AN INVENTORY OF THE TURTLE FAUNA OF THE RIO BRAVO CONSERVATION AND MANAGEMENT AREA

A PRELIMINARY REPORT

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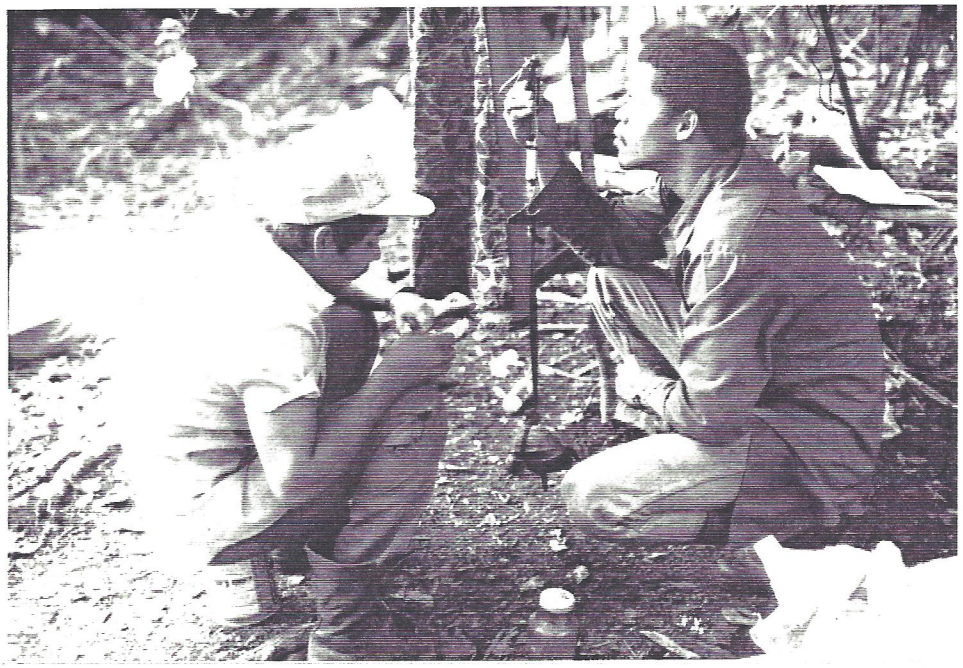
Atanacio "Taniko" Soler with a typical adult female *Dermatemys*.
Lower Rio Bravo.

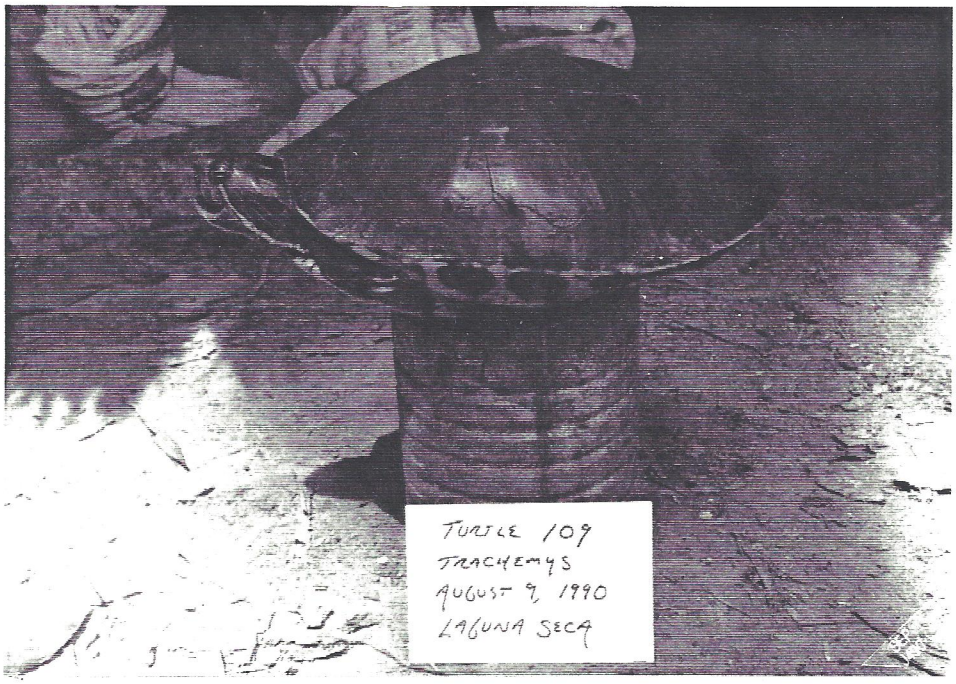
The preliminary report briefly summarizes an inventory of the turtle species of the Rio Bravo Conservation and Management Area. Some critical management problems are also discussed.

The inventory took place between June 2-3 and July 17-August 10, 1990.

A subsequent report, to be issued in April 1991, will contain a more detailed analyses of species composition and habitat preferences.



Atanacio Soler and Joseph Herrera weighing a young "Loggerhead" or giant musk turtle (*Staurotypus triporcatus*), lower Rio Bravo.



A large female slider (*Trachemys scripta*), Laguna Seca.

Inventory personnel included Joseph Herrera, a Programme for Belize Assistant/Trainee from Isabella Bank, and Atanacio "Taniko" Soler, an ex-chiclero from Scotland Halfmoon. Scheduling, purchases, and field activities were directed by John Polisar.

During the inventory, a total of 30 sampling stations were examined. These included terrestrial sites, small forest streams, forested swamps, marshes, ponds, lagoons, and rivers. The primary emphasis was on the Programme for Belize property. Roughly one-half of our effort was spent on the area between Cedar Crossing and the Las Milpas Research Station, one quarter on the lower Bravo (in the vicinity of the Booth's/Bravo Junction), and one quarter on various sites within the Gallon Jug Agroindustry Ltd. property.

Access to sampling stations was obtained by foot, vehicle, and by small skiffs powered by outboard motors. Roughly 13 days of work were completed while stationed at Las Milpas Research Station. Fifteen days involved occupancy in temporary camps along various waterways.

Samples were obtained via:

107 Funnel Trap "Days" (5-6 ft. long chicken wire traps re-baited with sardines twice daily)

4 Funnel Trap Days (baited with guava)

44 Eddy Net Days (8 ft long, 10 ft. deep, 4 in. mesh)

22 Trammel Net Days (30 ft. long, 8 ft. deep, 12 in. wall, 2 in. mesh)

6 Trammel Net Days (51 ft. long, 6 ft. deep, 14 in. wall, 2 in. mesh)

8 Lagoon Net Days (50 ft. long, 20 ft. deep, 4 in. mesh)

3 Lagoon Net Days (200 ft. long, 15 ft. deep, 4 in. mesh)

7 Hoop Net Days (16 ft. long, 4 ft. tall, 7 hoops, 3 throats)

19 Man Hours Free-Diving (mask and fins)

All captured turtles were measured and released. The following measurements were obtained for every specimen: carapace length (CL); carapace width (CW); plastron length (PL); carapace height (CH), and body

weight. The additional diagnostic measurements obtained from every kinosternon were length of plastral forelobe, gular length, interabdominal seam, dorsal width gular, ventral width gular, and overlap of 4th coastal and 11th marginal. Photovouchers were obtained for every species. All *Trachemys* and *Dermatemys* were marked by notching marginal scutes according to a consistent numerical scheme. Capture time and sampling station were recorded for every specimen.

A total of 115 turtles were measured and released. This included:

Family	Species	Local Names	# Turtles Measured and Released
Dermatemydidae	*Dermatemys mawii*	(Hicatee, Tortuga Blanca)	24
Emydidae	*Trachemys scripta*	(Boca Tora)	12
	Rhinoclemmys areolata	(Blackbelly)	5
Kinosternidae	*Staurotypus triporcatus*	(Loggerhead)	16
	Claudius *angustatus*	(Bush Loggerhead)	7
	Kinosternon spp.	(Swanka)	51

Twenty-six fish specimens, two crustaceans, ten *Dermatemys* stools, and an undetermined number of mollusks (snails and clams) were collected. These were preserved by immersion in 10-15% neutral buffered formalin. Larger fish were injected with pure formalin.

Discussion

The Central American River Turtle (*Dermatemys mawii*) is a species of particular interest due to its economic importance and vulnerable status. We captured a total of 11 of these turtles in long deep pools in the Rio Bravo upstream of Cedar Crossing. This included 2 adult females, 1 adult male, and 8 juveniles. Eight animals were captured by free diving, 2 in lagoon nets, and 1 in a trammel net. The upper Bravo (in the vicinity of Cedar Crossing) is atypical *Dermatemys* habitat due to its small size and frequent shallow rocky sections. However the species can find suitable habitat in deeper pools (2.4-5.4 meters deep) where accumulations of silt and detritus form a soft substrate. Abundant plant feeds (e.g., *Inga edulis* and *Ficus spp.*) line these pools. The presence of adult females (up to 418 mm CL and 9.5 kg. body weight, and the presence of an old eggshell in the littoral zone of one pool indicate that the upper Bravo can sustain reproducing populations of this species. Shallow rocky stretches are presumably only used as travel corridors.

In the lower Bravo (between the northern property line and the junction of Booth's River and the Bravo), we captured 14 *Dermatemys*. This included 1 adult female, 3 adult males, and 9 juveniles. Seven were captured by free diving, 3 in a hoop net baited with fig leaves, and 3 in eddy nets set in mangrove creek mouths. The largest female was 447 mm CL and 10 kg. The largest male was 389 mm CL and 6.9 kg. Four old *Dermatemys* nests were located at the junction of a barkadillo (old logging trail) and the Bravo. Concentrated sign of *Dermatemys* nesting activity has become very scarce and this represents a rare find.

The lower Bravo (from downstream of the property line to within 1 km of the Booth's/Bravo Junction) is classic *Dermatemys* habitat. In the section that we sampled intensively, mid-stream depths were routinely over 3.5 meters and, in a few places, exceeded 6 meters. Substrates were mostly mud with occasional submerged logs. Rocks were scarce.

We explored approximately 2 km up the Booth's River and 6.5 km up the Bravo beyond the junction of the two rivers. At the junction, the Bravo possessed a strong current of blue-green water carrying a heavy sediment load. The slower, darker "tea color" water of Booth's River was warmer by 1° centigrade. Despite a naturally darker color, underwater visibility in the Booth's River was better than the Bravo, due to the absence of sediment. Relatively shallow water and strong currents in the Bravo immediately upstream from the junction render that section generally unsuitable for *Dermatemys* except for travel. Presumably intermittent deep pools between that section and Cedar Crossing provide short stretches of suitable habitat. Our brief efforts

Nets in deep water. Rio Bravo just upstream of Cedar Crossing. Older Belizians refer to this pool as the "Hicatee Hole," in "Qualm Hill Creek." It now receives adequate protection.

Mangroves (*Rhizophora mangle*). A common sight in the lower Rio Bravo.

Predated *Dermatemys* nest. Lower Rio Bravo.

(free diving and trammel nets) in the Booth's River yielded no *Dermatemys*. However the discovery of an old flooded *Dermatemys* nest suggested at least seasonal use.

Management Recommendations

Virtually no *Dermatemys* populations in northern Belize have eluded human predation. This underlies the urgent need to establish some protected populations. Protected populations allow long-term, natural history research on such topics as growth rates, movements, and natural population dynamics. The population structure of a protected population can serve as a baseline for comparison against which the status of exploited populations can be assessed. Protected populations also provide "insurance" should the development and implementation of sustainable harvest prescriptions become a lengthy process.

Some sections of the Rio Bravo possess the potential of providing this natural laboratory. Despite a known history of intermittent exploitation, the pools in the upper Rio Bravo are now sufficiently protected to present some opportunities for long-term research. Unfortunately, the lower sections of the Rio Bravo do not currently enjoy the same level of protection. The lower Rio Bravo is classic *Dermatemys* habitat. It is comparable to a number of other areas harboring *Dermatemys*. Stringent protection of the aquatic biota in that waterway would definitely advance the objectives of the Programme for Belize.

At the present, the lower Rio Bravo is essentially unprotected. It receives known exploitation pressure from the villages of Carmelita, San Estevan, and San Felipe. During the dry season, rural Belizeans set nets in the river for fish and turtles. Some free-diving for turtles may also take place. Most river top consumptive traffic is generalized. Mammals and game birds add to the pot or pocket just as readily as fish and turtles. Because of a generalized antipathy towards crocodilians, and because of an anxiety for personal safety, rural Belizeans in small, wooden dugout canoes typically shoot large crocodilians that they encounter.

Roads and motorized vehicles are recent development in Belize. In past years, waterways were the "highways." Boat travel was the norm. For most rural Belizeans, a river still constitutes a very viable travel route. A horse ride to a hidden dugout canoe provides access to an aquatic highway.

Inland waters in Belize are public domain. Access is unrestricted along the rivers and up to 66 feet from the median high water mark. This allows unrestricted travel along the waterways, and camping in the riparian

zone. It does nothing to restrict the hunting of game species along the riverside. Although this condition protects the rights of low income Belizeans, it does little towards facilitating the objectives of the Rio Bravo Conservation and Management Area. The provisions of the Fisheries Ordinance (Statutory Instrument No. 34 of 1987) apply to all the rivers, streams, water courses, lakes, lagoons, and other inland waters of Belize. In the Fisheries Ordinance, "fish" are defined as all or any of the varieties of marine or freshwater animal or plant life. The Acting Fisheries Administrator has indicated that there may be a process that private entities can pursue to apply for special regulations concerning certain segments of inland waterways. Section 13.-(1)(C) of the Fisheries Ordinance allows the Minister to make regulations prohibiting the taking of fish at such times and within such areas as may be defined in the regulations. Section 13.-(1)(D) allows the Minister to make regulations for prohibiting or restricting the taking of fish by any particular means or apparatus which may be specified. It is recommended that the Programme for Belize explore this legislation, and any other relevant legislation.

If the objectives of the Programme for Belize are to be met in the lower Rio Bravo, occasional boat patrols will become necessary. These patrols would be most productive between February 1 and May 30. Clear legal regulations curtailing (prohibiting) certain activities along the Rio Bravo and Booth's River are an obvious prerequisite to patrols. We are aware of the substantial socioeconomic and political factors that make it difficult to effectively manage a large, remote protected area. Clarification of legal authority and efforts to communicate and enforce that authority will help the Rio Bravo Conservation and Management Area to accomplish its objectives.

The vast savannah near the confluence of Booth's River and Rio Bravo. Hunters perch in these trees to observe animal game below.

A riverside camp. Lower Rio Bravo.