

**ANNUAL SEA TURTLE MONITORING REPORT
MAINTENANCE DREDGING**

**GALVESTON DISTRICT
FISCAL YEAR 2003**

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INTRODUCTION

This report is submitted in fulfillment of requirements of the Endangered Species Act and the Section 7 Consultation - Biological Opinion, dated September 22, 1995, concerning channel maintenance dredging using a hopper dredge. Specifically this report, summarizing hopper dredging operations in Fiscal Year (FY) 2003 within the Galveston District, is submitted in compliance with reasonable and prudent measure No. 8 - Reporting.

The following four hopper maintenance dredging projects were completed in FY 2003.

Brazos Island Harbor	December 13, 2002 - December 19, 2002
Galveston Harbor and Channel	April 15, 2003 - June 25, 2003
Corpus Christi Ship Channel	April 9, 2003 - July 7, 2003
Sabine - Neches Waterway	August 6, 2003 - September 27, 2003

The following hopper maintenance dredging project was started in FY 2003, but will extend into FY 04.

Freeport Harbor	August 11, 2003 - Ongoing
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The use of hopper dredges to maintain these navigation projects is necessary because of three factors: safety, weather conditions and productivity. These factors are closely interrelated; however, the underlying emphasis is placed on safety. The nearshore Gulf of Mexico is characterized by a wide shallow shelf. The Sabine-Neches Waterway, for example, extends about 22 miles into the Gulf. A cutterhead dredge operating offshore would require a pipeline length that could extend for several miles.

The dredges operating in these channels must be highly mobile to rapidly maneuver out of the way of other vessels. Pipeline cutterhead dredges are not self-propelled, and are held into position with spuds. Furthermore, the swing of the cutterhead is controlled by cables attached to the cutterhead arm. These cables are anchored along the outer limits of the channel to be dredged. Prior to moving the dredge, tenders must raise the anchors, and a towboat must be fastened to the dredge. These characteristics prevent the pipeline dredge from quickly moving out of the channel when other vessels approach. From a practical standpoint, dredges are generally not relocated for normal ship

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traffic, rather, dredging may be interrupted, but the dredge remains a stationary obstruction in half of the channel. This situation is encountered in inland bays. The use of hopper dredges in the Gulf avoids such a stationary obstruction.

Weather conditions also affect the safety of the dredge and crew. Pipeline dredges were not designed to operate in open-sea conditions. Due to the reasons stated above, these dredges cannot rapidly demobilize in harsh weather. The pipelines used to transport the dredged material to the placement sites would also be highly susceptible to breaking during rough weather. Even in relatively sheltered bays, cutterhead dredges often stop dredging in rough weather, and during frontal passages, only water is pumped to keep tension on the pipelines to prevent breaking. In the open Gulf of Mexico, this precaution would not be effective, even if it were possible to leave the dredge offshore. During relatively calm weather conditions, only the largest cutterhead dredges would be able to operate efficiently. Sea swells make it difficult to control the depth of the cutterhead; consequently, this affects the dredging operation. To illustrate this point, in 1977, a 27-inch diameter pipeline cutterhead dredge sank near the jetties while dredging the Entrance Channel of the Port Mansfield project. A frontal passage caused large waves, which battered the dredge, breaking the spud used to secure the vessel. Water entered the dredge through cable ports faster than it could be pumped out. A 27-inch dredge is one of the largest dredges commonly used within the Galveston District.

Productivity of the dredging operation is important because the purpose of dredging is to remove shoals and provide a safe depth for waterborne traffic. The use of pipeline dredges in the open Gulf would result in frequent relocations, or other interruptions, due to weather and traffic conditions. Consequently, it would take longer to remove shoals, which present a hazard to safe navigation. The longer the time to remove the shoals, the longer a dredge must be on site to maintain the channel. The presence of the dredge and pipeline, themselves, present an obstruction to safe navigation. For these reasons, hopper dredges are used exclusively to maintain deep-draft entrance channels in the Galveston District.

The Galveston District will attempt to schedule hopper-dredging operations during the December 1 through March 31 window, wherever feasible. However, it is impossible to schedule all hopper-dredging projects during this time frame, due to the availability of the hopper dredge fleet. Hopper dredging priorities are developed in concert with other Corps Districts that conduct these operations along the Atlantic and Gulf Coasts. The priorities are determined after considering the dredging needs and resident sea turtle populations within the various Districts.

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TURTLE MONITORING PROGRAM

A result of the consultation process was the requirement to document turtle takes by the dredges. In order to accomplish this task, before hopper dredging operations commenced, they were equipped such that all inflows and overflows would be screened. The configuration and location of the screens depends upon the construction of the dredge. The mesh size of this screening is 4-inches by 4-inches. Additionally, around-the-clock monitoring by NMFS-approved turtle inspectors was conducted to identify any turtles or turtle parts that were caught on these screens. Draghead deflectors were also deployed to deflect any turtles that may happen to be in, or near, the path of the draghead during excavation. The design of the deflectors is such that a sediment riffle is created ahead of the draghead, cushioning any contact with turtles thereby preventing injuries.

The observers inspected and cleaned all inflow and overflow screening at the end of each load. Dragheads and deflectors were also inspected immediately after each load, and dredge personnel were informed if repairs were necessary. Data sheets were completed daily, detailing all biological samples and debris found in the screening and dragheads. The observers also recorded the start, end and discharge times for each load, the specific location of the dredging area, the type of material being dredged, weather, tide and water temperature data, the condition of the screening, and any other pertinent information. Any sea turtle encounters or takes would be described on a separate incident report form. Additionally, all incidents would be photographed and diagrams would be made of the specimen sampled. Dead specimens would be frozen until all concerned parties were notified. Specimens would then be weighted with scrap iron and disposed of at the dredged material placement site, thereby ensuring that these same samples would not wash ashore or be taken again by the dredge.

A bridge watch for sea turtles and marine mammals was maintained during all daylight hours, except when the observer was off the bridge, cleaning and inspecting the screens and dragheads. All sightings of cetaceans and sea turtles were recorded in a bridge watch logbook.

SCREEN CONFIGURATIONS

Turtle monitoring activities were conducted aboard three different hopper dredges during FY 2003. These are the *Atchafalaya*, *B.E. Lindholm*, *Newport*. Each of these vessels was required to have 100% inflow screening or overflow screening with openings no greater than 4" x 4", and rigid draghead deflectors.

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PROJECTS

Brazos Island Harbor - Entrance Channel

On December 13, 2002 the contract hopper dredge *B.E. Lindholm* began work on the Entrance Channel of the Brazos Island Harbor Project. This was a continuation of the dredging job that was suspended in March 2002, due to green turtle takes at this project and at the Port Mansfield Channel. Contract specifications required dredging an estimated 257,000 cubic yards (CY) of shoal material. The required depth of dredging was 41 to 43 feet below Mean Low Tide (MLT, Corps of Engineers Datum), with 2 feet of allowable overdepth dredging.

Dredging began on December 13, 2002, and was terminated on December 19, 2002. A total of 60 loads of dredged material were collected and deposited into Placement Area No. 1-A. Dredging was performed between Stations -6+000 and -12+500. A total of 121,549 CY of material were excavated from this project.

The dredge was equipped with rigid draghead turtle deflectors, and 100% inflow screening with a 4-inch square mesh. NMFS-approved turtle observers provided 24-hour/day monitoring of dragheads and screens for each load cycle. The observers were employed by REMSA, Inc. under a subcontract to the dredging contractor, Weeks Marine, Inc.

Relocation trawling was conducted on a 24-hour daily basis during dredging operations. A total of one loggerhead and 5 greens were captured, tagged and relocated safely. Additionally, one Kemp's ridley was captured, but escaped before being tagged.

During the performance of this dredging, two green sea turtle takes were documented. The first take occurred on December 15th and 16th in loads No. 26 and 29. The observers determined that parts of the same turtle were entrained in these two loads. The second take occurred on December 19th in load No. 59. The water temperature during these takes was about 17°C.

Dredging was again suspended prior to completion of work, due to green turtle takes.

Corpus Christi Ship Channel - Entrance Channel

On April 9, 2003 the contract hopper dredge *Atchafalaya* began work on the Entrance Channel of the Corpus Christi Ship Channel Project. Contract specifications required dredging an

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estimated 1,153,000 CY of shoal material. The required depth of dredging was 49 feet below Mean Low Tide (MLT, Corps of Engineers Datum), with 2 feet of allowable overdepth dredging.

Dredging began on April 9, 2003, and was completed on July 7, 2003. A total of 746 loads of dredged material were collected and deposited into Placement Area No. 1. Dredging was performed between Stations -38.03 and -30+00 in the Inner Basin and from Stations 86+00 to 210+00 along the Outer Bar Channel. A total of 930,657 CY of material were excavated from this project.

The dredge was equipped with rigid draghead turtle deflectors, and 100% inflow screening with a 4-inch square mesh. NMFS-approved turtle observers provided 24-hour/day monitoring of dragheads and screens for each load cycle. The observers were employed by REMSA, Inc. under a subcontract to the dredging contractor, B+B Dredging Co.

Relocation trawling was conducted on a 24-hour daily basis during dredging operations. On June 7, 2003 a second relocation trawler was added to provide better channel coverage. A total of 72 turtles were tagged and relocated. This total includes one leatherback; 15 Kemp's ridleys; and 56 loggerheads, three of which were recaptures. Additionally, one bottlenose dolphin was captured on June 24 but died on the way to a rehabilitation center.

During the performance of this dredging, a total of five lethal turtle takes were experienced. These included four loggerheads and one Kemp's ridley. The first take was the Kemp's ridley on April 13, in load No. 58. The water temperature during this take was about 18°C. All of the loggerheads were taken in May, on the 4th, 21st, 23rd and 24th in loads 241, 290, 387, and 392, respectively. The water temperature during these takes ranged from 26°C to 28°C.

Throughout the duration of dredging, bridge watch observations included numerous sightings of bottlenose dolphins.

Non-biological samples commonly included human-generated debris. Biological samples were typically sparse, probably because relocation trawling cleared the channel ahead of the dredge. When observed, by catch consisted of mainly blue crabs, with an occasional echinoderm, eel or ray.

Galveston Harbor and Channel - Entrance Channel

On April 15, 2003 the contract hopper dredge *Newport* began work on the Entrance Channel of the Galveston Harbor and Channel Project. Contract specifications required dredging an

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estimated 2,117,000 CY of shoal material. The required depth of dredging was 49 feet below Mean Low Tide (MLT, Corps of Engineers Datum), with 2 feet of allowable overdepth dredging.

Dredging began on April 15, 2003, and was completed on June 25, 2003. A total of 698 loads of dredged material were collected and deposited into Placement Area No. 1. Dredging was performed between Stations 38+000 and 48+000. A total of 3,888,683 CY of material were excavated from this project.

The dredge was equipped with rigid draghead turtle deflectors, and 100% inflow screening with a 4-inch square mesh. NMFS-approved turtle observers provided 24-hour/day monitoring of dragheads and screens for each load cycle. The observers were employed by Coastwise Consulting, Inc. under a subcontract to the dredging contractor, B+B Dredging Co

Relocation trawling was conducted on a 24-hour daily basis during dredging operations. A total of 12 turtles, including ten loggerheads and 2 Kemp's ridleys were captured, tagged and relocated safely. Copies of the trawling reports associated with these turtle captures are enclosed.

During the performance of this dredging, one lethal turtle take was experienced. This take was a loggerhead on June 9, in load No. 573. The water temperature during this take was about 28°C. Copies of the observer reports are enclosed.

Surface water temperature measurements were taken in conjunction with the screen and draghead monitoring. The water temperature ranged from 20.0°C - 31.1°C.

Throughout the duration of dredging, bridge watch observations included numerous sightings of bottlenose dolphins.

The material dredged consisted of primarily mud with significant amounts of clay. The inflow screens were frequently clogged with clay which cause the screening to remain open several inches. During these periods, 100% overflow screening was conducted. Dredging was occasionally delayed while the screens were cleared.

Non-biological samples commonly included human-generated debris. Biological samples were typically sparse, probably because relocation trawling cleared the channel ahead of the dredge. When observed, bycatch consisted of various species of fish, crabs, mollusks, and sargassum.

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Sabine - Neches Waterway – Sabine Pass Outer Bar and Sabine Bank Channels

On August 6, 2003, the contract hopper dredge *Padre Island* began work on the Sabine Pass Outer Bar, and Sabine Bank Channels of the Sabine-Neches Waterway Project. Contract specifications required dredging an estimated 3,331,000 CY of shoal material. The required depth of dredging was 44 feet below Mean Low Tide (MLT, Corps of Engineers Datum), with 2 feet of allowable overdepth dredging.

Dredging began on August 6, 2003, and was completed on September 27, 2003. Dredging operations were continuous during this time period. A total of 580 loads of dredged material were collected and deposited into Placement Area Nos. 1- 4. Dredging was performed from Stations 0+000 to 23+000, and 64+000 to 80+000. A total of 3,544,956 CY of material was excavated from this project.

The dredge was equipped with rigid draghead turtle deflectors, and 100% inflow screening with a 4-inch square mesh. NMFS-approved turtle observers provided 24-hour/day monitoring of dragheads and screens for each load cycle. The observers were employed by Coastwise Consulting under a subcontract to the dredging contractor, Great Lakes Dredge and Dock Co., Inc.

Relocation trawling was conducted on a 24-hour daily basis during dredging operations. A total of three turtles were tagged and safely relocated. These include one loggerhead on August 15, one ridley on August 16, and one ridley on September 10. Copies of the trawling reports associated with these turtle captures are enclosed.

During the performance of this dredging, no lethal turtle takes were experienced. Copies of the observer reports are enclosed.

Water temperature measurements were taken in conjunction with the screen and draghead monitoring. The water temperature ranged from 27.2°C – 33.0°C at the surface, and 27.2°C – 32.0°C below mid-depth. The water temperature was typically identical at both depths during each observation period, but when different it varied by only 1.0°C cooler below mid-depth.

Throughout the duration of dredging, bridge watch observations included numerous sightings of bottlenose dolphins.

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The material dredged consisted of primarily silt with significant amounts of clay. The inflow screens were frequently clogged with clay and debris, and were frequently forced open slightly by the pressure.

Non-biological samples commonly included human-generated debris, particularly fishing gear. Biological samples were typically sparse, probably because relocation trawling cleared the channel ahead of the dredge. When observed, by catch consisted mainly of various species of fish.

Freeport Harbor - Entrance and Jetty Channels

On August 11, 2003 the contract hopper dredge *Bayport* began work on the Entrance and Jetty Channels of the Freeport Harbor Project. Since this project is ongoing, it will be discussed in detail in the FY 2004 Annual Report.

To date, no lethal turtle takes were experienced.

COSTS

The costs incurred in performing the turtle-monitoring program during FY 2003 include the costs for equipping and maintaining screens and draghead deflectors on contractor-owned dredges, as well as providing NMFS-approved observers and relocation trawling. In addition to the direct costs are District costs for administration and oversight. Below is a table depicting the costs for FY 2003. However, costs not included in this discussion are unquantifiable costs associated with decreased dredging efficiency which may result from the use of the draghead deflectors, and downtime experienced during cleaning of excessively fouled screens. Estimates of these increased costs are anticipated by the potential contractors during the preparation of bids, and there is no way to determine the actual value of these costs.

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PROJECT	COST OF MONITORING
Brazos Island Harbor	\$72,321.00
Galveston Harbor and Channel	239,000.00
Corpus Christi Ship Channel	429,217.50
Sabine - Neches Waterway	188,954.00
Freeport Harbor	92,100.00
District labor	71,511.48
TOTAL	\$1,093,103.98

SUMMARY

During Fiscal Year 2003, four maintenance-dredging projects were completed by hopper dredges. Below is a table summarizing lethal turtle encounters.

INCIDENTAL TAKES OF SEA TURTLES

MAINTENANCE DREDGING

FY 03

Date Taken	Project	Dredge	Channel Reach	Water Temp. (°C)	Species and Authorized Incidental Take per Fiscal Year			
					Kemp's ridley 7	Loggerhead 15	Green 5	Hawksbill 1
15/16 Dec 02	BIH	<i>B.E. Lindholm</i>	26°03.982' N, 97°08.594' W	16.7			1	
19 Dec 02	BIH	<i>B.E. Lindholm</i>	-6+000 to -12+000	17.0			1	
13 Apr 03	CCSC	<i>Atchafalaya</i>	27°48.86' N, 97°01.15' W	18.0	1			
4 May 03	CCSC	<i>Atchafalaya</i>	27°49.17' N, 97°01.19' W	26.0		1		
12 May 03	CCSC	<i>Atchafalaya</i>	27°49.12' N, 97°00.58' W	27.0		1		
23 May 03	CCSC	<i>Atchafalaya</i>	27°49.71' N, 97°00.81' W	27.5		1		
24 May 03	CCSC	<i>Atchafalaya</i>	27°49.24' N, 97°00.74' W	28.0		1		
9 Jun 03	GALV	<i>Newport</i>	29°18.67' N, 94°38.12' W	28.0		1		
TOTAL TAKE					1	5	2	0
ALLOWABLE TAKE REMAINING					6	10	3	1