Protecting beaches: Turning the tide for sea turtles

GUIDELINES FOR COASTAL PROPERTY OWNERS, DEVELOPERS and MANAGERS

Sea Turtles

The beaches of the west and south coasts of Barbados are important recreational spaces used by locals and visitors.

At night, during the nesting season from May to November, hawksbill sea turtles come ashore and crawl above the high water mark to lay their eggs.

Hawksbills:

- Like to nest in darkness on quiet beaches
- Look for beaches that are wide enough to ensure that their eggs can complete their 60 day incubation period without being inundated with seawater
- Prefer to nest where natural vegetation grows because this indicates a place unlikely to be washed over by the sea
- Need sand deep enough to allow the safe burial of up to 150 eggs

Sea turtles must ensure that their eggs will not be washed over by the sea

Coral Reefs

Corals are animals that live In a symbiotic relationship with unicellular plants. They build reefs by laying down skeletons of calcium carbonate.

Coral reefs:

- Require clear, clean water to grow
- Cause waves to break thereby preventing sand from being washed off the beach
- Grow on headlands, separating bays of naturally wider beaches
- Die off in areas where corals are exposed to high temperatures or air, leaving reef rubble which offers important protection to beaches
- Produce calcareous (coral) sand as their skeletons are eroded by wave action

Healthy coral reefs produce sandy sediments and protect the shoreline

Beaches

If a property lies on a headland adjacent to a fringing reef, it is natural for the beach to be narrower than that of neighbouring properties that lie within a bay

Beaches:

- Are naturally dynamic, affected by low energy waves for most of the year, but by high swells seasonally
- Tend to erode between November and June and build up between July and October
- Are affected by the health of coral reefs. Healthy coral reefs will grow and continue to produce sediment, but erosive processes will overtake growth on an unhealthy reef reducing its effectiveness, both as a source of sand and as protection for an existing beach

November to June

July to October

Solid coastal structures like boundary walls and fences, curbs and roads can prevent beaches from forming

Beaches are often lost seasonally but will reform naturally if they are given space to do so

Beaches are naturally dynamic — changing form seasonally

Coastal Vegetation

Native coastal vegetation:

- Includes grasses and trailing vines (e.g. *Ipomoea pes-caprae and Canavalia maritima*) growing closest to the high water mark and coastal shrubs and trees including sea grape (*Coccoloba uvifera*), seaside mahoe (*Thespesia populnea*), manchineel (*Hippomane mancinella*) and West Indian almond (*Terminalia catappa*) at the back of the beach
- Is tolerant of salt spray and occasional wash over by the sea
- Includes shrubs and trees that are very deep-rooting. Even if their roots are temporarily exposed by high swells or storm waves, they provide the structure around which sand will collect when the waves retreat
- Has largely been lost as a result of development on the west and south coasts

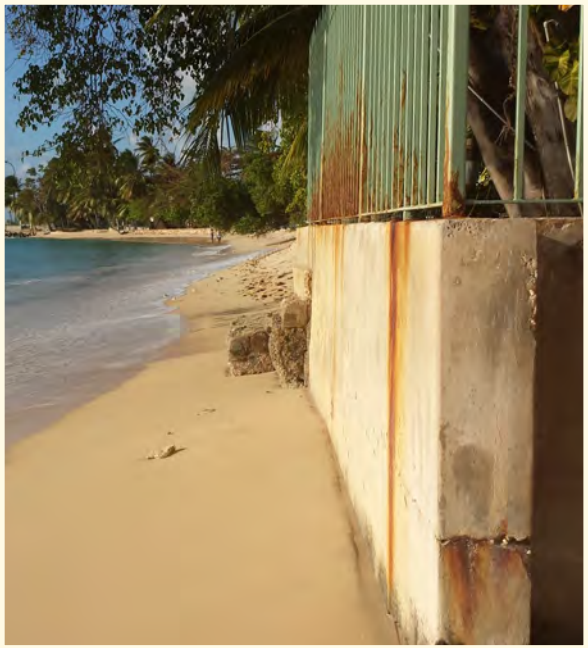
Coastal vegetation is adapted to survive in dry, nutrient-poor, salt-laden sediments. Deeper root systems allow these plants to access water resources unavailable to other plants.

Beachfront property owners can expect some loss of beach after a high seasonal swell or storm, as this is a natural phenomenon. Removal of native vegetation decreases the natural capacity of the coast to recover from beach erosion.

Preserving native coastal vegetation helps to protect beaches

Seawalls & Revetments

Seawalls have a solid vertical face, and are constructed parallel to the sea. They reflect all wave energy, adding to wave turbulence. The scour created can cause the permanent loss of any dry sand in front of the wall



Revetments are piles of boulders or gabions (wire baskets filled with rocks), placed at the base of coastal structures to diffuse wave energy. They may be seasonally covered with a thin layer of sand, but this is usually too shallow for a turtle to dig into

Seawalls and Revetments often result in the loss of adjacent beaches

Groynes & Breakwaters

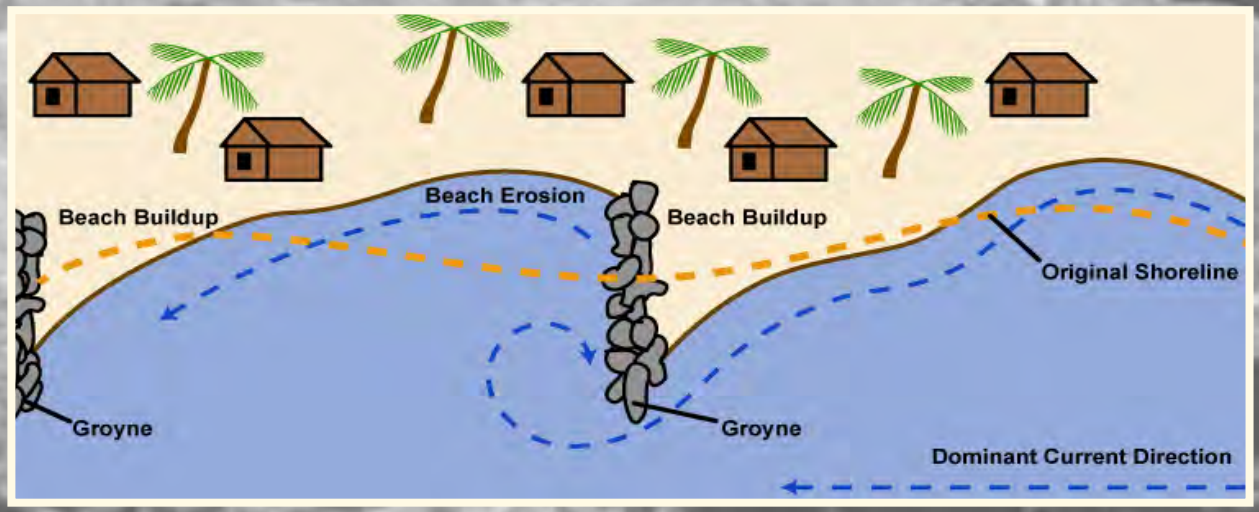
Breakwaters are made of boulders laid in the sea, constructed parallel to the beach.

They intercept the energy of the approaching waves, thereby sheltering the shoreline on their landward side.

They help stabilize sand on adjacent beaches and are often used in combination with sand nourishment to widen beaches.

Groynes are lines of boulders laid in the sea, constructed perpendicular to the beach.

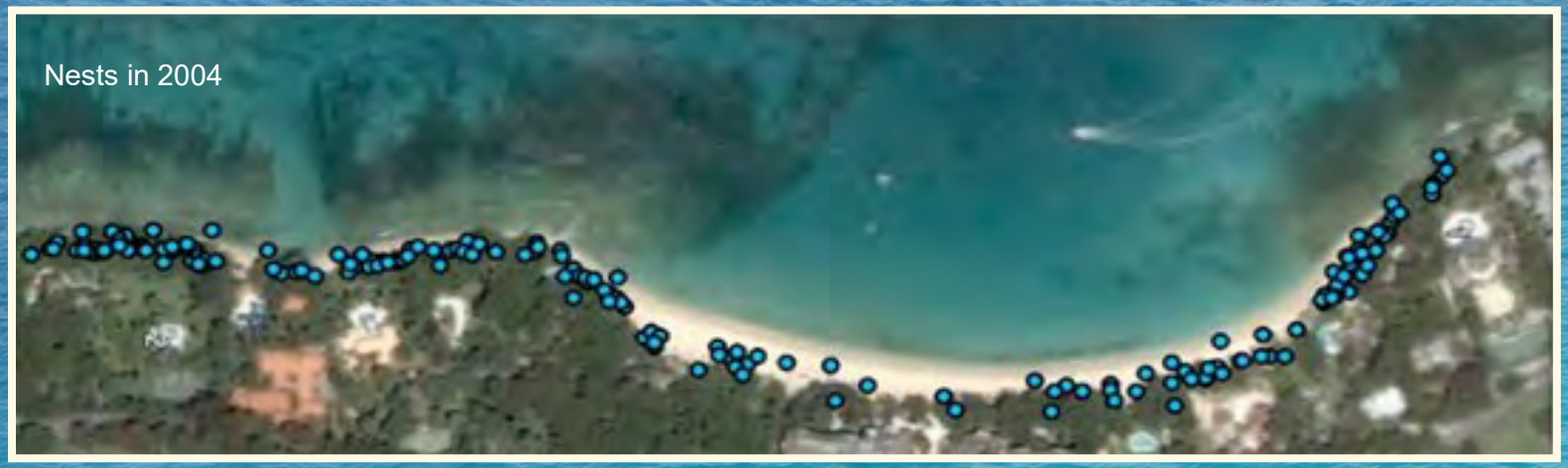
They must be high enough to prevent sand carried in longshore currents from being washed over them.



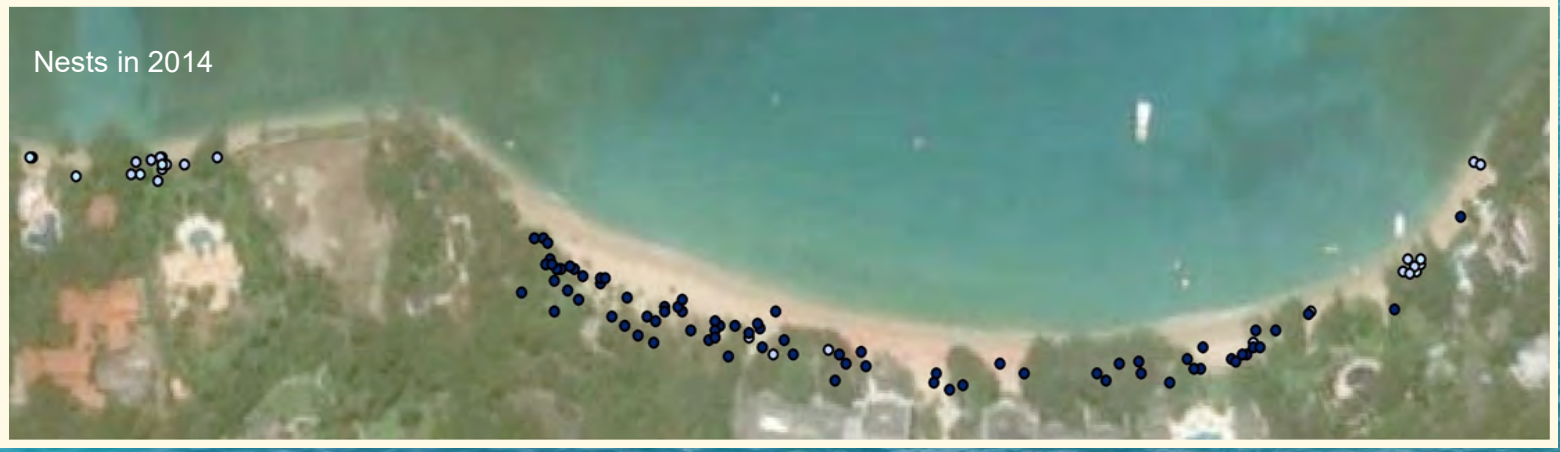
The trapped sand often starves beaches down current of the groyne creating problems for other property owners and beach users, including sea turtles.

Always give the beach time to recover naturally before considering remediation

Coastal Change



"Barbados West Coast." 13°11'37.99" N and 59°32'35.51" W. **Google Earth**. June 28, 2004. January 17, 2015.



"Barbados West Coast." 13o11'37.99" N and 59o32'35.51" W. Google Earth. June 21, 2014. April 02, 2015.

Loss of beaches causes turtles to nest at higher densities in smaller areas. Females dig up each other's eggs, break them open and expose them to bacteria, fungi and predators.

The widest beaches are often adjacent to hotels and therefore impacted by lights and activity at night, or they are adjacent to the mouths of gullies which break open during heavy rains and wash away the eggs.

Coastal defenses built by beachfront properties can affect the beach and therefore cause a significant reduction in nesting.

Beach works restrict where sea turtles can nest

Avoiding Harmful Beach Activities

Driving on the beach causes compaction of the sand and can destroy both incubating eggs and the vegetation that helps to prevent beach erosion. Tyre ruts are typically orientated along the length of the beach and therefore hatchlings trapped here can never reach the sea.

Lighting Bonfires during the nesting season on nesting beaches endangers sea turtles. Bonfires may accidentally be lit over an incubating nest or their brightness may attract emerging hatchlings to a fiery fate. Even bonfire embers left to die on their own may kill hundreds of hatchlings.

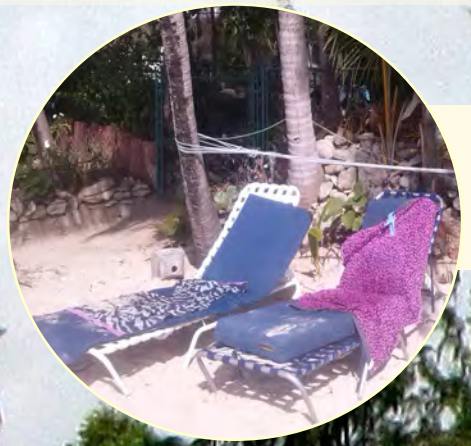
Garbage left on the beach is not only an eyesore and human health hazard, but is also deadly for sea turtles. Females can accidentally bury garbage over their eggs as they fill in their nest and this can prevent hatchlings from emerging. Rats and mongoose attracted to garbage can discover incubating turtle eggs and prey on them. Some types of garbage, like plastic bags, can be blown or washed into the sea, where they can be consumed by sea turtles mistaking them for food.

Keeping vehicles, garbage and bonfires off nesting beaches will help to protect sea turtles

Nowhere To Nest

Every year, while trying to nest, sea turtles are trapped, injured or killed by coastal structures they encounter on or next to the beach.

Solid boundary enclosures exclude turtles from safe nesting sites



Make sure that beach chairs are collected and stacked at the end of each day to minimize the area of dry beach they cover

Periodically monitor built structures on the beach during the nesting season to make sure that turtles are not trapped

Make members of staff/visitors aware of the Hotline number **(246) 230-0142** in cases of nesting, and trapped or disoriented turtles

Seek advice from the Barbados Sea Turtle Project before commencing beach works

BARBADOS SEA TURTLE PROJECT
UNIVERSITY OF THE WEST INDIES

Tips for "Sea Turtle Friendly" Beaches

Retain existing vegetation and plant more if possible. Choose native trees and shrubs

Use soft boundaries such as hedges of native plants in order to protect the property and beach, while still providing access for sea turtles

A tree with a trunk the circumference of which is 1m or more, at a point 0.5m or more from the ground, is protected by law

Ensure that setbacks of gates, fences, walls or other solid enclosures are at least 10m from the High Water Mark

A post and chain fence or a hedge can be used to delineate a boundary without impeding access by sea turtles

Beach Front Lighting and Sea Turtles

Turn off aesthetic and non-essential fixtures that light the beach or the nearshore after 9pm during the nesting season (May to November)

Ensure that light sources are screened or shaded to prevent light from reaching the beach and disorienting sea turtles at night

A good light source is one that is well shaded, directional, and points down and away from the beach

Sea turtles are very sensitive to light and both nesting females and hatchlings can be disorientated by artificial lights.

Hatchlings use the light from the moon and stars reflecting on the water surface to find their way to the sea.

Lights from properties and roadways can lure turtles from the beach and many die from dehydration, predation, exhaustion or are crushed by vehicles on the road.

Call the **Barbados Sea Turtle Project Hotline (Tel: 230-0142)** to find out if your property lies adjacent to a sea turtle nesting beach and to learn more about how you can keep your property “sea turtle friendly”.

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