yesterday, today and tomorrow

Learning about the past, looking to the future

REEF Beat 1

Hi I'm Sandy Seabird...

and the Great Barrier Reef Marine Park is my home.

Many of you have probably visited the Great Barrier Reef, especially if you live along the coast of Queensland. You may have gone there to swim at the beach, snorkel or dive on the Reef, jet ski or have been fishing with your family.

I have been around a long time and I've seen and experienced many things as well and I've made lots of friends. The Great Barrier Reef is a very important place to me. It is where I have made my home and had a family. It is also where my friends live, including fish, corals, whales, dolphins, dugongs, marine turtles, sharks and other seabirds.

For many people the Great Barrier Reef is where they work. Two of the biggest commercial activities that occur on the Reef are tourism and fishing. Approximately 1.9 million tourists and 4.9 million recreational visitors experience the Great Barrier Reef each year. The tourism industry in the Great Barrier Reef area employs 55 000 people and generates about $6 billion annually.

Each year about 15 000 tonnes of seafood (valued around $120 million) is harvested by commercial fishers. Based on recreational fishing surveys, there are more than 800 000 recreational fishers in Queensland, who spend over $240 million each year to catch approximately 4000 tonnes of seafood. Some 120 fishing charter vessels operate in the Great Barrier Reef Marine Park, ranging from large reef-going charter vessels to smaller inshore boats.

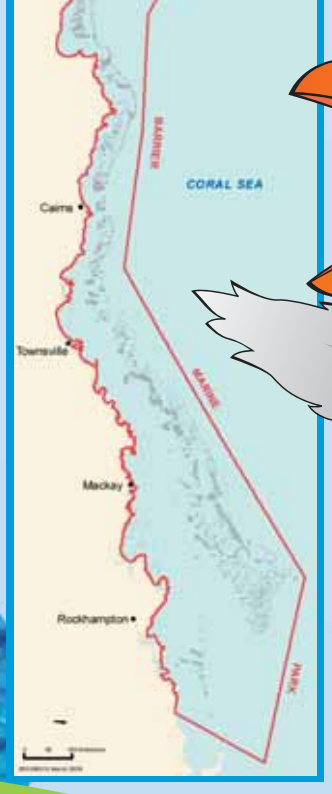
Many people want to know how old the Great Barrier Reef is. Some of the plants and animals that call the Great Barrier Reef home today have been around for millions of years, such as marine turtles, sharks and corals. The Great Barrier Reef has been evolving for over 18 million years, the corals we see today are between 10 000 and 12 000 years old.

To celebrate the 2008 International Year of the Reef, the Great Barrier Reef Marine Park Authority is asking the following questions:

What do we want the Great Barrier Reef to look like in the future?

And importantly:

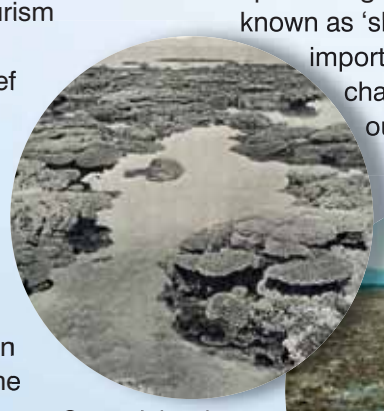
What did the Great Barrier Reef look like in the past?



Shifting Baselines

A baseline is a reference point from the present or past – how things are or used to be. If these reference points change or shift over time, we risk losing track of our standards and eventually accept the degraded state as being the natural one. This concept is known as 'shifting baselines.' In this International Year of the Reef it is important that everybody makes an effort to make some small changes to their behaviour, to ensure a sustainable future for our marine environment.

This Reef Beat series will help you learn more about the amazing plants and animals that call the Great Barrier Reef home whilst exploring how it was in the past, what it's like today and how it could be in the future.



Stone Island 1893

Stone Island 1994

Great Barrier Reef Marine Park Facts

More than **2300km long**

Over 2900 Reefs

600 Continental Islands

300 Coral Cays

344 400 km² Total Area

The largest World Heritage Area

Inscribed on the **World Heritage List** on 26 October1981

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REEF Beat 2

Fish

Creature Features

- There are more than 1500 species of fish that live in the Great Barrier Reef
- Their skeleton is made of bone
- They have one gill opening on each side of their head
- Most have a swim bladder to keep them afloat
- Most reproduce through external fertilisation (known as spawning)
- When fish eggs hatch, baby fish are on their own and they know instinctively how to swim and find food
- Some male fish carry the babies and give birth, such as the seahorse
- Reef fish use their colours to hide from predators and sneak up on prey; some reef fish can change their colour patterns to suit the colour of the surface they are resting on
- The ocean sunfish is the largest bony fish growing over three metres in diameter and weighing over two tonnes.

Seahorse

Coral Cod

Fabulous Fish

Although sharks and rays are technically fish they are considered to be slightly different because they have a skeleton made of cartilage and do not have a swim bladder, but we will talk more about sharks and rays in poster number eight.

Because there are so many different types of fish found on the Great Barrier Reef many have adapted to eat almost all available food ranging from algae to other fish. The fish living in the Great Barrier Reef come in many shapes and a kaleidoscope of colours, this is one of the reasons why the Great Barrier Reef is so famous. As a seabird I really love to catch and eat fish, and I know many people also love to catch fish. The main thing is that we make sure that there will always be enough fish for people, and seabirds of course, to catch in the future.

A day fishing in 1954...

I would now like to introduce you to my friend John Frisch. He is going to tell you what it was like when he went fishing in the Great Barrier Reef more than 50 years ago…

"Back in 1954 when I was just a young lad, my father and I would head out fishing almost every weekend. Back in those days there was no need to take the boat out hundreds of miles, as the Reef was virtually untouched and the fish were in abundance. When you were out on the water you were lucky to see another boat out there. My father and I would normally put two lines in, and by the time we had put the second line in there was something on our first line. I remember once my uncle caught a 320-kilogram groper! There never used to be legal size and possession limits on fish as there was just stacks of fish to catch."

Goby

Sunfish

John Frisch still going fishing today...

Well John and I have both been around a long time and we have seen how fishing technologies have changed over the last 50 years. It's a completely different scene for John out on the water today; let's hear his story…

"I got my first speed boat in 1964 and at that time there were only nine other boats registered in the area. Today there are more boats in my street than there were in the whole district in the 1960s. Today I have a boat that goes faster and further than ever before and onboard I have a GPS (Global Positioning System) that lets me know exactly where I am and a fish finder that tells me exactly where the fish are. When I head out in my boat I see other boats everywhere and they are all using their GPS to map out the area and mark the good fishing spots. The fish aren't as abundant as they used to be but because I have the latest in technology I can still manage to catch some fish. All of these advances in technology are advantages for fishers but not for the fish. There just never used to be this much pressure on fish stocks before."

Top speed

Sailfish	109km/h
Bluefin tuna	100km/h
Swordfish	90km/h
Marlin	80km/h
Flying fish	56km/h
Barracuda	43km/h
Mackerel	33km/h

What's being done to protect fish stocks?

Due to the pressure on fish stocks today government agencies are working to ensure there will be still be plenty of fish left to catch in the future.There are now size limits on the fish you can take and bag limits on the number of fish an individual can catch and keep. To help conserve the Great Barrier Reef Marine Park and improve fish stocks certain sections (known as zones) have been closed to fishing all together. It is really important to take a zoning map with you when go fishing in the Marine Park, so you know where you are and what you can do!

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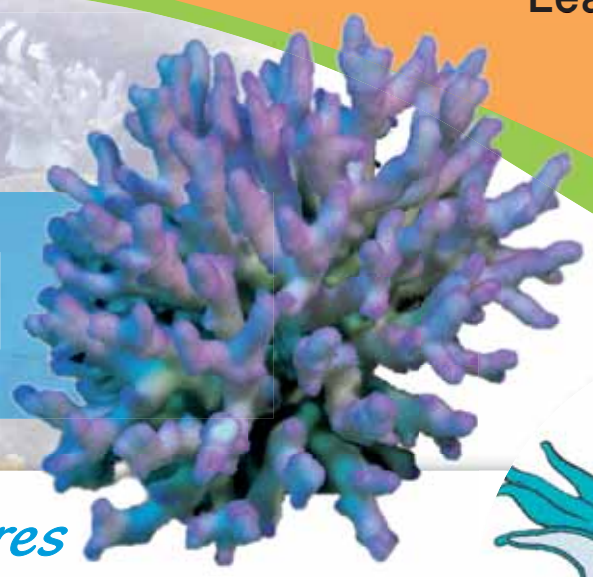
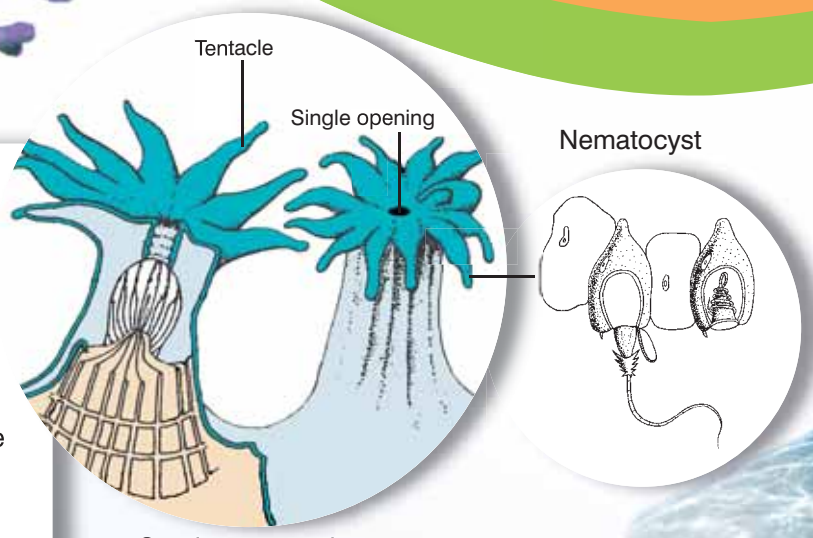
REEF Beat 3

Corals



Creature Features

- Most hard and soft coral colonies are made up of tiny animals called coral polyps
- Coral polyps have a single opening surrounded by tentacles for both food and waste, *(see coral cross section, right)*
- The "building blocks" of the Great Barrier Reef, corals are responsible for the formation of the Reef. They attract millions of visitors from around the world who visit the Reef each year to explore the wonderful corals and sea creatures
- The Great Barrier Reef has about one-third of the world's soft corals and 360 species of hard corals
- Jellyfish are in the same group of animals as corals and most use stinging cells found in their tentacles to capture food, these cells are called nematocysts, *(see nematocyst illustration, right)*.



Coral cross section

Conditions for Corals

The corals that we see in the Great Barrier Reef today are about 10 000 years old. Now I wasn't around back then, but I can tell you that 50 years ago corals in the Great Barrier Reef came in all shapes and sizes in every colour of the rainbow. Corals grow best in clean, clear and warm tropical waters (22° - 29° Celsius) with low nutrient levels and back then the tropical waters of Queensland provided exactly this.

Today, there are rising sea temperatures due to global warming and climate change. There are more people living along the coastline next to the Great Barrier Reef and pollution in the water running off the land is having a negative affect on the water quality surrounding the Reef. The corals are suffering and are not as resilient (able to withstand change) as they once were, because rising temperatures and poor water quality are affecting them.

How does Coral Bleaching occur?

Tiny single-celled algae, called zooxanthellae (pronounced zoo-zan-thel-ee), live within the tissue of corals and provide the energy that corals need to grow through photosynthesis. It is this zooxanthellae that give corals their extraordinary colours. When stressed the zooxanthellae are rejected out of the coral so that the coral's tissue becomes transparent. The skeleton inside the coral is white so the coral looks bleached without the zooxanthellae. The main cause of coral bleaching is extended periods of high water temperatures so bleaching is usually seen in summer.

Healthy Coral

Bleached Coral

Coral Forms

Types and Examples

Branching	*Acropora robusta*	Bushy	*Stylophora pistillata*	Plates	*Pachyseris speciosa*
Digitate	*Porites cylindrica*			Massive	*Oulophyllia bennettae*
Encrusting	*Montipora monasteriata*	Soft	*Sarcophyton sp*	Soft	*Sinularia sp*

What you can do

To improve the health of corals we need to reduce the impacts of climate change and improve water quality. Here are some of things you can do when at home or school:

- Reduce your energy use – turn lights off at school and in your home when you are not in the room
- Ride your bike to school or ask your parents to give your friends a lift to school one day and then you can go with your friends' parents the next day, this will cause less pollution (Carbon dioxide CO_2) from cars on the road
- Remember that what goes down the drain will end up in the ocean.

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REEF Beat 4

Reptiles

Green Turtle

Creature Features

- Marine reptiles are some of the oldest residents of the Great Barrier Reef Marine Park, they were around long before my family flew here, and now they are all protected species
- Six of the world's seven species of marine turtle are found in the Great Barrier Reef
- Unlike a tortoise, marine turtles are unable to hide their head and limbs in their shell (carapace) – they rely on short bursts of speed to escape most predators
- There are 17 species of sea snakes found in the Great Barrier Reef, they are among the most venomous snakes in the world but most have short fangs and are not aggressive
- Estuarine crocodiles have been spotted swimming in the open ocean a long way from the nearest land however the primary habitat for crocodiles is along the coast

Sea Snake

Threats to Marine Turtle Survival

Turtles are 'marine dinosaurs' they have been swimming in the ocean for about 150 million years. This suggests that turtles have adapted to previous environmental changes. The big question is whether marine turtles will survive global warming. As the earth warms, its climate is changing and sea levels are rising, turtles may return to beaches to lay their eggs but where there was once land there is now water. Some nesting beaches may be eroded away by strong wind and waves.

New research suggests turtles have adapted their behaviour in the past to a changing environment. Prior to the last ice age, sea levels were significantly lower, so the coastline and turtle nesting beaches were further out, as far as 1200 kilometers from their present day locations. By the time the last ice age ended 4000 years ago sea levels had risen significantly. The flatback turtle adapted and found new nesting sites and foraging (feeding) areas.

Coastal development can also impact on a marine turtle's survival. Lights on the land can distract turtles from heading to the water and animals, such as feral pigs dig up turtle nests. Litter can also have an impact, particularly plastic bags. Today, marine turtles are a protected species in the Marine Park and the Great Barrier Reef Marine Park Authority is working with others to ensure future generations can enjoy marine turtles in the Great Barrier Reef and not in a museum.

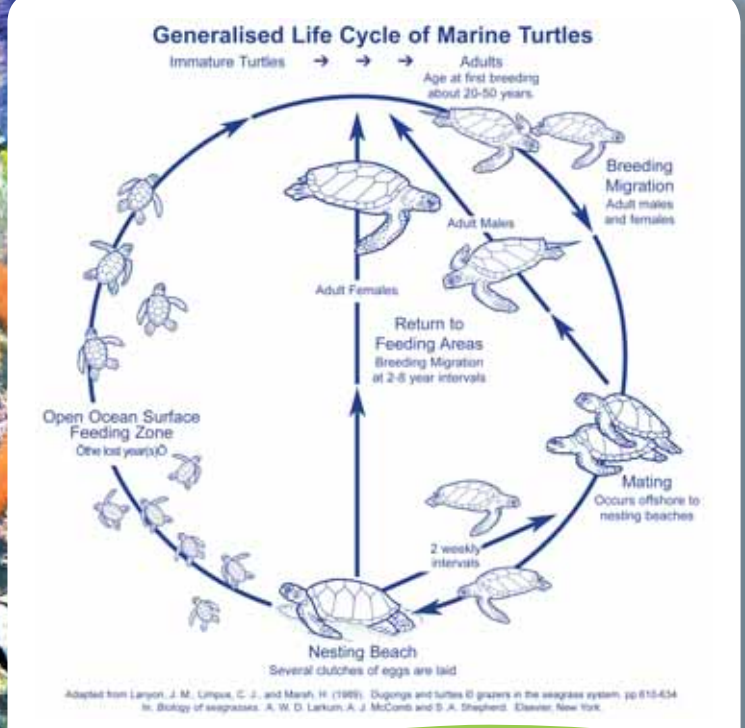
Life Cycle of Marine Turtles

Every year between October and November female marine turtles return to the same region where they were born and crawl up on the beach above the high-tide mark to dig a nest and lay 50 to 150 ping-pong ball size eggs. When born, approximately six to eight weeks later, the hatchlings dig out of the sand and hurry as fast as they can into the water. During this period the temperature of the sand around the nest determines the gender of the turtles. Warmer sand produces females, while cooler sand produces male turtles. It is estimated that only one in 1000 marine turtles reach the age where they themselves can lay eggs (which is generally around 40 years old).

Flatback Turtle Laying

Loggerhead Hatchlings

Turtle Eggs



Adapted from Lanyon, J. M., Limpus, C. J., and Marsh, H. (1989). Dugongs and turtles (I) grazers in the seagrass system. pp 610-634 In: Biology of seagrasses. A. W. D. Larkum, A. J. McComb and S. A. Shepherd. Elsevier, New York

Cultural Connections

Aborigines and Torres Strait Islanders have a strong connection with the land, sea, rivers, mountains, plants and animals. Marine turtles are culturally important to Aboriginal and Torres Strait Islander people living along the Great Barrier Reef coastline. The Great Barrier Reef Marine Park Authority is working with Traditional Owners to assist them with managing their hunting sustainably (making sure there is enough for future generations).

You can help protect our marine turtles

- Don't litter: even if you throw a piece of rubbish on the ground in your school, it can make its way into the ocean
- If visiting beaches along the Great Barrier Reef between October and April, switch off or minimise the use of lights (for example torches so that nesting turtles and hatchlings won't be confused
- Keep your dogs on a leash so turtles and hatchlings won't be harmed
- Do not chase, grab or block the path of a turtle either in the water or on the beach, regardless of the direction it is heading.

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REEF Beat 5

Mammals

Creature Features

- Whales, dolphins and dugongs are mammals, which means they are warm-blooded, breathe air and suckle their young
- Around 30 species of whales and dolphins have been recorded in the Great Barrier Reef area
- All whales, dolphins and dugongs are protected species in Australian waters
- Dugongs are one of the world's few vegetarian marine mammals, they can live for at least 70 years, and grow up to three metres long. They have only one calf at a time who remains with their mother for around 18 months after birth and their closest land relative is the elephant
- Whales swim by moving their tail, called a fluke, up and down; the lung of an adult humpback is the size of a small car
- Migaloo (the name Australian Aboriginal community elders from the Hervey Bay area use to describe a White Fella) is the name of the only known white humpback whale in the world. Migaloo visits the Great Barrier Reef once a year when he migrates north from the Antarctic.

Dugong and Calf

Dolphin

Population Pressures

Whales, in particular humpbacks, were subject to commercial harvesting. Between 1952 and 1962, 7423 humpback whales were killed at Tangalooma whaling station on Moreton Island and a smaller sister station at Byron Bay in New South Wales. During this period of whaling the quota for Tangalooma was 600 whales per annum. The whaling station would work seven days a week once the season began, harpooning as many whales a day as they could process. The whalers thought the whales would just keep returning every year. By 1962 the industry had become unviable due to the small numbers of whales passing through so they closed it down with an estimated whale population of only a few a hundred whales. Today whales are protected with many populations starting to increase and it is estimated that more than 12 000 whales migrate to the waters of the Great Barrier Reef from the Antarctic each year.

Humpback Whales

Minke Whale

The Downside for Dugong

The only historical evidence of dugong population decline comes from descriptions such as 'endless herds of dugong' published in memoirs during the 1800s and early 20th century. Dugong herds are now believed to be only a fraction of their former population size. Experts consider the decline in dugong numbers is due to deaths from human-related causes such as habitat loss or degradation, fishing nets, shark nets to protect swimmers, unsustainable traditional hunting in some areas, boat strikes, and marine debris (pollution).

A dugong population in the Great Barrier Reef can only cope with human-caused mortality (deaths caused by humans) of less than one to two per cent each year. This means that if there are 200 dugongs in a bay, the population will decline if there is a loss of more than two to four dugongs per year from all human causes, for example fishing nets, boat strikes, and traditional hunting.

The largest and most important remaining concentrations of dugongs in the Great Barrier Reef Marine Park are in the Cardwell/Hinchinbrook, Cleveland to Upstart Bay, and Shoalwater Bay areas. The Great Barrier Reef Marine Park Authority has established Dugong Protection Areas and is working with Traditional Owners to assist them with managing their hunting sustainably.

Go Slow for Those Below

- Be on the look out for dugong when you're in areas that they are known to inhabit or feed (for example, shallow seagrass beds)
- Slow down your vessel to a no-wake speed (less than 10 knots) in these areas
- If boating disengage your propeller whenever possible, if a dugong or whale appears near your boat
- Be alert and watch out for whales at all times, particularly during whale migration season (May to September)
- Remember pollution that goes down the drain can end up in the ocean.

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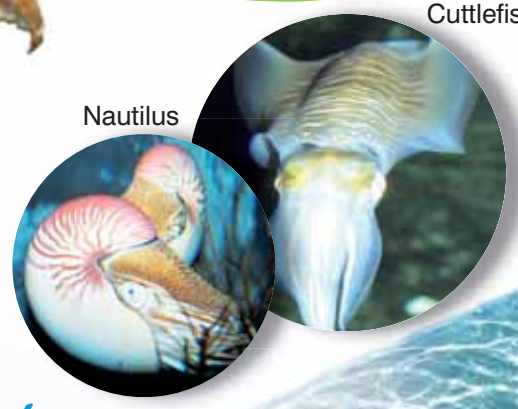
REEF Beat 6

Crustaceans and Molluscs

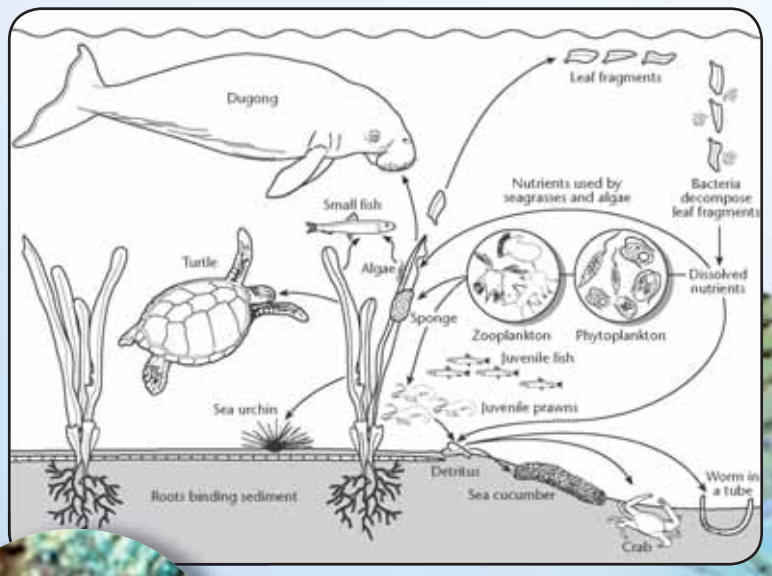
Creature Features

- Crustaceans have a hard external skeleton which is moulted regularly to allow for growth
- Crustaceans have a segmented body divided in separate parts: for example, prawns, crayfish, crabs, and lobsters
- Molluscs often have a hard shell to protects them: for example nautilus, clams, oysters, and snails
- Most molluscs have a specialised feeding apparatus, for example a radula (scraping tongue)
- Molluscs have a muscular foot used for crawling, burrowing or swimming: for example snails, nudibranchs, octopus, squid, and cuttlefish.



The blue highway

Did you know 26 major river catchments comprising 25 per cent of the land area of Queensland drain directly into the Great Barrier Reef Marine Park? The quality of water entering the Marine Park can affect the health of habitats and ecosystems that are home to many crustaceans and molluscs, for example seagrass beds. If we don't make sure the water reaching the Reef is of a high quality the next time you go out to dinner an order a 'fisherman's basket' it may not contain the beautiful prawns and scallops you are used to.



Seagrass Foodweb

Filling your fisherman's basket

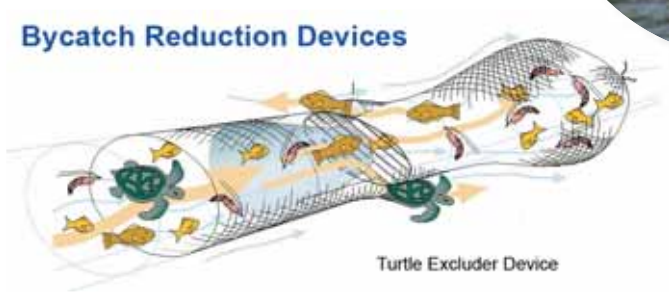
Crustaceans play a varied role on the Reef, from scavenging on the bottom to cleaning parasites off fish. Molluscs play many roles on the reef from coral burrowers and destroyers, to plant grazers and active hunters. Most importantly both groups of animals ensure there is an ecological balance within the Reef ecosystem.

These crusty critters are some of the most loved invertebrates, particularly when they are on our dinner plate. The East Coast Otter Trawl Fishery is a commercial fishery that operates in the Great Barrier Reef Marine Park. Trawling for tiger, endeavour and eastern king prawns is the largest part of this fishery, scallops and bugs are also caught. To move this industry towards ecological sustainability the number of otter trawl vessels has been reduced significantly from its peak in the early 1980s, when some 1400 operators were licensed to fish. Today about 400 vessels operate in the Great Barrier Reef Marine Park, landing around 6000 tonnes of product annually. The estimated value of this is about $80 million. All trawl vessels operating in the fishery are monitored via a satellite-based Vessel Monitoring System (VMS), which allows managing agencies to locate a boat's position at any time. A major issue with trawling is the large amount of unwanted by-catch and impact on the seabed. All trawlers must carry Turtle Excluder Devices (TEDs) and By-catch Reduction Devices (BRDs) in the trawl nets to minimise the bycatch and impact of trawling on the sea floor.

Nudibranch

Trawler

Octopus



Keeping the Blue Highway Clean

- Keep gutters, sinks and drains free of chemicals and rubbish, as what washes down sinks and drains could end up on the Reef
- Wash your car on the lawn, not on the driveway or road, to minimise detergent runoff into drains
- Minimise water runoff by planting trees, garden beds and ground cover around your home
- Use environmentally-friendly cleaners and fertilisers.

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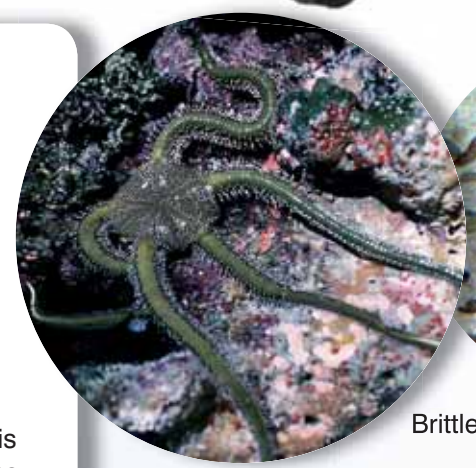
REEF Beat 7

Echinoderms

Creature Features

- There are at least 800 species of echinoderm on the Great Barrier Reef
- Echinoderm (meaning spiny skin in Greek), refers to a group of animals including feather stars, sea stars, brittle stars, crown-of-thorns starfish, sea cucumbers, and sea urchins
- They have no head or brain
- Echinoderms use a water vascular system (a hydraulic system) for locomotion, food and waste transportation, and respiration, which is composed of canals connecting hundreds of tube feet. Echinoderms move by alternately contracting muscles that forces water into the tube feet, causing them to extend and push against the ground, then relaxing to allow the feet to retract.

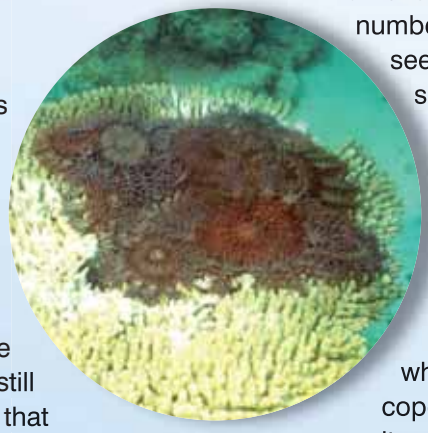


Brittle Star

Sea Cucumber

Thorny Outbreaks

One infamous but not very popular echinoderm is the crown-of-thorns starfish. They are attracted to the 'smell' of other starfish feeding, which can cause them to form large groups called feeding aggregations. For the past 40 years, crown-of-thorns outbreaks have regularly reached plague proportions – causing great concern in coastal communities. Scientists have been studying these thorny reef pests for more than 30 years but are still not sure what causes the outbreaks. They believe that outbreaks could simply be a natural phenomenon relating to fluctuations in the environment. Another idea is that humans have overfished the few predators of crown-of-thorns that might keep populations in check. The final theory is that crown-of-thorns larvae survive better in nutrient rich waters, like those nearby large coastal cities and agricultural areas. **Which theory do you think is right?**



Coral affected by Crown-of-thorns

What might the Future Hold?

Crown-of-thorns starfish have lived on the Reef for tens of thousands of years. Today, they can occur in such great numbers that they eat corals faster than the corals can grow. I have seen hundreds of crown-of-thorns starfish on a single reef! Like I said though, the scientists don't know if outbreaks are natural or caused by human activities and my relatives can't remember that far back. What we do know is that the Reef is under more stress today than it was in the past. Increased coastal development, declining water quality, increased fishing pressure and climate change are all putting extra pressure on our Great Barrier Reef, which is less able to cope with stress than it used to be.

Featherstar

Sea Urchins

Interesting COTs Facts

- Crown-of-thorns (COTs) starfish are voracious coral predators and can eat up to 5-6 square metres of coral each year (the area of a small classroom)
- The crown-of-thorns starfish gets its name from the dense covering of long sharp poisonous spines covering their upper surface
- Most sea stars have five arms but the crown-of-thorns can have up to 21!
- An adult feeds by pushing its stomach through its mouth to the outside of its body, digesting living coral tissue and leaving behind the white coral skeleton
- A single female crown-of-thorns starfish can produce up to 100 million eggs per year – that's a lot of babies!

Crown-of-thorns

What you can do

We need to help ensure that our Reef is as resilient (able to withstand change) and healthy as possible in order to cope with future outbreaks of crown-of-thorns starfish. This means we all need to take action to reduce other pressures on the Reef and do what we can to help keep crown-of-thorns populations in check. Here are some things you can do to help keep our Reef healthy:

- Make sure you and your family adhere to fishing regulations including bag limits (or if you don't fish, help spread the word to people who do)
- Remember that rain washes all the chemicals we use on land into the ocean
- Use less chemicals on your lawn and in your home and help educate others about the impacts of chemicals and pollution on the Reef.

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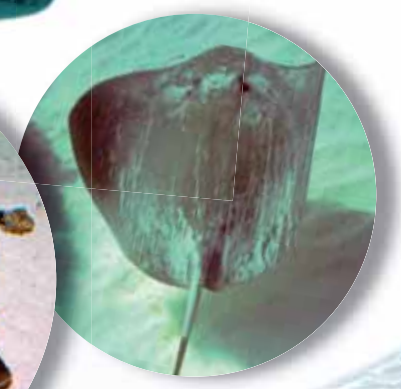
REEF Beat 8

Sharks and Rays

Shark and Ray Facts

- There are about 350 species of sharks and rays in Australian waters
- Sharks and rays have skeletons made of cartilage instead of bone. Cartilage is lighter and more flexible than bone and some sharks can almost twist themselves into a circle
- Some reef sharks give birth to fully formed live young while others lay eggs in egg cases
- Compared to bony fishes (like coral trout), sharks live for a long time, grow slowly and produce few young. The sandbar shark has a lower reproductive rate than the Asian tiger!
- The whale shark is the largest living fish in the world and can grow up to 12 metres long. In spite of their size, they only eat plankton
- The pygmy shark is the smallest shark and only grows to 15 centimetres long.



Stingray

Shovelnose Ray

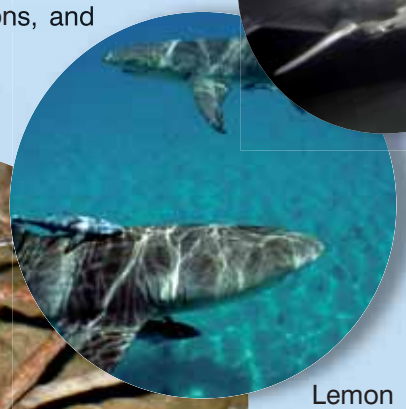
Sharks, ecosystems and people

As apex predators many sharks play vital roles in marine food chains by controlling population numbers, keeping them healthy. By targeting sick and injured animals, sharks also help prevent the spread of disease. When sharks are removed from the ecosystem, the whole ecosystem can be effected. On the Atlantic coast of the United States, scientists believe that declines of large sharks have led to large increases in populations of smaller predators such as cownose rays. These rays eat almost all of the available scallops and may be the main reason for the collapse of a century-old scallop fishery (in 2004, the catch of bay scallops in North Carolina fell to less than 68 kilograms).

Sharks and rays are also important to people. Indigenous Australians have many traditional and cultural links to sharks and rays, and sharks like the hammerhead shark are totems and characters in traditional stories. Medical researchers are also interested in sharks and rays and continue to conduct studies on how they could benefit humans.

Up to 100 million sharks are taken from the world's oceans every year, equivalent to three sharks per second. Unfortunately, sharks and rays cannot sustain intensive pressure because they reproduce slowly. Many shark and ray populations (and their fisheries) have collapsed and up to 20 per cent of the sharks and rays assessed by the IUCN (International Union for Conservation of Nature) are listed as threatened with extinction. In Queensland, scientists and fisheries managers are concerned about the health of shark populations, and some species are endangered.

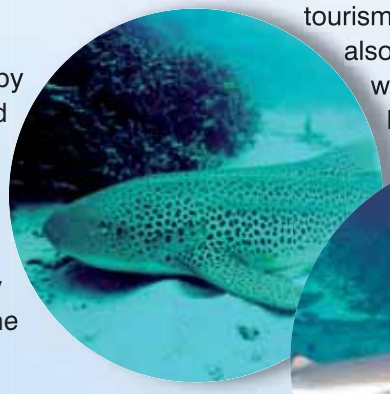
Whipray



Lemon Sharks

Where have all the sharks gone?

All sharks were once portrayed as vicious and dangerous "man-eaters". In reality, the risk of shark attack is very low and you are 15 times more likely to be killed by a falling coconut at the beach than being killed by a shark! Many people now value sharks and rays, and in the Great Barrier Reef, a single sighting of a shark may be worth as much as $1300 to the Reef tourism industry. Unfortunately, divers have also reported that in some areas of the world, the sharks they came to dive with have been fished out.



Leopard Shark

Blacktip Shark

Hammerhead Shark

What you can do

- Respect and understand sharks and rays. You don't have to love them, but understand that they are important to the health of marine ecosystems
- If you're fishing and you catch a shark, release it unharmed
- Show your support for the conservation of sharks and rays, and their habitats
- Show your commitment to sustainable Australian fisheries. Ask your fishmonger or supermarket deli about where the seafood has come from. Choose local seafood, find out about which fisheries are sustainable and only buy seafood from those with a good sustainability track record.

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Learning about the past, looking to the future

REEF Beat 9

Seabirds

Creature Features

- Feed and spend most of their time at sea
- Feathers are usually oiled, for water proofing
- Have webbed feet
- Excrete excess salt from special glands
- They have wings designed for long distance flying.

Red-tailed Tropic Bird and Chick

Red Footed Booby

Birds of a Feather

Well we have finally reached what I consider to be the most beautiful of all reef creatures, not that I am biased or anything! Let me tell you about my extended family. There are 23 species of seabird that breed on islands and cays of the Great Barrier Reef including – terns, noddies, gulls, shearwaters, frigatebirds and boobies. Between 1.4 and 1.7 million of us breed on the Great Barrier Reef each year and the Reef has another 425 000 non-breeding seabirds, giving a grand total of more than two million of us visiting or living there. There are 55 islands and cays that play host to key seabird nesting sites in the Great Barrier Reef World Heritage Area.

Beach Stone Curlew

We eat lots of seafood, in particular small fish, squid and crustaceans, but some of us are scavengers and help to keep the Reef clean by eating dead animals and plants. Seabirds are very important to healthy island ecosystems, when we gather together in large numbers our droppings (guano) help to fertilise plants. We sometimes carry plant seeds attached to our feathers, this helps to introduce new plants to other islands and cays that we visit during our travels.

Nesting Noodies and Terns

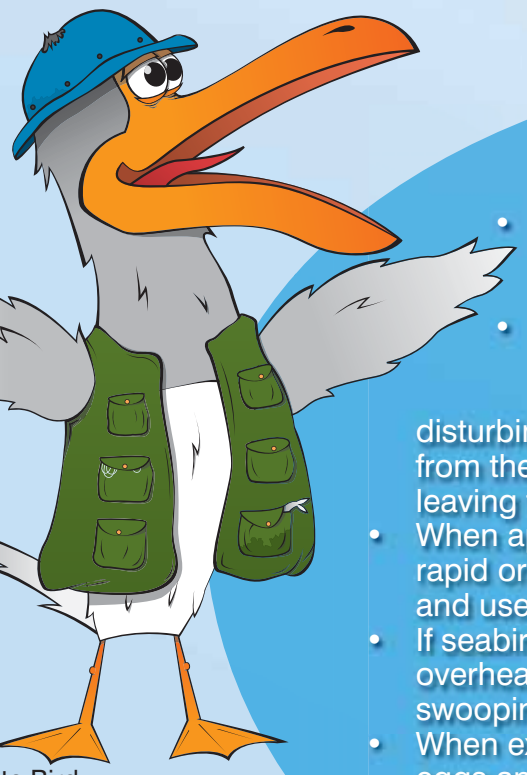
Seagull

Seahawk

Frigate Bird

Human Impacts

Cyclones and bad weather are natural problems for us seabirds. Big waves and strong winds can destroy our nests. Bad weather can also make it very hard for us to catch food and sometimes parents cannot catch enough food to feed their chicks. Although we love people coming to visit us sometimes they are careless, they walk around the islands that we are nesting on and they can accidentally step on eggs that have been laid on the ground. If people make too much noise around nesting seabirds they can scare parents away. Climate change is also affecting seabirds, as fish move further away from the coast to try to find cooler water, seabirds have to fly further to catch enough food to feed their chicks. Sometimes no chicks survive during extreme weather patterns when adult birds cannot find enough fish to feed them.



How you can help us

- Wherever possible keep well away from colonies of roosting or nesting seabirds
- If you cannot avoid going near a colony, always keep a low profile. This will minimise the risk of disturbing birds. Stressed birds may move from their nests or chicks, or take flight, leaving their nest unprotected
- When approaching birds, be quiet, avoid rapid or sudden movements, crouch low and use existing cover where possible
- If seabirds exhibit stressful behaviour overhead, such as raucous calling or swooping, leave the area immediately
- When exploring be careful not to crush eggs and chicks — some are well camouflaged
- Never attempt to touch birds, chicks or eggs
- Keep noise to a minimum and avoid using lights near or in bird colonies.

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Learning about the past, looking to the future

REEF Beat 10

THE GREAT BARRIER REEF
Doing Your Bit to Look After it

The Great Barrier Reef really is closer than you think. What you do at home, work and at school can impact on the Reef. Together, we can all make a difference by looking after the Reef and helping to protect the animals and plants that call it home, as well as maintaining the heritage and lifestyle that is important to us. You can do your bit to keep it great by doing some simple things:

At Home

- Recycle what you can - for example, plastics, paper, batteries and mobile phones
- Buy food and products with minimal or no packaging, or packaging that can be recycled
- Set up a worm farm and use the castings to fertilise your garden
- Compost fruit and vegetable scraps, shredded paper, grass clippings, leaves and cuttings (except noxious weeds and diseased cuttings), vacuum cleaner dust, used vegetable oil, tea leaves and bags, coffee grounds and egg shells
- Wash your car on the lawn, not on the driveway or road, to minimise detergent runoff into drains
- Operate your dishwasher and washing machine only when you have a full load
- Use environmentally-friendly cleaners and fertilisers
- Keep gutters, sinks and drains free of chemicals and rubbish as what washes down sinks and drains could end up on the Reef
- Minimise water runoff by planting trees, garden beds and ground cover around your home
- Use re-useable shopping bags rather than plastic bags
- Participate in community clean-up days
- Open windows and catch the breeze rather than using an air conditioner
- Clean the filters in your air conditioner and dishwasher regularly so they run efficiently
- Install energy efficient lighting and appliances and turn them off at the wall when not being used
- Donate quality second hand furniture, household items and clothing to charity organisations, rather than sending it to landfill
- Share these messages and your knowledge about the Great Barrier Reef with others.

At School

- Encourage recycling and revegetation programs
- Reduce plastic use in your school / conduct a waste audit
- Conserve and manage water and energy use in school buildings
- Hold a clean-up day at your school, park, creek, beach or oval
- Form an environmental committee in your school to try and make your school sustainable
- Use the ‘at home’ messages at your school - get everyone involved.

Out and about

- Take your rubbish home with you
- If you see rubbish, pick it up and recycle or dispose of it thoughtfully.

Reef HQ Aquarium is doing its bit

- Energy efficient light bulbs installed throughout the Aquarium
- Variable speed drives used on tank pumps that use less energy
- Solar thermal water chilling process for predator tank
- Aquarium air conditioning preset at an efficient level during winter and summer months.

The Great Barrier Reef Marine Park Authority is doing its bit

- Monitoring and assessing coral bleaching on the Reef each summer
- Working closely with coastal communities and Reef-based industries
- Identifying and supporting strategies to reduce climate change and its effects
- Implementing management plans that build reef resilience.

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