

Annual Report to Alabama Center for Estuarine Studies

Period Covered by the Report: February 1, 1999 to Present

Title: Evaluation of Alabama Estuaries as Developmental Habitat for Juvenile Sea Turtles; ' Are Alabama Estuaries a Major Developmental Habitat for Juvenile Sea Turtles?

Investigators:

P.I. /Project Leader:

David Nelson, Associate Professor, Dept. of Biology, Univ. of South Alabama, Mobile, AL 36688

CoP.I.s:

Thane Wibbels, Associate Professor, Dept. of Biology, Univ. of Alabama at Birmingham, Birmingham, AL 35294-1170.

Ken Marion, Professor, Dept. of Biology, Univ. of Alabama at Birmingham, Birmingham, AL 35294-1170

Research Category: Small Grant for Exploratory Research

Original Project Period: February 1, 1999 to January 31, 2002.

Objective of the Research Project:

Estuarine ecosystems in the northern Gulf of Mexico are considered vital for sea turtles, since they serve as developmental habitat for juveniles. Stranding data indicate that sea turtles such as Kemp's ridleys and loggerheads inhabit the nearshore waters and bay systems of Alabama, however such data is often anecdotal and does not identify specific foraging areas within these waters. Further, although the coast of Alabama represents one of the major estuarine systems in the northern Gulf of Mexico, we have only recently begun to systematically survey these waters for juvenile sea turtles. The presence of endangered sea turtles in estuaries represents a potential conflict for fisheries and coastal development. Optimal management strategy for estuaries should take into account the location of indigenous turtle stocks, in order to prevent potential conflicts. The purpose of the current project is to survey the estuarine ecosystems of Alabama for juvenile sea turtles. The movements of juvenile turtles captured during this project will be monitored after their release.

Progress Summary/Accomplishments:

During 1999 - 2001 we have been evaluating the abundance, location, and movements of juvenile sea turtles in the estuarine systems of Alabama. Our primary survey method involved the use of a 220 m tangle net which is continually tended. Our results indicate that juvenile sea turtles occur in the estuarine systems of Alabama, but in relatively low abundance. The great expanse of the Alabama bay systems together with the apparent low abundance of turtles has limited the number turtles captured. With the possible exception of an area near Perdido Bay Channel, we have not identified any areas in which juvenile sea turtles can be predictably captured. 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 began using visual survey methods (in addition to the netting surveys) to increase the amount of area which could be surveyed. The visual survey method involved the use of observers in a boat who would methodically look for turtles surfacing in a given area. 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 approximately 4 or 5 juvenile sea turtles per year during 2000 and 2001. This includes both loggerhead and Kemp's ridleys.

Since we can obtain a small number of juvenile sea turtles each year, we have evaluated optimal means of tracking their movements after release. In this way we are optimizing the amount of data which can be obtained from each turtle. Small sonic transmitters attached to the rear marginal scutes proved to be an effective method for short-term continuous tracking of juvenile sea turtles after release. Our sonic-tracking studies with Kemp's ridley and loggerhead turtles indicate that the juveniles can move rather large distances (at least several km) during a 24 hr period, but can also take up short-term (e.g. 24 hr) residency in a specific location. For example, one Kemp's ridley remained in the Fowl River for an approximate 24 hr period, and one loggerhead remained in Cotton Bayou over a similar time period.

We have also begun to accumulate recapture data on long-term movements of the juvenile turtles from this study. In one case, the results from one juvenile loggerhead suggests the Perdido Bay area as a preferred habitat. That turtle was captured and released in Cotton Bayou, and was then recaptured a year later only a few km north of the release site. However, in another case, we released a juvenile loggerhead in Cotton Bayou and it was recaptured several months later in Pensacola Bay.

More recently we implemented an optimal method for long-term tracking of turtles after their release. During 2001 we captured a juvenile loggerhead in our tangle net near the west end of Dauphin Island. We transferred the turtle to our collaborators in the sea turtle stranding network for temporary rehabilitation because it had ingested longline. Following its rehabilitation, we attached a satellite transmitter to its carapace and proceeded to track the turtle on a semi daily basis for approximately 40 days. During that time period, the turtle was tracked for hundreds of km, including in nearshore, offshore and estuarine waters. The turtle initially moved east from Dauphin Island to Perdido Bay. It then traveled in nearshore waters into Florida before heading offshore. Once offshore, the turtle moved west back into Alabama waters and remained in an area south of Dauphin Island for several weeks. Although satellite tracking has been used by a variety of researchers for adult sea turtles, our results indicate that it is also an effective means for tracking juveniles. We intend to continue our sonic and satellite tracking studies.

In summary, the results of this study to-date, indicate that juvenile sea turtles occur in the estuarine systems of Alabama, but in relatively low abundance. Although in low abundance, we are now consistently obtaining a small number of juvenile turtles each year for sonic and satellite tracking studies. Our movement data is only anecdotal at this time, but indicate that these juveniles can move large distances over relatively

short time periods, but the movements of some turtle suggest preference for certain areas. Accumulation of both the survey data and tracking data is a prerequisite to the development of an effective management strategy for preventing potential conflicts with the fisheries and coastal development.

Publications:

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, Technical Memorandum NMFS-SEFSC.

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

Wibbels, T., Marion, K., Geis, A., Murdock, C., and Nelson, D. (in press) James Askew. Location and movements of juvenile sea turtle in the bay systems and coastal waters of Alabama. Proceedings of the 22nd International Sea Turtle Symposium. Miami, FL, April 3rd- 7th, 2002. NOAA, Technical Memorandum NMFS-SEFSC.

Presentations:

Wibbels, T. Marion, K, Nelson, D., Dindo, J., and Geis, A. Evaluation of the bay systems of Alabama as potential foraging habitat for juvenile sea turtles. Alabama Center for Estuarine Studies 1st Annual Symposium, March 2000, Dauphin Island Sea Lab

Wibbels, T. Marion, K, Geis, A., Murdock, C., and Nelson, D. (in press) Capture and Tagging of juvenile sea turtles in the bay systems of Alabama. Alabama Center for Estuarine Studies 2nd Annual Symposium, March 2001, Dauphin Island Sea Lab

Future Activities:

During 2002 we will be continuing our survey of the Alabama bay systems. When possible, the movements of turtles captured during this study will be monitored following their release as described above under Progress Summary.

Relevant Key Words:

sea turtle, juvenile, conservation, estuarine, satellite tracking, sonic tracking

Relevant Web Sites:

<http://www.uab.edu/uabbio/wibbels.htm>

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