Maryland Department of Natural Resources
National Fish and Wildlife Foundation Grant Final Report

Project Title:	Sea Turtle Tagging and Health Assessment - II
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Award Period:	May 1, 2005 – April 30, 2006
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Report Period:	May 1, 2005 – April 30, 2006
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The Maryland Department of Natural Resources' (MD DNR) received monies from the National Fish and Wildlife Foundation to fund the "Sea Turtle Tagging and Health Assessment Study - II" in Maryland's Chesapeake Bay. The project involves an existing sea turtle pound net tagging and health assessment study in which sea turtles are measured, weighed, sampled for blood and tissue, tagged and released to study sea turtle health, seasonal distribution, genetic origin, and migratory pathways in Maryland's waters of the Chesapeake Bay and migratory routes along the East Coast. During the grant period key milestones were met that aid in fulfilling the objectives outlined in the proposal.

Field Season Preparation

MD DNR biologists (hereinafter "we" or "us") rely on the incidental capture of sea turtles in pound nets to acquire subjects for this study. Initial reports come from commercial watermen who encounter the turtles while fishing their pound nets. The success of this study is dependent upon the continued cooperation of commercial watermen in the Chesapeake Bay. As a result, it is imperative that efforts are made to contact pound netters throughout Maryland's Chesapeake Bay to solicit help with the study. In early May 2005, we sent postcards to 153 pound netters who are registered with the MD DNR to participate in the striped bass pound net fishery. While there are more pound netters registered with the state, those fishing for striped bass must register every year, so we were sure that these 153 individuals were actively fishing pound nets in the Chesapeake Bay. The mailing contained two attached postcards: the top postcard described the tagging study and asked for assistance while the second card contained a brief survey for the watermen to fill out, and could be detached and mailed back (postage paid) to MD DNR. We received postcards from several pound netters that participated in the study in previous years as well as a couple of new individuals who indicated they were interested in participating in 2005.

To prepare for the upcoming tagging season, we updated the tagging and health assessment protocols, data sheets, equipment lists and contact lists to reflect changes in procedures and to include contact numbers for participating watermen. One of the procedural changes involved

collecting blood glucose values in the field for comparison with professional laboratory results. To this end we purchased two handheld blood glucose meters and test strips to keep in the tagging kits. We also purchased other equipment and supplies including gloves, hanging scales, a handheld YSI for measuring water quality parameters at pound net sites, biopsy punches, Betadine, 70% alcohol, calipers, microtainer centrifuge rotor, Rite in the Rain paper, hematocrit tubes and sealant, slide mailers, blood smear slides, a digital camera, memory card, and stamps for the solicitation mailing. The P.I. held a training session in early May with MD DNR project staff to go over proper handling and sampling techniques for the tagging study as well as changes to the protocol and data sheets.

Sea Turtle Sampling Response

Nineteen sea turtles (8 loggerheads, 10 Kemps' ridleys and 1 green sea turtle) were examined in 2005. Turtles were measured, weighed, sampled for blood and tissue, tagged (flipper and PIT) and released. The eight loggerheads ranged in size from 62.5 to 75.4 cm curved carapace length (ccl) and 67.7 to 111.6 pounds. The ten Kemp's ridleys ranged in size from 29.8 to 57.2 cm ccl and in weight from 6.5 to 54.0 pounds. The green measured 34.2 cm ccl and weighed 9.3 pounds. The green was only the second of this species to be documented in this study. Reported incidental captures occurred between June 10th and September 23rd, 2005, with the majority in July (Figure 1).

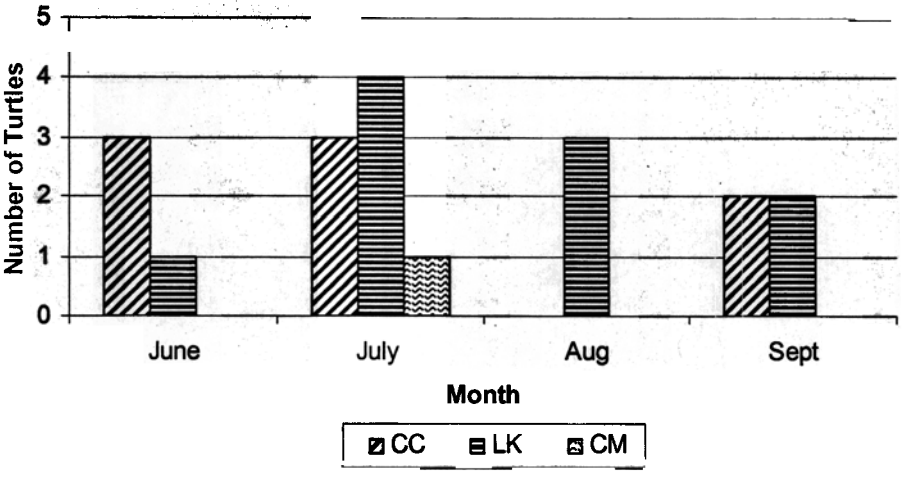

Figure 1. Monthly distribution of incidental captures of sea turtles in pound nets, 2005.

The 2005 reports came from four pound netters and turtles were found in a total of seven different net sites in the Chesapeake Bay (Table 1): the captures northwest of Hoopers Island occurred in four different nets registered to the same individual pound netter, while captures in Fishing Bay occurred in 2 different nets registered to the same pound netter and a single turtle was captured in a net in Pocomoke Sound. Pound netters were compensated $50 for assisting with the retrieval of an incidentally captured sea turtle.

Table 1. Distribution of incidental captures of sea turtles among net sites for 2005. Numbers in parentheses indicate recaptures.

Net Site	# of nets	CCA	LKE	CMY	Total
NW of Hoopers Island	4	7 (1)	4		9
Pocomoke Sound	1	0	1		2
Fishing Bay	2	1	5	1	3
Totals	**7**	**8(1)**	**10**	**1**	**19(1)**

One of the 19 turtles was a recapture from this study. A loggerhead was captured a total of three times during the tagging season over a span of approximately two months. The initial encounter occurred July 20, 2005; the animal was recaptured on September 21st and 23rd in the same general vicinity (the area NW of Hoopers Island) but in two different net sites than its original capture. This particular turtle was found in three of the four net sties near Hoopers Island. These recaptures within a season and in the same general area suggest localized movements in the Chesapeake Bay during the summer months.

Blood samples were collected from 16 of the 19 turtles and sent to Antech Diagnostics for analysis including a reptile chemistry panel, CBC, testosterone assay for sex determination, and parasitology. The reptilian comprehensive chemistry includes the following parameters: glucose, urea nitrogen (BUN), total protein, albumin, AST, calcium, phosphorus, sodium, potassium, chloride, globulin, CPK and uric acid. A report containing the results of the blood work analyses for each sea turtle was faxed to us. Results are being compiled for future analysis. Tissue samples were collected from all of the loggerheads and the green sea turtle for genetic analysis. All genetic samples collected to date for this project were submitted to Dr. Peter Dutton of the NMFS Southwest Fisheries Science Center in La Jolla, CA for analysis in November 2005. The results are pending.

Since the inception of the tagging and health assessment project in 2001, 77 sea turtles (70 individual animals consisting of 39 loggerheads, 29 Kemp's ridleys and 2 greens) were examined as part of this study (Figure 2). The number of turtles ranged from 7 in 2001 to 23 in 2004, with an average of 14 sea turtles a year. The number of watermen participating in the study varied from year to year, which in part accounts for the variability in numbers over the five year period.

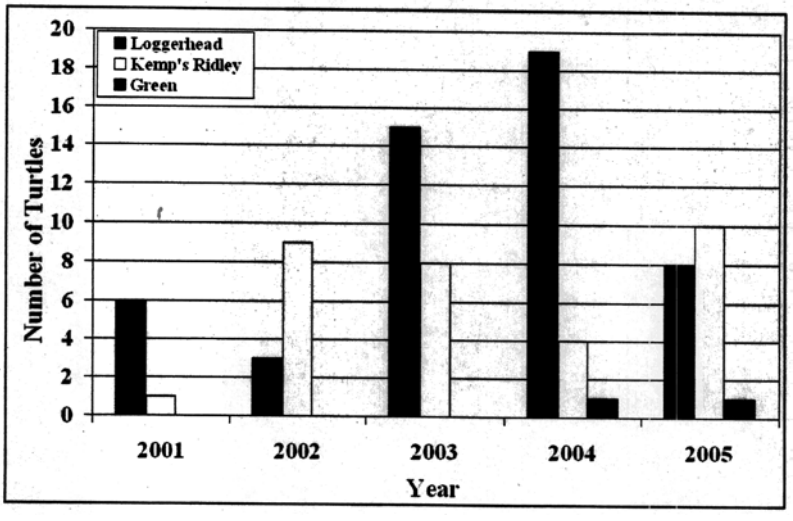

Figure 2. Yearly distribution of incidental captures in pound nets by species for 2001-2005. Note that the study did not begin until July 2001.

The loggerheads ranged in size from 51.9 to 105 cm (curved carapace length, notch to tip), the Kemp's ridleys from 29.8 to 57.2 cm (ccl) and the greens measured 34.2 cm and 83.1 cm (ccl), with the majority of animals being juveniles (Figure 3). The occurrence of a large subadult green sea turtle is uncommon in sampled nearshore waters along the East Coast of the United States. Reported captures occurred from May to October, with the majority in June and July (Figure 4).

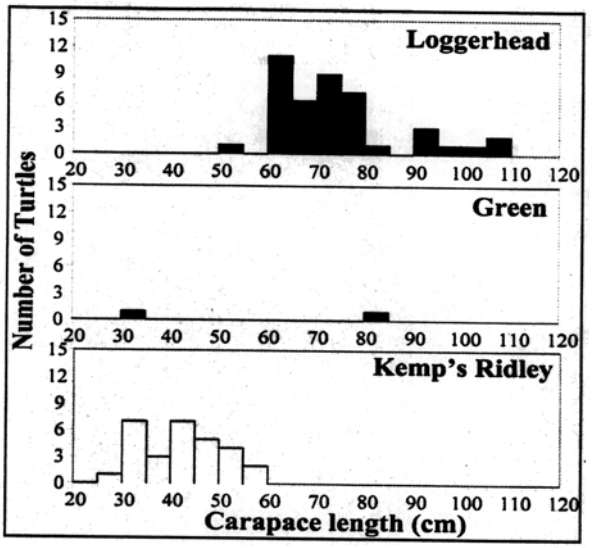

Figure 3. Length frequency distribution of loggerhead, Kemp's ridley and green sea turtles captured in pound nets, 2001-2005.

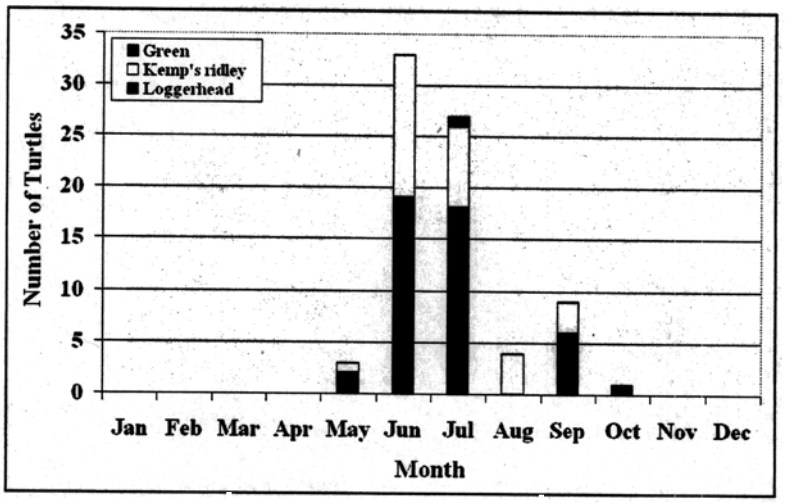

Figure 4. Monthly distribution of incidental captures in pound nets by species for 2001-2005.

Two sea turtles were previously tagged by other studies; a juvenile loggerhead tagged at the St. Lucie Power Plant in Florida traveled to the Chesapeake Bay over a period of 4 months, and an adult female loggerhead migrated from a nesting beach along the Atlantic coast of Florida to the Chesapeake Bay, demonstrating that juveniles, and to a lesser extent, adults, utilize the Bay during the summer months. Of the 70 individual turtles encountered in this study, 9% were recaptured either within or between sampling seasons. Four loggerheads and one Kemp's ridley

were recaptured once and a loggerhead was recaptured twice over a period of two months. Several recaptures recorded within a season suggest localized movements in the Bay during the summer months (Figure 5). Two loggerheads tagged in this study were re-encountered in subsequent years in the vicinity (less than 2.5 km) of their original capture sites. These recaptures demonstrate site fidelity to specific locations over both consecutive and non-consecutive years. Time at large for all recaptures ranged from 2 to 3,278 (~9 years) days (Figure 6) and growth rates for four loggerheads recaptured after being at large for 11 months or more (allowing for measurable growth) ranged from 0.41 to 2.90 cm yr^{-1} for straight-line length.

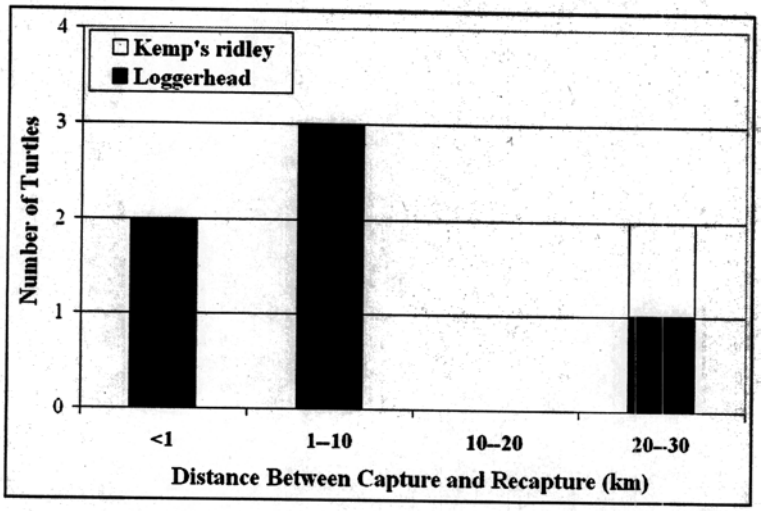

Figure 5. Distance between release and recapture sites in Maryland's Chesapeake Bay, 2001-2005

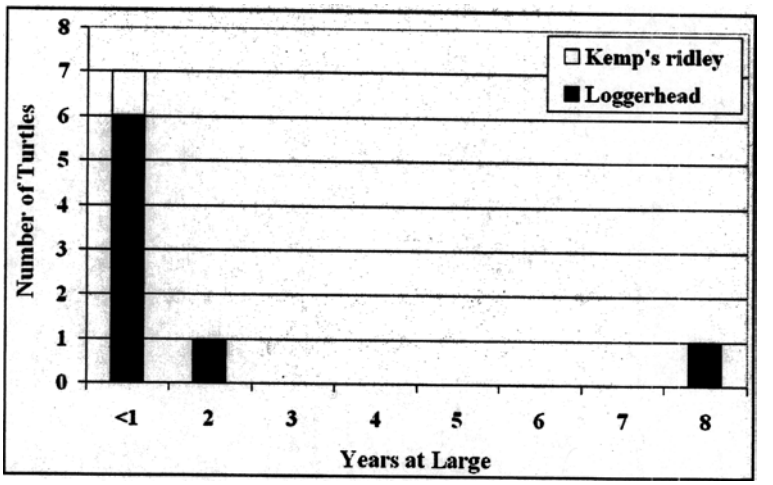

Figure 6. Time at large before recaptures of sea turtles in this project (n=9).

Satellite Tagging

Another objective of this project was to purchase and attach 5 SPOT4 satellite tags to sea turtles to further identify sea turtle habitat within the Chesapeake Bay and migratory routes along the East Coast. NFWF funds budgeted for in this grant included salary time for the P.I. and a small

amount of money for miscellaneous supplies (phase #3 of the project). The remaining funding needed to purchase and attach the satellite tags was to come from monies left over from Year 1 of this project (NFWF grant 2003-0206-003). The completion of this work was contingent upon the completion and approval of a Conservation Plan for sea turtles and commercial fisheries (including pound nets) in the Chesapeake Bay. The Section 10 scientific research permit (#1262) issued to MD DNR in July 2001 did not include satellite tagging. Therefore, MD DNR submitted a request to the National Marine Fisheries Service (NMFS) to modify the existing permit to authorize the attachment of satellite transmitters. In May 2004 MD DNR received notification that the amendment could not be processed because of a legal issue involving the unintentional capture of sea turtles in commercial pound nets. Under the Endangered Species Act these captures are considered illegal takes and therefore the watermen are in violation of the law. MD DNR has been working with the NMFS to complete a Conservation Plan and associated Incidental Take Permit that will authorize the incidental take of threatened and endangered species in commercial fisheries in the Chesapeake Bay. Once the conservation plan is complete the NMFS will continue the permit modification application process for the satellite telemetry research. Unfortunately, the plan is still being drafted and was not approved in time for the 2006 tagging season; therefore the satellite telemetry component of the project could not be completed as proposed. MD DNR is continuing to work on the Conservation Plan and hopes to have the issue resolved in time for the 2007 tagging season. Due to these reasons, MD DNR requested that phase #3 of the grant be eliminated and the associated funds be moved to project phase #4 to cover any additional unforeseen costs.

Travel

Using travel monies budgeted in the NFWF grant, Dr. Cindy Driscoll, State Veterinarian and support staff for this project, attended the 26th Annual Symposium on Sea Turtle Biology and Conservation on the Island of Crete, Greece from April 2-8, 2006. Tricia Kimmel, the P.I. on the project, was unable to attend the meeting but submitted an abstract and prepared a poster entitled, "A Five Year Summary of Sea Turtle Tagging Data from an In-water Study in the Maryland Portion of the Chesapeake Bay: Possible Evidence of Site Fidelity," which Cindy presented at the Symposium. The poster summarized the results of the first five years of data collected during the pound net tagging study, including morphometrics, recaptures, locations of incidental captures, seasonality, site fidelity and future work.

Outreach

In April 2006, Tricia Kimmel, the P.I. for this project, participated in Oxford Day, a city-wide event held in Oxford, Maryland, where the Cooperative Oxford Laboratory (and the stranding program) is located. The Cooperative Oxford Laboratory was open to the public for tours, kids' activities and interactions with researchers working at the facility. Tricia discussed the tagging and health assessment study with the public and produced a short video documenting the work conducted during the study that was run continuously throughout the day.

Tricia Kimmel gave a presentation at the Maryland Tidal Fisheries Advisory Commission monthly meeting on March 9, 2006. The Commission consists of 12 public members, many of which are commercial watermen, and its purpose is to advise the Secretary of DNR regarding commercial fisheries management issues. Tricia gave a brief background on the pound net

tagging and health assessment study and discussed in detail the pending Habitat Conservation Plan and Incidental Take Permit for several fisheries in the Chesapeake Bay and their implications for commercial fisheries.

Tricia Kimmel and other support staff attended Coast Days, sponsored by the Assateague Coastal Trust, at the Assateague State Park in September 2005. During this outreach event, personnel educated the public about sea turtles (including the tagging and health assessment study) and marine mammals through interactive displays that contained various information about these species, including species fact sheets, artifacts collected from stranded animals, posters, confiscated items, brochures, and puzzles and games for kids.