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

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
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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

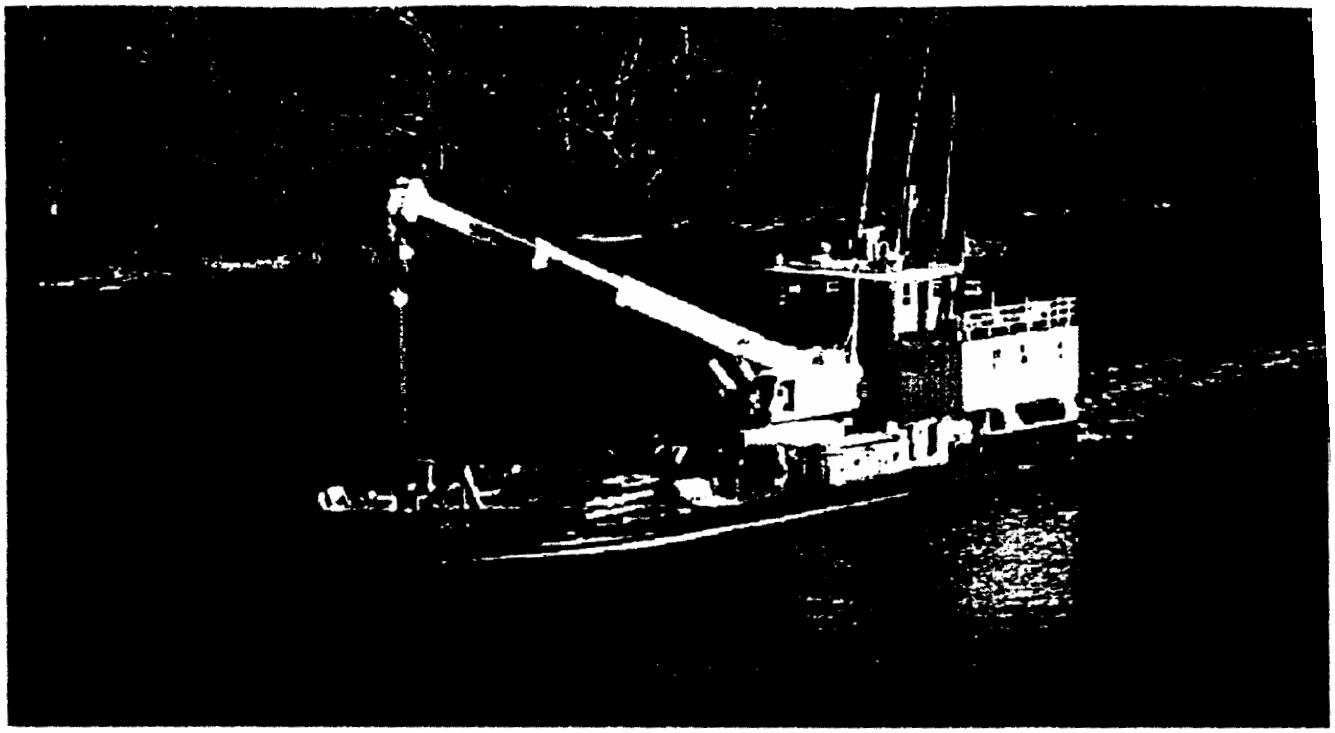
Radar: Furuno Model 805D

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:

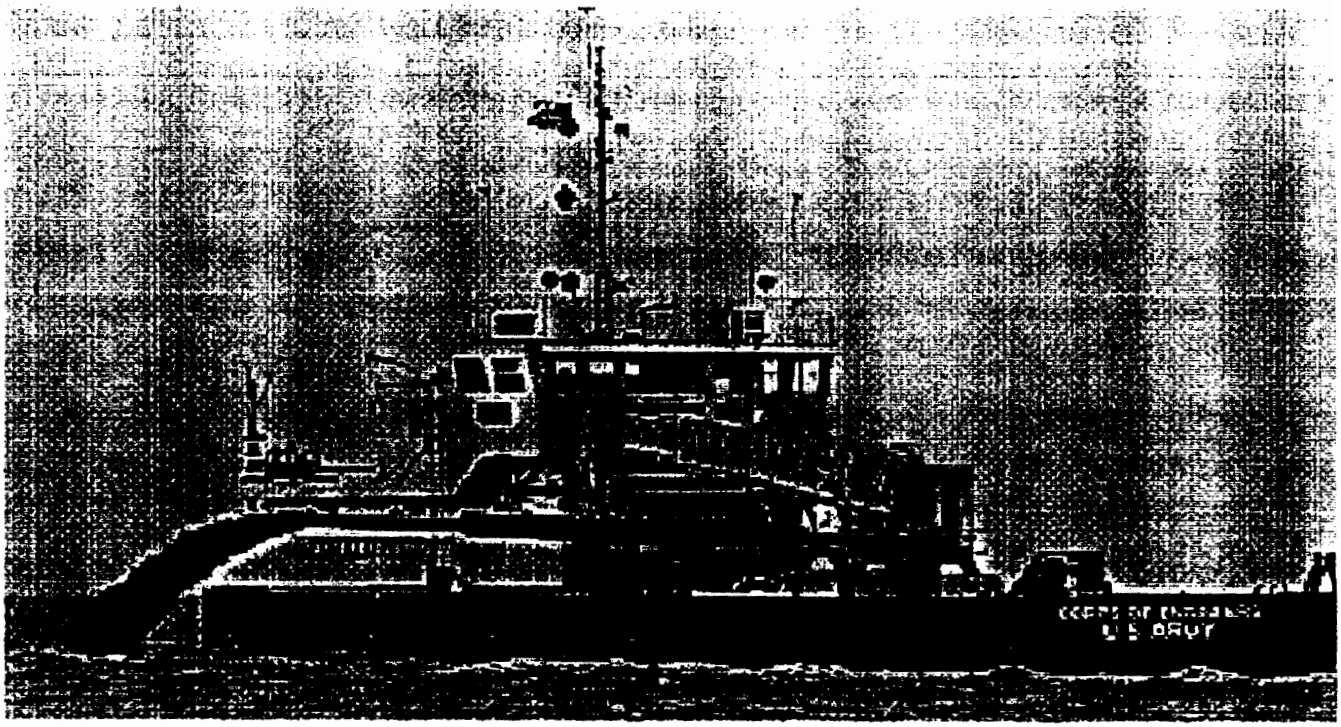
Primer mover-	2 ea GM 6V-71
Dredge Pumps-	2 ea HDM-32-12x10, 400 RPM-Dredge Master's direct coupled
Drags-	Brunswick County Type, fabricated at Eagle Island Yard
Drag hoisting winches-	Braden Series PD 12C

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

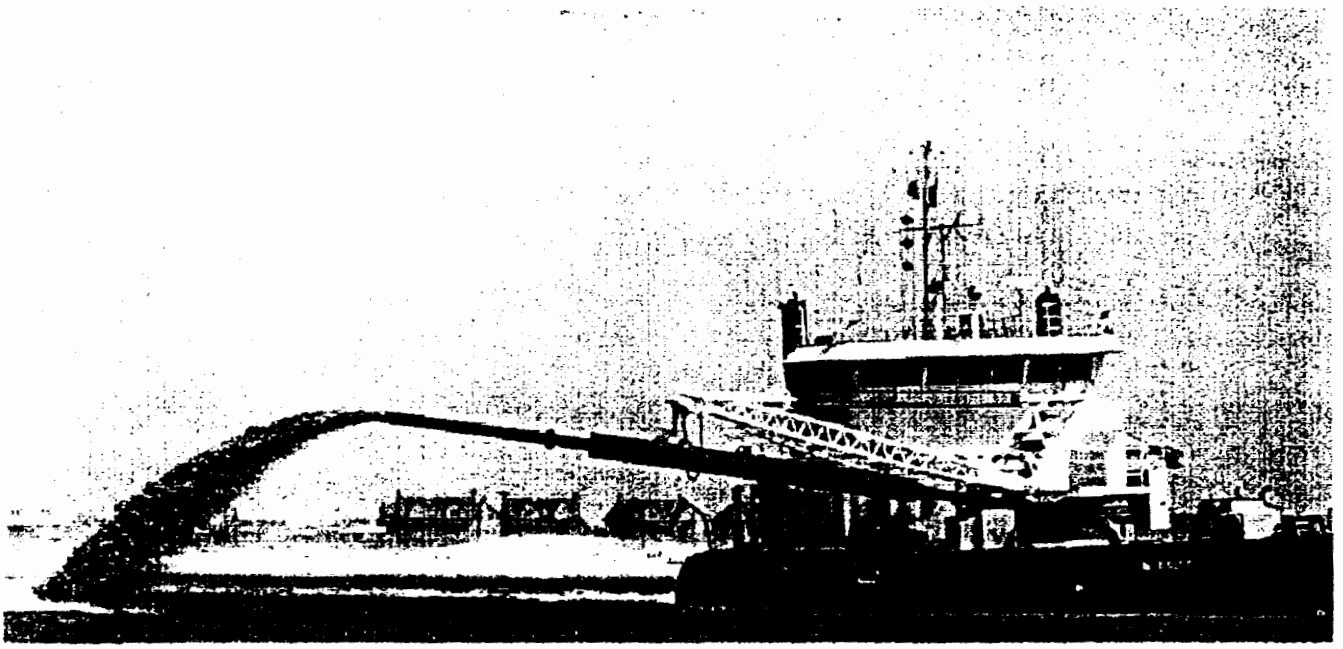
Compass: Danforth Constellation

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

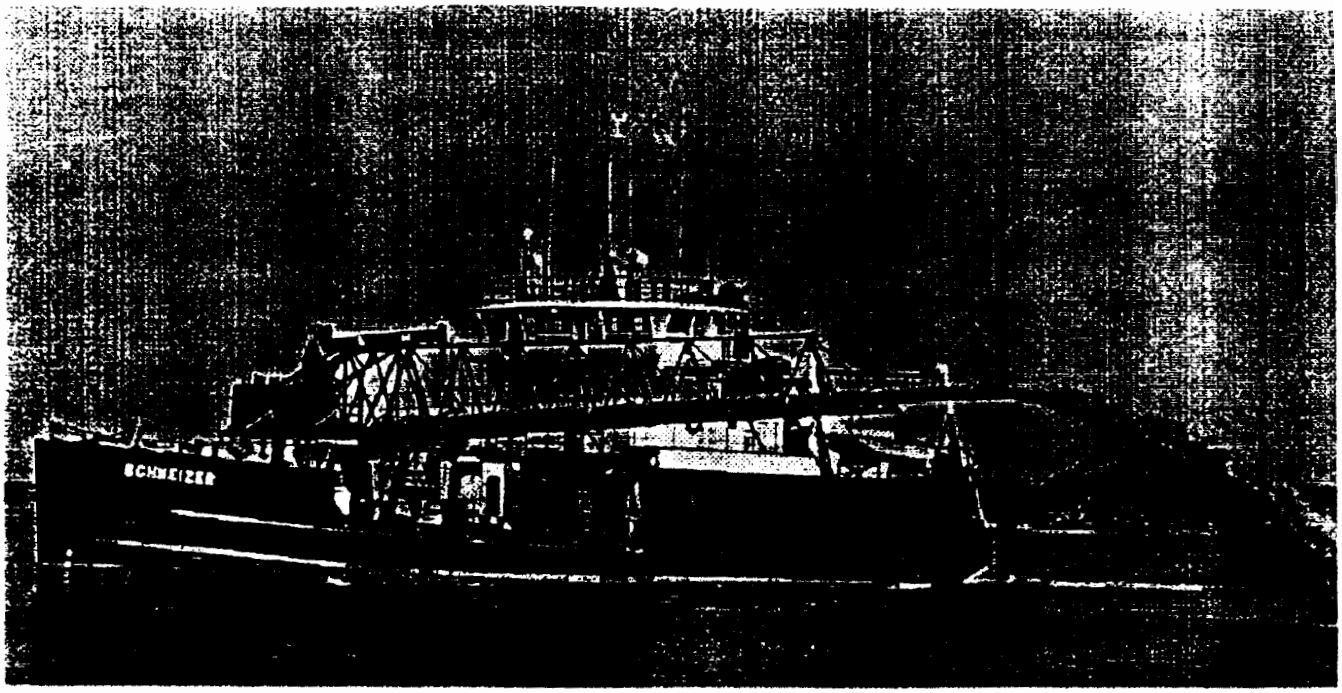
Pumping Equipment:

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

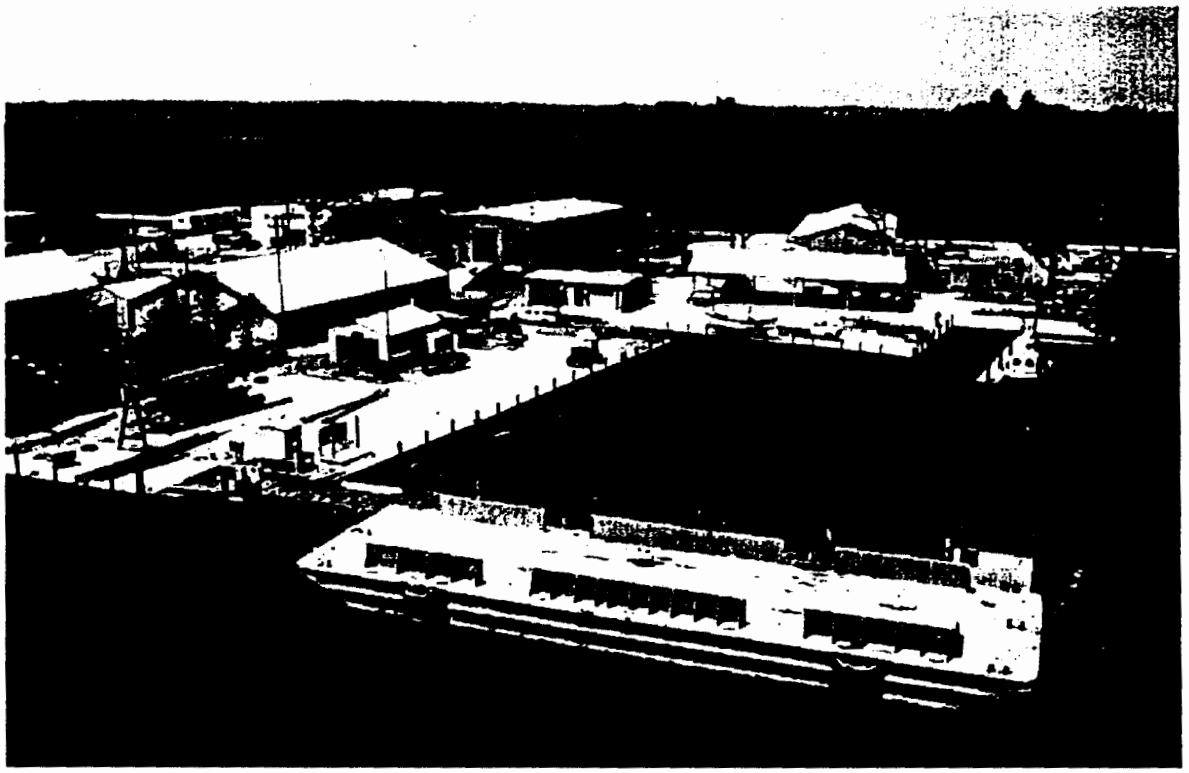
Compass: Sperry Gyro SR/30

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

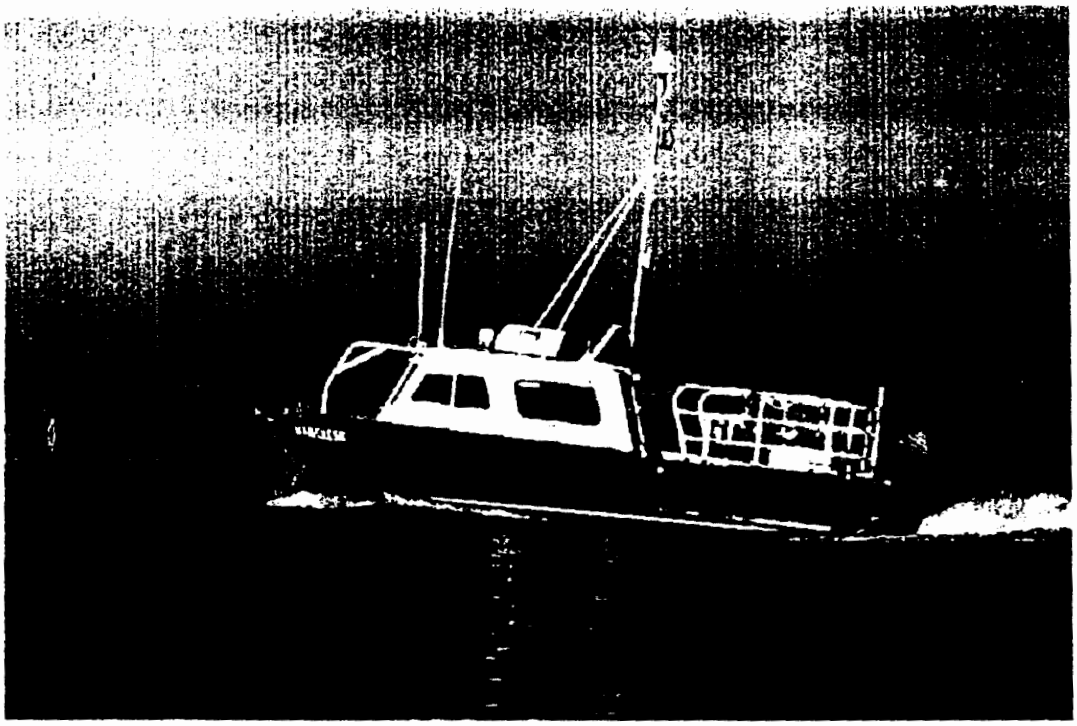
Located west side of the Cape Fear River, two miles downstream from Wilmington on Eagle Island, North Carolina, this facility is a repair yard and a storage area serving equipment on two multi-purpose flood control projects, two low flow water storage - flood control reservoirs, three locks and dams, 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.

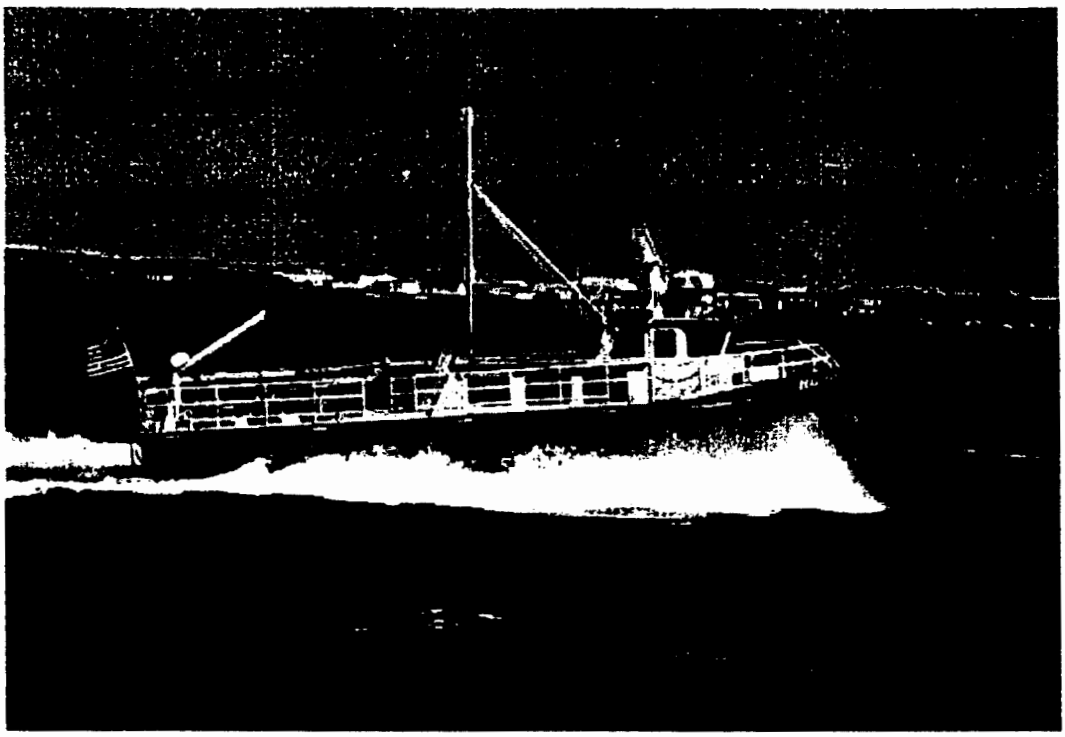
Considerable welding and mechanical work is done at the yard on dredging equipment for the *SNELL, FRY, MERRITT, SCHWEIZER*, and *CURRITUCK* and on machinery and fixtures for the flood control projects, locks, dams, bridges, and vessels.



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

ATTACHMENT C

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 D

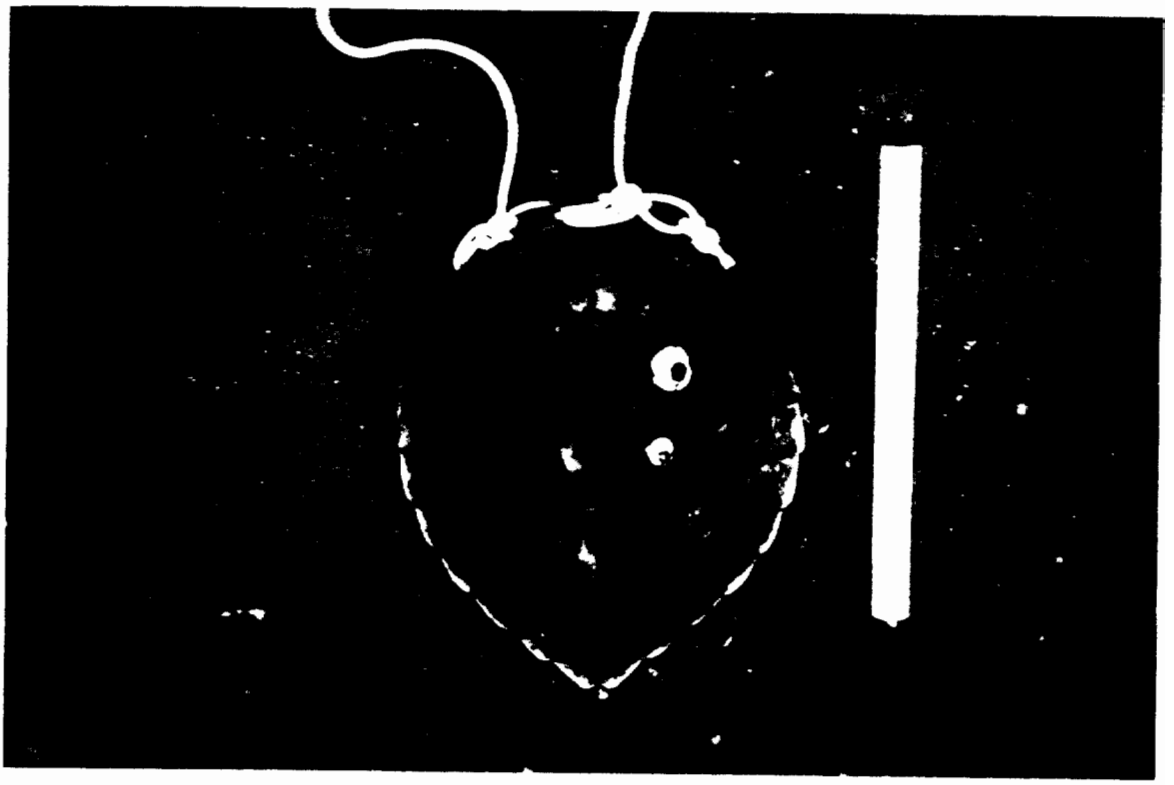


Figure 1. Test sea turtle, *Chelonia mydas*, prior to initiation of tests.

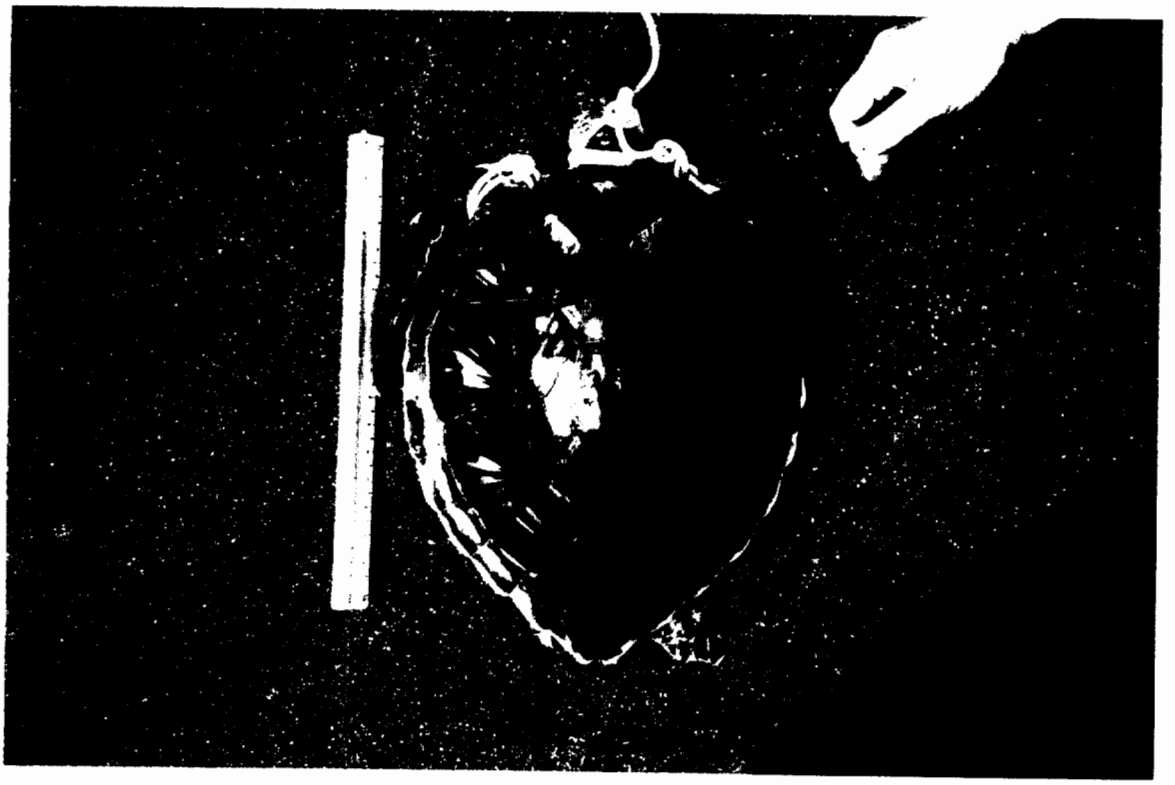


Figure 2. Same turtle as in Figure 1, after completion of all tests.

Figure 3. Draghead of sidecast dredge Fry. Overall, draghead is 24"X24", individual ports are 5.5 inch square and 5.5" by 8". Intake pipe is 10" diameter.

Figure 4. Close-up of same draghead as in Figure 3.