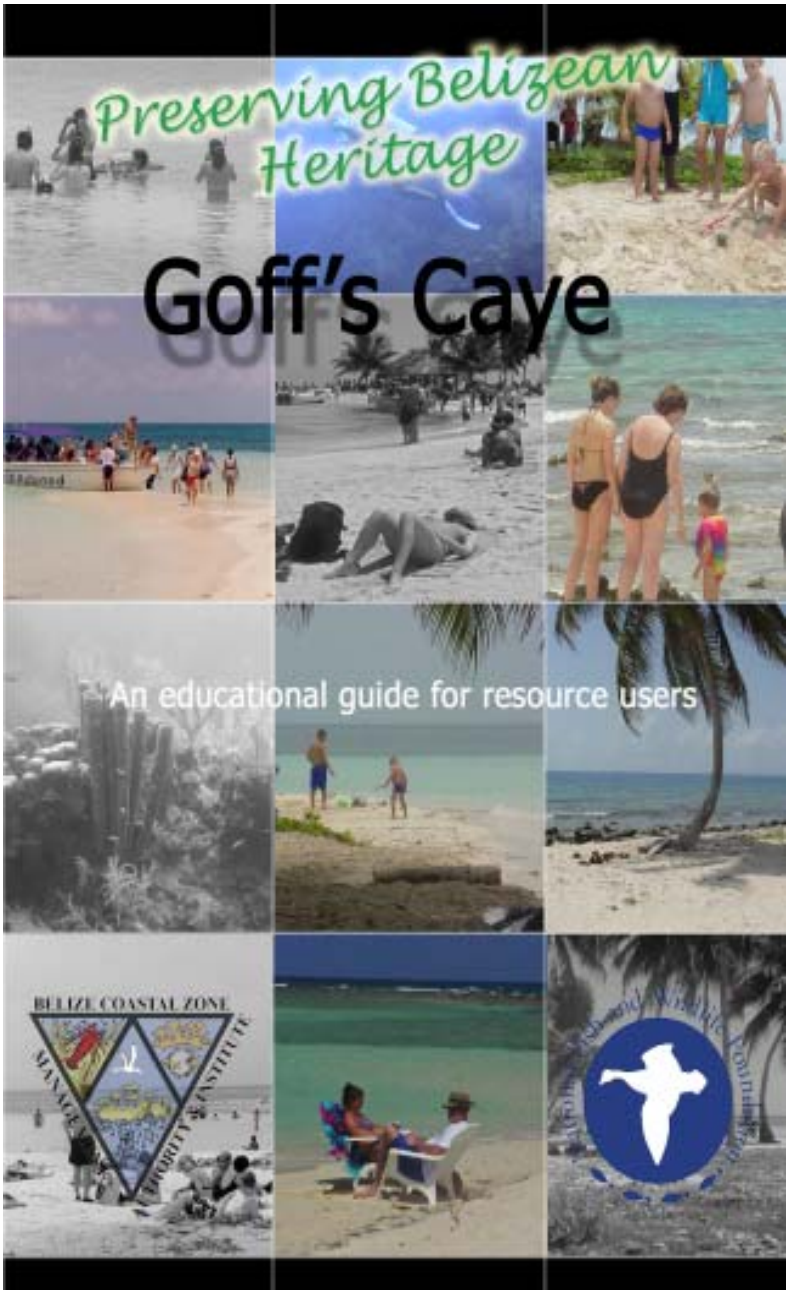

Preserving Belizean Heritage
Goff's Caye
An educational guide for resource users
BELIZE COASTAL ZONE

An initiative of the Coastal Zone Management Authority and Institute under the Conservation of Goff's Caye and Reef Habitat Project (ConGREH) funded by the U.S. National Fish and Wildlife Foundation (NFWF).

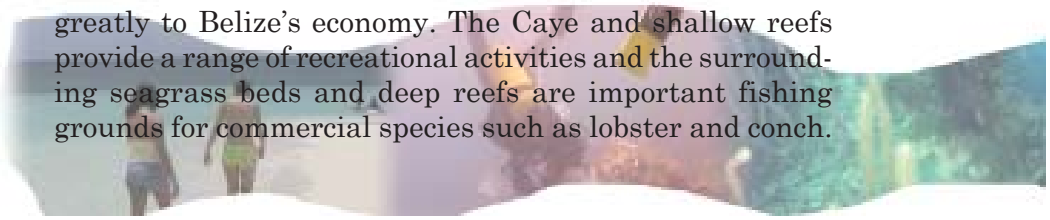
Contents

A picturesque view of Goff's Caye

Overview

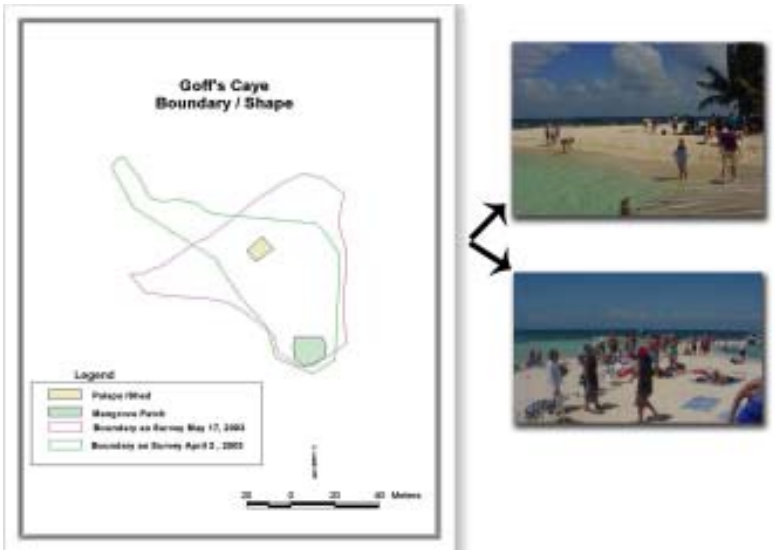
Belize is blessed with warm, clear, tropical waters, which provide optimum conditions for an abundance of coral reefs. These living underwater gardens provide unlimited pleasure from diving, snorkeling and fishing. Furthermore, many local economies depend on the commercial harvest from the reef. The future of Belize's economy depends heavily upon the continued health and vitality of its coral reefs and associated ecosystems (seagrass and mangroves). Preserving our coral reefs, our economy, and our quality of life are goals we should all share.

The Coral Reef Ecosystem of Goff's Caye is one such special place. This reef system exhibits an incredible biological diversity that draws foreigners and locals alike. It attracts residents and visitors from all over the world who enjoy snorkeling, diving, fishing, boating and nature on a whole. Tourism and commercial fishing are two primary activities associated with this locale and these contribute greatly to Belize's economy. The Caye and shallow reefs provide a range of recreational activities and the surrounding seagrass beds and deep reefs are important fishing grounds for commercial species such as lobster and conch.



The Island

Goff's Caye is a small sandy barrier island, approximately 1.2 acres in size, located in the central region of the Belize Barrier Reef. The Caye is well known for its white sandy beach, and its adjacent diverse and well-developed coral reef formations; considered to be the best in the central province. The island, however, is very vulnerable to seasonally changing wind and current patterns. These phenomena cause the Caye to exhibit a dynamic landmass with constantly changing dimensions. Apart from a small mangrove patch south of the island and a few scattered coconut palms and vines, the island has little vegetative cover.



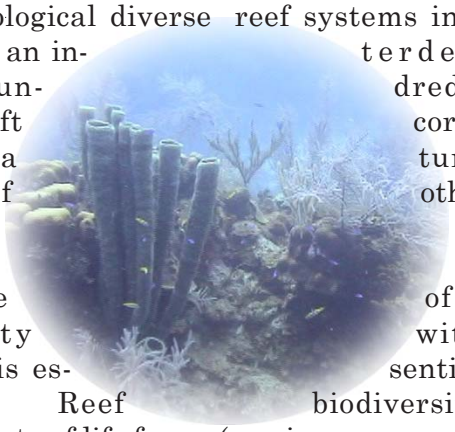
Map showing changes in the size and shape of Goff's Caye due to the shifting sand. Pictures show actual shift.

Recently, this area has been subjected to increased visitation by cruise ship passengers. It is considered as one of the major marine destinations for such visitors as it is easily accessible (being near to the anchorage of ships) and offers the unique mix of sun, sand and healthy reefs. Based on this upsurge in visitation, Goff's Caye has become increasingly exposed to threats from impacts due to

a high volume of visitors. The Coastal Zone Management Institute (CZMI) has been monitoring several reef sites in the area since 1999 and has observed physical damage from tourist activities and low coral cover in the back reef areas where tourist activity is highest.

The Reefs

Both barrier and patch reefs can be observed in the vicinity of Goff's Caye. These reefs have been labeled as some of the most biological diverse reef systems in Belize as they provide an interdependent home for hundreds of fish, hard and soft corals, crabs, lobsters, sea turtle and a myriad of other marine life.



Maintenance of such biodiversity within reef ecosystems is essential to their health. Reef biodiversity is basically the variety of life forms (species, communities, populations) within the reef ecosystem. These life forms and their environment are inextricably linked through complex interrelationships, and it is these interrelationships that sustain the structure and functioning of the reef ecosystems. Today, however, many of these ecosystems are being degraded and threatened into extinction largely because of over-exploitation, pollution and habitat destruction.

We must try to play a role in halting such destruction. The most effective manner by which this could be achieved is through education. We must educate ourselves as well as other users to understand why the reefs should be pro-

tected and the possible consequences of inappropriate actions, that contribute to the destruction of reefs.

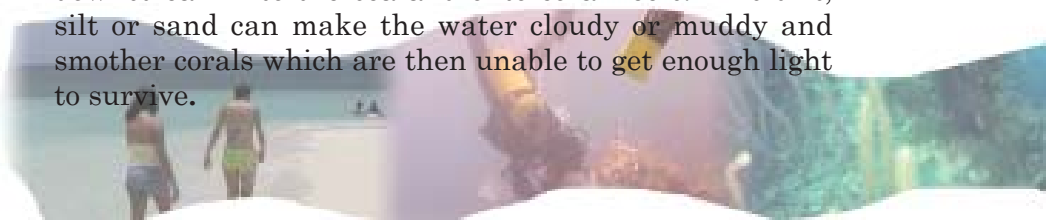
Degradation of Life on the Living Reef

The living coral reef is the most diverse marine ecosystem in the world. The balance of this delicate marine environment relies on the interaction of corals, sponges, fish, crustacea, mammals and other sea life. Together, their mutual survival is dependent on an environmentally sound maintenance of the environment in which they live. Such conditions include warm, clear and clean waters, normal salinity, the absence of sedimentation and physical destruction, amongst others.

Coral reef ecosystems cannot exist by themselves. They depend upon warmth and light from the sun, and need a constant supply of fresh, clear seawater from the surrounding oceans. Reefs also need the help of nearby mangrove forests and seagrass beds, which aid in filtering and trapping sediment found in runoffs and riverine waters. Many reef animals also depend on mangroves and seagrass beds for food and as nurseries for their young. In spite of the sturdy appearance of coral reefs, they are fragile and vulnerable to a number of threats.

Sedimentation

Inshore and coastal constructions, upstream mining or farming, and dredging can all cause soil to erode and rush downstream into the sea and onto coral reefs. This dirt, silt or sand can make the water cloudy or muddy and smother corals which are then unable to get enough light to survive.



Mangrove trees and seagrass beds, which normally function as filters for sediment, are also being rapidly removed for coastal developments. This has resulted in an increase in the amount of sediment reaching coral reefs.

Mangrove roots filter and trap sediments.

Prolonged boat engine threading on sandy patches within or adjacent to shallow reefs can also result in increased suspended loads of sediment on reefs.

Sediment can smother coral.

<u>Land-based Run-off</u>

Fertilizers and sewage released into coastal waters can increase the level of nitrogen on coral reefs, thereby encouraging rapid algae growth which blocks off the sunlight needed to keep reefs alive.

Fertilizers and sewage can cause algae overgrowth

Trash dumped into the water can also kill coral reef life. Lost or discarded fishing nets can snag on reefs and strangle fish that get caught in them.

High volumes of or increased urination in reef waters can

also result in increased nitrogen load on the reef.

Unsustainable Fishing Practices

Overfishing is a leading cause of coral reef degradation. Often too many fish are taken from one reef to sustain a population in that area. It affects not only the breeding stocks (adults), but also juvenile fish, which are removed before they can grow to maturity.

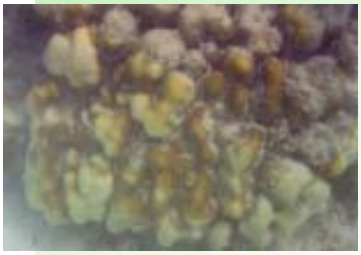
Overfishing also results in the removal of herbivorous fish such as the parrot, doctorfish, etc., which are important for maintaining the health of coral reefs. Such fish feed on algae thereby preventing their overgrowth on the reef.

Careless Recreation

Careless boating, diving, snorkeling and fishing can result in damaging coral reefs. Grabbing, kicking, standing, walking on, or stirring up sediment on reefs can contribute to reef destruction.

Excessive removal of herbivorous fish can result in algae overgrowth.

Careless boating can lead to accidents which destroy coral reefs.



Increased temperature may lead to coral bleaching.

Corals are also harmed when boat anchors are dropped on them.

Ocean Warming

Ocean warming is extremely dangerous to coral reefs, which are sensitive to changes in temperature. Increased in water temperature, believed to be linked to global warming, can cause mass coral bleaching. Bleaching occurs when stressed coral polyps (tiny animals that make up the coral colony) lose their symbiotic algae inside them, taking on a white or pale coloration. A prolonged condition can lead to coral death.

Reef Behavior/Etiquette

At their best and healthiest, coral reefs provide highly effective coastal protection against the destructive actions of various natural forces and generate sustenance and revenue through sustainable fishing and tourism.

Reef appear golden brown from the surface. ***(Photo by Tony Rath)***

There are many ways of enjoying visiting the reef while protecting the integrity of the fragile coral reef environment:

✔*Use navigational charts to locate coral reefs*

Most reefs are well marked on navigational charts. Should you not be familiar with an area, refer to the charts. There have already

been a number of instances where careless boaters have run aground, destroying coral colonies that are hundreds of years old.

It would be wise to remember the jingle: From the surface of the water, reefs appear golden brown…if you see brown, you may be about to hit a reef.

✔ *Stash your trash*

Bring your trash to shore, including fishing gear. It is unlawful for any vessel to dispose of any waste (including trash, bilge washing, or other debris) on or near the reefs! These can be damaging to reef organisms. If you see garbage, collect it and bring it in.

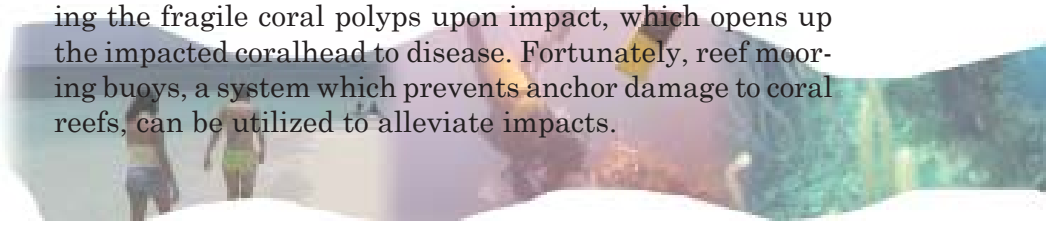
Unsightly garbage left to pile up on Goff's Caye.

✔ *Avoid trolling or fish above reef*

Avoid shallow reefs when trolling. Hooks can scar and injure corals, leaving them susceptible to infection by microscopic organisms that can kill them.

✔ *Anchor on mooring buoys or anchor in sand*

As Belize's tourism economy grows, so will the number of boats visiting Goff's Caye reefs. The careless toss of an anchor can destroy decades of coral growth. Boat anchors can do tremendous physical damage to coral reefs by crushing the fragile coral polyps upon impact, which opens up the impacted coralhead to disease. Fortunately, reef mooring buoys, a system which prevents anchor damage to coral reefs, can be utilized to alleviate impacts.



Reef mooring buoys are available at Goff's Caye; use them if available. Destruction of coral formations through grounding or imprudent anchoring can lead to penalties and fines.

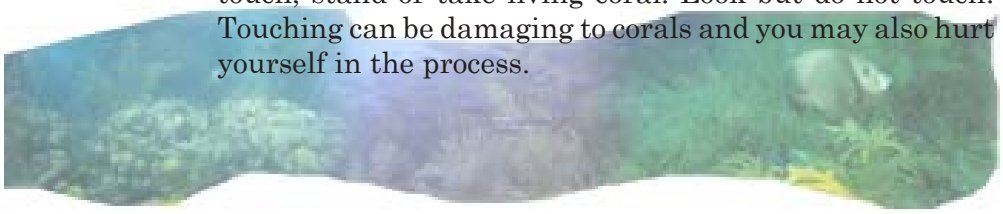
(left) Anchor has been placed directly into a coral colony. (right) The placement of mooring buoys in strategic areas at Goff's Caye should reduce the incidents of coral damage from anchors.

All boats should put out extra scope by adding an extra line to the mooring buoy pickup line to create a horizontal pull on the eyebolt. Otherwise, the eyebolt will be pulled. A good rule to remember is; if the buoy is pulled underwater, you must let out extra scope.

If you must use an anchor, choose an area of sandy bottom far from the reef, so that neither your anchor nor anchor chain damages nearby corals.

✕ *Refrain from touching corals*

Public awareness that coral is a fragile living animal is important to its survival; when diving or snorkeling, don't touch, stand or take living coral. Look but do not touch! Touching can be damaging to corals and you may also hurt yourself in the process.



Harvesting coral is against the law. This care should extend to inadvertent contact by diver equipment and fins. Gloves may protect you from the coral, but it does not protect the living organisms which comprise the reef. We recommend that gloves not be used at all while diving.

✗ *Do not place lobster or crab traps on corals*
During fishing for lobster or crabs, avoid placing traps on reefs. Traps can break corals and damage the bottom when pulled.

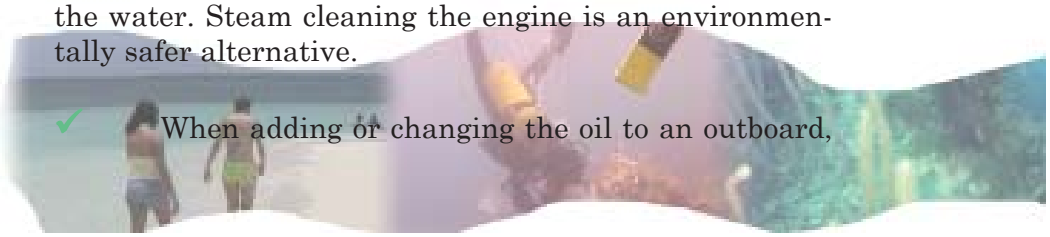
Boats and a Healthy Reef

✓ Use boat pump-out facilities to dispose of sewage. Avoid releasing bilge water near the reef. Oil pollution is deadly to sea life.

✓ Use oil absorbent sponges in the bilge to soak up excess amounts of contaminated water and dispose of them on land. Such sponges can last for many months.

✓ Minimize your use of toxic cleaners for topsides. All cleaners, bleaches, varnishes, paint and varnish removers and thinners should be considered toxic and handled accordingly. Use a nonphosphate detergent and a scrub brush instead of deck and hullside cleaners.

✓ Reduce your use of toxic paints and engine cleaners. These substances slowly release deadly chemicals into the water. Steam cleaning the engine is an environmentally safer alternative.



✓ When adding or changing the oil to an outboard,

wipe up spills immediately. Be extremely careful to catch all old oil in a container for on shore recycling. It's usually customary for most gas stations to have oil recycling drums. Use them where possible.

✗ Refrain from scrubbing your boat bottom in shallow water or near the reef. The toxins released are deadly to turtle grass and living coral.

✗ Refrain from applying bottom paint to smaller boats unless it's deemed extremely necessary.

✗ Avoid the temptation to top off the tank when refueling. This invariably leads to a spill, producing small but toxic slicks in the water.

Following these suggestions for everyday activities can and will have a positive impact on our living coral reef.

Source: Reef Relief

Work Citation

Household Guide to Coral Reef Protection. Reef Relief Environmental Center, Key West, Fl. Web Published.

Reef Relief. Protect Living Coral. Web Published.

Williams E. and Edwards A. Corals and Coral Reefs in the Caribbean. A Manual for Students. Revised Edition. CCA/ UNEP/UNESCO/CIDA.

For more information on Goff's Caye , please contact:

The Coastal Zone Management Authority
and Institute
Princess Margaret Drive
P.O. Box 1884
Belize City, Belize
Tel: 501-223-0719/2616/5739
Fax: 501-223-5738
Email: czmbze@btl.net

Visit us on the web at:
www.coastalzonebelize.org