

FINAL REPORT

**Sea Turtle Relocation Trawling
Matagorda Ship Channel
Matagorda, Texas
Contract # W912HY-04-C-0006**

**Dates:
18 January 2004 – 06 February 2004**

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ABSTRACT

A twenty-four-hour-per-day sea turtle relocation project was conducted onboard the *F/V Miss Anna* during the dredging project in Matagorda Ship Channel, Texas. Species targeted included Loggerhead (*Caretta caretta*), Kemp's ridley (*Lepidochelys kempii*), Green (*Chelonia mydas*), Leatherback (*Dermochelys coriacea*), and Hawksbill (*Eretmochelys imbricata*) sea turtles.

INTRODUCTION

The sea turtle relocation project was initiated as a safety precaution by ACOE, Galveston District to reduce the chance of sea turtle incidents that may be caused by dredging activities. After collaboration between National Marine Fisheries Service, the U.S. Army Corps of Engineers, and B + B Dredging it was determined that trawling should be commenced on 18 January 2004.

SCOPE OF WORK

The sea turtle abundance and relocation trawling project in Matagorda Bay, Texas was contracted by B + B Dredging. The party agreeing to provide relocation trawling services (*Remsa, Inc.*) was to be responsible for providing the trawler, nets, equipment, and the necessary trained personnel. Methods and equipment were standardized as much as possible including data sheets, nets, trawling speed and direction to tide, length of segment, length of tow, and numbers of tows per segment. Trawling was conducted with repetitive 30-40 minute (total time) tows in the respective borrow areas. Positions at the beginning and end of each tow were determined from DGPS positioning equipment. Tow speed was taken at the approximate mid point of each tow. The trawler was fitted with two 60 foot trawling nets constructed from 8 inch mesh (stretch) as specified by the ACOE turtle trawling net specification (Appendix 1).

All turtles that were caught were identified, measured, tagged, and released approximately five miles east of the dredging site. Turtles were tagged with Inconel tags previously obtained from the University of Florida's Archie Carr Center for Sea Turtle Research in each of the front flippers according to National Marine Fisheries Service protocol. Aseptic conditions were maintained for tag attachment and the tags themselves. Data on turtles was entered on standard data sheets provided by the ACOE.

Water temperature measurements were taken at the surface every three to four hours. Weather conditions were recorded including air temperature, wind velocity and direction, and wave height. High and low tide times that occur at each tow were recorded in military time.

Permits for handling threatened and endangered species were obtained from the appropriate state agencies (Appendix 2).

RESULTS

Sea turtle abundance and relocation trawling began on 18 January 2004 aboard the F/V *Miss Anna*. No turtles were caught during the twenty (20) days of trawling with a total of 427 tows of 40 minutes or less.

Trawling reports were completed for each tow which included: begin tow and end tow times, depth, speed mid tow, latitude and longitude, water temperature, wave height, air temperature, wind speed, by-catch, number of turtles, and comments were recorded. Copies of these reports will not be duplicated for this report, but will be available upon request.

The mean sea temperature during this period averaged 12.2°C (54°F) with a fluctuation of +/- 3 C. The biological by-catch on this project was minimal and noted in the tow sheet (Appendix 3).

DISCUSSION

The sea turtle relocation trawling project at Matagorda Ship Channel, Texas was performed in conjunction with the dredge maintenance project contracted by B + B Dredging. Trawling was mobilized on 18 January 2004 and continued until project completion on 06 February 2004.

If you would like more information on any aspect of this report, feel free to contact me at the telephone number above.

Appendix 1
ACOE Sea Turtle Trawling Net Specifications

Trawling Scope of Work

INTRODUCTION

The following scope of work is for assessment of the relative abundance of sea turtles in entrance channels which are being maintained by hopper dredges. Sea turtles will be captured by trawling. The trawling survey will provide information on the times of occurrence and general location of turtles in these channels. Species, size, sex, and general condition will be recorded for captured turtles. The approach used for this survey standardizes the distance trawled (2 km, 1.08 nm) and flow direction (with the tidal flow).

OBJECTIVES

To determine relative abundance of sea turtles in the entrance channel 2 to 7 days prior to dredging.

TRAWLING SPECIFICATIONS:

Trawling will be conducted to capture turtles to determine relative abundance in the channel. Survey methods and equipment will be standardized as much as possible including data sheets, nets, trawling speed and direction to tide, length of segment, length of tow, and numbers of tows per segment. Trawling will be conducted with repetitive 15-30 minute (total time) tows in the channel. Data sheets will be provided by CE. Nets to be used will be the standard CE turtle nets used on previous surveys (Appendix A.). Trawling speed will be at a constant rate and consistent for each tow (approximately 2.5-3.0 knots). Trawling will be conducted with the tidal flow. A minimum of 6 tows per segment, 2 each in the green, red, and center portion of the channel. The channel will be divided into segments 3 km in length which will be set for all surveys in that channel. The segments will include the areas of the channel which will be dredged and a "buffer" segment in the channel on each side of the dredged segments. Each 3 km segment will be trawled for a distance of 2 km. Tow times will be adjusted from 15 to 30 minutes to achieve the 2 km tow length. Surveys will be conducted according to a randomized design consistent with NMFS survey protocol as much as possible.

Positions at the beginning and end of each tow will be determined from GPS positioning equipment. Tow speed will be taken at the approximate mid point of each tow.

NET SPECIFICATIONS:

The trawler will be fitted with two 60 foot trawling nets constructed from 8 inch mesh (stretch) as specified in the attached description. The nets will be fitted with mud rollers and floats as specified.

TURTLE HANDLING AND MEASUREMENTS

All turtles that are caught will be identified, measured, tagged and released back into the channel at the approximate point of capture. They will be released into the channels in the location where they are captured to determine their recapture rate. Turtles will be returned to the water as soon as possible after capture. Measurements will be taken according to the protocol detailed in Pritchard et al. 1983. At a minimum, straight line length, straight line width, tail length, and weight will be taken. Turtles will be tagged with NMFS #681 Inconel tags in each of the front flippers according to National Marine Fisheries protocol. Trovan Passive Integrated Transponder (PIT) tags will be injected subcutaneously in the wrist area of the turtles right front flipper. Aseptic conditions will be maintained for tag attachment and tags. Data on turtles will be entered in a standard data sheet in a format provided by the Corps of Engineers (Appendix B.). Photographs will be taken of each turtle captured. Included in the photograph will be a 4 x 6 card with the tag numbers, date, and location written in large black letters. Additional photographs will be taken of methods, injured turtles, unusual bycatch, or other items of technical interest. A copy of the photos will be provided to the Corps of Engineers.

WATER QUALITY AND PHYSICAL MEASUREMENTS

Water temperature measurements will be taken at surface, mid depth, and bottom each slack tide during the sample period for a minimum of one measurement at the beginning and one at the end of the sample period (each month). Weather conditions will be recorded including air temperature, wind velocity and direction, sea

state-wave height, and precipitation. This information can be obtained from the local weather service. High and low tides that include each tow time will be recorded in military time.

SAMPLE PERIODS

Trawl surveys will be conducted in the channel two to seven days prior to initiation of dredging.

PERMITS

Permits for handling threatened and endangered species and for collecting other organisms will be obtained from the appropriate agencies.

APPENDIX B: TURTLE TRAWL NETS SPECIFICATIONS

Back

DESIGN: 4 seam, 4 legged, 2 bridal trawl net

WEBBING: 4 inch bar, 8 inch stretch top - 36 gauge twisted nylon dipped side - 36 gauge twisted nylon dipped bottom - 84 gauge braided nylon dipped

NET LENGTH: 60 ft from cork line to cod end

BODY TAPER: 2 to 1

WING END HEIGHT: 6 ft

CENTER HEIGHT: Dependent on depth of trawl 14 to 18 ft

COD END: Length 50 meshes x 4" = 16.7 ft Webbing 2 inch bar, 4 inch stretch, 84 gauge braid nylon dipped, 80 meshes around, 40 rigged meshes with 1/4 x 2 inch choker rings, 1 each x 4 inch at end cod end cover - none chaffing gear - none

HEAD ROPE: 60 ft x inch combination rope (braid nylon with stainless cable center)

FOOT ROPE: 65 ft x inch combination rope

LEG LINE: top - 6 ft, bottom 6 - ft

FLOATS: size - tuna floats (football style), diameter - 7 inch length - 9 inch, number - 12 each, spacing - center on top net 2 inches apart

MUD ROLLERS: size 5 inch diameter 5.5 inch length, number - 22 each, spacing - 3 ft attached with 3/8 inch polypropelene rope (replaced with snap on rollers when broken)

TICKLER CHAINS: NONE (discontinued- but previously used 1/4 inch x 74 ft galvanized chain)

WEIGHT: 20 ft of 1/4 inch galvanized chain on each wing, 40 ft per net looped and tied

DOOR SIZE: 7 ft x 40 inches (or 8 ft x 40 inches), Shoe - 1 inch x 6 inch, bridles - 3/8 inch high test chain

Appendix 2
State Agencies Threatened and Endangered Species
Permit

Appendix 3
Biological By-Catch

Biological By-Catch

The following is a list of species encountered during the trawling project at Matagorda Ship Channel, Texas. These numbers are estimates provided by the tow sheets. They provide a good indicator of species relative abundance on the trawler.

- Southern Stingray- *Dasyatis americana* (5)
- Cannonballs jelly- *Stomolophus meleagris* (55)
- Spiny Boxfish- *Ostracion diaphanum* (10)
- Atlantic Cutlassfish- *Trichiurus lepturus* (5)
- Mantis Shrimp- *Odontodactylus Scyllarus* (10)
- Moon jelly- *Aurelia aurita* (5)
- Black Drum- *Pogonias cromis* (5)
- White Shrimp- *Penaeus setiferus* (10)
- Brown Shrimp- *Penaeus aztecus* (10)