

Abalone Industry Reinvestment Fund (AIRF)

Updated: June 2024

Effects of urchin fishing on urchin populations and kelp recovery

Lead Agency: institute for Marine and Antarctic Studies

Funding: \$132,303

Start Date: 1 August 2020

End Date: 31 August 2024

Status: CURRENT

Aims and Objectives:

The overall aim of this project is to determine the impact of high intensity fishing pressure on urchin populations and the capacity of such pressure to restore kelp ecosystems on heavily fished reefs in NE Tasmania.

The specific objectives of this project are:

1. Assess changes in urchin population structure (urchin density, age and size) following high fishing pressure.
2. Quantify habitat (kelp) recovery of reefs subjected to high fishing pressure.
3. Develop detailed spatial maps of urchin barrens in the greater St Helens region pre and post the 2018/19 period of high fishing intensity.
4. Assess the effectiveness of urchin fishing as an effective *Centrostephanus* control tool.

Progress Report:

Size and age structure of local long-spined urchin populations in the St Helens region varied depending on fishing pressure. For test diameter (TD), frequency distributions display a clear shift in the population for sites that are fished, with test sizes being on average much smaller (Binalong Bay mean = 97.1mm, Sloop Rock mean = 93.1mm & St Helens Island (Shallow) mean = 99.1mm) than those in the unfished sites (Paddy's Island mean = 108.2mm, Elephant Rock mean = 101.5mm & St Helens Island (Deep) mean = 94.8mm). Pair-wise Kolmogorov-Smirnov tests revealed all sites to be significantly different from each other to the adjusted Bonferroni alpha ($\alpha = 0.0034$) except for the comparison of Elephant Rock and Binalong Bay $P = 0.008$.

Age frequencies showed a higher proportion of individuals were removed from the 15 – 25 years range in the fished sites, and there was a significantly higher proportion of older long-spined urchin in the unfished sites. There was a difference in the mean age range of fished versus unfished sites including Binalong Bay mean = 20.87 years, Sloop Rock mean = 18.94 years, St Helens Island (Shallow) mean = 24.81 years, Elephant Rock mean = 24.54 years, Paddy's Island mean = 24.61 years and St Helens Island (Deep) mean = 28.7 years. All pair-wise Kolmogorov-Smirnov tests yielded significant differences except for the comparison of Paddy's Island and Elephant rock $P = 0.1069$. The pair-wise comparisons between St Helens Island (Deep) and Elephant Rock $P = 0.0073$ and St Helens Island (Deep) and Paddy's Island $P = 0.0221$ did not significantly differ from the adjusted Bonferroni alpha, $\alpha = 0.0034$.

[Full Progress Report](#)