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

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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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