Migratory Pattern and Environmental Preference of the Blue Shark

Lucy Howey is pursuing her Master's degree at Nova Southeastern University's Oceanographic Center and Guy Harvey Research Institute (GHRI) (Fort Lauderdale, Florida) where she works under the direction of Dr. Mahmood Shivji and Dr. Brad Wetherbee (University of Rhode Island) researching patterns of habitat utilization and migration in blue sharks (Prionace glauca). The GHRI integrates genetics and field approaches to study the biology and conservation of marine fishes, with a focus on sharks, rays, billfishes and coral reef fishes. Lucy hopes to continue this blue shark research after she graduates later this year.

The blue shark *(Prionace glauca)* is a circumglobal, epipelagic and highly migratory species. It makes up a substantial portion of the shark bycatch in the international swordfish and tuna fisheries, and its fins comprise by far the highest proportion by species in the international shark fin trade. This high level of exploitation makes the blue shark an important species on which to focus our research. Due to the tags' numerous performance advantages, the GHRI has chosen to use Microwave Telemetry satellite tags to study the migratory movements of this wide ranging species.

Photo by Brad Wetherbee

Lucy and Mahmood attaching X-Tag to blue shark.

Atlantic blue sharks make expansive yearly migrations, the details of which are poorly understood despite substantial conventional tagging efforts (over 100,000 tagged over the last 40 years). The advantage of using satellite telemetry on blue sharks is the continuous, long-term record of movement and the fine scale information about habitat preferences, which is lost with conventional tagging. Every summer blue shark populations, mostly males, spend several months on the continental shelf of New England, which is where we have focused our

Photo by Capt. Vinny McCarthy

Mahmood (left), Lucy and Brad releasing a tagged blue shark.

tagging efforts. In the summer of 2007, we deployed 23 standard PTT-100's and X-Tags to 21 male and 2 female blue sharks. In addition to tagging blue sharks we also tagged several short-fin mako sharks for a project we have recently started. Our results were quite interesting. We found that the blue sharks stayed on the shallow (approximately 60 meters depth) continental shelf where they exhibited shallow diving behavior, with their mean depth being only 7 meters. The sharks spent 80% of their time in waters less than 20 meters, until October when the sharks traveled off the shelf in a general southeasterly direction toward warmer waters. Several sharks traveled to the Bermuda area and one male blue shark traveled to Puerto Rico in six months, a linear distance of almost 2500 km! In addition to our successful blue shark tracks the X-Tag carried by one of the mako sharks popped up and started transmitting from the Bahamas. The subadult female mako had traveled a distance of almost 2000 km in four months!

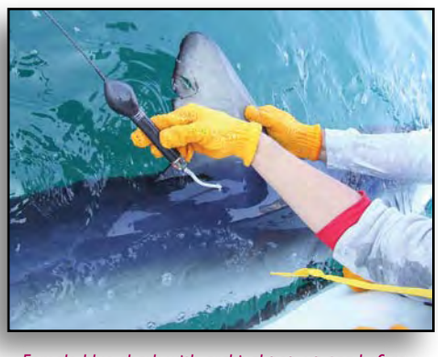

Photo by Brad Wetherbee

Female blue shark with archival pop-up tag before release. Note mating scars on the dorsal fin.

Our tracks from 2007 have provided us with important information on short-term blue shark behavior, showing that they prefer shallow waters and only infrequently dive through the thermocline when on the continental shelf. We also gathered important long-term migratory data, as we found that male blue sharks leave the continental shelf moving in a southeasterly direction in the fall following a general southern heading to warmer Caribbean waters and apparently return north to the New England continental shelf early the next summer. We have continued our tagging efforts in the summer of 2008, with six more, long-term duration tags (6-12 month scheduled pop-offs) deployed on male blue sharks and one on a shortfin mako, and are hopeful for a successful 12-month reporting tag!

Tagging and pop off loctions of blue shark and short fin mako shark released in the fall of 2007.