

Utilization of Passive Sonic Telemetry as Indicators of Movement and Nesting of the Northern Diamondback Terrapin (*Malaclemys terrapin terrapin*)



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ABSTRACT

- Bulkheading, dredging, boating, shoreline development, over-harvesting, and pollution are some of the major anthropogenic impacts to estuaries in North America.
- The diamondback terrapin (*Malaclemys terrapin*, Figure 1) is an ideal species for determining the effects of these human impacts to estuarine wildlife, because their habitat use and behavior uniquely utilize both land and aquatic habitats.
- Passive sonic telemetry technology and multiple Submersible Underwater Receivers (SURs) will remotely track free-ranging terrapins throughout Barnegat Bay Estuary, NJ.
- SURs will be positioned in arrays throughout areas of known terrapin habitat and nesting in the Bay, remotely logging each terrapin's transmitter when in range.
- Through this methodology we expect to determine terrapin home range and nest site use of the estuary, findings critical to understanding the direct and indirect effects of anthropogenic impacts to terrapins.
- These findings will aid in management decisions regarding both aquatic and land usage in relation to ensuring the viability of wildlife resources within the Barnegat Bay Estuary.



Figure 1. Diamondback terrapins basking. © Richard King

BACKGROUND

- Passive telemetry is an important tool for monitoring and understanding movement of ecologically and economically valuable species
- Telemetry studies are needed to determine the effects of climatic and temporal variations on movements of wildlife.
- Many aquatic turtle species (e.g., sea turtles) have large home ranges which are monitored using satellite telemetry. Conversely, diamondback terrapins exhibit fine-scale behaviors in restricted areas.
- Sonic or radio telemetry is ideal for investigating movements of species foraging, resting, and nesting over smaller spatial scales.

REFERENCES

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OBJECTIVE

To determine the home range and nest site selection of diamondback terrapins relative to anthropogenic impacts in Barnegat Bay Estuary, New Jersey.

EXPERIMENTAL METHODS

- Arrays of SUR units (Figure 2) will be organized adjacent to known terrapin nesting beaches.
- Captured gravid females of 500g or greater will be outfitted with a sonic transmitter on marginal scute (Figure 3) and released
- SURs will monitor the movements of fifteen terrapins outfitted with sonic transmitters, per site (Figures 4, 5, & 6).
- Transmitter ID (frequency), date, and time of signal reception will be logged remotely by each SUR from the terrapin's transmitter when in range.
- SUR arrays may be repositioned after nesting season to determine home range and habitat use of tracked individuals.

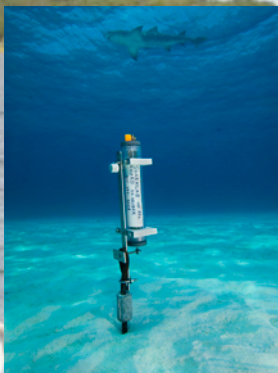


Figure 2. SUR unit mounted underwater. © Matthew D. Potenski



Figure 4. Sample site A: Sedge Island and Spizzle Creek, areas of observed nesting activity



Figure 3. Terrapin outfitted with sonic transmitter (orange arrow).

EXPECTED RESULTS

- Our previous research suggests that female terrapins travel further distances than males.
- We hypothesize that females will travel great distances (i.e., > 1 km) between areas of feeding and nesting
- Terrapins will travel greater distances in areas of low human impact vs. those in highly impacted areas
- Terrapins will use less impacted nest sites more frequently than those in highly impacted areas

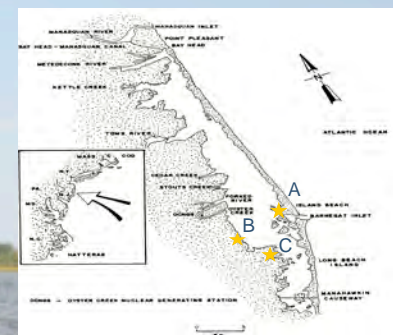


Figure 5. Overview of terrapin sampling sites at Barnegat Bay, NJ: Sedge Island and Spizzle Creek (A), Lighthouse Center Field Station (B), and Forsythe National Wildlife Refuge (C).



Figure 6. Sample site C: Conklin Beach at Edwin B. Forsythe National Wildlife Refuge, an area of observed nesting activity.

IMPORTANCE OF STUDY

- Understanding the movement and nesting ecology of wildlife is an essential component to quantifying the true impact of humans on a natural ecosystem
- This study will enhance the conservation and protection of a species potentially in decline in an area of high human influence.