

ANNUAL SEA TURTLE MONITORING REPORT
GALVESTON DISTRICT
MAINTENANCE DREDGING
FISCAL YEAR 1999

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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) 1999 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 99.

Freeport Harbor	Oct 11, 1998 – Nov 26, 1998
Brazos Island Harbor	Jan 31, 1999 – Mar 3, 1999
Corpus Christi Ship Channel	Jun 11, 1999 – Jul 11, 1999
Matagorda Ship Channel	Jul 16, 1999 – Aug 3, 1999

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 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

ANNUAL SEA TURTLE MONITORING REPORT.
GALVESTON DISTRICT - FY 1999 (Cont'd.)

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 in themselves 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.

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

ANNUAL SEA TURTLE MONITORING REPORT.
GALVESTON DISTRICT - FY 1999 (Cont'd.)

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 were described on a separate incident report form. Additionally, all incidents were photographed and diagrams were made of the specimen sampled. Dead specimens were frozen until all concerned parties were notified. Specimens were then 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 four different hopper dredges during FY 1999. These are the *Sugar Island*, *B.E. Lindholm* (formerly the *Ouachita*), *Northerly Island*, and *Eagle I*. Each of these vessels was required to have 100% inflow screening with openings no greater than 4" x 4", and rigid draghead deflectors.

PROJECTS

Freeport Harbor - Entrance and Jetty Channels

On October 11, 1998, the contract hopper dredge *Eagle I* began work on the Entrance and Jetty Channels of the Freeport Harbor Channel Project. Contract specifications required dredging an estimated 2,370,000 cubic yards (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 along the Entrance Channel and 47 feet MLT with 2 feet of overdepth along the Jetty Channel.

Dredging began on October 11, 1998, and was completed on November 26, 1998. A total of 864 loads of dredged material were collected and placed into Placement Area No. 1-A. Dredging was performed between Stations 30+00 along the Jetty Channel and -210+00 along the Entrance Channel. A total of 2,334,436 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

ANNUAL SEA TURTLE MONITORING REPORT.
GALVESTON DISTRICT - FY 1999 (Cont'd.)

Coastwise Consulting, Inc. under a subcontract to the dredging contractor, Bean Horizon Corp./Stuyvesant Dredging Co. (Joint Venture).

During the performance of this dredging, one lethal loggerhead take was experienced. This take occurred on October 29, in load No. 358. This turtle was taken from the Entrance Channel within 5,600 feet of the end of the jetties. The water temperature was about 24°C.

The observers reported that the dredge picked up abundant amounts of trash, which fouled the screens and required manual removal. There were also reports of excessive quantities of heavy clay being dredged to the extent that the observers requested larger openings in the inflow screens. Historically, the turtle observers have reported difficulties with clay in this channel, but not to the degree reported for this contract. It is unclear why clay would be encountered during a maintenance dredging project, since no new digging should occur. However, there have been anecdotal reports that during towing of jackup drilling platforms, the legs might have scraped the side slope of the channel displacing clay into the area to be dredged. Authorization to increase the screen mesh size was not granted, consequently, the boxes were periodically opened during dredging to clear the boxes of accumulated clay.

On October 13, the strut holding the port lander screen in place was damaged. This resulted in a reduced ability to effectively screen the inflow. This situation persisted until October 19, when repairs were finally completed.

Toward the end of the dredging operations, the starboard draghead was damaged. A replacement draghead was utilized for about two days (November 24 and 25) without a turtle deflector.

Water temperatures were taken in conjunction with the screen and draghead monitoring. The water seemed to be well mixed, as the surface and below mid-depth temperatures were nearly identical, with the mid-depth temperature generally less than 0.5°C cooler than the surface. These temperatures ranged from 17.0°C to 26.0°C. The single turtle take occurred when the water temperature was about 24°C.

Throughout the duration of dredging, bridge watch observations included numerous sightings of bottlenose dolphins (*Tursiops truncatus*), especially near the ends of the jetties.

The material dredged consisted of primarily silt with significant amounts of clay. Non-biological samples commonly included wood, netting, rocks, monofilament fishing line, plastic bags, and cable, along with other debris. The most common biological samples were comprised of various species of fish, rays, crabs, shrimp, whelks, eels, and grass.

ANNUAL SEA TURTLE MONITORING REPORT.
GALVESTON DISTRICT - FY 1999 (Cont'd.)

Brazos Island Harbor - Entrance Channel

On January 31, 1999, a contract hopper dredge began work on the Brownsville Entrance Channel of the Brazos Island Harbor Project. Contract specifications required dredging an estimated 604,000 CY of shoal material. However, only about 196,000 CY were to be removed by hopper dredge. The remainder of the material was to be excavated by pipeline dredge and used for beach nourishment. The required depth of dredging was 46 feet below MLT, with 2 feet of allowable overdepth dredging.

Dredging began on January 31, 1999, and was completed on March 3, 1999. The *Northerly Island* was employed under this contract. A total of 131 loads of dredged material were collected and placed into the nearshore berm in Placement Area No. 1-A. Hopper dredging was performed between Stations -6+000 and -12+000 along the Entrance Channel. A total of 186,571 CY of material was excavated by hopper dredges 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.

During the performance of this dredging, a total of two green sea turtle takes were documented. The first occurred on February 18 in load No. 69. The second was taken on March 2, in load No. 130.

Water temperatures were taken in conjunction with the screen and draghead monitoring. The water seemed to be well-mixed, as the surface and below mid-depth temperatures were nearly identical. These temperatures ranged from about 18°C to 21°C. The first turtle was taken when the water temperature was about 18°C; the second take occurred when the temperature was about 21°C.

Throughout the duration of dredging, bridge watch observations included numerous sightings of bottlenose dolphins. Sea turtles were also observed swimming in the vicinity on the 14th and 24th of February.

The material dredged consisted of primarily sand with some silt and clay. Non-biological samples commonly included rope, wood, netting, and rocks, along with other debris. The most common biological samples were comprised of various species of fish, skates, rays, crabs, whelks, sea stars, and sargassum. The screens were frequently clogged with sargassum and clay, which resulted in downtime while the screens were manually cleared.

ANNUAL SEA TURTLE MONITORING REPORT.
GALVESTON DISTRICT - FY 1999 (Cont'd.)

Corpus Christi Ship Channel - Entrance Channel

On June 11, 1999 the contract hopper dredge *B.E. Lindholm* (formerly the *Ouachita*) began work on the Entrance Channel of the Corpus Christi Ship Channel Project. Contract specifications required dredging an estimated 1,637,000 CY of shoal material. The required depth of dredging was 49 feet below MLT, with 2 feet of allowable overdepth dredging.

Dredging began on June 11, 1999, and was completed on July 11, 1999. A total of 601 loads of dredged material were collected and placed into Placement Area No. 1. Dredging was performed between Stations 34+00 and 50+00 along the Jetty Channel, and from Station 80+00 to 210+00 along the Outer Bar Channel. A total of 1,417,492 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, Inc. under a subcontract to the dredging contractor, Weeks Marine, Inc.

During the performance of this dredging, three lethal loggerhead takes were experienced. The first take occurred on June 18, in load No. 176. This turtle was taken from the Outer Bar Channel between Stations 80+00 and 120+00. The second take occurred in the same vicinity as the first, on June 19, in load No. 193. The third take occurred on June 30, in load No. 421. This turtle was taken from the Outer Bar Channel between Stations 120+00 and 210+00. The water temperature for all three instances was about 28°C.

Water temperatures were taken in conjunction with the screen and draghead monitoring. The water seemed to be well-mixed, as the surface and below mid-depth temperatures were nearly identical. These temperatures ranged from about 23°C to 29.5°C.

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

The material dredged consisted of primarily sand with some silt and clay. Non-biological samples commonly included human-generated debris, particularly fishing gear. The most common biological samples were comprised of various species of fish, eels, skates, rays, crabs, shrimp, whelks, worms, and sargassum. The screens were frequently clogged with sargassum and clay, which resulted in downtime while the screens were manually cleared.

ANNUAL SEA TURTLE MONITORING REPORT.
GALVESTON DISTRICT - FY 1999 (Cont'd.)

Matagorda Ship Channel - Entrance Channel

On July 16, 1999 the contract hopper dredge *Sugar Island* began work on the Entrance Channel of the Matagorda Ship Channel Project. Contract specifications required dredging an estimated 676,000 CY of shoal material. The required depth of dredging was 41 to 43 feet below MLT, with 2 feet of allowable overdepth dredging.

Dredging began on July 16, 1999, and was completed on August 3, 1999. A total of 213 loads of dredged material were collected and placed into Placement Area No. 1. Dredging was performed between Stations -5+000 and -6+000, and from Station -8+000 to -20+000. A total of 499,341 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, Inc. under a subcontract to the dredging contractor, NATCO Limited Partnership.

During the performance of this dredging, no lethal turtle takes were experienced.

Water temperatures were taken in conjunction with the screen and draghead monitoring. The water seemed to be well mixed, as the surface and below mid-depth temperatures were nearly identical. These temperatures ranged from 29°C to 30°C throughout the duration of this dredging.

Bridge watch observations included numerous sightings of bottlenose dolphins (*Tursiops truncatus*), and sightings of pilot whales on July 24th.

The material dredged consisted of primarily sand with silt, and clay. Non-biological samples commonly included logs and fishing gear, along with other debris. The most common biological samples were comprised of various species of fish, skates, crabs, whelks, sargassum, and jellyfish.

COSTS

The costs incurred in performing the turtle-monitoring program during FY 1999 include the costs for equipping and maintaining screens and draghead deflectors on contractor-owned dredges, as well as providing NMFS-approved observers. In addition to the direct costs are District costs for administration and oversight. Below is a table depicting the costs for FY 1999. 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

ANNUAL SEA TURTLE MONITORING REPORT.
GALVESTON DISTRICT - FY 1999 (Cont'd.)

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.

PROJECT	COST OF MONITORING
Freeport Harbor	\$30,000.00
Brazos Island Harbor	30,000.00
Corpus Christi Ship Ch.	29,000.00
Matagorda Ship Ch.	21,484.00
District labor	7,733.88
TOTAL	\$118,217.88

SUMMARY

During Fiscal Year 1999, four maintenance-dredging projects were performed by hopper dredges. Below is a table summarizing lethal turtle encounters.

INCIDENTAL TAKES OF SEA TURTLES

MAINTENANCE DREDGING

FY 99

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
29 Oct 1998	FH	<i>Eagle I</i>	-28+91 to -00+00 to -56+00	24.0		1		
18 Feb 1999	BIH	<i>Northerly Island</i>	-6+000 to -12+000	18.3			1	
2 Mar 1999	BIH	<i>Northerly Island</i>	26.03°N, 97.08°W	20.6			1	
18 Jun 99	CCSC	<i>B.E. Lindholm</i>	80+00 to 120+00	28.0		1		
19 Jun 99	CCSC	<i>B.E. Lindholm</i>	80+00 to 120+00	28.0		1		
30 Jun 99	CCSC	<i>B.E. Lindholm</i>	120+00 to 210+00	28.0		1		
TOTAL TAKE					0	4	2	0
ALLOWABLE TAKE REMAINING					7	11	3	1