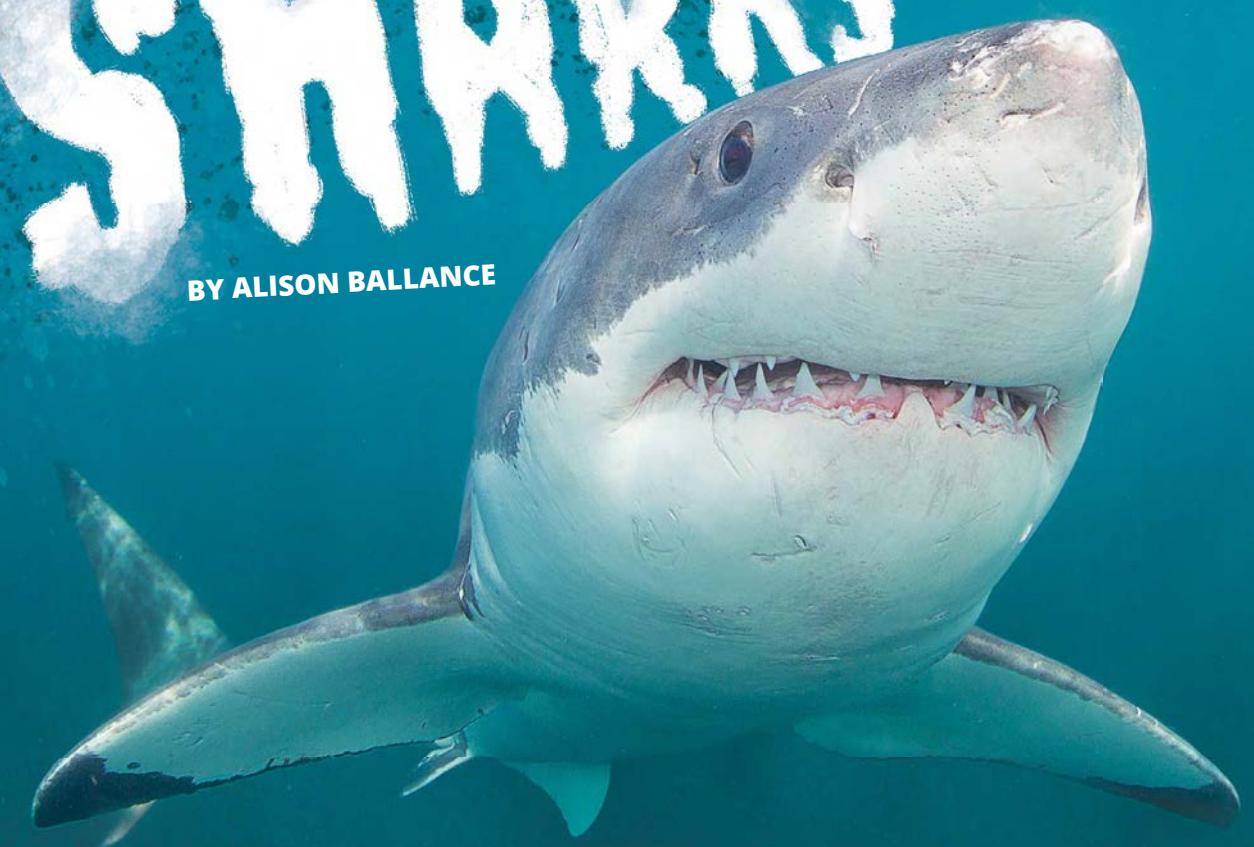


SHARKS

BY ALISON BALLANCE

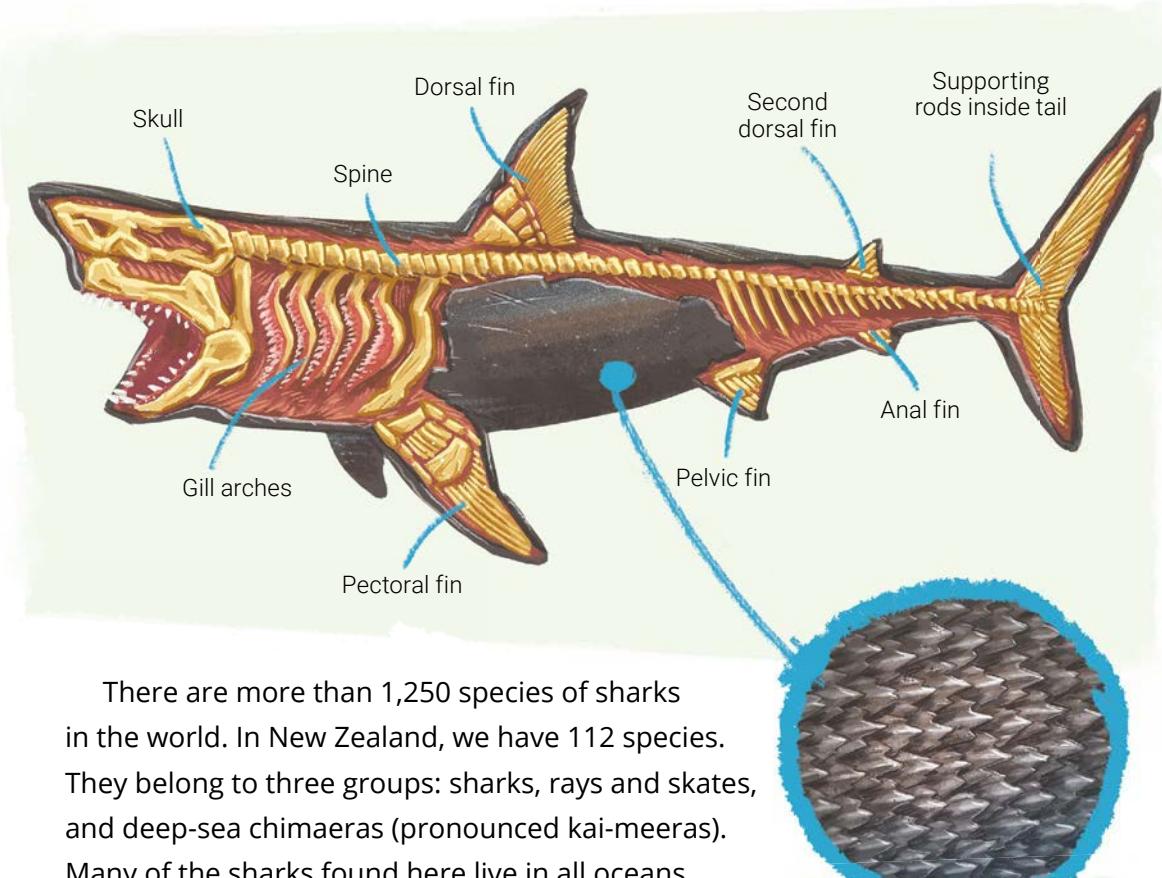


All kinds of sharks live in the seas around New Zealand. Some are small, others huge. There are sharks with stripes and sharks with spots. Some sharks live in the deep ocean. Others like shallow harbours. So what do these sharks have in common?

BIG FISH

All sharks are fish, although their skeletons are made from cartilage, not bone. Cartilage is lighter than bone, and it's tough but elastic. People have cartilage in their hip and knee joints.

The skin of a shark looks smooth and shiny, but look again! It's made of hard, grooved scales that protect the shark's body. These scales have another job. When a shark swims, water flows along the grooves. This means less **friction** so that the shark can swim faster.



There are more than 1,250 species of sharks in the world. In New Zealand, we have 112 species. They belong to three groups: sharks, rays and skates, and deep-sea chimaeras (pronounced kai-meeras). Many of the sharks found here live in all oceans, but around twenty-three species are **endemic** to New Zealand. We don't know a great deal about sharks, although scientists have studied a few species, including the great white.

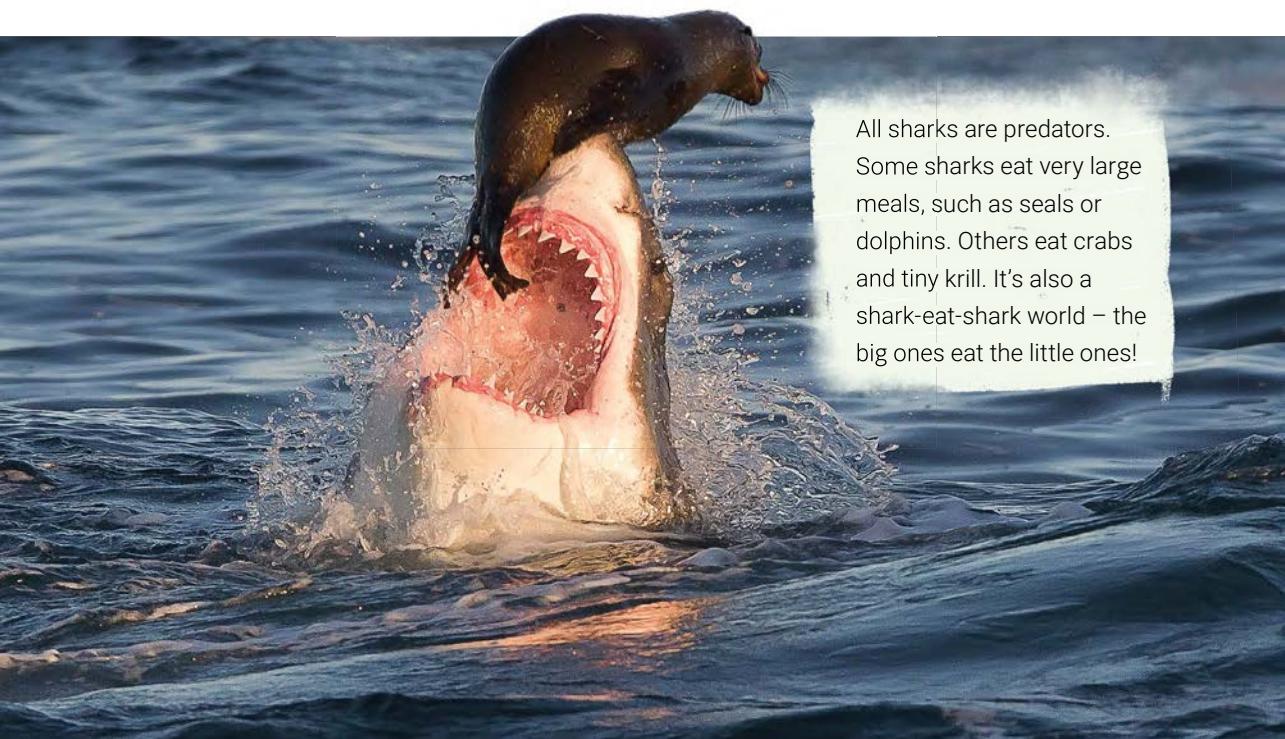
Shark skin seen through a powerful microscope

GREAT WHITE SHARKS

The great white is one of the largest sharks found in New Zealand. At birth, a great white measures around 1.5 metres, but it can grow up to 6 metres. The female sharks are usually bigger than the males.

Like many shark species, a great white has a grey back and a white belly. This is known as counter-shading. From above, the shark's back matches the dark water below. From below, it's hard to see the shark's white belly against the bright surface. These two colours meet around the gills, where they create patterns that are unique to each animal, just like a person's fingerprints.

In one study at Stewart Island, scientists used these patterns to identify more than 170 great whites. To find out where the sharks went during the year, the scientists then tagged around fifty of them. They discovered some surprising things. The great whites didn't stick to the cool waters around New Zealand. Most spent winter in the tropics. Some went to the Great Barrier Reef while others went to Vanuatu, New Caledonia, Fiji, or Tonga. A few of the sharks swam south, to the subantarctic region, before heading back north. This told scientists that great whites can live in water as cold as 3 degrees Celsius – another new discovery.

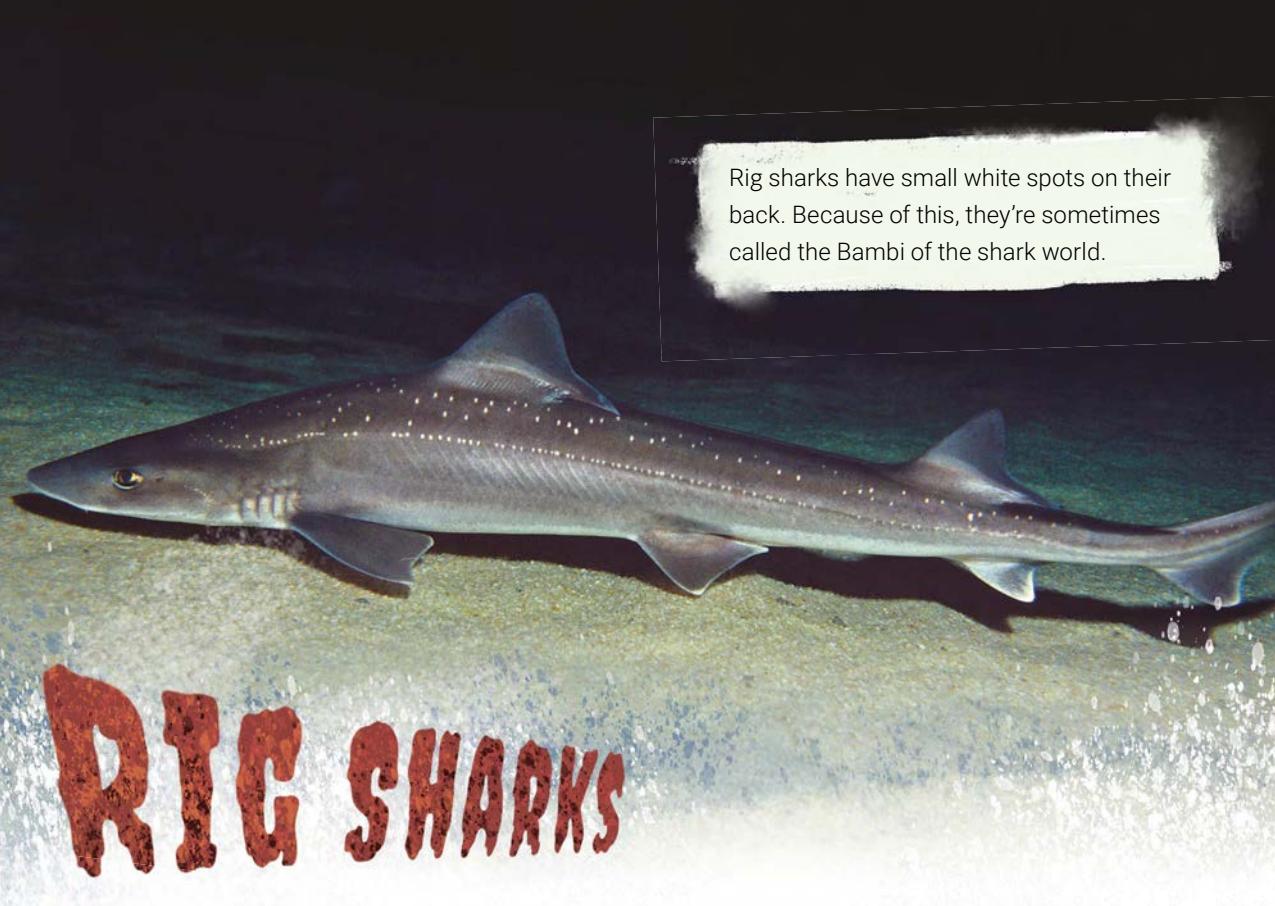


All sharks are predators. Some sharks eat very large meals, such as seals or dolphins. Others eat crabs and tiny krill. It's also a shark-eat-shark world – the big ones eat the little ones!



RECORD HOLDERS

The biggest shark found in New Zealand is the whale shark. The average length of an adult whale shark is 12 metres, although they can grow to 18 metres. In the summer, when the sea is warm, whale sharks are often found around Northland. Our smallest shark is the pygmy shark. This species never grows longer than 27 centimetres – shorter than your school ruler!



RIG SHARKS

Rig sharks live in harbours and estuaries right under your nose. You've probably eaten them without realising. Most fish and chip shops sell rig under the name lemonfish. Some people also use the name spotted dogfish.

A rig has a flat belly, and its mouth is on the underside of its head. This design allows it to hug a harbour's muddy bottom. Mud crabs and shellfish are a rig's favourite food, which is why its teeth are made to crush and grind. An adult rig can grow as big as 1.5 metres. In spring, they come into shallow water, including the Porirua, Raglan, and Kaipara harbours. These places are important breeding and nursery grounds. After the females give birth, the adults leave for deeper water. Because females mate with more than one male, shark pups born in the same **litter** can have different fathers. Newborn pups stay in shallow water for about six months, leaving in early winter.

After heavy rain, fresh water often floods the places where young rigs live, changing the **salinity** level. When this happens, the rigs move to the mouth of the harbour or estuary to be closer to the sea.

Rig sharks have small white spots on their back. Because of this, they're sometimes called the Bambi of the shark world.

EAGLE RAYS AND STINGRAYS

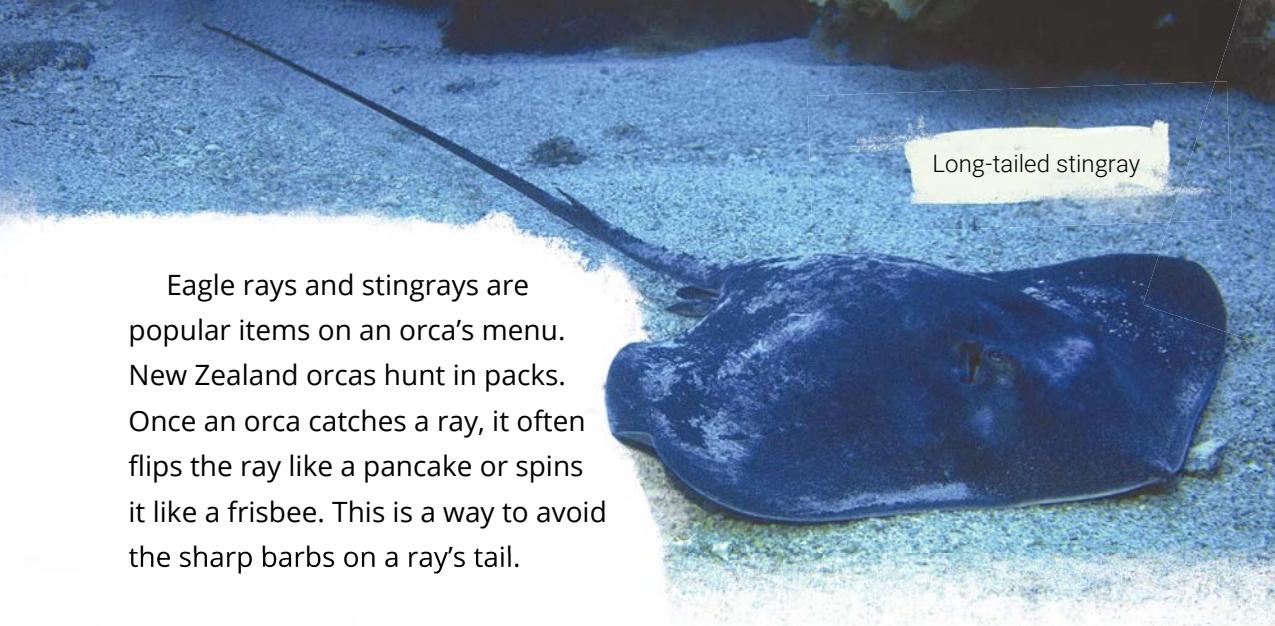
Eagle rays and stingrays are basically flattened sharks that move along the sea floor. It's easy to tell the two apart. Eagle rays have pointy wings, which they flap like a bird, and stingrays have rounder wings.

One eagle ray species and two species of stingrays are commonly found in New Zealand's shallow waters. A third stingray species lives in the open ocean. A good place to see eagle rays is Whairepo Lagoon on Wellington's waterfront. The lagoon is named after the eagle rays that visit during summer. It's common to see eagle rays and stingrays in places like this, especially when fishers feed them scraps.

Eagle rays scavenge fish scraps, but they also have a clever way of finding their own food. This involves using little holes, called spiracles, which are found on top of a ray's head. The ray sucks water in through these spiracles before jetting it out through gills on the underside of its body. This blows away sand and mud on the sea floor, exposing the crabs and shellfish that a ray likes to eat. Sometimes, at low tide, you can spot the feeding pits that hungry rays have left behind. Like a rig shark, an eagle ray's mouth is on the underside of its head.



Eagle ray



Eagle rays and stingrays are popular items on an orca's menu. New Zealand orcas hunt in packs. Once an orca catches a ray, it often flips the ray like a pancake or spins it like a frisbee. This is a way to avoid the sharp barbs on a ray's tail.

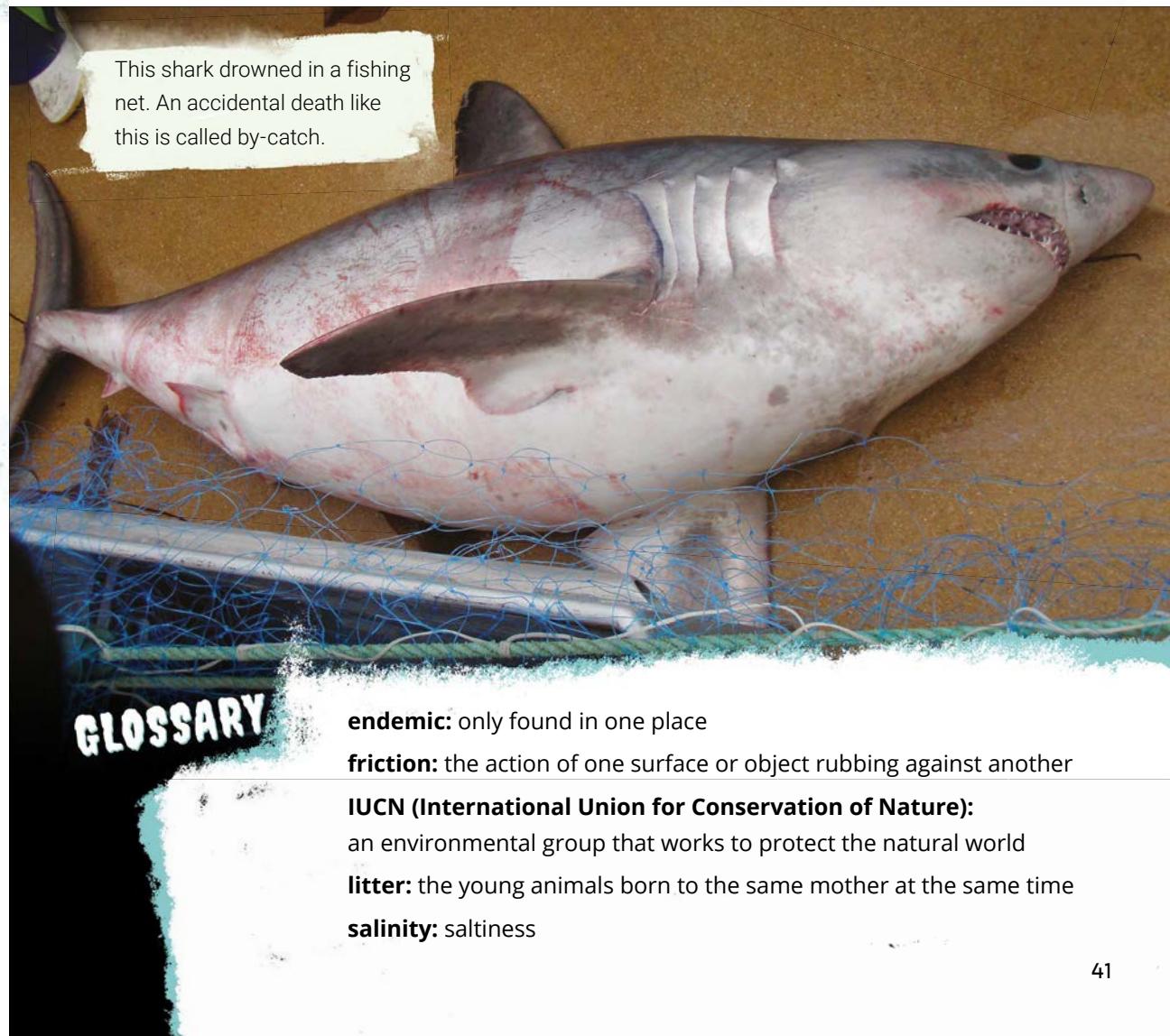


Chimaeras are small, mysterious sharks that live in deep water. Scientists are still finding new species of them. Chimaeras are very unusual looking, which is probably why they were named after the fire-breathing monster in Greek myths. This monster was a mix of animals: a lioness, a snake, and a goat. Chimaeras are also known as spookfish or ghost sharks.

A chimaera has smooth skin with no scales. Its big eyes have a reflective layer at the back, just like a cat's, so it can see in the dark. A chimaera also has strange-looking teeth that grind up food from the sea floor. Most chimaeras have a poisonous spine on their back.

SHARKS UNDER ATTACK

Sharks get a lot of bad press, but in New Zealand, fatal shark attacks are rare. A person is much more likely to drown than be killed by a shark. In fact, scientists argue that sharks themselves are under threat. Only seven species of sharks and rays are protected by New Zealand law. The conservation group **IUCN** lists four New Zealand shark species as vulnerable to extinction. More than seventy of our shark species are caught by fishers, often by accident. Sharks mature late and have few young, so this by-catch puts all shark species at risk – not to mention your fish and chips!



endemic: only found in one place

friction: the action of one surface or object rubbing against another

IUCN (International Union for Conservation of Nature): an environmental group that works to protect the natural world

litter: the young animals born to the same mother at the same time

salinity: saltiness

Sharks

by Alison Ballance

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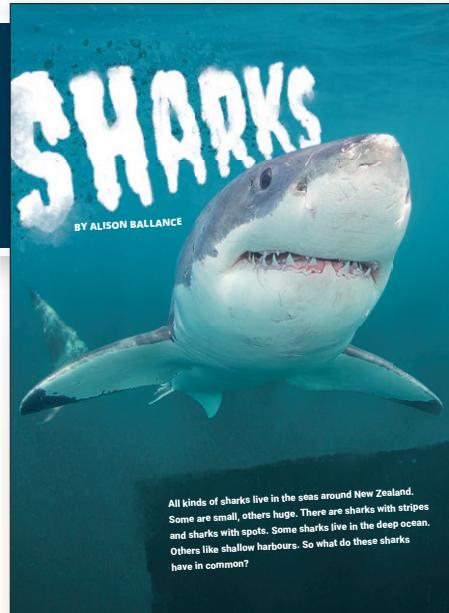
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