ADDRESSING BYCATCH IN A Global Leatherback Hotspot

By Ganesh Thannoo, Kyle Mitchell, and Scott Eckert

A leatherback turtle nests just steps away from the fishing village of Grande Riviere on Trinidad's north coast. © Ben J. Hicks/benjhicks.com

The dual-island nation of Trinidad and Tobago supports one of the world's largest nesting colonies of leatherbacks, with 40,000 or more nests annually. Most nesting occurs on the northeast coast of Trinidad and is centered near the communities of Grande Riviere, Matura, and Fishing Pond. At Matura (one of three index beaches), turtle populations are declining at approximately 5 percent per year, which likely represents a trend for the entire leatherback population.

Incidental capture by fisheries is a major source of mortality for all sea turtle populations globally, and artisanal fishers have a disproportionately high impact in Trinidad, especially near nesting beaches and during nesting season. Trinidad supports a large artisanal gillnet fishery near its leatherback beaches. That fishery uses a variety of gear including bottom-set monofilament gillnets, pots, various hook and line methods such as bottom-set longlines, and multifilament drift gillnets. The latter gear type sustains the highest levels of leatherback entanglement, estimated to exceed 3,000 adult leatherbacks yearly with a mortality rate of about 30 percent.

Efforts to reduce Trinidad's bycatch were undertaken during 2006–2010, beginning with a planning workshop hosted by the Wider Caribbean Sea Turtle Conservation Network (WIDECAST) and the Trinidad Ministry of Agriculture, Land, and Marine Resources. The workshop brought together representatives from government, artisanal fishing groups, conservation nongovernmental organizations (NGOs), and scientists with both fisheries and sea turtle expertise. The resulting plan called for a series of experiments in bycatch reduction methods aimed at reducing leatherback entanglement significantly while not reducing fisher incomes. Most of the studies focused on changes to nets. Only new nets were used, and onboard observers ensured compliance, consistency, and accuracy in data acquisition. Results indicated that nets no more than 50 meshes deep—instead of the more traditional depth of 100–150 meshes—provided the highest rate of reduction in turtle entanglement. However, a small reduction in target species catch was also a result. Entanglement rates also were influenced by turtle density. When the costs of net repair caused by damage sustained by entanglement events were included in an economic evaluation, the 50-mesh nets provided a 33 percent higher economic return despite a slightly lower fish catch. Anecdotal reports by fishers also noted that the 50-mesh nets allowed for easier extraction of turtles without harm to either the turtle or the net.

Fishing methods were also evaluated for their bycatch impacts. The most promising method for reducing entanglement was troll fishing, which, while common in Tobago, is rarely practiced in Trinidad. Trolling had a significantly higher rate of economic return for fishers, and it yielded no turtle bycatch. However, trolling required greater fisher expertise and effort, making it a less feasible replacement for gillnets. Other experiments looked at the effect of marking nets with colored LED marker lights; this effort yielded no reduction in entanglement rates.

Sadly, despite success in developing the bycatch-lowering alternatives to historic fishing practices, and notwithstanding initial support for the program from both fishers and regulatory agencies, there was a strong reluctance to adopt such methods after the program ended. A lack of financial resources, the complexity of introducing new regulations, and tradition were all given as reasons for this reticence.

Ultimately, a final project had 29 fishers deploy Vessel Monitoring Systems, which recorded fishing locations and turtle captures to identify hotspots for probable leatherback entanglement. From those data, a regulatory scheme was designed to set time or area closures for certain gear types, and model fisheries legislation was proposed. The regulations called for the north and east coasts of Trinidad to be divided into fishing gear exclusion zones, with (1) high leatherback interaction areas limited to the use of turtle-safe fishing methods such as trolling, (2) moderate interaction areas limited to shallow set drift gillnets and trolling, and (3) low-probability interaction areas allowed to follow standard gear practices. Although Trinidad has yet to adopt those bycatch reduction methods (either officially or in practice), policy changes at the national level are underway.

Conservation of Trinidad and Tobago's important leatherback rookery has been constantly evolving over the years, starting with efforts led by concerned villagers to curtail beach-based slaughter of turtles for community subsistence. That movement led to the research, policy, and conservation efforts at the national and international scales described herein. The government of Trinidad and Tobago has created a National Sea Turtle Recovery Plan and a cabinet-appointed Sea Turtle Taskforce, which is directly overseen by Parliament. Those groups have ensured deep community engagement at all levels. The country's sea turtles are now recognized for their global importance, and efforts to study and protect them have drawn international attention.

Changing the livelihoods of fishers, which are long-steeped in culture, history, and tradition, will not be easy, but it is possible. Thanks to a long-term awareness program led by the community-based nonprofit Nature Seekers, the citizenry is learning about the symbiotic relationship between sea turtles and fishes, as well as about the dual truths not only that sea turtle bycatch is harmful to a healthy sea turtle population, but also that an unhealthy sea turtle population is harmful to the fishing industry. •