

Can large taonga bivalves speed up recovery in degraded estuaries?



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THE QUESTION

Will the re-introduction of adult, long-lived bivalves with differing functional traits speed up recovery of degraded soft-sediment habitats in estuaries?

STUDY SPECIES

Tuangi (*Austrovenus stutchburyi*)
shallow burrowing, bioturbating
Hanikura (*Macomona liliانا*)
Deep burrowing, porewater-pressurising

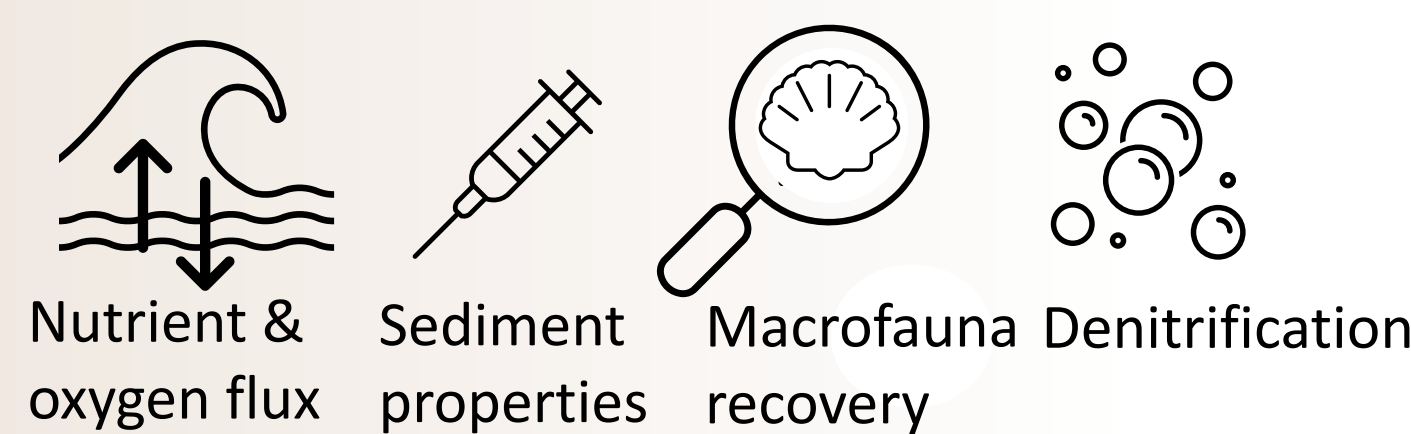


METHODS

- Defaunation of experimental plots
- One week after defaunation, we re-introduced large bivalves

→ Treatments: **Ambient** **Defaunation Control** **+ Hanikura** **+ Tuangi** **+ Both spp.**

→ After 1 month, 3 months, and one year, incubation chambers and sediment cores were used to measure:



RESULTS

Average bivalve survival after one year was 18% in + tuangi plots and 59% in + hanikura plots (Fig. 1).

Sediment oxygen consumption (SOC) after one month was enhanced by 116% in treatments containing tuangi compared to control treatments.

After one year those were similar to ambient levels, still showed higher SOC than control plots (Fig. 2).

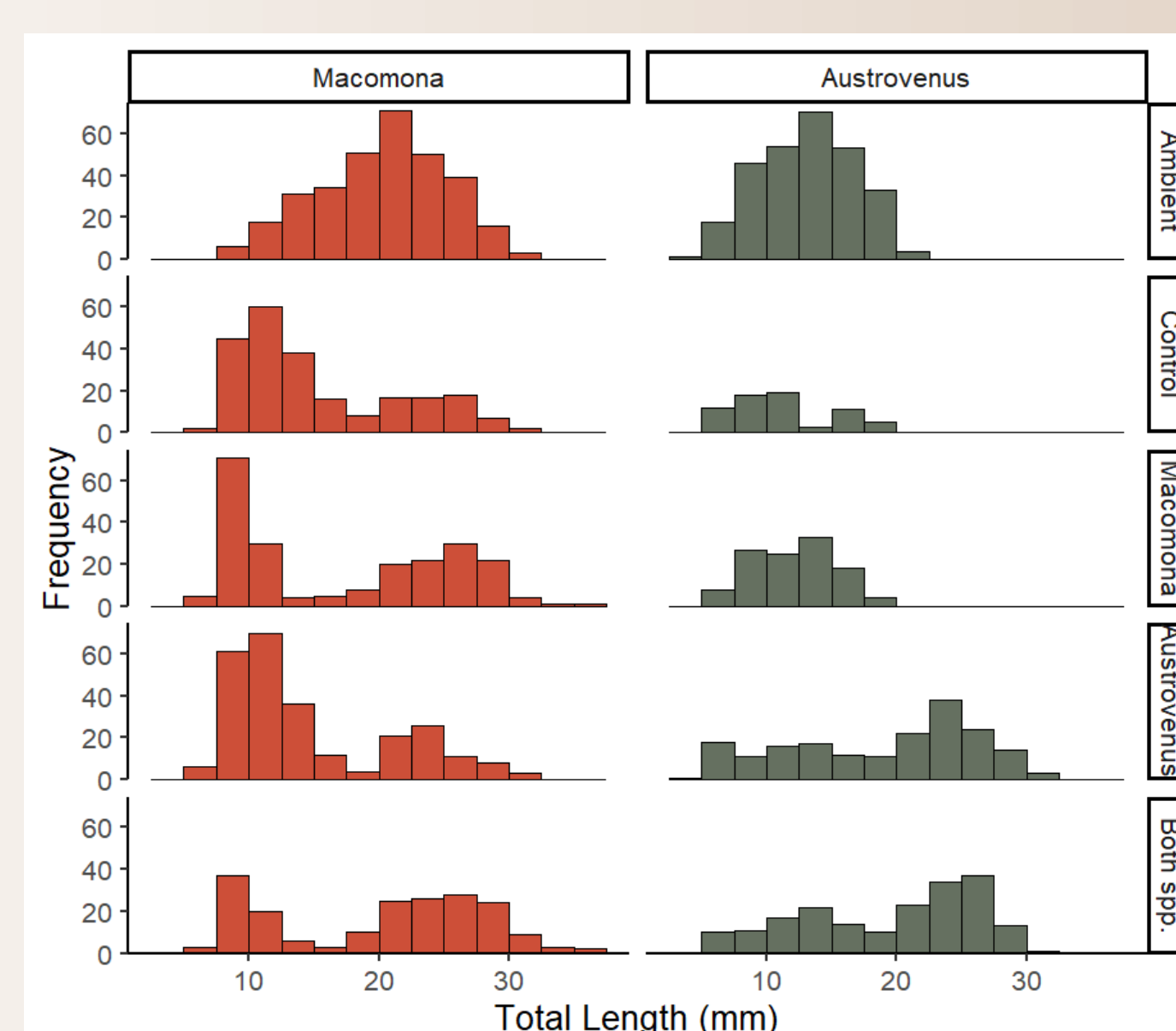


Figure 1. Survival size frequency of re-introduced bivalves after one year across treatments (Hanikura red, Tuangi green).

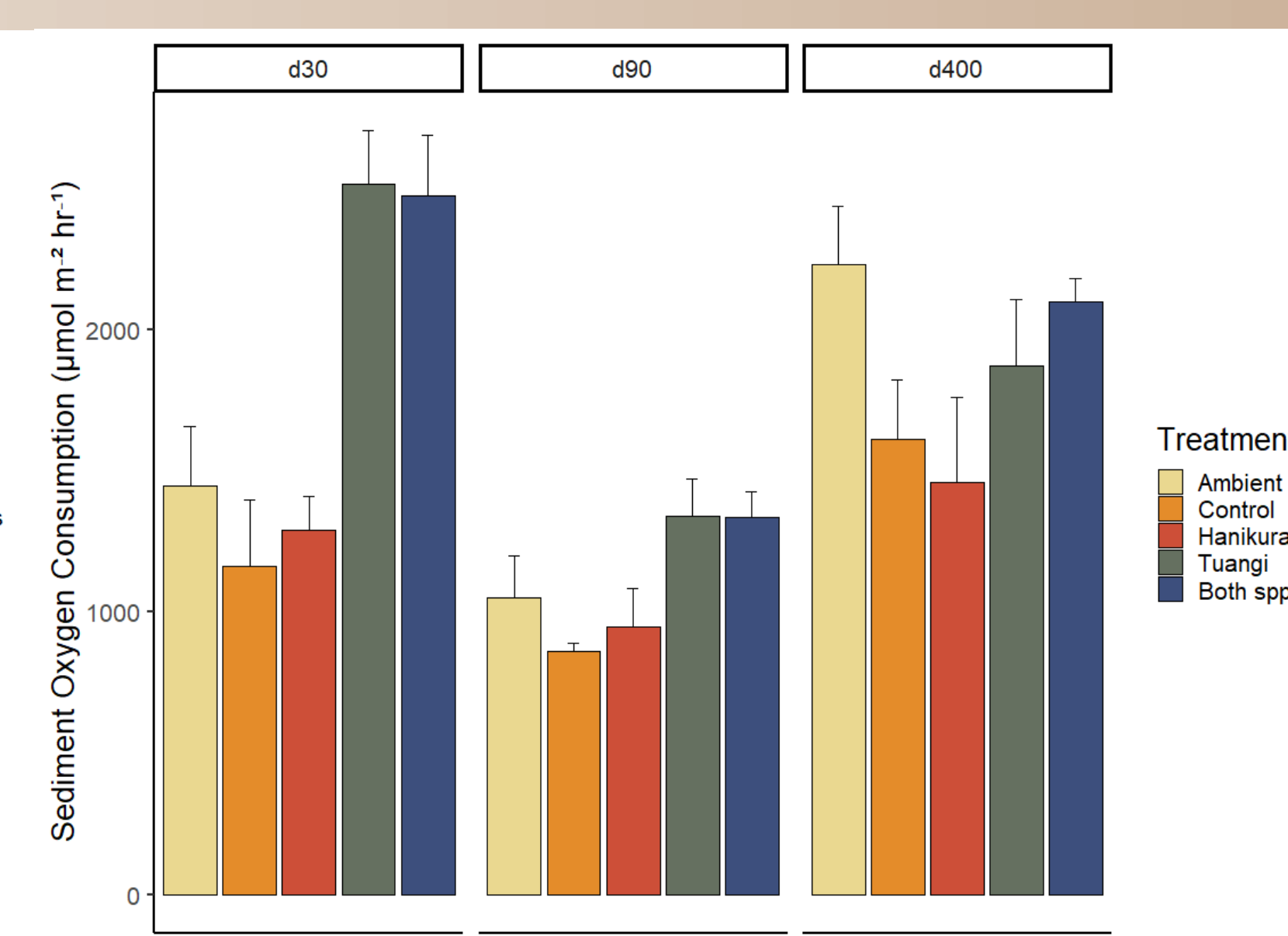


Figure 2. Sediment oxygen consumption in different treatment plots from February 2021 (d30), April 2021 (d90) and February 2022 (d400).

The variation in recovery measures depends on survival of re-introduced bivalves
→ **key to restoration efforts in the future!**

PROJECT Understanding degradation and recovery in social-ecological systems:
1.1 Ecological responses to cumulative effects

REFERENCES
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Woodin, S.A., Volkenborn, M., Pilditch, C.A., Lohrer, A.M., Wetthey, D.S., Hewitt, J.E. & Thrush, S.F. (2016). Same pattern, different mechanism: Looking onto the role of key species in seafloor ecosystem process. *Scientific Reports*, 6, 1–15.