What are the other benefits of protecting wetlands?

Wetlands that do not have Northland mudfish are still important ecosystems. They provide habitat for a wide range of plants and animals, such as orchids, tī/cabbage trees, bitterns, fernbirds, grey ducks, banded rails, crakes, and frogs—all of which will benefit from greater protection. Wetlands are natural purifiers—when water flows through a wetland system, the plant community takes up nutrients, and sediment is deposited as water percolates through. Wetlands also help balance the surrounding water supply, soaking up water during floods and releasing it slowly, as well as recharging water tables during periods of drought.

For more information on wetlands protection see www.doc.govt.nz/wetlands-protection

Banded rail. *Photo: D Veitch*

Australasian bittern. *Photo: D Veitch*

Spotless crake. *Photo: G Moon*

For more information

Department of Conservation
Pewhairangi/Bay of Islands Office
34 Landing Road
Kerikeri 0230
Ph: 09 407 0300

Check out the DOC website for more information on mudfish, and funding opportunities to help restore their habitat:
www.doc.govt.nz/mudfish
www.doc.govt.nz/funding

Northland Regional Council, Whangarei: www.nrc.govt.nz

QEII Trust for covenant information:
www.openspace.org.nz

Far North District Council rates remission for land under conservation covenant: www.fndc.govt.nz

Landcare Trust – Fish factsheets page:
www.landcare.org.nz

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Marvellous mudfish

Northland/burgundy mudfish

Mudfish (waikaka/hauhau) are small, native freshwater fish found in swampy lowland habitats, such as wetlands and slow-flowing streams, where they spend their entire lives. This brochure explores what makes Northland/burgundy mudfish unique, and what you can do to help protect them.

Department of Conservation
Te Papa Atawhai

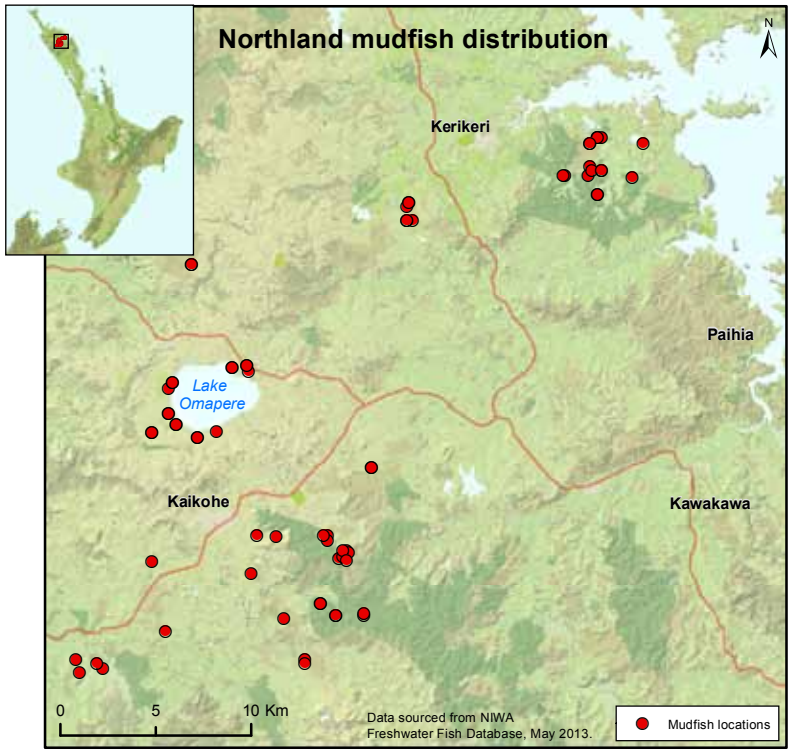
What are Northland mudfish?

Northland mudfish are one of five species of mudfish found in Aotearoa/New Zealand. They are also known as burgundy mudfish because of hints of burgundy colouring around their gills and belly. Growing to around 10 cm in length, they have a cigar-shaped body with thick skin and no scales.

Adults are primarily nocturnal and can be seen at night, although they can be tricky to spot amongst the wetland vegetation. Younger mudfish are active during both day and night, and can sometimes be seen in shoals in open waterbodies.

A very special fish

All species of mudfish in Aotearoa/New Zealand have the ability to survive during times when there is no surface water, which allows them to occupy habitats that other fish are unable to survive in. During these 'dry' periods, their metabolism slowly drops and they absorb oxygen through their skin. While mudfish can sometimes survive like this for extended periods of time, they must have damp surroundings and cover, such as mud, logs, and vegetation, to keep them alive. When surface water returns, they are able to become active again immediately.



Map background by Geographx

Northland/burgundy mudfish *(Neochanna heleios).* *Photo: Amy Macdonald*

Where can you find them?

Northland mudfish are only found in low-fertility wetlands, confined to a very restricted area within a 25 km radius of Lake Omapere. While their distribution ranges overlap with black mudfish (which are more common and can be found in a variety of wetland types from Waikato to the far north), the two species do not live in the same habitats.

Where do Northland mudfish live?

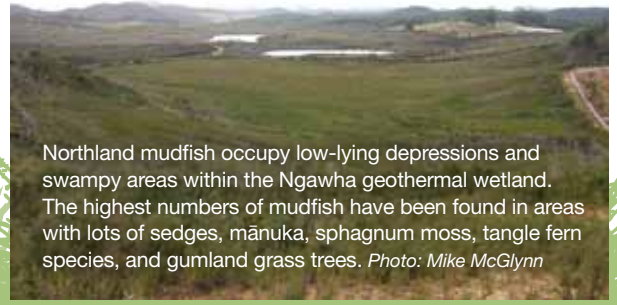
Northland mudfish are generally found in still or very gently flowing water in gumland and peat bog wetlands. The water is often tea coloured due to the presence of peat soils, and tends to be surrounded by dense vegetation.

Gumland wetlands form in areas that were originally kauri forest. The acidic leaf litter from the kauri trees causes a hard silica pan to form beneath the ground, preventing rain water from draining away. This means that the gumlands are often dry in summer and waterlogged in winter.

Peat bog wetlands are formed in low-lying, wetter areas by organic matter accumulating and decomposing very slowly, forming peat. These areas tend to retain water throughout the year.

Two key Northland mudfish populations are at Ngawha geothermal wetland and Wiroa Conservation Area (adjacent to Kerikeri Airport). Both of these sites are gumland wetland habitats.

The Wiroa Conservation Area contains gumholes created by historical kauri gum digging activities. These fill with rainwater, creating ideal habitat for Northland mudfish. *Photo: Mike McGlynn*



Northland mudfish occupy low-lying depressions and swampy areas within the Ngawha geothermal wetland. The highest numbers of mudfish have been found in areas with lots of sedges, mānuka, sphagnum moss, tangle fern species, and gumland grass trees. *Photo: Mike McGlynn*

Protecting Northland mudfish

It is estimated that around 90% of New Zealand's wetland environments have been lost, so the habitats mudfish are found in are now very rare.

Conservation efforts for Northland mudfish have focused on surveying sites to determine the distribution of the species by finding new populations. Several populations of mudfish are monitored and management actions, such as fencing off and re-vegetating the wetland, have been undertaken to protect these habitats.

A monitoring programme implemented by DOC is gathering information on how Northland mudfish populations respond to fencing, and the associated changes to the 'health' of their habitat. Monitoring also helps identify the type of wetland environments that are the most favourable habitat for Northland mudfish. This knowledge can then help determine what other wetlands could be potential Northland mudfish habitat.

Trapping mudfish to monitor populations.
Photos: Amy Macdonald

Threats

In Northland, wetlands have been extensively drained and modified, which has greatly impacted on suitable Northland mudfish habitat. Northland mudfish are a threatened species, and remaining populations are now found in relatively small pockets of wetland.

Northland mudfish are vulnerable to a number of major threats:

Wetland drainage decreases available habitat.

Grazing pressure on wetland plants and stock trampling wetland edges can damage habitat, making wetlands more vulnerable to drought and weed invasion.

Water pollution from additional nutrients entering the wetland from the surrounding catchment can degrade the water quality, potentially making it unsuitable for Northland mudfish.

Fire can damage habitat, drying out and opening up the wetland to weed invasion. Northland wetlands are very susceptible to fire during dry periods.

Weeds compete with native vegetation, can alter the ecology of the wetland, and may degrade the habitat.

Manipulating water levels to drain or pond wetland water can stress mudfish. Northland mudfish live in wetlands that have natural variations in water levels between seasons—extended dry periods may cause death, while artificial ponding of water provides an opportunity for the pest fish gambusia to establish.

Invasive fish, particularly gambusia, are a major threat as they reproduce rapidly, colonising new habitats and establishing large populations within areas that Northland mudfish occupy. They are voracious feeders, competing with mudfish for food resources, and can also eat mudfish fry (young fish).

Competition with other native freshwater fish species can also be a threat to Northland mudfish, and therefore they are rarely found in high numbers in habitats where other fish are present.

How you can help

Many wetlands that support Northland mudfish populations are on privately owned land. Populations are often found in small, isolated habitats, so even a small wetland can be very important. Protecting and restoring wetlands where Northland mudfish are present will help to ensure the right environmental conditions and food resources are available, increasing the mudfish population. If you think that a wetland on your property could be suitable habitat for Northland mudfish, contact your local DOC office for advice about carrying out a survey.

These are some examples of how Northland mudfish habitat can be protected. Remember to always check council rules to see if the actions are permitted, or if resource consent may be required.

Fence off the wetland to keep stock out and prevent wetland plants from being grazed and habitat trampled. It's important that stock are kept out all year round, even during summer months.

Increase the size of the wetland when establishing fence lines by including boggy areas and wetland edges, as these can become good wetland habitat once grazing pressures are removed. Remember that Northland mudfish are not good at competing with other fish species, so avoid creating new connections between your wetland and other waterways.

Plant a native vegetation buffer around the wetland to help to protect the habitat and water quality from the impacts of surrounding land-use.

Minimise nutrient inputs, such as nitrogen and phosphorus, which are transported into wetlands from the wider catchment by runoff and seepage. Careful management of fertilisers throughout the catchment can prevent excess nutrients from entering a wetland.

Control weeds to reduce competition with native plants. Weeds can also impact on the water table and ecology of the wetland, as well as alter the nutrient balance, leading to changes in water quality.

Allow natural water level fluctuations as Northland mudfish tend to occur in wetlands that have naturally variable water levels. Avoid using drains and weirs to manipulate water levels.

Prevent invasive fish establishing by finding out what invasive fish species are present in the catchment around your wetland and being careful not to accidentally move them between waterways.

Allow for long-term conservation of the wetland by formalising wetland protection with a conservation covenant. The Far North District Council also supports landowners with rates remission for land that is under legal protection for conservation purposes (such as covenants).

Regeneration beginning after a fire. *Photo: Amy Macdonald*

Wetland regeneration.

(Right) Before, 2004
Photo: Bruno David

(Below) After, 2013
Photo: Mike McGlynn