

TREASURES OF THE HAURAKI GULF MARINE PARK

Mussel Reefs - Kūtai, Kuku: Very special, nationally significant qualities are recognised in the designation Hauraki Gulf Marine Park.

Among these features is a stunning diversity of marine environments around open coast, rugged islands, sheltered bays and tidal flats. Remarkably though, one of the habitat types which once dominated and defined the Gulf is now almost completely absent.

Layer upon layer of green-lipped mussels once covered the bottom of much of the Firth of Thames and Tamaki Strait, forming one of New Zealand's most productive shallow water ecosystems. The filtering power of the mussel reefs might have flushed the Firth in a day; their associated fish life 10 times that found in the same areas now.

Fished by dredges and poached through last century until collapse, new research and community interest suggests the mussel reefs of the Gulf could make a comeback.

Without the filtering power of mussel reefs the waters of the Gulf have become murkier and more vulnerable to the effects of increasing nutrient runoff from farms.

Being so abundant it was thought the mussel reefs were inexhaustible. Commercial fishing began in 1910 and continued for nearly 60 years, with as many as eight boats dragging two-to-three metre wide dredges. They supplied domestic markets, mainly Auckland.

Kiwi ingenuity led to mussels being farmed on ropes in the Gulf to supply hungry markets. Fishers know that snapper love mussels too so mussel farms have become one of the popular fishing spots in the Gulf.

Spotty Paketi

Eagle Ray
Whai repo

Snapper
Tāmure

Common Octopus
Wheki

Mussels are community builders, providing places for animals, like the eagle ray and octopus, to shelter and grow. Ten times more fish, including blennies and triplefins, massive amounts of small invertebrates and other marine life are associated with mussel reefs.

Mussels have separate sexes and after spawning larvae drift in the water column settling on seaweeds or other surfaces such as the 'beards' of adult mussels. Once settled, spat secrete byssal threads enabling them to secure themselves and move around on suitable substrate.

In the right conditions mussels grow incredibly fast, going from finger-nail size to 10 centimetres 'supermarket' size in just a year.

Mussels are feeder filters pumping water, phytoplankton (microscopic plants) and other particles through their gills. A single mussel can filter up to 350 litres of seawater daily. This means that at their prime mussels could have filtered the water of the Firth every day. Now it would take two years for the few remaining reefs to do this.

The green-lipped mussel, *Perna canaliculus*, is one of 16 mussel species found in New Zealand and formed dense sub-tidal reefs on the soft sediments of the Gulf to depths of 30 metres.

Mussel spat may settle on live mussels, associated fresh shell and the other plants and animals growing on them: the living reef sending out chemical signals that it is OK for establishment. This could be the recipe for re-establishing larger, self-sustaining reefs.

Mussel spat can't re-establish on the bare sand and mud which now cover the bottom of the inner Gulf. But researchers recently found that adult, farmed mussels survived when 'replanted' in cages back in their former range, even in the murkiest parts of the Firth.

Fishery managers thought dredging might actually stimulate mussel growth and that reefs would recover if they were closed temporarily; if boats were licensed and their number restricted. But ripped up, damaged reefs did not rebuild and the seabed reverted to sand and mud, with new sediments being added from forest and land clearance.

Mussel Beard Hydroid
Kawekawe

Brittle Star
Weki huna

Cushion star

More research is planned on how mussel reefs can re-establish and a community trust is keen to get started, introducing trial plots to a few selected sites in the Gulf and observing what happens.

In time - just as community trusts have successfully restored the island habitats of the Gulf - mussel reefs might contribute to the protection and enhancement sought by the Hauraki Gulf Marine Park Act.

Breadcrumb Sponge
Kopututai

When the mussel fishery collapsed in the mid 1960s poachers took over, diving on remaining reefs, particularly around Orere Point, to supply jars of fat, juicy mussels for pub raffles.

Half Crab
Pāpaka

Robust Spotted Triplefin
Ika tiratoru

Sea Anemone
Kōtore moana

You can help. The new Mussel Reef Restoration Trust is looking for tip-offs about any last remaining wild reefs to study their dynamics, and also seeking volunteer assistance and funds for its restoration mission. Visit: www.reviveourgulf.org.nz or contact: musselreef@gmail.com.

