

Project History

In 2004, Bryan DeAngelis from the National Oceanic and Atmospheric Administration (NOAA) began a study to assess the species diversity and habitat use of elasmobranch species around St. Thomas and St. John, US Virgin Islands (USVI), with an emphasis on delineating shark nursery areas.



G. Skomal

A blacktip shark cruises the surface in Coral Harbor

Shortly after beginning the study, Bryan was contacted by the Coral Bay Community Council (CBCC). The CBCC insisted that a thorough examination of the USVI shark nursery areas would not be complete without an investigation of Coral Bay Harbor. Since then, Bryan and co-investigator Dr. Gregory Skomal of the Massachusetts Division of Marine Fisheries have been collecting data on the species diversity and relative abundance of sharks in Coral Bay, as well as determining the extent that Coral Harbor is used as a shark nursery.

Sharks are long-lived, slow growing animals with very low rates of reproduction. Despite having a public perception of being dangerous man-eaters, sharks are extremely important to a healthy coral reef ecosystem. Recent studies suggest that a decrease in top-level predators, including sharks, has ultimately led to a shift in coral reef ecosystems, resulting in coral reef die-off.

Shark Facts



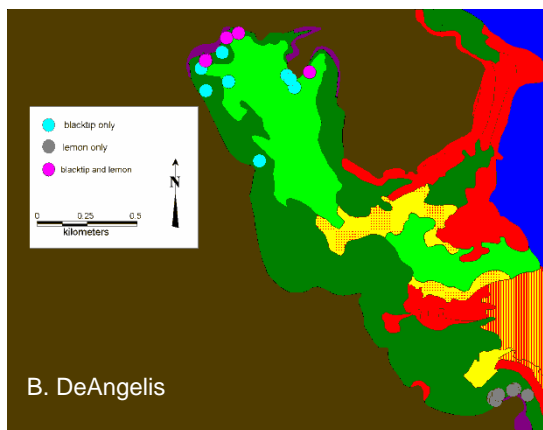
A nurse shark swims along the coral. Notice the streamer tag near the dorsal fin.

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important to a healthy coral reef ecosystem. Recent studies suggest that a decrease in top-level predators, including sharks, has ultimately led to a shift in coral reef ecosystems, resulting in coral reef die-off.

Many species of sharks utilize near-shore, shallow, protected waters as nursery areas. Once born, sharks use these areas for feeding and protection from predators until they are large enough to safely live outside the nursery. Because of the fragile life history of sharks, the protection of these near-shore areas is critical to the health of shark populations.

Although the USVI's is one of the most beautiful Caribbean ecosystems in the tropics, significant human activity has negatively impacted coastal areas. Therefore, it is crucial to accurately delineate and assess shark nursery areas. Our research has demonstrated that the shallow waters of Coral Harbor and Lagoon Point are among the most productive shark nursery areas in St. Thomas and St. John.



B. DeAngelis

Fig. 1 Capture locations of blacktip and lemon sharks in Coral Harbor and Lagoon Point

Results

Since 2005, 46 longline fishing sets have been conducted in Coral Harbor and Lagoon Point (Figure 1). Average catch rate was 8.1 (sharks per 100 hook-hours). Lemon sharks comprised the majority of the catch (52%), followed by blacktip sharks (38%), southern stingrays (6%), and nurse sharks (3%).

The average length of lemon and blacktip sharks was 59.1 cm (23.3 inches) fork length (FL) and 53.3 cm (21.0 in.) FL, respectively. Nearly every shark recorded is newborn or just over a year old (see figure 2) .

By stratifying the sampling of Coral Harbor and Lagoon Point, we can examine how blacktip and lemon sharks are distributed by depth and bottom type. Examination of catch rate by depth (fig. 3) clearly indicates a preference for shallow habitat, less than 1 m (3.3 feet).

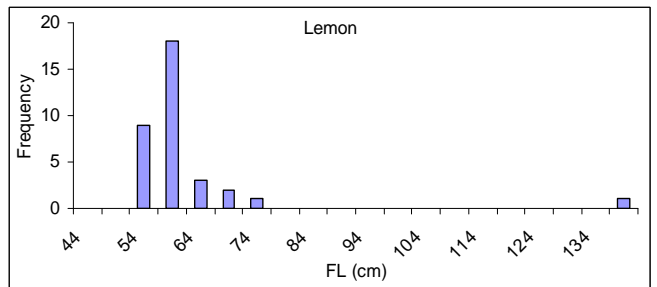
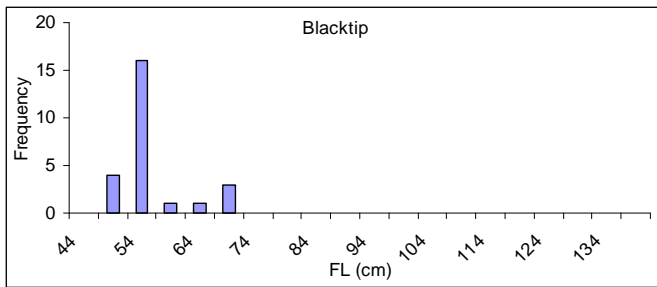


Fig. 2 Length frequency distributions of blacktip and lemon sharks in Coral Harbor and Lagoon Point

We also found some evidence that these two species partition the habitat. Figure 1 shows that both species prefer to remain against the coastline in relatively shallow water (less than 3 m [10 ft.]), but blacktips tend to use a wider range of Coral Harbor. Alternatively, lemon sharks appear to strictly prefer the north corner of the Coral Harbor coast, as well as the shallow mangrove flat of Lagoon Point.



A lemon shark cruises by in less than a few feet of water

Both areas of high lemon shark densities are characterized by very shallow water and often dense seagrass.

While we found some overlap of areas used by both species (see Fig. 1), no blacktip sharks have been recorded in Lagoon Point. This pattern of habitat use by depth and bottom type, and apparent habitat partitioning by the two kinds of shark mimics what we have found in Fish Bay, another well studied, highly productive shark nursery for these two species on St. John (DeAngelis et al., in press).

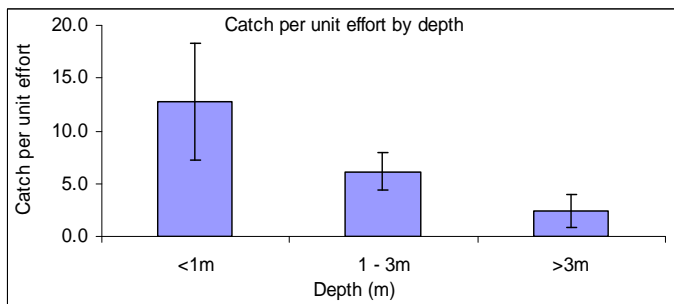
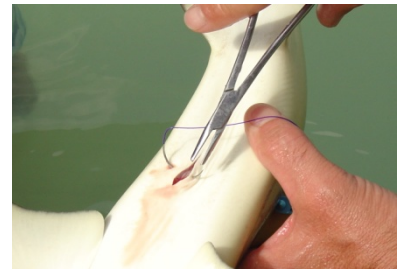


Fig 3. CPUE of blacktip and lemon sharks by depth

Future Work

Stratified longline sampling of Coral Harbor and Lagoon Point is scheduled to continue into 2008. We will continue to assess the importance of these bays as shark nurseries in an effort to better understand the spatial and temporal distribution of blacktip, lemon, and other species of sharks within these important areas.

In addition, we have been working to expand these studies with others on St. John. Cooperating NOAA scientists have deployed acoustic bottom monitors around the island of St. John, particularly on the south coast between Fish Bay and Coral Bay. Since 2006, we have been working with these scientists to track juvenile shark movements along the entire coast of St. John, hoping to examine movements between these two highly productive nursery areas.



Dr. Skomal stitches a lemon shark after implanting it with an acoustic tag that will allow us to track its movements

Support

This research, and future work, has been made possible by support from New England Biolabs Foundation, Project AWARE, and NOAA's Highly Migratory Species Management Division.

We would like to sincerely thank the members of the Coral Bay Community Council who have donated to this project, as well as Maho Bay Camps, Inc. for their generous support and in-kind donations.

For more information or to return a tag found on a shark, please contact:
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