

Seabird bycatch in the coastal areas of the Lithuanian Baltic Sea. How we can reduce it across the entire Baltic Sea?



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des Deutschen Bundestages

Baltic coast of Lithuania

90 km

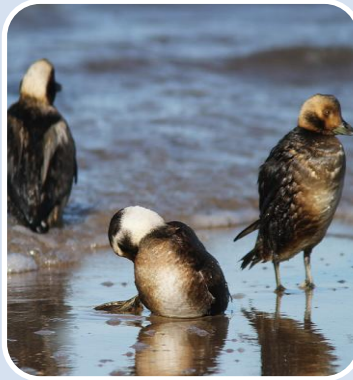


Threats to seabirds in the Baltic Sea



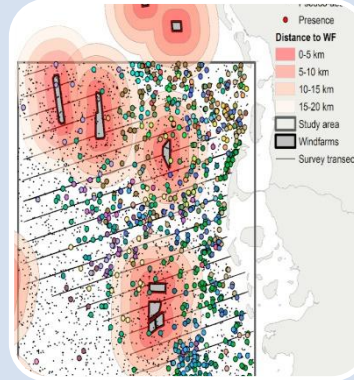
Climate
change in
breeding
and
wintering
grounds

Descamps et al.
2017



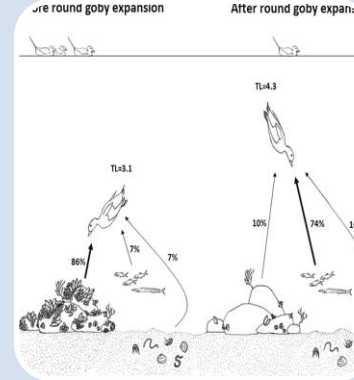
Oil spills and
oiling

Heubeck et al.
2003



Disturbance
by offshore
wind energy
construction

Hainenen et al.,
2020



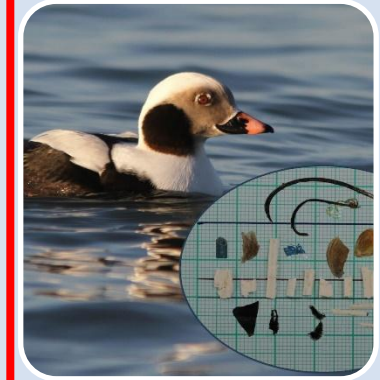
Degradation
of habitats,
impact from
invasive
species

Skabeikis et al.,
2019



Bycatch in
fishery

Žydelis et al., 2009,
Žydelis et. Al. 2013
Morkunas et al
2022.
Ramirez et al 2024



Ingestion of
marine
debris

Morkūnas et al.
2021

Accidental bycatch of seabirds in fishery

Seabirds are occasionally caught unintentionally during fishing operations.



How big is the problem?

- Gillnet fisheries are responsible for the drowning of approximately 400,000 seabirds globally each year (Žydelis et al., 2013).
- The annual bycatch mortality of seabirds in gillnet fisheries across the North and Baltic Seas is estimated at 100,000–200,000 individuals (Žydelis et al., 2009)
of these, an estimated 76,000 seabirds are killed annually in the Baltic Sea (Žydelis et al. 2013).
- The impact of current bycatch on seabird population declines is unclear because reliable national data on bird mortality are lacking.

Ramírez, I., Mitchell, D., Vulcano, A., Rouxel, Y., Marchowski, D., Almeida, A., Arcos, J.M., Cortes, V., Lange, G., Morkūnas, J. and Oliveira, N., 2024. Seabird bycatch in European waters. *Animal Conservation*.



Yearly in Baltic Sea is drowning 86 600 birds:

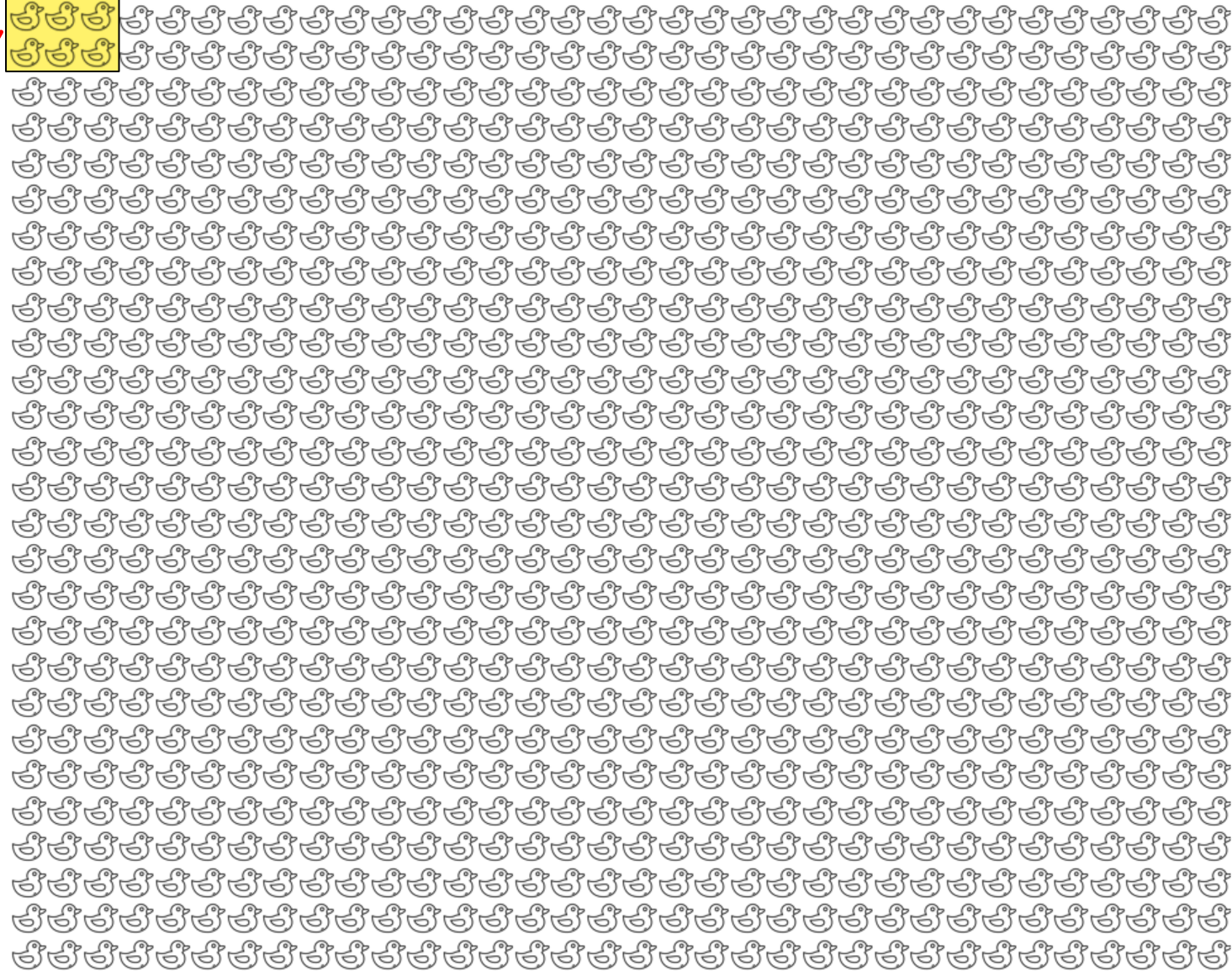
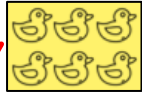
- Denmark – 2 721
- Estonia – 2 154
- Finland – 1 800
- Germany – 1 800
- Latvia – 1 914
- **Lithuania – 2 737**
- Poland – 21 300
- Russia – 524
- Sweden – 17 743
- Of which **49 500** occur in gillnets fishery.



Ramírez, I., Mitchell, D., Vulcano, A., Rouxel, Y., Marchowski, D., Almeida, A., Arcos, J.M., Cortes, V., Lange, G., Morkūnas, J. and Oliveira, N., 2024. **Seabird bycatch in European waters.** *Animal Conservation*.

Seabird bycatch in the small-scale coastal fishery of Lithuania

According to
Lithuania's official
report, only six birds
were recorded
between 2015 and
2020



The collected bycatch in 2015-2020 was 909 birds



Goal: to finding solutions to decrease the bycatch of vulnerable seabird species from Baltic gillnet fisheries and thereby mitigating conflicts between fisheries and nature conservation

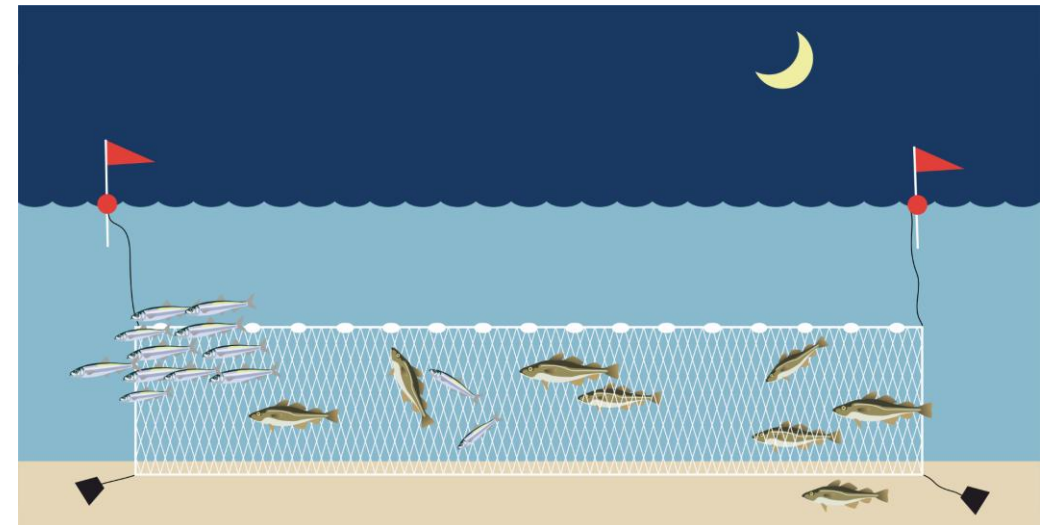
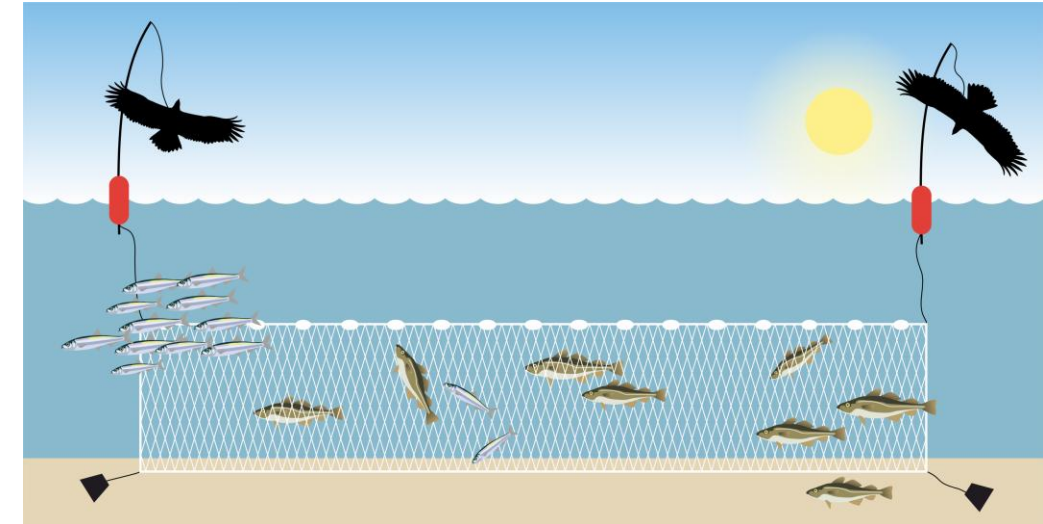
1) Fishing with kites mimicking predatory birds:

A series of 7 gillnets was deployed in a row, with kites attached to buoys at both ends of the set.

2) Night fishing:

Nets set in the evening and retrieved the following morning.

3) Assess spatio-temporal risk factors for bycatch and recommend fishing practices that minimize ecological impact while remaining practical for the industry.



Methods for analysis



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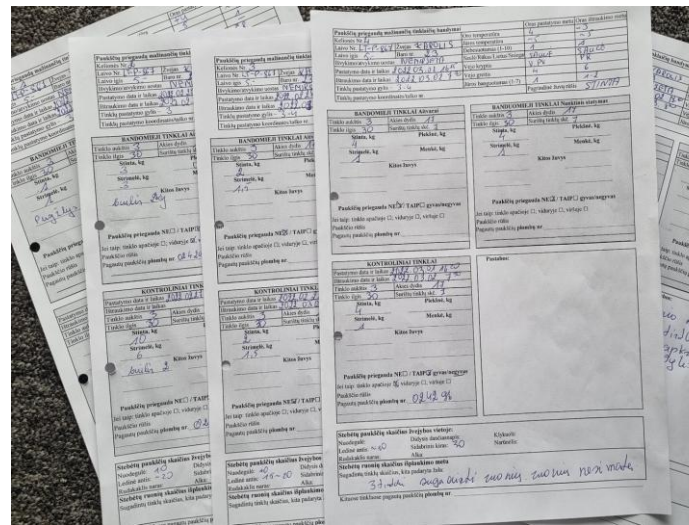


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- Fishing period: November–April, with 3–6 fishermen participating each season.
- Data collection on bycatch: By fishermen and observers on the boat.
- Bycatch handling: Bycaught seabirds were brought to the laboratory for identification and analysis.
- Tracking efforts: GPS units deployed on fishing vessels and seabirds tagged with GPS transmitters to monitor activity patterns.



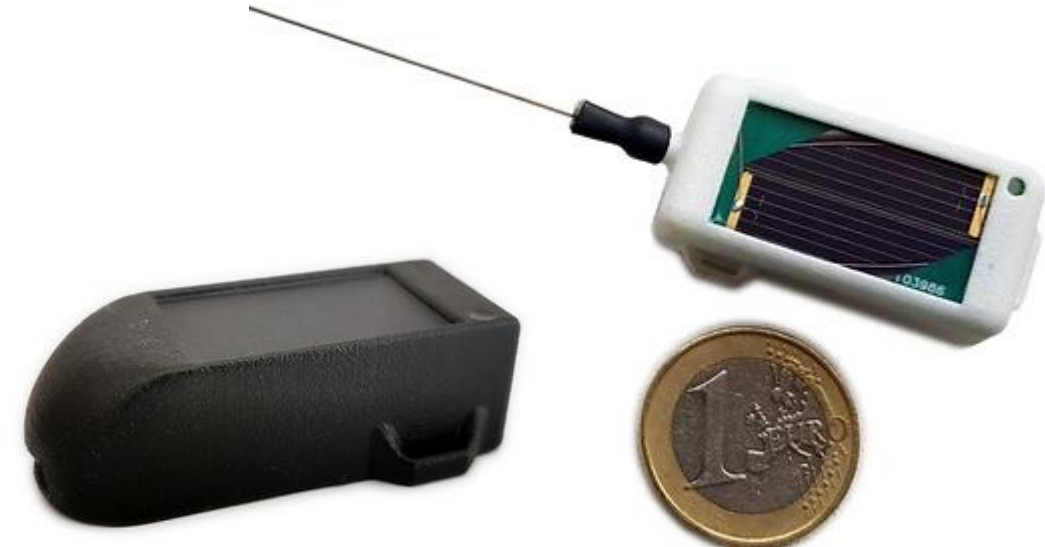
Total number of birds caught across all gillnets, including those from the regular fishing activities of the participating fishermen

Species	2021-2022	2022-2023	2023-2024	Total:
<i>Bucephala clangula</i>			1	1
<i>Clangula hyemalis</i>	136	170	248	554
<i>Gavia stellata</i>	6	12	18	36
<i>Melanitta fusca</i>	2	20	56	78
<i>Melanitta nigra</i>		23	10	33
<i>Mergus merganser</i>		1		1
<i>Phalacrocorax carbo</i>		2	29	31
<i>Podiceps cristatus</i>		1	4	5
<i>Uria aalge</i>			2	2
Total:	144	229	368	741

Bird behavior investigation with GPS transmitters

Species:

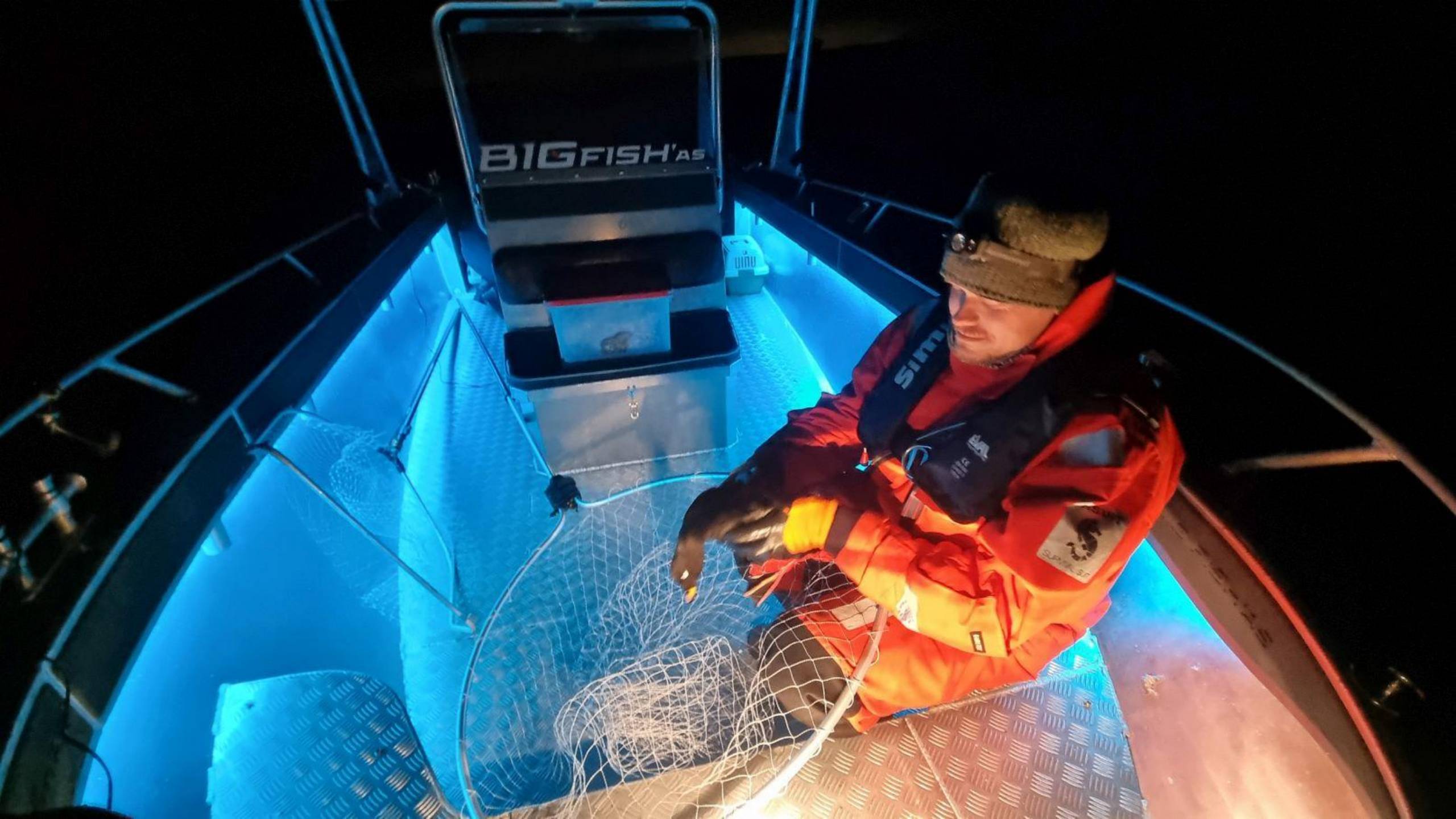
- Velvet Scoter
- Red-throated diver
- Long-tailed duck
- GPS/GSM transmitters from 15 g to 25 g
- Temporary attachment on back feathers



Seabird tracking with GPS









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During 3 wintering season used 86 transmitters and tracked 94 birds

Species	2021-2022	2022-2023	2023-2024	Total:
<i>Long-tailed duck</i>	5	10	18	33
<i>Red-throated diver</i>	7	8	13	28
<i>Velvet scoter</i>	8	25	0	33
Total:	20	43	31	94



Rezultatai – pasiskirstymas teritorijoje



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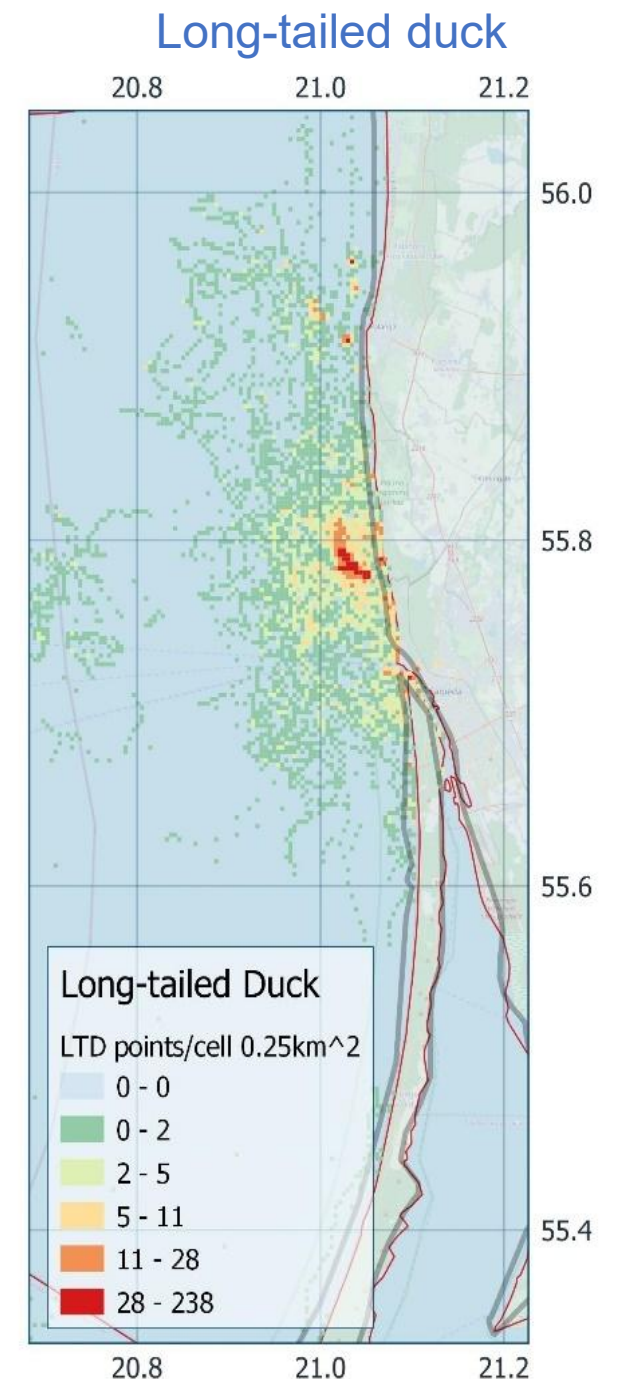
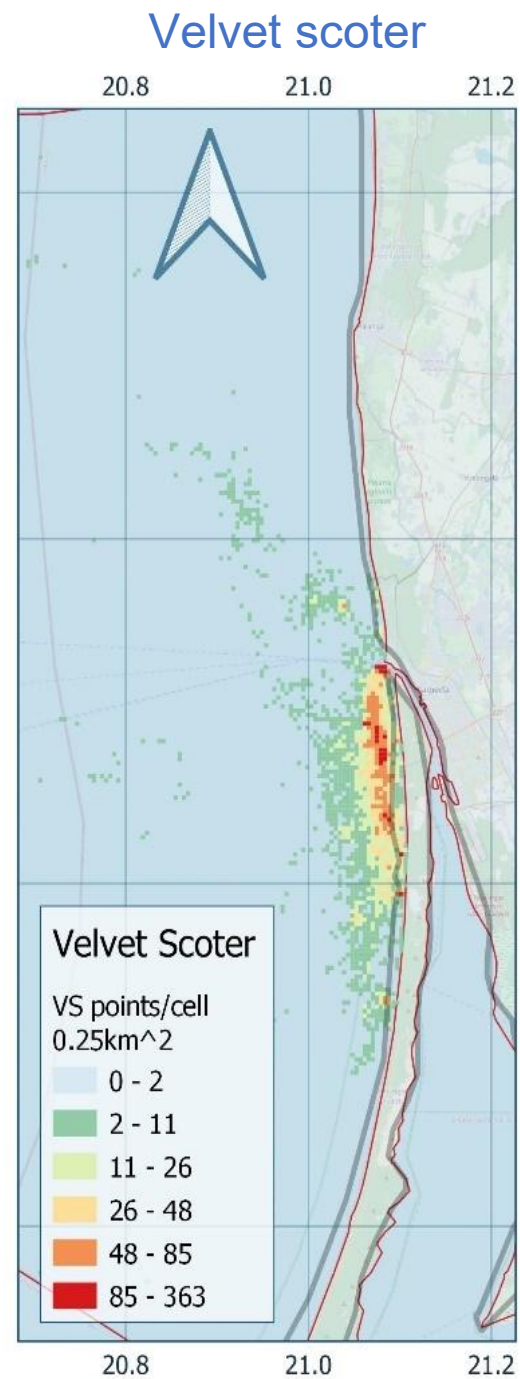
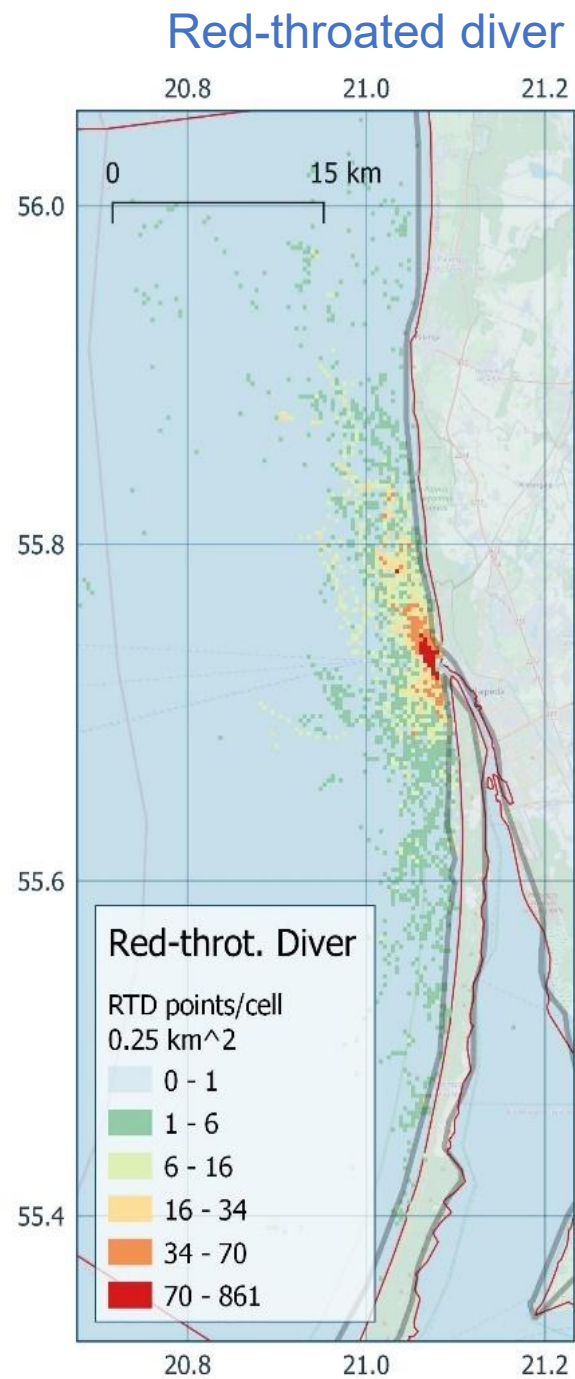


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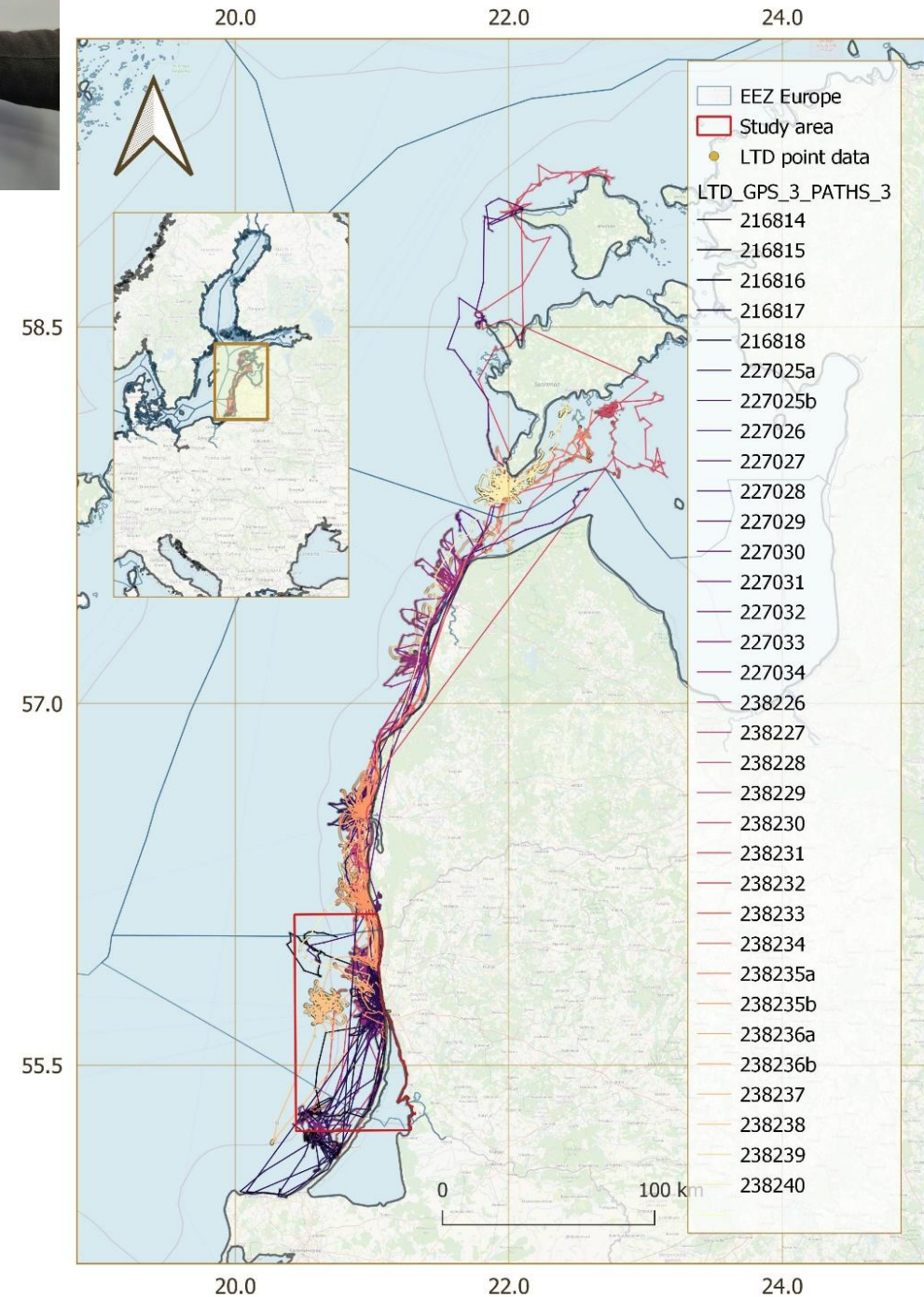
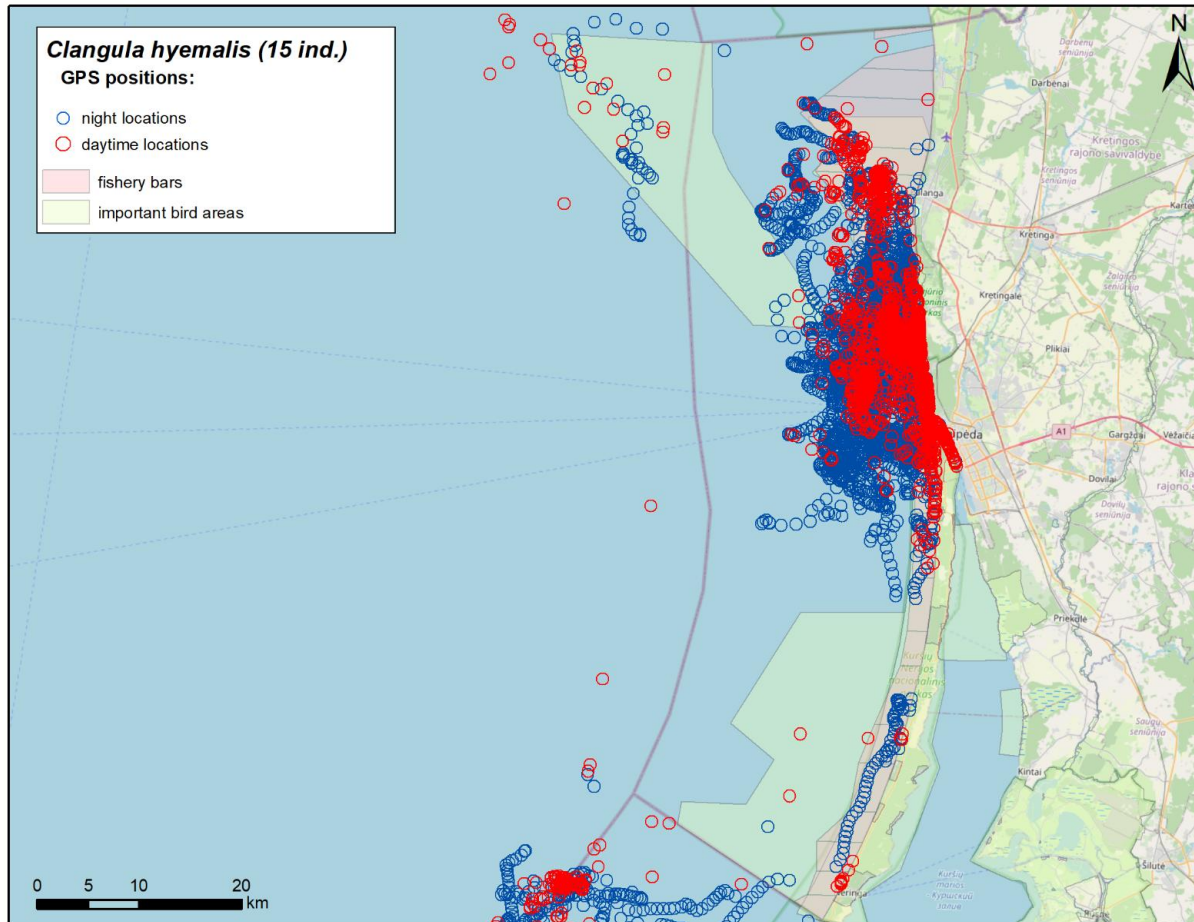
Activity of seabirds along Lithuanian coast



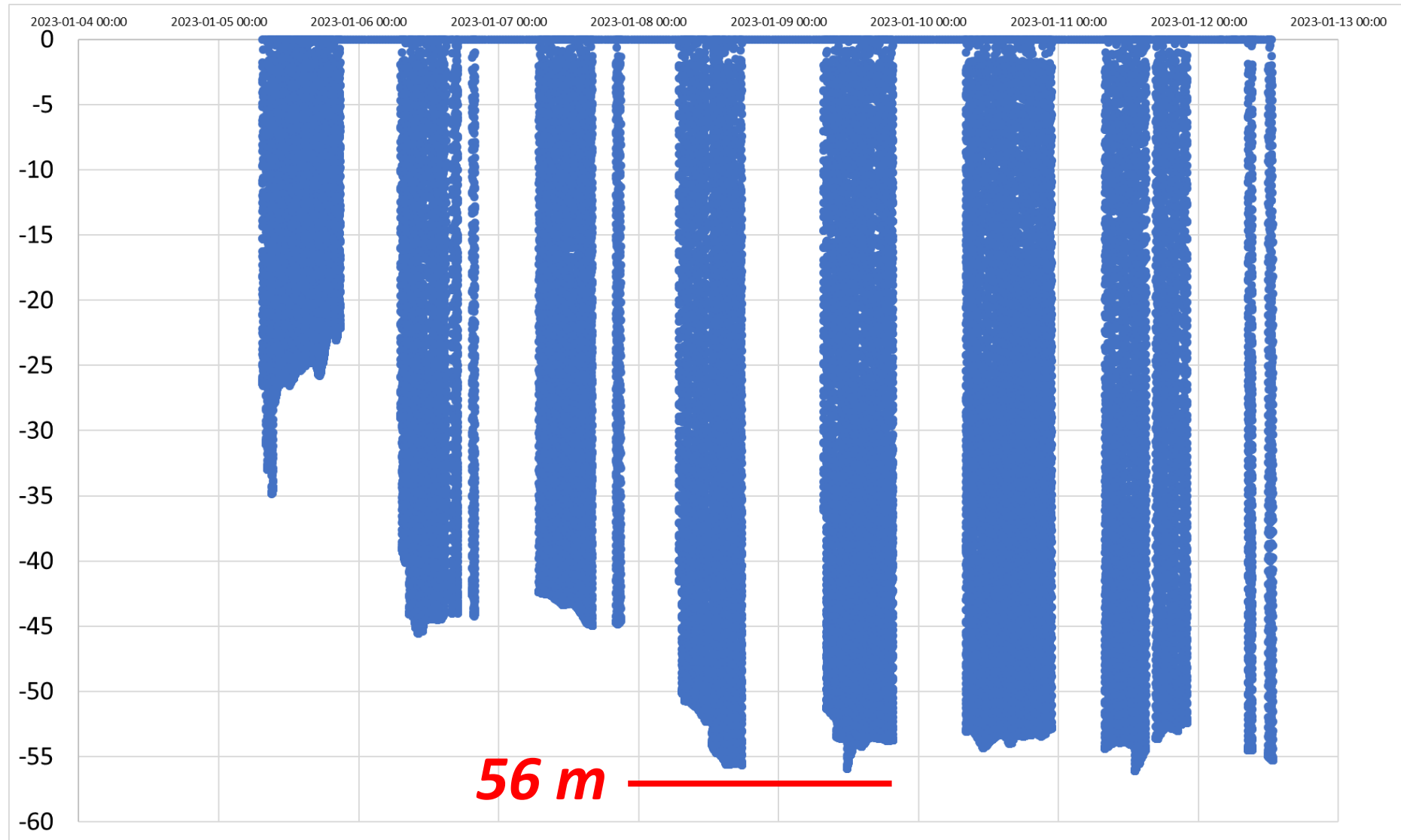
Long-tailed duck



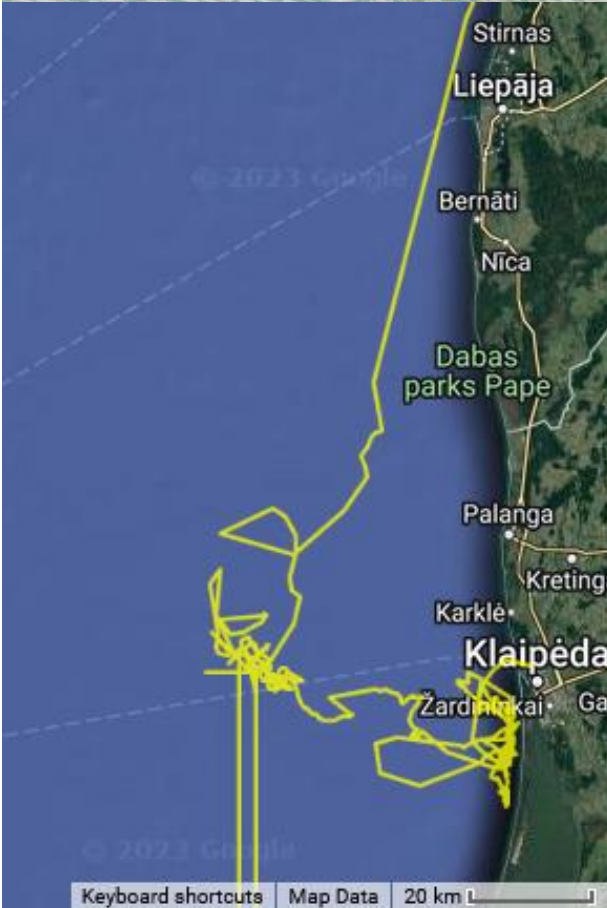
- Dispersion from December to March
- Day and night different activity



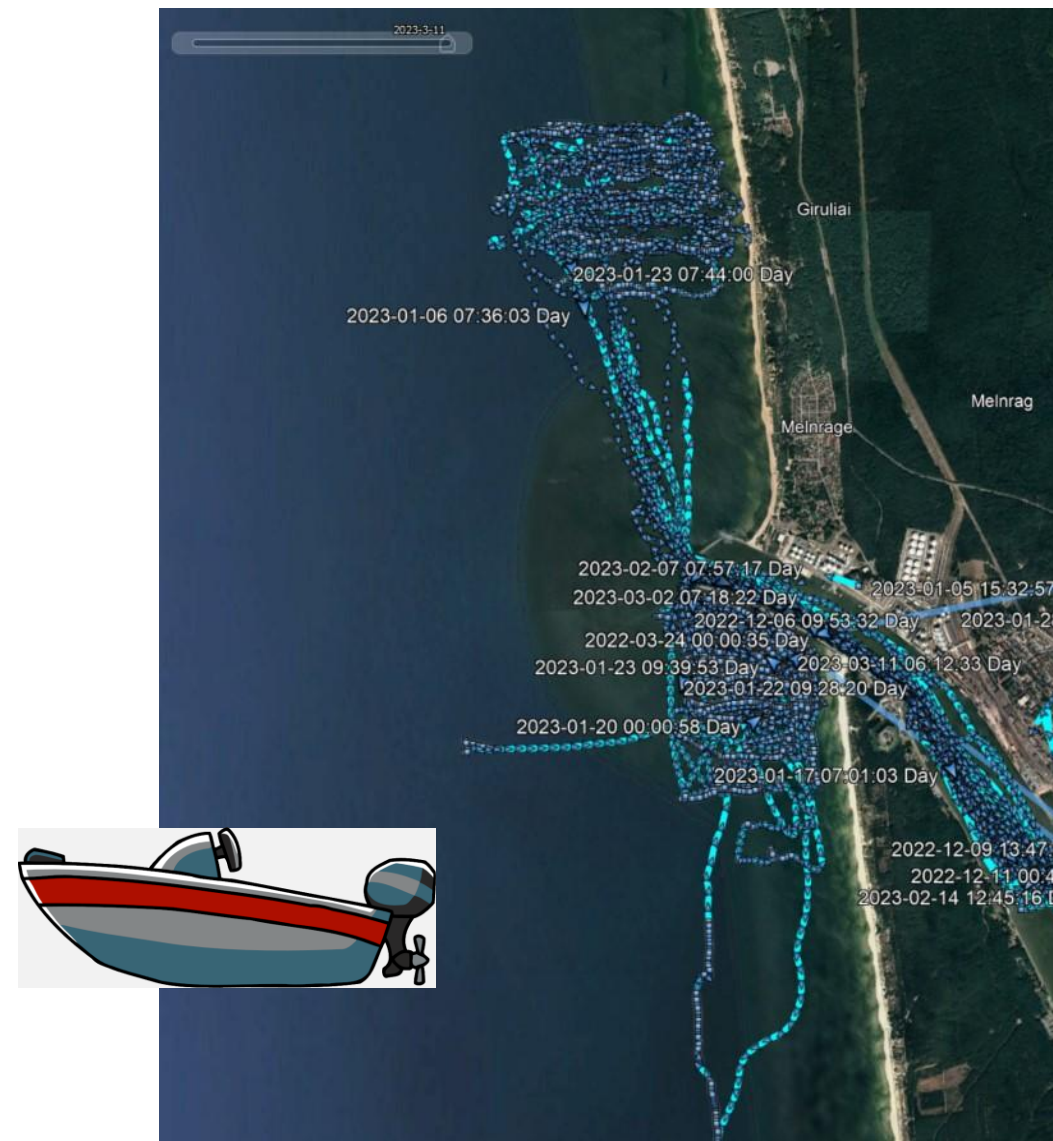
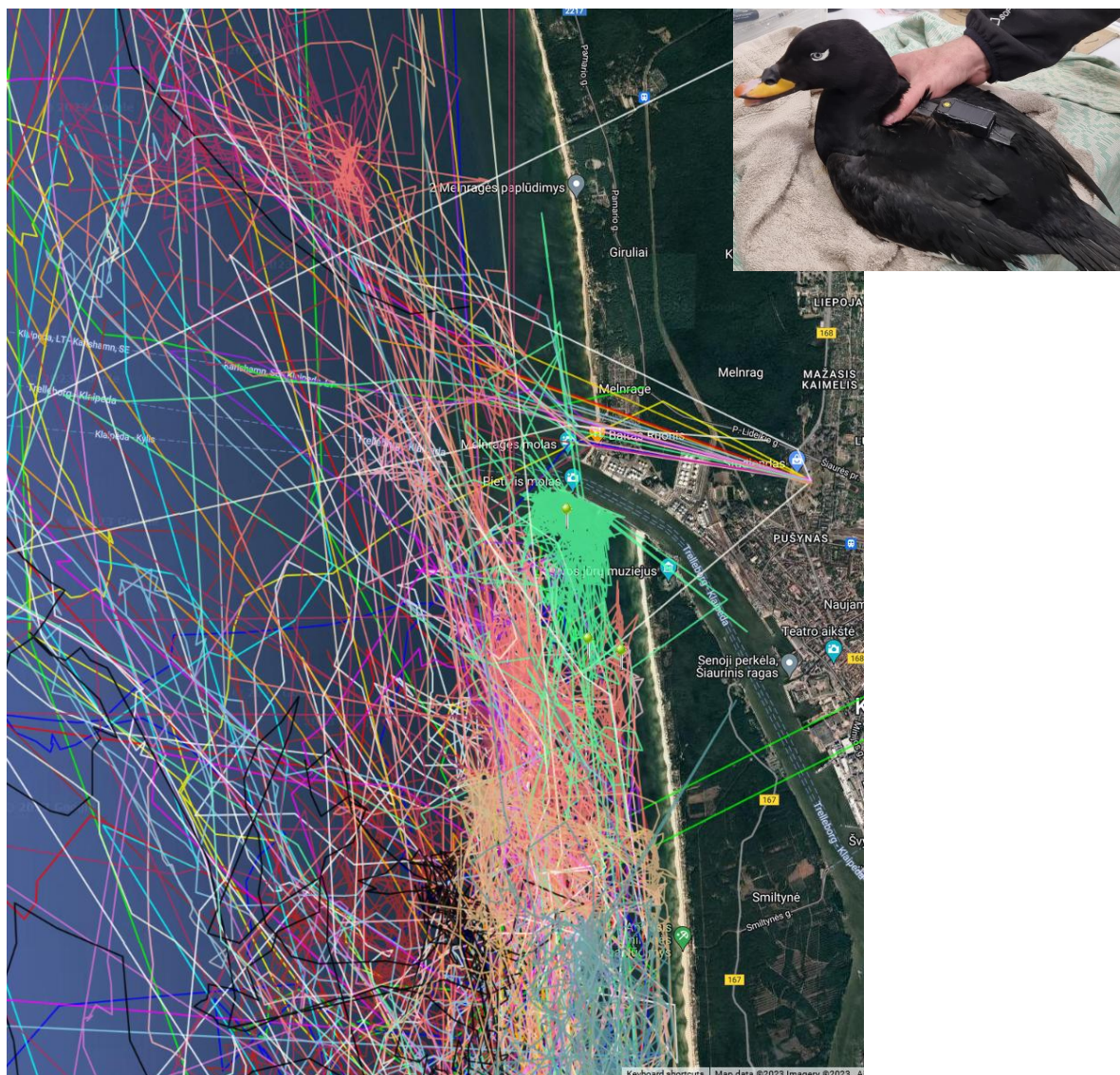
Up to 56 m



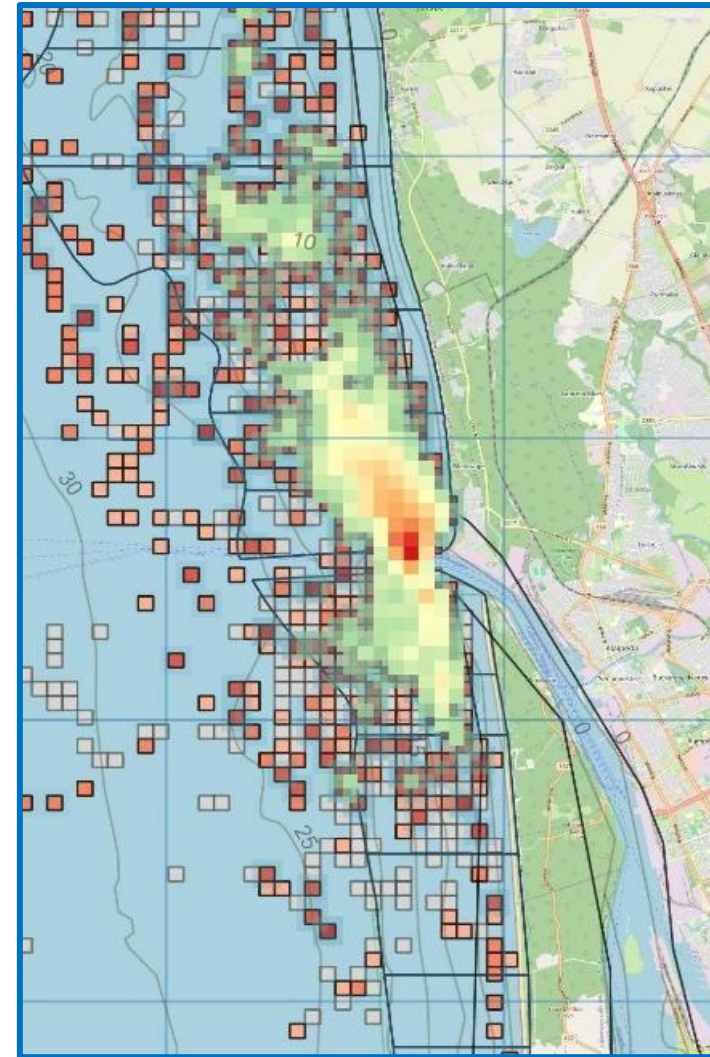
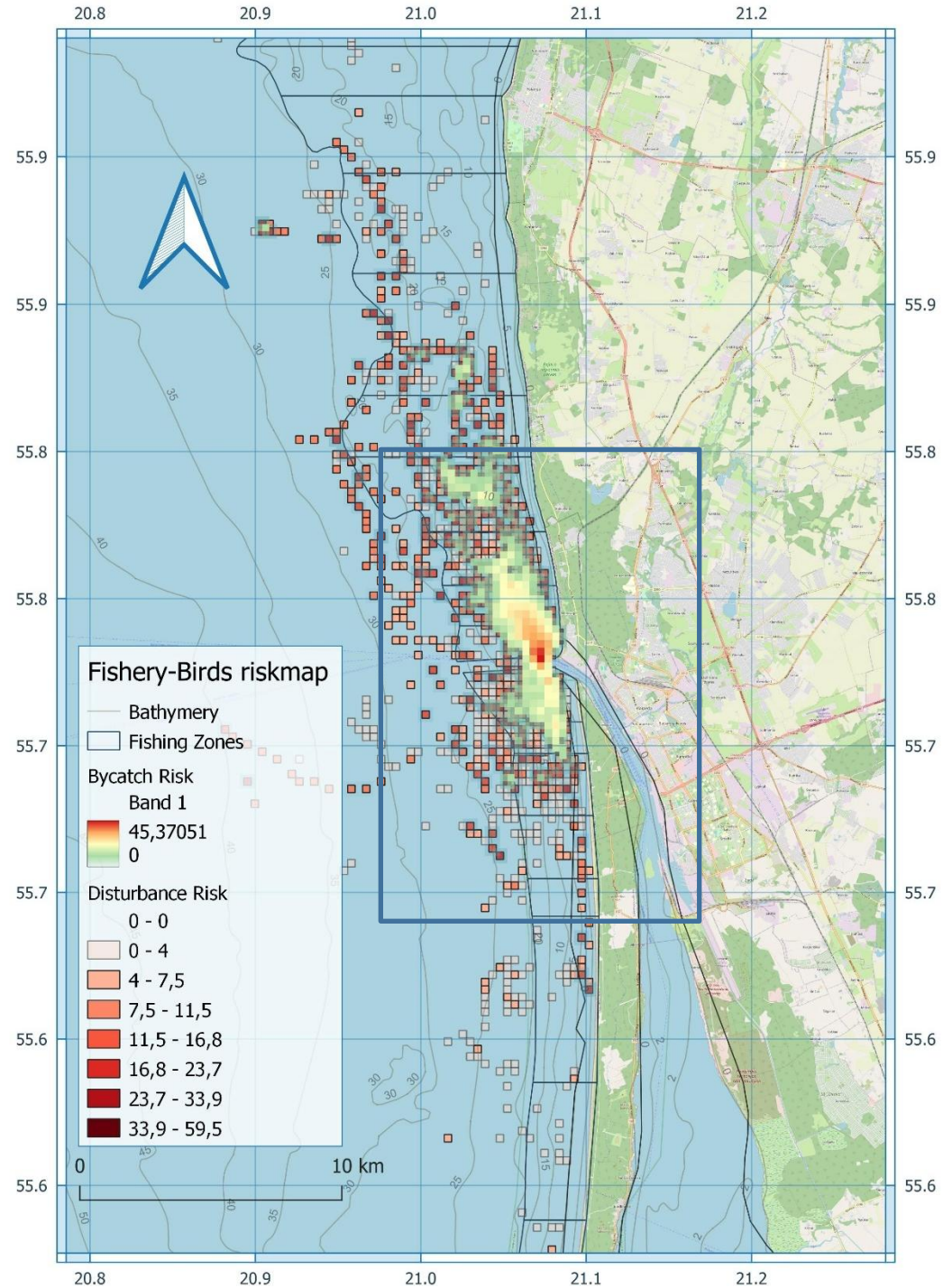
56 m



How fishery overlaps with bird activity in space and time



Fishery – Bird bycatch risk map

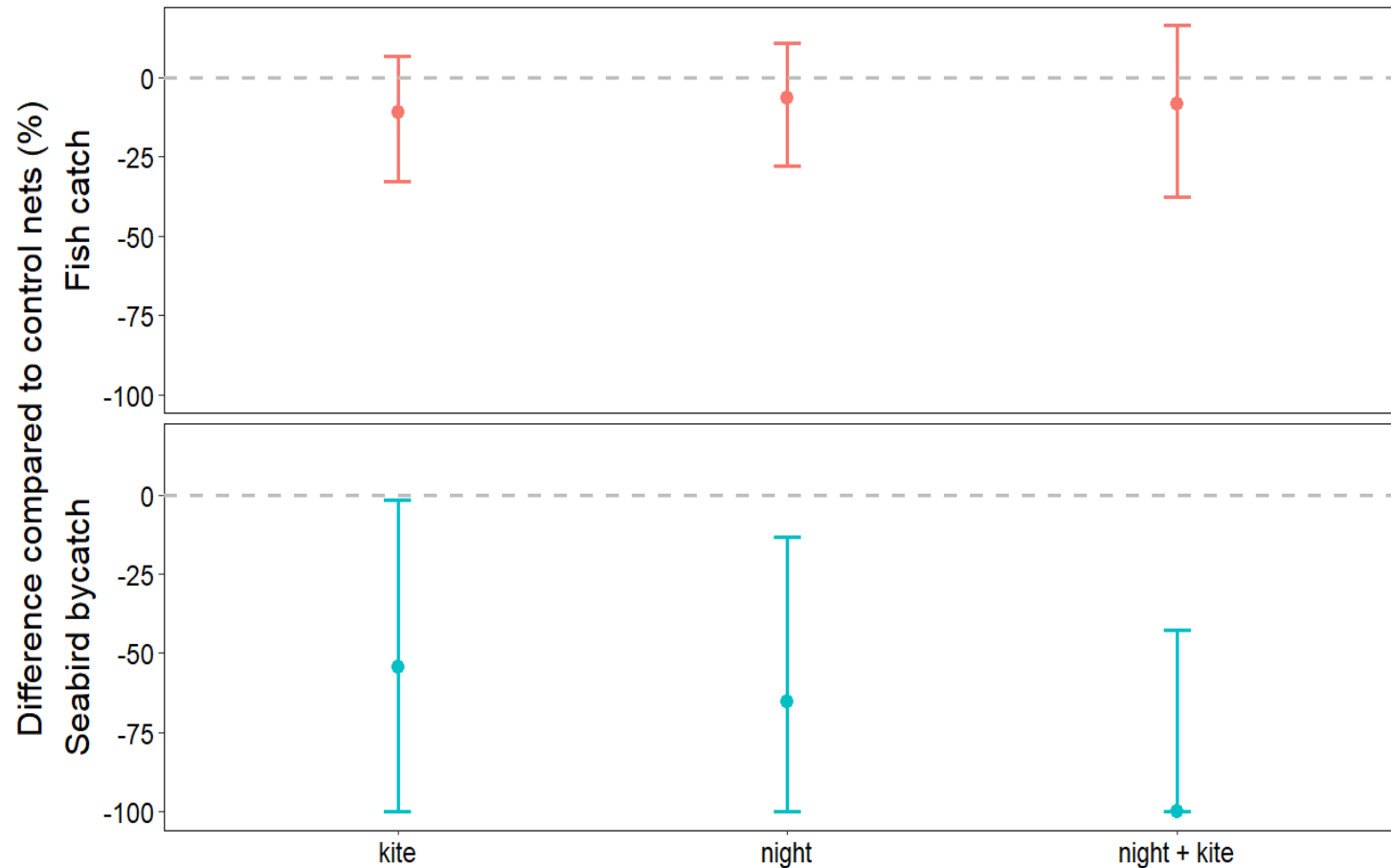


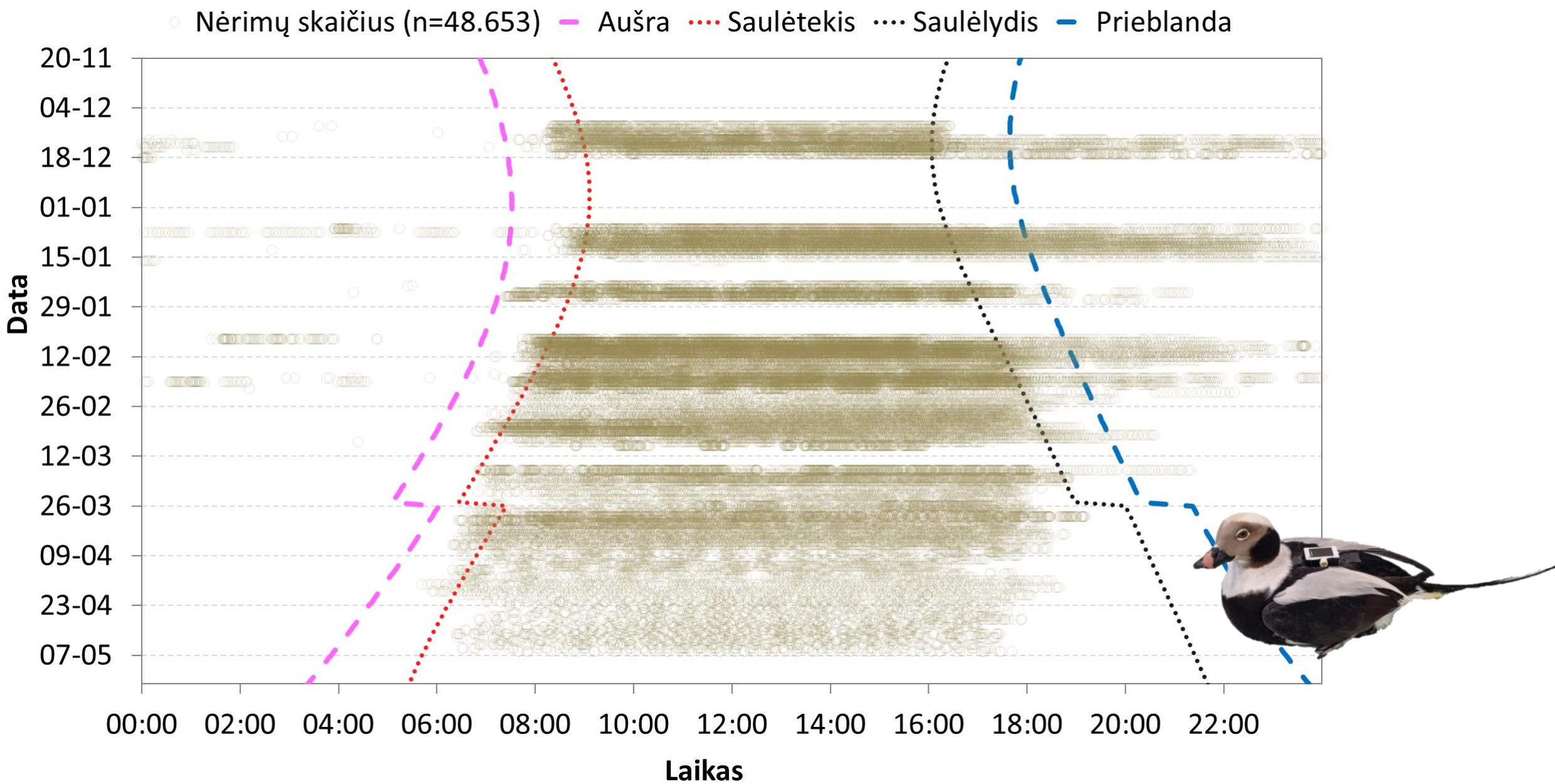
Total number of seabirds bycaught over the four seasons of gillnet mitigation trials in the Lithuanian coastal zone. For sample sizes of gillnet sets per mitigation type

Species	Control	Kite	Night	Night+Kite	Total
<i>Clangula hyemalis</i>	70	10	7	0	87
<i>Melanitta fusca</i>	11	3	0	0	14
<i>Melanitta nigra</i>	1	0	0	0	1
<i>Gavia stellata</i>	2	0	0	0	2
<i>Larus argentatus</i>	0	0	1	0	1
<i>Phalacrocorax carbo</i>	18	8	0	0	26
<i>Podiceps cristatus</i>	0	1	0	0	1
<i>Uria aalge</i>	0	1	0	0	1
Total	102	23	8	0	133

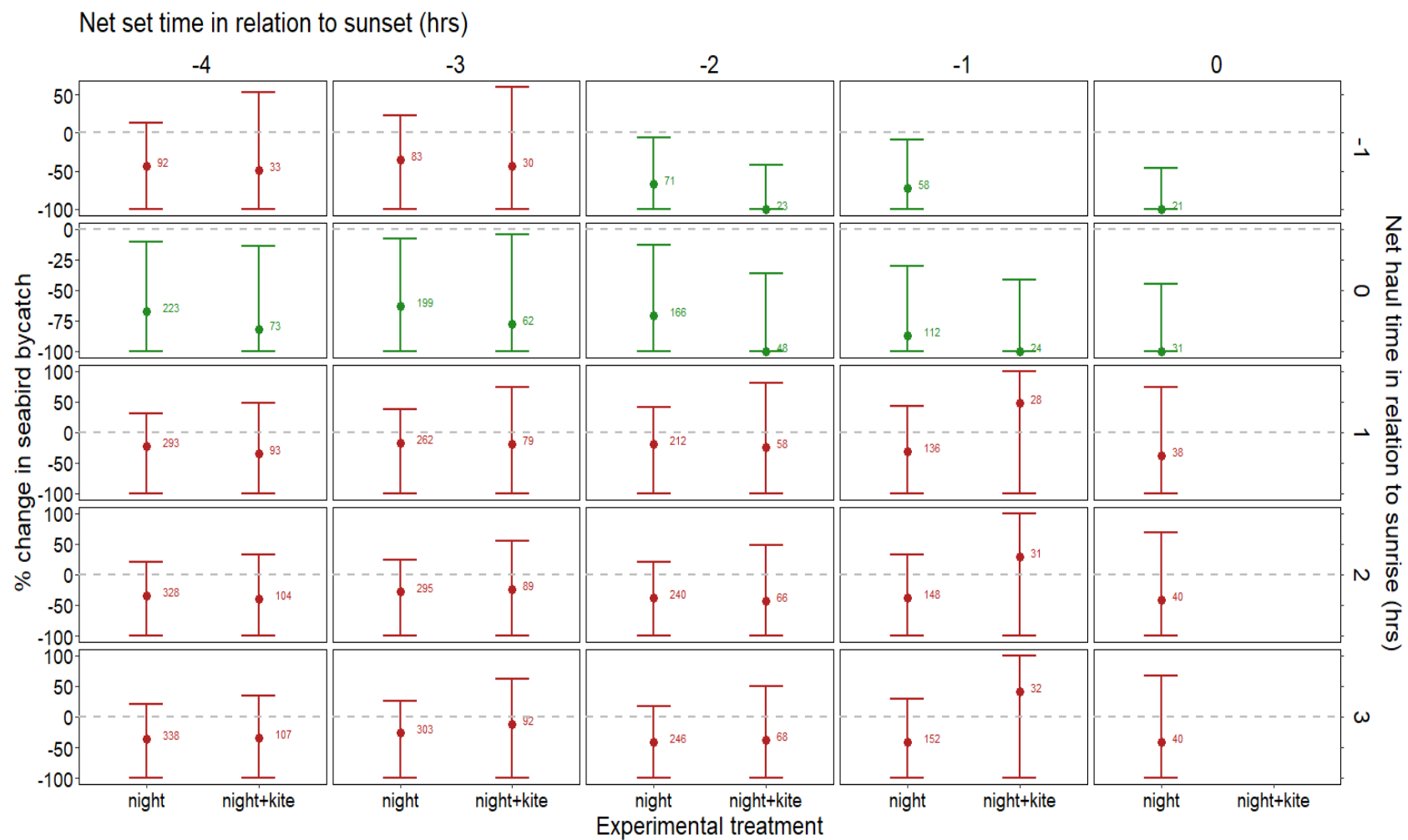
No statistically significant difference between experimental and control nets of fish catch.
Impact on target fish catch: Minimal catch reduction (6–11%) despite shorter soak times for night sets.

Demonstrates feasibility for commercial fisheries with low economic impact.



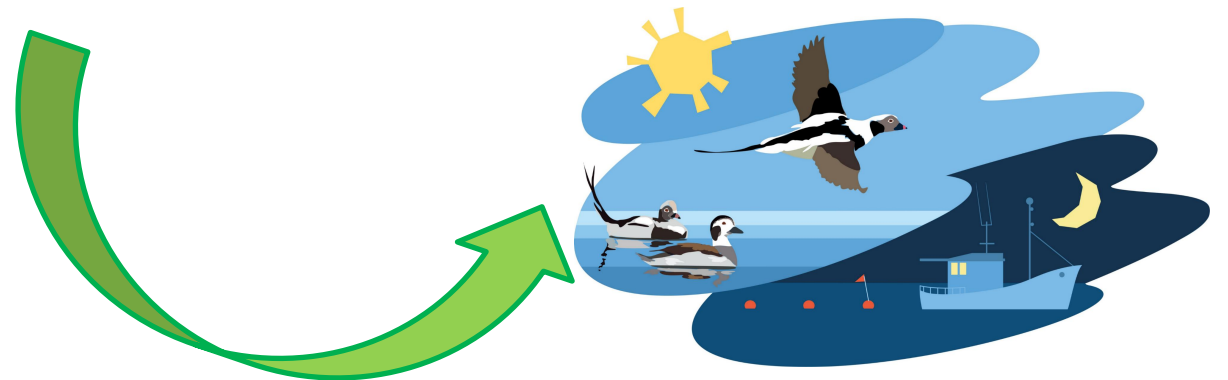


Mean relative seabird bycatch reduction (in % relative to control nets, with 95% confidence interval) between nets set at night (with or without predator-shaped kites) and control nets set outside of the defined night. Best option for fisheries operation would be start deploying gillnets at 2 hours before sunset, but it is essential to haul the gillnets before sunrise.



Recommendation for gillnet fishery in Baltic Sea

- Gillnet fisheries are the primary source of seabird bycatch. To reduce this impact, it is recommended that fishermen begin setting gillnets no earlier than two hours before sunset and ensure all nets are hauled before sunrise.
- Mitigation measures should be implemented across all protected areas without exception and adopted as soon as possible.
- If applied at scale, these measures could prevent approximately 2,000 seabird deaths annually in Lithuanian gillnet fisheries and up to 40,000 across the Baltic Sea. This represents a practical, low-cost, and proven solution to one of the most significant seabird bycatch issues worldwide.



Paldies par uzmanību !



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