Summary of Marine Turtle Nesting Activity 2009: Turtle Beach, Grafton and Mt. Irvine Back Bay

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SAVE OUR SEATURTLES TOBAGO, W.I.

December 2009

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Abstract

Giancarlo Lalsingh, SOS. 2009. Summary of Marine Turtle Nesting Activity 2009 – Turtle Beach, Grafton and Mt. Irvine Back Bay. The marine turtle fauna of Tobago is the most diverse of the twin island state Trinidad & Tobago. Three species (the leatherback, *Dermochelys coriacea*; hawksbill, *Eretmochelys imbricata*; and green turtle, *Chelonia mydas*) nest on the island's beaches and two more (the loggerhead, *Caretta caretta*; and olive ridley, *Lepidochelys olivacea*) have been recorded in its coastal waters. Of the 442 nests constructed, 421 were leatherback and 21 were hawksbill. There were no green turtle nests or activity reported for the survey area. The total survey effort for all three species was 3.2 kilometers per month, with a total survey effort of 22.4 kilometers. The greatest number of nesting activity was recorded in May and June. During the survey period 1st April – 31st October 2009, SOS volunteers contributed over TTD$100,000.00 dollars to the local community adjacent to marine turtle nesting beaches that form the SOS monitoring programme, through visitor accommodation. During the period April 1st to October 31st 2009, there were 4,644 persons recorded visiting marine turtle nesting beaches for the purpose of turtle watching within the survey area.

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SUMMARY

- Three marine turtle nesting beaches were monitored from 1st April – 31st October 2009, covering 22.4 km of survey effort.
- 442 marine turtle nests were recorded during the period.
- 80 marine turtles were flipper-tagged.
- 88 marine turtles were P.I.T tagged.
- 4644 persons were recorded turtle watching on monitored marine turtle nesting beaches.
- Estimated value of turtle watching and turtle related activities $78,600.00 USD – $125,760.00 USD ($495,180.00 TTD - $792,288.00 TTD).
- Increase in global environmental consciousness is becoming a greater factor for travelers when choosing tourism destinations.
- SOS visiting volunteers contributed over $100,000.00 TTD to the local economy.
- Marine turtle nesting beaches provide a valuable opportunity to offer significant income to the adjacent communities through conservation and eco-tourism related activities.
- Government personnel working in conjunction with local communities, CBOs, and NGOs provide a way forward in long-term monitoring efforts and sustainable management of marine turtle populations.
- Leatherback turtles are the most abundant marine turtle nesting in the survey area.
- Nesting of hawksbill turtles in the survey area is infrequent.
- Nesting of green turtles in the survey area is non-existent.
- Light pollution is an increasing problem on turtle nesting beaches.
- Illegal harvesting (poaching) of female turtles and eggs, predation by stray dogs loss and degradation of nesting and foraging habitat through human and environmental factors and the continued legal harvest in the open season are critical problems for the population of marine turtles in Tobago.
- Continued degradation and destruction of nesting habitat through recreational and industrial related coastal development along nesting beaches interferes with the vital process of marine turtle reproduction and can be expected to have serious adverse effects on current conservation efforts over the long term.
- Solutions that work toward safeguarding nesting and foraging habitat, requiring the least amount of manipulation of marine turtles and their natural behaviour, are certain to be the most successful and cost effective in preventing further decline of marine turtle populations and maintaining current nesting distribution.

INTRODUCTION

The marine turtle fauna of Tobago is the most diverse of the twin island state Trinidad & Tobago. Three species (the leatherback, *Dermochelys coriacea*; hawksbill, *Eretmochelys imbricata*; and green turtle, *Chelonia mydas*) nest on the island's beaches and two more (the loggerhead, *Caretta caretta*; and olive ridley, *Lepidochelys olivacea*) have been recorded in its coastal waters.

The leatherback population that nests in the Courland Bay area, (Turtle Beach, Grafton Beach, and Mt. Irvine Back Bay) is the largest on the island, and accounts for most of the turtle nesting activity in Tobago. Hawksbills are the second most numerous turtle nesting on the island. Tobago does support a small nesting population of green turtles, on beaches throughout the island, with reports coming from L'Anse Fourmi, Charlotteville (Hermitage and Cambelton Bays) and Kilgwyn Bay. Nesting sites for hawksbill and green turtles are often located on small isolated beaches associated with shallow offshore reefs. This combination of factors makes monitoring on a regular basis quite difficult.

Marine turtles regularly migrate vast distances between foraging grounds (feeding areas) and nesting beaches. Turtles that nest in Tobago come from widely scattered feeding grounds, many of which are outside the boundaries of Trinidad and Tobago. Satellite tagging of leatherbacks nesting in Trinidad show that they forage throughout the North Atlantic. The resident foraging grounds of Tobago's hawksbill and green turtles remain unknown; with the exception of one hawksbill turtle that was initially recorded and tagged in the Bahamas and subsequently nested in Tobago (see appendix).

All marine turtles that nest in Trinidad and Tobago are protected by the Conservation of Wildlife Act (Chapter 67:01), the Fisheries Act (Chapter 67:51), and the Environmental Management Act, 1995. All species are listed as endangered at a local level with the leatherback and hawksbill turtle listed critically endangered worldwide (IUCN).

Despite extensive protective legislation, the long term survival of marine turtles that nest in Tobago continue to be adversely affected by illegal hunting (poaching) of gravid females and their eggs, habitat loss and degradation through coastal development, pollution, boating-relating accidents, incidental capture in commercial fishing gear, and the continued legal harvest of marine turtles contrary to the international obligations of the government of Trinidad & Tobago.

These threats to various species and the specific actions necessary for the protection and recovery of marine turtles are described in the Draft National Sea Turtle Recovery Action Plan.

As part of a wider programme to promote the recovery of sea turtles, Save Our Sea Turtles (SOS) Tobago was formed in 2000 and regular beach patrols, and a monitoring programme were initiated with a mission to conserve local sea turtle populations, their coastal and marine habitat through community based initiatives in research, education, and eco-tourism.

In 2005 SOS began flipper tagging nesting turtles and in 2008 this was expanded to include passive integrated transponder (P.I.T.) tags. The focus of this monitoring and tagging programme has mainly been on the critically endangered leatherback turtle.

Data is collected through nightly patrols and morning surveys of tracks on nesting beaches. Data is compiled by SOS volunteers from nesting event data sheets, and results are disseminated through annual reports and publications. Here we report a summary of activities for the 2009 marine turtle nesting season.

Limitations of data presented in this report include:

1) No patrols were conducted in the month of March. As a result, the total numbers of nests, particularly for the leatherback turtle are underestimated.

2) Heterogeneous data-collection efforts and various levels of surveyor experience.

3) The survey effort is targeted primarily at the leatherback turtle and therefore, because of differences in nesting seasons of different species of turtles, does not encompass the entire nesting seasons of the hawksbill and the green turtle. As a result, the total numbers of nests for these two species are underestimated and do not accurately reflect their respective nesting seasons.

Because of these limitations, these data must be interpreted cautiously and appropriately. Although the information may be useful in evaluating the relative importance of a particular beach (presuming that it is monitored) as a site for marine turtle reproduction, due to the slow sexual maturity of marine turtles, we do not believe the data presented in this report are appropriate to evaluate long-term trends in population.

METHODS

The data were derived principally from:

a) Nightly patrols conducted from the 1st April to the 31st August 2009, between the hours of 8 P.M. to 6 A.M. where observers were present on the beaches surveyed (Turtle Beach, Grafton Beach, Mt. Irvine Back Bay) and actually witnessed nesting activities.

b) Evening and morning surveys from September 1st to October 31st, between the hours of 6 P.M. to 8 P.M. and 4 A.M. to 6 P.M. of tracks on beaches that are used as nesting sites by marine turtles. Species identifications and assessment of the nesting success after a turtle has already deposited eggs or gone were usually based on the surveyor's evaluation of features of the track and nest (e.g., track width, track configuration, size of the body pit).

We believe that errors in species identification do occur occasionally, particularly because of deterioration of the tracks (from weather, pedestrian or vehicular traffic) and surveyor inexperience, but we have no reason to believe that these errors are frequent enough to significantly affect the results of the survey.

Observers also recorded the number of persons (visitors and local residents) visiting nesting beaches for the purpose of turtle watching.

Locality names are given in the text and in the Appendix. "Survey effort" is defined as the number of kilometers of beach that are regularly monitored for nesting activity for all particular species.

We recognize that the number of kilometers of monitored beach is an imperfect measure of survey effort, however, some measure of survey effort is needed to interpret nesting totals.

Determination of successful nesting can be difficult especially in areas where nest densities are high or in situations where weather has erased the marks left in the sand by the turtle. In the case where a turtle is observed after depositing eggs or a nest is observed on a morning walk, nesting success is estimated and not confirmed but we have no reason to believe that this error would significantly affect the results of the survey.

RESULTS

NESTING

The number of marine turtle nests for all species are reported in table 1.

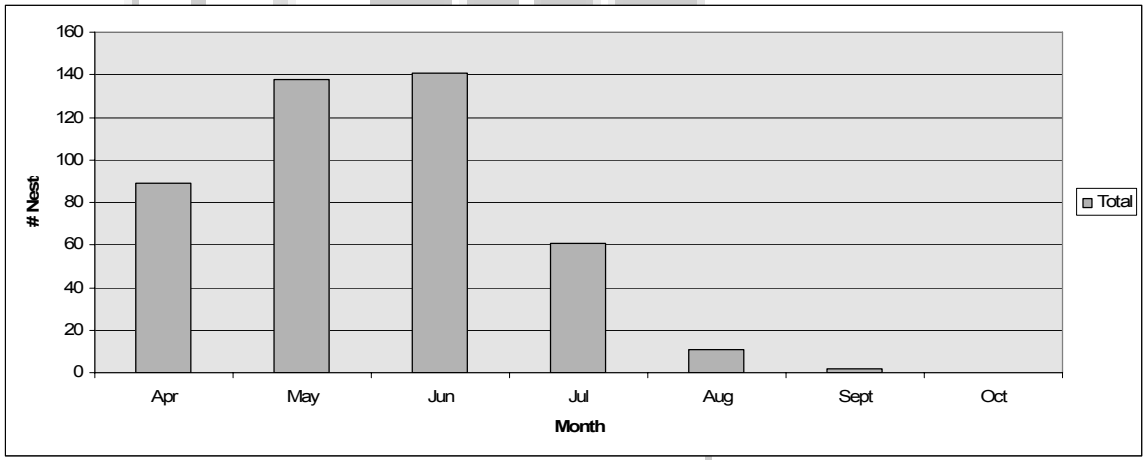
Table 1. NUMBER OF REPORTED MARINE TURTLE NESTS AND SURVEYED BEACH LENGTHS IN TOBAGO, 1ST APRIL – 31ST OCTOBER 2009

Month	Back Bay	Grafton	Turtle Beach	Survey Effort (Km)	Total
Apr	12	14	63	3.2 Km	89
May	31	19	88	3.2 Km	138
Jun	30	23	88	3.2 Km	141
Jul	8	12	41	3.2 Km	61
Aug	9	1	1	3.2 Km	11
Sept	2	0	0	3.2 Km	2
Oct	0	0	0	3.2 Km	0
Total	**92**	**69**	**281**	-	**442**

Of the 442 nests constructed, 421 were leatherback and 21 were hawksbill. There were no green turtle nests or activity reported for the survey area.

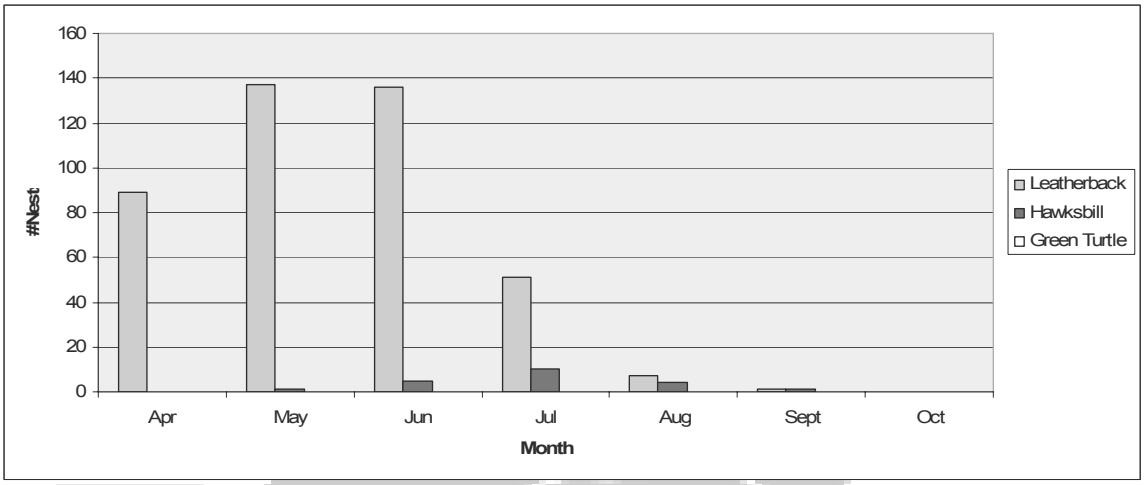
The total survey effort for all three species was 3.2 kilometers per month, with a total survey effort of 22.4 kilometers. The greatest number of nesting activity was recorded in May and June (figure 1.).

Figure 1. MARINE TURTLE NESTS RECORDED PER MONTH, 1ST APRIL – 31ST OCTOBER 2009



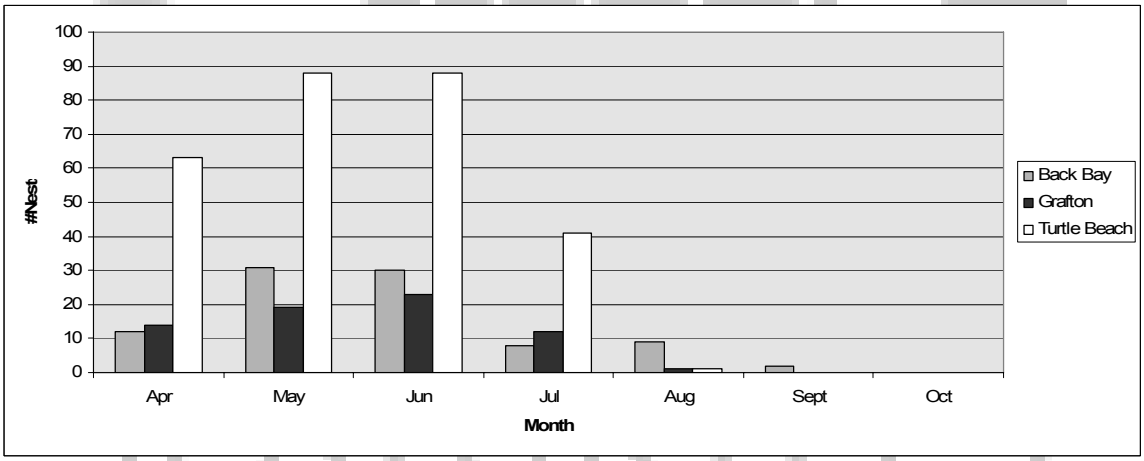
Leatherback turtles were by far the predominant species nesting in the survey area. The number of leatherback nests recorded during the survey period was 421. By comparison, there were only 12 hawksbill nests recorded. There were no nests recorded for the green turtle on any of the beaches that were part of the survey effort (figure 2.).

Figure 2. MARINE TURTLE NESTS RECORDED BY SPECIES, 1ST APRIL – 31ST OCTOBER 2009



The majority of nests recorded were on Turtle Beach, followed by Mt. Irvine Back Bay and Grafton Bay (Figure 3.).

Figure 3. MARINE TURTLE NESTS RECORDED BY BEACH, 1ST APRIL – 31ST OCTOBER 2009



TAGGING

The number and species of marine turtles, flipper and P.I.T. tagged are presented in Table 2 & 3.

TABLE 2. NUMBER OF REPORTED MARINE TURTLES FLIPPER TAGGED IN TOBAGO, 1ST April – 31ST OCTOBER 2009

Month	*Dermochelys coriacea*	*Eretmochelys imbricata*	*Chelonia mydas*
Apr	22	0	0
May	22	1	0
Jun	19	2	0
Jul	10	4	0
Aug	0	0	0
Sept	0	0	0
Oct	0	0	0
Total	**73**	**7**	**0**

73 leatherback turtles flipper tagged, 66 were recorded as 'NEW' having no flipper or P.I.T. tags present, and 7 were recorded as 'RETURNS' as P.I.T. tags were already present. All of the 7 hawksbill turtles tagged were recorded as 'NEW'.

TABLE 3. NUMBER OF REPORTED MARINE TURTLES P.I.T TAGGED IN TOBAGO, 1ST April – 31ST OCTOBER 2009

Month	*Dermochelys coriacea*	*Eretmochelys imbricata*	*Chelonia mydas*
Apr	17	0	0
May	33	0	0
Jun	26	0	0
Jul	12	0	0
Aug	0	0	0
Sept	0	0	0
Oct	0	0	0
Total	**88**	**0**	**0**

42 of the leatherback turtles P.I.T. tagged were recorded as 'NEW' having no flipper or P.I.T. tags present, and 46 were recorded as 'RETURNS' (current and previous years) as flipper tags were already present.

TURTLE WATCHING

During the period April 1st to October 31st 2009, there were 4,644 persons recorded visiting marine turtle nesting beaches for the purpose of turtle watching within the survey area. Of this, 3144 were non-local visitors and 1500 were local residents. The highest numbers of persons were recorded in April (Figure 4.) with the majority of these persons visiting Turtle Beach (Figure 5.).

Figure 4. PERSONS RECORDED TURTLE WATCHING PER MONTH, 1ST APRIL – 31ST OCTOBER 2009

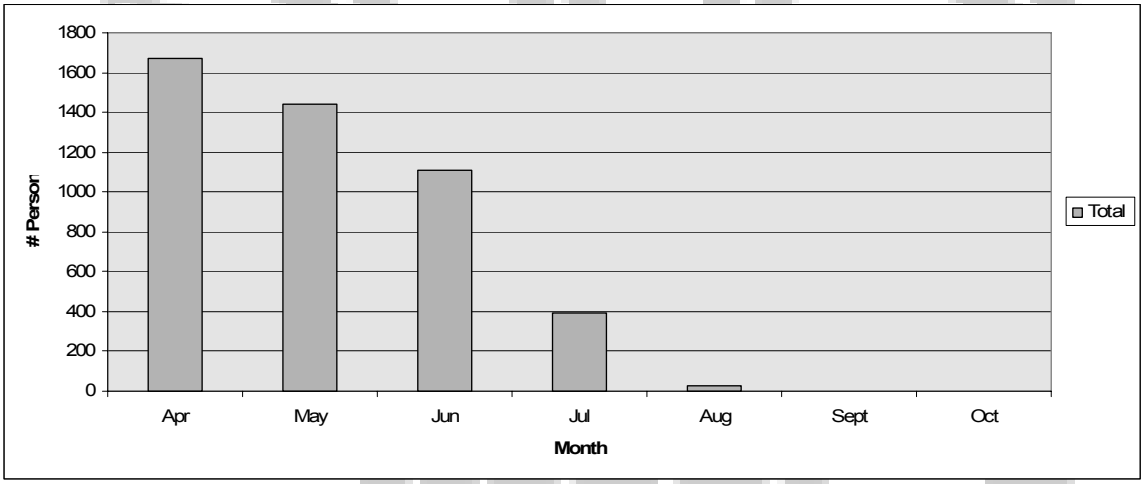
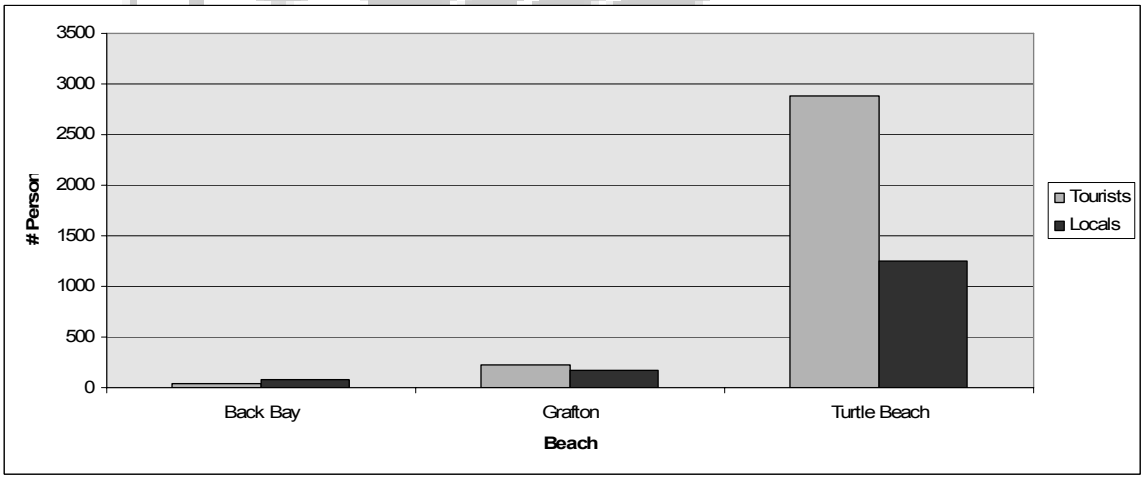


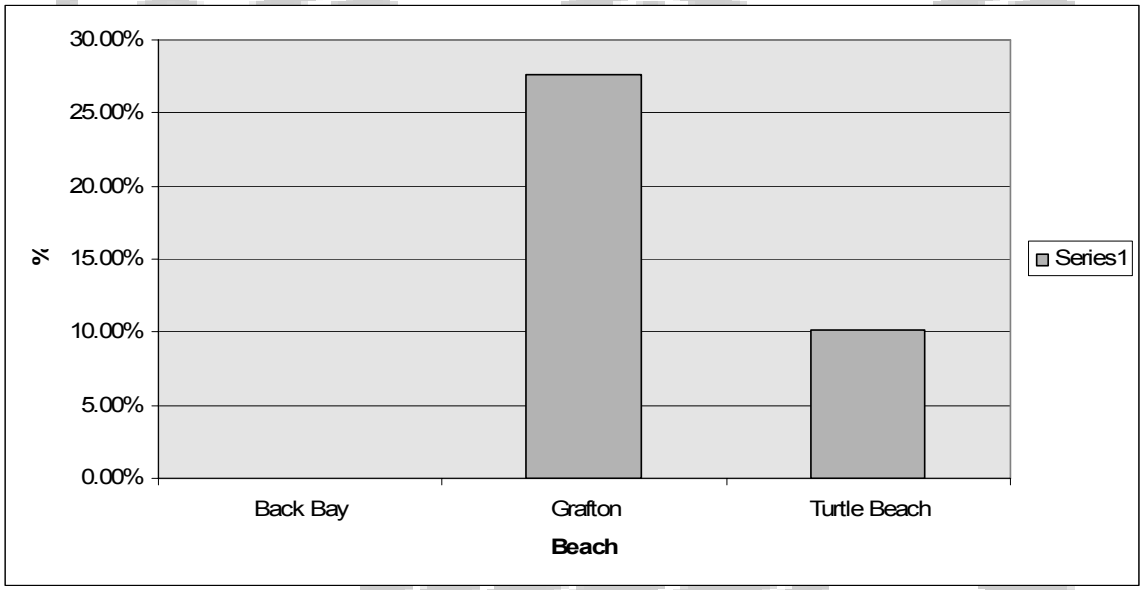
Figure 5. PERSONS RECORDED TURTLE WATCHING BY BEACH, 1ST APRIL – 31ST OCTOBER 2009



LIGHT DISTURBANCE

The percentage of marine turtles disturbed or disoriented by lights is presented in figure 6.

Figure 6. PERCENTAGE OF MARINE TURTLES DISTURBED BY LIGHTS PER BEACH, 1ST APRIL – 31ST OCTOBER 2009



Marine turtles nesting on Grafton Bay experienced the highest percentage of disturbance from light with 27.67% of all nesting turtles suffering from disorientation due to lights, followed by Turtle Beach, 11.8% and Back Bay with 0%.

DISCUSSION

SPECIES REPRESENTATION

Leatherbacks nest regularly in the survey area and nests have been reported for every month of the monitoring period (1st April – 31st October 2009) except October. Nesting by the hawksbill has been reported sporadically while nesting by the green turtle is non-existent. These species account for 95%, 5% and 0%, respectively, of total nesting activity.

DERMOCHELYS CORIACEA

While survey effort remained relatively constant during the period 1st April – 31st October, the total number of nests fluctuated between as little as 2 and as much as 141 on a monthly basis. The total numbers of leatherback nests constructed were 421, up from 378 in 2008. Leatherbacks in Tobago have been recorded nesting as early as January and as late as December, whereas the surveys only cover the period April - October. Because of some gaps in survey coverage, notably the lack of patrols in March 2009, this is undoubtedly an underestimate of the true number of nests constructed.

The minimum curved carapace width or (CCW) for leatherbacks recorded was 92 cm and the maximum was 136cm. The mean being 112.5cm.

The minimum curved carapace length or (CCL) for leatherbacks recorded was 135cm and the maximum was 176. The mean being 154.5cm.

ERETMOCHELYS IMBRICATA

Nesting by hawksbills in Tobago is not frequent, but deficiencies in the surveillance of this species should be mentioned. Most surveys involve track counts rather than actual encounters with turtles on the nesting beach. The total numbers of Hawksbill nests constructed were 21, up from 8 in 2008, partly due to the extension of the survey period into September and October. Another consideration is that hawksbills nest on beaches and bays which do not form part of the monitoring programme, and where surveillance is not regular. Although we have no indication that significant nesting by this species occurs in the survey area, there are reports that hawksbill nesting elsewhere in Tobago warrants further investigation. Easily accessible sites of particular interest include Pigeon Point, Milford Bay, Kilgywn and Rockly Bays.

The minimum CCW for hawksbills recorded was 80 cm and the maximum was 82cm. The mean being 80.8cm.

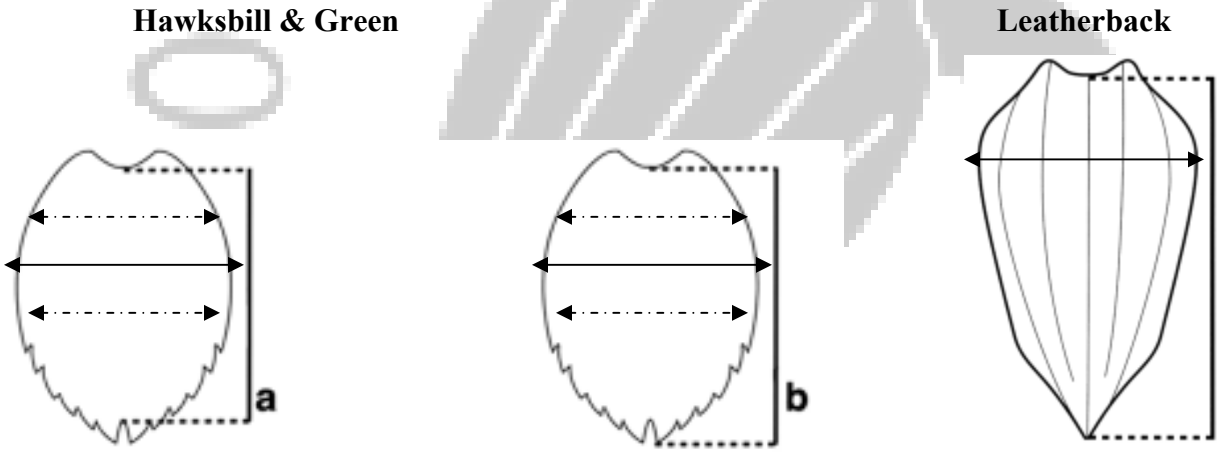
The minimum CCL notch to notch for hawksbills recorded was 81cm and the maximum was 94. The mean being 86.8cm.

The minimum CCL notch to tip for hawksbills recorded was 85cm and the maximum was 99. The mean being 90.8cm.

CHELONIA MYDAS

The extent to which green turtles nested historically in Tobago remains unclear and is now unquestionably rare, despite their continued presence in the coastal waters. Like hawksbills, most surveys involve track counts rather than actual encounters with turtles on the nesting beach. Green turtle tracks differ from hawksbill tracks but due to their similar size and use of the same nesting beaches they may not always be correctly identified by surveyors. Although there were no reports of nesting activity on beaches within the survey sites, nesting activity has been reported on beaches and bays that do not form part of the monitoring programme, where surveillance is not regular. We have no indication that significant nesting by this species occurs anywhere in Tobago, with the possible exception of Kilgwyn Bay.

Figure 7. CCL (N-N), CCL (N-T) AND WIDTH MEASUREMENTS IN HAWKSBILL, GREEN AND LEATHERBACK TURTLES



TOURISM AND TURTLE WATCHING

Despite the global economic downturn, there was not a significant drop in persons visiting nesting beaches for the purpose of turtle watching in 2009, when compared to the number in 2008. The total number of visitors recorded for 2008 and 2009 were 5025 and 4644 respectively. This represents only a drop of 381 persons or 7.5%.

This demonstrates that Turtle watching remains a highly valuable asset to Tobago as it seeks to position itself as the tourism destination of choice in the wider Caribbean.

Turtle watching of nesting marine turtles continues to be a popular activity among local and foreign visitors alike, and provide in some instances significant financial benefit to tour guides and other persons offering turtle watching tours. Tours offered to non-local visitors range in price from **$25.00 US Dollars to $40.00 US Dollars per person**.

This represents an estimated range of **$78,600.00 USD – $125,760.00 US Dollars ($495,180.00 TTD - $792,288.00 TTD)** in potential revenue from turtle watching on beaches that form part of the SOS nesting beach monitoring programme.

During the survey period 1st April – 31st October 2009, SOS volunteers contributed over TTD$100,000.00 dollars to the local community adjacent to marine turtle nesting beaches that form the SOS monitoring programme, through visitor accommodation.

Many of these visitors also utilize services such as craft, food, transport, accommodation and other services from local communities, hotels, villas, and guest houses adjacent to marine turtle nesting beaches. So the true direct and indirect economic benefit derived from turtle watching is undoubtedly an underestimate and far greater than any socioeconomic benefit derived from the harvest and sale of turtle meat.

Despite the many benefits marine turtles as a natural living resource contribute to the livelihoods of local people and the economy of Tobago, there continues to be little or no effort on the part of Government agencies to financially support marine turtle conservation monitoring activities, promote responsible turtle watching practices and to enforce or update laws that protect marine turtles and their nesting habitat.

BEACH FRONT LIGHTING AND DISORIENTATION OF MARINE TURTLES

In recent years with the continued and accelerated development along Tobago's coastline, disturbance and disorientation of marine turtles from artificial lights has become a growing concern. Not only does an increase in artificial lights prevent some female turtles from nesting but females that do manage successfully nest suffer from light disorientation on their return to sea and upon hatching, their offspring are similarly affected and many die before ever finding their way to the sea.

Marine turtles use natural light from the lighter horizon to guide them back to the sea on completion of egg-laying. Artificial lights, which are brighter than these natural light cues disorient turtles, causing them to spend extended periods of time navigating the beach before returning to the sea. In some cases these lights attract turtles away from the sea and even on to the road, after which the turtles can suffer severe exhaustion or even death if unaided.

Compared to other nesting beaches in the survey area, Grafton Beach suffered the highest incidence on light disturbance and disorientation when compared to Turtle Beach and Back Bay. This has been caused mainly by the installation of street lamps along the entire length of the road which runs alongside the beach.

While the purpose of these lights are meant to address the issue of added security for hotel and villa properties in the area, it seems that no consideration or planning was ever taken for the use of the beach as an important nesting site for nesting leatherback and hawksbill turtles. As mentioned earlier in this report, the presence of nesting turtles increases Tobago's ability to attract visitors to the island and brings added value to the many hotels, villa properties and associated businesses within the community.

There are currently no laws that address the issue of beach front lighting in or around turtle nesting beaches in Trinidad and Tobago and the issue is left to the discretion of various property holders. However, inappropriate lighting can be remedied in some areas by simple design changes (shading and redirection), alternative light types (red or orange vs white or yellow bulbs) and use of vegetational hedges as light buffers (e.g. seagrapes).

In addition to the street lights along the lower Grafton road, there are a number of other ongoing light issues that need to be addressed with some urgency. Specifically the lighting at Turtle Beach Hotel and the Fisheries building on Turtle Beach as well as the extremely bright lights at Plymouth basketball courts that also shine on to Turtle Beach, completely illuminating two thirds of the entire beachfront area.

POACHING

SOS was first formed in 2000 to address the rampant and illegal poaching activity that took place on the beaches that form the survey area. **The presence of a regular beach patrol, coupled with ongoing education and awareness campaigns over the last ten years has dramatically reduced the incidence of poaching that was once evident in the survey area.**

In 2009 it is unfortunate to report that one leatherback and two hawksbills were killed during the survey period in the survey area. These opportunistic killings coincided with the annual Black Rock village harvest in July.

This however pales in comparison to the regular reports of the continued slaughter of nesting turtles on non-monitored rural beaches throughout Tobago, with reports coming from both local residents and foreign visitors alike.

While this practice certainly undermines the efforts of local conservation groups and the overall survival of marine turtles nesting in Tobago, in the end, the ultimate damage may be to Tobago's image as a tourism destination that promotes itself as "Clean, Green, Safe and Serene".

In addition to the issue of illegal poaching on the beaches during the nesting season, the continued slaughter of numerous greens and hawksbills in nets during the open season also continues to do significant damage to the species and Tobago's equally fragile 'eco-credibility.

Word of mouth and visitor feedback sites such as Trip Advisor play an increasingly important role in the decision making process for technologically savvy travelers in today's interconnected world. With an ever growing global environmental consciousness, travelers are choosing to go to destinations that promote environmental stewardship and sustainable management of natural resources.

RECREATION AND ITS EFFECTS ON MARINE TURTLES

It is clear that the continued and accelerated degradation and destruction of nesting habitat through tourism related activities and beachfront development interferes with the vital process of marine turtle reproduction and can be expected to have serious adverse effects that will only be further exacerbated by climate change and the associated issues of sea level rise and global warming. The argument that turtles prevented from nesting in one location will simply go elsewhere to nest fails to provide a long term answer to the problem of shrinking habitat, and it ignores the fact that nesting site fidelity is a well documented behaviour of marine turtles.

The sheer pressure of thousands of people using nesting beaches for recreation has its effects too. **Because Tobago's nesting beaches do not have prohibited status like those in Trinidad, there is currently no legal framework for controlling beach use during the nesting season. This is probably the single greatest challenge to turtle conservation in the current SOS survey area and direct government intervention is necessary if this situation is ever to change.**

In 2010, SOS patrollers have had to protect female turtles and hatchlings not just from poachers but also from obstructions due to recreational and commercial equipment left on the beach – from fishing nets and beach chairs to flambeaux and barbeque pits. There was also tremendous disturbance as a result of lights, noise, crowds and litter from casual and organized parties, in the Black Rock Heritage Park on weekends and on the occasion of Black Rock Heritage when the stage itself was mounted on the beach.

Another worrying and growing trend in the survey area is the driving of vehicles on nesting beaches. While not a prohibited activity on beaches, the adverse effects on marine turtle nests and hatchlings is well documented. The weight of vehicles and other heavy equipment, such as the stage for Black Rock Heritage, causes compaction of the sand, crushing buried turtle eggs and trapping and killing hatchling turtles.

CONCLUSIONS

The challenge ahead is to ensure the long term survival of marine turtles in Tobago. Numerous factors continue to affect turtles at all stages of their life-history, but effectively ensuring the protection turtles and their nesting habitat is within our reach.

There is a need for greater awareness among our communities, private sector and Government agencies, about marine turtles, their life history, the threats they face and solutions to these threats, many of which are already at hand.

These sectors need to work much more closely in a spirit of cooperation to achieve the goal of marine turtle conservation, balanced with the needs of human beings. Solutions that require the least amount of manipulation of turtles and their natural behaviour are certain to be the most successful and, in many cases, the most cost effective. These include:

- Improved enforcement of existing laws and active support for updating the current legislation pertaining to marine turtle conservation.

- An increase in fines for persons caught poaching marine turtles or in possession of their carcass, meat and other products.

- Greater physical support for community and NGO groups from Government agencies and the private sector.

- Improved overall management of coastal areas particularly those used by both human beings and marine turtles, especially in regards to long term infrastructural development and short term events planning.

- Designation of marine turtles nesting beaches as prohibited areas during hours of darkness; especially, Turtle Beach, Grafton Beach and Mt. Irvine Back Bay.

- Implementation of guidelines and regulations for tour guides and tour operators to promote turtle watching best practices that are both mutually beneficial to turtle watchers and nesting turtles.

- Implementation of a 'lights out' policy on beaches used as nesting sites by marine turtles.

- Greater emphasis on the importance of public education and awareness programmes.

- Incentives for individuals, communities and businesses that support marine turtle conservation.

- Continued long term research initiatives.

APPENDIX

TURTLE WATCHING GUIDELINES

1. Use of flashlights should be kept to a minimum, and only used when necessary, as these can scare off turtles emerging from the water and disorient nesting females and hatchlings.

2. As soon as a turtle has been sighted, quietly and slowly retreat to a distance of 15m (45 feet).

3. Be sure to stay behind the turtle at all times.

4. When a turtle has stopped digging, the SOS patrol, game warden, hotel security or trained guide will determine if the laying process has begun by approaching the turtle from behind.

5. During the laying process, SOS patrollers, game warden, hotel security or trained guide may record size, tag and observe the well being of turtle, and occasionally, if the situation permits, allow small groups of people to observe the laying process.

6. Groups should consist of no more than 10 persons at a time.

7. Flashlights should preferably be equipped with a red photographic filter or red L.E.D. bulbs and only be used to highlight the laying process. Never shine a flashlight at or on a turtle's head.

8. Flash photography is not permitted at anytime during the nesting process.

9. Be very careful where you walk when hatchlings are around - they are difficult to see at night and can be easily crushed.

10. If hatchlings are found, never place directly into the sea as this interferes with their natural imprinting process.

11. Never drive or use heavy equipment on nesting beaches as these may crush nests or prevent hatchlings from digging their way to the surface through nest compaction.

12. Remove any obstructions (sand castles, beach chairs, nets etc.) on the beach as these can prevent turtles from nesting and hatchlings from reaching the sea.

For full details of turtle watching guidelines or what to do in an emergency, please refer to the Sea Turtle Manual for Nesting Beach Hotels, Staff, Security and Tour Guides (Clovis, T. 2005) or contact SOS for a copy.

Appendix Box 1. Beach localities, description and lengths surveyed In Tobago, 1st April – 31st October 2009

BEACH NAME	DESCRIPTION	LENGTH (Km)
Turtle Beach	Located on the Caribbean coast between the communities of Plymouth and Black Rock. High level of beach front development along its length including a 100+ room hotel, fisheries depot, private villas and residential properties	1.76 Km
Grafton Beach	Located on the Caribbean coast between the communities of Black Rock and Pleasant Prospect. High Level of beach front development including two 100+ room hotels, private villas, restaurants and coastal road.	0.8 Km
Mt. Irvine Back Bay	Located on the Caribbean coast between the community of Pleasant Prospect and Mt. Irvine Beach. No coastal development present.	0.64 Km

SOS NESTING EVENT DATA SHEET (Please print in BLOCK LETTERS)

Female See by Patrol (circle one) YES NO

Date _____ Time Seen _____ Time Out _____

Species (circle one) LBK HWK GRN Other species (please specify) _____

Location (circle one) TB GR BB Other beach (please specify) _____

Zone (circle one) 1 2 3 4 GPS: N 11. W 60.

Landmark (please specify) _____

Weather (circle one) Clear Overcast Rain Stormy Unknown

Activity (circle one) Approach Body Pitting Digging Laying Covering

Camouflaging Leaving Gone Unknown

Outcome (circle one) Confirmed Lay Estimated Lay False Crawl

False Crawl with Body Pit Unknown Outcome Poaching Stranding

TAGS & MEASUREMENTS

Left Flipper Tag _____ NEW OLD
Left Flipper Tag _____ NEW OLD

Right Flipper Tag _____ NEW OLD
Right Flipper Tag _____ NEW OLD

PIT Tag _____ NEW OLD

PIT Tag _____ NEW OLD

CCL (N-N) (cm) _____ CCL (N-T) (CM) _____ CCW (cm) _____

Does carapace damage affect measurement? YES NO

NOTES (Injuries/ Parasites/ other)

OBSERVERS (Please print name in BLOCK LETTERS)

Head Patroller _____

Volunteers _____

_____

_____

_____

Tourists _____ Locals _____

Nest Relocation Date _____

Time collected _____

Time reburied _____

Location Name _____

Zone _____

Egg Count _____

GPS: N 11. W 60.

Turtle Disturbed by Lights (circle one) YES NO

Turtle Disturbed by People (circle one) YES NO

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Marine Turtle Newsletter

Juvenile Hawksbill Tagged in The Bahamas Nests in Tobago

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In the Atlantic there are few, if any, reports of the length of time required for wild-caught immature hawksbills to grow to sexual maturity. Here we report on an immature hawksbill tagged in The Bahamas and seen nesting more than nine years later on Tobago (Fig. 1).

Although the longterm research project at the Union Creek Reserve (UCR), Great Inagua, Bahamas, has focused on green turtles (Bjorndal & Bolten 2008), about 10% of the turtles captured there each year are hawksbills. On 2 February 1996, a hawksbill was captured in UCR, and a light blue plastic jumbo-roto flipper tag was applied to each flipper (BP4822/3/4/5). Two straight carapace lengths (Bolten 1999) were measured (± 0.1 cm). Straight carapace length notch to tip (SCLn-t) from the anterior point at midline (nuchal scute) to the posterior tip of the longer supracaudal was 45.1 cm, and minimum straight carapace length (SCLmin) from the anterior point at mid-line to the posterior notch at midline between the supracaudals was 42.4 cm. The turtle was not seen again in UCR.

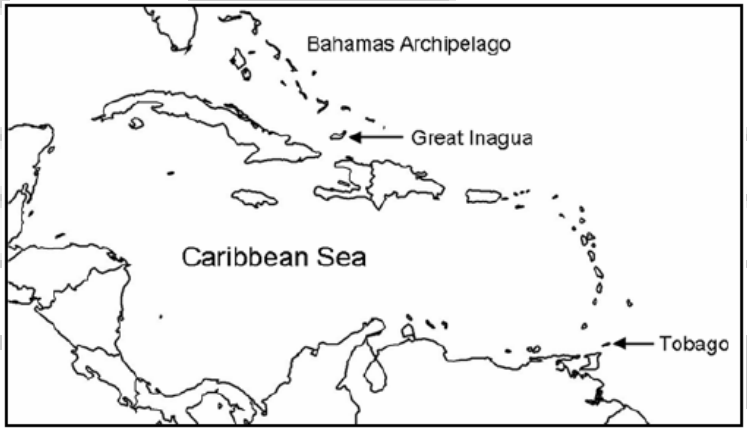

Figure 1. Map showing location of original tagging (Great Inagua) and recapture (Tobago) locations.

In June 2005, members of the Save Our Sea Turtles program on Tobago twice encountered a hawksbill that carried tags BP4824 and BP4825 depositing eggs on the southwest coast of Tobago. On 13 June 2005 it nested on Mt Irvine Back Bay, and on 28

June 2005 (having lost BP4825) it nested on the nearby beach of Grafton or Stone Haven Bay. Also, a hawksbill with blue plastic tags had been reported nesting in the first two weeks of March on Turtle Beach, the beach north of Grafton, which was probably this turtle. Curved carapace length notch to tip (CCLn-t) was 84 cm.

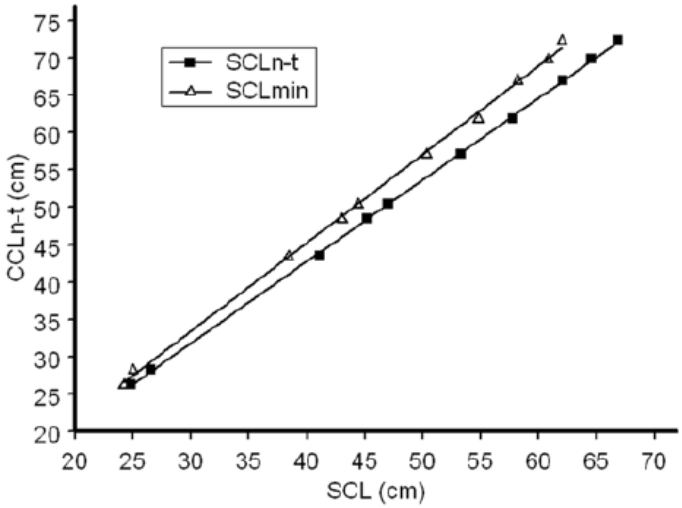

Figure 2. Relationship between CCLn-t and SCLn-t (closed squares) or SCLmin (open triangles) for 10 hawksbills measured in Union Creek Reserve, Great Inagua, The Bahamas.

The recapture interval from 2 February 1996 to 13 June 2005 was 3419 days (9.37 yr). To calculate growth rate of the turtle, we converted our SCL measures to CCLn-t using equations generated from 10 hawksbills from UCR for which we measured SCLn-t, SCLmin, and CCLn-t (Fig. 2). The resulting equations are:

CCLn-t = 1.0925 SCLn-t – 0.9254 [$p<0.0001$; $R2 = 0.9997$]

And

CCLn-t = 1.1819 SCLmin – 1.9851 [$p<0.0001$; $R2 = 0.9988$].

Thus, when the hawksbill was captured in UCR, its CCLn-t estimated from SCLn-t was 48.3 cm and its CCLn-t estimated from SCLmin was 48.1 cm. Taking the average value of 48.2 cm, we calculate that the rate of growth was 3.8 cm per year.

Of course, the hawksbill may have reached sexual maturity before it was seen nesting in 2005. If so, the duration for the 45 cm SCL hawksbill to grow to sexual maturity would be less than 9 years, and growth rates would have been more rapid, assuming growth slowed substantially once sexual maturity was attained. Until we have study aggregations of hawksbills at which growth to sexual maturity can be determined in tagged animals, such serendipitous encounters as that reported here are valuable to place bounds on our estimates. This report also underscores the importance of monitoring nesting beaches so that turtles tagged as immatures may be intercepted.

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BJORNDAL, K.A. & A.B. BOLTEN. 2008. Annual variation in source contributions to a mixed stock: implications for quantifying connectivity. Molecular Ecology 17:2185–2193.

BOLTEN, A.B. 1999. Techniques for measuring sea turtles. In: K.L. Eckert, K.A. Bjorndal, F.A. Abreu-Grobois & M. Donnelly (Eds.). Research and Management Techniques for the Conservation of Sea Turtles. IUCN/SSC Marine Turtle Specialist Group Publication No. 4. pp. 110-114.

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