

FINAL REPORT TO THE ALABAMA CENTER FOR ESTUARINE STUDIES

JUNE 2003

Project Title: "Evaluation of Alabama estuaries as development habitat for juvenile sea turtles"

(Continuation Project Title): "Are Alabama estuaries a major developmental habitat for juvenile sea turtles?"

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Purpose of this ACES-Sponsored Research Project:

Estuarine ecosystems in the northern Gulf of Mexico represent a critical habitat for sea turtles, as well as a potential developmental habitat for juveniles. Optimal management strategy for estuaries should take into account the abundance and location of indigenous sea turtles, in order to prevent potential conflicts with fisheries and coastal development. Such information, can enhance management strategies and thus enhance the survival and recovery of sea turtle populations. Although the coast of Alabama represents one of the major estuarine systems in the northern Gulf of Mexico, our ACES-sponsored research represents the first extensive survey for sea turtles in the Alabama bay systems. In addition to the sea turtle data, we also accumulated an

extensive database on the abundance and locations of stingrays which were incidentally captured during our netting surveys.

a) Detailed Description of Activities:

From 1999 through 2002 we utilized a tangle net methodology and observational surveys in an attempt to survey the estuarine ecosystems of Alabama for juvenile sea turtles. The net was 220 m long, 4 m deep and has approximately 8 inch square mesh. We continually tended the net when it was set, and we routinely checked the net approximately every 30 minutes for turtles. We normally began our surveys during May of each year and continued through October. The net was normally set for a 4 to 8 hour period per day. The netting surveys were conducted approximately 2 to 6 days per month. We surveyed areas as far west as Grand Bay near the Mississippi/Alabama border, to areas as far east as Perdido Bay near the Florida/Alabama border (a complete list of the survey locations and dates is attached to this report). In addition to the netting surveys, we also conducted numerous observational surveys in which we would survey areas for turtles as they surfaced to breathe. Such surveys were particularly appropriate for high boat traffic areas where netting surveys were not possible (e.g. certain regions of Perdido Bay). During observational surveys, the boat was anchored in a specific location for a minimum of 30 minutes and each person on board was given a specific region to observe.

During 1999, 20 surveys were conducted, but no turtles were observed or captured.

During 2000, we conducted over 20 surveys and captured and released two juvenile loggerheads. We released and tracked one juvenile Kemp's ridley that was found sick or injured in Mobile Bay and had been rehabilitated by the Sea Turtle Stranding and Salvage Network. We also tagged and released one juvenile Kemp's ridley on the east side of Mobile Bay near the mouth of the channel. Additionally, we had three other sightings of juvenile loggerheads during 2000. All of the juvenile loggerheads that were captured or sighted during 2000 were found in the Perdido Bay area.

During 2001, we tagged and released two juvenile Kemp's ridleys and two juvenile loggerheads. One Kemp's ridley was captured on the east side of Mobile Bay near the mouth of the channel. The second Kemp's ridley was captured on the west side of Mobile Bay. We tagged and released one juvenile loggerhead in Perdido Bay during 2001, and we captured one juvenile loggerhead near the west end of Dauphin Island during 2001. The latter turtle was taken in for rehabilitation to the Sea Turtle Stranding and Salvage Network because of severe front right flipper damage due to constricting long line around flipper. The turtle also had ingested longline which traversed the entire digestive system. The turtle was rehabilitated by Sea Turtle Stranding and Salvage Network personnel associated with J.L. Scott Marine Aquarium under the direct supervision of their veterinarian. That turtle was tagged with a satellite transmitter and released from Dauphin Island after it was rehabilitated.

During 2002, 11 surveys were conducted, but we did not capture any turtles. However, we did observe one juvenile loggerhead in Perdido Bay.

A detailed list of data on all turtles that were tagged and released during this

study is shown below.

Tracking of Turtles:

We tracked three turtles with sonic transmitters and one turtle with a satellite transmitter during this study. The sonic transmitters were used for short term tracking. We initially tracked a juvenile Kemp's ridley in the Mississippi Sound near Dauphin Island. Although we tracked it immediately after release, we could not locate it the following morning, thus suggesting that it had moved a relatively large distance from the release area. Several days later this turtle was presumably spotted on the Gulf side of Dauphin Island (it was spotted swimming under the fishing pier with the transmitter attached). Thus, it apparently had moved out of the bay and part-way down the island in the nearshore water. We were able to track one juvenile loggerhead over a two day period in Perdido Bay and one Kemp's ridley over a two day period in the Fowl River area of Mobile Bay. Data from both of these turtles indicate that they may remain in a specific area for short periods of time. However, in both cases, the turtles left the area. We attached a satellite transmitter to one loggerhead and it traveled along the coast from Dauphin Island to the Perdido Bay Channel, then into waters off Florida. At that point the turtle headed back east into waters off Alabama, but it remained well offshore. We lost contact with the turtle after approximately 40 days of tracking. At that point it was approximately 50 miles off the coast of Alabama. The sonic and satellite tracking of sea turtles allowed us to significantly enhance the data we collected regarding the movements of turtles in the bays and coastal waters of Alabama. Although we have not been able to capture large numbers of turtles, use of these tracking technologies provides a means of optimizing the data which can be obtained from individual turtles.

b) Summary of Findings

During 1999 - 2002 we have been evaluating the abundance, location, and movements of juvenile sea turtles in the estuarine systems of Alabama. To a large extent, our results have been negative, thus documenting that many areas have a low abundance of sea turtles. For example, during the initial year of this project (1999), we did not capture any turtles, although 20 different netting locations were examined. In an effort to increase the number of captures during the 2nd and 3rd year of the project, we continued using the netting surveys, but have also began using visual survey methods from boats to increase the area which could be surveyed. We also developed collaborations with the Sea Turtle Stranding and Salvage Networks in the study area in order to obtain turtles for tracking studies. Collectively, this three-pronged approach has resulted in the observation, capture, tagging, and/or tracking of as many as four juvenile sea turtles per year during 2000 and 2001, including both loggerhead and Kemp's ridley sea turtles. We have obtained recapture data on two of those turtles which is providing long-term movement data. In one case, a loggerhead captured in Cotton Bayou (XXF301) was recaptured one year later in a different region of Perdido bay. In another case, a loggerhead (tag XXF307, see below) had moved from Perdido Bay into Pensacola Bay over a several month period.

Overall, our survey data as well as historical stranding data indicate that sea turtles (primarily loggerheads and Kemp's ridleys) inhabit the estuarine waters of

Alabama. However, they do not appear to occur in large numbers, and there do not appear to be any areas which tend to concentrate sea turtles in the Alabama bay systems. That is, there do not appear to be any areas where turtles can be captured in relatively large numbers in a predictable fashion. Therefore, there is no evidence at this time that there are specific areas in the estuarine environment that have relatively high abundance of sea turtles. It appears that juvenile Kemp's ridleys and loggerheads travel through and feed in the bay systems of Alabama, but do not take up "residency" in any specific area for long periods of time. The expanse of the Alabama bay systems together with the lack of areas which concentrate sea turtles prevents the predictable capture of large numbers of juvenile sea turtles.

From a management viewpoint, our data do not suggest any specific areas in the Alabama bay systems require special considerations in regards to the protection of critical habitat for juvenile sea turtles. However, it is clear that the Alabama bay systems function as a feeding ground for some juvenile sea turtles.

Detailed Information on Turtles Tagged and Released During this Study From 1999 Through 2002.

2000

1) Date 2/27/2000 (Release date)

Species: Kemp's ridley (*Lepidochelys kempi*)

This turtle was rehabilitated in the J.L. Scott Marine Science Center in Biloxi, MS. It was tagged with flipper tags and a PIT tag by the curator at J.L. Scott (Alex Schesny). He has already submitted information on the tagging and release of this turtle in accordance with his permits.

We attached sonic and radio transmitters to this turtle and tracked it after its release. We were not able to find the turtle the following morning, but it was observed several days later on the Gulf side of Dauphin Island.

Release Location: Airport Marsh on the bay side of Dauphin Island, AL

Species: Kemp's ridley (*Lepidochelys kempi*)

Curved Carapace Length: 37.7 cm

Curved Carapace Width: 37.7 cm

Weight: 5.9 kg

Tags Left rear flipper: SSR835 (applied by J.L. Scott Personnel)

Left rear flipper: SSR836 (applied by J.L. Scott Personnel)

PIT Tag: Front left flipper 410B322517 (applied by J.L. Scott Personnel)

2) Date: 7/19/00

Species: Loggerhead (*Caretta caretta*)

Location: Cotton Bayou, just east of Pedido Inlet at Orange Beach, Alabama

Straight Carapace Length: 53.8 cm

Straight Carapace Width: 43.7 cm

Weight: 25.2 kg

Tags: Left front flipper: XXF301 (we applied this tag)
Right: front flipper: SSS700 (previously applied by NMFS)

3) Date: 8/9/00

Species: Loggerhead (*Caretta caretta*)

Location: Cotton Bayou, just east of Pedido Inlet at Orange Beach, Alabama

Straight Carapace Length: 35.2 cm

Straight Carapace Width: 30.2 cm

Weight: 5.6 kg

Tags: Left front flipper: XXF302 (we applied this tag)

Right: front flipper: XXK077 (previously applied by NMFS)

4) Date 10/27/00

Species: Kemp's ridley (*Lepidochelys kempi*)

Location: East side of Mobile bay near mouth of channel

Tags Applied: Right Front Flipper: XXF303

PIT Tag: 413634251B inserted in right front flipper

Straight Carapace Length: 46.4 cm

Curved Carapace Length: 48.5 cm

Straight Carapace Width: 44.5 cm

Curved Carapace Width: 50.0 cm

Tail length: Plastron to tip: 9.7 cm Plastron to vent: 6.5 cm

2001

1) Date: 5/4/01

Species: Kemp's ridley (*Lepidochelys kempi*)

Location: Just off Fort Morgan on the east side of the mouth of channel to Mobile Bay.

Tags Applied: Left Front Flipper: XXF305 Right Front Flipper: XXF306

PIT tag: 413574686F inserted in right front flipper

Straight Carapace Length: 39.0 cm

Curved Carapace Length: 38.0 cm

Straight Carapace Width: 38.3 cm

Curved Carapace Width: 43.0 cm

Tail length: Plastron to tip: 7.8 cm Plastron to vent: 4.3 cm

2) Date 5/31/01

Species: Loggerhead (*Caretta caretta*)

Location: Cotton Bayou in Perdido Bay

Tags Applied: Left Front Flipper: XXF307 Right Front Flipper: XXF308

PIT Tag: 4136030E4D inserted in right front flipper

Small sonic tag was applied to rear marginal scute, turtle was successfully tracked for two days.

Straight Carapace Length: 26.8 cm

Curved Carapace Length: 27.2 cm

Straight Carapace Width: 21.3 cm
Curved Carapace Width: 25.3 cm
Tail length: Plastron to tip: 5.3 cm Plastron to vent: 3.5 cm

3) Date: 8/9/01

Species: Kemp's ridley (*Lepidochelys kempi*)

Location: Mouth of Fowl River in Mobile Bay

Tags Applied: Left Front Flipper: XXF309 Right Front Flipper: XXF 310

PIT Tag: 41371E5251 inserted in right front flipper

Small sonic tag was applied to rear marginal scute, turtle was successfully tracked for two days.

Straight Carapace Length: 35.4 cm

Curved Carapace Length: 37.0 cm

Straight Carapace Width: 34.5 cm

Curved Carapace Width: 38.5 cm

Tail length: Plastron to tip: 5.5 cm Plastron to vent: 4.5 cm

4) Date of Release:9/30/01 Date of Capture: 6/28/01

Species: Loggerhead (*Caretta caretta*)

Turtle was taken in for rehabilitation to the Sea Turtle Stranding Network because of severe front right flipper damage due to constricting long line around flipper. Turtle also had ingested longline which traversed the entire digestive system. Turtle was rehabilitated by Sea Turtle Stranding and Salvage Network personnel associated with J.L. Scott Marine Aquarium under the direct supervision of their veterinarian.

Species: Loggerhead (*Caretta caretta*)

Location: Dauphin Island near channel at mouth of Mobile Bay

Tags Applied: Left Front Flipper: XXF311 Right Front Flipper (no tag applied due to flipper damage).

PIT Tag: 4136210C09 applied to left front flipper

Satellite transmitter attached to carapace. Turtle was successfully tracked for approximately 40 days. It was released near Dauphin Island, traveled along the coast into Florida, and then headed back east to the offshore waters of Alabama.

Straight Carapace Length: 67.5 cm

Curved Carapace Length: 73.0 cm

Straight Carapace Width: 56.7 cm

Curved Carapace Width: 70.5 cm

Tail length: Plastron to tip: 13.0 cm Plastron to vent: 10.5 cm

c) Coordination and Dissemination of Data from this Project: The P.I.s present the data from this project on a yearly basis through presentation and publications at the Annual International Symposium on Sea Turtle Biology and Conservation (see below).

List of presentations/publications relating to this project:

Wibbels, T, Marion, K., Geis, A, Estes, J., Murdock, C., Nelson, D., and Askew, J. (in

press) Locations and movements of juvenile sea turtles in the bay systems and coastal waters of Alabama. Proceedings of the 22nd International Sea Turtle Symposium. Miami, FL April 3-7, 2002. NOAA Publication NMFS-SEFSC.

Wibbels, T. Marion, K., Geis, A. and D. Nelson. (in press) Capture of juvenile sea turtles in the bay systems of Alabama. Proceedings of the 21st International Sea Turtle Symposium. Philadelphia, PA. February 24 - 28, 2001, NOAA Publication NMFS-SEFSC .

Wibbels, T. Marion, K, Nelson, D., Dindo, J., and Geis, A. (in press) Evaluation of the bay systems of Alabama as potential foraging habitat for juvenile sea turtles. Proceedings of the 20th International Sea Turtle Symposium, Orlando, FL. February 29th-March 4th, 2000. NOAA Publication NMFS-SEFSC.

Attachments:

- 1) Attached is a list of all survey locations with, date, time, and the atitude and longitude of the survey locations.
- 2) Attached is a figure showing the movements of the juvenile loggerhead sea turtles which was tracking using a satellite transmitter.

ATTACHMENT 1. LIST OF ALL SURVEY LOCATIONS

**ATTACHEMENT 2. FIGURE SHOWING THE
MOVEMENTS OF A JUVENILE LOGGERHEAD WHICH
WAS TRACKED USING A SATELLITE TRANSMITTER**