



What we know about the effectiveness of the 'PAL' (Porpoise Alert) application as an anti- bycatch measure

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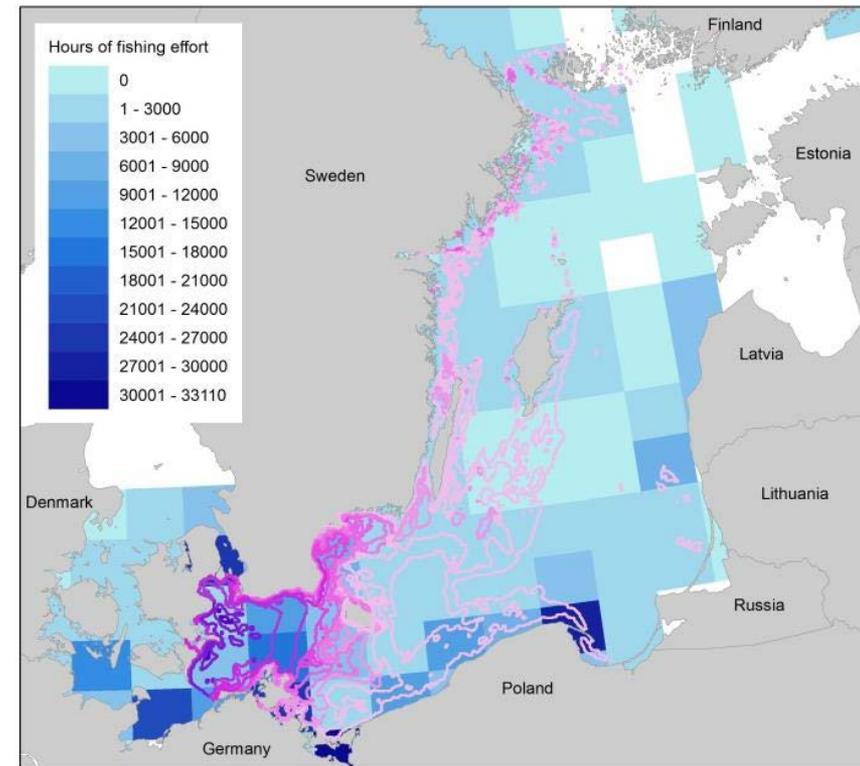
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Bycatch is the primary threat for the Baltic harbour porpoise

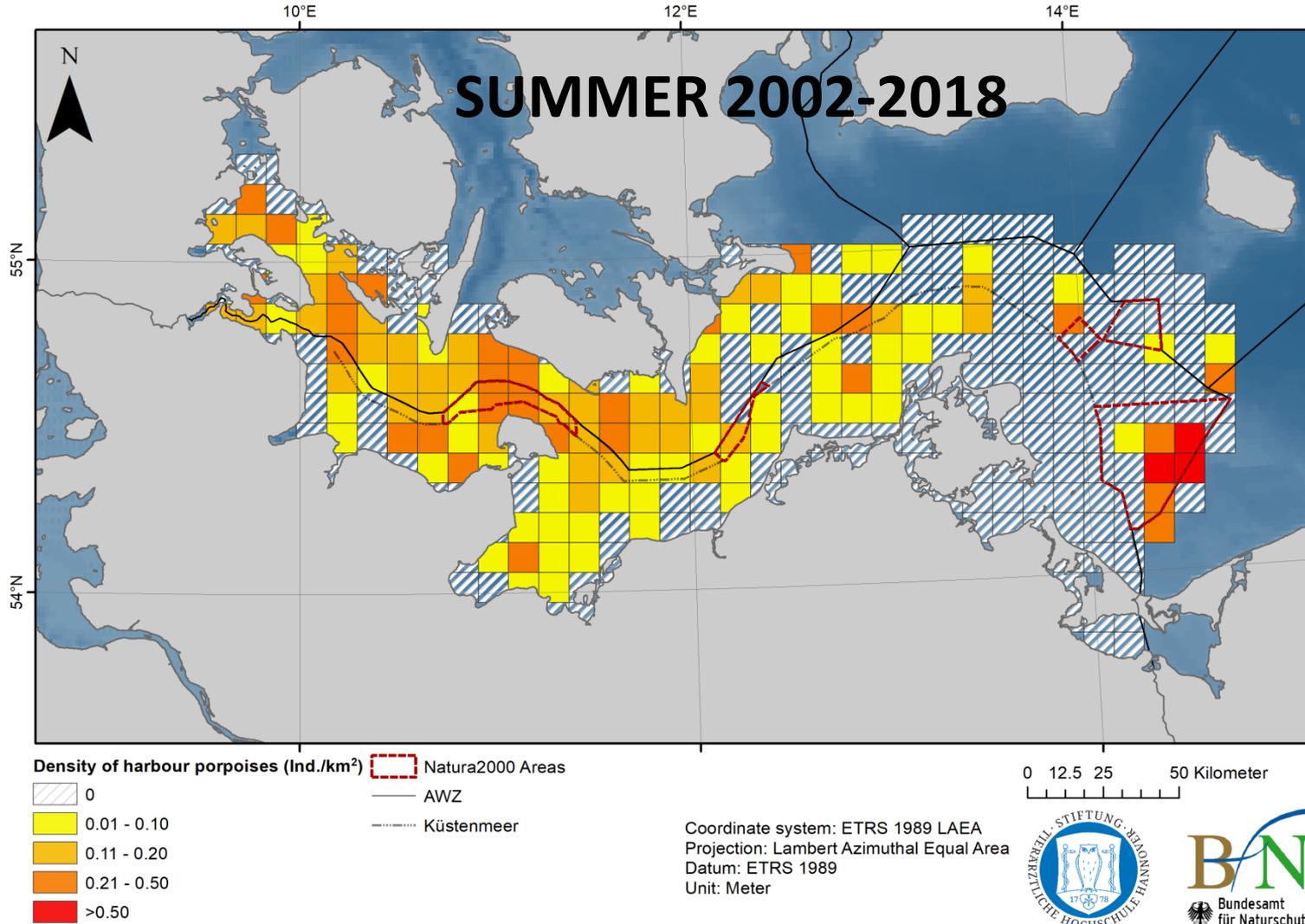
Situation in the Baltic Sea

- **Bycatch in gillnet fisheries has been recognized as the primary threat** for the survival of the Baltic harbour porpoise population
- Agreement on 'Recovery Plan for Baltic Harbour Porpoises (**Jastarnia Plan**)'
(document: MOP8_2016-3_JastarniaPlan_inclAnnex.pdf)
- **Number of annually bycaught animals is critically needed** to evaluate and monitor threat from bycatch



Monthly probability of detection of harbour porpoises together with total hours fished (Jastarnia Plan, Fig. 8)

Bycatch is the primary threat for the Baltic harbour porpoise



What are the measures to prevent bycatch?

According to 'ASCOBANS Recovery Plan for Baltic Harbour Porpoises'

- **Replacements of gillnets by alternative fishing gear with lower bycatch potential**
 - Hooks, seine nets, fish traps, ...
- **Use of acoustic deterrent devices**
 - Variety of 'pingers' available
- **Protected areas or time area closures**
 - Reduction of fishing effort

Situation in German Baltic Sea (Schleswig-Holstein)

Voluntary agreement with fishermen in Schleswig-Holstein in Nov. 2015

Objectives

Maintain gillnet fisheries and economic efficiency in compliance with harbour porpoise and diving duck protection

- 219 of 280 fishermen in Schleswig-Holstein voluntarily signed agreement
- **Report bycatches** and participate in harbour porpoise monitoring
- **Participate in scientific investigations** on alternative fishery methods and anti-bycatch devices
- Avoid areas with diving duck aggregations from 16.11. – 01.03.
- **Limitation of maximum net-row length** to 4, 3 and 1.5 km for boats >8, <8 and <6m from **01.06 – 31.08.**

Ideal pinger from a porpoise conservation point of view

We critically need a (deterrent) device with...

- High efficiency in reducing bycatch
- No habituation effects
- Very small exclusion zone

The PAL promises...

- **No deterring effect** and therefore **no habitat reduction**
 - Supporting the harbour porpoise to detect the gillnet on its own
- **No effect on catch rates of fisherman**, maintain profitability
- **70 % bycatch reduction**



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What is known about PAL effectiveness?

Outcomes of Culik et al. (2015) and pilot study in gillnet fisheries

- PAL signal imitates aggressive call of harbour porpoise in human care
- Playback study in Denmark with PAL signal
 - Increase in echolocation activity of 10%
 - Comparably low deterrence of 23 m
- Test in commercial gillnet fisheries in Germany and Denmark in the Baltic Sea
 - 3 participating fishing vessels
 - 20 bycatches, 17 control nets, 3 PAL nets
 - 70% bycatch reduction

What we don't know about PAL effectiveness

Uncertainties in PAL usage

- **No monitoring** of harbour porpoise presence in the surrounding of gillnets
- Indication of increased gillnet detectability?
 - **Meaning of PAL signals for porpoises?**
 - **Not tested:** Reported deterrence of 23 m (Culik et al. 2015)
 - Detection range of set-nets between 3 – 26 m (Kastelein & Villardsgaards 2007)
- **No effectiveness in preventing bycatches in the German North Sea**
- **No effectiveness in preventing bycatches in Iceland**
 - Attractiveness for males suspected
- **Number of reported bycaught animals is decreasing?**
 - Less bycaught or less intention to deliver them?
 - Number of stranded animals in the Baltic Sea is not decreasing

Large scale usage of PALs in the German Baltic Sea

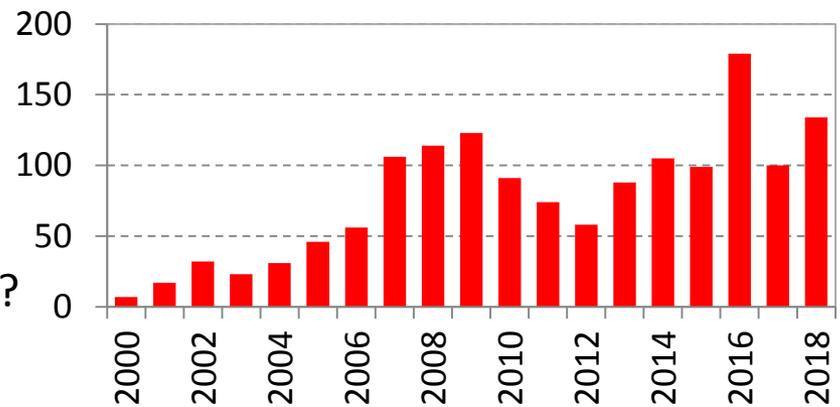
April 2017:

- 1680 PAL devices bought for fishermen in Schleswig-Holstein
- 83 of 219 fishermen within voluntary agreement use PALs
- If fishermen use PALS no further limitations in length of net-rows

Observed effectiveness of PAL?

- Indication of reduced bycatch?
→ **Actually not**
- Indication of reduced stranded porpoises?
→ **NO**

Number of stranded porpoises



Stranded porpoises at the coast of Schleswig-Holstein (data: ITAW)

Need for further studies on PAL effectiveness and application

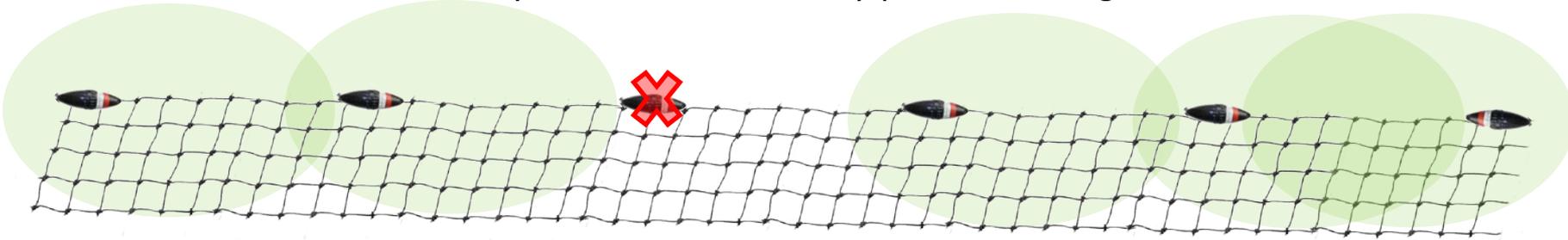
Urgently needed investigations on...

- **How do harbour porpoises (seals, birds,...) react to the PAL signal?**
 - Deterrence or behavioural change?
 - Indication for decrease in harbour porpoise detections during PAL deployment found (Schaffeld 2016, master thesis)
 - How do harbour porpoises react at a gillnet?
 - Without and with the use of PALs
 - In what context do harbour porpoise approach nets?
 - Do PALs lead to a better detection of nets?
 - Do interactions with other interfering noises (ships, etc. . .) occur?
 - Are there any indications of habituation?

Need for further studies on PAL effectiveness and application

We request further investigations on...

- **Sound propagation along nets?**
 - Acoustic coverage of gillnet row?
 - Is the signal in 200 m distance still loud enough to alarm porpoises?
 - Directionality & attachment, battery-power, masking, etc.

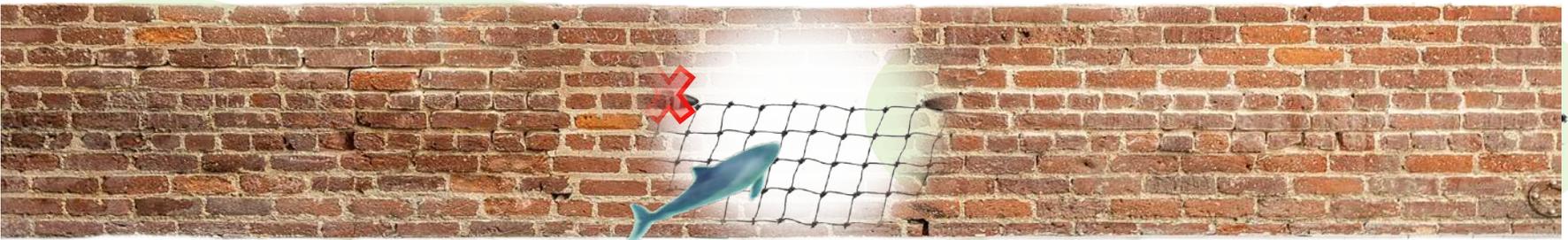


- Acoustic gaps could lead to increased bycatches (Palka et al. 2008)

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- Acoustic gaps could lead to increased bycatches (Palka et al. 2008)
- Effect when net-rows are close to each other?

Further extensive investigation are needed!

Thanks for your attention

