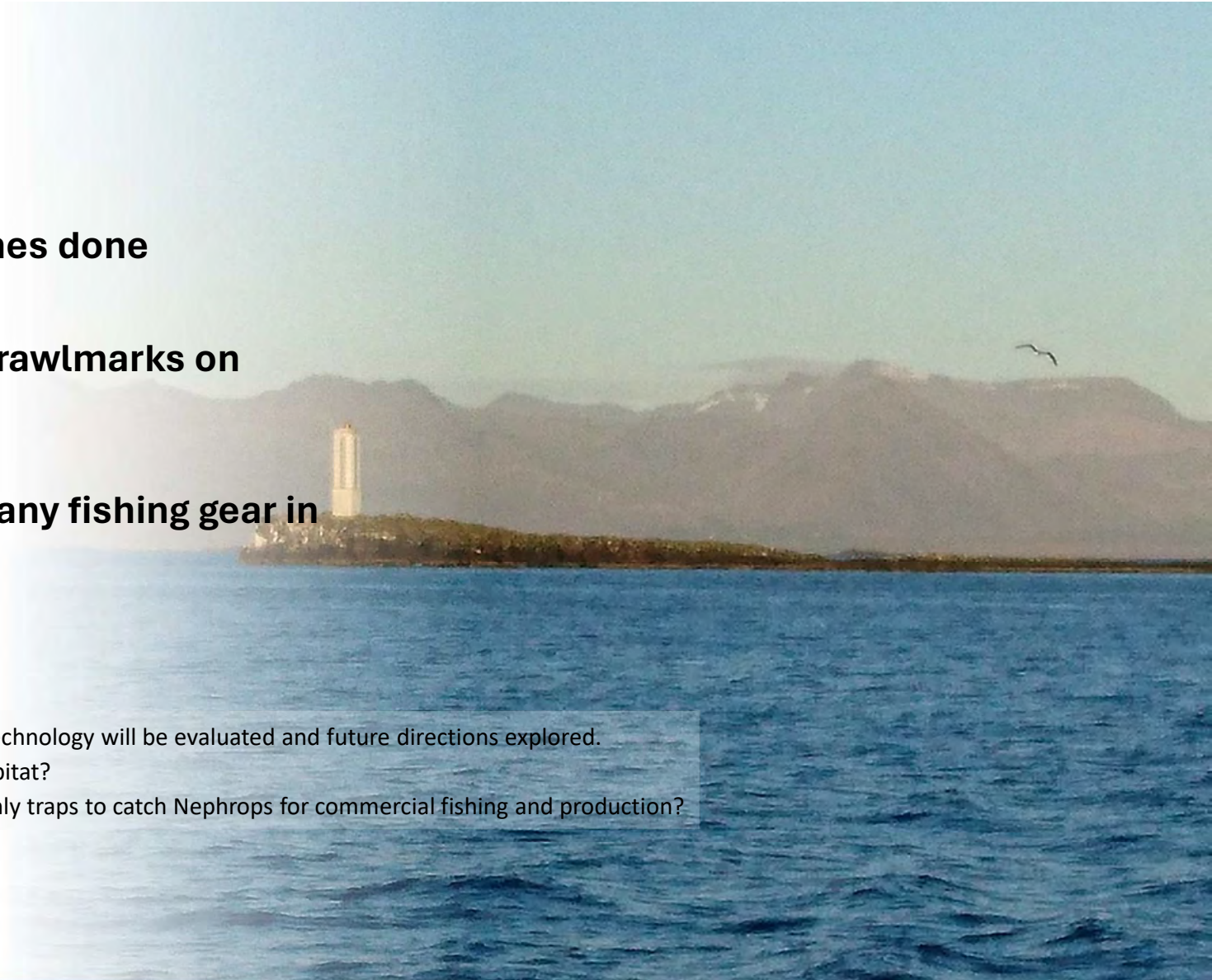


The Nephrops Fishery in Iceland

Haraldur Arnar Einarsson
MFRI

Intro

- **Overview of gear researches done**
- **Using UWTV to estimate trawlmarks on Nephrops fishery ground**
- **Prose and cones of using any fishing gear in fishery**
- **Final**
 1. Recent developments in fishing gear technology will be evaluated and future directions explored.
 2. Is trawling damaging the Nephrops habitat?
 3. Is it realistic to ban trawling and use only traps to catch Nephrops for commercial fishing and production?



Overview of gear researches done

1992 Guđni Þorsteinsson

International Council for the
Exploration of the Sea

CM 1992/B:3 (Ref.K)
Shellfish Committee

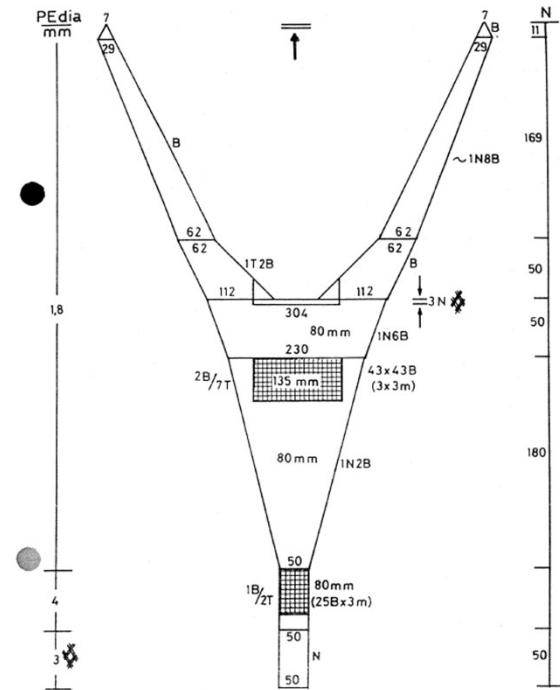
Experiments with square mesh windows in the Nephrops trawling off South-Iceland

by

Gudni Thorsteinsson
Marine Research Institute
Reykjavík

Abstract

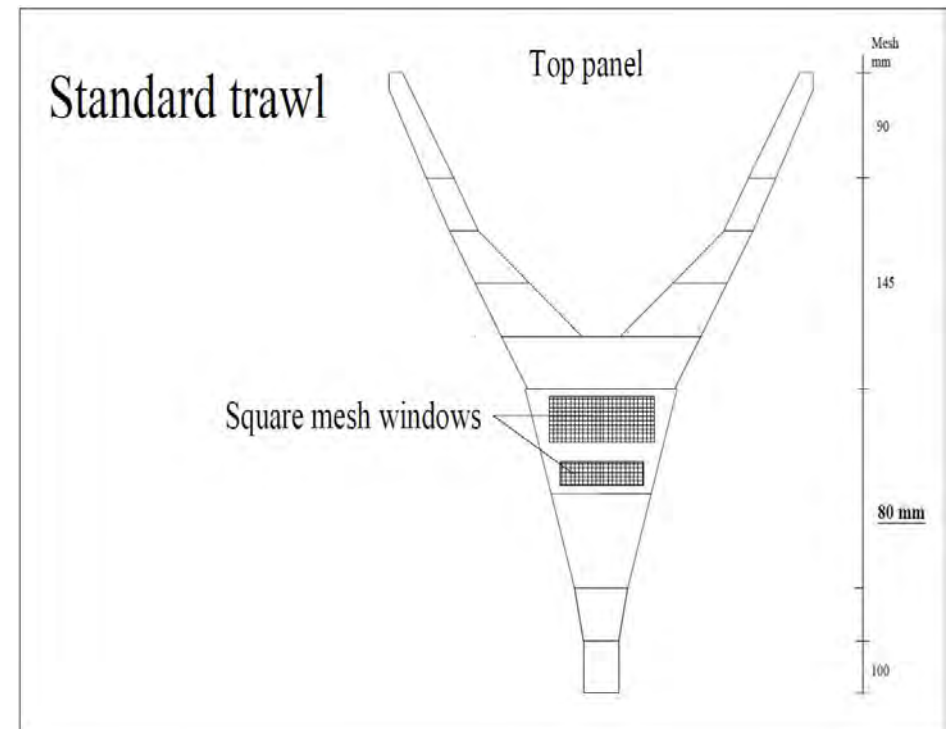
Bycatch of small haddock has often been a problem in the Icelandic Nephrops fishery. In May 1992 the Marine Research Institute in Reykjavík conducted experiments on board a commercial twin trawler fishing with two identical trawls, one of them with a square mesh window. A window made of usual Nephrops netting (80 mm) in the extension had little effect on the release of haddock whereas a window with 135 mm mesh opening inserted in the front part of the belly proved to be effective in releasing small haddock and whiting and even cod. All Icelandic Nephrops trawlers were obliged to use such a window from June 1st just 10 days after the experiments had been concluded.



Overview of gear researches done

2004 Haraldur A. Einarsson

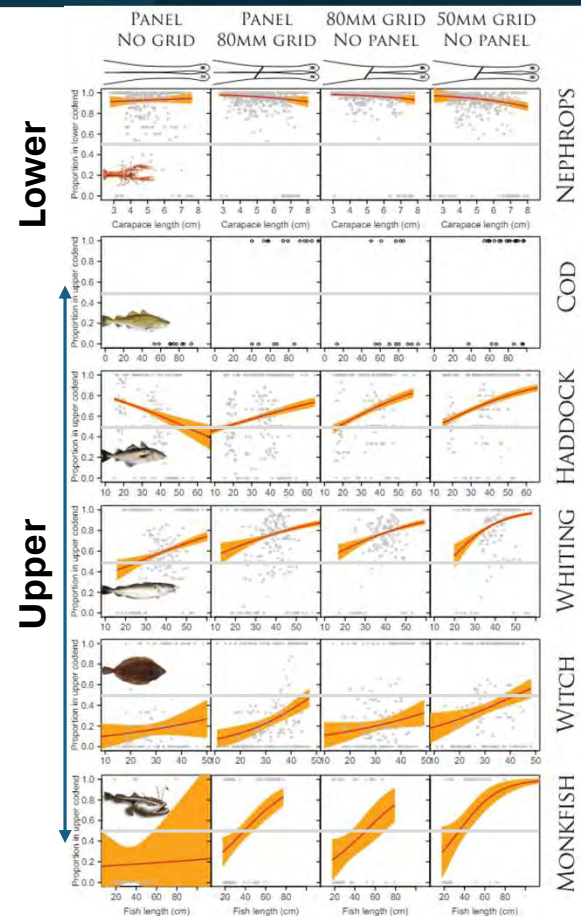
Proposed Regulation Amendment: Evaluation of Mandatory Square Window Size Requirement on Top Panel



Overview of gear researches done

2009 Olafur A. Ingolfsson

Experiment with using two vertically positioned codends, with or without separation panels in front and grids with different spaces between bars



Overview of gear researches done

2010 Olafur A Ingolfsson



Fisheries Research
Volume 108, Issue 1, February 2011, Pages 218-222



Short communication

The effect of forced mesh opening in the upper panel of a *Nephrops* trawl on size selection of *Nephrops*, haddock and whiting

[Ólafur Arnar Ingólfsson](#)

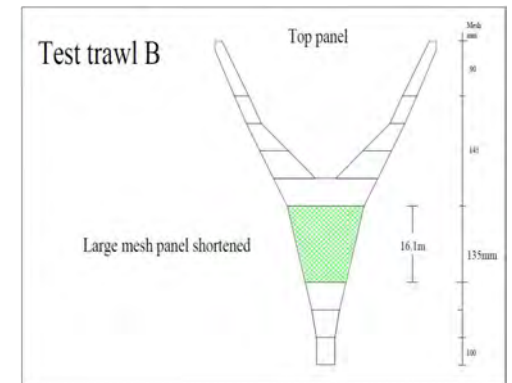
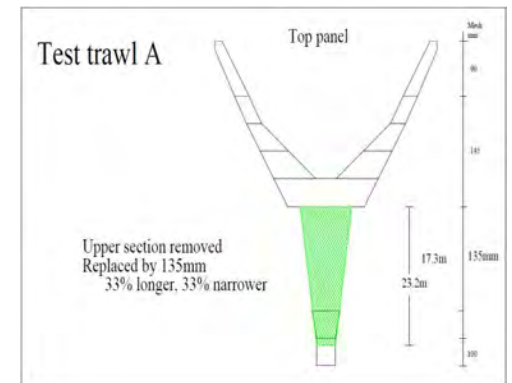
Show more

Two different designs with 135mm mesh panel

- A. 23.2m long panel
- B. 16.1m long panel

Main results

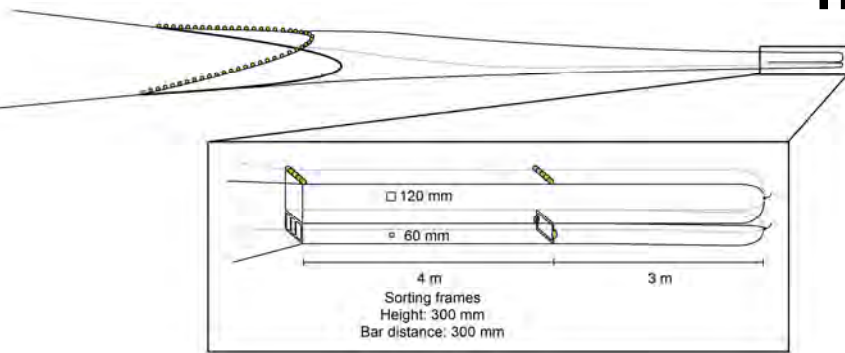
- A. Half of *Nephrops*, haddock and whiting lost, all sizes
- B. Declining of the smallest *Nephrops*, main fish species



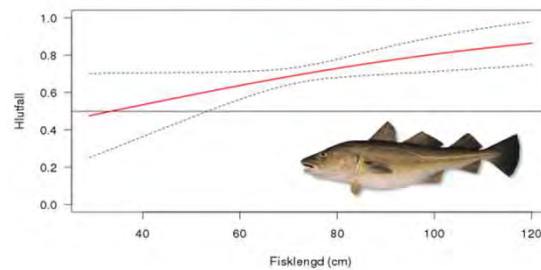
Overview of gear researches done

2010 Olafur A Ingolfsson & Haraldur A Einarsson

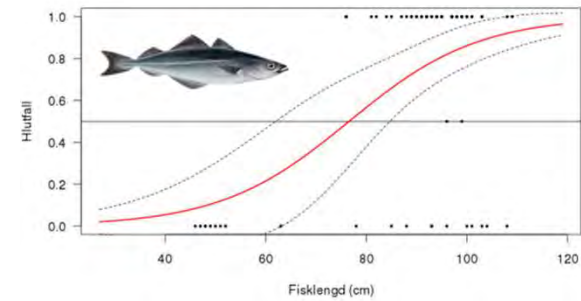
Trial on the Danish method



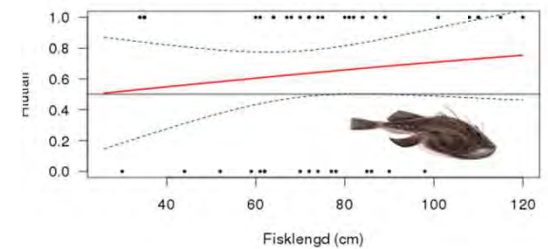
Ratio in the top codend



Ratio in the top codend



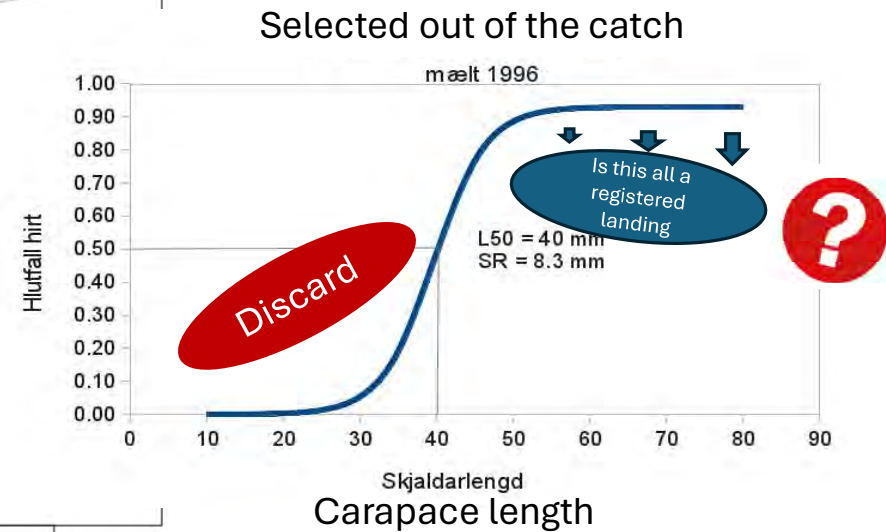
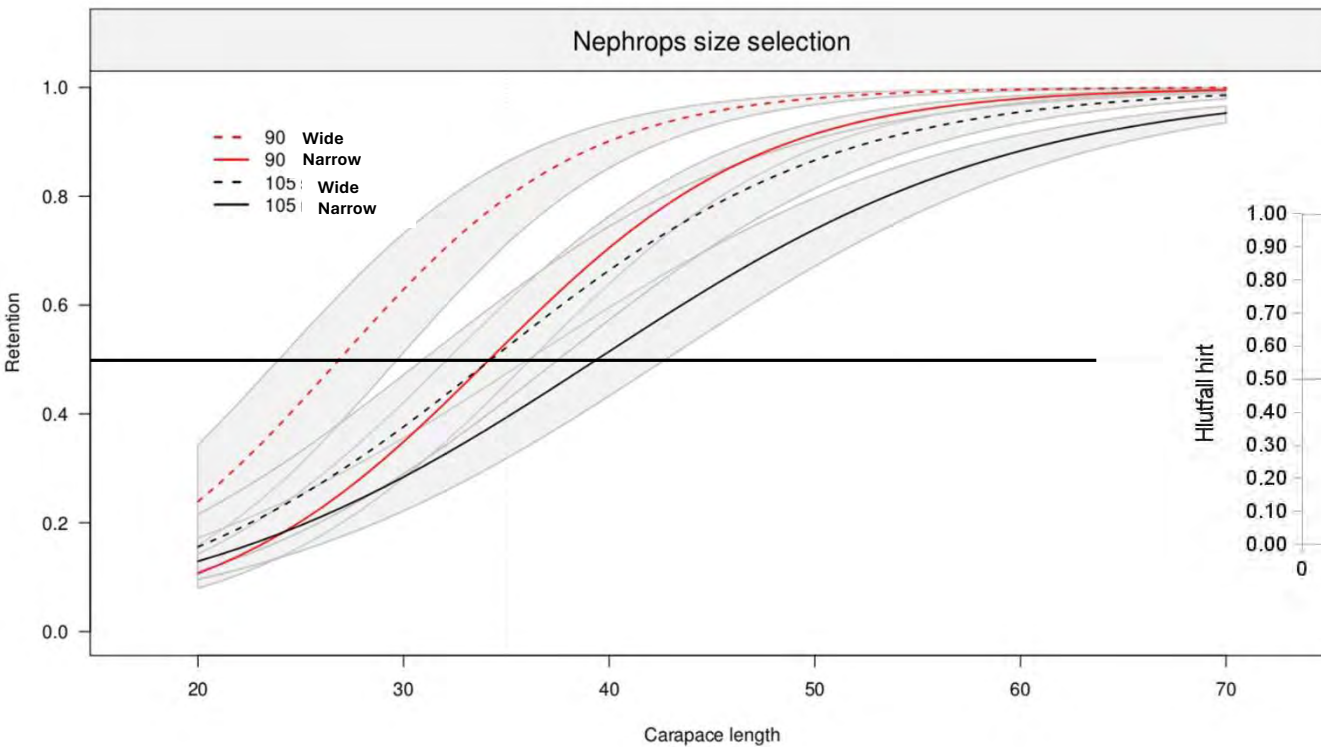
Ratio in the top codend



Overview of gear researches done

2012 Olafur A Ingolfsson & Haraldur A Einarsson

90 mm wide and narrow compared to 105mm wide and narrow



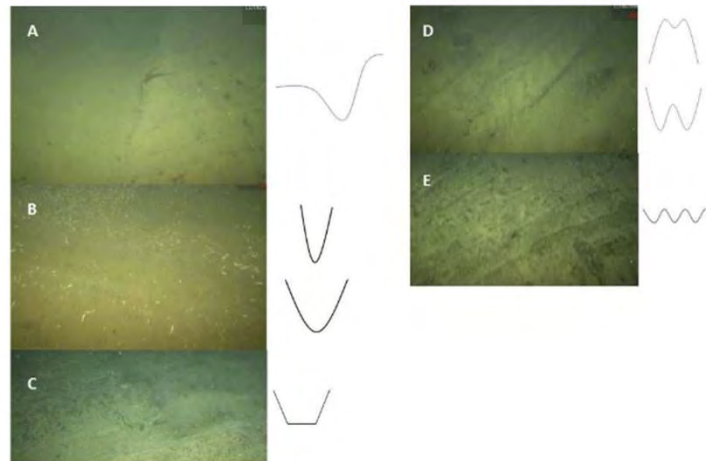
Using UWTV to estimate trawl marks on Nephrops fishery ground



HAF- OG VATNARANNSÓKNIR
MARINE AND FRESHWATER RESEARCH IN ICELAND

Use of Underwater TV-survey to monitor trawl marks on Nephrops grounds

Stefanie Haase, Haraldur Arnar Einarsson,
Jónas P. Jónasson og Julian M. Burgos



Classification of different types of trawl marks
6 types & 4 states

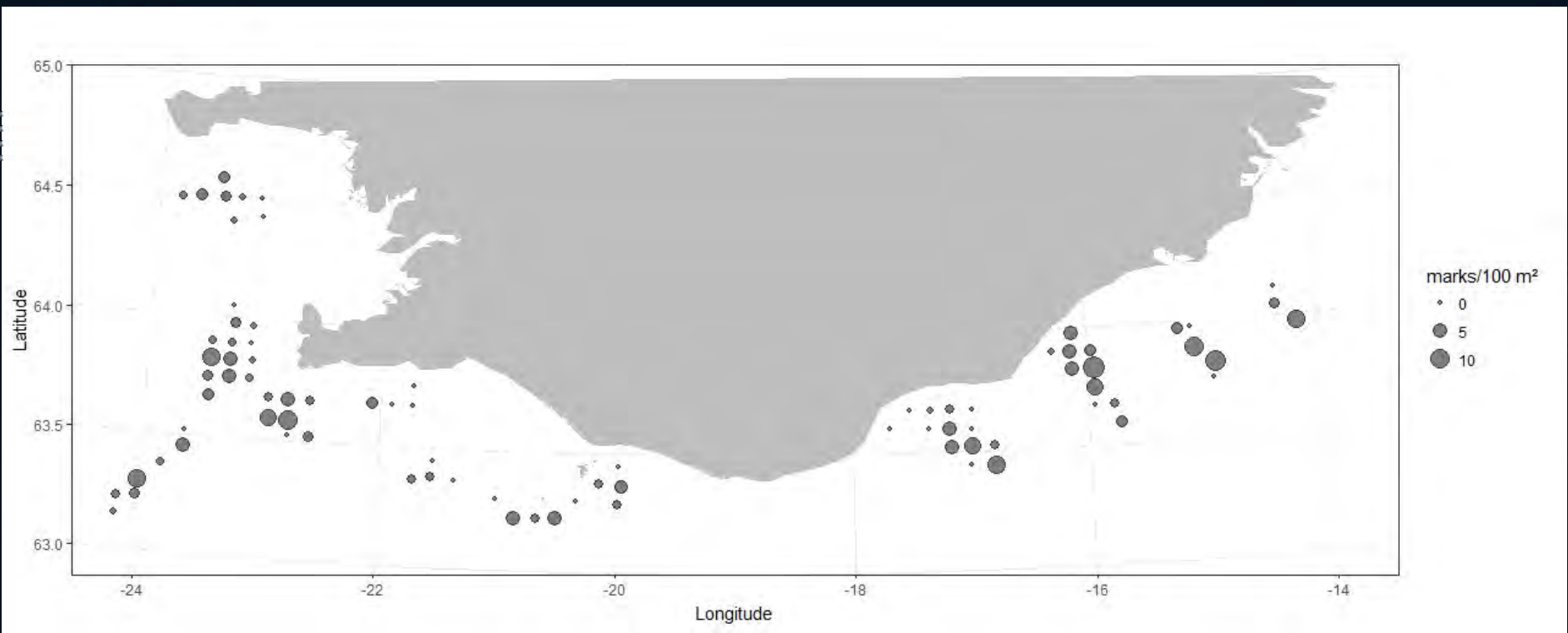
- A. Higher hill on one side of the furrow (Door mark).
- B. U or V shaped
- C. Wider and flatter bottom than B – weight between trawl.
- D. Two hills or furrows close to each other
- E. Wavelike furrows composed of smaller furrows
- F. Other types

| State | Title | Description |
|-------|------------------|--|
| 1 | distinguished | structure is fresh and detailed |
| 2 | started to erode | structure blurs |
| 3 | eroded | structure is rounded and soil deposited inmark |
| 4 | uncertain | maybe just a bottom feature |

Classification of the types of the trawl marks and how fresh

Trawlmarks per 100 m (2016)

- 71 % of station with at least one mark in 2016
- Average 2.5 furrows per station



Follow changes in sea pens abundance

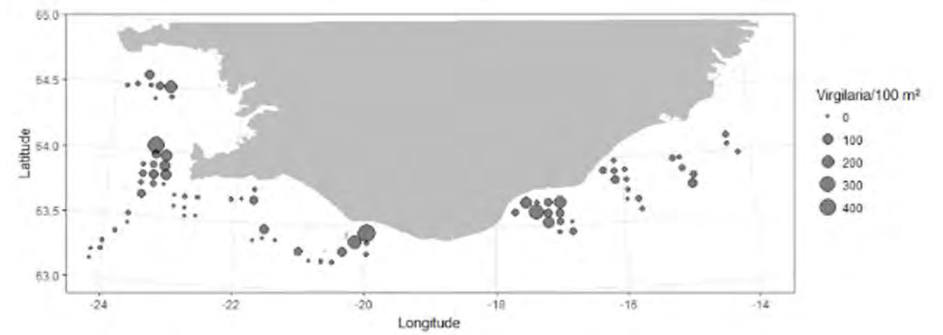


Figure 6. Number of *Virgularia* sea pens counted over a distance of 100 m², from 2016 UWTV-survey.

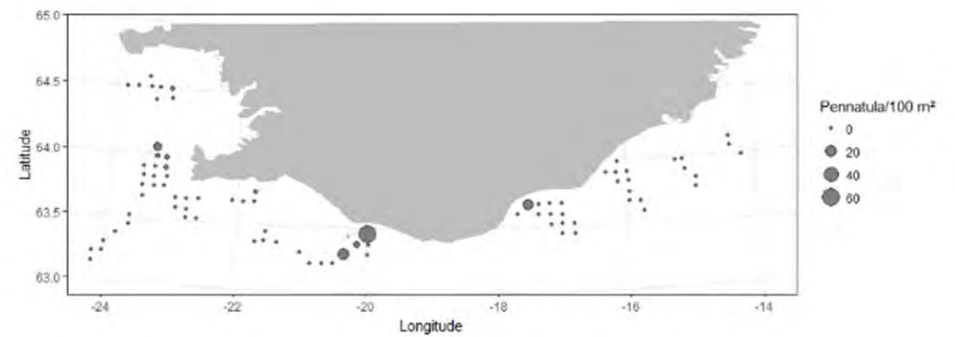
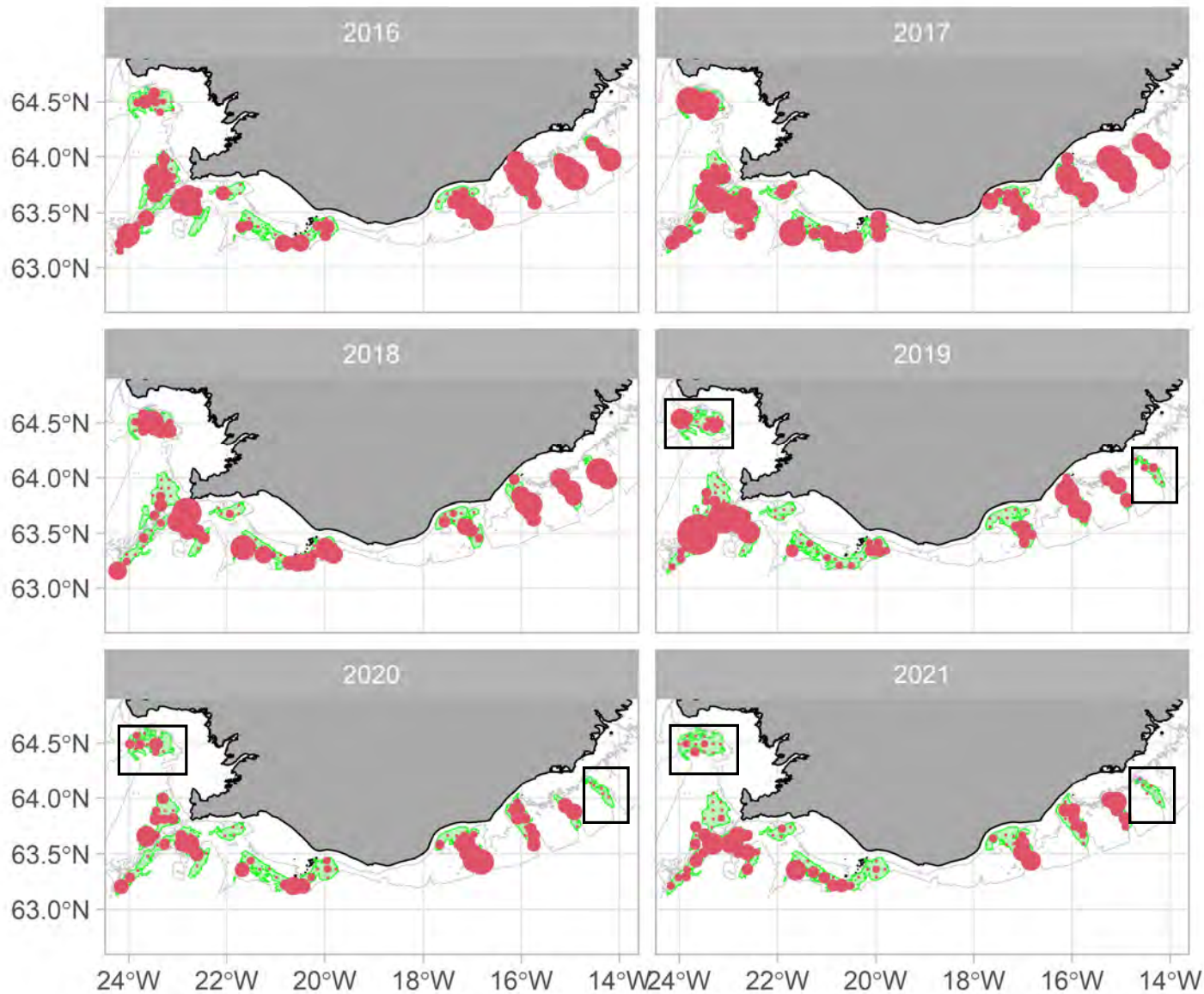


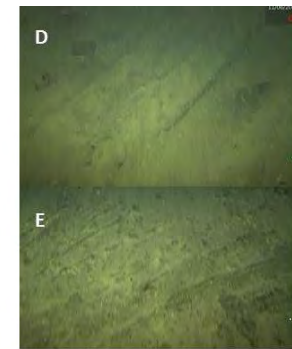
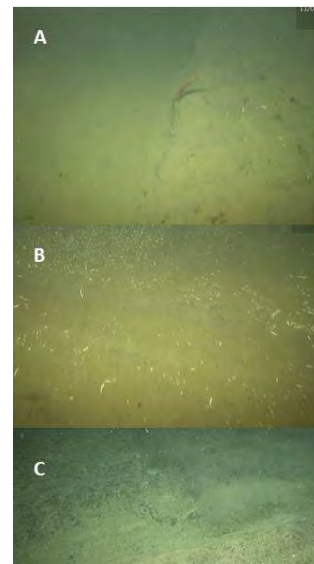
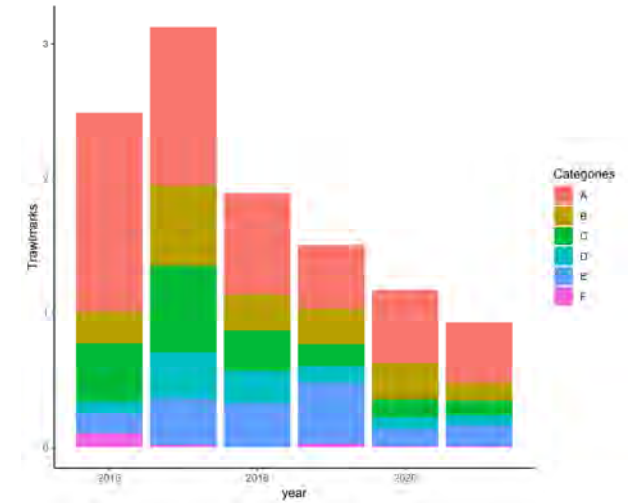
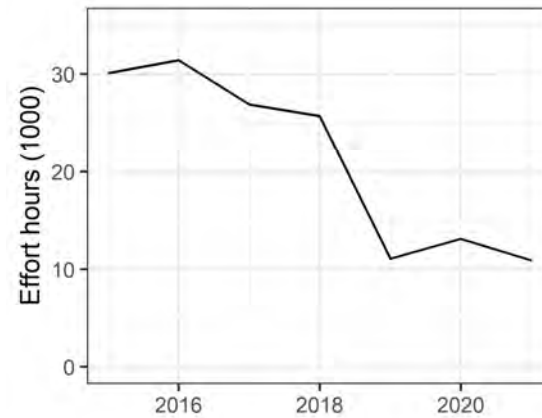
Figure 7. Number of *Pennatula* spp sea pens counted over a distance of 100 m², from 2016 UWTV-survey.



Trawlmarks on *nephrops* grounds in UWTV surveys of 2016 - 2021

Nephrops grounds of Jökuldjúp and Lónsdjúp were closed in 2019

Average trawl marks per station (per 100 m²) on *Nephrops* grounds in UWTV surveys of 2016 – 2021



Average trawl marks per station (per 100 m²) on *Nephrops* grounds in UWTV surveys of 2016 – 2021

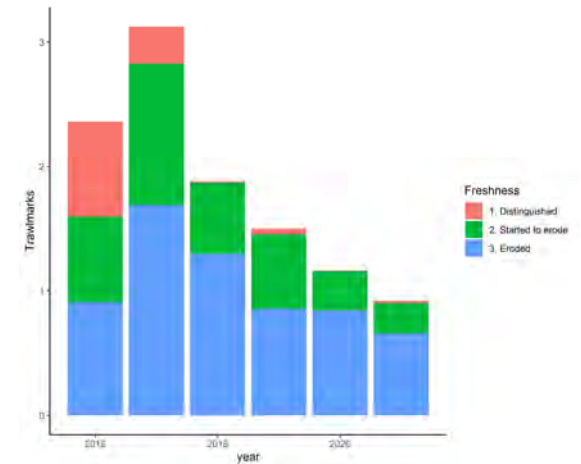
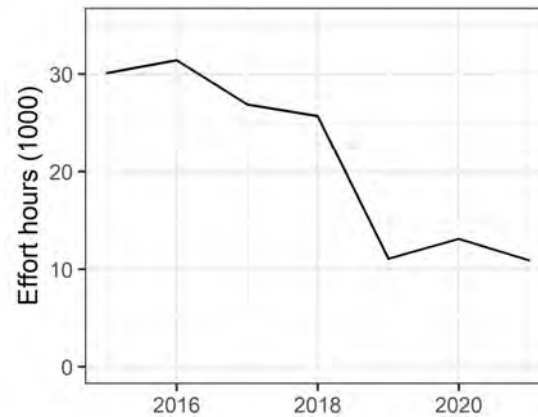


Table 1. Classification of different states of trawl marks.

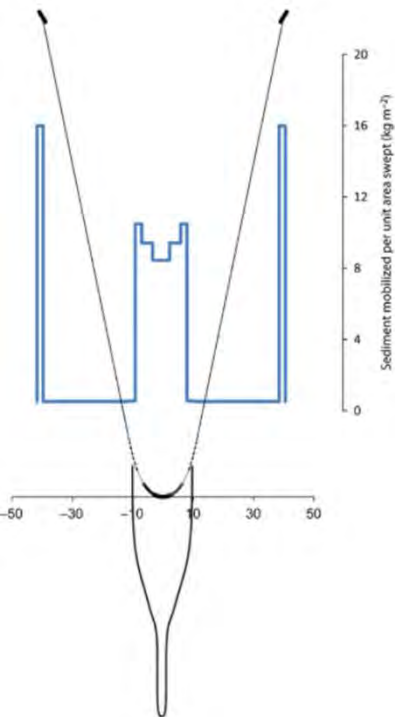
| State | Title | Description |
|-------|------------------|--|
| 1 | distinguished | structure is fresh and detailed |
| 2 | started to erode | structure blurs |
| 3 | eroded | structure is rounded and soil deposited inmark |
| 4 | uncertain | maybe just a bottom feature |

Pros and cons of using any fishing gear in fishery

With a standard Nephrops trawl, CPUE could be ~ 40kg/h

Catching 100 tons would be ~ 2500 hours of towing

- If ~ 100 meters between doors, the swept area might **cover over ~116 km²**
- **Thereof the doors could have covered some 4-8 km²**



- **Bycatch rate high**
- **Discard rate a fact**
- **ALDFG limited if any**
- **Ghost fishing none**

But we can:

- **Develop better trawls and lower the impact much**
- **Stop discarding totally**

With Nephrops creel (pot), CPUE could be ~ 0.3 kg/creel

Catching 100 tons would need to haul up 333 thousand pots



- **Need for ~15-30 tons of bait**
- **Footprint ~ 26000 – 50000 m²**
- **Ghost gears – 1% loss?**
- **Ghost fishing for several months (years)**
- **Almost no Bycatch**
- **Discard rate very low if any**

But we can:

- **Use by-products from the fishery for bait**
- **Implement stringent management practices for creel usage to minimize creel loss and prevent ghost fishing**



Final



1. **Recent developments in fishing gear technology will be evaluated, and future directions explored.**
 - The development of gear used in the Nephrops fishery has significant potential for improvement. However, progress requires time, funding, and industry cooperation.
2. **Is trawling damaging the Nephrop's habitat?**
 - Yes, all bottom fishing gear impacts marine life. However, solely blaming trawling for the decline of Icelandic Nephrops stock is inaccurate. Fisher activity contributes to stock collapses.
3. **Is it realistic to ban trawling and use only traps to catch Nephrops for commercial fishing and production?**
 - Relying solely on creels (pots) for Nephrops harvesting could pose unforeseen environmental challenges in the Icelandic fishery. Significant improvements in management and observation systems would be needed.
 - Alternatively, advancements in trawling methods could mitigate its environmental impact compared to other gear types.

TAKK FYRIR

