

WHY ARE PORPOISES CAUGHT IN GILL NETS?

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WHY ARE PORPOISES CAUGHT IN GILL NETS?



HYPOTHESES

PORPOISES ARE CAUGHT
BECAUSE...

🐟 ...porpoises **CANNOT** detect
the nets at sufficient
distance to avoid them.

🐟 Porpoises **CAN** detect the
nets at sufficient distance

Detection distance

is a function of:

Source Level

Ambient noise

Target Strength

EVIDENCE

🐟 None....?

🐟 Hatakeyama & Soeda (1990)

🐟 estimated 2 m DD

🐟 Kastelein *et al.* (2000)

🐟 estimated 3-6 m DD

🐟 Mooney *et al.* (2004)

🐟 estimated 3-5 m DD

🐟 Villadsgaard, Wahlberg &
Tougaard (in prep.)


🐟 estimated SL >200 dB

🐟 corresponds to +20 m DD

HYPOTHESES

PORPOISES ARE CAUGHT
BECAUSE...

POTENTIAL SOLUTIONS

 ...porpoises **CANNOT** detect
the nets at sufficient
distance


 Porpoises **CAN** detect the
nets at sufficient distance

 Increase Target Strength

HYPOTHESES

PORPOISES CAN DETECT
THE NETS, BUT...

 ...porpoises **DON'T** use
their sonar all the time.

 Porpoises **DO** use their
sonar all the time.

EVIDENCE

 Teilmann, Akamatsu *et al.*
(poster at MMC-2005)

 90 % silent periods < 20 s

 4 % silent periods > 50 s

 scanning ahead c. 50 m

 Verfuss *et al.* (2005)


 sonar used continuously

 in daylight & good visibility

HYPOTHESES

PORPOISES CAN DETECT
THE NETS, BUT...

 ...porpoises **DON'T** use
their sonar all the time.

 Porpoises **DO** use their
sonar all the time.

POTENTIAL SOLUTIONS

 Alerting the porpoises...?

HYPOTHESES

PORPOISES USE SONAR
MOST OF THE TIME, BUT...

- 🐟 ...sonar is directed away from travel direction.
- 🐟 ...sonar is locked on another target.
- 🐟 ...target incorrectly classified.
- 🐟 ...lack of attention.
- 🐟 ...nets are used to herd fish.
- 🐟 ...nets are investigated, played with, etc.







EVIDENCE

FOR / AGAINST







- 🐟 'bottom grubbing'
- 🐟 ???? / ...impractical...?
- 🐟 Kastelein *et al.* (1995)
- 🐟 Kastelein *et al.* (1995)
- 🐟 ???? / ?????
- 🐟 Kastelein *et al.* (1995)

HYPOTHESES

PORPOISES USE SONAR
MOST OF THE TIME, BUT...








-  ...sonar is directed away from travel direction.
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POTENTIAL SOLUTIONS








-  Alerting the porpoises...?
-  Increase Target Strength
-  Increase Target Strength
-  Alerting the porpoises...?
-  Pingers
-  Pingers

CONCLUSIONS

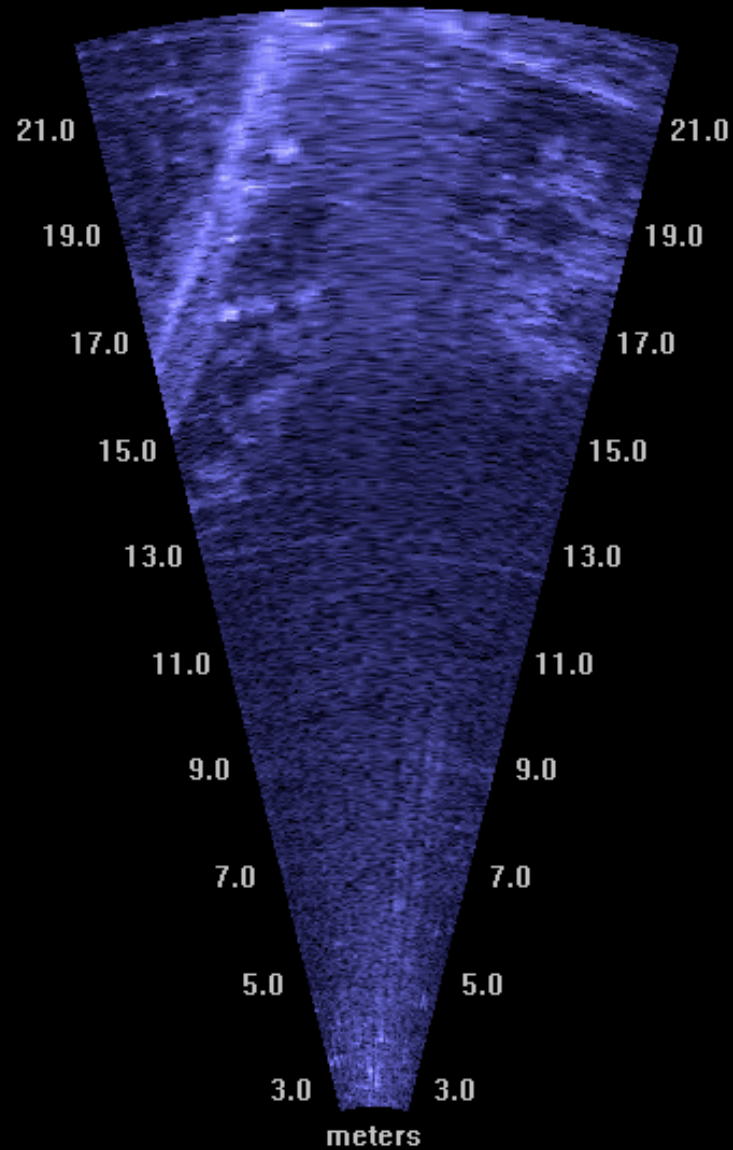
PORPOISES ARE CAUGHT BECAUSE...

-  ...they can't detect the nets.
-  ...they don't use their sonar all the time.
-  ...sonar is directed away from travel direction
-  ...sonar is locked on another target.
-  ...target incorrectly classified.
-  ...lack of attention.
-  ...nets are used to herd fish, investigated, played with, etc.

RESEARCH NEEDED

-  Detection experiments in noise.
-  More acoustic data loggers on porpoises in the wild.
-  Observe porpoise behaviour around nets (DIDSON?).
-  Studies of prey capture (in captive animals...?)
-  Trials with nets with high TS.
-  Trials with alerting devices.
-  Observe porpoise behaviour around nets (DIDSON?).

DIDSON recordings of porpoises in the pool at Fjord&Belt, Kerteminde



A slightly
different
solution
to the
problem

