

CASE STUDIES: Fishery innovations Preserving biodiversity in practice

Fisheries around the world are innovating and making the improvements needed to protect ocean biodiversity. Their success and impact are often the result of collaboration between research scientists or NGOs and fishers whose shared knowledge results in deeper insights. The following examples show the impact they are having across the globe.

TEACHER NOTE

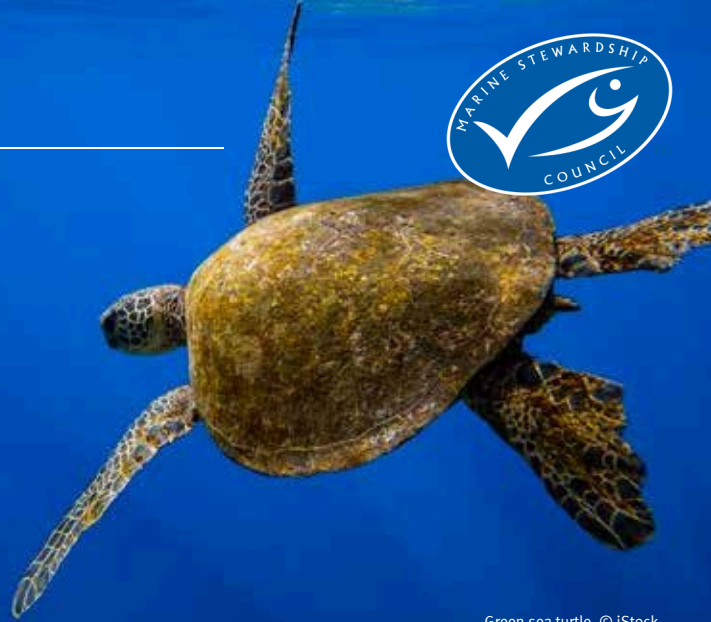
These CASE STUDIES on Fishery innovations - sustainable fishing protecting ocean biodiversity. Learners could read about one fishery innovation, report back to the class about the innovation, and whether they feel optimistic, unsure or pessimistic after reading about it / why.



CASE STUDY

Keeping turtles at sea

Turtle interactions down 99% thanks to the introduction of Turtle Exclusion Devices.



Green sea turtle. © iStock

Australia Northern prawn fishery (certified Nov 2012) NORTHERN AUSTRALIA

The country's largest wild prawn fishery, Australia Northern Prawn, has been fishing 771,000 square kilometres of extreme wilderness for more than 60 years. In 2012 it became the world's first MSC certified sustainable tropical prawn fishery.

Even before it got its sustainability certification, this fishery was already working to protect the ocean. It's located in a part of the world with lots of marine life, and the fishers are always trying to reduce harm to animals that live in the sea.

Saving Sea Turtles

One big improvement was helping sea turtles. Turtles can accidentally get caught in fishing nets, which can hurt or even kill them. Around the world, six out of seven sea turtle species are at risk of disappearing.

Since the year 2000, this fishery has used a special tool called a Turtle Excluder Device (TED). A TED is a grid that goes inside the fishing net. It lets prawns stay in the net, but gives turtles a way to get out safely.

Thanks to TEDs:

- Turtle accidents are down by 99%
- In 2023, no turtles were killed by this fishery's nets

TEDs also help other sea animals. Accidents with big sharks and rays are now much lower too.

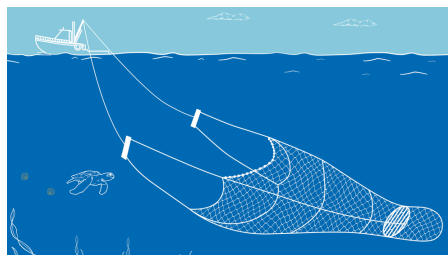
What's Next?

The fishery is now working on protecting other endangered sea animals like sawfish and sea snakes. They received funding to:

- Look at when and where bycatch (accidental catch) happens
- Test new gear that helps sawfish avoid getting caught

This work shows how fishers can be kaitiaki—guardians of the moana (ocean). By using smart science and better tools, they are helping to keep marine life safe for the future.

Thanks to TEDs, turtle accidents are down by 99%, and, in 2023, no turtles were killed by this fishery's nets.



Turtle Excluder Device

Why This Matters in Aotearoa New Zealand

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Whilst we don't often see turtles in New Zealand waters, this story is relevant to Aotearoa too where kaitiakitanga (guardianship of the environment) is an important part of who we are! The story shows how people who rely on the ocean for work can respect and protect wildlife. In Aotearoa, we have important seabirds and marine life that need protecting too.

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Sawfish swimming. © iStock



CASE STUDY

Helping pelicans to thrive

Smart vessel modifications help to reduce accidental deaths of protected pelicans from 46 in one year to just six across five years.

Brown pelicans in water. © Ernie Enkelaar/MSC

Southern Gulf of California Thread Herring fishery (certified Oct 2016) SINALOA, MEXICO

The Gulf of California was once described by the marine explorer Jacques Cousteau as “the world’s aquarium”. It’s a rich ecosystem that is home to 900 fish species and 170 different types of seabird.

One of the most well-known seabirds in the Americas is the brown pelican (*Pelecanus occidentalis*). These birds are famous for their dive-bombing hunting style and their large throat pouch, which they use to scoop up fish.

Brown pelicans mainly eat small schooling fish like anchovies and thread herring. An adult pelican can eat almost 2 kilograms of fish every day!

They often follow fishing boats close to the coast and dive into the water when fish are bunched together. Sometimes they eat so much that they don’t fly away immediately. This can make it difficult for fishing crews, as they can’t lift the nets until the pelicans are out of the way—otherwise the birds can get caught or injured.

A Risk for Pelicans

In the 2013–2014 fishing season in the Southern Gulf of California, there were 46 brown pelican deaths in just 201 fishing trips. That’s about one pelican every five trips. At that time, only 6% of trips had observers on board to monitor what was happening to wildlife.

Creative Solutions from the Fishers

To help solve this, the fishery made some important changes as part of its Marine Stewardship Council (MSC) program. One of the main actions was designing a special metal bar shaped like a “T” on the front of the pulley system, which helps stop birds from getting caught when nets are being pulled in. Fishers call this device “el venadito” (which means “little deer”) because of the way it looks.

They also increased the number of observer trips, which helps monitor bird safety and ensures fishers are following best practice. Between 2015 and 2020, observers were on board about 34–58% of trips. During this time, even though over 64,000 pelican sightings were recorded, only 6 birds died. That’s a huge improvement!

Extra Bird Protection Strategies

The fishing crews also use creative ways to stop birds from coming too close when the nets are being used:

- Spraying water like a curtain to keep birds away
- Sounding horns
- Waving rain jackets to scare off birds

All these actions help prevent seabirds like pelicans from getting tangled in the nets.



Fisher deters birds with water. © MSC

Why This Matters in Aotearoa New Zealand

“ This story links to our own ideas of kaitiakitanga (guardianship of the environment). It shows how people who rely on the ocean for work can still respect and protect wildlife. In Aotearoa, we also have important seabirds and marine life that need protecting when fishing.

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el venadito. © Maz Sardina S.A. de C.V.



CASE STUDY

Saving harbour porpoises

Bycatch of harbour porpoise down 80% after banana pingers installed on all vessels.

Harbour porpoise swimming. © iStock

Cornish hake gillnet fishery (certified June 2015) CORNWALL, UK

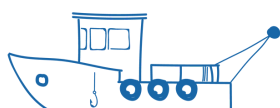
Protecting Porpoises: How Fishers Are Helping Marine Mammals

The harbour porpoise (*Phocoena phocoena*) is the smallest member of the dolphin and whale family (called cetaceans) found in UK waters. It's also the only porpoise that lives around the coast of Britain.

Marine mammals like porpoises are slow to grow and have few babies, which makes them very vulnerable. If too many are caught by fisheries by accident (called bycatch), their population can drop quickly and take a long time to recover.

Fishing and the Need for Protection

When the Cornish hake gillnet fishery was working towards its MSC sustainability certification, experts said that more data was needed to show how the fishery affected marine mammals like porpoises. They also recommended a plan to reduce harm to endangered, threatened, and protected species (called ETP species).



Pingers: A High-Tech Way to Help

To fix this, the fishery started using “pingers” – small devices that send out underwater sound waves. These sounds let marine mammals know that there are fishing nets in the water, so they can avoid getting tangled. These are especially useful in gillnet and trawl fisheries.

In the UK, some boats are required by law to use pingers, but the Cornish hake fishery went further by using them on all of their boats, even the ones not required to. This helped reduce bycatch of harbour porpoises by 80%, and in 2019, the fishery reported zero porpoise deaths or injuries.

Porpoises have very sensitive hearing, so the pingers work well to keep them away from danger.

Do Porpoises Get Used to the Sound?

Some scientists wondered if porpoises might get used to the sound and start ignoring it over time. To find out, researchers tested a type of pinger called the “Banana Pinger”, made by a company called Fishtek Marine. After eight months, they found that porpoises did not get used to the sound, and would come back to the area once the pingers were turned off.



Banana pinger in action. © Fishtek Marine

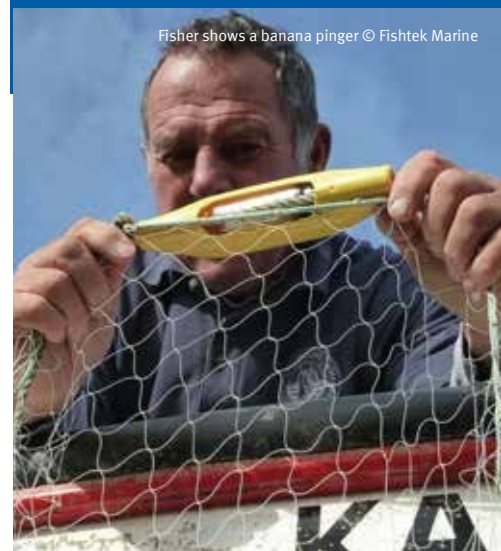
Why This Matters in Aotearoa New Zealand

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Just like in the UK, many of our marine animals in Aotearoa—like Hector's and Māui dolphins—are at risk from bycatch in fishing nets. This story shows how technology, science, and responsible fishing can work together to protect sea life.

This connects to our values of kaitiakitanga (guardianship) and looking after taonga species (treasured living things).

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Fisher shows a banana pinger © Fishtek Marine



Saving and surveying silky sharks

91% of silky sharks released alive after training and introduction of special gear.

Shark swimming. © iStock.

Eastern Pacific Ocean tropical tuna purse seine fishery with TUNACONS Foundation (certified July 2022) MANTA, ECUADOR

Silky sharks are known for their smooth, velvety skin – that’s how they got their name. But this sleek predator is in trouble. The IUCN Red List classifies silky sharks as vulnerable in the Eastern Pacific Ocean because of:

- Overfishing
- Getting caught in Fish Aggregating Devices (FADs) – floating objects that attract fish
- Ongoing demand for shark fins

Silky sharks often damage tuna nets, earning the nickname “net-eater shark”. To help protect these sharks, the tropical tuna fishery in the Eastern Pacific has been working hard to improve how they handle and release sharks when they are caught by mistake (called bycatch).

Crew Members Stepping Up

To make a real difference, fishers needed training and teamwork. The organisation TUNACONS (a group of 8 tuna companies) created a special team called “Crew Members To The Rescue”. This group focuses on making sure sharks are released safely and quickly.

Here’s what they’ve been doing:

- Learning how to handle sharks carefully to reduce harm
- Using special equipment like stretchers to help return sharks to the water safely
- Reducing release times to lower stress and help sharks survive
- Working closely with boat captains for better coordination during rescues

These actions have already made a big difference. In 2018, about 76% of accidentally caught silky sharks were released alive. By 2023, that number had jumped to over 90%!

Using Science to Help Sharks

Scientists are also using technology to learn more about what happens to the sharks after they’re released:

- Satellite tags track the sharks after they are let go
- Blood samples are taken to check for stress levels
- Observers on boats record the size, condition, and how the sharks were handled

All this data is studied by the Inter-American Tropical Tuna Commission (IATTC) to find out what factors help silky sharks survive.

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Why It Matters in Aotearoa
Just like in the Pacific, we face challenges in New Zealand waters with protecting species like sharks, dolphins, and seabirds. This story shows how fisheries, science, and smart teamwork can come together to protect the ocean and the animals that live in it.

By using kaitiakitanga (guardianship) and combining traditional knowledge with modern science, we can help protect our own taonga species and ecosystems.

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Fishers use a shark stretcher.
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