Gales Point, Belize Conservation and Research Project, 1994

Protection and hatching success of Hawksbill sea turtle (Eretmochelys imbricata) nests at Manatee Bar

Survey of West Indian Manatee (Trichechus manatus) in Southern Lagoon and adjacent waters

by

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Introduction

Belize is a small country of approximately 200,000 people located on the Caribbean Sea, south of the Yucatan Peninsula. Most of the 280 kms of shoreline is protected by the second longest barrier reef in the world.

Both manatees and sea turtles were used by the Mayans and the first settlers (known as Baymen) living in Belize as food. During the 1600's, 1700's, and 1800's manatees and sea turtles were hunted throughout the Caribbean for food, and hawksbill sea turtles for their shells. As a result of overhunting, nesting rookeries of sea turtles became extinct in Bermuda, the Caymens, and the Dry Tortugas by the 1900's. Other populations of sea turtles were threatened with extinction throughout the region. Manatees also became rare throughout the Caribbean. In 1883, Sir Danial Morris, the Director of Public Gardens of Jamaica, reported that in British Honduras 'Along the coast the manatee is said to be occasionally seen, although becoming more and more rare with the attacks made upon it.' Today, manatees are endangered throughout their range.

In 1989, an aerial survey by Tom O'Shea and Lex Salisbury "...resulted in the highest manatee count yet obtained anywhere in the Caribbean." Of the 102 manatee sighted in this survey, 55 were in the Southern Lagoon area. More information is needed about manatee distribution and use of this area in order to make sound management decisions to protect manatees and their habitat.

In 1990, a countrywide survey of Belize for sea turtle nesting sites by the author located the most important nesting site at Manatee Bar just east of Southern Lagoon and Gales Point village. A follow-up study conducted by the author in 1991, identified 108 hawksbill sea turtle nests lain on this beach, making this nesting concentration a regionally important site for hawksbill. Hawksbill are highly endangered in the Caribbean and worldwide.

Predators (raccoons, coatimundi, and skunks) were found to be destroying most of the 15,000-20,000 hawksbill eggs lain annually. Protection of nests from predators was begun in 1992 by the author using local villagers. Protection was continued in 1993 using local villagers and will be needed annually to protect this important rookery.

Objectives

1. Protection of the 15,000-20,000 hawksbill eggs destroyed annually by
predators at Manatee Bar.

2. Determination of hatching success and emergence success of hawksbill nests protected by cages.

3. Removal of beach debris that could entangle nesting females and hatchlings or block hatchlings from reaching the sea.

4. Identify manatee feeding areas, resting areas, and travel routes.

5. Record manatee behavior, particularly that associated with boats and motors, including researchers'.

6. Observe other wildlife, particularly birds and when possible record species, habitat, numbers, and site where observed in the Manatee Special Development Area (MSDA).

7. Involve local villagers in data collection, research, protection, and appreciation of the hawksbill sea turtles, manatees, and other wildlife found in the MSDA.

8. Lay ground work for future studies on seasonal distribution of manatees in Southern Lagoon.

Site Description

Gales Point / Manatee is a small village located on Southern Lagoon, 20 miles south of Belize City. Historically, the area has been known as Manatee and both the village and the lagoon are still referred to as Manatee throughout Belize.

Southern Lagoon is a long, narrow body of water divided into many arms. Much of this lagoon is less than 2 meters deep and has a mud and sand bottom. The Manatee River and a number of creeks flow into Southern Lagoon making the water brackish and turbid, visibility usually being less than one meter. One kilometer northeast of the village is the deepest area in Southern Lagoon. This is locally known as the 'Tarpon Hole' where tarpon and manatee are known to congregate. Freshwater upwelling is reported from this site.

Southern Lagoon enters into the sea at Manatee Bar via the Bar River. This is a twisting two kilometer channel, 80-150 meters wide and 3-5 meters deep. It is overhung by red mangroves up to 15 meters high. This is the most direct outlet to the sea for boats and manatee. A second outlet, 'Main
Creek is located at the north end of Southern Lagoon. Main Creek connects to Northern Lagoon, which in turn connects to a man-made canal to Belize City. Main Creek is very narrow and where it meets Southern Lagoon it is very shallow. There manatees have been hit by fast boats enroute to and from Belize City.

Manatee Bar Hawksbill Nesting Beach which reaches elevations of 3 meters is one of the best beaches in Belize. Composed of quartz sand from the overlooking Maya Mountains, this hawksbill nesting area extends 2 kilometers north and 8 kilometers south of the Bar River mouth, Manatee Bar. Beach vegetation is characterized by coconut, sea grape, coco plum, yucca, poisonwood, and palmetto.

**Methods**

Principal investigator will be Greg Smith working under a permit granted through the Fisheries Department and the Department of Natural Resources. Principal investigator will be responsible for training and supervising all participants in research techniques and record keeping, collection and checking of all field data sheets, and preparation of research results. Results will be submitted to the Fisheries Department, the Department of Natural Resources, the Ministry of the Environment and Tourism, the Coastal Zone Planning Unit, and the villagers of Gales Point.

Beach patrols of the 8 kms south of Manatee Bar will begin in May, 1994. Conducted by villagers of Gales Point, trained and supervised by principal investigator, patrols will be made every second day in May, daily in June, July, August, and September, and as needed after September until nesting is completed.

Patrols will protect nests from predators by locating egg chambers and burying one and one-half inch mesh wire cages 16-18 inches deep around the eggs. They will also monitor protected nests for signs of predator disturbance and hatchling emergence. When signs of hatchling emergence such as a collapsed egg chamber or hatchling tracks are observed, nests will be excavated. Live hatchlings will be counted then released and dead hatchlings, undeveloped eggs, hatched eggs, and developed but unhatched eggs counted to determine hatching and emergence success.

In August when peak nesting occurs, groups of 1-5 volunteers will accompany villagers and principal investigator to assist in patrols.

Also beginning in May, tour guides and operators from the Gales Point Progressive Cooperative trained and supervised by principle investigator
will begin collecting sightings of manatee opportunistically from villagers. They will record the date, time, location, group size, and behavior when possible without disturbing the manatees.

In August these members of the Tour Operators Association will then conduct surveys for manatees in the Southern Lagoon area. These villagers will use their expertise in the area and their boats which are large dugout canoes that do not endanger manatees. This survey will concentrate on identifying areas used by manatees, when these areas are used, how an area is used, how these areas are used by boats, and what, if any, response manatees have to boats when using these areas.

Groups of one to five volunteers will assist local guides and principle investigator in observations and data collection. Motors will be used to reach survey areas, but only paddles or poles will be used during surveying. Binoculars will be used to observe manatee behavior from a distance to minimize the presence of researchers on manatee behavior.

While patrolling and surveying, sightings of other wildlife will also be recorded. If possible, the species will be identified along with the location, date, time, and habitat.

**Significance of Research**

Recognizing the ecological importance of this area in 1991, the Government of Belize designated over 100,000 acres as the Manatee Special Development Area (MSDA). This will allow zoning restrictions to be established for both private and public land within the MSDA. This was done by the Government of Belize to protect the ecosystem and its wildlife, particularly endangered species such as manatee and hawksbill sea turtles.

Until recently, development and population pressure in the Manatee Special Development Area had been slight. However, the opening of a coastal road in 1992 through the MSDA and a growing tourism industry hungry for beachfront property has already begun to impact the area. New houses are being built and old houses repaired throughout the village. Construction of houses on the beach was begun in early 1994. Larger, faster boats with large motors are towing skiers near the Tarpon Hole, bringing tourists to view manatee at the Tarpon Hole, and just coming to visit the village. Incidents of these larger, faster boats hitting manatees have been reported.

Baseline data is needed to make the management decisions necessary to allow development that protects manatees and hawksbill and their critical
habitats. The villagers of Gales Point must be brought into the process of making these management decisions, and an important component of the project is the training of the local villagers in data collection methods. By working with the villagers to collect baseline data on manatees, hawksbill, and other wildlife, this research project will make an important contribution to preserving manatees and hawksbill in Belize and the Caribbean.

Role of Participants

Volunteers will play a key role in involving the village of Gales Point in protection, research, management, and appreciation of the manatees, hawksbill sea turtles, and other wildlife in the area, many of which are also endangered i.e... tapir, jaguar, ocelot, margay, jaguarundi, river otter, howler monkey, and hicatee river turtle.

Under the direction of Greg Smith, one group of volunteers will work with two guides of the village cooperative, assisting in beach patrols, and a second group will work with two other guides of the cooperative assisting in manatee surveys. Volunteers will work side-by-side with the local guides in the process of learning data collection methods. To maximize the benefit to the villagers, a succession of guides and boat operators will take part.

1. Volunteers on turtle patrols will patrol two miles of beach south of Manatee Bar. They will locate hawksbill nests lain the previous night and place protective cages around the eggs. They will clear debris which could block hatchlings access to the sea or entangle adults or hatchlings. They will also monitor all previous unhatched nests within their area for predator disturbance, repairing and recording any disturbance found. Nests will also be monitored for evidence of hatching and emergence and excavated to determine success. Live hatchlings will be released. Biological information will be recorded on standard data forms.

2. Volunteers assisting in manatee surveys will record depth, bottom type, location and time spent at each site surveyed on standard data forms. Where overhanging vegetation or grasses are adjacent to water over 1 foot in depth, the type of vegetation and presence or absence of signs of manatee feeding will be recorded. Other boating activity, location, time, and estimate of speed (slow, medium, fast) will be recorded.

When manatees are observed, timing of surfacing/breathing, group size, distance between individuals, and behavior will be recorded. Any behavior associated to boats, particularly researchers' such as investigating boat,
ignoring boat, or avoiding boat will be recorded.

Volunteers will also record sightings of other wildlife including birds and attempt to identify same. Volunteers with expertise in biological or physical sciences or from participation in other research programs will be encouraged to share their expertise with villagers and other volunteers.