

PĀ KŌURA

WHAT ARE THEY?

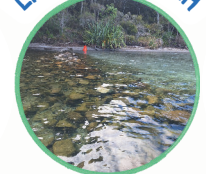
Pā kōura are rocky reefs that are created to mimic natural boulder and cobble habitats where kōura are often most abundant. Research has shown that pā kōura are a particularly effective habitat solution for kōura protection.

EXAMPLES OF PĀ KŌURA

LAKE ROTOMĀ



LAKE TARAWERA



LAKE ROTOITI



A mixture of large and small rocks will create numerous refuges for kōura at different life stages.



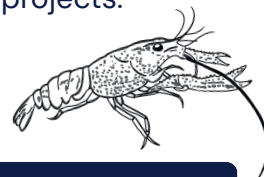
REMEMBER

Kōura populations take time to establish. New habitat may not show immediate results; it can take several years for a healthy population to develop.

Long-term monitoring helps determine what works best and improves future restoration projects.

OUR RESEARCH

LEARN MORE



PROJECT PARTNERS

Fish Futures Research Programme
Cawthron Institute
Ian Kusabs & Associates
Te Arawa Lakes Trust
Bay of Plenty Regional Council

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 **CAWTHRON**

PĀ KŌURA

Using rocky reefs to restore freshwater habitats in Aotearoa New Zealand



Fish Futures



Ian Kusabs & Associates Ltd

WHO ARE KŌURA?



A hidden hero of freshwater ecosystems

Kōura are Aotearoa New Zealand's native freshwater crayfish. They play an important role in freshwater food webs by recycling nutrients, breaking down organic matter, and providing food for other species. They are also taonga (treasured species) and an important mahinga kai (traditional food source).

Kōura spend most of the day hiding in safe shelters, emerging at night to feed. They eat a variety of foods, including leaves, aquatic plants, snails, insects, worms, and dead fish.

THREATS



HABITAT LOSS

EROSION & SEDIMENT

DEGRADED WATER EDGES

POOR WATER QUALITY

INVASIVE SPECIES: CATFISH

A DECADE OF DECLINE

76%↓
LAKE ROTORUA

91%↓
LAKE ROTOITI

PĀ KŌURA:

BUILDING BETTER HABITAT

Research shows that kōura need places to hide (refuge) from predators, such as catfish, to breed and grow.

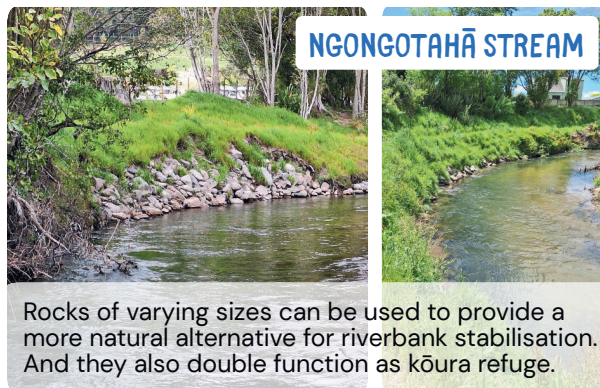
What makes good kōura habitat?

- ✓ Rocks, cobbles, and boulders
- ✓ Woody debris and plant roots
- ✓ Diverse shorelines with different depths
- ✓ Clean, cool, oxygen-rich water
- ✓ Places to hide and find food

A pā kōura is a purpose-built habitat that creates shelter and protection for kōura.

A GOOD KŌURA REFUGE IS

- Large enough for kōura to fit completely inside
- Small enough to exclude predators
- Stable during floods, waves, and changing water levels
- Relatively free of silt and weed build-up over time
- Close to feeding habitats



NGONGOTAHĀ STREAM

Rocks of varying sizes can be used to provide a more natural alternative for riverbank stabilisation. And they also double function as kōura refuge.

LAKE ŌKĀREKA

PRACTICAL TIPS FOR CREATING PĀ KŌURA

1. BEFORE PĀ KŌURA DEVELOPMENT

- Protect existing habitat first
- Retain native vegetation and woody debris
- Ensure pā kōura will be installed near feeding areas and with good water quality and oxygen levels
- Consider potential construction impacts on existing kōura
- Work with mana whenua from the start

2. DURING PĀ KŌURA INSTALLATION

- Use a mixture of rock sizes to create shelter spaces
- Use local rocks and natural materials where possible
- Create habitat across different water depths
- Ensure stable rock placement to withstand floods and storm waves

3. AFTER INSTALLING PĀ KŌURA

- Plant stream and lakeshore margins to provide more shelter and shading
- Monitor kōura in partnership with mana whenua