



NIWA
Taihoro Nukurangi



TUANGI

WHAT DOES SCIENCE TELL US ABOUT
NEW ZEALAND COCKLES?

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TAONGA SPECIES SERIES

Taonga species such as pātiki (flounder), tuangi (cockles), and toheroa 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.

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

The Taonga Species Series includes booklets on tuna, kākahi, īnanga, kōura, piharau, tuangi, toheroa and pātiki.

Find out more about the series at

niwa.co.nz/tekuwaha/CK2020





WHAT IS A TUANGI AND WHERE CAN YOU FIND IT?

Tuangi are clams which are endemic to Aotearoa.



Tuangi (*Austrovenus stutchburyi*) are commonly known as the New Zealand cockle or little neck clam, as well as hūwai, tuaki or huangi depending on iwi dialect.

They are one of the most common and widespread shellfish in Aotearoa with populations found in the North and South Island, Stewart Island, the Chatham Islands, and the Subantarctic islands.

Tuangi are usually found buried just below the surface of sheltered intertidal mud and sand flats. Most tuangi will be found 2-4 cm beneath the surface.

They can be found closely packed together with more than 3,000 individual tuangi per square metre!



Endemic means that these species are only found in Aotearoa

WHY ARE TUANGI IMPORTANT?



Tuangi are functionally important and can positively contribute to their ecosystem.

Water clarity

Tuangi can filter up to 3 litres of water per hour! When tuangi are in high densities, this has a positive effect on water clarity.

Bioindicator

Tuangi are sensitive to long term exposure of environmental stressors, including sediments and high levels of mud and copper contaminants, which can affect their behaviour and survival as well as decrease abundances.

Nutrient dynamics

The filtering ability of tuangi means they can trap nutrients and sediments then cycle them through the ecosystem.

Food source

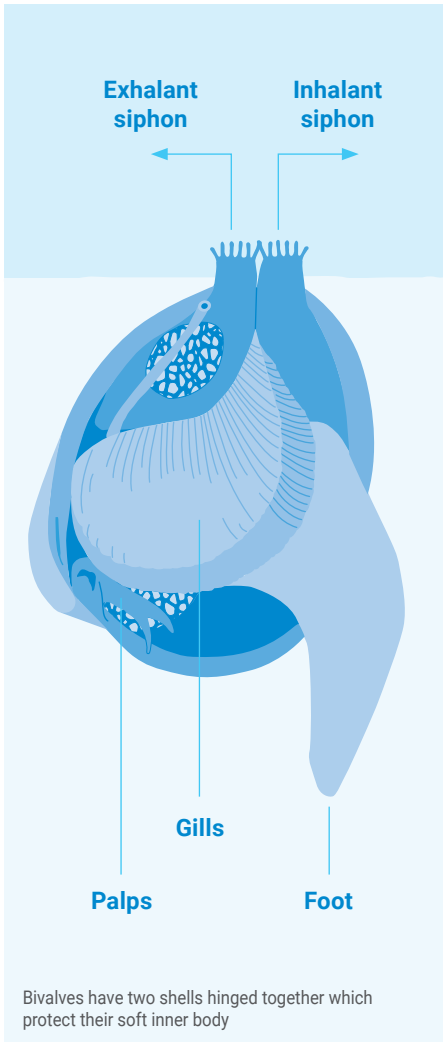
Tuangi are an important food source for fish, crabs, and people.



A bioindicator is a biological organism used to indicate the health of an ecosystem.

TUANGI ANATOMY

The basic anatomy of tuangi includes:



Shell

The hard-outer shell helps to provide protection from predation, physical damage, and drying out. The grooves on the shell also provide stability from the waves and shifting sand.

Siphons

Each tuangi has two siphons – the inhalant siphon draws in seawater and the exhalant siphon expels it.

Gills

The gills play an important role in filtering seawater to obtain oxygen, as well as capturing plant material and small microscopic animals.

Palps

Large particles that are not ingested are redirected by the palps into the exhalant water stream.

Foot

The tuangi uses its muscular foot to move and burrow into the sand.

LIFE CYCLE

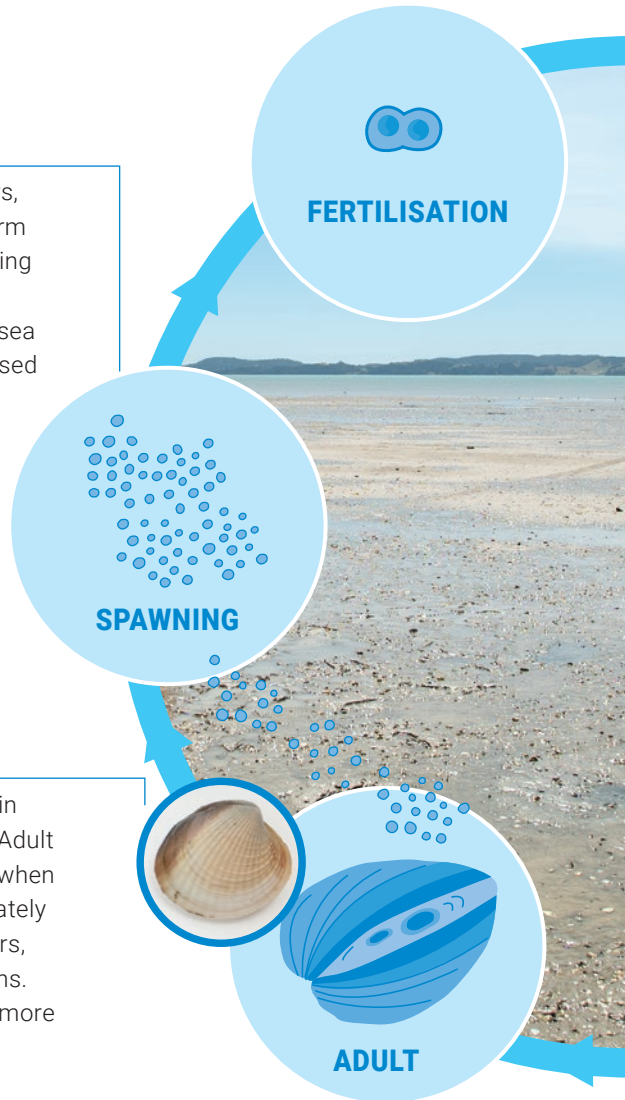
Tuangi are one of the most widespread

Spawning

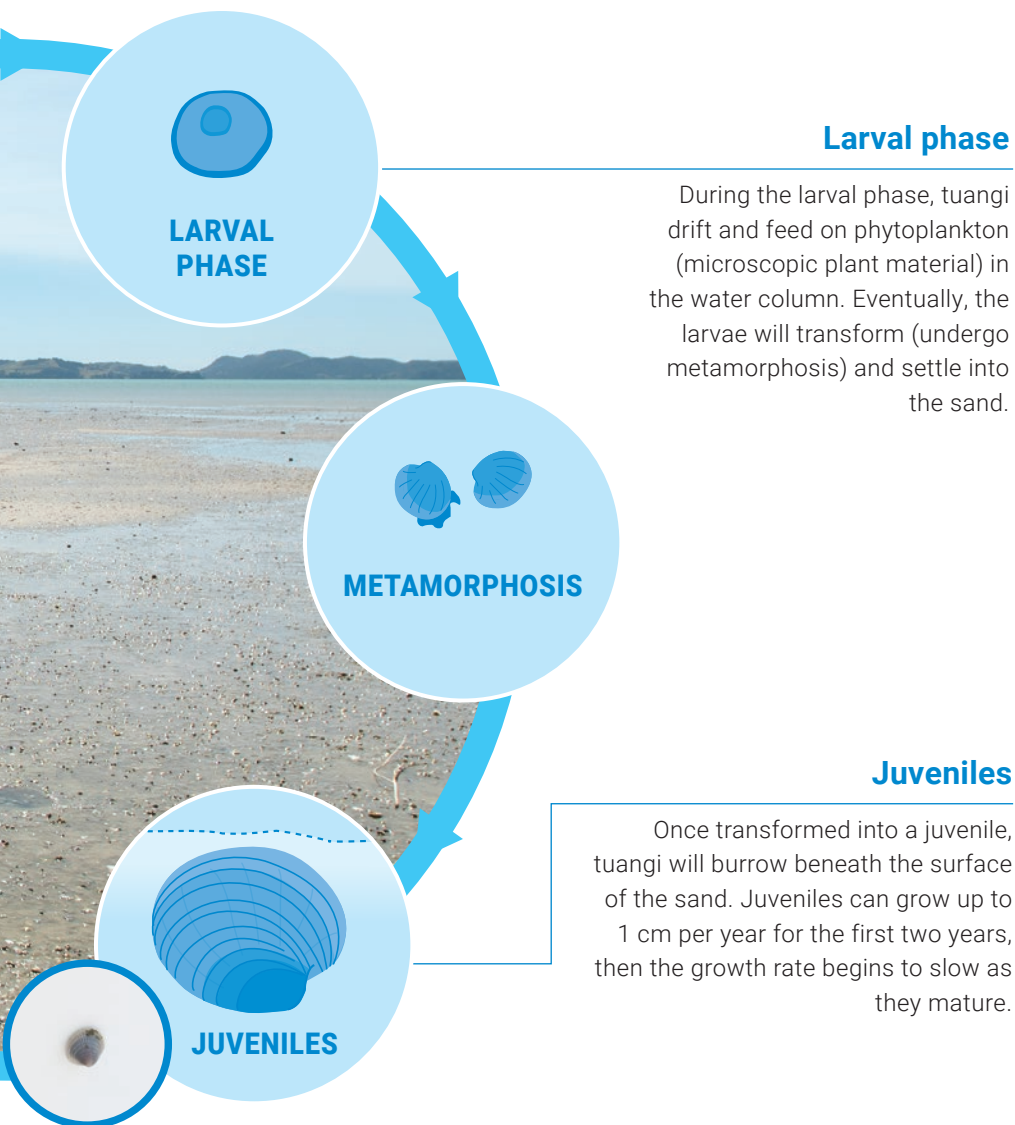
Adult tuangi are broadcast spawners, which means they release their sperm and eggs into the water column during warmer periods, usually spring and summer. The eggs may float in the sea for some time before they are fertilised and develop into tiny larvae called veligers.

Adult tuangi

Most tuangi will grow up to 50 mm in length and may live up to 25 years. Adult tuangi mature and begin spawning when their shell length reaches approximately 18 mm, which usually takes 2-3 years, depending on location and conditions. Typically, the larger the female, the more eggs she can produce.



shellfish found in tidal mud and sand flats in Aotearoa.



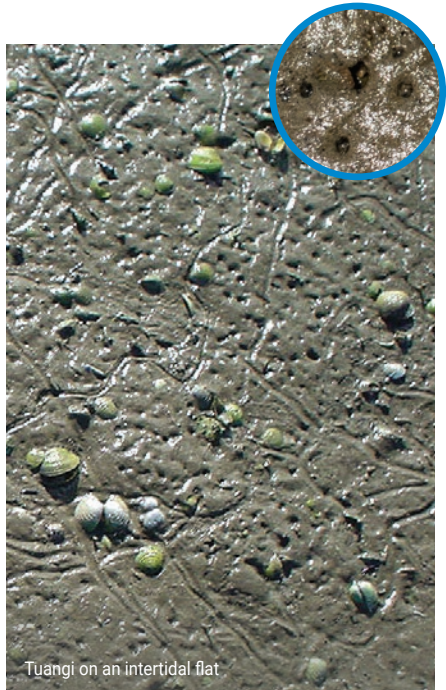
WHAT DO TUANGI EAT?



Tuangi are filter (suspension) feeders, which means they obtain all their food by straining it from the water. They mainly feed on phytoplankton (microscopic plants).

Using the inhalant siphon, tuangi inhale water to their gills where food and inedible matter is sorted. The inedible matter is discarded as pseudofaeces or redirected to the exhalant water stream and expelled through the exhalant siphon.

Due to their strong filtering abilities, tuangi can also accumulate bacteria and contaminants (e.g., various metals) in their flesh. Depending on the type of contaminant and the amount accumulated, this may pose a human health risk to those consuming the tuangi. Therefore, it is important to collect tuangi from areas with healthy water sources and to avoid harvesting for up to three days after rain events to minimise these risks.



Tuangi on an intertidal flat

WHAT AFFECTS TUANGI GROWTH?

There are several factors which can affect the growth of tuangi including:

Age

the growth rate of tuangi tends to slow as they get older.

Food availability

the more food (like plankton) that is available for tuangi, the higher the growth rate.

Position on the beach

the growth rate increases the further you move seaward. This is because the longer tuangi are submerged under water, the longer food is available, and therefore the faster they can grow.

Seasons

Tuangi growth tends to be most rapid over the spring and summer periods.

Environmental conditions

including temperature and salinity can affect the growth rate.

Most of the factors which can affect the growth rate of tuangi can be attributed back to the age of tuangi or food availability.



TUANGI MOBILITY

Tuangi can move up, down, and across the sand by digging and crawling with their strong muscular foot.

Tuangi are found just below the sediment surface, so that their short siphons can extend up and into the water column for feeding. They can move up to 1.5 m along the shore per tidal cycle by crawling.

This mobility is important as they often need to move closer to the surface when there are small increases in sediment around them, or if they become dislodged.

Juveniles vs. adults

Juveniles are more mobile than adults, with most adult tuangi remaining lower on the shore where food availability is greater. Juveniles tend to settle slightly higher on the shore than the adult populations. As they grow bigger, these smaller tuangi will move lower down the shore, maximising food availability.



Tuangi 'bulldozing' or pushing through the sand

WHAT ARE THE THREATS FOR TUANGI?

Across Aotearoa, tuangi are exposed to a range of threats which could impact their population, including:

Climate change

Changes in sea temperature and pH can affect survival and shell formation.

Predators

Shorebirds such as oystercatchers, marine life like stingrays, paddle crabs, flounders, and starfish prey on tuangi.

Sediment input

Significant increases in sediment inputs to tuangi habitats, particularly from run off from land or erosion during storms, can lead to a loss of suitable habitat and may even smother tuangi. It can also elevate suspended sediment concentrations, making filter feeding more difficult.

Overharvesting

Human harvesting activities can also negatively impact tuangi populations.

It is important to monitor the tuangi population over time as this could help to identify or minimise the impact of these threats.



**An oystercatcher
can eat 200 tuangi
in a day**

HOW CAN WE HELP TUANGI?

Tuangi are an important taonga species across Aotearoa. Some ways we can help our tuangi populations include:



Protect and restore tuangi habitat



Ensure estuaries are healthy, with good water and sediment quality



Get involved in tuangi monitoring surveys and programmes



Following harvest regulations in place in your area and not taking more than you need



The daily bag limit is typically 150 per person, except for Auckland, Coromandel and other rāhui areas where the daily limit is lower or restricted. Please check your local regulations before harvesting

Photo credits: Dave Allen, Stuart MacKay, Ani Kainamu Murchie, James Williams, Stephen Fitzherbert, Sarah Hailes and Drew Lohrer.



NIWA

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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 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.



For more visit www.niwa.co.nz/te-kuwaha/tuangi

Climate, Freshwater & Ocean Science



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