Hauling mitigation for small longline vessels

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D. Goad* and T. Peatman†

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* Vita Maris † Independent Fisheries Consultant

Background

- To date most focus has been on mitigating dead (set) captures
- 33% BLL and 16% SLL captures alive
- Tend to fly off, historically not perceived by fishers as serious
- Fate unknown, ‘counted’ as 0.5 in the risk assessment
- H&S risk to crew, and loss of time
- Easier task than setting mitigation = smaller area, beside the boat

Objective

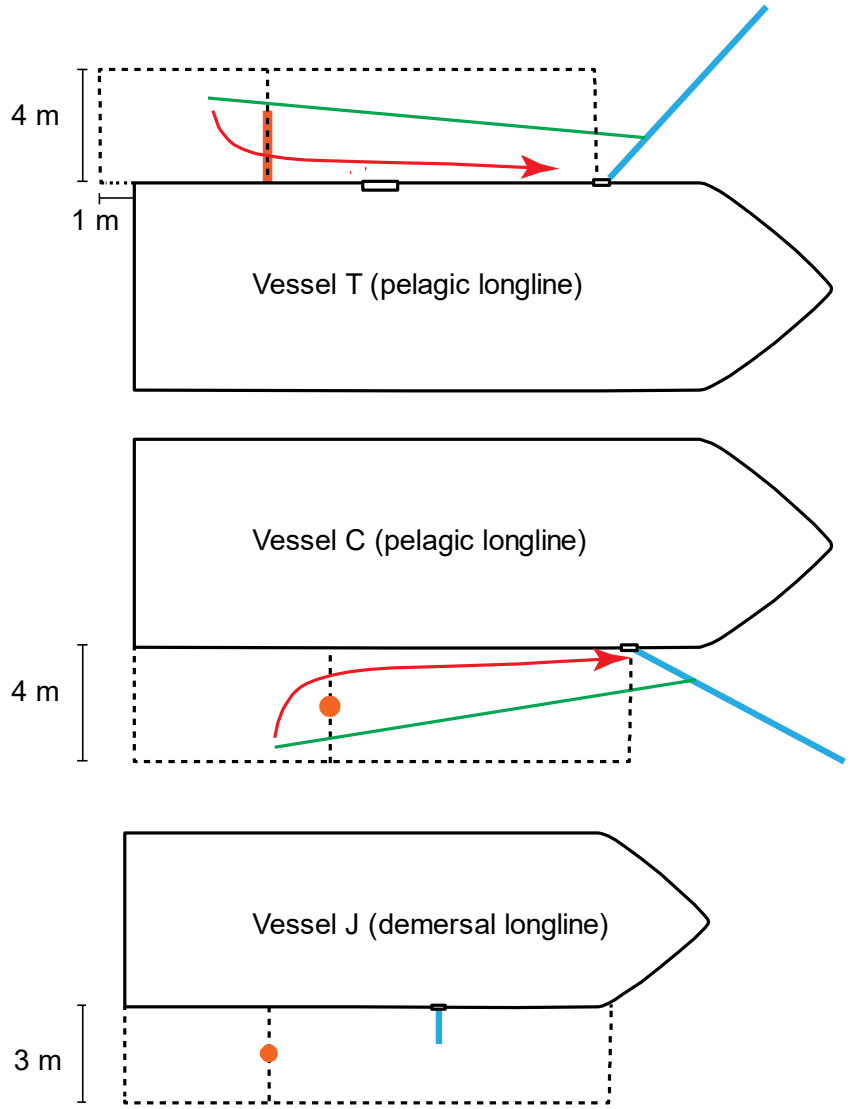
To develop effective and practical options to mitigate the capture of seabirds on haul in small vessel demersal and pelagic longline fisheries.

Methods

- Design / fit devices
- Sea trips to trial devices and collect data
- Comparing mitigation and no mitigation treatments using real time observations and Go Pro video
- Also collected a longer-term dataset from BLL EM footage
- Captures are rare – need to use a proxy for risk

  (birds in or moving into a risky area)

Methods – At sea data collection



Bait 1 [ ] % [ ] salted (y/n) [ ] Bait 2 [ ] % [ ] salted (y/n) [ ] Swell height (m) [ ]

Observation number [ ] Treatment [ ] Start [ ] Stop [ ]

Wind speed [ ] Wind direction Swell direction Visibility score [ ]

Abundance counts

Species					
< 100 m in the air					
< 100 m on the water					
< 1.5 m from line					
1.5 - 3 m from line					
0 - 3 m from discard point					

Comments

Behaviour counts

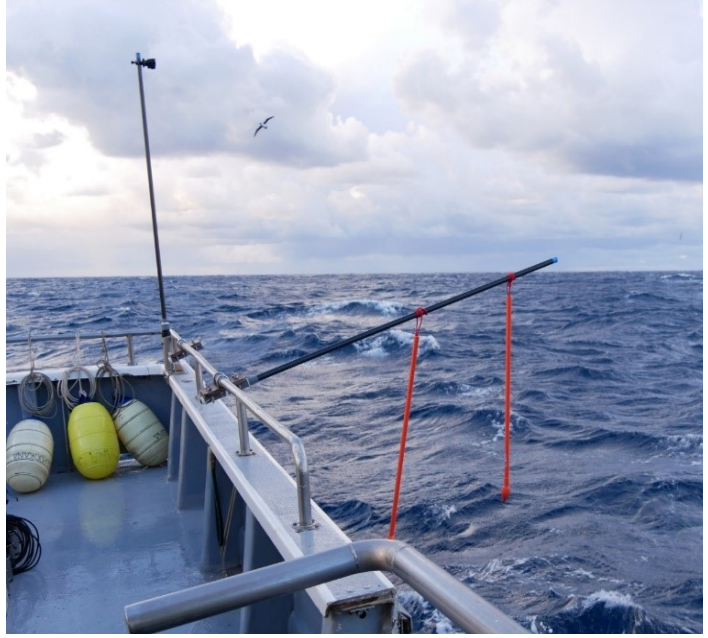
Start time		End time	
Hooks hauled			
Baits returned			
Submerged dives			
Contacts with baited hook			
Contacts with line / snood			
Birds behind device			
Birds forward of device			
Discarded baits			
Discarded fish			
Discarded offal			

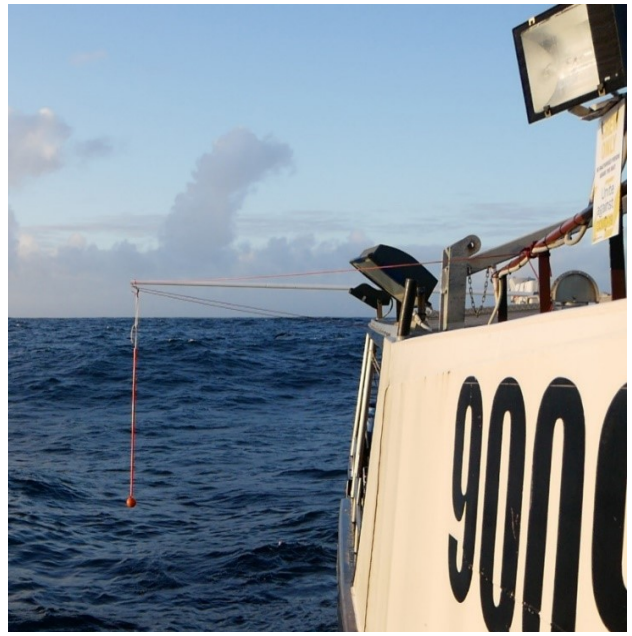
Methods – Data analysis

- Data exploration – box-whisker plots by observation period
- Bayesian MCMC models for real time data sets and EM dataset
- Real time - Rate of seabirds entering the area forward of the mitigation, defined as numbers per hook per bird within 100 m for pelagic longlines, and numbers per minute per bird within 100 m for demersal longlines.
- Observations with no seabirds within 100 m of the vessel were excluded from the modelled dataset. This removed all (pelagic longline) fishing events where gear was hauled at night time.
- EM - Rate of seabirds moving into the area forward of the mitigation device per minute.

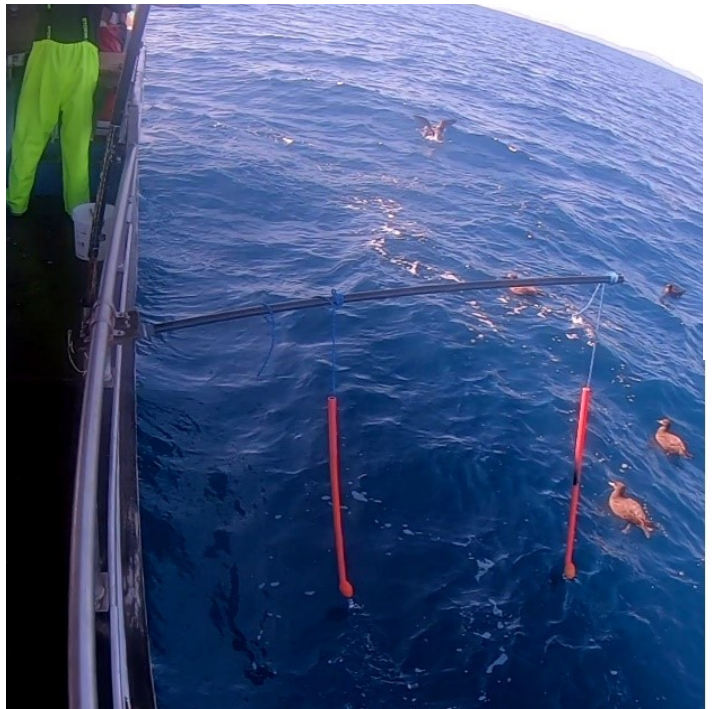
Results - Devices

- Surface longline

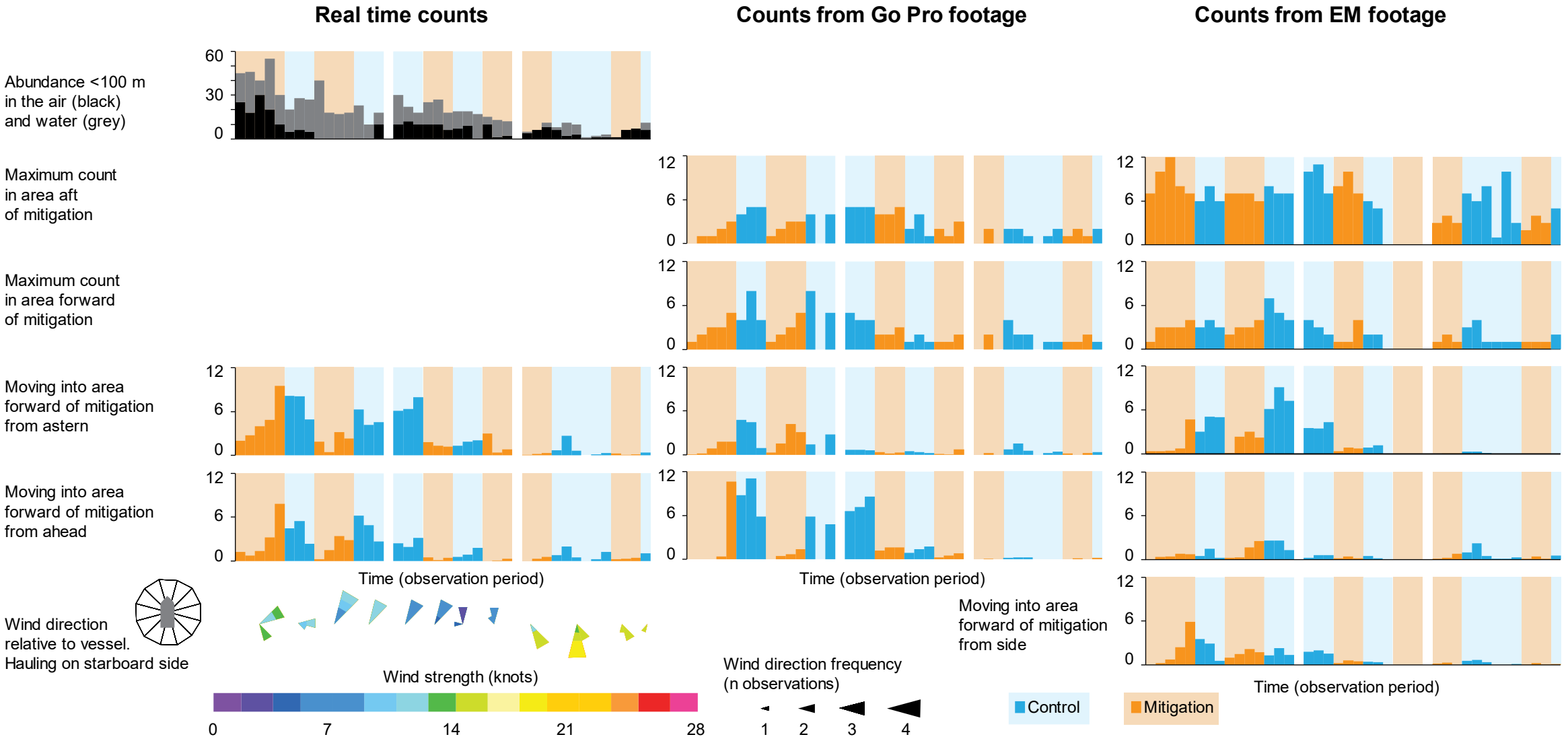




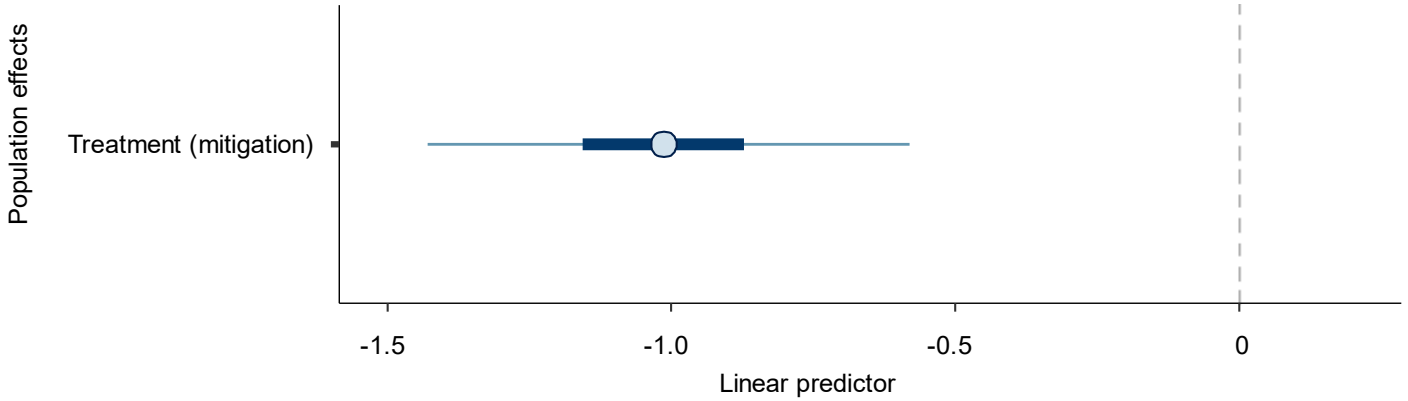
- Demersal longline

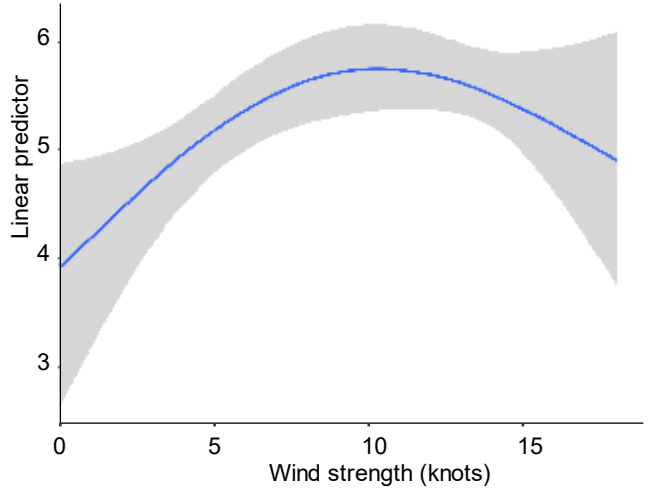


Results – Demersal longline different data sources

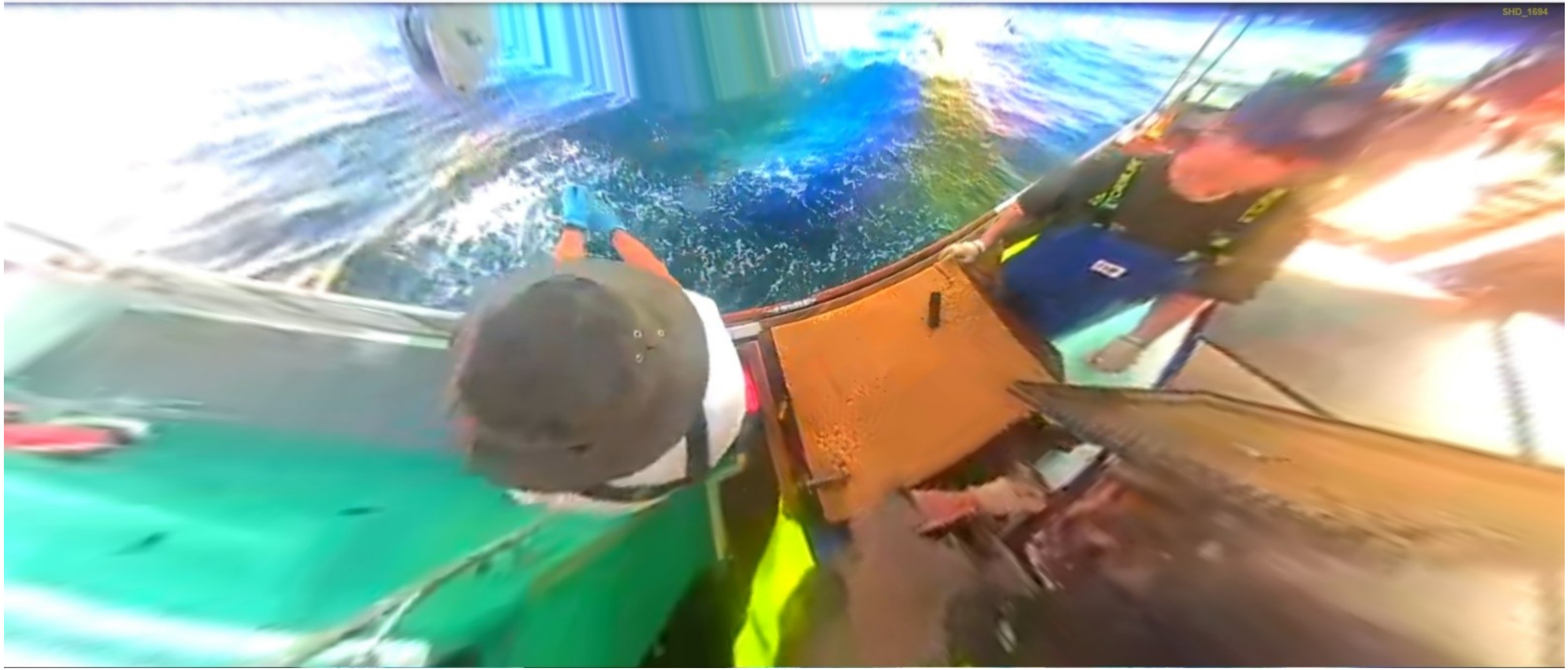


Results – Demersal longline model real time data





Results – Demersal longline EM footage



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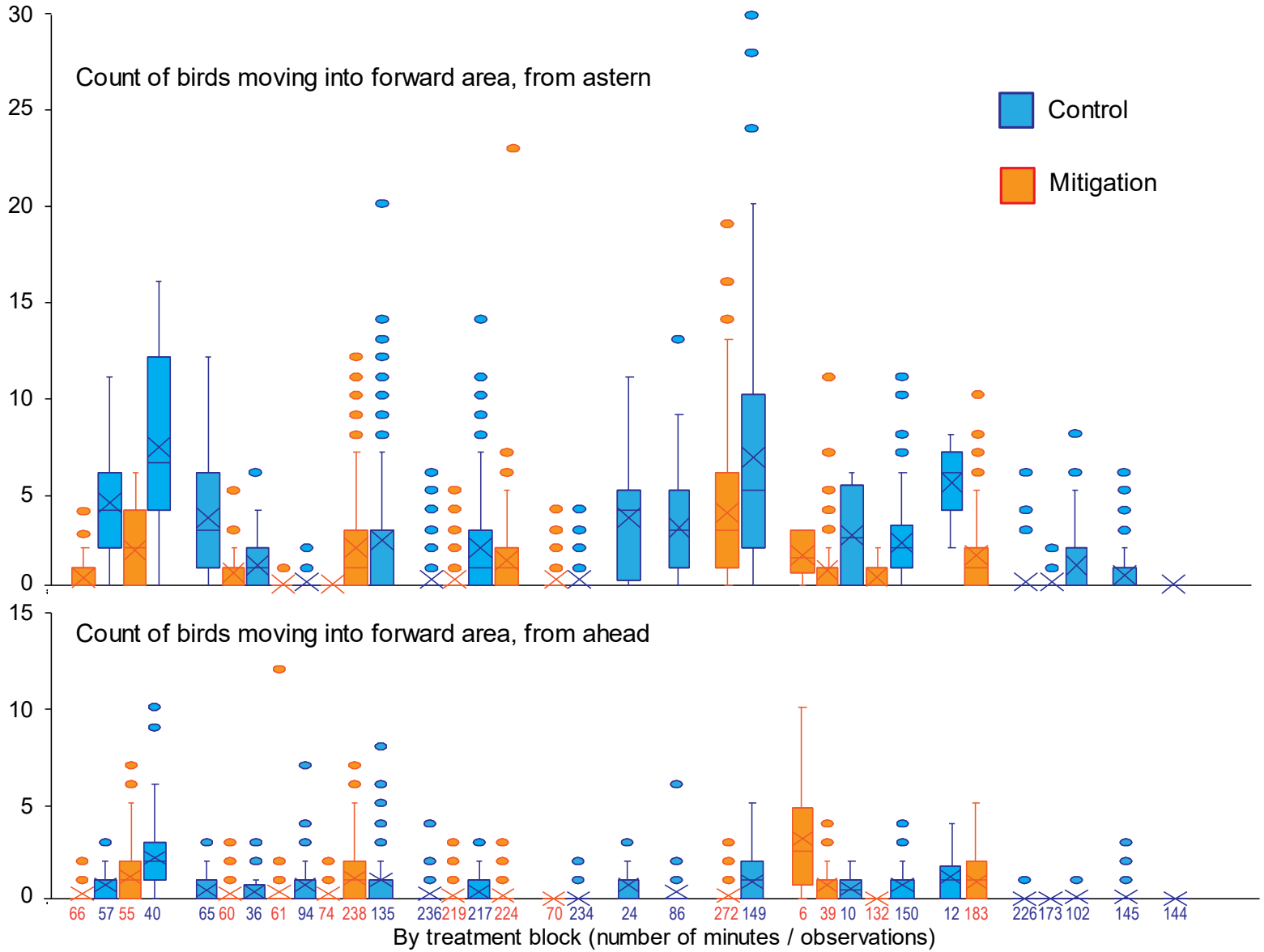
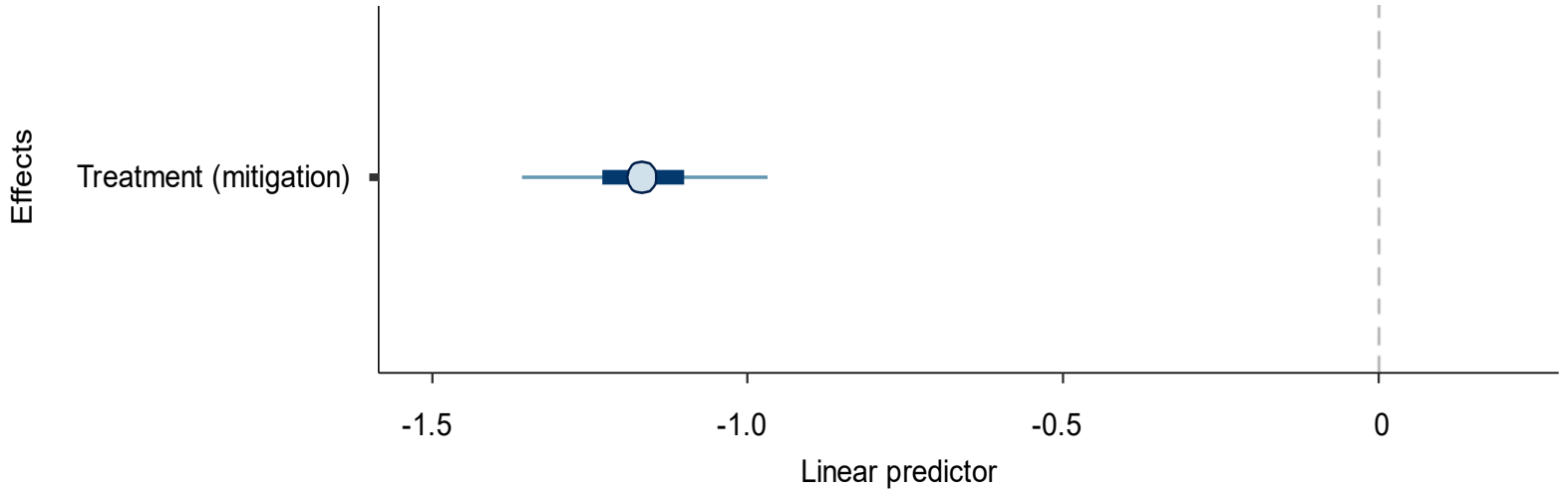
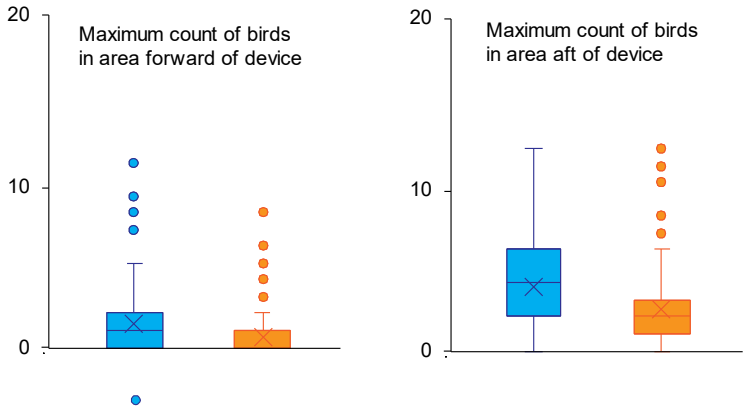
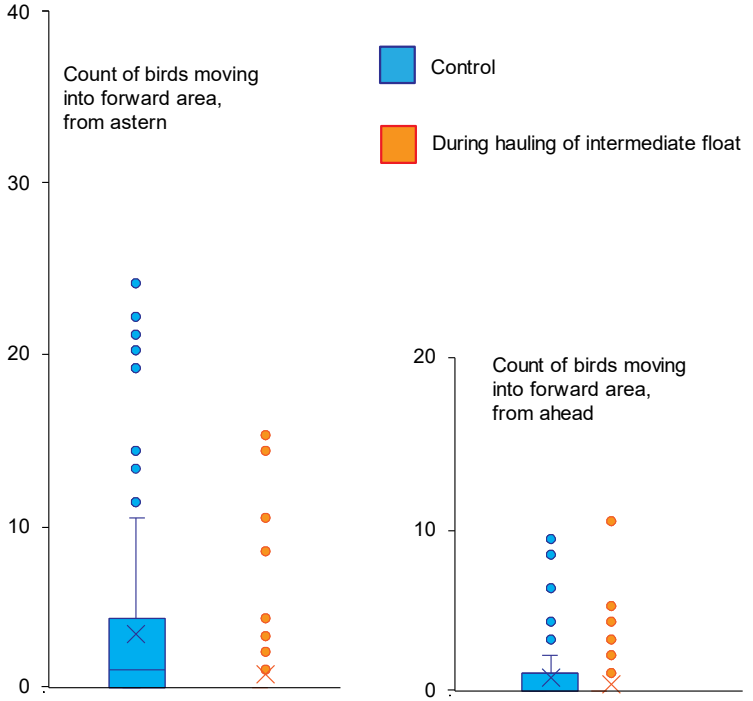


Results – Demersal longline model EM data



Results - Demersal longline float





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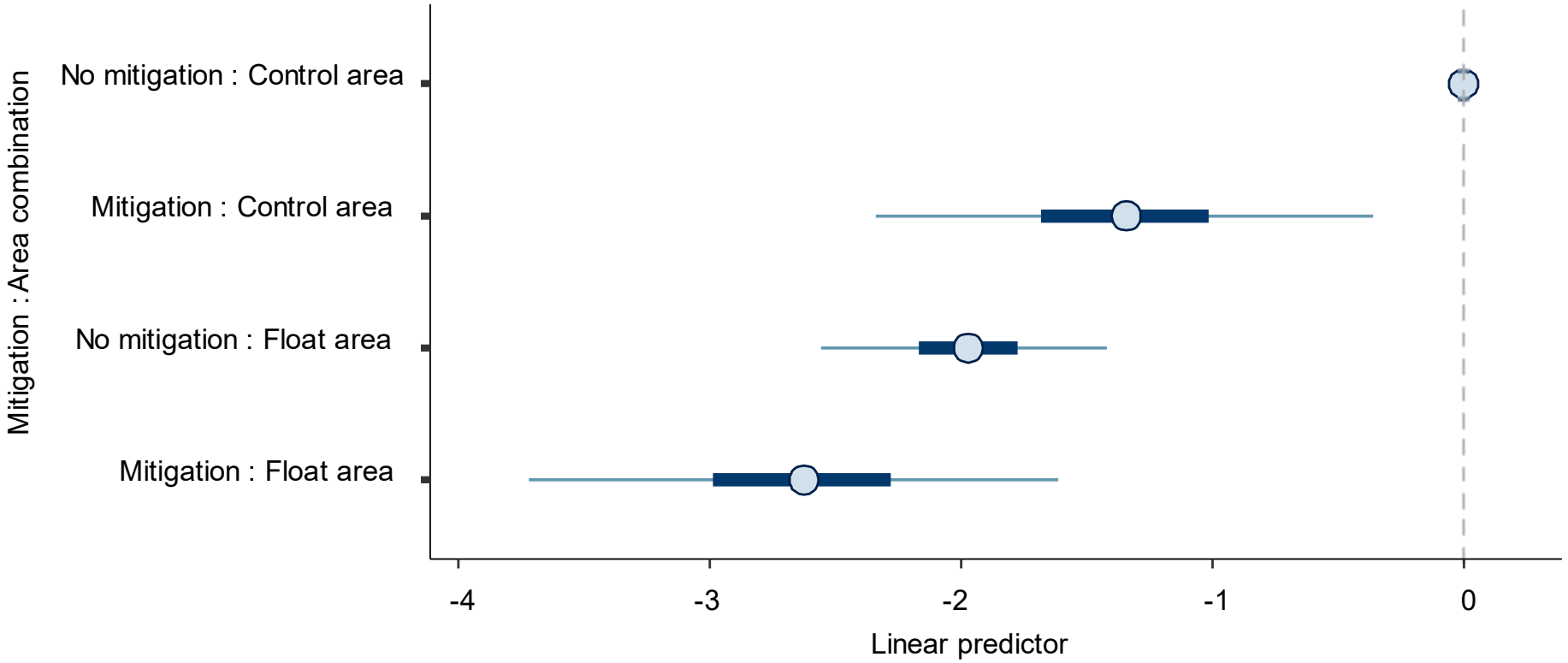
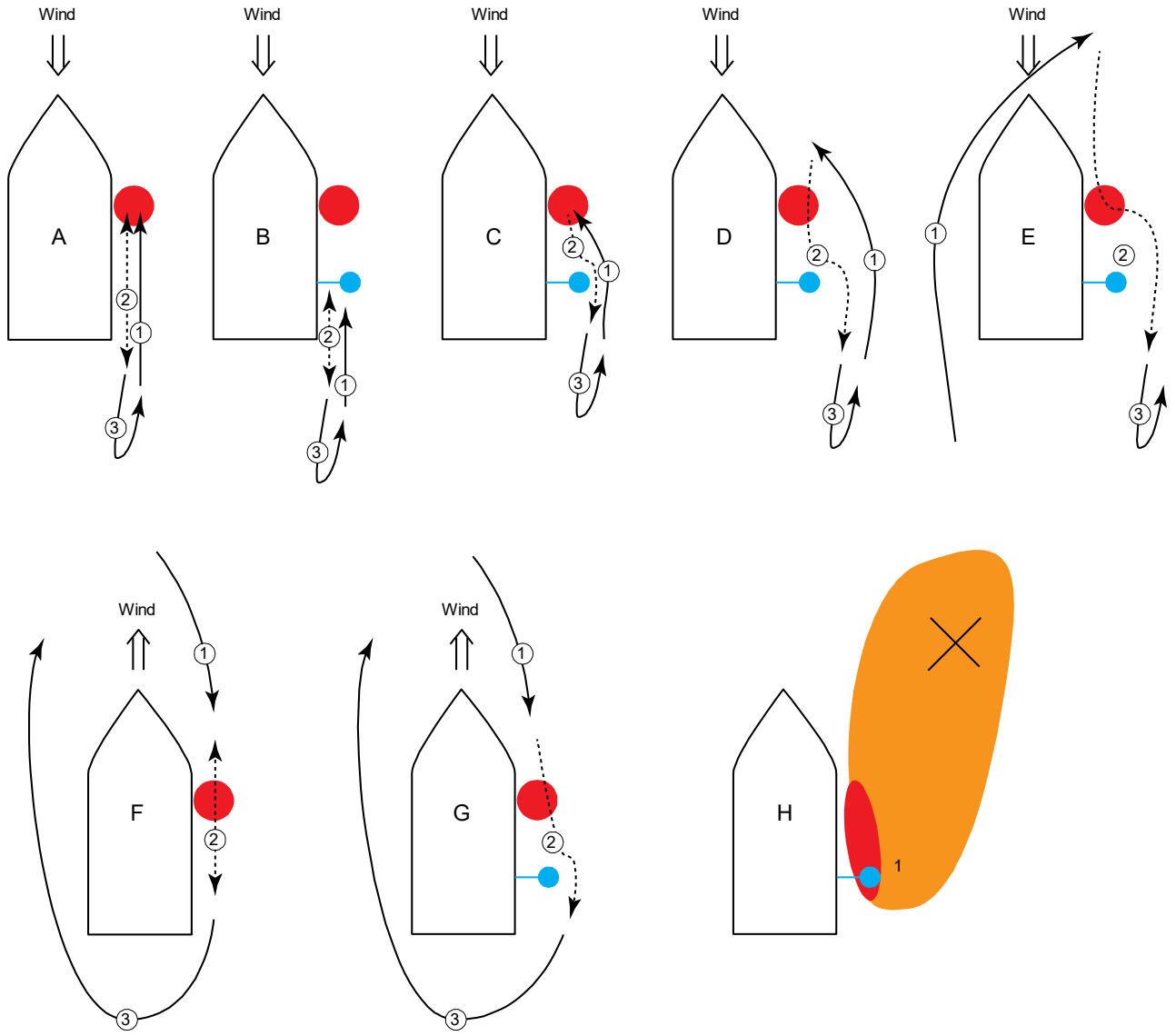
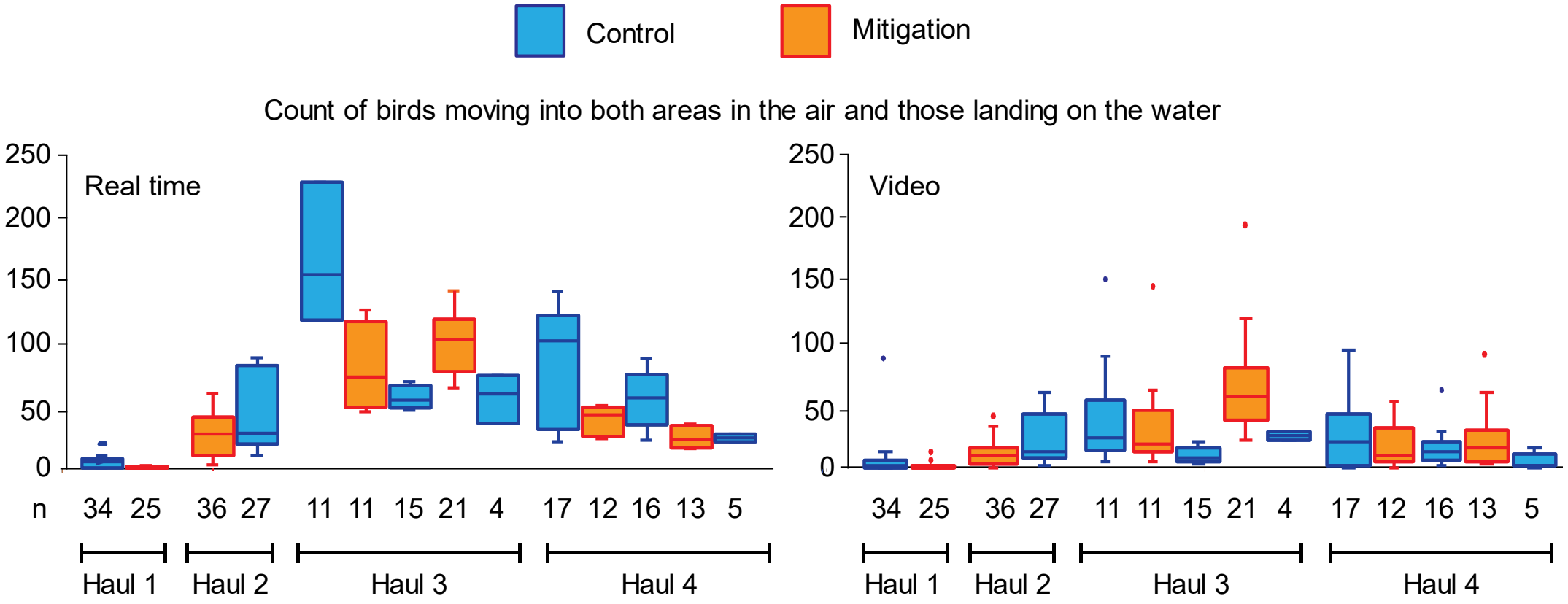


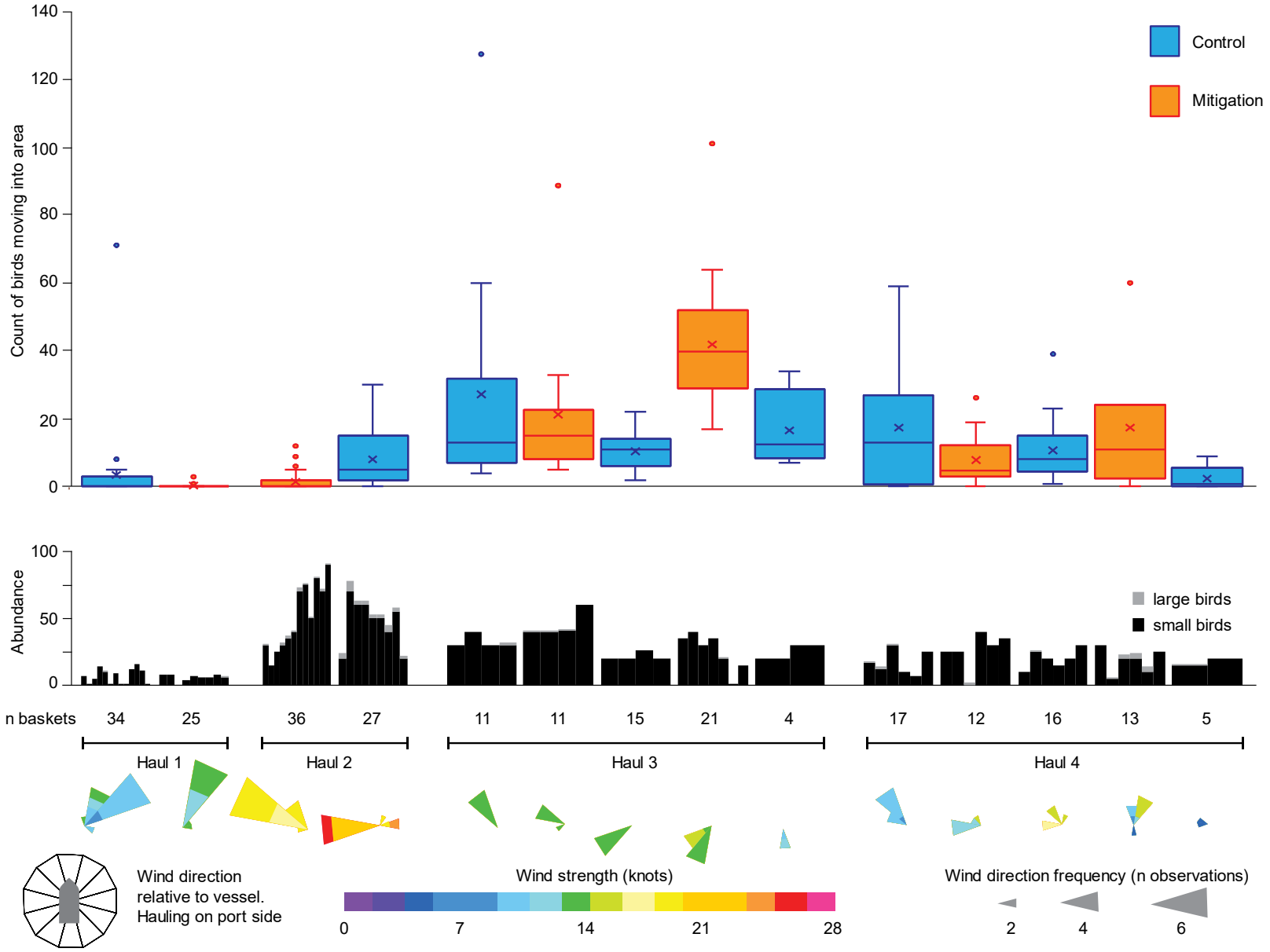
Results – Bird behaviour



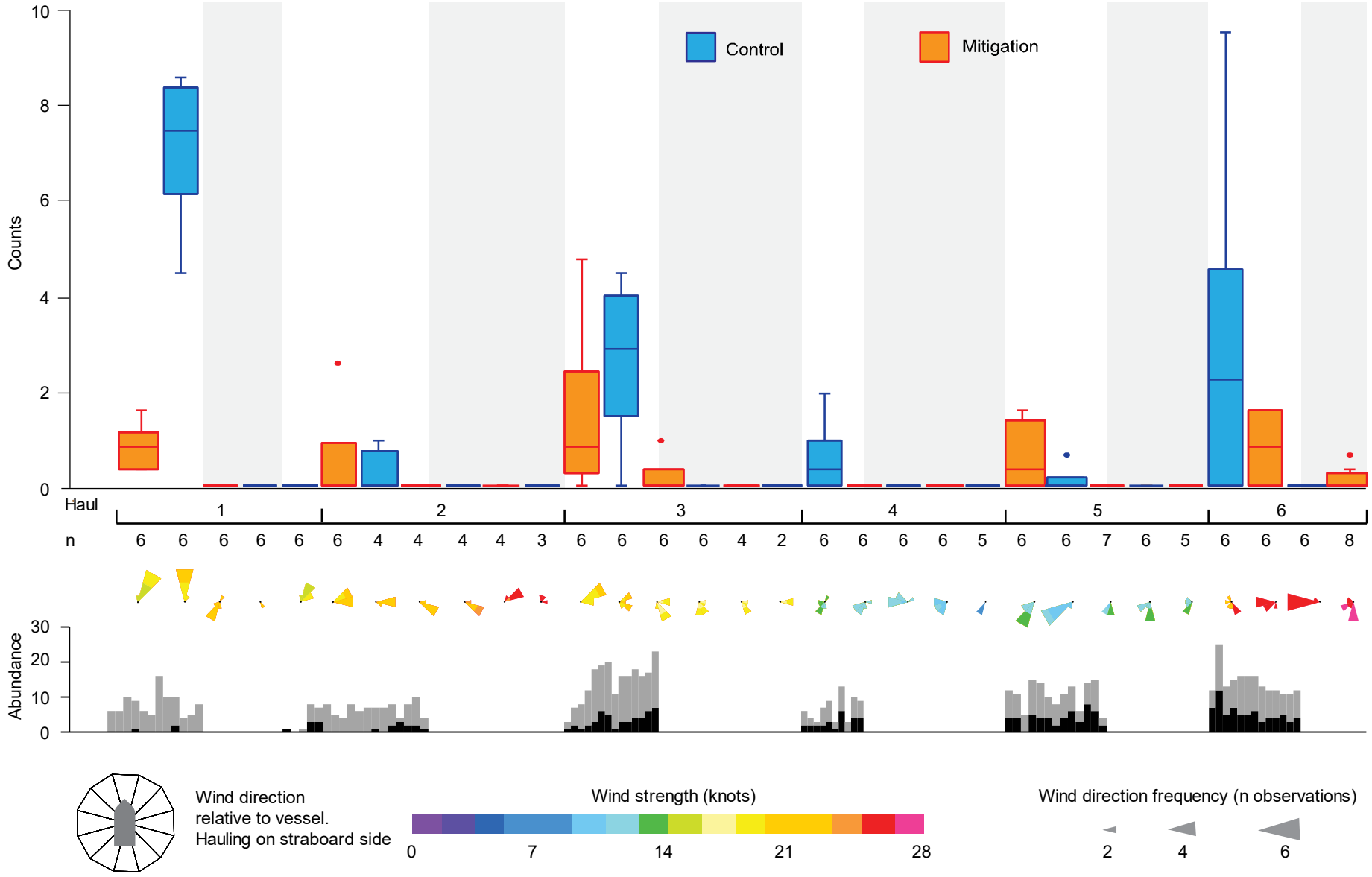
Results – Pelagic longline real time vs Go Pro video



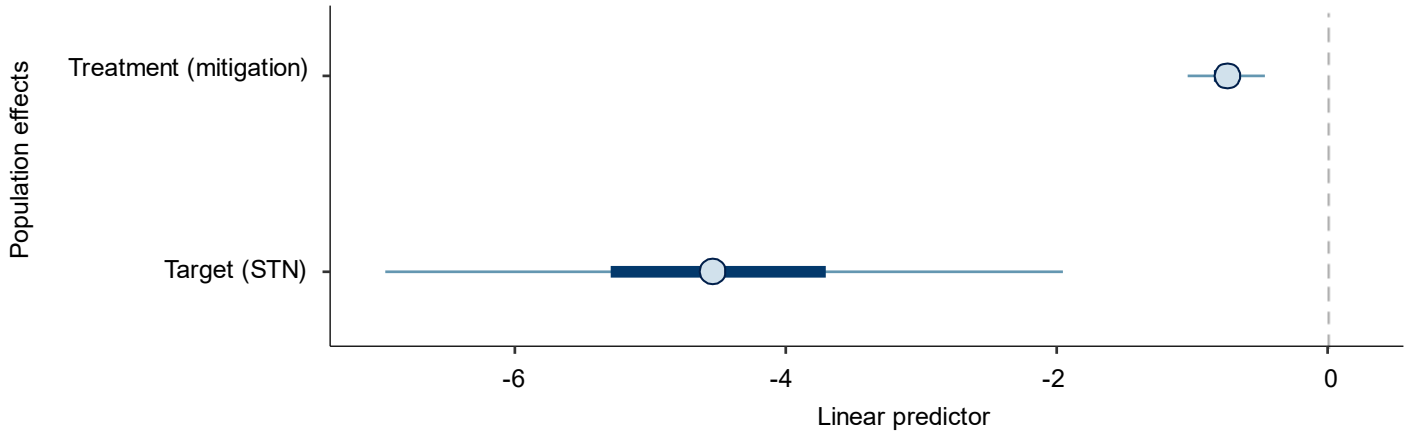
Results – Pelagic longline - summer

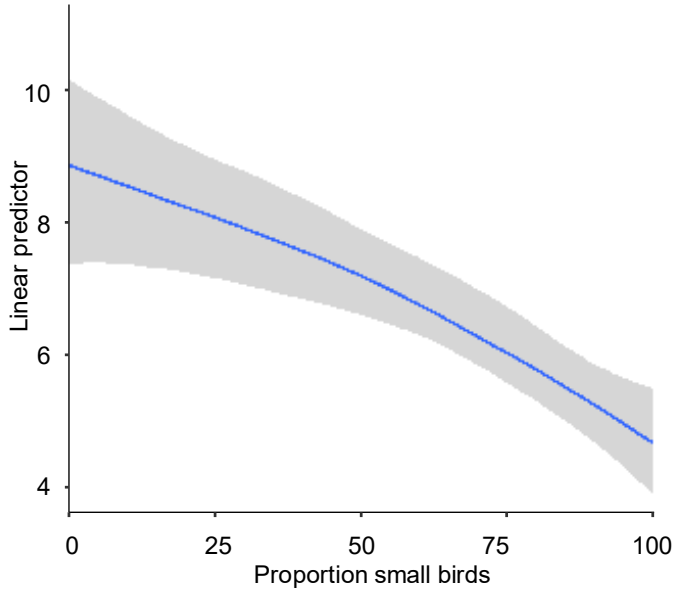


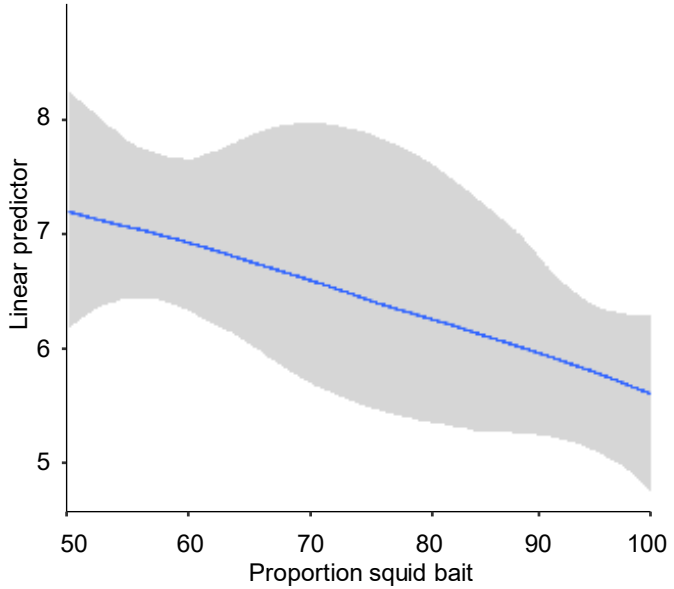
Results – Pelagic longline - winter



Results – Pelagic longline







Conclusions

- Results and feedback from skippers show that the simple, cheap, and hassle-free designs presented here are acceptable to fishers and reduce, but not eliminate, risk to birds during hauling.
- Encourage uptake across the fleet
- On some demersal longliners it may be possible to use a towed float
- The nature of pelagic longline gear provides a much larger area in which birds can access hooks. It is hard to mitigate birds diving in front of the vessel.
- The use of video footage, including EM derived footage, was adequate for assessing the efficacy of mitigation. Quantifying mitigation use and capturing this data when routinely reviewing EM data should be encouraged.

Acknowledgements

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