

Field report to
Belize Marine Program, Wildlife Conservation Society

In-water Surveys of Marine Turtles at Glover's Reef Marine Reserve, April 2008

by

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Principal Objective

Conduct follow-up training and in-water surveys and captures of marine turtles at Glover's Reef Marine Reserve (GRMR).

In-water Surveys

The in-water survey team was comprised of up to seven WCS staff, five Belize Fisheries staff (see Participants listed at end of report). Environmental conditions were relatively good for the April surveys which were conducted from 21-25 April. New participants were trained in measuring, weighing, and collecting tissue samples, and for repeat participants methods presented in April and September 2007 were reinforced. In addition, three volunteers assisted with several surveys, Jennifer McGinnis, Tamsin Broome and Paul Enos.

The survey team conducted a total of 14 in-water surveys (Table 1). The majority of surveys were 60 minutes in duration, with three surveys 30 or 45 minutes. A total of 12.75 hours of surveys were conducted, and varied from approximately 0.3 to 1.4 km in length for a total of 13.1 km of in-water habitat surveyed for sea turtles. The greatest number of turtle sightings in a single survey occurred south of Long Caye on the east side of the atoll with five turtles sighted during 1.2 km survey. During the surveys we sighted a total of 49 sea turtles (Figure 1), an overall sighting rate of 3.84 turtles/survey hour. Of these 49 turtles, 41 (83.7%) were hawksbills (*Eretmochelys imbricata*), 3 (6.1%) were green turtles (*Chelonia mydas*), 3 (6.1%) were loggerheads (*Caretta caretta*), and 2 (4.1%) were not identified to species. The in-water survey team captured 23 of the 49 turtles sighted, 19 of these were juvenile hawksbills, one was a juvenile green turtle, and three were adult male loggerheads. This effort resulted in a relatively high capture rate of 0.469, almost one turtle captured out of every two turtles sighted. Sightings relative to survey length averaged 2.56 turtles/km. One turtle was a recapture from the September 2007 surveys.

Turtles captured for the first time were measured, weighed, tagged, and a tissue sample extracted from the left rear flipper prior to release at the location sighted. Turtles recaptured from a previous survey (either April or September 07) were remeasured prior to release. Mean size for captured hawksbills was 41.9 cm minimum straight carapace length (SCL), SD= 7.4, range = 26.5-53.3 cm, n=19, and for loggerheads was 85.0 cm SCL (SD= 5.5, range = 78.7-89.0 cm, n=3). The green turtle captured was 32.7 cm SCL. Measurements from the recaptured juvenile hawksbill indicate the turtle grew approximately 1.5 cm SCL during the seven month interval between release and recapture. This is a relatively slow growth rate for a juvenile hawksbill. All methods for collecting biometric data were the same as described in the field report for the April 2007 monitoring effort.

Table 1. In-water survey results for 14 surveys conducted at Glover's Reef Marine Reserve from 21 to 25 April 2008.

Date	Location	No. of Snorkellers	Duration (minutes)	Approximate survey length (km)	Hawksbills Sightings	Loggerhead Sightings	Green Sightings	Unknown Species Sightings	Total Sighted	Total Captured
21-Apr-08	Fisherman Camp 1	8	60	0.907	3				3	1
21-Apr-08	Baking Swash	8	60	1.22	4		1		5	2
22-Apr-08	South of Fisherman Camp	9	60	1.05	2			1	3	1
22-Apr-08	Baking Swash/Fishcut	9	60	1.37	3				3	3
22-Apr-08	South of Long Caye	8	60	1.22	5				5	1
23-Apr-08	North of Middle Caye	8	60	1.24	1		1		2	1
23-Apr-08	North of Southwest Caye	9	60	1.38	3				3	2
23-Apr-08	Southwest Caye	8	60	0.661	2				2	1
23-Apr-08	South of Fishcut	8	45	0.91	4		1		5	2
24-Apr-08	North East (Lighthouse area)	8	60	1.44	2				2	1
24-Apr-08	East of Northwest Point	7	60	0.390	4	1			5	2
24-Apr-08	South of Fisherman Camp	6	60	1.26	4			1	5	4
25-Apr-08	North of Northeast Caye	6	30	0.093	4	2			6	2
25-Apr-08	Southwest Caye	8	30	Unknown	0				0	0
Total			765	13.141	41	3	3	2	49	23

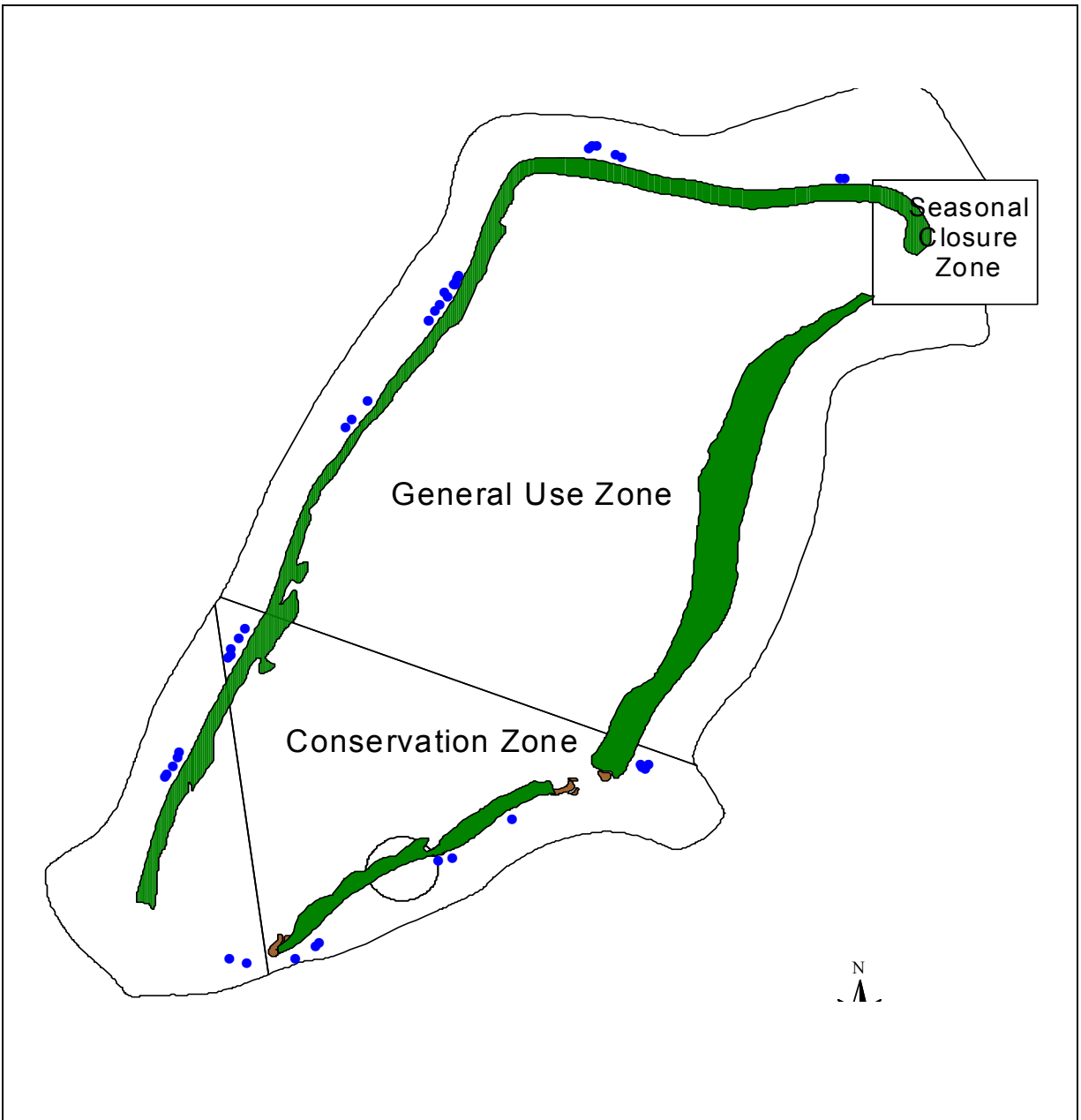


Figure 1. Map of Glover's Reef Marine Reserve with sightings of sea turtles (blue dots) during in-water monitoring 21-25 April 2008.

Discussion & Summary

The April 2008 survey effort was very successful at both sightings and captures of marine turtles around the Glover's Atoll. When comparing to previous surveys in 2007, more turtles were sighted and captured in April 08 than in previous surveys; however, the capture rate was almost the same in April 08 as September 07. Loggerheads were again sighted in April, providing more evidence that their use of the habitat is seasonal and likely related to loggerhead reproductive season in the region.

The size of hawksbill turtles captured in April 08 is consistent with previous surveys in 2007, and since we recaptured one turtle originally captured in September there is more evidence that individual juvenile hawksbills reside in the area throughout the year, although we still have not yet sampled during the winter season. However, growth rates during winter months may be somewhat slow as evidenced by the recaptured hawksbill.

While not abundant, regular sightings of small juvenile green turtles at Glover's is somewhat surprising since there is relatively little seagrass around the reef where the turtles have been sighted/captured. Possibly, these small green turtles have a more varied diet than is typical of juvenile greens, but further study will be needed to better understand their use of the area.

The in-water monitoring project at Glover's Reef provides the opportunity to gain valuable insight into sea turtle aggregations at the atoll, which would otherwise not be possible. For example, growth rates, habitat use, spatial and temporal distribution, and genetic stock assessment to determine the origin of turtles in the GRMR aggregation, among others, are all important for managing the recovery of sea turtles, and thus monitoring efforts should be continued at GRMR.

Recommended Next Steps

- Complete the in-water protocol for the in-water monitoring study, including development of a schedule for the in-water surveys.
- Archive and manage turtle capture data in Access. Collaborate with Fisheries Department to develop methods for in-water and beach monitoring, and standardize data management.
- Continue training Belize Fisheries Biologists and other appropriate institutions in sea turtle biology and handling methods at GRMR as deemed possible. Acquire training materials such as DVDs, books etc to use and distribute as needed.
- Purchase PIT tags and Reader for use on sea turtles captured at GRMR to improve long-term identification of individuals. Implement tagging with PIT for all sea turtle captures at GRMR.

Participants – In-water Monitoring

Name	Organization
Virginia Burns	Wildlife Conservation Society
Elias Cantun	Belize Fisheries Department
Roberto Carballo	Belize Fisheries Department
Robin Coleman	Wildlife Conservation Society
Samuel Novelo	Belize Fisheries Department
Danny Wesby	Wildlife Conservation Society
Carlos Martinez	Belize Fisheries Department
Luis Novelo	Belize Fisheries Department
Alex Tilley	Wildlife Conservation Society
Tamsin Broome	Volunteer
Paul Enos	Volunteer
Jennifer McGinnis	Volunteer

Photographs



Photo 1: Juvenile hawksbill (*Eretmochelys imbricata*) captured at Glover's Reef Marine Reserve, with temporary orange paint number on carapace. Photo by: C.L. Campbell/WCS.



Photo 2: Elias Cantun (Belize Fisheries Dept.) releasing juvenile green turtle captured at Glover's Reef Marine Reserve. Photo by: C.L. Campbell/WCS.



Photo 3: Luis Novelo and Roberto Carbello with captured loggerhead (*Caretta caretta*) at Glover's Reef Marine Reserve. Photo by: C.L. Campbell/WCS.



Photo 4: Two adult male loggerheads (*Caretta caretta*) captured at Glover's Reef Marine Reserve. Photo by: C.L. Campbell/WCS.