



PO Box 370 • Forest Knolls, CA 94933

P: 415.663.8590 • F: 415.663.9534

www.SeaTurtles.org • www.SpawnUSA.org • www.GotMercury.org

Cocos Island Sea Turtle and Shark Tagging Expedition 18-28 September 2011

Principal Investigators: Todd Steiner, Randall Arauz and Erick Lopez

Research Assistants: Paul Brennan, Michael Foust, Sam Forbes, Chris Hadley, Jennifer Hadley, Helga Mena, Deborah Kearney, Mike Silver, Nonie Silver, Tom Smith, Mark Stabb, Daniel Thomas

UnderSea Hunter Staff: Rodrigo Roesch & Warren Fernandez, Divemasters Manuel Campos & Rafael Solano, Skiff drivers

Introduction:

As part of a research program to understand the movements of sharks and turtles within and beyond the borders of Cocos Island National Park, Costa Rica, participants spent seven days at Cocos Island National capturing and tagging sea turtles, and tagging scalloped hammerhead sharks. Additionally data was collected on relative abundance on all species of sharks and rays encountered, and various biological samples were collected for future analysis, including turtle tissue samples to pinpoint the nesting origin of species encountered.

Participants were divided into two dive teams, which conducted a total of 54 dives during seven days of diving (September 21-27) at 12 dive sites. Water temperature (from Todd's dive computer) averaged 78° F and visibility was generally good (averaging ~50 feet). The two coldest temperatures were recorded at Alcyone; 62° F and 69° F.

All turtles seen were counted and when possible, attempts to capture them were made. All assistants helped with catching, moving, weighing and measuring turtles. Other duties carried out by research assistants included photo/video documentation, shark tagging, shark counting, and receiver retrieval, servicing and deployment.

All receivers were retrieved, data downloaded, new batteries installed and re-deployed, except Alcyone receiver, which was lost and replaced.

Results:

Pacific green (black) turtles (*Chelonia mydas*) continue to be the most common turtle seen at Cocos with 24 sightings on this trip. Ten individual green turtles were caught (one was caught twice) on this trip; four for the first time (40%) and six tagged on previous trips (Table 1). Three satellite tags were deployed on green turtles (two females and one male) and three acoustic tags were deployed on green turtles.

One hawksbill (*Eretmochelys imbricata*) was captured; a juvenile first captured on August 25, 2010. The turtle was released with an acoustic tag.

Date of First Capture	Species	(D-M-Yr)	Left/Right Flipper Tag	
	<i>C. mydas</i>	01-06-10	PE 191(new)	PE 035
	<i>E. imbricata</i>	25-08-10	NS 687	NS 688
	<i>C. mydas</i>	29-06-10	PE 115	PE 196 (new)
	<i>C. mydas</i>	01-06-10	PE 191	PE 035
	<i>C. mydas</i>	08-03-11	PE 155	PE 156

Six scalloped hammerhead sharks (*Sphyrna lewini*) were tagged with acoustic tags. Other shark species observed included tiger sharks (*Galeocerdo cuvier*) Galapagos sharks (*Carcharhinus galapagensis*) reef white tip sharks (*Triaenodon obesus*) silky sharks (*Carcharhinus falciformis*) and a whale shark (*Rhincodon typus*) The most abundant shark species were reef white tip sharks and scalloped hammerhead sharks.

Four ray species were observed: marbled rays (*Taeniura meyeni*), spotted eagle rays (*Aetobatus narinari*), giant manta (*Manta birostris*), and mobula rays (*Mobula mobular*). Marbled rays were the most abundant.

A Random Single Point in Time (RSPT) counting method was employed to quantify a measure of relative abundance of shark and ray species. RSPT consists of stopping at random times during the dive and counting all the observed species of interest. Combining all records from all dive sites where counts were completed on this trip, white tip sharks were present 68% of the time, and both hammerhead sharks and marbled rays were seen 25% of the time. This method does not capture estimates of actual shark numbers; for example, the random time method rarely captures the wall of hammerheads or the school of hunting white tips going by. We aim to incorporate additional counting strategies that will allow us to capture this data on future expeditions.

Most unusual sightings:

Three orcas (*Orcinus orca*) were seen enroute from Chatham Bay to Dirty Rock. We are not aware of orcas at Cocos Island documented in the scientific literature, but Cocos dive masters informed us they have been seen occasionally over the years. Dive Master Warren Fernandez said it was not his first sighting, having seen them before at Cocos approximately five years ago.

We captured a male green turtle at Alcyone with a deep wound to its tail and apparent shark bite marks down the back of his carapace. The wound did not appear infected and seemed to be healing. Later, we received video footage from a Cocos park ranger shot by a recreational diver a week before showing a satellite tagged tiger shark chasing a male green turtle at Ulloa, most probably the same turtle.

At Alcyone, a hunting assemblage of bottlenose dolphins (*Tursiops truncates*), yellowfin tuna (*Thunnus albacares*) and silky sharks passed us as we approached the surface, following a school of scad or small jacks (family Carangidae, possibly *Decapterus sp.*). Before the dive, we saw bird dive feeding behavior at the surface. We also observed a thin layer of reddish brown water descend on Alcyone being pushed by a current of very cold water.