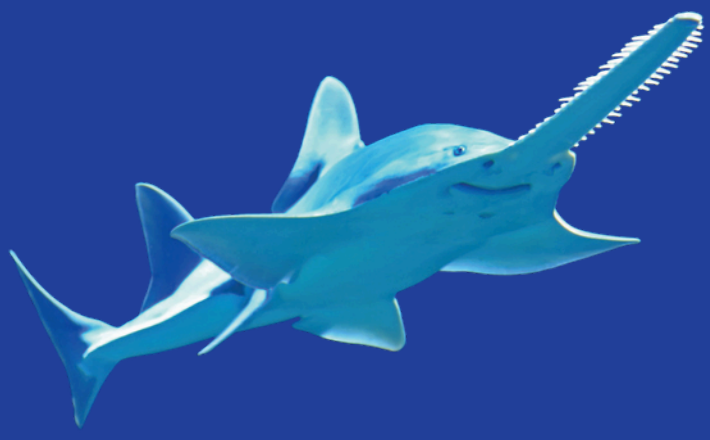
SEA LIFE

TROUBLED WATERS

Endangered Species Booklet



Troubled Waters Booklet

Our planet Earth is home to some amazing habitats and animals. With about 71% of Earth's surface made up of oceans, it is no doubt our oceans are one of the biggest, interesting and fascinating ecosystems.

Scientists estimate that approximately one million different species inhabit our oceans. While some animals thrive in this environment, some species need help from humans to protect their livelihood from extinction.

SEA LIFE Aquariums would like to take you across Australia and New Zealand to highlight some endangered species that we think are pretty special and deserve to be around for future generations to come!

Endangered Species Fact File: Australian Sea Lion

Habitat Profile

Sea lions are typically found in waters off the South Australia and Western Australia coastlines. They're normally found on islands offshore to Australia, as these are more protected habitats that sea lions prefer. However, while not normally located around far north tropical Queensland, we have some amazing rescued sea lions that call SEA LIFE Sunshine Coast home.

Adaptations of the Australian Sea Lion

Sea lions have many adaptations that help them survive in the ocean. These include:

1. Body shape - Their bodies have been streamlined like a torpedo and their limbs have been dramatically modified.

2. Flippers - The winglike pectoral flippers contain the sea lion's arm bones as well as the finger bones, which have been elongated.

3. Markings - Sea lions have the ability of countershading, which is almost like a camouflage. Their dark dorsal surface camouflage into the bottom of the ocean floor, whereas the lighter ventral surface camouflages into the surface of the water.

4. Joints - Sea lions have flexible hip joints to allow them to walk on land and climb on rocky beaches and outcrops.

5. Eyesight - Sea lions have adapted their vision to see clearly in and out of the water.

6. Whiskers - Sea lions also rely on their whiskers (correct term vibrissae), which allow them to detect vibrations in the water column, whether it be a predator or prey. Results have shown that some seals can find food better in the dark, relying on their whiskers, compared to during the day when they rely on their eyesight.

Conservation - Australian Sea Lion status

Currently, the Australian sea lion is a threatened species (listed as endangered by the International Union for Conservation of Nature or IUCN) with the population estimated at 10,000 – 12,000.

Human disturbance has a huge impact on pinnipeds, e.g. humans coming too close to them or interfering with their natural behaviour and feeding cycles.

Population numbers are not growing, and Australia's sea lions are not expanding their range of colonies; they are a non-migratory species.

The sea lions' survival is threatened by many factors, including by-catch in commercial fisheries, entanglement in marine debris and impacts related to climate change.
Currently, the biggest threat to Australia's sea lion colonies is gill-nets, which are invisible, thin mesh nets suspended in the water. Gill-nets are used by commercial fisheries to capture sharks, predominantly for the 'flake' and chip market in Australia. However, Australian sea lions also get snagged in the mesh of gill-nets and drown.

Endangered Species Fact File: White's Seahorse

Habitat Profile:

The White's seahorse is endemic to the waters of southern Queensland (Hervey Bay) to Sussex Inlet, NSW, where it can be found occurring in coastal embankments and estuaries. It is known to occur from depths of 1 m to 18 m. Habitats that are considered important for the White's seahorse include natural habitats such as sponge gardens, seagrass meadows and soft corals. It is also known to use artificial habitats such as protective swimming net enclosures and jetty pylons.

In Port Stephens on the NSW coast, adult White's seahorses show a preference for sponge, soft coral and Posidonia australis seagrass habitats. Juveniles prefer habitats such as sponges and soft corals. In the Sydney region, they are most likely to be found on the artificial protective swimming net habitats.

Adaptations of the White's Seahorse

The White's Seahorse has a number of physical adaptations and external features that help it to survive in its environment.

These adaptations include:

1. Bony body and camouflage: Their bony body is covered by skin that can change colour depending on their mood and habitat colouration.
2. Eyes: Seahorses can see in front and behind them at the same time because their eyes can move in different directions.
3. Tail: Their prehensile tail can only be unlocked in the most extreme conditions helping them anchor onto the seaweed or seagrass that they use to hide in.
4. Pipe nose: Seahorses use their elongated snouts to suck up plankton and small crustaceans. Seahorses have no teeth and no stomach.
5. Movement: Seahorses move with the help of a small fin that flutters about 35 times per second. Smaller pectoral fins, on the back of the head, are used for steering.

Conservation:

The primary cause for the decline in the abundance of White's seahorse is the loss of natural habitats across their range in eastern Australia. The seahorses occur within coastal estuaries and embayments, which are areas subject to population pressure.

Within Port Stephens, over 90% of the soft coral and sponge habitats have declined at sites where the seahorse used to be abundant. Habitats in Port Stephens have been destroyed through the installation of boat moorings, boat anchors and the inundation of habitat by sand movement.

Within Sydney Harbour, population pressure has caused their natural habitats to decline and, as a result, the species is now predominantly found on man-made swimming nets within the harbour.

These nets are periodically cleaned to remove the marine growth and repair the structural integrity of the nets, which can lead to further displacement of seahorses and cause populations to dramatically decline. DPI Fisheries has been working with councils to develop practices that avoid damage to seahorses during net cleaning and repair.

Seahorse Breeding Project at SEA LIFE

To help declining populations of the White's Seahorse recover, our team here at SEA LIFE Sydney undertook a breeding program. Wild seahorses from Clifton Gardens were moved to the aquarium, where they gave birth to hundreds of babies.

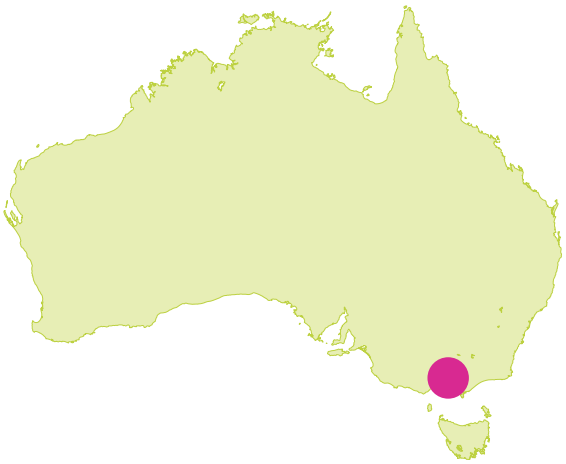
These baby seahorses grew healthy and strong, and in May 2020, they were released onto the Clifton Gardens swimming net and nearby seahorse hotels.

The project has continued for several years now with great success.

Endangered Species Fact File: Australian Sawfish

Habitat Profile

The Australian sawfish is one of the most endangered animals on the planet. Once abundant, sawfish - which are part of the ray family - swam in the waters from Sydney to Perth. Nowadays, you're more likely to spot its saw nailed to the wall of a pub.



The sawfish, known for its long, tooth-edged rostrum that looks like a saw, is one of the world's most threatened marine creatures. Sadly, it has fallen victim to overfishing, flesh and fin hunting, entanglement and habitat loss. This close relative of sharks and rays is found around the world in tropical and subtropical seas, but in recent years, conservationists have become gravely concerned about populations.

How endangered are Sawfish?

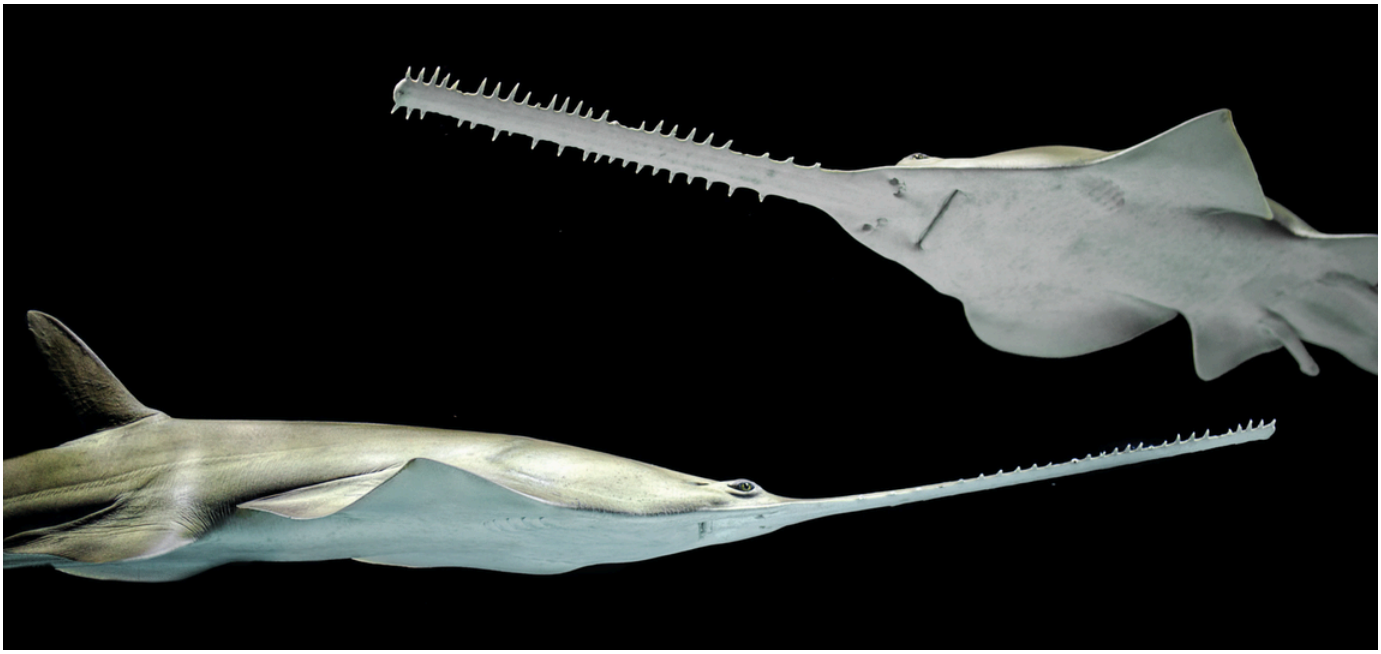
Among the sharks and rays, sawfish are some of the most threatened, with all five species listed as 'Critically Endangered' or 'Endangered' by the International Union for Conservation of Nature (IUCN). It's a far cry from the days that sawfish were so plentiful that people in Sudan used their rostra as fence posts. Additionally, a study from Lake Nicaragua estimated that between 1970 and 1975, around 60,000 – 100,000 sawfish were caught in the lake by commercial fishers, while a survey in 1992 could not find traces of a single individual in the lake.

Adaptations of the Australian Sawfish

The Australian sawfish has several physical and behavioural adaptations that help the remaining population survive its natural habitats.

1. Inbuilt saw – This fish uses its 'saw'-like snout to fend off predators much larger than itself, as well as a harpoon for catching food. It does this by swimming into a large school of fish, swinging its head so that the saw will skewer its prey.

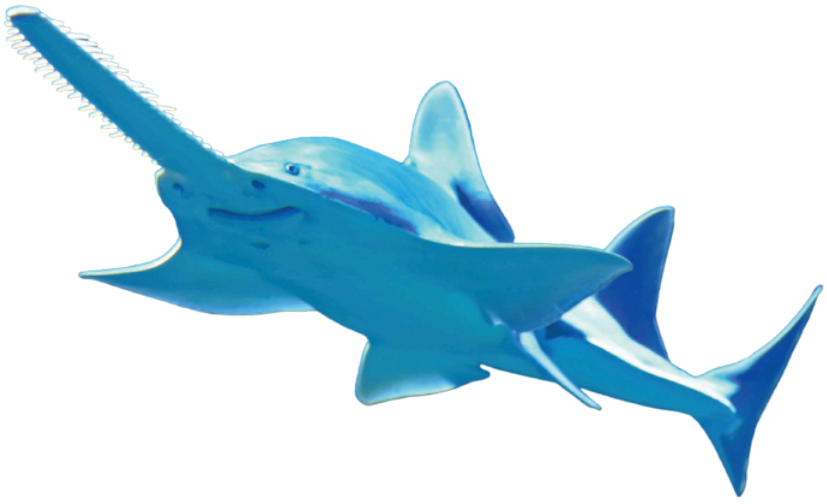
2. Electro-detection - Sawfish saws are super sensitive to electrical currents, containing a lot of sensory pores known as the ampullae of Lorenzini. These can detect the tiniest of muscle contractions given off by prey, allowing them to hunt in murky waters or in the black of night.



Conservation

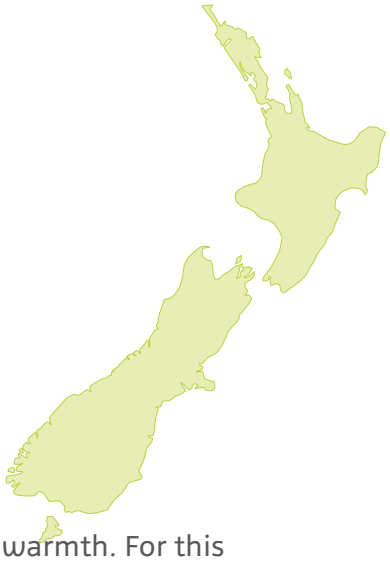
Sadly, what makes these rays so remarkable also makes them vulnerable to overfishing. Due to their large nose and size, they can easily become entangled in fishing nets. The rostrum is also often sold as a curious item or artifact.

All species are now classified as either Critically Endangered or Endangered.



Endangered Species Fact File: Sea Turtles

Habitat Profile



Sea turtles are ancient creatures – the earliest fossil record dates back to 2.5 million years ago! This means that they were here before the dinosaurs, survived mass extinction events and were present for the evolution of birds.

Today, all 7 species of marine turtles are either Endangered or Critically Endangered. This means that it is absolutely crucial to the survival of the species that we protect and help them in any way that we can.

Being reptiles, sea turtles are cold-blooded, and they rely on the sun for body warmth. For this reason, most do prefer the warmer tropical regions of the world, especially during their nesting seasons. Having said that, sea turtles can be found in most oceans around the world, with 5 out of the 7 different species being spotted in Australian & New Zealand waters!

Sea turtles travel incredible distances in their life time – some migrating across entire ocean basins in order to get between their feeding, breeding and nesting grounds.

Adaptations

The sea turtle has some cool adaptations that help it to survive for millions of years. These include:

1. Armour plates – The hard and rough shells provide turtles with protection. A green sea turtles shell is made up of keratin, the same as fingernails. Underneath the keratin shell is a fine network of capillaries that carry blood and heat to and from the turtle's body.

2. Sharp beak – Turtles have no teeth, their jaw is powerful and shaped like a bird's beak which helps them eat hard-shelled animals as well as their main diet of sea grass.

3. Forelimbs – Their forelimbs are modified into long, paddle-like flippers for swimming. This allows it to maintain its speed whilst traveling. The cruising speed for green sea turtles is about 1.5 to 9.3 km/h.

4. Body shape – Turtles are hydrodynamic, meaning their bodies are shaped to minimise drag and resistance when travelling through the water.

5. Lungs – Turtles have more than one lung located on the top of their shells for breathing. They also have two sets of muscles for breathing. One set of muscles is responsible for stretching the body outward from the shell, which expands the body cavity of the turtle, allowing it to inhale, while the other set draws the body inward to exhale.

Conservation

Protecting and rehabilitating sea turtles is a team effort – we work with the Department of Conservation (DoC) and a variety of other government bodies. We also rely on members of the public as well, who are most commonly the first to spot sick or injured turtles.

So what would you do if this were you? The correct thing to do would be to give the turtle space and ensure no other people or animals were bothering it. You would then call a local wildlife rescue or vet, who would assess and rescue the turtle if necessary. Remember, not all turtles need to be rescued, and only a trusted wildlife rescue department should be making that decision.

If in need of rescuing, turtles are then transported for medical treatment. Once that's done, it's off to a turtle rehab specialist, similar to one located at a SEA LIFE aquarium, for rest, relaxation and any ongoing treatment. Initially, turtles are housed in quarantine tanks to ensure that any disease/parasites are not passed on to any other animals. But once they have a clean bill of health, they're moved into Turtle Bay. This is the final stage of rehabilitation; this tank is specifically designed to resemble the habitat that they will be released into. Here, they are well fed and monitored, and finally released during the summer months.

We specifically release turtles during the summer months because of their preference for warmer waters. They are taken further North and released into an offshoot of the East Australian Current (EAC). This current carries warm water from the tropical regions and gives our turtles the best chance of survival. As sad as it is to say goodbye, every turtle we release is a chance for the future of the entire population!

Threats

Having survived so long, every species of sea turtle is now either Endangered or Critically Endangered. This is happening for a variety of reasons.

In many parts of the world, turtles have been hunted as both a food source and for their shells. Hawksbill turtles are close to extinction due to their beautiful shells. "Tortoise shell" decoration was highly fashionable for some time; little did people know that this was, in fact, made from hawksbill turtle shells.

Green turtles are so named due to the colour of their flesh – they have been hunted as a food source for many years, and still are in some areas. Unfortunately, areas that still hunt sea turtles are often areas that have a high number of nesting sites. When female turtles come up on the beach to lay their eggs, they are at their most vulnerable. If she successfully lays her eggs, these too are often poached.

Although they spend the majority of their life in the water, sea turtles breathe air from the atmosphere – meaning they have to surface to take a breath. Fishing nets, especially discarded ones, often trap turtles and prevent them from doing this.

The single biggest threat to sea turtles is rubbish pollution, both within the sea and on the beaches. Turtles simply cannot escape the threat of rubbish, especially plastic. They cannot distinguish between rubbish items and their food; often ingesting a lot of this. Being unable to digest and break down plastics, it builds up in their digestive system, preventing them from being able to eat anything else. Eventually, they begin to starve, and if they are lucky, that is when they will be rescued. However, it is the sad truth that for many sea turtles, rather than being rescued, that is when they perish.

Student Activities

Activity 1 - Research

In Australia we have so many species of animals facing endangered status across our oceans and land.

Select one animal from the list below and create your own animal profile poster about this endangered animal. In your poster, remember to highlight why it is important for us to protect this species.

You can research one of the following animals:

- Dugong
- Coral reefs
- Grey Nurse Shark
- Animal of your own choice (must have an Endangered or Critically Endangered status)

Activity 2 - Radio or TV Show

Plan, script and produce either a radio or TV show that will be presented to your whole school at assembly.

The aim of the show is to make other students at your school aware of this endangered species and educate them on how they can help to protect this species from becoming extinct.

Your show should include the following segments and talking areas.

1. Introduce hosts of the show
2. Introduce topic - Troubled Waters, and animals needing our help
3. General info about the animal- you could interview an expert to provide this section, this could be a real expert like an aquarist or someone in your group who can pretend to be an expert.
4. Tell us why they are endangered, and what has happened to this species. What are their major threats?
5. What can humans do at home and at school to help protect this species?
6. End show segment

Activity 3 - Share your work!

We would love to see your work and share your message with other students, teachers and school groups. Send your video or work across (education@merlinentertainments.com.au) and we will make sure our SEA LIFE team across Australia and New Zealand see it too!