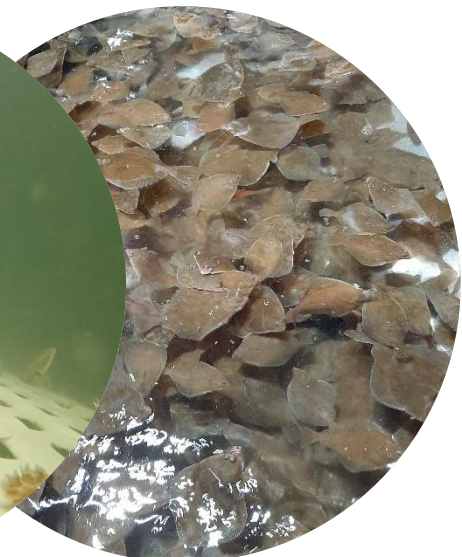


MHS trials in the Dutch mixed demersal beam trawl fishery

Improve fish quality and survival of discarded bycatch

Pieke Molenaar, Edward Schram, Alessa Mattens, Allard van Mens, Lennert vd Pol

Wageningen Marine research – The Netherlands



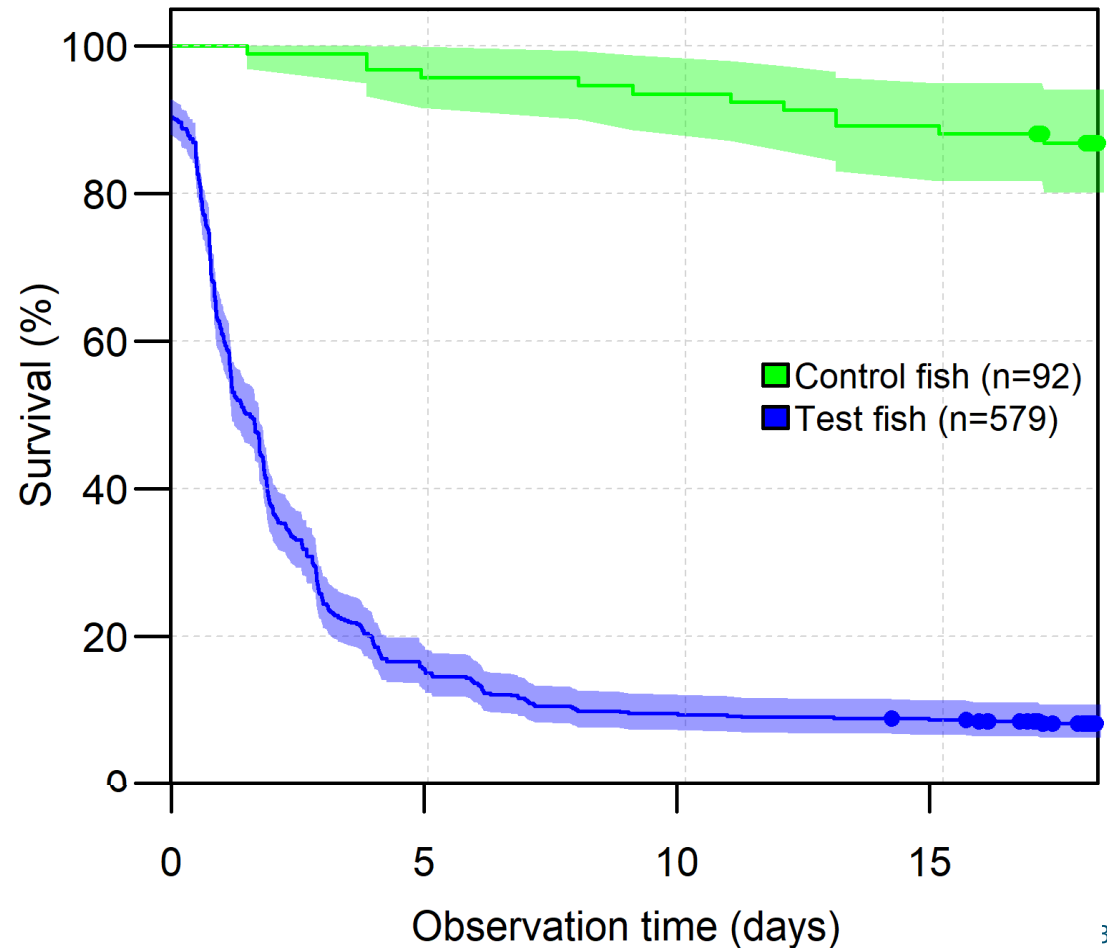
Introduction

- Tickler chain beam trawl
- Mixed fishery
- Main target species: Sole & Plaice
- High bycatch undersized plaice

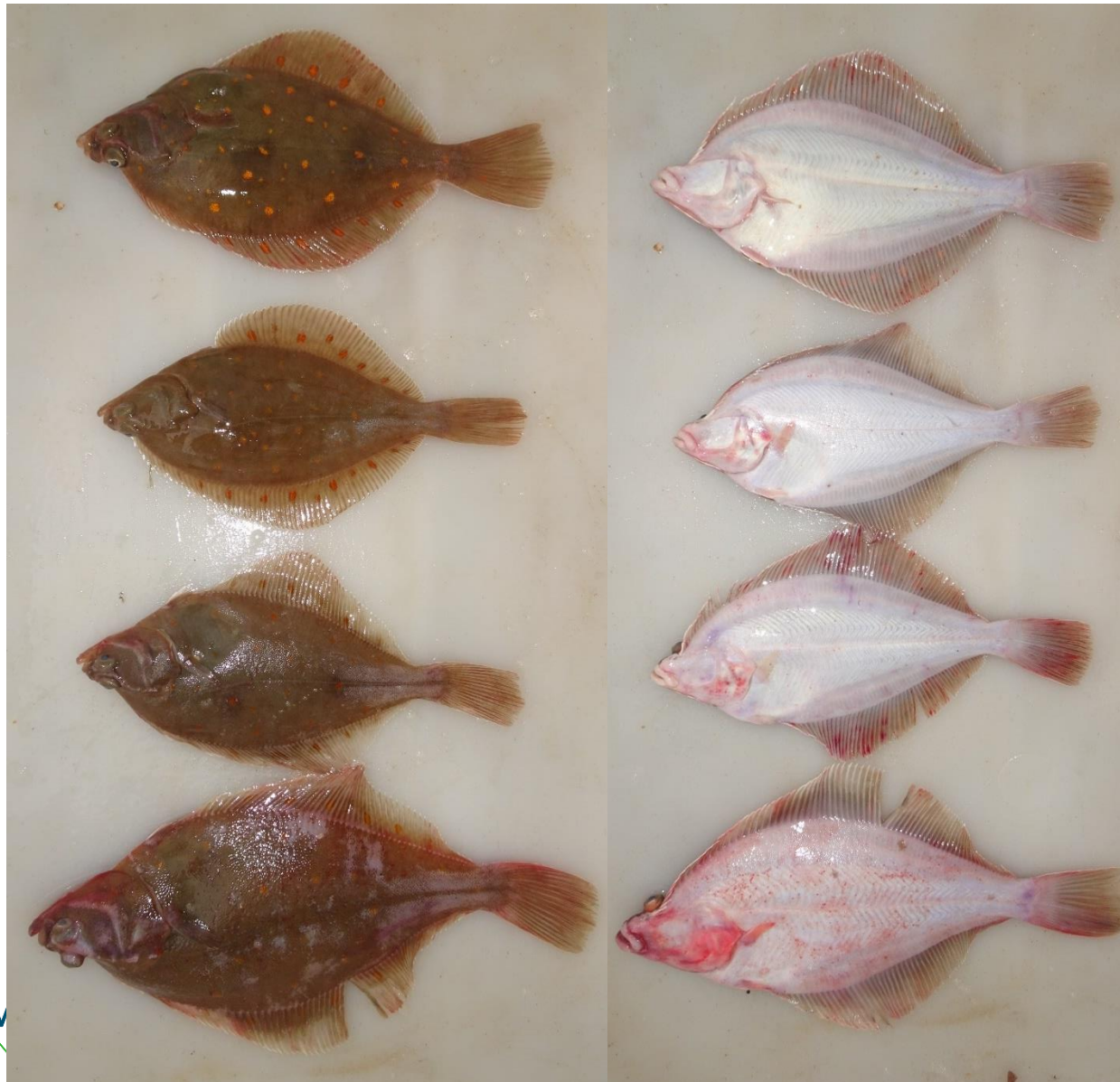


Undersized plaice discards survival in conventional Beam trawl

- Low survival after discarding



Undersized plaice post capture condition



A

B

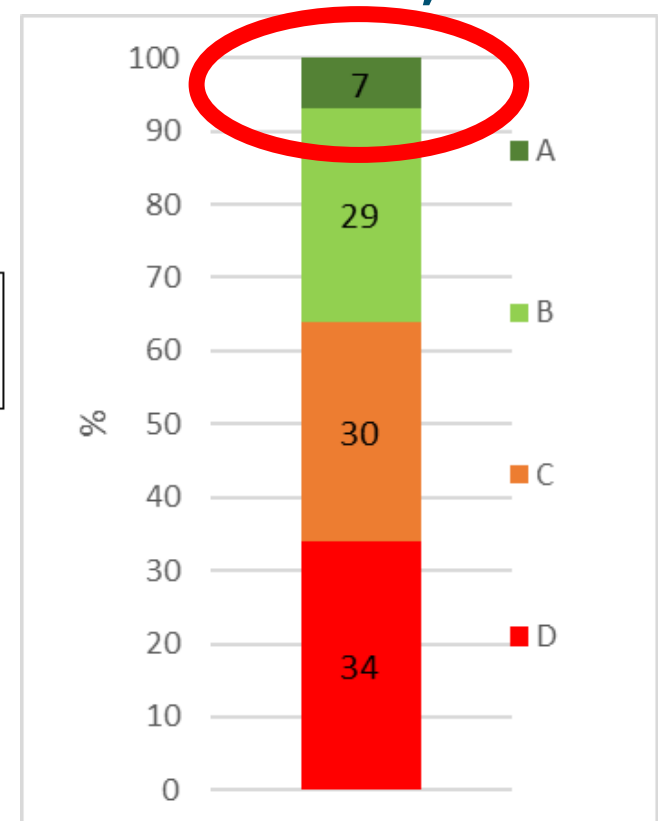
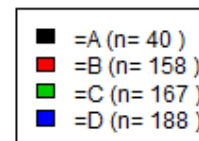
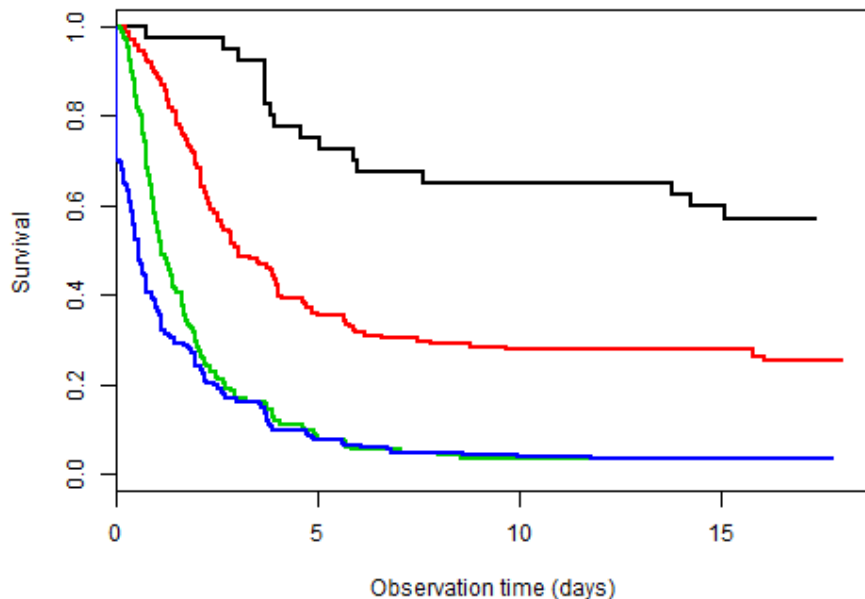
C

D

Condition undersized plaice



- Large effect condition on survival
- Poor condition = low survival
- Only 7% in good condition (A)
- **Improve condition = higher discard survival, welfare & product quality**



Modular Harvest System MHS to increase discard survival in beam trawling?

- New Zealand MHS concept replaces the lengthener and codend of a trawl



Design escape opening retention module

- Sole minimum landing size: 24 cm



Selectivity opening retention module

- MHS opening: 62 mm x 12 mm



Sea trials on commercial trawler

- MHS design and fabrication in New Zealand



Tickler chain beam trawl MHS



Inside a conventional cod-end



Conventional cod-end

Inside a MHS cod-end



Conventional cod-end

Hauling MHS



MHS comparison trials on beam trawler

Conventional versus MSH Codend

- Marketable catch
- Selectivity
- Undersized fish condition
- Discard survival



Marketable catch quality

MHS cod-end



Conventional cod-end



Condition score assessment



Undersized plaice condition

Conventional cod-end

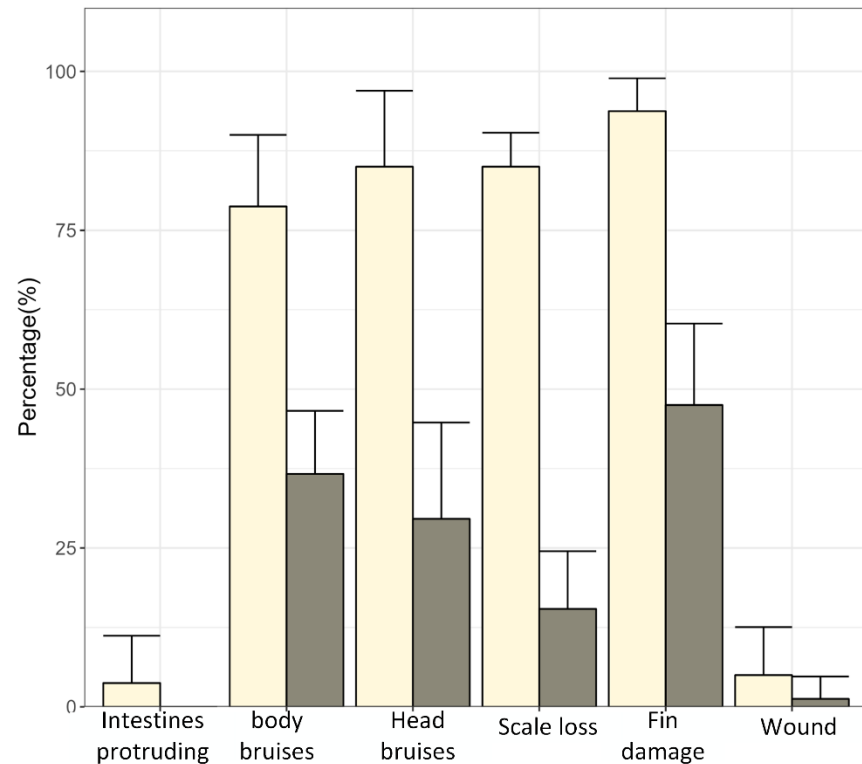
MHS cod-end



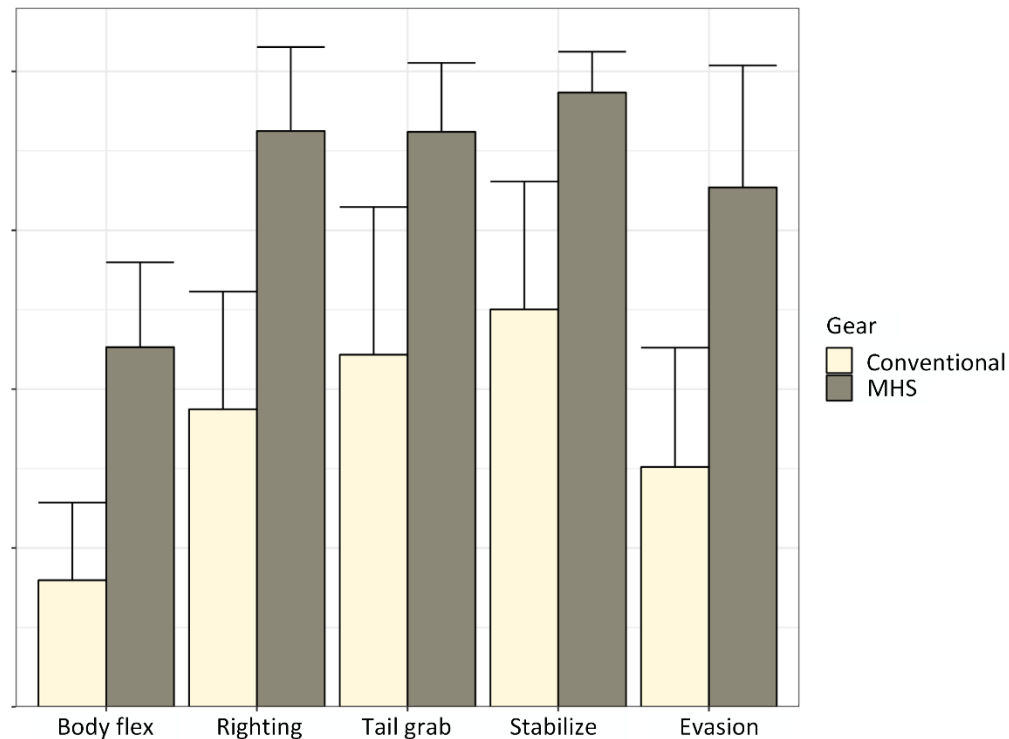
Undersized plaice Condition

- Reduction fish damage in MHS
- Reduction impaired reflexes in MHS
 - Fish less exhausted in MHS

Damage



Reflexes



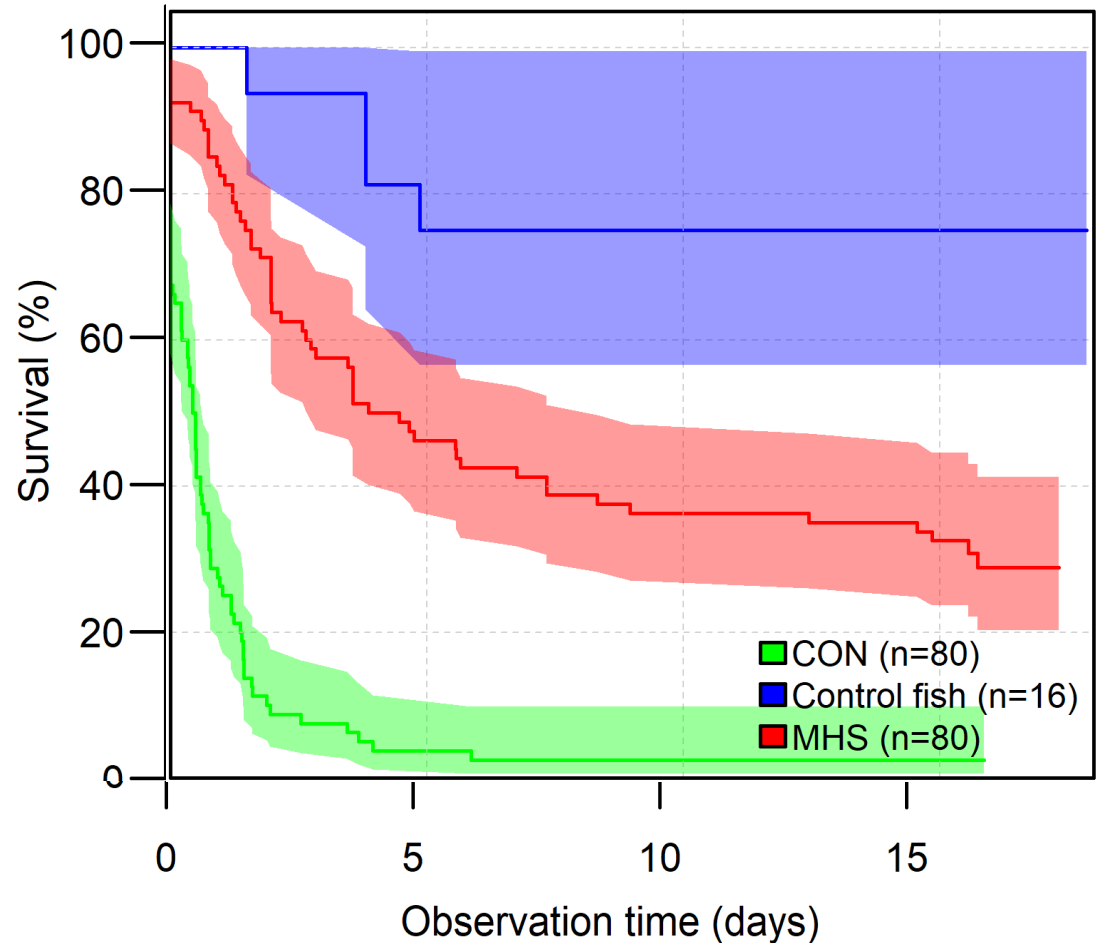
Undersized plaice discards survival

July 2023

- Conventional 4%
- MHS cod-end 30%

- Improved onboard catch processing may further increase survival

- Higher survival in winter months!

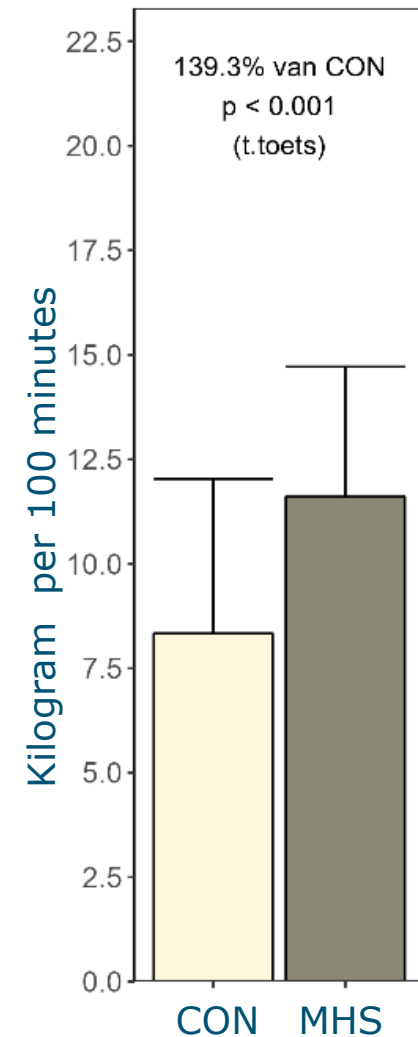


Catch composition - Landings



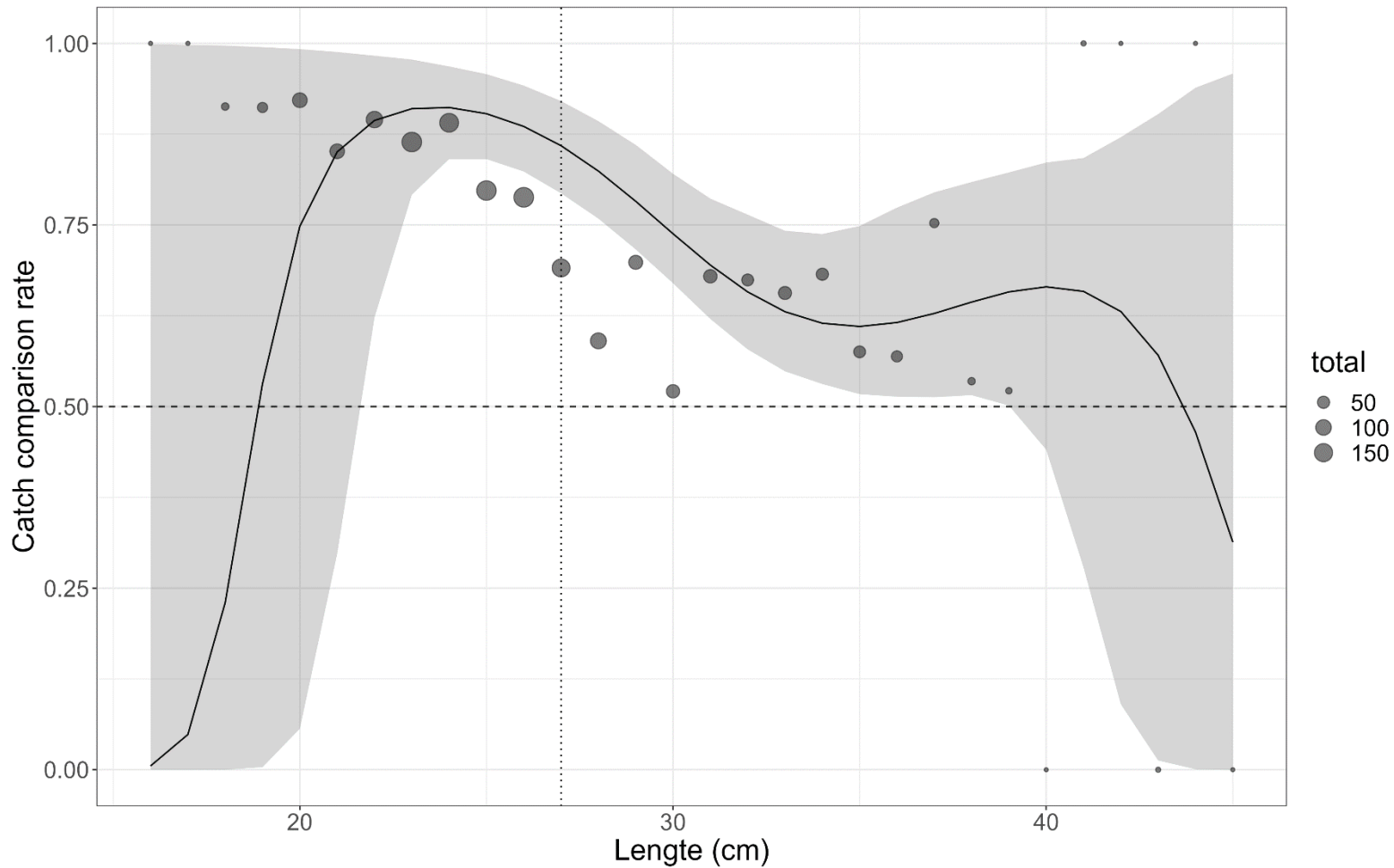
Marketable fish

- 40% increase sole landings in MHS
- No differences other species



Selectivity Sole

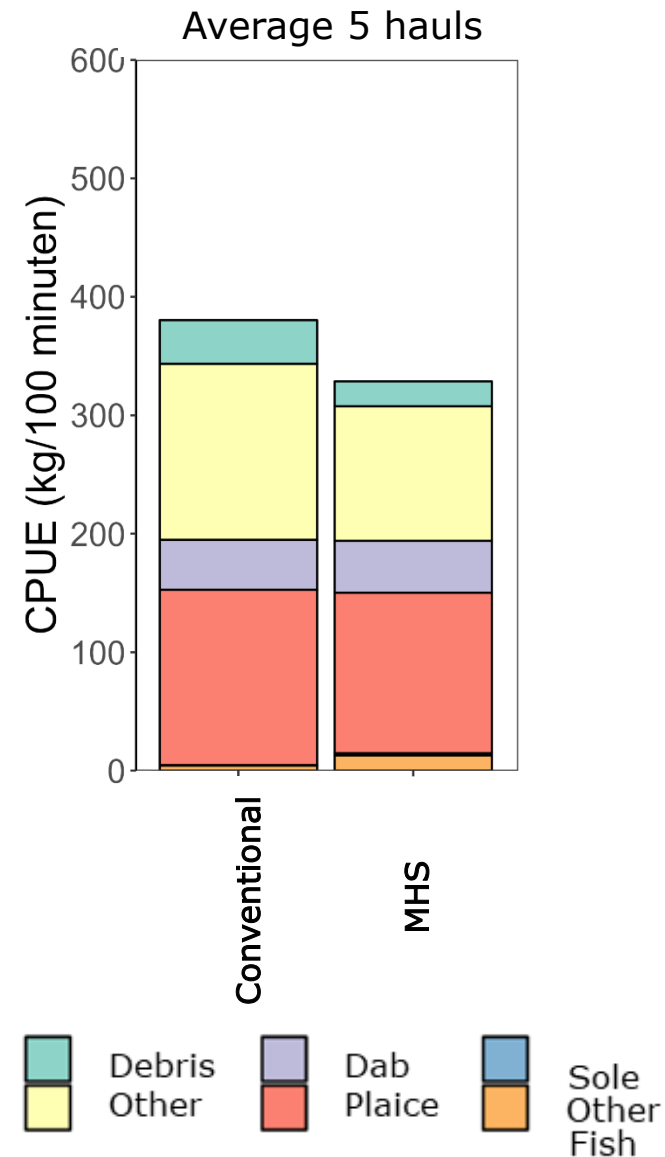
Higher MSH Sole catches



Catch composition - Discards

Discards

- 15% overall reduction
 - Brittle stars
 - Swimming crabs
- Increased bycatch undersized sole



Conclusions

- Improved fish condition & discards survival
- Improved product quality
- Similar selectivity + higher survival = reduced fishery mortality undersized fish
- Opportunities for species specific selectivity (shape & behaviour) -> future focus
- Technology Readiness Level 7 for Beam trawl fishery



Future developments

- Improve on board catch processing
- Endurance experiment fishery (different fishing grounds)
- Legalization within EU en UK waters
- Use for species specific selectivity measures
- Explore application in other fisheries (Otter trawl / Flyshoot)



Questions?



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