

**ANNUAL SEA TURTLE MONITORING REPORT
MAINTENANCE DREDGING**

**GALVESTON DISTRICT
FISCAL YEAR 2008**

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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 concerning Dredging of Gulf of Mexico Navigation Channels and Sand Mining (“Borrow”) Areas Using Hopper Dredges by COE Galveston, New Orleans, Mobile, and Jacksonville Districts (Consultation Number F/SER/2000/01287) dated November 19, 2003. Specifically this report, summarizing hopper dredging operations in Fiscal Year (FY) 2008 within the Galveston District, is submitted in compliance with reasonable and prudent measure No. 9 - Reporting.

The following six hopper maintenance dredging projects were completed in FY 2008.

Freeport Harbor (FH)	October 12, 2007 - December 4, 2007
Houston Ship Channel (HSC)	December 18, 2007 - January 28, 2008
Sabine-Neches Waterway (SNWW)	December 28, 2007 - April 25, 2008
Brazos Island Harbor (BIH)	June 3, 2008 - June 23, 2008
Brazos Island Harbor (BIH)	August 30, 2008 - September 4, 2008

The following project began in FY 2007 and continued in FY 2008.

Galveston Channel (GALV)	September 30, 2007 - December 14, 2007
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Except for the Houston Ship Channel, 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 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. During these periods, 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 to maintain deep-draft entrance channels in the Galveston District.

The Galveston District endeavors to schedule hopper-dredging operations during the recommended 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 of Engineers 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 (where feasible) would be screened. The configuration and location of the screens depends upon the construction of the dredge. The starting 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 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. These specimens were provided to authorized researchers, or 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. Live injured turtles were taken to a rehabilitation facility for treatment and observation.

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 six different hopper dredges during FY 2008 these include the *Columbia*, *Newport*, *Liberty Island*, *B.E. Lindholm*, *R.N. Weeks*, and *Glenn Edwards*. These vessels were required to have rigid draghead deflectors, and 100% inflow screening or overflow screening with openings starting at 4" x 4."

PROJECTS

Galveston Harbor and Channel - Galveston Channel

On September 12, 2007 the contract hopper dredge *Glenn Edwards* began work on the Bolivar Roads to Pier B segment of the Galveston Channel Project. Contract specifications required dredging an estimated 2,068,000 cubic yards (CY) of shoal material. The required depth of dredging was 40 feet below Mean Low Tide (MLT, Corps of Engineers Datum) with one foot of allowable overdepth.

Dredging began on September 12, 2007, and was completed on December 14, 2007. Dredging operations were continuous during this time period. A total of 406 loads of dredged material were excavated from Stations 2+500 to 22+544, and a total of 2,938,933 CY of material was deposited into Placement Area No. 1. These totals include excavation of 2,268,933 CY in 289 loads during FY 2008.

The dredge was equipped with rigid draghead turtle deflectors, and 100% inflow screening with 4-inch diameter circular holes cut into metal plates. 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, Manson Construction Co.

No risk assessment trawling or relocation trawling were conducted during dredging operations.

During the performance of this dredging, no turtle takes were experienced. The water temperature during this project ranged from about 30.5° to 12.4°C.

Coordination was conducted with the Sea Turtle Stranding and Salvage Network (STSSN). There were no reports of stranded turtles that bore injuries that might be consistent with a potential encounter with a hopper dredge.

Material dredged consisted mostly of mud and silt, but some clay was also encountered. However, there were no indications that the clay caused any problem such as screen clogs. There was a lot of debris encountered along a part of the channel that was not dredged for several years, but there was no indication of unacceptable fouling of the screens.

Freeport Harbor - Entrance and Jetty Channels

On October 12, 2007 the contract hopper dredge *Liberty Island* began work on the Entrance and Jetty Channels of the Freeport Harbor Project. Contract specifications required dredging an estimated 1,157,000 CY of shoal material. The required depth of dredging was 49 feet below MLT, 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 12, 2007, and was completed on December 4, 2007. Dredging operations were continuous during this time period. A total of 465 loads of dredged material were collected and deposited into Placement Area No. 1-A. Dredging was performed between Stations 78+63 along the Jetty Channel and (-)150+00 along the Outer Bar Channel. A total of about 1,415,421 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 East Coast Observers, Inc. under subcontract to the dredging contractor, Great Lakes Dredge and Dock Co.

During the performance of this dredging, three turtle takes were experienced. The first was a green turtle on 2 November in Load No. 262. The water temperature was about 21.7°C. The second and third takes were Kemp's ridleys on 3 November in Load No. 285, and 4 November in Load No. 293, respectively. The water temperature was about 22.8°C for both.

In response to these takes, relocation trawling was initiated on November 7, 2007, and was performed on a 24-hour daily basis during dredging operations. A total of 430 tows were conducted. During this effort, no turtles were captured or relocated. There were, however, fragments of a single turtle retrieved from two separate tows (Tow Nos. 148 and 152). This turtle was judged to be a casualty of a large ship propeller, and not dredge related. For this reason, it is considered to be a stranding rather than a take.

Coordination was conducted with the STSSN. There were no reports of stranded turtles that bore injuries consistent with a potential encounter with a hopper dredge.

Material dredged consisted mostly of mud and clay. However, there were no indications that the clay caused any problem such as screen clogs.

Houston Ship Channel – Station 59+400 to Station 78+000

On December 18, 2007 the contract hopper dredge *Glenn Edwards* began work on the segment of the Houston Ship Channel from Station 59+400 to Station 78+000. Contract specifications required dredging an estimated 1,288,400 CY of shoal material. The required depth of dredging was 47 feet below MLT with 2.0 feet of allowable overdepth.

Dredging began on December 18, 2007 and was completed on January 28, 2008. Dredging operations were continuous during this time period. A total of 138 loads containing 1,151,801 CY of material was collected and deposited into Placement Area No. 2.

The dredge was equipped with rigid draghead turtle deflectors, and 100% inflow screening with 4-inch 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, Manson Construction Co.

No risk assessment trawling or relocation trawling was conducted during dredging operations.

During the performance of this dredging, no turtle takes were experienced. The water temperature during this project ranged from about 8.0° to 16.7°C.

Coordination was conducted with the STSSN. There was one report of a stranded green turtle that had injuries that could be consistent with a hopper dredge encounter. This turtle was found on Galveston Beach about six miles from the offshore placement area, and about 25 miles from the dredging site. It is unlikely that this stranding resulted from this hopper dredging operation. If this turtle was entrained by the draghead suction, the size of the carcass would have precluded it from passing through the inflow screens where it would have been observed by the endangered species monitor. If the injuries were sustained by the draghead without entrainment, it is unlikely that this turtle would have been found at the reported beach location because of the distance from the dredging site.

Material dredged was reported as mud. There were no indications that dredged material or debris encountered caused any unacceptable fouling of the screens.

Sabine-Neches Waterway - Sabine Pass Outer Bar Channel

On December 28, 2007 contract hopper dredges began work on the Sabine Pass Outer Bar Channel of the Sabine-Neches Waterway Project. Contract specifications required dredging an estimated 3,175,000 CY of shoal material. The required depth of dredging was 44 feet below MLT, with 2 feet of allowable overdepth dredging.

Dredging began on December 28, 2007, and was completed on April 25, 2008. Dredging was not continuous; no dredging occurred during the period from February 14 until March 24. Three dredges were employed under this contract, they were the *Columbia*, *Newport*, and the *Glenn Edwards*. The *Columbia* worked from December 28 until January 17, departed then returned on March 24 and remained until work was completed, dredging 346 loads. The *Newport* worked from January 15 until February 12, and excavated 265 loads of dredged material. The *Glenn Edwards* worked from January 31 until February 8, and removed 64 loads. A total of 675 loads of dredged material were collected and placed into Placement Area No. 4. Dredging was performed between Stations 0+000 and 18+000; a total of 2,646,462 CY of material was excavated from this project.

The dredges were 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.

No risk assessment trawling or relocation trawling was conducted during dredging operations.

During the performance of this dredging, no turtle takes were experienced. The surface water temperature during this project ranged from about 13.0° to 20.6°C.

Coordination was conducted with the STSSN. There were no reports of stranded turtles that bore injuries that might be consistent with a potential encounter with a hopper dredge.

Material dredged consisted mostly of mud and silt. There were no indications that the material or debris caused any problems such as screen clogs.

Brazos Island Harbor - Jetty Channel

On June 3, 2008, the contract hopper dredge *R.N. Weeks* began dredging in the Jetty Channel of the Brazos Island Harbor Project. Contract specifications required dredging an estimated 450,000

CY of shoal material. The required depth of dredging was 46 feet below MLT, with 2 feet of allowable overdepth dredging.

Dredging began on June 3, 2008, and was completed on June 23, 2008. Dredging operations were continuous during this time period, excavating about 490,690 CY of material between Stations -0+600 and -5+600. A total of 199 loads of dredged material were collected and deposited into the nearshore berm at Placement Area Nos. 1A and 1B.

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 subcontract to the dredging contractor, Weeks Marine, Inc.

During the performance of this dredging, two turtle takes were experienced, one lethal loggerhead take and one live green. The first take was a loggerhead on June 20 in load 172, the second was the green on June 21 in load 178. This green was alive and appeared to be well except for minor injuries. It was transported to Sea Turtle, Inc., a rehabilitation facility for care and observation. The surface water temperature during these takes was about 28.0°C.

Relocation trawling was conducted using two trawlers working on a 24-hour daily basis prior to, and during dredging operations. Trawling operations were initiated on May 30. Operation of these vessels was coordinated to provide better channel coverage, and provide opportunity to release captured turtles while maintaining continuous trawling by at least one boat. A total of 1,304 tows were conducted. During this effort, 14 turtles were tagged and relocated; 11 were loggerheads, including three recaptures. There were also two Kemp's ridleys and one green.

Coordination was conducted with the STSSN. There were no reports of stranded turtles that bore injuries that might be consistent with a potential encounter with a hopper dredge.

Material dredged consisted mostly of sand and silt. There were no indications that the material or debris caused any problems such as screen clogs.

Brazos Island Harbor - Entrance Channel

On August 30, 2008, the contract hopper dredge *B.E. Lindholm* began dredging in the Entrance Channel of the Brazos Island Harbor Project. Contract specifications required dredging for an estimated 10 days between station numbers -6+400 and -13+000 with the objective of removing

approximately 350,000 CY of shoal material. The required depth of dredging was 46 feet below MLT, with 2 feet of allowable overdepth dredging.

Dredging began on August 30, 2008, and continued until September 5, 2008. Dredging operations were continuous during this time period, however the dredge experienced a breakdown and was not able to continue work for the remainder of the FY. Completed work included excavating about 130,933 CY in 51 loads. This material was deposited into the nearshore berm at Placement Area No. 1A.

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 East Coast Observers, Inc. under subcontract to the dredging contractor, Weeks Marine, Inc.

During the performance of this dredging, no turtle takes were experienced. The surface water temperature during this project ranged from about 27.8° to 28.9°C.

Relocation trawling was conducted using two trawlers working on a 24-hour daily basis prior to, and during dredging operations. Trawling operations were initiated on August 29. Operation of these vessels was coordinated to provide better channel coverage, and provide opportunity to release captured turtles while maintaining continuous trawling by at least one boat. A total of 411 tows were conducted. During this effort three turtles were tagged and relocated, two loggerheads and one Kemp's ridley.

Coordination was conducted with the STSSN. There were no reports of stranded turtles that bore injuries that might be consistent with a potential encounter with a hopper dredge.

Material dredged consisted mostly of sand, mud and clay. There were no indications that the material or debris caused any problems such as screen clogs.

COSTS

The costs incurred in performing the turtle-monitoring program during FY 2008 include the costs for equipping and maintaining screens and draghead deflectors on contractor 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 2008. 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.

TURTLE PROTECTION COSTS

Project Name	Relocation Trawling Costs (\$)	Dredge Monitoring Costs (\$)	Total (\$)
GALV	N/A	45,000.00	45,000.00
FH	79,500.00	13,750.00	93,250.00
HSC	N/A	32,500.00	32,500.00
SNWW	N/A	55,000.00	55,000.00
BIH - Jetty Ch.	150,000.00	11,000.00	161,000.00
BIH - Entrance Ch.	68,400.00	31,920.00	100,320.00
District labor	NA	NA	34,095.00
TOTALS	297,900.00	189,170.00	521,165.00

SUMMARY

During Fiscal Year 2008, six maintenance-dredging projects were conducted by hopper dredge during which 8,104,240 CY of sediments were excavated. Five turtles were taken by the dredges, four of which were lethal. Lethal takes consisted of two Kemp's ridleys, one loggerhead, and one green; one green was captured alive.

Where implemented, relocation trawling was performed on a 24-hour daily basis during dredging operations. Two trawlers worked concurrently to provide better channel coverage during dredging at both BIH projects. During the course of 2,145 trawls, 17 turtles were relocated; this includes 13 loggerheads, 3 Kemp's ridley, and 1 green. This total also includes three loggerhead recaptures. Below is a table detailing trawling results.

RELOCATION TRAWLING

Project Name	Number of Tows	Number of Turtles Captured	Catch per Unit Effort
FH	430	0	0.0000
BIH - Jetty Ch.	1,304	14	0.0107
BIH - Entrance Ch.	411	3	0.0073
TOTALS	2,145	17	0.0079

Coordination was conducted with the STSSN. There was one report of a stranded green turtle that had injuries that could be consistent with a hopper dredge encounter. This turtle was found on Galveston Beach about six miles from the offshore placement area, and about 25 miles from the dredging site. It is unlikely that this stranding resulted from hopper dredging operations.

All trawling and tagging data, observer and incident reports, and stranding information can all be accessed at the USACE Sea Turtle Data Warehouse. The link is: <http://el.erdc.usace.army.mil/seaturtles/list.cfm?Code=Project&Step=2&Type=SWG>.

**GALVESTON DISTRICT
INCIDENTAL TAKES OF SEA TURTLES
MAINTENANCE DREDGING - FY 2008**

Date Taken	Project	Dredge	Channel Reach	Water Temp. (°C)	Species and District Trigger Points per Fiscal Year (Gulfwide Pool)			
					Kemp's ridley 6 (16)	Loggerhead 12 (32)	Green 4 (11)	Hawksbill 1 (3)
2 Nov 07	FH	<i>Liberty Island</i>	28° 55.314'N; 95° 16.931'W	21.7			1	
3 Nov 07	FH	<i>Liberty Island</i>	0+00 – (-)50+00	22.8	1			
4 Nov 07	FH	<i>Liberty Island</i>	0+00 – (-)50+00	22.8	1			
20 Jun 08	BIH	<i>R.N. Weeks</i>	26° 03.970'N; 97° 09.190'W	28.0		1		
21 Jun 08	BIH	<i>R.N. Weeks</i>	26° 03.970'N; 97° 09.190'W	28.0			1	
TOTAL TAKE					2	1	2	0
ALLOWABLE TAKE REMAINING					4 (14)	11 (31)	2 (9)	1 (3)