

Mussel decline and recovery potential in Kenepuru Sound

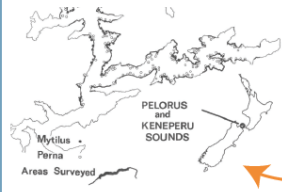
Trevyn Toone^{1,2}, Emilee Benjamin^{1,2}, Sean Handley², Jenny Hillman¹, Andrew Jeffs¹

¹Institute of Marine Science, University of Auckland, Auckland, New Zealand

²National Institute of Water and Atmospheric Research, Nelson, New Zealand

Introduction

- Mussels perform vital ecosystem services including **water filtration**, **habitat creation**, and **denitrification** and generate over **\$300 million** through New Zealand aquaculture
- Mussels globally have seen **substantial declines** from overharvesting, habitat loss, and other factors
- In NZ, Kenepuru Sound was historically an area of **dense intertidal mussel beds**
- These beds are locally reported to be depleted, leading to calls for restoration
- However, **no surveys** of these beds have been conducted since the late 1960's, so current green-lipped mussel populations are unknown
- To inform **future restoration efforts**, we first need clear data on **current** and **historic** populations and **factors behind population changes** over time



Each dot represents an area with over 30 mussels/m² in 1969, compare this with current levels in poster centre!

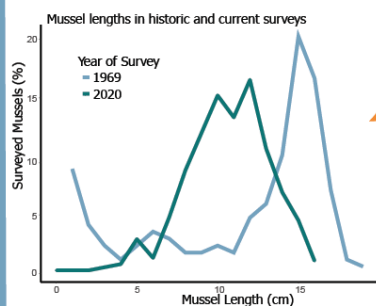
Methods

- Surveyed **55 km** of shoreline or almost the entire Kenepuru
- Recorded green-lipped mussel **abundances, densities, and lengths**
- Mapped mussel distributions for comparison to historic surveys
- Interviewed **9 long-term local residents** (50+ years in the area)
- Asked questions about **historical mussels**, population declines, and **factors behind declines or recoveries**.



Resurvey Results

- Resurveys recorded **88,000 mussels**
- Mussels were throughout Kenepuru, but in **very low densities**, with an average of between one and two mussels/m²
- **Only two sections reached 30 mussels/m²**, common in the 1960s, and nowhere currently approaches the historical highs of 70/m²
- Mussels also **no longer reach maximum historical sizes**
- Very few mussels under 30 mm were found, unlike in historical surveys, indicating **problems with natural recruitment**

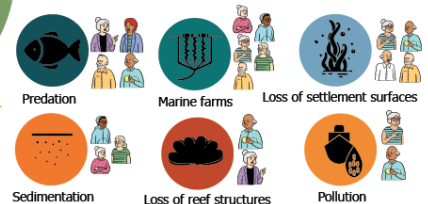


Current mussels are 45 mm smaller than historic mussels, but also missing juveniles!



Interview Results

- Residents confirmed **widespread** and dense **historical mussel populations**
- "Used to be a line of mussels 'round the shoreline... 2-3 metres wide"
- Participants also unanimously indicated **handpicking** in the 1970's as the cause of **steep population declines**
- "The concentration of the pickers... they'd take every mussel"
- Residents were more split on **why mussels have not recovered** since handpicking stopped in the mid 1980's.



Conclusions

- Intertidal green-lipped mussels were **once widespread**
- **Commercial handpicking** in the 1970's and 1980's **decimated their populations**
- Populations **have not rebounded** and current populations are low, scattered, small, and showing no signs of recovery
- Multiple factors are behind lack of recovery
- **Future research** will focus on narrowing down which factors are preventing natural recovery and how restoration efforts can best **overcome barriers to success**



Acknowledgments

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 ttoo112@aucklanduni.ac.nz

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