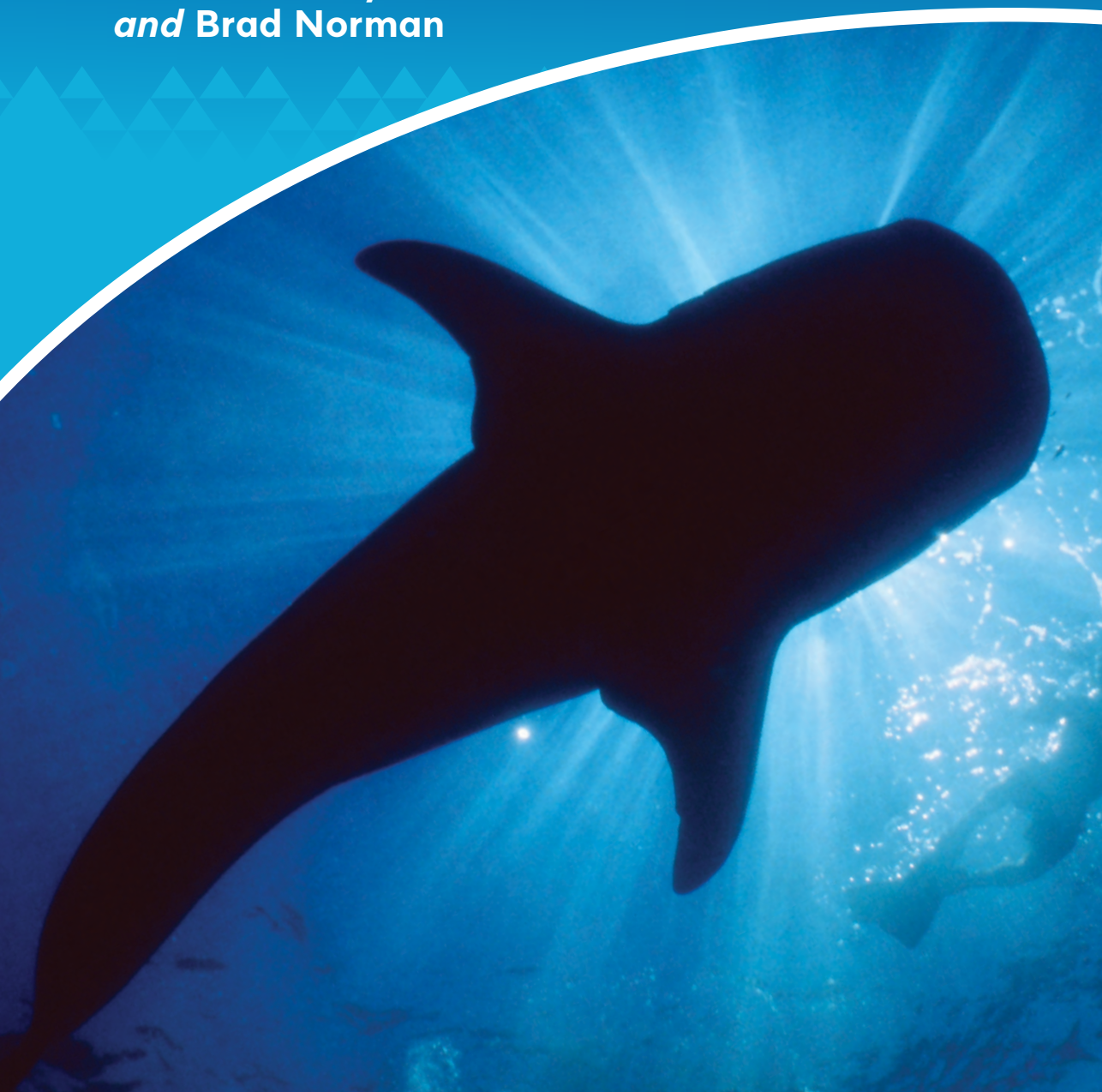




What in the World Is a Whale Shark?

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and Brad Norman



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The whale shark: the world's biggest fish

Don't let the name confuse you – whale sharks are sharks, not whales. But there's a reason they're named after the giants of the ocean. An adult whale shark can grow up to 18 metres long. This makes whale sharks the biggest fish in the sea.

Like all fish, sharks are cold-blooded. They use fins to swim through the ocean and gills to extract **oxygen** from the water. But unlike other fish, sharks don't have bones. Instead, their skeleton is made entirely from **cartilage** and connective tissue.

Fascinating facts about whale sharks

- Whale sharks have over 300 rows of tiny teeth, but they don't use them for feeding. Instead, they feed by swimming through the ocean with their mouths wide open, sucking in water and free-floating **plankton**. They use their gill rakers to sieve out the plankton, as they release the water back into the ocean.
- Because of this method of feeding, whale sharks are not dangerous to humans. In many places around the world, tourists even go swimming with these gentle giants.
- Whale sharks are ovoviviparous. This means that young whale sharks, called pups, develop inside an egg and hatch while they are still inside their mother. They are born when they are about 50 to 60 centimetres long.
- Whale sharks have a beautiful pattern of spots and stripes on their skin. The patterns are unique to each individual, just like our fingerprints. Scientists use them to identify individual whale sharks and track their movements.

Whale shark mysteries

Whale sharks are often found in **aggregations**, in the same locations at the same times every year. For example, every year from March to August, an aggregation of whale sharks gathers at Ningaloo Reef in Western Australia. But we don't know much about where they go at other times. Do they migrate between different aggregations or to other oceans?

The whale sharks seen at coastal aggregations are mostly young males, about 4 to 7 metres in length. Where are all the female and new-born whale sharks? No-one knows where the whale sharks go to find a mate or give birth to their pups. In fact, only one pregnant whale shark has ever been found – off the coast of Taiwan in 1995. She had 300 pups inside her, some still in their eggs and some ready to be born.

The Tokelau whale shark mystery

In May 2018, a juvenile whale shark was found in Nukunonu's lagoon. Scientists and the Nukunonu community were very surprised! There has never been a whale shark found in an atoll lagoon, such as Nukunonu's, where there are no deep channels through the reef for a whale shark to swim through. So how did it get there?

At 3 metres long, the Nukunonu whale shark is quite small – for a whale shark. It probably got into the lagoon when it was much smaller. But was it born nearby? Maybe there's a breeding ground for whale sharks in the central Pacific Ocean – right near Tokelau!

▼ The juvenile in Nukunonu's lagoon



◀ Measuring the juvenile



Tagata Tokelau – citizen scientists

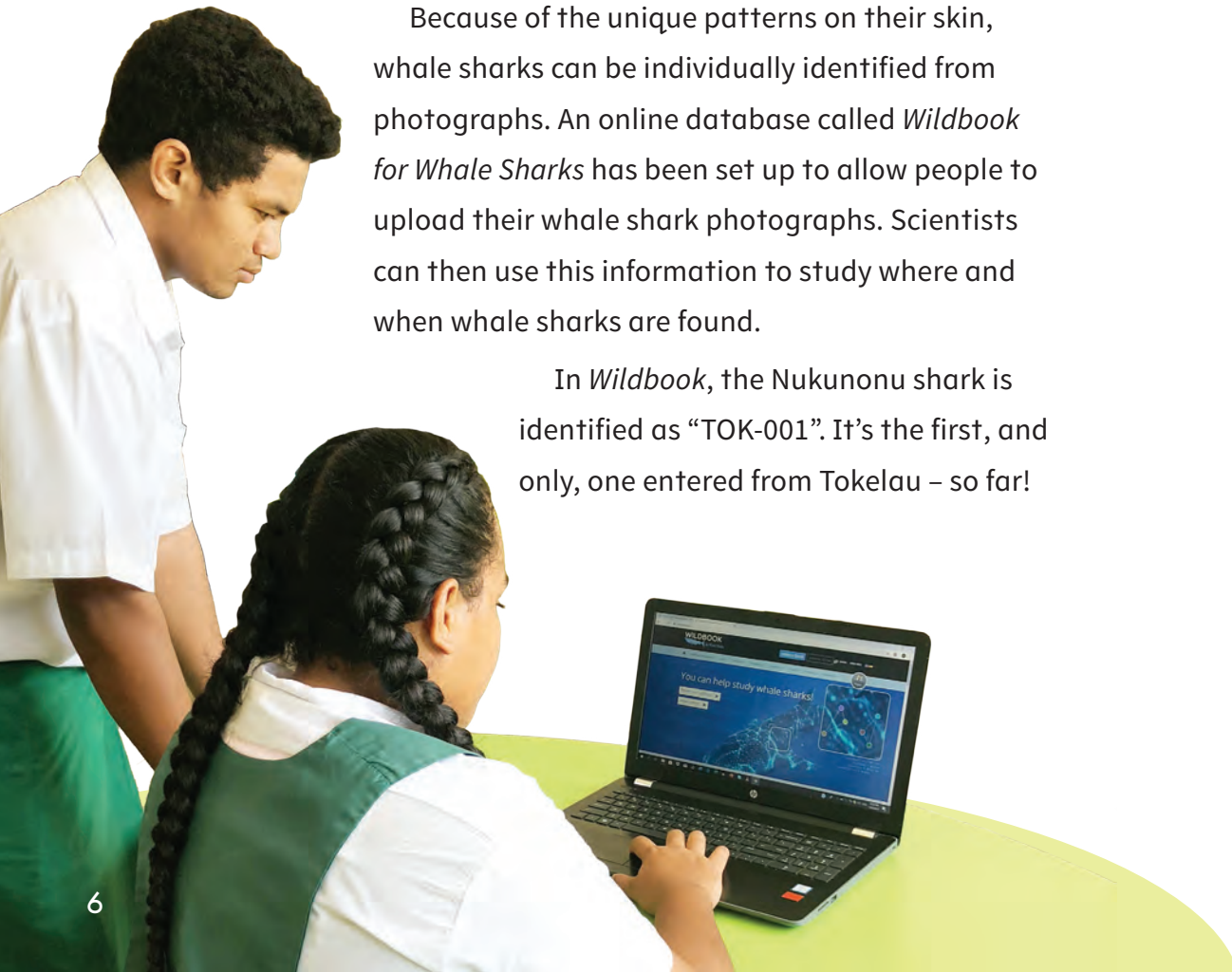
Despite being found in oceans around the world, whale sharks are endangered. Their population is declining, and they are in danger of becoming **extinct**. Scientists want to discover more about whale sharks to conserve them into the future. To do this, they're calling on the help of citizen scientists. A citizen scientist is a member of the public who helps scientists by collecting data about the natural world.



▲ Helping the scientists

Because of the unique patterns on their skin, whale sharks can be individually identified from photographs. An online database called *Wildbook for Whale Sharks* has been set up to allow people to upload their whale shark photographs. Scientists can then use this information to study where and when whale sharks are found.

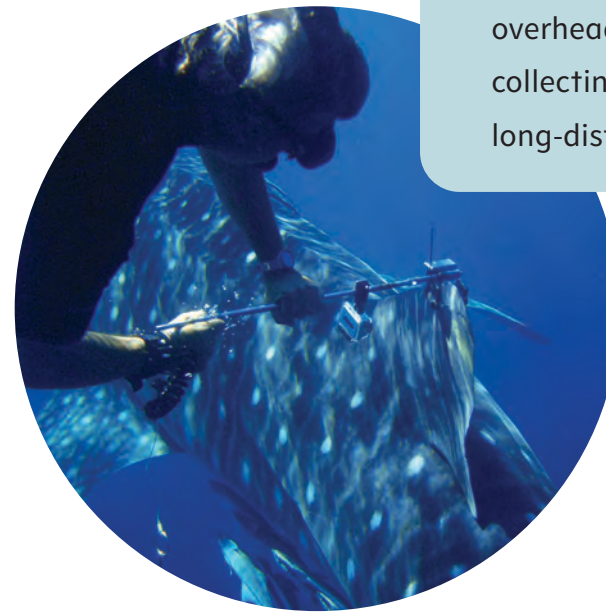
In *Wildbook*, the Nukunonu shark is identified as "TOK-001". It's the first, and only, one entered from Tokelau – so far!



Biotelemetry

Scientists also use biotelemetry to study whale sharks. Biotelemetry involves attaching electronic tags to animals to collect information about their movements and behaviour. To study whale sharks, scientists use three main types of tags:

- **Satellite tags** – send information about the location of a shark to satellites orbiting overhead. Satellite tags are good for collecting information about whale sharks' long-distance movements.



- **Acoustic tags** – send out coded sound waves to receivers in the ocean. Acoustic tags are good for collecting information on how whale sharks move throughout a particular area.

- **Behavioural data-loggers** – sometimes called "Daily Diaries" – collect information about the exact movements of whale sharks, such as their direction and speed. They're perfect for finding out what the sharks get up to underwater.



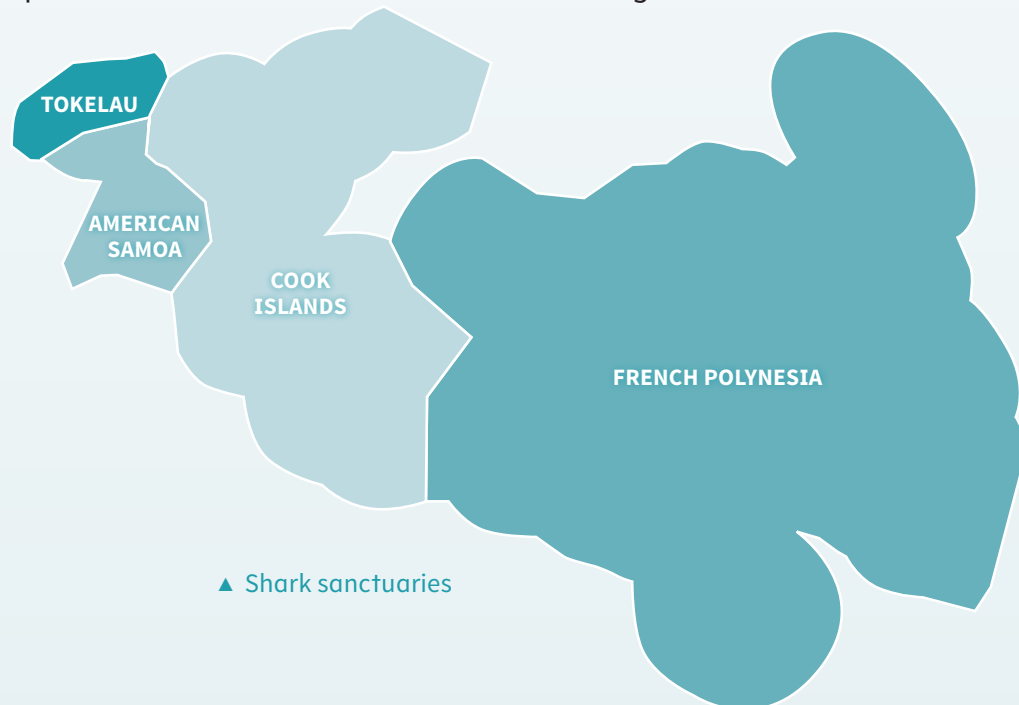
A sanctuary for sharks

Although whale sharks are protected by law in many countries, they are still under threat. Man-made impacts such as fishing (either as the target species or as

by-catch), **ship-strike**, and pollution (including **microplastic** in the oceans) are the biggest dangers. The effects of climate change, such as sea temperature rise, may also have an impact.

Whale sharks aren't alone. Many shark species are declining in numbers, with 31 percent of shark and ray species surveyed by the IUCN Red List threatened with extinction. In response to this alarming trend, many countries have set up shark sanctuaries – including Tokelau.

Tokelau has been a sanctuary for sharks since 2011. Over 30 species of sharks are protected in Tokelau's 319,031 square kilometres of ocean, providing them with a safe place to breed and grow. By taking responsibility for the sharks' well-being, Tokelau is giving endangered species like whale sharks a chance to thrive again.



Glossary

aggregations – groups

by-catch – something that is caught by accident while fishing

cartilage – a firm but flexible type of tissue, made from specialised fibres

extinct – all members of the species have died; no longer existing

oxygen – a gas

plankton – tiny organisms that float in the sea

ship-strike – a collision between a ship and a marine animal

microplastic – very small pieces of plastic

Find out more

Wildbook for Whale Sharks is a publicly accessible website at www.whaleshark.org

The IUCN Red List of Threatened Species website is at www.iucnredlist.org

