Strategies for the gradual elimination of discards in European fisheries

DiscardLess

- EU Horizon 2020 Program
- 31 partners in 12 countries
- Coordinated by
  - Clara Ulrich DTU - Aqua

DiscardLess

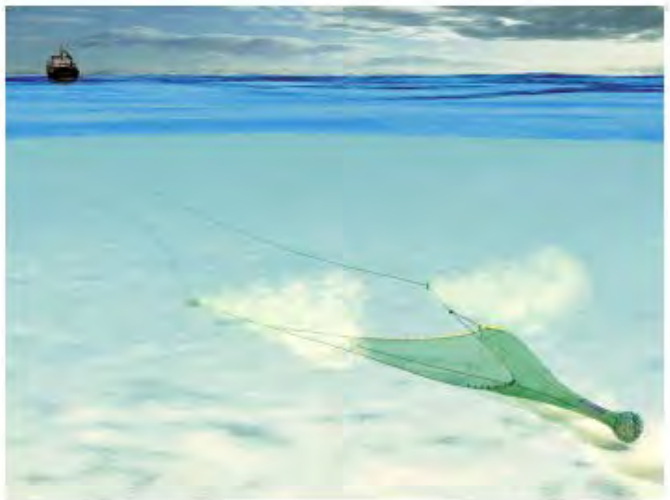
- make best use of unwanted catches
- estimate the ecosystem effects of the removal of biomass hitherto discarded at sea
- How to control and monitor compliance with the landing obligation
- avoid unwanted catches

WP3 -Avoidance through technological changes

- Manual of trawl selectivity
- Fact sheets of selectivity trials
- Meta analysis of selectivity data
- Using light to modify selectivity

SELECTIVITY IN TRAWL FISHING GEARS

F.G. O'Neill and K. Mutch



marinescotland science

The Scottish Government

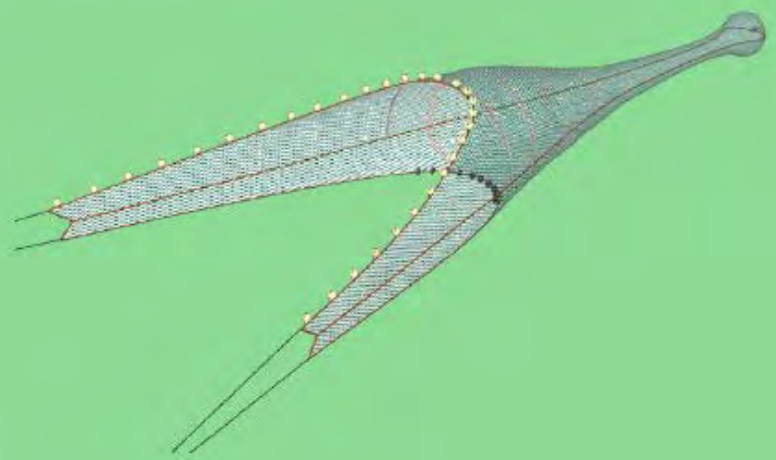
DiscardLess

INTRODUCTION

In this manual we describe the different stages of the fish capture process, highlight how different parts of the gear may influence selection and identify possible design changes which can alter the selectivity of the gear. The intention is to make fishermen, net makers and fisheries managers more aware of the possible modifications that can be made to their gears so that they can design and develop gears with a selective performance suitable for their particular fishery.

We have also assembled a catalogue of fact sheets which provide brief descriptions of many of the catch comparison and selectivity trials that have taken place in the North Atlantic and adjacent seas. This is again to highlight the potential gear modifications that can be made and to provide an indication of their likely effect. It is important to bring together this type of information and to disseminate it as broadly as possible. Not only will the preferred selective performance differ at a fishery by fishery level, it may also vary at a vessel by vessel level, as individual fishermen may wish to tailor their gears to the specific catch and quota restrictions they may face and/or to optimise their response to the prevailing market forces.

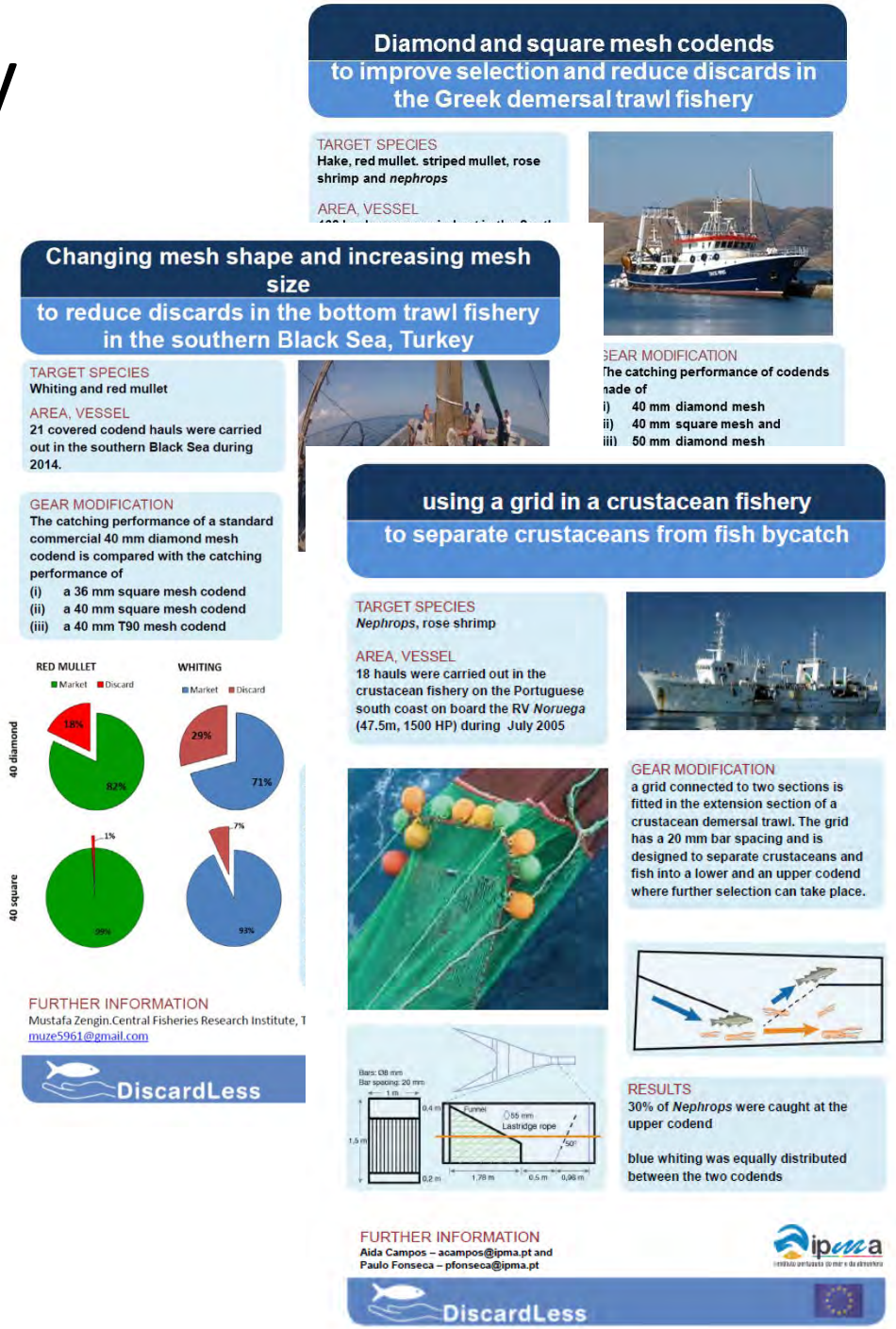
Furthermore, the catalogue of factsheets is by no means exhaustive, indeed, it is just a starting point that needs to be added to and built upon.



Factsheets of selectivity trials

About 70 from
Turkey, Greece, Italy,
Spain, Portugal, England,
Scotland, Ireland, Belgium,
Holland, Denmark, Germany

available online



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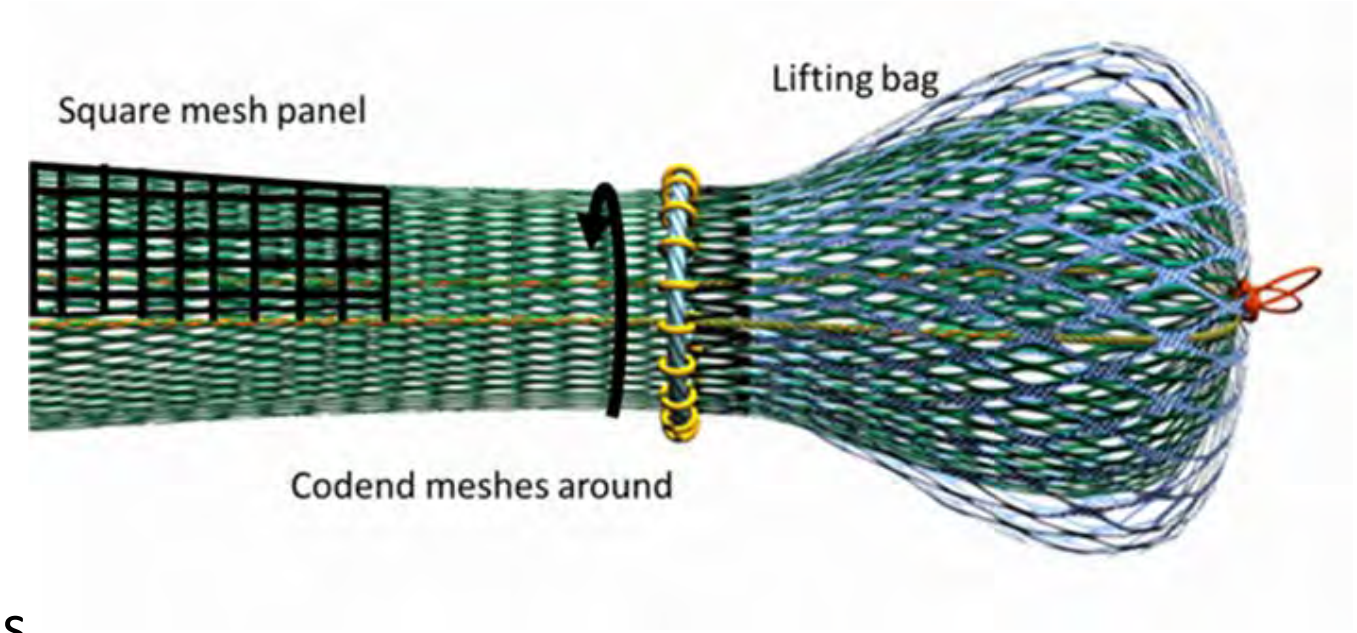
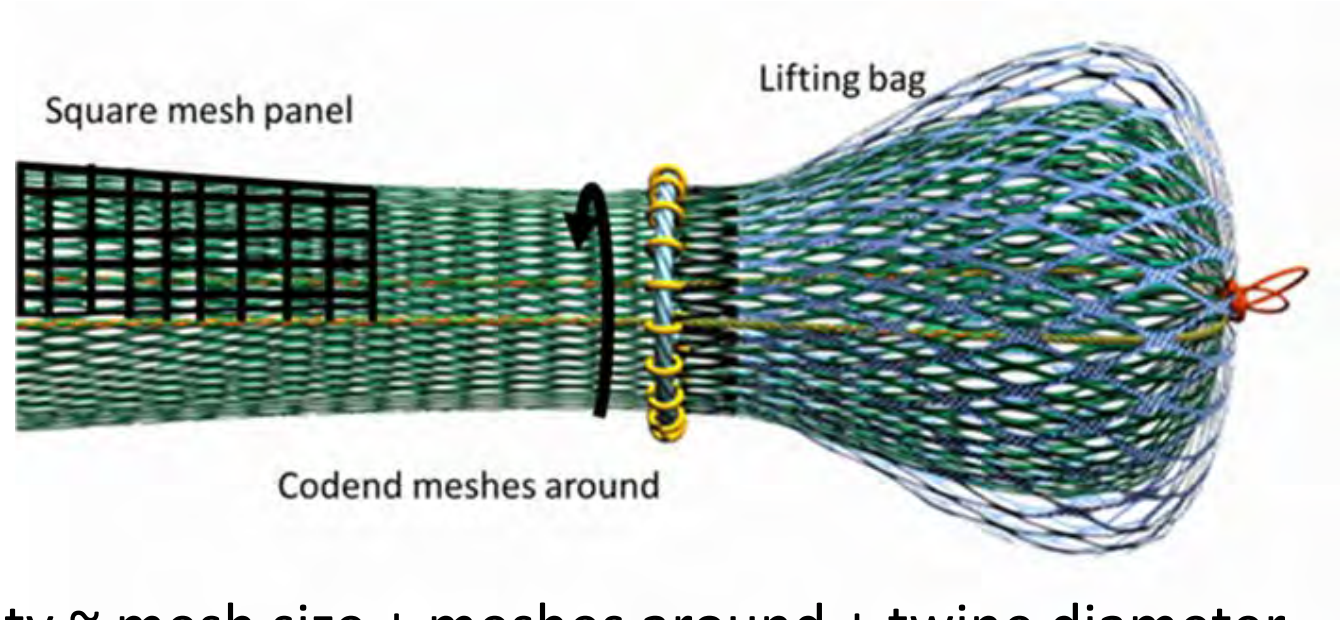
meta-analysis of haddock selectivity data



- 38 sets of trials
  - 20 diamond mesh selection
  - 18 diamond mesh codend with a square mesh panel
- 614 individual hauls

meta-analysis of haddock selectivity data

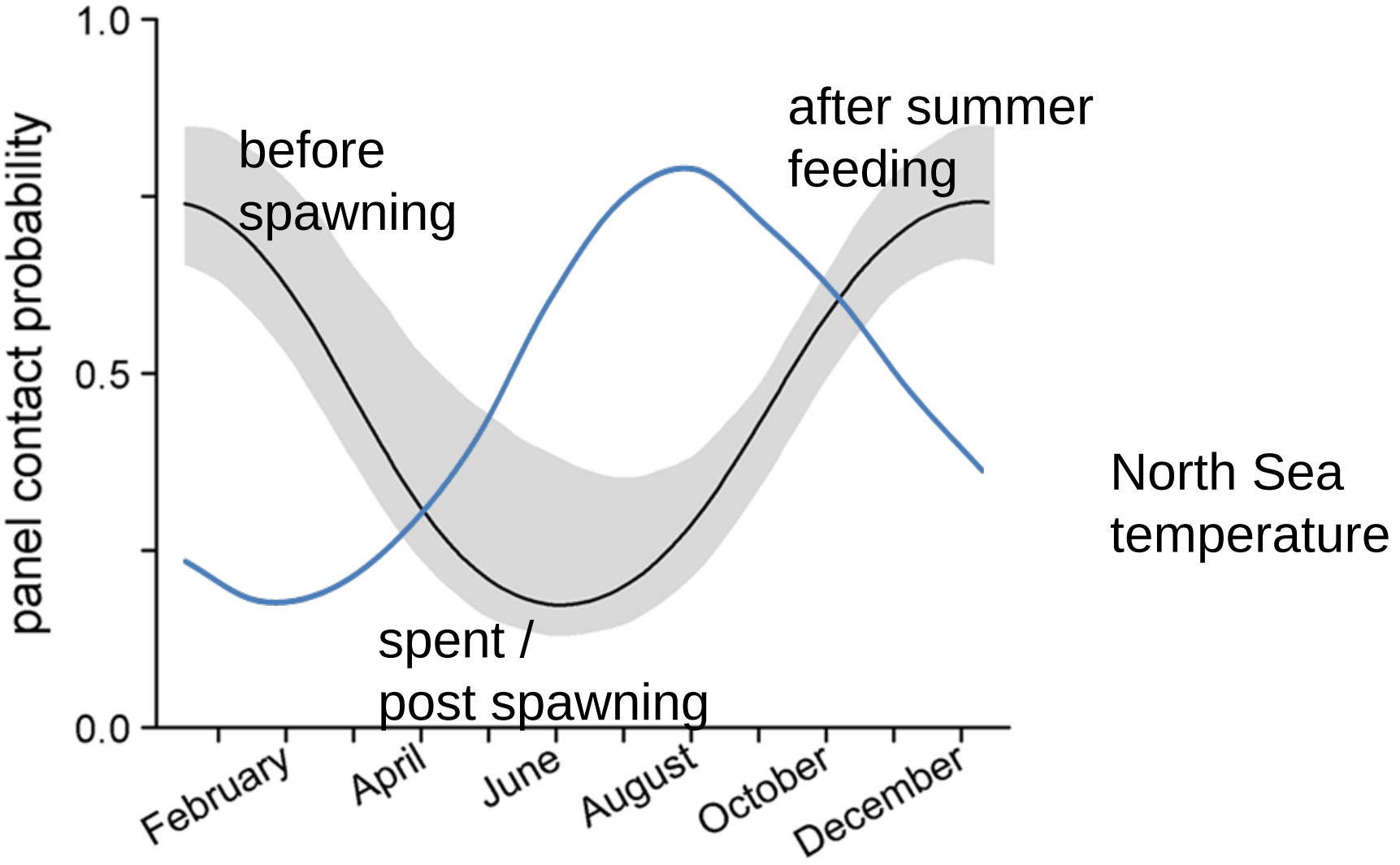


codend selectivity ~ mesh size + meshes around + twine diameter

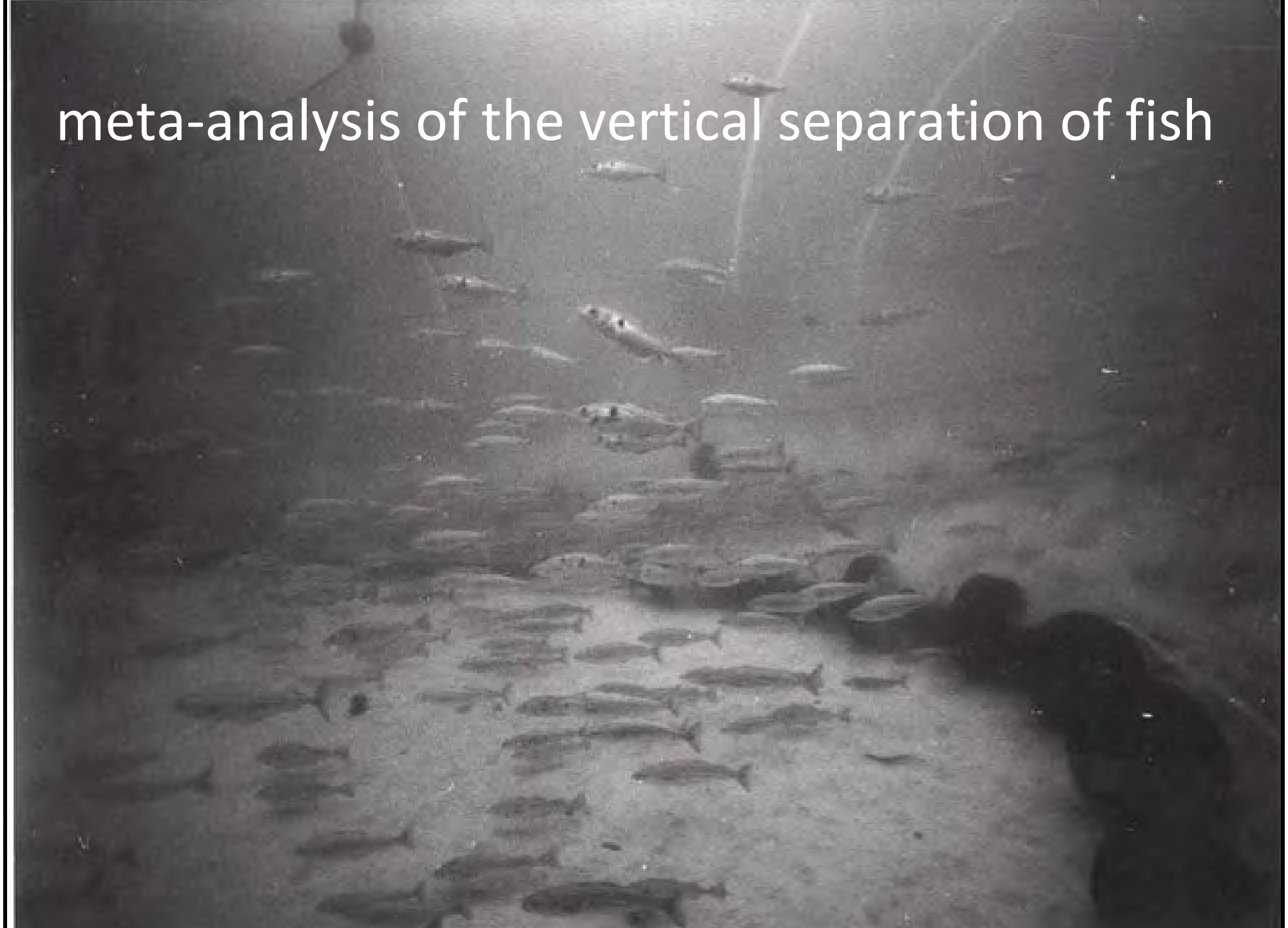
panel selectivity ~ panel mesh size

panel efficiency ~ panel position + s(month)

meta-analysis of haddock selectivity data

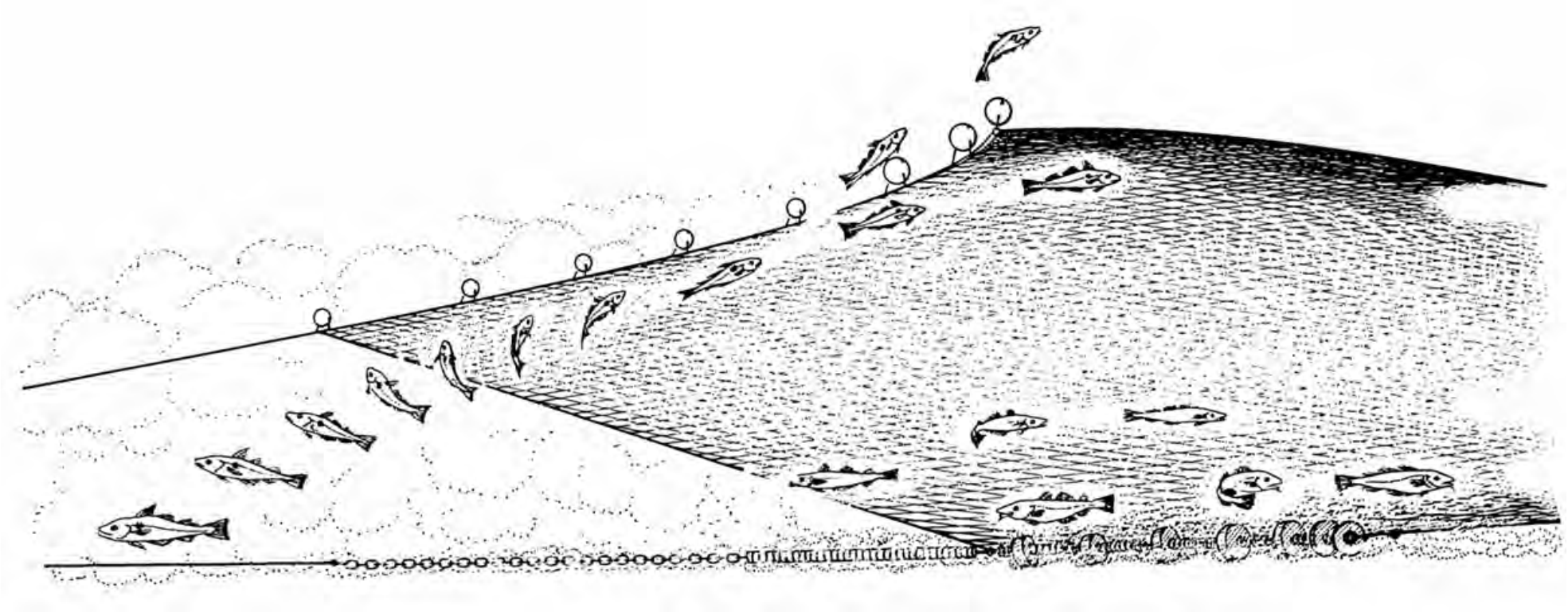


meta-analysis of the vertical separation of fish



DiscardLess - WP3

meta analysis of the vertical separation of fish

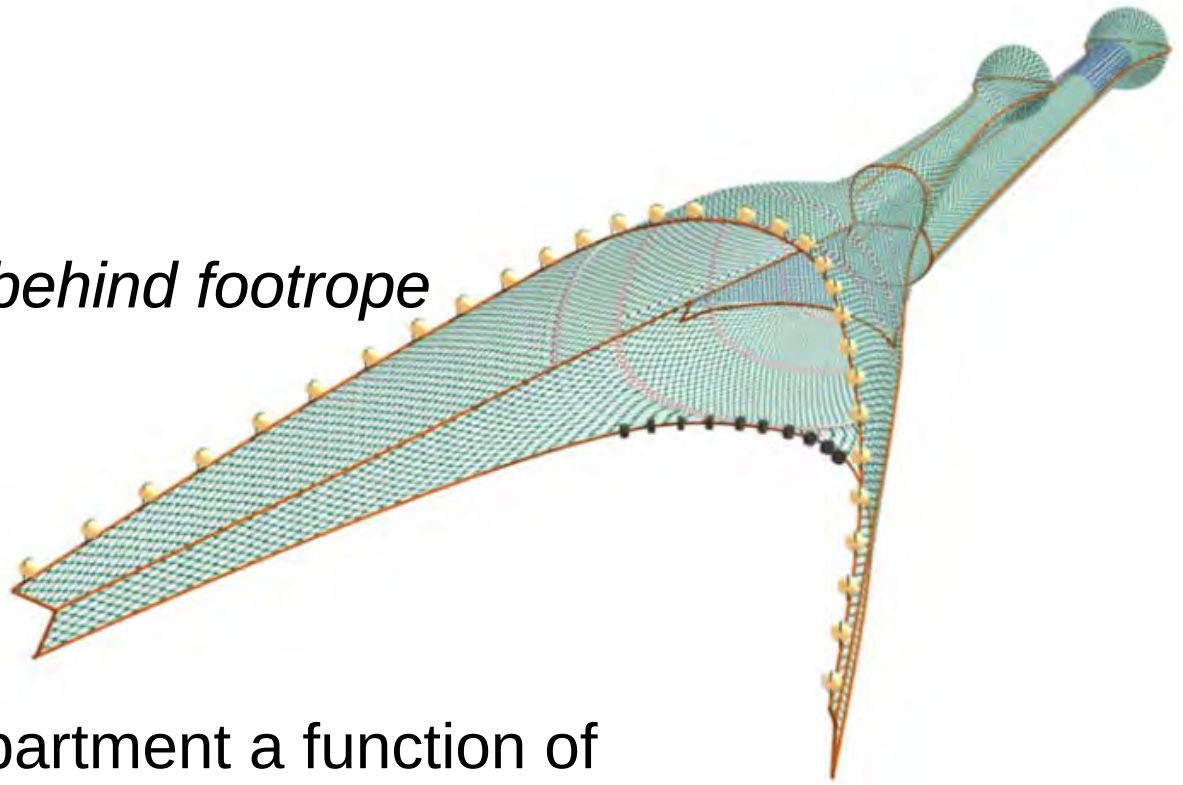


20 trips

38 panel configurations

height, distance behind footrope

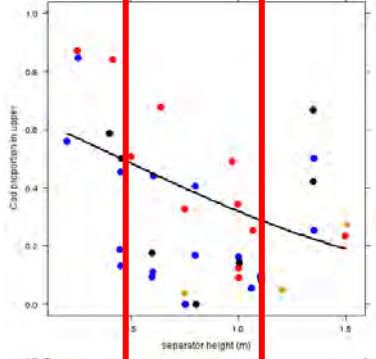
haddock, whiting, cod,
flat fish, monk …



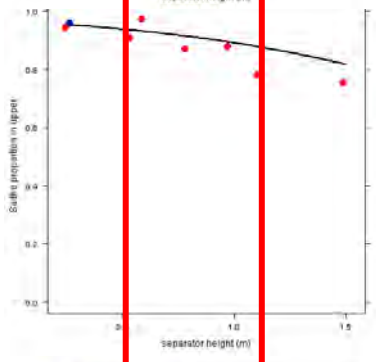
proportion in each compartment a function of

height, distance behind footrope.

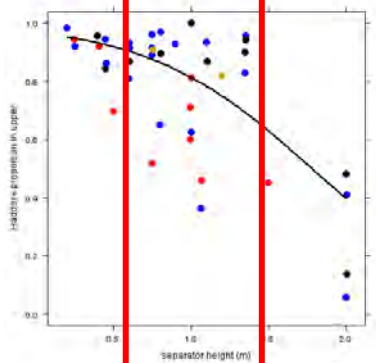
Cod



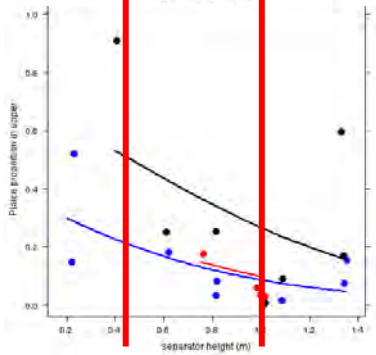
Saithe

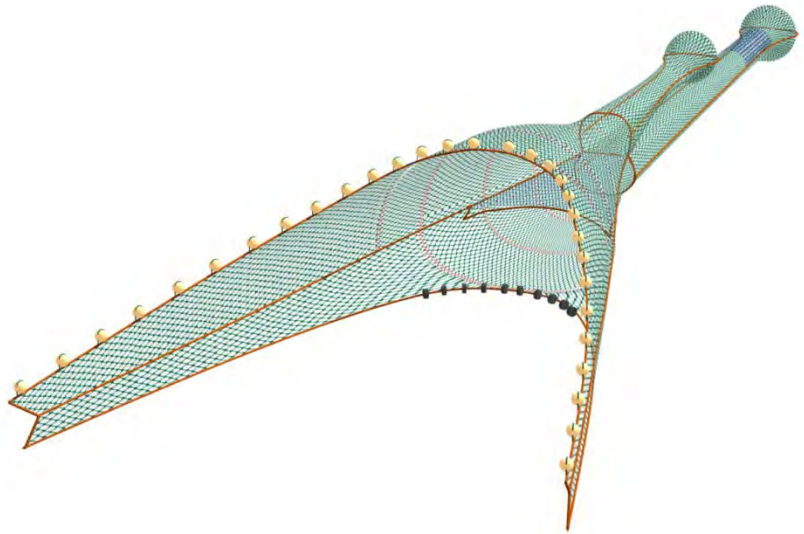


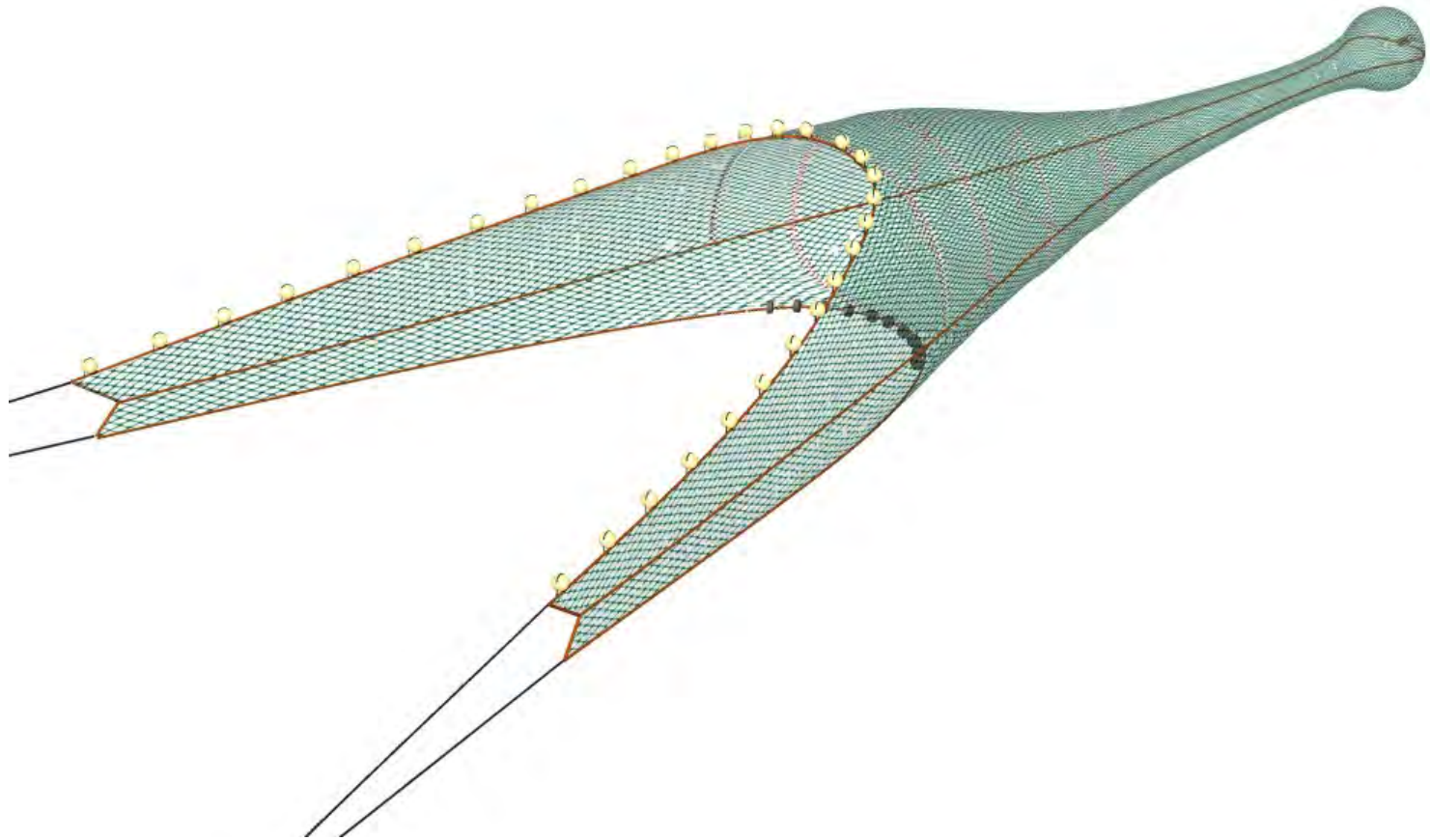
Haddock



plaice







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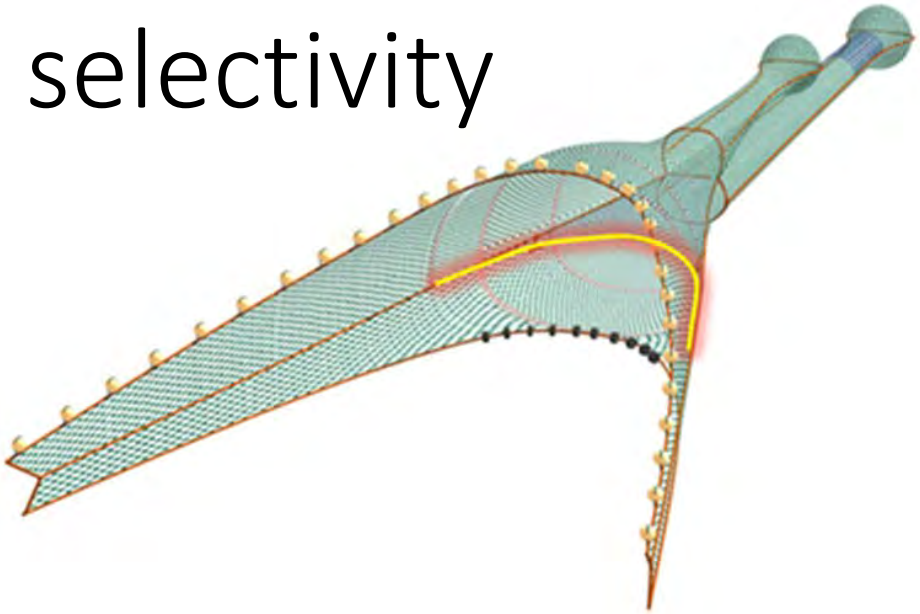
- Using light to modify selectivity

using light to modify trawl gear selectivity



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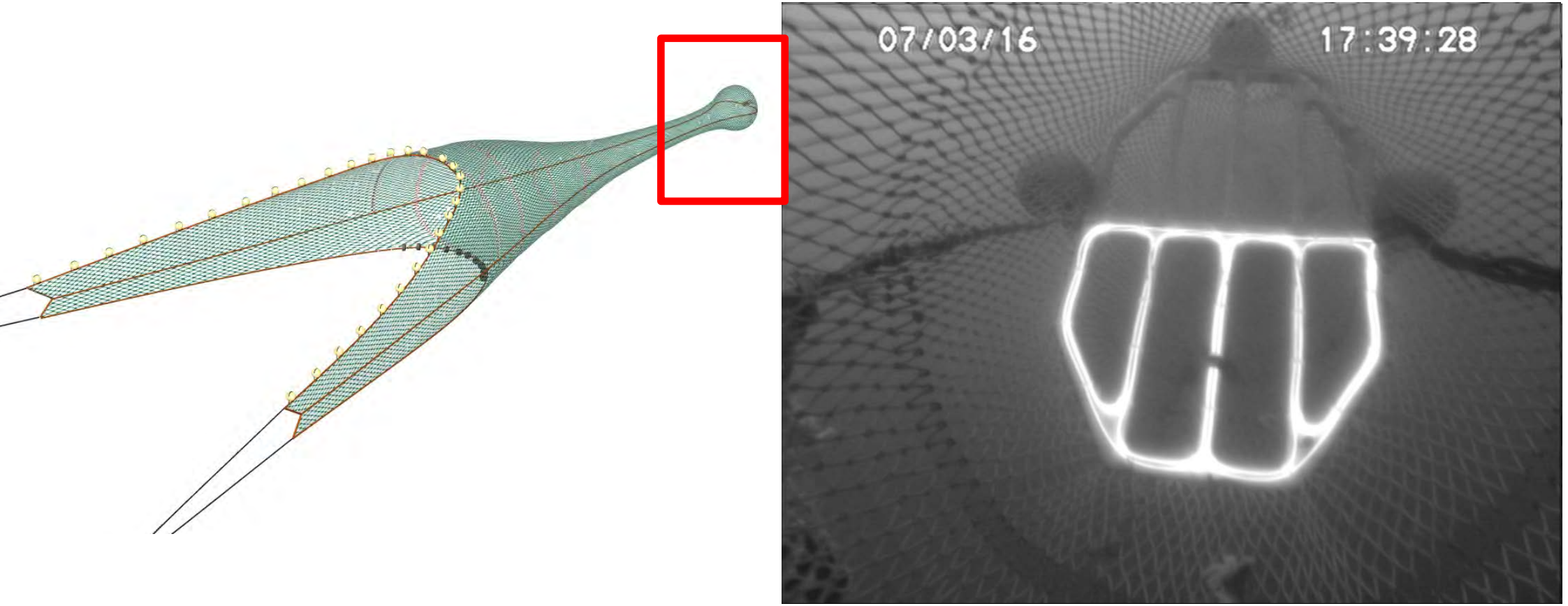
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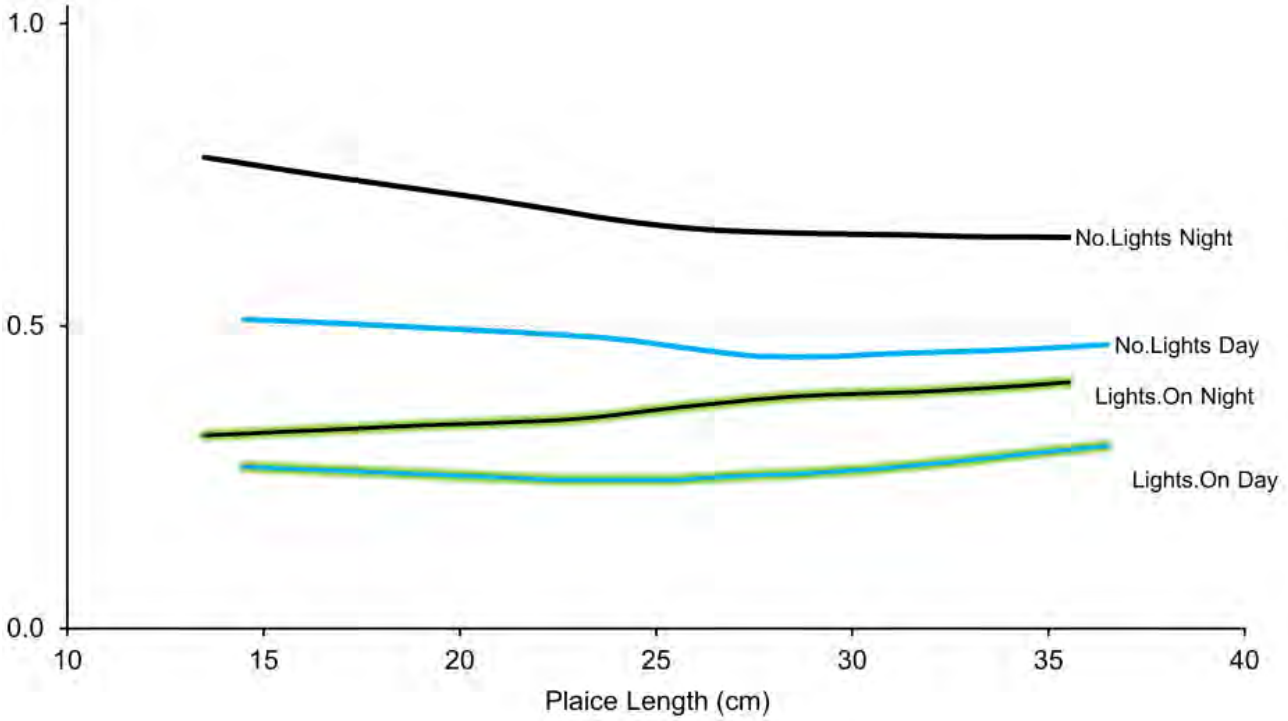
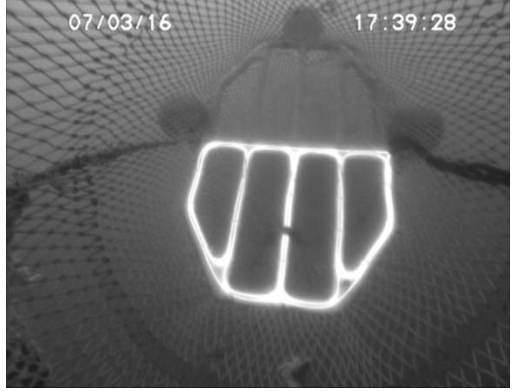


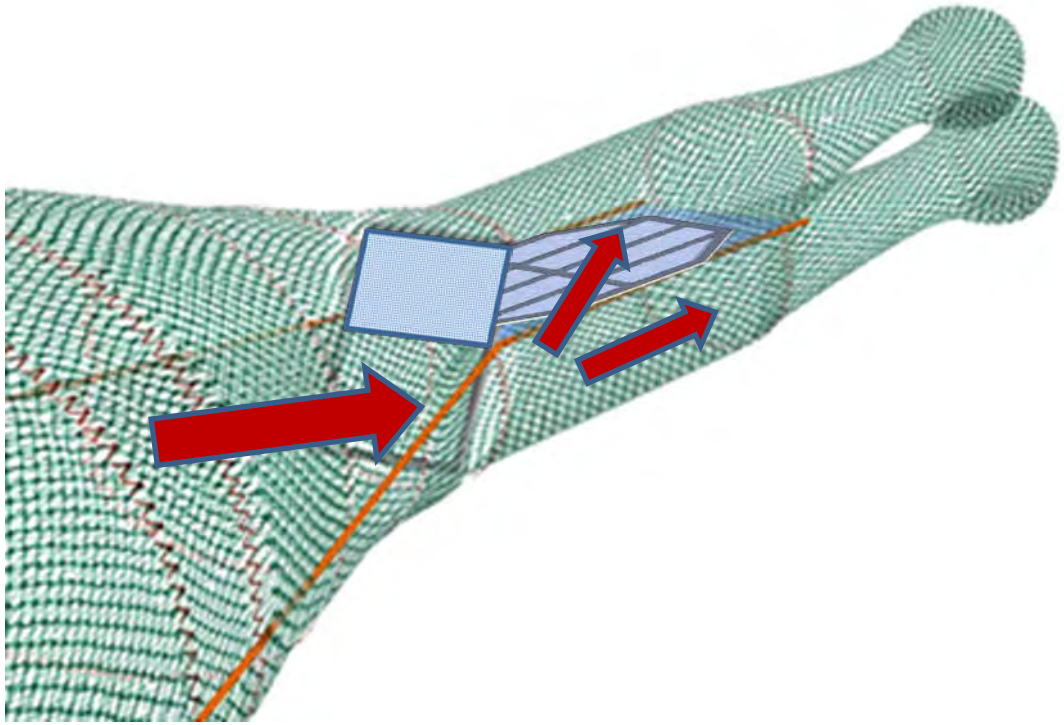


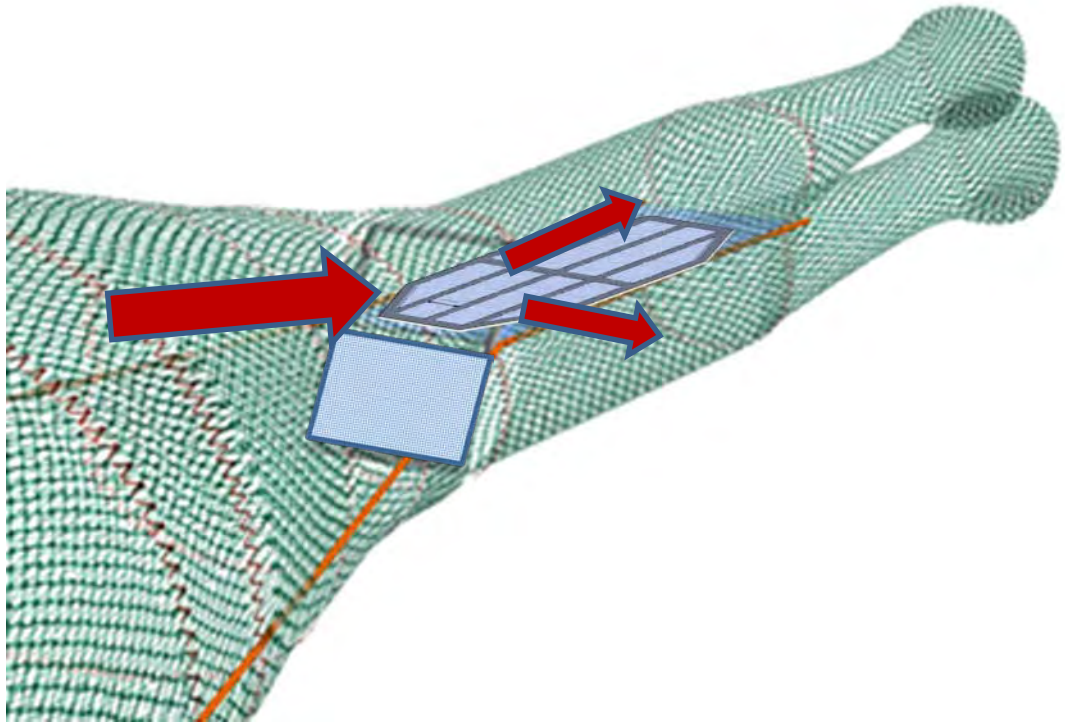
fish do not seem to be attracted to or repulsed by the light

but behave differently when there is light

seem to remain/go lower when there is more light

day/artificial light





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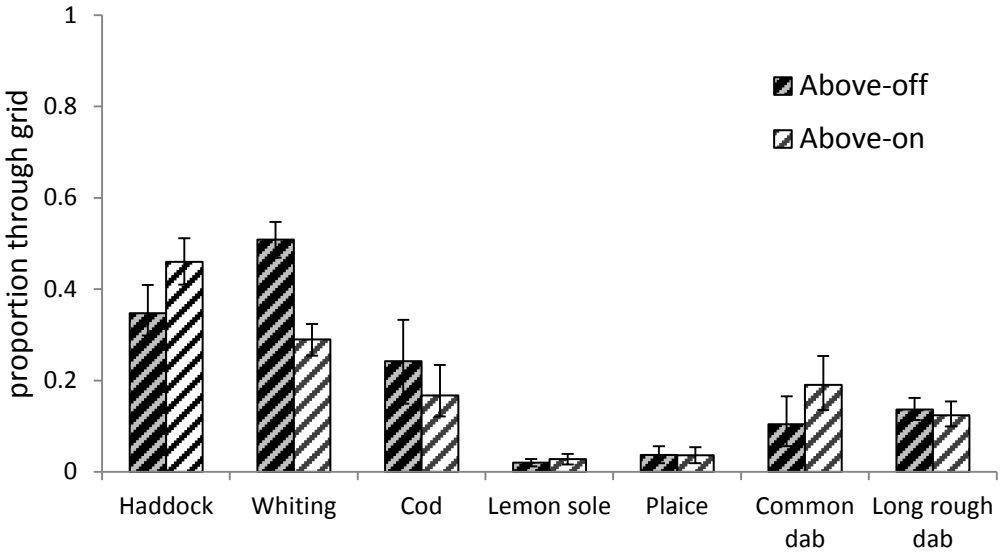
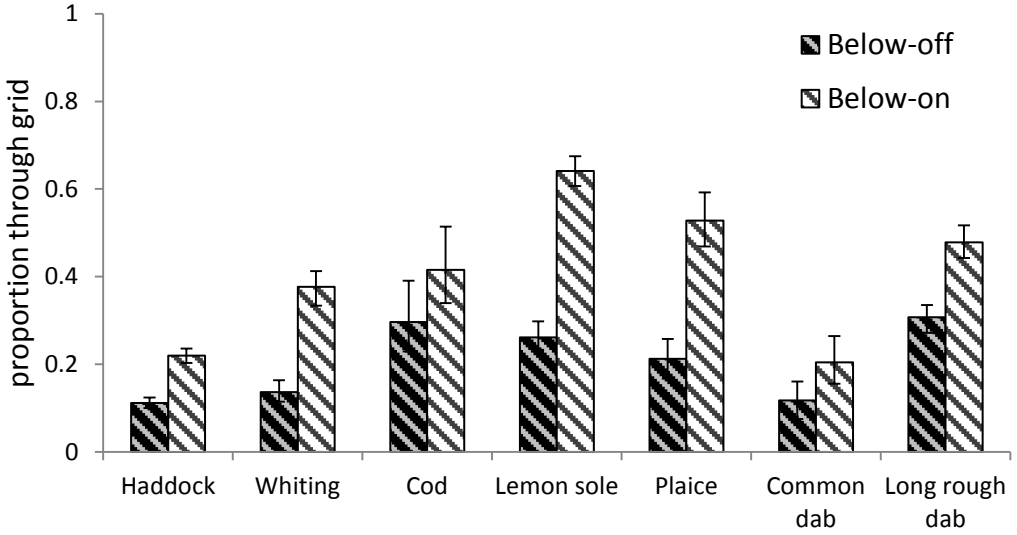

1
0.8
0.6
0.4
0.2
0
proportion through grid
Above-off
Above-on
Haddock
Whiting
Cod
Lemon sole
Plaice
Common dab
Long rough dab


1
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0.4
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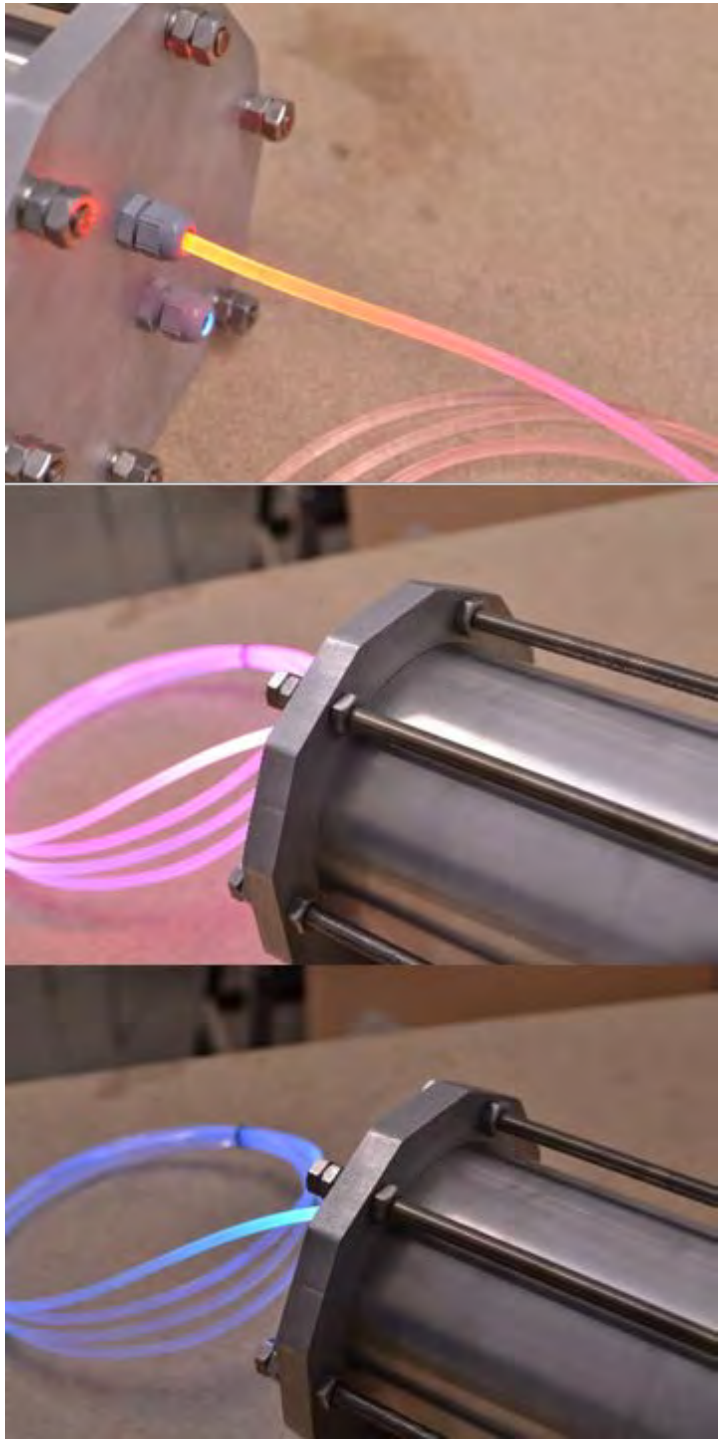
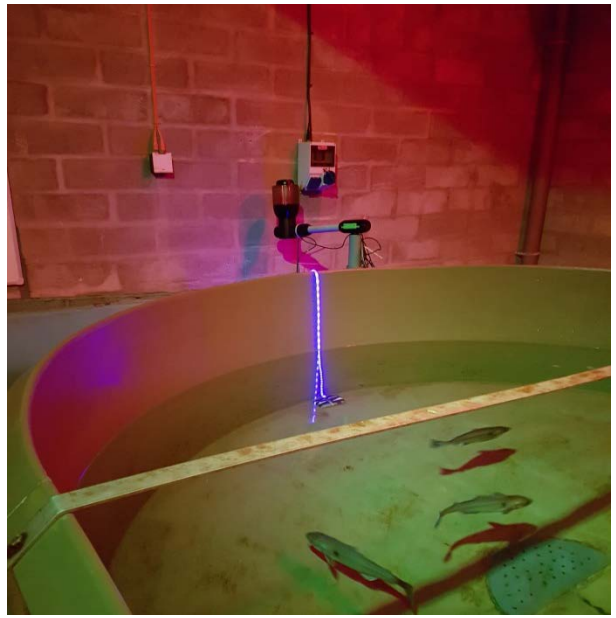
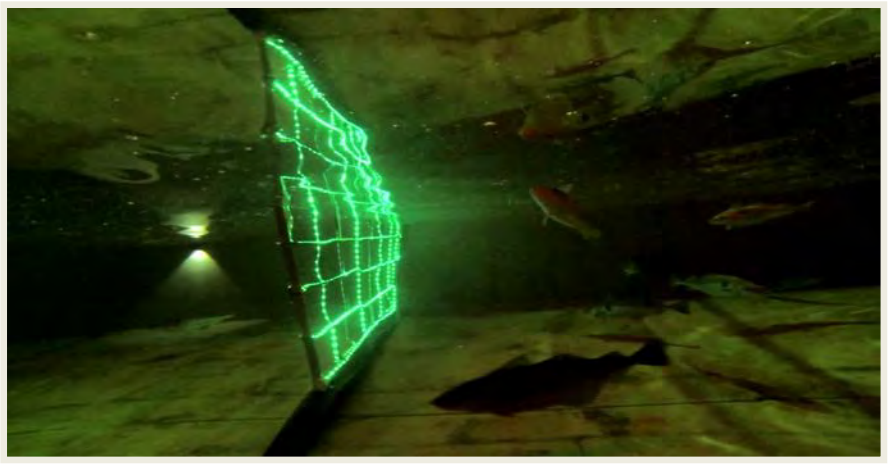
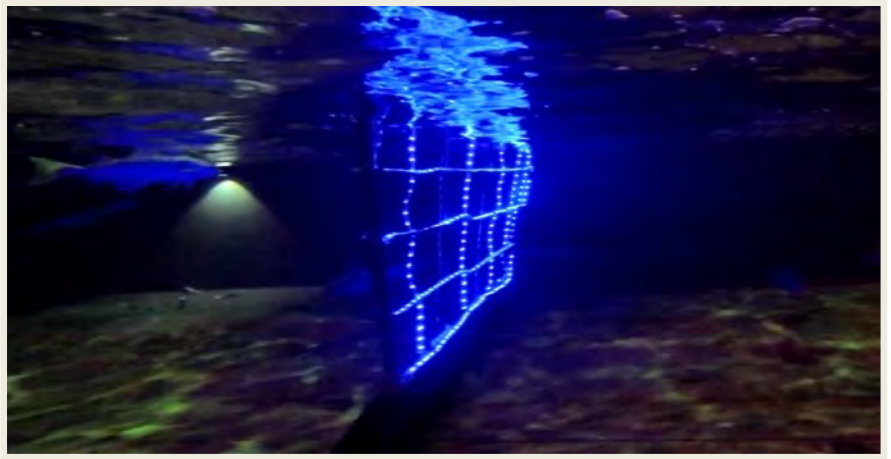
proportion through grid
Below-off
Below-on
Haddock
Whiting
Cod
Lemon sole
Plaice
Common dab
Long rough dab

starting to identify behavioural differences that can be harnessed to design species selective gears

We need a more systematic approach

A better understanding of how the light parameters will effect fish behaviour

- wavelength
- intensity
- flashing/strobe



laboratory experiments