



Kanakana

The Pouched Lamprey

A Taonga Species

Written by Ariana Drabble

Kanakana illustrations by Jade Watkin

NEW ZEALAND'S
BIOLOGICAL
HERITAGE

Ngā Koiora
Tuku Iho

National
SCIENCE
Challenges



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author's bio

Kia Ora

Ko Ariana tōku ingoa

Ko Te Arawa, Ngāti Raukawa, Ngāti Toa ōku iwi

Ko Ngāti Whakaue, Ngāti Koroki, Ngāti Kimihia ōku hāpu

Ko Whakaue, Raukawa, Katihiku ōku marae

Nō Māketu raua ko Ōtaki ōku tīpuna

Ko Tapsell raua ko Carkeek tōku Whānau

My name is Ariana

My tribes are Te Arawa, Ngāti Raukawa and Ngāti Toa

My subtribes are Ngāti Whakaue, Ngāto Koroki and Ngāti Kimihia

My marae are Whakaue, Raukawa and Katihiku

My ancestors are from Māketu and Ōtaki

Tapsell and Carkeek is my family

I grew up in a small rural town at the bottom of New Zealand called Winton, where I was raised on a dairy farm with my parents and two sisters. I was educated at the local primary school (Limehills) and went on to attend the local college (Central Southland College), where I found a passion for science. I moved to Dunedin in 2022 to pursue a Bachelor of Biomedical Science degree, where I study microbes, the human body and cancer.

Science is an exciting and ever-expanding field, filled with endless discoveries. New discoveries every day help us understand the very complex world we live in and can make a difference to people and the environment that surrounds us. What I love about science is that it fulfils my curiosity and passion. I will continue my studies at the University of Otago in 2025 to complete an honours degree, and I am very excited about where my career in science will take me.

acknowledgements

Starting this project, I had no experience in freshwater ecology. I had no idea what the kanakana/lamprey was and how it would become a big part of my life and help to challenge and change my perspective on culture and science. This project has been a personal and educational journey where I have developed my research skills, acquired a deeper understanding of my culture, and learnt to look at my identity and the environment through a different lens. From the beginning, when I first met the kanakana at the Mataura Falls, to now, I had no idea the effect that such a small, mysterious, strange-looking creature could have on me, nor the passion it evokes in the hearts and minds of those determined to save it. The exposure to this area of science has been an eye-opening experience. It has helped me realise that culture is tied into all facets of life and community and that I should always look more broadly at life, as there is much more out there that I am yet to experience, and that if given the opportunities to grow my knowledge and understanding of myself, my culture and world around me, I should take it.

I am forever thankful to my supervisor, Dr Jane Kitson, and to Ngā Pae o te Māramatanga, Aotearoa's Māori Centre of Research Excellence, for offering this project and supporting me through a summer internship; it has been an amazing experience working with you. This work was also supported by funding from funding from the Biological Heritage National Science Challenge via the Freshwater for our Taonga research programme. Thank you to the Hokonui Rūnanga Taiao Freshwater team and the University of Canterbury Freshwater Ecology Research Group for the training and fieldwork opportunities. Working with and learning from all of you was a pleasure, and I could not have written this book without this experience.

Who Am I?

I am a small secretive fish species hiding away in the cool river water all over Aotearoa. Believe it or not my ancestors have been around for 360 million years and have survived through many challenges, there are currently over 40 different lamprey species in the world, and only 5 in the southern hemisphere.

In Aotearoa, I have many names. In the South Island I am known as the kanakana, in the North Island we are called piharau but scientist like to call us pouched lamprey. Our scientific name is *Geotria australis*. Māori consider me a taonga species and mahinga kai as I am a important food source that nourishes the tangata (people) that catch and eat me.

From a distance I am often mistaken as a Tuna (eel), but we have many differences. Instead of a jaw, I have a circular sucker mouth that I use to attach to my prey and it helps me get over barriers while migrating. I also have no bones and instead have cartilage.

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Where Do I Live?

When I enter the rivers after my time at sea, rocks, logs and grassy banks is where I hide during the day, at night is when I swim as I am a nocturnal fish, which makes me a difficult fish to spot.

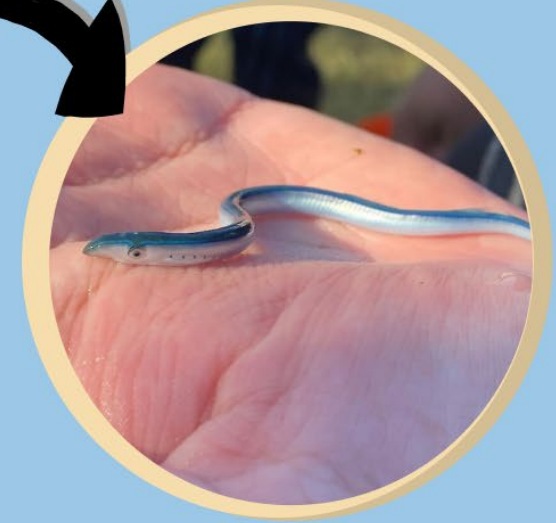
Throughout my life cycle I spend time in both rivers and the ocean. When I am born, I am very small and live in the sand and sediment at the bottom of the river bed. As an adult, I migrate out to sea where I use my sucker mouth to attach to a larger fish. Once I have matured, I make my way back to the river to breed and lay eggs. After my off spring have spawned I die.

TAONGA SPECIES AND MAHINGA KAI

A taonga species is a treasure or anything that has significance to a community or individual, this can include animals or plants. Mahinga kai is a term which includes the species and the habitat which supports it.



Early Life of the Kanakana



Spawning nest

First, my egg along with thousands of other eggs are laid under boulders or in burrows to keep us hidden. When we hatch we stay attached to the boulder for approximately 3 weeks. During this time, my mother and father stay to protect the nest from predators and die shortly after hatching.

Ammocoetes

(am-o-seets)

Next, I grow into juvenile kanakana called ammocoetes and live in the sand and sediment of the rivers to hide from predators. The colour of my body is brown to help me blend in. Filter feeding algae and other small particles is how I gain nutrients to grow. This stage of my life cycle lasts for 3.25 to 4.25 years.

Macrophthalmia

(Mac-rof-thal-mi-a)

After, I change over 7 months into a macrophthalmia, also called a miniature adult. My back changes to a bright blue colour with silver underneath. Development of my eyes and circular sucker mouth occurs and I grow up to 12 cm in length. I begin migration down the river and into the ocean

Life at Sea

My time at sea is still a mystery to many as I am difficult to find. I spend about 3 to 4 years of my life out in salty ocean. During this time, my long blue body grows up to 75 cm long and I will eventually become a Velasia (Adult).

Velasia (Adult)

I become an adult as I enter the freshwater river for migration after my time at sea. Maturation occurs over the next 14 to 16 months and during this time I stop eating. Instead I use all my stored energy and shrink in size. My bright blue colour changes to a dark brown. When we reach sexual maturity, a male develops a pouch under his head and the females develops a ridge above the first dorsal fin.

Predators

Predators are a big threat to us as we migrate up and down the river and while at sea. Both marine animals and birds like to feed on us.

Way out to sea

When migrating out I am quite small and am an ideal food source for other fresh water fish. Predators include trout and eels.

While at sea

At sea, my predators tends to be larger marine animals such as seals and tuna fish. Gulls and shags also like to feed on us.



What do I feed on?

Previously I have been known as a vampire fish. This is because I parasitically feed on the flesh and blood of larger marine animals in the ocean, such as larger fish and even whales. My sucker mouth is used to attach to my prey and allows me to hold on for a long period of time.

Migration up the River

Challenges of Migration

HARVESTING

For hundreds of years, Māori have harvested us, cooked us up and eaten us to nourish the tangata whenua (people of the land). We are harvested by being plucked off the rocks and waterfalls we are trying to get over. At Matura falls we are harvested in the months of October and November. This could potentially impact the amount of offspring we produce if our population numbers become very low

HABITAT ALTERATION

Due to the large amount of wetland in Southland being turned into farmland, we have lost a lot of our natural habitat. We have less trees, rocks and logs to hide under and build our nest. During alterations, other barriers are put into the river such as dams, flood gates and stop banks, making it more difficult for us to get upstream.

MATAURA FALLS WEIR

A weir is a type of dam which alters the flow of the water, in this case the water is diverted to the sides of the river and into a channels, leaving the center of the river with low water levels. For us, it is difficult to get over the weir due to its design and not many places for us to attach our sucker mouth to.

Adult kanakana using its sucker mouth to attach to the side of a bucket

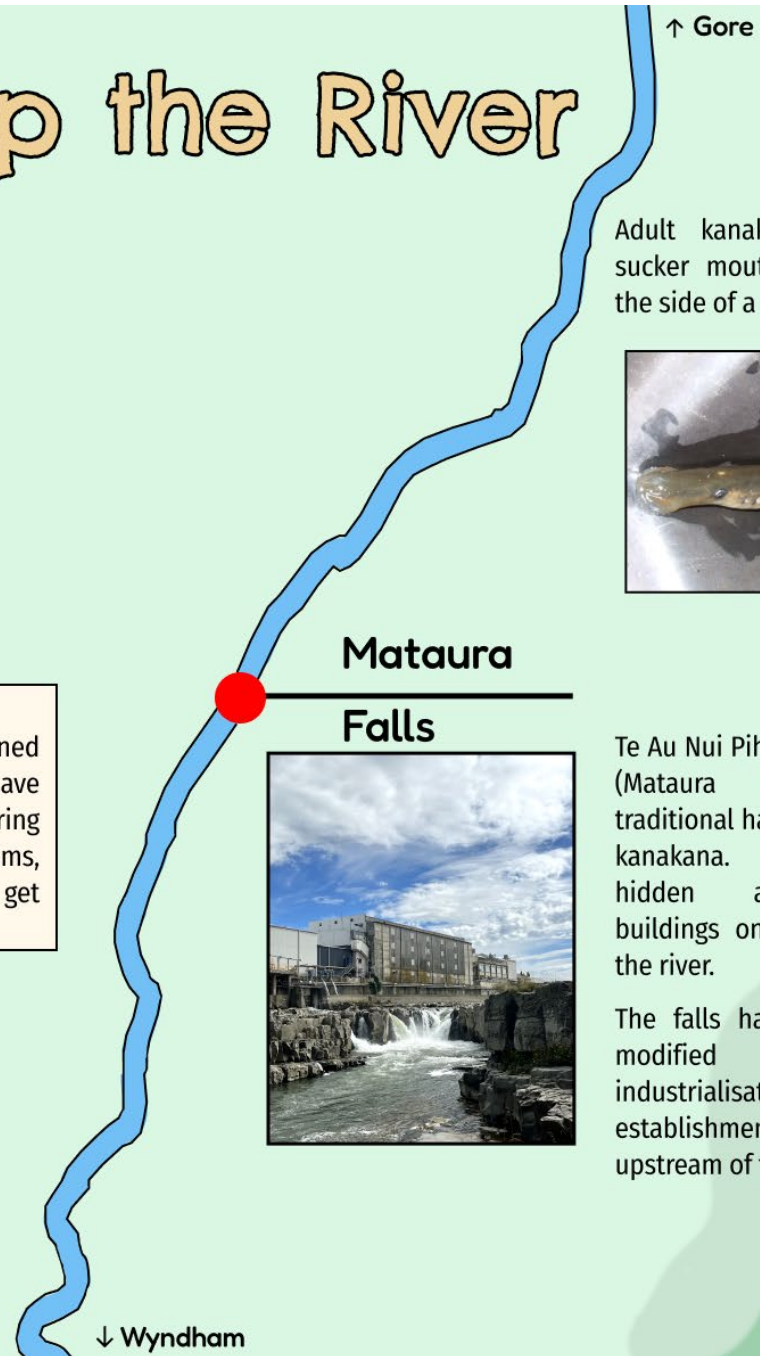


Matura Falls



Te Au Nui Pihapiha Kanakana (Matura Falls) is a traditional harvesting site for kanakana. The falls are hidden away behind buildings on either side of the river.

The falls has been heavily modified due to industrialisation, and the establishment of the weir upstream of the falls.



Conservation Efforts

Bioheritage National Science challenge

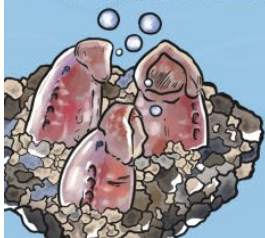
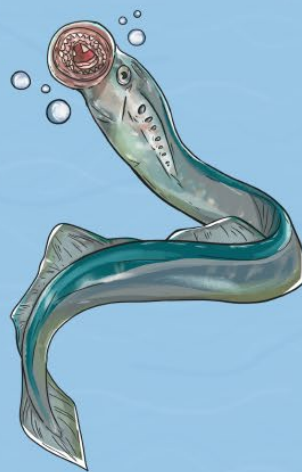
Bioheritage run a programme called Fresh water for our Taonga. It is a collaborative project which focuses on the health of tuna (eel) and kanakana/piharau. Its overall aim is to enhance and restore freshwater rivers and the species which inhabit them. The research is led by Māori and incorporates traditional knowledge.

Hokonui Rūnanga

The Hokonui Rūnanga Taiao Freshwater team have multiple fresh water projects including kanakana monitoring. The purpose of this monitoring is to observe whether they are making it past the man made barriers put into the Mataura River such as the weir, and seeing if they are actively migrating to rivers and streams that run into the Mataura River.

NIWA

NIWA has taken on research projects to help fill in the knowledge gaps. Studies were conducted to help understand kanakana abundance, distribution and spawning location. They also designed and installed artificial nesting habitats to encourage kanakana to nest in a specific location. If successful, the nesting process will be studied.



What can you do?

Rivers and streams are amazing places where many fun activities take place. People go to rivers to swim, fish, go boating or even just to look at. It is important that every time you go to a river or stream to remember that it is not only our home but home for many other creatures. The waterways need to be kept natural and clean for us to keep living there.

Things to do when around a waterway

- Take your rubbish with you and pick up any you see on the ground or in the water
- Leave the rocks, trees, bushes and logs as they were in the river or on the bank
- If gathering kai(food), stay within the limits

Other ways to help would be getting involved with conservation efforts. This can be done in many different ways such as joining a river clean up project or a tree planting project. This can improve the water quality and habitat in the river to help the species thrive.

Written By Ariana Drabble

Illustrations:

Drawings of kanakana by Jade Watkin
Backgrounds by Ariana Drabble

Images:

Page 2 left by Cindy baker
Page 2 middle by Ariana Drabble
Page 2 right by Mollie Lyders
Page 4 Top by Andrew Thomas
Page 4 bottom by Ariana Drabble

Glossary

Cartilage - A tough, flexible tissue that gives structure in the body

Industrialisation - the process of developing buildings and machines to do jobs traditionally done by people.

Juvenile - not physically mature

Nocturnal - active at night

Parasite - an organism which feeds off of a host organism

Sediment - solid material that settles at the bottom of a liquid

Additional Resources and References

NIWA: Taonga species series: Piharau <https://niwa.co.nz/te-kuwaha/piharau>

Bioheritage National Science Challenge: Freshwater for our Taonga <https://bioheritage.nz/research/freshwater-for-our-taonga/>

Hokonui Rūnanga Taiao: Kanakana monitoring <https://hokonuitaiao.org.nz/sample-page/fresh-water-mahi/kanakana-monitoring/>

