# Marine Farming Association - May Monthly Update - for the Industry Advisory Group

## June mussel sampling

The next mussel sampling will occur on the week of 22 June 2020. The mussels will be sampled to determine mussel growth, condition, and survival.

- Mussel growth is a measure of health and while previous research in the North Island showed that every 6 months the mussels had grown at all the deployment sites, we are interested to see how the growth rates might be different among our five sites in the Pelorus Sound.
- The measure of mussel condition provides an understanding of the overall health status of the mussels as a result of their environmental conditions. Previous work has shown that low mussel condition is associated with many variables including higher environmental turbidity, recent breeding activity, or poor feeding conditions. We are interested to see how the different deployment locations of our study may have an effect on mussel condition over time.
- Mussel survival has been shown to be variable among different studies in the North Island, with some having as low as 26.2% survival by the end of two years. With the high initial survival recorded in our mussel beds, we are interested in monitoring how the survival rates may change over time.

By utilizing these three measures we will be able to quantify how the mussels are responding to the different deployment habitats and sites, and also compare these responses with those recorded in restoration projects elsewhere.

## Fish Assessments and Biodiversity Estimates

The restored beds will also be sampled in June to look at the animal communities living underneath the mussels in the sediment, within the mussel matrix, and visiting the mussel beds. A study done in the North Island showed 13.7 times more small and juvenile fish and 3.5 times greater density of small organisms on mussel beds then in the surrounding areas. We will use an underwater video system to spy on the fish communities at the mussel beds, along with taking sediment cores to look at animals living in the sediment. We will be able to quantify the biodiversity on the mussel beds and compare that to the surrounding area. Biodiversity is an important measurement that is representative of overall ecosystem health and we can use these results to compare to findings in other restoration studies.

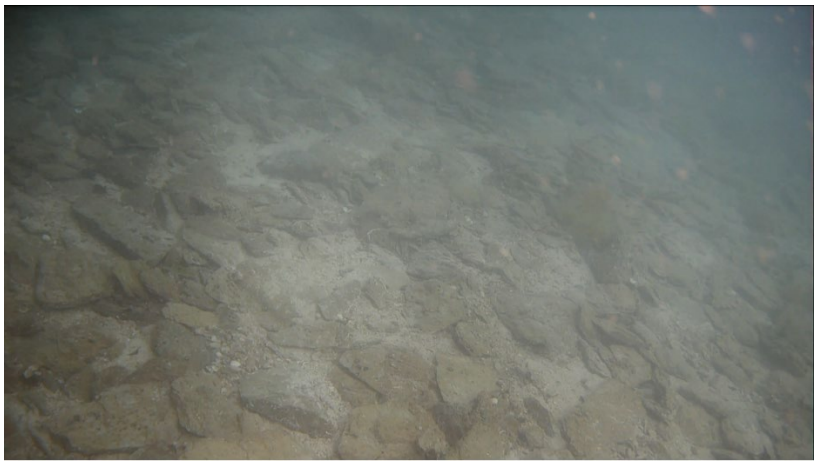

*Figure 1: Grant Bay before the mussels were deployed showing a mostly empty, rocky area with low biodiversity.*

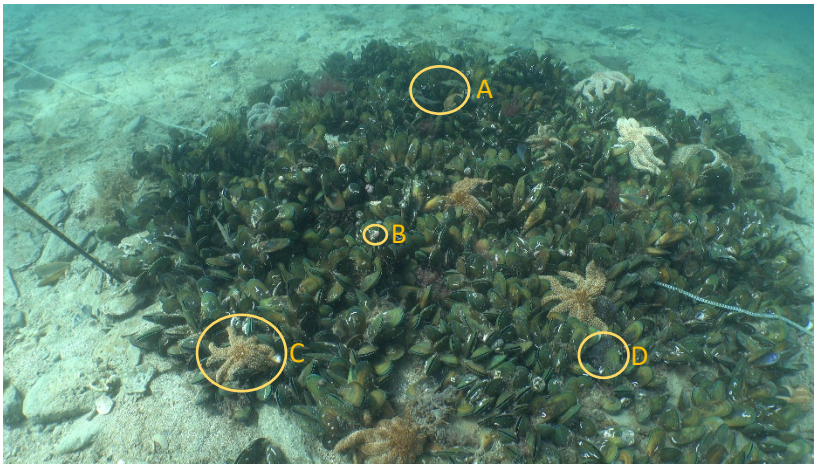


*Figure 2: A restored mussel bed at Grant Bay with a variety of animals including spotties (A), different types of marine snails (B), 11-arm sea stars (C), sea cucumbers (D) and other animals that are hiding in the mussel matrix.*

## Next Steps

The next steps of this project are to place down recycled shell at two locations in the inner Pelorus Sound for two months to prepare for the second mussel deployment. The second deployment will be a large-scale deployment where mussels will be placed on the recycled shell and onto adjacent sediment. Other studies have shown that adding recycled shell leads to higher survival, biodiversity, and recruitment. This study will provide insight on the effects that recycled shell will have on mussel restoration for the Marlborough Sounds and we are currently working on a timeline to get this underway.

I hope everyone is enjoying being out of lockdown, and as always if you have any comments or feedback on this month's progress, please feel free to reach out via email at egol669@aucklanduni.ac.nz.

Thank you for all your help and your time with this project. 😊 Emilee Benjamin