

Revision No. 1 to November 19, 2003, Gulf of Mexico Regional Biological Opinion (GOM RBO) on Hopper Dredging of Navigation Channels and Borrow Areas in the U.S. Gulf of Mexico

The following replaces and supersedes the corresponding sections on pages 65-81 (Sections 9, 10, and 11) of the November 19, 2003, GOM RBO. New or revised text or paragraphs are identified by underline.

9.0 Reasonable and Prudent Measures

Regulations (50 CFR 402.02) implementing section 7 of the ESA define reasonable and prudent measures as actions the Director believes necessary or appropriate to minimize the impacts, i.e., amount or extent, of incidental take. The reasonable and prudent measures that NOAA Fisheries believes are necessary to minimize the impacts of hopper dredging in the Gulf of Mexico have been discussed with the COE and include use of temporal dredging windows, intake and overflow screening, use of sea turtle deflector dragheads, observer and reporting requirements, and sea turtle relocation trawling. The following reasonable and prudent measures and associated terms and conditions are established to implement these measures, and to document incidental takes. Only incidental takes that occur while these measures are in full implementation are authorized. These restrictions remain valid until reinitiation and conclusion of any subsequent section 7 consultation.

Seasonal Dredging Windows, Observer Requirements, Deflector Dragheads, and Relocation Trawling¹

Experience has shown that injuries sustained by sea turtles entrained in the hopper dredge dragheads are usually fatal. Current regional opinions for hopper dredging require seasonal dredging windows and observer monitoring requirements, deflector dragheads, and conditions and guidelines for relocation trawling, which NOAA Fisheries' believes are necessary to minimize effects of these removals on listed sea turtle species that occur in inshore and nearshore Gulf and South Atlantic waters.

Temperature- and date-based dredging windows:

Both the Mobile and Jacksonville Districts expressed comments opposing NOAA Fisheries' imposition of seasonal dredging windows in their respective Gulf of Mexico dredging areas. In their November 28, 2000, BA on their Florida west coast hopper dredging activities, the Jacksonville District indicated that sea turtles are present year-round in the Gulf, so windows would only be of limited effectiveness. In their October 30, 2002, comments to NOAA Fisheries, the Mobile District noted it did not want to be restricted to seasonal hopper dredging windows, indicating that these would potentially seriously and detrimentally impact its ability to complete its operations and maintain Federal navigation projects due to "no excess of large dredges of the type required to perform maintenance of most Federal projects" and other reasons related to dredging industry capacity, downsizing, "loss of production" associated with the deflector draghead, and safety concerns.

¹The COE Wilmington District's sidecast dredges FRY, MERRITT, and SCHWEIZER, and split-hull hopper dredge CURRITUCK, are exempt from the above hopper dredging requirements (operating windows, deflectors, screening, observers, reporting requirements, etc.). Their small size and operating characteristics including small draghead sizes [2-ft by 2-ft, to 2-ft by 3-ft], small draghead openings [5-in by 5-in to 5 in by 8 in], small suction intake pipe diameters [10-14 in], and limited draghead suction [350-400 hp] have been previously determined by NOAA Fisheries to not adversely affect listed species (March 9, 1999, ESA consultation with COE Wilmington District, incorporated herein by reference). The aforementioned vessels and commercial hopper and sidecast dredges of the same or lesser sizes and operating characteristics working in the Gulf of Mexico would be considered similarly exempt by NOAA Fisheries' SERO after consultation with SERO.

Sea turtles generally move inshore with warming waters and offshore with cooling waters. In East Coast channels, Dickerson et al. (1995) found reduced sea turtle abundance with water temperatures less than 16°C. They found that 1,008 trawls conducted at or below 16°C captured 22 turtles (4.4 percent), while 1,791 trawls conducted above 16°C resulted in 473 (95.6 percent) captures. Dickerson et al. also found that sea turtles tend to avoid water temperatures less than 15°C; however, hopper dredging Kings Bay, Georgia between March 1-12, 1997 with surface water temperatures of 57-58°F (13.9-14.4°C) resulted in 11 turtle takes in nine days (NMFS 1997).

More recently, the Savannah District COE (COE 2003) reported that the average surface temperature at which recent hopper dredge turtle takes have occurred in Brunswick is 57.7°F (14.3°C) and that “there are scattered takes at lower temperatures than turtles would normally be expected to occur” but that “These lower temperatures may not have played a significant role in those takes.” The lowest temperature at which multiple takes have occurred in Brunswick in 2003 is 57°F (13.9°C).

Recognizing the relationship between water temperature and sea turtle presence and based on work by the NOAA Fisheries’ Galveston Laboratory (Renaud et al. 1994, 1995) funded by the COE, NOAA Fisheries wrote in its September 22, 1995 RBO to the Galveston and New Orleans Districts that sea turtles might be taken by hopper dredges “in all ship channels in the northern Gulf when temperatures exceed 12°C,” and that “Lacking seasonal water temperature data, NMFS believes takes may occur from April through November northeast of Corpus Christi, Texas.” Consequently, Term and Condition No. 3 of the 1995 RBO required that observers be aboard hopper dredges year-round from Corpus Christi southwest to the Mexican border, but “If no turtle take is observed in December, then observer coverage can be terminated during January and February or until water temperatures again reach 12°C.” It also required that “In channels northeast of Corpus Christi (except for MR-SWP), observers shall be aboard whenever surface water temperatures are 12°C or greater, and/or between April 1 and November 30.”

NOAA Fisheries published a final rule (67 FR 71895, December 3, 2002) effective January 2, 2003, to reduce the impact of large-mesh gillnet fisheries on the Atlantic Coast on sea turtles. This rule was directed primarily at the monkfish fishery, which uses large-mesh gillnet gear and operates in the area when sea turtles are present. The rule reduces impacts on endangered and threatened species of sea turtles by closing portions of the Mid-Atlantic Exclusive Economic Zone (EEZ) waters to fishing with gillnets with a mesh size larger than 8-inch (20.3-cm) stretched mesh. The timing of the restrictions was based upon an analysis of sea surface temperatures for the above areas. Sea turtles are known to migrate into and through these waters when the sea surface temperature is 11°C or greater (Epperly and Braun-McNeill 2002). The January 15 date for the re-opening of the areas north of Oregon Inlet, North Carolina to the large-mesh gillnet fisheries was also based upon the 11°C threshold and is consistent with the seasonal boundary established for the summer flounder fishery-sea turtle protection area (50 CFR 223.206(d)(2) (iii)(A)). In summary, NOAA Fisheries believes that the 11°C threshold established to protect East Coast sea turtles is reasonable and prudent to protect sea turtles in the Gulf of Mexico from hopper dredging operations.

Temperature- and date-based dredging windows appear to have been very effective in reducing sea turtle entrainments. Observer requirements and monitoring including assessment and relocation trawling have provided valuable real-time estimates of sea turtle abundance, takes, and distribution which have been helpful to COE project planning efforts. Evidence that the windows and observer requirements are effective and valuable is that neither the Galveston or New Orleans District's hopper dredging projects have exceeded their anticipated incidental takes since their combined RBO was issued in 1995; SAD has not exceeded its anticipated incidental take since its RBO was amended in 1997.

NMFS-approved observers monitor dredged material inflow and overflow screening baskets on many projects; however, screening is only partially effective and observed, documented takes provide only partial estimates of total sea turtle and Gulf sturgeon mortality. NOAA Fisheries believes that some listed species taken by hopper dredges go undetected because body parts are forced through the sampling screens by the water pressure and are buried in the dredged material, or animals are crushed or killed but not entrained by the suction and so the takes may go unnoticed. The only mortalities that are documented are those where body parts either float, are large enough to be caught in the screens, and can be identified as from sea turtle or sturgeon species. However, this Opinion estimates that with 4-inch inflow screening in place, the observers probably detect and record at least 50% of total mortality.

Relocation trawling has proved to be a useful conservation tool in most dredging projects where it has been implemented. The September 22, 1995, RBO included a Conservation Recommendation for relocation trawling which stated that relocation trawling in advance of an operating dredge in Texas and Louisiana channels should be considered if takes are documented early in a project that requires use of a hopper dredge during a period in which large number of sea turtles may occur." That RBO was amended by NOAA Fisheries (Amendment No. 1, June 13, 2002) to change the Conservation Recommendation to a Term and Condition of the RBO. Overall, it is NOAA Fisheries' opinion that the COE Districts choosing to implement relocation trawling have benefitted from their decisions. For example, in the Galveston District, Freeport Harbor Project (July 13-September 24, 2002), assessment and relocation trawling resulted in one loggerhead capture. In Sabine Pass (Sabine-Neches Waterway), assessment and relocation trawling in July-August 2002 resulted in five loggerhead and three Kemp's ridley captures. One turtle was killed by the dredge; this occurred while the relocation trawler was in port repairing its trawl net (P. Bargo, pers. comm. 2002). In the Jacksonville District, sea turtles have been relocated out of the path of hoppers dredges operating in Tampa Bay and Charlotte Harbor or their entrance channels. During St. Petersburg Harbor and Entrance Channel dredging in the fall of 2000, a pre-dredging risk assessment trawl survey resulted in capture, tagging, and relocation of two adult loggerheads and one subadult green turtle. In February 2002 during the Jacksonville District's Canaveral Channel emergency hopper dredging project for the Navy, two trawlers working around the clock captured and relocated 69 loggerhead and green turtles in seven days, and no turtles were entrained by the hopper dredge. In the Wilmington District's Bogue Banks Project in North Carolina, two trawlers successfully relocated five turtles in 15 days between March 13 and 27, 2003; one turtle was taken by the dredge. Most recently, Aransas Pass relocation trawling associated with hopper dredging resulted in 71 turtles captured

and released (with three recaptures) in three months of dredging and relocation trawling. Five turtles were killed by the dredge. No turtles were killed after relocation trawling was increased from 12 to 24 hours per day (Trish Bargo, October 27, 2003, pers. comm. to Eric Hawk).

This Opinion authorizes the per-fiscal-year non-lethal non-injurious take (minor skin abrasions resulting from trawl capture are considered non-injurious), external flipper-tagging, and taking of tissue samples of 300 sea turtles and eight Gulf sturgeon in association with all relocation trawling conducted by the COE throughout the Gulf of Mexico. This take shall not be broken down by District but rather is a Gulf-wide take limit. This take is limited to relocation trawling conducted during the 0-3 days immediately preceding the start of hopper dredging (as a means to determine/reduce the initial abundance of sea turtles in the area and determine if additional trawling efforts are needed), and during actual hopper dredging. Relocation trawling performed to reduce endangered species/hopper dredge interactions is subject to the requirements detailed in the terms and conditions of this Opinion.

NOAA Fisheries estimates that 0-2 turtles and 0-1 Gulf sturgeon will be killed or injured annually pursuant to annual relocation trawling in the Gulf of Mexico. These Gulf-wide take levels are in addition to the harmful takes estimated to result from hopper dredging. In Section 7 of this opinion, NMFS conducted its jeopardy analyses based on the anticipated, documented lethal take across the GOM per fiscal year (i.e., by the combined districts) of 4 Gulf sturgeon and 40 loggerhead, 20 Kemp's ridley, 14 green, and 4 hawksbill sea turtles; 300 turtle and 8 Gulf sturgeon captures (non-injurious takes) by relocation trawling, and an additional 0-2 turtles and 0-1 Gulf sturgeon injured or killed during relocation trawling. NMFS has determined that it would not alter the jeopardy analyses if the total number of individuals of all the species authorized to be taken by the combined GOM districts (i.e., combined hopper dredge takes or combined relocation trawling takes) are taken all by one district in one fiscal year, or are taken across all 4 districts across the fiscal year. NMFS has determined that no individual species population will be unduly impacted if, for example, all 40 authorized, documented loggerhead takes were to occur in any one of the 4 GOM districts, rather than across all districts, the Mobile district were to take all 4 Gulf sturgeon, or all 20 green turtle takes occurred in the Galveston district. None of the species analyzed in the opinion for which takes have been authorized – turtles and Gulf sturgeon – have sub-populations that would be believed to be disproportionately adversely affected if all the takes came from one district versus another district.

Consequently, the district-specific take levels specified above shall constitute initial allocations, based on the COE's desire to have separate take allotments for each district. Districts that exceed their initial allocations may borrow takes from other districts, without adversely affecting listed species. However, if any district exceeds its initial allocation and continues operations using borrowed takes, that district should notify NMFS so NMFS can analyze why the district's anticipated take levels were exceeded. Also, the COE would need to tell NMFS which district the takes are being re-allocated from. NMFS does not believe that inter-district take sharing will result in significantly increased take levels by district, since each district will still want to conservatively manage its protected species allotment to ensure its ability to complete its own hopper dredging requirements. Nevertheless, NMFS will monitor for such a possibility. Take sharing restrictions are described in R&PM No. 19.

Deflector Dragheads

V-shaped, sea turtle deflector dragheads prevent an unquantifiable yet significant number of sea turtles from being entrained and killed in hopper dredges each year. Without them, turtle takes during hopper dredging operations would unquestionably be higher. Draghead tests conducted in May-June 1993 by the COE's WES in clear water conditions on the sea floor off Fort Pierce, Florida, with 300 mock turtles placed in rows, showed convincingly that the newly-developed WES deflector draghead "performed exceedingly well at deflecting the mock turtles." Thirty-seven of 39 mock turtles encountered were deflected, two turtles were not deflected, and none were damaged. Also, "the deflector draghead provided better production rates than the unmodified California draghead, and the deflector draghead was easier to operate and maneuver than the unmodified California flat-front draghead." The V-shape reduced forces encountered by the draghead, and resulted in smoother operation (WES, Sea Turtle Project Progress Report, June 1993)." V-shaped deflecting dragheads are now a widely accepted conservation tool, the dredging industry is familiar with them and their operation, and they are used by all COE Districts conducting hopper dredge operations where turtles may be present, with the exception of the Mobile District.

In Gulf of Mexico coastal waters, evidence indicates that turtles are present year-round, further arguing for year-round deflector draghead use by all COE Districts of the Gulf of Mexico. Recent comprehensive NOAA Fisheries' Southeast Fishery Science Center (SEFSC) review and analyses (unpublished data, December 2002: Environmental Assessment/Regulatory Impact Review of Technical Changes to the Turtle Excluder Device (TED) Regulations to Enhance Turtle Protection in the Southeastern United States) of seasonal sea turtle distribution and strandings throughout the Gulf of Mexico (including coastal waters dredged by the Mobile District) noted that "Aerial surveys and observer data have indicated the presence of turtles in areas where strandings data are sparse" and "Turtles were in all areas at all times." (September 13, 2002, e-mail, Epperly to Hawk). NOAA Fisheries' SEFSC's sea turtle team leader Epperly also recommended against hopper dredges operating in those same areas "without monitoring, relocation, and specialized gear (i.e., deflectors) on the dragheads."

It wasn't until late-summer 2002 that the Mobile District started requiring observers and screening on its hopper dredges. REMSA recently completed ten days of 24-hr relocation trawling/dredged material monitoring for the Mobile District during ten days of emergency maintenance hopper dredging of the Mobile Bay ship channel (July 10-20, 2003). No sea turtle specimens or parts of specimens were observed during the ten days by either the relocation trawler observers or the shipboard dredge observers. Dredging is currently conducted in the Mobile District with onboard observers and 4-inch inflow screening but without deflector dragheads (Ladner, pers. comm. to Hawk, November 26, 2002). Mobile District, in written comments dated October 30, 2002, on a draft version of the present Opinion, noted that "The District recognizes the benefits of deflector dragheads to conservation of the species in areas where sea turtle takes occur. However, dragheads reduce dredging efficiency and result in dredges being onsite for a longer period of time. Consequently, the District finds no overriding need to utilize deflectors until it is proven, through use of screens and observers, that the Mobile District actually takes sea turtles during normal operations."

Habitat Protection Buffers

COE Jacksonville District biologists expressed concern (Yvonne Haberer, email to Eric Hawk, April 2003; Terri Jordan, pers. comm. August 11, 2003) over a NOAA Fisheries' draft version of the current Opinion proposed requirement of a 200-m buffer zone around hardgrounds in the vicinity of COE-proposed sand mining areas off Florida. In discussions over the Pinellas County Shore Protection Project, the COE noted that NOAA Fisheries has previously required only a 200-ft zone around hardgrounds adjacent to COE sand mining operations in the Gulf of Mexico.

NOAA Fisheries' Protected Resources Division consulted with NOAA Fisheries Habitat Conservation Division, which stated that as a general rule, buffer zones should not be less than 400 feet to protect essential fish habitat. In its response to the COE, which included a request for additional information (Eric Hawk email to Yvonne Haberer, May 14, 2003) which was never received, NOAA Fisheries' Protected Resources Division concluded that a 200-ft buffer was inadequate and that a 200-meter buffer zone was appropriate to protect sea turtles which may be foraging on or around hardgrounds adjacent to mining sites from hopper dredge entrainment. NOAA Fisheries noted that hopper dredge vessels are large (typically 300-400 ft long); limited in their ability to maneuver; and given other variable factors such as wind, tide, weather, sea state, currents, operator fatigue, operator error, and instrument error, a 200-ft margin of safety around hardgrounds was inadequate to protect NOAA Fisheries trust resources and sea turtles which could be expected to frequent hardgrounds and their vicinity. Subsequently, however, conversations with hopper dredge industry officials and dredge operators have led NOAA Fisheries to conclude that based on advances in hopper dredge construction, including the use of highly maneuverable Z-drives (on some dredges), enhanced station-keeping ability, and industry-standard navigation practices and technologies including routine use of differential global positioning systems (DGPS), dredge operators will be able to routinely and safely maintain desired safe distances from hardgrounds that are marked on their charts (E. Hawk, August 14 and 18, 2003, pers. comms. with R. Richardson, Manson Dredging; Mark Sickles, Dredge Contractors of America; and W. Murcheson, NATCO Dredging). NOAA Fisheries has determined that 400 feet is an adequate, reasonable buffer zone that should be maintained around hardgrounds, to protect endangered living resources, i.e., sea turtles that may be foraging in their vicinity. Four hundred feet also provides the additional benefit of protecting hardgrounds from some of the probable adverse effects of sedimentation from the dredged material plume. For example, a generic test case numerical model simulation of a typical situation representative of hopper dredging of MMS shoals using the Trailing Suction Hopper Dredge Plume Model developed by Baird, Inc., for MMS, using inputted variables of a cross current of 20 cm/s, fine sand, two million cubic meter project, and a water depth of about 15 to 20 m, gave a sedimentation footprint of 200 m beyond the boundary of the dredge area (Rob Nairn, October 3, 2003, pers. comm. to Eric Hawk).

Summary

NOAA Fisheries has carefully reviewed and fully considered these and all other comments received from the affected COE Districts; however, in summary, after review of WES studies, SEFSC survey data, and based on past experience, NOAA Fisheries believes that seasonal dredging windows, deflector dragheads, observer and screening requirements, and relocation trawling have proved convincingly over the last decade to be an excellent combination of reasonable and prudent measures for minimizing the number and impact of sea turtle takes,

enabling NOAA Fisheries to assess the quantity of turtles being taken, and allowing the affected COE Districts (Wilmington, Charleston, Savannah, Jacksonville, New Orleans, and Galveston) to meet their essential dredging requirements to keep Federal navigation channels open.

There are increased costs associated with observers and relocation trawling (current estimates are \$3,500-\$5,000/day for 24 hours of relocation trawling, \$150-\$200/day for a hopper dredge endangered species observer); delays sometimes occur, particularly when two turtles are taken in 24 hours, or when clay-like materials clog the inflow screening boxes; and dredging projects may take longer to complete. However, overall, NOAA Fisheries believes that loss of production associated with the deflector draghead is insignificant, while saving significant numbers of sea turtles from almost-certain death by dismemberment in suction dragheads; increased production costs, including costs of observers and relocation trawlers, pale in comparison to overall project costs; and NOAA Fisheries' experience over the past decade with the COE's SAD Districts and the Gulf of Mexico's Galveston and New Orleans Districts has shown that Federal hopper dredging projects get completed in a timely fashion. Also, allowable overdredging by the COE reduces to some degree the need for frequent maintenance dredging, and the conservation measures required by the biological opinions in place result in significantly reduced dredge interactions, usually fatal, with sea turtles.

NOAA Fisheries considers that PIT tagging, external flipper tagging, and tissue sampling of turtles captured pursuant to relocation trawling, including genetic analysis of tissue samples taken from dredge- and trawl-captured turtles, will provide benefits to the species by providing data which will enable NOAA Fisheries to make determinations on what sea turtle stocks are being impacted, and how that may change over time as the population growth rates change among the different stocks (Sheryan Epperly, pers. comm. to Eric Hawk).

NMFS and COE shall jointly develop and implement a Sampling and Analysis Plan for the collection and genetic analysis of sea turtle tissue samples that will provide information on the nesting or subpopulation identity of sea turtles being captured across the Gulf of Mexico, in order to validate the assumptions underlying the analysis of the effects of hopper dredging on sea turtles. NOAA Fisheries initially estimates that up to 340 sea turtle tissue samples may be taken annually in the Gulf of Mexico during COE dredging and relocation trawling operations, but the final total number of yearly samples, number of samples per species, distribution of samples across dredging locations in the Gulf of Mexico, and genetic and statistical analyses of samples will be determined in the Sampling and Analysis Plan.

There are several alternatives for funding the genetic sampling and analysis. COE funds may be provided to NOAA Fisheries' Southwest Fisheries Center's Dr. Peter Dutton, preferably in a lump-sum, one-time payment as a part of a Memorandum of Understanding (MOU) to be developed between Dr. Dutton and the COE's combined Gulf of Mexico Districts (similar to the current MOU nearing completion between the COE's South Atlantic Division and the Southwest Fisheries Science Center for hopper dredging/relocation trawling conducted by the South Atlantic Divisions four Atlantic Districts). Alternatively, the COE may conduct the analyses at their facilities. Another alternative is for the COE to contract out the sample analyses to independent laboratory(s) outside of NMFS and the COE. Inclusion of this sampling and

analysis requirement as a reasonable and prudent measure of this Opinion will result in the gathering of knowledge that will test the assumptions underlying the effects analyses of the Opinion, and may be helpful in reducing the effect of the takes from Gulf of Mexico dredging projects.

The dredging windows set forth in the terms and conditions of the 1995 Gulf of Mexico hopper dredging RBO, while very strongly encouraged by NOAA Fisheries for previously stated reasons, were ultimately discretionary activities by the COE and could be deviated from by the SAD or the Galveston or New Orleans Districts when they deemed essential or necessary after consultation with NOAA Fisheries, though this was infrequent. This flexibility is also stipulated in the Proposed Action section of the present Opinion, which applies to all four COE Districts. Terms and conditions of the present Opinion remain largely the same, with the following significant exceptions:

- 1) The allowable window for hopper dredging has been extended to include the Mobile and Jacksonville Districts so that the December-March window is now Gulf-wide, from the Texas-Mexico border to Key West channels.
- 2) Previous temperature requirements of Term and Condition No. 3 of the 1995 RBO (i.e., “If no turtle take is observed during December, observer coverage can be terminated during January and February or until water temperatures again reach 12°C; In channels northeast of Corpus Christi, Texas [except for Southwest Pass as discussed below], observers shall be aboard whenever surface water temperatures are 12°C or greater, and/or between April 1 and November 30.”) have been modified downward to 11°C based on new sea turtle distribution information which indicates that sea turtles are more tolerant of cold than was previously thought. The discussion of temperature/sea turtle distribution supporting this change is incorporated herein by reference to the Monkfish Biological Opinion (dated April 14, 2003, prepared by NOAA Fisheries Northeast Region).
- 3) The September 22, 1995, RBO included a Conservation Recommendation for relocation trawling which stated that “Relocation trawling in advance of an operating dredge in Texas and Louisiana channels should be considered if takes are documented early in a project that requires use of a hopper dredge during a period in which large number of sea turtles may occur.” That RBO was amended by NOAA Fisheries SER (Amendment No. 1, June 13, 2002), to change the Conservation Recommendation to a Term and Condition of the RBO. Term and Condition No. 10 of the amended RBO specified conditions under which relocation trawling “should be considered” and subject to what precautions it should be carried out, and authorized unlimited non-lethal, non-injurious take of sea turtles and Gulf sturgeon in association with relocation trawling deemed necessary the by COE. This amount of discretion has since been determined to be inappropriate for a non-discretionary term and condition of an ITS. Thus, the present Opinion’s requirement for relocation trawling is more non-discretionary than as written in Amendment No. 1 in that it **requires** the use of relocation trawlers under specific conditions as a way to minimize turtle interactions, rather than only requiring that it be “considered” by the COE.

4) In the present Opinion, the COE Districts are authorized to request waivers from the relocation trawling requirement (which may be delivered and responded to by both agencies via electronic mail) for projects where the COE Districts do not feel relocation trawling is feasible, necessary or warranted.

5) The Districts are required to fund the cost of tissue sampling and genetic analyses of tissue samples from turtles taken during projects in their respective Districts.

The following terms and conditions implement the reasonable and prudent measures discussed above:

Terms and Conditions

1. *Hopper Dredging*: Hopper dredging activities in Gulf of Mexico waters from the Mexico-Texas border to Key West, Florida up to one mile into rivers shall be completed, whenever possible, between December 1 and March 31, when sea turtle abundance is lowest throughout Gulf coastal waters. Hopper dredging of Key West channels is covered by the existing August 25, 1995, RBO to the COE's SAD. The COE shall discuss with NOAA Fisheries why a particular project cannot be done within the December 1-March 31 window.
2. *Non-hopper Type Dredging*: Pipeline or hydraulic dredges, because they are not known to take turtles, must be used whenever possible between April 1 and November 30 in Gulf of Mexico waters up to one mile into rivers. This should be considered particularly in channels such as those associated with Galveston Bay and Mississippi River - Gulf Outlet (MR-GO), where lethal takes of endangered Kemp's ridleys have been documented during summer months, and Aransas Pass, where large numbers of loggerheads may be found during summer months. In the MR-GO, incidental takes and sightings of threatened loggerhead sea turtles have historically been highest during April and October.
3. *Annual Reports*: The annual summary report, discussed below (No.9), must give a complete explanation of why alternative dredges (dredges other than hopper dredges) were not used for maintenance dredging of channels between April and November.
4. *Observers*: The COE shall arrange for NOAA Fisheries-approved observers to be aboard the hopper dredges to monitor the hopper spoil, screening, and dragheads for sea turtles and Gulf sturgeon and their remains.
 - a. Brazos Santiago Pass east to Key West, Florida: Observer coverage sufficient for 100% monitoring (i.e., two observers) of hopper dredging operations is required aboard the hopper dredges year-round from Brazos Santiago Pass to (not including) Key West, Florida between April 1 and November 30, and whenever surface water temperatures are 11°C or greater.

- b. Observer coverage of hopper dredging of sand mining areas shall ensure 50% monitoring (i.e., one observer).
 - c. Observers are not required at any time in Mississippi River - Southwest Pass (MR-SWP).
5. *Operational Procedures:* During periods in which hopper dredges are operating and NOAA Fisheries-approved observers are *not* required, (as delineated in No. 4 above), the appropriate COE District must:
- a. Advise inspectors, operators and vessel captains about the prohibitions on taking, harming, or harassing sea turtles
 - b. Instruct the captain of the hopper dredge to avoid any turtles and whales encountered while traveling between the dredge site and offshore disposal area, and to immediately contact the COE if sea turtles or whales are seen in the vicinity.
 - c. Notify NOAA Fisheries if sea turtles are observed in the dredging area, to coordinate further precautions to avoid impacts to turtles.
 - d. Notify NOAA Fisheries immediately by phone (727/824-5312) or fax (727/824-5309) if a sea turtle or Gulf sturgeon is taken by the dredge.
6. *Screening:* When sea turtle observers are required on hopper dredges, 100% inflow screening of dredged material is required and 100% overflow screening is recommended. If conditions prevent 100% inflow screening, inflow screening may be reduced gradually, as further detailed in the following paragraph, but 100% overflow screening is then required. NOAA Fisheries must be consulted **prior** to the reductions in screening, and an explanation must be included in the dredging report.
- a. *Screen Size:* The hopper's inflow screens should have 4-inch by 4-inch screening. If the COE, in consultation with observers and the draghead operator, determines that the draghead is clogging and reducing production substantially, the screens may be modified sequentially: mesh size may be increased to 6-inch by 6-inch, then 9-inch by 9-inch, then 12-inch by 12-inch openings. Clogging should be greatly reduced with these flexible options; however, further clogging may compel removal of the screening altogether, in which case **effective** 100% overflow screening is mandatory. The COE shall notify NOAA Fisheries **beforehand** if inflow screening is going to be reduced or eliminated, and provide details of how effective overflow screening will be achieved.
 - b. *Need for Flexible, Graduated Screens:* NOAA Fisheries believes that this flexible, graduated-screen option is necessary, since the need to constantly clear the inflow screens will increase the time it takes to complete the project and therefore increase the exposure of sea turtles to the risk of impingement or entrainment. Additionally, there are increased risks to sea turtles in the water column when the inflow is halted to clear

screens, since this results in clogged intake pipes, which may have to be lifted from the bottom to discharge the clay by applying suction.

c. Exemption - MR-SWP: Screening is not required at any time in MR-SWP.

7. *Dredging Pumps*: Standard operating procedure shall be that dredging pumps shall be disengaged by the operator when the dragheads are not firmly on the bottom, to prevent impingement or entrainment of sea turtles within the water column. This precaution is especially important during the cleanup phase of dredging operations when the draghead frequently comes off the bottom and can suck in turtles resting in the shallow depressions between the high spots the draghead is trimming off.
8. *Sea Turtle Deflecting Draghead*: A state-of-the-art rigid deflector draghead must be used on all hopper dredges in all Gulf of Mexico channels and sand mining sites at all times of the year except that the rigid deflector draghead is not required in MR-SWP at any time of the year.
9. *Dredge Take Reporting*: Observer reports of incidental take by hopper dredges must be faxed to NOAA Fisheries' Southeast Regional Office (727-570-5517) by onboard endangered species observers within 24 hours of any sea turtle, Gulf sturgeon, or other listed species take observed.

A preliminary report summarizing the results of the hopper dredging and any documented sea turtle or Gulf sturgeon takes must be submitted to NOAA Fisheries within 30 working days of completion of any dredging project. Reports shall contain information on project location (specific channel/area dredged), start-up and completion dates, cubic yards of material dredged, problems encountered, incidental takes and sightings of protected species, mitigative actions taken (if relocation trawling, the number and species of turtles relocated), screening type (inflow, overflow) utilized, daily water temperatures, name of dredge, names of endangered species observers, percent observer coverage, and any other information the COE deems relevant.

An annual report (based on fiscal year) must be submitted to NOAA Fisheries summarizing hopper dredging projects and documented incidental takes.

10. *Sea Turtle Strandings*: The COE Project Manager or designated representative shall notify the Sea Turtle Stranding and Salvage Network (STSSN) state representative (contact information available at: <http://www.sefsc.noaa.gov/seaturtleSTSSN.jsp>) of the start-up and completion of hopper dredging operations and bed-leveler dredging operations and ask to be notified of any sea turtle/sturgeon strandings in the project area that, in the estimation of STSSN personnel, bear signs of potential draghead impingement or entrainment, or interaction with a bed-leveling type dredge.

Information on any such strandings shall be reported in writing within 30 days of project end to NOAA Fisheries' Southeast Regional Office. Because the deaths of these turtles,

if hopper dredge or bed-leveler dredge-related, have already been accounted for in NMFS' jeopardy analysis, and because of different possible explanations for, and subjectivity in the interpretation of potential causes of strandings, these strandings will not be counted against the COE's take limit.

11. *Reporting - Strandings*: Each COE District shall provide NOAA Fisheries' Southeast Regional Office with an annual report detailing incidents, with photographs when available, of stranded sea turtles and Gulf sturgeon that bear indications of draghead impingement or entrainment. This reporting requirement may be included in the end-of-year report required in Term and Condition No. 9, above.
12. *District Annual Relocation Trawling Report*: Each COE District shall provide NOAA Fisheries' Southeast Regional Office with end-of-project reports within 30 days of completion of relocation trawling projects, and an annual report summarizing relocation trawling efforts and results within their District. The annual report requirement may be included in the end-of-year report required in Term and Condition No. 9, above.
13. *Conditions Requiring Relocation Trawling*: Handling of sea turtles captured during relocation trawling in association with hopper dredging projects in Gulf of Mexico navigation channels and sand mining areas shall be conducted by NOAA Fisheries-approved endangered species observers. Relocation trawling shall be undertaken by the COE at all projects where any of the following conditions are met; however, other ongoing projects not meeting these conditions are not required to conduct relocation trawling:
 - a. Two or more turtles are taken in a 24-hour period in the project.
 - b. Four or more turtles are taken in the project.
 - c. 75% of a District's sea turtle species initial take allocation for a particular species has previously been met.
14. *Relocation Trawling Waiver*: For individual projects the affected COE District may request by letter to NOAA Fisheries a waiver of part or all of the relocation trawling requirements. NOAA Fisheries will consider these requests and decide favorably if the evidence is compelling.
15. *Relocation Trawling - Annual Take Limits*: This Opinion authorizes the annual (by fiscal year) non-injurious take of 300 sea turtles (of one species or combination of species) and 8 Gulf sturgeon, and lethal or injurious takes of up to 2 sea turtles and 1 Gulf sturgeon annually, by duly-permitted, NOAA Fisheries-approved observers in association with all relocation trawling conducted or contracted by the four Gulf of Mexico COE Districts to temporarily reduce or assess the abundance of these listed species during (and in the 0-3 days immediately preceding) a hopper dredging project in order to reduce the possibility of lethal hopper dredge interactions, subject to the following conditions:

- a. *Trawl Time*: Trawl tow-time duration shall not exceed 42 minutes (doors in - doors out) and trawl speeds shall not exceed 3.5 knots.
- b. *Handling During Trawling*: Sea turtles and sturgeon captured pursuant to relocation trawling shall be handled in a manner designed to ensure their safety and viability, and shall be released over the side of the vessel, away from the propeller, and only after ensuring that the vessel's propeller is in the neutral, or disengaged, position (i.e., not rotating). Resuscitation guidelines are attached (Appendix IV).
- c. *Captured Turtle Holding Conditions*: Captured turtles shall be kept moist, and shaded whenever possible, until they are released.
- d. *Weight and Size Measurements*: All turtles shall be measured (standard carapace measurements including body depth) and tagged, and weighed when safely possible, prior to release; Gulf sturgeon shall be measured (fork length and total length) and—when safely possible—tagged, weighed, and a tissue sample taken prior to release. Any external tags shall be noted and data recorded into the observers log. Only NOAA Fisheries-approved observers or observer candidates in training under the direct supervision of a NOAA Fisheries-approved observer shall conduct the tagging/measuring/weighing/tissue sampling operations.
- e. *Take and Release Time During Trawling - Turtles*: Turtles shall be kept no longer than 12 hours prior to release and shall be released not less than three nautical miles (nmi) from the dredge site. If two or more released turtles are later recaptured, subsequent turtle captures shall be released not less than five nmi away. If it can be done safely, turtles may be transferred onto another vessel for transport to the release area to enable the relocation trawler to keep sweeping the dredge site without interruption.
- f. *Take and Release Time During Trawling - Gulf Sturgeon*: Gulf sturgeon shall be released immediately after capture, away from the dredge site or into already dredged areas, unless the trawl vessel is equipped with a suitable (not less than: 2 ft high by 2 ft wide by 8 ft long), well-aerated seawater holding tank where a maximum of one sturgeon may be held for not longer than 30 minutes before it must be released or relocated away from the dredge site.
- g. *Injuries and Incidental Take Limits*: Any protected species injured or killed during or as a consequence of relocation trawling shall count toward the Gulf-wide limit for injurious or lethal takes during relocation trawling. Minor skin abrasions resulting from trawl capture are considered non-injurious. Injured sea turtles shall be immediately transported to the nearest sea turtle rehabilitation facility.
- h. *Flipper Tagging*: All sea turtles captured by relocation trawling shall be flipper-tagged prior to release with external tags which shall be obtained prior to the project

from the University of Florida's Archie Carr Center for Sea Turtle Research. This Opinion serves as the permitting authority for any NOAA Fisheries-approved endangered species observer aboard these relocation trawlers to flipper-tag with external tags (e.g., Inconel tags) captured sea turtles. Columbus crabs or other organisms living on external sea turtle surfaces may also be sampled and removed under this authority.

- i. *Gulf Sturgeon Tagging*: Tagging of live-captured Gulf sturgeon may also be done under the permitting authority of this Opinion; however, it may be done only by personnel with prior fish tagging experience or training, and is limited to external tagging only, unless the observer holds a valid sturgeon research permit (obtained pursuant to section 10 of the ESA, from the NOAA Fisheries' Office of Protected Resources, Permits Division) authorizing sampling, either as the permit holder, or as designated agent of the permit holder.
- j. *PIT-Tag Scanning*: All sea turtles captured by relocation trawling (or dredges) shall be thoroughly scanned for the presence of PIT tags prior to release using a scanner powerful enough to read dual frequencies (125 and 134 kHz) and read tags deeply embedded deep in muscle tissue (e.g., manufactured by Biomark or Avid). Turtles which scans show have been previously PIT tagged shall never-the-less be externally flipper tagged. The data collected (PIT tag scan data and external tagging data) shall be submitted to NOAA, National Marine Fisheries Service, Southeast Fisheries Science Center, Attn: Lisa Belskis, 75 Virginia Beach Drive, Miami, Florida 33149. All data collected shall be submitted in electronic format within 60 working days to Lisa.Belskis@noaa.gov.
- k. *CMTTP*: External flipper tag and PIT tag data generated and collected by relocation trawlers shall also be submitted to the Cooperative Marine Turtle Tagging Program (CMTTP), on the appropriate CMTTP form, at the University of Florida's Archie Carr Center for Sea Turtle Research.
- l. *Tissue Sampling*: All live or dead sea turtles captured by relocation trawling or dredging shall be tissue-sampled prior to release, according to the protocols to be developed, as described below. This Opinion serves as the permitting authority for any NOAA Fisheries-approved endangered species observers aboard relocation trawlers or hopper dredges to tissue-sample live- or dead-captured sea turtles, without the need for a section 10 permit.
- m. *Tissue Sampling and Genetic Analysis*: The COE's Gulf of Mexico Districts shall collect and analyze a sufficient number of sea turtle tissue samples taken annually during COE hopper dredging/trawling operations in the Gulf of Mexico, to provide reliable information on the nesting or subpopulation identity of sea turtles being captured across the Gulf of Mexico. NMFS and the COE shall jointly design a Sampling and Analysis Plan, to be implemented by no later than the end of calendar year 2005, that prescribes, among other things, the total numbers of samples, numbers

- of samples per species, distribution of sample collections across dredging locations, and genetic and statistical analyses. The NMFS Southwest Fisheries Science Center (SWFSC) is the NMFS center for sea turtle genetic analysis, and NMFS' preferred approach to analyzing tissue samples is for the COE to enter into a memorandum of understanding with SWFSC to conduct the required analyses. The COE may arrange to have the genetic analyses conducted by any other qualified laboratory that may exist, so long as the results are consistent with the national standards for sea turtle genetic analysis in use at the SWFSC, and consistent with the Sampling and Analysis Plan to be developed under this Opinion.
- n. *PIT Tagging*: PIT tagging is **not required or authorized for, and shall not be conducted** by ESOs who do not have 1) section 10 permits authorizing said activity and 2) prior training or experience in said activity; however, if the ESO has received prior training in PIT tagging procedures and is also authorized to conduct said activity by a section 10 permit, then the ESO **must** PIT tag the animal prior to release (in addition to the standard external flipper tagging). PIT tagging must then be performed in accordance with the protocol detailed at NOAA Fisheries' Southeast Science Center's webpage: <http://www.sefsc.noaa.gov/seaturtlefisheriesobservers.jsp>. (See Appendix C on SEC's "Fisheries Observers" webpage). PIT tags used must be sterile, individually wrapped tags to prevent disease transmission. PIT tags should be 125 kHz, glass-encapsulated tags - the smallest ones made. Note: If scanning reveals a PIT tag and it was not difficult to find, then **do not** insert another PIT tag; simply record the tag number and location, and frequency, if known. If for some reason the tag is difficult to detect (e.g., tag is embedded deep in muscle, or is a 400 MHz tag), then insert one in the other shoulder.
- o. *Other Sampling Procedures*: All other tagging and external or internal sampling procedures (e.g., PIT tagging, blood letting, laparoscopies, anal and gastric lavages, mounting satellite or radio transmitters, etc.) performed on live sea turtles or live sturgeon are **not permitted under this Opinion unless** the observer holds a valid sea turtle or sturgeon research permit (obtained pursuant to section 10 of the ESA, from the NOAA Fisheries' Office of Protected Resources, Permits Division) authorizing the activity, either as the permit holder, or as designated agent of the permit holder.
- p. *Handling Fibropapillomatose Turtles*: When handling sea turtles infected with fibropapilloma tumors, observers must either: 1) clean all equipment that comes in contact with the turtle (tagging equipment, tape measures, etc.) with mild bleach solution, between the processing of each turtle or 2) maintain a separate set of sampling equipment for handling animals displaying fibropapilloma tumors or lesions.
16. *Hardground Buffer Zones*: All dredging in sand mining areas will be designed to ensure that dredging will not occur within a minimum of 400 feet from any significant hardground areas or bottom structures that serve as attractants to sea turtles for foraging or shelter. NOAA Fisheries considers (for the purposes of this Opinion only) a

significant hardground in a project area to be one that, over a horizontal distance of 150 feet, has an average elevation above the sand of 1.5 feet or greater, and has algae growing on it. The COE Districts shall ensure that sand mining sites within their Districts are adequately mapped to enable the dredge to stay at least 400 feet from these areas. If the COE is uncertain as to what constitutes significance, it shall consult with NOAA Fisheries' Habitat Conservation Division and NOAA Fisheries' Protected Resources Division for clarification and guidance.

17. *Training - Personnel on Hopper Dredges:* The respective COE Districts must ensure that all contracted personnel involved in operating hopper dredges (whether privately-funded or federally-funded projects) receive thorough training on measures of dredge operation that will minimize takes of sea turtles. It shall be the goal of each hopper dredging operation to establish operating procedures that are consistent with those that have been used successfully during hopper dredging in other regions of the coastal United States, and which have proven effective in reducing turtle/dredge interactions. Therefore, COE Engineering Research and Development Center experts or other persons with expertise in this matter shall be involved both in dredge operation training, and installation, adjustment, and monitoring of the rigid deflector draghead assembly.
18. *Dredge Lighting:* From May 1 through October 31, sea turtle nesting and emergence season, all lighting aboard hopper dredges and hopper dredge pumpout barges operating within three nmi of sea turtle nesting beaches shall be limited to the minimal lighting necessary to comply with U.S. Coast Guard and/or OSHA requirements. All non-essential lighting on the dredge and pumpout barge shall be minimized through reduction, shielding, lowering, and appropriate placement of lights to minimize illumination of the water to reduce potential disorientation effects on female sea turtles approaching the nesting beaches and sea turtle hatchlings making their way seaward from their natal beaches.
19. *Reallocation of Initial Take Allotments Among Districts:* As discussed above, the district-specific take allotments in Section 8.0 of this Opinion are initial allocations, based on past and projected future patterns of take in different areas of the Gulf of Mexico, but the jeopardy analyses are based upon the total Gulf-wide levels of take. Thus, the district-specific allotments may be used by the COE for planning purposes. Gulf of Mexico districts that exceed their initial allotments must request and receive re-allocation of takes from other districts within the GOM. The ceding district's initial take level is then correspondingly reduced. The district exceeding its initial allotment and borrowing take from another district must notify NMFS that it has exceeded its initial take allotment and which district it is borrowing from, so that NMFS may determine whether or not the exceedance represents new information in conflict with the assumptions underlying the effects analyses of the Opinion. A single district's exceedance of its initial allotment alone does not require reinitiation of consultation of the Opinion.

10.0 Conservation Recommendations

Pursuant to section 7(a)(1) of the ESA, the following conservation recommendations are made to assist the COE in contributing to the conservation of sea turtles and Gulf sturgeon by further reducing or eliminating adverse impacts that result from hopper dredging.

1. *Channel Conditions and Seasonal Abundance Studies:* Channel-specific studies should be undertaken to identify seasonal relative abundance of sea turtles and Gulf sturgeon within Gulf of Mexico channels. The December 1 through March 31 dredging window and associated observer requirements listed above may be adjusted (after consultation and authorization by NOAA Fisheries) on a channel-specific basis, if (a) the COE can provide sufficient scientific evidence that sea turtles and Gulf sturgeon are not present or that levels of abundance are extremely low during other months of the year, or (b) the COE can identify seawater temperature regimes that ensure extremely low abundance of sea turtles or Gulf sturgeon in coastal waters, and can monitor water temperatures in a real-time manner. Surveys may indicate that some channels do not support significant turtle populations, and hopper dredging in these channels may be unrestricted on a year-round basis, as in the case of MR-SWP. To date, sea turtle deflector draghead efficiency has not reached the point where seasonal restrictions can be lifted.
2. *Draghead Modifications and Bed Leveling Studies:* The New Orleans, Galveston, Mobile, and Jacksonville Districts should supplement the efforts of SAD and WES to develop modifications to existing dredges to reduce or eliminate take of sea turtles, and develop methods to minimize sea turtle take during “cleanup” operations when the draghead maintains only intermittent contact with the bottom. Some method to level the “peaks and valleys” created by dredging would reduce the amount of time dragheads are off the bottom.
3. *Draghead Evaluation Studies and Protocol:* Additional research, development, and improved performance is needed before the V-shaped rigid deflector draghead can replace seasonal restrictions as a method of reducing sea turtle captures during hopper dredging activities. Development of a more effective deflector draghead or other entrainment-detering device (or combination of devices, including use of acoustic deterrents) could potentially reduce the need for sea turtle relocation or result in expansion of the winter dredging window. NOAA Fisheries should be consulted regarding the development of a protocol for draghead evaluation tests. NOAA Fisheries recommends that the COE’s Galveston, New Orleans, Mobile, and Jacksonville Districts coordinate with ERDC, SAD, the Association of Dredge Contractors of America, and dredge operators (Manson, Bean-Stuyvesant, Great Lakes, Natco, etc.) regarding additional reasonable measures they may take to further reduce the likelihood of sea turtle and Gulf sturgeon takes.
4. *Continuous Improvements in Monitoring and Detecting Takes:* The COE should seek continuous improvements in detecting takes and should determine, through research and development, a better method for monitoring and estimating sea turtle and Gulf sturgeon

takes by hopper dredge. Observation of overflow and inflow screening is only partially effective and provides only partial estimates of total sea turtle and Gulf sturgeon mortality.

Overflow Screening: The COE should encourage dredging companies to develop or modify existing overflow screening methods on their company's dredge vessels for maximum effectiveness of screening and monitoring. Horizontal overflow screening is preferable to vertical overflow screening because NOAA Fisheries considers that horizontal overflow screening is significantly more effective at detecting evidence of protected species entrainment than vertical overflow screening.

Preferential Consideration for Horizontal Overflow Screening: The COE should give preferential consideration to hopper dredges with horizontal overflow screening when awarding hopper dredging contracts for areas where new materials, large amounts of debris, or clay may be encountered, or have historically been encountered. Excessive inflow screen clogging may in some instances necessitate removal of inflow screening, at which point effective overflow screening becomes more important.

5. *Section 10 Research Permits and Relocation Trawling:* NOAA Fisheries recommends that the COE's Galveston, New Orleans, Mobile, and Jacksonville Districts, either singly or combined, apply to NOAA Fisheries for an ESA section 10 research permit to conduct endangered species research on species incidentally captured during relocation trawling. For example, satellite tagging of captured turtles could enable the COE Districts to gain important knowledge on sea turtle seasonal distribution and presence in navigation channels and sand mining sites and also, as mandated by section 7(a)(1) of the ESA, to utilize their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of listed species. SERO shall assist the COE Districts with the permit application process.
6. *Draghead Improvements - Water Ports:* NOAA Fisheries recommends that the COE's Gulf of Mexico Districts require or at least recommend to dredge operators that all dragheads on hopper dredges contracted by the COE for dredging projects be eventually outfitted with water ports located in the *top* of the dragheads to help prevent the dragheads from becoming plugged with sediments. When the dragheads become plugged with sediments, the dragheads are often raised off the bottom (by the dredge operator) with the suction pumps on in order to take in enough water to help clear clogs in the dragarm pipeline, which increases the likelihood that sea turtles in the vicinity of the draghead will be taken by the dredge. Water ports located in the top of the dragheads would relieve the necessity of raising the draghead off the bottom to perform such an action, and reduce the chance of incidental take of sea turtles.

NOAA Fisheries supports and recommends the implementation of proposals by ERDC and SAD personnel for various draghead modifications to address scenarios where turtles may be entrained during hopper dredging (Dickerson and Clausner 2003). These include: a) an adjustable visor; b) water jets for flaps to prevent plugging and thus reduce

the requirement to lift the draghead off the bottom; and c) a valve arrangement (which mimics the function of a “Hoffer” valve used on cutterhead type dredges to allow additional water to be brought in when the suction line is plugging) that will provide a very large amount of water into the suction pipe thereby significantly reducing flow through the visor when the draghead is lifted off the bottom, reducing the potential to take a turtle.

7. *Economic Incentives for No Turtle Takes:* The COE should consider devising and implementing some method of significant economic incentives to hopper dredge operators such as financial reimbursement based on their satisfactory completion of dredging operations, or *X* number of cubic yards of material moved, or hours of dredging performed, *without taking turtles*. This may encourage dredging companies to research and develop “turtle friendly” dredging methods; more effective, deflector dragheads; pre-deflectors; top-located water ports on dragarms; etc.
8. *Sedimentation Limits to Protect Resources (Hardbottoms/Reefs):* NOAA Fisheries recommends water column sediment load deposition rates of no more than 200 mg/cm²/day, averaged over a 7-day period, to protect coral reefs and hard bottom communities from dredging-associated turbidity impacts to listed species foraging habitat.
9. *Boca Grande Pass - Conditions:* If the COE’s Jacksonville District decides to renew dredging permits for the Boca Grande Pass, NOAA Fisheries recommends that the District conduct or sponsor a Gulf sturgeon study, including gillnetting and tagging utilizing ultrasonic and radio transmitters, and mtDNA sampling, to help determine the genetic origins, relative and seasonal abundance, distribution and utilization of estuarine and marine habitat by Gulf sturgeon within Charlotte Harbor estuary and Charlotte Harbor Entrance Channel, and shall report to NOAA Fisheries biannually on the progress and final results of said study.
10. *Relocation Trawling - Guidelines:* Within six months of the issuance of this Opinion, the COE’s Gulf of Mexico Districts, in coordination with COE’s SAD, shall develop relocation trawling guidelines to ensure safe handling and standardized data gathering techniques for sea turtles and Gulf sturgeon by COE contractors, and forward copies to NOAA Fisheries’ Protected Resources Division.
11. *Sodium Vapor Lights on Offshore Equipment:* On offshore equipment (i.e., hopper dredges, pumpout barges) shielded low pressure sodium vapor lights are highly recommended for lights that cannot be eliminated.

11.0 Reinitiation of Consultation

Requirements for Reinitiation of Consultation: Reinitiation of formal consultation is required if (a) the total GOM-wide amount or extent of taking specified in the incidental take statement is exceeded, (b) new information 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, (c) the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in the Opinion, or (d) a new species is listed or critical habitat designated that may be affected by the identified action.

Advance Discussions of Potential Need for Reinitiation: NOAA Fisheries requests that COE districts initiate discussions with the Southeast Regional Office Protected Resources Division early to identify the potential need for reinitiation of consultation, well in advance of actually exceeding the amount or extent of taking specified in the incidental take statement. NOAA Fisheries requests notification when a) more than one turtle is taken by a dredge in any 24-hour period; b) four turtles are taken by a dredge during a single project; c) the dredge take reaches 75% of the total take level established for any one species; d) a Gulf sturgeon is taken by a dredge; e) a hawksbill turtle is taken by a dredge; f) a turtle or Gulf sturgeon is injuriously or lethally taken by a relocation trawler; or g) the relocation trawling incidental take limit for turtles or sturgeon is reached. The NOAA Fisheries Southeast Regional Office will work with the COE to quickly review such incidents, to discuss the need and advisability of further mitigating measures, and to plan for a reinitiation of consultation if it appears that one of the reinitiation triggers is likely to be met.

Dredging/Trawling Operations During Reinitiation of Consultation: Once the need for reinitiation is triggered, the COE is not necessarily required to suspend dredging or relocation trawling operations pending the conclusion of the reinitiated consultation, so long as the continuation of operations (by all districts) would not violate section 7(a)(2) or 7(d) of the ESA. In that case, the COE is advised to document its determination that these 6/24/2005 provisions would not be violated by continuing activities covered by this Opinion during the reinitiation period and to seek NMFS' concurrence with its findings.