in the area.

Alternative 3 - Maintenance of the horseshoe route any time of year (Proposed Action): As explained above, warm weather dredging is not expected to occur more than it would if windows were applied, since the need to dredge throughout the year would still exist. All pipeline dredging would occur in the winter months and only government-owned dredges would operate in the spring and summertime with plans to dredge minimum volumes needed to maintain the route through the summer season. Sensitive life stages of economically and ecologically important fisheries will be more abundant within the project area during warmer months, however the minor effects on water quality, noise, and species' behaviors are not anticipated to adversely affect populations. As was explained in detail in the 2004 Use of Government Plant to Dredge in Federally Authorized Navigation Projects in North Carolina, due to the small size of dragheads, low suction power and low speed, these dredges are not capable of entraining adult-sized species. Smaller life stages could become entrained if they are on the seafloor within the path of the draghead, however it is possible they may survive entrainment and relocation with the placed material. Summer dredging with government plant has been occurring in South Ferry Channel for years with no observable impacts to species, so maintaining the horseshoe route any time of year may have minor impacts on nekton like the aforementioned but would not result in significant effects on any species.

5.5.2 Benthos.

Aquatic organisms that live in close association with the bottom, or substrate, of a body of water, are collectively called benthos. Given the susceptibility of the proposed project area to currents and water movement and the subsequent shoaling, the sandy sediments would not be expected to support significant numbers of organisms within benthic communities. Common benthic organisms in these sediments would likely include polychaetes, amphipods, decapods, and mollusks.

Overall, initial dredging (new construction) results in more impacts on benthos than maintenance of existing channels. The biggest impact occurs on the sea floor and results in the removal of upper layers of substrate and the placement of large amount of material (smothering) from the special purpose hopper dredge. However, removal of benthos and benthic habitat represents a minor resource loss since the channel bottom and dredged material placement areas will become recolonized by benthic organisms

within a matter of months (but never fully recover due to the regular maintenance of the channels). Benthic invertebrates exhibit strong seasonality in reproduction, meaning that the seasonal timing of dredging can influence recovery rates. However, not all benthic taxa reproduce most intensively during the same season, so timing of dredging can select for dominance of different taxa during the recovery process (Michel 2013).

Environmental Impacts.

Alternative 1 - No Action: Near-continuous dredging to maintain the historic channel would mean a constant disturbance to the benthos present within the dredged areas, which would result in permanent impacts to the benthos since there would be no opportunity for recovery between dredging events. This would be localized to the area of dredging within the channel. Placement activity for the sidecast dredge would be directed towards an ebb tide which would carry most dredge sediments away into deeper waters. Sidecast material would scatter and is not likely to smother benthos, however the special purpose hopper would dump approximately 300-500 CYs at a time in a designated nearshore area and is likely to cause smothering within the localized area. Benthos in nearshore areas are expected to recover after 6-9 months (Wilbur, 2001).

Alternative 2 - Maintenance of the horseshoe route between 1 October and 31 March: Since the proposed corridor is the best water for navigation at this time, channel maintenance will be necessary, and limited to the locations where hot spots occur. Initial dredging would impact relatively small areas of benthic communities, since identified hot spots make up a small percentage of the overall footprint of the channel (2%). Effects related to the different dredge types would be like those of the No Action alternative. The affected area would be very small relative to the amount of benthic habitat present on the seafloor; therefore, the ecological significance of temporary benthic losses is considered minor.

Alternative 3 - Maintenance of the horseshoe route any time of year (Proposed Action): The effects of dredging and dredged material placement in the spring and summer would be more severe than dredging in colder months of the year, since benthos and bottom feeding fish would be more abundant during the warmer months of the year. Warm weather dredging would occur for all three alternatives, therefore the effect on benthos and benthos recovery would be the same.

Alternatives 2 and 3 have the same dredging footprint (hot spots) and the time of year that dredging occurs would not differ much. Periods between dredge events would allow for some benthic recovery however, the continual sedimentation and shoaling that results in the need for maintenance dredging is ongoing and therefore the benthic populations in the channel hot spots likely will never fully recover, despite the time of year they are dredged. Therefore, dredging any time of year will be the same as Alternative 2 and not result in significant impacts on benthic invertebrates.

5.6 Fisheries Resources and Fish Habitat.

The 1996 Congressional amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) (Public Law 94-265) set forth new requirements for the National Marine Fisheries Service (NMFS), regional fishery management councils (FMC), and other federal agencies to identify and protect important marine and anadromous fish habitat. These amendments established procedures for the identification of Essential Fish Habitat (EFH) and a requirement for interagency coordination to further the conservation of federally managed fisheries. The EFH assessment is included in the body of this EA and will be coordinated with NMFS Habitat Conservation Division (HCD) upon its circulation.

The EFH assessment includes fish species managed under MSFCMA that may occur in the vicinity of the Project. Categories of EFH and Habitat Areas of Particular Concern (HAPC) for managed species are identified as potentially occurring in southeastern states in the Fishery Management Plan Amendments of the South Atlantic Fishery Management Council.

Table 2 shows the categories of EFH habitat located within the project vicinity of Pamlico Sound, Hatteras Inlet and beach and nearshore placement areas (www.habitat.noaa.gov/apps/efhmapper). They include Coastal Migratory Pelagics, Snapper Grouper, and Spiny Lobster EFH species of the South Atlantic. These are described below along with HAPCs and other designated managed fishery habitats within the project area.

Table 2. Categories of EFH Habitat

Species	Adult	Juvenile	Neonatal	Spawning
Atlantic Angel Shark	x	x	x	x
Atlantic Sharpnose Shark (Atlantic Stock)	x	x	x	
Blacknose Shark (Atlantic Stock)	x	x		
Blacktip Shark (Atlantic Stock)	x	x		
Common Thresher Shark	x	x	x	x
Dusky Shark			x	
Sand Tiger Shark	x	x	x	
Sandbar Shark	x	x	x	
Scalloped Hammerhead Shark	x	x		
Smoothhound Shark Complex (Atlantic Stock)	x	x	x	x
Spinner Shark	x	x	x	
Tiger Shark	x	x	x	
Albacore Tuna		x		
Bluefin Tuna	x	x	x	
Sailfish	x	x		
Yellowfin Tuna		x		

5.6.1 Coastal Migratory Pelagics.

Essential fish habitat for coastal migratory pelagic species includes sandy shoals of capes and offshore bars, high profile rocky bottom, and barrier island ocean-side waters from the surf to the shelf break zone. In addition, all coastal inlets, all state-designated nursery habitats of particular importance to coastal migratory pelagics (for example, in North Carolina this would include all Primary Nursery Areas and all Secondary Nursery Areas). For Cobia essential fish habitat also includes high salinity bays, estuaries, and seagrass habitat. In addition, the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse coastal migratory pelagic larvae. For king and Spanish mackerel and cobia essential fish habitat occurs in the South Atlantic and Mid-Atlantic Bights.

5.6.2 Snapper-Grouper.

Essential fish habitat for snapper-grouper species includes coral reefs, live/hard bottom, submerged aquatic vegetation, artificial reefs, and medium to high profile outcroppings on and around the shelf break zone from shore to at least 600 feet (at least 2000 feet for wreckfish) where the annual water temperature range is sufficiently warm to maintain adult populations of members of this largely tropical complex. EFH includes the spawning area in the water column above the adult habitat and the additional pelagic environment, including Sargassum, required for larval survival and growth up to and including settlement. In addition, the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse snapper grouper larvae. For specific life stages of estuarine dependent and nearshore snapper-grouper species, essential fish habitat includes areas inshore of the 100-foot contour such as attached macroalgae; submerged rooted vascular plants (seagrasses); estuarine emergent vegetated wetlands (saltmarshes, brackish marsh); tidal creeks; estuarine scrub/shrub (mangrove fringe); oyster reefs and shell banks; unconsolidated bottom (soft sediments); artificial reefs; and coral reefs and live/hard bottom.

5.6.3 Spiny Lobster.

Essential fish habitat for spiny lobster includes nearshore shelf/oceanic waters; shallow subtidal bottom; seagrass habitat; unconsolidated bottom (soft sediments); coral and live/hard bottom habitat; sponges; algal communities (Laurencia); and mangrove habitat (prop roots). In addition, the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse spiny lobster larvae. EFH for the spiny lobster fishery in the U.S. Caribbean consists of all waters from mean high water to the outer boundary of the EEZ – habitats used by phyllosome larvae –and seagrass, benthic algae, mangrove, coral, and live/hard bottom substrates from mean high water to 100 fathoms depth.

5.6.4 HAPCs.

Additionally, Habitat Areas of Particular Concern (HAPC) were reviewed using the EFH Mapper to identify any HAPCs located within the vicinity of the project areas. The HAPC are special habitat areas that are designated by NMFS to further the conservation and enhancement of EFH. The NMFS Mapper shows HAPC present within the inshore areas of Pamlico Sound, Hatteras Inlet, and outer portions of beach and nearshore placement areas (EFH Mapper 2021). HAPCs include species of

penaeid shrimp, within all coastal inlets, all state-designated nursery habitats of particular importance to shrimp (for example, in North Carolina this would include all Primary Nursery Areas and all Secondary Nursery Areas), and state-identified overwintering areas.

5.6.5 Submerged Aquatic Vegetation (SAV) and Shellfish Beds.
SAV and shellfish beds do not occur in areas intended for dredging (within the proposed corridor limits). SAV are prolific in estuaries of Pamlico Sound and portions of Rollinson Channel outside of the project area behind Hatteras Island. Although SAV can quickly populate shallow bottom when conditions are conducive, the currents, sand movement, and turbid water in the project area greatly minimize or eliminate the presence of SAV in the proposed project area.

DEQ DMF online resources (http://portal.ncdenr.org/web/mf/habitat/SAV) show identified SAVs in large clusters within the inshore areas of the project area. These mapped areas provide maximum historic extent from 1981 – 2015, however USACE analysis of SAVs over the last 20 years has shown a significant decline in SAV abundance. This may be due to the high erosion rates of the Hatteras and Ocracoke shorelines and the expansion of the inlet. Acres of upland habitat are now subtidal shoals that have covered existing SAV beds, and continuous shifting of this material prevents large colonies from forming.

Figure 6 depicts the presence and locations of SAVs from 2019 – 2021 within a half mile of the corridor using aerial imagery. The closest SAVs to the corridor are approximately 360 feet west of the Barney Slough Channel. Prior to each dredging event, SAVs will be identified using the latest aerial photography and GIS imagery. A 300-foot buffer will be placed around any SAVs identified to protecting them from effects of turbidity and sedimentation. No dredging or placement, including sidecasting of dredged material, will occur within 300 feet of identified SAVs for any of the three alternatives analyzed.

Shellfish beds are not present within the proposed corridor or impact area of the sidecast dredge but they are present within Pamlico Sound. The dominant species are the American oyster (*Crassostrea virginica*) and the Atlantic hard clam (*Mercenaria mercenaria*). Due to the dynamic conditions present within Hatteras Inlet and the project area, significant numbers of shellfish would not be expected.

There are no DMF-listed oyster sanctuaries within the project area.

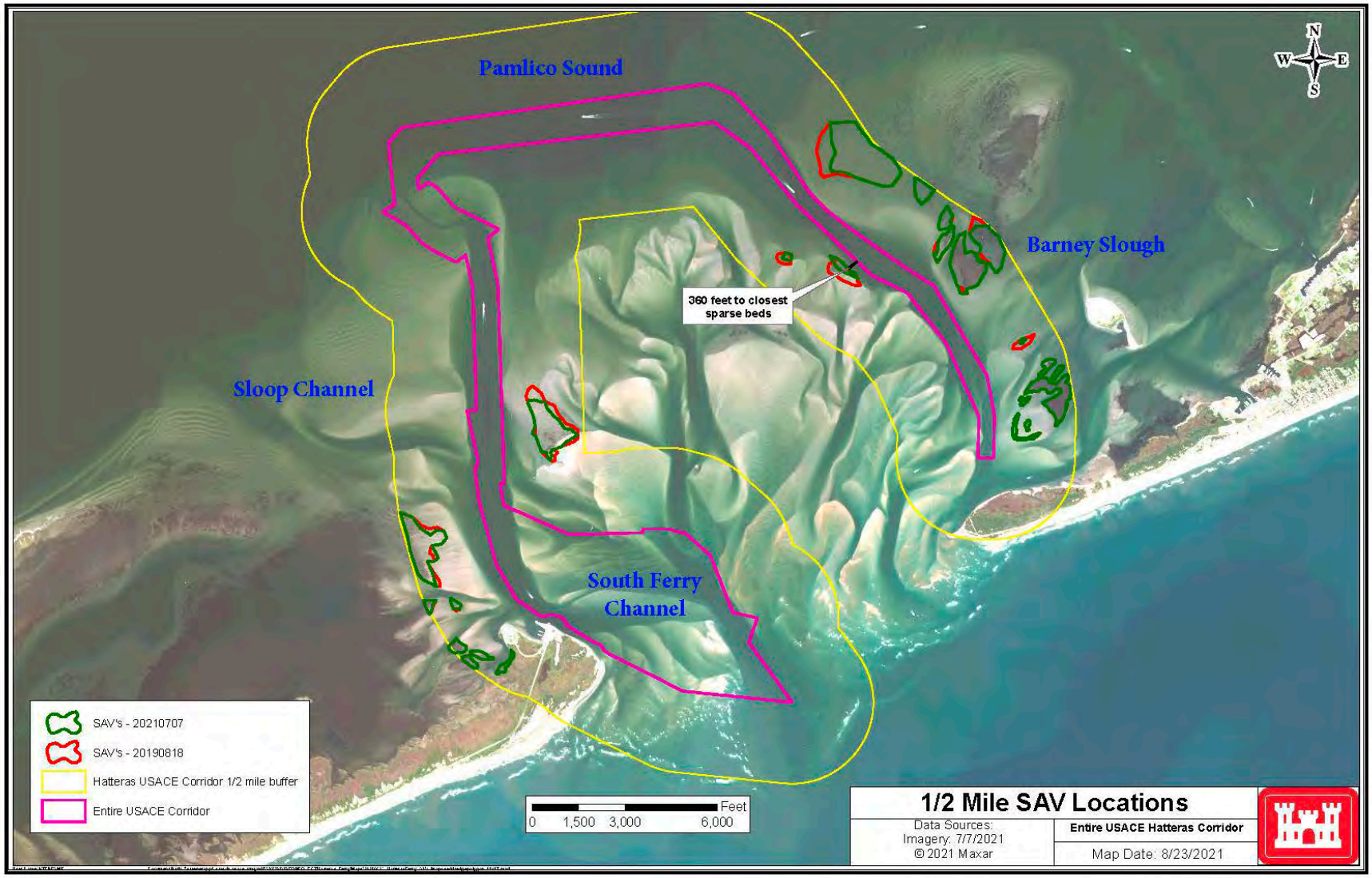


Figure 6. Proposed corridor with half-mile buffer showing SAV locations 2019 and 2021.

5.6.6 Primary Nursery Areas.

The State of North Carolina defines Primary Nursery Areas (PNAs) as tidal saltwater, which provides essential habitat for the early development of commercially important fish and shellfish (15 NCAC 3B .1405). It is in these estuarine areas that many fish species undergo initial postlarval development. PNAs are designated by the North Carolina Marine Fisheries Commission (NCMFC). The NCMFC does not classify the project area as PNA.

5.6.7 Crab Spawning Sanctuary.

The Atlantic blue crab spawns in high salinity soft-bottom inlet habitat such as that of Hatteras Inlet. According to An Assessment of Fisheries Species to Inform Time-of-Year Restrictions for North Carolina and South Carolina (Wickliffe, 2019), spawning occurs during the months of April through September, so female blue crabs are present in the inlet during these months. New Crab Spawning Sanctuaries were established in April 2020 under the Blue Crab Fishery Management Plan, Amendment 3. During March 1 – October 31, inlets are now closed to use of trawls, pots, fishing equipment and mechanical methods for oysters and clams to protect females that congregate in inlet systems to spawn.

Figure 7 shows the designated Hatteras Inlet Area Crab Spawning Sanctuary (CSS) with its described boundaries detailed in 15A NCAC 03R .0110. If blue crabs are abundant within the channel designated as CSS and cannot avoid the dredge they may be entrained or crushed by the draghead of sidecast or special purpose hopper dredges during the months of April through September. Bottom dwellers and feeders within the channels and placement areas would be more abundant during the warmer months of the year, increasing their risks to the effects of dredging and dredged material placement.

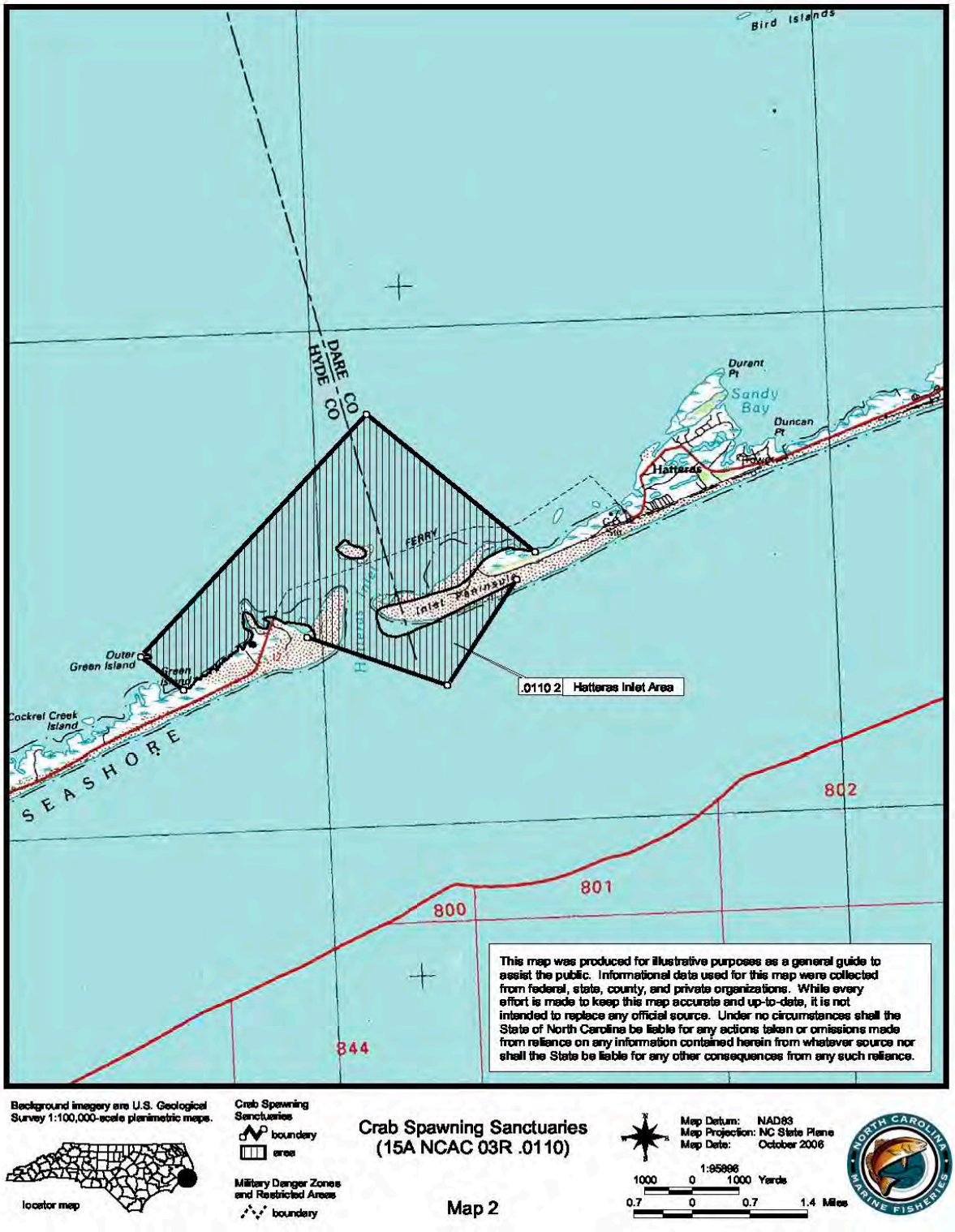


Figure 7. Hatteras Inlet Area Crab Spawning Sanctuary (CSS) 15A NCAC 03R .0110
https://deq.nc.gov/news/press-releases/2020/04/17/new-blue-crab-management-measures-implemented

5.6.8 Anadromous Fish Spawning Areas.
Anadromous Fish Spawning Areas (AFSA) are designated and regulated by the Marine Fisheries Council and the Wildlife Resources Commission. Hatteras Inlet provides anadromous fish access to the Neuse River, Tar/Pamlico River and Roanoke River AFSAs, which contain spawning areas upstream for species such as Atlantic sturgeon, blueback herring, alewife, hickory shad and striped bass. All inshore areas of Pamlico Sound are designated Striped Bass Management Area (15A NCAC 03R .0201).

Environmental Impacts

Alternative 1 - No Action: Near-constant dredging of the direct route would have minor impacts on fisheries and localized impacts to fish habitat, limited to the dredged area within the channel and sidecast placement area. Commercially and ecologically important fisheries species, including blue crab, are present within the inlet and constant dredging may disturb feeding, mating, spawning and migration. This may adversely affect the blue crab during spawning season when female crabs are abundant within the inlet. During warmer months, smaller, sensitive life stages of some fisheries may become entrained within the dredge (sidecast or special purpose hopper) or harmed by the placement of sidecast material (abrasion or burial), and survival is unknown. Overall, the quality of bottom habitat in the channel and sidecast placement areas may decline due repeated maintenance, but this would be very localized.

Alternative 2 - Maintenance of the horseshoe route between 1 October and 31 March: Under the second alternative, regular maintenance dredging would occur within hot spots between the months of October and March by pipeline once every 3-5 years and by special purpose or sidecast dredge annually for 2–3-week periods (approximately) due to high need along this route. Based on historic shoaling rates in South Ferry Channel, dredging would still be required during the months of April to September and would be coordinated with resource agencies (under emergency declaration) in advance of dredging. SAVs within the area of effect would be identified and avoided to the maximum extent practicable. Dredge events would occur once funding and dredge availability is secured and last if these variables permit. Impacts to fisheries and fish habitat (like those above) during these coordinated events are anticipated to be minor, as they would be short-term (3 days to 3 weeks) and localized. This method of reactive dredging, however, could result in more frequent dredge events during the warmer season as we saw in 2021.

Alternative 3 - Maintenance of the horseshoe route any time of year (Proposed Action): Government plant dredging without a window within corridor hot spots is expected to have minor, localized, and short-term impacts on fisheries and fish habitat within the Hatteras Inlet area. As with Alternatives 1 and 2, the greatest impacts would occur during warmer months to sessile and slow-moving organisms from entrainment and discharge of sidecast material, creating a potential increase of risk to spawning blue crabs and fish species. When sidecasting, SAVs would be avoided and to the

maximum extent practicable, sidecasting would be directed towards an ebb tide to carry material out to deeper waters.

Contract pipeline dredging during the November – March window every 3-5 years within hot spots will not have adverse effects on fisheries and fish habitat. Quarterly sidecast and special purpose hopper dredging any time of year is not expected have adverse impacts to EFH, HAPC, or EFH species since dredging effects would be minor when considering the area of habitat in the inlet and sound as compared to the footprint of the federal channel and areas disturbed by placement.

5.7 Endangered and Threatened Species.
The Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531–1543), provides a program for the conservation of threatened and endangered (T&E) plants and animals and the habitats in which they are found. In accordance with section 7 (a)(2) of the ESA, the USACE has been in consultation with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) to ensure that effects of the proposed project would not jeopardize the continued existence of listed species or result in the destruction or adverse modification of designated critical habitat of such species.

Federally listed T&E species (aquatic and terrestrial) with the potential to occur in the vicinity of the project area are listed in Table 3. This list includes species that could be present in the area based upon their historical occurrence or potential geographic range. However, the actual occurrence of a species in the area depends upon the availability of suitable habitat, the season of the year relative to a species' temperature tolerance, migratory habits, and other factors.

Table 3. Federally listed Threatened & Endangered species (aquatic and terrestrial)

Species	**Status (T/E)**	**USFWS/NMFS**	**Present?**
Green sea turtle (*Chelonia mydas*)	T	Both	Yes
Loggerhead sea turtle (*Caretta caretta*)	T	Both	Yes
Leatherback sea turtle (*Dermochelys coriacea*)	E	Both	Rare
Hawksbill sea turtle (*Eretmochelys imbricate*)	E	Both	Rare
Kemp’s ridley sea turtle (*Lepidochelys kempii*)	E	Both	Yes
Red knot (*Calidris canutus rufa*)	T	USFWS	Yes

Species	Status (T/E)	USFWS/NMFS	Present?
Piping plover (*Charadrius melodus*)	E	USFWS	Yes
Roseate tern (*Sterna dougallii dougallii*)	E	USFWS	No
Eastern Black Rail (*Laterallus jamaicensis*)	T	USFWS	No
West Indian manatee (*Trichechus manatus*)	E	USFWS	Rare
Sensitive joint-vetch (*Aeschynomene virginica*)	T	USFWS	No
Seabeach amaranth (*Amaranthus pumilus*)	T	USFWS	Yes
Humpback whale (Megaptera novaeangliae)	E	NMFS	No
North Atlantic right whale (*Eubalaena glacialis*)	E	NMFS	No
Shortnose sturgeon (*Acipenser brevirostrum*)	E	NMFS	Rare
Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*)	E	NMFS	Yes
Giant manta ray (*Manta birostris*)	T	NMFS	Yes
Smalltooth sawfish (*Pistis pectinata*)	E	NMFS	Yes

USFWS.

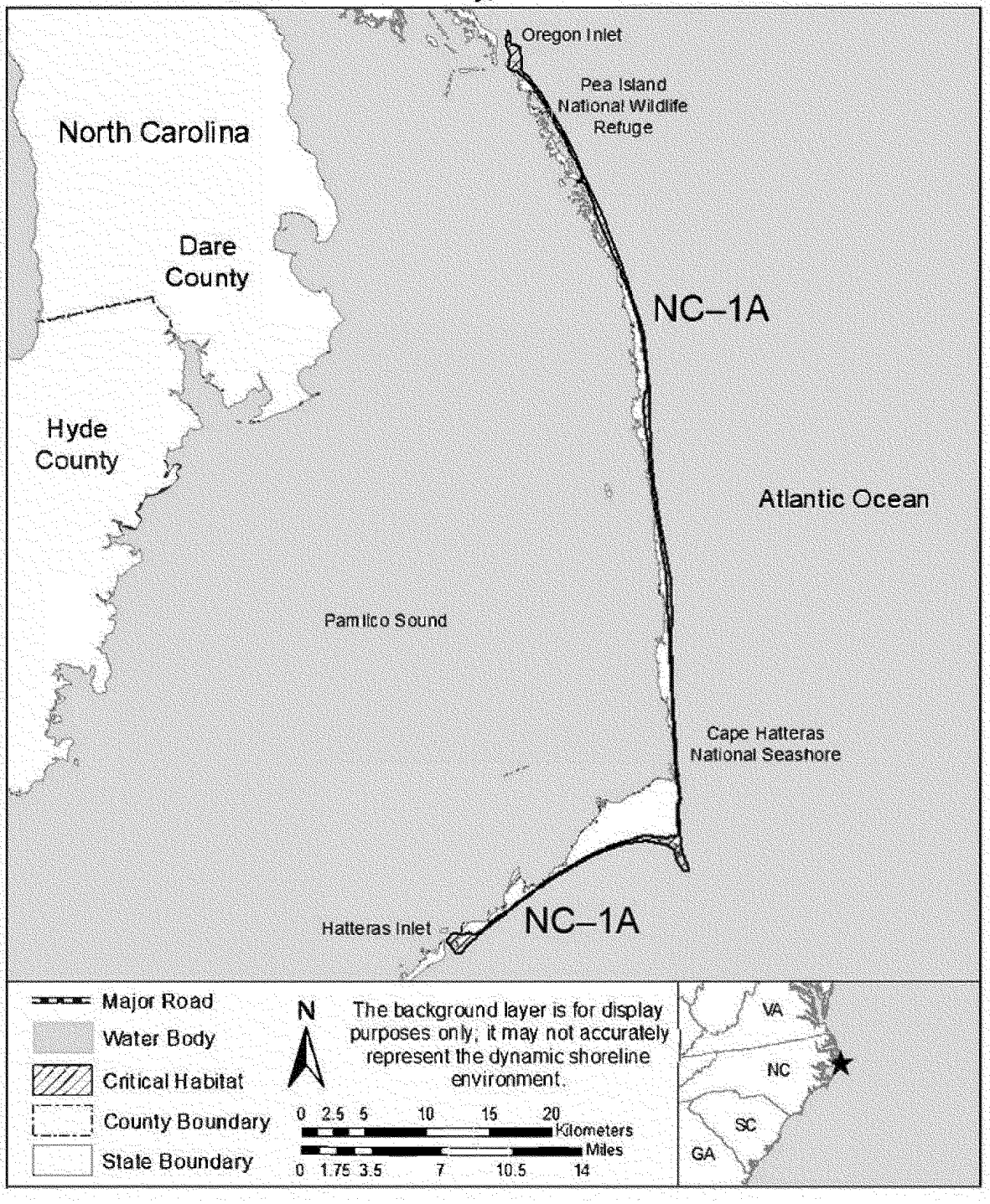
An updated list of T&E species for the project area within Dare and Hyde Counties, North Carolina was obtained from the USFWS Information, Planning and Conservation System (IPAC) website (http://ecos.fws.gov/ipac/) (Appendix C). The list of species is shown in Table 3, which includes T&E species that could be present in the area based on their historical occurrence or potential geographic range. The species and critical habitats under the purview of the USFWS are:

> Sea turtles [green (*Chelonia mydas*), loggerhead (*Caretta caretta*), leatherback (*Dermochelys coriacea*), Hawksbill (*Eretmochelys imbricate*), and Kemp's ridley (*Lepidochelys kempii*)]; red knot (*Calidris canutus rufa*); piping plover (*Charadrius melodus*); roseate tern (*Sterna dougallii dougallii*); Eastern Black Rail (*Laterallus jamaicensis*); West Indian manatee (*Trichechus manatus*); Sensitive joint-vetch (*Aeschynomene virginica*) and Seabeach Amaranth (*Amaranthus pumilus*).

Designated critical habitat (CH) for wintering piping plover is present within the project area on federally managed National Park Service land on both sides of Hatteras Inlet. The NC-4 Hatteras Island unit includes all emergent sandbars within Hatteras Inlet between Hatteras Island and Ocracoke Island, sandy shoals and beachfronts of Hatteras and Ocracoke Islands including lands owned by the State of North Carolina.

Also, currently under USFWS consideration is the proposed CH for Red Knot, posted July 15, 2021 (Figure 8). This includes Outer Banks Units NC-1A and NC-1B and encompasses the same lands as the piping plover CH.

Critical Habitat for Rufa Red Knot
NC–1A Outer Banks-Hatteras Island and Shoals;
Dare County, North Carolina



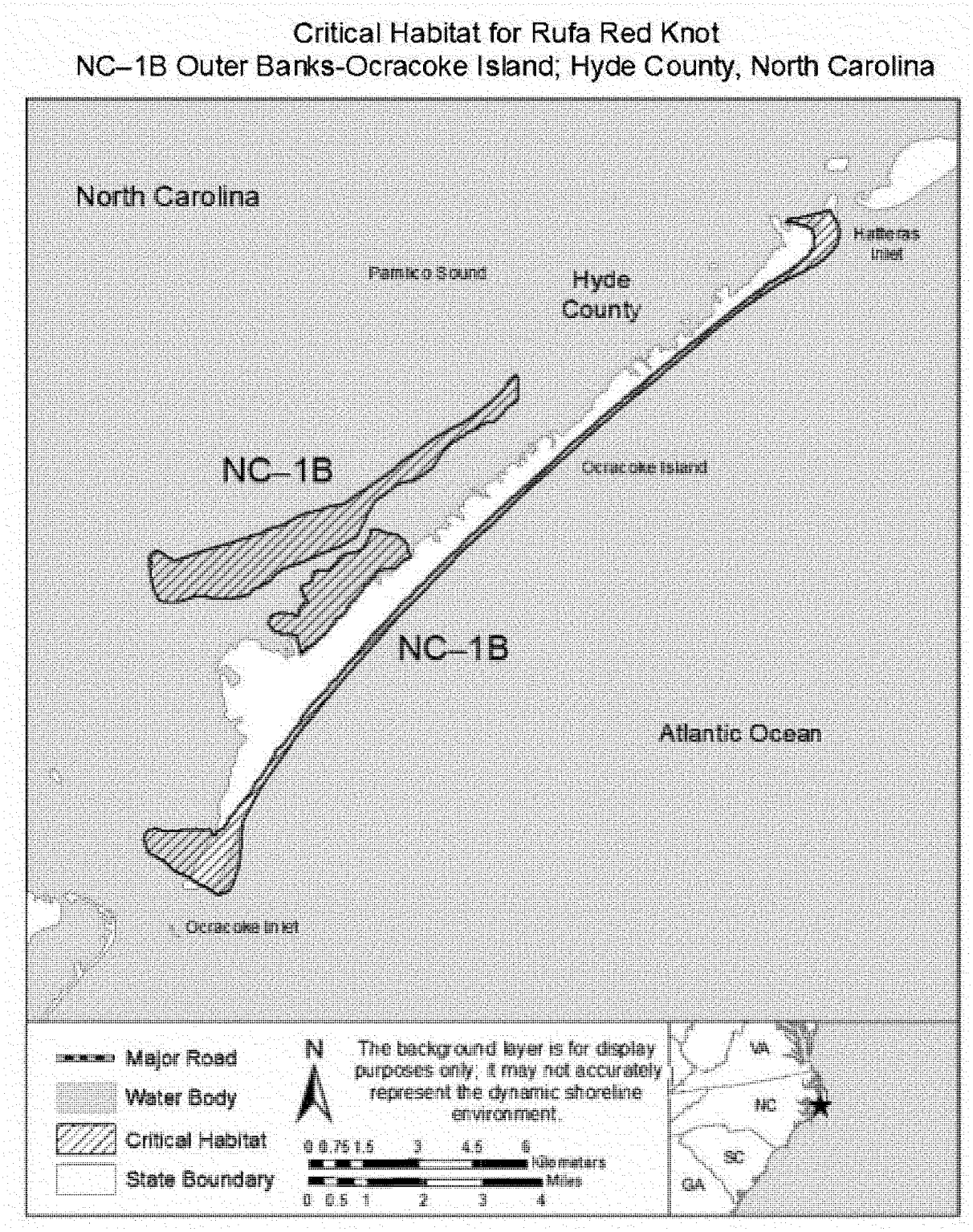


Figure 8. NC-1A and NC-1B, Proposed Rufa Red Knot Critical Habitat
https://www.federalregister.gov/documents/2021/07/15/2021-14406/endangered-and-threatened-wildlife-and-plants-designation-of-critical-habitat-for-rufa-red-knot

Sea turtle nesting may occur on the beachfronts of Ocracoke and Hatteras islands where beach quality dredged material may be placed, however placement will occur during 16 November to 31 March to avoid nesting season. Likewise, control of effluent practices on bird islands will adhere to the shorebird nesting window of 1 September to 31 March, thereby protecting nesting piping plovers and visiting red knots. All conditions and conservation recommendations of the USFWS 2017 North Carolina Coastal Beach Sand Placement, Statewide Programmatic Biological Opinion will be abided by, therefore no impacts to T&E species including Seabeach Amaranth are anticipated. The roseate tern, eastern black rail and sensitive joint-vetch are not expected to occur within the project area. The Westin Indian manatee may be present, however, by following the 2017 USFWS Guidelines for Avoiding Impacts to the West Indian Manatee, no impacts are anticipated.

The USACE does not anticipate the need for formal consultation with USFWS for this project.

NMFS.

Regarding T&E species under the purview of NMFS, the proposed project activities are covered by the South Atlantic Regional Biological Assessment (SARBO) issued by the NMFS on March 20, 2020 (NMFS 2020). The 2020 SARBO can be located at https://www.fisheries.noaa.gov/content/endangered-species-act-section-7-biological-opinions-southeast.

The species and critical habitats under the purview of the NMFS are:

> Sea turtles [green (*Chelonia mydas*), loggerhead (*Caretta caretta*), leatherback (*Dermochelys coriacea*), Hawksbill (Eretmochelys imbricate), and Kemp's ridley (*Lepidochelys kempii*)]; Blue Whale (*Balaenoptera musculus); Sei Whale (Balaenoptera Borealis); Sperm whale (Physeter Macrocephalus); Finback whale* (*Balaenoptera physalus);* Humpback whale (*Megaptera novaeangliae*); North Atlantic right whale (*Eubalaena glacialis*); shortnose sturgeon (*Acipenser brevirostrum*); Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*); Giant Manta Ray (*Manta birostris*); and Smalltooth sawfish (*Pistis pectinata*).

The project will comply with all relevant SARBO project design criteria (PDC) requirements. PDC requirements include training and education of on-site personnel (vessel captain, crew, etc.) of project requirements, and completing work in a manner that will minimize effects to species. All work, including equipment, staging areas, and placement of materials, will be done in a manner that does not block access of ESA-listed species from moving around or past construction. Equipment will be staged, placed, and moved in areas and ways that minimize effects to species and resources in the area, to the maximum extent possible. All work that may generate turbidity will be completed in a way that minimizes the risk of turbidity and sedimentation to the maximum extent practicable. Beach placement will be conducted in a manner that minimizes turbidity in nearshore waters by using methods that promote settlement before water returns to the water body (i.e., shore parallel dikes). Turbidity and marine

sedimentation will be further controlled using land-based erosion and sediment control measures to the maximum extent practicable. Land-based erosion and sediment control measures will (1) be inspected regularly to remove excess material that could be an entanglement risk, (2) be removed promptly upon project completion, (3) and will not block entry to or exit from designated critical habitat for ESA-listed species. Lighting associated with beach placement activities will be minimized through reduction, shielding, lowering, and/or use of turtle friendly lights, to the extent practicable without compromising safety, to reduce potential disorientation effects on female sea turtles approaching the nesting beaches and sea turtle hatchlings making their way seaward from their natal beaches. The conservation measures will be revaluated annually and project changes, including time and/or equipment, may be altered, based on new information and experience.

The focus for this EA is the identified corridor and placement areas to include routes taken to transport dredged material (either by moving dredge or pipeline route). The USACE acknowledges the presence of sea turtles within adjacent waters of the Atlantic Ocean and Pamlico Sound year-round. Atlantic Sturgeon may also be present throughout the year, feeding offshore along nearshore areas and migrating through Hatteras Inlet during spawning migrations. Whale species are not expected to be within the project area, as water depths would be too shallow. However, crew of the special purpose hopper dredges will be required to watch for possible whale sightings during transit to the nearshore during migration months of November – March.

Since the proposed project activities are covered by the 2020 SARBO, USACE does not anticipate the need for formal consultation with NMFS for this project.

Environmental Impacts

Alternative 1 - No Action: Near-continuous dredging using government plant may have minor impacts on listed marine species present within the Hatteras Inlet area. Although risk of entrainment with the pipeline, special purpose and sidecast dredges are very low, constant noise and turbidity over long periods of time may disturb foraging, mating, migrating and other behaviors. However, these species are expected to avoid disturbances without harm.

All dredging and placement activities for the No Action alternative would be conducted in accordance with the PDCs of the 2020 SARBO and the terms and conditions of the USFWS Statewide Programmatic BO, thereby leading to a may affect, not likely to adversely affect determination for sea turtles, sturgeon, manta rays, sawfish, manatee, and whales.

Alternative 2 - Maintenance of the horseshoe route between 1 October and 31 March:

Impacts relative to Alternative 2 would be the same as the No Action Alternative except that dredging events would be a lot less frequent. Regardless of time of year or type of dredge plant used, maintenance of the horseshoe route will adhere to all the relevant PDCs of the 2020 SARBO for all dredging and placement activities. Incidental takes

are not anticipated, lethal or non-lethal, as risk of entrainment, ship strikes, etc. with pipeline and government plant dredges is very low. Dredging during winter months when the North Atlantic Right Whales (NARW) is migrating is not anticipated to negatively impact the NARW physically or behaviorally.

The placement of beach quality dredged material and the associated construction activities during the 16 November – 31 March window may have minor and temporary impacts on piping plover and red knot foraging, sheltering, and roosting habitat. It may impact the constituent elements for piping plover nesting and wintering habitat. Bird island placement of dredged material onto Cora June and DOT Islands is expected to enhance nesting habitat for piping plovers. All placement activities will follow the terms and conditions and conservation recommendations of the 2017 Statewide Programmatic BO and the PDCs of the 2020 SARBO and are not expected to adversely affect protected species under USFWS or NMFS purview.

Consequently, Alternative 2 may affect, but is not likely to adversely affect sea turtles, sturgeon, manta rays, sawfish, manatee and whales, piping plover, red knot, and amaranth.

Alternative 3 - Maintenance of the horseshoe route any time of year (Proposed Action):

As with Alternative 2 with window, the 2017 Statewide Programmatic BO and 2020 SARBO will be adhered by, thus reducing risks and impacts to listed species. Therefore, any associated behavioral affects are expected to be minor and temporary. Consequently, Alternative 3 may affect but is not likely to adversely affect sea turtles, sturgeon, manta rays, sawfish, manatee and whales, piping plover, red knot, and amaranth.

5.8 Cultural Resources.

The North Carolina State Historic Preservation Office's (SHPO) HPOWEB Map Service was queried to identify known cultural resources in and near the project area (North Carolina State Historic Preservation Office 2021). This service provides information for sites listed on the National Register of Historic Places, sites designated as Local Landmarks, and other data useful in considering potential impacts to cultural resources but typically does not include submerged resources. According to HPOWEB, the resource closest to the project area is the Hatteras Inlet Lifesaving Station (Site ID HY0672); however, this site was destroyed by a hurricane in the 1950s (Figure 9).

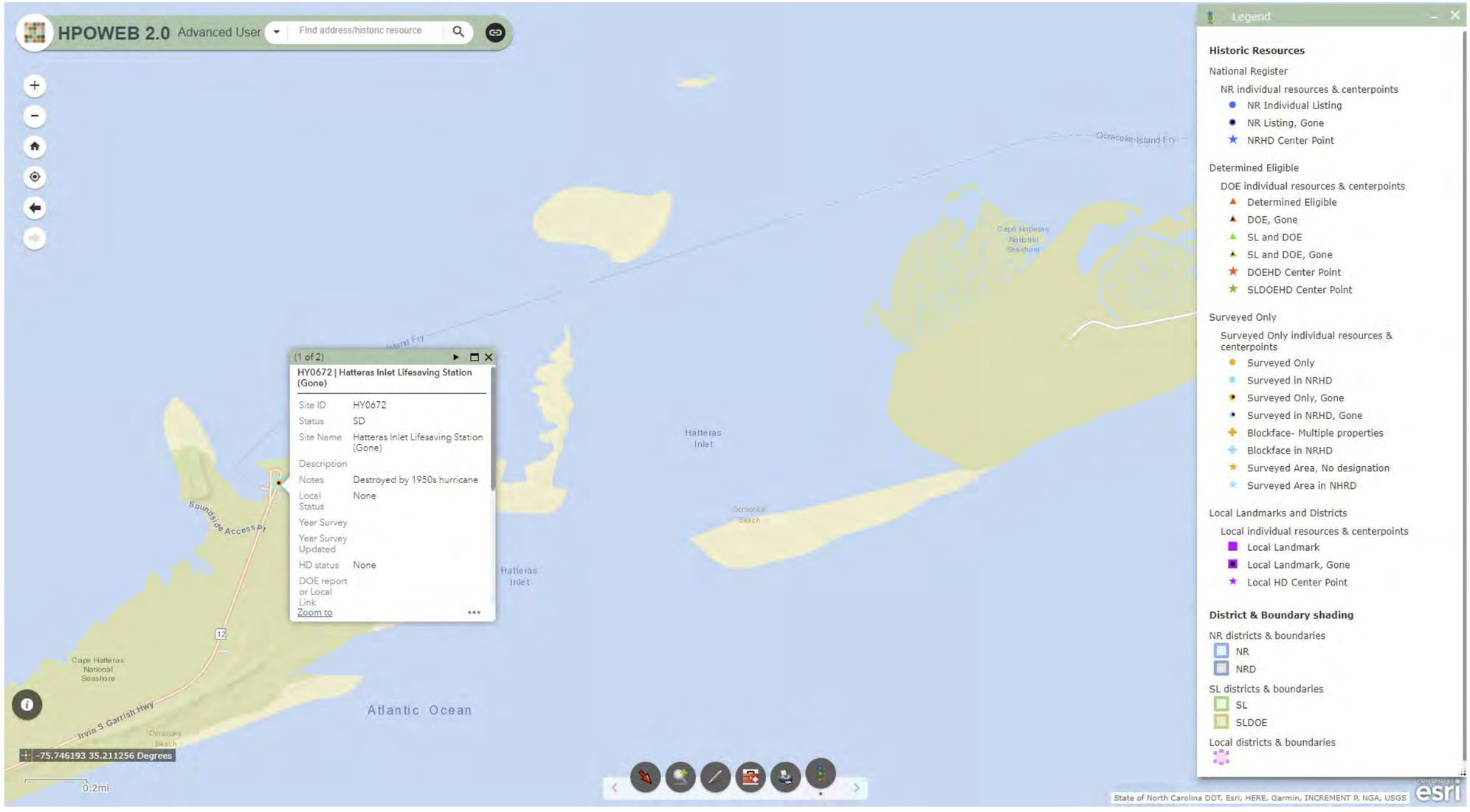


Figure 9. Cultural Resources Near Proposed Project Area according to HPOWEB

Regarding submerged cultural resources within the project's area of potential effects (APE), the USACE has coordinated with the SHPO under tracking number ER 16-2031. By letter dated April 7, 2021, which is the most recent communication between the USACE and the SHPO concerning the proposed action, the SHPO recommends that this dredging project proceed without the need for further archaeological investigation. This recommendation was made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800 and assumes that the North Carolina Department of Transportation (NCDOT) has conducted, or will conduct, an archaeological survey within the northwestern portion of Sloop Channel as shown in Figure 10. This recommendation also assumes that dredging will take place only within the identified corridor and as described throughout this Environmental Assessment. Restricted areas were coordinated with the SHPO by Dare County, North Carolina independent of USACE coordination efforts; however, the USACE will assume responsibility for avoidance of identified restricted areas during dredging operations.

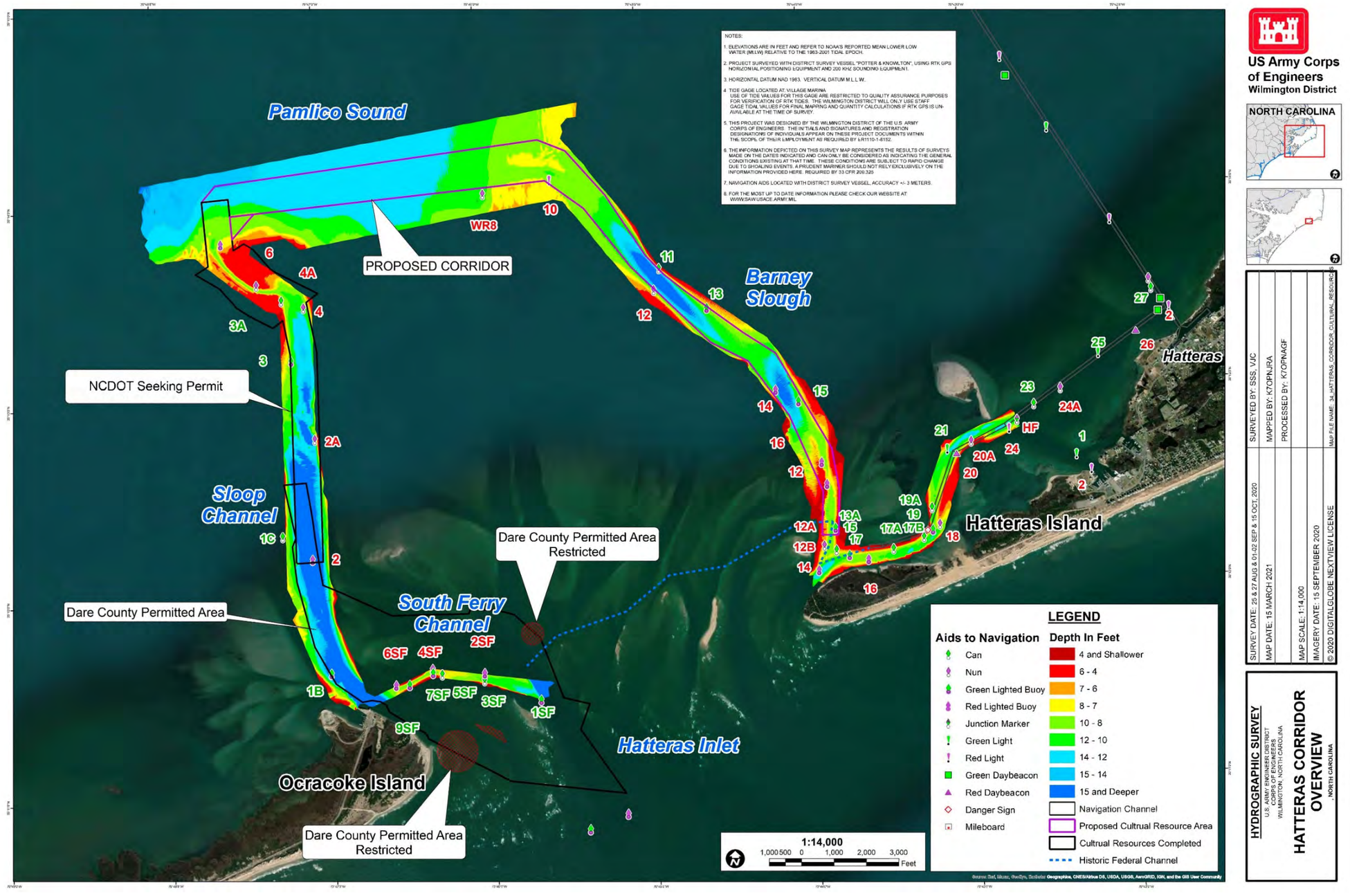


Figure 10. Area of Potential Cultural Effects (with three SHPO-identified restricted areas)

If significant deviation from the proposed corridor occurs, regarding dredging, the SHPO will be consulted for comment. Additionally, should dredged material placement include any ground disturbing activity (e.g., anchoring associated with piping dredged material to an upland location), such placement will be coordinated with the SHPO prior to implementation.

Executive Order 11593 states that the Federal Government shall provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the Nation. Federal agencies shall administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations, initiate measures necessary to direct their policies, plans and programs in such a way that federally owned sites, structures, and objects of historical, architectural or archaeological significance are preserved, restored, and maintained for the inspiration and benefit of the people, and, in consultation with the Advisory Council on Historic Preservation (16 U.S.C. 470i), institute procedures to assure that Federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures and objects of historical, architectural or archaeological significance.

Environmental Impacts.

No alternatives considered would adversely affect cultural resources; however, in the event cultural resources, including, but not limited to, cultural artifacts, relics, remains, or objects of antiquity are discovered in the project area, the resource(s) in question will be protected from further disturbance until instructed otherwise based on coordination with the SHPO. All alternatives will be in full compliance with Executive Order 11593 following completion of the NEPA process.

5.9 Climate Change and Sea Level Change.

In accordance with ER 1100-2-8162, dated 31 December 2013, potential relative sea level change must be considered in every USACE coastal activity as far inland as the extent of estimated tidal influence. The entirety of the proposed horseshoe corridor is in presently submerged and may be minimally affected by sea level rise. The tide gauge used in this analysis is a long-term data gauge with a 53-year data record used to develop mean sea level rise trends and was used here to develop “low” and “high” scenarios. Using the historic sea level rise rate (“low”), extrapolation produced a sea level rise increase of approximately 0.035 meters in the project area by the year 2033 while using National Research Council curve 3 (“high”) predicted a sea level rise over the same period of approximately 0.410 meters; the result is a 0.375-meter difference between “low” and “high” scenarios.

A review of the U.S. Environmental Protection Agency’s analysis for climate change for North Carolina titled *What Climate Change Means for North Carolina* (https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-nc.pdf) states that the sea level rise along the coast of NC is expected to likely rise anywhere from one to four feet in the next 100 years. Barrier island features, such as beaches and bird island placement areas addressed in

this EA, are likely to experience higher water levels causing beach erosion and opening of new or changing of alignments of existing inlets during larger storm events.

Environmental Impacts.

The three alternatives will not increase the effects of climate change or sea level rise in the project area; however, all alternatives are likely to be affected by climate change in the future due to the project area being on the coast where effects of climate change, such as increased storm events and sea level rise, will likely be more dramatic than inland portions of the State. For all three alternatives considered, rising sea levels may increase water depths in the coming years, which could reduce required dredging volumes and frequencies.

5.10 Socioeconomics.

The project area is in Pamlico Sound, Hatteras Inlet, and the nearshore Atlantic Ocean, but socio-economic effects of the project can be felt locally throughout Hyde and Dare Counties and Statewide. Hatteras Ferry Channel provides important economic and recreational benefits to local communities and the Nation as a much-navigated thoroughfare for commercial and recreational activities, as well as delivery of supplies and daily transport. Safety and security provided by the USCG also has an influence on the socioeconomics of the region as well.

5.10.1 Ferry Services.

The NC Ferry system is extremely important to Ocracoke and Hatteras Island residents as a major transportation corridor (part of NC Highway 12). Ocracoke Island is only accessible by boat, and water transportation to the island is provided almost exclusively by ferry. Currently, there are no alternatives for travel between Hatteras and Ocracoke beyond ferry service. This route is essential to daily commutes to school and work, access to mainland supplies and services, medical care, and emergency evacuations. The NC Ferry Division's reports show the Hatteras-Ocracoke route supports a total of 3,360 jobs resulting in earned wages of approximately $123 million. This translates into $19.5 million in local and State tax revenue (NC Department of Commerce, 2018). These socioeconomic resources are expected to increase in the future.

Since the horseshoe route was first utilized in 2013, 6-7 ferry vessels requiring 5 to 6-foot drafts are in constant operation during daylight hours of peak season transporting people goods, and services. In the past 5 years, vessels have transported an average of 600,000 people and 240,000 vehicles, but those numbers have declined each year due to navigation issues. Ferry transits have been reduced from 72 per day to 60 per day to allow for safe passage through Sloop Channel.

5.10.2 Tourism.

A scenic setting is provided by the ocean, sound and coastal beaches which lure millions of visitors per year from thousands of miles away. The marine environment offers boating and fishing and a multitude of seasonal recreational opportunities for residents and visitors, providing significant socioeconomic benefits. Hotels, rental

homes, restaurants, and other related businesses depend on the transport of visitors by ferry, mainly between the months of May and August. During the peak season, the population of Ocracoke and Hatteras Islands triples, boosting overall business output.

5.10.3 Recreational and Commercial Fishing.
Recreational and commercial fishermen extensively utilize the nearshore marine and estuarine waters of the Hatteras Inlet area between May and October but also on a year-round basis. The USACE maintains navigation channels in Pamlico Sound and Hatteras Inlet that are actively fished, or provide passage to other waters, including the Atlantic Ocean. Species that bring in the highest annual revenue include summer and southern flounder, blue crab, brown shrimp, yellowfin tuna, and swordfish.

Commercial seafood landings in Hatteras total $3.3 million, with a total economic impact of almost $10 million. For-hire fishing vessels in Hatteras, which routinely go offshore, generate approximately $8.4 million in revenue, and the total economic impact of off-boat spending by passengers on for-hire fishing vessels total almost $100 million.

The area supports at least 8 fishing tournaments between May and October each year, which helps contribute to an overall business output of $414 million for the Outer Banks. Fishing tournaments within the Hatteras Inlet area take place inshore, onshore (surf fishing), nearshore and offshore (deep sea fishing). Offshore fishing tournaments in Hatteras currently generate approximately $500,000 in economic impacts a year. These tournaments have experienced an almost 30% reduction in boats participating due to shoaling conditions in Hatteras Inlet.

5.10.4 U.S. Coast Guard.
The territory of the U.S. Coast Guard Station Hatteras Inlet covers over 2,350 nautical miles of Atlantic Ocean, approximately one-third of Pamlico Sound, as well as Hatteras Inlet, and Ocracoke Inlet. The station operates 4 vessels, which require minimum depths of 4 feet and 6 feet to perform search and rescue operations (approximately 20 – 40 rescues per year). The number of rescues is highest during peak season.

Environmental Impacts.

Alternative 1 - No Action: Attempts to keep the historic route open with continuous dredging may not be successful in maintaining the fully authorized width and depth of the channel, either due to lack of funding, dredge availability, or storm events. Ultimately, this could raise the cost of goods and have a wide-spread effect on the regional economy. Both the NC Ferry Division and Dare County would have to fund any dredging and maintenance efforts of the horseshoe route, and ultimately those expenses would be a burden to local taxpayers. The Hatteras to Ocracoke ferry transported 875,000 passengers in 2010, but by 2019, the number of passengers had fallen to 524,000. This is a direct result of having to light load ferries and limit the number of vehicles and passengers to ensure safe passage between the islands. The No Action alternative could result in significant adverse effects to the regional economy, by adversely affecting tourism, the ferry system (transport of goods and services

between the islands), fishing tournaments, commercial and recreational fishing, and USCG rescue efforts.

Alternative 2 - Maintenance of the horseshoe route between 1 October and 31 March: Dredging within the proposed corridor between the months of October and March would be a significant improvement to the ferry service, tourism, fishing and USCG. As with South Ferry Channel, emergency dredging events during the months of April – September may occur, however the time needed for the Wilmington District to coordinate with resource agencies may have an adverse effect (strandings, delays, safety concerns etc.) during a time when immediate dredging is needed most.

With this alternative, the USCG may experience a significant decline in the ability to perform rescues due to limited access to the inlet between the months of April – September when needed most. Likewise, delays to ferry services during peak months would occur because of time needed to declare an emergency, procure funding and an available dredge and coordinate with resource agencies.

Alternative 3 - Maintenance of the horseshoe route any time of year (Proposed Action): The project area provides important economic benefits to the Nation as a much-navigated thoroughfare for commerce. Year-round navigability of the channel will require dredging periodically throughout the year and lifting dredging restrictions would mean that the USACE could plan dredging events in advance to take advantage of dredge availability, funding and to stay ahead of shoaling. Proactive dredging would allow for dredging of the hot spot areas prior to them becoming a hazard, therefore the proposed action would benefit the regional economy by ensuring consistently safe, reliable navigation for the ferry service, the USCG, and all other mariners attempting to navigate between Ocracoke and Hatteras Islands.

5.11 Environmental Impact Comparison of Alternatives.
Table 4 below provides a summary and comparison of impacts to the physical and natural environment for the alternatives considered.

Table 4. Comparison of Environmental Impacts

Project Area Resource	Alternative 1 No Action Maintain Historic Route	Alternative 2 Maintain Horseshoe w/ Window	Alternative 3 (proposed action) Maintain Horseshoe w/o Window
Sediments	Minor effects due to near-constant dredging.	Minor effects due to movement of material.	Minor effects due to movement of material (same as Alt 2).
Hydrology	Minor and localized effects via channel deepening.	Temporary and minor effects via channel deepening.	Temporary and minor effects via channel deepening (same as Alt 2).
Water Quality	Minor effects via turbidity increases at dredging and placement locations.	Temporary and minor effects via turbidity increases at dredging and placement locations.	Temporary and minor effects via turbidity increases at dredging and placement locations (same as Alt 2).
Wetlands & Floodplains	No effects within the historic route.	No effects within the proposed corridor.	No effects within the proposed corridor.
Air Quality	Minor effects due to constant dredging.	No effects within the proposed corridor.	No effects within the proposed corridor.
Noise	Minor and localized effects due to near-constant dredging.	Temporary, minor, and localized effects within the proposed corridor.	Temporary, minor, and localized effects within the proposed corridor (same as Alt 2).
Nekton	Minor and localized effects due to near-constant dredging.	Temporary and minor effects within the proposed corridor.	Temporary and minor effects within the proposed corridor (same as Alt 2).
Benthos	Minor and localized effects due to near-constant dredging.	Temporary and minor effects at dredging and placement locations.	Temporary and minor effects at dredging and placement locations (same as Alt 2).
Fisheries & Fish Habitat	Minor effects due to near-constant dredging within the historic route.	Temporary and minor effects at dredging and placement locations in terms of turbidity increases and egg/larval entrainment/burial.	Temporary and minor effects at dredging and placement locations in terms of turbidity increases and egg/larval entrainment/burial (same as Alt 2).

Table 5. Comparison of Environmental Impacts (continued)

Project Area Resource	Alternative 1 No Action Maintain Historic Route	Alternative 2 Maintain Horseshoe w/ Window	Alternative 3 (proposed action) Maintain Horseshoe w/o Window
T&E Species	May affect, not likely to adversely affect species within the historic route.	May affect, not likely to adversely affect species via increase in turbidity and noise, removal of bottom habitat/benthos.	May affect, not likely to adversely affect species via increase in turbidity and noise, removal of bottom habitat/benthos (same as Alt 2).
Cultural Resources	No effects within the historic route.	No effects within the proposed corridor.	No effects within the proposed corridor.
Climate Change & SLR	No effects within the historic route.	No effects within the proposed corridor.	No effects within the proposed corridor..
Socioeconomics	May adversely affect ferry service, tourism, fishing and USCG	Improvements to the ferry service, tourism, fishing and USCG relative to the No Action alternative.	Significant improvements to ferry service, tourism, fishing and USCG relative to the No Action alternative due to a consistent more reliable channel.

6.0 STATUS OF ENVIRONMENTAL COMPLIANCE.

6.1 National Environmental Policy Act (NEPA).
This EA has been prepared in accordance with the NEPA, the Council on Environmental Quality regulations (40 Code of Federal Regulations (CFR) parts 1500-1508,1515-1518) recently updated in 2020, and Engineering Regulation (ER) 200-2-2 and Engineering Regulation (ER) 200-2-2. To ensure the EA included an assessment of impacts on all significant resources in the project area, the Wilmington District circulated a scoping letter by email dated February 23, 2021, to state and federal resource agencies and members of the public for a 30-day comment period. A formal scoping meeting was conducted virtually on March 16, 2021 and attended by USEPA, USFWS, NMFS, NPS, DCM, DMF, WRC, USCG, NCDOT and Dare County representatives. Concerns expressed by the resource agencies included increased dredging effects in the spring and summer months; disruption to migratory species; turbidity and entrainment effects on critical life stages of important fisheries; and the need for a thorough alternatives analysis of environmental impacts.

The Draft EA has been released for 30-day public review and comment. All identified agency and stakeholder concerns will be considered and addressed during the development of the Final EA.

Pursuant to NEPA, a new EA will be prepared if there are significant changes proposed to the project or new circumstances or information relevant to the environmental impacts of the proposed action.

6.2 North Carolina Coastal Zone Management Program.
The actions addressed in this EA for the proposed action will take place in the designated coastal zone of the State of North Carolina. Pursuant to the Federal Coastal Zone Management Act (CZMA) of 1972, as amended (P.L. 92-583), federal activities are required to be consistent to the maximum extent practicable with the federally approved coastal management program of the state in which their activities would be occurring.

With release of the Draft EA, the USACE has submitted a federal consistency determination to the N.C. Division of Coastal Management in accordance with Section 307 (c) (l) of the Federal Coastal Zone Management Act of 1972, as amended. NCDCM requests 60 days for review and response.

Section 1102 (a) states that “clean, beach quality material from navigation channels within the active nearshore, beach, or inlet shoal systems must not be removed permanently from the active nearshore, beach or inlet shoal system unless no practicable alternative exists. Preferably, this dredged material will be disposed of on the ocean beach or shallow active nearshore area where environmentally acceptable and compatible with other uses of the beach.” When considering a project’s compliance

with Section 1102, NC Division of Coastal Management (NCDCM) has stated that the section should be read in concert with NCAC 7H.0208 (2)(G), which does provide some flexibility for publicly funded projects, allowing them to be considered by review agencies on a case-by-case basis with respect to dredged material placement. Placement of dredged material will be done in accordance with this regulation with the majority of the clean, beach quality material (i.e., ≥90% sand) being placed within approved nearshore placement areas, on bird islands, beachfronts or in the ferry landing scour hole.

6.2.1 Areas of Environmental Concern (AECs).
The proposed action would take place in or near areas designated under the NC Coastal Management Program as AECs (15A NCAC 7H .0100). Specifically, the activities will occur in three AECs, Estuarine Waters, Ocean Hazard, and Public Trust Area. The following determination has been made regarding the consistency of the proposed action with the State's management objective for the AECs that may be affected:
Estuarine Waters: Estuarine Waters are the state's oceans, sounds, tidal rivers, and their tributaries, which stretch across coastal North Carolina and link to the other parts of the estuarine system: public trust areas, coastal wetlands, and coastal shorelines. For regulatory purposes, the inland, or upstream, boundary of estuarine waters is the same line used to separate the jurisdictions of the NC Division of Marine Fisheries (NCDMF) and the NC Wildlife Resources Commission (NCWRC). However, many of the fish and shellfish that spend part of their lives in estuaries move between the "official" estuarine and inland waters.

The proposed action would not adversely impact estuarine waters, since dredging and placement will be temporary, and effects will be minor.

Ocean Hazard: The Ocean Hazard System is made up of oceanfront lands and the inlets that connect the ocean to the sounds. Hatteras Inlet is within the designated Ocean Hazard System.

The proposed action would not adversely affect oceanfront lands or inlets since no new or additional work is proposed within the Ocean Hazard area.

Public Trust Areas: These areas include waters of the Atlantic Ocean and the lands there under from the mean high-water mark to the 3-mile limit of state jurisdiction. The nearshore placement areas located off Ocracoke and Hatteras islands are within these Public Trust Areas. Acceptable uses include those that are consistent with protection of the public rights for navigation and recreation, as well as conservation and management to safeguard and perpetuate the biological, economic, and aesthetic value of these areas. The activities that comprise the proposed action are not intended to adversely

impact public rights for navigation and recreation and are consistent with conservation of the biological, physical, and aesthetic values of public trust areas.

6.2.2 Other State Policies.
The following state policies found in the NC Coastal Management Program document are also applicable to the proposed action in terms of nearshore placement of sand. Shoreline Erosion Response Policies: NC Administrative Code 7M - Section .0200 addresses beneficial use of dredged material as feasible alternatives to the loss or massive relocation of oceanfront development when public beaches and public or private properties are threatened by erosion; when beneficial use is determined to be socially and economically feasible and causes no significant adverse environmental impacts; and the project is consistent with state policies for shoreline erosion response and state use standards for Ocean Hazard and Public Trust Areas AECs. Policies on Beneficial Use of Materials from the Excavation or Maintenance of Navigation Channels: NC Administrative Code 7M - Section .1101 states that it is the policy of the state that material resulting from the excavation or maintenance of navigation channels be used in a beneficial way wherever practicable. Policy statement .1102 (a) indicates that "clean, beach quality material dredged from navigation channels within the active nearshore, beach, or inlet shoal systems must not be removed permanently from the active nearshore, beach, or inlet shoal system unless no practicable alternative exists. Preferably, this dredged material will be placed on the ocean beach or shallow active nearshore area where environmentally acceptable and compatible with other uses of the beach."

6.3 Clean Water Act.
The proposed action will be evaluated under the Section 404(b)(1) (P.L. 95-2017) and included in Appendix B. The three alternatives evaluated will not require a NCDWR 401 WQC for the dredging portion of the project since there is no regulated discharge, pursuant to the Clean Water Act. However, dredged material placed in the authorized beachfront and nearshore placement areas is covered under WQC #4146, and placement by control-of-effluent on the bird islands will be covered under WQC #4152. A copy of the WQCs can be found in Appendix B. The USACE will apply for WQC authorization for sidecasting and scour hole placement options.

The proposed corridor alternatives are in compliance with Sections 404 and 401 of the Clean Water Act.

6.4 Endangered Species Act.
The Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531–1543), provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. In accordance with section 7 (a)(2) of the ESA, and under the purview of the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS), the USACE will ensure that effects of the

proposed project would not jeopardize the continued existence of listed species or result in the destruction or adverse modification of designated critical habitat of such species. USACE dredging and placement will operate under the 2017 USFWS NC Statewide Programmatic Biological Opinion which lays out the terms and conditions and conservation recommendations for beach placement activities for the protection of sea turtles, manatee, piping plover, red knot and seabeach amaranth. This BO is expected to be updated for Red Knot Critical Habitat in the near future.

The 2020 SARBO includes requirements for yearly reporting to NMFS for agency review and evaluation of all projects to make sure no threatened and endangered species are being negatively impacted. Also, monthly calls between agencies (USACE SAD/ BOEM/ NMFS) are ongoing to discuss the progress of existing projects, completed projects, new work, and risk to threatened and endangered species and the environment associated with all known dredging work covered by the 2020 SARBO. The adaptable framework of the risk analysis includes regular coordination with various federal and state resource agencies and considers dredging risk to all species, including threatened and endangered. The risk analysis also allows for planning to consider threatened and endangered species that are considered critically endangered and how to avoid any negative impacts to these species that could occur within the project area, such as the NARW.

All work done for the proposed project will comply with the 2020 SARBO https://www.fisheries.noaa.gov/content/endangered-species-act-section-7-biological-opinions-southeast.

6.5 Magnuson-Stevens Fishery Conservation and Management Act.
The 1996 Congressional amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) (PL 94-265) set forth requirements for the National Marine Fisheries Service (NMFS), regional fishery management councils (FMC), and other federal agencies to identify and protect important marine and anadromous fish habitat. These amendments established procedures for the identification of Essential Fish Habitat (EFH) and a requirement for interagency coordination to further the conservation of Federally managed fisheries.

USACE EFH coordination with NMFS Habitat Conservation Division (HCD) will be complete with release of the Final EA/FONSI.

6.6 Public Laws and Executive Orders.
Table 5 lists the compliance status of all executive orders considered for the proposed Hatteras Ferry Channel Realignment project. Further descriptions of proposed project compliance with executive orders are below.

Table 6. The Relationship of the Proposed Action to Federal Laws and Policies

Title of Public Law	US CODE	*Compliance Status
Abandoned Shipwreck Act of 1987	43 USC 2101	Full Compliance
Anadromous Fish Conservation Act of 1965, As Amended	16 USC 757 et seq.	Full Compliance
Antiquities Act of 1906, As Amended	16 USC 431	Full Compliance
Archeological and Historic Preservation Act of 1974, As Amended	16 USC 469	Full Compliance
Archeological Resources Protection Act of 1979, As Amended	16 USC 470	Full Compliance
Clean Air Act of 1972, As Amended	42 USC 7401 et seq.	Full Compliance
Clean Water Act of 1972, As Amended	33 USC 1251 et seq.	Full Compliance
Coastal Zone Management Act of 1972, As Amended	16 USC 1451 et seq.	Full Compliance
Endangered Species Act of 1973	16 USC 1531	Full Compliance
Estuary Program Act of 1968	16 USC 1221 et seq.	Full Compliance
Equal Opportunity	42 USC 2000d	Full Compliance
Farmland Protection Policy Act	7 USC 4201 et seq.	Full Compliance
Fish and Wildlife Coordination Act of 1958, As Amended	16 USC 661	Full Compliance
Historic and Archeological Data Preservation	16 USC 469	Full Compliance
Historic Sites Act of 1935	16 USC 461	Full Compliance
Magnuson Fishery Conservation and Management Act – Essential Fish Habitat	16 USC 1801	Full Compliance
National Environmental Policy Act of 1969, As Amended	42 USC 4321 et seq.	Full Compliance
National Historic Preservation Act of 1966, As Amended	16 USC 470	Full Compliance
National Historic Preservation Act Amendments of 1980	16 USC 469a	Full Compliance

Title of Public Law	US CODE	*Compliance Status
Native American Religious Freedom Act of 1978	42 USC 1996	Full Compliance
Executive Orders		
Protection and Enhancement of Environmental Quality	11514/11991	Full Compliance
Protection and Enhancement of the Cultural Environment	11593	Full Compliance
Floodplain Management	11988	Full Compliance
Protection of Wetlands	11990	Full Compliance
Federal Actions to Address Environmental Justice and Minority and Low-Income Populations	12898	Full Compliance
Implementation of the North American Free Trade Agreement	12889	Full Compliance
Invasive Species	13112	Full Compliance

*Full compliance once the NEPA process is complete.

The proposed action will not adversely affect natural and cultural resources and will be in full compliance with Executive Orders stated above following completion of the NEPA process.

6.7 Park Service Special Use Permit National.
The National Park Service (NPS) has identified areas of beachfront within the Cape Hatteras National Seashore as eligible for receiving sand for purposes of habitat restoration and enhancement through the process of obtaining a Special Use Permit (SUP). The NPS completed the Sediment Management Framework Environmental Impact Statement (EIS) in 2021 that will facilitate and expedite the SUP process.

Figure 11 shows the extent of placement areas on Ocracoke and Hatteras Islands approved by the NPS.

Figure 11. Placement areas on Ocracoke and Hatteras Islands (shown in yellow and black) as approved by the NPS

6.8 Coordination of This Document.

Prior to the release of the Draft EA, several meetings have taken place with state and federal resource agencies to resolve comments and concerns raised during the scoping period. Following the March 16, 2021 virtual Scoping Presentation, the USACE held agency meetings on April 30 and May 4, 2021 to discuss comments and concerns. On July 1, 2021, the USACE held an in-person meeting to discuss the importance of government plant dredging without windows to support the proposed action.

The proposed action and the environmental impacts of the proposed action are thoroughly addressed in this EA. The Draft EA was made available to an extensive list of local, State, and federal regulatory agencies, elected officials, and members of the public for a 30-day review and comment period. A list of recipients has been included as Appendix D of this document.

The Draft EA may also be accessed on the Wilmington District Website at:
http://www.saw.usace.army.mil/Missions/Navigation/Dredging/.

7.0 ENVIRONMENTAL COMMITMENTS.

To proceed with the proposed alternative of dredging and placement with government plant without environmental windows, the USACE will follow the environmental commitments listed below:

- Agency notification will occur ~2 weeks prior to dredging between 1 April – 30 September.
- Beach placement and bird island placement will only occur during the relevant environmental windows.
- Prior to each dredging event, SAVs in the project area will be identified and avoided; no dredging or sidecasting of material will occur within 300 feet of identified SAVs.
- A Special Use Permit will be obtained from the NPS prior to commencement of work on beachfronts.
- The USACE will abide by the USFWS 2017 Statewide Programmatic Beach Placement BO and 2017 Manatee Guidelines.
- The USACE will abide by the NMFS 2020 SARBO and relevant PDCs.
- Any changes in the proposed plan will be coordinated with resources agencies.

8.0 CONCLUSION.

Based on findings described in this EA, it is in the federal interest to implement the proposed alternative to allow government plant dredging to occur without window restrictions as had occurred previously within the historic route. Overall, the impacts associated with the government plant dredges are less than those of the contracted dredges, and volumes of material to be dredged are limited to small areas of shoaling. Furthermore, dredged material is beach quality sand and falls out quickly, thus limiting turbidity within the water column. Maintenance dredging of hot spots within the proposed corridor may result in minor, short-term and localized impacts to water quality, noise, benthic organisms, important fisheries and protected marine species and critical habitat. Impacts to natural resources associated with sidecast and special purpose hopper dredging during the months of April – September is expected to be minor and short-term, since hot spots within the corridor are limited to 3-4 small areas requiring 3-4 dredge events each per year, totaling approximately 177,000 CYs and 132 days of dredging.

Shoaling in the project vicinity occurs throughout the year, so the assumption is this pattern will continue and dredging will be required regularly throughout the year even with an environmental window. The proposed action would avoid having to coordinate with environmental agencies prior to each dredging event needed outside the window of 1 October and 31 March.

The overall benefit of the proposed action is that it will allow flexibility for government plant to dredge in a proactive manner and provision of a safer, more navigable channel for ferries, fishermen and the US Coast Guard. Dredging with government plant as needed will keep supplies flowing, increase the local and national economy and support the life-safety mission of the USCG. Proactive dredging is favored over reactive dredging for many reasons, and with environmental commitments in place, dredging as needed will have widespread benefits.

9.0 POINT OF CONTACT.

Ms. Emily Hughes, CESAW-ECP-PE, U.S. Army Engineer District, Wilmington, 69 Darlington Avenue, Wilmington, North Carolina 28403-1343. Telephone (910) 251-4635, email Emily.b.hughes@usace.army.mil.

10.0 REFERENCES.

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Appendix A:

USACE Geotechnical Sediment Analysis

APPENDIX A
USACE GEOTECHNICAL SEDIMENT ANALYSIS
HATTERAS FERRY CHANNEL REALIGNMENT
ROLLINSON CHANNEL NAVIGATION PROJECT, NORTH CAROLINA

Location: The Rollinson Channel Navigation project is located within the eastern side of Pamlico Sound in Dare County, North Carolina. The project provides a 12-foot deep channel from Pamlico Sound to the Hatteras Ferry terminal/basin located on the southwestern side of Hatteras Island. The project also provides for a navigation corridor along the sound side of Hatteras Island to Hatteras Inlet (Figure 1). The 8.5-mile-long corridor is located within the Hatteras Inlet complex between Ocracoke Island (Hyde County) and Hatteras Island (Dare County). The Hatteras Island side begins near greenlight buoy 15 and includes Barney Slough, Pamlico Sound, Sloop Channel and the South Ferry Channel.

Impediments to Navigation and Proposed Work: The northwestern corner of Sloop Channel has shoaled in significantly and is impeding ferry travel for the Hatteras-Ocracoke ferries. Hydrographic surveys (see Figure 1) indicate that shoaling is most problematic between buoys #4 to #6; however, significant shoaling is also present along the Barney-Slough portion of the navigation channel near buoys #10 and between buoys #16 and #14. With respect to Hatteras Inlet, this shoaling is occurring where the navigation channel overlies the distal edge of the Hatteras Inlet flood tidal shoal.

USACE plans to improve navigation along the ferry corridor which includes Sloop and Barney Slough Channels. The new corridor is to follow naturally deep water, and will be maintained at the authorized dimensions of 100 feet wide and 10 feet deep plus 2 feet allowable overdepth mean lower low water (MLLW). USACE has an environmental material constraint for side-cast placement; the in-situ material within the dredge prism must contain no more than 10% fines. This is the same constraint used by USACE for beach nourishment projects.

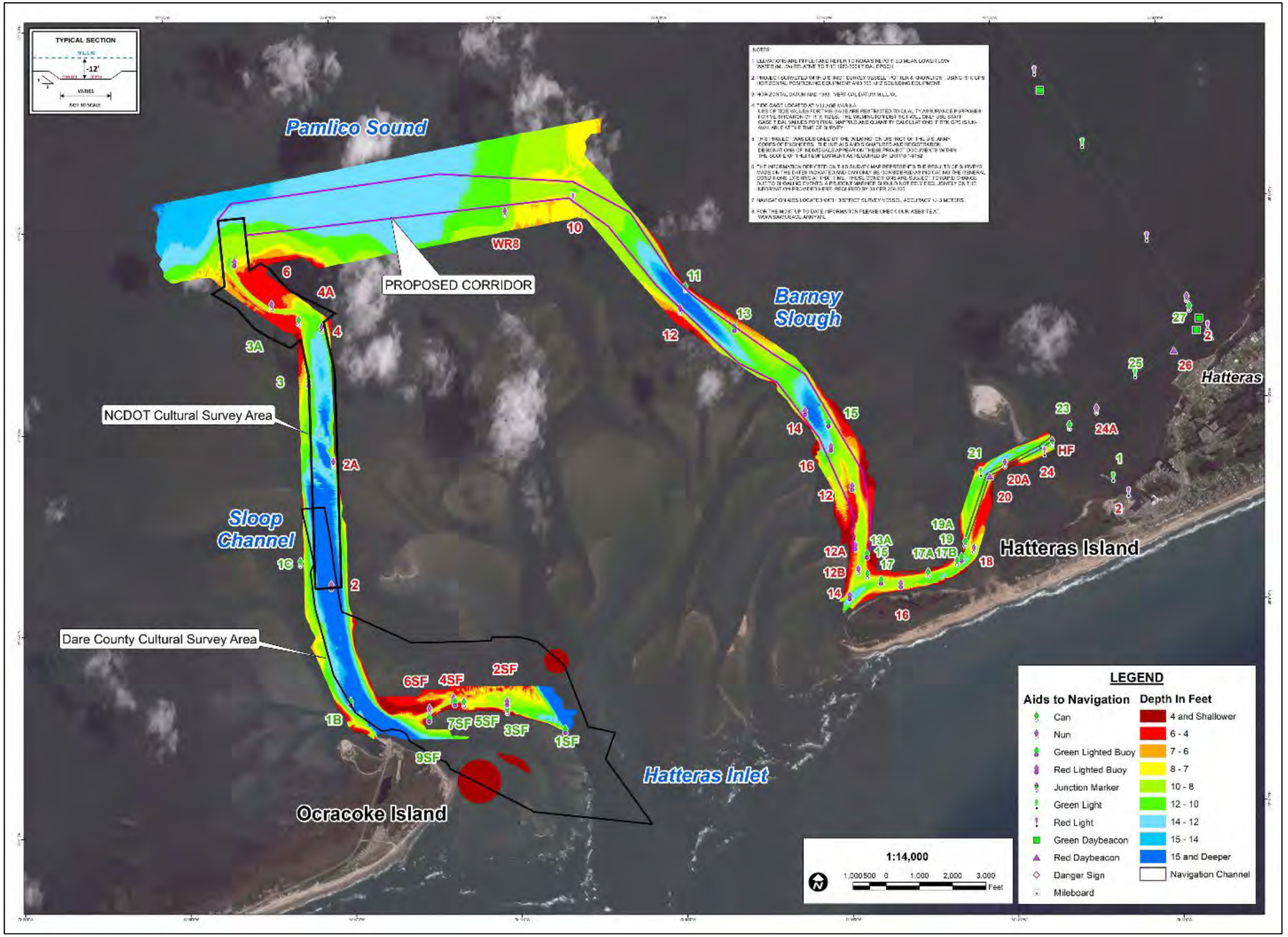

Figure 1. Rollinson Channel Re-Alignment Project Area. Note that the proposed corridor follows naturally deep water along the periphery of the flood tide delta.

Project Geologic Setting: The general geology of the project area is shown in Figure 2. The project site lies adjacent to Hatteras Island within the Atlantic Coastal Plain of North Carolina, on the eastern edge of the Pamlico Sound drowned-river estuary. The Atlantic Coastal Plain of North Carolina is comprised of a seaward thickening wedge of sedimentary strata that extends to the modern-day continental shelf break (Klitgord and Behrend, 1979; Harris et al., 1979; Harris and Zullo, 1991). This sedimentary wedge is composed of stratigraphically complex sequences of Cretaceous (145.5-65.5 Ma) to Quaternary (2.58 Ma-Present) sediments that overlie warped and faulted crystalline basement rock, which controlled the formation of paleo-depositional basins that would eventually form the Albemarle and Pamlico Sounds in North Carolina (Harris et al., 1979; Sohl and Owens, 1991). Structural warping about the Cape Fear Arch changed the elevation of the paleo-continental shelf relative to sea-level, which influenced sedimentation and depositional patterns from the Cretaceous to the Quaternary (Sohl and Owens, 1991; Ward et al., 1991). Geologic strata underlying Pamlico Sound contains thick sequences of unconsolidated Pliocene (5.3 Ma-2.58 Ma) and Quaternary sediments draped unconformably atop Cretaceous-aged units that are only exposed in upland stream bank outcrops (Mallinson et al., 2010). The configuration of inland dunes and terraces and formation of the drowned estuaries within the North Carolina Coastal Plain is attributed to cyclic sea-level fluctuation resulting from multiple ice ages during the Pliocene and early Pleistocene periods (Ward et al., 1991). Approximately 5,000 years before present, the rate of sea-level rise slowed enough to allow wave, current, and wind action to begin accreting enough sand to build the present-day barrier islands. Reworked modern and relict sands and gravels were deposited by wind or storm over wash atop finer-grained, estuarine to fluvial sediments. During this time, many of the oldest and largest of the Outer Banks sand dunes were formed as the material for the islands accreted atop older, exposed Pleistocene headlands (Dolan and Lins, 2000). Large back-barrier dune fields formed during periods of accretion, building atop and in front of older dunes on complex island segments (Havholm et al., 2004). Sand rich islands of the Outer Banks may have measured a mile across; interconnecting these larger islands were narrow, sand-poor, over wash dominated simple barrier islands and spits that were periodically breached to form temporal inlets (Dolan and Lins, 2000). A major breach occurred circa 1000 A.D., which resulted in the collapse of a 31-mile section of the Southern Outer Banks in the vicinity of Portsmouth, Ocracoke, and Hatteras Island (Culver et al., 2007). The collapse is believed to have been caused by a combination of major storm activity and transgressive conditions that existed during a warm climatic interval known as the Medieval Warm Period (Culver et al., 2007; Mallinson et al., 2008). Following the collapse, the affected areas were transformed into a large submarine shoal system, allowing open communication between Pamlico Sound and the Atlantic Ocean. The deposition of fine sand, marine foraminifera, and Gulf Stream plankton atop of organic-rich estuarine mud records this dramatic shift in environmental conditions (Culver et al., 2007). Marine conditions persisted within southern Pamlico Sound for approximately 500 years, upon which simple barrier islands reformed, resulting in a shift back to a low-energy estuarine environment (Riggs et al.,

2009). In 1846, a hurricane breached the Outer Banks near Hatteras, forming what is now the Hatteras Inlet (Mallinson et. al., 2009). The present-day Hatteras Island is still very much a dynamic system that is being constantly changed by the rising sea-level, tides, longshore current, and nearby inlet dynamics.

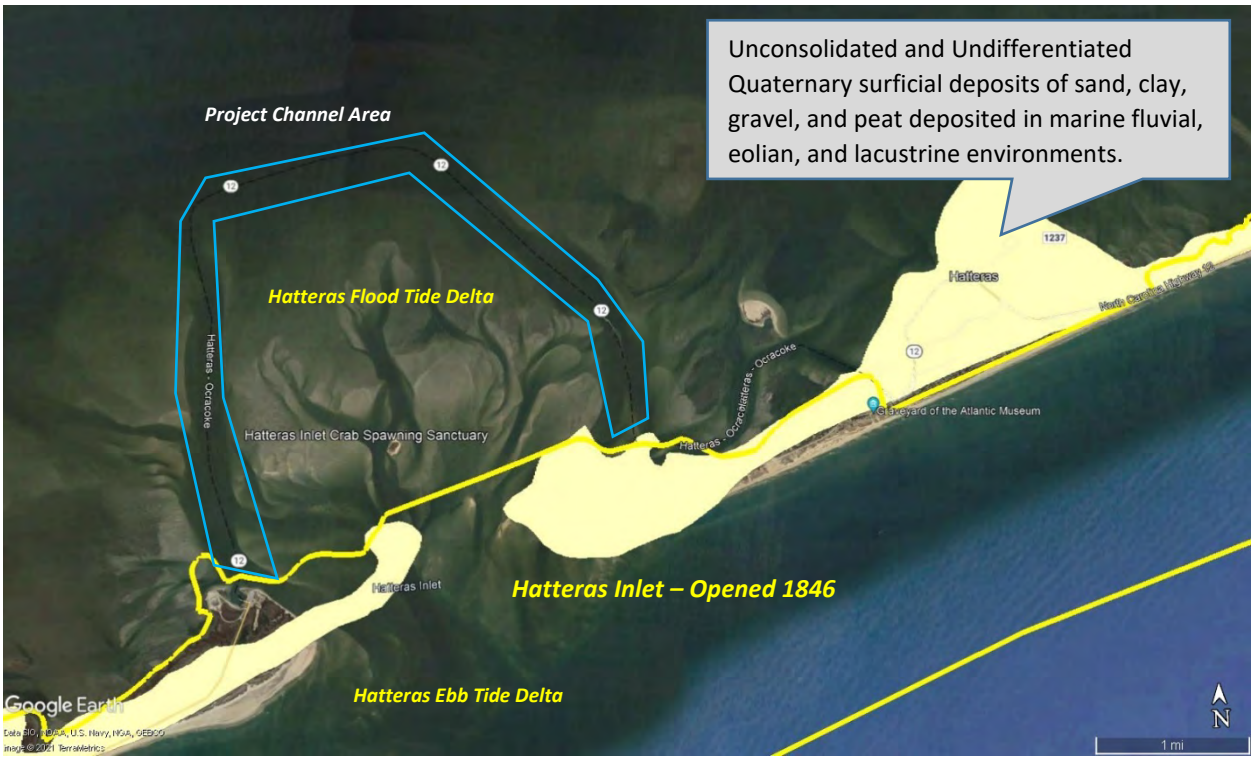

Figure 2. Generalized geology of the project area, from North Carolina Geological Survey (1985).

Historical Dredging and Previous Subsurface Investigations: USACE has conducted routine dredging within most of Rollinson Channel since its authorization and construction in 1962. When the original Hatteras Ferry Channel shoaled in and became impassible, Sloop Channel and Barney Slough were utilized in 2013 to provide passage to Ocracoke Island. Dredging has never been conducted in Sloop Channel and Barney Slough Channel, but shoaling occurs due to the large amount of sedimentation between Pamlico Sound and Hatteras Inlet. USACE dredges the Hatteras Ferry Channel regularly (see Table 1). The typical method of placement has been via sidecast or special purpose hopper dredge with material placement into open water or in the nearshore off Ocracoke Island. The present channel has an operational depth of -10 feet MLLW. Table 1 details the history of dredging activity.

Table 1. USACE Dredging History of Hatteras Ferry Channel System

HATTERAS FERRY CHANNEL (FEDERAL)		SOUTH FERRY CHANNEL (NON-FEDERAL)	
DREDGING DATE RANGE	**PLANT**	**DREDGING DATE RANGE**	**PLANT**
July 27 - 31, 2016	MERRITT		
August 7 - 19, 2016	MERRITT		
December 26, 2016 - January 11, 2017	MERRITT		
February 5 - 9, 2017	MERRITT		
April 21 -24, 2017	MERRITT		
May 11 - June 2, 2017	MERRITT		
June 1 - 2, 2017	MERRITT		
August 9 -11, 2017	MERRITT		
September 17 - 24, 2017	MERRITT		
March 20 - 29, 2018	CURRITUCK	March 30 - 31, 2018	CURRITUCK
December 15 -19, 2018	CURRITUCK		
December 29, 2018 - January 2, 2019	CURRITUCK		
January 2 - 15, 2019	MURDEN		
March 20 - April 10, 2019	MERRITT	March 16 - April 11, 2019	MERRITT
August 8 - 17, 2019	MERRITT		
September 26 - 30, 2019	MERRITT		
October 1 - 11, 2019	MERRITT		
December 27, 2019 - January 8, 2020	MERRITT		
January 29 - February 13, 2020	MERRITT	January 25 - February 11, 2020	MERRITT
July 23 - August 25, 2020	MERRITT	July 23 - September 2, 2020	MERRITT
December 1, 2, 9, 15, 2020	MERRITT	December 3 - 19, 2020	MERRITT
March 2 -22, 2021	MERRITT	March 2 - 18, 2021	MERRITT
March 27, 2021 - ongoing	MERRITT / MURDEN	March 27, 2021 - ongoing	MERRITT / MURDEN

To date, there have been five previous subsurface investigations conducted within the Hatteras Ferry Channel Project by both USACE and NCDOT (see Figure 3):

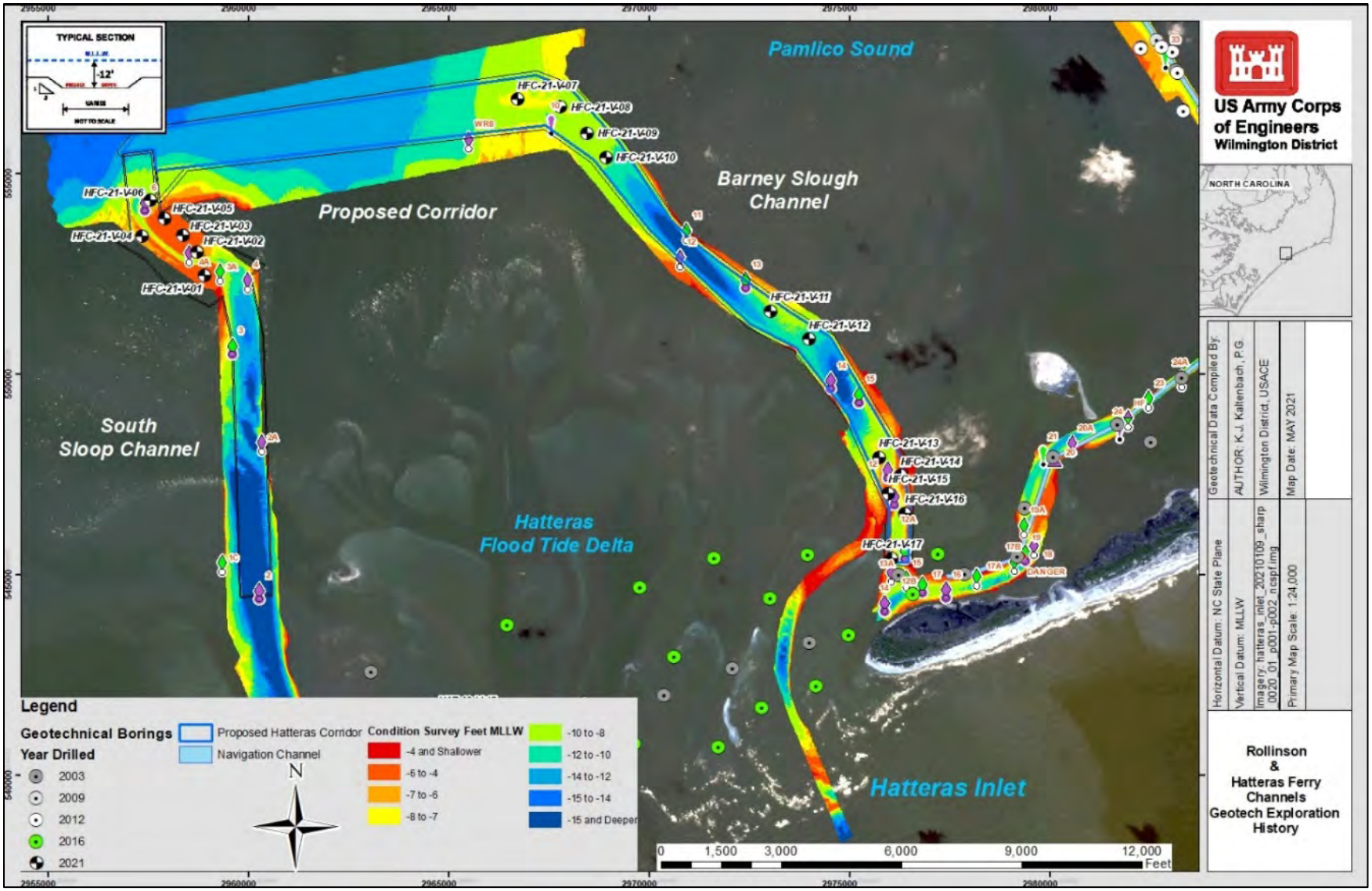

Figure 3. Historical and 2021 boring locations Rollinson and Hatteras Ferry Channel.

- USACE 2003, Vibracore investigation of Hatteras Ferry Channel. The purpose of the investigation was to evaluate the feasibility of maintaining the project as originally authorized. USACE drilled 34 vibracores using the S/B Snell. Borings that were drilled into the inlet throat, the flood tide delta, and nearby channel shoals encountered fine to medium-grained, poorly-graded sand with little to trace amounts of fines (SP, SP-SM). Borings that were drilled in the ferry channel segments behind Hatteras and Ocracoke Islands encountered 3 to 4 feet of silty, fine-grained material overlying fine-medium grained sand. Marina areas contained possible organics from spilled fuel/engine oil, which may pose an HTRW[1] issue if future work in these areas is considered.

- USACE 2009, Vibracore investigation of Rollinson Channel. The purpose of this investigation was to evaluate the composition of shoaling material within the main Rollinson Channel segment for maintenance dredging and sidecast placement. USACE drilled a total of 19 vibracores using the S/B Snell sampling several shoal deposits that were impinging upon the navigation channel. No borings were taken along the Hatteras Ferry Channel.

- USACE 2012, Vibracore investigation of Rollinson Channel. The purpose of this investigation was to validate the findings from the 2009 investigation and to thoroughly characterize the main Rollinson Channel segment for future maintenance dredging and material disposal. USACE drilled a total of 19 vibracores using the S/B Snell, targeting shoal deposits that had accumulated adjacent to the channel since it was dredged in 2009.

- USACE 2016, Vibracore investigation of Hatteras Ferry Channel. The purpose of this investigation was to evaluate several possible channel alternatives for a new alignment that cross cuts the Hatteras Inlet flood tide delta. USACE contracted with Athena Technologies to drill 15 vibracores within the flood tide delta. Most of the material encountered consisted of medium to fine-grained, poorly-graded sand (SP), with lesser amounts of coarse-grained, well-graded sand (SW) and fine-grained, poorly-graded sand with silt (SP-SM).
- NCDOT 2018, Vibracore investigation of Sloop Channel segment, Rollinson Channel project. NCDOT contracted with Catlin Engineering in 2018 to drill 5 vibracore borings in Sloop Channel to evaluate shoaled soils within an area of the channel that contains unspecified cultural resources. It is assumed that NCDOT is considering dredging this area to improve channel navigability for their ferry system. Their borings have been integrated into the USACE dataset for evaluation.

[1] Hazardous, Toxic, and Radioactive Waste, mostly from oils and fuels entrained into the bottom channel sediments, derived from the local marina.

Current Investigation Scope: The purpose and scope of the present investigation is to evaluate the suitability of the shoal material within the proposed channel realignment (Sloop Channel and Barney Slough) for side-cast placement.

USACE conducted hydrographic surveys of the channel alignment from late-August to mid- October 2020. Shoaling areas that impinge upon the proposed alignment were targeted for vibracore sampling. A total of 17 vibracore targets were designated and provided to an A-E Contractor (Figure 4). USACE awarded the contract to AMDRILL, Inc. which mobilized to the project site on 16MAR2021, and began drilling operations on 17MAR2021. The field work was concluded on 24MAR2021. No field work was conducted between 18-23MAR2021 due to adverse sea/weather conditions.

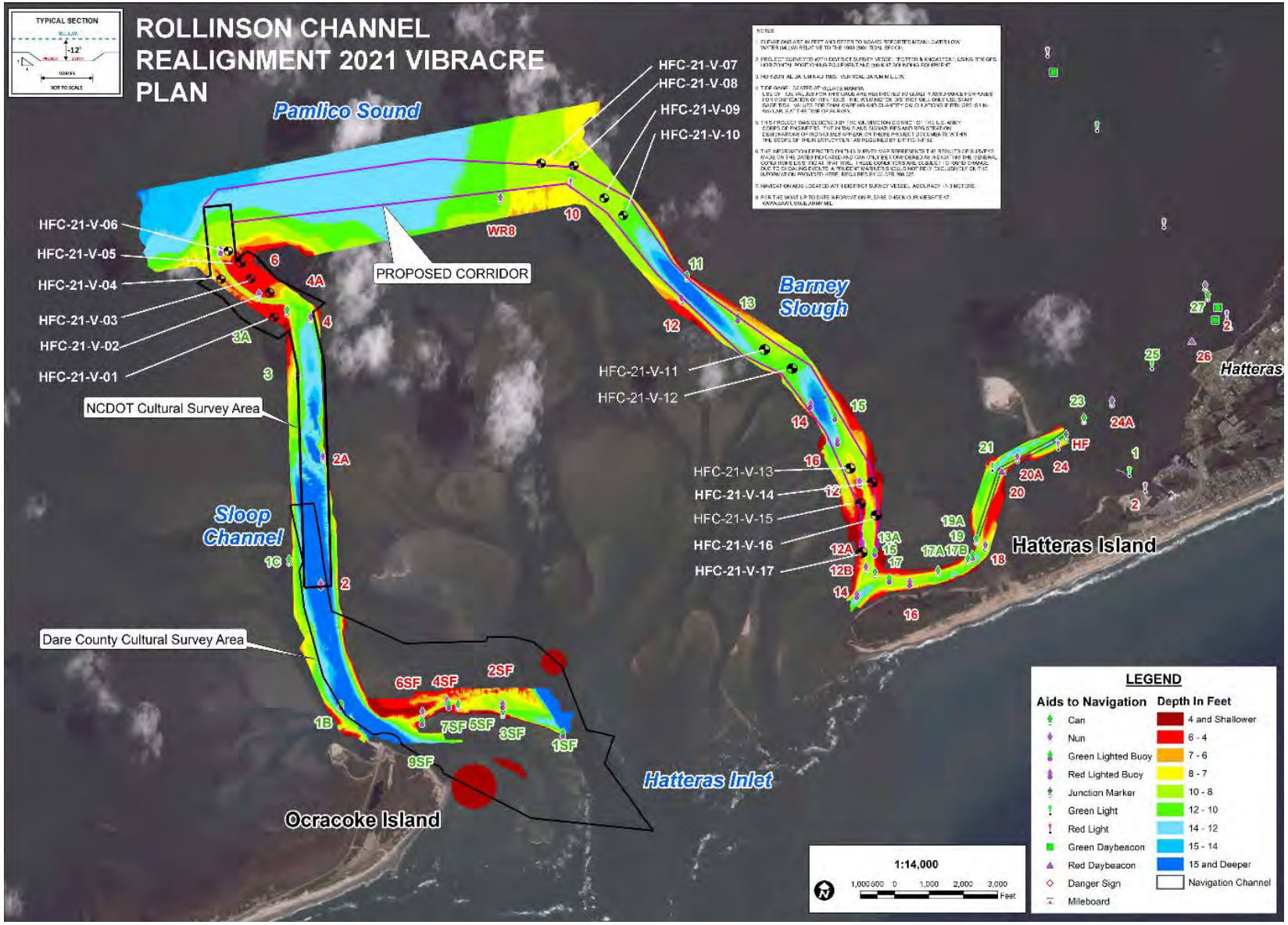

Figure 4. Location map of 2021 vibracore borings in project area.

Floating Plant and Sampling Details:
AMDRILL, Inc. utilized the 34-foot Scully, which is an aluminum hulled, shallow draft vessel (Figure 5), to act as the sampling platform for this project. The Scully was equipped with all required United States Coast Guard (USCG) safety gear and was operated by a USCG-certified 100 Ton Master Captain. A Garmin 547XS Global Positioning System (GPS) was utilized for primary navigation. Once on station, hydraulic spuds were lowered to secure the vessel at which time the sampling location (GPS coordinates) was recorded and compared to the proposed station to ensure the samples were within 20 horizontal feet of the proposed location. After verification of acceptable positioning, the water depth was measured with a lead line and recorded along with the GPS locations and transmitted to CATLIN's survey support vessel equipped with a Seafloor Systems Hydrolite Echosounder interfaced with a Real Time Kinematic (RTK) Trimble R12i global navigation satellite system (GNSS). This survey package provided horizontal and vertical accuracy to less than 0.2 feet. Horizontal coordinates were recorded in North American Datum of 1983 State Plane Coordinate System, North Carolina (Zone 3200), U.S. International Feet.

Figure 5. Vessel "Scully" owned and operated by AMDRILL, Inc.,

Vertical elevation post processed to convert to feet, MLLW by applying a 0.39 feet correction factor as determined from the National Oceanic and Atmospheric Administration (NOAA) Tide Station #8654467 located at the USCG Station Hatteras, N.C.

AMDRILL, Inc. utilized a Rossfelder P-5 vibro-percussive sampling device to collect the geotechnical vibracores. The vibracore assembly was lowered to the channel bottom by electric winch and cable until the bottom of the barrel was directly above the sediment surface. The vibracore machine was turned on and the sample barrel penetrated until the bottom of the sample barrel reached a minimum depth of 10 feet below sediment surface, or until refusal was encountered. The vibracore was then retrieved and the recovered length was recorded. All vibracores were advanced to a maximum depth of 10 feet below the seafloor, or until vibracore refusal was met. "Vibracore Refusal" was defined as the sampling barrel having a penetration rate of less than 0.2 feet over a 2-minute period. Generally, most of the vibracores achieved 80% or greater recovery. A penetrometer was used to determine depth advancement into the seafloor and the penetration rates were recorded.

Vibracore Logging and Sample Selection: All vibracores were split-open longitudinally at CATLIN's processing facility and geotechnical laboratory in Wilmington, N.C. The stratigraphy and lithology of the sampled strata was logged and visually

classified by Athena in accordance with ASTM 2488-09A. Supplemental information including depths for the entire length of recovered material, boring recovery, penetrometer data and refusal depth were provided on drilling logs (SAW Form 1836-A). Depth corrected draft drilling logs and photo-mosaic images of the cores were provided to USACE for selection of soil lab testing intervals. USACE selected granular soil samples for testing that were considered representative of the soil layer. Upon receipt of sample selections from USACE, CATLIN extracted the soil-samples for granulometric testing.

Soils Laboratory Methods: A total of 68 soil samples were designated for testing by USACE. The following laboratory methods were used to analyze the soil samples:

- ASTM D6913, "Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis," modified by using the following sieve sizes: 1-in., 3/8-in., No. 4, No. 7, No. 10, No. 14, No. 18, No. 25, No. 35, No. 45, No. 60, No. 80, No. 120, No. 170, No. 200, and No. 230.

- ASTM D2487 "Standard Practice for Classification of Soils for Engineering Purposes (Unified Soils Classification System (USCS))."

- Visual, volumetric percentage of shell and rock fragment determination. Visual percent shell content and visual percent rock fragment content shall be estimated for the 1-in., $^{3}/_{8}$-in., and No. 4 sieve sizes.

Evaluation of 2021 Subsurface Data: The Wilmington District conducted an inventory of archived geotechnical data within the extent of the project area addressed in the Environmental Assessment (EA). The scope of the EA encompasses Hatteras Ferry Channel segments: North Sloop Channel, Barney Slough Channel, and a proposed interconnecting corridor that follows naturally deep water. The geotechnical investigation was required to properly characterize both shoal material in the existing navigation channels and in-situ new work material in the proposed corridor to determine the most suitable placement options. These materials lie above the minimum allowable dredging elevation of -12 feet MLLW (includes the project depth of -10 feet MLLW plus -2 feet of over depth for advanced maintenance).

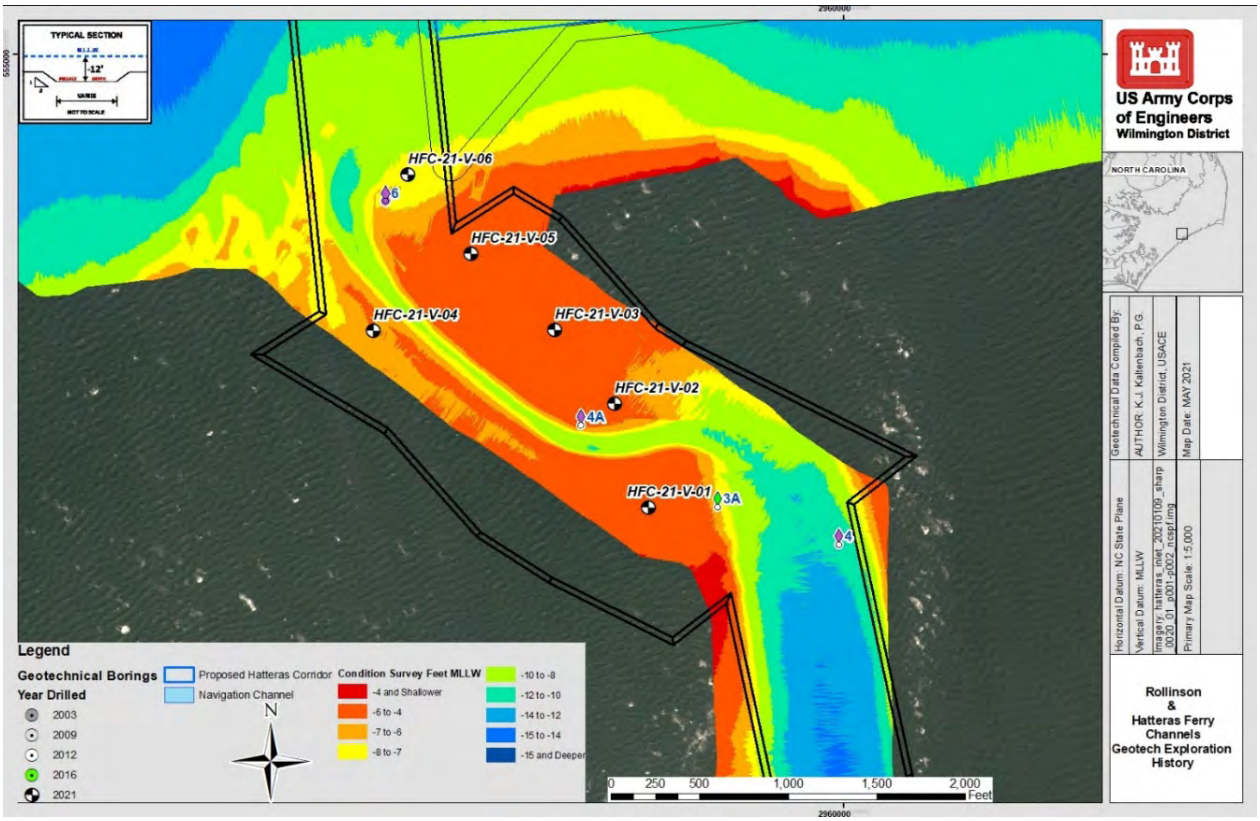

Figure 6. 2021 vibracore locations in South Sloop Channel between buoys #4 and #6.

Six vibracore borings (HFC-21-V-01 through HFC-21-V-06) were drilled in North Sloop Channel between navigation buoys #4 and #6 to sample a thick shoal that ranges in depth from -4 to -8 feet MLLW (Figure 6). Four vibracore borings (HFC-21-V-07 through HFC-21-V-10) were drilled in the proposed Hatteras Channel corridor, near the northern extent of Barney Slough Channel, buoy #10 to target a relatively thin shoal at depths ranging from -8 to -9 feet MLLW (Figure 7). To the southeast, two additional vibracores (HFC-21-V-11 and HFC-21-V-12) were drilled into a minor shoal that is present between navigation buoys #13 and #14 at depths of -8 to -10 ft (Figure 8). The remaining five vibracores (HFC-21-V-13 through HFC-21-V-17) were drilled in the southern extent of Barney Slough Channel to sample widespread shoaling present between navigation buoys #12 and #12B, at water depths ranging from -4 to -8 feet MLLW (Figure 9).

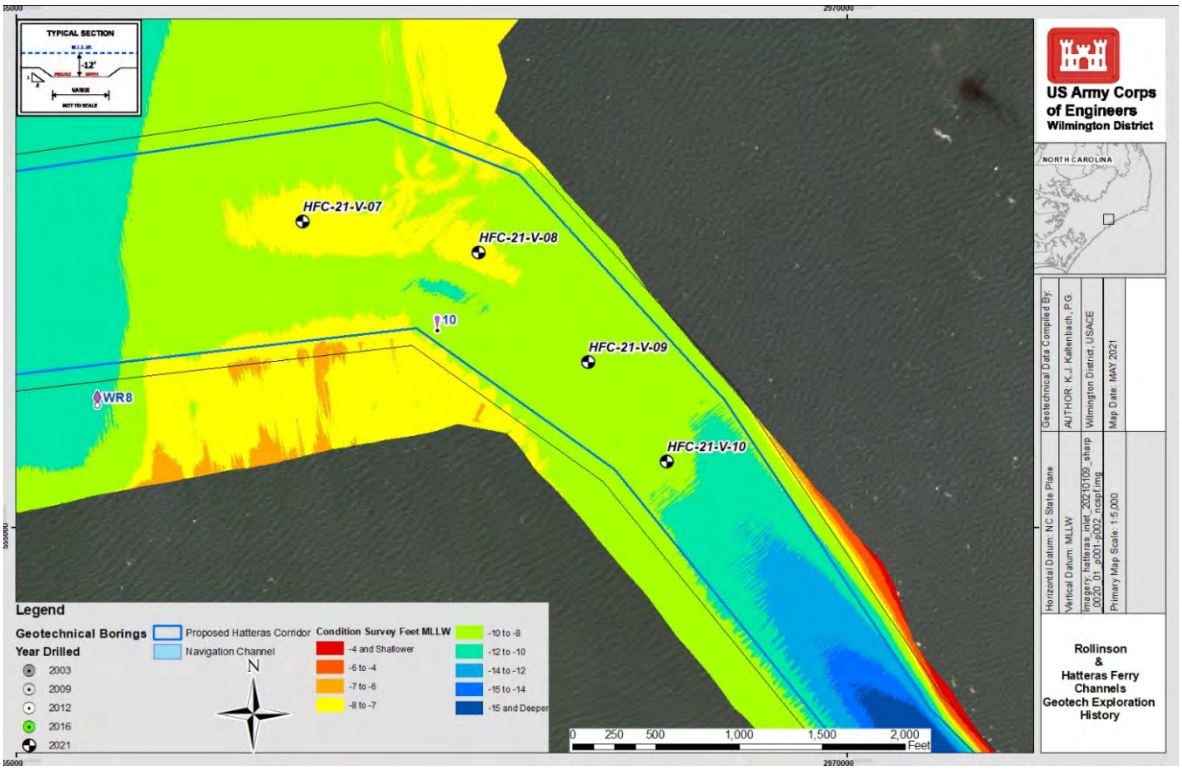

Figure 7. 2021 vibracore locations in the proposed Hatteras Channel Corridor, near buoy #10.

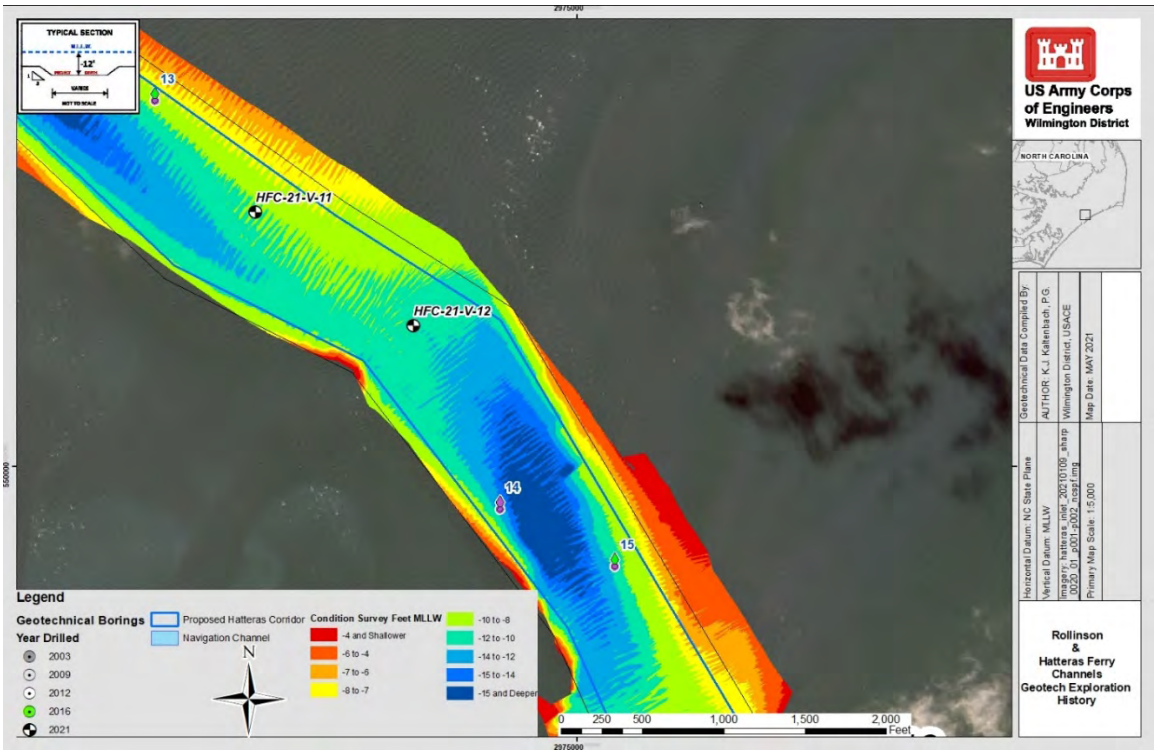

Figure 8. 2021 vibracore locations in Barny Slough channel segment between buoys #13 and #14.

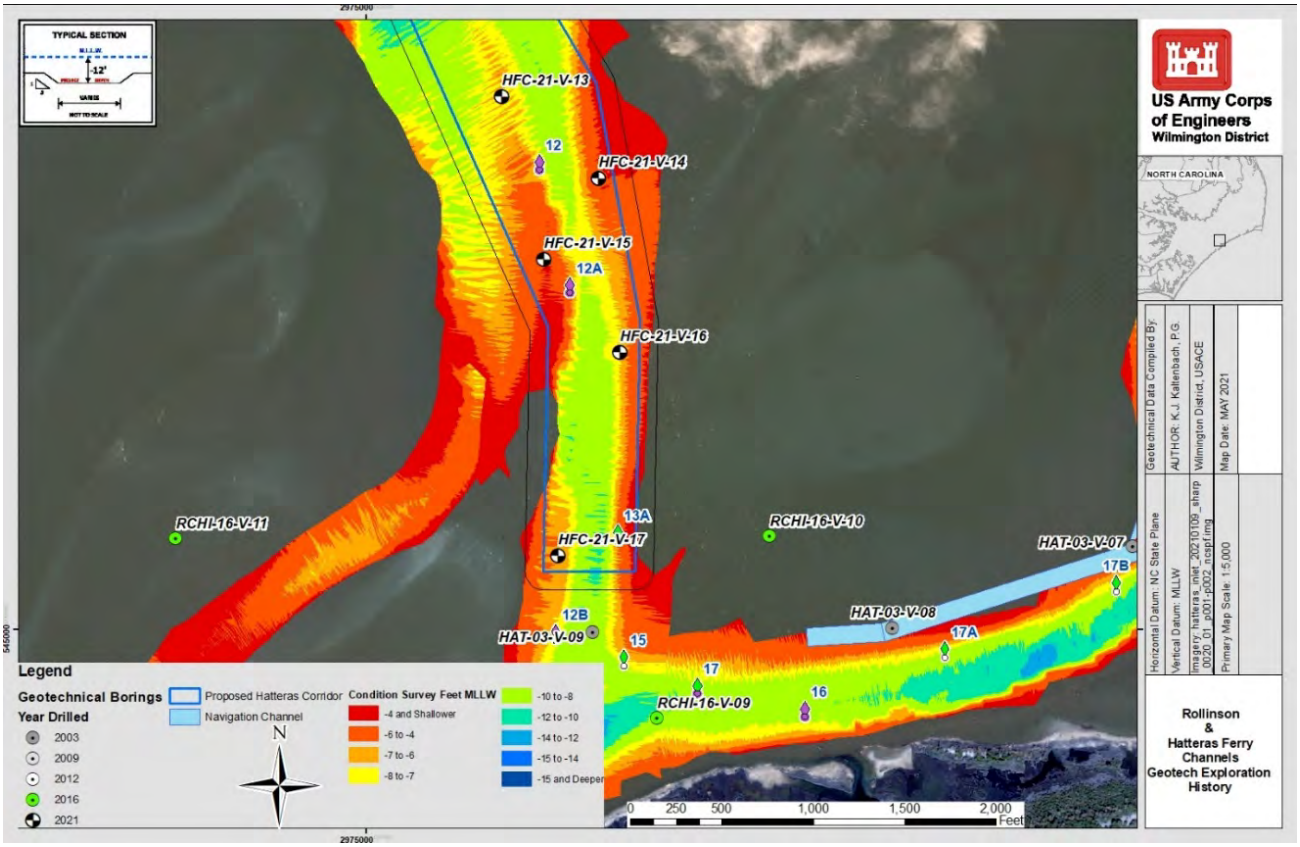

Figure 9. 2021 vibracore locations in southern portion of Barney Slough Channel, in the vicinity of buoys #12 and #12B.

Soil sampled between the channel bottom and -12 feet MLLW was characterized based upon the field visual classification and laboratory granulometric determination. Color symbology was established to rapidly characterize[2] the dredge prism soils in each boring:

- Red = Dredge prism soils that contain greater that 12% fines, or rock.
- Yellow = Dredge prism soils that contain between 5 and 12% fines.
- Green = Dredge prism soils that contain less than 5% fines.

Figures 10 through 13 show characterized dredge prism soils for each channel segment, utilizing the criteria established above. As shown in Figures 10 through 13, most of the sampled soils consist of poorly graded sand (SP), which has a fines content that ranges from 0 to 5%. Lesser amounts of poorly graded sand with silt (SP-SM) are also present in the underlying strata, but this is still acceptable for beneficial use placement. In accordance with the USCS, an SP-SM can have a fines content that

[2] Based upon USCS criteria for determining fine-grained soils. Any soils within the dredging prism that contain greater than 12% fines will be identified as being potentially unsuitable and impacts to the dredging prism would be evaluated in the study.

ranges from 5-12%; however, the lab testing by CATLIN indicates the fines content is cleaner, ranging between 6.7 and 9.1%. In practice, the maximum allowable fines content for USACE beach placement projects is 10% fines, composited vertically through the strata-datapoint; however, none of the dredge prism test samples exceed this 10% fine criteria. In addition, cross-sectional fence diagrams were constructed to evaluate the sampled soils against the project depth and maximum dredge depth limits. Figures 14 through 17 illustrate that the dredging prism consists predominantly of SP, with lesser amounts of SP-SM soils.

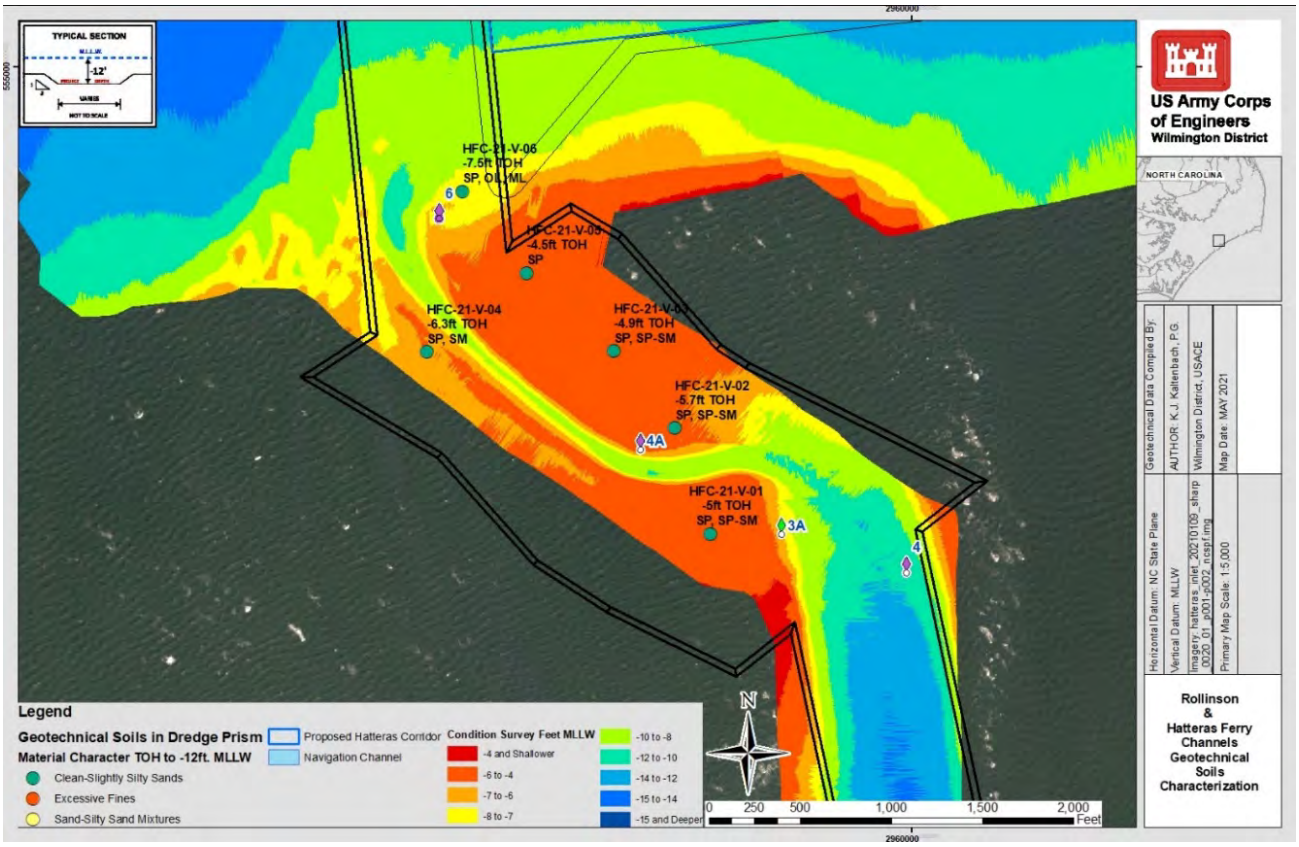

Figure 10. Geotechnical soils characterization of dredging prism from vibracores taken in vicinity of South Sloop Channel.

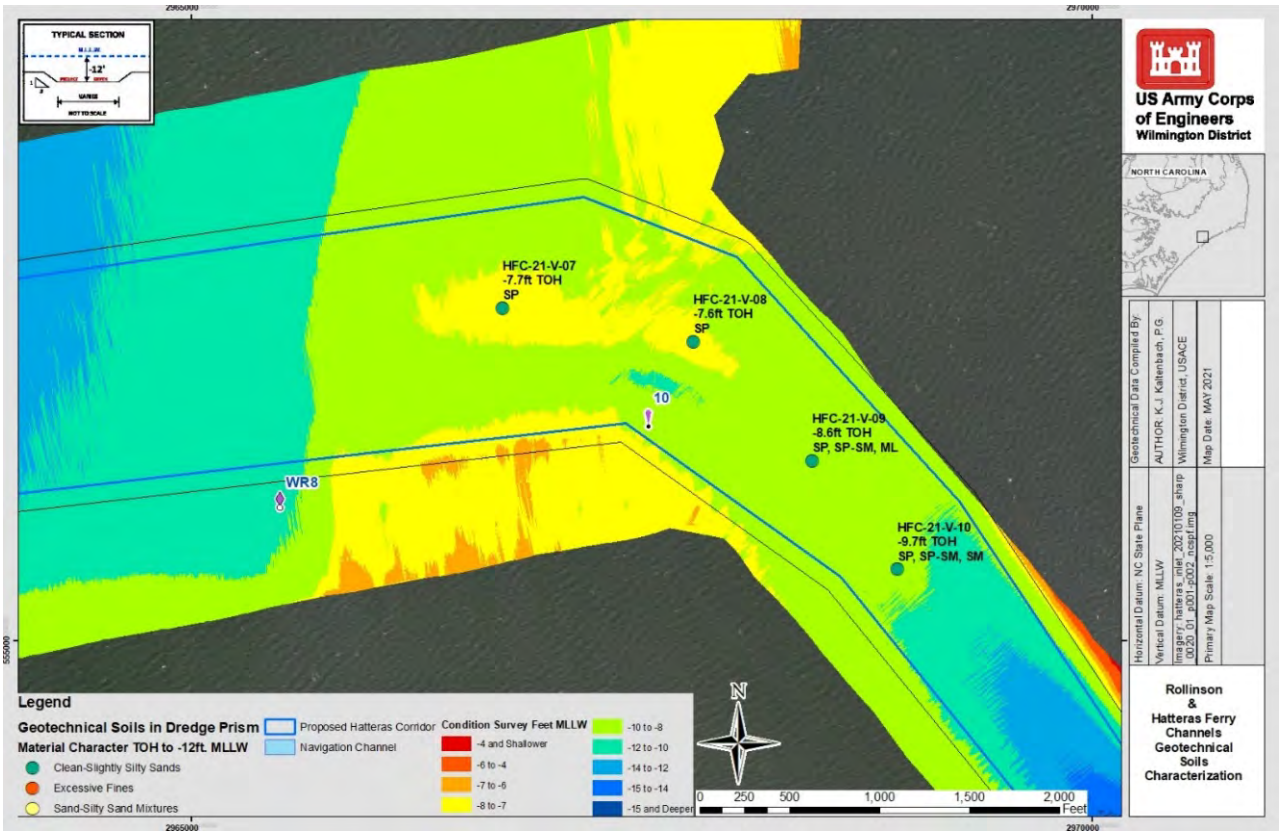

Figure 11. Geotechnical soils characterization of dredging prism from vibracores taken within the proposed channel corridor.

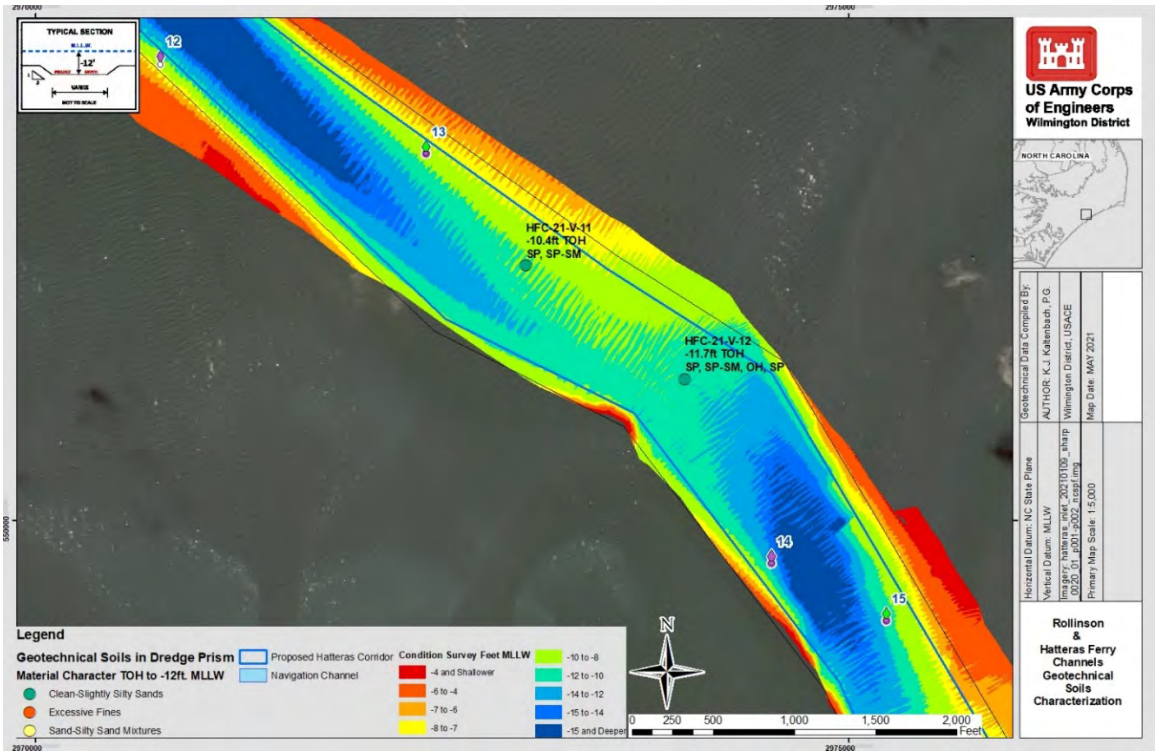

Figure 12. Geotechnical soils characterization of dredging prism from vibracores taken within Barney Slough Channel segment.

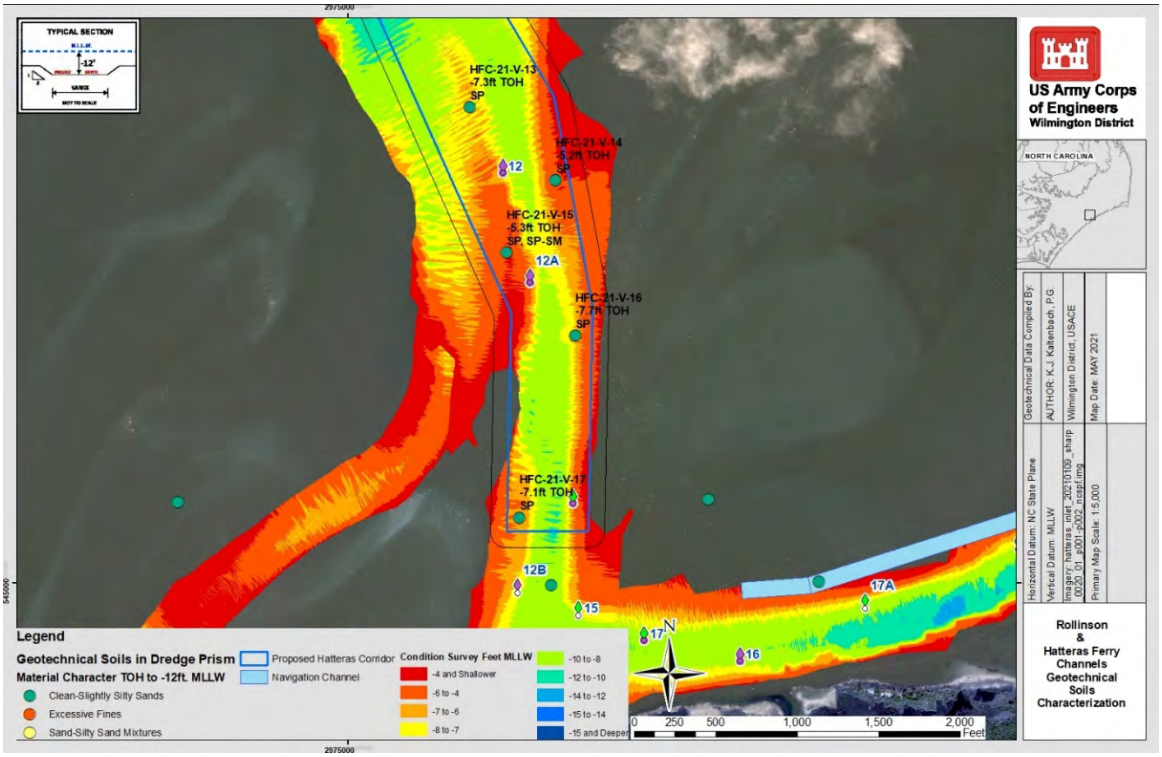

Figure 13. Geotechnical soils characterization of dredging prism from vibracores taken within Barney Slough Channel segment.

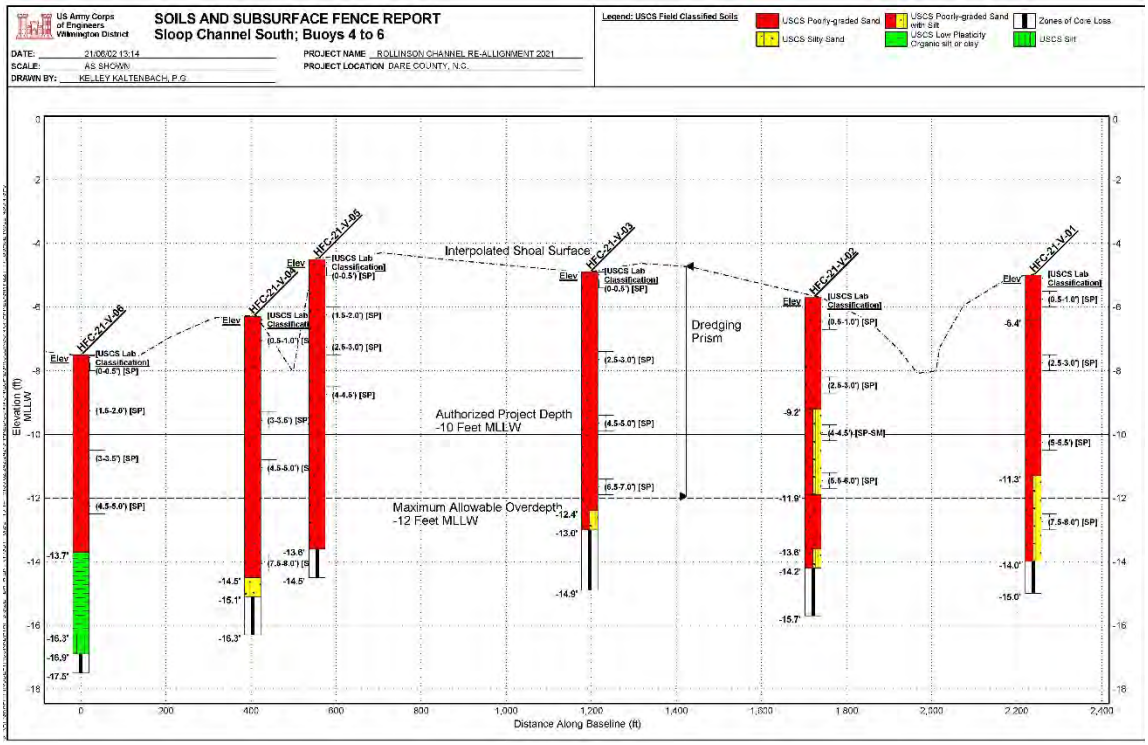

Figure 14. Fence cross-section, borings in Sloop Channel South.

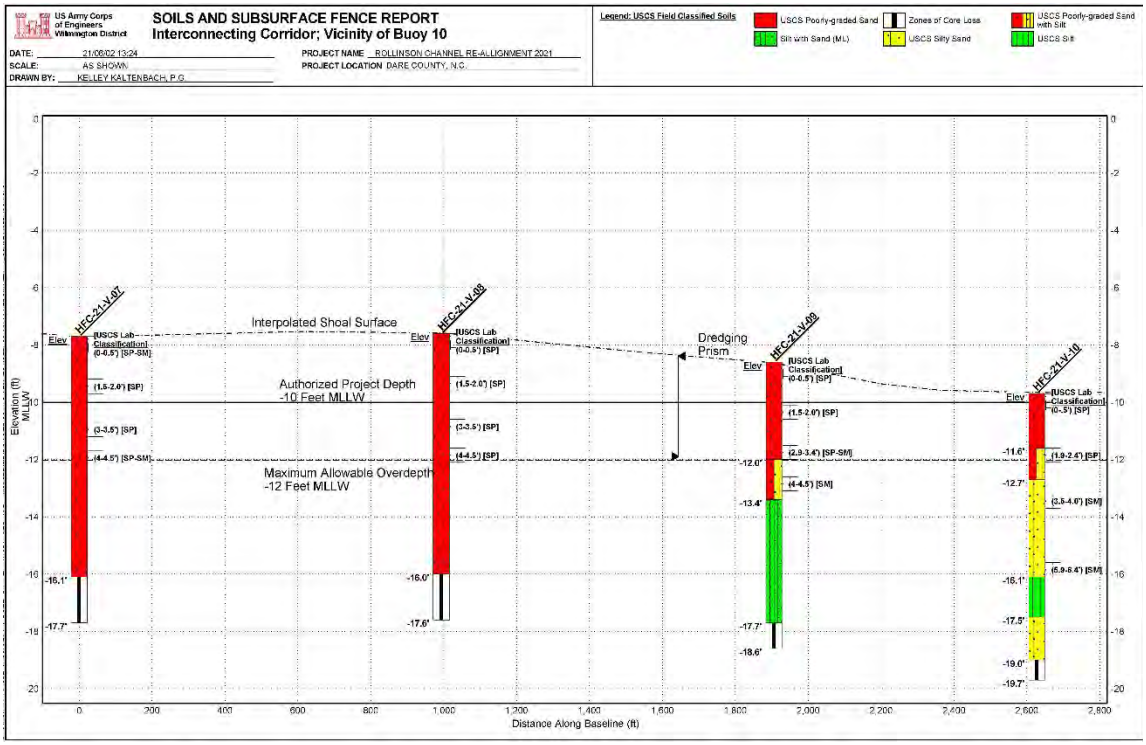

Figure 15. Fence cross-section, borings in interconnecting corridor.

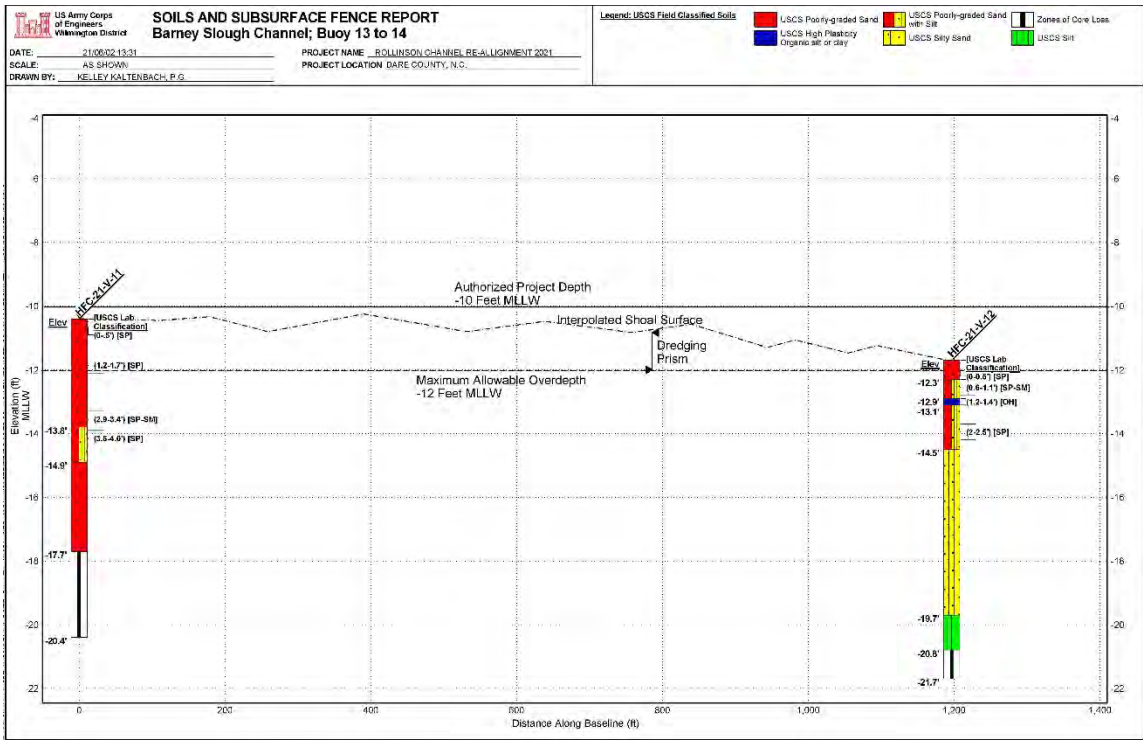

Figure 16. Fence cross-section, borings in Barney Slough Channel

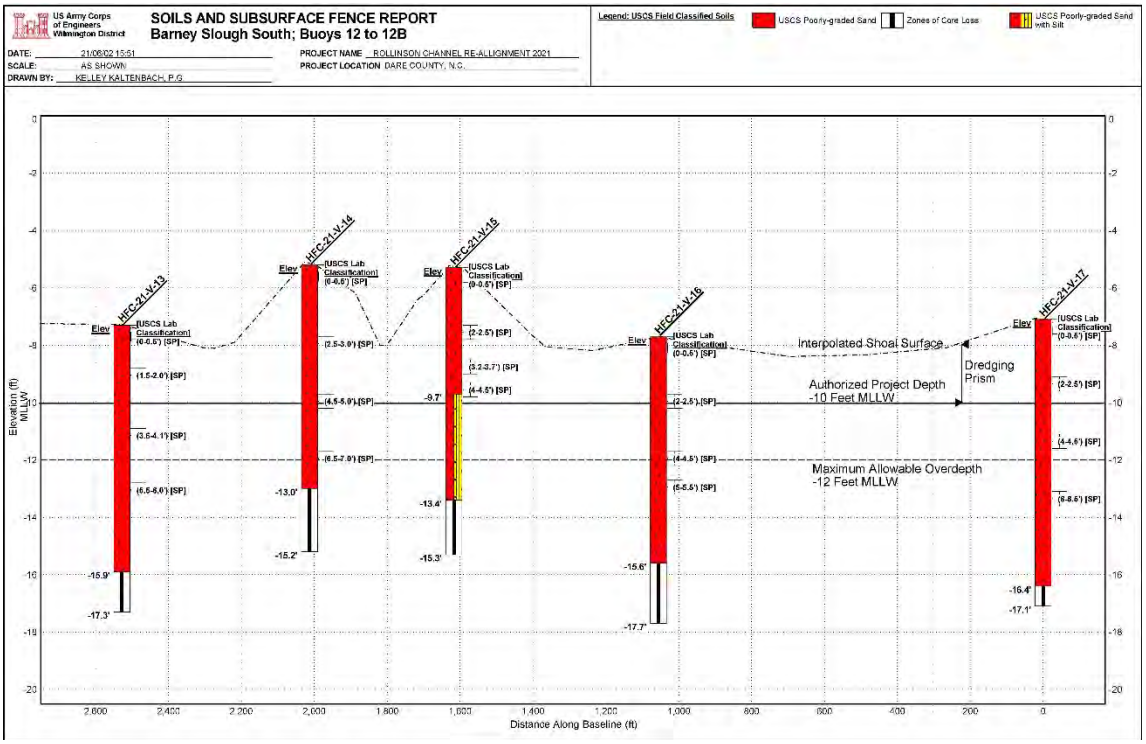

Figure 17. Figure 16. Fence cross-section, borings in Barney Slough Channel South.

A summary of the laboratory testing is provided in Table 2 below. The calculated percent passing and retained on the #10 Sieve, percent passing the #200, percent shell, and mean grain size (in mm), for all borings and sampled stratum that lies within the dredging prism is presented. Top of hole (TOH) elevations are provided in feet, MLLW. The sampled stratum lies specifically between the surveyed channel bottom and -12 feet MLLW elevation (refer to Figures 14 through 17). Table 3 provides the weighted average of the percent retained and passing the #10 sieve, percent passing the #200, and mean grain size (mm) for all sampled material within the current dredging prism (bathymetric surface to -12 feet MLLW). On average, the material is best characterized as a fine-grained, poorly-graded sand (SP), with a weighted mean grain size of 0.18 millimeters, a shell content of 0.17%, and a fines content of 2.5%. It is suitable for many uses; granular construction fill for beach nourishment or bird habitat restoration, nearshore placement, or a substrate for spawning fish habitat.

Table 2. Granulometric Summary of Vibracore Borings to -12 MLLW, Hatteras Ferry Channel Re-Alignment.

Boring ID	Elev. TOH Ft. MLLW	% Retained #10	% Pass #10	% Pass #200	% Shell	Mean grain (mm)
HFC-21-V-01	-5	0.00	100.00	2.19	0.00	0.17
HFC-21-V-02	-5.7	0.02	99.98	3.62	0.00	0.16
HFC-21-V-03	-4.9	0.05	99.95	2.75	0.00	0.15
HFC-21-V-04	-6.3	0.03	99.97	2.93	0.00	0.17
HFC-21-V-05	-4.5	0.16	99.84	1.89	0.00	0.17
HFC-21-V-06	-7.5	0.42	99.58	1.43	0.11	0.17
HFC-21-V-07	-7.7	0.18	99.82	5.45	0.02	0.16
HFC-21-V-08	-7.6	0.10	99.90	3.48	0.03	0.17
HFC-21-V-09	-8.6	0.64	99.36	3.57	0.45	0.19
HFC-21-V-10	-9.7	0.25	99.75	1.50	0.12	0.21
HFC-21-V-11	-10.4	0.45	99.55	2.35	0.29	0.20
HFC-21-V-12	-11.7	0.06	99.94	1.69	0.00	0.21
HFC-21-V-13	-7.3	0.07	99.93	0.71	0.08	0.19
HFC-21-V-14	-5.2	0.51	99.49	2.11	0.07	0.20
HFC-21-V-15	-5.3	0.90	99.10	1.47	0.59	0.18
HFC-21-V-16	-7.7	1.55	98.45	2.69	1.00	0.21
HFC-21-V-17	-7.1	1.66	98.34	1.18	0.63	0.37

Table 3. Granulometric Summary of Dredge Prism Material to -12 MLLW, Hatteras Ferry Channel Re-Alignment.

% Retained #10	% Pass #10	% Pass #200	% Shell	Mean Phi	Std. Dev	Mean grain size (mm)
0.4	99.6	2.5	0.17	2.45	0.45	0.18

Table 4 and Figure 18 provide rough volume estimates of shoal material within the most likely channel routes. The volumes were estimated using ArcGIS to delineate the area (yd^2) for the most likely navigation channel corridors through each shoal segment, and the average thickness was estimated from the bathymetry. Within the project channel segments, the maximum amount of material present is approximately 852,659 cubic yards (cy) of beach quality material. It should be noted that the actual volume of material within the dredging prism will likely be less depending upon the channel prism geometry and path taken. In addition, these volume calculations do not take into consideration volume losses due to dredging and disposal operations.

Table 4. Maximum volume estimates for most likely channel corridors.

Accumulation Type	Location	Area (sq. yds.)	Avg. Thickness (yds.)	Volume (cu. yds.)
Sand Shoal	Buoys #4 - #6	186,588.2	1.3	242,564.7
Sand Shoal	Vic. Buoy #10	404,884.8	1	404,884.8
Sand Shoal	Buoys #13 - #14	116,630.9	0.3	34,989.3
Sand Shoal	Buoys #15 - #12B	130,930.9	1.3	170,210.2

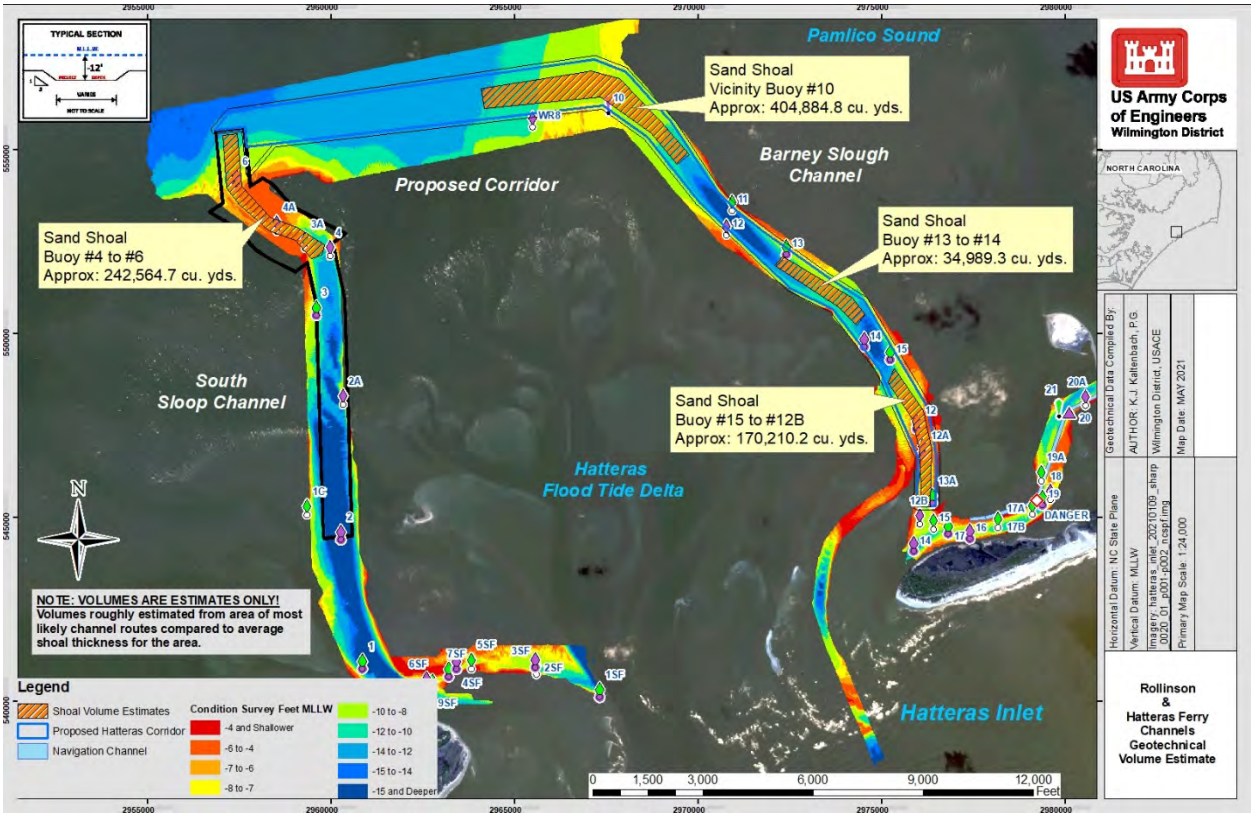

Figure 18. Maximum volume estimates for dredgable material along most likely channel corridors.

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Appendix B:

NCDEQ-DWQ Approval Use of General Certificates #4146 and #4152

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NORTH CAROLINA
Environmental Quality

September 30, 2019

DWR # 08-0806 v5
Brunswick, New Hanover, Onslow, Pender, Dare, Currituck, & Hyde Counties

U.S. Army Corps of Engineers, Wilmington District
Attn: Ms. Jenny Owens, Chief Environmental Resources Section
69 Darlington Avenue
Wilmington, NC 28403

Subject: **APPROVAL OF 401 WATER QUALITY CERTIFICATION WITH ADDITIONAL CONDITIONS**
Corps of Engineers (ILM) Maintenance Dredging/Disposal/Beach Renourishment Program

Dear Ms. Owens:

You have our approval for the impacts listed below for the purpose described in your application dated August 6, 2019, received by the Division of Water Resources (Division) on August 9, 2019. These impacts are covered by the attached Water Quality General Certification Numbers 4137, 4142, 4146, 4151, and 4152 and the conditions listed below. Please note that you should get any other federal, state or local permits before proceeding with your project, including those required by (but not limited to) Sediment and Erosion Control, Non-Discharge, and Water Supply Watershed regulations. **This approval to proceed with your proposed impacts or to conduct impacts to waters as depicted in your application shall expire upon the expiration of the above General Certifications.**

This approval requires you to follow the conditions listed in the enclosed certifications and the following additional conditions:

1. The following impacts are hereby approved provided that all of the other specific and general conditions of the Certification are met. No other impacts are approved, including incidental impacts. [15A NCAC 02H .0506(b) and/or (c)]

Type of Impact	Amount Approved (units) Permanent	Amount Approved (units) Temporary
Stream	NA	NA
404/401 Wetlands	NA	NA
Open Waters	Multi acres Maintenance Dredging	

2. This approval is for the purpose and design described in your application. The plans and specifications for this project are incorporated by reference as part of the Certification. If you change your project, you must notify the Division and you may be required to submit a new application package with the appropriate fee. If the property is sold, the new owner must be given a copy of this approval letter and General Certification(s)/Permit/Authorization and is responsible for complying with all conditions. [15A NCAC 02H .0507(d)(2)]

3. Work Moratoriums
   The permittee shall adhere to all appropriate in-water work moratoriums as prescribed by the NC Wildlife Resources Commission, the US Fish and Wildlife Service, and National Marine Fisheries Service.

This approval and its conditions are final and binding unless contested. [G.S. 143-215.5]

This Certification can be contested as provided in Articles 3 and 4 of General Statute 150B by filing a written petition for an administrative hearing to the Office of Administrative Hearings (hereby known as OAH) **within sixty (60) calendar days**.

A petition form may be obtained from the OAH at http://www.ncoah.com/ or by calling the OAH Clerk's Office at (919) 431-3000 for information. A petition is considered filed when the original and one (1) copy along with any applicable OAH filing fee is received in the OAH during normal office hours (Monday through Friday between 8:00am and 5:00pm, excluding official state holidays).

The petition may be faxed to the OAH at (919) 431-3100, provided the original and one copy of the petition along with any applicable OAH filing fee is received by the OAH within five (5) business days following the faxed transmission.

Mailing address for the OAH:

If sending via US Postal Service:	*If sending via delivery service (UPS, FedEx, etc):*
Office of Administrative Hearings 6714 Mail Service Center Raleigh, NC 27699-6714	Office of Administrative Hearings 1711 New Hope Church Road Raleigh, NC 27609-6285

One (1) copy of the petition must also be served to Department of Environmental Quality:

William F. Lane, General Counsel
Department of Environmental Quality
1601 Mail Service Center
Raleigh, NC 27699-1601

This letter completes the review of the Division under section 401 of the Clean Water Act. Please contact Chad Coburn at 910-796-7215 or chad.coburn@ncdenr.gov if you have any questions or concerns.

Sincerely,

DocuSigned by:
Morella Sanchez-King
E3ABA14AC7DC434...

Morella Sanchez-King, Regional Supervisor
Water Quality Regional Operations Section
Wilmington Regional Office
Division of Water Resources, NCDEQ

Enclosures: GC 4137, 4142, 4146, 4151, and 4152

cc: Emily Hughes - USACE Wilmington Regulatory Field Office (via email)
DWR WaRO (via email)

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES

WATER QUALITY GENERAL CERTIFICATION NO. 4146

GENERAL CERTIFICATION FOR PROJECTS ELIGIBLE FOR US ARMY CORPS OF ENGINEERS

- **REGIONAL GENERAL PERMIT 198000048 (EMERGENCY ACTIVITIES ON OCEAN BEACHES)**

Water Quality Certification Number 4146 is issued in conformity with the requirements of Section 401, Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina in 15A NCAC 02H .0500 and 15A NCAC 02B .0200 for the discharge of fill material to surface waters and wetland areas as described in the US Army Corps of Engineers Wilmington District's Regional General Permit 198000048.

The State of North Carolina certifies that the specified category of activity will not violate applicable portions of Sections 301, 302, 303, 306 and 307 of the Public Laws 92-500 and 95-217 if conducted in accordance with the conditions hereinafter set forth.

Effective date: December 1, 2017

Signed this day: December 1, 2017

By

for Linda Culpepper
Interim Director

Activities meeting any one (1) of the following thresholds or circumstances require *written approval* for a 401 Water Quality Certification from the Division of Water Resources (DWR):

a) If any of the Conditions of this Certification (listed below) cannot be met; or
b) Any permanent fill into or modification of wetlands and/or waters; or
c) Any impacts to streams from excavation or dredging other than excavation that is conducted as preparation for installing permanent fill or structures; or
d) Any stream relocation or stream restoration; or
e) Any permanent impacts to waters, or to wetlands adjacent to waters, designated as: ORW (including SAV), HQW (including PNA), SA, WS-I, WS-II, Trout, or North Carolina or National Wild and Scenic River; or
f) Any impacts to coastal wetlands [15A NCAC 07H .0205], or Unique Wetlands (UWL); or
g) Any permanent impact associated with a Notice of Violation or an enforcement action for violation(s) of NC Wetland Rules (15A NCAC 02H .0500), NC Isolated Wetland Rules (15A NCAC 02H .1300), NC Surface Water or Wetland Standards (15A NCAC 02B .0200), or State Regulated Riparian Buffer Rules (15A NCAC 02B .0200); or
h) Any impacts to subject water bodies and/or state regulated riparian buffers along subject water bodies in the Neuse, Tar-Pamlico, or Catawba River Basins or in the Randleman Lake, Jordan Lake or Goose Creek Watersheds (or any other basin or watershed with State Regulated Riparian Area Protection Rules [Buffer Rules] in effect at the time of application) *unless:*
    i. The activities are listed as "EXEMPT" from these rules; or
    ii. A Buffer Authorization Certificate is issued by the NC Division of Coastal Management (DCM); or
    iii. A Buffer Authorization Certificate or a Minor Variance is issued by a delegated or designated local government implementing a state riparian buffer program pursuant to 143-215.23.

Activities included in this General Certification that do not meet one of the thresholds listed above do not require written approval.

I. ACTIVITY SPECIFIC CONDITIONS:

1. The discharge shall not contain levels of pollutants that would result in a violation of state water quality and wetland standards. [15A NCAC 02H .0200]

II. GENERAL CONDITIONS:

1. When written authorization is required, the plans and specifications for the project are incorporated into the authorization by reference and are an enforceable part of the Certification. Any modifications to the project require notification to DWR and may require an application submittal to DWR with the appropriate fee. [15A NCAC 02H .0501 and .0502]

2. No waste, spoil, solids, or fill of any kind shall occur in wetlands or waters beyond the footprint of the impacts (including temporary impacts) as authorized in the written approval from DWR; or beyond the thresholds established for use of this Certification without written authorization. [15A NCAC 02H .0501 and .0502]

   No removal of vegetation or other impacts of any kind shall occur to state regulated riparian buffers beyond the footprint of impacts approved in a Buffer Authorization or Variance or as listed as an exempt activity in the applicable riparian buffer rules. [15A NCAC 02B .0200]

3. In accordance with 15A NCAC 02H .0506(h) and Session Law 2017-10, compensatory mitigation may be required for losses of greater than 300 linear feet of perennial streams and/or greater than one (1) acre of wetlands. Impacts associated with the removal of a dam shall not require mitigation when the removal complies with the requirements of Part 3 of Article 21 in Chapter 143 of the North Carolina General Statutes. Impacts to isolated and other non-404 jurisdictional wetlands shall not be combined with 404 jurisdictional wetlands for the purpose of determining when impact thresholds trigger a mitigation requirement. For linear publicly owned and maintained transportation projects that are not determined to be part of a larger common plan of development by the US Army Corps of Engineers, compensatory mitigation may be required for losses of greater than 300 linear feet per perennial stream.

   Compensatory stream and/or wetland mitigation shall be proposed and completed in compliance with G.S. 143-214.11. For applicants proposing to conduct mitigation within a project site, a complete mitigation proposal developed in accordance with the most recent guidance issued by the US Army Corps of Engineers Wilmington District shall be submitted for review and approval with the application for impacts.

4. All activities shall be in compliance with any applicable State Regulated Riparian Buffer Rules in Chapter 2 of Title 15A.

5. When applicable, all construction activities shall be performed and maintained in full compliance with G.S. Chapter 113A Article 4 (Sediment and Pollution Control Act of 1973). Regardless of applicability of the Sediment and Pollution Control Act, all projects shall incorporate appropriate Best Management Practices for the control of sediment and erosion so that no violations of state water quality standards, statutes, or rules occur. [15A NCAC 02H .0506(b)(3) and (c)(3) and 15A NCAC 02B .0200]

   Design, installation, operation, and maintenance of all sediment and erosion control measures shall be equal to or exceed the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*, or for linear transportation projects, the *NCDOT Sediment and Erosion Control Manual*.

   All devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) sites, including contractor-owned or leased borrow pits associated with the project. Sufficient materials required for stabilization and/or repair of erosion control measures and stormwater routing and treatment shall be on site at all times.

For borrow pit sites, the erosion and sediment control measures shall be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*. Reclamation measures and implementation shall comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act and the Mining Act of 1971.

If the project occurs in waters or watersheds classified as Primary Nursery Areas (PNAs), SA, WS-I, WS-II, High Quality Waters (HQW), or Outstanding Resource Waters (ORW), then the sedimentation and erosion control designs shall comply with the requirements set forth in 15A NCAC 04B .0124, *Design Standards in Sensitive Watersheds*.

6. Sediment and erosion control measures shall not be placed in wetlands or waters except within the footprint of temporary or permanent impacts authorized under this Certification. Exceptions to this condition require application to and written approval from DWR. [15A NCAC 02H .0501 and .0502]

7. Erosion control matting that incorporates plastic mesh and/or plastic twine shall not be used along streambanks or within wetlands. Exceptions to this condition require application to and written approval from DWR. [15A NCAC 02B .0201]

8. An NPDES Construction Stormwater Permit (NCG010000) is required for construction projects that disturb one (1) or more acres of land. The NCG010000 Permit allows stormwater to be discharged during land disturbing construction activities as stipulated in the conditions of the permit. If the project is covered by this permit, full compliance with permit conditions including the erosion & sedimentation control plan, inspections and maintenance, self-monitoring, record keeping and reporting requirements is required. [15A NCAC 02H .0506(b)(5) and (c)(5)]

   The North Carolina Department of Transportation (NCDOT) shall be required to be in full compliance with the conditions related to construction activities within the most recent version of their individual NPDES (NCS000250) stormwater permit. [15A NCAC 02H .0506(b)(5) and (c)(5)]

9. All work in or adjacent to streams shall be conducted so that the flowing stream does not come in contact with the disturbed area. Approved best management practices from the most current version of the *NC Sediment and Erosion Control Manual*, or the *NC DOT Construction and Maintenance Activities Manual*, such as sandbags, rock berms, cofferdams, and other diversion structures shall be used to minimize excavation in flowing water. Exceptions to this condition require application to and written approval from DWR. [15A NCAC 02H .0506(b)(3) and (c)(3)]

10. If activities must occur during periods of high biological activity (e.g. sea turtle nesting, fish spawning, or bird nesting), then biological monitoring may be required at the request of other state or federal agencies and coordinated with these activities. [15A NCAC 02H .0506(b)(2) and 15A NCAC 04B .0125]

All moratoriums on construction activities established by the NC Wildlife Resources Commission (WRC), US Fish and Wildlife Service (USFWS), NC Division of Marine Fisheries (DMF), or National Marine Fisheries Service (NMFS) shall be implemented. Exceptions to this condition require written approval by the resource agency responsible for the given moratorium. A copy of the approval from the resource agency shall be forwarded to DWR.

Work within a designated trout watershed of North Carolina (as identified by the Wilmington District of the US Army Corps of Engineers) or identified state or federal endangered or threatened species habitat, shall be coordinated with the appropriate WRC, USFWS, NMFS, and/or DMF personnel.

11. Culverts shall be designed and installed in such a manner that the original stream profiles are not altered and allow for aquatic life movement during low flows. The dimension, pattern, and profile of the stream above and below a pipe or culvert shall not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed culvert shall be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. [15A NCAC 02H .0506(b)(2) and (c)(2)]

    Placement of culverts and other structures in streams shall be below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20% of the culvert diameter for culverts having a diameter less than or equal to 48 inches, to allow low flow passage of water and aquatic life.

    If multiple pipes or barrels are required, they shall be designed to mimic the existing stream cross section as closely as possible including pipes or barrels at flood plain elevation and/or sills where appropriate. Widening the stream channel shall be avoided.

    When topographic constraints indicate culvert slopes of greater than 5%, culvert burial is not required, provided that all alternative options for flattening the slope have been investigated and aquatic life movement/connectivity has been provided when possible (e.g. rock ladders, cross vanes, etc.). Notification, including supporting documentation to include a location map of the culvert, culvert profile drawings, and slope calculations, shall be provided to DWR 60 calendar days prior to the installation of the culvert.

    When bedrock is present in culvert locations, culvert burial is not required provided that there is sufficient documentation of the presence of bedrock. Notification, including supporting documentation such as, a location map of the culvert, geotechnical reports, photographs, etc. shall be provided to DWR a minimum of 60 calendar days prior to the installation of the culvert. If bedrock is discovered during construction, then DWR shall be notified by phone or email within 24 hours of discovery.

    If other site-specific topographic constraints preclude the ability to bury the culverts as described above and/or it can be demonstrated that burying the culvert would result in destabilization of the channel, then exceptions to this condition require application to and written approval from DWR.

Installation of culverts in wetlands shall ensure continuity of water movement and be designed to adequately accommodate high water or flood conditions. When roadways, causeways, or other fill projects are constructed across FEMA-designated floodways or wetlands, openings such as culverts or bridges shall be provided to maintain the natural hydrology of the system as well as prevent constriction of the floodway that may result in destabilization of streams or wetlands.

The establishment of native woody vegetation and other soft stream bank stabilization techniques shall be used where practicable instead of rip-rap or other bank hardening methods.

12. Bridge deck drains shall not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means to the maximum extent practicable (e.g. grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. Exceptions to this condition require application to and written approval from DWR. [15A NCAC 02H .0506(b)(5)]

13. Application of fertilizer to establish planted/seeded vegetation within disturbed riparian areas shall be conducted at agronomic rates and shall comply with all other Federal, State and Local regulations. Fertilizer application shall be accomplished in a manner that minimizes the risk of contact between the fertilizer and surface waters. [15A NCAC 02B .0200 and 15A NCAC 02B .0231]

14. If concrete is used during construction, then all necessary measures shall be taken to prevent direct contact between uncured or curing concrete and waters of the state. Water that inadvertently contacts uncured concrete shall not be discharged to waters of the state. [15A NCAC 02B .0200]

15. All proposed and approved temporary fill and culverts shall be removed and the impacted area shall be returned to natural conditions within 60 calendar days after the temporary impact is no longer necessary. The impacted areas shall be restored to original grade, including each stream's original cross sectional dimensions, planform pattern, and longitudinal bed profile. For projects that receive written approval, no temporary impacts are allowed beyond those included in the application and authorization. All temporarily impacted sites shall be restored and stabilized with native vegetation. [15A NCAC 02H .0506(b)(2) and (c)(2)]

16. All proposed and approved temporary pipes/culverts/rip-rap pads etc. in streams shall be installed as outlined in the most recent edition of the *North Carolina Sediment and Erosion Control Planning and Design Manual* or the *North Carolina Surface Mining Manual* or the *North Carolina Department of Transportation Best Management Practices for Construction and Maintenance Activities* so as not to restrict stream flow or cause dis-equilibrium during use of this Certification. [15A NCAC 02H .0506(b)(2) and (c)(2)]

17. Any rip-rap required for proper culvert placement, stream stabilization, or restoration of temporarily disturbed areas shall be restricted to the area directly impacted by the approved construction activity. All rip-rap shall be placed such that the original stream elevation and streambank contours are restored and maintained. Placement of rip-rap or other approved materials shall not result in de-stabilization of the stream bed or banks upstream or downstream of the area or in a manner that precludes aquatic life passage. [15A NCAC 02H .0506(b)(2)]

18. Any rip-rap used for stream or shoreline stabilization shall be of a size and density to prevent movement by wave, current action, or stream flows and shall consist of clean rock or masonry material free of debris or toxic pollutants. Rip-rap shall not be installed in the streambed except in specific areas required for velocity control and to ensure structural integrity of bank stabilization measures. [15A NCAC 02H .0506(b)(2)]

19. Applications for rip-rap groins proposed in accordance with 15A NCAC 07H .1401 (NC Division of Coastal Management General Permit for construction of Wooden and Rip-rap Groins in Estuarine and Public Trust Waters) shall meet all the specific conditions for design and construction specified in 15A NCAC 07H .1405.

20. All mechanized equipment operated near surface waters shall be inspected and maintained regularly to prevent contamination of surface waters from fuels, lubricants, hydraulic fluids, or other toxic materials. Construction shall be staged in order to minimize the exposure of equipment to surface waters to the maximum extent practicable. Fueling, lubrication and general equipment maintenance shall be performed in a manner to prevent, to the maximum extent practicable, contamination of surface waters by fuels and oils. [15A NCAC 02H .0506(b)(3) and (c)(3) and 15A NCAC 02B .0211 (12)]

21. Heavy equipment working in wetlands shall be placed on mats or other measures shall be taken to minimize soil disturbance. [15A NCAC 02H .0506(b)(3) and (c)(3)]

22. In accordance with 143-215.85(b), the applicant shall report any petroleum spill of 25 gallons or more; any spill regardless of amount that causes a sheen on surface waters; any petroleum spill regardless of amount occurring within 100 feet of surface waters; and any petroleum spill less than 25 gallons that cannot be cleaned up within 24 hours.

23. If an environmental document is required under the State Environmental Policy Act (SEPA), then this General Certification is not valid until a Finding of No Significant Impact (FONSI) or Record of Decision (ROD) is issued by the State Clearinghouse. If an environmental document is required under the National Environmental Policy Act (NEPA), then this General Certification is not valid until a Categorical Exclusion, the Final Environmental Assessment, or Final Environmental Impact Statement is published by the lead agency. [15A NCAC 01C .0107(a)]

24. This General Certification does not relieve the applicant of the responsibility to obtain all other required Federal, State, or Local approvals before proceeding with the project, including those required by, but not limited to, Sediment and Erosion Control, Non-Discharge, Water Supply Watershed, and Trout Buffer regulations.

25. The applicant and their authorized agents shall conduct all activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act), and any other appropriate requirements of State and Federal Law. If DWR determines that such standards or laws are not being met, including failure to sustain a designated or achieved use, or that State or Federal law is being violated, or that further conditions are necessary to assure compliance, then DWR may revoke or modify a written authorization associated with this General Water Quality Certification. [15A NCAC 02H .0507(d)]

26. The permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project, and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this Certification. A copy of this Certification, including all conditions shall be available at the project site during the construction and maintenance of this project. [15A NCAC 02H .0507 (c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]

27. When written authorization is required for use of this Certification, upon completion of all permitted impacts included within the approval and any subsequent modifications, the applicant shall be required to return a certificate of completion (available on the DWR website: https://edocs.deq.nc.gov/Forms/Certificate-of-Completion). [15A NCAC 02H .0502(f)]

28. Additional site-specific conditions, including monitoring and/or modeling requirements, may be added to the written approval letter for projects proposed under this Water Quality Certification in order to ensure compliance with all applicable water quality and effluent standards. [15A NCAC 02H .0507(c)]

29. If the property or project is sold or transferred, the new permittee shall be given a copy of this Certification (and written authorization if applicable) and is responsible for complying with all conditions. [15A NCAC 02H .0501 and .0502]

III. GENERAL CERTIFICATION ADMINISTRATION:

1. In accordance with North Carolina General Statute 143-215.3D(e), written approval for a 401 Water Quality General Certification must include the appropriate fee. An applicant for a CAMA permit under Article 7 of Chapter 113A of the General Statutes for which a Water Quality Certification is required shall only make one payment to satisfy both agencies; the fee shall be as established by the Secretary in accordance with 143-215.3D(e)(7).

2. This Certification neither grants nor affirms any property right, license, or privilege in any waters, or any right of use in any waters. This Certification does not authorize any person to interfere with the riparian rights, littoral rights, or water use rights of any other person and this Certification does not create any prescriptive right or any right of priority regarding any usage of water. This Certification shall not be interposed as a defense in any action respecting the determination of riparian or littoral rights or other rights to water use. No consumptive user is deemed by virtue of this Certification to possess any prescriptive or other right of priority with respect to any other consumptive user regardless of the quantity of the withdrawal or the date on which the withdrawal was initiated or expanded.

3. This Certification grants permission to the Director, an authorized representative of the Director, or DWR staff, upon the presentation of proper credentials, to enter the property during normal business hours. [15A NCAC 02H .0502(e)]

4. This General Certification shall expire on the same day as the expiration date of the corresponding Nationwide Permit and/or Regional General Permit. The conditions in effect on the date of issuance of Certification for a specific project shall remain in effect for the life of the project, regardless of the expiration date of this Certification. This General Certification is rescinded when the US Army Corps of Engineers reauthorizes any of the corresponding Nationwide Permits and/or Regional General Permits or when deemed appropriate by the Director of the Division of Water Resources.

5. Non-compliance with or violation of the conditions herein set forth by a specific project may result in revocation of this General Certification for the project and may also result in criminal and/or civil penalties.

6. The Director of the North Carolina Division of Water Resources may require submission of a formal application for Individual Certification for any project in this category of activity if it is deemed in the public's best interest or determined that the project is likely to have a significant adverse effect upon water quality, including state or federally listed endangered or threatened aquatic species, or degrade the waters so that existing uses of the water or downstream waters are precluded.

History Note: Water Quality Certification (WQC) Number 4146 issued December 1, 2017 replaces WQC4099 issued March 3, 2017; WQC 3908 issued March 19, 2012; WQC 3703 issued November 1, 2007; WQC 3640 issued March 2007; WQC 3493 issued December 2004; and WQC 3372 issued March 18, 2002.

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES

WATER QUALITY GENERAL CERTIFICATION NO. 4152

GENERAL CERTIFICATION FOR THE US ARMY CORPS OF ENGINEERS DREDGING ACTIVITIES INVOLVING CONTROL OF EFFLUENT DISPOSAL OF DREDGED MATERIAL IN EXISTING DREDGE MAINTENANCE SITES WITHIN NORTH CAROLINA

Water Quality Certification Number 4152 is issued in conformity with the requirements of Section 401, Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Regulations in 15A NCAC 02H .0500 and 15A NCAC 02B .0200 for the discharge of fill material to surface waters and wetland areas which are waters of the United States as described in 33 CFR 325 Appendix A of the US Army Corps of Engineers regulations.

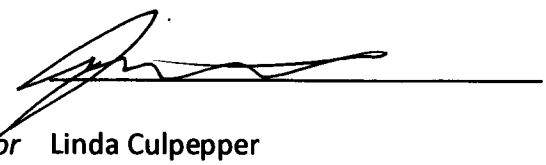
This General Certification is issued only for existing dredge sites at the following locations:

1. Manteo--Shallowbag Bay,
2. Hatteras Inlet (Cora June Island),
3. Oregon Inlet (Wells and Parnell Islands),
4. Wilmington Harbor--Bird Islands and Eagle Island,
5. Harkers Island area (Sandbag Island),
6. New River Inlet (Uni, New River 1, 2, and 3, DOT Island),
7. Atlantic (New Dump Island),
8. Wilmington Harbor (Cape Fear waterbird islands),
9. Big Foot Slough, and
10. Wainwright Slough.

The State of North Carolina certifies that the specified category of activity will not violate applicable portions of Sections 301, 302, 303, 306 and 307 of the Public Laws 92-500 and 95-217 if conducted in accordance with the conditions hereinafter set forth.

Effective date: December 1, 2017
Signed this day: December 1, 2017

By



for Linda Culpepper
Interim Director

Activities meeting any one (1) of the following thresholds or circumstances require *written approval* for a 401 Water Quality Certification from the Division of Water Resources (DWR):

a) If any of the conditions of this Certification (listed below) cannot be met; or
b) Any permanent fill into or modification of wetlands and/or waters; or
c) Any stream relocation or stream restoration; or
d) Any permanent impacts to Unique Wetlands (UWL); or
e) Any impact associated with a Notice of Violation or an enforcement action for violation(s) of NC Wetland Rules (15A NCAC 02H .0500), NC Isolated Wetland Rules (15A NCAC 02H .1300), NC Surface Water or Wetland Standards (15A NCAC 02B .0200), or State Regulated Riparian Buffer Rules (15A NCAC 02B .0200); or
f) Any impacts to subject water bodies and/or state regulated riparian buffers along subject water bodies in the Neuse, Tar-Pamlico, or Catawba River Basins or in the Randleman Lake, Jordan Lake or Goose Creek Watersheds (or any other basin or watershed with State Regulated Riparian Area Protection Rules [Buffer Rules] in effect at the time of application) *unless*
    i. The activities are listed as "EXEMPT" from these rules; or
    ii. A Buffer Authorization Certificate is issued by the NC Division of Coastal Management (DCM); or
    iii. A Buffer Authorization Certificate or a Minor Variance is issued by a delegated or designated local government implementing a state riparian buffer program pursuant to 143-215.23.

Activities included in this General Certification that do not meet one of the thresholds listed above do not require written approval from the DWR.

I. ACTIVITY SPECIFIC CONDITIONS:

1. The appropriate turbidity water quality standard shall not be exceeded or be above natural background conditions as stipulated in 15A NCAC 02B .0211(21) or 02B .0220(19) beyond an appropriate mixing zone if one is established for a project by DWR. Methods of control may include silt curtains, reducing dredging intensity, or other practicable methods to ensure minimization of turbidity during project construction. [15A NCAC 02B .0200]

2. The terminal end of the pipeline from the dredge shall be positioned at the highest point possible on the dredge disposal site to allow maximum distance for settling of suspended solids. [15A NCAC 02H .0506 (b)(4) and (c)(4)]

3. The flow of discharge shall be directed away from any emergent vegetation along the shoreline unless it can be clearly shown by the applicant that a different design will result in less environmental impact (e.g. berm at Wainwright Slough disposal site). [15A NCAC 02H .0506 (b)(4) and (c)(4)]

II. GENERAL CONDITIONS:

1. When written authorization is required, the plans and specifications for the project are incorporated into the authorization by reference and are an enforceable part of the Certification. Any modifications to the project require notification to DWR and may require an application submittal to DWR with the appropriate fee. [15A NCAC 02H .0501 and .0502]

2. No waste, spoil, solids, or fill of any kind shall occur in wetlands or waters beyond the footprint of the impacts (including temporary impacts) as authorized in the written approval from DWR; or beyond the thresholds established for use of this Certification without written authorization. [15A NCAC 02H .0501 and .0502]

   No removal of vegetation or other impacts of any kind shall occur to state regulated riparian buffers beyond the footprint of impacts approved in a Buffer Authorization or Variance or as listed as an exempt activity in the applicable riparian buffer rules. [15A NCAC 02B .0200]

3. In accordance with 15A NCAC 02H .0506(h) and Session Law 2017-10, compensatory mitigation may be required for losses of greater than 300 linear feet of perennial streams and/or greater than one (1) acre of wetlands. Impacts associated with the removal of a dam shall not require mitigation when the removal complies with the requirements of Part 3 of Article 21 in Chapter 143 of the North Carolina General Statutes. Impacts to isolated and other non-404 jurisdictional wetlands shall not be combined with 404 jurisdictional wetlands for the purpose of determining when impact thresholds trigger a mitigation requirement. For linear publicly owned and maintained transportation projects that are not determined to be part of a larger common plan of development by the US Army Corps of Engineers, compensatory mitigation may be required for losses of greater than 300 linear feet per perennial stream.

   Compensatory stream and/or wetland mitigation shall be proposed and completed in compliance with G.S. 143-214.11. For applicants proposing to conduct mitigation within a project site, a complete mitigation proposal developed in accordance with the most recent guidance issued by the US Army Corps of Engineers Wilmington District shall be submitted for review and approval with the application for impacts.

4. All activities shall be in compliance with any applicable State Regulated Riparian Buffer Rules in Chapter 2 of Title 15A.

5. When applicable, all construction activities shall be performed and maintained in full compliance with G.S. Chapter 113A Article 4 (Sediment and Pollution Control Act of 1973). Regardless of applicability of the Sediment and Pollution Control Act, all projects shall incorporate appropriate Best Management Practices for the control of sediment and erosion so that no violations of state water quality standards, statutes, or rules occur. [15A NCAC 02H .0506(b)(3) and (c)(3) and 15A NCAC 02B .0200].

   Design, installation, operation, and maintenance of all sediment and erosion control measures shall be equal to or exceed the requirements specified in the most recent version

of the *North Carolina Sediment and Erosion Control Manual*, or for linear transportation projects, the *NCDOT Sediment and Erosion Control Manual*.

All devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) sites, including contractor-owned or leased borrow pits associated with the project. Sufficient materials required for stabilization and/or repair of erosion control measures and stormwater routing and treatment shall be on site at all times.

For borrow pit sites, the erosion and sediment control measures shall be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*. Reclamation measures and implementation shall comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act and the Mining Act of 1971.

If the project occurs in waters or watersheds classified as Primary Nursery Areas (PNAs), SA, WS-I, WS-II, High Quality Waters (HQW), or Outstanding Resource Waters (ORW), then the sedimentation and erosion control designs shall comply with the requirements set forth in 15A NCAC 04B .0124, *Design Standards in Sensitive Watersheds*.

6. Sediment and erosion control measures shall not be placed in wetlands or waters except within the footprint of temporary or permanent impacts authorized under this Certification. Exceptions to this condition require application to and written approval from DWR. [15A NCAC 02H .0501 and .0502]

7. Erosion control matting that incorporates plastic mesh and/or plastic twine shall not be used along streambanks or within wetlands. Exceptions to this condition require application to and written approval from DWR. [15A NCAC 02B .0201]

8. An NPDES Construction Stormwater Permit (NCG010000) is required for construction projects that disturb one (1) or more acres of land. The NCG010000 Permit allows stormwater to be discharged during land disturbing construction activities as stipulated in the conditions of the permit. If the project is covered by this permit, full compliance with permit conditions including the erosion & sedimentation control plan, inspections and maintenance, self-monitoring, record keeping and reporting requirements is required. [15A NCAC 02H .0506(b)(5) and (c)(5)]

   The North Carolina Department of Transportation (NCDOT) shall be required to be in full compliance with the conditions related to construction activities within the most recent version of their individual NPDES (NCS000250) stormwater permit. [15A NCAC 02H .0506(b)(5) and (c)(5)]

9. All work in or adjacent to streams shall be conducted so that the flowing stream does not come in contact with the disturbed area. Approved best management practices from the most current version of the *NC Sediment and Erosion Control Manual*, or the *NC DOT Construction and Maintenance Activities Manual*, such as sandbags, rock berms, cofferdams, and other diversion structures shall be used to minimize excavation in flowing

water. Exceptions to this condition require application to and written approval from DWR. [15A NCAC 02H .0506(b)(3) and (c)(3)]

10. If activities must occur during periods of high biological activity (e.g. sea turtle nesting, fish spawning, or bird nesting), then biological monitoring may be required at the request of other state or federal agencies and coordinated with these activities. [15A NCAC 02H .0506(b)(2) and 15A NCAC 04B .0125]

    All moratoriums on construction activities established by the NC Wildlife Resources Commission (WRC), US Fish and Wildlife Service (USFWS), NC Division of Marine Fisheries (DMF), or National Marine Fisheries Service (NMFS) shall be implemented. Exceptions to this condition require written approval by the resource agency responsible for the given moratorium. A copy of the approval from the resource agency shall be forwarded to DWR.

    Work within a designated trout watershed of North Carolina (as identified by the Wilmington District of the US Army Corps of Engineers) or identified state or federal endangered or threatened species habitat, shall be coordinated with the appropriate WRC, USFWS, NMFS, and/or DMF personnel.

11. Culverts shall be designed and installed in such a manner that the original stream profiles are not altered and allow for aquatic life movement during low flows. The dimension, pattern, and profile of the stream above and below a pipe or culvert shall not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed culvert shall be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. [15A NCAC 02H .0506(b)(2) and (c)(2)]

    Placement of culverts and other structures in streams shall be below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20% of the culvert diameter for culverts having a diameter less than or equal to 48 inches, to allow low flow passage of water and aquatic life.

    If multiple pipes or barrels are required, they shall be designed to mimic the existing stream cross section as closely as possible including pipes or barrels at flood plain elevation and/or sills where appropriate. Widening the stream channel shall be avoided.

    When topographic constraints indicate culvert slopes of greater than 5%, culvert burial is not required, provided that all alternative options for flattening the slope have been investigated and aquatic life movement/connectivity has been provided when possible (e.g. rock ladders, cross vanes, etc.). Notification, including supporting documentation to include a location map of the culvert, culvert profile drawings, and slope calculations, shall be provided to DWR 60 calendar days prior to the installation of the culvert.

    When bedrock is present in culvert locations, culvert burial is not required provided that there is sufficient documentation of the presence of bedrock. Notification, including supporting documentation such as a location map of the culvert, geotechnical reports,

photographs, etc. shall be provided to DWR a minimum of 60 calendar days prior to the installation of the culvert. If bedrock is discovered during construction, then DWR shall be notified by phone or email within 24 hours of discovery.

If other site-specific topographic constraints preclude the ability to bury the culverts as described above and/or it can be demonstrated that burying the culvert would result in destabilization of the channel, then exceptions to this condition require application to and written approval from DWR.

Installation of culverts in wetlands shall ensure continuity of water movement and be designed to adequately accommodate high water or flood conditions. When roadways, causeways, or other fill projects are constructed across FEMA-designated floodways or wetlands, openings such as culverts or bridges shall be provided to maintain the natural hydrology of the system as well as prevent constriction of the floodway that may result in destabilization of streams or wetlands.

The establishment of native woody vegetation and other soft stream bank stabilization techniques shall be used where practicable instead of rip-rap or other bank hardening methods.

12. Bridge deck drains shall not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means to the maximum extent practicable (e.g. grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. Exceptions to this condition require application to and written approval from DWR. [15A NCAC 02H .0506(b)(5)]

13. Application of fertilizer to establish planted/seeded vegetation within disturbed riparian areas and/or wetlands shall be conducted at agronomic rates and shall comply with all other Federal, State and Local regulations. Fertilizer application shall be accomplished in a manner that minimizes the risk of contact between the fertilizer and surface waters. [15A NCAC 02B .0200 and 15A NCAC 02B .0231]

14. If concrete is used during construction, then all necessary measures shall be taken to prevent direct contact between uncured or curing concrete and waters of the state. Water that inadvertently contacts uncured concrete shall not be discharged to waters of the state. [15A NCAC 02B .0200]

15. All proposed and approved temporary fill and culverts shall be removed and the impacted area shall be returned to natural conditions within 60 calendar days after the temporary impact is no longer necessary. The impacted areas shall be restored to original grade, including each stream's original cross sectional dimensions, planform pattern, and longitudinal bed profile. For projects that receive written approval, no temporary impacts are allowed beyond those included in the application and authorization. All temporarily impacted sites shall be restored and stabilized with native vegetation. [15A NCAC 02H .0506(b)(2) and (c)(2)]

16. All proposed and approved temporary pipes/culverts/rip-rap pads etc. in streams shall be installed as outlined in the most recent edition of the *North Carolina Sediment and Erosion Control Planning and Design Manual* or the *North Carolina Surface Mining Manual* or the *North Carolina Department of Transportation Best Management Practices for Construction and Maintenance Activities* so as not to restrict stream flow or cause dis-equilibrium during use of this Certification. [15A NCAC 02H .0506(b)(2) and (c)(2)]

17. Any rip-rap required for proper culvert placement, stream stabilization, or restoration of temporarily disturbed areas shall be restricted to the area directly impacted by the approved construction activity. All rip-rap shall be placed such that the original stream elevation and streambank contours are restored and maintained. Placement of rip-rap or other approved materials shall not result in de-stabilization of the stream bed or banks upstream or downstream of the area or in a manner that precludes aquatic life passage. [15A NCAC 02H .0506(b)(2)]

18. Any rip-rap used for stream or shoreline stabilization shall be of a size and density to prevent movement by wave, current action, or stream flows and shall consist of clean rock or masonry material free of debris or toxic pollutants. Rip-rap shall not be installed in the streambed except in specific areas required for velocity control and to ensure structural integrity of bank stabilization measures. [15A NCAC 02H .0506(b)(2)]

19. Applications for rip-rap groins proposed in accordance with 15A NCAC 07H .1401 (NC Division of Coastal Management General Permit for construction of Wooden and Rip-rap Groins in Estuarine and Public Trust Waters) shall meet all the specific conditions for design and construction specified in 15A NCAC 07H .1405.

20. All mechanized equipment operated near surface waters shall be inspected and maintained regularly to prevent contamination of surface waters from fuels, lubricants, hydraulic fluids, or other toxic materials. Construction shall be staged in order to minimize the exposure of equipment to surface waters to the maximum extent practicable. Fueling, lubrication and general equipment maintenance shall be performed in a manner to prevent, to the maximum extent practicable, contamination of surface waters by fuels and oils. [15A NCAC 02H .0506(b)(3) and (c)(3) and 15A NCAC 02B .0211 (12)]

21. Heavy equipment working in wetlands shall be placed on mats or other measures shall be taken to minimize soil disturbance. [15A NCAC 02H .0506(b)(3) and (c)(3)]

22. In accordance with 143-215.85(b), the applicant shall report any petroleum spill of 25 gallons or more; any spill regardless of amount that causes a sheen on surface waters; any petroleum spill regardless of amount occurring within 100 feet of surface waters; and any petroleum spill less than 25 gallons that cannot be cleaned up within 24 hours.

23. If an environmental document is required under the State Environmental Policy Act (SEPA), then this General Certification is not valid until a Finding of No Significant Impact (FONSI) or Record of Decision (ROD) is issued by the State Clearinghouse. If an environmental document is required under the National Environmental Policy Act (NEPA), then this

General Certification is not valid until a Categorical Exclusion, the Final Environmental Assessment, or Final Environmental Impact Statement is published by the lead agency. [15A NCAC 01C .0107(a)]

24. This General Certification does not relieve the applicant of the responsibility to obtain all other required Federal, State, or Local approvals before proceeding with the project, including those required by, but not limited to, Sediment and Erosion Control, Non-Discharge, Water Supply Watershed, and Trout Buffer regulations.

25. The applicant and their authorized agents shall conduct all activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act), and any other appropriate requirements of State and Federal Law. If DWR determines that such standards or laws are not being met, including failure to sustain a designated or achieved use, or that State or Federal law is being violated, or that further conditions are necessary to assure compliance, then DWR may revoke or modify a written authorization associated with this General Water Quality Certification. [15A NCAC 02H .0507(d)]

26. The permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project, and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this Certification. A copy of this Certification, including all conditions shall be available at the project site during the construction and maintenance of this project. [15A NCAC 02H .0507 (c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]

27. When written authorization is required for use of this Certification, upon completion of all permitted impacts included within the approval and any subsequent modifications, the applicant shall be required to return a certificate of completion (available on the DWR website: https://edocs.deq.nc.gov/Forms/Certificate-of-Completion). [15A NCAC 02H .0502(f)]

28. Additional site-specific conditions, including monitoring and/or modeling requirements, may be added to the written approval letter for projects proposed under this Water Quality Certification in order to ensure compliance with all applicable water quality and effluent standards. [15A NCAC 02H .0507(c)]

29. If the property or project is sold or transferred, the new permittee shall be given a copy of this Certification (and written authorization if applicable) and is responsible for complying with all conditions. [15A NCAC 02H .0501 and .0502]

III. GENERAL CERTIFICATION ADMINISTRATION:

1. In accordance with North Carolina General Statute 143-215.3D(e), written approval for a 401 Water Quality General Certification must include the appropriate fee. An applicant for a CAMA permit under Article 7 of Chapter 113A of the General Statutes for which a Water

Quality Certification is required shall only make one payment to satisfy both agencies; the fee shall be as established by the Secretary in accordance with 143-215.3D(e)(7).

2. This Certification neither grants nor affirms any property right, license, or privilege in any waters, or any right of use in any waters. This Certification does not authorize any person to interfere with the riparian rights, littoral rights, or water use rights of any other person and this Certification does not create any prescriptive right or any right of priority regarding any usage of water. This Certification shall not be interposed as a defense in any action respecting the determination of riparian or littoral rights or other rights to water use. No consumptive user is deemed by virtue of this Certification to possess any prescriptive or other right of priority with respect to any other consumptive user regardless of the quantity of the withdrawal or the date on which the withdrawal was initiated or expanded.

3. This Certification grants permission to the Director, an authorized representative of the Director, or DWR staff, upon the presentation of proper credentials, to enter the property during normal business hours. [15A NCAC 02H .0502(e)]

4. This General Certification shall expire on the same day as the expiration date of the corresponding Nationwide Permit and/or Regional General Permit. The conditions in effect on the date of issuance of Certification for a specific project shall remain in effect for the life of the project, regardless of the expiration date of this Certification. This General Certification is rescinded when the US Army Corps of Engineers reauthorizes any of the corresponding Nationwide Permits and/or Regional General Permits or when deemed appropriate by the Director of the Division of Water Resources.

5. Non-compliance with or violation of the conditions herein set forth by a specific project may result in revocation of this General Certification for the project and may also result in criminal and/or civil penalties.

6. The Director of the North Carolina Division of Water Resources may require submission of a formal application for Individual Certification for any project in this category of activity if it is deemed in the public's best interest or determined that the project is likely to have a significant adverse effect upon water quality, including state or federally listed endangered or threatened aquatic species, or degrade the waters so that existing uses of the water or downstream waters are precluded.

History Note: Water Quality Certification (WQC) Number 4152 issued December 1, 2017 replaces WQC 4105 issued March 3, 2017; WQC Number 3904 issued March 19, 2012 replaces WQC Number 3684 issued November 1, 2007; WQC Number 3649 issued March 19, 2007 WQC Number 3368 issued March 18, 2002; and WQC Number 3122 issued February 11, 1997.

Appendix C:

Updated Lists of ESA Listed Species (IPAC)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Ecological Services Field Office
Post Office Box 33726
Raleigh, NC 27636-3726
Phone: (919) 856-4520 Fax: (919) 856-4556

In Reply Refer To: July 23, 2021
Consultation Code: 04EN2000-2021-SLI-1617
Event Code: 04EN2000-2021-E-03504
Project Name: Rollinson Channel Realignment

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The species list generated pursuant to the information you provided identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

Section 7 of the Act requires that all federal agencies (or their designated non-federal representative), in consultation with the Service, insure that any action federally authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of any federally-listed endangered or threatened species. A biological assessment or evaluation may be prepared to fulfill that requirement and in determining whether additional consultation with the Service is necessary. In addition to the federally-protected species list, information on the species' life histories and habitats and information on completing a biological assessment or

evaluation and can be found on our web page at http://www.fws.gov/raleigh. Please check the web site often for updated information or changes

If your project contains suitable habitat for any of the federally-listed species known to be present within the county where your project occurs, the proposed action has the potential to adversely affect those species. As such, we recommend that surveys be conducted to determine the species' presence or absence within the project area. The use of North Carolina Natural Heritage program data should not be substituted for actual field surveys.

If you determine that the proposed action may affect (i.e., likely to adversely affect or not likely to adversely affect) a federally-protected species, you should notify this office with your determination, the results of your surveys, survey methodologies, and an analysis of the effects of the action on listed species, including consideration of direct, indirect, and cumulative effects, before conducting any activities that might affect the species. If you determine that the proposed action will have no effect (i.e., no beneficial or adverse, direct or indirect effect) on federally listed species, then you are not required to contact our office for concurrence (unless an Environmental Impact Statement is prepared). However, you should maintain a complete record of the assessment, including steps leading to your determination of effect, the qualified personnel conducting the assessment, habitat conditions, site photographs, and any other related articles.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

Not all Threatened and Endangered Species that occur in North Carolina are subject to section 7 consultation with the U.S Fish and Wildlife Service. Atlantic and shortnose sturgeon, sea turtles,when in the water, and certain marine mammals are under purview of the National Marine Fisheries Service. If your project occurs in marine, estuarine, or coastal river systems you should also contact the National Marine Fisheries Service, http://www.nmfs.noaa.gov/

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office. If you have any questions or comments, please contact John Ellis of this office at john_ellis@fws.gov.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Raleigh Ecological Services Field Office
Post Office Box 33726
Raleigh, NC 27636-3726
(919) 856-4520

Project Summary

Consultation Code: 04EN2000-2021-SLI-1617
Event Code: 04EN2000-2021-E-03504
Project Name: Rollinson Channel Realignment
Project Type: DREDGE / EXCAVATION
Project Description: Maintenance of federal channel using side cast, hopper and pipeline dredging with open water, beach and bird island placement of dredged material.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@35.2158094,-75.76919841321183,14z

Counties: Dare and Hyde counties, North Carolina

Endangered Species Act Species

There is a total of 16 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened
Red Wolf *Canis rufus* Population: U.S.A. (portions of NC and TN) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/37	Experimental Population, Non-Essential
West Indian Manatee *Trichechus manatus* There is **final** critical habitat for this species. The location of the critical habitat is not available. ***This species is also protected by the Marine Mammal Protection Act, and may have additional consultation requirements.*** Species profile: https://ecos.fws.gov/ecp/species/4469	Threatened

Birds

NAME	STATUS
Eastern Black Rail *Laterallus jamaicensis ssp. jamaicensis*	Threatened
No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10477	
Piping Plover *Charadrius melodus*	Threatened
Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	
Red Knot *Calidris canutus rufa*	Threatened
There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1864	
Red-cockaded Woodpecker *Picoides borealis*	Endangered
No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7614	
Roseate Tern *Sterna dougallii dougallii*	Endangered
Population: Northeast U.S. nesting population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	

Reptiles

NAME	STATUS
American Alligator *Alligator mississippiensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/776	Similarity of Appearance (Threatened)
Green Sea Turtle *Chelonia mydas* Population: North Atlantic DPS There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened
Hawksbill Sea Turtle *Eretmochelys imbricata* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3656	Endangered
Kemp's Ridley Sea Turtle *Lepidochelys kempii* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5523	Endangered
Leatherback Sea Turtle *Dermochelys coriacea* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1493	Endangered
Loggerhead Sea Turtle *Caretta caretta* Population: Northwest Atlantic Ocean DPS There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1110	Threatened

Flowering Plants

NAME	STATUS
Seabeach Amaranth *Amaranthus pumilus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8549	Threatened
Sensitive Joint-vetch *Aeschynomene virginica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/855	Threatened

Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Piping Plover *Charadrius melodus* https://ecos.fws.gov/ecp/species/6039#crithab	Final

Appendix D:

List of Draft EA Recipients

HATTERAS FERRY CHANNEL EA EMAIL LISTING		
Line No.	**Organization / Title**	**POC Name**
	ELECTED OFFICIALS	
01	U.S. Senator	Richard Burr
02	U.S. Senator	Thom Tillis
03	Representative	Gregory Murphy
04	Representative	Bobby Hanig
05	N.C. Senator	Bob Steinburg
06	Mayor (Kill Devil Hills)	Ben Sproul
	NON-PROFIT ORGANIZATIONS	
7	Audubon, North Carolina	Lindsay Addison
8	N.C. Coastal Federation	Kerri Allen
9	N.C. Coastal Federation	Ana Zivanovic-Nenadovic
10	N.C. Wildlife Federation	Manley Fuller
11	Southern Environmental Law Center	Melissa Whaling
12	Southern Environmental Law Center	Ramona McGee
13	Outer Banks Visitors Bureau	NA
14	Ocracoke Preservation Society	Andrea Powers
15	Ocracoke Tourism Development Authority	Helena Stevens
	RESOURCE AGENCIES	
16	Atlantic States Marine Fisheries Commission	Toni Kerns
17	Environmental Protection Agency (EPA)	Ntale Kajumba
18	N.C. Division of Coastal Management (NCDCM)	Braxton Davis
19	N.C. Division of Coastal Management (NCDCM)	Dan Govoni
20	N.C. Division of Marine Fisheries (NCDMF)	Anne Deaton
21	N.C. Division of Marine Fisheries (NCDMF)	Jimmy Harrison
22	N.C. Division of Water Resources (NCDWR)	Paul Wojoski
23	N.C. Wildlife Resources Commission (NCWRC)	Maria Dunn
24	National Marine Fisheries Service (NMFS)	Andy Herndon
25	National Marine Fisheries Service (NMFS)	Pace Wilber
26	National Marine Fisheries Service (NMFS)	Fritz Rohde
27	National Marine Fisheries Service (NMFS)	Twyla Cheatwood
28	National Park Service, CAHA	David Hallac
29	National Park Service, CAHA	Sabrina Henry
30	N.C. State Historical Preservation Officer	Renee Gledhill-Earley
31	NC State Historical Arch	Chris Southerly
32	NC State Historical Arch	Stephen Atkinson
33	U.S. Fish and Wildlife Service (USFWS)	Pete Benjamin
34	U.S. Fish and Wildlife Service (USFWS)	John Ellis
35	U.S. Fish and Wildlife Service (USFWS)	Kathy Matthews
36	USACE, Wilmington Regulatory	David Lekson
37	USACE, Wilmington Regulatory	Tyler Crumbley
	OTHER	
38	U.S. Coast Guard	Brittany Akers
39	N.C. Dept of Transportation	John Dixon

HATTERAS FERRY CHANNEL EA EMAIL LISTING		
Line No.	**Organization / Title**	**POC Name**
40	N.C. Dept of Transportation	Lance Winslow
41	N.C. Dept of Transportation	Brian Doliber
42	N.C. Dept of Transportation	Cat Peele
43	Dare Co. Waterways Commission	Steve Coulter
44	Dare County	Barton Grover
45	Dare County	Bobby Outten
46	Hyde County	Kris Noble