

# Ecology Field Course 2025

Ecology Degree Programme  
University of Otago

From 27 January to 7 February 2025, undergraduate Ecology students carried out research projects on Rēkohu Wharekauri Chatham Island



This document contains visual summaries of each of the 9 projects that the students carried out in pairs.

If you have a question about any of the results and data, or an idea for a future project, please contact Dr. Travis Ingram ([travis.ingram@otago.ac.nz](mailto:travis.ingram@otago.ac.nz)).

For info about Otago Ecology, visit <https://www.otago.ac.nz/ecology>

Thanks to the Hokotehi Moriori Trust for support, and to many landowners for permission to access sites



Ōtākou  
Whakaihu Waka  
UNIVERSITY OF OTAGO





# Among the Rushes: Habitat Selection of the Chatham Island Mudfish

Maddie Dominikovich and Emily Reese

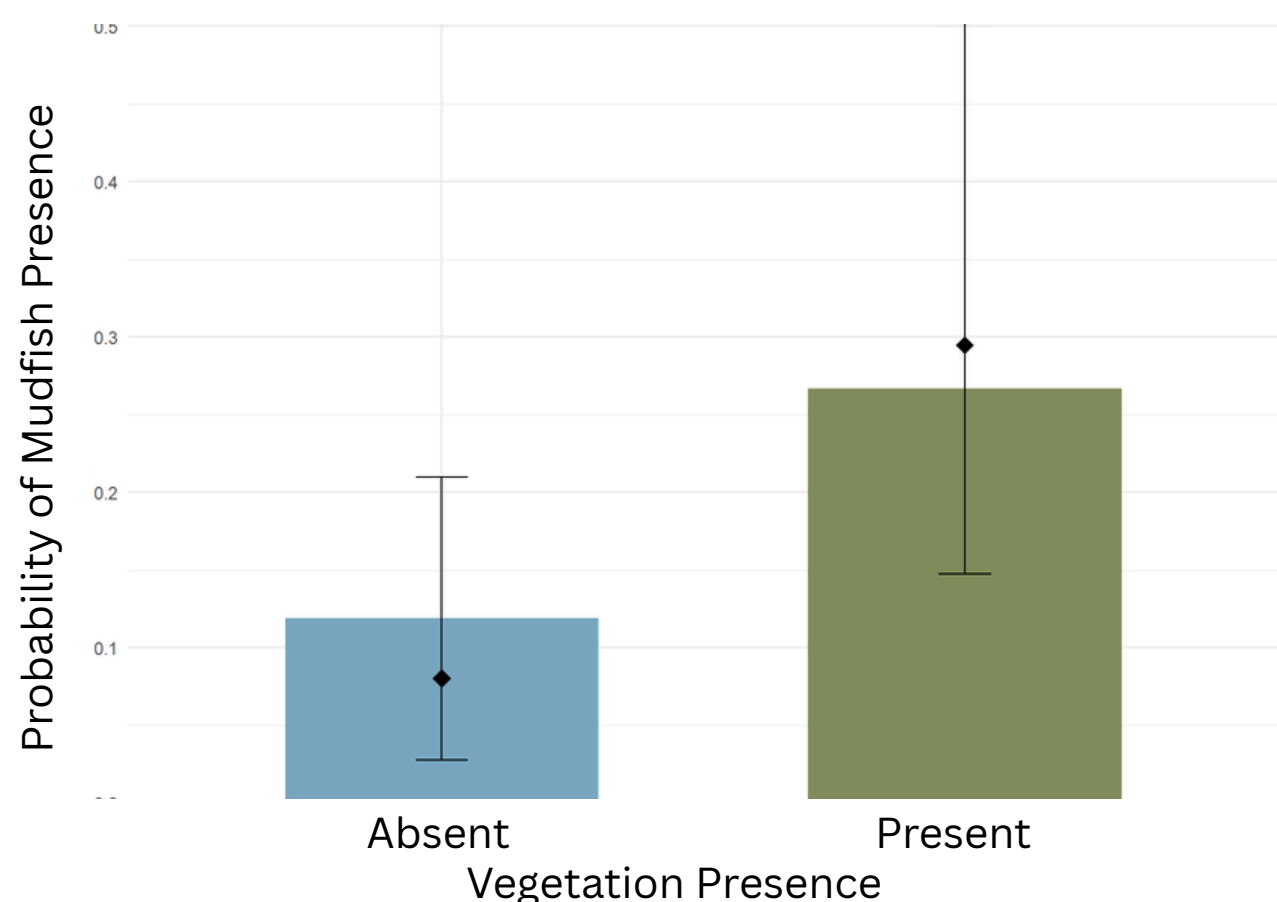
## Background

Freshwater ecosystems are increasingly threatened by habitat degradation. In New Zealand, 85-90% of wetlands have been lost. Species with restricted ranges, such as the Chatham Island mudfish (*Neochanna rekohua*), are particularly vulnerable. Despite this, little is known about its microhabitat preferences.



## Aim

This study aimed to assess the influence of vegetation presence (rushes) on Chatham Island mudfish presence.



## Results

The presence of vegetation had a significant positive effect on mudfish presence, with more mudfish found in vegetated areas.

## Implications

Vegetated areas appear to play an important role in supporting Chatham Island mudfish, which may be affected by habitat changes from livestock access. Managing disturbance and maintaining aquatic vegetation could help support the species' long-term persistence.



Thank you to the Hokotehi Moriori Trust for access to the lake!





# The impact of culverts and weir on freshwater fish

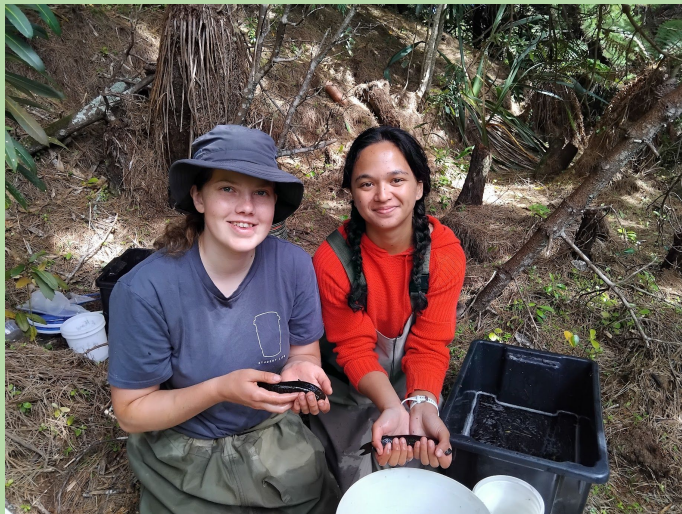
Anna Christensen and Rāwinia Wikaira



Most of the freshwater fish on the Chatham Islands need to migrate out to sea to complete their life cycle. Man made structures in the river, often called fish barriers, can impede their access to the habitat they need when they come back from the sea. We tested how these barriers impacted the fish present. This was done through trapping at Awatotara, Kiringe, Kahiti and Gillespie streams.

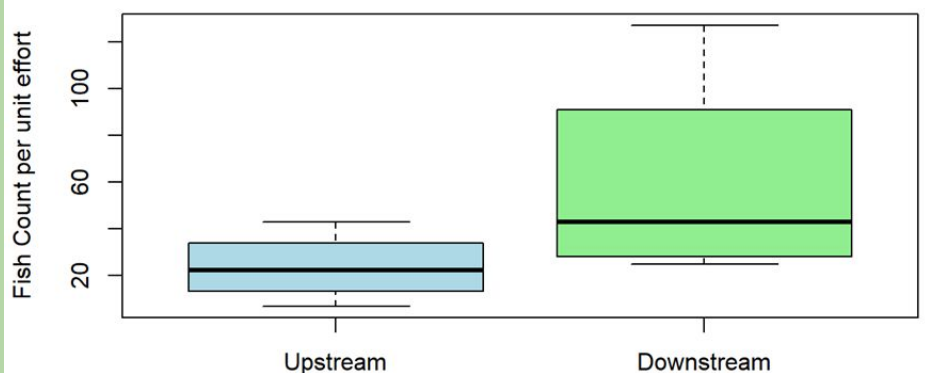


*Man-made migration barrier (culvert) at Gillespie Stream.*



It was found that there was a lower catch of fish and longer average length upstream of the migration barriers. This indicates that the structures are acting as partial barriers, as although some fish can get past, many can not such that they accumulate downstream. Longer fish are better swimmers such that the shorter fish were more likely to accumulate downstream.

Given that the barriers are partial, and do affect the fish community, it is recommended that they are improved through retrofitting fish passage structures (e.g. baffles and ramps), although more research is needed.



*Fish catch upstream and downstream of a migration barrier.*



***Thank you to Bruce and Liz Tuanui and Hayden Preece for access to the streams in this study, Kōpinga Marae for hosting us and Chatham Island Community for their hospitality.***



# Salt and Sand

## What Affects River Invertebrates on Rēkohu?

By Billy Watts and Jack Winiana

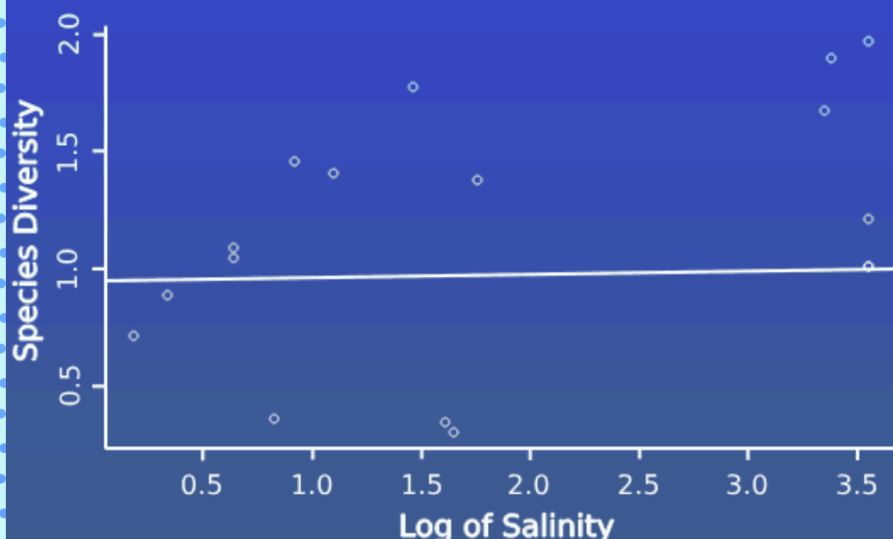
Our study aimed to discover the effects salinity (salt) and sediment (mud and sand) had on aquatic invertebrates within the Nairn / Mangatukarewa River

Invertebrates are understudied, especially on the Chatham Islands, so we hoped to fill gaps in information by observing how these factors affected invertebrate communities

We'd like to extend a special thanks to Floyd Prendeville for allowing us access to his land, and Duncan Ryan for providing gear to process our sediment samples



Log of Salinity vs Species Diversity  
(Shannon Diversity Index Score)



When comparing the communities based on sediment type and salinity, we found very little difference in community makeup

While many of our linear model relationships were not significant, we found salinity had a positive relationship with species diversity

This is an interesting result, as other existing research suggest salinity decreases species diversity

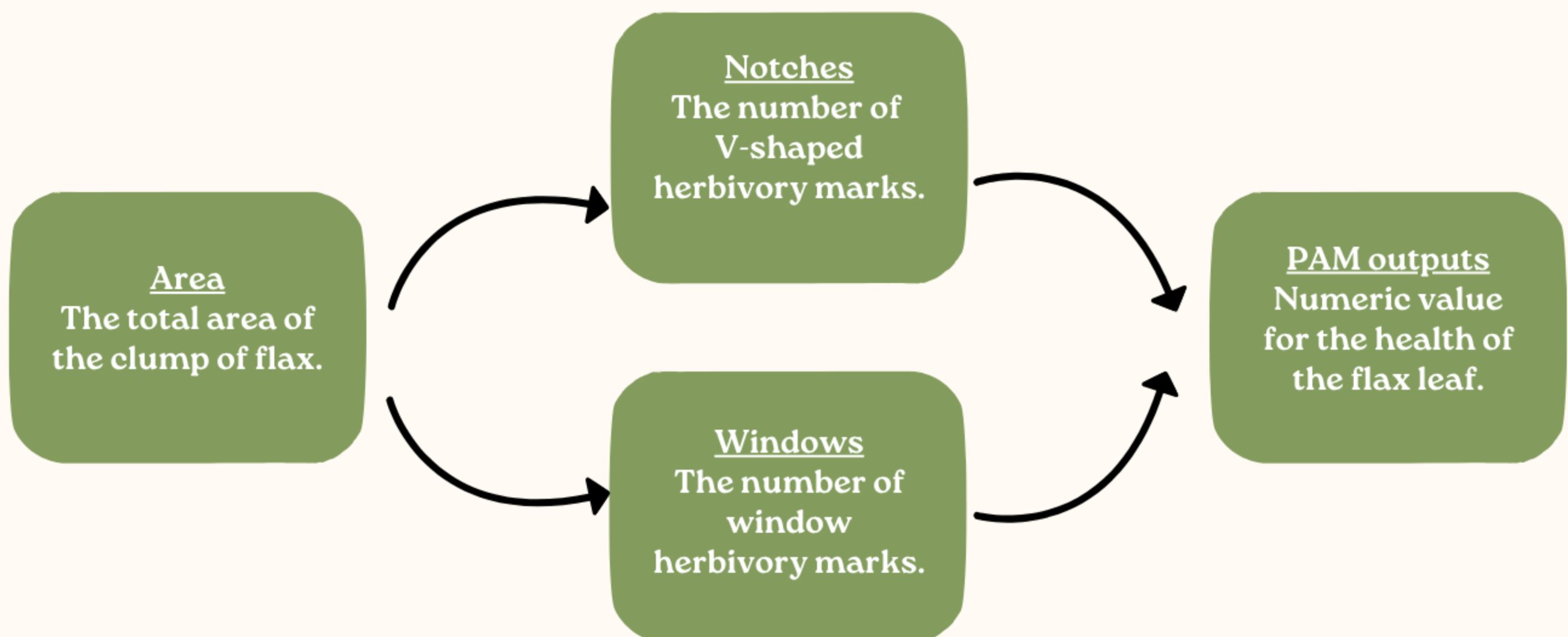


# How Does Herbivory Affect Harakeke?

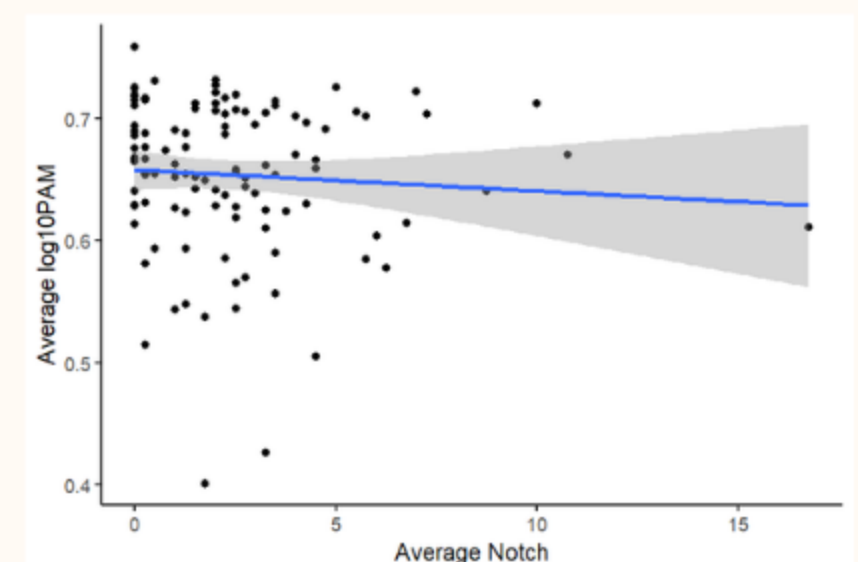
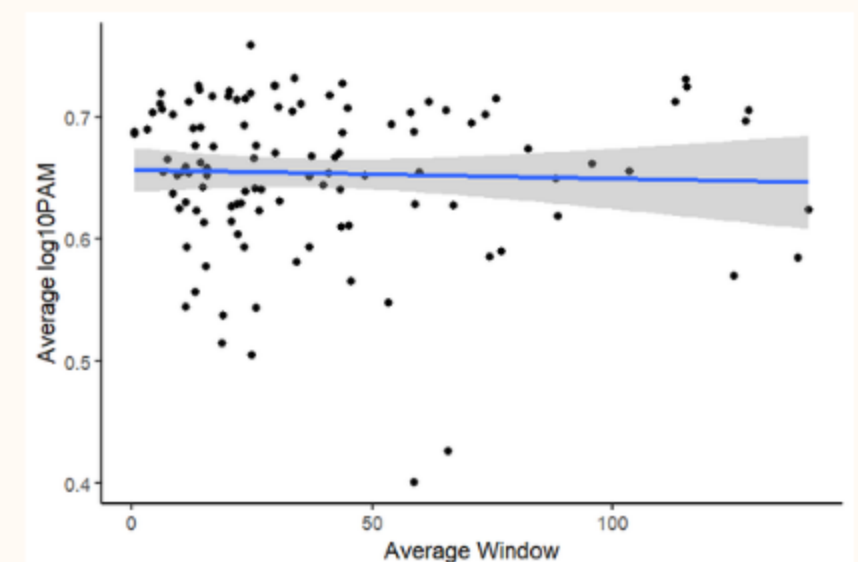
Our aim was to assess whether the health of harapepe (flax) on Rēkohu is being significantly harmed by moth herbivory.

We were particularly interested in harapepe because it is so important to Māori and Moriori communities, and ecologically acts as the foundation of the ecosystem. The two moth species and the harapepe are all native to the Chatham islands and were expected to be coexisting stably. We had clusters of flax across two locations at Point Munning.

This flow chart shows how each factor influences each other in the system. It is also the order that we did our analysis in.



There was no difference seen in the health of flax with more herbivory marks. This probably means the harapepe on Rēkohu are resilient and healthy.



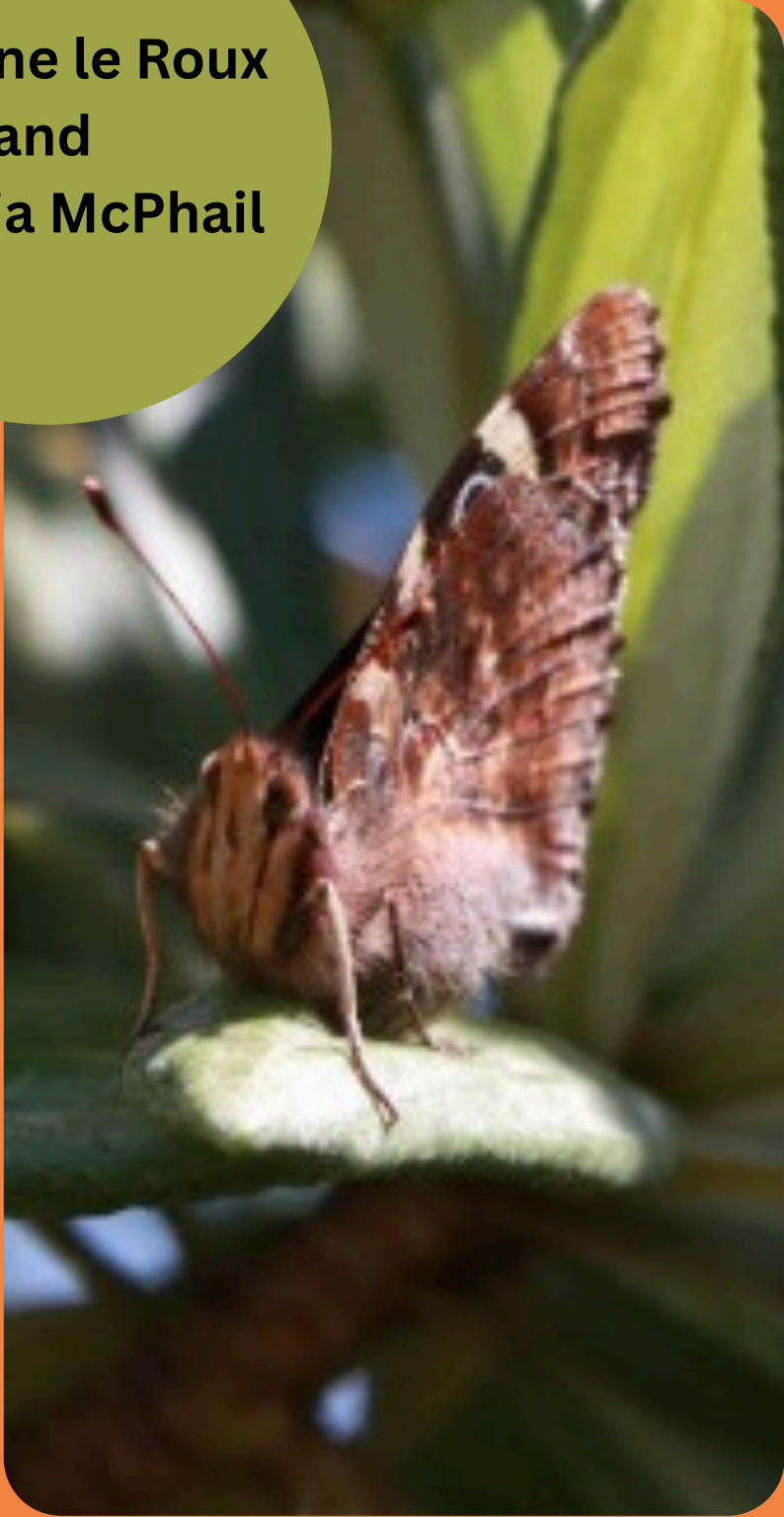
Thank you to the Muirsons for access to their land at Point Munning and Te Whakuru Island.



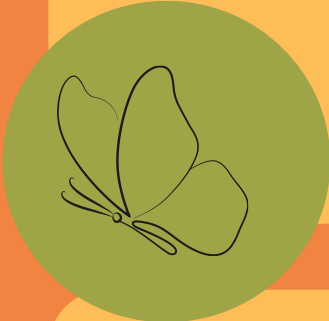
# Competition and the Feeding Behaviour of Chatham Island Red Admirals

Roxanne le Roux  
and  
Claudia McPhail

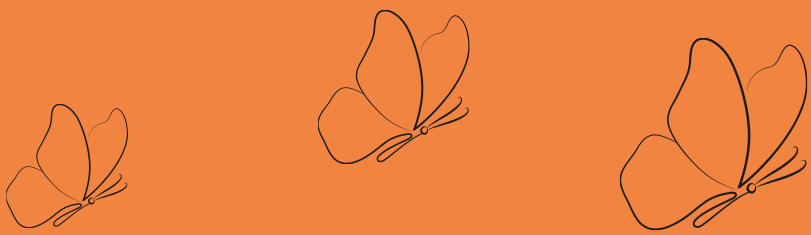
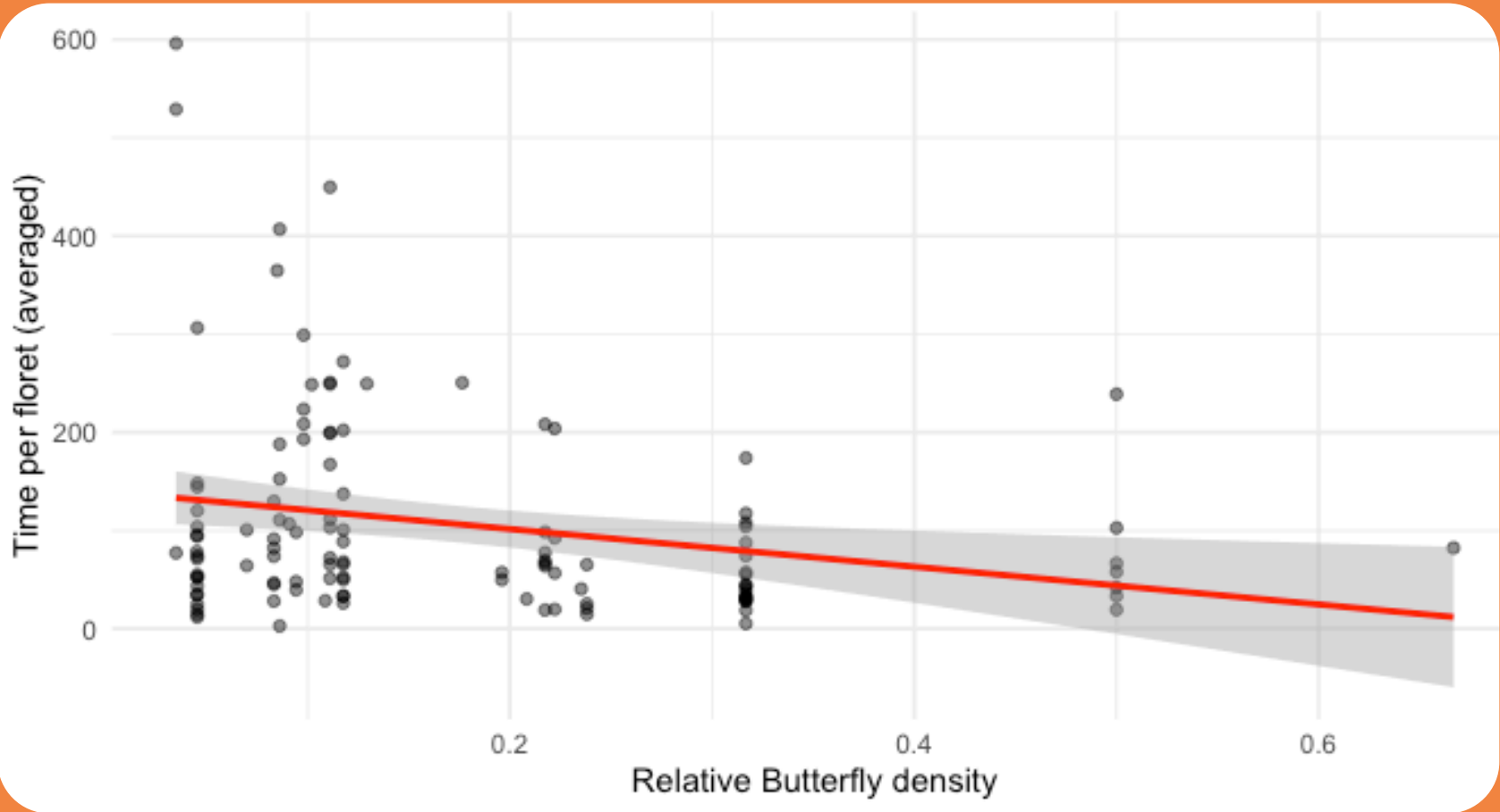
*Vanessa gonerilla ida*, or the Chatham Red Admiral, is an endemic butterfly species to Rēkohu. But we don't know much about this beautiful species, including how they interact with each other! Competition is one type of interaction which is important to our understanding of ecology. we were interested in how individuals within this species compete for food.



We looked at the effects of species abundance on the feeding duration of *V. ida*. To do this, we timed how long the butterflies were spending on flowers, and compared it to how many butterflies were on the plant.

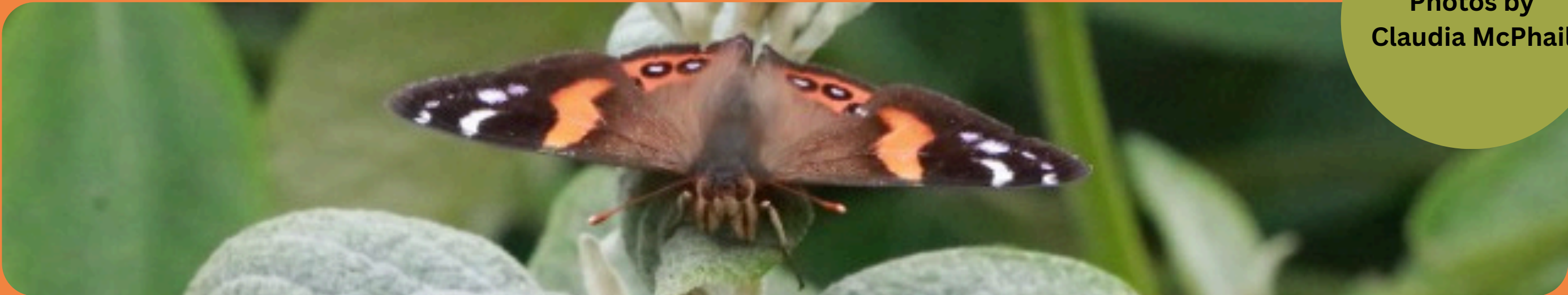


We used three different focal plant species, Buddleia (*Buddleja davidii*), Chatham Island tree hebe (*Veronica*) and Oregano (*Origanum vulgare*).



Competition did have an effect on feeding behaviour. When there were more butterflies, the individuals spent less time feeding!

Photos by  
Claudia McPhail



Thank you so much to the locals for welcoming us into the community!

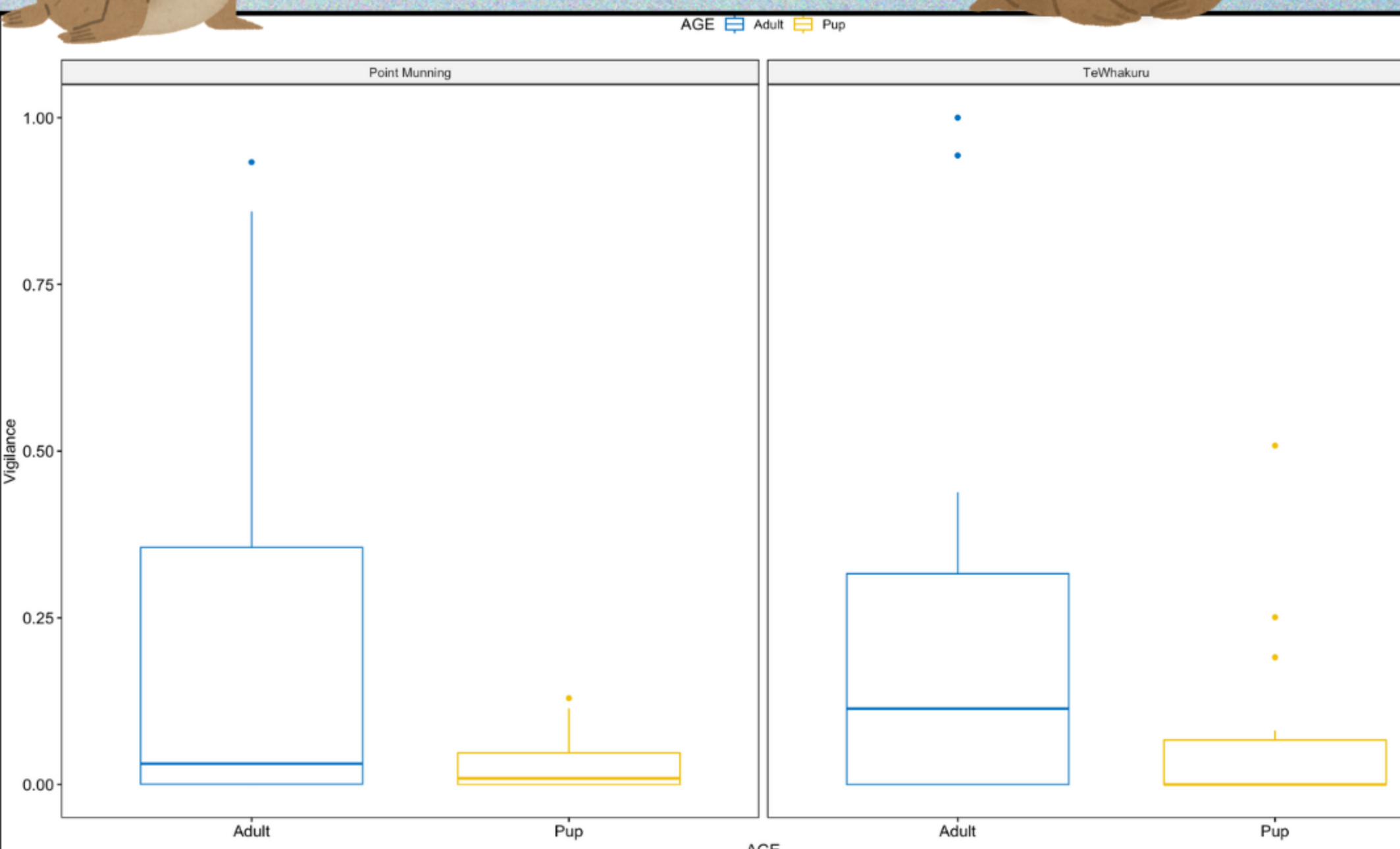
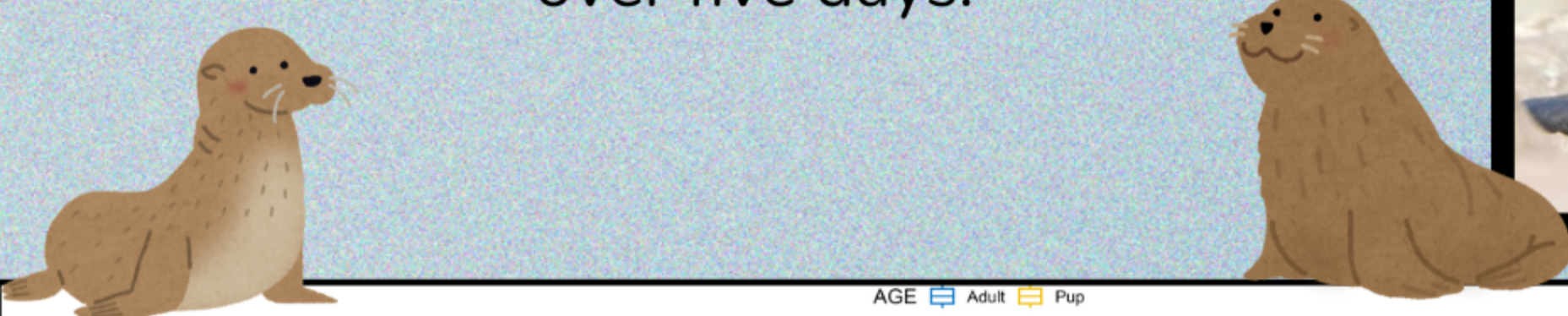


# The Effect of Human Disturbance on New Zealand Fur Seals

## on Rēkohu

This study investigated the behavioural responses of New Zealand Fur Seals (kekeno) to human presence at two sites on Rēkohu: Point Munning, which experiences some tourism, and Te Whakuru, which experiences little to none.

Behavioural observations of 80 seals, 40 Adults and 40 Pups, were recorded over five days.



Results showed no significant difference in vigilance between the sites, suggesting no habituation to human presence at Point Munning. Pups locomoted more frequently, while adults displayed more tracking behaviours, indicating age-related differences in behavioural responses.

These findings suggest that current levels of tourism at both sites do not significantly disrupt kekeno behaviour, which is a positive finding for management and tourism.



By Lizzy Kelly and Austin Stewart  
Thank you to the Muirsons, Kōpinga Marae,  
Bernadette Lim and the ECOL314 staff!



# Kina and Pāua Populations

Graycie Gill & Maggie Atienza

## Background:

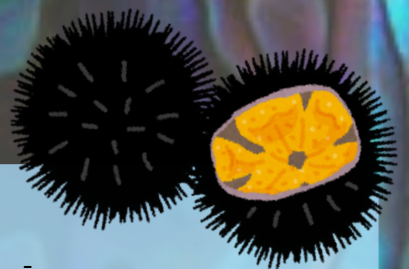
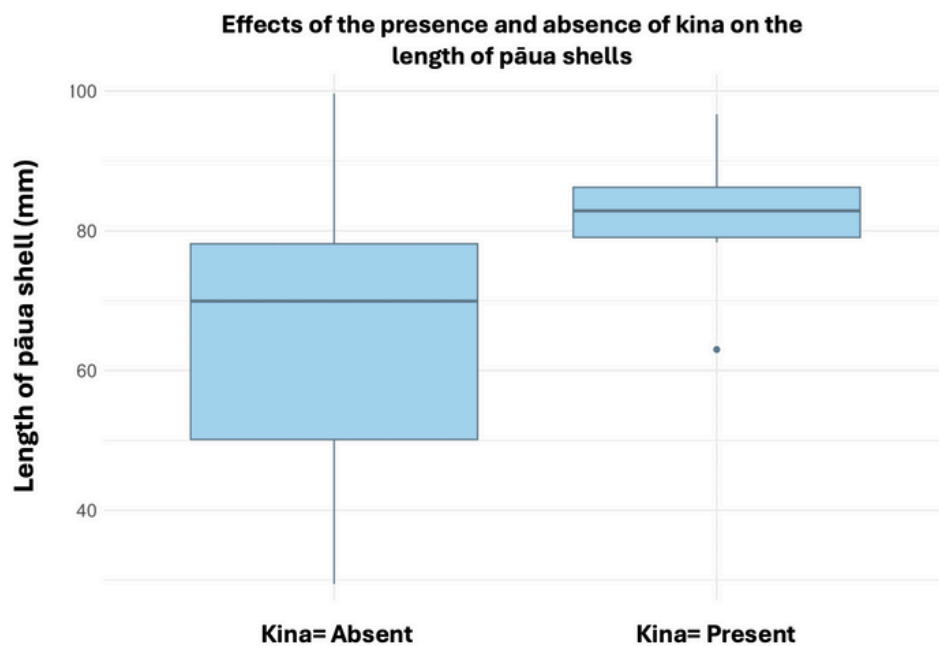
In ecosystems rich in biodiversity such as the rocky intertidal coastlines of Rēkohu, competition between species for limited resources (food and space) is expected.

We therefore chose to study how kina presence and abundance affects black foot pāua populations. We chose to study these prized taonga species due to their ecological, cultural and economic importance.

## Methods:

Along a 2km stretch of rocky coastline on the southwest of Rēkohu, we spent 5 days gathering samples from 19 rockpools. During this study, we:

- Carried out a count of how many kina and pāua were found in each rockpool.
- Used calipers to measure the diameter (mm) of each kina and/or pāua counted.
- Measured the length of each rockpool.



## Findings:

- Statistically significantly, kina did not affect the length or abundance of pāua.
- Instead of concluding that there is no competition between the two species, this could be an overall positive indication of the health of the marine ecosystem surrounding Rēkohu's coastlines, suggesting there is a large food supply encouraging the co-occurrence of kina and pāua
- Future research could expand on this research but over a larger duration and area to gather a deeper understanding of the constantly moving marine environment.

Thank you to Hamish Tuanui-Chisholm for the use of his land in this project!



# Seaweed and Pāua

Luke Moffitt & Ruby La Hood

**Aim:** Investigating the effects of seaweed diversity against different shore heights in correlation with relative pāua abundance.

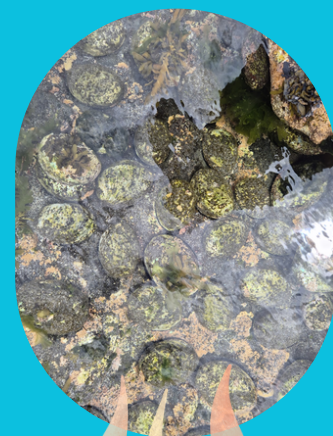
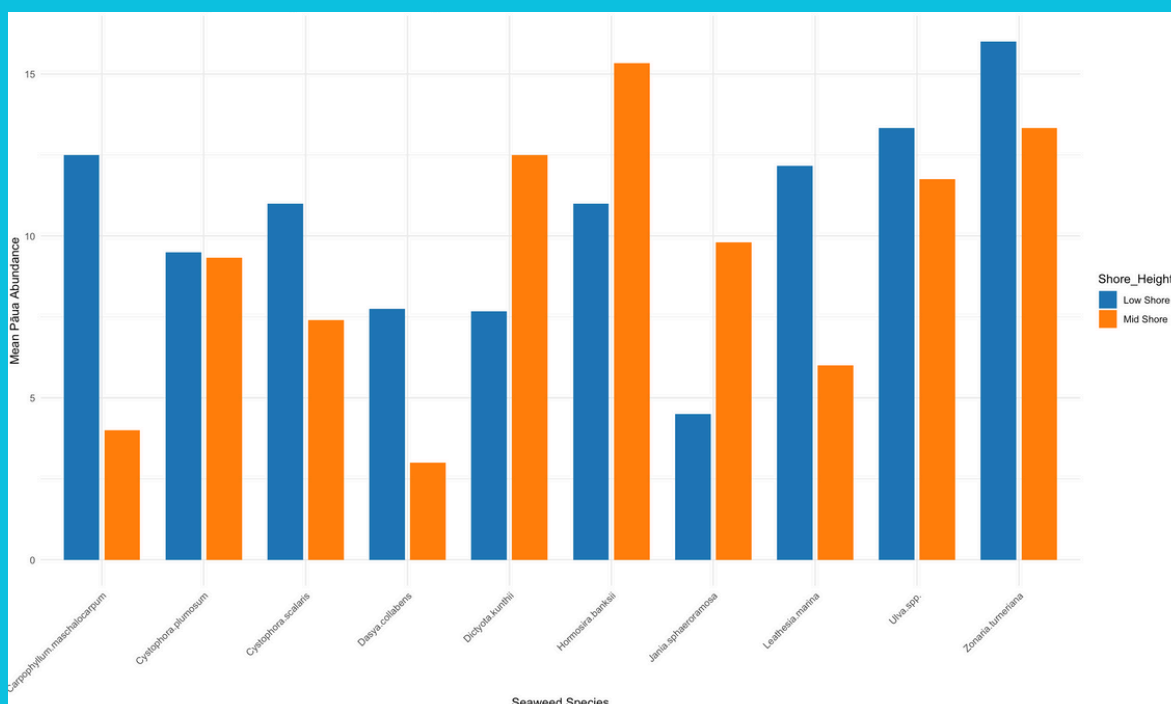
## Background:

Pāua is critical to understanding how they interact with their environment, and the information can be used to help fisheries management in the future if large extinction events happen. Seaweed is a primary producer, supporting many life forms, including pāua, which graze on certain species in the intertidal zone. This partially influences where pāua are found.

## Method:

Sampling across mid and low shore height, using 30m transect lines, 10 quadrats per transect, with 130 samples across 7 sites at Okawa Point and Owenga/Manukau Point.

The results show a significant difference between shore height and pāua abundance, but there is a considerable difference between seaweed species and shore height. Species of brown seaweed presented data that further backs up the link between individual species and pāua being more frequently found in one zone than another (i.e. low shore vs mid shore). This can be linked back to where species of seaweed are found across the shore.



**Figure 1.** Mean Pāua Abundance by Seaweed Species and Shore Height. Observing the differences between shore height shows a pattern where higher abundances of pāua can be found in the Low Shore, compared to the Mid

Thank you to the  
Hohotehi Moriori  
Trust and Maui  
Solomon



# ***The Effects of Geology on Intertidal Rocky Shore Invertebrate Communities on the Chatham Islands***

Chloe (Jack) Biggs & Fraser Wood

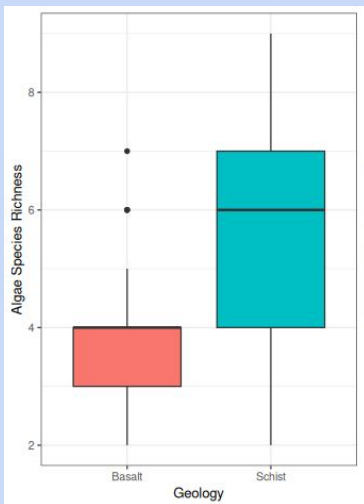
Intertidal zones are areas that can be above or below water depending on the tides. The rockpools found within these zones are often rich with life, such as Kina and Pāua on the Chathams. We studied whether rock pools on schist platforms differed to ones on basalt platforms, and predicted that schist would have higher diversity due to its jagged shape which could provide more habitats for invertebrates.

Okawa - Schist

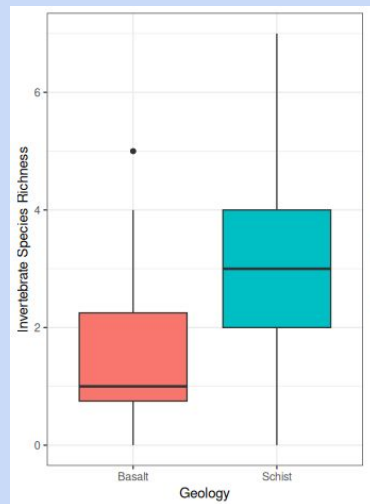


We investigated 4 sites, 2 each of schist and basalt. The graphs below show the overall species richness of the sites, grouped into schist (blue) and basalt (red)

South Coast - Basalt



Algae richness



Invertebrate richness

We found that schist did have higher species richness and diversity at our sites, however we cannot draw too many conclusions as the number of sites were so low. We found 54 different species of invertebrates and algae across all of the sites .

Acknowledgements for site access: Hokotehi Moriori Trust, Hamish, Susan and Sarah.