

The vast majority of sea turtle studies happen on beaches when females emerge to nest, yet sea turtles spend virtually all of their lives at sea. Aside from the logistical challenge of studying the turtles down deep where they live, there are also potentially prohibitive economic components including skilled professionals, boats, and scuba (self-contained underwater breathing apparatus) gear. In spite of those challenges, since 1998 the Barbados Sea Turtle Project (BSTP) of the University of the West Indies, Barbados, has been monitoring hawksbill turtles on foraging sites at depths of up to 40 meters (131 feet).

Most foraging ground studies are conducted in shallow waters where sighting and capturing the animals are easier. Given sufficient turtle numbers in a shallow-water study site, researchers can achieve fairly high capture rates with minimal gear using common techniques such as netting, turtle rodeo-ing (jumping off a boat), and snorkeling or free-diving.

The study of turtles in deeper water habitats, however, requires a boat, a crew, and usually scuba diving. Although scuba diving allows people to enter underwater worlds that are otherwise inaccessible, it requires safety precautions that set certain limitations, such as the number of safe ascents and descents that can be made in a given time period. As such, the catch-per-unit effort is generally lower than with surface capture methods, and many hours of diving are required to catch a sufficient sample of turtles for research purposes. Surface capture studies generally have a high intensity of effort over a shorter period of time, whereas scuba diving requires a significant investment in time spread over a longer period.

In Barbados, BSTP has overcome the costs and logistical issues involved in operating a scuba diving-based turtle monitoring program by partnering with a recreational dive company, Hightide Watersports. The company generously allows the BSTP staff to conduct underwater research without paying for boat time, tank fills, or dive equipment. As a result, BSTP has conducted more than 2,500 hours of survey on 1,700 dives over the past decade. The project has captured approximately 1,000 turtles, mostly juvenile hawksbills, with many caught more than once and some up to 15 times over a 10-year period.



During the study, turtles are brought aboard the dive boat where researchers can collect standard morphometric data, apply tags, and collect samples. This program has provided important new information on growth and survival of juvenile and sub-adult size hawksbill turtles and has allowed BSTP to develop a tissue database representing many individuals, sampled over a long time span.

In return for supporting BSTP, Hightide Watersports is able to provide a unique experience for its customers. With sea turtle biologists conducting research on board, patrons are able to see turtles up close in a controlled environment in which they can watch the data collection process, ask questions, and

take photographs. Non-divers can also go out on the dive boat to observe the monitoring, thereby providing the dive operator with an additional source of income. BSTP biologists use the opportunity to provide a thorough, educational experience for Hightide Watersports' customers, who often declare it to be "the highlight of their entire holiday." This experience often results in repeat visits by customers within the same holiday period, and it is also a driving force for repeated vacations to Barbados. The turtle experience can be so profound that many participants stay engaged with BSTP for years after their trip, writing to find out about the turtle(s) they saw captured during their dives.

Studying Hawksbills Where *They* Live



Deep-water research is providing life-history information about sea turtles that is of great importance in helping to conserve those animals and their habitats. In Barbados, it is also providing added business for a tourist-centered dive operation. Although the value of nesting sea turtles to tourism is well recognized, the value of foraging animals is seldom seen. The partnership between BSTP and Hightide Watersports serves as a model for how the challenges of conducting at-sea turtle research can be met through creative and mutually beneficial ties with the tourism industry.



A scuba diver trails after a hawksbill. © REINHARD DIRSCHERL / OCEAN-PHOTO.DE INSET: Barry Krueger prepares to release a hawksbill turtle after conducting research aboard a dive boat in Barbados. © BRIAN J. HUTCHINSON

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 Visit www.SeaTurtleStatus.org to watch footage of Barry Krueger in the field!