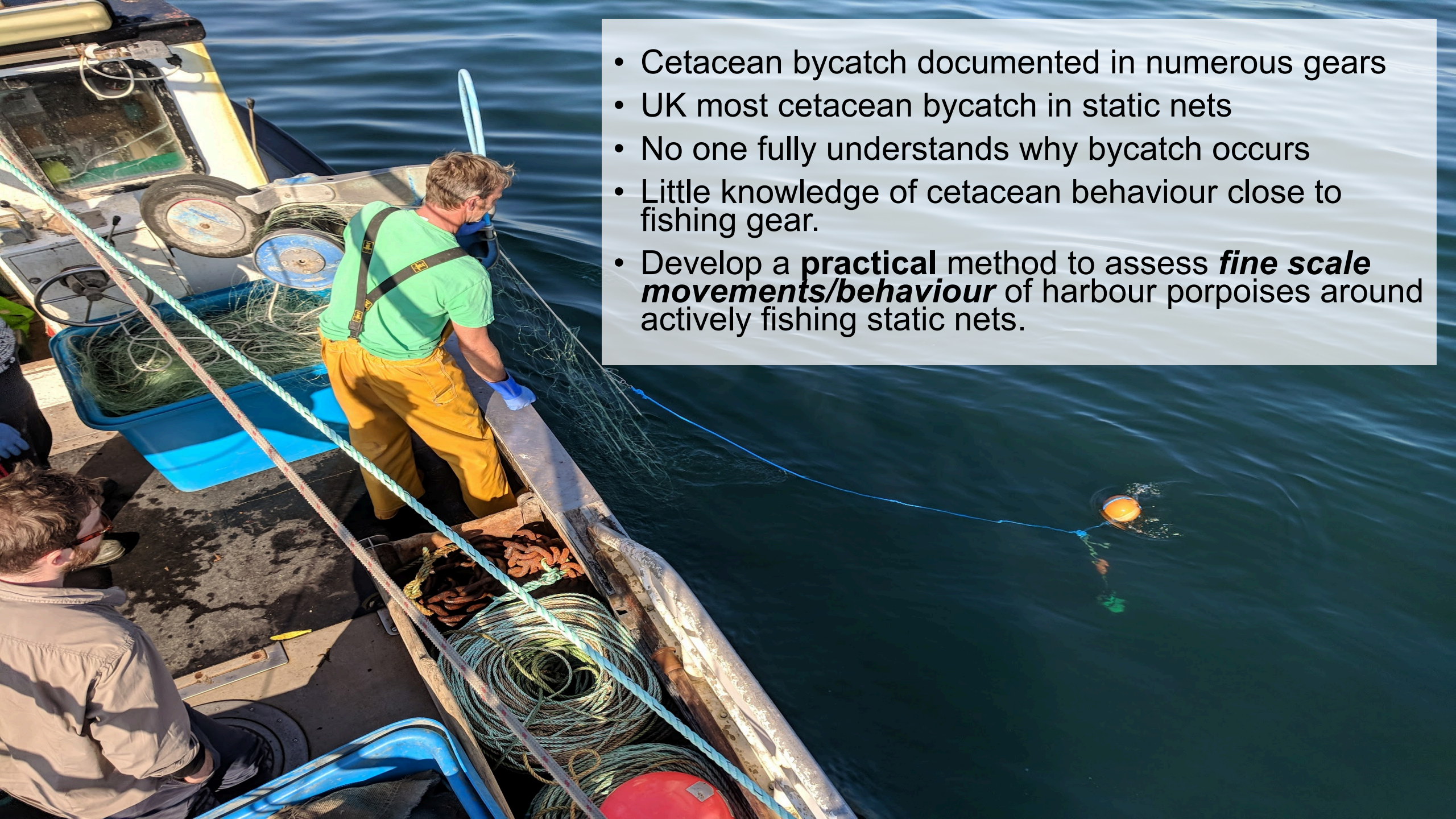
Cetacean bycatch

Improving understanding of why it happens and what it means.

Al Kingston, Jamie Macaulay, Simon Northridge, Alex Coram & WGBYC

Sea Mammal Research Unit

www.smru.st-andrews.ac.uk

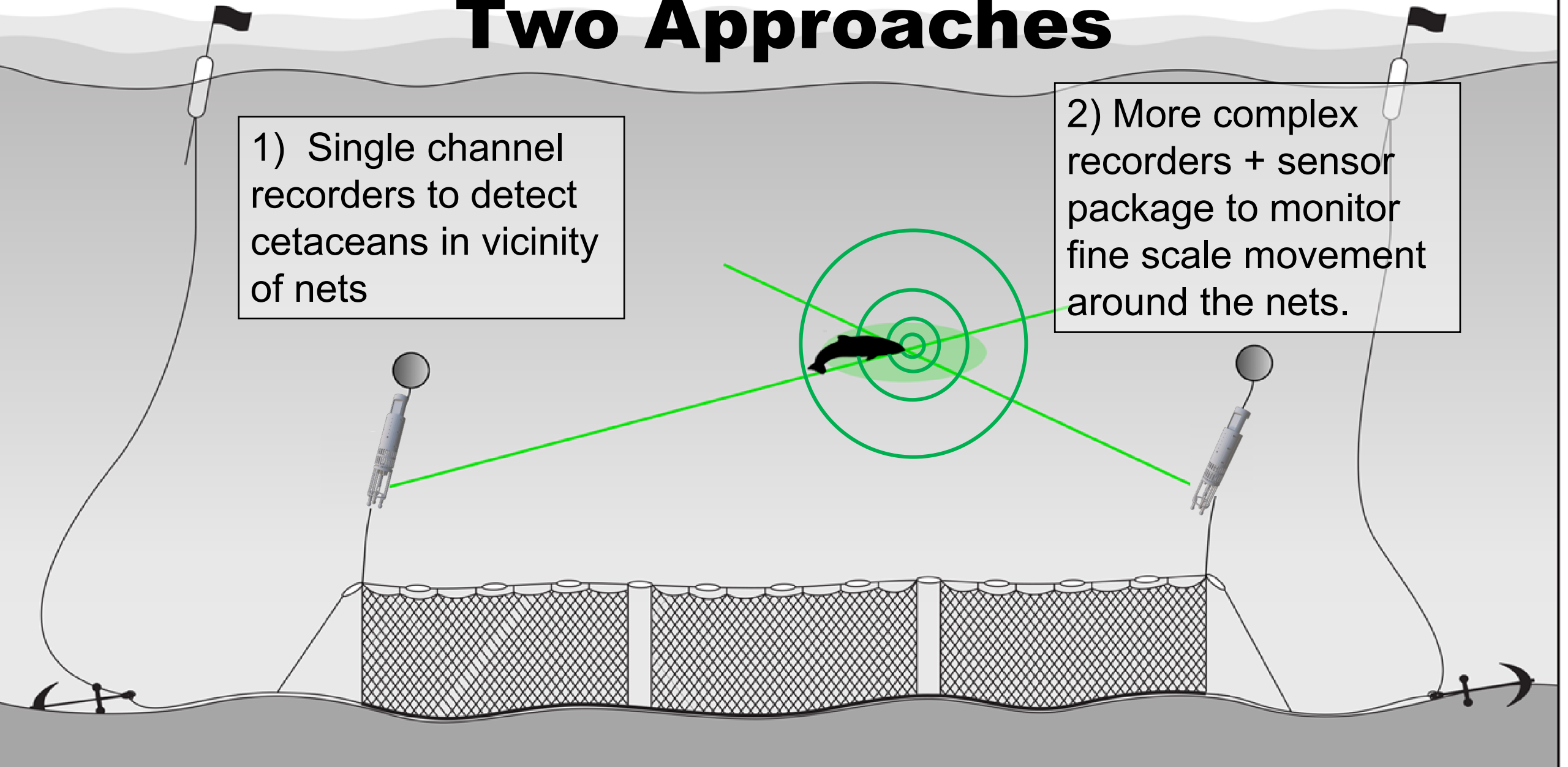


- Cetacean bycatch documented in numerous gears
- UK most cetacean bycatch in static nets
- No one fully understands why bycatch occurs
- Little knowledge of cetacean behaviour close to fishing gear.
- Develop a **practical** method to assess ***fine scale movements/behaviour*** of harbour porpoises around actively fishing static nets.

Passive Acoustic Monitoring. Two Approaches

1) Single channel recorders to detect cetaceans in vicinity of nets

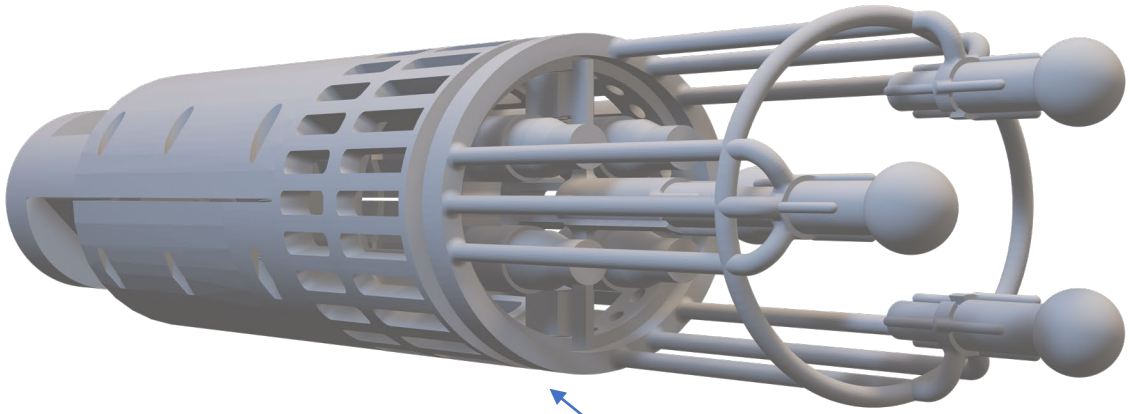
2) More complex recorders + sensor package to monitor fine scale movement around the nets.



4 Channel SoundTrap

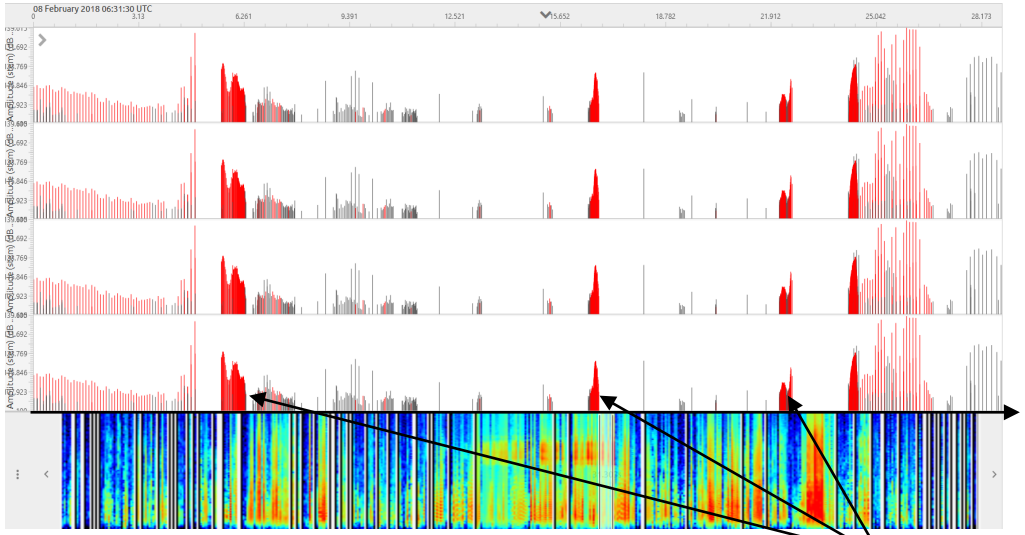
- Constructed at SMRU.
- Calculates a 3D bearing to detected clicks and whistles.
- **Two** devices for 3D tracking.
- Orientation, pressure, depth, light sensors

Hydrophones
4 x high frequency for dolphins and harbour porpoises.



Instrument Package
Records high accuracy pressure and orientation synced with acoustic recordings.

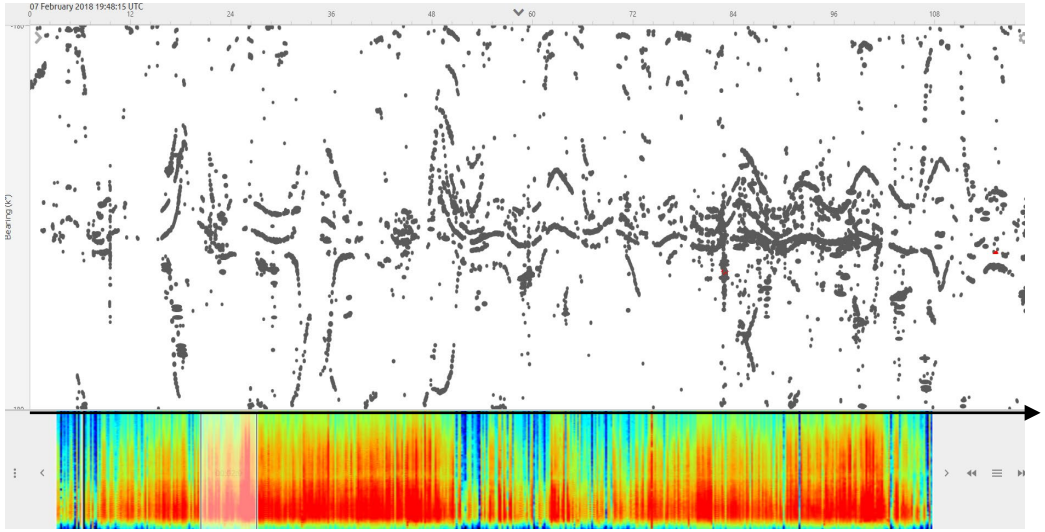
Housing
Graphite cut using precision laser.



Time
(30s)

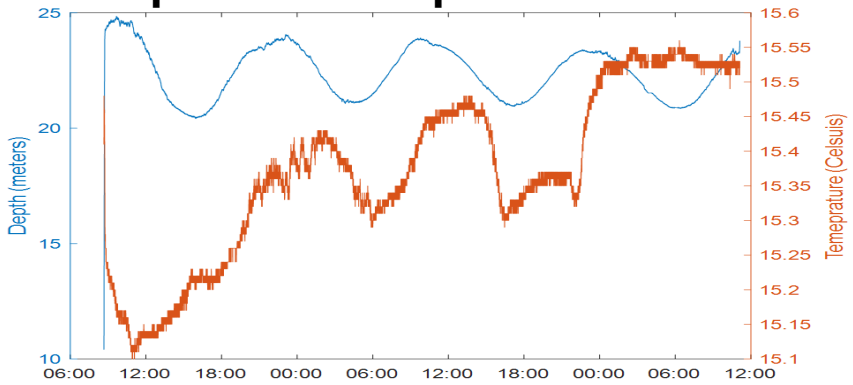
Porpoise Buzzes

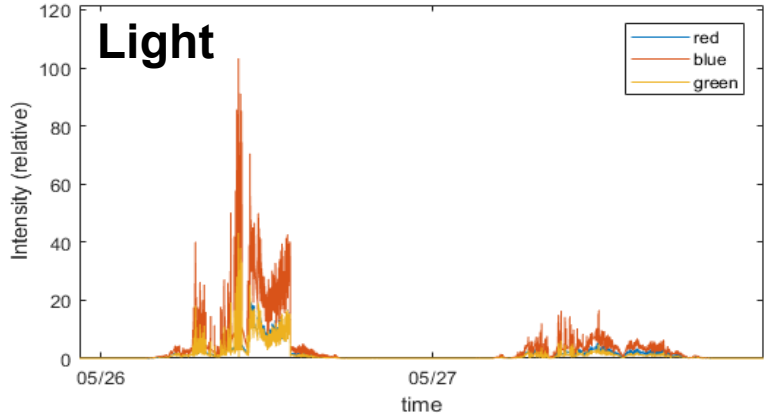
Lots of dolphins

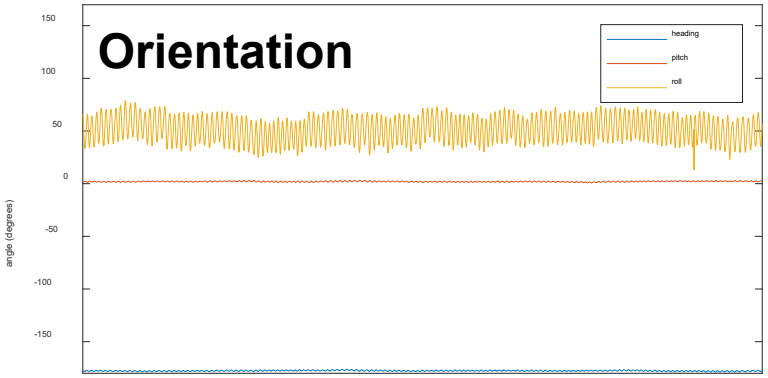


Time
(120s)

Depth and Temperature

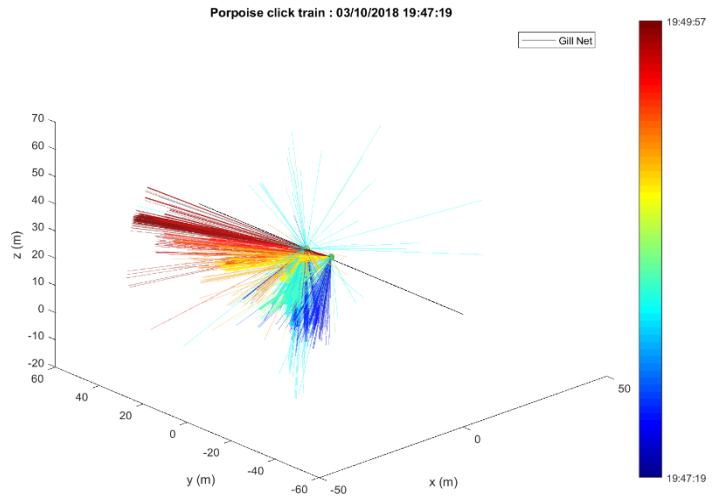


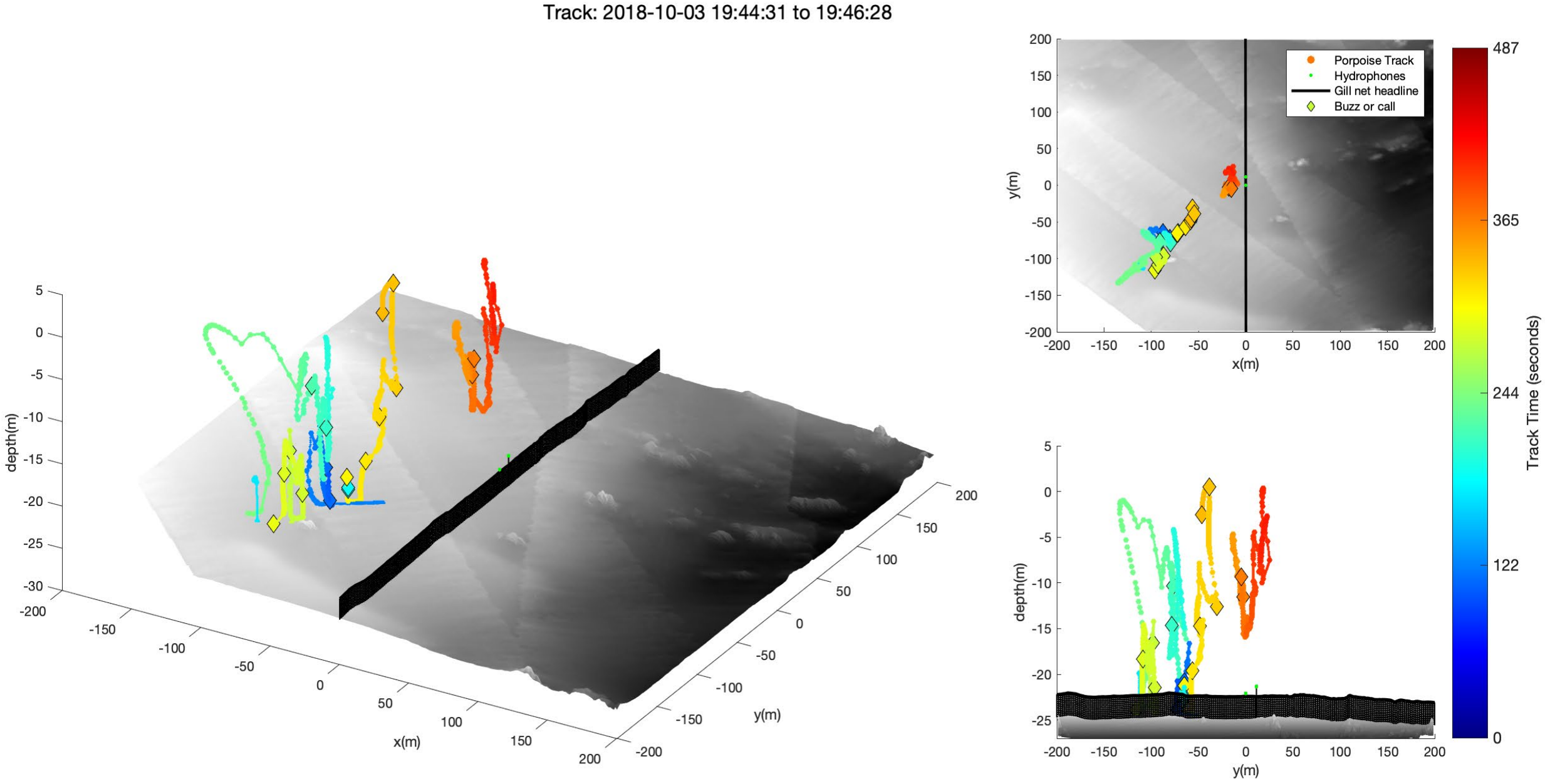




Results: 4 Channel System

- Dozens of test deployments
- Several full system deployments.
- Harbour porpoises detected and localised near nets.




Track: 2018-10-03 19:44:31 to 19:46:28
Porpoise Track
Hydrophones
Gill net headline
Buzz or call
depth(m)
x(m)
y(m)
Track Time (seconds)
0
122
244
365
487

Next steps

- 2 papers in preparation
- Make the system more user friendly
- Further deployments on different net types

- Use a bigger dataset to investigate fine scale behaviour under different circumstances (net, depth, time etc)

Improving bycatch estimates

(from monitoring data)

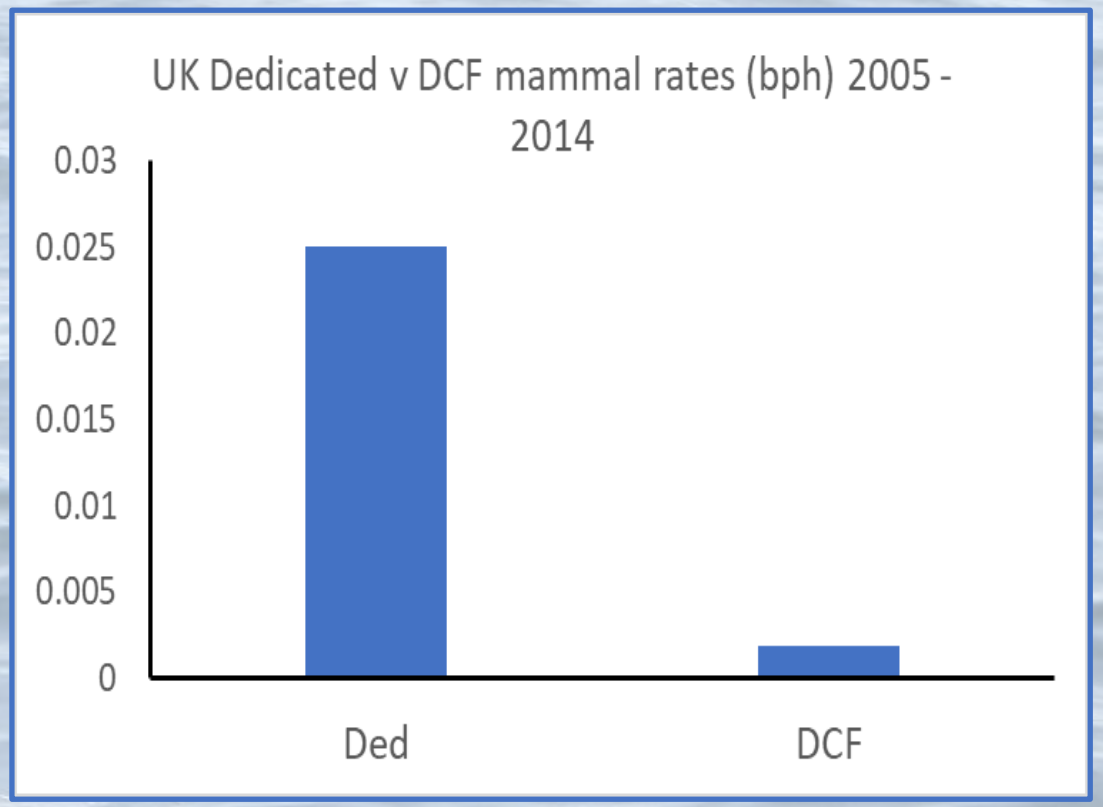
Bycatch estimates have 2 main components:

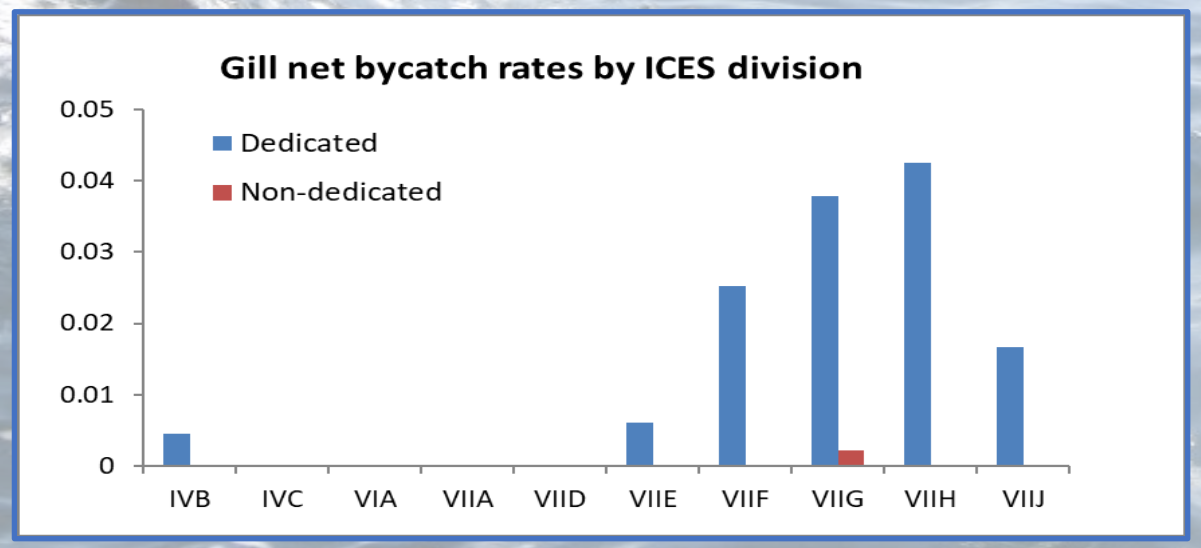
1. Bycatch rate
2. Total fishing effort

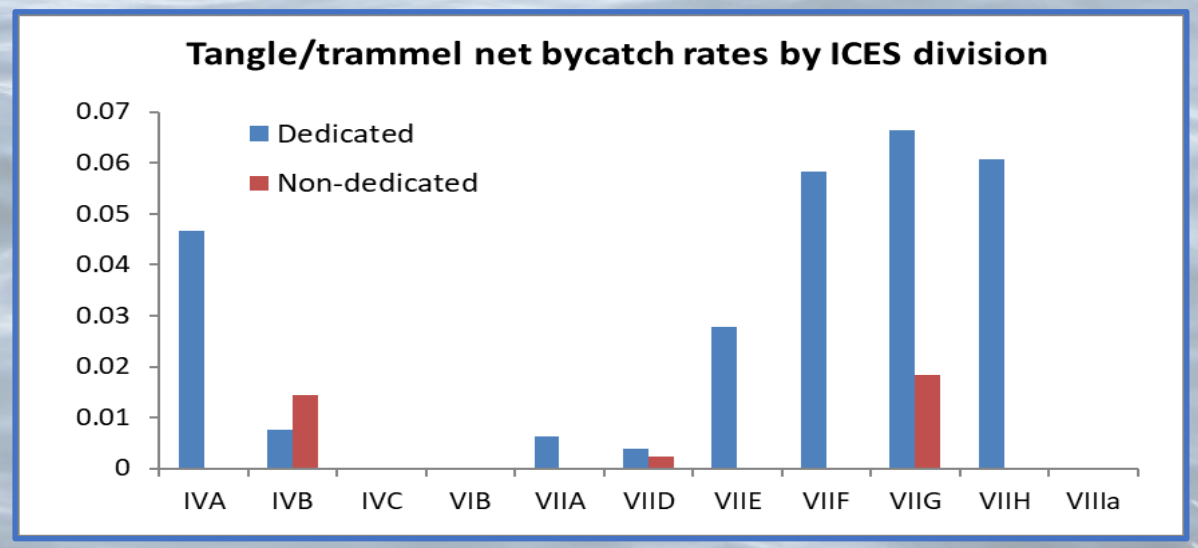
1 x 2 = estimate

Simple…… but there are problems in 1 & 2

- 2005 several MS Ded programmes
- Dedicated programmes gradually absorbed into DCF
- Concern bycatch rates may differ between programmes
- UK - some net fisheries sampled using different protocols







- Suggests mortality estimates using DCF derived rates could be significantly under-estimated
- Not a criticism of DCF – will help make it multi-purpose

- Now accepted that DCF protocols not optimal for many PETs
- Efforts to improve PETs sampling
- 2017 PETs formally included under DCF
- RDBES data fields: true/false 0's

Situation improving but still work to do

WKPETSAMP REPORT 2018

ICES ECOSYSTEM OBSERVATION STEERING GROUP

ICES CM 2018/ EOSG: 35

REF ACOM, SCICOM, WGBYC & WGCATCH

Joint WGBYC-WGCATCH Workshop on sampling of bycatch and PET species (WKPETSAMP)

- 2017 - WGBYC begin transition from 812/2004 reports to other sources of effort
- Compared several effort datasets (VMS, Logbooks, WGBYC data call, RDB)
- WGBYC and RDB “most complete” but <u>not</u> the same

- Similar pattern across other metiers – OTM, OTB
- 2020 WGBYC develop questionnaire
- Circulated prior to WGCATCH
- Multiple reasons for discrepancies

- Ideally bycatch estimates based on robust rates and realistic effort data