



The Central Caribbean Marine Institute's

Green Guide to the Cayman Islands

Special Publication No. 1: **The Marine Environment**

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Here in the Cayman Islands our life on the land is inextricably linked to the ocean – the health of each one depends on the other.

contents

2CCMI Chairman's Message

5Introduction

6Purpose

threats

8Threatened Habitats of the Coral Reef System

12Threatened Species

protection

15Environmental Laws and Policy

19Why We Have Open and Closed Seasons

20The Good News

Looking Forward

conservation: you can make a difference

23Water Conservation

The Sun's Free Energy

Waste

24Model for Sustainable Living: Little Cayman Research Centre

ideas for action

25Measuring the effects of humans on earth

26Green tips



A message from the Chairman

In the Cayman Islands we are enriched with a wonderful natural environment. In this *Green Guide to our Marine Environment* we hope to show you how all of our lives on these three magical islands are intimately connected to the land and the sea that surrounds it.

Like many of our Caribbean neighbours, a large proportion of our economy depends on reef-based fishing, diving and tourism. The beauty of our coral reefs, our beaches and our lagoons is that it is part of our heritage, and it draws many thousands of overseas visitors to our shores. It is our responsibility, as stakeholders sharing this beautiful environment, to do what we can to minimise our impact upon it. Ogier has sponsored the Green Guide, and through this publication, is helping us to preserve our natural and cultural heritage.

It is a heartbreaking fact that the coral reefs of the world are facing an increasing number of severe threats. Fish stocks worldwide are declining rapidly, and pollution, human population pressure, global warming and simple carelessness are putting our marine environment under great stress.

At the Central Caribbean Marine Institute, our mission is to sustain marine biodiversity through research, education, and outreach. We learn about our natural environment, teach what we know, and reach out to our community and government as partners who will benefit from that work. As part of that mission, we aim to produce, in partnership with our sponsors, a series of Green Guides to help residents and visitors to these beautiful islands preserve their natural treasures.

In many ways, our islands come from the sea. The sea is the link between our past and our future. We hope that this Green Guide to the Cayman Islands' Marine Environment will help you to appreciate and understand the ways in which we can all work towards protecting that wonderful natural heritage for future generations. We thank Ogier for their leadership in working toward conserving the diversity of life on our islands.

Peter Hillenbrand
Chairman
Central Caribbean Marine Institute



About our Chairman:

Peter Hillenbrand moved to the Cayman Islands in 1995. He has worked tirelessly to establish CCMI as a premier non profit organisation, working to empower our youth to be conservation oriented and to appreciate our marine heritage. He was instrumental in developing the renewable energy design for the Little Cayman Research Centre, funded our first Cayman Scholars Internships, and played a leadership role in the Legacy Campaign to raise funds to build the research centre. Mr. Hillenbrand's resort, the Southern Cross Club, has incorporated numerous green technologies to reduce impacts on land and on coral reefs of the Cayman Islands.



introduction

Three Islands born in the Caribbean Sea

The Cayman Islands are a series of three islands; Grand Cayman – the largest & most populated – and the smaller Sister Islands of Little Cayman and Cayman Brac. The bedrock of all three islands is a porous limestone. Although it is thousands of meters thick, it is built from the external skeletons of millions upon millions of tiny marine organisms – examples of which are still living on the diverse reefs of the Caribbean.

Long before Christopher Columbus navigated our three little islands on his last voyage, major tectonic unrest along the boundary of the Caribbean and North American plates created a ridge from Cuba southwestward to Nicaragua. This ridge created a series of mounds across the Caribbean Sea that were close enough to the sunlit surface for corals to begin to congregate, and settle. Slowly, over 40 million years, through several major shifts in the earth's climate, and dramatic fluctuations in sea levels, the Cayman Islands were formed.

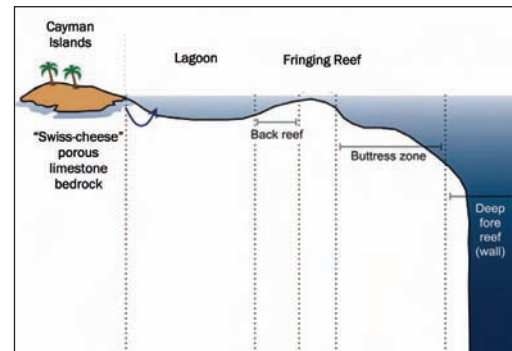
Even the ironshore rock formations that rim our shores are remnants of reefs that formed only in the last few thousand years as ice melted and the sea level rose. During times of lower sea level, large caves formed in the limestone as it dissolved – imagine that underneath us the rocks look like Swiss cheese!

Over time, corals built the modern fringing reef up to sea level, creating a powerful barrier to large waves, protecting our islands from erosion and allowing plants to grow.

Cayman has a rich diversity of habitats – reefs, lagoons, mangrove, beaches – and yet the total land mass of our three islands is only 100 square miles!

These three islands have no rivers which could carry sediment and nutrients into the sea, giving Cayman some of the clearest waters on earth. Our healthy marine environment provides us with food, shelter and the very land that we live on.

The reefs and their inhabitants produced sand for our beaches and provided a barrier for our shallow lagoons. These reefs also play a significant role in reducing coastal flooding as the sea level continues to rise. Connections are clear between our reefs, the sandy beaches and the mangroves that developed soon after.



Reef Geography illustrating the connection between the island and nearby reefs through porous limestone. Modified from NOAA.

Relative to the enormous Great Barrier Reef of Australia, Caribbean coral reefs have a low marine biodiversity. Scientists conclude that our region is highly vulnerable to disease and over exploitation as a direct result. While Australia's Great Barrier Reef has some 350 species of reef-building corals and 1,500 species of fish, in the Caribbean there are 60 species of corals and only a few hundred species of fish.

For too long, mankind has seen the ocean as a dumping ground. We assumed that it would always feed us, that the tides would wash our shores, sea winds would clean our air and evaporation from the oceans would bring us rain. We now know that the ocean is moderated and affected by every living thing on Earth.

Every ecosystem and every organism relies on a complex symphony that occurs beneath the sea. Coral reefs are a key part of that complex process. They are extraordinary, but to most people, most of the time, they are unseen. Only recently, in scientific

terms have we begun to understand their importance, and their fragility. From the beginning of geologic time the sea has given birth to life on earth.

HAZARD: The porous limestone substrate enables fluids to be transported from land to sea quickly. Chemicals, pesticides, sewage, waste, and water flows almost directly into the sea and can potentially kill otherwise healthy corals and reef organisms.





purpose

The CCMI Green Guide to the Cayman Islands aims to:

- **illustrate** how our everyday life is inextricably linked to the natural environment that surrounds us in Cayman.
- **inspire** each individual to make changes that will have a positive impact on the environment and on our own quality of life.
- **expose** some of the shocking threats to our most critical habitats and species.
- **communicate** to businesses, residents and visitors the value of preserving the biodiversity of our islands in a friendly and informative way.
- **offer** some concrete examples of the best green practices that will help preserve the environment.

Coral reefs are now considered more vulnerable and more threatened than tropical rainforests.

threatened habitats

Healthy coral reef habitats need clear, clean water...

Top threats to coral reefs

- Coastal Development
- Habitat Loss
- Over fishing and destructive fishing

Leading threatened habitats in the Cayman Islands

- Coral Reefs
- Mangrove Shorelines
- Sandy Beaches

Coral Reefs are the largest living animal colony on earth. Many different corals populate the reef habitat, some are soft, some are stony, some are flat, & some are round, but there is one feature that they all have in common: tiny animals called coral polyps. These polyps form a thin and very fragile layer of life that covers the limestone base of the reef.

Polyps extend their tentacles from the coral skeleton to filter particles of food from the sea, mostly during the night. During the day, tiny single celled plants (algae) living inside the polyp gather energy from the sun, and through photosynthesis, make food. Working together, polyps and algae create a mutually beneficial (symbiotic) arrangement to produce a highly efficient biological mechanism to generate a healthy coral.

This life style is finely balanced: add pollution, excess organic material, or even extra sediment from dredging or coastal erosion and corals begin to suffer because the particles clog the tiny polyps and prevent them from eating.

When the corals die, the reef system begins to collapse. A whole chain of marine life begins to starve, to lose its breeding grounds and its home. Eventually, even the islands behind the reefs begin to suffer: people living on them lose a food resource and in extreme cases the islands themselves will be washed away by the ocean.

Our healthy coral reef habitat needs clear, clean sea water.

Stony corals are the framework for reefs because as they grow, each generation leaves behind a limestone exoskeleton that over thousands of years builds the coral reef. It is strong enough to sink ships and to reduce wave energy along our shoreline by 90%.

Warm water corals are not the only animals that live on the reef but without corals our shallow environment would be deserted. The coral reef habitat is a Mecca for sharks, rays, angel fish, lobsters, conch, sea cucumbers, sponges, with a diversity that surpasses any other marine environment on earth.

Corals do not create the integrity of the reef alone. Reef structures are like houses built with bricks and mortar cemented together by all of the encrusting sponges, algae, and corals.

This tapestry of life creates the splendor of our coral reefs that attracts divers, yachtsmen and anglers to the Cayman Islands. Our beautiful marine environment is famous throughout the world.

Our reefs are thousands of years old. It may take one coral head 250 years to grow to be the size of your living room couch. What might be damaged in a matter of minutes will take three human generations to restore.





threatened habitats.

Growing healthy coral reefs, maintaining healthy corals

Over the last 25 years, coral reefs in the Caribbean region have declined by 80%.

What are the threats to our clean clear water?

Our beautiful sandy beaches, and healthy coral reef, our mangrove and lagoon habitats are all interdependent. Mangroves, with their interlocking root systems along our shorelines act like a wall to incoming waves. They protect the island from erosion, protect our homes, and may even protect our lives during a major storm.

Scientists completed a study of coastal areas after the catastrophic 2004 Indonesian tsunami and showed that areas with intact mangroves had the lowest loss of life and property. Intact mangroves also filter sand and mud which helps keep the water in the nearby lagoons crystal clear.

The major threat to water quality is the partial and complete removal of mangroves in coastal zones and coastal erosion. Little by little our coastline is eroding. Coastal erosion is a complex issue for the Cayman Islands that we plan to discuss in detail in our upcoming publications.

What is being done?

The Central Caribbean Marine Institute provides leadership in undergraduate, graduate and professional education through marine ecology and conservation field-oriented courses so that students gain a better understanding of critical issues facing tropical marine environments. The Caribbean Sea Camp program is designed to engage local high school students in active learning about the local marine protection laws and to empower them to make the best choices for the local environment. CCMI offers generous scholarships for local students to participate in this program.

At CCMI's marine facility, the Little Cayman Research Centre, scientists are working to better understand what is causing the declines in the health of our reefs and what we could do to contribute to a more resilient reef. The goal is to reduce the major threats by humans so that our reefs can be more resilient to the stresses caused by global warming and climate change.

In 2005, CCMI began tagging juvenile corals to measure their rate of growth. The idea was to measure any decline in the amount of coral on the reef and to see how long it might take to regenerate the reef.

This work shows that Cayman coral species grow at highly variable rates from year to year. Corals take an extremely long time to grow, the fastest species at 15 cm/year, with many growing less than 1 cm/year. A large head of star coral might take 300 years to grow to 3 meters.



threatened species

Corals

Two corals that were once remarkably abundant are now rare in Cayman and have just been listed by the US Endangered Species Act (May 6, 2006). The corals are the Staghorn coral (*Acropora cervicornis*) and the Elkhorn coral (*Acropora palmata*).

In the 2007 reef survey, CCMI scientists reported these endangered species in the Cayman Islands have increased over the previous 10 years, but more work needs to be done.

Why they are threatened

Both coral species have succumbed to disease, have been destroyed by major storms, and some have been broken by divers and snorkelers. One of the most dramatic declines in regional coral reefs in the past 30 years has been the demise of these two species.

These species provided an important baffling structure along the fringing reef – absorbing the force of the breaking waves – so that other organisms could become established. These species are the equivalent of a pioneering species in a forest and they still provide protection for our shoreline.

Elkhorn coral and rubble is responsible for the whitecaps that you see offshore on the north, south and east sides of all three islands.

Ever since the last ice age some 18,000 years ago, sea level has continued to rise and corals developed at the edge of what was the islands. These corals could grow so rapidly that they kept pace with the sea level. As they grew, they created a barrier for lagoons to develop all around the Cayman Islands several thousand years ago.

Will the demise of these species result in higher wave energy along our shore as this baffling system breaks down? Yes.

Don't touch!

Divers and snorkelers must hover well above the reef. For the best experience, keep your eyes open & your hands to yourself. The coral structure may be limestone but remember that the tiny polyps are as soft as delicate flowers or sea anemones, and they are easily damaged. In fact, when corals are broken by boat anchors, storms, or a diver's fins they rarely survive. Many corals also have a protective mucus layer that can be ruptured by the touch of a human finger – if the mucus is disturbed the coral may be prone to infections.

Turtles

Today, all of the turtles that you will find around the Cayman Islands, Loggerheads, Hawksbills, and Green turtles are listed as endangered species. This is largely due to the turtles being an exclusive source of food and income to the early settlers of the islands and continued hunting even today. Over time, the turtles around the islands began to disappear, and the turtle industry began to suffer.

A limited license from the Marine Conservation Board is granted during the open season that allows turtles to still be caught for food around the Cayman Islands. Turtles have played an important functional role on reefs. Hawksbills eat sponges which could potentially out compete corals for space on the reef. Green turtles eat sea grass and they are important for maintaining healthy stands of sea grass communities.

Extinctions are forever

Some Other Endangered or Highly Threatened Marine Species:

- Nassau grouper
- Queen Conch
- Caribbean Spiny Lobster
- West Indian Whelk





protection

Environmental laws & policy in the Cayman Islands

Local Laws

Open and Closed Seasons:

The protection of the immensely beautiful and diversified natural resources of the Cayman Islands is vital. For this reason there are some guidelines to follow. Seek guidance from the Cayman Islands Department of Environment for a complete set of environmental laws and if any of the following limits, seasons, restrictions, or general rules are unclear.

CLOSED SEASONS & LIMITS

Conch: 1st May – 31st October (CLOSED) – 5 conch per person/10 per boat

Echinoderms: May not be taken at any time. (sea urchins, starfish, etc.)

Lobsters: 1st March – 30th November (CLOSED) – 3 per person/ 6 per boat.

Nassau Grouper: No fishing in designated spawning areas.
Size limit of 12 inches minimum, year round.

Sharks: No feeding or attracting of any type of shark.

Other Protected Fish: Goliath Grouper, Tilefish, Filefish, Angelfish (including grey, French, and queen fish) may not be taken at any time.
Size limit of 8 inches minimum on all other fish, except goggle eyes, herrings, anchovies, and silversides.

Turtles: 1st May – 31st October. License required from the Marine Conservation Board.
Possession of turtle eggs is prohibited. Don't bother the turtles!

Whelks: 1st May – 31st October – 2.5 gallons in shell limit.

Fishing Licenses are required – except for catch & release!



protection

General Rules

- Damaging coral by anchor, chains, or any other means anywhere in Cayman waters is prohibited.
- No taking of any marine object alive or dead while on scuba.
- No taking of any coral, sponge, etc. from Cayman waters.
- Wearing gloves while diving or snorkeling is prohibited.
- Export of live fish is prohibited.
- Fishing with gill nets, poison, or any noxious substance is prohibited.
- Dumping anything into Cayman waters is prohibited.
- Export of conch shells & black corals requires a CITES permit (Convention on the International Trade of Endangered Species).

Violations in Cayman may incur severe penalties

- Violation of any of these laws is an offense carrying a maximum penalty of CI\$500,000 fine and 1 year in jail.
- Upon conviction, forfeiture of the vessel or other equipment may also be ordered.

Marine Parks

Marine parks abound in the Cayman Islands. While visitation is encouraged, there are many rules and regulations to follow depending on which type of park you intend to visit. To minimise problems, always pay close attention to where you are, & talk to guides & local people before you go!

REPORT AN OFFENSE

Call: 948-6002 or 911 or VHF: Channel 17



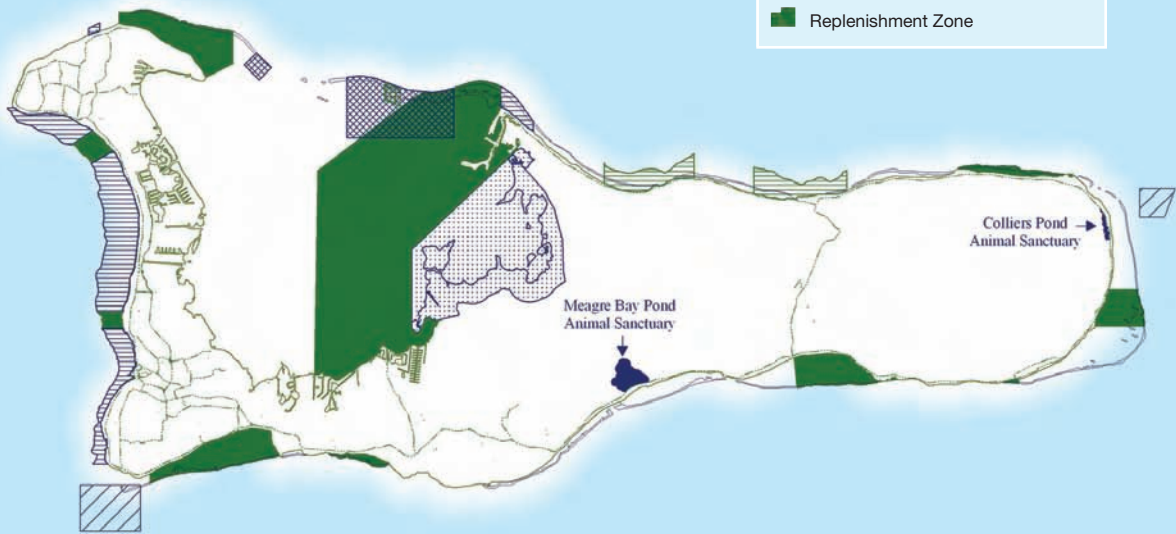
Photo: diana@research.org

cayman islands marine parks



know the marine park signs

- Designated Grouper Hole
- Sand Bar No Scuba Diving Zone
- Wildlife Interaction Zone
- Environmental Zone
- Marine Park
- No Dive Zone
- Replenishment Zone





Why we have open and closed seasons

Everyone has heard that the ocean is being exploited in an unsustainable way. This means we are taking more of a certain species than can be replaced through natural reproductive cycles. Scientific data provides shocking facts about declining fisheries from shallow, intermediate and deep ocean depths.

Many species have been fished to near extinction and others have had the seasons closed for longer and longer periods of time to reduce the threat of extinction. This is what the United Nations Fisheries Department says:

“Smaller fish and smaller catches suggest that the world’s oceans are no longer producing at their full potential. The bounty of the sea is becoming less generous – scientists estimate that the number of large fish in the oceans has fallen by as much as 90% since the 1950s. Improvements in technology have made it easier for fisherman to find and harvest more fish than ever before - while demand for sea life products – which are consumed by both the rich and poor – is at an all time high.”

A recent report (Review of the State of World Marine Fishery Resources) from the United Nations Food and Agriculture Organisation’s Fisheries Department says,

“77% of the world’s fish stocks are “fully exploited” – producing catches that are already at or very close to their maximum sustainable production limit, over-exploited, depleted, or recovering. The proportion of stocks FAO classifies as “under-exploited” has fallen to 3%, while the amount of “moderately exploited” stocks stands at 20%.”

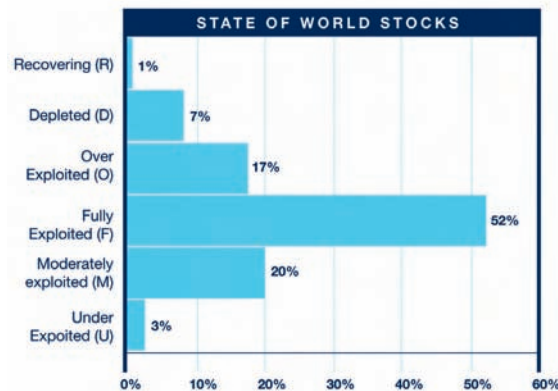


Table courtesy of the Marine Resources Service, Fishery Resources Division, FAO Fisheries Department.

protection

Good News

The good news is that by having closed areas or closed seasons for threatened species we have seen remarkable recoveries where the law has been enforced.

One such positive example is here in the Cayman Islands, where a Nassau grouper spawning aggregation off the west side of Little Cayman was rediscovered by our local fisherman. During the first two full moons of the new year in 2000 and 2001, fishermen were able to easily catch 100 or more fish to fill up their skiffs in the early predawn hours. The site is now protected.

Like many fish species, Nassau groupers' reproductive behaviour is linked to the lunar cycle. At full moon the groupers come together – aggregate – in the thousands to spawn. At the grouper aggregation on Little Cayman over half of the population of this fat-lipped fish was taken from the ocean by a small group of fishermen who believed there was an endless resource.

The closure of the aggregations in Cayman to fishing is having a remarkably positive result and at Little Cayman, several groupers will be seen during any single dive. Sadly, several grouper spawning grounds have already been lost. It will take many years to know whether the grouper population can recover at the other sites.

Looking Forward

Conservation ideology has evolved in recent years. Instead of trying to solve local problems piecemeal, large organisations such as The United Nations Environmental Program (UNEP) and The Nature Conservancy (TNC) are looking for solutions that will have global impact. The Caribbean Challenge is one such project.

TNC is challenging Caribbean nations to increase their marine parks and to improve marine

enforcement. The current thinking is that a global network of marine parks could control what the experts call “the tragedy of commons.”

In many areas, fish in the ocean are an open, or ‘common’, resource with no limits to how much can be taken or by whom. Countries can send their fishing fleet thousands of miles from their own shores to fish “the high seas.” But we know that our ocean currents connect far reaching places on earth. Take all of the fish from one place, and the effects can be felt on the other side of the world.

Fish and corals don't need passports: ocean currents transport fish and coral larvae, and many other organisms across the open ocean to our reefs and between one island and the next.

Cayman has one of the most important coral reefs to protect, and global networks could provide the capacity for our small island nation to reap major benefits with little effort.







conservation

You can make a measurable difference

Life on an island is great, but small islands generally rely on bringing in much of their basic needs from elsewhere, usually at great cost. And, on a small island we soon run out of space when we try to get rid of all our waste and trash.

There are some basic necessities that we all need, but we tend to forget about them during the daily hustle and bustle.

Water

Fresh ground water flows in the bedrock and sand beneath the surface of the island. The supply of water depends on the amount of rainfall, the size of the reservoir, and the connectivity between the areas of recharge (or replenishment, like wetlands) and where wells are being drilled.

The small size of the Cayman Islands makes it impossible for Mother Nature to replenish the ground water at a fast enough rate to serve our population size. There are two alternative ways to produce water.

Catchments collect and hold rain water in cisterns or wells, and desalination plants use a system called reverse osmosis. Reverse osmosis works by forcing the salt water through a membrane, so that the salt is stuck on one side and fresh water comes out on the other side. This, however, requires an enormous amount of fossil fuel energy, which is expensive in the Cayman Islands.

SOLUTIONS: Reduce water consumption by adopting conservation measures at home and at work.

Grey water gardens are also a fantastic opportunity to recycle the water that you use in your showers or that you wash down your sink drain. CCMI has a grey water system at the Little Cayman Research Centre that services the landscaping.

The sun's free energy

Solar energy has been used for thousands of years, and today solar technologies to harness the sun's energy and use it to produce electricity, heat, and hot water. Little Cayman Research Centre uses a solar panel with copper tubing coils inside to capture the sun's energy and heat our water.

CCMI relies entirely on the sun's energy at the bath house for lighting and all of the energy needed to operate. The major issue that is always of central concern is the cost of such a system. In most places the cost of fossil fuel energy averages 7.5¢ CI per kilowatt hour whereas the cost in Cayman is roughly 30¢ per kilowatt hour. The Little Cayman Research Centre will recoup the \$15,000 investment in solar energies within 4 years as compared to between 12 – 15 years in the US.

Consider using free energy at your home or business.

Waste

Composting is not a new idea either, although there is more to it now than just digging a hole in the ground! This method allows human waste to fall into a large container, where it is literally eaten by tiny microbes until it is turned into earth! One major asset to composting systems is that they reduce water consumption – making this a perfect example for sustainable development especially for public facilities and for private homes.

With advances in some of these technologies and a better understanding of how nature works, it is possible to live an ideal island life and minimise your impact on the environment. Solar power and composting toilets are two ways in which this is possible. It is only proper that CCMI's facility uses rain water catchments, solar power for hot water in the bath house, and a special system of composting toilets.



(above) Model for Sustainable Living:
Little Cayman Research Centre's Bath House

(right) Passive Solar Heating

Bath House Sustainable Design Features

- Composting Toilets
- Gray Water Garden
- Passive Solar Hot Water
- Solar Power for LED high efficiency lighting
- Water Catchment System
- Elevated
- Simple Air Ventilation Design



ideas & actions

Measuring the effect of humans on earth

40% of all of our 6.5 billion people living on earth live in coastal areas (UNEP)

80% of all marine pollution originates from land (UNEP)

Oil discharge from industry and cities has been cut by nearly 90% since the mid-1980's. (UNEP)

extinctions



Acropora cervicornis
(staghorn)

Of the 2175 coral species described, the ecological status of only 13 have been evaluated and 38% of these are on the IUCN Red List as threatened. (IUCN Table 1 2007)

Two Caribbean coral species are listed as threatened based by the US Endangered Species Act as of May 6, 2006. These corals are the Elkhorn (*Acropora palmata*) and staghorn (*Acropora cervicornis*).



Acropora palmata
(elkhorn)

In the Millennium Ecosystem Assessment (2005), the most comprehensive audit to date, scientists report that organisms are disappearing at 100 – 1000 times the 'background levels' seen in the fossil record.

measuring your ecological footprint

With human population growing to 6.5 billion, the earth has 4.5 biologically productive acres per person. The average consumer in the western world requires the equivalent of 24 acres.

That means they need about five Earths!

Several organizations have developed a simple and fun online calculator for you to estimate how much land and water you need to support your current consumption and lifestyle.

www.earthday.net/footprint www.ecologicalfootprint.org

TIP to reduce your footprint

If every household (in the USA) replaced just three of its incandescent light bulbs with energy-saving designs and used them for five hours per day, it would reduce emissions of carbon dioxide by 23 million tonnes, reduce electricity demand by the equivalent of 11 coal-fired power stations and save \$1.8bn.



Changing your habits can make a measurable difference

- 1 Walk, bike and carpool. This action reduces traffic and saves energy.
- 2 Dry laundry on a line
- 3 Eat eco-friendly seafood
- 4 Use zoned air conditioning
- 5 Install compact fluorescent lighting
- 6 Keep temperature several degrees higher. Just a few degrees makes a difference.
- 7 Unplug hot water tank if going off island.
- 8 Eliminate lawn pesticides
- 9 Reduce home water usage
- 10 Inspire your friends to take similar actions



green tips

for divers

Report any damage to the coral reef to your dive operator or to the Department of Environment.

Practice good buoyancy in a swimming pool before you go diving in the ocean.

Maintain good buoyancy control particularly when using cameras

Hover above the reef and do not touch the sea floor.

Never touch marine life.

Observe briefings from local dive professionals

Keep your gauges tucked in and be aware where your fin tips are

Don't feed the fish

for boaters

Use only biodegradable cleaning agents

Maintain your engine for peak efficiency

When replacing engines purchase high efficiency four stroke engines or other new technologies

Use moorings or anchor in sand where permitted

Never anchor on coral or in sea grass beds

Pump sewage and grey water tanks into an appropriate shore facility

Never dump trash or anything into the ocean

Becoming a green traveller

- Choose a dive operator that is aware of the marine environment.
- Support environmentally responsible resorts and tour operators that properly treat sewage and wastewater.
- Never eat local threatened sea food.
- Never purchase souvenirs made from coral or any threatened or endangered marine species.
- Hang your towels to dry so you can reuse them and reduce water and energy consumption.
- Be aware of protected fish and sea food in the Cayman Islands.
- Know the Marine Conservation laws. Be aware of all regulations and laws including the new Wildlife Interaction Zone (WIZ) regulations for interacting with marine life at the Sandbar and Stingray City on Grand Cayman.
 - No removal of stingrays from the water
 - No feeding marine life in any of Cayman waters other than those areas designated as WIZ's.
 - Only approved fish food is permitted.
 - No vessel's anchor can be closer than 20 ft to any reef structure.

What to eat and not to eat: Visit www.fishonline.org to get advice.

Household tips: trash & recycling

reduce water consumption: go low flow

- Low flow faucets, low flow shower heads, low flow toilets (place a brick in the cistern)
- When replacing old appliances purchase high efficiency, low flow washing machines, dishwashers.
- Build a grey water garden to water your lawn.

reduce energy consumption – go solar. go fluorescent.

- Solar hot water systems are an easy and moderate cost option in Cayman.
- Solar electric panels can also be installed to reduce your reliance on electricity.
- Low energy high efficiency fluorescent light bulbs
These are excellent for providing good lighting at a fraction of the consumption of old-fashioned incandescent bulbs. The International Energy Agency calculates that 19% of global electricity generation is used for lighting, but old-style bulbs convert only 5% of their energy into light.

reduce the amount of garbage you produce

- Learn how to compost your discarded food.
- Reduce the use of non-recyclable items.
- Take a shopping bag shopping with you to reduce wasting grocery bags.

Tips for restaurants & hotels

Developing a Green Strategy makes sense because it will reduce costs and minimise your business's detrimental impacts on the environment.

establish a waste management plan

- Eliminate paper and plastic products from your dining room
- Recycle linen, food, office paper, and packages

establish an energy management plan

- Install timers on electrical equipment such as outdoor lighting, pools and jacuzzi jets, and even kitchen equipment
- Use solar walkway lighting
- Increase guest awareness of ways they can reduce energy waste, such as reusing their towels and turning off the air conditioning when they leave their rooms.

conserve water

- Monitor total water use on your property.
- Water gardens at night.
- Use low flow shower, faucet, and toilet fixtures.
- Build a grey water garden.

eliminate hazardous substances

- Substitute non-biodegradable toxic chemical cleaners for biodegradable non-toxic chemicals for your kitchens, rooms, and boats.

increase staff awareness

- Make sure your staff is aware of the local marine protection laws.
- Establish an environmentally aware orientation for staff.

promote sustainable fisheries

- Don't serve any locally threatened fish and sea food species.
- Be aware of globally threatened fish and sea food and provide information to your guests as to why you are not serving these fish. www.blueocean.org/seafood



Photo: davidwolfephotography.com

acknowledgements

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