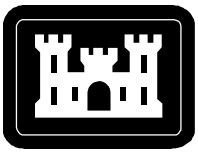

US Army Corps
of Engineers®
Wilmington District

ENVIRONMENTAL ASSESSMENT

Use of Government Plant to Dredge in Federally Authorized Navigation Projects in North Carolina

March 2004

ENVIRONMENTAL ASSESSMENT

USE OF GOVERNMENT PLANT TO DREDGE IN FEDERALLY AUTHORIZED NAVIGATION PROJECTS IN NORTH CAROLINA

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ENVIRONMENTAL ASSESSMENT`

USE OF GOVERNMENT PLANT TO DREDGE IN FEDERALLY AUTHORIZED NAVIGATION PROJECTS IN NORTH CAROLINA

March 2004

1.00 PURPOSE AND NEED

This Environmental Assessment (EA) addresses the proposed use of government owned dredge plant (the "MERRITT" or "FRY" or similar sidecast dredge and the "CURRITUCK" or similar special purpose dredge (a special purpose dredge is capable of engaging in shallow-draft hopper dredge operations) which are described in the Preferred Alternative Description, Section 5.0) to dredge small and/or isolated, regularly occurring shoals in Federally authorized navigation projects within the U.S. Army Corps of Engineers, Wilmington District (Corps) in North Carolina. The proposed dredging locations are depicted in Figure 1.

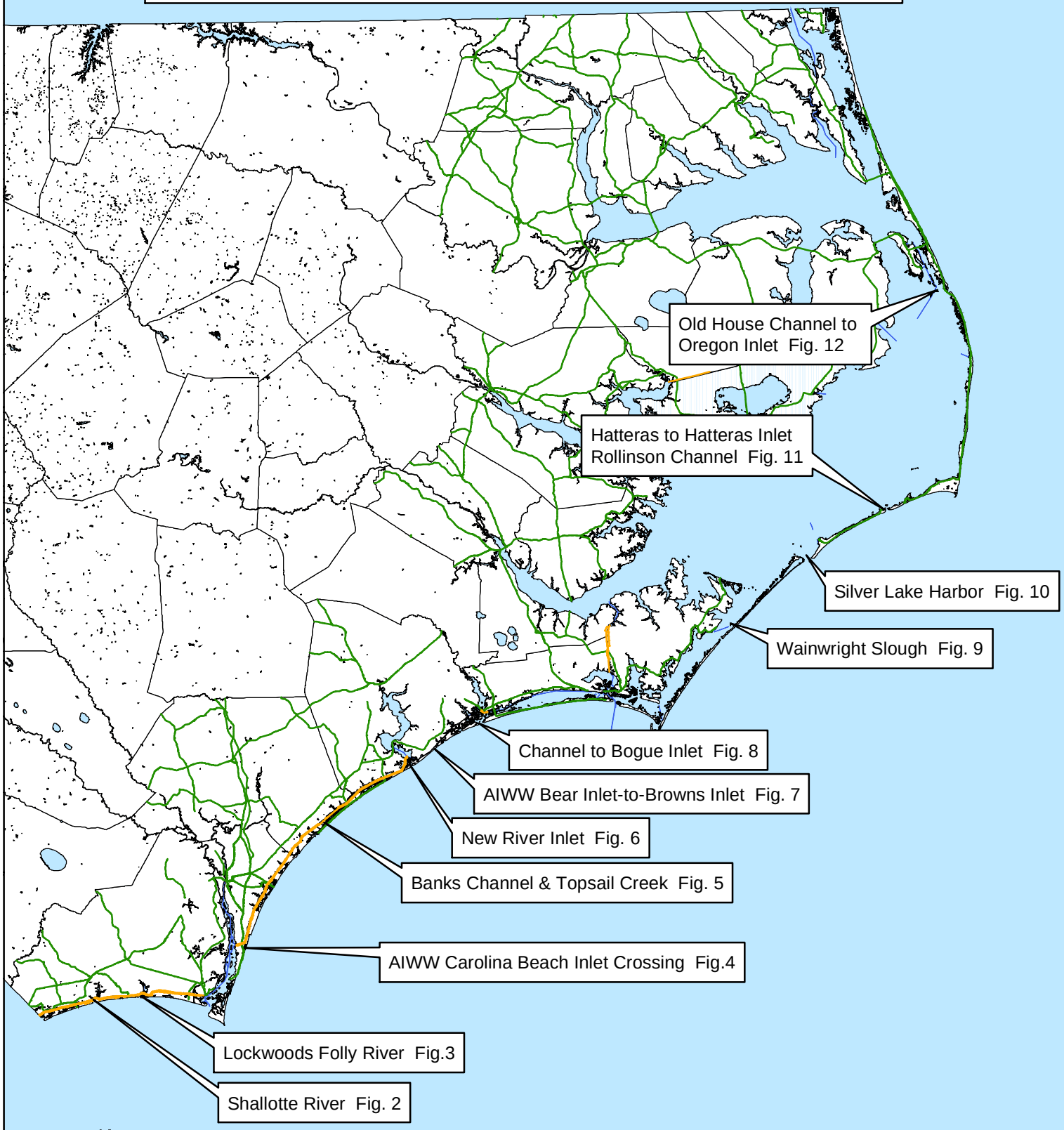
The subject locations are routinely included in dredging work contracted out by the Corps. Advertised contracts routinely target portions of federally maintained navigation projects that contain shoals impeding or threatening navigation traffic. This contract dredging is dependent upon available funding but routinely occurs every one to two years using hydraulic pipeline dredges. Dredged material is disposed on existing dredge material islands or ocean facing beaches. With some exceptions, primarily in the ocean inlets, environmental and procedural clearances have not been obtained for the routine or normal use of any type of dredge other than a hydraulic pipeline dredge.

During periods when a normal dredging event is not scheduled, small and/or isolated shoaling frequently and rapidly occurs to the degree that safe navigation is impeded. To ensure the continued viability of commercial navigation and the safety of the boating public, these rapidly forming shoals must be dredged to a depth whereby safe navigation is restored. Because clearances to use alternative dredging methods have not been obtained, the Corps must utilize emergency authorization procedures as a means of expeditiously removing isolated shoals with the government dredge plants.

An Emergency Dredging Memorandum of Agreement (MOA) (Attachment A) has been arranged between the Corps and federal and state agencies. This MOA allows the expedited review of a project that meets emergency criteria. An emergency declaration is an evaluation made by the Wilmington District Engineer, and approved by the Division Engineer in Atlanta (33CFR 209.145(F)(4)), based on: the presence of an unpredictable shoal creating a situation that would result in an unacceptable hazard to life or navigation, a significant loss of property, or an immediate and unforeseen

Figure 1

Shoal Areas In Wilmington District Proposed to be Dredged by Corps' Special Purpose or Sidecast Dredges



significant economic hardship, and normal maintenance dredging is not scheduled within the next three months. Declaration of an emergency requires contacting multiple agencies and requesting prompt agency responses, at the expense of ongoing work. Several emergency declarations separated by short intervals of time can result in a disruption of agencies' workloads.

Although a shoal may not meet the emergency criteria described above, it may still pose a hazard to navigational safety. The Corps has no options for removal of these shoals other than to include their removal in dredging contracts or wait until they become emergencies. The shoals addressed by this project usually consist of less than 30,000 cubic yards of sandy material.

The proposed project is being considered for the purpose of proactively planning for the expeditious, routine dredging of small and/or isolated shoals for the rapid and efficient improvement of navigational safety, in addition to noticeably reducing the time and cost expenditures that result from emergency declaration. The ability of the Corps to remove these shoals before emergency conditions arise will reduce potential groundings and other navigational hazards and mishaps that commonly occur as a result of these type shoals.

1.01 Description of Project Locations The eleven locations (and their authorized project depths) proposed for periodic shoal dredging are described below. These locations include federally maintained inlets that connect the Atlantic Intracoastal Waterway (AIWW) to the Atlantic Ocean. The inlets are heavily used by recreational boaters and fishermen, and are subject to the accumulation of sand moved by currents, tides, winds, storms, and boat traffic. All locations described, including adjacent portions of the AIWW, routinely experience shoal development between regularly scheduled dredging contracts. In all areas addressed by this proposal, the AIWW proper is authorized as a 12-feet deep by 90-feet wide project.

- An approximate 8,850-foot long portion of the Shallotte River (4-feet deep by 36-feet wide) and an approximate 3,500-foot long portion of the AIWW in Brunswick County (Shallotte Inlet itself is not a federally maintained waterway). The nearshore disposal site for material dredged by a special purpose dredge is located on the west side of Shallotte Inlet, off the east end of Ocean Isle Beach (Figure 2),

- An approximate 12,350-foot long portion of the Lockwoods Folly River (6-feet deep by 100-feet wide), an approximate 3,150-foot long portion of Lockwoods Folly Inlet (8-feet deep by 150-feet wide) and an approximate 9,950-foot long portion of the AIWW in Brunswick County. The nearshore disposal site for material dredged by a special purpose dredge is located on either side of Lockwoods Folly Inlet, off the east end of Holden Beach and off the west end of Oak Island (Figure 3),

- An approximate 4,300-foot long portion of Carolina Beach Inlet (8-feet deep by 150-feet wide) and an approximate 3,750-foot long portion of the AIWW in New Hanover County. The nearshore disposal site for material dredged by a special purpose dredge is located on either side of Carolina Beach Inlet, off the north end of Carolina Beach and off the south end of Masonboro Island (Figure 4),

- An approximate 2,600-foot long portion of New Topsail Inlet (8-feet deep by 150-feet wide project), an approximate 18,000-foot long portion of Banks Channel (7-feet deep by 80-feet wide), and an approximate 7,500- foot long portion of the east end of Topsail Creek (7-feet deep by 80-feet wide) in Pender County. The nearshore disposal site for material dredged by a special purpose dredge is located on the north side of New Topsail Inlet, off the south end of Topsail Beach (Figure 5),

- An approximate 10,300-foot long portion of New River Inlet, including the section known as Cedar Bush Cut (6-feet deep by 90-feet wide), an approximate 16,650-foot long portion of the New River (12-feet deep by 90-feet wide) and an approximate 16,000-foot long portion of the AIWW in Onslow County. The nearshore disposal site for material dredged by a special purpose dredge is located on the south side of New River Inlet, off the north end of North Topsail Beach (Figure 6),

- An approximate 30,200-foot long portion of the AIWW between Bear Inlet and Browns Inlet in Onslow County (Figure 7). The nearshore disposal site for material dredged by a special purpose dredge is located at the disposal sites described for New River Inlet and Bogue Inlet,

- An approximate 4,000-foot long portion of Bogue Inlet (8-feet deep by 150-feet wide), an approximate 12,200-foot long portion of the channel to Bogue Inlet (6-feet deep by 90-feet wide) and an approximate 5,500-foot long portion of the AIWW in Carteret County. The nearshore disposal site for material dredged by a special purpose dredge is located on the east side of Bogue Inlet, off the west end of Emerald Isle (Figure 8),

- An approximate 8,400-foot long portion of Wainwright Slough (7-feet deep by 75-feet wide) in Carteret County (Figure 9). A nearshore disposal site for material dredged by a special purpose dredge has not been identified for this particular location. The Corps hopes to work with the resource agencies to locate a suitable disposal area. Sidecast material would be placed on or as close as possible to the existing Wainwright Island.

- An approximate 10,550-foot long portion of Ocracoke Inlet (18-feet deep by 400-feet wide), an approximate 6,400-foot long portion of the Teaches Hole Channel (12-feet deep by 150-feet wide) an approximate 2,750-foot long portion of the channel to Silver Lake Harbor (12-feet deep by 150-feet

wide), and an approximate 7,650-foot long portion of the Big Foot Slough channel (12-feet deep by 150-feet wide) in Hyde County. The nearshore disposal site for material dredged by a special purpose dredge is located on either side of Ocracoke Inlet, off the north end of Portsmouth Island or off the south end of Ocracoke Island, whichever is safer depending upon the weather conditions at the time (Figure 10),

- An approximate 18,200-foot long portion of the channel from Hatteras Inlet to Hatteras (10-feet deep by 100-feet wide) in Dare County, (Hatteras Inlet itself is not a federally maintained waterway). The nearshore disposal site for material dredged by a special purpose dredge is located on either side of Hatteras Inlet, off the northeast end of Ocracoke Island or off the southwest end of Hatteras Island, whichever is safer depending upon the weather conditions at the time (Figure 11), and

- An approximate 2,650-foot long portion of Oregon Inlet (14-feet deep by 400-feet wide), an approximate 16,050-foot long portion of the channel from Oregon Inlet to Hell's Gate (12-feet deep by 100-feet wide) and an approximate 2,850-foot long portion of Old House Channel (12-feet deep by 100-feet wide) in Dare County. The nearshore disposal site for material dredged by a special purpose dredge is located on the south side of Oregon Inlet, off the north end of Pea Island, and in deep scour holes beneath the Herbert C. Bonner Bridge (Figure 12).

1.02 Commercial and Private Use of the AIWW The AIWW is presently utilized by commercial, military, and recreational boat traffic on a year-round basis. For example, the state port in Morehead City routinely has 40 or more commercial vessels (imports and exports) per month, having a combined monthly cargo of approximately 100,000 short tons. The state port in Wilmington had an average of 73 "LASH" barges (**L**ighter **A**board **SH**ips, approximately one third the size of typical barges. LASH barges are loaded at interior river and shallow draft ports, towed to ocean port's fleeting areas, and loaded onto the LASH mother vessel for transport. If the destination is an interior or shallow port, the LASH barges are unloaded from the mother vessel and towed to the final port), for steel and forest products, per year between 2000 and 2002 (personal communications, Mr. Layton Bedsole, 2002). The AIWW drawbridges at Surf City, Wrightsville Beach, and Sunset Beach each averaged approximately 10,000 openings (commercial and recreational) between December 2001 and November 2002 (personal communication, Mr. Ardell Lewis Jr., 2002).

1.03 Existing Conditions The constantly changing characteristics of coastal navigation projects result from currents, tides, storms, wind, and heavy use by commercial and private boat traffic, all of which affect the navigable condition of the navigation projects. Certain stretches of the navigation projects may not shoal for long periods of time, and then suddenly become shoaling "hotspots" due to changes in prevailing conditions. Predicting the presence or absence of shoals in the foreseeable future is difficult, although summer usually has a lower occurrence of shoals due to

calmer winds and waves compared to other times of year. At present, there are no economically viable structural or administrative methods to control shoaling or the need for maintenance dredging of any of these navigation projects.

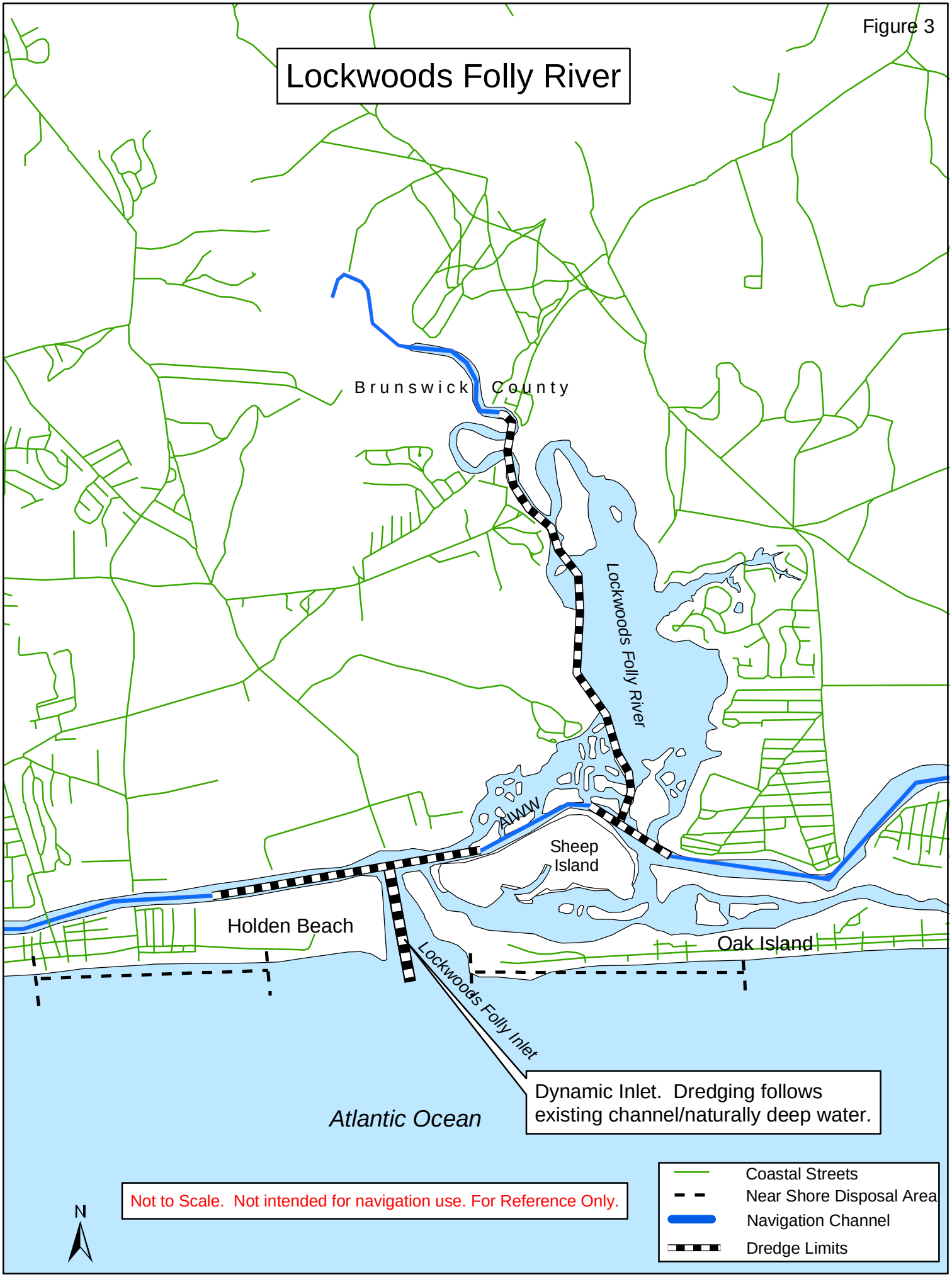
When a report of a shoal reaches the Corps, a determination is made as to whether the reported shoal is within a federally maintained channel. If so, a survey is made by the Corps to assess the severity of the shoal. Based on this survey, the Corps determines whether emergency criteria (described in Section 1.00 above) exist.

Examples of recent emergency declarations include: Carolina Beach in December 2001, New River in April 2002, Topsail Inlet and Banks Channel in May 2002, Rollinson Channel in June 2002 and October 2003, Shallotte River in September 2002, Teaches Hole in December 2002, Cedar Bush Cut in the New River Inlet in January 2003, in June 2003, and again in January 2004, Hell's Gate in October 2003, and Old House Channel in November 2003.

The Corps currently provides available surveys of maintained channels on the Wilmington District Navigation Branch's internet web page. Efforts are underway to make updating this information easier and more accessible to commercial interests and the boating public. Information on shoaled areas is also available on the U.S. Coast Guard's internet website, usually updated on a weekly basis, and Notice to Mariners are continually broadcast over a VHF radio channel.


Figure 2
Shallotte River
Brunswick County
Shallotte River
Holden Beach
Shallotte Inlet
Ocean Isle Beach
Atlantic Ocean
Not to Scale. Not intended for navigation use. For Reference Only.
N
Coastal Streets
Near Shore Disposal Area
Navigation Channel
Dredge Limits

Figure 3


Lockwoods Folly River
Brunswick County
Lockwoods Folly River
AIWW
Sheep Island
Holden Beach
Oak Island
Lockwoods Folly Inlet
Atlantic Ocean
Dynamic Inlet. Dredging follows existing channel/naturally deep water.
Not to Scale. Not intended for navigation use. For Reference Only.
N
Coastal Streets
Near Shore Disposal Area
Navigation Channel
Dredge Limits

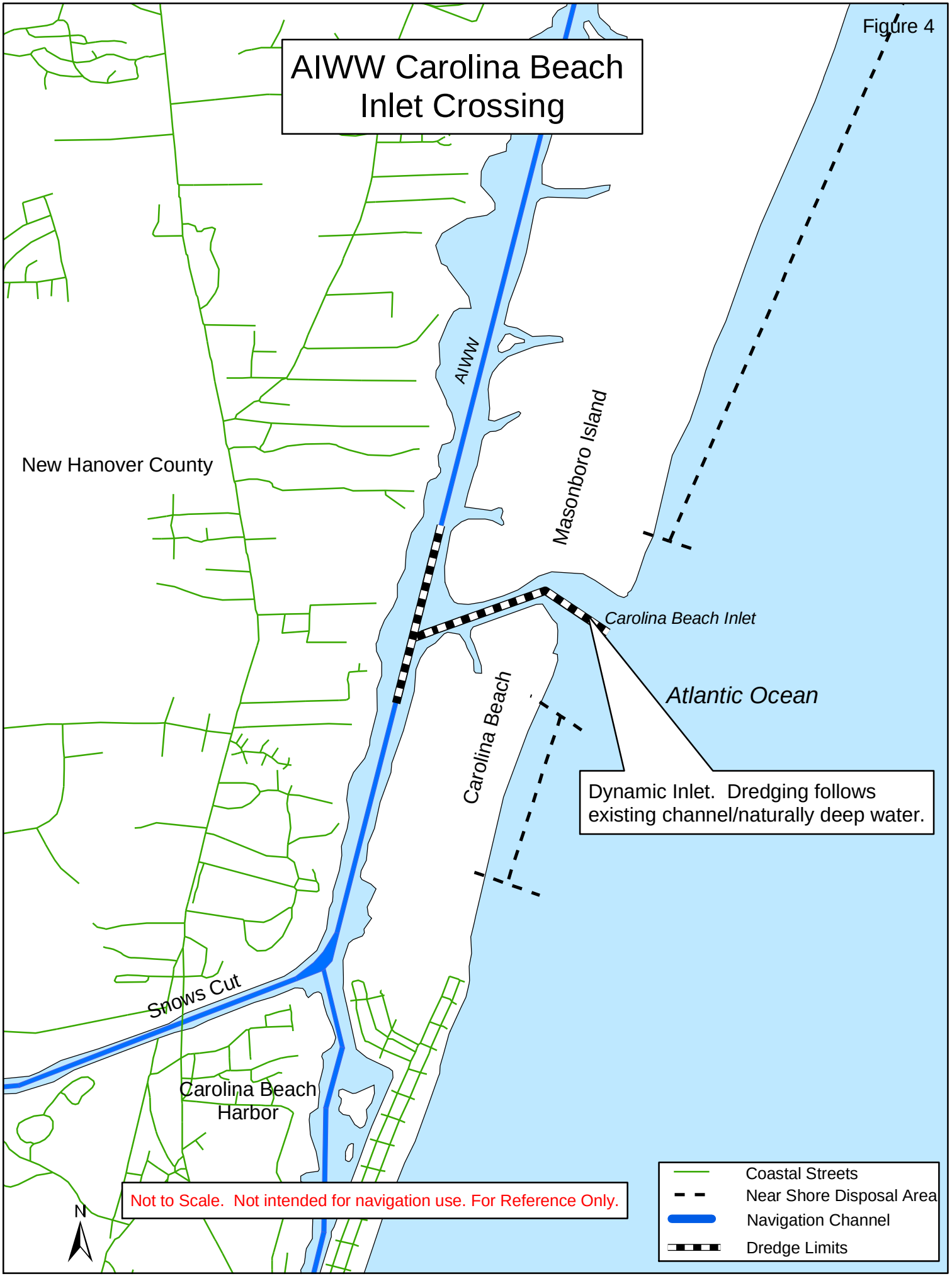


Figure 4
AIWW Carolina Beach Inlet Crossing
New Hanover County
AIWW
Masonboro Island
Carolina Beach Inlet
Atlantic Ocean
Carolina Beach
Dynamic Inlet. Dredging follows existing channel/naturally deep water.
Snows Cut
Carolina Beach Harbor
Not to Scale. Not intended for navigation use. For Reference Only.
N
Coastal Streets
Near Shore Disposal Area
Navigation Channel
Dredge Limits

Figure 5

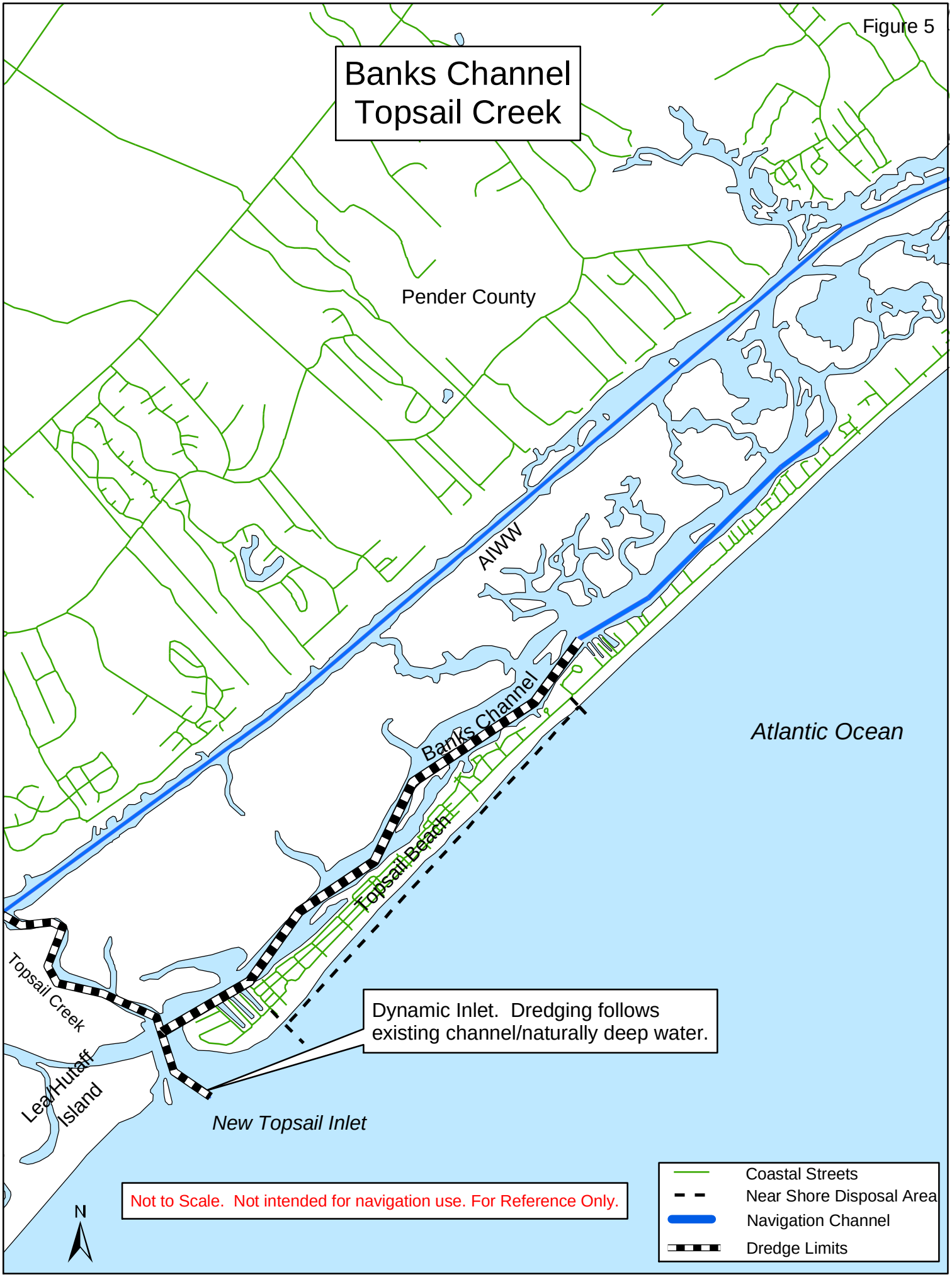
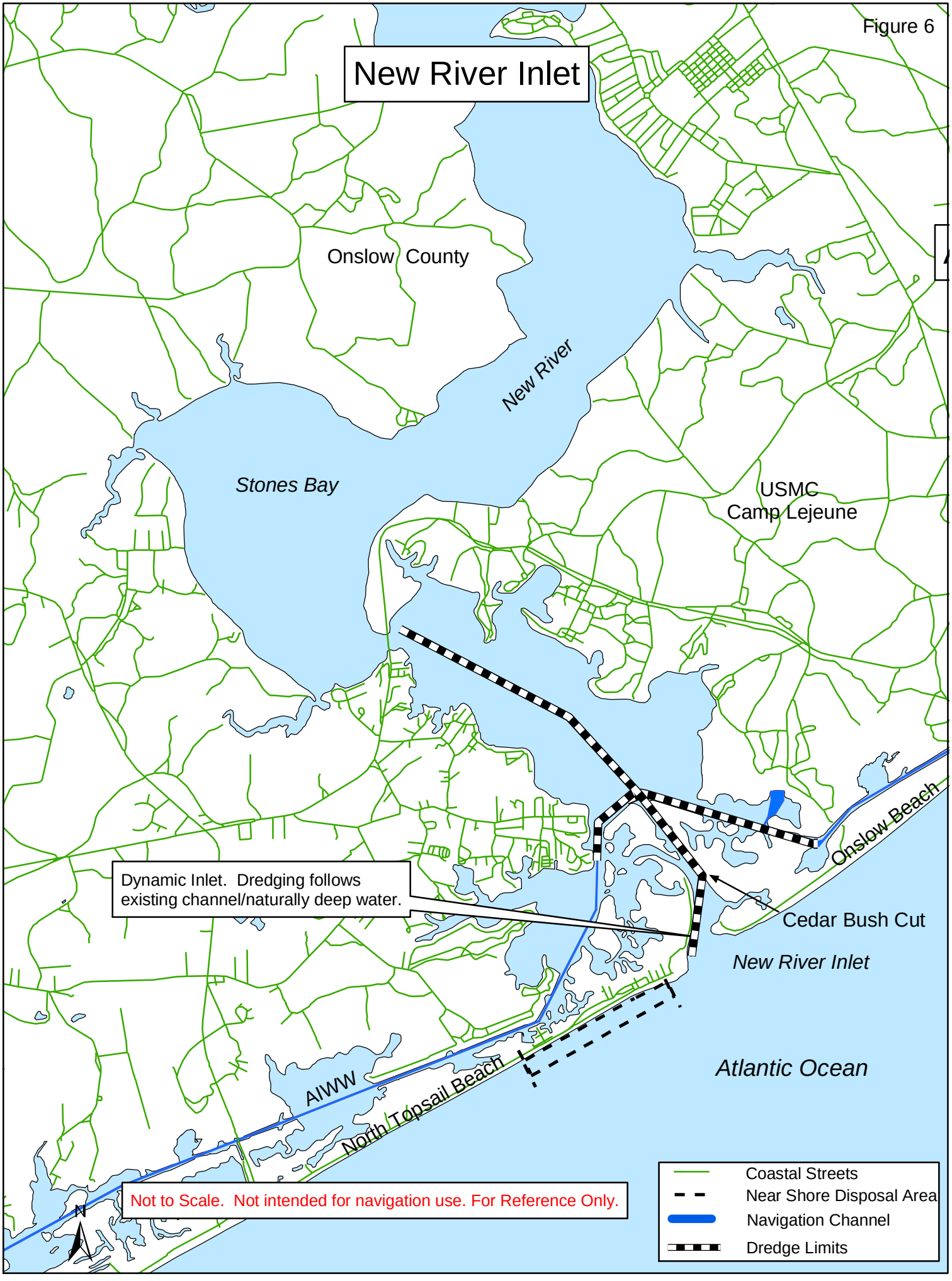

Banks Channel
Topsail Creek
Pender County
AIWW
Banks Channel
Topsail Beach
Atlantic Ocean
Topsail Creek
Lea-Hutaff Island
New Topsail Inlet
Dynamic Inlet. Dredging follows existing channel/naturally deep water.
Not to Scale. Not intended for navigation use. For Reference Only.
N
Coastal Streets
Near Shore Disposal Area
Navigation Channel
Dredge Limits

Figure 6


New River Inlet
Onslow County
New River
Stones Bay
USMC
Camp Lejeune
Onslow Beach
Dynamic Inlet. Dredging follows existing channel/naturally deep water.
Cedar Bush Cut
New River Inlet
Atlantic Ocean
AIWW
North Topsail Beach
Not to Scale. Not intended for navigation use. For Reference Only.
Coastal Streets
Near Shore Disposal Area
Navigation Channel
Dredge Limits

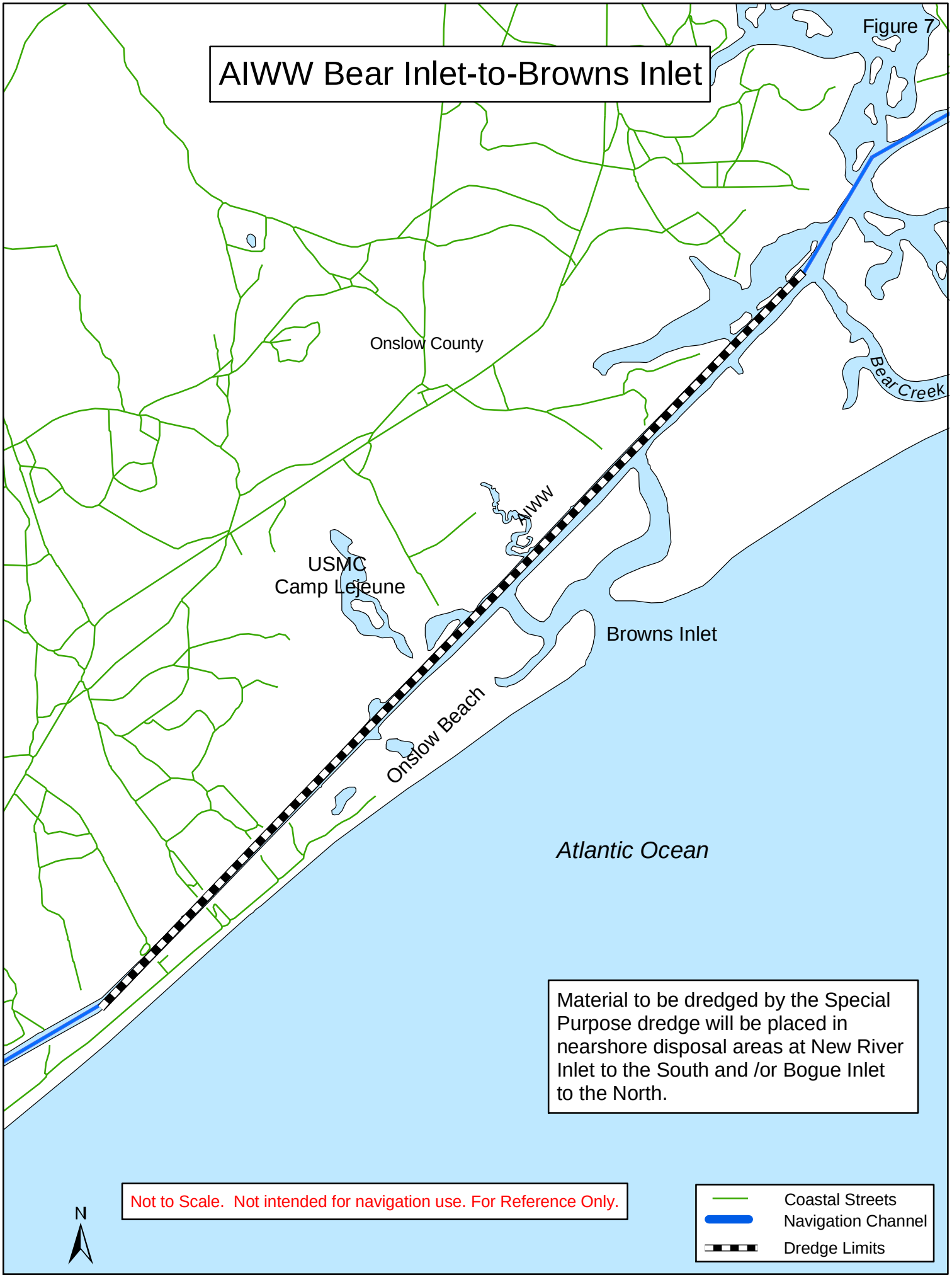


Figure 7
AIWW Bear Inlet-to-Browns Inlet
Onslow County
Bear Creek
AIWW
USMC
Camp Lejeune
Browns Inlet
Onslow Beach
Atlantic Ocean
Material to be dredged by the Special Purpose dredge will be placed in nearshore disposal areas at New River Inlet to the South and /or Bogue Inlet to the North.
Not to Scale. Not intended for navigation use. For Reference Only.
N
Coastal Streets
Navigation Channel
Dredge Limits

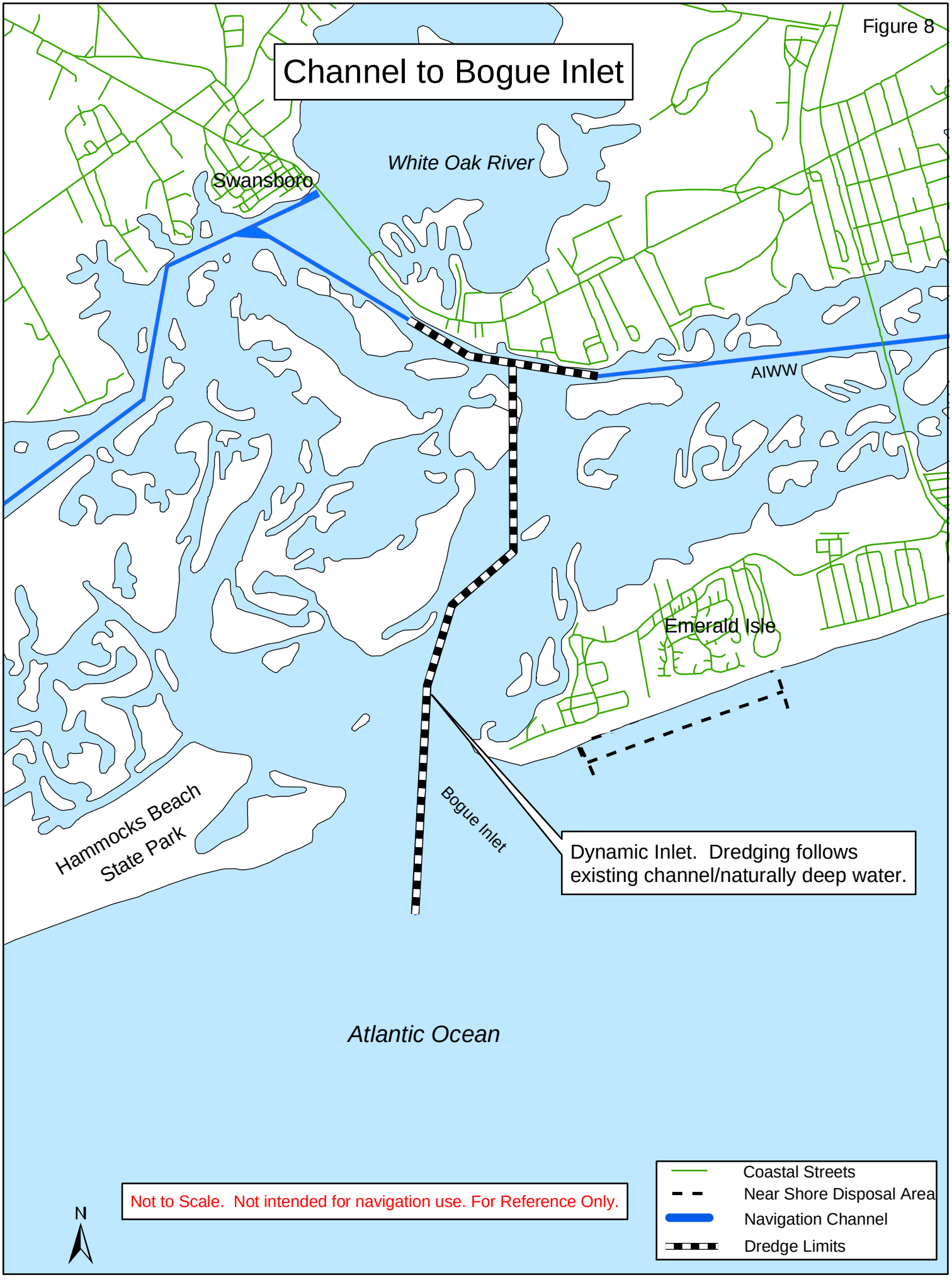


Figure 8
Channel to Bogue Inlet
White Oak River
Swansboro
AIWW
Emerald Isle
Hammocks Beach State Park
Bogue Inlet
Dynamic Inlet. Dredging follows existing channel/naturally deep water.
Atlantic Ocean
Not to Scale. Not intended for navigation use. For Reference Only.
N
Coastal Streets
Near Shore Disposal Area
Navigation Channel
Dredge Limits

Figure 9

Wainwright Slough

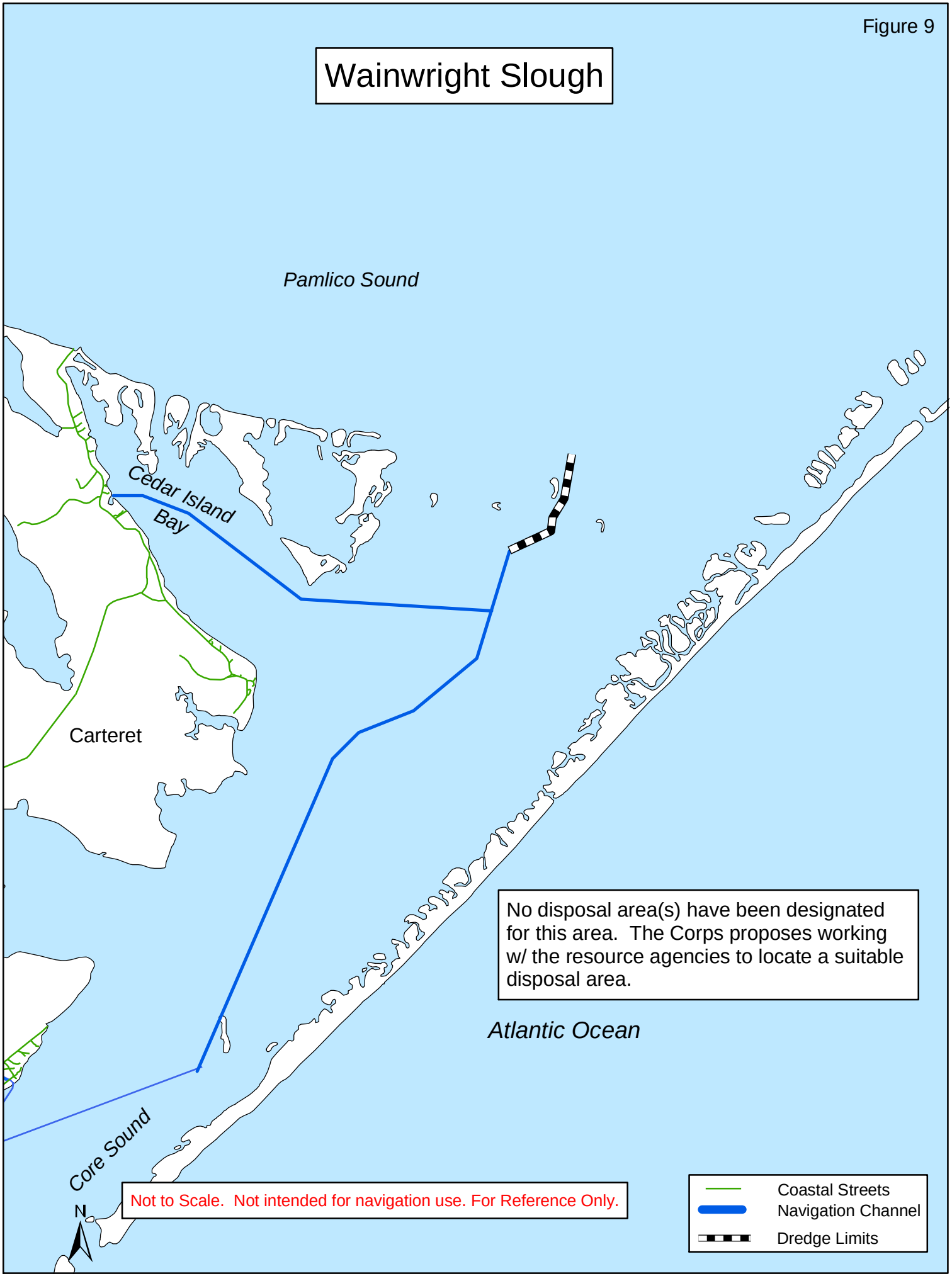


Figure 10

Silver Lake Harbor

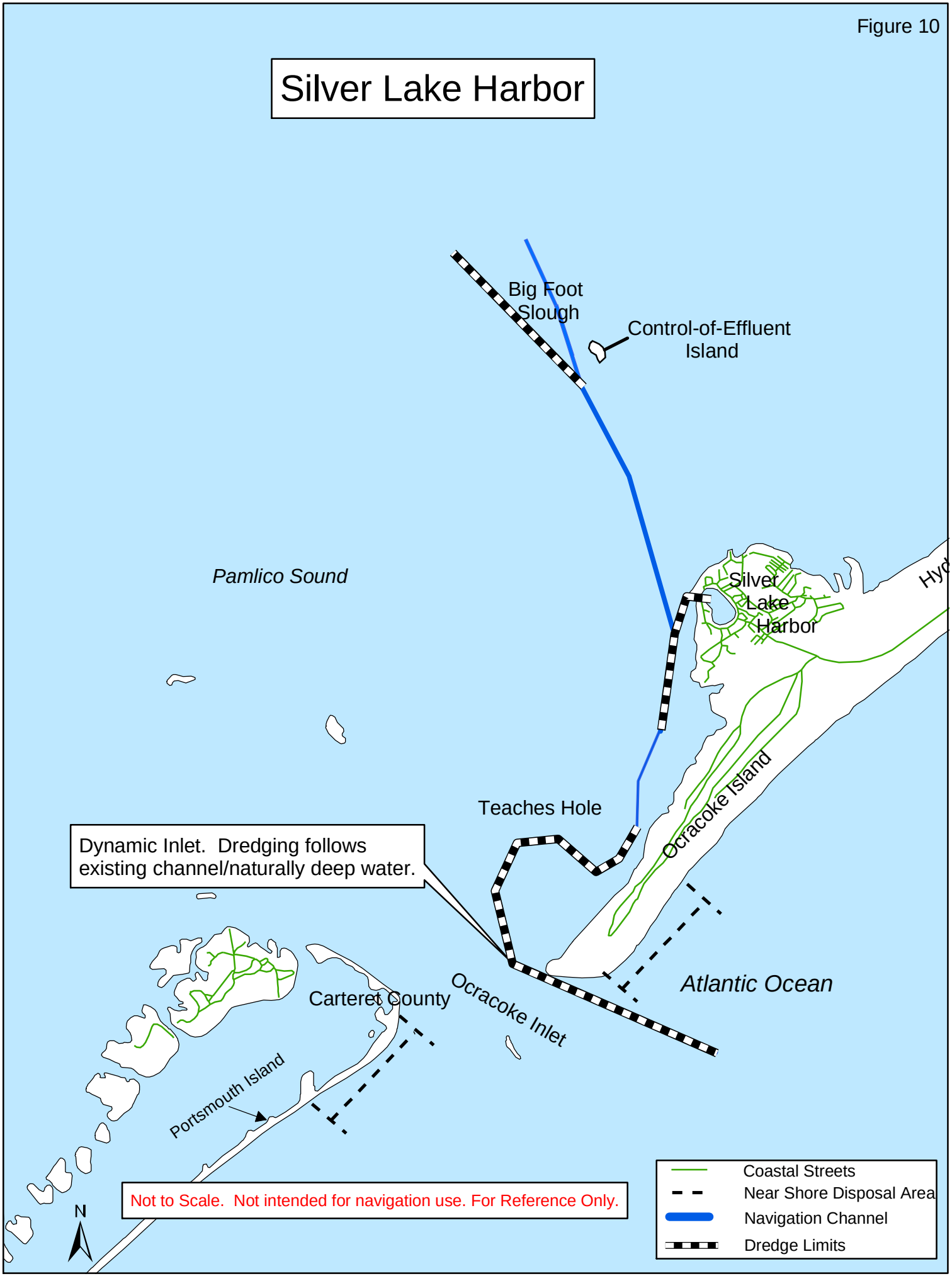


Figure 11

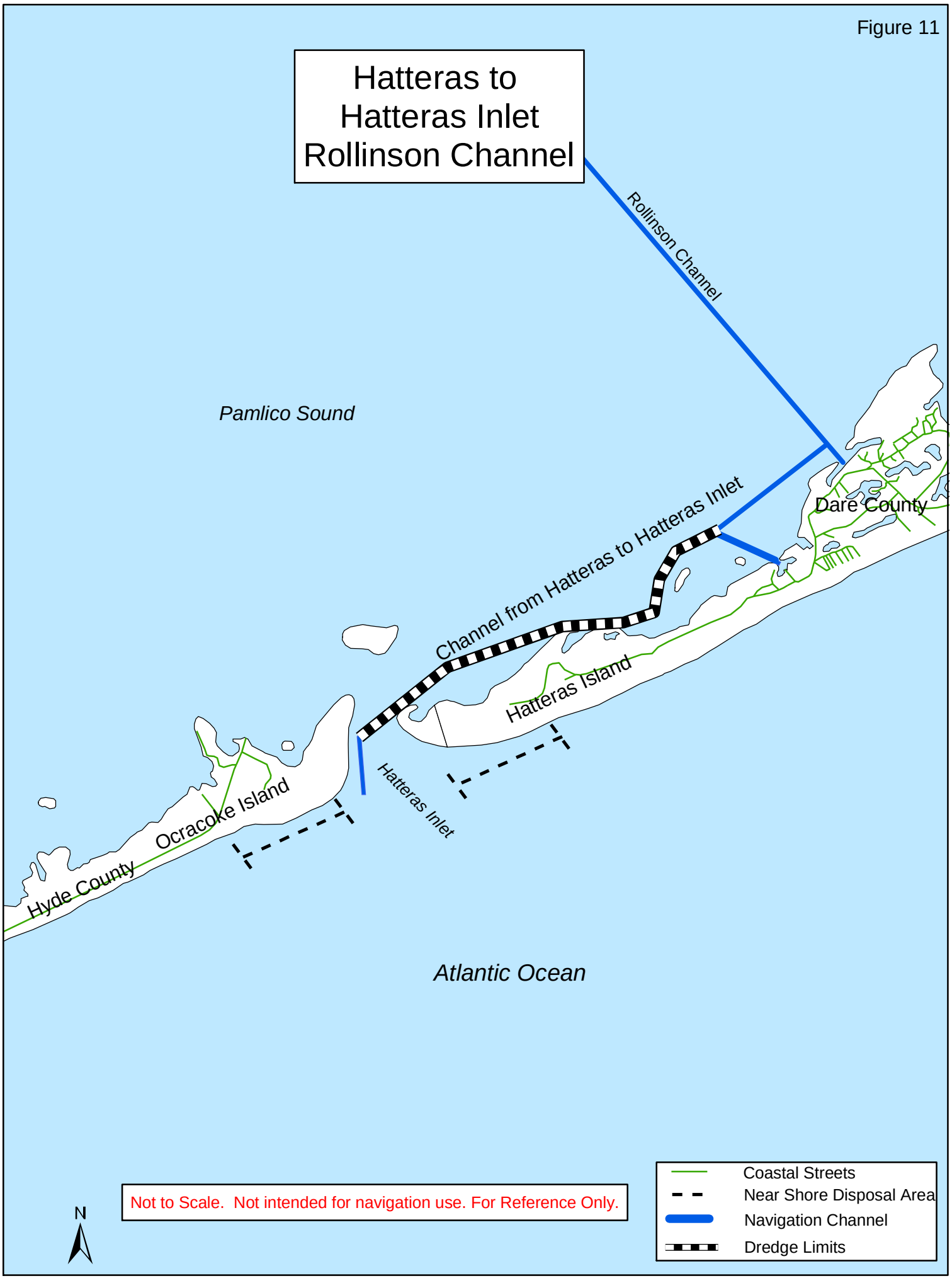
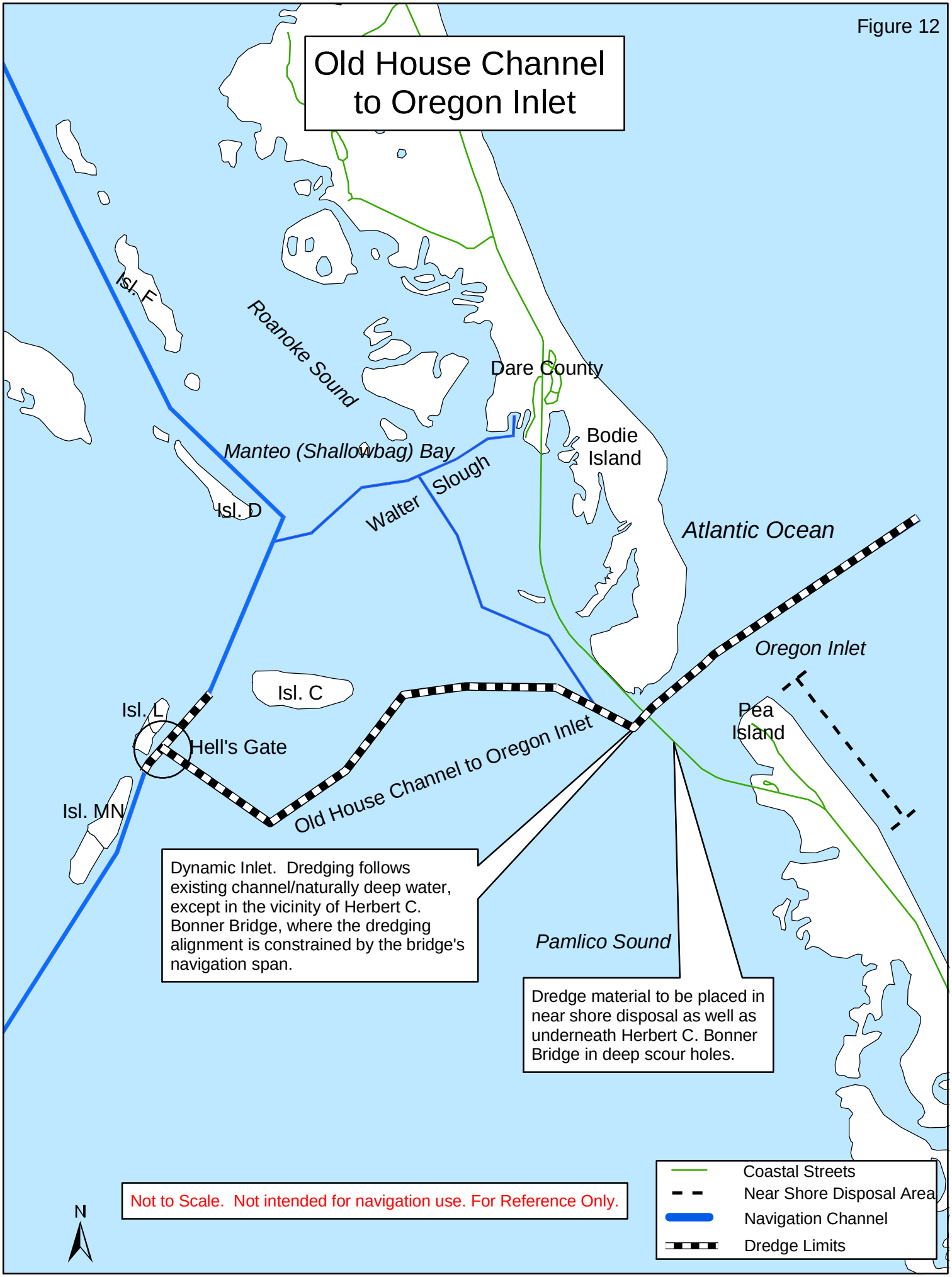

Hatteras to
Hatteras Inlet
Rollinson Channel
Rollinson Channel
Pamlico Sound
Dare County
Channel from Hatteras to Hatteras Inlet
Hatteras Island
Hatteras Inlet
Ocracoke Island
Hyde County
Atlantic Ocean
Not to Scale. Not intended for navigation use. For Reference Only.
N
Coastal Streets
Near Shore Disposal Area
Navigation Channel
Dredge Limits

Figure 12


Old House Channel to Oregon Inlet
Isl. F
Roanoke Sound
Dare County
Bodie Island
Manteo (Shallowbag) Bay
Isl. D
Walter
Slough
Atlantic Ocean
Oregon Inlet
Isl. C
Isl. L
Hell's Gate
Pea Island
Old House Channel to Oregon Inlet
Isl. MN
Dynamic Inlet. Dredging follows existing channel/naturally deep water, except in the vicinity of Herbert C. Bonner Bridge, where the dredging alignment is constrained by the bridge's navigation span.
Pamlico Sound
Dredge material to be placed in near shore disposal as well as underneath Herbert C. Bonner Bridge in deep scour holes.
Not to Scale. Not intended for navigation use. For Reference Only.
N
Coastal Streets
Near Shore Disposal Area
Navigation Channel
Dredge Limits

2.00 AUTHORIZATION

The Congress has authorized the construction and maintenance of the AIWW and other federally maintained navigation projects in North Carolina. Authorizations for specific portions of the proposed project may be requested from Mr. Jeff Richter of the Environmental Resources Section at telephone (910) 251-4636.

3.00 INCORPORATION BY REFERENCE

The following documents address the impacts of dredging within some of the locations to be included in the proposed project. They are incorporated by reference.

- The final environmental impact statement (FEIS), Maintenance of The Navigation Projects On Sounds Of North Carolina, filed with the Council on Environmental Quality on August 26, 1976,

- FEIS, Maintenance of the Atlantic Intracoastal Waterway, North Carolina, dated August 1975 and submitted to US Environmental Protection Agency (EPA) on November 6, 1975,

- FEIS, Maintenance of the Waterway Connecting Pamlico Sound and Beaufort Harbor, North Carolina, dated August 1976,

- FEIS, Maintenance of Atlantic Intracoastal Waterway Side Channels, North Carolina, dated July 1976

4.00 ALTERNATIVES

The preferred alternative, routine dredging, using government owned dredge plant (special purpose or sidecast), of small and/or isolated shoals that pose a threat to safe navigation between scheduled contract maintenance dredging events, is described in Section 4.03. Alternatives to the preferred project are addressed below.

4.01 No Action This alternative is the status quo of the existing conditions. The "No Action" alternative would result in no feasible method to dredge routine, rapidly forming small and/or isolated shoals other than through declaration of an emergency and subsequent dredging with government dredge plant or by waiting until routinely contracted commercial dredges include the shoaled locations in their overall dredging work. Shoals that develop in the subject locations during periods when a normal dredging event is not scheduled must be removed to maintain navigational safety. Removal of these shoals would continue to be coordinated pursuant to the emergency MOA authorization and continued case-by-case handling of recurring problems.

4.02 Contracting with Commercial Dredging Companies This alternative would arise when shoals develop and must be removed during periods when a normal dredging event is not scheduled, and would entail contracting a commercial dredge company for the sole purpose of removing the shoal or shoals causing the navigation problems. This contracting would require compliance with federal bid requirements, including the necessary design of plans, advertising, bidding, and awarding of a contract to a commercial dredging company. Presently, there are no commercial dredging companies with sidecast dredges. In addition, at this time there are no commercial dredging companies with shallow draft hopper dredges. The smallest commercial hopper dredges draw approximately 13 feet of water, which make them too large to perform the proposed project. Therefore, the only type of equipment that could be commercially contracted is a hydraulic pipeline dredge.

Because the shoals to be dredged usually consist of less than 30,000 cubic yards of sandy material, it is not economically practical to contract a large dredging firm to dredge shoals, as costs for just mobilization and demobilization of a hydraulic pipeline dredge often exceed $500,000. Routinely, costs for bid and contract preparation are greater than $50,000, in addition to the month or more of time required to complete all aspects of these procedures. Following award of a contract, additional time would be required to allow a contract dredge to reach the area and set up disposal operations. Therefore, the expedient removal of shoals necessary to maintain safe navigation could not occur.

Hydraulic pipeline dredging would require disposal of the dredged material on either an ocean beach or in an existing diked disposal area. Both alternatives would require the expensive set-up of a pipeline route. Use of a diked disposal area would require inspection of the dike walls and outfall pipe; possible repairs could be necessary, involving a delay in dredging in addition to expenses incurred. The expenses required for setting up pipeline routes and/or repairing disposal areas would not be practical given the small amount of material to be dredged and the expeditious removal of the subject shoals intended by the proposed project.

4.03 Use of Government Dredge Plant (Preferred Alternative) The preferred alternative consists of the proposed use of the Corps' shallow-draft special purpose dredge "Currituck" (or similar Corps special purpose dredge) and the sidecast dredge "Merritt" (or similar Corps' sidecast dredge) to expeditiously perform routine dredging of small and/or isolated shoals that pose a threat to safe navigation during periods when a normal dredging event is not scheduled. It is the Wilmington District's intent to remove these isolated shoals before emergency criteria exist, thereby lessening potential navigational hazards. The proposed dredging would not be intended to restore authorized project depths but would occur to a depth whereby safe navigation is restored.

The "Currituck" is a seagoing, split-hull, special purpose dredge, capable of undertaking work routinely assigned to shallow-draft hopper dredges. It is capable of dredging approximately 300 cubic yards of material in thirty minutes. The Wilmington District

presently has two sidecast dredges, the “Merritt” and the “Fry”. The “Merritt” is capable of dredging at a minimum depth of 6 feet of water, has two adjustable drag heads with a 12-inch discharge pipe that is 80 feet long with a 10-foot extension available. The “Merritt” casts material approximately 100 feet from the centerline of the vessel. The ”Fry” is capable of dredging at a minimum depth of 6 feet of water, has a 10-inch drag head with a 12-inch discharge pipe that is 80-feet in length, and discharges material approximately 100 feet from the centerline of the vessel.

Because the intent of the project is to expeditiously remove shoals that have rapidly developed, the proposed dredging could occur at any time of the year. In order to remove the shoal as quickly as possible at any of the proposed sites, the most readily available dredge (either special purpose or sidecast) would be used, except in the upper reaches of the New River, Shallotte River and the Lockwoods Folly River. In these locations, only a hopper dredge would be used as a result of coordination with the North Carolina Division of Marine Fisheries in which concerns for impacts to fishery resources resulting from sidecast dredge discharges were expressed. It is estimated that any single dredging occurrence would last approximately 5-15 days, although actual duration would be dependent upon the amount of material to be dredged, the time necessary to travel to and from the disposal site (in the case of special purpose dredges), in addition to weather conditions and equipment problems, any of which could be a factor in extending the time from start to finish of any dredging job. Routinely, government plant can dredge approximately 2,000 cubic yards of material per day.

Material dredged by the sidecast dredges would be sidecast into adjacent waters. Material dredged by the special purpose dredges at and near the Shallotte River and Lockwoods Folly Inlet, Carolina Beach Inlet, New Topsail Inlet, New River Inlet, Bogue Inlet, Big Foot Slough and Silver Lake Harbor and Ocracoke Inlet, the Channel from Hatteras to Hatteras Inlet, and Hell’s Gate and Old House Channel and Oregon Inlet would be placed in previously approved nearshore disposal areas adjacent to ocean beaches on one or both sides of the inlet. These nearshore areas have all been used repeatedly in the past for the deposition of beach quality sand. The locations of these nearshore disposal areas are shown on Figures 2, 3, 4, 5, 6, 8, 10, 11, and 12. In addition to placement in the nearshore area off the north end of Pea Island, disposal of material dredged by special purpose dredge from Oregon Inlet and Hell’s Gate and Old House Channel would also be placed in deep scour holes beneath the Herbert C. Bonner Bridge, a method utilized in the recent past to protect bridge support pilings from undermining. Material dredged by special purpose dredge in the Bear Inlet to Browns Inlet section of the AIWW would be placed in either the New River Inlet or Bogue Inlet disposal areas. There is no defined location for disposal of material dredged by special purpose dredge in Wainwright Slough. The Corps hopes to work with the resource agencies to arrive at a suitable location in this area. Material dredged by sidecast dredge will be placed on or as near as possible to the existing Wainwright Island.

Based on past experiences with shoals, maintenance dredging is not expected to occur more than once or twice a year at any specific site, although on rare occasions, certain locations have had shoals develop more than two times in one year. However, the

intent of the project is to dredge shoals that pose a hazard to navigation; therefore, dredging may occur more frequently than twice a year at any specific location if conditions result in more frequent shoals.

Government dredge plant is efficient at the removal of these small isolated shoals as evidenced by past emergency undertakings. Having the ability to dredge these shoals prior to their meeting emergency criteria will reduce the amount of time and quantity of material dredged, further minimize any environmental impacts, in addition to restoring safe navigation to the area.

The use of Corps' special purpose and sidecast dredges allows for prompt and economical responses to quickly developing shoaling situations. The proposed dredging would be performed when shoaling conditions in the subject locations have developed to the point that safe navigation is compromised. This is at or near the point at which the Corps would ordinarily declare the existence of a navigational emergency. In an effort to proactively maintain safe navigation conditions, the proposed project would allow the Corps to remove shoals before emergency conditions arise. Similar to emergency dredging, the tight schedules under which the government dredge plants operate do not allow for long stays at any one location; therefore, the proposed shoal removal would rarely if ever be performed to the authorized project depth (described in Section 1.01 above). It would almost always be performed only to the degree that safe navigation could be resumed

The proposed dredging of shoals in the subject locations would significantly reduce work presently associated with the emergency procedures. Although dangerous shoaling requiring emergency dredging may develop in Corps' federally maintained navigation projects other than the locations addressed in this EA, such occurrences are anticipated to be infrequent and likely the result of severe events such as hurricanes. In these situations, the emergency MOA would be followed.

5.00 ALTERNATIVES ANALYSIS

The benefits and detractions of the alternatives described above are addressed in Table 1.

Table 1. Review of Project Alternatives

Alternative	Review
Contracting with Commercial Dredging Companies	1) The safety of commercial and private navigation in the subject navigation projects would be compromised due to delays inherent in the required Federal contract bid process. 2) The Federal government would encounter cost associated with the preparation of plans, bidding and contract award process, and contractor mobilization and demobilization and disposal area preparation. 3) The removal of small isolated shoals would not be expedited due to the required times associated with the Federal contract bid process. 4) Sand would be retained in the littoral system if beach disposal occurs. If sand were disposed in a diked area, it would be removed from the littoral system. 5) Small isolated shoals occurring outside scheduled dredge contract operations would be routinely addressed, but the Corps would first have to become aware of the problem, then create specific plans prior to opening the project for bid, before awarding a contract to have the shoal removed. 6) Environmental impacts associated with removal of shoals would be minimal and temporary.
Use of Government Dredge Plant (Preferred Alternative)	1) The safety of commercial and private navigation in the subject navigation projects would be maintained as a result of the ability to remove shoals expeditiously, in many cases before they meet emergency criteria. 2) The federal government would encounter the cost of operating government dredge plant (approximately $10,000/day) 3) The removal of small isolated shoals would be expedited due to the short time between the Corps becoming aware of the problem and the ability to have either type dredge plant working. 4) Sand would be retained in the littoral system. 5) Small isolated shoals occurring outside scheduled dredge contract operations would be routinely addressed and resolved by scheduling government dredge plant to remove the shoal. 6) Environmental impacts associated with removal of shoals would be minimal and temporary.

No Action	1) The safety of commercial and private navigation in the subject navigation projects would be maintained, however shoals would have to meet emergency criteria prior to dredging outside of routinely contracted dredging projects. 2) The federal government would encounter the cost of operating government dredge plant (approximately $10,000/day) 3) The removal of small isolated shoals would be delayed; the emergency MOA could not be initiated until emergency criteria exist. Emergency coordination with the review agencies is almost always completed within one or two days. 4) Sand would be retained in the littoral system. 5) Small isolated shoals occurring outside scheduled dredge contract operations would be routinely addressed and resolved by the emergency MOA process only after emergency criteria are met. 6) Environmental impacts associated with removal of shoals would be minimal and temporary.

6.00 ENVIRONMENT EFFECTS

Environmental effects associated with the dredging of the subject navigation projects are addressed in the documents referenced in Section 3.00. The following paragraphs provide additional information and address anticipated impacts of each alternative.

6.01 Wildlife and Vegetation The preferred alternative would result in the dredging of recently formed shoals in open water. Emergent vegetation would not have established on these shoals as they are recently formed and permanently inundated, therefore, the actual dredging associated with any of the alternatives would not impact emergent vegetation.

Disposal of dredged material would depend upon the type of dredge used; the special purpose dredge would place material in nearshore disposal areas along the Atlantic Ocean Beach, adjacent to the nearby inlet, while the sidecast dredge would place material in open waters adjacent to the dredge site. No emergent vegetation grows in or adjacent to the nearshore disposal areas. Restricting dredging to times of dormancy would not allow for the removal of shoals in an expeditious manner, therefore, this attempt at minimization would not be feasible. However, requiring that the use of a sidecast dredge only occur during high tides, in addition to working with the configuration of the discharge pipe and area being dredged would minimize impacts. The anticipated short-term occurrence of dredging associated with the preferred alternative, in addition to measures to avoid a discharge of material on vegetated marsh should result in minimal impacts to marsh.

The areas to be dredged are routinely navigated by numerous boats, therefore, wildlife, primarily birds, would not be unduly disturbed by occasional maintenance dredging. Dredging to be conducted in accordance with this preferred alternative is expected to be intermittent and of short duration.

Because of the short-term duration of any shoal dredging that would occur, the anticipated intermittent occurrence of shoal dredging, and the history of routine maintenance dredging that has occurred in the subject areas, vegetation and wildlife would be no more than minimally and temporarily impacted by the preferred alternative.

The contracting with commercial dredging companies alternative would entail the use of a hydraulic pipeline dredge. Discharge of dredged material would occur either on designated beach disposal areas or into established diked disposal areas. Neither method would impact vegetation and wildlife more than minimally. Emergent vegetation would not be impacted in the portion of the AIWW between Bear Inlet and Browns Inlet in Onslow County.

The no action alternative would result in similar impacts to vegetation and wildlife as those resulting from the preferred alternative.

6.02 Fishes The proposed dredging would occur in dynamic areas that routinely experience rapid accumulation of sand in addition to frequent boat traffic. Although the mature fish species present in these areas are highly mobile and would be able to avoid the small dredges that would be utilized, some fish mortality would be expected. Mortality rates would be low and not adversely detrimental to any species. Resource agencies will be advised a minimum of one week prior to the initiation of any government plant dredging in the subject locations.

6.02.01 Essential Fish Habitat The 1996 Congressional amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) (PL 94-265) set forth new requirements for the National Marine Fisheries Service (NMFS), regional fishery management councils (South Atlantic Fishery Management Council [SAFMC] and Mid-Atlantic Fishery Management Council [MAFMC]), 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. This assessment will be coordinated with the NMFS Southeast Region.

EFH species for Coastal North Carolina as identified by NMFS, SAFMC, and MAFMC are listed in Table 2.

Table 2. Essential Fish Habitat (EFH) Species for Coastal North Carolina.[1]

MANAGEMENT AGENCY[3]	MANAGEMENT PLAN SPECIES GROUP	COMMON NAME OF SPECIES	SCIENTIFIC NAME OF SPECIES	EFH LIFE STAGES BY ECOSYSTEM[2]		HABITAT AREAS OF PARTICULAR CONCERN
				Marine	Estuarine	
SAFMC	Calico Scallop	Calico scallop	*Argopecten gibbus*	A		
SAFMC	Coastal Migratory Pelagics	Cobia	*Rachycentron canadum*	E L P J A	L P J A	Capes Fear, Lookout, & Hatteras sandy shoals; The Point; Ten Fathom Ledge; Big Rock; Bogue Sd; New River; Broad River; hardbottom
SAFMC	Coastal Migratory Pelagics	Dolphin	*Coryphaena hippurus*	L P J A		Capes Fear, Lookout, & Hatteras sandy shoals; The Point; Ten Fathom Ledge; Big Rock; Bogue Sd; New River; Broad River; hardbottom
SAFMC	Coastal Migratory Pelagics	King mackerel	*Scomberomorus cavalla*	J A		Capes Fear, Lookout, & Hatteras sandy shoals; The Point; Ten Fathom Ledge; Big Rock; Bogue Sd; New River; Broad River; hardbottom
SAFMC	Coastal Migratory Pelagics	Spanish mackerel	*Scomberomorus maculatus*	L J A	J	Capes Fear, Lookout, & Hatteras sandy shoals; The Point; Ten Fathom Ledge; Big Rock; Bogue Sd; New River; Broad River; hardbottom
SAFMC	Coral & Coral Reef	Corals	100s of species	Florida only		Big Rock; Ten Fathom Ledge; The Point
SAFMC	Golden Crab	Golden crab	*Chaceon fenneri*	A		
SAFMC	Red Drum	Red drum	*Sciaenops ocellatus*	E L A	P J S A	tidal inlets, state nursery, spawning sites, SAV
SAFMC	Shrimp	Brown shrimp	*Farfantepenaeus aztecus*	E L A	P J S	tidal inlets, state nursery, overwintering habitats
SAFMC	Shrimp	Pink shrimp	*Farfantepenaeus duorarum*	E L A	P J S	tidal inlets, state nursery, overwintering habitats
SAFMC	Shrimp	Rock shrimp	*Sicyonia brevirostris*	A		
SAFMC	Shrimp	Royal red shrimp	*Pleoticus robustus*	A		
SAFMC	Shrimp	White shrimp	*Lilopenaeus setiferus*	E L A	P J S	tidal inlets, state nursery, overwintering habitats
SAFMC	Snapper Grouper	Blackfin snapper	*Lutjanus buccanella*	J, A		hardbottom, SAV, oyster/shell, inlets, state nursery, The Point, Ten Fathom Ledge, Big Rock, Hoyt Hills
SAFMC	Snapper Grouper	Blueline tilefish	*Caulolatilus microps*	E, A		hardbottom, SAV, oyster/shell, inlets, state nursery, The Point, Ten Fathom Ledge, Big Rock, Hoyt Hills
SAFMC	Snapper Grouper	Golden tilefish	*Lopholatilus chamaeleonticeps*	A		hardbottom, SAV, oyster/shell, inlets, state nursery, The Point, Ten Fathom Ledge, Big Rock, Hoyt Hills
SAFMC	Snapper Grouper	Gray snapper	*Lutjanus griseus*	L, A	P, J, A	hardbottom, SAV, oyster/shell, inlets, state nursery, The Point, Ten Fathom Ledge, Big Rock, Hoyt Hills
SAFMC	Snapper Grouper	Greater amberjack	*Seriola dumerili*	J, A		hardbottom, SAV, oyster/shell, inlets, state nursery, The Point, Ten Fathom Ledge, Big Rock, Hoyt Hills
SAFMC	Snapper Grouper	Jewfish	*Epinephelus itajara*	Florida only	Florida only	hardbottom, SAV, oyster/shell, inlets, state nursery, The Point, Ten Fathom Ledge, Big Rock, Hoyt Hills
SAFMC	Snapper Grouper	Mutton snapper	*Lutjanus analis*	Florida only	Florida only	hardbottom, SAV, oyster/shell, inlets, state nursery, The Point, Ten Fathom Ledge, Big Rock, Hoyt Hills
SAFMC	Snapper Grouper	Red porgy	*Pagrus pagrus*	E L J A		
SAFMC	Snapper Grouper	Red snapper	*Lutjanus campechanus*	L, P, J, A		hardbottom, SAV, oyster/shell, inlets, state nursery, The Point, Ten Fathom Ledge, Big Rock, Hoyt Hills
SAFMC	Snapper Grouper	Scamp	*Mycteroperca phenax*	A		hardbottom, SAV, oyster/shell, inlets, state nursery, The Point, Ten Fathom Ledge, Big Rock, Hoyt Hills
SAFMC	Snapper Grouper	Silk snapper	*Lutjanus vivanus*	J, A		hardbottom, SAV, oyster/shell, inlets, state nursery, The Point, Ten Fathom Ledge, Big Rock, Hoyt Hills
SAFMC	Snapper Grouper	Snowy grouper	*Epinephelus niveatus*	E L A		hardbottom, SAV, oyster/shell, inlets, state nursery, The Point, Ten Fathom Ledge, Big Rock, Hoyt Hills
SAFMC	Snapper Grouper	Speckled hind	*Epinephelus drummondhayi*	A		hardbottom, SAV, oyster/shell, inlets, state nursery, The Point, Ten Fathom Ledge, Big Rock, Hoyt Hills
SAFMC	Snapper Grouper	Vermillion snapper	*Rhomboplites aurorubens*	J, A		hardbottom, SAV, oyster/shell, inlets, state nursery, The Point, Ten Fathom Ledge, Big Rock, Hoyt Hills
SAFMC	Snapper Grouper	Warsaw grouper	*Epinephelus nigritus*	E A		hardbottom, SAV, oyster/shell, inlets, state nursery, The Point, Ten Fathom Ledge, Big Rock, Hoyt Hills
SAFMC	Snapper Grouper	White grunt	*Haemulon plumieri*	E, L, A		hardbottom, SAV, oyster/shell, inlets, state nursery, The Point, Ten Fathom Ledge, Big Rock, Hoyt Hills
SAFMC	Snapper Grouper	Wreckfish	*Polyprion americanus*	A		hardbottom, SAV, oyster/shell, inlets, state nursery, The Point, Ten Fathom Ledge, Big Rock, Hoyt Hills
SAFMC	Snapper Grouper	Yellowedge grouper	*Epinephelus flavolimbatus*	E L A		hardbottom, SAV, oyster/shell, inlets, state nursery, The Point, Ten Fathom Ledge, Big Rock, Hoyt Hills
SAFMC	Spiny Lobster	Spiny Lobster	*Panulirus argus*	L J A	L J A	Spiny lobster EFH and HAPC located only in Florida
MAFMC	Atlantic Mackerel, Squid, Butterfish	Atlantic butterfish	*Peprilus triacanthus*			
MAFMC	Atlantic Mackerel, Squid, Butterfish	Atlantic mackerel	*Scomber scombrus*			
MAFMC	Atlantic Mackerel, Squid, Butterfish	Long finned squid	*Loligo pealei*			
MAFMC	Atlantic Mackerel, Squid, Butterfish	Short finned squid	*Illex illecebrosus*			
MAFMC	Atlantic Surfclam & Ocean Quahog	Ocean quahog	*Artica islandica*			
MAFMC	Atlantic Surfclam & Ocean Quahog	Surfclam	*Spisula solidissima*			
MAFMC	Bluefish	Bluefish	*Pomatomus saltatrix*	L J A	J A	
MAFMC	Spiny Dogfish	Spiny dogfish	*Squalus acanthias*	J A		
MAFMC	Summer Flounder, Scup, Black Sea Bass	Black sea bass	*Centropristis striata*	E L J A		
MAFMC	Summer Flounder, Scup, Black Sea Bass	Scup	*Stenotomus chrysops*	E L J A		
MAFMC	Summer Flounder, Scup, Black Sea Bass	Summer flounder	*Paralichthys dentatus*	L J A	L J A	SAV for larvae and juveniles
NMFS	Billfish	Blue marlin	*Makaira nigricans*	E L J A		
NMFS	Billfish	Longbill spearfish	*Tetrapturus pfluegeri*	J A		
NMFS	Billfish	Sailfish	*Istiophorus platypterus*	E L J A		
NMFS	Billfish	White marlin	*Tetrapturus albidus*	J A		

Table 2. Essential Fish Habitat (EFH) Species for Coastal North Carolina.[1]

MANAGEMENT AGENCY[3]	MANAGEMENT PLAN SPECIES GROUP	COMMON NAME OF SPECIES	SCIENTIFIC NAME OF SPECIES	EFH LIFE STAGES BY ECOSYSTEM[2]		HABITAT AREAS OF PARTICULAR CONCERN
				Marine	Estuarine	
NMFS	Sharks	Atlantic angel shark	*Squatina dumerili*			
NMFS	Sharks	Atlantic sharpnose shark	*Rhizoprionodon terraenovae*	J A	J	
NMFS	Sharks	Basking shark	*Cetorhinos maximus*			
NMFS	Sharks	Big nose shark	*Carcharhinus altimus*	J		
NMFS	Sharks	Bigeye sand tiger shark	*Odontaspis noronhai*			
NMFS	Sharks	Bigeye sixgill shark	*Hexanchus vitulus*			
NMFS	Sharks	Bigeye thresher shark	*Alopias superciliosus*	E L P J S A		
NMFS	Sharks	Blacknose shark	*Carcharhinus acronotus*	J A		
NMFS	Sharks	Blacktip shark	*Carcharhinus limbatus*	J A		
NMFS	Sharks	Blue shark	*Prionace glauca*	J S A		
NMFS	Sharks	Bonnethead	*Sphyrna tiburo*	J A	J A	
NMFS	Sharks	Bull shark	*Carcharhinus leucas*	J	J	
NMFS	Sharks	Carribean reef shark	*Carcharhinus perezi*	research area		
NMFS	Sharks	Carribean sharpnose shark	*Rhizoprionodon porosus*			
NMFS	Sharks	Dusky shark	*Carcharhinus obscurus*	A	J A	
NMFS	Sharks	Finetooth shark	*Carcharhinus isodon*	E L P J S A		
NMFS	Sharks	Galapagos shark	*Carcharhinus galapagensis*			
NMFS	Sharks	Great hammerhead	*Sphyrna mokarran*	J A		
NMFS	Sharks	Lemon shark	*Negaprion brevirostris*	J A	J A	
NMFS	Sharks	Longfin mako shark	*Isurus paucus*	E L P J S A		
NMFS	Sharks	Narrowtooth shark	*Carcharhinus brachyurus*			
NMFS	Sharks	Night shark	*Carcharhinus signatus*	J A		
NMFS	Sharks	Nurse shark	*Ginglymostoma cirratum*	J A		
NMFS	Sharks	Oceanic whitetip shark	*Carcharhinus longimanus*	J S A		
NMFS	Sharks	Porbeagle shark	*Lamna nasus*			
NMFS	Sharks	Sand tiger shark	*Odontaspis taurus*	J A		
NMFS	Sharks	Sandbar shark	*Carcharhinus plumbeus*	J A	J A	Pamlico Sound adjacent to Hatteras and Ocracoke Islands and offshore
NMFS	Sharks	Scalloped hammerhead	*Sphyrna lewini*	J A		
NMFS	Sharks	Sharpnose sevengill shark	*Heptranchias perlo*			
NMFS	Sharks	Shortfin mako shark	*Isurus oxyrinchus*	E L P J S A		
NMFS	Sharks	Silky shark	*Carcharhinus falciformis*	J		
NMFS	Sharks	Sixgill shark	*Hexanchus griseus*			
NMFS	Sharks	Smalltail shark	*Carcharhinus porosus*			
NMFS	Sharks	Smooth hamerhead	*Sphyrna zygaena*			
NMFS	Sharks	Spinner shark	*Carcharhinus brevipinna*	J A		
NMFS	Sharks	Thresher shark, common	*Alopias vulpinus*			
NMFS	Sharks	Tiger shark	*Galeocerdo cuvieri*	J S A		
NMFS	Sharks	Whale shark	*Rhincodon typus*			
NMFS	Sharks	White shark	*Carcharodon carcharias*	J		
NMFS	Swordfish	Swordfish	*Xiphias gladius*	E L J S A		
NMFS	Tuna	Albacore	*Thunnus alalunga*	A		
NMFS	Tuna	Atlantic bigeye tuna	*Thunnus obesus*	J A		
NMFS	Tuna	Atlantic Yellowfin tuna	*Thunnus albacares*	E L J S A		
NMFS	Tuna	Skipjack tuna	*Katsuwonus pelamis*	E L J S A		
NMFS	Tuna	Western Atlantic bluefin tuna	*Thunnus thynnus*	E L J S A		

Note: 1.These Essential Fish Habitat species were compiled from Essential Fish Habitat: A Marine Fish Habitat Conservation Mandate for Federal Agencies. February 1999 (Revised 10/2001) (Appendices 2, 3, 6, 7, and 8).
Although 49 species are listed in Appendix 3 under National Marine Fisheries Service management, only 35 of these species have EFH listed in Appendix 8.
2. Life stages include: E = Eggs, L = Larvae, P = PostLarvae, J = Juveniles, S = SubAdults, A = Adults
3. Organizations responsible for Fishery Management Plans include: SAFMC = South Atlantic Fishery Management Council; MAFMC = Mid-Atlantic Fishery Management Council; NMFS = National Marine Fisheries Service.

Categories of EFH are listed in Table 3. There are no Estuarine Scrub/Shrub Mangroves, Oyster Reefs & Shell Banks, Intertidal Flats, Palustrine Emergent & Forested Wetlands, Aquatic Beds, Creeks, Mud Bottoms, coral reefs, or *Sargassum* in the potential project impact areas. Impacts on the remaining habitat categories that are in or directly adjacent to the potential project impact areas are discussed below.

Habitat Areas of Particular Concern (HAPC) The Fishery Management Plan Amendments of the SAFMC also identify categories of HAPC, which are listed in Table 3. While all of these habitat categories occur in waters of the southeastern United States, some are not located in the immediate project vicinity or the project impact zone. These include estuarine scrub/shrub mangroves which require a more tropical environment and several areas that are geographically removed from the project area including:

a) Hoyt Hills, located in the Blake Plateau area in water 450-600 meters deep,
b) the Point, located off Cape Hatteras near the 200-meter contour,
c) Big Rock and Ten Fathom Ledge, both located about 20 miles east of the nearest proposed project area (Bogue Inlet)
d) *Sargassum* habitat (also listed in EFH areas above), located on the continental shelf, in the Sargasso Sea, and in the Gulf Stream
e) hermatypic (reef-forming) coral habitat and coral reefs ((also listed in EFH areas above), located in the gulf stream area off the NC coast
f) sandy shoals off Cape Hatteras, Cape Lookout, and Cape Fear, located at least 10 miles offshore.

Impacts on the remaining habitat categories that are potentially present in the project vicinity are discussed below.

Table 3. Categories of Essential Fish Habitat and Habitat Areas of Particular Concern in the Project Vicinity and Potential Impacts.

ESSENTIAL FISH HABITAT	Potential Presence		Potential Impacts	
Estuarine Areas	**In / Near Project Vicinity**	**Project Impact Area**	**Dredge Plant Operation**	**Sediment Disposal Activities**
Estuarine Emergent Wetlands	yes	yes	no	insignificant
Estuarine Scrub / Shrub Mangroves	no	no	no	no
Submerged Aquatic Vegetation (SAV)	yes	yes	insignificant	insignificant
Oyster Reefs & Shell Banks	yes	no	no	no
Intertidal Flats	yes	no	no	no
Palustrine Emergent & Forested Wetlands	no	no	no	no
Aquatic Beds	yes	yes	insignificant	insignificant
Estuarine Water Column	yes	yes	insignificant	insignificant
Seagrass	yes	yes	insignificant	insignificant
Creeks	yes	no	no	no
Mud Bottom	yes	no	no	no
Marine Areas				
Live / Hard Bottoms	nearshore ocean	no	no	no
Coral & Coral Reefs	distant offshore	no	no	no
Artificial / Manmade Reefs	>1 mile away	no	no	no
Sargassum	distant offshore	no	no	no
Water Column	yes	yes	insignificant	insignificant
GEOGRAPHICALLY DEFINED HABITAT AREAS OF PARTICULAR CONCERN				
Area - Wide				
Council-designated Artificial Reef Special Management Zones	no	no	no	no
Hermatypic (reef-forming) Coral Habitat & Reefs	distant offshore	no	no	no
Hard Bottoms	nearshore ocean	no	no	no
Hoyt Hills	distant offshore	no	no	no
Sargassum Habitat	distant offshore	no	no	no
State-designated Areas of Importance of Managed Species (PNAs)	yes	yes	insignificant	insignificant
Submerged Aquatic Vegetation (SAV)	yes	yes	insignificant	insignificant
North Carolina				
Big Rock	distant offshore	no	no	no
Bogue Sound	yes	yes	insignificant	insignificant
Pamlico Sound at Hatteras / Ocracoke Islands	yes	yes	insignificant	insignificant
Cape Fear sandy shoals	distant offshore	no	no	no
Cape Hatteras sandy shoals	distant offshore	no	no	no
Cape Lookout sandy shoals	distant offshore	no	no	no
New River	yes	yes	insignificant	insignificant
The Ten Fathom Ledge	distant offshore	no	no	no
The Point	distant offshore	no	no	no

Essential Fish Habitat areas are identified in Fishery Management Plan Amendments for the South Atlantic and Mid-Atlantic Fishery Management Councils. Geographically Defined Habitat Areas of Particular Concern are identified in Fishery Management Plan Amendments affecting the South Atlantic Area. Areas listed in this table were derived from Essential Fish Habitat: A Marine Fish Habitat Conservation Mandate for Federal Agencies. February 1999 (Revised 10/2001) (Appendices 4 and 5).

Estuarine Emergent Wetlands Except for the section of the AIWW between Bear Inlet and Browns Inlet, no impacts to estuarine emergent wetlands are anticipated. Between Bear Inlet and Browns Inlet, potential impacts are discussed above in Section 6.01 "Vegetation and Wildlife".

Submerged Aquatic Vegetation (SAV) (including Seagrass) SAV frequently populate waters having low rates of sediment accumulation and calm currents. While the proposed work would occur in the vicinity of known SAV habitat, the rapid accumulation of sand characteristic of the development of such shoals likely precludes the presence of mature or extensive SAV populations within the areas to be dredged. SAV do no occur in the nearshore areas adjacent to the ocean beaches of North Carolina, therefore the disposal of material in nearshore sites by special purpose dredges would not impact SAV. The nature of sidecast dredging involves a discharge adjacent to the area being dredged. When possible, the use of a sidecast dredge will include positioning of the discharge pipe into the deepest water. Conditions that would preclude this would be if winds and/or currents would redeposit this material back into the recently dredged area. The decision as to whether this positioning can be done will be left up to the dredge captain, but the need to avoid deposition in shallow water to the maximum extent practicable will be emphasized each time a sidecast dredge is used.

If SAV are present within the sidecast dredge's deposition area, they could be impacted. However, effluent from the dredge is expected to rapidly dissipate, and the quantity of material is anticipated to be less than that occurring in past emergency dredging scenarios due to the proposed project's preemptive removal of shoals before they become too large. Any impacts to SAV are anticipated to be minimal, temporary, and short-lived.

Impacts on the Estuarine and Marine Water Columns The potential water quality impacts of dredging and disposal are addressed in Section 6.05. Dredging and disposal operations conducted during project construction may impact the estuarine and marine water columns in the immediate vicinity of the discharge; either adjacent to the dredging project in the case of sidecast dredge use or adjacent to the nearshore disposal area in the case of special purpose dredge use. These impacts may include minor and short-term suspended sediment plumes and related turbidity, as well as the release of soluble trace constituents from the sediment. Outside the project area, turbidity increases resulting from the actual dredging would be less than 25 NTUs and are, therefore, considered insignificant.

Scientific data are very limited with regard to the effects of placement of dredged material on fishery resources. These effects may be similar, on a smaller scale, to the effects of storms; storm effects may include increased turbidity and sediment load in the water column and, in some cases, changes in fish community structure (Hackney et al., 1996).

Placement of dredged material in nearshore disposal area could temporarily affect fishery resources and EFH through increases in turbidity and sedimentation that, in turn, may create localized stressful habitat conditions and may result in temporary displacement of fish and other biota. However, as the amount of disposal will be less than 300 cubic yards at a time, mobile biota, including juvenile and adult fish, should be able to relocate outside the more stressful conditions of the proposed action.

Effluent from sidecast dredges would result in temporary elevation of turbid water quality. Because of the sandy nature of the material and the locations in which disposal would occur, elevations of turbidity would be expected to be temporary, minimal, and quickly dissipated.

Overall water quality impacts resulting from all three alternatives would be short-term and minor. Living estuarine and marine resources dependent upon good water quality are not expected to experience more than minimal, temporary adverse impacts due to water quality changes.

Impacts on Hard Bottoms Of special concern in the offshore area are hardbottoms, which are localized areas, not covered by unconsolidated sediments and where the ocean floor is hard rock. Hardbottoms are also called "live bottoms" because they support a rich diversity of invertebrates such as corals, anemones, and sponges that are refuges for fish and other marine life. They provide valuable habitat for reef fish such as black sea bass, red porgy, and groupers. Hardbottoms are also attractive to pelagic species such as king mackerel, amberjack, and cobia. Along the North Carolina coast, hardbottoms are most abundant in the southern portion of the state, and substantial amounts of low-relief hardbottoms occur off Brunswick County, generally more than one mile offshore. All maintenance dredging would be located within existing, routinely maintenance dredged channels, and nearshore disposal would occur in existing disposal areas. Nearshore disposal would not impact hardbottoms.

Impacts to Artificial Reefs The NCDMF oversees the NC Artificial Reef Project (NCARP) and lists 33 artificial reefs in the ocean waters offshore of the North Carolina coast and 7 estuarine artificial reefs in the Albemarle and Pamlico Sounds and their connecting tributaries. None of the artificial reef sites are within one mile of any of the proposed dredging sites. Neither dredging nor disposal resulting from any of the three alternatives would impact NCARP reefs.

Impacts on Bogue Sound One of the proposed shoal dredging locations includes Bogue Inlet, the approximate 12,200-foot long channel from Bogue Inlet to the AIWW, and an approximate 5,550-foot long portion of the AIWW. Work would be conducted within the existing maintained navigation channels and only when a shoal has formed. Any impacts to the HAPC resulting from any of the three alternatives would be minimal, temporary, and short term.

Impacts to Pamlico Sound at Hatteras/Ocracoke Islands The preferred project includes shoal dredging in and around Hatteras and Ocracoke Inlets. All work is to be confined to existing Federally maintained channels, in highly dynamic ecosystems where sedimentation is active enough to rapidly form sand shoals. Dredging by special purpose dredge would entail the disposal of material in nearshore disposal areas. There are no nearshore disposal areas in the vicinity of either of these inlets; therefore, resource agency coordination would be required for any proposed creation of such an area. Unless disposal in a distant location is intended, the use of a sidecast dredge is the likely method of shoal dredging that would occur in the near future. The volume of dredged material discharged by the sidecast dredge, in addition to the location of the dredging would result in minimal, short-term impacts to the HAPC within Pamlico Sound at Hatteras/Ocracoke Islands.

Impacts to New River One of the proposed shoal dredging locations includes New River Inlet, the AIWW at the Inlet crossing, and approximately 16,650 linear feet of the River (from the AIWW to Pollock's Point). Work would be conducted within the existing maintained navigation channels and only when a shoal has formed. Any impacts to the HAPC would be minimal, temporary, and short term.

Impacts on State-designated Areas Important for Managed Species Primary Nursery Areas (PNAs) are designated by the NC Marine Fisheries Commission and are defined by the State of North Carolina as tidal saltwater portions of the estuarine system, which, for reasons such as an abundance of food, good cover, suitable bottom type, lower salinity, favorable temperature, and other factors, provide essential habitat for the initial post-larval development and a major portion of the early juvenile life cycle of economically important seafood species (including finfish, shellfish, and crustaceans) (15 NC Administrative Code 3B .1405).

To protect juveniles, many commercial fishing activities are prohibited in these waters; including the use of trawl nets, seine nets, dredges or any mechanical methods used for taking clams or oysters.

Of the 11 locations for dredging proposed in the EA, Shallotte River, Lockwoods Folly Inlet and River, Carolina Beach Inlet area, Topsail Sound, New River and New River Inlet (except the marked/designated New River Inlet channel), and Bogue Inlet are located in or adjacent to designated PNAs.

The proposed dredging would occur within routinely dredged navigation channels that have rapid accumulations of sand. The scope of intended work for the preferred alternative and the no-action alternative do not involve the use of large dredges, although the dredging itself would not impact PNAs. Because proposed dredging is dependent upon the presence of shoals, work could be performed at any time of the year. Special purpose dredges would discharge material in nearshore disposal areas

adjacent to ocean beaches, outside designated PNAs. Sidecast dredges would discharge material adjacent to the area being dredged. Due to the nature of the material being dredged and the fact that the proposed locations are routinely dredged, impacts to PNAs would be minimal, temporary, and short term.

Impacts on other Habitat Areas of Particular Concern (HAPC) Tidal inlets comprise HAPC for several important species, including the planktonic larvae of brown shrimp, white shrimp, pink shrimp, as well as the eggs and larvae of red drum. Therefore, maintenance shoal dredging conducted in the early spring in the inlets would likely impact the early life stages of these species through entrainment by suction dredging. While individual mortality is the result, population level impacts are considered to be insignificant, as is explained in Section 6.02.04 “Impacts of Larval Entrainment“ below.

The surf zone represents HAPC for adult bluefish and red drum that feed extensively in this portion of the ocean. Disposal operations along the beach can result in increased turbidity and mortality of intertidal macrofauna that serves as food organisms for these and other species. Therefore, feeding activities of these species may be interrupted in the immediate area of nearshore placement. However, these mobile species are expected to temporarily relocate to other areas as the work proceeds along the disposal areas. Once the disposal operation is completed, physical conditions in the impact zone quickly recover and biological recovery soon follows. Surf-feeding fish can then resume their normal activities in these areas. Therefore, these impacts are considered temporary and minor.

Impact Summary for Essential Fish Habitat As a result of the dynamic nature of the areas to be dredged, including continual water and sediment movement from tides, storms, winds, and ongoing navigation, in addition to the sandy nature of the dredged material and the past and expected future routine dredging of these areas, neither of the three alternatives would cause any significant adverse impacts to EFH, HPAC, or EFH species. Impacts that do occur would be expected to be minor, temporary, and short-lived on an individual and cumulative effects basis. As a result of these minimal impacts, mitigation to offset impacts would not be required.

6.02.02 Surf zone fishes The surf zone fisheries of the project areas have not been extensively studied. Surf zone fisheries are typically fairly diverse, with 52 species having been identified from North Carolina (Ross 1996, Ross and Lancaster 1996). The importance of surf zone habitat to maintain healthy stocks of certain species has only recently come under investigation. Preliminary studies by Ross and Lancaster (1996) indicate that juveniles of certain species may have high site fidelity and extended residence time in the surf zone, indicating that the surf zone may be functioning as a nursery area. Two species in particular, the Florida pompano (*Trachinotus carolinus*) and gulf kingfish (*Menticirrhus littoralis*) seem to use the surf zone exclusively as a juvenile nursery area.

Use of a sidecast dredge with both the preferred alternative and the no action alternative, as well as discharge of dredged material in a diked disposal area by a commercial hydraulic pipeline dredge would have no impact on surf fish. Use of a special purpose dredge with nearshore disposal and beach disposal by a commercial hydraulic pipeline dredge would impact surf zone fish. However, these impacts would be minor, temporary, and short-lived due to the small amount of discharged material.

6.02.03 Larval fishes Inlets are important passageways for the larvae of many species of commercially or ecologically important species of fish. These larvae, hatched in the open ocean, migrate inshore and enter into the sounds through inlets. The sounds, with their abundant marshes, creeks, and sheltered areas, serve as nursery habitat where the young fish undergo rapid growth before returning to the ocean. The methods these fish larvae use to traverse large distances over the open ocean and find inlets are uncertain. Both passive and active transport methods are likely employed. Various environmental cues such as salinity, depth, temperature, swells, etc., may be important in directing these movements.

The greatest threat to larval fish (and other marine and estuarine organisms) is the potential for entrainment during dredging. Entrainment is defined and discussed below.

The impacts to larval fish associated with the discharge of dredged material resulting from any of the three alternatives would be minor, temporary, and short-lived.

6.02.04 Impacts of larval entrainment Larvae and early juvenile stages of many species pose a greater concern that adults because their powers of mobility are either absent or poorly developed, leaving them subject to transport by tides and currents. This physical limitation makes them potentially more susceptible to entrainment by an operating dredge. Organisms close to the dredge intake may be captured by the effects of its suction and may be entrained in the flow of dredged sediment and water. As a worst-case, it may be assumed that entrained animals experience 100 percent mortality, although some small number may survive. Susceptibility to this effect depends upon avoidance reactions of the organism, the efficiency of its swimming ability, its proximity to the intake, the pumping rate of the dredge, and possibly other factors. Behavioral characteristics of different species in response to factors such as salinity, current, and diurnal phase (daylight versus darkness) are also believed to affect their concentrations in particular locations or strata of the water column. Any organisms present near the channel bottom would be closer to the dredge intake and, therefore, subject to higher risk of entrainment

The biological effect of hydraulic entrainment has long been a subject of concern and numerous studies have been conducted nationwide to assess its impact on early life stages of marine resources, including larval oysters (Carriker et al., 1986), post-larval brown shrimp (Van Dolah et al., 1994), striped bass eggs and larvae (Burton et al., 1992), juvenile salmonid fishes (Buell, 1992), and Dungeness crabs (Armstrong et al., 1982). These studies indicate that the primary organisms subject to entrainment by hydraulic dredges are bottom-oriented fishes and shellfishes. The significance of

entrainment impact depends upon the species present; the number of organisms entrained; the relationship of the number entrained to local, regional, and total population numbers; and the natural mortality rate for the various life stages of a species. Assessment of the significance of entrainment is difficult, but most studies indicate that the significance of impact is low. Reasons for low levels of impact include: (1) the very small volumes of water pumped by dredges relative to the total amount of water in the vicinity, thereby impacting only a small proportion of organisms, (2) the extremely large numbers of larvae produced by most estuarine-dependent species, and (3) the extremely high natural mortality rate for early life stages of many fish species (natural larval mortalities may approach 99 percent [Dew and Hecht, 1994; Cushing, 1988]).

In summary, only a very small percentage of marine and estuarine larvae are subject to entrainment; therefore, dredging conducted as part of the any of the three alternatives is not expected to significantly impact these life forms at local or regional population levels.

6.02.05 Benthic Resources - Beach and Surf Zone The intertidal zone offshore is considered as being the area between mean low tide landward to the high tide mark. This area serves as habitat for invertebrate communities adapted to the high-energy sandy beach environment. Organisms in the intertidal community include mole crabs, coquina clams, amphipods, isopods, and polychaetes. Although none of these species are commercially important, they constitute considerable biomass and serve as an important food source for surf-feeding fish and shore birds.

Nearshore disposal associated with the preferred alternative and the no action alternative would have only indirect impacts to these resources. These indirect impacts would be minimal based on the small amount of material disposed, the sandy nature of the material, the short-term and intermittent occurrence of any disposal, and the distance of the discharge from the intertidal zone. Impacts from beach disposal associated with the contracting of commercial dredge companies alternative would also be minimal due to the short-term and intermittent nature of the work, the minimal amount of material discharged, and the overall temporary nature of impacts associated with beach disposal.

6.03 Benthos Benthic resources in the proposed dredge areas are limited as a result of the dynamic nature of the areas and rapid accumulation of sediments. Routine dredging also limits the presence of mature and extensive populations of benthic species. Varied numbers of colonizing species are likely present, specific numbers being dependent upon the occurrence of the last dredging event and the subsequent sedimentation rate. Undertaking shoal dredging at the subject locations by any of the three alternatives would result in impacts to benthos, however, impacts are not anticipated to be significant or long term due to the nature of the areas, the occurrence of routinely contracted maintenance dredging, and the moderate to high sedimentation rates.

6.04 Threatened and Endangered Species The proposed work has been reviewed for compliance with the Endangered Species Act of 1973, as amended. The Corps prepared a Biological Assessment (BA) dated July 1, 1998, for the use of the sidecast and hopper dredges, now referred to as special purpose, in Coastal US Waters. The BA addresses the following species:

Common name	Scientific Name	Federal Status
Finback whale	*Balaenoptera physalus*	Endangered
Humpback whale	*Megaptera novaeangliae*	Endangered
Right whale	*Eubaleana glacialis*	Endangered
Sei whale	*Balaenoptera borealis*	Endangered
Sperm whale	*Physeter catodon*	Endangered
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered
Leatherback sea turtle	*Dermochelys coriacea*	Endangered
Green sea turtle	*Chelonia mydas*	Threatened
Loggerhead sea turtle	*Caretta caretta*	Threatened
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered
Shortnose sturgeon	*Acipenser brevirostrum*	Endangered

The Corps' BA concluded that the continued use of these dredges is not likely to adversely affect any listed species. The National Marine Fisheries Service provided a Biological Opinion dated March 9, 1999, that concurred with the Corps' conclusion. Both the BA and the BO are included in Attachment B. Please note that the US Army Corps of Engineers no longer owns or operates the sidecast dredge "SCHWEIZER" or the survey boat "WANCHESE".

Three additional federally listed species are present within the proposed project areas:

Florida Manatee	*Trichechus manatus*	Endangered
Piping plover	*Charadrius melodus*	Threatened
American alligator	*Alligator mississipiensis*	Threatened (S/A)

(a) Florida Manatee The manatee is only an "occasional seasonal visitor to North Carolina waters", with populations that are "presumed to be low" (Clark, 1987). However, scattered records of this species in the region span all seasons, as evidenced by a dead individual found in the Cape Fear River in the late winter of 1986.

Schwartz (1995) gives nine records of the manatee in Dare County: from the Atlantic Ocean, Collington Bay, Roanoke Island (2); Wanchese, Rodanthe (2); Stumpy Point; and the sound near Hatteras. All nine records fall between late June and the end of October.

There is no information available which would allow the prediction of the manatee's occurrence at any given site at any given time. Therefore, while manatees have been reported near some of the proposed project areas, there is no reliable way of predicting its occurrence there again during any given time period. It is expected that the likelihood of it occurring in the area is very low.

During previous dredging emergencies, USFWS has recommended compliance with all "GUIDELINES FOR AVOIDING IMPACTS TO THE WEST INDIAN MANATEE" (Attachment C). For all dredging that occurs between June and October, the dredges would comply with all precautions in the guidelines to avoid impacts to manatees. Due to its rare occurrence in the area, the nature of the proposed construction activities, and compliance with the guidelines, the project as currently proposed is not likely to adversely impact the manatee.

(b) Piping Plover The piping plover is a winter resident along the beaches of North Carolina. The species is known to nest in low numbers in widely scattered localities on North Carolina's beaches.

On June 6, 2001, U.S. Fish and Wildlife Service listed critical habitat for the piping plover. Within North Carolina, critical habitat includes oceanfront beaches and lands adjacent to inlets. Critical habitat has been designated for beaches and sandy areas adjacent to Shallotte, Lockwoods Folly, Carolina Beach, Topsail, Bogue, Ocracoke, Hatteras, and Oregon Inlets.

The preferred alternative involves dredging to be conducted as soon as possible following detection of a navigation-impeding shoal. All proposed work, including the deposition of dredged material, would occur waterward of mean low water. Noise from dredges would be audible to birds, however, such noise would be minimal due to the small sizes of the dredges, and would be short-term. Therefore, the project as currently proposed is not likely to adversely impact the piping plover.

(c) American Alligator The American alligator is listed as threatened due to similarity of appearance based on its similarity to the listed American Crocodile. The American Alligator is therefore not considered further in this EA as the species itself is not actually threatened.

In summary, based on the above analysis and provided that all appropriate protocols are followed, the Corps has determined that the preferred alternative and the no action alternative are not likely to adversely affect any listed species. Contracting a commercial hydraulic pipeline dredge would require coordination with the resource agencies with regard to potential impacts to sea turtles and piping plovers and an additional species, the seabeach amaranth.

6.05 Water Quality The N.C. Division of Water Quality has classified all waters in areas to be dredged as SA (suitable for shellfishing) except for the Atlantic Ocean, which is classified as SB (suitable for primary recreation). Many of the waters are also considered HQW, or High Quality Waters. Expanded definitions of water classifications may be obtained by visiting the following website address:

http://h2o.enr.state.nc.us/admin/rules/rb040103.pdf

The project locations are located in dynamic areas and are routinely maintenance dredged. In addition, the material to be dredged is sandy and would settle rapidly following cessation of work. The relatively minor amount of dredging and dredged material disposal anticipated from all three alternatives would result in only temporary and minimal impacts to water quality.

6.06 Cultural Resources In the years following passage of the National Historic Preservation Act (1966) and the Abandoned Shipwreck Act (1987), the Wilmington District and the NC Division of Archives and History evaluated sensitive inlets for potential impacts of dredging and nearshore dredged material disposal. These initial studies included dredged and nearshore disposal areas associated with the preferred alternative, and considered potential cultural resource impacts to the authorized project depth. While these proposed areas are routinely maintained by contract dredging to the authorized project depth, the proposed shoal removal dredging would be performed only to a depth suitable to removal of the shoal. This would rarely if ever be the authorized project depth.

The federally maintained channels in the inlet areas (Lockwoods Folly, Carolina Beach, Topsail, New River, Bogue, Ocracoke, and Oregon) follow existing deep water. The deep water shifts locations within these inlet areas routinely. Numerous shipwrecks lie within and just offshore of these inlets, and shifting channels are known to routinely cross shipwreck sites. Dredging a shoal in these channels could result in damage to the shipwreck in addition to damage to the dredge. The North Carolina Department of Cultural Resources (NCDCR) has been consulted on this project. By letter dated September 9, 2003, NCDCR requested the development of a Programmatic Agreement pursuant to Section 106 of the National Historic Preservation Act, for an inlet monitoring program to better avoid historical shipwrecks in the shifting inlets. This Programmatic Agreement will specify updated inlet and disposal area mapping, periodic resurvey of known sensitive areas, and a monitoring plan.

Deposition of dredged material in nearshore disposal areas allows for sand to remain in the littoral system and be moved down shore or onto the beach by prevailing currents. The nearshore disposal areas associated with the preferred alternative are not routinely impacted, but the preferred alternative would only result in the deposition of a relatively small amount of material (less than 20,000 cubic yards in most cases). While not expected to occur in any of the proposed disposal areas, burying shipwrecks is an acceptable method of preservation. Based on this rationale, there would be no impacts to cultural resources as a result of nearshore disposal.

Sidecast dredging discharges would occur near the dredge areas. Similar to the above description, an addition of material to a dynamic aquatic environment would not result in adverse impacts to cultural resources.

Based on the nature and locations of the proposed work, the implementation of the proposed Programmatic Agreement, and coordination with the NCDCR, there would be no impacts to cultural resources resulting from any of the three alternatives.

6.07 Sediments, Contamination, and Dangerous Debris All dredging associated with the three alternatives would occur in routinely dredged areas in dynamic environments, and dredged sediments would be sandy. Because of these dynamic, energetic conditions and sediment characteristics, contaminated sediments are not likely to be present. A 404(b)(1) analysis is included as Attachment D.

The Bear-to-Brown's Inlet portion of the AIWW is part of the U.S. Marine Corps (USMC) N-1/BT-3 impact area and could contain unexploded ordnance. Prior to any proposed shoal removal dredging in this area, the appropriate ordnance detection personnel at USMC would be contacted to locate and remove unexploded ordnance.

6.08 Air Quality The project is in compliance with Section 176 (c) of the Clean Air Act, as amended (CAA). The direct and indirect emissions from the project fall below the prescribed de minimus levels; therefore, none of the three alternatives are anticipated to create any adverse effect on the air quality of the project areas.

6.09 Aesthetics The project areas are frequented predominantly by boat traffic. For all three alternatives, the majority of the shoal removal work would be completed in less than 7 days; therefore, aesthetics would be affected only during the time of actual dredging. These impacts would be minimal. Following completion of shoal removal, aesthetics would be unchanged from conditions existing prior to undertaking the project.

6.10 Other Significant Resources

Section 122 of Public Law 91-611 identifies other significant resources that should be considered during project development. These resources, and their occurrence in the study area, are described below.

a. Air, noise and water pollution: Air quality is discussed in Section 6.08 above. Noise would be a factor associated with all three alternatives due to the locations of the project sites and the presence of boat traffic, waves, and recreational activities that commonly occur there. While actual dredging would elevate noise levels somewhat, each dredging event would be short term and any elevated noise levels would be noticeable only within a very localized area around the project site. Water quality is discussed in Section 6.05, above.

b. Man-made and natural resources, aesthetic values, community cohesion and the availability of public facilities and services: Man-made resources in the project area, other than the federally constructed/maintained navigation projects, consist of boats and other watercraft, and navigation. With all three alternatives, these would be temporarily impacted only during times of actual construction, and these impacts would be short-term. However, without the project, impacts to these resources could be considerably more severe. Natural resources are discussed in Sections 6.00 through 6.08 above. Aesthetics are discussed in Section 6.09 above.

c. Employment, tax and property value: All three alternatives provide few if any types of employment for any of the proposed dredge area. Waterfront property values in the vicinity of the project are high with regard to waterfront property, but these properties and their values would not be impacted as a result of dredging other than benefits associated with improved and maintained safe navigability. Project construction should not affect employment, taxes, or property values.

d. Displacement of people, businesses and farms: No people, businesses or farms will be displaced by any of the three alternatives.

e. Community and regional growth: Because all three alternatives involve only temporary, periodic, and short-term dredging, there would be no affect on the growth climate of any of the project areas.

f. Coastal Management Program. Based on information presented in this EA, it is our opinion that the use of government owned sidecast and shallow-draft hopper dredges to remove shoals from the federally maintained waterways locations addressed is consistent with the approved Coastal Management Program of the State of North Carolina. The EA is being furnished to North Carolina Division of Coastal Management with a request for consistency.

7.00 EXECUTIVE ORDERS

E. O.11593 (Protection and Enhancement of the Cultural Environment). The proposed work has been evaluated under Executive Order 11593, and it is not an undertaking affecting potential National Register sites.

E.O. 11990 (Protection of Wetlands) - The proposed project would not impact any areas defined as wetlands under Executive Order 11990.

E.O. 11988 (Floodplain Protection) - The proposed project would not involve any impacts to areas defined as a flood plain.

E.O. 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low Income Communities and Low Income Populations) - The proposed action would not adversely affect any minority communities or low- income populations. All

work would be confined to existing federally maintained navigation projects and near shore areas adjacent to ocean beaches. Existing flooding problems in the watershed would not be aggravated by any of the proposed work.

E. O. 13405 (Protection of Children From Environmental Health Risks) - This Executive Order mandates Federal agencies identify and assess environmental health and safety risks that may disproportionately affect children as a result of the implementation of Federal policies, programs, activities, and standards. The preferred alternative would not result in any increased safety risks during actual dredging or upon its completion.

8.00 MITIGATION

No mitigation is proposed as a part of this project as its construction would result in minimal and temporary environmental impacts, while improving navigational safety.

9.00 POINT OF CONTACT

Any comments or questions regarding this EA should be directed to Mr. Jeff Richter, CESAW-TS-PE, U.S. Army Engineer District, PO Box 1890, Wilmington, North Carolina, 28402-1890, telephone (910-251-4636) or email: jeffrey.h.richter@usace.army.mil.

10.00 COORDINATION

10.01 Scoping

Emergency dredging of shoals involves close coordination with Federal and State resource agencies. Upon initial identification of the proposed shoal dredging areas, a scoping letter describing the project, identifying the locations, and announcing a scoping meeting, was mailed to the agencies on April 14, 2003. The scoping meeting was held on May 7, 2003, and was attended by representatives from the US Fish and Wildlife Service, National Marine Fisheries Service, US Marine Corps at Camp Lejeune, NC Division of Coastal Management, NC Division of Marine Fisheries, NC Wildlife Resources Commission, NC Division of Water Quality, and NC State Ports. The US Environmental Protection Agency was unable to attend but commented by telephone. Based on the scoping meeting, written comments on the preferred alternative were requested by August 1, 2003, for consideration in the preparation of this EA. Written comments were received from USFWS, NMFS, NC Division of Water Quality, and NC Department of Cultural Resources. Comments were received telephonically from the US Marine Corps Base, Camp Lejeune. All comments have been addressed in this EA.

Representatives from the NCDCR met with Corps representatives on August 20, 2003, to discuss potential impacts of the project on buried and sunken archaeological and cultural resources within the project areas. By letter dated September 9, 2003, NCDCR

submitted comments and recommendations. These comments and recommendations have been addressed in this EA and incorporated into the project scope.

10.02 List of Recipients

The following agencies and individuals have been provided a copy of this Environmental Assessment.

REPRESENTATIVES

Honorable Mike McIntyre
Honorable Walter B Jones
Honorable John Edwards
Honorable Elizabeth Dole

FEDERAL AGENCIES

U.S. Environmental Protection Agency, Office of
Federal Activities
U.S. Environmental Protection Agency, Region IV
Forest Service, USDA
HUD, Atlanta Regional Office
Executive Director, Advisory Council on Historic
Preservation
Environmental Conservation Office, Department of
Commerce, NOAA
Center of Disease Control
Beaufort Marine Fisheries Center, National Marine
Fisheries Service
Director, Office of Environmental Affairs, Department of the Interior
Raleigh Field Office, U.S. Fish and Wildlife Service
Commander, Fifth Coast Guard District
Federal Highway Administration
Asheville Field Office, U.S Fish and Wildlife Service
Office of the Solicitor, Energy and Resources,
US Department of the Interior
State Conservationist, Natural Resources
Conservation Service, USDA
Area Conservationist, Natural Resources
Conservation Service, USDA
Director, Office of Environmental Compliance,
Department of Energy
Regional Director, National Park Service
National Park Service, Washington, DC

STATE AGENCIES

North Carolina State Clearinghouse
N.C. Division of Coastal Management

LOCAL GOVERNMENT

Brunswick County Board of Commissioners
New Hanover County Board of Commissioners
Pender County Board of Commissioners
Onslow County Board of Commissioners
Carteret County Board of Commissioners
Hyde County Board of Commissioners
Dare County Board of Commissioners

INDEPENDENT GROUPS AND INDIVIDUALS

Conservation Council of North Carolina
Sierra Club Legal Defense Fund
Defenders of Wildlife
Fund for Animals
National Parks and Conservation Association
National Audubon Society, Southeastern Regional Office
North Carolina Wildlife Federation
National Wildlife Federation
North Carolina Environmental Defense Fund
North Carolina Coastal Federation
NC Fisheries Association
National Wildlife Refuge Association
Wilderness Society
Dr. Anne B. McCrary
Dr. Vince Bellis
Mr. Ray P. Brandi, Cape Fear Community College
Orrin Pilkey Ph.D.
Billy Edge
Robert Dean
John Babicz

11.00 FINDINGS

The use of the Corps' special purpose dredge "CURRITUCK" (or similar Corps' hopper dredge) and the sidecast dredge "MERRITT" (or similar Corps' sidecast dredge) to perform routine dredging of small and/or isolated shoals that pose a threat to safe navigation during periods when a normal dredging event is not scheduled is the preferred alternative because it: will allow the expeditious removal of shoals, thereby

restoring safe navigation, will have minimal and short-term environmental impacts, will be less costly than contracting commercial dredgers, and will avoid the need for swift coordination and response times associated with the emergency MOA.

The proposed action is not expected to significantly affect the quality of the human environments; therefore an Environmental Impact Statement is not required. If this judgment is confirmed through coordination of this EA, a Finding of No Significant Impact (FONSI) will be signed prior to initiation of the proposed action. The signed FONSI will be available to the public.

12.00 REFERENCES

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Mr. Layton Bedsole, Jr., Manager, Environmental Affairs, NC State Ports Authority, telephone (910) 790-2332. Personal communication, December 10, 2002.

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ATTACHMENT A

Emergency Dredging Memorandum of Agreement

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890

REPLY TO ATTENTION OF

November 10, 1986

Planning Division

Mr. S. Thomas Rhodes, Secretary
North Carolina Department of Natural
Resources and Community Development
Post Office Box 27687
Raleigh, North Carolina 27611-7687

Dear Mr. Rhodes:

Attached is a signed copy of the Memorandum of Agreement (MOA) between the Wilmington District and the North Carolina Department of Natural Resources and Community Development outlining the procedure that will be followed when it becomes necessary for the District to perform emergency dredging in the coastal zone of North Carolina.

The MOA was discussed with staff members of the Division of Coastal Management, the Division of Environmental Management, and other State review agencies, during the annual maintenance dredging coordination meeting in Morehead City on October 1, 1986. The MOA identifies the Division of Coastal Management as the lead agency for coordination of State agencies during emergency work, since that Division is responsible for all matters relating to Federal Consistency under Section 307 of the Federal Coastal Zone Management Act of 1972, as amended. If the MOA meets with your approval, please return a countersigned copy of the agreement for our files.

If you have any questions or need additional information, please contact Mr. Daniel Small of my Environmental Resources Branch, Water Quality Section, at (919) 343-4730.

Sincerely,

Paul W. Woodbury
Colonel, Corps of Engineers
District Engineer

Enclosure

Copies Furnished (w/encl):

Mr. David Owens, Director
Division of Coastal Management
North Carolina Department of Natural
Resources and Community Development
Post Office Box 27687
Raleigh, North Carolina 27611-7687

Mr. R. Paul Wilms, Director
Division of Environmental Management
North Carolina Department of Natural
Resources and Community Development
Post Office Box 27687
Raleigh, North Carolina 27611-7687

BCF (w/encl):
SAWCO-N/Holliday

SAWPD-EW/Small/an/4730
SAWPD-E/Correale
SAWPD/Saunders
SAWDX/Burch
SAWDD/LTC Miniclier
SAWDE/COL Woodbury/s
Mail
SAWPD Files
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MEMORANDUM OF AGREEMENT
BETWEEN
NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
AND
U.S. ARMY CORPS OF ENGINEERS, WILMINGTON DISTRICT
FOR
EMERGENCY DREDGING AND DISPOSAL, FEDERAL NAVIGATION PROJECTS

1. PURPOSE. This Memorandum of Agreement (MOA) between the State of North Carolina, Department of Natural Resources and Community Development, and the U.S. Army Corps of Engineers, Wilmington District, will allow the Wilmington District to perform emergency dredging that meets identified criteria within the coastal zone of the State. The MOA will allow the State to expedite its review of a project that meets the criteria so as to allow the District to perform the emergency work with State approval.

2. APPLICABILITY. This procedure is applicable to any authorized Federal navigation project that has an individual Section 401 (P.L. 95-217) water quality certificate or that can meet the requirements of any general water quality certificate issued by the North Carolina Division of Environmental Management.

3. CRITERIA. The emergency procedure will be implemented in those cases where a rapid response is required because of unpredictable shoals forming in an authorized Federal navigation channel. The channel must be one in which commercial tonnage is moved. No recreational projects will be considered except those where the U.S. Coast Guard contemplates closure of a channel to all navigation because of critical shoaling.

The Corps of Engineers' decision to declare an emergency shall be made based on the following evaluation:

a. the District has received complaints from users;

b. the basis of the emergency which is defined as follows: a situation which would result in an unacceptable hazard to life or navigation, a significant loss of property, or an immediate and unforseen significant economic hardship if corrective action is not taken within a time period less than the normal time needed under standard procedures;

c. a District survey shows that the authorized navigation channel has shoaled as a result of a recent and unexpected event, and normal maintenance dredging is not scheduled within the next 3 months;

d. the length of time the channel has been at the controlling depth shown by the most recent survey available;

e. the quantity of material that needs to be dredged to resolve the emergency;

f. the proposed disposal area;

g. the reason(s) why normal dredging/disposal coordination and contracting procedures are inadequate;

h. the administrative and contractual requirements that have to be met before the work can proceed; and

i. the alternative(s) to declaring an emergency.

Based on the above evaluation, a determination will be made by the District Engineer that circumstances surrounding an authorized project require emergency action. The District Engineer will be responsible for requesting approval of the emergency action from the Division Engineer (33 CFR 209.145(f)(4)).

4. DISPOSAL METHODS. Dredged material disposal in emergency situations will be in accordance with an individual water quality certification or a general water quality certification. Disposal under general water quality certificate No. 1332 dated 18 June 1979 for sidecasting or other dredging with open water disposal adjacent to the channel will be considered:

a. only if an upland disposal area is not available or within reasonable distance; or

b. an upland area is available but a pipeline dredge cannot be obtained within a reasonable time because of availability, distance from the emergency site, or time required for contractual procedures.

5. PROCEDURES. The District staff will be responsible for informing the point of contact or the designated alternate in the Division of Coastal Management (via telephone) that the necessary approval has been received from the Division Engineer for work to proceed under emergency authority. The District staff will also be responsible for notifying and coordinating with Federal agencies.

The North Carolina Division of Coastal Management will be responsible for designating a single point of contact for coordination of emergency actions with the District and State agencies and the establishment of a single State position on each project.

Once an emergency action has been declared by the Corps of Engineers, the Division of Coastal Management will be responsible for coordinating State review (via telephone), resolving any conflicts, and obtaining a State position.

A formal consistency determination under Section 307(c)(1) and (2) of the Coastal Zone Management Act will be waived. All emergency work will be conducted in a manner consistent to the maximum extent practicable with policies and guidelines of the North Carolina Coastal Management Program for dredging and dredged material disposal. Waiver of the consistency determination will not relieve the District of obtaining or complying with other applicable State or Federal environmental permits or approvals.

On receipt of State verbal approval (via telephone) from the Division of Coastal Management, the District will issue a public notice required by 33 CFR 209.145(g), Section 404(a) of P.L. 95-217, and 33 CFR 209.145 (f)(4). State verbal approval will be confirmed in writing to the District. The emergency work will be performed concurrently with the issuance of the public notice.

6. State agencies to be contacted by the Division of Coastal Management are:

a. North Carolina Department of Natural Resources and Community Development

-Division of Marine Fisheries

-Division of Environmental Management

-Office of Environmental Planning and Assessment

-Division of Land Resources

b. North Carolina Department of Cultural Resources

-Division of Archives and History

c. North Carolina Wildlife Resources Commission

d. North Carolina Department of Administration

-State Property Office

e. North Carolina Department of Human Resources

-Shellfish Sanitation Branch

-Health Services Section

7. Federal agencies to be contacted by the District:

a. U.S. Environmental Protection Agency, Region IV, Environmental Impact Assessment Branch, NEPA review staff

b. U.S. Fish and Wildlife Service, Raleigh Field Office, Division of Ecological Services and Asheville Endangered Species Field Office

c. National Marine Fisheries Service, Habitat Conservation Division, Beaufort, N.C.

12/19/86
Date

S. Thomas Rhodes
Secretary, N.C. Department of Natural Resources and Community Development

15 Nov 86
Date

District Engineer, Wilmington District

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, FL 33702
(727) 570-5312; FAX 570-5517

F/SER3:EGH:ts

MAR 9 1999

Mr. C. E. Shuford, Jr., P.E.
Chief, Technical Services Division
Wilmington District Corps of Engineers
P.O. Box 1890
Wilmington, NC 28402-1890

Dear Mr. Shuford:

This letter responds to your letter to me dated July 1, 1998 and enclosed Biological Assessment (BA). Your BA, submitted pursuant to Endangered Species Act (ESA) section 7 consultation requirements, assesses the use of the U.S. Army Corps of Engineers (COE) sidecast dredges FRY, MERRITT and SCHWEIZER, and the split-hull hopper dredge CURRITUCK in United States coastal waters. Additional, revised information was submitted to this office on March 2, 1999.

Proposed Action

This consultation addresses the use of the sidecast dredges FRY, MERRITT and SCHWEIZER and the split-hull hopper dredge CURRITUCK, to maintain shallow, coastal inlet navigation channels along the eastern seaboard of the United States. These specialized dredge plants are currently used primarily by the Wilmington District Corps of Engineers at many locations in North Carolina but also occasionally elsewhere along the eastern seaboard. Normally, they are used in: 1) shallow coastal inlets which cannot be dredged safely or effectively with commercially available dredges, 2) during emergencies, or 3) when an urgent and compelling need exists for clearing out a navigation channel, such as periods when rapid shoaling has occurred, a navigation hazard may exist, and there is insufficient time to contract commercial dredges.

The sidecast dredges FRY and MERRITT each have two drag arms, one on each side, that vacuum the sediment through 10-inch intake pipes as the arms drag along the bottom. The sediment is pumped through a combined 12-inch discharge pipe that is above the water surface and perpendicular to the dredge. The SCHWEIZER is laid out similarly but its dredge suction pipes are 14 inches in diameter and combined discharge pipe is 16 inches in diameter. In all three dredges the discharge pipe extends about 60 feet beyond the side of the dredge. This pipe distance and force from the pumps generally results in the sediment being deposited 85 to 100 feet from the dredge. The sediment is discharged on the side of the channel where the predominant currents would tend to move the sediment away from the channel.

The split-hull hopper dredge CURRITUCK has drag arms similar to a sidecast dredge, but the sediment is pumped into the dredge's hopper. The water in the hopper is overflowed to provide an economic load of sand, since the dredged slurry entering the hopper contains about 20% sand and 80% water. Once the hopper is full of sand (about 300 cubic yards), the sediment is taken to nearshore ocean waters (normally 6 to 10 below feet mean low water) where the split-hull hopper is opened and the sediments are dumped.

These vessels operate year-round to dredge and maintain shallow navigation channels with depths between 4 feet and 14 feet below mean low water. Vessels operate without sea turtle deflectors on the dragheads, and have no screening or observers. Draghead suction is produced by use of dredge pumps averaging 350-horsepower, with a maximum horsepower of 400. The draghead sizes range from approximately 2 feet by 2 feet to 2 feet by 3 feet. The draghead openings are further subdivided on their undersides by gridded baffles, with openings ranging from about 5 inches by 5 inches to 5 inches by 8 inches. These baffles restrict the size of objects which can enter the dredge draghead.

Listed Species and Critical Habitat

Listed species under the jurisdiction of the NMFS that may occur in channels along the southeastern United States and which may be affected by dredging include:

THREATENED:
(1) the loggerhead turtle - *Caretta caretta*

ENDANGERED:
(1) the right whale - *Eubalaena glacialis*
(2) the humpback whale - *Megaptera novaeangliae*
(3) the green turtle - *Chelonia mydas*
Note: green turtles in U.S. waters are listed as threatened, except for the Florida breeding population which is listed as endangered.
(4) the Kemp's ridley turtle - *Lepidochelys kempii*
(5) the hawksbill turtle - *Eretmochelys imbricata*
(6) the shortnose sturgeon - *Acipenser brevirostrum*

Additional endangered species which are known to occur along the Atlantic coast include the finback (*Balaenoptera physalus*), the sei (*Balaenoptera borealis*), and sperm (*Physeter macrocephalus*) whales and the leatherback sea turtle (*Dermochelys coriacea*). NMFS has determined that these species are unlikely to be adversely affected by the proposed dredge vessel activities because they are unlikely to be encountered in the shallow, coastal inlet waters that typify the project areas.

Right whale critical habitat overlaps portions of the project area. There are five well-known habitats used annually by right whales including: 1) coastal Florida and Georgia, 2) the Great South Channel, east of Cape Cod, 3) Cape Cod and Massachusetts bays, 4) the Bay of Fundy, and 5) Browns and Baccaro Banks, south of Nova Scotia. The first three areas occur in U.S. waters and have been designated by NMFS as critical habitat (59 FR, 28793, June 3, 1994).

Biological information on the right whale and humpback whale is included by reference to the August 25, 1995 Biological Opinion on hopper dredging in the southeastern United States, and the NMFS recovery plans for right whales and humpback whales (NMFS 1991a; 1991b). The following discussions focus primarily on vessel interactions with whales.

Right Whales:
New information has recently become available on the right whale population. A progression of discussions and analysis has occurred during ESA section 7 consultations conducted in 1995 and 1996 on vessel and aircraft operations of the U.S. Coast Guard, and the prosecution of northeast Atlantic fisheries for American lobster and multi-species, concerning the population trend for the northern right whale. The current conclusion is that it remains unknown whether or not the population is showing a decline, or whether the population growth rate has remained at a constant rate of 2.5% or at a constant, but lower rate. The 1996 NMFS draft stock assessment report indicates that the size of this population may have been as low as 50 at the turn of the century, which suggests that the species may be showing signs of a slow recovery to the current estimate of 295. However, a recent statistical analysis based on current trends in right whale mortality predicts that the northern right whale population is doomed to extinction and calculates their extinction date as 2189 (Caswell *et al.* 1999 in press) . Other right whale researchers have expressed their doubts as to the efficacy of current conservation measures to prevent extinction of the northern right whale population (Slay 1999, personal communication). In any event, the current small population size combined with their low reproductive rate suggest that anthropogenic impacts may have a greater effect on this species than other endangered whales subject to the same impacts.

Anthropogenic causes of right whale mortality are discussed in detail in Kraus (1990) as well as in NMFS (1991a). Ship collisions and entanglements are the most common direct causes of mortality identified through right whale strandings. Twenty percent of all right whale mortalities observed between 1970 and 1989 were caused by vessel collisions/interactions with right whales. An additional 8% of these mortalities are suspected to have resulted from vessel collision.

As a result of the potential for interactions between vessels and right whales from December through March in the calving area off Georgia and northern Florida, aerial surveys funded by the COE, Navy and USCG have been implemented as the right whale early warning system. These surveys are conducted to identify the occurrence and distribution of right whales in the vicinity of ship channels in the winter breeding area, and to notify nearby vessel operators of whales in their path. Data collected during these surveys indicate that right whales are observed off Savannah,

Georgia, in December and March, and are relatively abundant between Brunswick, Georgia, south to Cape Canaveral from December through March. During early 1995, a right whale was also observed by shipboard observers off Morehead City, North Carolina.

Humpback Whales:
The Humpback Whale Recovery Plan (NMFS 1991b) identifies entanglement and ship collisions as potential sources of mortality, and disturbance, habitat degradation, and competition with commercial fisheries as potential factors delaying recovery of the species.

Until recently, humpback whales in the mid- and south Atlantic were considered transients. Few were seen during aerial surveys conducted over a decade ago (Shoop *et al.*, 1982). However, since 1989, sightings of feeding juvenile humpbacks have increased along the coasts of Virginia and North Carolina, peaking during the months of January through March in 1991 and 1992 (Swingle *et al.*, 1993). Shipboard observations conducted during daylight hours during dredging activities in the Morehead City Harbor entrance channel during January and February 1995 documented sightings of young humpback whales on at least six days near the channel and disposal area, through January 22, 1995. Three humpback strandings were documented in North Carolina in that year, one each in February, March, and April, suggesting that humpback whales remained within South Atlantic waters through April.

Swingle *et al.* (1993) identify a shift in distribution of juvenile humpback whales in the nearshore waters of Virginia, primarily in winter months. Those whales using this mid-Atlantic area that have been identified were found to be residents of the Gulf of Maine feeding group, suggesting a shift in distribution that may be related to winter prey availability. In concert with the increase in mid-Atlantic whale sightings, strandings of humpback whales have increased between New Jersey and Florida since 1985. Strandings were most frequent during the months of September through April in North Carolina and Virginia waters, and were composed primarily of juvenile humpback whales of no more than 11 meters in length (Wiley *et al.*, 1995). Six of 18 humpbacks (33 percent) for which the cause of mortality was determined were killed by vessel strikes. An additional humpback had scars and bone fractures indicative of a previous vessel strike that may have contributed to the whale's mortality. Sixty percent of those mortalities that were closely investigated showed signs of entanglement or vessel collision (Wiley *et al.*, 1993).

Sea Turtles:
Information on the biology and distribution of sea turtles can be found in the 1991 and 1995 Biological Opinions on hopper dredging in channels and borrow areas, which are incorporated by reference. Channel specific information has been collected by the COE for channels at Morehead City, Charleston, Savannah, Brunswick, Fernandina and Canaveral, and is presented in detail in COE summary report entitled "Assessment of Sea Turtle Abundance in Six South Atlantic U.S. Channels" (Dickerson *et al.* 1994) and in the COE's Biological Assessment. Information on the

biology and distribution of right whales and humpback whales can be found in the 1991 and 1995 Biological Opinions as well. There is no significant new information regarding the status of sea turtle species that has not been discussed in the Biological Opinions that have been incorporated by reference.

Sturgeons:
Shortnose sturgeon are found in rivers, estuaries, and the sea, but populations are confined mostly to natal rivers and estuaries. The species appears to be estuarine anadromous in the southern part of its range, but in some northern rivers it is "freshwater amphidromous," i.e., adults spawn in freshwater but regularly enter saltwater habitats during their life. Adults in southern rivers forage at the interface of fresh tidal water and saline estuaries and enter the upper reaches of rivers to spawn in early spring (NMFS 1998).

The use of saline habitat varies greatly among northern populations. In the Saint John and Hudson rivers, adults occur in both freshwater and upper tidal saline areas all year. This situation may also exist in the Kennebec River system where, during summer, some adults forage in the saline estuary while others forage in freshwater reaches. In the Delaware, Merrimack and Connecticut Rivers, adults remain in freshwater all year, but some adults briefly enter low salinity river reaches in May-June then return upriver. Some adults have been captured in nearshore marine habitat, but this is not well documented. Many tagging and telemetry studies in rivers throughout the species' range indicate that these fish remain in their natal river or the river's estuary (NMFS 1998).

The final recovery plan for the shortnose sturgeon (NMFS 1998b) gives the current, best available information on the distribution and abundance of shortnose sturgeon, and is incorporated herein by reference. However, in the project area, the Cape Fear River, North Carolina, shortnose sturgeon population would be the most likely to be affected by the proposed dredging activities. No other shortnose sturgeon populations are known from North Carolina, which is where most of the maintenance dredging by the vessels considered in this consultation has historically occurred and will continue.

Effects of the Proposed Action

Effects on Sea Turtles
The construction and maintenance of Federal navigation channels by hopper dredges have been identified as a source of turtle mortality. NMFS has previously consulted on the use of hopper dredges in southeastern United States channels and borrow areas, and Gulf of Mexico channels. The November 25, 1991 biological opinion issued to the COE's South Atlantic Division (SAD) found that continued hopper dredging activity was likely to jeopardize the continued existence of the Kemp's ridley sea turtle. The reasonable and prudent alternative issued with the 1991

biological opinion included the prohibition of hopper dredging in the Canaveral channel (Florida), seasonal restrictions which allowed hopper dredging from December through March in channels from North Carolina through Canaveral, or use of alternative dredges in all southeastern U.S. channels.

In addition to hopper dredges, clamshell, sidecast and pipeline dredges are all used to dredge and maintain navigation channels. Pipeline and clamshell dredges are relatively stationary, and therefore act on only small areas at any given time. Observer coverage was required at pipeline outflows during several dredging projects deploying pipeline dredges along the Atlantic coast. No turtles or turtle parts were observed. Additionally, the COE's SAD provided documentation of hundreds of hours of informal observation by COE inspectors during which no takes of listed species were observed. Additional monitoring by other agency personnel, conservation organizations, and the general public has never resulted in reports of a turtle take by pipeline dredges. In contrast, large capacity, oceangoing hopper dredges, which are frequently used in ocean bar channels and sometimes in harbor channels and offshore borrow areas, move relatively rapidly and can entrain and kill sea turtles, presumably as the drag arm of the moving dredge overtakes the slower moving turtle. Brumation by sea turtles in southeastern channels, when they bury themselves in the channel bottom mud and presumably slow their metabolic processes, is also suspected in deaths of some sea turtles by hopper dredge. The reasons for this are that: 1) the turtle deflector device on the leading edge of the draghead is probably less effective at deflecting buried sea turtles than deflecting turtles which are simply resting or foraging on the channel bottom, 2) the turtles' ability to move out of the way quickly may be compromised because they are partially buried in sediment, and 3) their flight response time may be lengthened due to their torpor or reduced metabolic rate during brumation.

The operation of sidecast dredges FRY, MERRITT and SCHWEIZER and the small capacity, coastal hopper dredge CURRITUCK is not expected to adversely affect listed species of sea turtles because of the slow speed of the vessels, the low suction levels inherent to these small dredges, and the small size of the dragheads. These species should be able to get out of the way of the slow moving dredges, which operate at speeds of 1 to 3 knots when working in inlet channels. From sea turtle tests performed by the Corps of Engineers in New River Inlet in 1998, it is known that the suction dragheads of these vessels exhibit very low suction forces. Further, the dragheads have very small openings--3 inches by 5 inches for the CURRITUCK and 5.5 inches by 8 inches for the sidecast dredges. The results of the tests conducted by the Corps of Engineers on a previously-dead, juvenile (13.5-inch carapace length) green turtle demonstrated that the low suction forces and small openings prevented the lifeless turtle from being entrained. Further, the suction force was low enough that the turtle was easily prodded and moved with a pole despite being held by the suction force against the draghead. If a small, live turtle did get impinged by the pump suction against the draghead, the turtle would very likely soon be broken free of the suction by the motion of the draghead along the irregular bottom and/or its own efforts to free itself. Even if a turtle small enough to pass through the draghead were encountered, it could pass through the dredge relatively unharmed due to the low pump pressures involved.

It is unlikely that turtles small enough to pass through the dragheads will be encountered in significant numbers in the proposed operating area of the dredges. The smallest of three sea turtles (all loggerheads) taken during hopper dredging operations in November-December 1998 at Beaufort Inlet Entrance Channel, North Carolina by the dredge SUGAR ISLAND measured 57 cm by 44 cm curved carapace length (CCL) by curved carapace width (CCW). During hopper dredging operations in February of 1999 in Kings Bay Entrance Channel, Fernandina, Florida, a total of 33 sea turtles (all juvenile loggerheads) were captured and relocated by a contract trawler sweeping the area in front of the large capacity hopper dredge R.N. WEEKS. (The R.N. WEEKS has a dredged material storage capacity approximately 10 times that of the CURRITUCK, and significantly larger dragheads, pumps and suction). The smallest captured and relocated loggerhead measured 54.5 cm CCL by 52.0 cm CCW. One Kemp's ridley that was lethally taken by the R.N. WEEKS measured approximately 30 cm in carapace diameter. Neither of these turtles would have been entrained by the smaller sized gridded dragheads of the vessels considered in this consultation because of their small openings.

Sea turtle strandings were compiled by R. Boettcher of North Carolina Marine Fisheries Commission for beaches within 3 miles (north, south, and inland) of Oregon Inlet, Drum Inlet, New Topsail Inlet, and Lockwood Folly Inlet, North Carolina for all periods when dredging operations occurred for 1994 - 1997 (ACOE, 1998) for the four vessels considered in this consultation. A total of 19 loggerheads, one green and one Kemp's ridley were reported stranded. The size of the stranded loggerheads would have precluded their entrainment by the vessels considered in this consultation (the smallest loggerhead which stranded measured 23.5 inches by 22.5 inches (CCL by CCW). The rarest and smallest of the turtles which stranded during the reporting period–the green and the Kemp's ridley – measured 12 inches by 10 inches (CCL by CCW), and 15 inches by 15 inches, respectively, and were also too large to have been entrained by the dragheads of the vessels considered in this consultation. Both of these turtles stranded within three miles of Lockwood Folly Inlet.

Additional data was compiled and analyzed by Boettcher on the measurements of sea turtle strandings and incidental captures in North Carolina from 1996-1998. Of 25 stranded green turtles for which straight-line carapace widths (SCWs) were measured in 1996, roughly 95% (mean plus or minus two standard deviations) ranged between 7.5-12.5 inches (mean SCW was 10.0 inches); in 1997, roughly 95% of 29 stranded green turtles had SCWs of 6.7-12.4 inches (mean SCW was 9.5 inches); in 1998, roughly 95% of 43 stranded green turtles had SCWs of 3.8-16.4 inches (mean SCW was 10.1 inches), while roughly 68% (mean plus or minus one standard deviation) had SCWs of 7.0-13.3 inches. In 1996 of 9 stranded Kemp's, roughly 95% had SCWs of 7.5-17.4 inches (mean SCW was 12.6 inches); in 1997 of 34 stranded Kemp's, roughly 95% had SCWs of 6.2-19.2 inches (mean SCW was 12.7 inches); in 1998 of 75 stranded Kemp's, roughly 95% had SCWs of 4.6-19.5 inches (mean SCW was 12.0 inches). The difference between the SCW and straight-line carapace length (SCL) measurements of the 212 stranded Kemp's and greens considered above ranged from 0.8 to 2.2 inches. It appears based on these measurements and the size of the openings on the dragheads (the largest opening is 5 by 8 inches), that the vast majority of both greens and Kemp's ridleys considered here could not and

would not be entrained by the dragheads. Both species are considerably smaller than the abundant loggerheads. While the possibility of entrainment of the smallest individuals of these two species cannot be ruled out, it is unlikely to occur.

Effects on Sturgeon

Aside from seasonal migrations to estuarine waters, shortnose sturgeon rarely occur in the marine environment. Shortnose sturgeon spawning habitat in the potential project areas should lie well upstream of the ocean inlet environments typically dredged by the small capacity, coastal hopper dredge CURRITUCK and the small sidecast dredges FRY, SCHWEIZER and MERRITT. Juvenile shortnose usually remain upstream of saline water until they reach about 45 cm (approximately 18 inches) in length.

Habitat conditions normally suitable for adults (shortnose greater than 45 cm in length) could occur in estuarine areas where these vessels might be required to work. Sturgeon habitat within the areas dredged would be temporarily disturbed during maintenance dredging. However, the dredges considered in this consultation restore navigation channels to their authorized dimensions to reestablish a previously existing condition (depth). Therefore, no new permanent modification of habitat will occur.

Maintenance dredging of Federal navigational channels can adversely affect sturgeon by entraining them in dredge dragarms and impeller pumps (NMFS 1998). Other dredging methods may also adversely affect sturgeon. Hastings (1983) reported anecdotal accounts of adult sturgeon being expelled from dredge spoil pipes while conducting a study on sturgeon on the Atlantic coast. Atlantic sturgeon were killed in both hydraulic pipeline and bucket-and-barge (clamshell dredge) operations in the Cape Fear River (M. Moser in NMFS 1998). NMFS observers documented the take of one Atlantic sturgeon in a hopper dredge operating in King's Bay, Georgia (C. Slay in NMFS 1998). Two shortnose sturgeon carcasses were discovered in a dredge spoil near Tullytown, Pennsylvania and apparently killed by a hydraulic pipeline dredge operating in the Delaware River in March 1996 (NMFS 1998). In early 1998, three shortnose sturgeon were killed by a hydraulic pipeline dredge operating in the Florence to Trenton section of the upper Delaware River (NMFS 1998).

Adult shortnose could occur in some of the areas that may be dredged by these vessels. Adults would be most likely to be encountered in the winter and spring, after spawning and their migrations to feeding areas in downstream and estuarine waters. However, because of their mobility, adult shortnose sturgeon should be able to avoid the slow moving dredge equipment if they move away when they detect the approaching draghead. Given their specialized sensory apparatus, they should be able to detect the vibrations of a slow moving, approaching draghead. Also, given the size of the shortnose sturgeon which would be expected to occupy the coastal inlets being dredged, i.e. greater than 45 cm, it is unlikely that they would be entrained by the slow moving, low suction dragheads. Entrained sturgeons passing through the suction pipelines could pass through unharmed, or they could be killed. Though the possibility of injury or death cannot be ruled out, as evidenced by the historic record, the likelihood is remote.

Effects on Whales

Right whales and humpback whales are vulnerable to small vessel and ship collisions when the whales make their annual migrations along the eastern seaboard. The sidecast dredges FRY, MERRITT and SCHWEIZER transit at approximately 7 to 10 knots from the inlet dredging sites to adjacent beach sites to dispose of dredged materials. The CURRITUCK travels at speeds of 5 to 8 knots to adjacent beaches or offshore disposal sites. Because of these slow speeds, these vessels should present a minimal threat to migrating whales – certainly less than that of normal, faster-moving commercial ship traffic and recreational boating. Adverse impacts to right whales and humpbacks from the dredges and dredging operations are not expected because 1) the dredges work in the throats and interior portions of inlets which are not used by whales, 2) the dredges travel at very low rates of speed during dredging operations, 3) the captains of the dredges will be provided daily information on the positions of the migrating right whales, and 4) the dredges will reduce their speed as necessary and maintain a proper lookout to avoid collisions with whales when transiting to disposal sites and right whales are in the area.

Conclusion

Based on our consideration of the best available information, we believe that the year-round operation of the hopper dredge CURRITUCK and the sidecast dredges FRY, MERRITT and SCHWEIZER to maintain coastal inlets on the eastern seaboard of the United States may affect, but is not likely to adversely affect the continued existence of listed species under NMFS purview. This consultation is valid as well for the operation by Wilmington District Corps of Engineers for channel maintenance dredging of up to 10 vessels of this or similar type and size class (under 500 gross tons), with similar dragheads (Brunswick, Brunswick County Type, Brunswick Adjustable, or equivalent), dredge pump horsepower (400 H.P. maximum), and suction and discharge pipe specifications (dredge suction pipes 10-14 inches in diameter, and combined discharge pipe 12-16 inches in diameter).

This concludes consultation responsibilities with NMFS under section 7 of the ESA. Consultation should also be reinitiated pursuant to 50 CFR 402.16 if there is new information that reveals effects of the action that may affect listed species or critical habitat (when designated) in a manner or to an extent not previously considered, if the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that has not been considered, or if a new species is listed or critical habitat is designated that may be affected by the identified action.

Please call Mr. Eric Hawk, Fishery Biologist, at 727/570-5312 if you have any questions regarding this consultation or if further coordination is necessary.

Sincerely,

Andrew J. Kemmerer
Regional Administrator

cc: F/PR3

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ATTACHMENT B

U.S. Army Corps of Engineers Biological Assessment dated 1 July 1998 And National Marine Fisheries Biological Opinion on Threatened and Endangered Species Section 7 Consultation

Note: Reference EA, Section 6.04 Threatened and Endangered Species: "The Wilmington District no longer owns or operates the sidecast dredge SCHWEIZER or the survey boat WANCHESE."

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890

July 1, 1998

IN REPLY REFER TO
Environmental Resources Section

CESAW-TS-PE/Adams

Dr. Andy Kemmerer, Regional Director
National Marine Fisheries Service
9721 Executive Center Drive North
St. Petersburg, Florida 33702-2449

Dear Dr. Kemmerer:

Enclosed is our Biological Assessment, Use of the Sidecast Dredges Fry, Merritt, Schweizer, and the Split-Hull Hopper Dredge Currituck in Coastal United States Waters, dated July 1998. The assessment documents our finding that the use of these vessels to maintain navigation channels along the eastern seaboard of the United States is not likely to adversely affect any listed species under the jurisdiction of your agency.

As discussed with Ms. Colleen Coogan of your staff, we would like to have your office serve to coordinate your agency's review of this assessment since it discusses the operation of these vessels within the National Marine Fisheries Service's Southeast and Northeast Regions. A copy of this assessment is enclosed for Ms. Nancy Hanley of the Northeast Region.

If you have any questions regarding the operation of these vessels, the investigations performed, or any other part of this assessment, please contact Mr. William Adams at (910) 251-4748.

Sincerely,

C. E. Shuford, Jr., P.E.
Chief, Technical Services Division

Enclosure

Copy Furnished:

Ms. Nancy Haley
National Marine Fisheries Service
Northeast Regional Office
One Blackburn Drive
Gloucester, MA 01930

Ms. Ruth Boettcher
North Carolina Wildlife Resources Commission
P.O. Box 178
Marshallberg, NC 28553

BCF:

CESAW-TS-ON/Sattin
CESAW-TS-ON/Potter

CESAW-TS-PE/Adams/dr/4748
CESAW-TS-PE/Griffin
CESAW-TS-P/Long
CESAW-TS-ON/Sattin
CESAW-TS/Jahnke
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BIOLOGICAL ASSESSMENT

USE OF THE SIDECAST DREDGES FRY, MERRITT, SCHWEIZER, AND THE SPLIT-HULL HOPPER DREDGE CURRITUCK IN COASTAL UNITED STATES WATERS

JULY 1998

BIOLOGICAL ASSESSMENT
USE OF THE SIDECAST DREDGES FRY, MERRITT, AND SCHWEIZER AND THE SPLIT-HULL HOPPER DREDGE CURRITUCK IN COASTAL UNITED STATES WATERS

1.00 Background

The sidecast dredges Fry, Merritt, and Schweizer, and the split-hull hopper dredge Currituck, are used throughout the east coast of the United States to maintain adequate depths in navigation channels through shallow coastal inlets. These dredges are Government-owned and are based in, and operate out of, Wilmington, North Carolina, and are administered by the Wilmington District, U.S. Army Corps of Engineers.

These dredges were once covered under the Regional Biological Opinion (RBO) for hopper dredging issued by the Southeastern Regional Office of the National Marine Fisheries Service. However, they were left out of the 1997 RBO because of concerns about their potential impacts to listed species since they operate without deflectors, have no screening or observers, and operate during all times of year, including warm weather seasons. In order to address these concerns, a separate Biological Assessment became necessary.

2.00 Description of Dredge Plants

These shallow draft dredges all use small California style dragheads to collect shoal material; however, their sizes and power are substantially less than that of the commercial hopper dredges which employ similar draghead technology in the southeast. Dredge pumps on these vessels average around 350 horsepower and draghead sizes range from approximately 2' X 2' to 2' X 3'. The draghead openings are further subdivided on their undersides by gridded baffles, with openings ranging from about 5" X 5" to 5" X 8". These baffles serve to restrict the size of objects which can enter the dredge and to even-out and direct the hydraulic forces during dredging, allowing for maximum production with each dredge cut.

When operating, the Fry, Merritt, and Schweizer cast dredged material to the side of the navigation channel whereas the Currituck fills a small hopper with the material and transports it to designated disposal areas. These vessels operate at working speeds ranging between 1 and 3 knots and travel at speeds between 7.0 and 10 knot. These dredges normally dredge shallow channels, with depths between 4 feet and 14 feet below mean low water.

Photographs and complete descriptions of each of these vessels are provided in Attachment A. Photographs of the draghead of the dredge Fry are also included in Attachment D.

3.00 Dredging Locations and Times

These specialized dredge plants are currently used at many locations in North Carolina and elsewhere along the eastern seaboard. Normally, they are used in: 1) shallow coastal inlets which cannot be dredged safely or effectively with commercially available dredges, 2) during emergencies, or 3) when an urgent and compelling need exists for clearing out a navigation channel (periods when rapid shoaling has occurred, a navigation hazard may exist, and there is insufficient time to contract commercial dredges).

All locations dredged by these vessels for the past few years are included in Attachment B. This listing is not intended to be restrictive as future conditions may make the use of these vessels desirable at additional locations; however, this Biological Assessment assumes that all covered activities will occur along the eastern seaboard of the United States. Potential activities in gulf or west coast waters would need to be covered under a separate Biological Assessment.

In North Carolina, these vessels operate under no seasonal restrictions. When working in other states, the host District normally provides all necessary environmental clearances for a vessel to operate at the desired locations and dates. In the past, this has included clearances under Section 7 of the Endangered Species Act, as amended. Through this Biological Assessment, and subsequent NMFS Biological Opinion, the host District will be able to incorporate this consultation by reference, hopefully minimizing the need for individual consultations in the future.

4.00 Species Covered Under This Assessment

The following threatened or endangered species are under the jurisdiction of the National Marine Fisheries Service and are known to occur in the waters of the eastern U.S. seaboard:

MAMMALS
Finback whale (*Balaenoptera physalus*) - Endangered
Humpback whale (*Megaptera novaeangliae*) - Endangered
Right whale (*Eubaleana glacialis*) - Endangered
Sei whale (*Balaenoptera borealis*) - Endangered
Sperm whale (*Physeter catodon*) - Endangered

REPTILES
Green sea turtle (*Chelonia mydas*) - Threatened
Hawksbill sea turtle (*Eretmochelys imbricata*) - Endangered
Kemp's ridley sea turtle (*Lepidochelys kempi*) - Endangered
Leatherback sea turtle (*Dermochelys coriacea*) - Endangered
Loggerhead sea turtle (*Caretta caretta*) - Threatened

FISHES
Shortnose sturgeon (*Acipenser brevirostrum*) - Endangered

5.00 Species Assessments

5.01 Finback whale, humpback whale, right whale, sei whale, and sperm whale

a. Status - all endangered

b. Occurrence in Immediate Project Vicinity - Whales occur infrequently in the ocean off the coast of North America. Of these, only the right whale routinely comes close enough inshore to encounter these dredges which would be operating in the immediate vicinity of ocean inlets. The right whale winter calving grounds occur in the nearshore ocean near the Florida/Georgia state line and their late summer feeding and breeding grounds are in the lower Bay of Fundy or the lower Scotian shelf. Their occurrence along much of the eastern seaboard is usually associated with migrations. Sighting data provided by the Right Whale Program of the New England Aquarium indicates that 93 percent of all North Carolina sightings between 1976 and 1992 occurred between mid-October and mid-April (Chris Slay, personal communication, 1993). Since these dredges operate year-round along the eastern seaboard, this species could easily be in the vicinity of the dredges during some of their operations.

c. Current Threats to Continued Use of the Project Area - None

d. Project Impacts -

(1) Habitat - These dredges restore navigation channels to their authorized dimensions, in essence, reestablishing a previously existing condition. No permanent modification of habitat will occur.

(2) Food Supply - Right whales feed on copepods and juvenile euphasiids. The productivity of these prey species will not be diminished by the maintenance dredging of inlets channels; therefore, the food supply of the right whale should be unaffected.

(3) Relationship to Critical Periods in Life Cycle - Over most of the eastern seaboard, these dredges operate year-round while right whales should only be present during migrations. Right whales are vulnerable to ship and small vessel collisions while migrating; however, sidecast dredges and the Currituck normally work in the throat and interior portions of inlets. When working in inlet channels, the vessels operate at speeds between 1 and 3 knots. The Currituck travels to an adjacent beach to dispose of dredged material at speeds between 5 and 8 knots. The vessels transit between sites at speeds of 7 to 10 knots. These speeds allow maximum dredging efficiency but maintain an adequate speed for steerage in inlet environments. Because of these slow speeds, these vessels should present less of a threat to migrating whales than normal commercial ship traffic and recreational boating. When operating near, or traveling through, the right whale calving grounds, the Captains of these vessels would be provided daily information on the locations of the whales from the right whale monitoring program and would operate their vessels accordingly.

(4) Affect Determination - Since: 1) existing habitat conditions and food supplies will be maintained, 2) the sidecast dredges and Currituck normally work in the throats and interior portions of inlets which are not used by whales, and 3) these vessels travel at very low rates of speed during operation; it has been determined that the operation of these vessels is not likely to adversely affect any species of whale.

5.02 loggerhead sea turtle, green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, and leatherback sea turtle

a. Status - loggerhead and green sea turtles, threatened; others, endangered

b. Occurrence in Immediate Project Vicinity - Over most of the eastern seaboard, the green, Kemp's ridley, and the loggerhead sea turtles are known from primarily from estuarine and oceanic waters, whereas the leatherback and the hawksbill are known principally from oceanic waters. All of these species are considered to be residents of the seaboard primarily from the spring through the fall although occasional winter records exist. Sea turtles are known to nest on ocean beaches from Virginia south through Florida. The sea turtle nesting season begins in early spring, increases to a peak in late spring to mid-summer, and declines until completion in late summer.

c. Current Threats to Continued Use of Area - The most significant threats posed to adult and subadult sea turtles are accidental drowning in nets, ingestion of lethal non-food material, collisions with watercraft, and natural predators.

d. Project Impacts -

(1) Habitat - These dredges restore navigation channels to their authorized dimensions, in essence, reestablishing a previously existing condition. No permanent modification of habitat will occur.

(2) Food Supply - These species feed primarily on a wide variety of invertebrates and plant materials. Maintenance dredging will temporarily remove some of these resources from the channel bottom. Impacts on foraging habitat will be minor as dredging will only affect a small portion of the estuary and ocean bottom where work is being performed; therefore, dredging should not have any adverse long term affect on the food supply of these species.

(3) Relationship to Critical Periods in Life Cycle - These dredges operate year-round and could, therefore, be operating in shallow inlet areas when sea turtles are present. Turtles frequent such areas, particularly when entering and exiting estuarine waters. Their residence time in shallow inlet environments is unknown. Because of the apparent potential for adversely impacting sea turtles, sea turtle stranding data was analyzed by Ms. Ruth Boettcher, NC Wildlife Resources Commission, to see if over the past several years dead turtles have washed up in the vicinity of dredging operations. In addition, a field impingement test using a sidecast dredge and a fresh dead green sea turtle was conducted in New River Inlet on 28 February 1998.

Analysis of stranding data does not reveal any pattern which would indicate that either the sidecast dredges or the Currituck were responsible for any of the strandings in inlet areas. Of the eight inlet areas examined, four of them had no strandings during the multiple periods when dredging was occurring. Of the other four, almost half of the strandings (9 out of 21) could not be attributed to any known cause, i.e., no damage to the turtles was apparent. Of the remaining, boat propellers or human molestation appeared to be the probable cause of mortality in most cases (9 out of 12), in the remaining (3), injury was too non-specific or the specimen was too badly decomposed to assess any cause of death. The complete text of Boettcher's report is included as Attachment C.

On 26 February 1998, Ruth Boettcher, NC Wildlife Resources Commission, and Messers. Frank Yelverton and William Adams, Corps of Engineers, visited the sidecast dredge "Fry", located in New River Inlet, Onslow Co., N. C., to test whether or not this class of vessel could take sea turtles. A fresh dead 13.5" green sea turtle from Pamlico Sound (taken last year but kept frozen) was used in the tests (see photographs in Attachment D). Three tests were run: 1) in the water column, the turtle was impinged on the draghead and the pumps were run for 5 minutes (this test was performed twice), 2) the turtle was impinged on the draghead, then the draghead placed on the bottom and the pumps were run for 5 minutes (this test was also performed twice), and 3) the turtle was impinged on the draghead and the vessel performed routine dredging for 5 minutes. Results were as follows:

For test one, first run, no significant damage was visible to the turtle, only a few barely detectable nicks to the carapace. After the second run, the barnacles had been sucked off but, again, the shell and flippers had no detectable damage. For test two, both runs, no significant damage was done, a few nicks on the carapace were apparent but nothing else. For test three, significant abrasions occurred on the anterior portion of the carapace and one blister-like hematoma (dime-sized) was raised on the underside of the left front flipper. Significant quantities of sand had also been forced into the turtle's mouth. Several important observations were made during the tests.

The suction force coming through the draghead was not strong. In one case, the turtle was not properly impinged and it was easily prodded with a pole into proper position. This would not have been possible if it were tightly held by suction forces. A check with the Captain indicated that the vacuum gauge for the pump showed no change when the turtle was impinged. This further indicates minimal suction forces at the draghead.

The same turtle was used on all of the tests. At the end of all of this cumulative impingement abuse, the only damage observed was abrasion from being dragged along the bottom. No fractures, dislocations, or any other type of physical damage was detectable.

The last test was considered to be a worst case scenario - an impinged turtle unable to escape because it was tied to a draghead. Under normal circumstances, it is questionable whether these vessels could actually impinge a sea turtle with such low suction forces. If a sea turtle were to accidentally become impinged, at such low suction forces it would have ample opportunity for escape due to bottom irregularities.

(4) Affect Determination - Based on the findings of Boettcher's report on turtle strandings and the results of the test dredging, it appears that these dredges, all of which have similar dragheads and pumps, do not pose a significant threat to sea turtles. Even if a turtle small enough to pass through the draghead were encountered, it appears highly probable that it would pass through the dredge unharmed due to the low pump pressures involved. For these reasons, it has been determined that continued operation of these dredges along the eastern seaboard is not likely to adversely affect any species of sea turtle.

5.03 shortnose sturgeon

a. Status - endangered

b. Occurrence in Immediate Project Vicinity - The shortnose sturgeon occurs in rivers along the Atlantic seaboard from the Saint John River in New Brunswick, Canada, to the Saint Johns River, Florida; therefore, these dredges may occasionally work in the vicinity of shortnose sturgeon populations. The species is known to use three distinct portions of river systems: (1) non-tidal freshwater areas for spawning and occasional overwintering; (2) tidal areas in the vicinity of the fresh/saltwater mixing zone, year-round as juveniles (to 45 cm) and during the summer months as adults; and (3) high salinity estuarine areas (15 parts per thousand (ppt) salinity or greater) as adults during the winter. Because of the wide range of habitats available in the major river systems along the Atlantic seaboard, variation from this general scheme can be found. One population, in Holyoke Pool, Connecticut, is totally landlocked.

c. Current Threats to Continued Use of the Area. Pollution, over-fishing, and blocked access to historic spawning areas are generally considered to be the principal causes of the decline of this species.

d. Project Impacts.

(1) Habitat - Spawning habitat for the shortnose sturgeon should lie well upstream of the ocean inlet environments typically dredged by these vessels. In addition, juveniles usually remain inland of saline water until about 45 cm in length. Habitat conditions normally suitable for adults (>45cm) could occur within estuarine areas where these vessels might be required to work. Any sturgeon habitat within the areas dredged would be temporarily disturbed during maintenance. These dredges restore navigation channels to their authorized dimensions, in essence, reestablishing a previously existing condition. No permanent modification of habitat will occur.

(2) Food Supply - The shortnose sturgeon is a bottom feeder, consuming various invertebrates and occasionally plant material. Adult foraging activities normally occur at night in shallow water areas adjacent to the deep water areas occupied during the day. Juveniles are not known to leave deep water areas and are expected to feed there. All bottoms dredged as a part of a given maintenance activity will suffer temporary declines in benthic fauna populations in comparison to adjacent undisturbed areas. Given adequate recovery time, future channel bottoms

would be expected to continue to support benthic populations similar to those existing prior to maintenance dredging.

(3) Relationship to Critical Periods in Life Cycle - Maintenance dredging with these vessels can be performed at any time of year. Compliance with seasonal restrictions is the responsibility of the host Corp District; if requested to dredge in a given area, it is assumed that the host Corps District has coordinated the activity and obtained the necessary environmental clearances.

Adults could occur in some of the areas that may be dredged by these vessels. Because of the mobility of adults, they should be able to avoid the slow moving dredging equipment if they exhibit flight behavior when approached. Whether or not this occurs is unknown. From the sea turtle tests performed in New River Inlet and described above, it is known that the suction dragheads of these vessels exhibit very low suction forces and have very small openings, ranging from 3" X 5" for the Currituck and 5.5"x 8" for the sidecast dredges. Given the size of shortnose sturgeon which would be expected to occupy the areas being dredged (>45cm = 17.7"), the low suction forces and small openings, and an expected flight response, it is unlikely that an adult sturgeon would be taken under normal circumstances.

(4) Affect Determination - Analysis of the life history and range of the shortnose sturgeon and the general physical characteristics of the areas likely to be dredged within that range indicate that these dredges may occasionally be working in the vicinity of the species. Project maintenance should not result in significant habitat modification and feeding areas will not be significantly affected. Spawning areas and nursery areas for juveniles would be expected to occur outside of the areas normally dredged, but adult shortnose sturgeon could be present in dredging areas. Since the shortnose sturgeon which occupy the project area are mobile, they should be able to avoid locations being disturbed by dredging. Assuming a worst case, based on the low suction forces of these vessels and the small size of the draghead openings, direct impingement is considered unlikely. For these reasons, it has been determined that continued operation of these vessels along the eastern seaboard is not likely to adversely affect the shortnose sturgeon.

6.00 SUMMARY AND CONCLUSION

6.01 Factors Considered

This biological assessment has analyzed the potential impacts associated with the maintenance of coastal inlets along the eastern seaboard with sidecast dredges and the splithull hopper dredge Currituck, on those listed species which the National Marine Fisheries Service believes may be in the project area. Factors which were considered in making effect determinations were as follows:

* Project location in relation to distribution of listed species.
* Types of environmental impacts created by the project, including secondary impacts.
* Seasonality of occupation of the area by listed species.

* Life history requirements and behavior of listed species.
* Human use pressures on the area.

6.02 Conclusion

Through analysis of the above mentioned factors, it has been determined that the continued use of these vessels to maintain shallow coastal inlets along the eastern seaboard is not likely to adversely affect any listed species.

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ATTACHMENT A

U.S. Army
Corps of Engineers

Wilmington District
Floating Plant

Manual

Surveyboat Gillette

Vessel Characteristics and Specifications

Hull Material	Aluminum
Length, Overall	64'-11-5/8"
Beam, Overall	18'-0"
Draft, FWD	2'-5"
Draft, AFT	4'-6"
Vertical Clearance	26'-0"
Speed, light	24 MPH
Speed, loaded	22 MPH
Tonnage, Gross	71.85 tons
Displacement	26.31 tons

Propulsion Engines: Main Engine- 2 ea 12V71 TI GM Diesel, 1040 HP, total
Propellers- 2-30"d x 32"p 4-blade (2 1/2" shaft)
Auxiliary Power-20 KW AC Generator GM 2-71 Diesel
Bunker Capacity: 1200 gal diesel fuel
Crew: 2-4

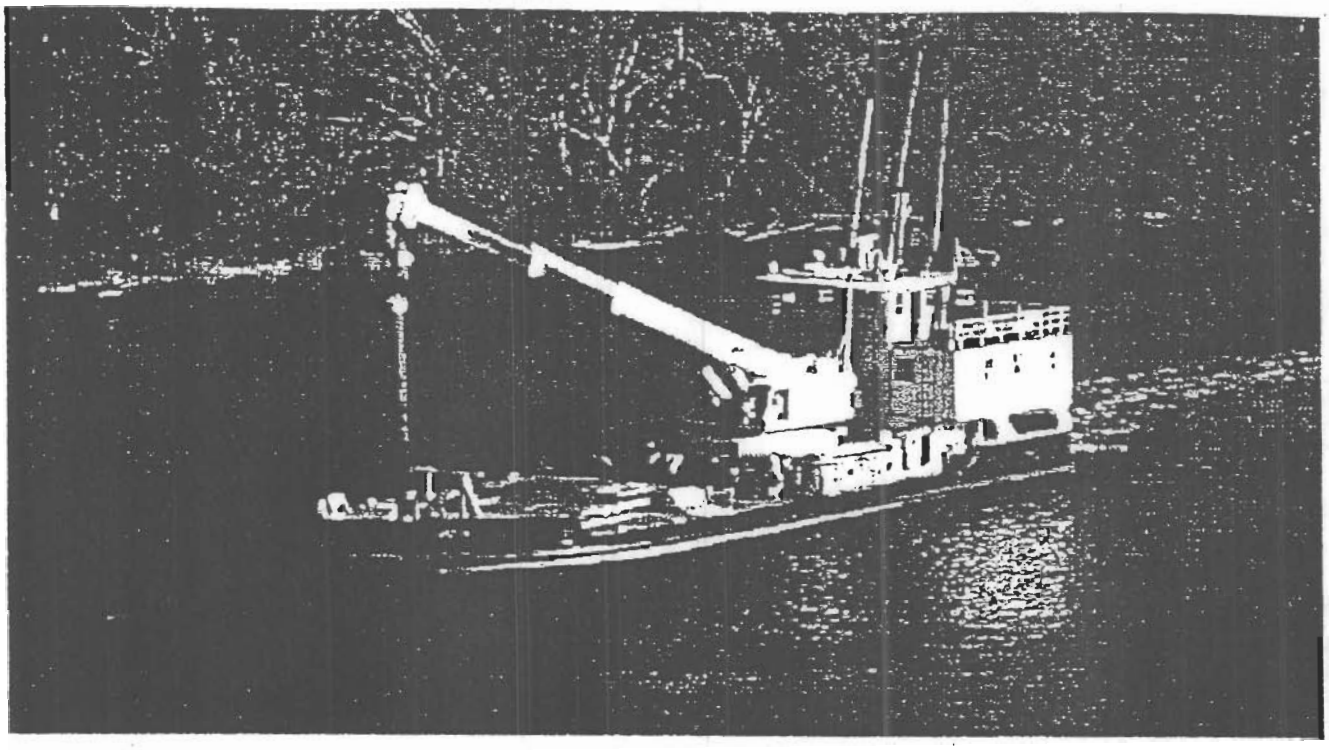
Radar: Furuno Model 805D

Loran: Micrologic ML-2000

Radio: Motorola VHF FM 163.4125 Mhz-Syncom 10- Synthesized Regency MT-5500 XL

Survey Equipment: Entron Pentium PC
Hypack surveying/navigation software
Ashtech GPS navigation system
Trimble Navbeacon system
Ross 200 and 28Khz dual frequency echosounder
Reson Seabat multibeam system
TSS heave compensation system
Hazen automated tide gage system

Launch: 16' Aluminum Skiff, Monark COV



Snagboat Snell

Radio Call Letters:AEGC

Performs clearing and snagging and wreck removal in AIWW, navigable rivers and other channels. Has capability for driving piling, construction and repairs of fender systems, dikes, jetties, and dolphins. Serves as derrick-boat, refueling vessel, clamshell dredge, etc. Works in Wilmington and Charleston Districts.

Built: Missouri Valley Bridge and Iron Company in 1945, originally designated Navy YSD 78.

Converted: 1967 by New Bern Shipyard, New Bern, NC. This conversion involved virtual rebuilding, including repowering, construction of house and replacement of practically all machinery. A large section of underwater hull plating was replaced.

Vessel Characteristics and Specifications:

Gross Tonnage	185 long tons
Displacement	323 long tons
Length, Overall	104'-0"
Beam	31'-2"
Depth, Molded	7'-9"
Draft, Aft	5'-6"
Draft, Forward	4'-0"

Propulsion Equipment:	(Diesel)
Engines:	2 each, GM, Model 12V71, each 350 HP, total 700 HP
Propellers:	2 each, 4-blade, 42"d x 32"p
Reduction Gear:	Twin disc, Ratio 3:1
	Twin Rudders with Wheels in Tunnels
Speed:	9.5 MPH
	Jet pump with GM 371 engine
Generators:	2, 45 KW AC diesel generators, GM 371 engine

Derrick:	Pettibone Model 130, 35 ton capacity SWL, GM 6V53 engine with Hydraulic graple device
Boom, Length:	35 -84 ft. telescope
Bunker Capacity:	10,000 gal diesel
Portable Water:	4,000 gal
Cruising Radius:	2600 miles
Water Pump:	(Jet & Dewatering) 4" Diesel powered
Air Compressor:	350 CFM/3-53 Diesel

Steering and engine controls on bridge wings

Radio Equipment:

Motorola MICOM-X, single side band 2.3000 MHZ thru 20.00 MHZ
Loran C Furuno & Micrologic ML5500 Loran
G.P.S. Plotter Positioning Gear
2-Regency Polaris MT5500 VHF Marine Band 156-163 MHZ
Transceiver WX1, WX2, WX3, WX4
Cellular Phone

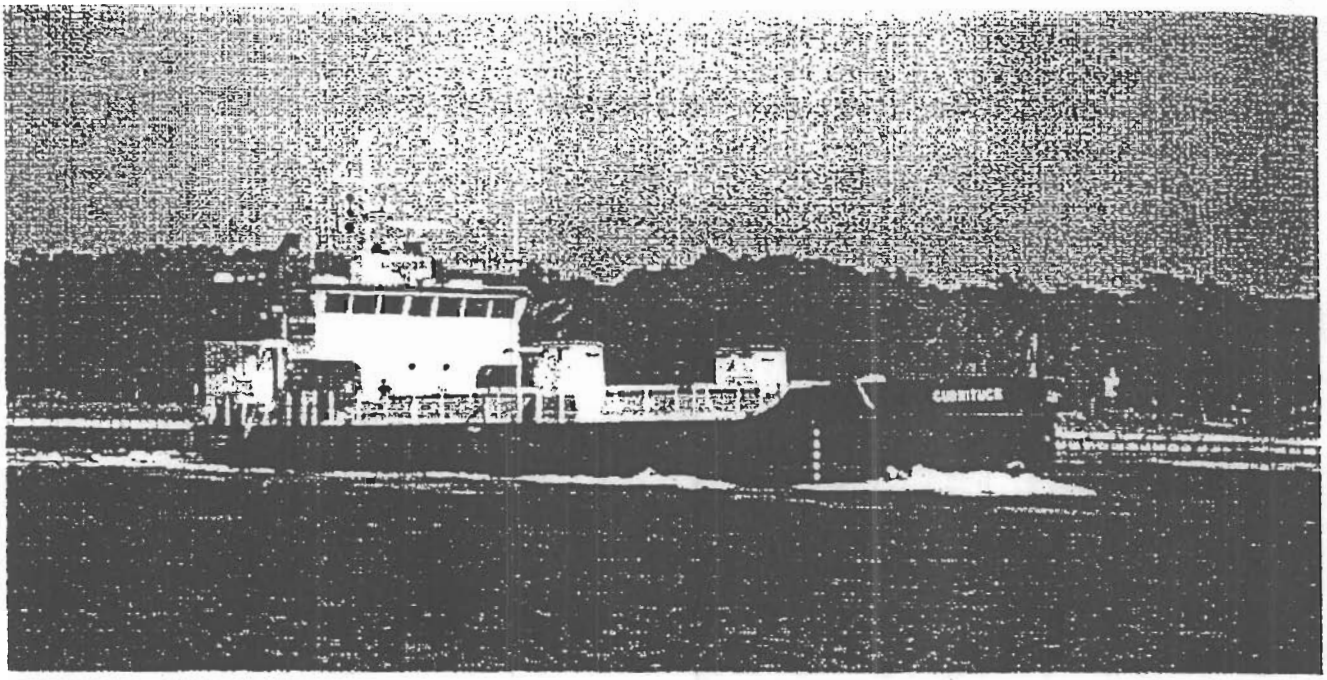
Crew: 6 men

Radar: Furuno Model FP5080, .25mi scale to 48 mi. scale

Fathometer: Standard-Horizon

NOTE: The quarters are centrally air conditioned; galley is fully equipped with freezer locker and all necessary gear. The mess area serves as a recreation room with TV installed. The master, Chief Engineer and crew have private quarters.

Launch: 17' fiberglass, Boston Whaler, with 90 HP Mercury outboard motor propulsion unit, COB



Hopper Dredge Currituck

Radio Call Letters: AEFR

Home Port: Wilmington, North Carolina

This vessel works in the shallow-draft ocean bar channels along the Atlantic Coast. However, in addition to removing dredged material from the channel, the CURRITUCK can transport the material to the downdrift beach and deposit it in the surf zone to nourish sand-starved beaches.

Type: Seagoing, split-hull hopper dredge, steel construction, full diesel, with twin outboard propulsion units.

Built: Barbour Boat Works, New Bern, North Carolina, 1974.

Converted to Dredge: US Army Engineer Yard, Eagle Island, North Carolina, 1977

Vessel Characteristics and Specifications:

Gross Tonnage	484 tons
Displacement, Light	175 long tons
Displacement, Loaded	615 long tons
Length, Overall	150'-0"
Beam, Molded	30'-7"
Draft, Light	3'-4"
Draft, Loaded	7'-6"
Hopper Capacity	315 cubic yards

Propulsion Equipment:

Engines- 2 Detroit Diesels GM 12-V-71, 350 HP @ 1800 RPM
Outboard Propelling Units- Holland Roerpropeller,
Model HRP 350 Deckunit

Speed, Loaded Approx: 8 MPH

Speed, Light: 9.5 MPR

Bunker Capacity: 3600 gal diesel fuel

Dredging Equipment:

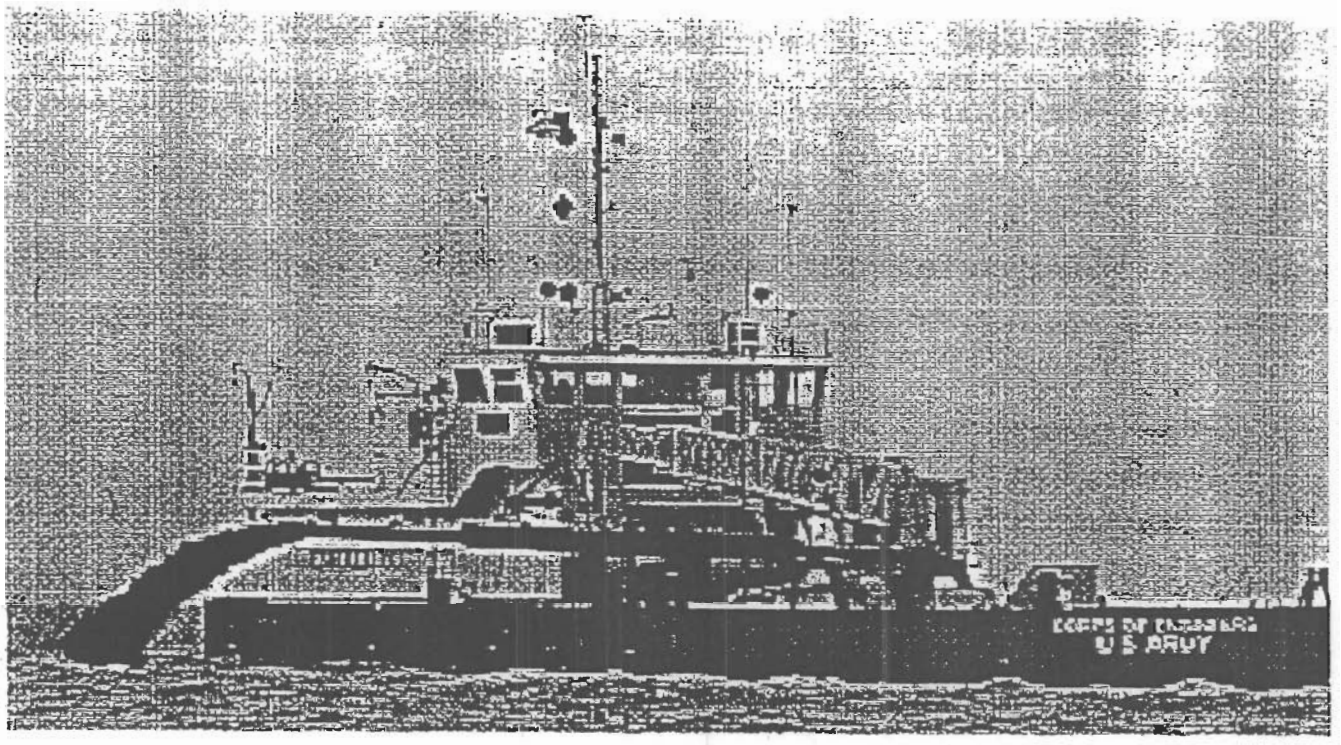
Primer mover-	2 ea GM 6V-71
Dredge Pumps-	2 ea HDM-32-12x10, 400 RPM-Dredge Master's direct coupled
Drags-	Brunswick County Type, fabricated at Eagle Island Yard
Drag hoisting winches-	Braden Series PD 12C

Total Compliment: 11 men split into 2 crews

Radio:

Regency Polaris MT-5500 VHF, Programmable 20 channel scanner, 88 channels-20 scan and monitor all US, monitor 16 channels, scan 4 weather channels
ICOM - VHF Marine Transceiver IC-M120
Raytheon - Ray 90 VHF-FM Radio Telephone
ICOM - IC-M810 HF Marine Transceiver
Audiovox Cellular Phone

Radar:	Furuno, FR 8100D
Fathometer:	Furuno FCV-667
Compass:	Magnetic - C. Plath
Gyro:	Sperry SR130. with Repeator
Loran:	Furuno, LC 90 Rayplot 700I
Generator:	2 ea 45 KW GM 3-71, HP @ 1800, and 30 KW standby
Launch:	16' aluminum work boat and 50 HP Johnson outboard



Sidecasting Dredge Fry

Radio Call LettersAESY

Home Port: Wilmington, North Carolina

The ***FRY*** was converted to a sidecasting dredge in 1972 by the Philadelphia District. Prior to that time, the ***MERRITT*** had been assigned to maintain four inlet projects in New Jersey in addition to her schedule in North Carolina. The ***MERRITT'S*** schedule was such that the Wilmington District was unable to keep up with the work and Wilmington assisted Philadelphia in constructing the dredge ***FRY***. The *FRY* is identical to the ***MERRITT*** in all major respects. The ***FRY*** was transferred to Wilmington for operation in the sidecasting fleet in 1983. The ***FRY*** was staffed for two-shift operation and has permitted the sidecasting fleet to maintain the schedule and react to emergency needs.

Vessel Characteristics and Specifications:

Gross Tonnage	202 tons
Displacement	354 long tons
Length, Overall	104' - 2"
Beam, Molded	30' - 0"
Breath, with drags in work position	40' - 10"
Depth, Molded	7' - 9"
Draft	4' - 8"
Draft, Loaded	5' - 11"
Draghead & Hoppers	2 Brunswick Adjustable
Drags	10"d
Discharge Pipe	12"d, 80' in length, casts material 100' from centerline

Propulsion Equipment:

Main Engines- 2 each Detroit Diesel, 12-cylinder, Total 700 HP @ 1850 RPM
Reduction Gear-Twin Disc, 3:1
Propellers- 2 each, 4-blade, 36, 34 pitch

Pumping Equipment:

Pumps, 2 each, 10" suctions, 10" discharges combine into 12" discharge
Pump engines, 2 each, Detroit Diesel, 6V71, 230 HP @ 1850 RPM
Sidecasting capacity, 10 cubic yards sand per minute
Dredging Depth, 6' to 25'

Auxiliary Power:

Generators- 2-75KW each. Powered by Detroit Diesel 4-71 engines.

Derrick: Crane capacity, 4.5-ton
Electric-hydraulic operation

Speed: 8.5 MPH (light), 7.5 MPH (loaded)

Bunker Capacity: 10,000 gal diesel oil

Total Compliment: 14 men (2 crews of 7 men each)

Radar: Furuno FR 8111

Radio:

Motorola Micomix single side band
Motorola VHF FM SYNTOR 136-174 Mhz
MODOR TRITON UHF FM Channel 16, 6, 13, 21A, 22A, 23A, WEA
KOM K-M56 VHF Marine Transceiver
A.R.C. President 40-channel CB radio

Fathometer: Raytheon Model, V820 Recorder and
Datamarine International offshore digital

Loran: Micrologic Model- ML-320 and Model Explorer II Loran C

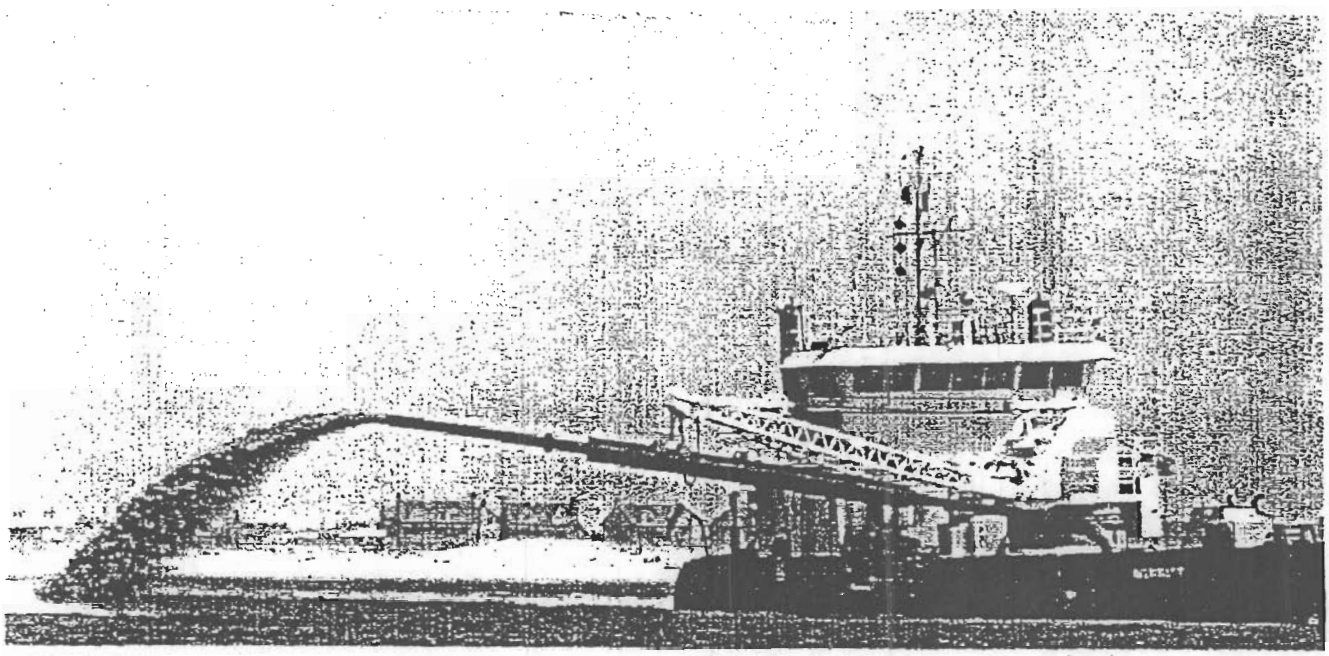
Compass: Danforth Constellation

Loud Hailer: Raytheon 430

Gyro: Sperry MIC 27 Model

Vertical Clearance from Waterline:
53' mast up, 39 mast down

Launch: CON- Boston Whaler- 16'-6', 90 HP Evinrude Motor



Sidecasting Dredge Merritt

Radio Call Letters:AEVZ

Home Port: Wilmington, North Carolina

Performs dredging work in numerous inlets along the South Atlantic Coast. Is especially suited to maintenance of shallow, unstablized inlets where larger hopper dredges cannot operate due to strong currents and ocean environment. Often serves hopper and larger sidecasting dredges by constructing pilot channels across limiting shoals, widening channels into high bank areas, serving as fueling barge in emergencies.

Type: Seagoing sidecasting dredge, steel construction, side drags, port and starboard, full diesel, twin screw, twin rudder.

Built: US Navy Yard, Charleston, SC, in 1944 and designated YSD-59.

Converted to Dredge: 1964 by Wilmington Shipyard, Inc., Wilmington, NC.

Vessel Characteristics and Specifications:

Gross Tonnage	195 long tons
Displacement	342 long tons
Length, Overall	104'-0"
Beam, Molded	30'-0"
Width, Overall Over Drag Elbow	35'-0"
Depth, Molded	7'-9"
Draft, Bow	4'-8"
Draft, Stern	5'-6"
Hoppers	None
Drags	2 Brunswick Adjustable
Discharge	12"d, 80' centerline of ship plus 10' extension- cast material 100 feet from centerline.

Propulsion Equipment:

Main Engines- 2 ea. GM 12V71, 350 HP ea
Total 700 HP @ 1850 RPM
Reduction Gear- 3:1, Twin Disc, MG 514
Propellers- 2 ea, 3-blade, 3'-6"d, 2'-8" pitch

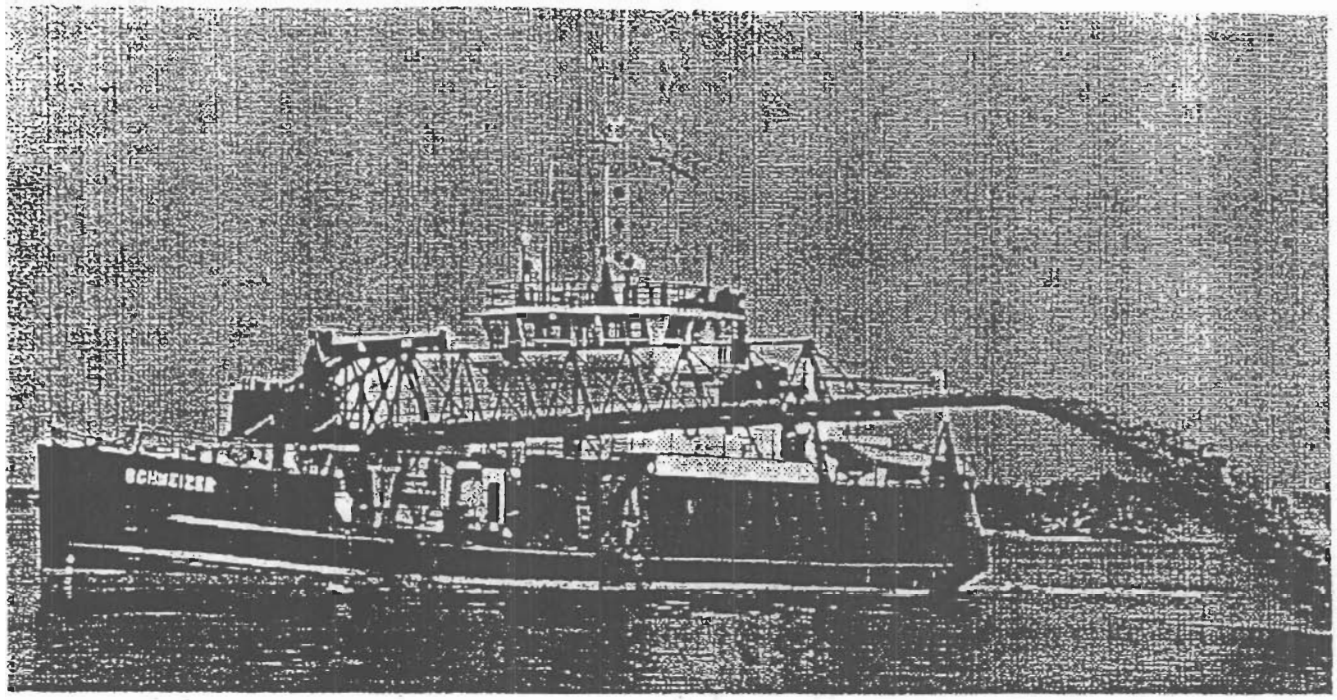
Pumping Equipment:

Pumps, Morris, two each, 10" suctions, 10" discharges combine into 12" discharge
Runner, 34", 3-vane
RPM, 500
Pump engine, 1 GM, 12V71, 340 HP @ 1800 RPM, Chain drive (3.66: 1)
Sidecasting capacity, 300 to 450 cy/hr
Dredging depth, 6' to 25'

A.C. Generators:	2 AC 90 KW-4-71
Derrick:	Driven by electric hydraulic pump, approximately 6-ton lifting capacity at typical operating boom angle
Potable Water tank:	4000 gal capacity
Speed:	7.5 MPH
Bunker Capacity:	10,000 gal diesel
Cruising Radius:	1,200 miles
Total Crew:	7-Single Shift Operation

NOTE: Quarters are fully air conditioned accomodations for 8 men including 2 officers, galley, no recreation room, TV installed for use after hours. No visitor quarters available.

Loran:	North Star GPS-Loran 800
Radio:	CAI SSB 5400 Khz Regency Polaris MT5500XL
Fathometer:	ICOM M-120, Gradurte 301, International Offshore- Furuno-FCV-667
Compass:	Sperry Gyro
Vertical Clearance from Waterline:	46'
Launch:	17' Fiberglass-1987 Boston Whaler, 90hp Evinrude, COB
Aluminum Skiff:	16' COB
Radar:	Furuno FR 8111



Sidecasting Dredge Schweizer

Radio Call Letters:AEWS

Home Port: Wilmington, North Carolina

Performs dredging work in numerous ocean inlets along the Atlantic Coast from Florida to New England. This vessel is especially suited to maintenance of the shallow, unstablized inlets where shallow channels prohibit operation of the larger hopper dredges.

Type: Seagoing sidecasting dredge,steel construction, side drags, port and starboard, full diesel, twin screw and twin rudder.

Built: 1946 by Missouri Valley Bridge Company and originally designated Navy YF-865.

Converted to Dredge: 1966 by Boland Machine and Manufacturing Company from Navy YF-865.

Vessel Characteristics and Specifications:

Gross Tonnage	361 long tons
Displacement	550 long tons
Length of Hull	133'-7"
Length, Overall Including Discharge Pipe	188'-6"
Beam, Molded	30'-0"
Width, Overall Over Drag Elbow	38'-0"
Draft, Bow	7'-9"
Draft, Stern	9'-0"
Hoppers	None
Drags	2 Brunswick type
Discharge Pipe	12"d, 99' long. Casts material 80' from side of vessel

Propulsion Equipment:

Main Engines:	2 ea GM-16-V-149, 900HP @ 1800RPM, total 1800HP
Reduction Gear:	Twin disc gears MG 540; 4.6 to 1
Propellers:	60" dia X 66" pitch, stainless steel, 4-blade

Pumping Equipment:

Pumps- (2) 12" Thomas Simplicity Dredge Pumps
RPM- 450
Pump engines- 2 Detroit Diesels, 12V71, 350 HP @ 1800 RPM
Sidecasting capacity- 650 cy/hr
Dredging depth- 9' to 20'

Speed: 9 MPH

Bunker Capacity: 8,600 gal
@SPACE =

Total Crew: 3 Officers, 4 men

Radio:

Motorola Micomix, SSB, 2300 Khz, 2326, 2350, 4090, 5400, 5437.5, 6785, 6790
Motorola VHF FM Maritime Channels 6, 8, 9, 10, 12, 13, 14, 26
Motorola VHF FM Channels 18A, 68, 70, 24,28, 21A, 22A, 23A, 81A, WX1, WX3
Regency Polaris 5500XL VHF FM

Radar: Furuno FCR 1411

Fathometer: Standard: DST Slant Bar 21 with Bronze Transducer

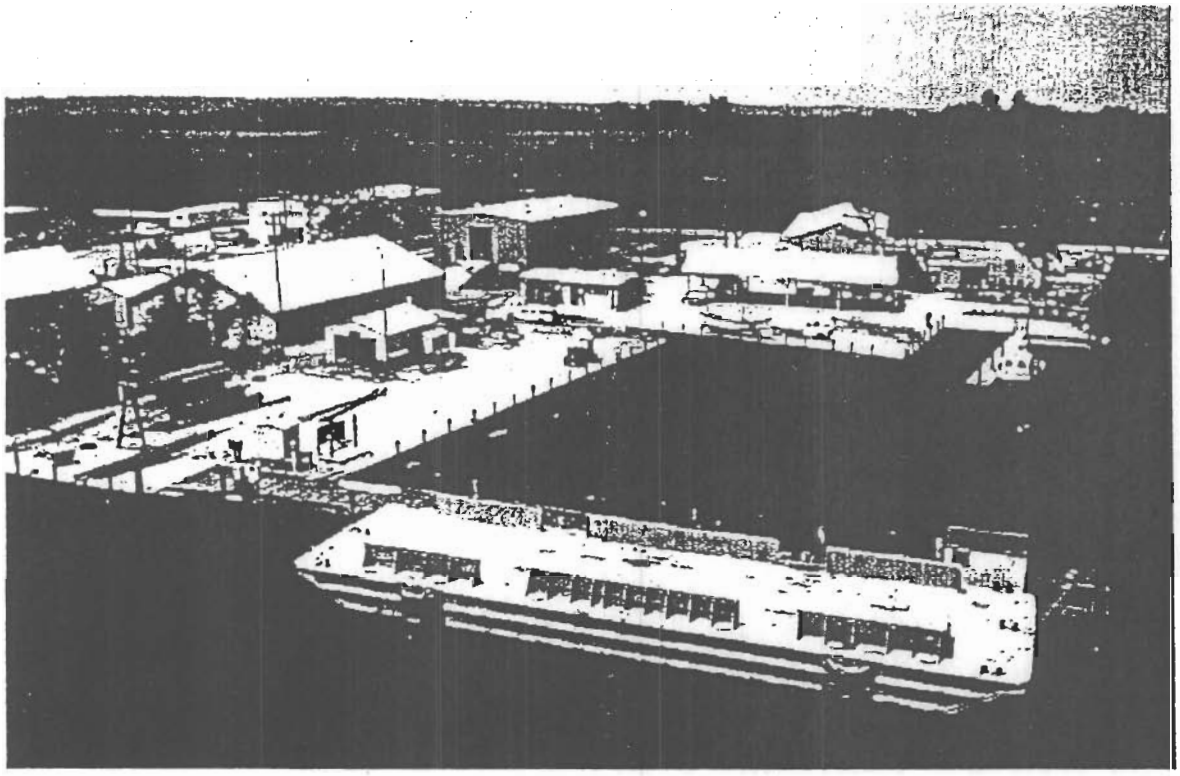
Compass: Sperry Gyro SR/30

Vertical Clearance from Waterline: 43'

Launch: 17' fiberglass, 1987 Boston Whaler, 90 hp, Evinrude, COB

AC Generators: 2 ea 100 KW GM 6-71-175 HP @ 1800 RPM

Emergency AC Generator: 1 ea 45 KW GM-3-71-HP @ 1800 RPM



Wilmington District Engineer Yard

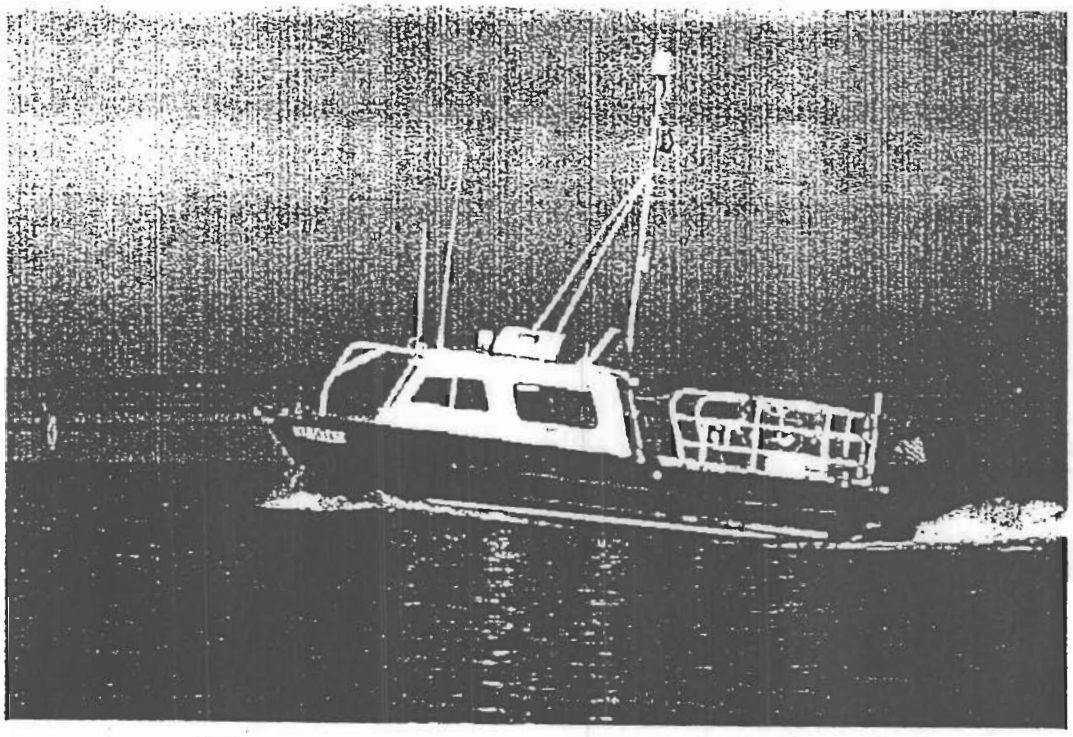
Located west side of the Cape Fear River, two miles downstream from Wilmington on Eagle Island, North Carolina, this facility is a repair yard and a storage area serving equipment on two multi-purpose flood control projects, two low flow water storage - flood control reservoirs, three locks and dams, highway bridges, and all the floating plant owned by the District. The site contains 3.3 acres with 7 buildings and a wharf. The area is enclosed by a 6' high chain link fence with a security gate at the entrance. Each building is secured by door locks.

The yard is under the supervision and direction of the Operations Branch, Construction-Operations Division. The permanent work force at this facility consists of a superintendent and generally five additional full-time employees.

Two four-man survey parties, the survey boat GILLETTE and several small survey boats are also based at the yard.

The yard is equipped with a carpenter shop and well equipped machine/welding shop, a warehouse, and an equipment shelter. Two docks and a steel bulkhead afford vessel berthing facilities.

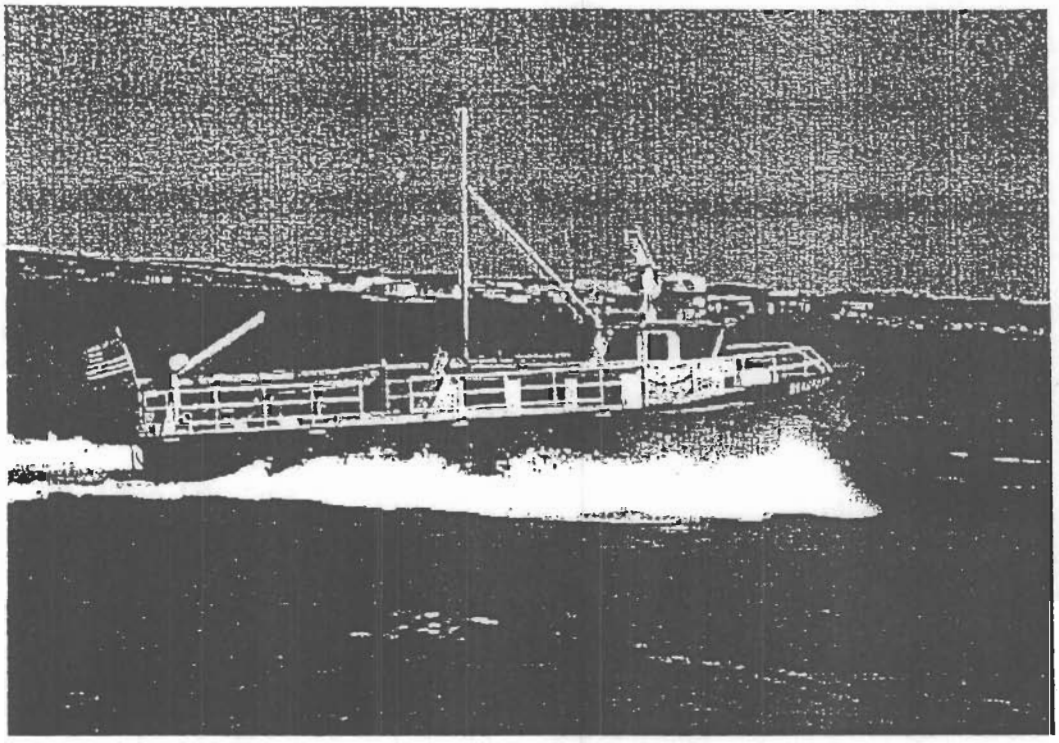
Considerable welding and mechanical work is done at the yard on dredging equipment for the *SNELL, FRY, MERRITT, SCHWEIZER*, and *CURRITUCK* and on machinery and fixtures for the flood control projects, locks, dams, bridges, and vessels.



Surveyboat Wanchese

Vessel Characteristics and Specifications

Hull Material:	Aluminum
Length, Overall:	25'-0"
Beam, Overall:	8'-0"
Displacement:	2.6 tons (light), 3.2 ton (loaded)
Draft:	8'-0"
Highest Fixed Point:	31 MPH (light),
Speed:	30 MPH (loaded)
Propulsion Engines:	
Main Engine	1 ea. 6 BT 5.9 Cummings
Horsepower	210 @ 2600 RPM's
Propeller	1 ea. 19" dia., 3-blade, 20 pitch Nibral cupped
Drive	1 ea. Marine Drive
Auxiliary Power:	1 each Kohler diesel generator 12 KW
Bunker capacity:	2 each @ 40 gal
Crew:	2-3
Radio:	Motorola Micor VHF FM 163.4125 Mhz and 163.4375 Mhz District Radio Regency 5500 XL VHF FM Channels 6,9,13,16,22A,24,26,28,WX1
Survey Equipment:	Entron Pentium PC Hypack surveying/navigation software NovAtel GPS system Trimble Navbeacon system Innerspace Technology thermal depth sounder model 448 TSS heave compensation system



Surveyboat Beaufort

Vessel Characteristics and Specifications

Material of Hull:	Aluminum
Length, Overall:	47' 6"
Beam, Overall:	15'
Displacement:	14.3 long tons, light, 17.4 long tons, loaded
Vertical Clearance Required:	16'-6"
Draft, Normal Loaded, Forward:	2'-6"
Draft, Normal Loaded, Aft:	4'-6"
Speed:	26 Knots
Propulsion Engine:	2 GM Diesel 8-V92 TI, 570 HP each at 2300
Bunker Capacity:	800 gal diesel fuel
Cruising Radius:	500 miles
Crew:	2
Propellers:	Two 4-blade, 26" diameter, 25" pitch Nibral
Survey Equipment:	Entron Pentium PC Hypack surveying/navigation software Trimble Navigation GPS system Trimble Navbeacon System Innerspace Technology thermal depth sounder model 448 TSS heave compensation system
Radar:	Furuno 805D, Marine Radar
Radio Equipment:	Motorola SYNTOR VHF FM District Communications Northstar 800 Loran C Regency Polaris MT 5500 XL VHF

ATTACHMENT B

REPORT OF OPERATIONS FOR CURRITUCK

New River Inlet		Nov 30 - Jan 30, 1996
Carolina Beach		Jan 31 - Feb 5, 1996
Eagle Island		Feb 6 - 27, 1996
Carolina Beach		Feb 28 - Mar 14, 1996
Barnegat Inlet		Mar 15 - Apr 12, 1996
Manasquan Inlet		Apr 13 - Apr 22, 1996
Barnegat Inlet		Apr 23 - 28, 1996
Green Harbor		Apr 29 - May 30, 1996
Block Island		May 31 - Jun 7, 1996
Sesuit Harbor		Jun 8 - 21, 1996
Barnegat Inlet		Jun 22 - Aug 14, 1996
New River Inlet		Aug 15 - 26, 1996
Staten Island		Aug 27 - Sep 30, 1996
Mays Shipyard		Oct 1 - 31, 1996
Barnegat Inlet		Nov 1 - Dec 4, 1996
Carolina Beach		Dec 5 - Dec 13, 1996
Eagle Island		Dec 14 - Dec 20, 1996
Lockwoods Folly		Dec 21 - Jan 19, 1997
Eagle Island		Jan 20 - 27, 1997
New River Inlet		Jan 28 - 31, 1997
Eagle Island		Feb 1 - 5, 1997
Cape May		Feb 6 - 10, 1997
Barnegat Inlet		Feb 11 - 26, 1997
Jones Creek		Feb 27 - Mar 24, 1997
Barnegat Inlet		Mar 25 - Apr 26, 1997
Cuttyhunk, Ma		Apr 27 - May 6, 1997
Woodhole, Ma		7-May-97
Green Harbor		May 8 - Jun 6, 1997
Barnegat Inlet		Jun 7 - Jul 20, 1997
Topsail Inlet		Jul 21 - Aug 17, 1997
Drum Inlet		Aug 18 - 30, 1997
Lockwoods Folly		Aug 31 - Sep 15, 1997
Carolina Beach		Sep 16 - 30, 1997
Carolina Beach		Oct 1 - 11, 1997
Eagle Island		Oct 12 - 15, 1997
Barnegat Inlet		Oct 28 - Nov 29, 1997
Bennett's Creek		Nov 30 - Dec 12, 1997
Rudee Inlet		Dec 13 - 18, 1997
Drum Inlet		Dec 19 - Jan 18, 1998
Lockwood's Folly		Jan 19 - Feb 2, 1998
Carolina Beach		Feb 3 - 15, 1998
Engineer Yard		Feb 16 - Mar 5, 1998
Rudee Inlet		Mar 6 - 14, 1998
Manasquan Inlet		Mar 15 - Apr 1, 1998
Barnegat Inlet		Apr 2 - 27, 1998
Repairs at Manasquan		28-Apr-98
Green Harbor		Apr 29 - May 23, 1998

REPORT OF OPERATIONS FOR MERRITT

LOCATION	DATE
Eagle Island	Oct 1 - 10, 1996
New River Inlet	Oct 10 - Nov 15, 1996
Bogue Inlet	Nov 16 - 24, 1996
Norshipco	Nov 25 - Jan 5, 1997
Eagle Island	Jan 6 - 14, 1997
Carolina Beach	Jan 15 - Mar 11, 1997
Lockwoods Folly	Mar 12 - Apr 7, 1997
Topsail Inlet	Apr 8 - 21, 1997
New River Inlet	Apr 22 - May 28, 1997
Carolina Beach	May 29 - Jun 16, 1997
New River Inlet	Jun 17 - Jul 7, 1997
New Topsail Inlet	Jul 8 - 9, 1997
Eagle Island	Jul 10 - 20, 1997
Bogue Inlet	Jul 21 - Sep 7, 1997
New Topsail Inlet	Sep 8 - 30, 1997
New Topsail Inlet	Oct 1 - 27, 1997
Eagle Island	Oct 28 - Nov 2, 1997
Bogue Inlet	Nov 3 - 16, 1997
Drum Inlet	Nov 17 - Dec 9, 1997
New Topsail Inlet	Dec 10 - 16, 1997
Carolina Beach	Dec 17 - Jan 16, 1998
Oregon Inlet	Jan 17 - Feb 25, 1998
Bogue Inlet	Feb 26 - Mar 14, 1998
Carolina Beach	Mar 15 - Apr 16, 1998
New River Inlet	Apr 17 - May 11, 1998

REPORT OF OPERATIONS FOR FRY

LOCATION	DATE	LOCATION	DATE
Topsail Inlet	Dec 28 - Jan 4, 1996	New River Inlet	Dec 28 - Jan 24, 1997
Bogue Inlet	Jan 5 - Feb 1, 1996	Engineer Yard	Jan 25 - Feb 12, 1997
Lockwoods Folly	Feb 2 - Mar 5, 1996	New River Inlet	Feb 13 - Mar 19,1997
Topsail Inlet	Mar 6 - 25, 1996	Drum Inlet	Mar 20 - Apr 30, 1997
New River Inlet	Mar 26 - Apr 9, 1996	Carolina Beach	May 1 - 4, 1997
Lockwoods Folly	Apr 10 - 24, 1996	Engineer Yard	May 5 - 15, 1997
New River Inlet	Apr 25 - May 7, 1996	Braswell Shipyard	May 16 - Jun 5, 1997
Eagle Island	May 8 - 10, 1996	Folly Beach, SC	Jun 6 - Jul 9, 1997
Carolina Beach	May 11 - Jun 2, 1996	Town Creek, SC	Jul 10 - Sep 3, 1997
Lockwoods Folly	Jun 3 - 14, 1996	Carolina Beach	Sep 4 - 10, 1997
Folly Beach, SC	Jun 15 - Jul 9, 1996	New River Inlet	Sep 11 - 30, 1997
Lockwoods Folly	Jul 10 - Jul 18, 1996	New River Inlet	Oct 1 - 8, 1997
Bogue Inlet	Jul 19 - 31, 1996	Lockwoods Folly	Oct 9 - 19, 1997
Eagle Island	Aug 1 - 14, 1996	Eagle Island	Oct 20 - 24, 1997
New Topsail Inlet	Aug 15 - 29, 1996	New River Inlet	Oct 25 - Nov 16, 1997
Carolina Beach	Aug 30 - Sep 6, 1996	Bogue Inlet	Nov 17 - Dec 14, 1997
Eagle Island	Sep 7 - 10, 1996	Engineer Yard	Dec 15 - 20, 1997
Lockwoods Folly	Sep 11 - 23, 1996	New River Inlet	Dec 21 - 28, 1997
Carolina Beach	Sep 24 - 27, 1996	Eagle Island	Dec 29 - Jan 1, 1998
New River Inlet	Sep 28 - 30, 1996	New River Inlet	Jan 2 - 5, 1998
New River Inlet	Oct 1 - 30, 1996	New Topsail Inlet	Jan 6 - Feb 2, 1998
Bogue Inlet	Oct 31 - Nov 13, 1996	Cape May Inlet	Mar 12 - 31, 1998
Carolina Beach	Nov 14 - 23, 1996	Eagle Island	Apr 1 - 8, 1998
Engineer Yard	Nov 24 - 28, 1996	Topsail Island	Apr 9 - 20, 1998
Masonboro Inlet	Nov 29 - Dec 5, 1996	Engineer Yard	Apr 21 - 22, 1998
Bogue Inlet	Dec 6 - 27, 1996	Clark Creek	Apr 23 - May 20, 1998

REPORT OF OPERATIONS FOR SCHWEIZER

LOCATION	DATE
Oregon Inlet	Oct 1 - Mar 13, 1996
Cape May	Mar 14 - 25, 1996
Oregon Inlet	Mar 26 - May 1, 1996
Bulls Bay	May 2 - Jun 24, 1996
Eagle Island	Jun 25 - Sep 9, 1996
Oregon Inlet	Sep 10 - 25, 1996
Oregon Inlet	Sep 26 - 30, 1996
Oregon Inlet	Oct 1 - Mar 2, 1997
Cape May	Mar 3 - 19, 1997
Eagle Island	Mar 20 - Apr 14, 1997
Oregon Inlet	Apr 15 - Jun 9, 1997
McClellanville, SC	Jun 10 - 17, 1997
Eagle Island	18-Jun-97
Oregon Inlet	Jun 19 - Sep 30, 1997
Oregon Inlet	Oct 1 - Dec 15, 1997

SUMMARY OF SEA TURTLE STRANDINGS REPORTED DURING COASTAL INLET DREDGING OPERATIONS IN NORTH CAROLINA: 1994 - 1997

This report summarizes all sea turtle strandings reported during inlet dredging operations from 1994 - 1997. It should be noted that 1997 dredging dates and locations are not complete because exact starting and ending dates were not specified in the dredge schedule supplied by the USACOE's Wilmington District. Additionally, it appears that emergency dredging operations were not included in the schedule (i.e., Drum Inlet, August 1997).

All strandings reported in the area extending from the center of the inlets to three miles north, three miles south, and three miles inland (hereinafter referred to as the search area) are included in the summary. The search area for inlets bordered by beaches with an east-west orientation extends three miles east, three miles west, and three miles north (inland) from the center of the inlet. Listed below are the inlets and the range of coordinates that form their respective search area.

Oregon Inlet:	35° 45.0' - 35° 49.1' N 75° 30.2' - 75° 35.0' W
Drum Inlet:	34° 49.2' - 34° 53.0' N 76° 16.5' - 76° 22.0' W
Bogue Inlet:	34° 37.9' - 34° 41.2' N 77° 09.5' - 77° 04.0' W
New River Inlet:	34° 30.7' - 34° 34.4' N 77° 17.9' - 77° 22.9' W
New Topsail Inlet:	34° 19.0' - 34° 22.5' N 77° 37.3' - 77° 41.6' W
Masonboro Inlet:	34° 08.9' - 34° 13.5' N 77° 47.0' - 77° 51.6' W
Carolina Beach Inlet:	34° 02.7' - 34° 07.2' N 77° 51.0' - 77° 56.7' W
Lockwood Folly Inlet:	33° 54.6' - 33° 57.0' N 78° 11.1' - 78° 17.5' W

Listed below are the inlets for which no strandings were reported in the search area. Dredging periods are included for verification by the USACOE.

Bogue Inlet:

No strandings were reported during the following dredging periods:

07/28/95 - 07/31/95	11/01/96 - 11/30/96
01/05/96 - 01/31/96	02/15/97 - 02/28/97
07/09/96 - 08/31/96	07/31/97 - 07/31/97

New River Inlet:

No strandings were reported during the following dredging periods:

10/01/94 - 10/11/94	10/01/96 - 10/31/96
12/01/94 - 12/31/94	02/01/97 - 02/15/97
08/01/95 - 08/31/95	06/01/97 - 06/30/97
10/01/95 - 10/31/95	08/01/97 - 08/31/97
12/08/95 - 01/15/96	

Masonboro Inlet:

No strandings were reported during the following dredging period:

12/01/96 - 12/31/96

Carolina Beach:

No strandings were reported during the following dredging periods:

11/01/94 - 11/27/94	03/01/96 - 03/14/96
12/01/94 - 12/31/94	05/01/96 - 05/31/96
04/01/95 - 04/10/95	07/10/96 - 07/31/96
08/01/95 - 08/31/95	09/01/96 - 09/30/96
09/01/95 - 09/06/95	01/01/97 - 02/28/97
10/01/95 - 10/22/95	

Definitions of variables and cell values found in the tables below:

Dredge Period - span of time a dredging operation took place.

Strn. Date - stranding date.

Lat. - latitude (stranding location).

Long. - longitude (stranding location).

Cond. - condition of turtle carcass.

Cause - probable cause of turtle stranding.

Cells with n/a indicate that no strandings were reported during the respective dredging period.

CCL (found under "Carapace Measurements") - curved carapace length.
CCW (found under "Carapace Measurements") - curved carapace width.

Table 1. Sea Turtle strandings reported during dredging operations in Oregon Inlet, North Carolina, 1994 - 1997.

DREDGE PERIOD	STRN. DATE	SPECIES	LAT.	LONG.	COND.	CAUSE & COMMENTS	CARAPACE MEASUREMENTS
10/01/94 - 04/30/95	11/15/94	Loggerhead	35°48.0'	75°32.5'	Fresh	Unknown without injury.	CCL: 37.0 in. CCW: 34.0 in.
06/01/95 - 07/22/95	06/01/95	Loggerhead	35°49.1'	75°33.1'	Fresh	Unknown without injury.	Carapace measurements were taken incorrectly.
06/01/95 - 07/22/95	06/30/95	Loggerhead	35°45.8'	75°30.8'	Severely decomposed	Unknown - a rope with a heavy wooden crate was tied to one of its rear flippers.	CCL: 43.0 in. CCW: 39.0 in.
06/01/95 - 07/22/95	07/11/95	Leatherback	35°45.5'	75°30.6'	Moderately decomposed	Boat propeller lacerations penetrated carapace; viscera exposed.	CCL: 62.0 in. CCW: 47.0 in.
10/01/95 - 02/29/95	n/a	n/a	n/a	n/a	n/a	n/a	n/a
04/01/96 - 04/30/96	n/a	n/a	n/a	n/a	n/a	n/a	n/a
10/01/96 - 02/28/97	11/17/96	Loggerhead	35°48.3'	75°32.8'	Fresh	Unknown without injury; trawling activity in nearshore waters.	CCL: 24.2 in. CCW: 22.7 in.
03/15/97 - 09/30/97	05/22/97	Loggerhead	35°46.7'	75°34.7'	Moderately decomposed	Unknown without injury.	Did not obtain CCL CCW: 25.0 in.
03/15/97 - 09/30/97	06/25/97	Loggerhead	35°46.2'	75°32.2'	Severely decomposed	Unknown with injury; head and right rear flipper missing.	CCL: 58.0 cm CCW: 50.5 cm
03/15/97 - 09/30/97	07/06/97	Loggerhead	35°46.8'	75°32.2'	Severely decomposed	Unknown with injury; head and all four flippers missing.	CCL: 24.5 in. CCW: 24.0 in.

Table 2. Sea Turtle strandings reported during dredging operations in Drum Inlet, North Carolina, 1997.

DREDGE PERIOD	STRN. DATE	SPECIES	LAT.	LONG.	COND.	CAUSE & COMMENTS	CARAPACE MEASUREMENTS
03/01/97 - 03/31/97	03/21/97	Loggerhead	34°53.0'	76°16.6'	Moderately decomposed	Unknown without injury; old, healed wound on right side of carapace.	CCL: 27.2 in. CCW: 26.5 in.
03/01/97 - 03/31/97	03/28/97	Loggerhead	34°51.7'	76°18.5'	Dried carcass	Only carapace and plastron present; found in an area rarely patrolled.	CCL: 26.0 in. CCW: 25.0 in.

Table 2. Sea Turtle strandings reported during dredging operations in Drum Inlet, North Carolina, 1997 - January 1998.

DREDGE PERIOD	STRN. DATE	SPECIES	LAT.	LONG.	COND.	CAUSE & COMMENTS	CARAPACE MEASUREMENTS
03/20/97 - 04/30/97	03/21/97	Loggerhead	34°53.0'	76°16.6'	Moderately decomposed	Unknown without injury; old, healed wound on right side of carapace.	CCL: 27.2 in. CCW: 26.5 in.
03/20/97 - 04/30/97	03/28/97	Loggerhead	34°51.7'	76°18.5'	Dried carcass	Only carapace and plastron present; found in an area rarely patrolled.	CCL: 26.0 in. CCW: 25.0 in.
03/20/97 - 04/30/97	04/10/97	Loggerhead	34°50.7'	76°19.4	Severely decomposed	No visible wounds.	CCL: 23.5 in. CCW: 22.5 in.
08/18/97 - 08/30/97	n/a	n/a	n/a	n/a	n/a	n/a	n/a
11/17/97 - 12/09/97	11/22/97	Kemp's ridley	34°52.7'	76°17.0'	Moderately decomposed	Missing most of the left front flipper; tear in throat (prob. scavengers); shrimp & crab parts in GI tract.	CCL: 26.5 cm CCW: 26.0 cm
11/17/97 - 12/09/97	12/03/97	Loggerhead	34°51.7'	76°18.3'	Moderately decomposed	3 cm hole in left side of neck.	CCL: 52.0 cm CCW: 49.0 cm
11/17/97 - 12/09/97	12/05/97	Loggerhead	34°50.0'	76°20.1'	Moderately decomposed	Small hole in left side of neck.	CCL: 68.0 cm CCW: 65.5 cm
12/19/97 - 01/18/98	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Table 3. Sea Turtle strandings reported during dredging operations in New Topsail Inlet, North Carolina, 1995 - 1997.

DREDGE PERIOD	STRN. DATE	SPECIES	LAT.	LONG.	COND.	CAUSE & COMMENTS	CARAPACE MEASUREMENTS
03/01/95 - 03/31/95	n/a	n/a	n/a	n/a	n/a	n/a	n/a
12/06/95 - 12/31/95	n/a	n/a	n/a	n/a	n/a	n/a	n/a
03/09/96 - 03/31/96	n/a	n/a	n/a	n/a	n/a	n/a	n/a
08/15/96 - 08/31/96	n/a	n/a	n/a	n/a	n/a	n/a	n/a
04/01/97 - 04/31/97	04/16/97	Loggerhead	34°21.2'	77°38.8'	Severely decomposed	Carcass was buried before it was checked by a stranding network participant.	No meas. obtained; est. CCL: 22.0 in., est. CCW: 17.5 in.
08/01/97 - 09/30/97	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Table 4. Sea Turtle strandings reported during dredging operations in Lockwood Folly Inlet, North Carolina, 1994 - 1997.

DREDGE PERIOD	STRN. DATE	SPECIES	LAT.	LONG.	COND.	CAUSE & COMMENTS	CARAPACE MEASUREMENTS
10/01/94 - 10/14/94	n/a	n/a	n/a	n/a	n/a	n/a	n/a
01/01/95 - 02/29/95	n/a	n/a	n/a	n/a	n/a	n/a	n/a
09/01/95 - 09/30/95	n/a	n/a	n/a	n/a	n/a	n/a	n/a
02/02/96 - 03/08/96	n/a	n/a	n/a	n/a	n/a	n/a	n/a
04/01/96 - 04/30/96	04/25/96	Loggerhead	33°54.7'	78°11.9'	Fresh	Unknown with injury; small hole on left side of neck; right side of neck bruised; blood oozed from nose.	CCL: 64.3 cm. CCW: 62.2 cm.
09/01/96 - 09/30/96	09/03/96	Green	33°54.6'	78°15.0'	Severely decomposed	Two severe propeller cuts in right rear quadrant of carapace that also penetrated the plastron.	CCL: 12.0 in. CCW: 10.0 in.
09/01/96 - 09/30/96	09/27/96	Kemp's ridley	33°54.6'	78°15.8'	Moderately decomposed	Unknown without injury.	CCL: 15.0 in. CCW: 15.0 in.
12/01/96 - 01/31/97	n/a	n/a	n/a	n/a	n/a	n/a	n/a
03/01/97 - 03/31/97	n/a	n/a	n/a	n/a	n/a	n/a	n/a
09/01/97 - 09/30/97	09/07/97	Loggerhead	33°54.7'	78°12.0'	Fresh	Unknown without injury.	CCL: 53.0 cm. CCW: 48.0 cm.

ATTACHMENT C

Guidelines for Avoiding Impacts to the West Indian Manatee

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

GUIDELINES FOR AVOIDING IMPACTS TO THE WEST INDIAN MANATEE
Precautionary Measures for Construction Activities in North Carolina Waters

The West Indian manatee (*Trichechus manatus*), also known as the Florida manatee, is a Federally-listed endangered aquatic mammal protected under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) and the Marine Mammal Protection Act of 1972, as amended (16 U.S.C 1461 *et seq.*). The manatee is also listed as endangered under the North Carolina Endangered Species Act of 1987 (Article 25 of Chapter 113 of the General Statutes). The U.S. Fish and Wildlife Service (Service) is the lead Federal agency responsible for the protection and recovery of the West Indian manatee under the provisions of the Endangered Species Act.

Adult manatees average 10 feet long and weigh about 2,200 pounds, although some individuals have been recorded at lengths greater than 13 feet and weighing as much as 3,500 pounds. Manatees are commonly found in fresh, brackish, or marine water habitats, including shallow coastal bays, lagoons, estuaries, and inland rivers of varying salinity extremes. Manatees spend much of their time underwater or partly submerged, making them difficult to detect even in shallow water. While the manatee's principal stronghold in the United States is Florida, the species is considered a seasonal inhabitant of North Carolina with most occurrences reported from June through October.

To protect manatees in North Carolina, the Service's Raleigh Field Office has prepared precautionary measures for general construction activities in waters used by the species. Implementation of these measures will allow in-water projects that do not require blasting to proceed without adverse impacts to manatees. In addition, inclusion of these guidelines as conservation measures in a Biological Assessment or Biological Evaluation, or as part of the determination of impacts on the manatee in an environmental document prepared pursuant to the National Environmental Policy Act, will expedite the Service's review of the document for the fulfillment of requirements under Section 7 of the Endangered Species Act. These measures include:

1. The project manager and/or contractor will inform all personnel associated with the project that manatees may be present in the project area, and the need to avoid any harm to these endangered mammals. The project manager will ensure that all construction personnel know the general appearance of the species and their habit of moving about completely or partially submerged in shallow water.

All construction personnel will be informed that they are responsible for observing water-related activities for the presence of manatees.

2. The project manager and/or the contractor will advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act and the Endangered Species Act.

3. If a manatee is seen within 100 yards of the active construction and/or dredging operation or vessel movement, all appropriate precautions will be implemented to ensure protection of the manatee. These precautions will include the immediate shutdown of moving equipment if a manatee comes within 50 feet of the operational area of the equipment. Activities will not resume until the manatee has departed the project area on its own volition (i.e., it may not be herded or harassed from the area).

4. Any collision with and/or injury to a manatee will be reported immediately. The report must be made to the U.S. Fish and Wildlife Service (ph. 919.856.4520 ext. 16), the National Marine Fisheries Service (ph. 252.728.8762), and the North Carolina Wildlife Resources Commission (ph. 252.448.1546).

5. A sign will be posted in all vessels associated with the project where it is clearly visible to the vessel operator. The sign should state:

> CAUTION: The endangered manatee may occur in these waters during the warmer months, primarily from June through October. Idle speed is required if operating this vessel in shallow water during these months. All equipment must be shut down if a manatee comes within 50 feet of the vessel or operating equipment. A collision with and/or injury to the manatee must be reported immediately to the U.S. Fish and Wildlife Service (919-856-4520 ext. 16), the National Marine Fisheries Service (252.728.8762), and the North Carolina Wildlife Resources Commission (252.448.1546).

6. The contractor will maintain a log detailing sightings, collisions, and/or injuries to manatees during project activities. Upon completion of the action, the project manager will prepare a report which summarizes all information on manatees encountered and submit the report to the Service's Raleigh Field Office.

7. All vessels associated with the construction project will operate at "no wake/idle" speeds at all times while in water where the draft of the vessel provides less than a four foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.

8. If siltation barriers must be placed in shallow water, these barriers will be: (a) made of material in which manatees cannot become entangled; (b) secured in a manner that they cannot break free and entangle manatees; and, (c) regularly monitored to ensure that manatees have not become entangled. Barriers will be placed in a manner to allow manatees entry to or exit from essential habitat.

Prepared by (rev. 06/2003):
U.S. Fish and Wildlife Service
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726
919/856-4520

ATTACHMENT D

Preliminary Evaluation of Section 404(b)(1) Guidelines 40 CFR 230

Use of Government Plant to Dredge in Federally Authorized Navigation Project in North Carolina

Preliminary Evaluation of Section 404 (b) (1) Guidelines 40 CFR 230

This evaluation covers the discharge of all dredged material into waters and wetlands of the United States required for the use of Government dredge plant to dredge shoals in Federally authorized waterways in North Carolina.

Section 404 Public Notice No. CESAW-TS-PE-04-0010

		Preliminary 1/	Final 2/
1.	Review of Compliance (230.10(a)-(d)) A review of the NEPA Document indicates that:		
a.	The discharge represents the least environmentally damaging practicable alternative and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in the aquatic ecosystem to fulfill its basic purpose (if no, see section 2 and NEPA document);	YES ✓ NO☐	YES☐ NO☐
b.	The activity does not: 1) violate applicable State water quality standards or effluent standards prohibited under Section 307 of the CWA; 2) jeopardize the existence of federally listed endangered or threatened species or their habitat; and 3) violate requirements of any federally designated marine sanctuary (if no, see section 2b and check responses from resource and water quality certifying agencies);	YES✓ NO☐*	YES☐ NO☐
c.	The activity will not cause or contribute to significant degradation of waters of the U.S. including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values (if no, see section 2);	YES✓ NO☐	YES☐ NO☐
d	Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem (if no, see section 5).	YES✓ NO☐*	YES☐ NO☐

Proceed to Section 2
*, 1, 2/ See page 6.

2. Technical Evaluation Factors (Subparts C-F)	N/A	Not Significant	Significant
a. Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C)			
(1) Substrate impacts.		X	
(2) Suspended particulates/turbidity impacts		X	
(3) Water column impacts.		X	
(4) Alteration of current patterns and water circulation.		X	
(5) Alteration of normal water fluctuations/hydroperiod.	X		
(6) Alteration of salinity gradients.	X		
b. Biological Characteristics of the Aquatic Ecosystem (Subpart D)			
(1) Effect on threatened/endangered species and their habitat.		X	
(2) Effect on the aquatic food web.			
(3) Effect on other wildlife (mammals birds, reptiles, and amphibians).		X	
		X	
c Special Aquatic Sites (Subpart E)			
(1) Sanctuaries and refuges.	X		
(2) Wetlands.		X	
(3) Mud flats.	X		
(4) Vegetated shallows.		X	
(5) Coral reefs.	X		
(6) Riffle and pool complexes.	X		
d. Human Use Characteristics (Subpart F)			
(1) Effects on municipal and private water supplies.	X		
(2) Recreational and commercial fisheries impacts		X	
(3) Effects on water-related recreation.		X	
(4) Aesthetic impacts.		X	
(5) Effects on parks, national and historical monuments, national seashores, wilderness areas, research sites,, and similar preserves.		X	

Remarks: Where a check is placed under the significant category, preparer add explanation below.

Proceed to Section 3
*See page 6.

3. Evaluation of Dredged or Fill Material (Subpart G) 3/

a. The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material. (Check only those appropriate.)

(1) Physical characteristics. . . . . ☐
(2) Hydrography in relation to known or anticipated sources of contaminants . . . . . ☐
(3) Results from previous testing of the material or similar material in the vicinity of the project . . . . . ✓
(4) Known, significant sources of persistent pesticides from land runoff or percolation . . . . . ☐
(5) Spill records for petroleum products or designated (Section 311 of CWA) hazardous substances . . . . . ☐
(6) Other public records of significant introduction of contaminants from industries, municipalities, or other sources. . . . . ☐
(7) Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities. . . . . ☐

(8) Other sources (specify). . . . . ☐

b. An evaluation of the appropriate information in 3a above indicates that there is reason to believe the proposed dredge or fill material is not a carrier of contaminants, or that levels of contaminants are substantively similar at extraction and disposal sites and not likely to result in degradation of the disposal site.** YES ✓ NO☐*

Proceed to Section 4
*, 3/, see page 6.

4. Disposal Site Determinations (230.11(f)).

a. The following factors as appropriate, have been considered in evaluating the disposal site.

(1) Depth of water at disposal site. . . . . ✓

(2) Current velocity, direction, and variability at disposal site . . . . . ✓

(3) Degree of turbulence. . . . . ✓

(4) Water column stratification . . . . . ✓

(5) Discharge vessel speed and direction . . . . . ✓

(6) Rate of discharge . . . . . ✓

(7) Dredged material characteristics (constituents, amount and type of material, settling velocities). . . . . ✓

(8) Number of discharges per unit of time. . . . . ✓

(9) Other factors affecting rates and patterns of mixing (specify)

b. An evaluation of the appropriate factors in 4a above indicates that the disposal site and/or size of mixing zone are acceptable. YES ✓ NO ☐*

5. Actions to Minimize Adverse Effects (Subpart H).

All appropriate and practicable steps have been taken, through application of recommendations of 40 CFR Parts 230.70-230.77, to ensure minimal adverse effects of the proposed discharge. List actions taken. YES ✓ NO ☐*

See Section 4.03 of the EA for a description of the preferred alternative.
See Section 6.01 of the EA for wildlife and vegetation.
See Section 6.02 of the EA for fishes.

Return to section 1 for final stage of compliance review. See also note 3/, page 3.
*See page 6.

6. Factual Determinations (230.11).

A review of appropriate information as identified in items 2-5 above indicates that there is minimal potential for short- or long-term environmental effects of the proposed discharge as related to:

a. Physical substrate at the disposal site (review sections 2a, 3, 4, and 5). YES ✓ NO ☐*

b. Water circulation, fluctuation, and salinity (review sections 2a, 3, 4, and 5). YES ✓ NO ☐*

c. Suspended particulates/turbidity (review sections 2a, 3, 4, and 5). YES ✓ NO ☐*

d Contaminant availability (review sections 2a, 3, and 4). YES ✓ NO ☐*

e. Aquatic ecosystem structure and function (review sections 2b and c, 3, and 5). YES ✓ NO ☐*

f. Disposal site (review sections 2, 4, and 5). YES ✓ NO ☐*

g. Cumulative impact on the aquatic ecosystem. YES ✓ NO ☐*

h. Secondary impacts on the aquatic ecosystem. YES ✓ NO ☐*

7. Findings.

a. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines. . . . . ✓

b. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines with the inclusion of the following conditions:. . . . . ☐

c. The proposed disposal site for discharge of dredged or fill material does not comply with the Section 404(b)(1) guidelines for the following reasons(s):

(1) There is a less damaging practicable alternative . . . . . ☐

(2) The proposed discharge will result in significant degradation of the aquatic ecosystem . . . . . ☐

*See page 6.

(3) The proposed discharge does not include all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem. . . . . ☐

8.

Charles R. Alexander, Jr.
Colonel, U.S. Army
District Engineer

Date: _____

*A negative, significant, or unknown response indicates that the permit application may not be in compliance with the Section 404(b)(1) Guidelines.

1/ Negative responses to three or more of the compliance criteria at this stage indicate that the proposed projects may not be evaluated using this "short form procedure." Care should be used in assessing pertinent portions of the technical information of items 2 a-d, before completing the final review of compliance.

2/ Negative response to one of the compliance criteria at this stage indicates that the proposed project does not comply with the guidelines. If the economics of navigation and anchorage of Section 404(b)(2) are to be evaluated in the decision-making process, the "short form evaluation process is inappropriate."

3/ If the dredged or fill material cannot be excluded from individual testing, the "short-form" evaluation process is inappropriate.