Evaluating management options for pāua fisheries in Aotearoa/New Zealand: Towards fine-scale management

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PAU fisheries in Aotearoa

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- Integrated, length-based stock assessments, including projections under a range of catches to give management advice.
Over-all management context

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- Other QMAs with greatest management need did not have useful operating models (PAU 4, PAU 3A/B)
- Spatial heterogeneity in dynamics (status, trends etc) increasingly important to account for:
  - Management and monitoring needs can vary over relatively small spatial scales according to biomass trends, biology, fishing pressure
- Development of spatial population models - can be fitted or “conditioned” on fisheries and survey data
- Local management options can be evaluated and scaled up to QMA level outcomes
Control rules for spatial management

1. Area below target (needs rebuilding): place low buffer (or slope) at current agreed catch and CPUE
2. Area CPUE at target (maintain status quo): place target area at current CPUE & catch
3. Area fishing better than can be expected over long term (e.g., after closure): place high buffer at current CPUE/catch
Evaluating management options in PAU 3A

- Consistent fishery pre-earthquake, but closed for 5 years
- Post-earthquake surveys provide index of recovery
- Industry fisheries plan suggests management based on formal MPs to rebuild fishery
- Industry zones based on length composition of the stock in recent year - indicative of growth differences
- Development of spatial operating models based on biological data, fisheries trends & industry management zones
Extending the MP framework: operating models

Development of spatial operating models based on biological data, fisheries trends: PAU 3A - Earthquake affected area

● Operating model is a fitted, integrated stock assessment, including hypotheses of earthquake impacts

● Evaluation of scenarios to manage recreational and commercial harvest post-reopening
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Development of spatial operating models based on biological data, fisheries trends: PAU 3A - Earthquake affected area

- Operating model is a fitted, integrated stock assessment, including hypotheses of earthquake impacts
- Evaluation of scenarios to manage recreational and commercial harvest post-reopening
- Keytrade-offs in catch allocation identified for areas of high recreational pressure
Extending the MP framework: operating models

- Development of spatial operating models for three important areas:
  - PAU 3A - Earthquake affected area
  - PAU 3B - Earthquake un-affected area
  - PAU 4 - 

  - Inputs and outputs split at PAU4 statistical areas scale - 46 areas with non-zero catch, reflecting current spatial management by pauamac4.
We’re working to integrate fine-scale spatial industry management with the “bigger picture” - testing smaller scale spatial management against Fisheries NZ harvest strategy standard.

- Responsive decision making on small scales that meets large scale sustainability requirements
Extending the MP framework: challenges

- Politics: ability to use fine-scale MPs to drive TACC decisions
- Data: good fine scale data is recent, often incomplete, especially for biological inputs
  - Strategic programmes for data collection (LFs, growth, maturity) are needed to inform models and support fine scale management
- Changing environments: what works today won’t work tomorrow: need a more holistic understanding of pāua in their environment.
Extending the MP framework: challenges

PAU7 statistical areas

Sea surface temperature

All statistical areas

Key figures for the fishing year to date in PAU7

- Catch: 29.4 MT
- Standardised CPUE: 18.1 kg/hr

Updated daily from ACE holders who have signed eCatch or FishServe data consent forms.
- Calculated 01 Mar 2023. Includes fishing events up to 28 Feb 2023.

The map on the left provides an overview of the state of the fishery. The colors reflect self-imposed limits.
Thank you.