# FINAL REPORT

Endangered Species Monitoring

Contract DACW21-93-C-0072

Dredge "R.N. Weeks"

Savannah Harbor Entrance Channel

Savannah, GA

Dates
December 13, 1993 to March 25, 1994

Submitted by

Cecelia Miles
3916 Old Nassauville Road
Fernandina Beach, FL 32034

April 4, 1994

## EXECUTIVE SUMMARY

A 24-hour-a-day endangered species monitoring program specifically targeting sea turtles , manatees, and North Atlantic right whales was conducted during the maintenance dredging operation performed in the Savannah Harbor Entrance Channel, Savannah, GA by the hopper dredge "R.N. Weeks". The project began on December 13, 1993 and the dredge was released on March 25, 1994. Two sea turtles were recovered alive (one loggerhead on March 15 and one Kemp's ridley on March 24) and transported to Marineland in Florida for rehabilitation. No whales or manatees were sighted from the vessel. North Atlantic right whales were sighted within 15 miles of the dredging area by aerial survey on two occasions (December 18 and January 23).

## INTRODUCTION

This observer program to monitor the impact of dredging on endangered species present in the area of operations was conducted in response to the U.S. Army Corps of Engineers (COE) contract to perform maintenance dredging in the Savannah Harbor Entrance Channel at Savannah, GA. In accordance with National Marine Fisheries Service's (NMFS) ongoing agreement with COE, approved observers were present onboard the dredge at all times to document any detected incidents involving endangered species in the digging or disposal area.

## SCOPE OF WORK

The observer program at Savannah Harbor was contracted by Weeks Marine, Inc. of Cranford, NJ. The party agreeing to provide observer coverage was to be responsible for providing the necessary NMFS approved personnel and equipment to clean and monitor inflow and overflow screens onboard the hopper dredge "R.N. Weeks". Monitoring was to be continuous, seven days a week, 24 hours a day. Observers were to inspect and clean all inflow and overflow screens after each loading cycle. Each drag head and its associated "turtle deflector device" was to be inspected after each load. Any evidence of death or injury involving target species was to be identified, logged, measured, photographed, and preseved as appropriate. Any uninjured sea turtles incidentally taken by the dredge were to be weighed, measured, tagged and released. Any individuals taken by the dredge and determined by the observers to be in need of rehabilitation were to be transported to the nearest suitable facility. Target species included the loggerhead turtle (Caretta caretta), green turtle (Chelonia mydas), Kemp's ridley turtle (Lepidodchelys kempii), leatherback turtle (Dermochelys coriacea), and hawksbill turtle (Erytmochelys imbricata).

A daylight bridge watch was to be conducted during transits to and from the disposal area to monitor for the presence of the North Atlantic right whale (Eubalaena glacialis). Sightings of any right whales during daylight hours from the vessel were to be reported immediately to the Captain who was to coordinate all ship's movements to avoid any collision or harassment. In addition to this lookout, a daily aerial survey of the waters for 15 nautical miles around the entire area of the dredging operation was to be conducted by a separate party. Daily coordination with the aerial survey team and the onboard observers was to be maintained by marine radio. In the event that right whales were sighted, whether from the vessel or by the survey team, all transits to and from the disposal area on those nights were to be made at 5 knot maximum speeds. If no survey was performed then 5 knot maximum speeds were to be maintained from sunset to sunrise. During all bridge watches a lookout for the West Indian manatee (Trichechus manatus) was also to be kept.

All dredge personnel were to be instructed in the habits and identification of the target species, especially of the right whales, and were to be reminded of the need to avoid collisions with any of these endangered animals.

Weekly reports concerning monitoring effectiveness, and any interaction with target species were to be submitted to NMFS. A final summary report was to be submitted to the U.S. Army Corps of Engineers within 30 days of completion of the project.

## METHODS

Maintenance dredging in the Savannah Harbor Entrance Channel was accomplished by the hopper dredge "R.N. Weeks" from December 13, 1993 through March 25, 1994. Material was removed from areas near the jetties, as well as further offshore, and deposited in an offshore disposal area (an excerpt of the navigational chart of this area is included in the Appendix). Two NMFS approved observers were present onboard the vessel, working 12 hour shifts, to provide continuous monitoring. Names and addresses of individuals are furnished in the Appendix.

At the onset of dredging a presentation was made by the observers to all dredge personnel concerning the presence of endangered species in the operations area, which species we might be expected to encounter, and how to identify target species, with special emphasis on the North Atlantic right whale. Videos were used for assistance in pointing out identifying characteristics of the right whales, and additional informational material was made available to all crew members. A question and answer period was followed by a reminder that these animals are protected by federal law and harming, harassing, or killing them can involve civil and criminal penalties.

Hopper overflow on the "R.N. Weeks" consisted of two rectangular skimmers, which are hydraulically controlled discharges that allow the lightest material and water to flow directly through the hull and overboard. Both the port and starboard skimmers, or weirs, were 100% screened with standard deck grating (openings of 1"X4" that were promptly modified by cutting numerous 4"X4" openings). This material provided very effective screening with an extra measure of safety for observers working in them. These screens were equipped with trapdoors that allowed observers to dispose of unrelated debris directly overboard. Lateral overflow of the hopper itself occurred periodically beginning February 5, and was screened with standard chain link fencing (2"X2" openings) suspended in a vertical plane along the hopper coaming. Chain link fencing was installed from the aft end of the hopper forward for 60' on the port side and 63' on the starboard side. While this method of screening prevented unrestricted overflow of the hopper, it did not provide any way to sample the materials that had been contained within the hopper.

Discharges into the hopper consisted of six doors, or three openings in each of the two discharge lines. The aft-most openings, though screened, were rarely used and were consistently shut out of the system by valves. The forward and midship openings were initially screened with 4"X4" grating that had been constructed flush with the pipe itself. While it was possible to open these doors and remove material from the discharge line, collection of whatever sample had been contained was awkward and difficult. The excessive hydraulic forces continually at work against these doors made keeping them intact and secured extremely difficult. Modifications were fabricated that consisted of four large rectangular baskets surrounding these openings that extended out into the hopper approximately 45". These screens were about 70" long, 40" deep, and open on the top. They were each equipped with large trapdooors on the inboard side that allowed prompt sorting and disposal of collected material. In addition, handrails were installed at each basket to facilitate safe access for observers. All openings in these screens were 4"X4", and installation was fully completed by January 9.

Drag heads onboard the "R.N. Weeks" were of the California type and were initially equipped with "turtle deflector devices". The device was a heavy steel framework suspended from the leading edge of each drag head. Connected to the framework was a welded chain mesh that was intended to deflect any turtles encountered in the substrate out of the path of the dredge pump intake. These devices were removed on December 17 per instructions from COE.

## RESULTS

Two incidents involving live sea turtles occurred during the dredging operation. A live loggerhead (Caretta caretta) was found in the starboard midship inflow screen on March 15. This individual had a crack through the carapace at the posterior and

was very unresponsive when first recovered. A live Kemp's ridley (Lepidochelys kempii) was found in the port overflow weir screen on March 24 that had no severe visible trauma but was not responsive enough to be released. Both of these turtles were transported to Marineland in St. Augustine, FL for rehabilitation and were expected to survive with the appropriate care (per telephone conversation with Dr. J. Whaley on March 30). All necessary agencies were notified, incident reports were submitted, and copies of these are appended to this report.

No manatees or whales were sighted from the vessel. North Atlantic right whales were reported by aerial survey to be within a 15 mile radius of the dredging operations area on two occasions. On December 18, 1993 (sighting reported at 30°04.3'N and 80°41.6'W) the dredge made night transits to the disposal area at 5 knot maximum speeds. On January 23, 1994 (sighting reported at 31°45.7'N and 80°53.35'W) the dredge made no run to the disposal area from sunset to sunrise. Speeds of 5 knots maximum were also maintained for night transits on days that no aerial surveys were conducted due to weather, and on all nights from February 23 to the completion of dredging, due to suspension of the aerial surveys altogether.

## DISCUSSION

The most clear-cut conclusion that can be drawn from the fact that two turtles were taken by the dredge from March 15 through 24, and that none were detected in the three months of work which preceded that period, is that the turtles had returned to the area prior to the closing of the March 31 "turtle window" for dredging. The water temperatures in the Savannah area, as recorded at Skidaway Island at the Georgia Marine Institute, for the relevant time period are recorded in Table 1 in the Appendix. This table clearly shows that during the month of March the water temperature rose to 60°F and above and remained there, a condition which had not previously existed during this dredging operation. It could be informative, in the future, to record surface and water column temperatures at the work site, or for better consistency of data, at a data collection station in the channel, for possible correlation with the reappearance of turtles in the channel.

It is also apparent that both the turtles taken by the "R.N. Weeks" and the two reportedly killed by the "Ouachita" (during the same 10 day period in March) were taken near the dogleg, near buoy "6". This would appear to be a possible trouble spot that may require some attention, perhaps preemptive trawling or other monitoring measures, when water temperatures rise or near the end of the "turtle window" for dredging in the future.

No other turtles or turtle parts, except for weathered turtle bones that were not related to the ongoing dredging, were recovered in either the inflow or overflow screening. We would, however, like to reinforce the need for overflow screening to be in place even

when inflow screening is required. Inflow screening by its very nature takes extreme wear and can fail during loading even with scrupulous efforts at maintenance.

Installation and monitoring of overflow screening on dredges working in areas where sea turtles may be encountered is common. However, it has limitations as to sampling effectiveness since only material of the lightest density can possibly come into contact with the screen. Consequently, sample size is small and not necessarily representative. While inflow screening is the most thorough method for determining exactly what is entering the hopper, implementation of this policy is difficult. Engineering challenges are as individual as each dredge design and the changing nature of the material in each section of a channel. The intent of inflow screening is to maximize screening effectiveness but it must also minimize any reduction of dredge productivity. Questions concerning total volume of each basket (if filled, can they all be cleaned in the available time?), the possibility of obstructing the discharge (installation of trapdoors, ability to allow overflow out the top preventing backup into the discharge line), and the type of material expected (clay, rocks, extensive trash) all affect useful design decisions.

On this job the nature of the material being removed varied from section to section, with accumulation of heavy clay and sand mixtures presenting the most problems. It was quickly evident that the initial screening, installed flush with the discharge pipe, was unworkable from both the maintenance and sampling effectiveness perspectives. The modifications adopted on the "R.N. Weeks" for this contract dealt with both these problems. Fortunately, as the dredge began digging closer and closer to the disposal area the screens continued to collect less clay and unrelated debris so that as dump runs became shorter, screen inspection and cleaning became less time consuming. At the outside digging limit the trip to the disposal area took only 7-10 minutes each way. The flexibility and willingness to achieve workable inflow screens on the part of Weeks Marine, along with the fortuitous distribution of material in relation to the distance to the disposal area, led to a prompt and functional solution to a potentially difficult problem. Every effort was made by the crew of the "R.N. Weeks" to comply fully with the contract specifications concerning both inflow and overflow screening. Design modifications were implemented in a timely fashion with exceptional concern for observer safety. Handrails and auxiliary lighting were installed and maintenance work on the inflow baskets, where volume and velocity of material was highest, was diligently performed.

Lookout for the North Atlantic right whale was performed from the bridge by the observer on duty during daylight hours. The changing proximity of the digging area to the disposal area also influenced the onboard whale watch. At the beginning of the contract when the dredge worked near the jetties, the trip to the dump was approximately 6 nautical miles (nm) so that screen cleaning could be completed near-shore and an adequate whale watch still be

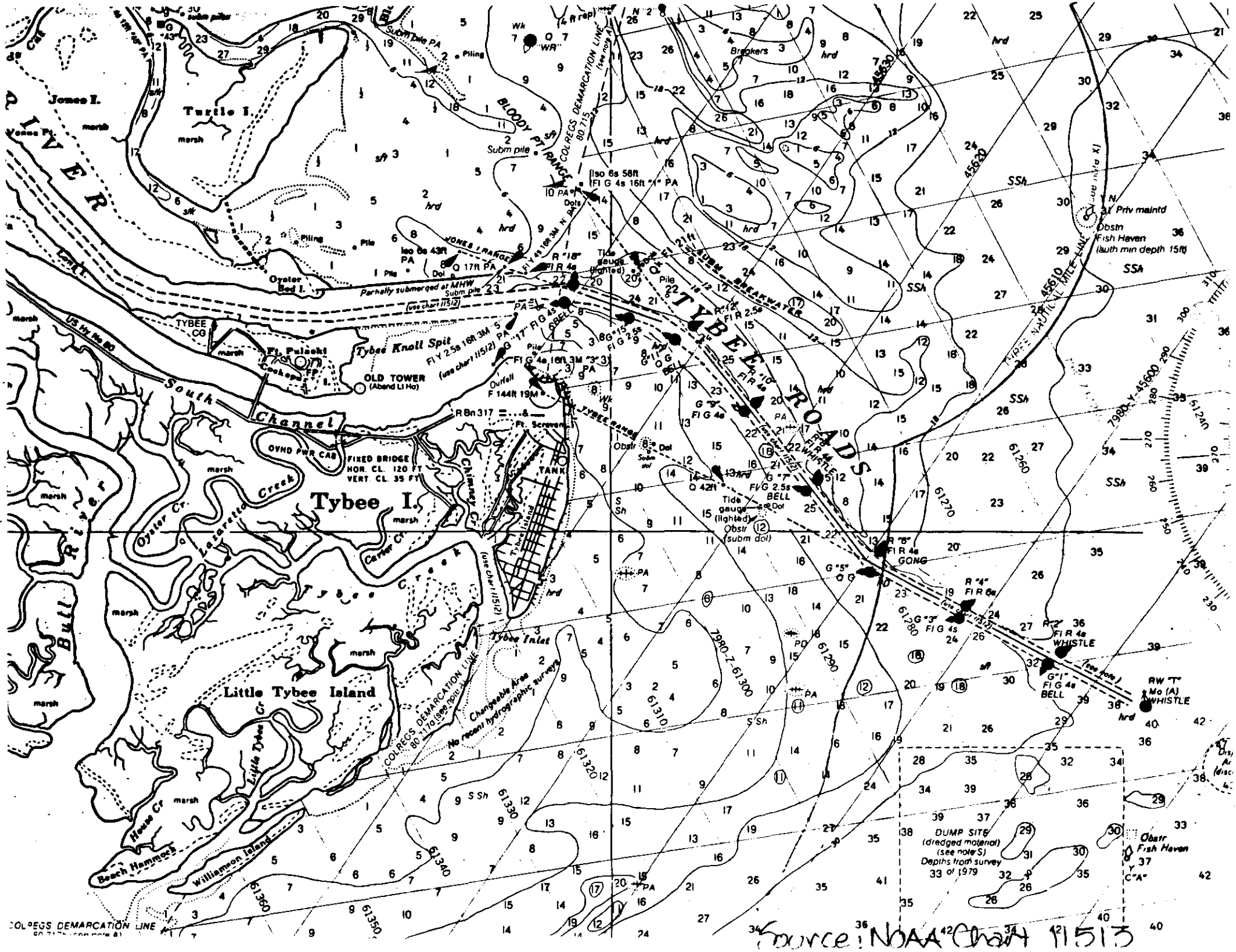
accomplished by the one observer on duty during daylight hours. As the dredge moved offshore and the trip to the dump varied from about 1.5 to less than 1 nm, it became necessary to keep the whale watch while dredging and to clean the screens during the brief transit. Since we were able to see the entire disposal area, weather permitting, while digging in the channel from these outside sections it was felt that any whales entering our immediate area would have been detected. With the assistance of the dredge's bridge personnel during those times that the observer was necessarily working in the hopper, we felt all reasonable efforts to maintain an effective watch were being made. In addition, the daily aerial surveys were extremely helpful until they were discontinued beginning February 23. Although weather had prevented flights on some occasions prior to that date (and slow speeds were observed on those related night transits), the flights provided much appreciated support since the observer on bridge watch did have to leave that post in order to inspect and clean the turtle screens.

If any further details are needed or there are any questions concerning procedures, results, or comments please contact

Cecelia Miles
3916 Old Nassauville Road
Fernandina Beach, FL 32034
(904) 277-3947

# APPENDIX

Note: Copies of all 465 load sheets (excepting those for loads involved in turtle incidents) have been omitted to all agencies except U.S. Army Corps of Engineers. If an individual load sheet is needed please contact COE.




Source: NOAA Chart 11513

Observers

Cecelia Miles
3916 Old Nassauville Road
Fernandina Beach, FL 32034

Thomas Darbro
P.O. Box 6145
Fernandina Beach, FL 32035

Jamie Greager
Route 1 Box 725
Palermo, ME 04354

Micheal Donald
635 Tarpon Ave #6
Fernandina Beach, FL 32034

INCIDENT REPORT OF SEA TURTLE MORTALITY AND DREDGING ACTIVITY

Species Caretta caretta

Date 5-15-94

Time: 24 hour clock 1650

Geographic site Savannah Harbour Entrance Channel

Location in channel Between buoys "2" & "4"

Location: Latitude 31°59.77' N Longitude 80°47.09 W

Vessel name "R.N. Weeks"

Type of dredging activity maintenance work w/ hopper dredge

Load # 431

Sampling method inflow screening

Location specimen recovered ~~mid~~ starboard side inflow

Draghead deflector ____ Yes ✓ No

Condition of deflector N/A

Weather conditions 70° F, Sea 1-3', wind S 15-20 mph, barom 1010 mbars

Water temp: Surface N/A Column N/A

Head width 13 cm

Plastron length Not taken

Carapace S.L. length Calipers not available

Carapace S.L. width Calipers not available

Carapace O.C. length 58 cm

Carapace O.C. width 55 cm

Condition of specimen alive - crack apx 6" posterior carapace

Turtle tagged ____ Yes ✓ No

Tag # ____ Tag Date ____

Comments/other * See reverse

Observer's Name Cecelia Miles

2 cracks-margins of carapace on either edge where individual exited discharge pipe

INCIDENT REPORT OF SEA TURTLE MORTALITY AND DREDGING ACTIVITY

Species: Lepidochelys kempii

Date: 3-24-94

Time: 24 hour clock: 0817

Geographic site: Savannah Harbor Entrance Channel

Location in channel: Near buoy #"16"

Location: Latitude 31°59.8'N Longitude 80°46.1'W

Vessel name: "R.N. Weeks"

Type of dredging activity: Maintenance dredging w/hopper

Load #: 464

Sampling method: inflow & overflow screening

Location specimen recovered: port overflow weir screen

Draghead deflector: ____ Yes ✓ No

Condition of deflector: ____

Weather conditions: Cloudy, sea calm, 57°F, air temp, wind SW light

Water temp: Surface 63°F Column not available

Head width: 5.5 cm

Plastron length: 23 cm

Carapace S.L. length: calipers not available

Carapace S.L. width: calipers not available

Carapace O.C. length: 32 cm

Carapace O.C. width: 31.5 cm

Condition of specimen: alive, responsive to touch.

Turtle tagged: ____ Yes ✓ No

Tag #: N/A Tag Date: N/A

Comments/other: transported to Marineland

Observer's Name: Cecelia Mayes

St. Augustine FL 3-24-94.

Condition (cont.): sandblasting to soft tissue, contusions to the head and to the carapace. No cracks in carapace or plastron evident. All wounds are superficial

Savannah Coastal Water Temperatures
Read on Skidaway Island
The Georgia Marine Institute

| | December 1993 | January 1994 | February 1994 | March 1994 |
|---|---|---|---|---|
| 1 | 59 | | 50 | 58 |
| 2 | 59 | | 50 | |
| 3 | 59 | 51 | 48 | |
| 4 | | 51 | 49 | 58 |
| 5 | | 49 | | |
| 6 | 61 | 49 | | |
| 7 | 61 | 50 | | 60 |
| 8 | 59 | | | 60 |
| 9 | 59 | | | 61 |
| 10 | 58 | 50 | 54 | 63 |
| 11 | | 49 | 55 | |
| 12 | | 50 | | |
| 13 | 56 | 50 | | |
| 14 | 55 | 50 | 54 | |
| 15 | 55 | | 55 | 61 |
| 16 | 54 | | 55 | 60 |
| 17 | | | 56 | 60 |
| 18 | | 48 | 55 | |
| 19 | | 48 | | |
| 20 | 54 | 48 | | |
| 21 | 55 | 47 | | 64 |
| 22 | 55 | | | 67 |
| 23 | 55 | | 59 | 67 |
| 24 | | 48 | 61 | |
| 25 | | | 60 | 66 |
| 26 | | | | |
| 27 | | 48 | | |
| 28 | 50 | | 58 | 69 |
| 29 | | | | |
| 30 | | | | |
| 31 | | 52 | | |

Temperatures all in degrees Fahrenheit, taken on weekdays only excluding holidays.

Source: National Oceanographic and Atmospheric Administration
U.S. Department of Commerce
WSO Savannah, GA

Table 1

Sect GA 94

Cecelia Miles
Endangered Species Monitoring
3916 Old Nassauville Road
Fernandina Beach, FL 32034

Ms. Colleen Coogan
NMFS
SE Region
9450 Koger Blvd
St. Petersburg, FL 33702

Dear Colleen,

I am enclosing a copy of the final summary report for the maintenance dredging work onboard the "R.N. Weeks" from Savannah Harbor Entrance Channel. I hope you find this complete, but if you have any questions please contact me anytime.

Sincerely,
Cecelia Miles
Cecelia Miles