MFA Mussel Restoration Project - November 2020 Update

Understanding the Historic Decline of Intertidal Green-lipped Mussels

The last scientific surveys on wild green-lipped mussels in Pelorus Sound were conducted in the late 1960's – meaning there's a fifty-year data gap in our understanding of wild mussel populations. While it's widely accepted that intertidal mussel populations have decreased, questions remain regarding why they decreased, the extent of the decrease, where they currently are, and how restoration efforts should occur moving forward. To shed light on some of these questions, I've interviewed long-term residents of the area for local knowledge and extensively surveyed the shoreline at low tides.

Local knowledge and Interviews

The first component of this project has been interviewing long-term residents of the Sounds to compile their local knowledge on the extent and decline of the mussel beds. So far a dozen long-term residents (40+ years in the area) have been interviewed and more interviews are scheduled before the end of the year. In interviews the residents shared their memories of historic intertidal mussel beds in the area, changes to these mussel populations over time, and general environmental concerns. These interviews are then compiled to generate a fuller picture of intertidal mussel beds in Pelorus Sound over the last seven decades, their decline, and potential environmental and human-generated factors behind this decline.

So far, a few common themes have emerged from the interviews. Residents generally agree that there were widespread historical intertidal mussel beds in the 1960s and prior, followed by commercial handpicking leading to a population crash in the 1970s. Residents also report low populations since the crash with no evidence of natural recovery of populations despite the end of the handpicking industry. When it comes to factors behind this lack of recovery, residents I've interviewed are more divided. The most common factors identified have been over-sedimentation, competition with marine farms, and predation. Other residents have also pointed to pollution, loss of reef structures, and changes to seaweeds as potential problems for mussels. Currently I am investigating some of these potential problems to identify which are most likely to be the cause of the lack of mussel recovery and ways to overcome these to restore mussels.

Re-surveys of the Kenepuru

To provide some baseline information on where mussels are currently found in Pelorus Sound, I've conducted a survey of the coastline of the Kenepuru, including areas surveyed in reports from the late 1960's. The goal of this survey was to provide a direct comparison between the historical and current extent of intertidal mussel beds in exactly the same area.

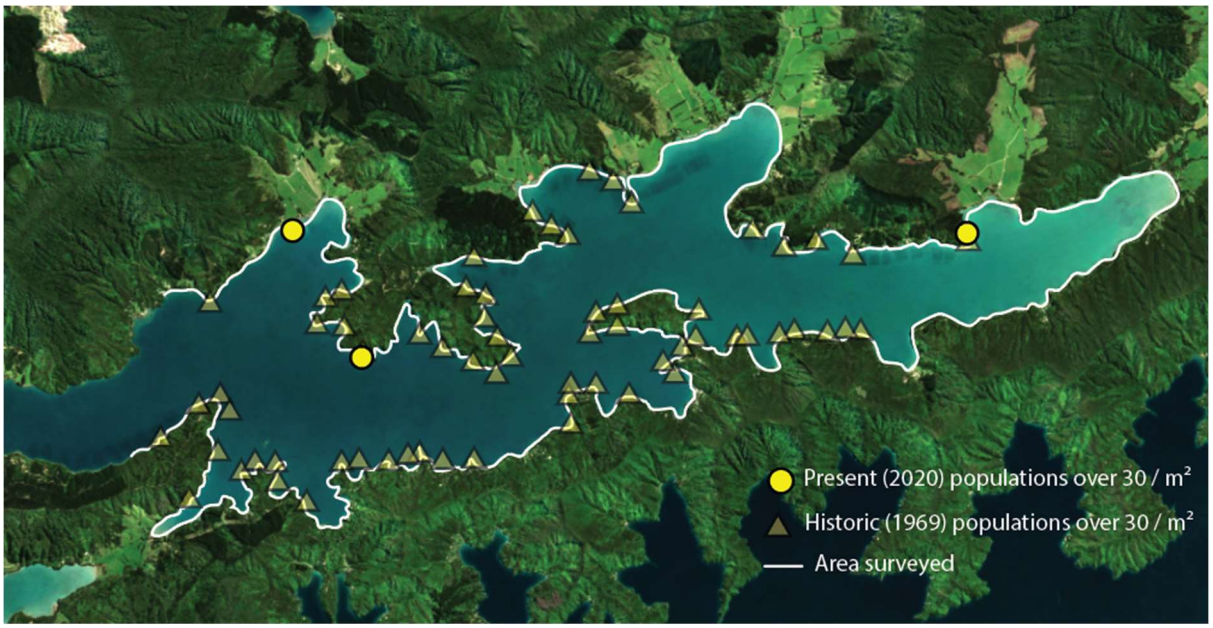
I've now finished this part of the project and have surveyed 73 km of coastline or from Schnapper Point to Hopewell. The results show that intertidal green-lipped mussels are still present along much of the Kenepuru coastline – over 107,000 mussels were found during the surveys! The bad news is that these mussel populations are nowhere near their historical numbers, based on both historical surveys and local knowledge from interviews. While historical surveys describe beds of over 70 mussels per square metre and residents have recalled dense reefs of mussels in the intertidal, the current populations are much more scattered. Over 70% of the shoreline has fewer than one mussel per square metre and less than 3% even reaches 10 mussels per square metre. As a direct comparison, historical surveys identified over 60 sections of the Kenepuru with more than 30 mussels per square metre

while my own surveys have revealed only three remaining sections with mussels that dense. Additionally, the current mussels I've found in the Kenepuru are smaller than historic mussels – about 2 cm smaller in length than mussels found in historic surveys. This phenomenon has been confirmed by residents who identify the current largest mussels I've found in the Kenepuru as the smallest size class that were historically sold during mussel picking. This size change may be a result of some of the same factors behind lack of recovery of the beds along the coast, but more research is needed for now.

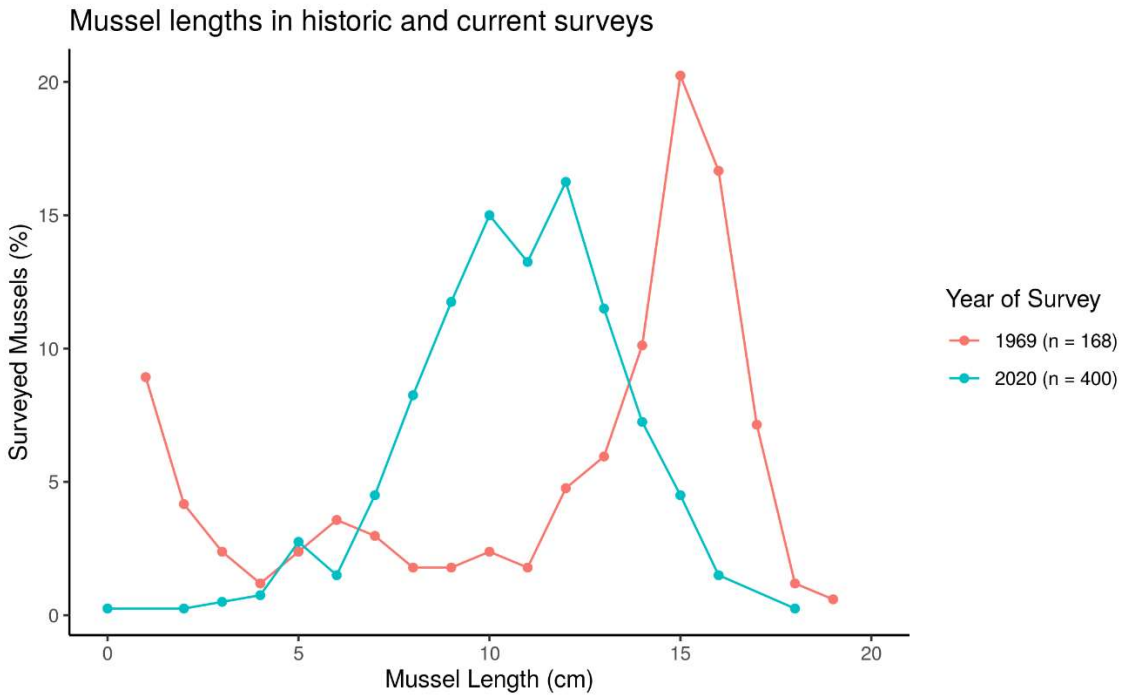
I hope this has provided an interesting look into some of the intertidal work going on and I'll continue to update with more information and results! As always if you have any comments or feedback, please feel free to reach me at ttoo112@aucklanduni.ac.nz.

Cheers,

Trevyn Toone, Ph.D. Researcher, University of Auckland (based in Nelson)



Mussel distributions in Kenepuru Sound. Areas with over 30 mussels per square metre in 2020 or 1969 are marked, showing a dramatic decline in mussel populations.



Mussels lengths recorded in 2020 and 1969, showing declines in average intertidal mussel lengths.