A. Mason

Sea Turtle Manual for Nesting Beach Hotels, Staff, Security and Tour Guides

Compiled and edited by Tanya Clovis, SOS Tobago
with assistance from WIDECAST

Sponsored by The Travel Foundation

SAVE OUR SEATURTLES
TOBAGO, W.I.

the travel foundation
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WIDECAST
Wider Caribbean Sea Turtle Conservation Network

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This manual is a distillation of the experiences of our entire beach patrol team, and a fitting way to end our fifth year of operation as an 'official' group, so many thanks to the guys on the beach and the supporters behind the scenes, especially…

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Tanya Clovis

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A BRIEF HISTORY OF SEA TURTLE CONSERVATION IN TOBAGO

During the early 1980s, the Field Naturalists Club and the Forestry Department conducted limited patrols and tagging efforts throughout the island of Tobago in the Republic of Trinidad and Tobago. The Forestry Department installed sea turtle sighting data books at major beachfront hotels and with Customs officials at the international airport. Dedicated warden and Forestry officer Selwyn Davis spearheaded small scale community outreach and patrolling activities with the support of his Department. The national Field Naturalists Club engaged in turtle monitoring activities and experimented with captive-rearing of hatchlings led by the indomitable outdoorsman David Rooks. Both parties engaged in some flipper tagging, in keeping with the standards at that time.

In the mid 1980s, private individuals in the Black Rock/Plymouth area became more actively involved in sea turtle protection at Great Courland Bay, often at great personal risk. These efforts gradually expanded to include outreach activities at the Rex Turtle Beach Hotel in hopes of encouraging 'turtle watching' as a viable alternative / deterrent to turtle hunting. Wendy Herron, a pioneer in this effort, went on to represent Tobago at the regional level as the Tobago coordinator of WIDECAST, the Wider Caribbean Sea Turtle Conservation Network. By the 1990s, the Field Naturalists Club had evolved into Environment TOBAGO, Tobago's first local environmental NGO with a Board of Directors comprising many of Tobago's resident and visiting environmentalists.

In 1996, seeking support for the island's community-led sea turtle conservation efforts, Ms. Herron joined Environment TOBAGO. As a result, local sea turtle conservation efforts soon broadened to include media exposure, beach clean-ups, educational outreach programs, and collaborative initiatives with Government, the Police, and hotel security staff. In February 2000, in her capacity as WIDECAST Country Coordinator and an Environment TOBAGO Director, Ms. Herron chaired a gathering at Mt. Irvine Beach Facilities of young surfers, artists and students who were outraged by the continued killing of nesting sea turtles and eager to become involved, thus 'Save Our Sea Turtles' (SOS) was born.

SOS Tobago's mission is to conserve our local sea turtle population and their coastal and marine habitat through community based initiatives in research, education and eco-tourism. A volunteer Beach Patrol monitors turtle nesting activity nightly throughout the nesting season (March-July) on three beaches in southwest Tobago. Turtle Beach, Grafton Beach and Mt. Irvine Back Bay are the most active turtle nesting beaches in Tobago and have been identified as 'index beaches' for the critically endangered leatherback turtle. An 'index beach' is a site which is monitored regularly and, ideally, in perpetuity so that the data collected there can be compared and interpreted from year and year and can be viewed as representative of trends in island-wide populations. This concept is important, because not all beaches can be monitored at all times. The fact that some beaches are prioritised for surveillance, which is conducted according to international best practices, means that SOS and its community volunteers are contributing meaningful management information to island and national-level policy makers.

A volunteer Education Team within SOS conducts interactive lectures and field trips for village councils and schools and produces educational displays at a variety of events and venues throughout the year. A volunteer Eco-tourism Team facilitates turtle watch training for registered tour guides and presentations for beachfront hotel staff, management and guests about appropriate conduct on turtle nesting beaches. SOS Tobago is a registered community based organization (CBO) and as a small group we derive great strength from our partnerships with agencies like Environment TOBAGO, the Travel Foundation, the Tobago House of Assembly (THA) and the Tour Guide Association, with regional expertise such as is available through WIDECAST, and through the commitment of individuals like yourself who take the time to get involved.

Thank you for taking the time to read through this manual, which is designed to develop your skills in handling the sea turtles that nest on your beach. Your help and understanding are essential to ensuring that these sensitive and critically endangered creatures nest successfully – every successful nesting event increases the chances that they will survive well into the next generation.

BASIC SEA TURTLE BIOLOGY AND ECOLOGY

Source: The following species descriptions are largely excerpted from WIDECAST (2001) "ENDANGERED SEA TURTLES OF THE CARIBBEAN", a narrated slide show.

The oldest sea turtle fossil, named Santanachelys, dates to 112 million years ago! Today only seven species of sea turtle inhabit the oceans of Planet Earth, but more than 100 different species have been described from the fossil records. Hence, over millions of years, sea turtles have been a diverse and widespread group of animals. Sea turtles are air-breathing reptiles, very well adapted for life in the ocean. Their broad, paddle-like flippers slice the water cleanly and their smooth shells are streamlined for speed.

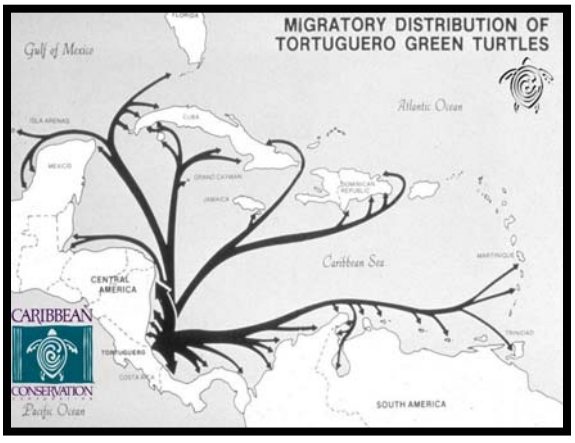
Today most scientists recognize seven species of sea turtle: the Green, Loggerhead, Hawksbill, Olive ridley, Kemp's ridley, Leatherback, and Australian Flatback. Six species of sea turtle are found in the Western Atlantic Region, including the Caribbean Sea. Tobago is fortunate to be one of the most important sites in the Caribbean for the endangered Green turtle and the critically endangered Leatherback and Hawksbill. Trinidad and Tobago is also one of the few countries in the world where turtle hunting is still allowed, albeit for only part of the year. Luckily, the closed hunting season (February - September) coincides with the primary turtle nesting seasons for Green and leatherback turtles; however, the later nesting Hawksbill turtles remain extremely vulnerable. Because sea turtle meat and eggs are still considered a local delicacy in some areas, opportunistic and illegal turtle hunting and egg collection continues.

The most common nesting species in the Black Rock area (i.e. along the index beaches) is the migratory Leatherback, which begins nesting early in the year (April-July). Although Leatherback nesting is sporadic beyond Black Rock (with the exception of Moriah and L'Anse Fourmi), Tobago's smaller beaches are actually preferred by Hawksbill and Green turtles which both nest a little later in the season (June – August). The Leatherbacks are the most popular species for turtle watching because of their grand size and the relative accessibility of the beaches in the Black Rock area; however, the more rural beaches are ideal for overnight camping trips and it is often possible to see more than one species in a night while the surrounding reefs and rainforests host a wealth of biodiversity in their own right.

Hawksbill Turtle (*aka oxbill*)
Hawksbill turtles, known to scientists as "Eretmochelys imbricata", prefer to live near coral reefs where their mottled coloration acts as camouflage. They are smaller than Green turtles, and adults rarely exceed 180 pounds [80 kg]. The narrow head and beak are distinctive, as is the fact that the "scutes" or colorful plates on their carapace overlap like shingles on a roof. They have an unusual diet, feeding largely on sponges and other reef invertebrates and are named for their distinctive hawk-like beak.

Hawksbills are highly tropical in their distribution, and nest throughout the Caribbean Sea. Nesting typically peaks in late summer, but can continue at low densities throughout much of the year. Most females prefer to nest amongst beach vegetation. Nesting grounds often consist of small and isolated stretches of beach, often associated with shallow offshore reefs. This combination of traits can make it difficult for scientists to conduct nesting surveys on a regular basis.

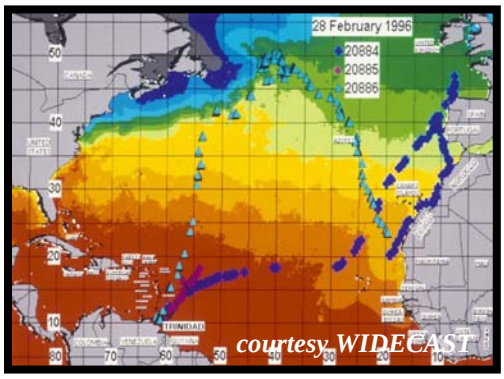
Green Turtle *(aka greenback)*
Green turtles, known to scientists as "Chelonia mydas" have a petite round head and a rather blunt beak. Green turtles are vegetarians, grazers actually, and they are often observed feeding on seagrasses in calm, shallow bays. "Green turtles" are not actually green. They were named because their body fat absorbs chlorophyll [the pigment that makes grass green] and thus they are green on the inside!



Green turtles often migrate vast distances between foraging grounds [feeding areas] and nesting beaches. By tagging females when nesting and recording the locations from which the tags are returned, scientists have shown us the many countries to which green turtles return after nesting at Tortuguero, Costa Rica, the largest nesting ground in our region. Adults have a remarkable ability to return to very specific nesting areas over the course of many years, and then return with equal precision to their preferred feeding ground, even if the two are separated by many hundreds of miles.

Leatherback Turtle *aka caldon, coffinback or battalie)*
Leatherback turtles, known to scientists as "Dermochelys coriacea", are perhaps the most spectacular of all sea turtles. Females nesting in the Caribbean often exceed 1,000 pounds [450 kg]! A male drowned in a fishing net off the coast of Wales, U.K., in 1988 weighed more than 2,000 pounds [916 kg]. The Leatherback does not have a hard, bony shell; rather, the leathery carapace is raised into ridges that streamline its dark grey spotted body. Leatherbacks nest in low numbers in most Caribbean countries, with the main areas being French Guiana, Trinidad, Costa Rica, the Dominican Republic, and Puerto Rico.

Leatherbacks eat soft-bodied animals such as jellyfish. They are a beneficial predator in that they delight in eating Physalia, which we know as the poisonous 'Man-O-War' jellyfish. They also enjoy Cyanea, the 'Arctic jellyfish', which can be 6 feet [1.8 meters] across and have tentacles 260 feet [80 meters] long! Sharp cusps in their jaw slice through the soft prey, and the mouth cavity is lined with stiff spines to aid in swallowing. Long flippers and heavily muscled shoulders make this species a powerful swimmer. Adults dive nearly constantly, and sometimes to depths exceeding 3,250 feet [1,000 meters]. Such diving skills are needed because the turtle lacks the protection of a hard shell. When threatened by a great white shark or an orca whale ('killer' whale), both known to eat Leatherback turtles, the only defense the turtle has is to out-swim, and out-dive the powerful predator!



Leatherbacks are also credited with some of the longest migrations on Earth, traveling over thousands of miles of open ocean between tropical nesting beaches and distant feeding grounds. This map illustrates the post-nesting journey of three Leatherbacks after they finished nesting in Trinidad in 1996. Notice that one headed north to feed in international waters, while another headed directly east, eventually settling to feed in the Bay of Biscaye. After more than a year, both ended up in the vicinity of the Cape Verde Islands before their transmitters stopped working. [Source: S. A. Eckert/ WIDECAST, used with permission]

All sea turtles have the ability to orient and to navigate by using an internal "magnetic compass" meaning that they can sense magnetic field strength (which varies from east to west like longitude) and angle (which varies from the equator to the poles, like latitude). By evaluating a combination of magnetic field strength and field angle, sea turtles can estimate their location [their latitude and longitude] in an otherwise featureless expanse of sea!

LOCAL THREATS TO SEA TURTLE POPULATIONS

Commercial fishing equipment entangles many sea turtles daily. As sea turtles need air to breathe, most will drown and be discarded as 'incidental by-catch' when they become entangled in fishing gear. This is currently the main killer of Leatherbacks worldwide. In 2004, the reluctance of the local Fisheries officials to crack down on the tremendous number of turtles being accidentally caught by trawlers led to a US ban on shrimp exported from Trinidad. Turtle Excluder Devices (TEDS) are in use on trawlers in the US, and in many countries throughout the world, to minimize the risk of sea turtle entanglement and drowning.

Illegal hunting (poaching) of pregnant females and eggs on nesting beaches and intentional capture of turtles at sea remain the biggest local threats to all of our turtles. Green turtles are the preferred eating turtle and are caught while nesting on land or more regularly in turtle nets set near the seagrass beds in which they feed. Hawksbills are targeted by hunters on land and by spear fishermen on reefs. Although the market for their shell has been significantly reduced by international laws that prevent trade in sea turtle products between countries, there is still a local market for the meat and eggs despite the fact that poisoning resulting from eating Hawksbill flesh has been reported in some parts of the world. Leatherbacks are not traditionally eaten but with the decline in the other species and the quantity of meat that one turtle yields, they are being increasingly targeted in Tobago.

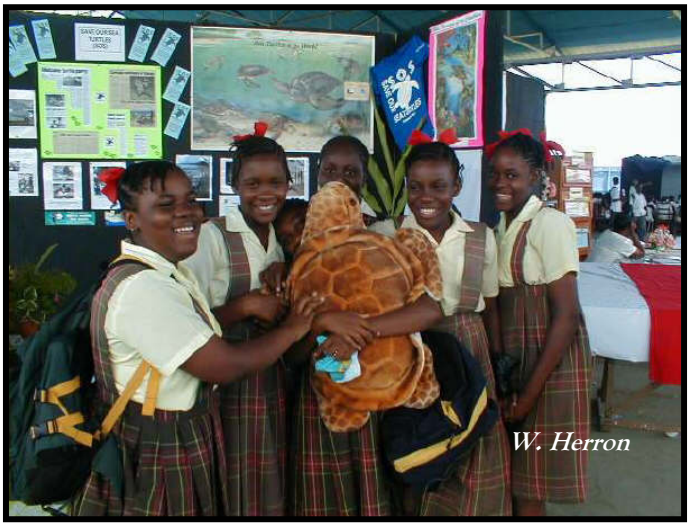
Irresponsible coastal development destroys nesting beaches and feeding grounds such as wetlands, seagrass beds, and coral reefs. **Illegal sand mining, even on a small scale,** destroys nests and can contribute to beach erosion, which reduces viable nesting areas for subsequent seasons. **Driving on the nesting beaches** destroys countless nests every year and **lights from beachfront homes, hotels and roads** disorient hatchlings and adults.

Garbage that is not properly disposed of washes out to sea where it can entangle turtles or be eaten, especially by Leatherbacks who will often mistake a plastic bag for their favorite food: jellyfish. Litter on land is also a threat to hatchlings that can become tangled up in discarded fishing line or plastic litter on the beach.

Water pollution has been linked to an increase in **sea turtle diseases** such as fibropappillomas, a herpes-related viral infection that causes tumours in green turtles. The tumours are often found around the face and flippers, making it difficult for the turtles to eat and swim and eventually leading to death by starvation, predation or drowning. It is not clear what effect this disease could have on humans who come into contact with contaminated turtles, but scientists warn against eating any animal, including a sea turtle, infected with a fatal tumour ailment.

Increasing **boat traffic** in Tobago's waters is taking its toll on the marine environment. For example, **high speed propellers** can fatally wound sea turtles, while **irresponsible anchoring** can damage or destroy reef and seagrass habitat that is critical to the survival of turtles, as well as to the survival of subsistence and commercial fisheries.

High natural mortality in young sea turtles and **slow growth rates** are not so much a threat as a conservation challenge. Only 1 egg in 1000 will produce a hatchling that will survive to reproduce. Moreover, it can take decades for a hatchling to become a reproductive adult, so it is difficult to judge the health of the population or the impact of the conservation effort immediately. Conservation efforts must, therefore, be sustained over the long term with the approach that the results may not necessarily be for the satisfaction of the current generation … but more for the enjoyment of the next.



A NOTE ABOUT BEACHFRONT LIGHTING

Of all the threats that reduce the survival prospects of our sea turtles, beachfront lighting is one of the most studied, easiest to remedy, and falls within our jurisdiction (unlike, for example, highseas fishing-related sources of mortality) so that we have very few excuses for not taking the responsibility for dealing effectively with this challenge.

Some countries have done well in quantifying this threat. For example, the Barbados Sea Turtle Project has recorded disorientation in as much as 60% of hatchlings after emergence and over 30% of females after nesting in that country on illuminated "hotel beaches". Beachfront lighting is also a major issue on Tobago's leading leatherback nesting beach, Great Courland Bay (Turtle Beach), and a growing problem around the island as coastal development increases. This is typical of many small islands where coastal development is often tourism-driven and many hotels are built as close to the shore as possible. Increasingly, the authorities are encouraging 'setbacks' from the coast as a way of reducing the environmental impact and the natural disaster risk. However, in many cases, remedial action is necessary to reduce or reverse the effects of existing lights on the nesting beaches and the sea turtles that use them.

The following pointers on beachfront lighting are drawn from Witherington and Martin's definitive manual: "Understanding, assessing, and resolving light-pollution problems on sea turtle nesting beaches" (http://www.nofs.navy.mil/about_NOFS/staff/cbl/LPSnet/FMRI-TR2.pdf).

- Turn off unnecessary or non-essential beachfront lighting, such as decorative lights.
- Think about timing. Temporary seasonal alterations to light management are not as good as permanent ones, but they can be very effective for the duration of the nesting season or at least for peak hatching and laying months.
- Limit light duration through the use of motion detectors; the more momentary a light source the smaller its effect.
- Use good light control. Position or shield lights so that they shine away from the beach, lower light fixtures or recess them in the wall or under the eaves so that there is less light scattered around on the beach.
- Use light screens to block the overall glow from lights that might be difficult to adjust at the source, such as distant streetlights. While artificial screens would work, plants like sea grapes can be encouraged to grow along the tree line, thus shielding the beach naturally. Such hedging has also been found to reduce erosion and increase Hawksbill nesting by providing more of the sheltered nesting habitat that these turtles prefer.
- Substitute longer wavelength light sources - such as pure red or yellow LED or true neon bulbs - for shorter wavelength blue, white or bright yellow lighting.
- Remember, if you can see a light while standing on the beach at night, sea turtles can see it, too!

HOW YOU CAN HELP AND WHY YOU SHOULD

Sea turtles play a critical role in the health and life of the ocean, which in turn plays a critical role in the health and life of our planet. Leatherbacks, for example provide an invaluable service to our fishing industry by consuming tons of jellyfish that feed on fish eggs and young and that also compete with fish for plankton and other micro-organisms. Green turtles, the "cows" of the sea, maintain healthy seagrass beds that are a safe haven for spawning fish, their young and a multitude of mollusks and crustaceans like conch. Hawksbills keep the sponge population in check, thus helping to maintain the balance between sponge and coral development that is so critical to healthy coral reefs.

Sea turtle conservation is therefore not just about the turtles, but also about the many coastal and marine resources that we also enjoy, such as the beaches, the reefs and the oceans. In this way the health of the sea turtle population is very much tied to the health of those visitors and residents who live, work and play along our coasts. Often the very things that lure us to the coast are most at risk as a result of our activities along the coast and we must all take a certain amount of personal responsibility to ensure that the impact of our building and our behavior is minimal. Issues of land erosion, water pollution and over-crowding affect humans and turtles alike. In this regard sea turtles are the ultimate mascot for responsible, sustainable coastal development; a thriving sea turtle population is a strong indicator of a coastal community that is creating harmony with rather than causing harm to their beaches and seas.

Due to the migratory nature of these creatures, their conservation is also not just a local issue but a regional and international one, as well. Our responsibility as concerned citizens is, therefore, not just to our country but also to the world. The numerous threats to sea turtles in the open sea as a result of the commercial fishing industry can sometimes seem overwhelming; however, it is precisely because there is so much that we cannot control beyond our shores that we must do everything in our power to protect these ancient creatures when they are within our reach. Sea turtles are a powerful ecological, cultural and even mythological presence in our part of the world; we are truly blessed to be able to interact so closely with an endangered species on the beaches at the point of their reproduction and in our near shore waters during their juvenile stages.


L. Kirkland

What Can be Done?

- **Get involved in species and habitat conservation efforts**
    - Keep the beach clean by disposing of garbage properly and moving natural debris behind the tree line.
    - Keep the beach dark by turning off beachfront lights (or lowering and re-directing them so they are not visible from the beach) and using only red-filtered lights and no flash cameras when 'turtle watching'
    - Keep the beaches safe by starting or joining an SOS Turtle Patrol or Turtle Watch Team in your area.

- **Spread the word to family, friends, neighbours and policy makers**
    - Contact SOS for informational materials, to schedule a 'turtle talk' or to participate in a 'turtle watch' with your family, office, club or church.
    - Encourage visitors to book a turtle watching tour with a THA certified, SOS trained tour guide (call SOS at 868 639-0026/9669 for current listings)
    - Ask your government representatives what they are doing to make a difference; lobby them to do more for Tobago's turtles and their coastal and marine habitat, which we also share.

- **Make responsible personal and professional decisions about how you live on the planet**
    - Don't drive on the beach or set campfires in the sand during turtle nesting and hatching seasons (March – October)
    - Sponsor an SOS activity or program or contribute patrol supplies like rain coats, flashlight batteries or even phone cards.
    - Report poaching and the illegal possession of turtle meat and eggs to the authorities.

SEA TURTLE NESTING BEHAVIOUR

Source: The information presented in this section is largely excerpted from WIDECAST (2001) "ENDANGERED SEA TURTLES OF THE CARIBBEAN", a narrated slide show.

Sea turtles spend their lives at sea, but adult females must come ashore to lay their eggs; with the exception of Green turtles in some parts of the world, male turtles rarely return to land once they hatch. Nesting is confined to tropical and subtropical areas and it is therefore during nesting or at the point of reproduction that we are most likely to come in contact with these ancient seafarers. Sea turtles are shy and cumbersome when out of their watery element. If you come upon a nesting sea turtle, it is essential that you remain still and leave your lights off! If you sit comfortably a short distance (10-15m) away, preferably behind and downwind of the turtle, you will find that your eyes adjust to the darkness and you can observe the nesting without disturbing her.

Once the gravid [meaning "egg-bearing"] female has chosen a suitable site on a dark sandy beach, she will sweep the area smooth and create a shallow body pit with her flippers. A nest chamber is then excavated using the rear flippers alone. Sand is scooped with one flipper and then the other until she can reach no deeper. This rhythmic, timeless process is characteristic of all sea turtle species. If the sand is too wet or too dry, she will be unable to complete the chamber and she may have to select another site.

With the egg chamber complete, the female quickly lays 100 or more leathery-shelled white eggs. The exact number of eggs may vary from 50 to 250, depending on the species. Leatherbacks are unusual in that a number of small, often misshapen eggs are also laid. These are laid last and contain no yolk; therefore, they do not produce hatchlings. Most females nest 2-5 times per year, again depending on the species, with leatherbacks, on occasion, depositing as many as 11 or 12 clutches of eggs during a single year!

After the eggs are laid, the turtle refills the nest chamber with sand and packs it firmly over the eggs. Sand is then flung in all directions, with the intent of confusing a potential egg-predator with an extensive area of disturbance. The exhausted female leaves her eggs to incubate in the warm sand, and she returns to the sea. She is unlikely to mate again, but rather will use sperm stored from matings earlier in the year to fertilize her next clutch of eggs, which, again depending on the species, will be ready for laying in about 8-15 days.

Since females lay multiple numbers of nests during each reproductive season, the number of nests must be further divided by the average number of nests produced by each female in order to estimate population size. In an area with 75 successful nests, the total number of turtles, in the case of Leatherbacks, might only be about 10 because each female is responsible for an average of seven - ten nests per year (typically a 3-4 month nesting season). The female never returns to check on her eggs, the hatchlings emerge after 6-8 weeks as perfect miniature replicas of their mother, instinctively prepared for life in the open sea.

SEA TURTLE WATCHING GUIDELINES

In recognition of the fact that: Tobago is an important nesting site for the Leatherback, Hawksbill and Green sea turtles; the World Conservation Union (IUCN) has identified the Green turtle as Endangered and the Leatherback and Hawksbill turtles as Critically Endangered (www.redlist.org); Trinidad and Tobago Fisheries and Forestry laws both identify these sea turtles as protected species from March to September (see Appendix III). "Turtle Watching" is growing in popularity both as a family past time and as a viable livelihood for tour guides during the turtle nesting season; there are currently no official regulations or laws informing the practice of "Turtle Watching"; irresponsible "Turtle Watching" can be disruptive to the turtles and to the nesting beach environment; and for "Turtle Watching" to be an important and successful part of Tobago's eco-tourism product, or of any field based education / public awareness program, it must be controlled by clear guidelines, the following revised "Sea Turtle Watching Guidelines" have been developed by SOS Tobago in collaboration with the Tour Guide Association and the Department of Natural Resources and the Environment.

Draft guidelines, submitted by SOS Tobago for review by the THA in 2004, have been in use since 2002 when they were presented at a Tour Guide Training Workshop and field-tested by SOS patrollers and tour guides on Turtle Beach that year. The Guidelines were subsequently reviewed, amended and approved in 2004 by regional WIDECAST experts, including marine biologist and founder of the Barbados Sea Turtle Project of UWI-Cave Hill, Dr. Julia Horrocks and the WIDECAST Director of Science, Dr. Scott Eckert, based at Duke University in the US. It is our hope that these guidelines can be adopted as policy by the THA for use on all turtle nesting beaches as a first step towards official, co-operative regulation of activities on those beaches during the nesting season. Please feel free to photocopy and distribute these guidelines to your guests, clients, friends and/or family who may be interested in turtle watching. See Appendix II for answers to some of the most common questions that may arise during a turtle viewing experience.

Turtle Friendly Tips

1) Turtles can be deterred from emerging on the beach, or scared off the beach before nesting, by light and activity. Be quiet and unobtrusive on beaches during the nesting season. Keep noise and movement to a minimum and you are much more likely to see a turtle!!
2) Don't use flashlights, flambeaux or campfires while on nesting beaches at night! Campfires can literally bake the eggs beneath them and light scares and disorients turtles and hatchlings. For this reason, beachfront lights should be turned off or shielded in such a manner that they do not shine on (nor can they be seen from) the beach (see "A Note about Beachfront Lighting").
3) Refrain from smoking! Turtles may be disturbed by smoke and other strong fragrances.

4) Don't litter! Garbage left on the beach can trap hatchlings and prevent them from reaching the sea. Turtles at sea can choke or suffocate when they mistake floating plastic bags for jellyfish.
5) Don't drive on nesting beaches! Vehicles can crush entire clutches of eggs (or hatchlings waiting, unseen) beneath the sand.
6) Don't stake umbrellas or other objects on nesting beaches. Nests will not always be obvious, and for this reason sandcastles should also be kept below the high water mark to avoid accidentally disturbing or destroying any eggs.
7) Control (leash) dogs on the beach as they can sometimes dig up nests for fun, or to eat eggs and/or hatchlings; some have even been known to attack smaller species.
8) Don't ride or harass nesting turtles or try to keep hatchlings as pets! Not only is this harmful to the turtles, it is also illegal in Trinidad and Tobago during the annual closed season.

Turtle Encounter Guidelines for Nesting Beaches

1) Group size: the Visitor:Guide ratio should not exceed 10:1 on Tobago nesting beaches.
2) As soon as a turtle has been sighted, quietly and slowly retreat to a distance of 15m (45ft) away from her and make yourself comfortable. The entire nesting process can take up to 2 hours. Keep your lights off, your eyes will adjust and you will enjoy the encounter much more fully.
3) When the turtle has stopped digging, the SOS Turtle Patrol, hotel security or a knowledgeable trained guide will determine if the laying process has begun by approaching the turtle cautiously from behind (see "Flashlights").
4) During the actual laying process, SOS patrollers and / or hotel security may record the size and well being of the turtle and occasionally, if the situation permits, small groups may be led closer to briefly see the eggs.

a) Groups shall consist of no more than 10 persons at a time.
b) Groups may move forward, in turns, once the nest cavity is completed and may stay until the first phase of covering the eggs is completed; once the front flippers are engaged in covering, all persons must move back to their original location.
c) Closer viewings will be conducted on a first come, first serve basis with preference being given to children.

5) Be sure to stay behind the turtle at all times, i.e. WHERE SHE CANNOT SEE YOU!

Flashlights

1) All flashlights being used on turtle nesting beaches during nesting season should be equipped with a red photographic-quality filter that filters out all other colors or that uses a red LED bulb. Note: red cellophane is not adequate because it allows other colors to transmit, even though to the human eye the light appears to be "red".

2) Overall flashlight use should be kept to a bare minimum, and pointed downward at your feet … not swung aimlessly about.
3) Flashlights may be used from behind the turtle, as long as the turtle cannot see the light, to:
    a) highlight the laying process,
    b) aid in the collection of research data by qualified beach patrollers,
    c) Aid in the case of an emergency.
4) Never shine a flashlight near the turtle's face or directly at hatchlings; they have very sensitive eyes (see "Photography").

Photography

1) Flash photography of nesting turtles is a controversial issue. In some places it is considered harassment and is illegal. Out of respect for the nesting turtle, SOS Tobago asks that there be no flash photography. These blinding flashes are known to disorient both adult and hatchling turtles and complicate or postpone their return to the sea. Buy a postcard instead! Infrared / low-light video recording (with permission from your guide) is acceptable if no artificial light is used.

Hatchlings

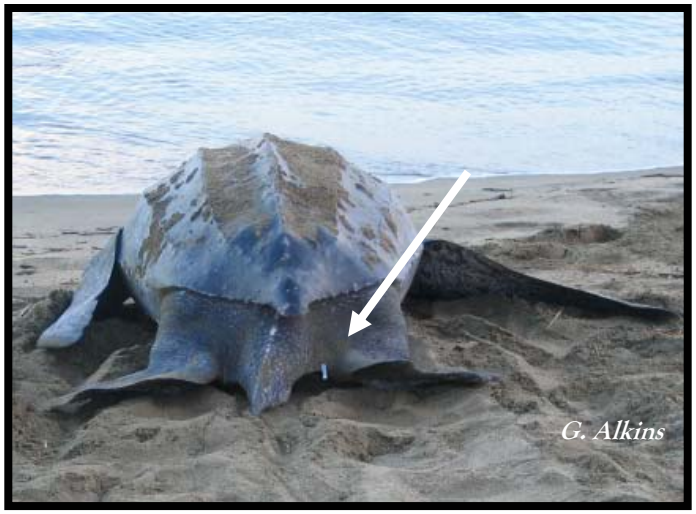
1) Be VERY careful where you put your feet when there are hatchlings on the beach - they are difficult to see at night and can be easily crushed!
2) Do not touch or disturb emerging hatchlings, as they must orient themselves to their environment by crossing the beach. NEVER place hatchlings directly into the sea.
3) As far as possible, remove any obstructions (sandcastles, debris etc.), control any potential predators (dogs etc.) and turn off or block any light sources that may complicate the hatchlings journey to the sea. Remember hatchlings need to see the bright, open horizon of the ocean to find their way "home"!
4) SOS Turtle Patrol, hotel security or a knowledgeable guide may assist hatchlings disoriented by artificial lights by gathering them up and releasing them at a darker point along on the beach. This is in accordance with international best practices and does not confuse the hatchlings' natural orientation processes.
5) After emergence has ceased, SOS Turtle Patrol may excavate the already hatched nest to assess hatching success and to release any hatchlings trapped behind in the nest.

DATA COLLECTION

The data collected by the SOS Tobago Beach Patrol is used for our own internal population monitoring and forwarded annually to the international scientific community through the Wider Caribbean Sea Turtle Conservation Network (WIDECAST). Information collected includes time of approach and departure, as well as length, width, tag numbers etc. Data sheets, like the one below, are helpful for standardizing the information coming in. All "hands-on" work, like measuring and tagging, is done with a red light while the turtle is egg-laying. If there is a rowdy crowd or the turtle appears otherwise unsettled, this kind of information is forfeited; the turtle always comes first. While tagging requires specialized training and equipment, measuring and general health assessments require nothing more than a measuring tape and a keen eye.

Measurements are taken from the edge of the carapace / shell (just behind the head) to the furthest tip (alongside the central ridge in Leatherbacks)- this is called the curved carapace length (CCL). The curved carapace width (CCW) is taken across the widest part of the carapace / shell. Tags and other identifying marks are often found along the flipper edges with most Leatherbacks being tagged in the rear and Hawksbills and Greens in the front, usually one on each side. The tags may not be readily visible and it is often necessary to feel, gently, around in the folds of the flipper to be sure that none are present, try to avoid the sensitive tail when looking for rear tags. If tags are found, there will be a number on one side and a return address on the other, these should be noted and **if** the turtle is dead, the tags should be removed and returned directly to the address or passed on to SOS for return, **only if the turtle is dead**, otherwise just submit the numbers as recorded.

Make a note of any injuries or obvious scars or nicks on the carapace, shoulders and head as well. Rope or net/fishing line "burn", for example, is a very commonly recorded as a pink / white stripe around the shoulder. Just record what you see. If you are interested in getting more involved in the scientific side of patrols and monitoring, call us to find out about upcoming training workshops etc. Feel free to photocopy the attached data sheet (Appendix V) to keep records on your own beach, even if just to keep track of nests rather than actual nesting events. **ALL INFORMATION IS VALUABLE AND WE ENCOURAGE YOU TO SEND COPIES OF YOUR DATA SHEETS TO SOS AT THE END OF THE SEASON.**



EMERGENCY RESPONSE PROCEDURES

While on the beaches during turtle nesting season, a variety of incidents can occur that are relatively extra-ordinary. These can be positive, like a turtle nesting in daylight, or negative, like finding a turtle carcass butchered by poachers (illegal hunters). Either way, these incidents tend to generate even more interest and excitement than the average nesting or hatching situation and, as such, a cool head and a confident response is very important. The following scenarios have all happened more than once on SOS Tobago's main index beaches and although every incident is unique, certain aspects of the response can be streamlined for maximum efficiency.

These procedures are by no means "cast in stone", they are simply a distillation of what has and has not worked for us. In all cases it is advisable to call SOS immediately so that even if, for some reason, we are not able to respond in time, in person, we can be on the line to help you through step by step **(see Appendix I for emergency contact numbers)**. Cell phones can be very helpful in this regard. Please, NEVER abandon a sea turtle in distress. If all else fails, be creative, put yourself in the turtle's position and see if you can find another way to help her and then tell us about it! By reporting all incidents to SOS Tobago as soon as they happen (while the memory is still fresh) we are able to continuously adapt and improve these procedures based on what is learnt from your experience.

What do I do if a turtle comes on to the beach in daylight?

This is a relatively rare occurrence that happens more often on rainy or overcast days and does not always result in a successful nest, sometimes she is just checking things out. It is difficult to keep people the full 15m away in the day; the beach is busier and people are excited and often want to get close for the purposes of photography. Some will argue that as the turtle is up in the day anyway, "she is obviously oblivious to the other distractions". However, just as at night, the turtle can eventually be scared off by insensitive behaviour and it is important to emphasise this to onlookers. Try to keep people well behind her until she has started to lay and stay clear of her head at all times, especially when she is covering and getting ready to return to the sea. There is sometimes a feeling that once she is returning "anything goes", but this should not be the case. Do not block her path to make her stay longer for the sake of getting more pictures - if she is ready to go back, allow her to do so.

Absolutely forbid onlookers, including children, to ride the turtle to the sea. Explain that hauling her 300-500 kg frame (in the case of a Leatherback) out of the neutral buoyancy of the sea has already been extremely difficult. Ask the visitor to watch her compassionately for a minute, noticing how laborious it is for her to breathe, and then emphasise how much more difficult it would be for her if she were carrying extra weight. Consider taking the children closer to see the turtle's eyes or the pink spot on her head, using the opportunity to discover and discuss the little details that are not always visible at night (see Appendix II for more ideas and answers to frequently asked questions).

What do I do if a nesting turtle becomes disoriented?

Before nest-digging begins it is common for a turtle to spend some time wandering around trying to find the 'right spot', which is why it is so important to give her lots of room in those critical early stages of the nesting process. If she does settle down, she will often lay or if she is not satisfied with the situation she may leave and try again later or elsewhere. However, if a turtle is found heaving herself across the beach after laying, obviously disoriented, it is important to figure out why she is behaving like this. Lights, other human distractions or a misunderstood obstacle may be confusing her. Observe her carefully for a few moments before making a decision to ensure that she is definitely moving in the wrong direction and not just circling to disguise her nest.

a. If something or someone is blocking her path to the sea, move it/them.
b. If an embedded obstacle is in her way, encourage her to turn away from it by standing or placing a baton or strong stick in front of the edge of her flipper, restricting her movement and causing her to turn. Never strike or threaten the turtle with any object.
c. If the disorientation occurs at hight and she is clearly heading towards a light source, there are three options that may work singly or in combination, depending on the situation.
    i. Turn the light(s) off!
    ii. If there are enough people around, use them to create a lights shield; i.e. have them move closer to each other to form a closed line between the turtle and the light (while still maintaining some distance from the turtle herself) so that her head is kept in shadow. Have them move slowly as she moves so that her head remains in shadow, gradually leading her in this way to the sea edge.
    iii. In combination with (c)(ii), encourage her to turn by restricting flipper movement on one side as described in (b).
    iv. If she still persists in moving away from the sea, catch her attention with a white light flashlight shown on the sand in front of her, and gradually guide her back to the sea – still using the crowd as a light barrier and even guiding her flippers if absolutely necessary. Do not move the light too quickly ahead as she will lose sight of it and go back towards the initial 'problem' light, so try to hold her attention. DO NOT TURN OFF THE LIGHT UNTIL SHE IS COMPLETELY IN THE WATER, this often means having to walk in with her. If you are in uniform it is better to have someone else do this part, try to make the transition seamless, keeping the light steady.

What do I do if hatchlings are disoriented?

Hatchlings are even more sensitive to light than adult turtles and are sometimes much harder to locate because of their size. If there is one disoriented hatchling there is a good chance that s/he is not alone so it is important to search the area thoroughly for any other stragglers by following their tiny tracks. It is helpful to have a clean bucket to collect them in so that they can all be taken down to a dark part of the beach and released simultaneously above the high tide mark; this helps them to maintain the advantage of safety in numbers by all entering the sea together. If the chosen area is still not dark enough, use the flashlight to help guide them to the sea by focussing the beam just in front of the pack (on the sand, NOT in their eyes) and gradually moving it closer to the water just as you would for an adult.

What do I do if a turtle is digging in an unstable area i.e. too close to the waterline / river?

Desperation, inexperience and human distraction have all been blamed for why some turtles lay in sometimes obviously unstable areas, but no one really knows why. It may be as a consequence of nesting on dynamic beaches where sand erodes and builds up frequently. Whatever the reason, moving a nest is a lot of work and should be seen as the last resort, the decision is largely based on what stage she is at when she is discovered. Moving eggs is tricky and requires both gentleness and precision, but in the case where a nest is clearly doomed, it is worth the risk. Call SOS first but if we are unavailable, this is how it is done:

a. If she has just started digging with her rear flippers:
    i. Quietly approach her from behind and place an obstruction in the hole like a big coconut or a stone. This should cause her to move off (hopefully away from the water) and try somewhere else. Be persistent.
    ii. IF you have had some experience leading a turtle back into the water with a flashlight, the same technique may be used here to guide her higher up the beach. Typically the light will cause her to pause and then follow and at some point, she will try to body pit again and the light can be removed. This approach can be very effective but is controversial because there is a risk that she may decide to abandon nesting all together; however, if the nest is going to be lost anyway there are clear benefits to giving it a try. It is important to explain to everyone what is going on and to have just one person take command of the situation – do not crowd the turtle.
b. If (a) doesn't work OR if she is almost finished digging the nest hole:
    i. Enlist the help of other onlookers and explain your actions clearly and with authority, not with attitude; conflict and debate will just cause you to lose precious time.

ii. QUICKLY send someone to get a sturdy garbage or dive bag and meanwhile dig an egg cavity in a safer location, making sure that there are no other nests already there! The hole should be the same depth as the turtle would have constructed, in the case of a Leatherback that would be arm's length deep. In any case the new nest should be slightly rounded and wider at the base (i.e. like a corn bird nest underground) and well smoothed around the edges.
iii. Using the garbage (or dive) bag, line her egg cavity so that all four corners stick out of the nest. When she has completed laying, dig out the side of the nest facing you so that you can (gently) gather up the four corners and lift the bag from the nest. It may take two people, remember that the eggs are slippery. DO NOT attempt to pull the bag directly from the nest, remember that it's wider at the bottom than it is at the top so there is no way to pull the eggs straight up without the bag breaking so you'll need to enlarge the hole by digging out the back. When the eggs are free of the nest, transport them to the new site and remove them, one by one, from the bag and place them gently in the waiting hole. Cover the nest with sand, imitating the gentle but firm movements of the turtle.
iv. Before handling the eggs, rub your hands in sand and water at the sea's edge to remove any sunscreen, bug repellent or other potential contaminant. If possible, use thin latex (surgical) gloves or plastic bags on your hands to reduce risk (remember that a thick glove will compromise your feeling, and you may not treat the eggs as gently as you should).
v. Note carefully the spot where the eggs have been reburied so that you can monitor the progress of the nest until it, hopefully, hatches.

What do I do if I see a nest being eroded and eggs washing away?

It is never too late to try and save a nest that is doomed by circumstance, call SOS to relocate the nest or if necessary, attempt to relocate it yourself following the instructions above for preparation and packing of the substitute nest, record the location and report to SOS.

What do I do if a turtle gets stuck in a river or on rocks?

Assess the situation immediately; is she in mortal danger or just in an uncomfortable situation? Can she breathe normally? Is she panicking? Is it night or day? Sometimes, particularly if it is a smaller turtle stuck in a river or tidal pool, the situation is not immediately critical and time can be taken to pull together a small team to get her out.

Whatever the species, it is useful to give the turtle time to come out on its own; if this is clearly impossible, then human intervention is needed.

a. If it is night time, try to lure her out with a flashlight as described above.
b. If a smaller turtle (Hawksbill, Green) is stuck, call SOS and Fisheries immediately as she will have to be physically lifted and removed.
c. If a Leatherback is stuck in the mud, obstructing her flipper movement from behind will give her something firmer with which to leverage herself out. Call SOS and Fisheries for back-up. Be aware of human safety, especially if the river is polluted (anyone going in the water should wear boots).
d. If a turtle is stuck on the rocks, call SOS and Fisheries for back up, as she will have to be physically removed. Be very aware of human safety, stay clear of the flippers and head to avoid being thrown into the water. If you can't free her yourself, splash water or drape a wet towel on her back until help arrives, leave her head free, (she needs to breathe), stay calm and try to keep her calm as she will damage herself more by thrashing around.
e. NOTE: Leatherbacks, in particular, are extremely powerful; don't position yourself in front of a flailing turtle and avoid being struck by a front flipper.

What do I do if a turtle is tangled in rope or nets?

Assess the situation immediately, is she at sea or on land? Tangled in fishing net or boat ropes or buoy line? Do you know how long she has been there? How badly is she tangled? Is her neck and head free? Are one or both front flippers tangled? Is her whole body tangled? Can she breathe? Has the rope cut through her skin? What is the rope / line / net attached to? Can she be untangled or will you have to cut the rope / line / net? Do you have a sharp enough instrument (dive knife is good)? Most importantly, make sure at least one fisherman is there – their experience is critical to ensuring that the turtle is freed effectively, with as little damage to the equipment (net, anchor line, etc) as possible. Always seek to find out who the owner is so that they can be reimbursed if damage occurs and encourage fishermen in your area to store their nets in piles or on racks to reduce the likelihood of entanglement of nesting turtles or hatchlings on the beach.

a. Time her breathing and moving so that your actions will be in rhythm with hers, not fighting against it. If she is very stressed and you can't seem to get a natural pause, make an attempt to cover her eyes with a T-shirt or towel to calm her down (careful not to obstruct her breathing).
b. If she is tangled on land in a net, carefully untangle the net from her flippers, pausing whenever she moves and keeping the freed bits of net as far away as possible so that she doesn't re-entangle herself. Try not to cut the net unless it is absolutely necessary.
c. If she is tangled and moving towards the water with the net / rope, use a flashlight to trick her into coming back on to shore and then disentangle

her. It may be possible to stand with her in shallow water, where you can manoeuvre her more easily.

d. If she is tangled at sea, call SOS, Fisheries, the nearest dive shop, the owner of the boat / net / buoy, or any other fishermen ASAP! Disentangling a turtle at sea is extremely risky and best left to divers and fishermen as their experience and training gives them a lot more 'water sense' than the average person.
    i. If you are the person going in the water, do NOT go alone, work with at least one other person. Remember to time her breathing and movements, taking advantage of her natural pauses and staying well clear of the line / net yourself. Be sure to free the neck, head, carapace and rear flippers first, because once the front flippers are free, she will take off. **Remember to secure the boat / net firmly, work with the boat / net owner or another fisherman from the same area**.
    ii. Examine the pattern of entanglement carefully. DO NOT cut the rope / line in such a way as to enable the turtle to simply swim away with the line still strangling her or cutting into her flesh. Similarly, be aware that if you release her from a line / rope that has cut deeply into her flesh, she may bleed out. Use common sense, do the best you can.
    iii. If you are the person on shore, find out the name of the boat / net owner and his/her contact details and pass it on to the SOS and Fisheries officials. Prepare dry towels and something to drink for the people in the water.
    iv. If the turtle is seriously injured, consider contacting a veterinarian or local aquarium, where trained staff are on hand. Visit www.widecast.org/trauma for detailed information on how to respond to a critically injured sea turtle, and see "What do I do if a turtle is sick or injured?" below.

What do I do if a turtle is sick or injured?

Most importantly, keep good notes; this is critical if we are to understand how these creatures heal from injuries or cope with disease and pollution. Observe everything about her, strange sounds, smells and behaviour can be an indicator of disease. Common situations are:

a. A strange smelling greenish brown slime covering the carapace. This can be wiped off when she is egg-laying. Place an uncontaminated swab of the substance in a plastic bag (for example, use the bag and not your hand to collect the sample) and refrigerate it as soon as possible for further analysis as it could be linked to offshore oil/gas activities.

b. Excessive difficulty breathing could indicate an obstruction. If an obstruction like a plastic bag is protruding from the mouth, try gently removing it when she is egg-laying. If a fishing line is protruding from the mouth as if attached to a hook, SOS has a device to remove hooks from the throat, call us immediately! DO NOT attempt to remove a line that is protruding from both the mouth and the cloaca (egg-laying opening), as you can seriously damage the turtle internally.
c. Minor (and even not-so-minor) lacerations / rope burns are common and will heal quickly on their own in the salt water; carefully note location, condition and colour of wound.
d. Hooks should be removed when the turtle is egg-laying; pliers or galvanise cutters can be used to cut off the barb so that the hook can be eased out.
f. If a turtle is missing more than half of either front or rear flippers, she may need assistance in the nesting process.
    v. If she is missing a rear flipper it will be difficult for her to dig deep enough, so please assist her by lying quietly behind her and mirroring the action of the good flipper. Go in rhythm with her movements and try not to get in the way. Remember that in the case of a Leatherback, the hole should be an arm's length deep (0.7-1m). If both rear flippers are compromised, she may also need help covering the nest, again be as inconspicuous as possible. NOTE: Assisting a turtle in her nest excavation is not as simple as it sounds. Do not rest directly on the edge o f the hole, as tempting as that is when the hole begins to deepen. Brace one hand and arm well away from the nest rim and use the free hand to dig, much like doing a one-handed push-up. Enjoy the exercise! If your weight falls too near the rim of nest it will collapse, necessitating that both you and the sea turtle start over.

What do I do if I find a dead turtle on the beach?

If the turtle is clearly freshly killed, immediately call the Police, the Departments of Environment and Fisheries, SOS and the media (see Appendix 1). If you feel threatened on the scene, immediately seek out any person of authority, such as a hotel security guard. Leave the area untouched, as if it were a murder scene, until the officials arrive. Keep an eye out for suspicious characters and observe and record everything about the incident, including the time, the turtle's condition and the persons observed. Turtle related arrests are rare, but only possible with proper information and follow through. Local turtle laws are listed in Appendix III. If you find a well decayed carcass on the beach, report the findings to SOS who will notify the relevant authorities.

What do I do if I see someone in the process of digging up eggs or killing a turtle?

According to SOS patrol protocol, if the damage is already done (i.e. turtle is already dead or the nest is already fully excavated) and you have not yet been seen, retreat and call Police, Department of Natural Resources and the Resources (DNRE) and SOS immediately (see Appendix 1) so that the persons may be caught in the act and an arrest made. If the turtle is still alive or the nest barely disturbed, make an attempt to scare the offenders off using lights, noise, legal threats, … whatever it takes. DO NOT COMPROMISE YOUR PERSONAL SAFETY. Always note very carefully the identity of the perpetrators and try to speak clearly with people to diffuse potentially confrontational situations. The law is on your side, most people know this and would rather be given a way out than a fight.

What do I do if a nest hatches during the day?

Ideally a nest will hatch at or after dusk when predators are less active and the sand is cooler, but if a nest hatches well after dawn (in the heat of the day) the hatchlings will very likely need some help to make it safely to sea. Try to keep predators (dogs, birds, crabs) at bay until the hatchlings have crossed the beach. If the sand is too hot for you to stand on comfortably barefoot, it is definitely too hot for the hatchlings. Take them to the edge of the high water mark or create a wet path for them in the sand (this is one case where you can actually place hatchlings directly at the water's edge; otherwise, it's best to let them orient on their own). If they appear to be overwhelmed by the heat, revive them by gently drizzling salt water on their heads and backs. It is important that the hatching process be as natural as possible so that you do not interrupt the natural progression of the hatchling from the nest, across the beach, through the coastal zone and into the open sea where it will spend its first several years of life. If the hatching event is completely out of control or if you come across lethargic hatchlings in the middle of the day, get them out of the sun and into some damp sand (such as might be placed in a cooler) until they have the strength to respond to gentle stroking (which mimics the movement of other hatchlings emerging from the nest). NEVER TOSS HATCHLINGS DIRECTLY INTO THE SEA, or "ferry" them into deeper water. Report all hatching events to SOS for recording purposes.

Appendix I

EMERGENCY CONTACT NUMBERS

PLEASE KEEP THESE NUMBERS UP-TO-DATE, IN CASE OF EMERGENCY; IT IS VITAL TO HAVE THE AUTHORITIES, THE MEDIA AND OTHER HELPFUL INDIVIDUALS ON CALL. CONTACT SOS TOBAGO OR THE DEPARTMENT OF THE ENVIRONMENT FOR THE NAMES AND NUMBERS OF HONOURARY GAME WARDENS IN YOUR AREA; THESE PRIVATE CITIZENS HAVE BEEN VESTED WITH THE AUTHORITY TO ARREST AND CHARGE PERSONS CAUGHT VIOLATING THE WILDLIFE ACT.

FOR REPORTS OF ANY TURTLE ACTIVITY (NESTING, POACHING, HATCHING ETC)
SOS TOBAGO – 635 –1728 / 762-5542 / 639 –9669

FOR REPORTS OF POACHING OF EGGS and/or ADULTS
POLICE – 999
OLD GRANGE STATION – 639-8888
ROXBOROUGH STATION – 660-4333
MORIAH STATION – 660-0029
CROWN POINT STATION – 639 –0042
or, ENVIRONMENTAL POLICE / DEP'T OF ENVIRONMENT – 639 –2273
or, HONOURARY GAME WARDENS IN YOUR AREA *(fill in as relevant to area)*
e/g NAME: Jester Allman, Hon. Game Warden for Plymouth NUMBER:639-1385
NAME: NUMBER:

FOR REPORTS OF ENTANGLEMENT
DEP'T OF MARINE RESOURCES AND FISHERIES – 639 –4446
or, DIVE SHOPS / HELPFUL BOAT OWNERS IN YOUR AREA *(fill in as relevant to area)*
- e/g NAME: Eco Adventure Divers @ Grafton Resort (Andrew Lovell) NUMBER: 639-9667
- NAME: NUMBER:

FOR REPORTS OF TAGS
- SOS TOBAGO – 639 –0026 / 762-5542 / 753 –9004 / 639 –9669
- INSTITUTE OF MARINE AFFAIRS, LORI LEE-LUM – 634-4291-4

OTHER USEFUL CONTACTS
MEDIA
- TOBAGO CHANNEL 5 – 635 – 1412
- RADIO TAMBRIN – 639 – 3437

FISHERMEN IN YOUR AREA *(fill in as relevant to area)*
- NAME: NUMBER:

BEACHFRONT PROPERTY OWNERS *(fill in as relevant to area)*
- NAME: NUMBER:

Appendix II
FREQUENTLY ASKED QUESTIONS

MOST OF THE QUESTIONS BELOW APPLY TO LEATHERBACKS, ONLY BECAUSE THAT IS THE SPECIES THAT WE HAVE THE MOST EXPERIENCE WITH AND IT IS ALSO THE SPECIES MOST COMMONLY USED FOR 'TURTLE WATCH TOURS'. HOWEVER, HAWKSBILLS ARE ALSO COMMON IN TOBAGO AND IF YOU SHOULD NEED MORE INFORMATION ABOUT THEM, FEEL FREE TO CONTACT US.

Why does the nesting turtle "cry"?
Nesting sea turtles do shed tears, but in fact these salty secretions are the turtles' way of ridding the body of excess salt consumed at sea. There are tales told about how the mother is crying because the nesting process is so difficult, or because so many of her eggs are stolen by man and other predators, or because she will never see her tiny hatchlings. But the truth is that all sea turtles "cry", whether they are on land or in the sea. It's an important part of their physiology!

How many eggs does a Leatherback lay?
A Leatherback will lay approximately 85 to 100 yolked eggs each time she nests, as well as variable number of unyolked eggs which will not develop into hatchlings but presumably play an important role in the nest environment.

How often does she nest?
A Leatherback typically nests every 2 to 3 years, but sometimes intervals of 5 years of more are documented. When it is her "nesting" year she will lay 3 to 10 (or more!) nests at 8 to 12 day intervals.

What determines whether a hatchling will be a male or a female?
In sea turtles, as in all reptiles, the temperature of the nest during the incubation period is largely responsible for determining the sex of the hatchlings. The warmer the nest, the greater proportion of young are likely to be female.

Do the male Leatherbacks ever come ashore?
No. Once the male hatchlings emerge from their nest they head to the sea and remain there for the rest of their lives. The only time we might see a male is prior to the nesting season when they mate with the females; on occasion the mating will occur in local waters.

Why are the Leatherbacks on the "critically endangered" list?
Because the worldwide population has declined so rapidly in recent years. The term "critically endangered", which is also applied to Kemp's ridley and Hawksbill sea turtles, is used when the global scientific community can document a decline of more than 80% of a species' numbers over the period of "10 years or three generations, whichever is longer". In sea turtles, three generations (roughly 100 years) is the longer, and so it is over the course of the 20th century that we have seen such dramatic declines in global stocks as to necessitate urgent and large scale conservation efforts. Indeed, the Leatherbacks in the greater Pacific Ocean will, by some estimates, be extinct within a decade.

Why is that?
There are a number of reasons why their decline has been at such a rapid rate, with huge losses reported in recent decades (did you know that half of all adult Leatherbacks on earth were lost during the 1990s when the Pacific Mexico colonies were devastated as bycatch in commercial fisheries in Peru and Chile?). Loss of habitat is due to coastal development and beach erosion, as well as pollution in our oceans such as oil slicks, red tide etc. Plastic bags in the water look like jellyfish to a turtle; if they eat it, the plastic bag is non-digestible and will stick in their throats or obstruct their intestines, causing them to suffocate or to starve. One of the biggest culprits is the fact that sea turtle are caught as "bycatch" in commercial fishing; for example by gillnets or longlines laid for miles in the sea to catch tuna/swordfish. Turtles often become snared or entangled in these and since they need to surface periodically to breathe, they often end up drowning. Poaching of nesting females and eggs is another factor, especially here in Tobago.

What role does Trinidad and Tobago play in the survival of these creatures?
Trinidad and Tobago is the largest island-nesting colony of Leatherback turtles in the world, and the second largest known nesting colony (after the Guianas) left on earth. We have a unique and urgent responsibility to the survival of this species, globally, by protecting the nursery grounds for this ancient and gentle creature. Adult leatherbacks leaving Trinidad and Tobago after nesting are known (from satellite telemetry studies) to return to foraging grounds in the far north and eastern Atlantic Ocean. Most Leatherbacks encountered in North America, Europe, and Africa were born in Trinidad, Tobago,, French Guiana or Suriname. Can you imagine the "ripple effect" to the ecology of the greater Atlantic basin if our nursery ground were to be lost?

How long do Leatherbacks live?
It is thought that Leatherbacks have a lifespan roughly equivalent to that of a human, perhaps 75 years. However, due to the extreme conditions they now face (mentioned above) it is doubtful that many live that long. Here in Tobago the nesting females are much smaller than they were 20 years ago. Why? Because they don't live long enough to reach their greatest size.

How old are the females when they start to nest?
Scientists believe females start to lay at about age 25, which is similar to reproductive maturity for other Caribbean sea turtle species. Age at maturity ranges, depending on the species, from about 12 (in the case of Kemp's ridley) to nearly 40 (in the case of the Green turtle) years.

Why do the turtles nest in Tobago?
The turtles that nest here were born in Tobago. Turtles always return to the general areas of their birth to lay their eggs. Although Leatherbacks travel to colder regions such as Canada and northern Europe for food, they must nest on tropical and subtropical beaches in order to provide the best incubation conditions for the eggs.

What do Leatherbacks eat?

Leatherbacks eat only jellyfish and related animals, and it is thought that the reason they travel such tremendous distances is that they are following their food source. Leatherbacks particularly enjoy very large jellyfish found only in colder, northern waters.

Why is "Turtle Beach" the favourite beach in Tobago for Leatherbacks?
Because it has a deep water approach; the Leatherbacks are so large it is easier for them to get closer to the shore at Turtle Beach and onto the beach more quickly. They would never nest at Pigeon Point, for example, as it is too shallow for such large reptiles and they would be dragging on the bottom long before they reached the shore. In addition, they cannot cross coral or rock because of their fragile "skin" covered shell, which scars and bleeds easily.

Why don't we collect all the eggs into a protected hatchery?
One of the most interesting aspects of sea turtle biology is that the sex of developing embryos is determined by temperature! Female turtles are produced in warmer nests, males in cooler locations, and a temperature of about 29.5 ^{o}C produces roughly equal numbers of males and females. Careful round the clock monitoring is necessary to ensure that the natural gender balance is maintained, as a population of all males or all females would be unable to reproduce. Hatcheries must be well constructed to keep dogs and other predators out, guarded to preclude egg theft by humans, and moved every year because toxins build up from the organic materials left behind after the nests hatch. Hatcheries are a lot of work! This is not to say that beach hatcheries are not useful under some circumstances, in cases where an area is consistently lost to the elements (e.g. at river mouths) it may be worthwhile to move 'at risk' nests to a more secure location. However, here in Tobago our sea turtle threats are generally human-induced, meaning that simply concentrating the eggs in a highly visible hatchery enclosure may increase rather than decrease their vulnerability.

Why don't we just breed sea turtles in captivity?
As for captive breeding, it is well known that sea turtles take many years to reach maturity and require professional husbandry facilities to ensure their health and survival during this time. Even if we had those luxuries in Tobago, how do we know whether they will know how to feed themselves, how to defend against a shark, or how to locate their nesting beach when the time is right? And what is the point of making more turtles, if the habitat continues to deteriorate? It is the policy of SOS to preserve naturally functioning coastal ecosystems in Tobago that enhance the quality of life for our people and our turtles, so rather that focusing efforts on creating artificial environments that may or may not be successful we choose to focus our limited resources on protecting the nesting females in their natural habitat. We feel strongly that this will yield the greatest conservation result for our turtles and the coastal habitat upon which we both depend.

How do you know the difference between a male and a female?
Mature adult male turtles have a distinguishable tail that extends well beyond the end of the carapace / shell, but it is virtually impossible to tell the difference at the juvenile stage by sight. One of the challenges to enforcement of our current Fisheries legislation is that the law prohibits capture of "any female turtle that is in the sea within any reef or within

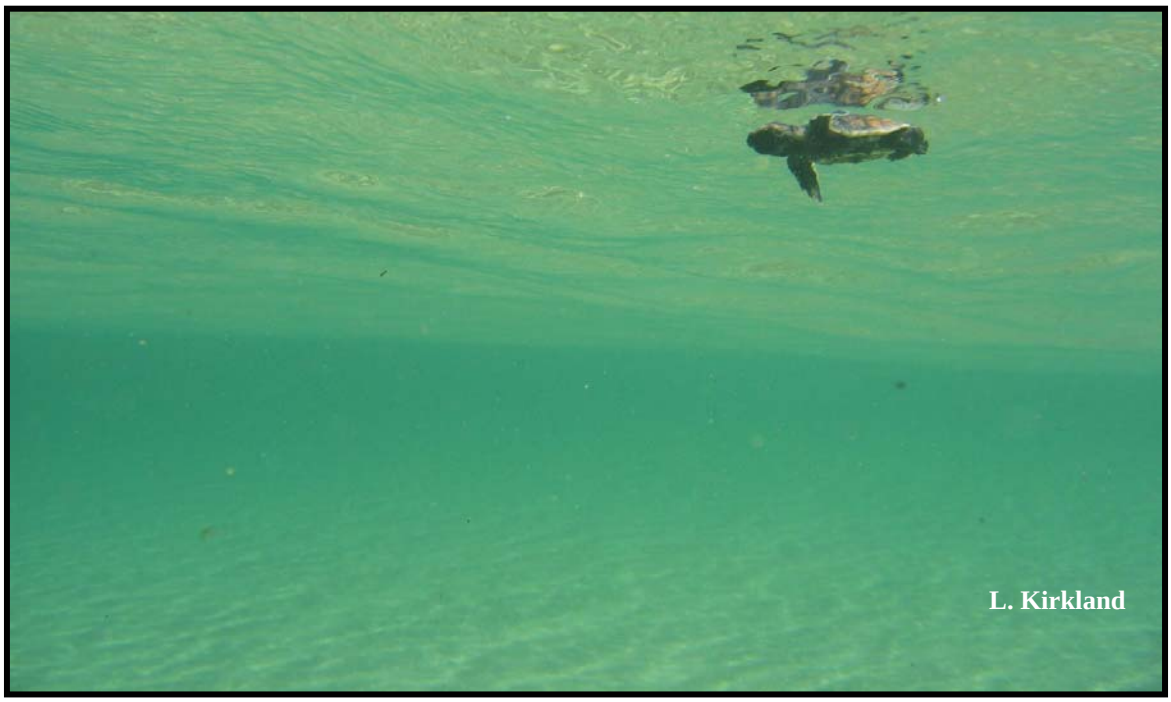
1000 yards from the high water mark of the foreshore where there is no reef". However, it is impossible to distinguish an immature turtle by sex, this law is currently under review. (and most turtles caught in our waters are Greens and Hawksbills, and are immature), and it is very difficult to prove exactly *where* the turtle was caught, as such

Where do they mate?

All sea turtles mate at sea. Leatherback males start arriving in tropical waters up to a month before nesting begins and leave in mid-season to return to colder regions. The male mounts the female, and sometimes several males will vie for the attention of the female. The female stores the sperm from several pre-season matings and will use it to fertilize her many eggs throughout the breeding season.

Where do the babies go?

The juvenile years of a sea turtle are often referred to as the "lost years" because so little is understood about this critical phase of life. Studies suggest that many swim directly to the Sargasso Sea (mid-Atlantic gyre) or other areas of convergent currents where they can hide amongst the seaweed and other flotsam while developing the strength and size to venture further afield. Most young turtles seem to eat anything at first and their diet becomes more specialized when they return to the habitat that they will inhabit for the rest of their life; e.g., reefs for Hawksbills and seagrass beds for Greens. Juvenile Leatherbacks are very rarely reported in nearshore waters, and there is no scientific information on the whereabouts of the post-hatchlings stages.



Appendix III

TRINIDAD AND TOBAGO TURTLE LAW - IN BRIEF

Trinidad and Tobago is signatory to many international "turtle-friendly" treaties, such as the Convention on International Trade in Endangered Species (CITES) and the Convention on Biological Diversity. However, there is somewhat of a "disconnect" between these broader treaties and the existing local laws and as a result the following three pieces of legislation are currently under review with regards to sea turtles.

Conservation of Wildlife Act, Ch. 67:01

This Act addresses the protection and management of all wildlife (including sea turtles) through specifying pest and game species that may be hunted. As sea turtles are not listed under either of these categories, by omission they are protected species. This conflicts directly with the Fisheries Act, which specifically provides for the hunting of sea turtles and their eggs. Even the very weak protection offered under the Conservation of Wildlife Act is compromised. Efforts have been underway for more than five years to revise and strengthen this law to provide for listing of sea turtles and other species as endangered and to make provisions for their protection and management.

Fisheries Act, Ch. 25.

This Act specifically provides for hunting of sea turtles and their eggs, with no recognition of their status as endangered species. However, it does provide some limits to hunting through regulations under Section 3 of the Fisheries Ordinance. The protection of Turtle and Turtle Eggs Regulations of 1975 states that:

"No person shall:

- Kill, harpoon, catch or otherwise take possession of any female turtle that is in the sea within any reef or within 1000 yards from the high water mark of the foreshore where there is no reef.
- Take or remove or cause to be taken or removed any turtle eggs after they have been laid and buried by a female turtle or after they have been buried by any person.
- Purchase, sell, offer, or expose for sale or cause to be sold or offered or exposed for sale or be in possession of any turtle eggs.
- No person shall, between the first day of March and thirtieth day of September, kill, harpoon, catch or otherwise take possession of or purchase, sell, offer or expose for sale any turtle or turtle meat."

Environmental Management Act, 1995

This is an Act to provide for the management of the environment within T&T. It primarily focuses on "brown" issues, but does make provision for the establishment of Environmentally Sensitive Species and Environmentally Sensitive Areas. This provides a potential opportunity for protection of sea turtles and their habitat in T&T if existing conflicts between other legislation is addressed.

APPENDIX IV

HELPFUL WEB RESOURCES

THE FOLLOWING IS A SHORT LIST OF SOME OF SEA TURTLE WEBSITES THAT WE HAVE FOUND HELPFUL, SOS TOBAGO ALSO HAS ON FILE, A NUMBER OF PUBLICATIONS ON SEA TURTLE CONSERVATION THAT WE WOULD BE HAPPY TO SHARE, PLEASE DO NOT HESITATE TO CALL US FOR MORE INFORMATION.

www.sos-tobago.org SOS Tobago online; the only place online to find information specifically about Tobago's turtles, read articles, see pictures, join the discussion, get involved in home grown advocacy for responsible coastal development, there's even a special children's section

http://www.barbadosseaturtles.org/ Homepage of the Barbados Sea Turtle Project at UWI which is also home to WIDECAST's Caribbean Marine Turtle Tagging Centre. This is a particularly good source of information on hawksbills and on managing the impacts of coastal development on turtles, also the place to report all hawksbill tags.

.www.widecast.org The Wider Caribbean Sea Turtle Conservation Network supports sea turtle projects throughout the Caribbean by linking them not only to each other, but also to lobbying power, technical expertise and funding opportunities not always accessible by smaller, individual groups.

www.seaturtle.org One of the largest sea turtle specific websites out there where you can so almost anything from following the satellite tracks of tagged turtles from all over the world to signing up for the Marine Turtle Newsletter for the latest research and conservation news.

www.darksky.org The International Dark-Sky Association is and excellent source of information on light pollution with a mission to preserve and protect the nighttime environment and our heritage of dark skies through quality outdoor lighting.

www.EuroTurtle.org Europe's first educational website for the conservation and biology of sea turtles is an excellent source for educational ideas and materials, from interactive online "exploding turtle skeletons" to printable quizzes.

http://www.iucn-mtsg.org/publications/Tech_Manual/Tech_Manual_en/06%20Pritchard&Mortimer.pdf. An online publication of the "Research and Management Techniques for the Conservation of Sea Turtles" prepared by the IUCN/SSC Marine Turtle Specialist Group. This is an excellent resource manual for those wanting to learn more about the science of turtle conservation, written and edited by the leading experts in the field.

http://www.nofs.navy.mil/about_NOFS/staff/cbl/LPSnet/FMRI-TR2.pdf. Witherington and Martin's definitive manual: "Understanding, assessing, and resolving light-pollution problems on sea turtle nesting beaches" as sited in the "Note About Beachfront Lighting" section, p. 12.

Appendix V

Sample Nesting Data Sheet

This sheet is for Personal Observation and/or use on Non-Index Beaches only (photocopy as required). SOS patrols use slightly more detailed data sheets for recording nesting and hatching activity on the Index Beaches i.e. Mt. Irvine Back Bay, Grafton and Turtle Beach/Great Courland Bay.

If you would like to start a more organized community 'turtle watch' program in your area, SOS is happy to provide the initial training and ongoing support to develop a program tailored to meet the needs of the people and turtles in your community. We envision a day when all the nesting beaches in Tobago will be monitored and protected by a vibrant, supportive network of strong community groups, collaborating with each other and the government authorities to inform responsible coastal management in Tobago.

Date	Time Seen	Beach/Location/ Landmarks	Species1	Activity (see below2)	CCL3 cm	CCW4 cm5	Tag 16	Tag 2	General Condition or Injuries	Return Time	Comments e/g number of people present, any problems (lights, nest location, crowd, etc.) # of hatchlings

[1] **LB** = Leatherback, **GN** = Green, **HK** = Hawksbill; see p. 9-10 re: identification or contact SOS for more details on how to identify tracks etc.

[2] **Activity:** Approaching **(AP)**, Digging **(DG)**, Laying **(LA)**, Covering **(CV)**, Leaving **(LV)**, Hatching **(HC)**, Dead **(DD)** or Did Not See **(DNS)** i.e. only see the nest or tracks but missed the actual event, still specify whether adult turtle / hatchlings.

[3] **CCL** = Curved Carapace Length = Measure from tip of tail to base of neck (where shell meets skin), following the curve of the back.

[4] **CCW** = Curved Carapace Width = Measure across widest part of back (below the 'armpits'), following the natural curve of the back.

[5]Measurements: **ONLY TAKEN DURING LAYING!** Use a measuring tape and exercise caution around hawksbills heads as they can snap – see Nesting Beach Guidelines and Data Collection sections of manual (p.17-20) for more guidance on how and when to approach nesting turtles and hatchlings.

[6] Again, see Data Collection section of manual on how to find and read tags.