

Reef Facts for Tour Guides

Sharks – misunderstood or maneaters?

Thanks to Hollywood and some shocking publicity, sharks are arguably some of the most feared creatures on the planet. In reality, sharks are the ones threatened in the Great Barrier Reef Marine Park, and they play a vital role in the health of the Reef ecosystem.

This fact sheet aims to set the record straight about this much maligned animal and will help you create greater understanding and respect amongst your guests for some of the Reef's most sophisticated, fascinating residents.



The shark numbers game...

How many?	Worldwide, there are roughly 1100 species of sharks and rays, 134 (12%) of which are found in the Great Barrier Reef Marine Park.
How fast?	Generally, sharks swim at speeds less than 5 k/h (about 3 m/h), which is about the average walking speed of most people. Makos are among the fastest sharks, conservatively estimated to reach speeds up to 48 k/h (30 m/ph).
How big?	Sharks range in size from the pygmy ribbontail catshark (not found in the Great Barrier Reef Marine Park) at 16 cm (7 inches) or about the length of a man's hand, to the whale shark (found in the Great Barrier Reef Marine Park) which can grow to 12 m (40 feet); longer than a bus.
How old?	Not much is known about the age of sharks. It's thought sharks live 25-30 years – some may live to 100 years old.
How much?	The liver of the basking shark, a filter-feeding shark similar to the whale shark, can contain up to 1000 litres of oil! In the early 1900's, shark liver oil was used to light street lamps in Sydney.





Sharks are fish... aren't they?

Sharks ARE fish but they are in a class of their own - which also includes rays and skates: ELASMOBRANCHII (pronounced e-las-mo-brank-ke-i). They are different from other fish mainly because of their structure.

Unlike fish, sharks don't have bones. Their skeleton is made of cartilage, just like our nose and ears. Sharks have small tooth-like scales and five to seven gill openings along each side of the head whereas fishes have large scales and one gill opening per side. Sharks also have renewable teeth arranged like a conveyor belt; when a tooth is damaged or lost, another slides forward in its place.



Rather than a swim bladder - a special air sac which helps with buoyancy - like a fish, sharks have an oil-filled liver and balance the lift created by their flattened, hydro-foil like pectoral fins - the paired fins just behind or below the gill openings - with the downward force created by their tail.

Compared to fish, sharks have a lower reproductive potential. They produce fewer young, take a long time to reach sexual maturity and live for many years. Sharks can lay eggs, give birth to fully developed pups or a combination of both.

What's a group of sharks called?

A group of sharks is called a *shiver*, but a *school* is also acceptable.

Ray-latively speaking

Most rays differ from their close shark relatives in that their gill slits are located on the underside of their bodies and their pectoral fins are greatly expanded and attached to their heads creating wing-like appendages. In essence, they're bottom-dwelling sharks that look like they've been run over by a steamroller.

The hunter becomes the hunted...

Many shark species are close to becoming endangered largely due to over-fishing and accidental bycatch. Data from the United Nations Food and Agricultural Organisation shows a steady increase in reported global shark landings from approximately 271 813 tonnes in 1950 to 824 772 tonnes in 2001. This equates to about 100 million sharks every year, or three sharks every second.

While Australia lands only a small fraction of the global shark harvest, sharks comprise 4.9 per cent of Australia's total capture fishery production; it is the fourth highest in the world. The commercial harvest of shark in the Great Barrier Reef increased four fold between 1994 and 2003. It is unknown whether this level of fishing is sustainable.

A national survey of recreational fishers conducted in 2000 and 2001 estimated that 35 899 sharks are retained by Queensland anglers every year.

The underwater equivalent of lions, sharks are at the top of the food chain and help to regulate the populations of prey species and maintain an ecological balance. Ecosystem models have shown an alarming example of just how fragile the Great Barrier Reef Marine Park's ecosystem could be. In one scenario, the removal of tiger sharks resulted in a population explosion of sea birds. The increased bird numbers led to uncontrolled predation by seabirds on fishes to the extent that fish populations collapsed.

Also, as Undersea Explorer's John Rumney points out, sharks are worth more alive than dead: "The sharks we are diving with are worth \$1 million alive through tourism compared to \$200 dead and non-renewable."



Whale sharks are not aggressive and cruise the oceans feeding on zooplankton, small fish and squid.

What? They've been around for HOW long?

Sharks give new meaning to the expression 'ancient mariner'! With the oldest shark fossils dating back more than 400 million years, they've been around longer than dinosaurs!

One of these ancient sharks was the Megalodon (*Carcharodon megalodon*) - estimated to have been more than 12 m (40 ft) long and related to the modern day great white shark which grows to just over 6 m (21 ft). Incredibly, some existing shark species, such as the hornshark, have retained the same basic physical characteristics for more than 150 million years.



Telling the story - separating urban myths from facts

Visitors to the Great Barrier Reef have often heard stories about sharks and their ray cousins; some of the stories are true and some are just urban myths.

The information below is designed to help you address some of the most commonly held ideas about sharks and rays, and respond to some of the most common questions from visitors.

FACTS OR URBAN MYTHS? THE (REAL) STORY

Sharks are man-eaters and there's a high risk of being bitten if I swim in the ocean
– URBAN MYTH.

Put it into perspective... On average every year in Australia, less than one person dies from a shark attack while over 2000 people are killed in motor vehicle accidents. More people are killed by lightning each year than by sharks.

Sharks aren't very intelligent
– URBAN MYTH.

Relate it to things people know about... Sharks, like all large predators, are relatively intelligent. This is necessary since they have to catch their prey. As a rule their prey are herbivores (plant eaters) which usually are not very intelligent since they only have to "catch" grass. Sharks can even be trained to perform specific tasks just like dogs or dolphins.

Sharks can help cure cancer
– URBAN MYTH.

To put it plainly... Contrary to popular myth, sharks do get cancer. Tests on the effectiveness of shark cancer cures have shown no effects on cancer patients. Clinical trials also showed that shark cartilage treatments might result in adverse side effects.

Sharks have very sensitive eyes
– FACT.

Compare it to humans... Sharks have eyes that are similar to humans with a few interesting differences. Sharks, unlike most fish, have the ability to open and close their pupil in response to differing light situations. Research shows that sharks may be more than 10 times as sensitive to light as humans.

Sharks have an amazing sense of smell
– FACT.

Make complex examples simple... A shark's sense of smell is about 10 000 times better than ours. Blacktip reef sharks, like those found in the Great Barrier Reef Marine Park, have the ability to sense one part of grouper flesh in 10 billion parts of water – that's equivalent to a grain of sugar in an Olympic-size swimming pool!

Steve Irwin was killed by a stingray in the GBR
– FACT.



Doing the stingray shuffle can help to scare off stingrays hidden in shallow sandy water.

Put it into perspective... Stingrays, like sharks, are generally 'path of least resistance' types. Given an opportunity to flee rather than fight, most will swim away. Stingrays are however, very capable of defending themselves, although only a handful of deaths due to stingrays have ever been recorded. To avoid stingrays when wading in shallow water, do the 'stingray shuffle' - drag your feet rather than walk to reduce the likelihood you'll accidentally step on a buried stingray by giving it a chance to escape. When diving over sand flats in deeper water, stay well off the bottom and watch for the rhomboidal outline that could indicate a buried stingray. If a stingray repeatedly turns to face you or raises its tail above its back like a scorpion, it's a good idea to back off.

Confessions of a reef guide

Sharks often hold a scary fascination for many visitors of the Great Barrier Reef Marine Park and you're bound to get questions about these misunderstood creatures.

Here are useful suggestions for getting the right message across from two experienced marine tourism guides, both of whom work for Ecotourism Australia EcoCertified tourism operators.

Undersea Explorer's skipper/manager,

John Rumney, is one of the Great Barrier Reef's shark gurus, researcher and devoted champion of this misunderstood creature. He says people typically have "a high level of fear" about sharks. His main message to nervous visitors to the Great Barrier Reef is: "Don't worry, you're NOT on the menu!"



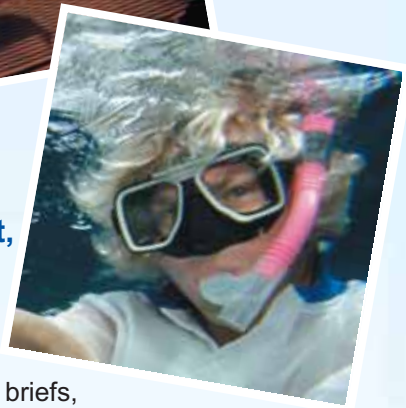
CHRIS "FLUFFY"

JONES, a marine biologist, with **Wavelength/Poseidon**, has his own unique way of dealing with nervous passengers.

In addition to information in general briefs, common questions about sharks are answered with a series of fast, humorous statements that deliver maximum information in a short time period. For example:

Q: "What about sharks?"

A: There are about a dozen common sharks found around here, most are not very colourful but rather elegant looking.



By giving the above response in a matter of fact manner, I'm not pandering to their desire to be wowed or have fears confirmed. They think that if the marine biologist doesn't even START to think along the lines of danger or risk then it must be far enough away from his mind to be a non-issue.

Q: "Yes, but are they dangerous?"

A1: Oh yes, deadly, we lose about three tourists a week....

This response is usually reserved for the young adventurous people who can handle humorous sarcasm – it's a quick way of cutting to the chase. Obviously, the statement is not true and as soon as they think about it - people obviously don't get bitten every week, then it must be safe.

A2: Well, you sir, are not a fish so I think you are safe. They eat fish (smile).

This response is more for the senior guest. It is still humorous but brings a simple biological truth to the equation and allows the guest to feel informed and justified in his decision to accept that there is no threat.

A3: No. Unless you have a bleeding chicken in your hand. These guys are just fish. You have to remember that... they are just fish. That's all. They are mostly small species that eat other fish a fraction their size. We are too big and look nothing like a fish in the water.

This response still uses humour, but gives the guest more attention, which is often what they like. It satisfies most guests who have a persistent wish to not use their brains or who haven't subscribed to *Discovery Channel*.

Well worth a look

Great Barrier Reef Marine Park Reef Manual, (2003), a GBRMPA publication

ReefEd's website section on sharks and rays:
www.reefed.edu.au/explorer/animals/marine Vertebrates/sharks/index.html

Sharks and Rays of Australia, P.R Last & J.D Stevens, CSIRO (1994)

The State of the Great Barrier Reef Report – Environmental Status Update on Sharks & Rays:
www.gbrmpa.gov.au/corp_site/info_services/publications/sotr/sharks_rays/index.html

All about sharks – Florida Museum of Natural History:
www.flmnh.ufl.edu/fish/Sharks/sharks.htm

Your contributions, ideas and feedback are welcome. Simply contact Lorelle Schluter in GBRMPA's Tourism and Recreation Group by phone (07) 4750 0705 or email: l.schluter@gbrrmpa.gov.au.