NIWA
Taihoro Nukurangi

PĀTIKI

WHAT DOES SCIENCE TELL US ABOUT
NEW ZEALAND FLOUNDER?

CONTENTS

ISSN 1174-264X
NIWA Information Series 91
June 2020

THE TAONGA SPECIES SERIES

Taonga species such as pātiki (flounder), tuangi (cockles) and tuna (freshwater eel) are central to the identity and wellbeing of many Māori.

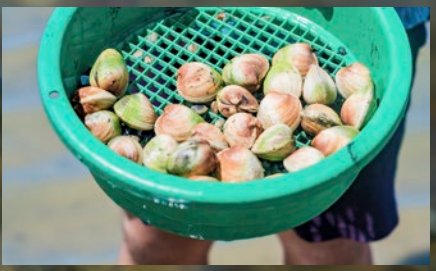
For generations these species have sustained communities and helped transfer customary practices and knowledge from one generation to the next.

However, many communities are reporting that the abundance and size of these taonga are declining.

Te Kūwaha, NIWA's National Centre for Māori Environmental Research has been working with whānau, hapū and iwi for more than a decade to co-develop methods for the protection, restoration and economic development of these species.

A series of booklets have been developed, sharing science knowledge to support species management strategy.

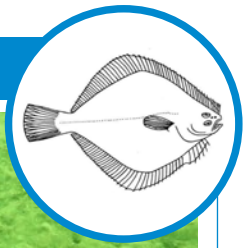
The Taonga Species Series includes booklets on tuna, kākahi, inānga, kōura, piharau, and pātiki. Find out more about the series at **niwa.co.nz/te-kuwaha/CK2020**



PĀTIKI SPECIES

There are four key species of pātiki commonly found around the shores of Aotearoa.

RHOMBOSOLEA PLEBEIA (maximum length 45 cm)

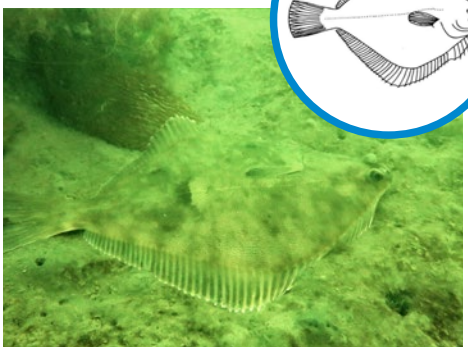


Common name:
Sand flounder

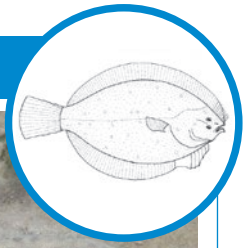
Māori name:
Pātiki

Identify by:

- Diamond shape
- Greenish brown with white belly



RHOMBOSOLEA RETIARIA (maximum length 45 cm)

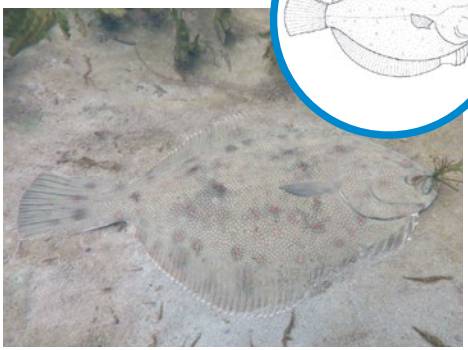


Common name:
Black flounder

Māori name:
Pātiki-mohoao

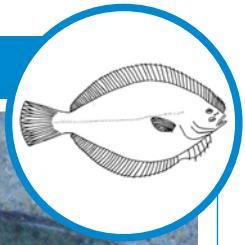
Identify by:

- Oval shape
- Brick orange spots on black back



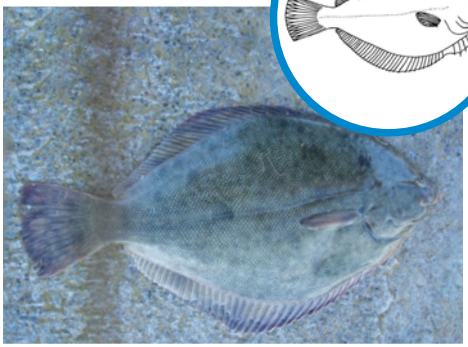
Yellow-belly and greenback flounder can often be mixed up as they look similar

RHOMBOSOLEA LEPORINA (maximum length 50 cm)



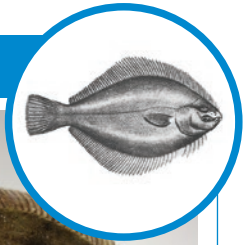
Common name:
Yellow-belly flounder

Māori name:
Pātiki-tōtara

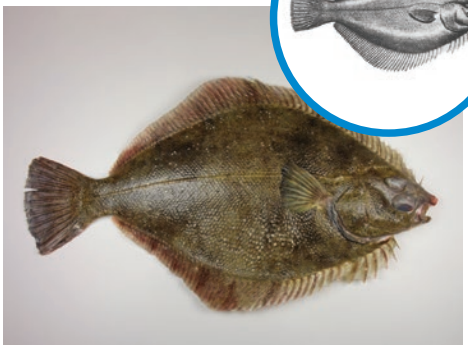


Identify by:
- Oval shape
- Greenish brown with yellow belly

RHOMBOSOLEA TAPIRINA (maximum length 50 cm)



Common name:
Greenback flounder



Identify by:
- Oval shape
- Dark green with white belly

WHERE DO PĀTIKI LIVE?


Coastal lake

Pātiki are found in shallow, brackish (slightly salty) waters including harbours, estuaries and inlets, coastal lakes and even rivers.

Sand, yellow-belly and greenback flounder choose places to live where they can hide in plain sight. They like muddy and sandy bottoms where they can bury themselves just below the surface and camouflage themselves. These three species tend to live in shallow water when they are young and move into deeper water as adults.

You can find yellow-belly flounder in shallow, muddy areas areas, whereas, sand flounder (as their name suggests) tend to prefer sandier habitats in harbours and open coastlines. Yellow-belly and sand flounder can also be found on surf beaches around Aotearoa.

Black flounder like estuaries, harbours, inlets and coastal lakes but can also be found in both freshwater rivers as well as open coastline. They are the only species that can live in completely fresh water.


Harbour


Estuary

PĀTIKI CAMOUFLAGE

Pātiki can rapidly change their colour to better blend into their environment. This helps them to hide and wait for their prey to pass.

Keep an eye out in your estuary during summertime for the small pātiki coming in.

LIFE CYCLE

Pātiki are unusual in that they start their
before transforming their bodies to allow

Eggs

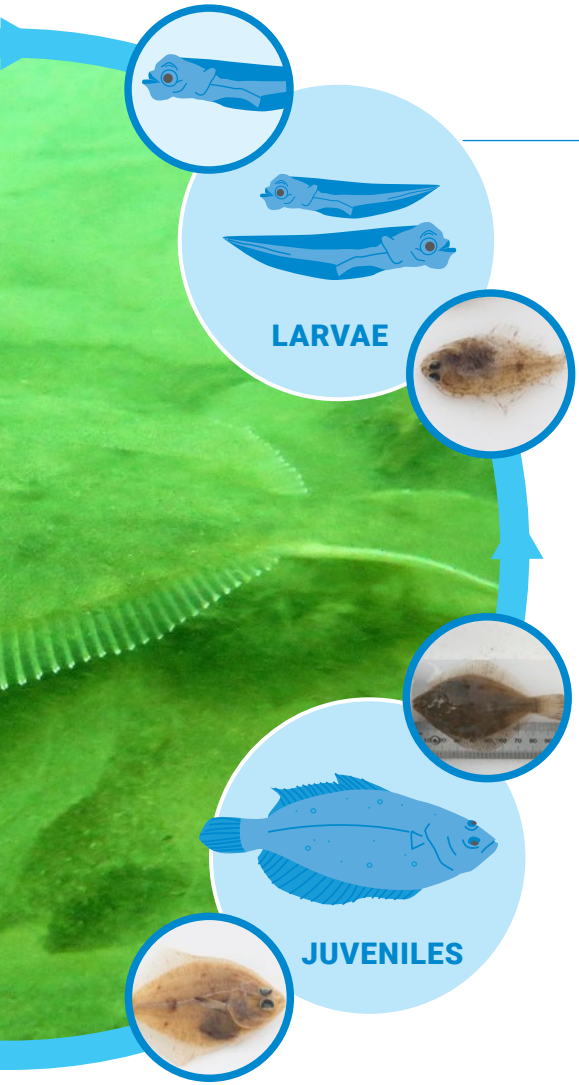
The pātiki starts its life as an egg off the coast. They spawn offshore and are washed into the estuaries with tides. Some pātiki can produce up to one million eggs each spawning event.

Adult pātiki

After about two years, pātiki have grown enough to begin to move out into deeper waters including the deeper parts of estuaries and harbours and inlets as well as out onto the open coastline. Sand flounder males reach maturity at around 12 cm, females from 18 – 22 cm. Yellow-belly flounder males mature at 15 cm and females at 26 – 27 cm. During summers they travel back into harbours to feed and to prepare to spawn in late winter and spring.

Underside of pātiki

lives similar to most fish as eggs and swimming larvae,
them to swim and lie flat on the bottom of the sea.



Larvae

Pātiki hatch into an upright swimming fish with one eye on each side of their body. As they grow the left eye moves to the right side of the head to prepare for when they are lying on the sea floor. Although they can swim a little, they are usually carried by the currents and tides into estuaries, harbours and inlets.

Juvenile pātiki

Once the eyes of the pātiki are both on the right side of their bodies, they begin to lie on their sides and move to the sea floor as juveniles. As juveniles they like to stay in the shallower parts of estuaries, harbours and inlets.

WHAT DO PĀTIKI EAT?

Pātiki like to eat anything they find on the sea floor. They ambush their prey and gulp it when they see it. If they eat any seaweed it is usually by accident.

When the pātiki are living in the estuary or sea close to the coast they like to eat crabs, shellfish, brittle stars, polychaete worms and anemones. All the pātiki hide in the sand or mud and wait till their prey comes past, then quickly gulp and swallow their food.

Because they ambush their prey and gulp it up they often eat a little bit of mud, sand and seaweed at the same time.

Yellow-belly and black flounder eat freshwater insects like midges and dobson-fly larvae if they are living in a freshwater environment.

KAI/FOOD FOR PĀTIKI


Tunneling mud crab


Cockles


Brittle star


Polychaete worm

HOW TO TELL HOW OLD A PĀTIKI IS

It is not possible to tell the age of a pātiki just by looking at its size. Pātiki size depends on location, how much kai is available and whether it is male or female.

The only way to age a pātiki is by looking at the ear bones (called otoliths). The otoliths grow as pātiki grow and each year a new layer is added like tree rings – to age the pātiki you count the rings.

Removing otoliths from pātiki can be difficult and reading them even more so as they are so small.

The oldest known pātiki in Aotearoa was a 10-year-old greenback flounder, found off the southeast coast of the South Island.


Sand flounder otolith


Black flounder otolith


Yellow-belly otolith

Otoliths are very small (mature pātiki otoliths can range from 2-10mm)

HOW BIG DO PĀTIKI GROW?

Growth

Most of our pātiki species grow up to 45 – 50 cm long. Females can grow larger than males (like the sand and yellow-belly females).

The same species can grow larger in the South Island than in the North Island. For example, the sand flounder grows up to 30 cm in the North Island and up to 40 cm in the South Island.

Maturity

Sand flounder males reach maturity at around 12 cm, but females mature from 18 – 22 cm depending on where they come from.

Yellow-belly flounder need to be a little larger, with males maturing at 15 cm and females maturing at 26 – 27 cm.

There is currently no information about how long our black or greenback flounder are before they mature.

PĀTIKI FISHERY

All four pātiki species are commercially fished across New Zealand alongside four other flatfish species.

The commercial and recreational fisheries are subject to minimum size limits of 23cm for sand flounder, and 25cm for yellow-belly, black and greenback flounder.

There are regional differences in the way you can catch pātiki, as well as how many you can take.

All pātiki species have been managed as one fishery under the code FLA but in recent times fishers have started to use individual species codes to help us better understand the differences in each of these pātiki catches.

If you don't really need to eat it, put the little ones back so they have a chance to reproduce.

WHAT ARE THE PRESSURES ON PĀTIKI?


Asian paddle crab

- The amount of oxygen, temperature, nutrients and sedimentation in the water can have a harmful impact on young pātiki population numbers. Climate change and continued degradation of estuarine environments may intensify these impacts.
- Invasive species have the potential to impact on our pātiki and their habitats through competition, predation and habitat modification.
- Continued fishing pressure from both commercial and recreational fishers is also impacting on our pātiki.

How can we help pātiki?

Some ways we can help our pātiki populations include:

- Monitor the numbers of your local juvenile pātiki.
- Protect and restore pātiki habitat
- Ensure that enough adults reach sexual maturity
- Keep an eye out for invasive species like the Asian paddle crab which may eat juvenile pātiki
- Support the improvement of water quality flowing into estuaries, harbours and inlets e.g. riparian planting beside streams

Photo credits Chris Woods, Lily Pryor-Rodgers, Shannan Crow, Crispin Middleton, Nick Gust, Rob Stewart, Dave Allen, Andrew Swales, Alastair Jamieson, P. Marriott and P. McMillan.

NIWA

National Institute of Water & Atmospheric Research Ltd (NIWA) is New Zealand's leading provider of climate, freshwater and ocean science. We deliver the science that supports economic growth, enhances human well-being and safety, and enables good stewardship of our natural environment.

Te Kūwaha o Taihoro Nukurangi

Te Kūwaha, NIWA's National Centre for Māori Environmental Research strives to deliver on Māori research aspirations in a way that reflects Māori values and respects both Māori and scientific knowledge systems. We are working with whānau, hapū and iwi across Aotearoa.

We recognise that whānau and hapū across Aotearoa have an extensive range of names for their freshwater taonga species. In this resource we have drawn on the most commonly used names, but please check with your local hapū for the te reo that is relevant to your area.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