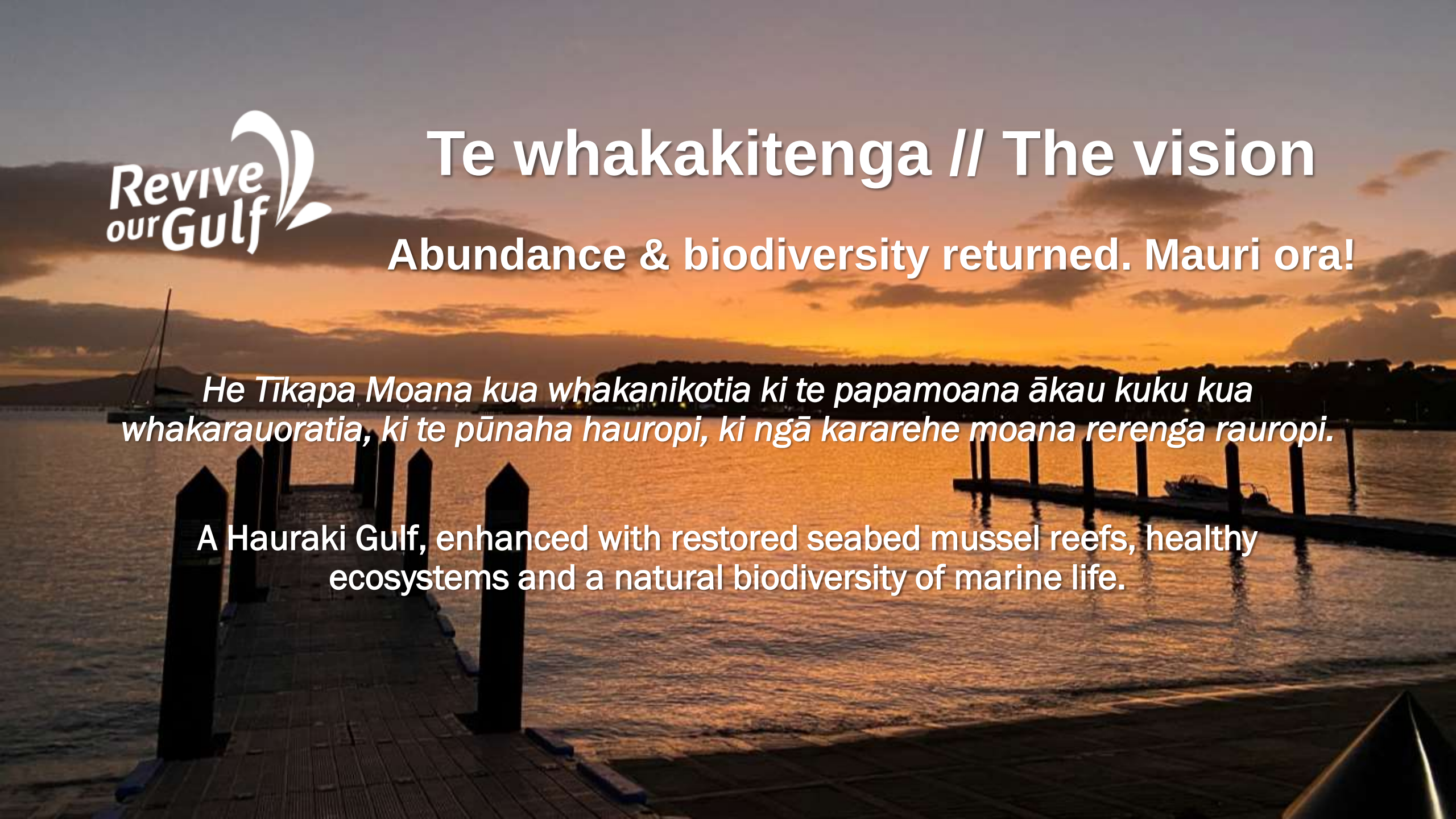
Re-musseling the Gulf

Restoring the biogenic kūtai reef habitats of
Tīkapa Moana / Te Moananui ā-Toi / The Hauraki Gulf

The Nature Conservancy

The Mussel Reef Restoration Trust
Te Ohu Whakahaumanu i ngā Ākau Kūtai

University of Auckland
Waipapa Taumata Rau
New Zealand



Te whakakitenga // The vision

Abundance & biodiversity returned. Mauri ora!

He Tīkapa Moana kua whakanikotia ki te papamoana ākau kuku kua whakarauoratia, ki te pūnaha hauropi, ki ngā kararehe moana rerenga rauropi.

A Hauraki Gulf, enhanced with restored seabed mussel reefs, healthy ecosystems and a natural biodiversity of marine life.

Te whāinga // The mission

To ‘re-mussel’ the Gulf.

Kia mahi tahi me te Mana Whenua me te hāpori anō hoki kia whakahaumanutia ngā ākau kuku o Te Moana ki Tīkapa / Te Moananui ā-Toi.

To work in partnership with tangata whenua & community to restore the mussel reefs of the Hauraki Gulf.

The Revive Our Gulf ecosystem

CORE COLLABORATORS

The Nature Conservancy

The Mussel Reef Restoration Trust
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New Zealand

TANGATA WHENUA

Ngāti Whātua Ōrākei

Ngāi Tai ki Tāmaki

Ngati Manuhiri Settlement Trust

PRINCIPAL PARTNERS & FUNDERS

Auckland Council

Hauraki Gulf Forum
Tikapa Moana
Te Moananui-ā-Toi

Foundation North
Te Kaitiaki Pūtea o Tāmaki ō Tai Tokerau

Auckland Foundation

The Tindall Foundation

PROJECT SUPPORTERS & CORPORATE SPONSORS

Ōrākei Local Board
Auckland Council

OBC Auckland

North Island Mussels Ltd

Heron Construction Co. Ltd.

Ports of Auckland
Tāmaki Herenga Waka

Sanford

HPCA Chartered Accountants

frank. risk management

Live Ocean Foundation

Shieling Laboratories

Okuma Inspired Fishing

Kūtai restoration in the Hauraki Gulf - Milestones

2008 … 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022

UoA commences shellfish research (2008)

Early Research (I McLeod 2009, D Parsons 2011)

Okahu Bay Ecological Restoration Plan (Kahui-McConnell 2012)

Mussel Reef Restoration Trust established (June 2013)

ROG/NIML deposit 7t of kūtai off eastern Waiheke (Nov 2013)

Feasibility study of using kūtai to cleanse Okahu Bay (Van Kampen 2013)

ROG/NIML deposit 63t of kūtai off Eastern Waiheke (Sep 2014)

Ngāti Whātua Ōrakei/ROG deploy 2t of kūtai at Ōkahu Bay (Aug 2014)

90t of kūtai deployed in various site across Mahurangi by UoA/ROG (2016 - 2019)

Kūtai in mussock attached with flax ropes to the Ōkahu Bay wharf (Sep 2017).

Characterising ideal habitats (van Kampen 2017)

Ecological restoration of mussel beds (M Wilcox et al 2017)

Attachment substrate a prerequisite? (M Wilcox et al 2017)

Impacts of sea star predation (M Wilcox et al 2019)

Subadult & Juveniles for restoration (A Alder et al 2020)

Patterns of settlement (M Wilcox et al 2020)

Aquaculture spillover (C Norrie et al 2020)

AC Consent granted (Feb 2021)

Biosecurity NZ framework (March 2021)

60t of kūtai deployed in Ōkahu Bay (Nov 2021)

Denitrification (J Hillman et al 2021) (M Sea, et al 2021)

Importance of stock selection (A Alder et al 2021)

Global review of shellfish reef conservation (T Toone et al 2021)

150t of kūtai deployed around Te Kawau Tūmārō-o-Toi (Jul-Oct 2022)

Timing restoration (A Alder et al. 2022)

Biodiversity (M Sea et al 2022) (E Benjamin et al 2022)

Carbon cycling (M Sea et al 2022)

Shellfish aquaculture and settlement (T Toone et al 2022)

Use of pilot experiments (E Benjamin et al 2022)

Ōkahu Bay

Mānawatia a Matariki

Research at UNIVERSITY OF AUCKLAND Waipapa Taumata Rau NEW ZEALAND

Monitoring restorations – Sophie Roberts

Gape sensors

Subtidal restoration in Pelorus Sound – Emilee Benjamin

Mapping topography

Intertidal restoration in Keneperu Sound – Trevyn Toone

Patterns of larval dispersal – Mikaela Stanborough, Brandy Biggar

Avoiding predators – Dr Al Alder

Improving restoration efficiency – Al Alder

Ecosystem modelling of restored beds – Holly Fleming

Ecosystem services of restored beds – Mallory Sea

How to restore

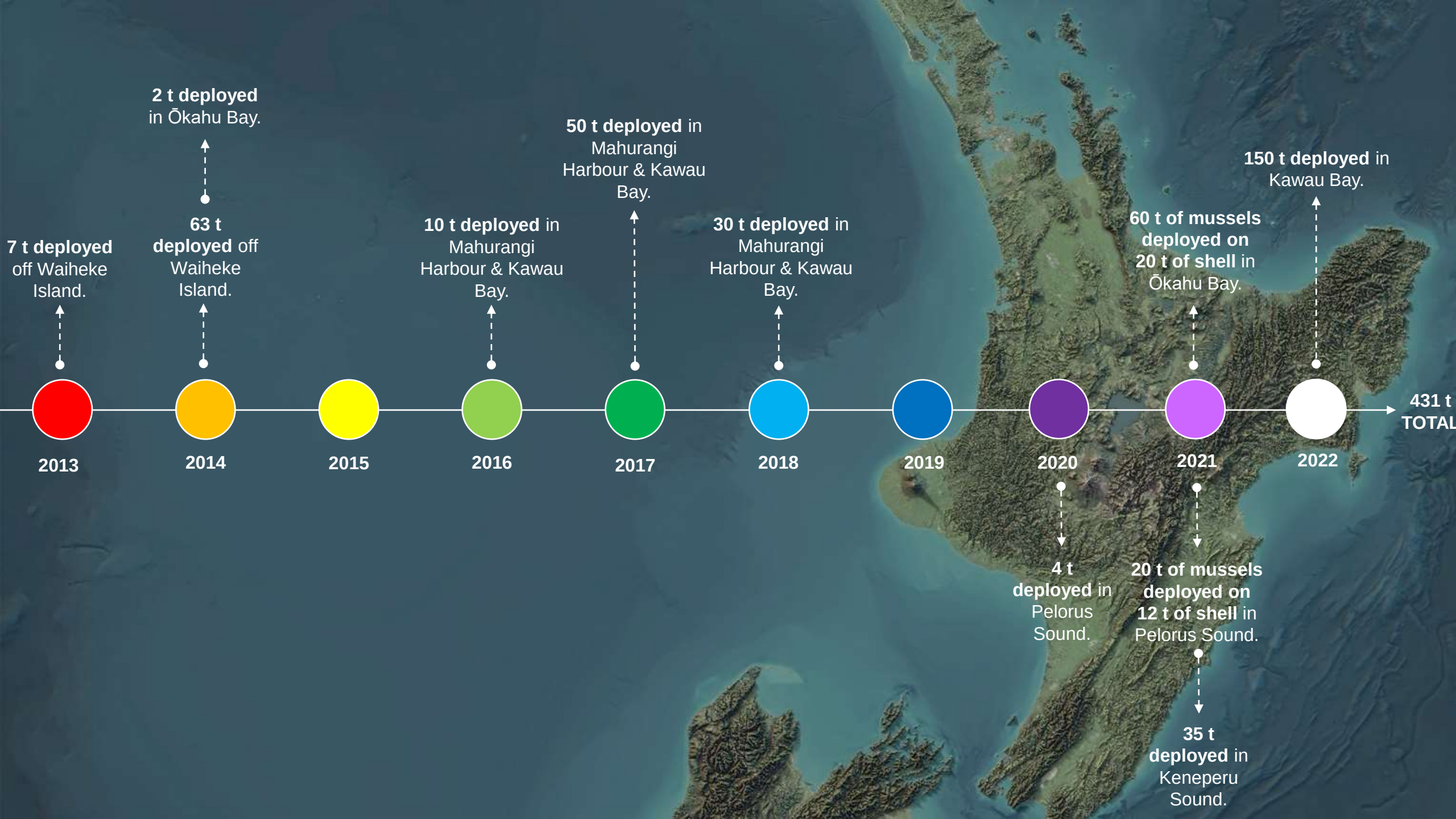
What is success

When to restore

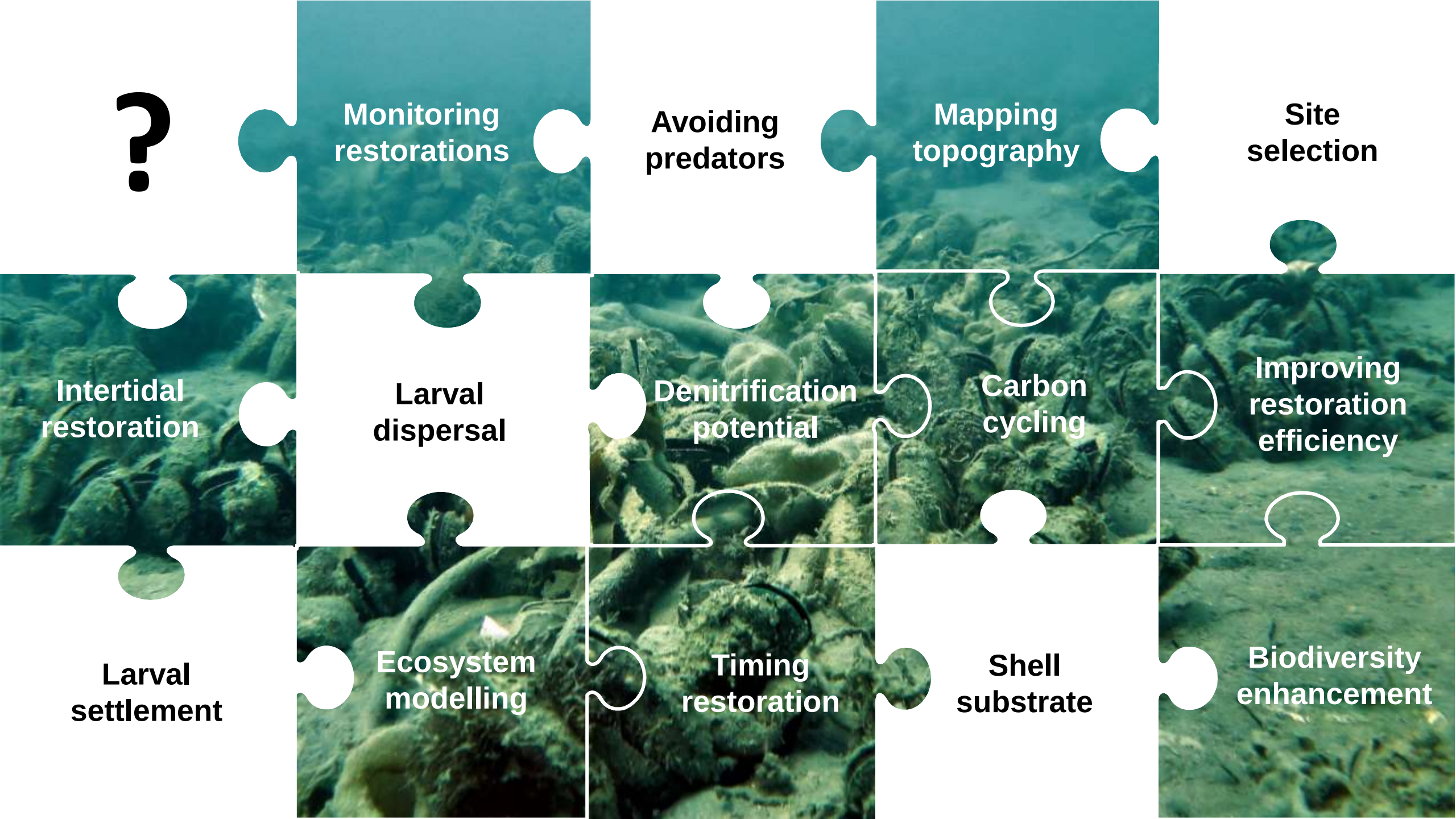
Where to restore

Why to restore

shellfishrestoration.wixsite.com/uoanz


7 t deployed off Waiheke Island.
2 t deployed in Ōkahu Bay.
63 t deployed off Waiheke Island.
10 t deployed in Mahurangi Harbour & Kawau Bay.
50 t deployed in Mahurangi Harbour & Kawau Bay.
30 t deployed in Mahurangi Harbour & Kawau Bay.
60 t of mussels deployed on 20 t of shell in Ōkahu Bay.
150 t deployed in Kawau Bay.
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
431 t TOTAL
4 t deployed in Pelorus Sound.
20 t of mussels deployed on 12 t of shell in Pelorus Sound.
35 t deployed in Keneperu Sound.


BEUCHAT


?
Monitoring restorations
Avoiding predators
Mapping topography
Site selection
Intertidal restoration
Larval dispersal
Denitrification potential
Carbon cycling
Improving restoration efficiency
Larval settlement
Ecosystem modelling
Timing restoration
Shell substrate
Biodiversity enhancement

What mussel reefs do
Te mahi a ngā kūtai

FILTRATION STRUCTURE SUSTENANCE CULTURAL

Kaimoana! Bring back kohinga kai and customary practices for manaakitanga / hospitality.

Provide shelter for crabs, snails and a nursery habitat for juvenile fish.

7x
biomass

A feeding ground for larger species like tāmure/snapper, wheke/octopus & whai/rays.

10x
fish abundance

Promote recovery of seagrass & seaweeds as clearer water means more light.

4x
invertebrate densities

Remove suspended solids from the water column

Provide a hard surface for other organisms to grow on, including baby mussels.

Remove toxins like heavy metals and excess nutrients from the water.

Stabilise the seafloor, reducing re-suspended sediment.

Provide a source of food for seafloor animals (infauna) that feed on waste material from filter feeding.

up to **25x**
denitrification rates

Ngā mihi!

reviveourgulf.org.nz

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