CAN PULSE TRAWLING REDUCE THE MECHANICAL IMPACT ON THE BENTHIC ECOSYSTEM IN THE BOTTOM TRAWL FISHERY FOR SOLE?

Beam trawl
Pulse trawl (sumwing)
Cramp reaction
Multiple stimuli in net opening
Flexible flatfish
Beam trawl versus pulse trawl

V-shaped groundrope
Mechanical stimulation by chains
High towing speed (6-7 kn)

Straight groundrope
Pulse stimulation by electrodes
Lower towing speed (5 kn)
Electric pulse field
Beam trawl versus pulse trawl
BACI experiments

Sea trials – comparison of impact tickler vs pulse
- Benthic dredge
- SPI
- Boxcorer
- Sediment-sledge
- Multibeam (acoustic)
- Catch comparison
- Catch Injury Index
- Stomach analysis
Mechanical impact

Trawl track

- Depression
- Settled after resuspension
- Disturbed sediment
- Compacted sediment

Resuspension sediments & nutrients; digging out of stones, shells, etc; homogenising texture of seafloor; mortality of benthos; indirect effects on scavengers & benthivorous fish
BACI experiments

Multibeam recordings
Deepening of the trawl track (cm)

Cumulative probability of occurrence

Depestele et al (in prep)
Sediment profile images (SPI)

Beam trawl tickler

Pulse trawl

Disturbed layer

Depestele et al (in prep)
Sediment profile images (SPI)

Cumulative probability of occurrence

Disturbance of sediment (cm)
Catch composition of benthos

BACI experiment

Total bycatch

Individuals/km²

Pulse trawl: 29,600
Beam trawl: 51,500
BACI experiment

Trawl path mortality

Not fished

Tickler chains

Pulse

\[ \log(B_{m2} + 1) \]
BACI: Effect of feeding

Stomach content

Scalibregma inflatum
Mortality rate due to trawl passage

Benthic indicators for seafloor disturbance
Main conclusions

• Seafloor disturbance of beam trawl > pulse trawl
• Overall impact in NS has reduced with the introduction of the pulse trawl
• Benthics has delivered a method with indicators that quantify seafloor disturbance
• This method is a useful tool for managing seafloor disturbance
Thank you for your attention!