

The Kaikōura earthquake and the pāua fishery: the road to re-opening and management of a new fishery



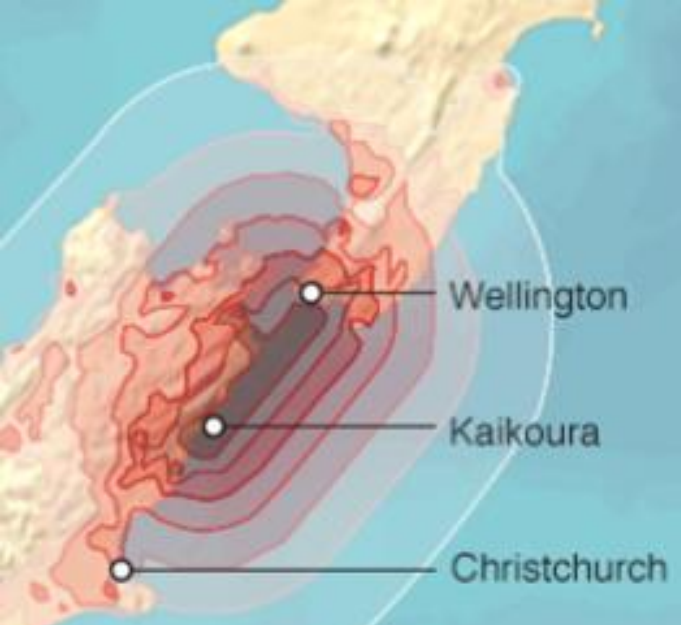
Dr. Tom McCowan – Paua Industry Council Ltd.
International Abalone Symposium, 2023



Outline

- The 2016 Kaikōura earthquake
- Effects on the pāua fishery
- Regulatory and research responses
- Fishery rebuild and re-opening





The Kaikōura earthquake

- 7.8 Mw earthquake
- Coastal uplift up to 6m
- Widespread mortality of marine organisms

Effects on pāua

- Pāua have a (relatively) shallow habitat range
 - Juveniles: intertidal
 - Adults: 1 to 10m
- Significant mortality of all life stages
- Habitat loss (~21% of the fishery)





Regulatory and management responses

Fishery Closure:

- Approx. 130 km of coastline
- Significant customary and recreational fishery
- Commercial:
 - PAU7: ~15t (16% TACC)
 - PAU3: ~47t (50% TACC)

Followed by:

- PAU3 QMA TACC reduction
- PAU3 sub-division
- PauaMAC3 and PauaMAC7 Fisheries Plans



Fishery re-opening

PAU3 Fisheries Plan and Kaikoura Marine Guardians re-opening proposal:

1. Widespread emergence of post-earthquake recruits is observed across the fishery; and
2. A sustained increase in pāua biomass is observed across the fishery

Supported by abundance and LF data after 4th survey period.

1st December 2021:

- 3 month fishing season
- Commercial
 - 23 t TACC
 - Management tools (PauaMAC3/7 Fisheries Plans)
- Recreational
 - Bag limit (5)
 - MLS (125mm)

5th January 2023:

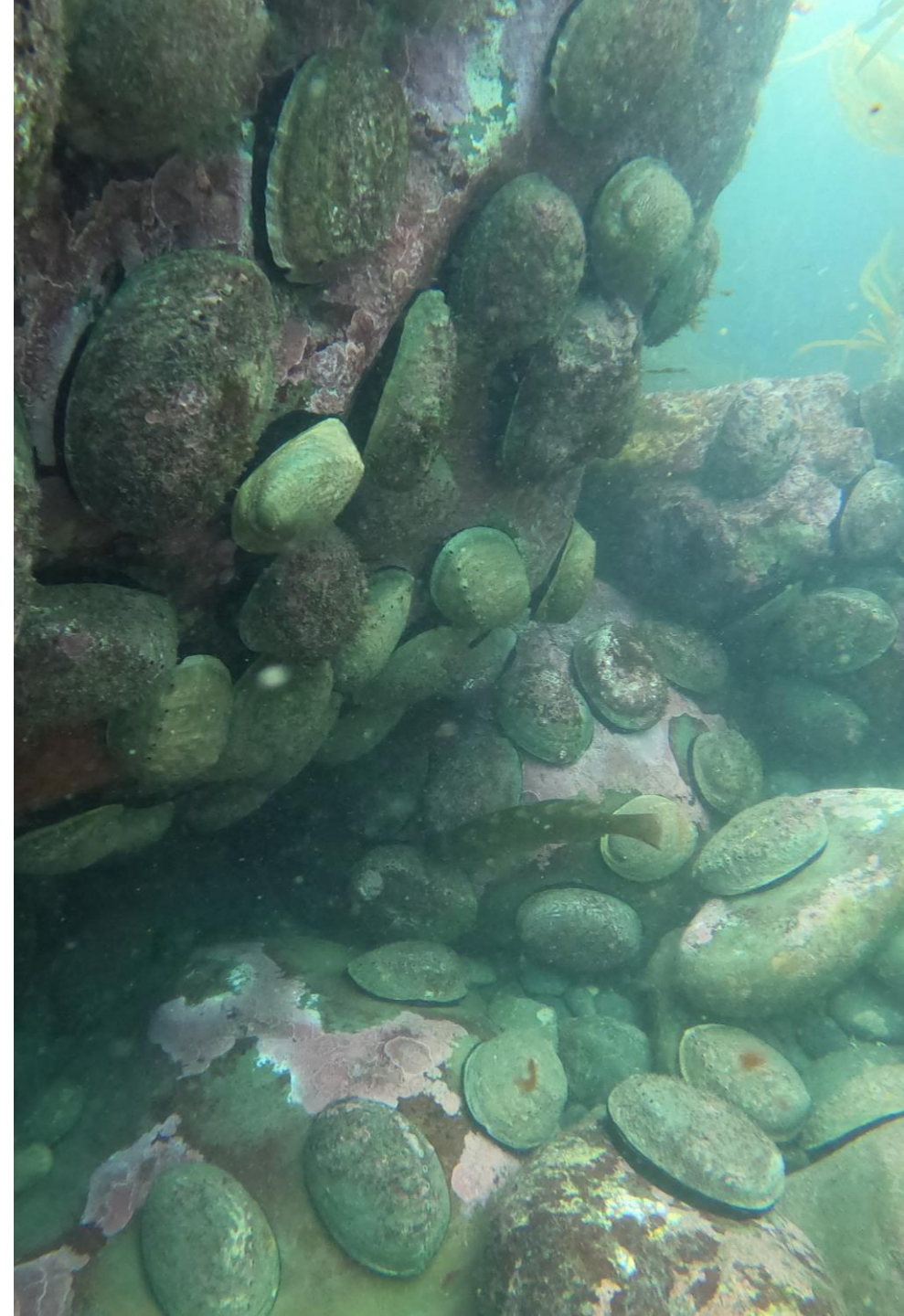
- Commercial
 - 23 t TACC
 - Management tools (PauaMAC3/7 Fisheries Plans)
 - Normal fishing season
- Recreational
 - 15 April – 15 June
 - Regulations?

Research Responses: Monitoring the recovery

- Monitoring of juvenile recruitment – intertidal surveys (University of Canterbury – Shawn Gerrity)
- Monitoring of spawning biomass – dive surveys (Paua Industry Council Ltd.)

Objective:

“To monitor the abundance and length-frequency of adult pāua populations to estimate biomass trends to inform management actions at the scale of the fishery closure”

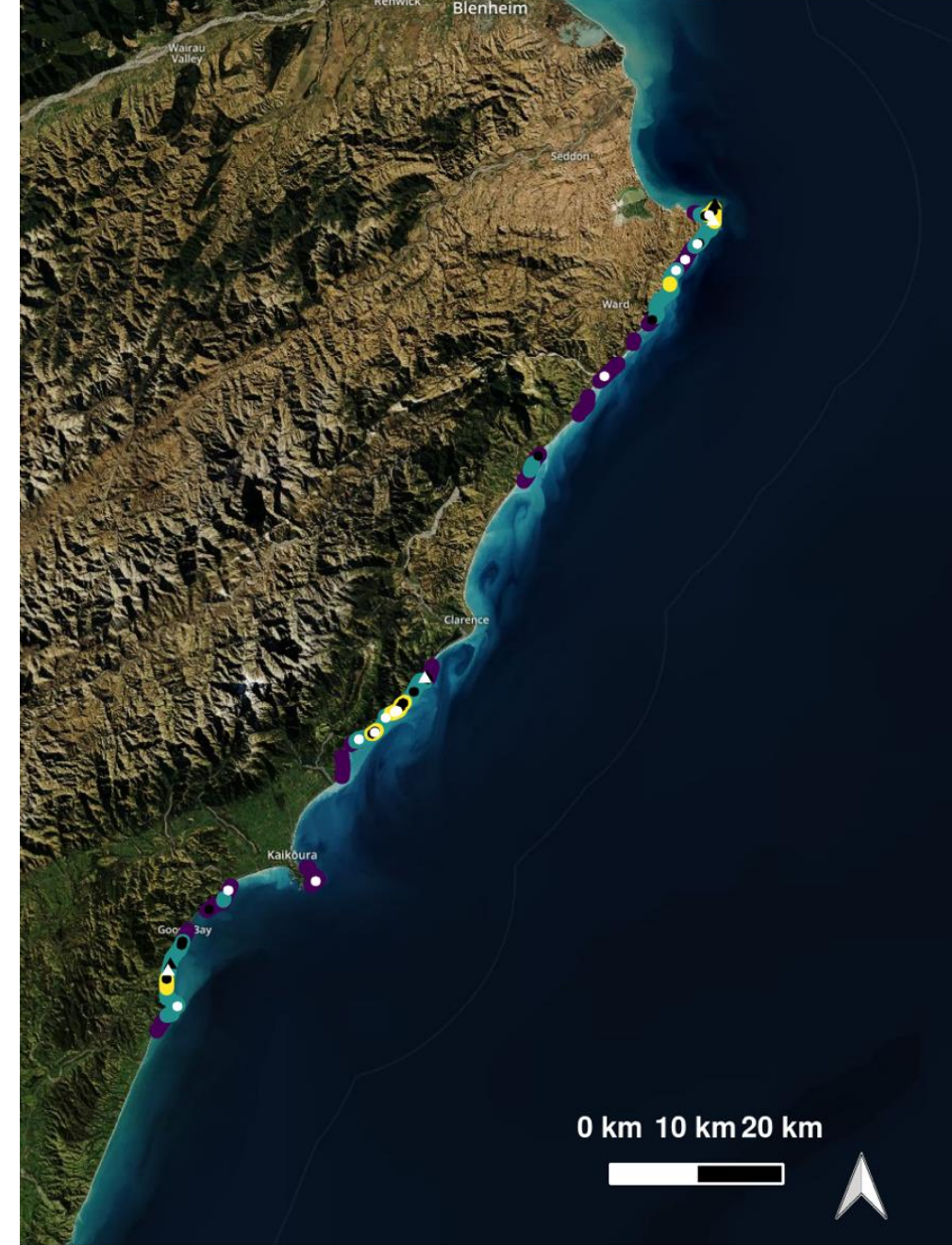


Survey design

- Sampling points allocated based on previous fisheries use strata, weighted towards high use
- Modified timed-swim methodologies:
 - 32 sites
 - pāua at each site measured and counted by 3 snorkel divers
 - (Initially) area delimited by GPS data logger
 - Record of conditions: swell, visibility, seaweed, habitat, 'cryptic rating'

Outputs

- Abundance estimates and length-frequency profiles over time at site and area wide scale
- 5 (1/2) rounds completed



173.668

Longitude (°E)

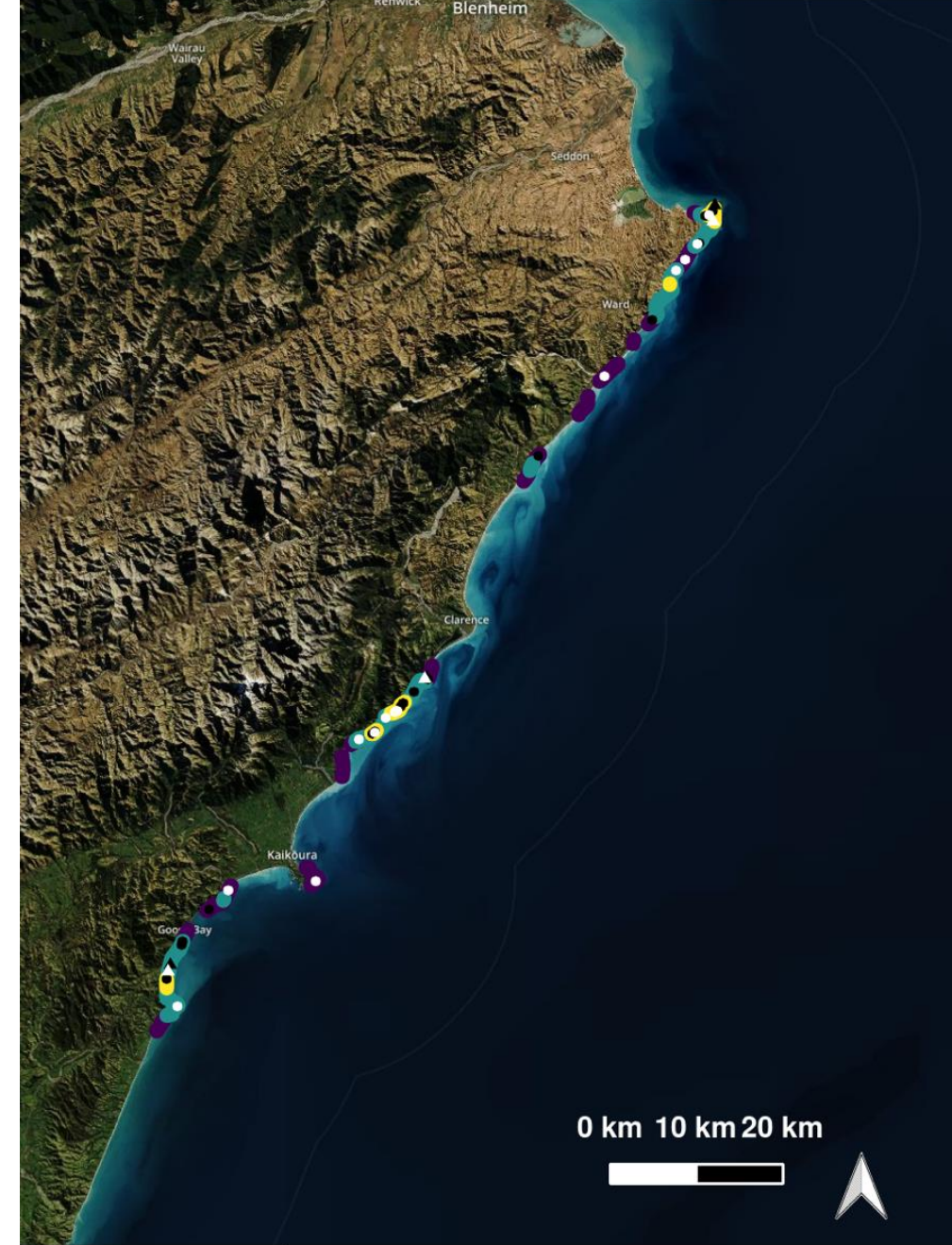


Survey design

- Sampling points allocated based on previous fisheries use strata, weighted towards high use
- Modified timed-swim methodologies:
 - 30 sites
 - pāua at each site measured and counted by 3 snorkel divers
 - (Initially) area delimited by GPS data logger
 - Record of conditions: swell, visibility, seaweed, habitat, 'cryptic rating'

Outputs

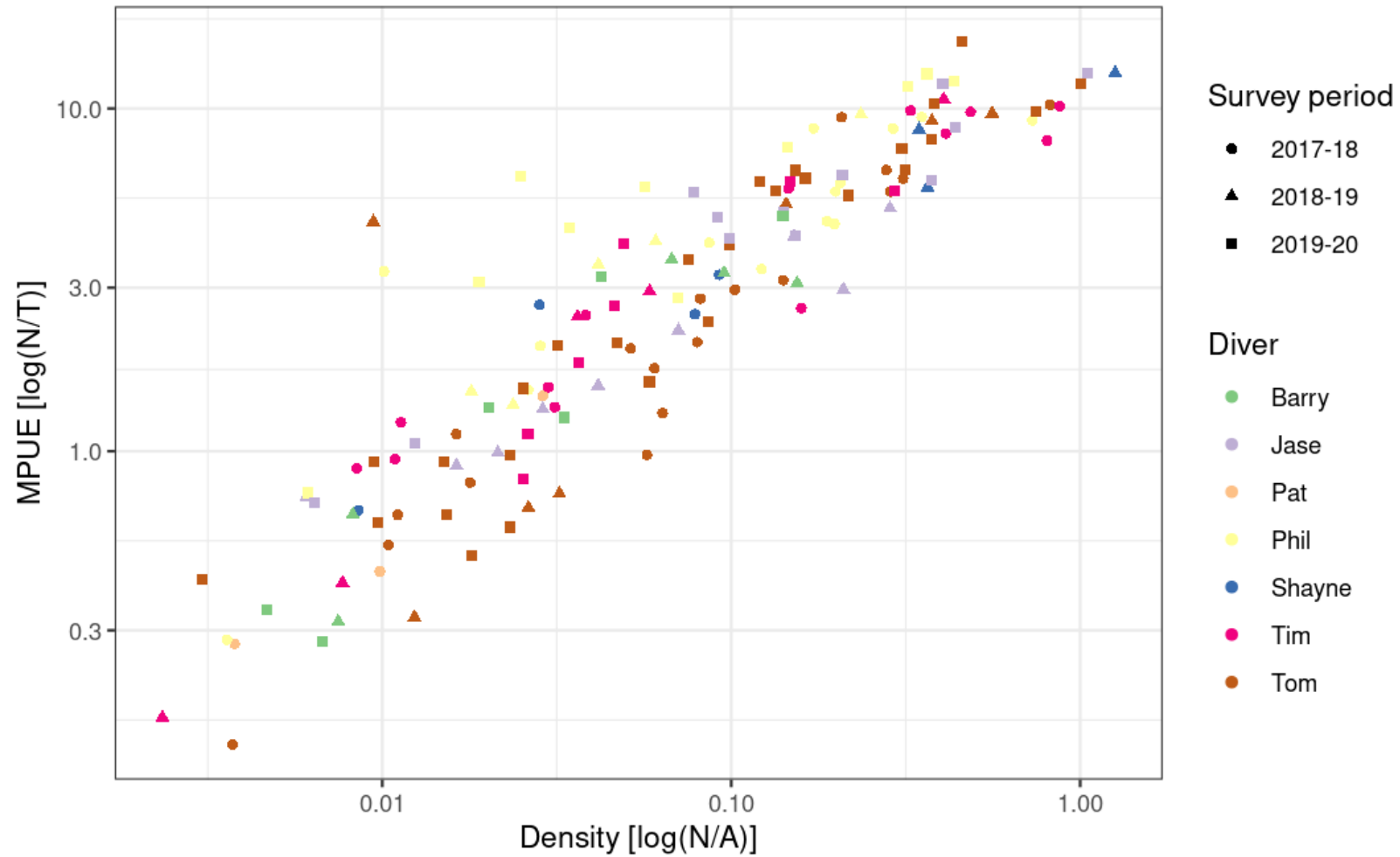
- Abundance estimates and length-frequency profiles over time at site and area wide scale
- 6 rounds completed



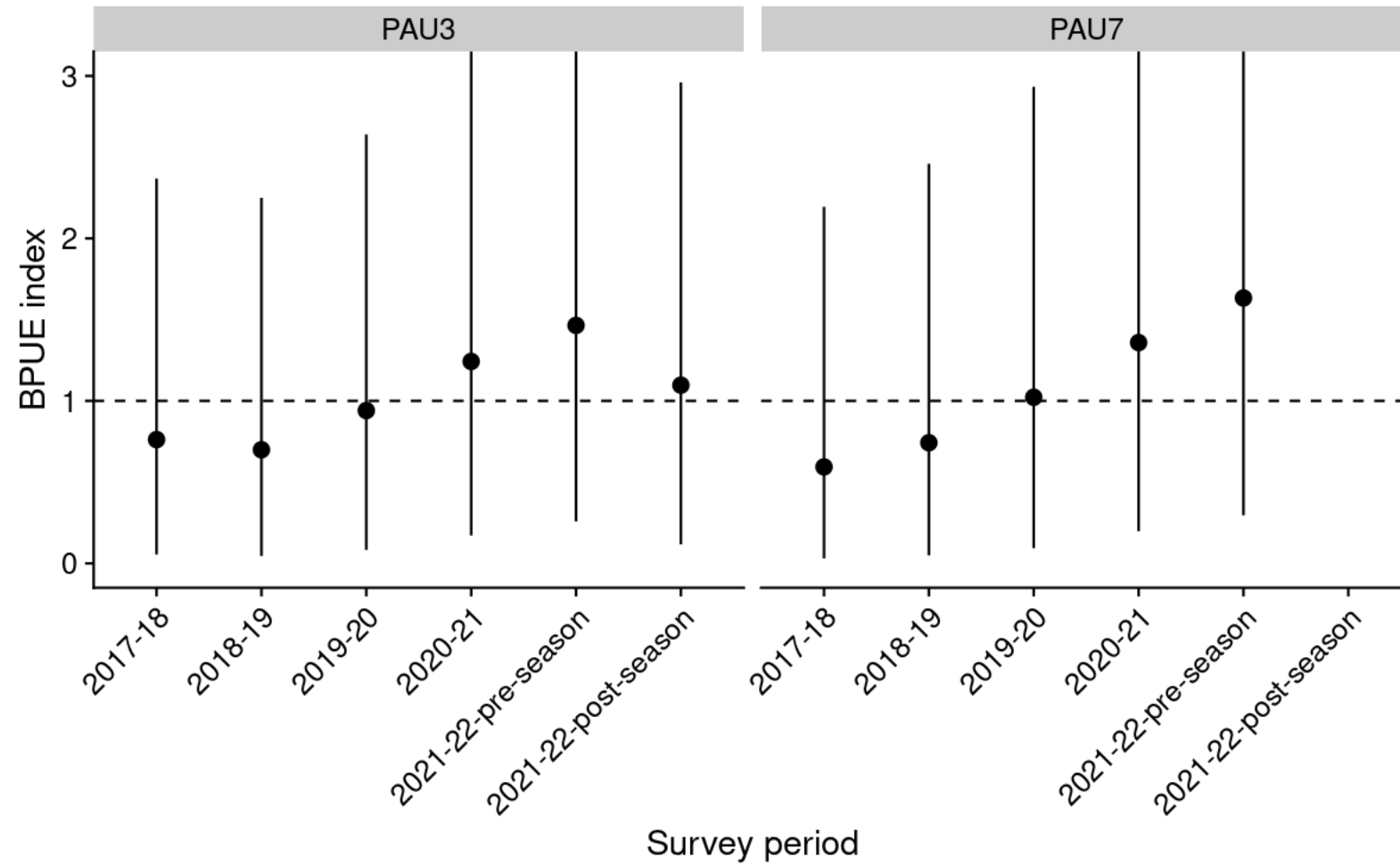
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Longitude (°E)

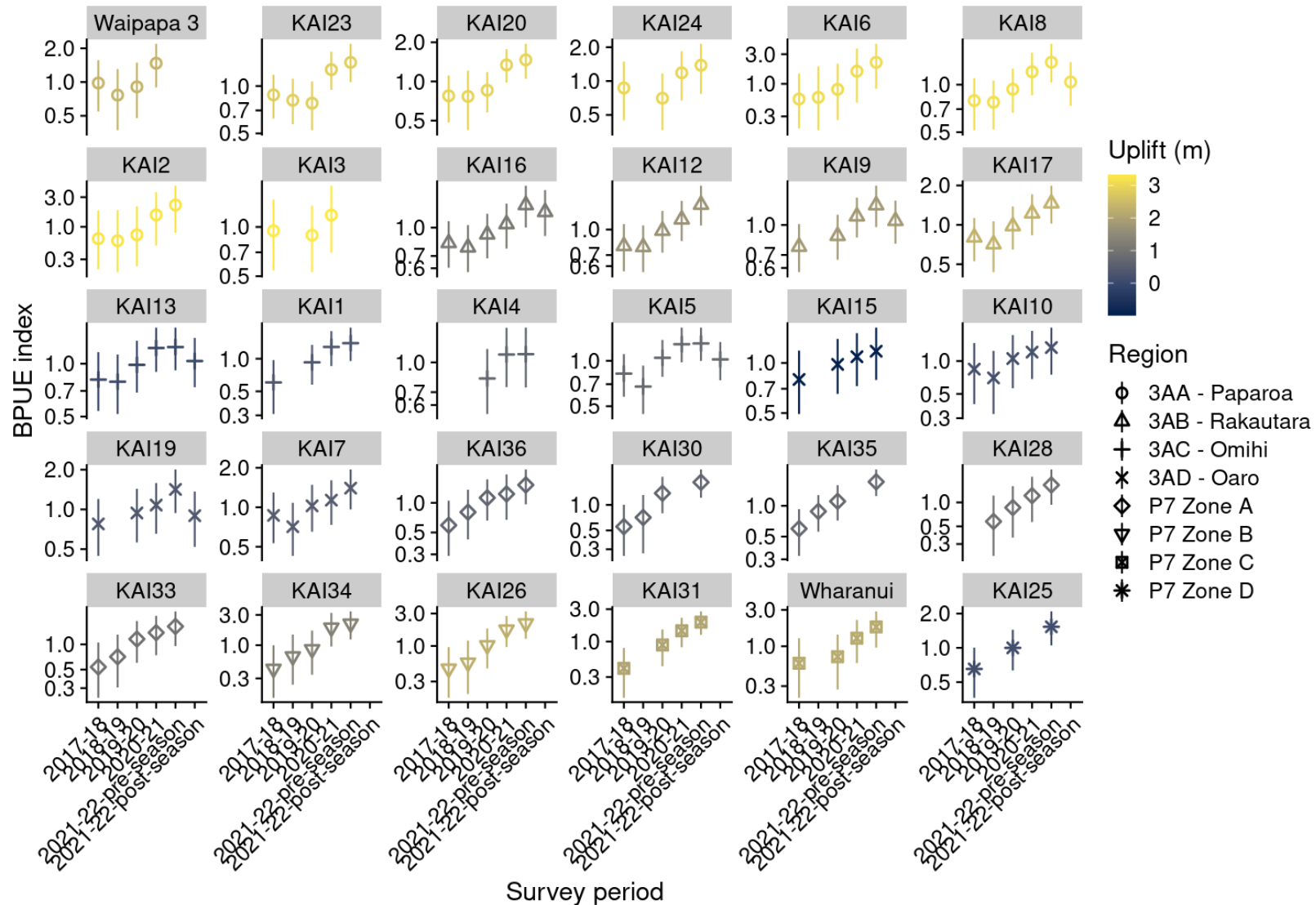
Index of abundance - BPUE



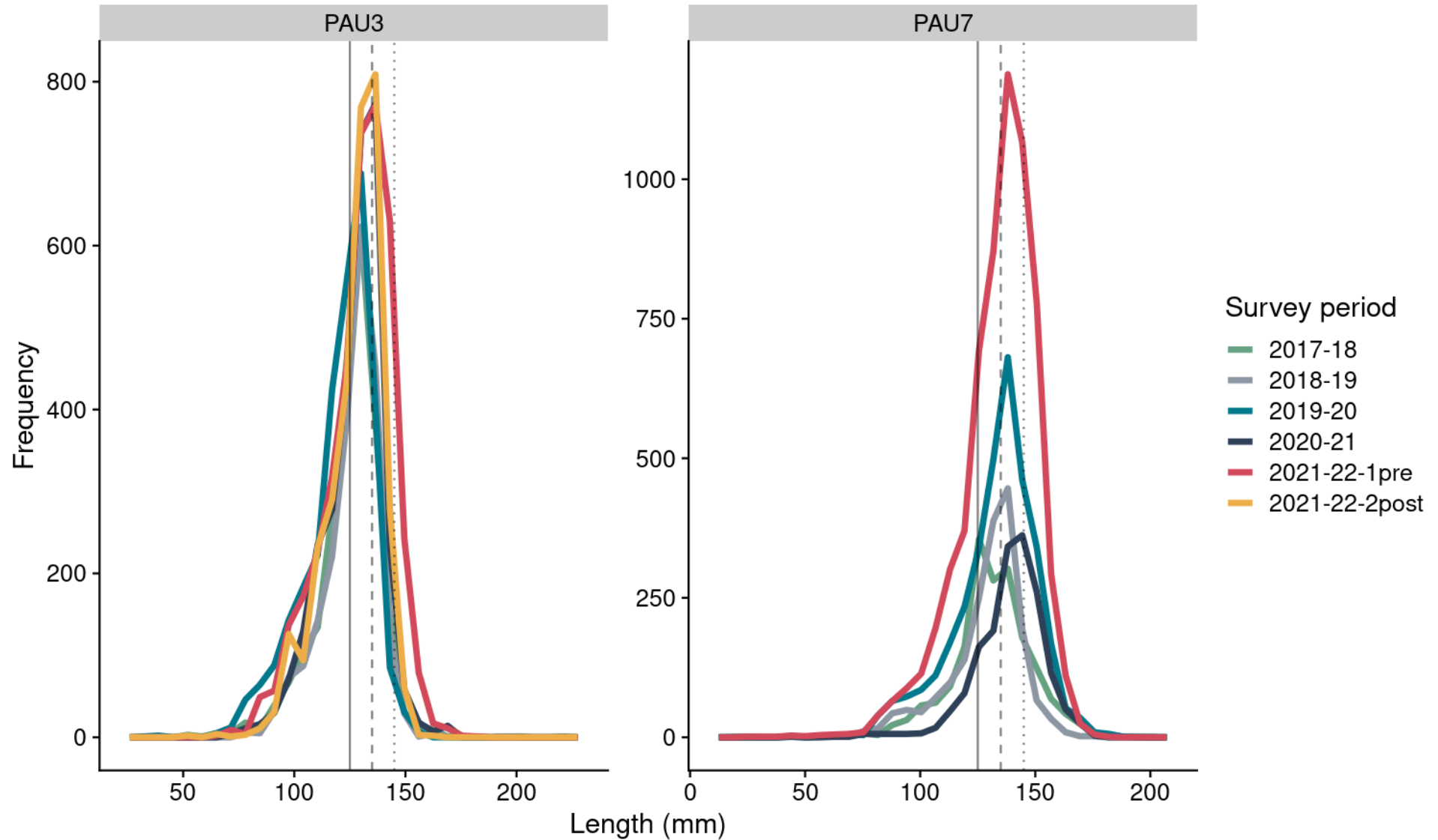
Abundance trends



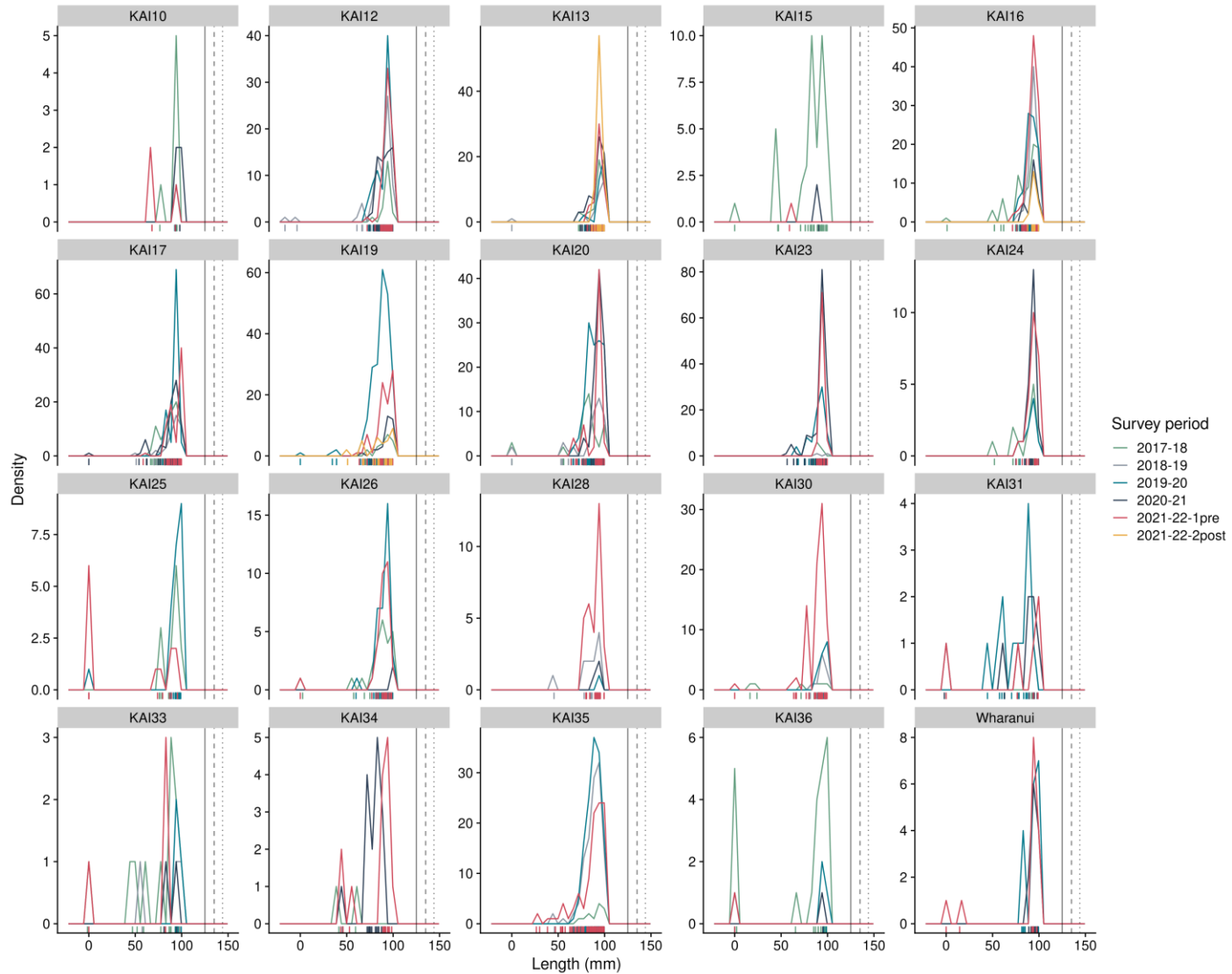
Abundance trends



Length-frequency trends



Length-frequency trends





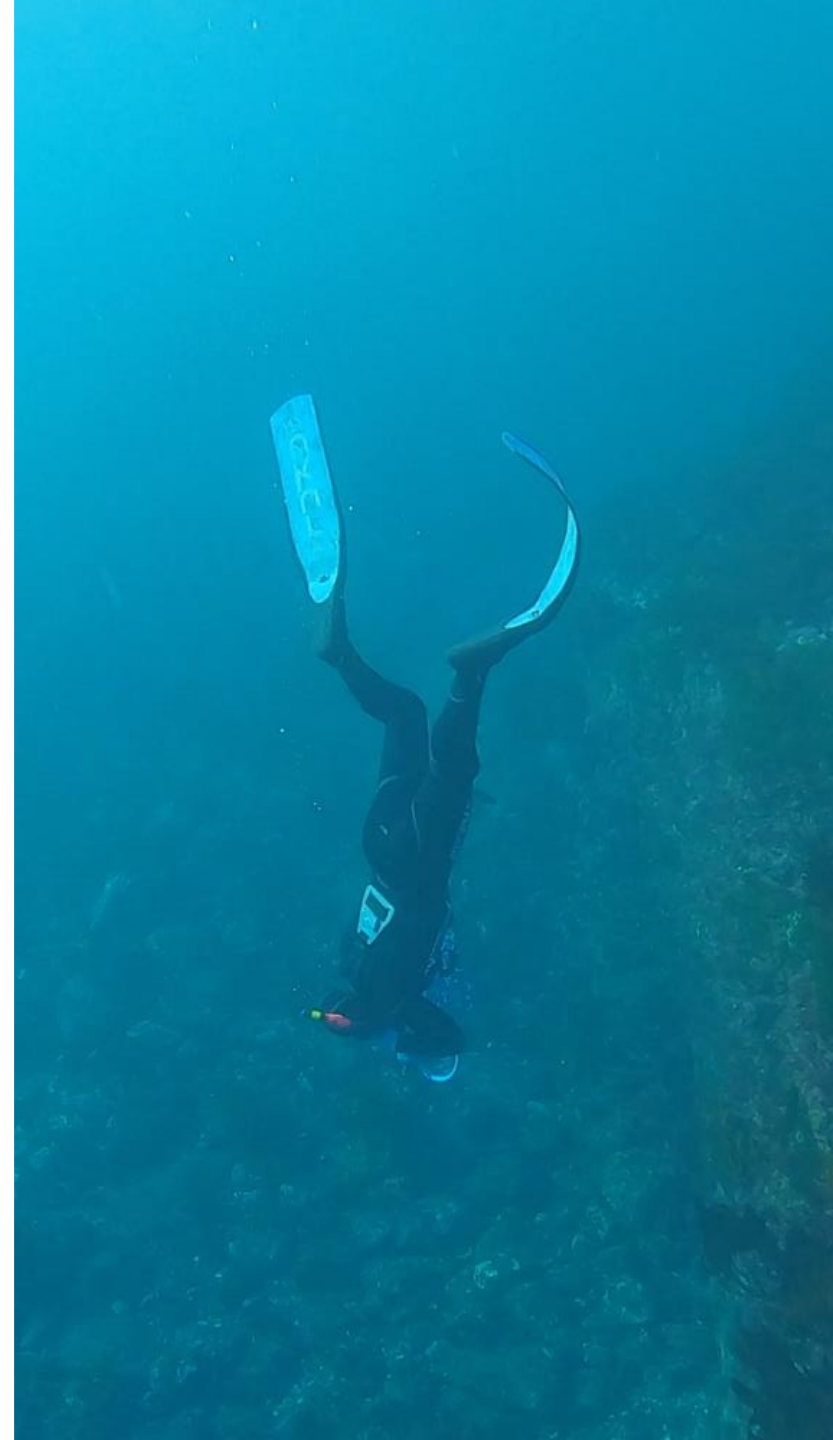
Ongoing monitoring

- Surveys to completed by mid-2023
- Continued fulfilment of re-opening criteria?
- Potential continuation to inform management procedure and harvest control rule for adaptive rebuild of fishery
- Alignment with fisheries dependent data

Management of the commercial fishery: The PauaMAC3 Fisheries Plan

Approach: *“Adaptive rebuild”*

- [TACC setting]
- **Catch spreading**
- **Minimum harvest size (MHS)**
- Fine-scale fisheries data collection
- Harvest control rule
- Contingency measures
- Enhancement



Outlook

- Adaptive rebuild of commercial fishery using management tools and HCR
- Supported by further monitoring and data collection
- Controls on recreational harvest
- 'Blank Canvas' for management

