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# Dolphin bycatch in the UK bass pair trawl fishery.


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**Presentation to the ATGTRT meeting, Providence – 20th of September 2006**

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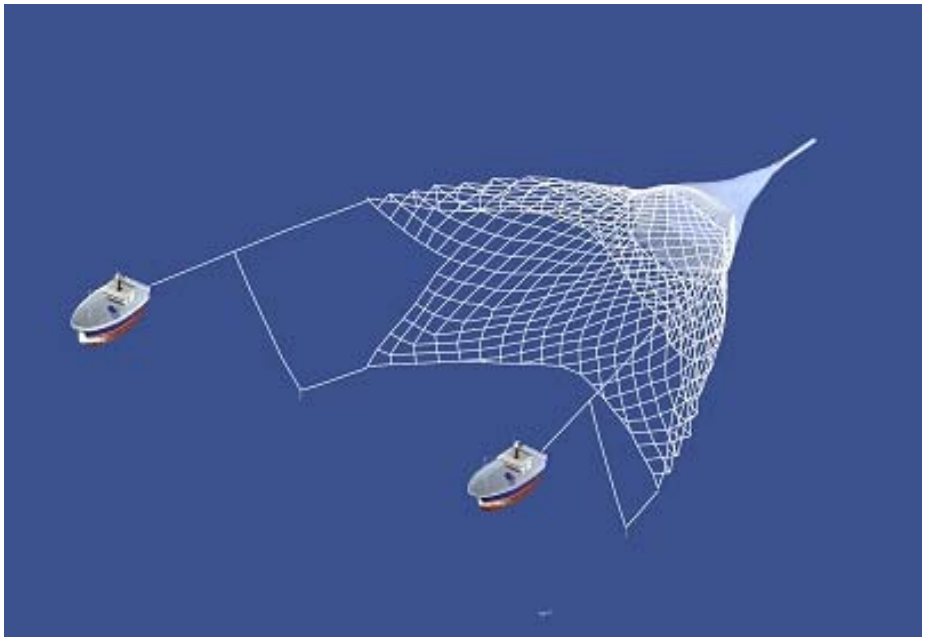
# Bass fishery trials

(co-funded by the NECESSITY project)

- Mainly focused on exclusion devices.
- Collaborative work with Industry, Net manufacturer, IMR, Sea Fish, IFREMER, BIM and other Necessity partners..



Escapement devices developed with the skippers involved.

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# Characteristics of the bass fishery

- Few vessels involved
- Limited fishing effort
- Restricted fishing area
- Seasonal
- Increased mid 1990s - currently more stable
- Method adopted from the French, mostly small boats
- Landings mainly into one port - Plymouth

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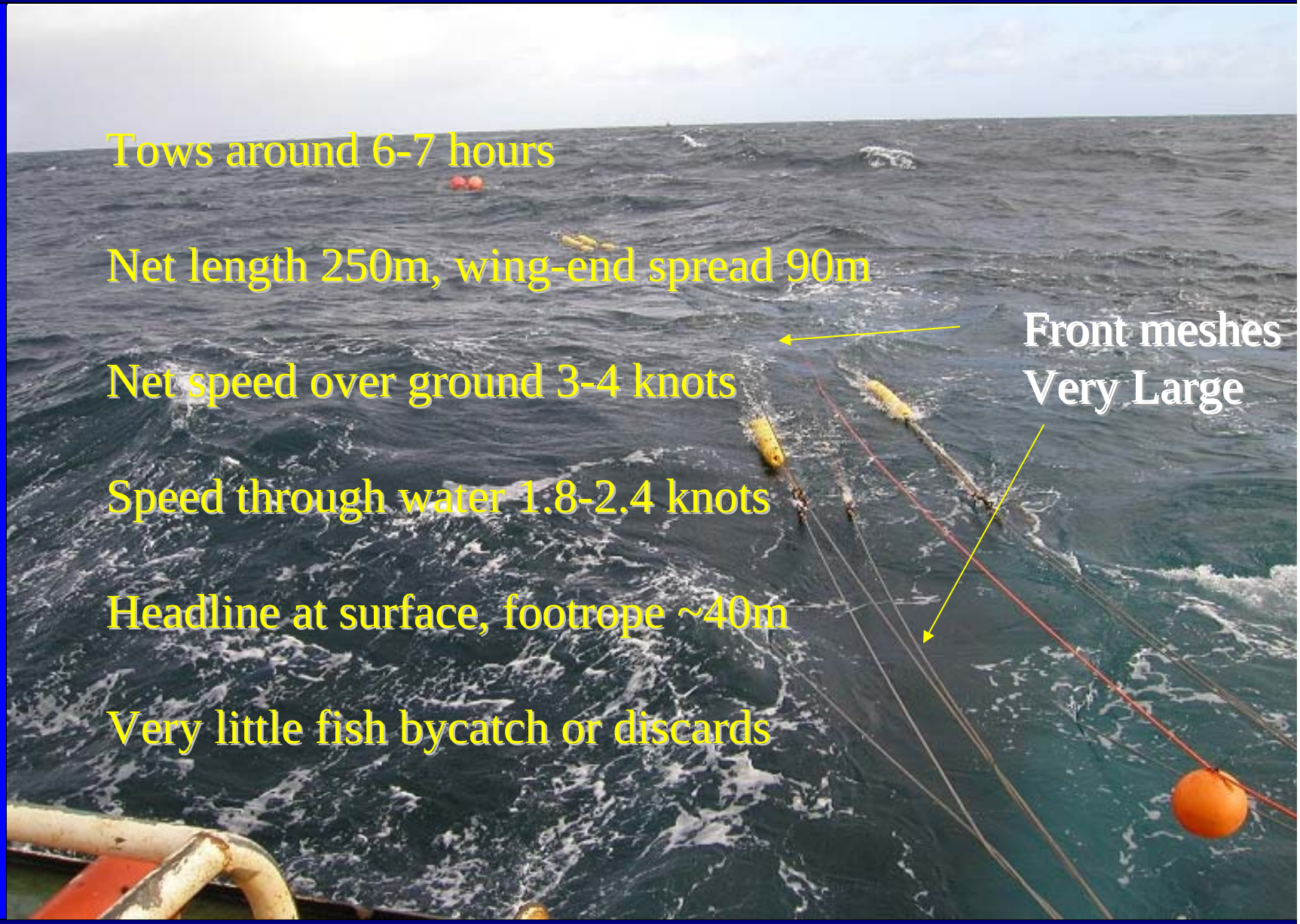
# Operational Characteristics



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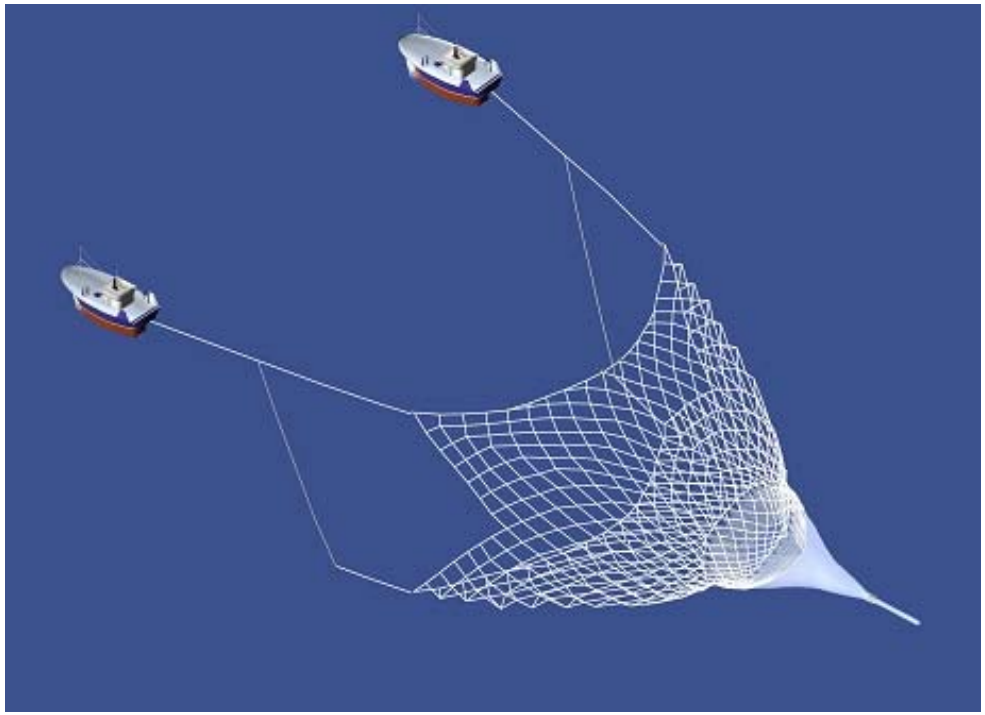
# Bass Pair Trawl Fishery



High bycatch rates have raised concerns among the public & industry

| | Observed Operations | Dead Dolphins |
|---|---|---|
| 2001 | 91 | 52 |
| 2002 | 91 | 9 |
| 2003 | 113 | 26 |
| 2004 | 133 | 169 |
| 2005 | 149 | 99 |
| Totals | 577 | **331** |

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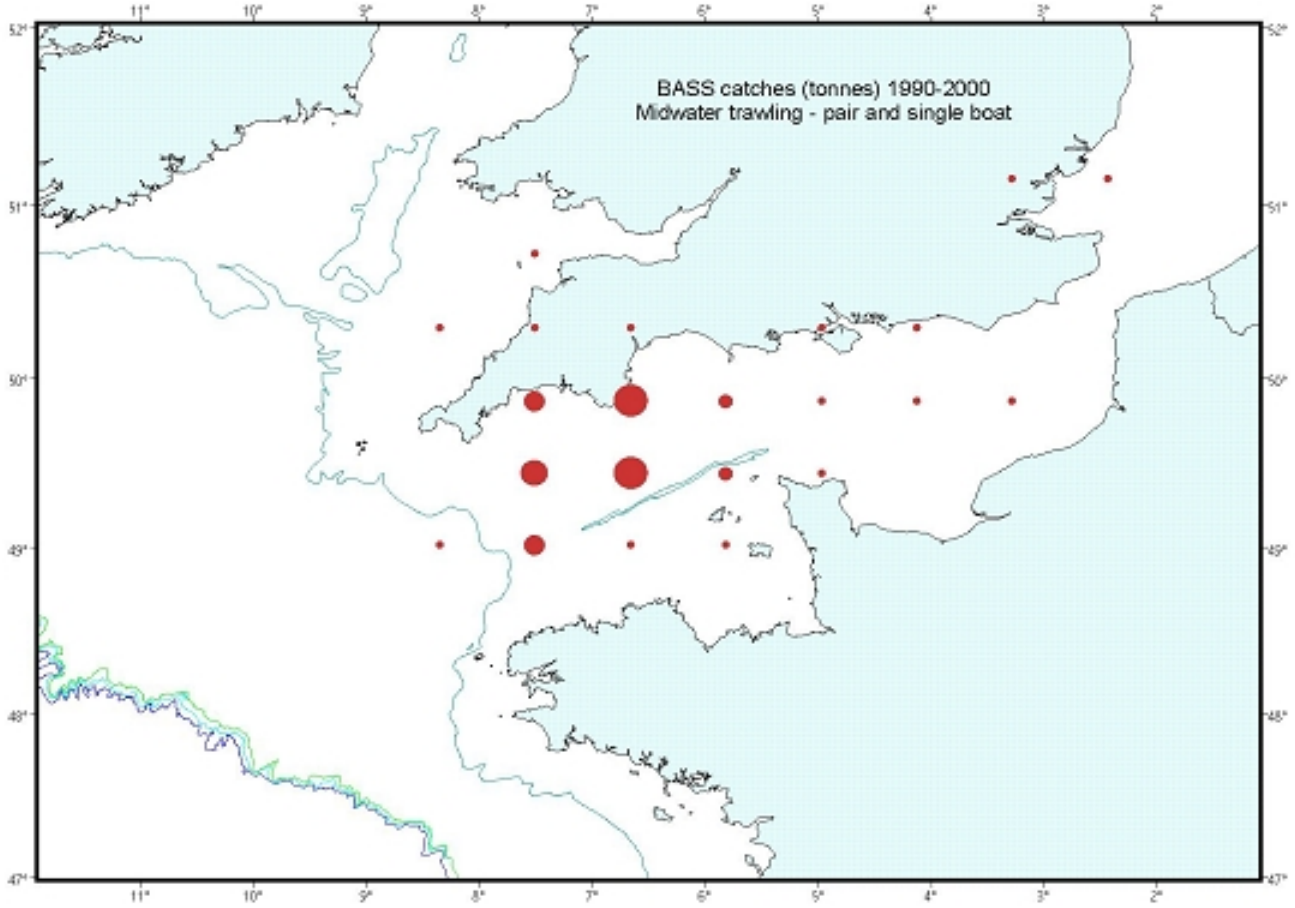
# Distribution of recorded bass landings by pelagic trawls 1990-2000



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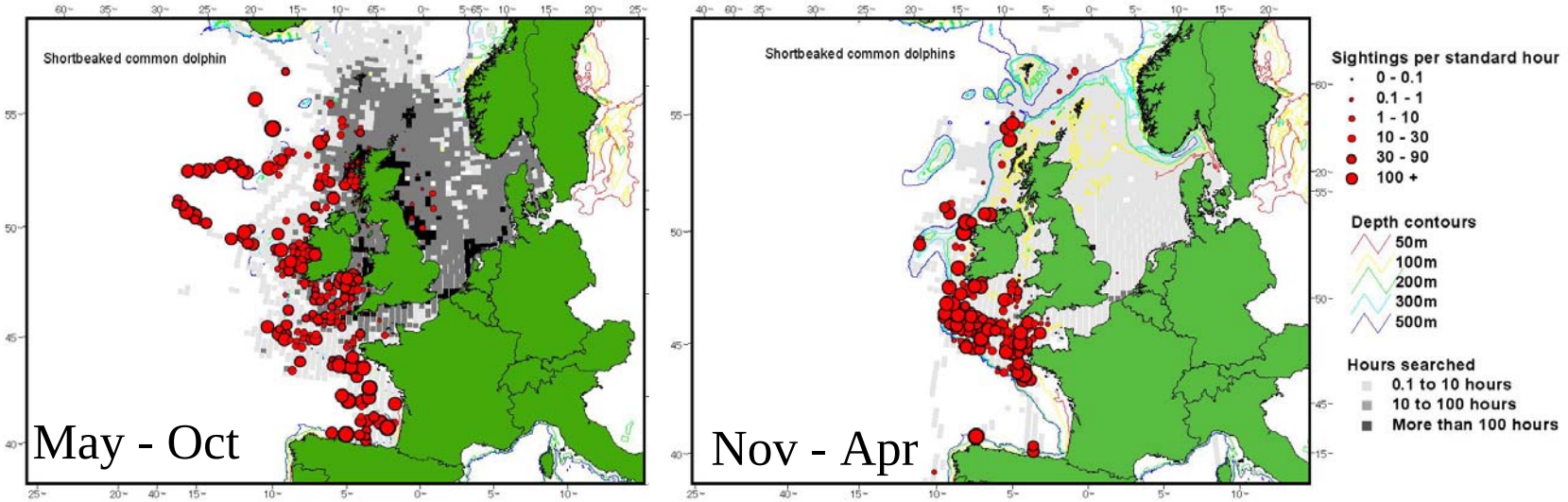
# Common dolphin distribution and abundance

- ACE suggested an abundance of around 380,000 animals in the NE Atlantic, based on data from a number of surveys.
- There is a seasonal increase in density of common dolphins around the Celtic shelf during the winter months.



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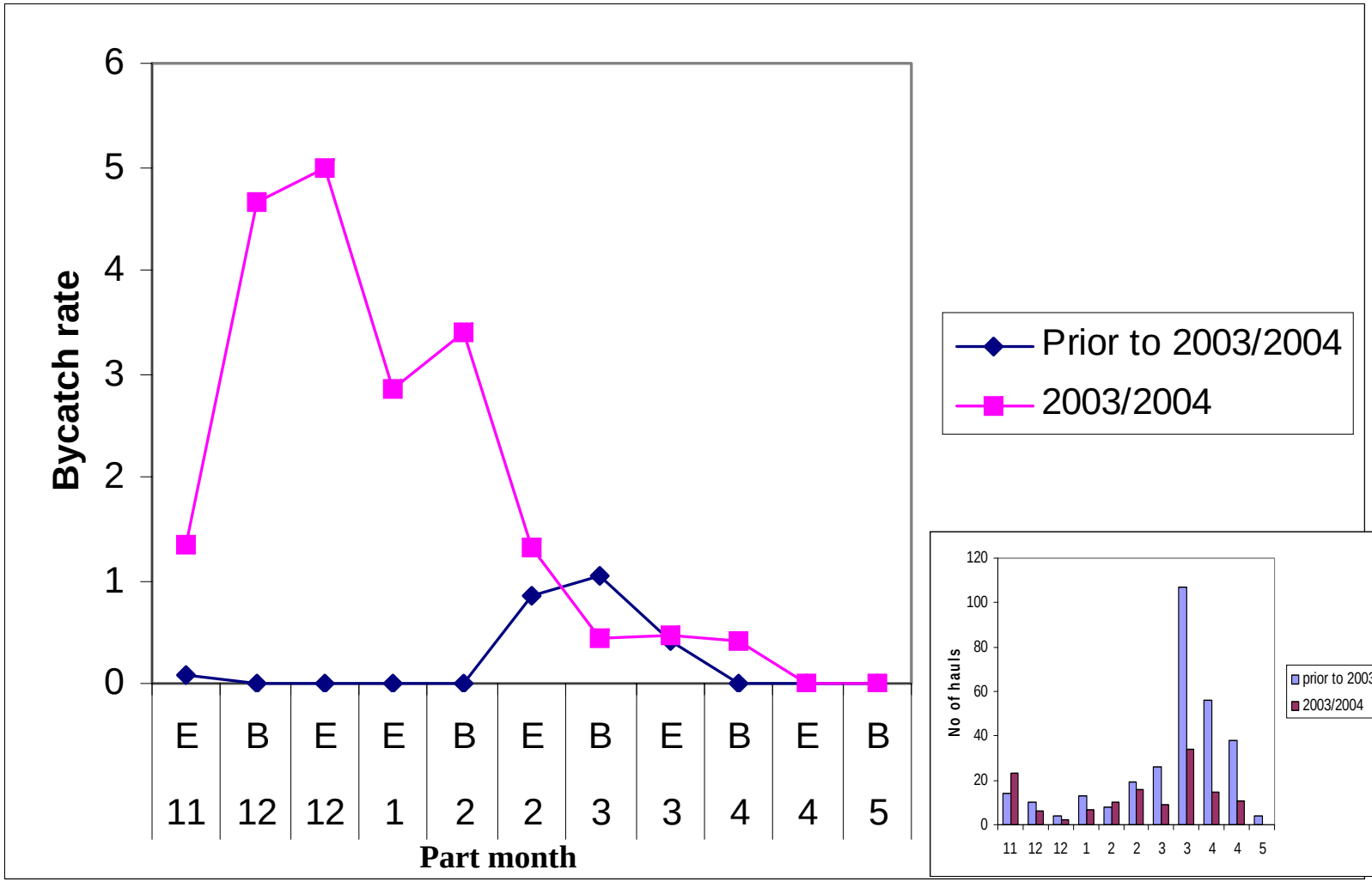
# Seasonal bycatch rates




Apparent increase in the abundance of common dolphins in the winter months after 2003.

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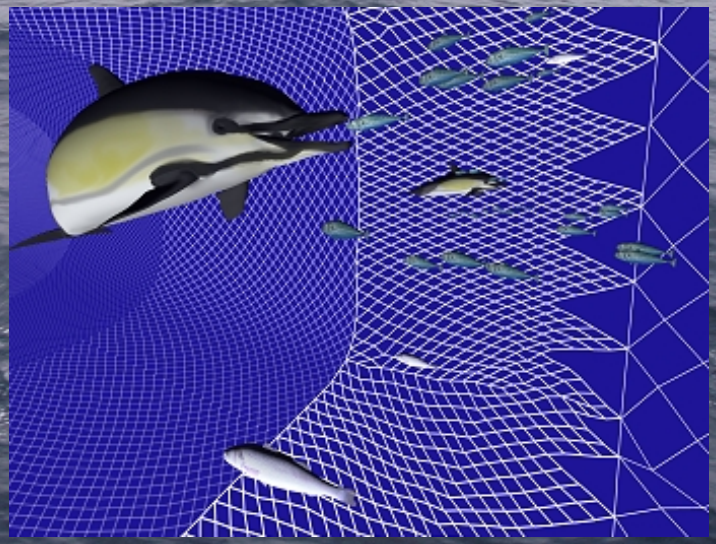
We assume they use the nets
Or they are fascinated by them,
At least some of the time …

*Delphinus* seem to be attracted to boats fishing in this way.



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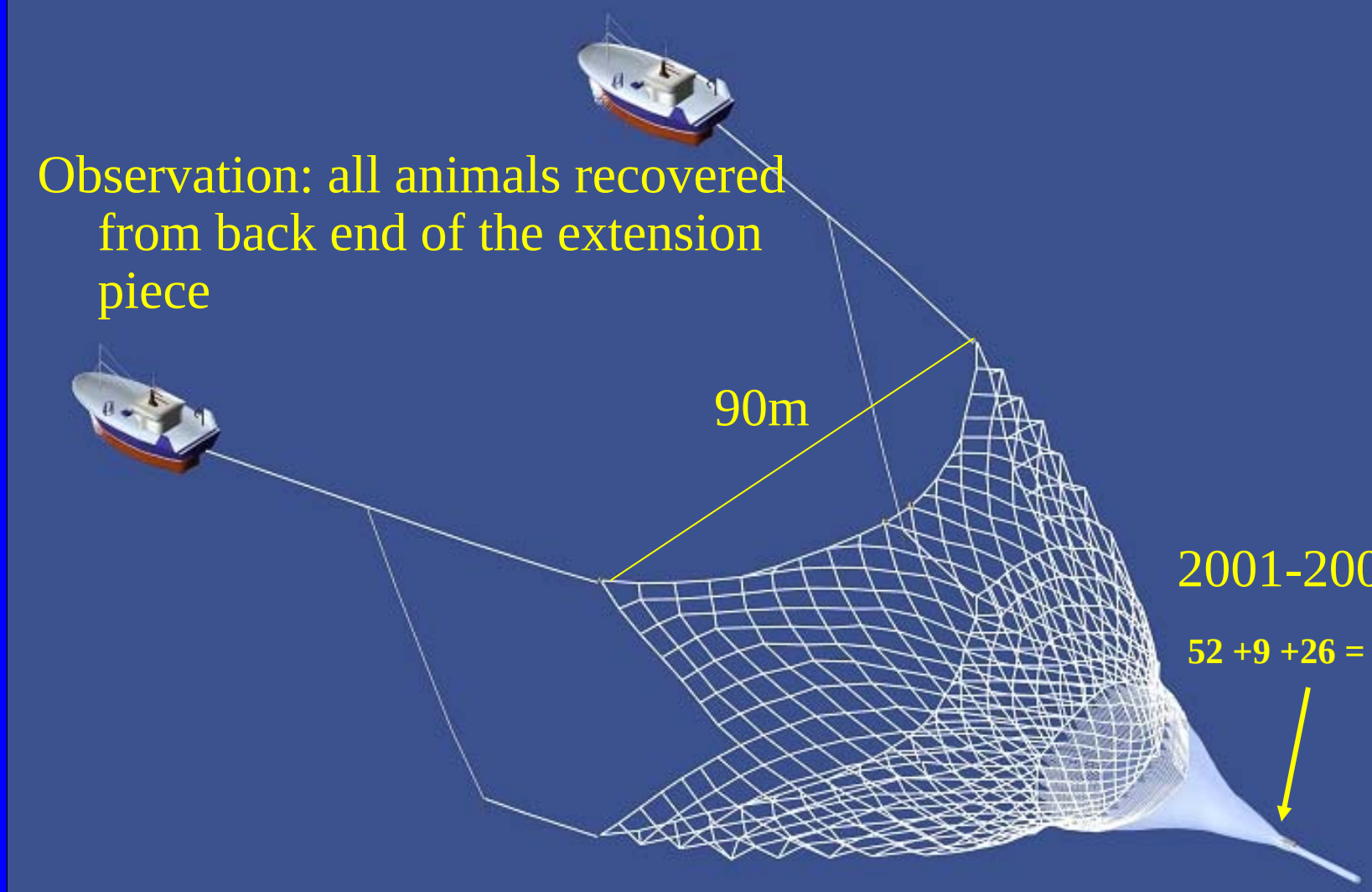
# Model of bass pair trawl operation



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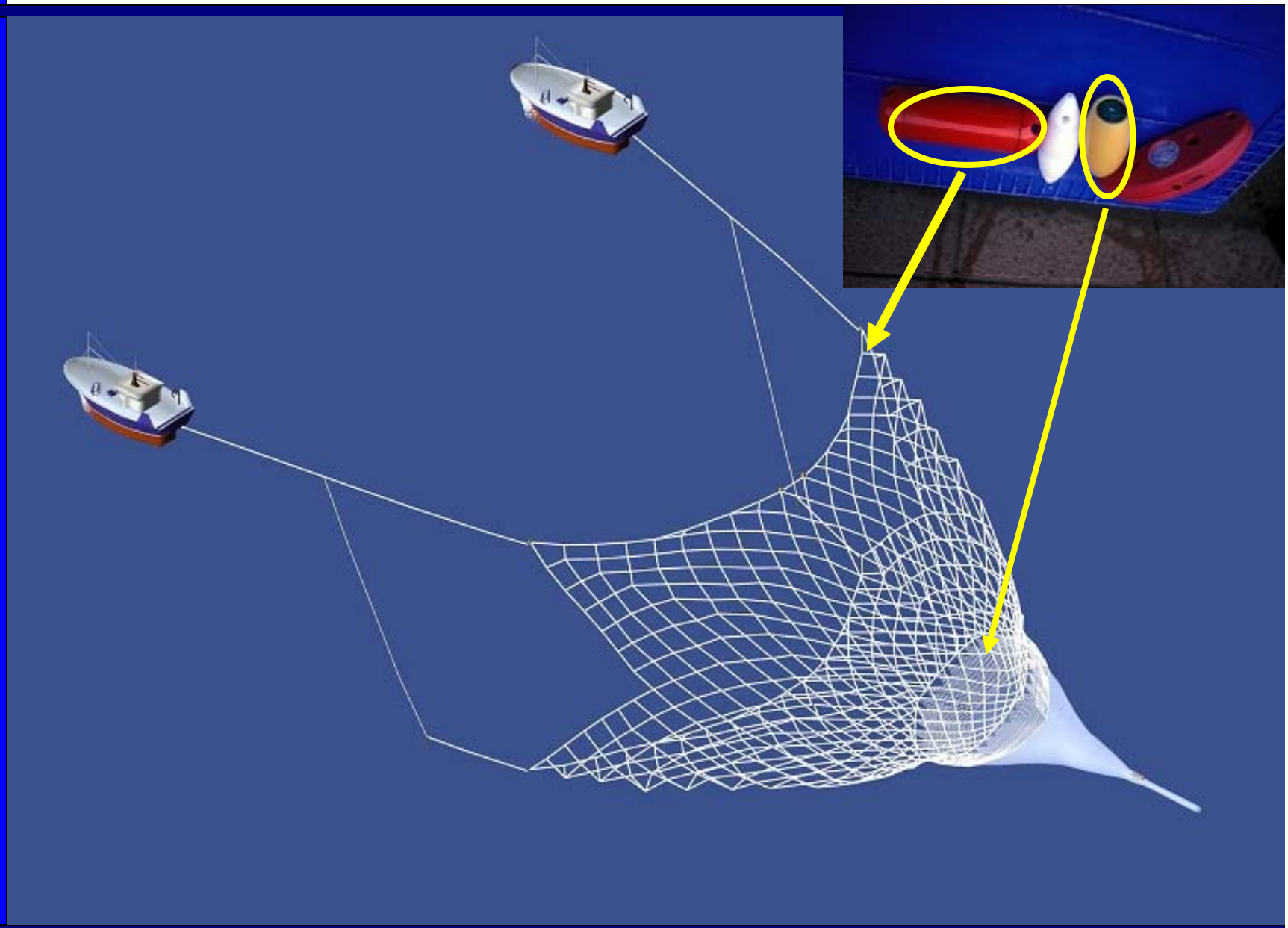
# Use of acoustic deterrents



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# Pinger Results

- 2001 – Dukane around the mouth

| Pingers: | No of tows | No of dolphins bycaught |
|---|---|---|
| Deployed | 15 | 19 |
| Not Deployed | 37 | 33 |

- 2003: Aquamark – around ‘sharks teeth’.

  2 Hauls without pingers took 20 animals;
  Thereafter all observed hauls were WITH pingers:
  Catch rate still around 0.7 animals per tow,
  (but group sizes 4, 2, 1, 1, 3, 2).

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# Development of exclusion grid

Bjoernar Isaksen, IMR, Norway

**Presentation to the ATGTRT meeting, Providence – 20th of September 2006**

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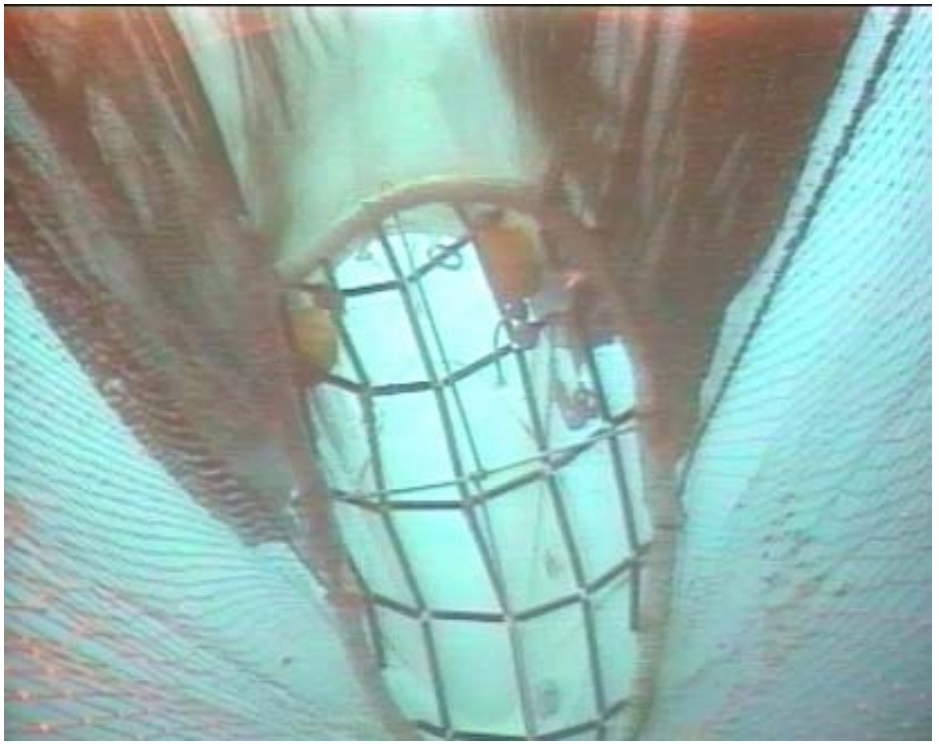
# Practicalities of using exclusion devices



- Camera essential: dolphin and fish behaviour.
- Handling of exclusion device
- Problems with using a camera cable

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# Results in 2002 -2003

- 40 hauls in March and 1 tow with 2 dolphins; 42+ tows in April – no dolphins;
- Unclear images from the camera
- Of the two animals one was trapped by its beak at the cover net
- Cover net involved had not been stiffened
- Cover net 22mm bar mesh size
- Bycatch rate in the other two pairs: **<u>average 1 bycatch event per 3 hauls</u>**

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# Possible reasons for observed results

- By chance – very improbable –
- Grid itself is a passive deterrent from tunnel
- Other equipment was a deterrent –
    - Scanmar grid sensor (10 days)
        - 186 dB ~40Hkz 13 second interval
- Combinations of any of the above
- This vessel had lower intrinsic rate of bycatch (not evident from other data)

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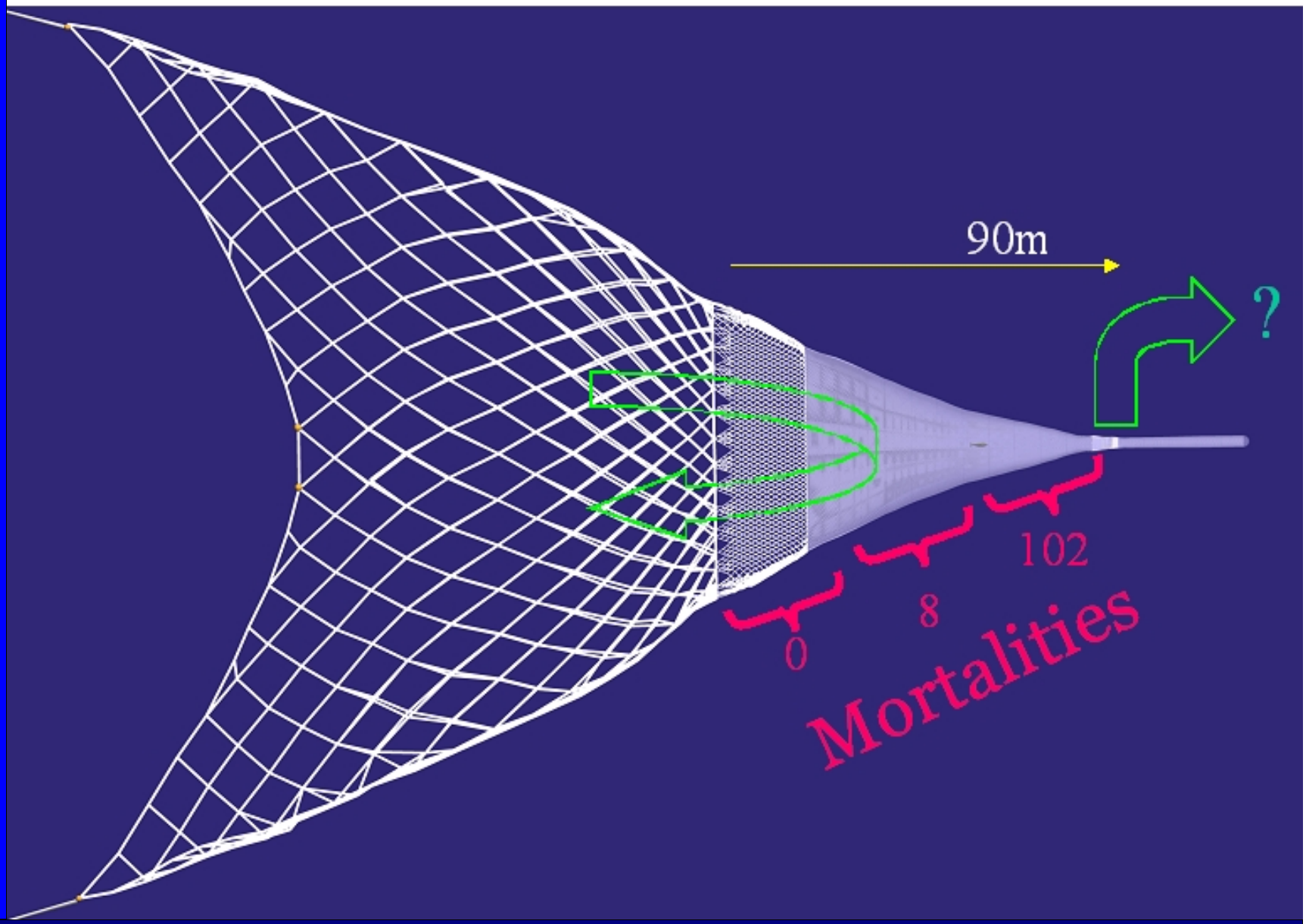
# 2003-2004



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# 2003-2004 exclusion devices

- 1: Initial Grid:
  - Solid steel;  1.7m opening; 22mm mesh size cover
- 2: Flexi-panel:
  - Plastic; 2.4m opening;22mm mesh size cover net
- 3: Tubular
  - Tubular steel; 2.4m opening; 5mm mesh cover net

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# Results from 2003-2004

| Grid type | Hole size | Escape hatch cover net type | Tows | Dolphins | Dolphin bycatch tows | Dolphins Per tow | Proportion of tows with bycatch |
|---|---|---|---|---|---|---|---|
| Steel | 1.7m | 22mm mesh | 10 | 45 | 5 | 4.5 | 0.5 |
| Flexi-panel | 2.4m | 22mm mesh | 30 | 53 | 7 | 1.77 | 0.23 |
| Steel (tube) | 2.4m | 5mm mesh | 30 | 29 | 8 | **0.96** | 0.26 |

Note that the Scanmar grid sensor was re-installed but did NOT affect dolphin bycatch rates
-> another negative acoustic deterrent result

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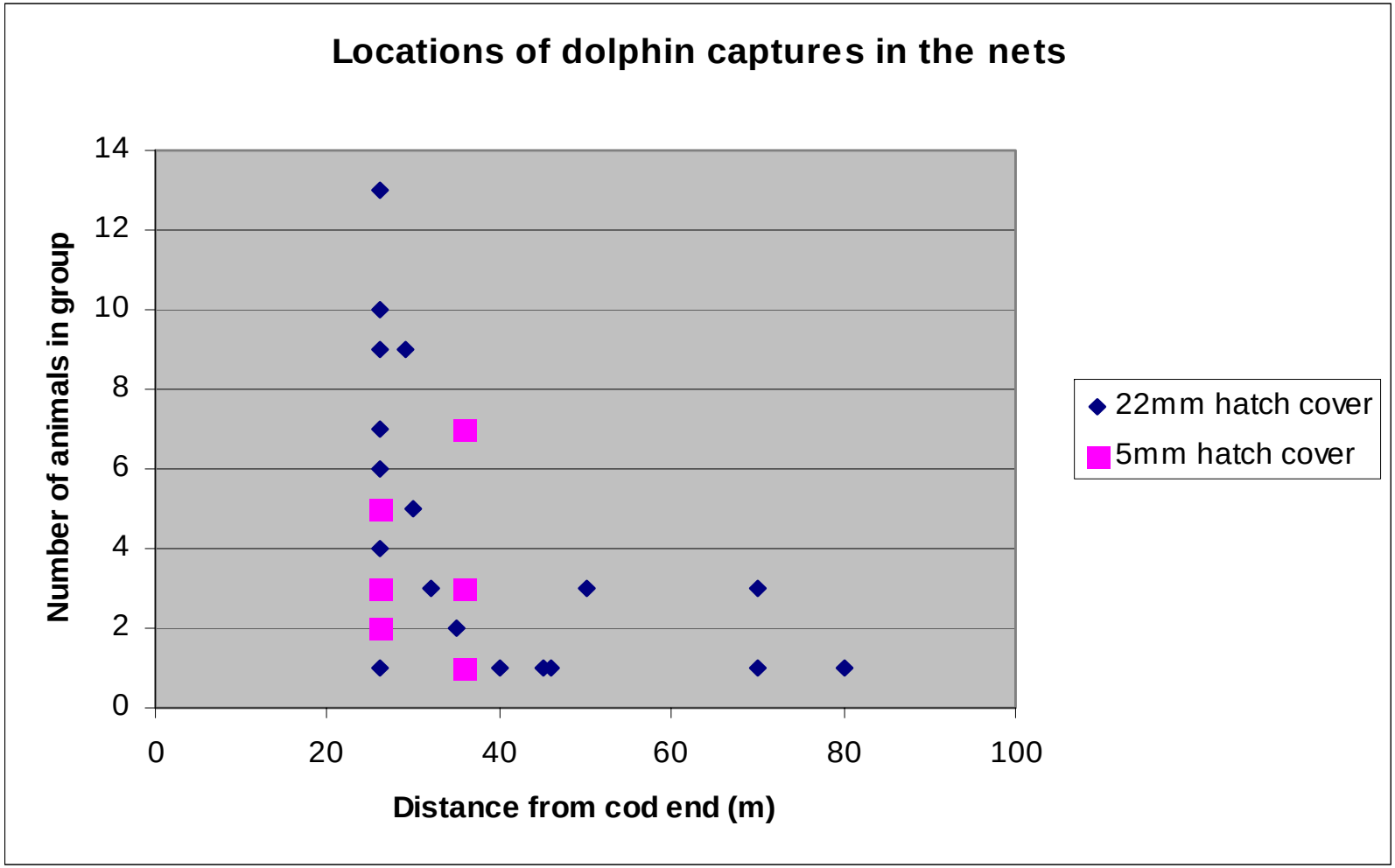
# Dolphin distribution in nets



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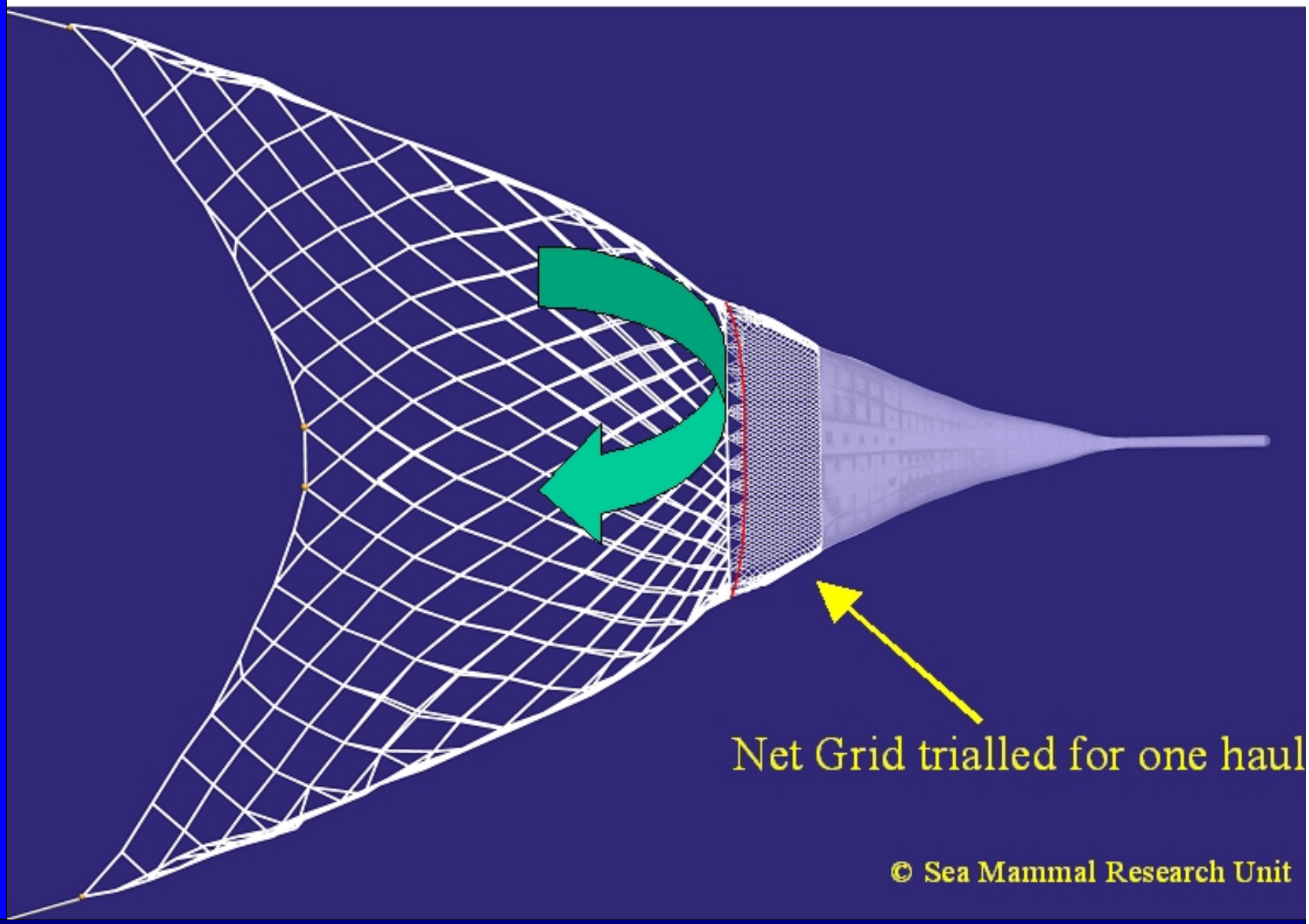
# 2004-5 (1)



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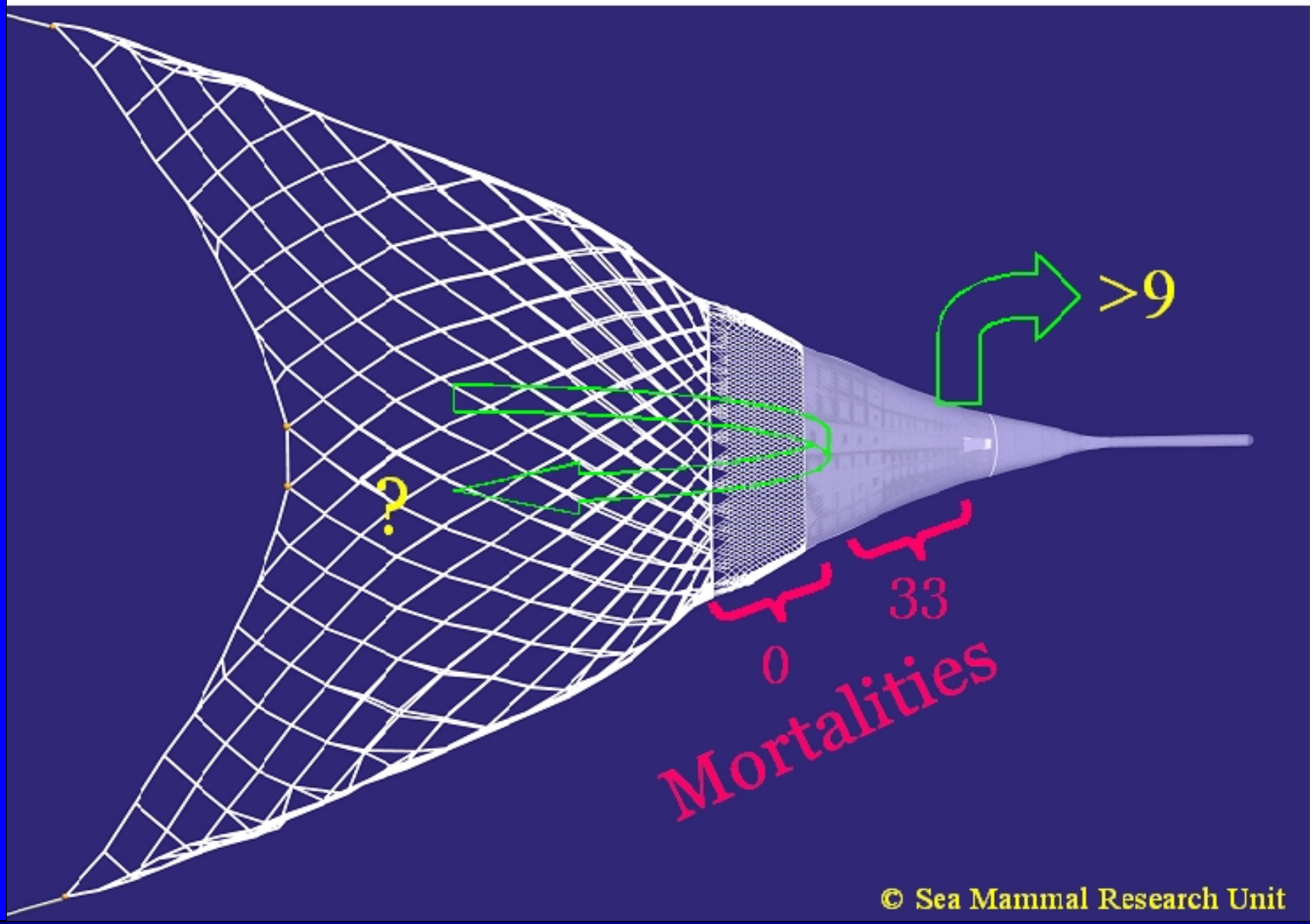
# 2004-5 (2)



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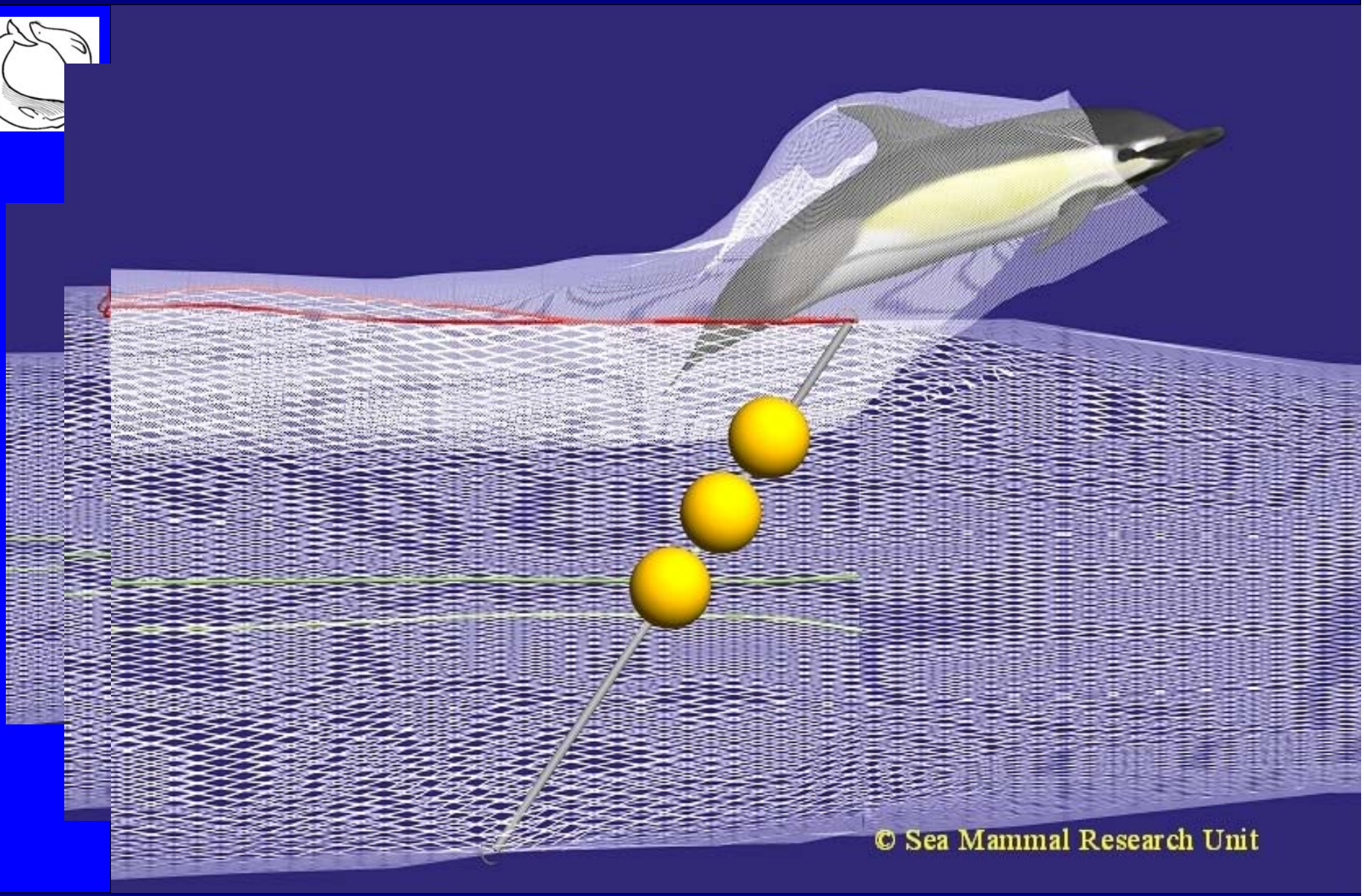
# Exit through escape hatch…



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# Improving escapement

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# 2005-2006

- Only one pair of boats fishing
- Short season due to low bass catches in this fishery and high fuel costs.
- 1 tow with modified bungee net but no exclusion grid, fish escape and dolphin bycatch observed
- Also tested new Aquatec interactive pinger during two tows, bycatch observed on both occasions.
- French trialled small bungee escape panel recorded dolphin escape and bycatch

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# Parallel acoustic work

- BIM working with Aquatec to make a responsive pinger.
  - Current Acoustic Signal Ineffective?
  - SMRU tested on two tows.
- IFREMER have tested alternate signals
  - Trials with Italian DDD
  - Initial field trials no consistent results.
- DIFRES Finn Larsen's trial's suggested DDD less effective than thought at first

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# Further modification and trials

- Continue monitoring with camera, additional resource of new camera system with built in hard drive.
- Continuing trial of net with new modifications – 3 escape hatches, one bungee escape panel and complete area of bungee – with a rope grid in place further up towards the mouth of the net.
- Additionally hope to begin acoustic monitoring with the aim to localise animals within the net if possible.

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# Overview of past and current European trawl bycatch research

- BIOECO Project 1994-5
- CetaSel (1996
- UK National Research programme (2000-present)
- Necessity (2004-7)
- Petracet (2004-5)
- National monitoring schemes


1. Morizur, Y., N. Tregenza, H. J. L. Heesen, S. D. Berrow, and S. Pouvreau. 1996. By-catch and discarding in pelagic trawl fisheries (BIOECO). Pages/l 121 + 127 Appendices. IFREMER, Plouzane.
2. de Haan, D., P.-Y. Dremiere, B. Woodward, R. Kastelein, M. Amundin, and K. E. Hansen. 1998. Prevention of the by-catch of cetaceans in pelagic trawls by technical means (CETASEL). Page 204. DLO-Netherlands Institute for Fisheries Research, Ijmuiden.

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