

Monitoring of Greylag-, Barnacle- and Taiga Bean Goose in Finland

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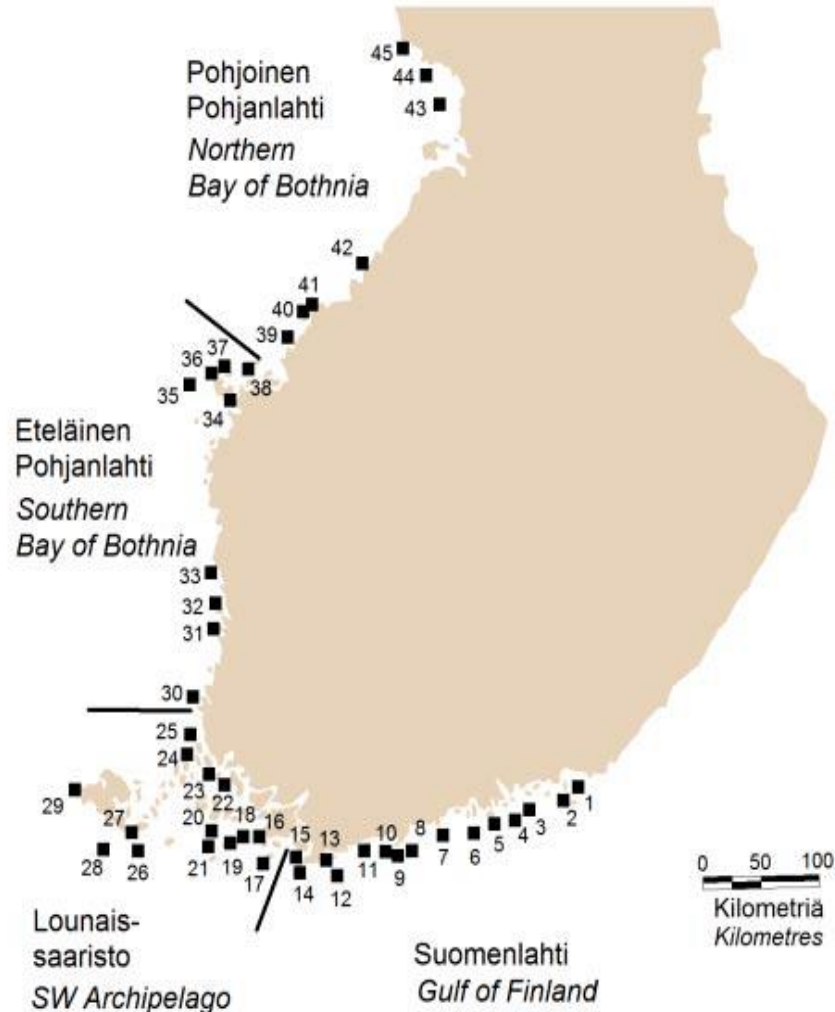
Natural Resources Institute Finland/Luke

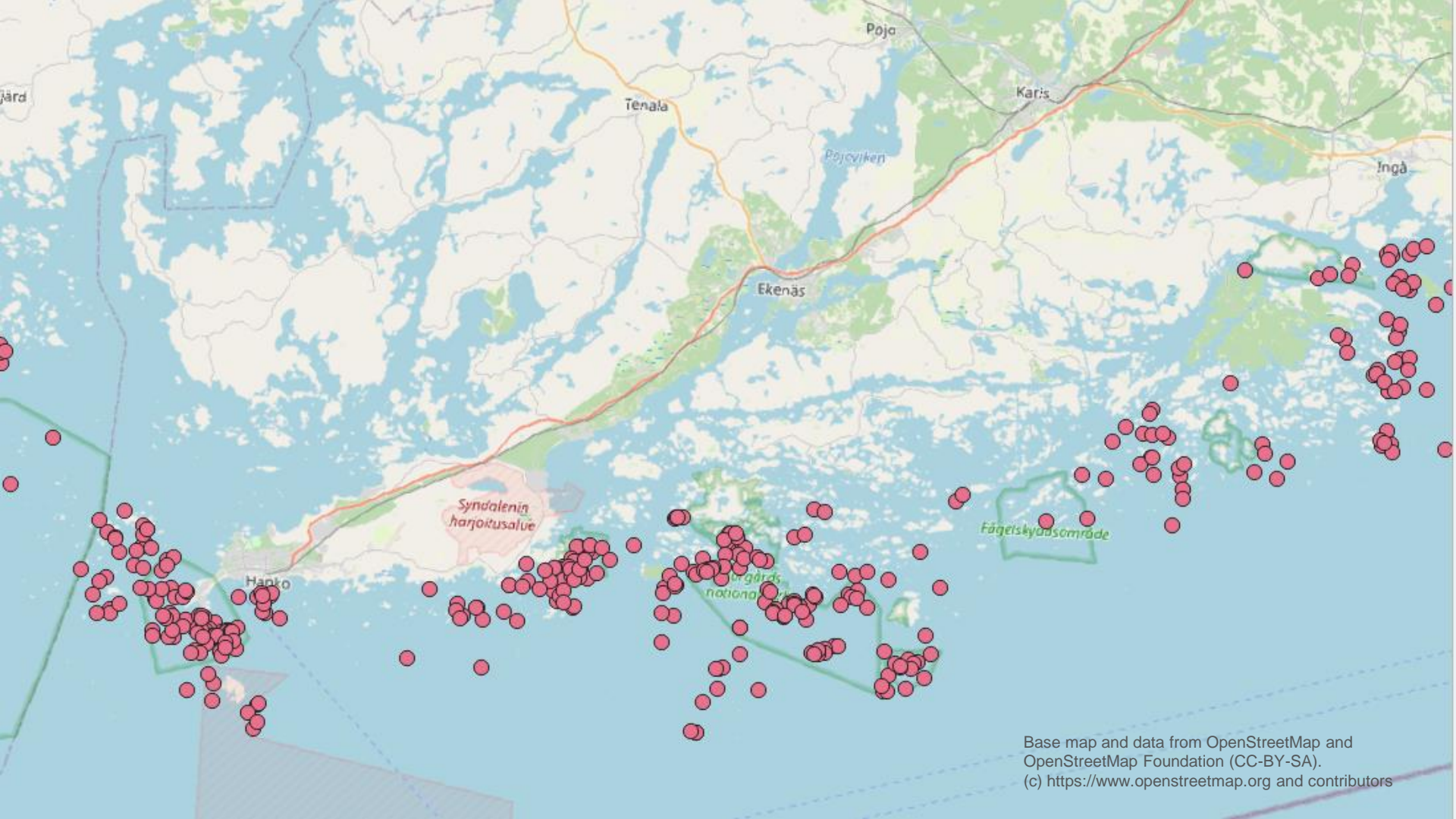
Markku Mikkola-Roos

Finnish Environment Institute/Syke

The archipelago bird monitoring scheme

- Current population monitoring of **Greylag- and Barnacle Goose** (+ ca 40 other species)
- Managed by: ***Parks & Wildlife Finland***
- Analysis (yearly starting 2024): ***Natural Resources Institute Finland***
- Voluntary birdwatchers and ringers visit islands and survey breeding birds
 - Nest counts and pair counts since 1990's
 - Late April to mid-June
 - Visited at least once per 3 years
- Divided into 48 larger archipelago areas
 - Concentrated to the outer archipelago and protected areas
 - Spatial coverage has increased during last years





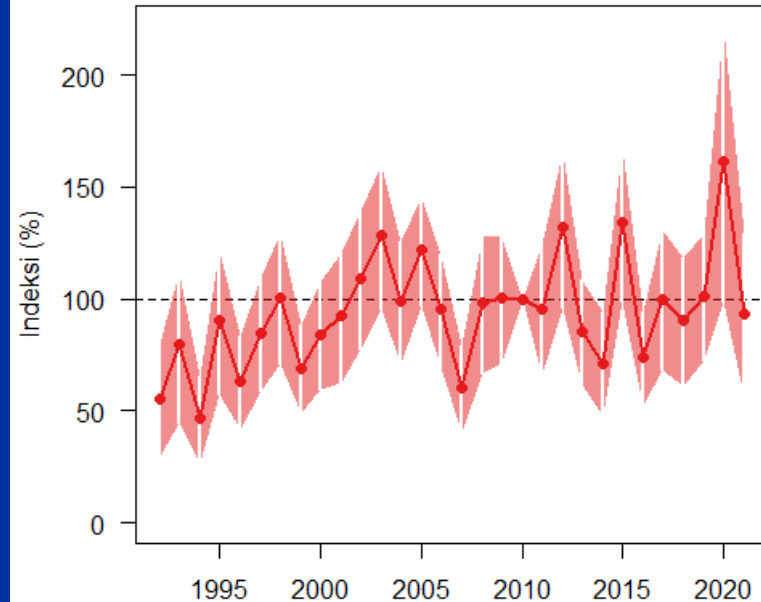
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Challenges in current monitoring

- Merely allows us to calculate population indices for BG and GLG, but majority of population not covered
- Greylag- and Barnacle Goose seems to be more numerous in the inner archipelago and near the coast
 - ✓ Effect of White-tailed Eagle
 - ✓ Could produce a negative bias on trend
 - ✓ Aim to expand surveys to inner archipelago
- **Taiga Bean Goose:** too little data from constant effort line transects to calculate population indices
- We have lacked through information on
 - ✓ Goose population sizes
 - ✓ Reproductive success



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What else? Other survey activities of geese in Finland!



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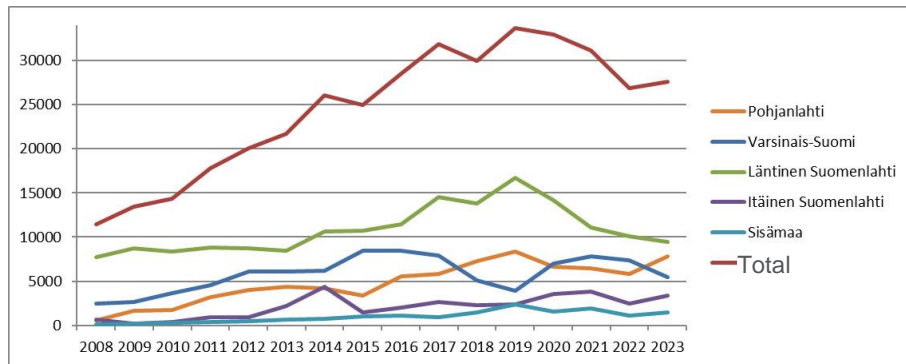


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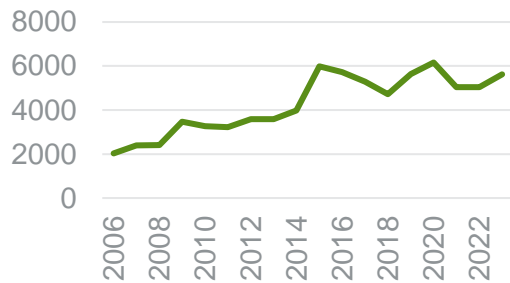
Monitoring of the Barnacle goose population breeding in Finland

- The Barnacle goose population in Finland is monitored with two separated counts:
 - Finnish Environment Institute monitors the annual breeding success of barnacle geese in urban areas, where the population is concentrated, with brood counts at the end of July
 - Size of the breeding population is monitored with a count made at the beginning of September coordinated by BirdLife Finland and Finnish Environment Institute

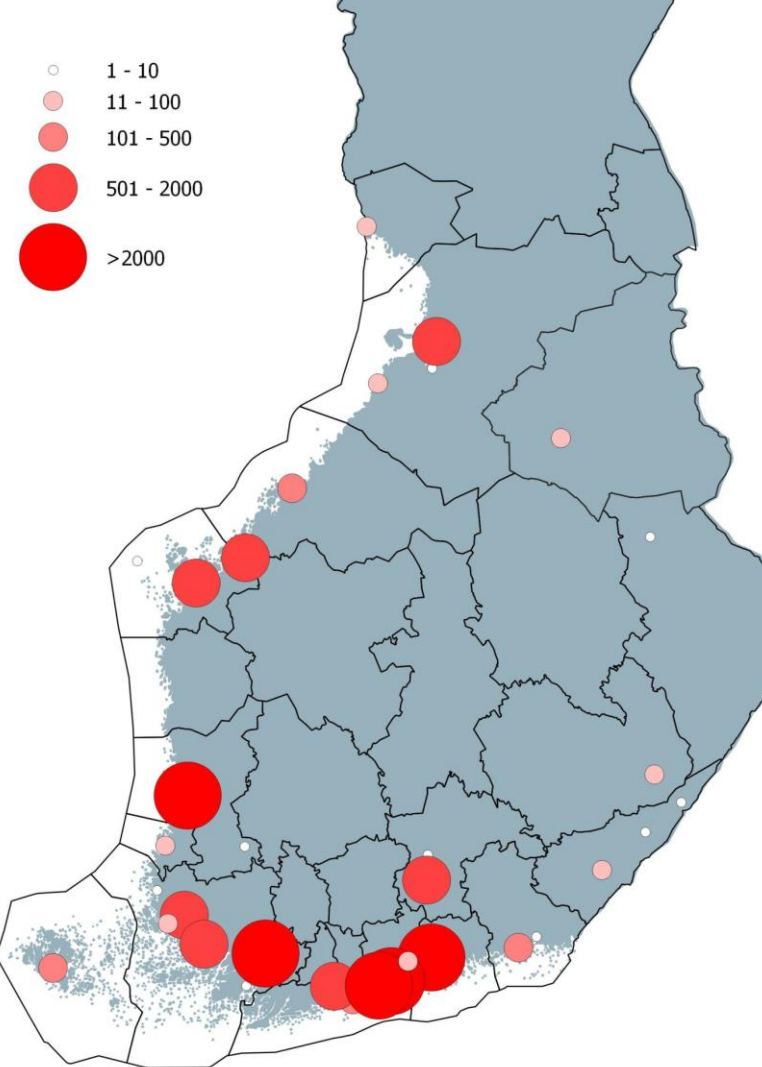
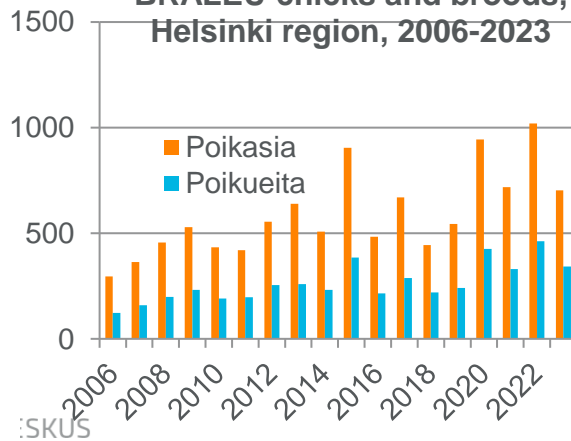
BRALEU total Finnish population in September 2023



BRALEU total number in July, Helsinki region, 2006-2023



BRALEU chicks and broods, Helsinki region, 2006-2023

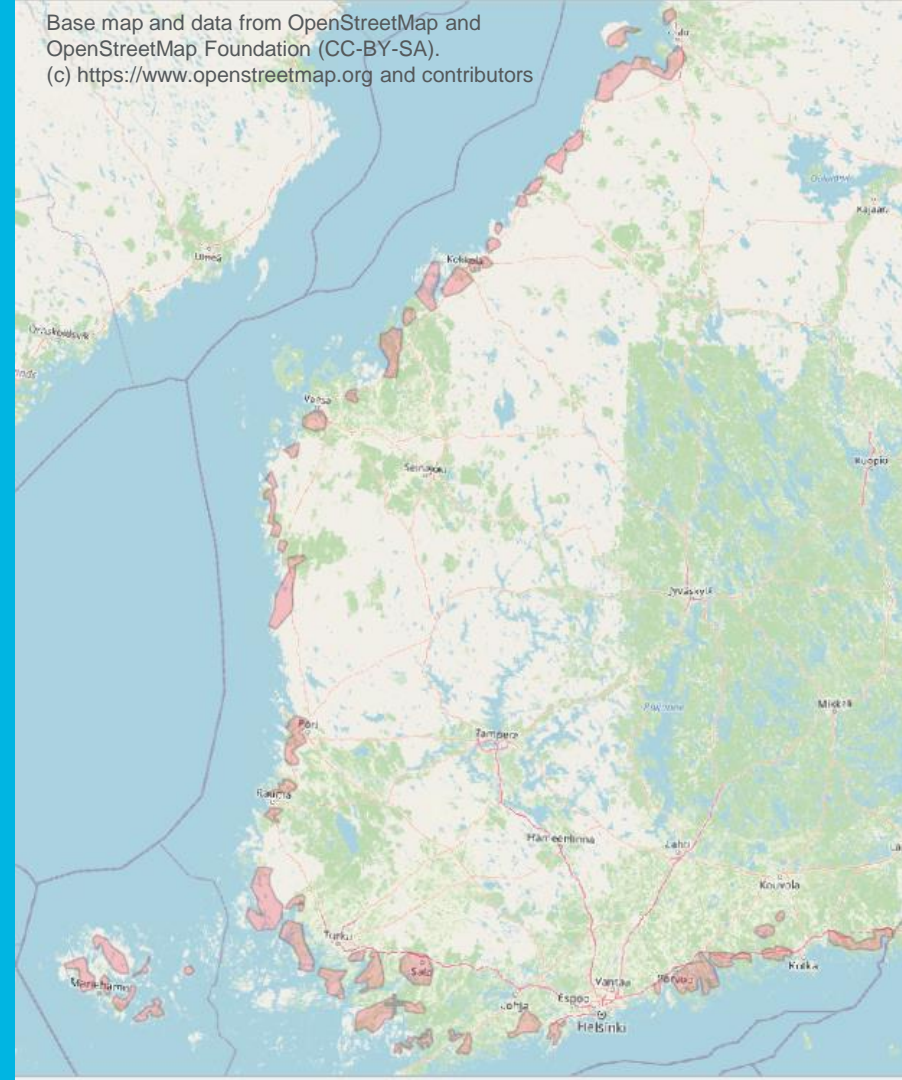


Greylag Goose surveys 2022–2023

Natural Resources institute Finland

- Funded by Finnish ministry of agriculture and forestry
- Aim to estimate population size of the two flyway populations; GPS birds inform us about:
 - observability (probability of detection)
 - the probability of flyway population membership
- Geese are counted at gathering areas along the whole coastline
 - Around 70 sites (polygons)
 - Birdwatchers and professionals (expenses covered)
 - Timing: 5.–6. August. Hunting begins 10. August.
 - Survey at the fields: ca 5–9 a.m. or after 6 p.m.
 - Coastal wetlands & estuaries: 10 a.m.–17 p.m.
- The proportion of young
 - All geese are aged, if possible
 - A sample is aged in large flocks
 - Ageing is challenging, especially at larger distance

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Aerial Taiga Bean Goose survey during moulting

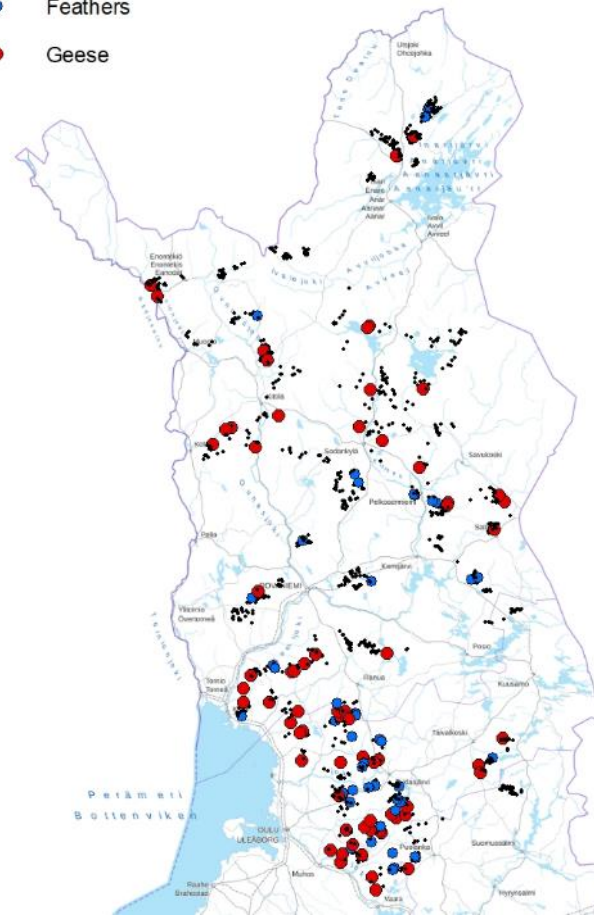
Natural Resources institute Finland

- Funded by Finnish ministry of agriculture and forestry
- During 6.–16.7.2023, in all 1222 potential moulting sites in Northern Finland surveyed using helicopter
- We found 1073 geese at 71 sites
 - 460 adults
 - 613 yearlings
 - Additionally, signs of moulting (feathers) at 122 sites
- Analysis of annual abundances (2020–2023)
 - GLMM for occupancy frequency
 - Zero-inflated GLMM numbers of geese
 - Spatial autocorrelation of sampling sites
 - Structural zeros depending on timing of sampling and latitude

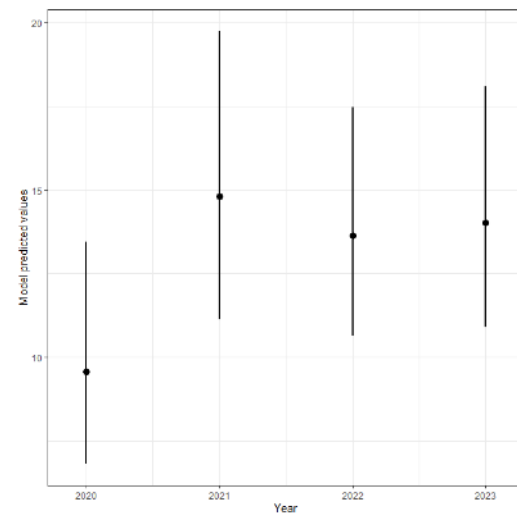
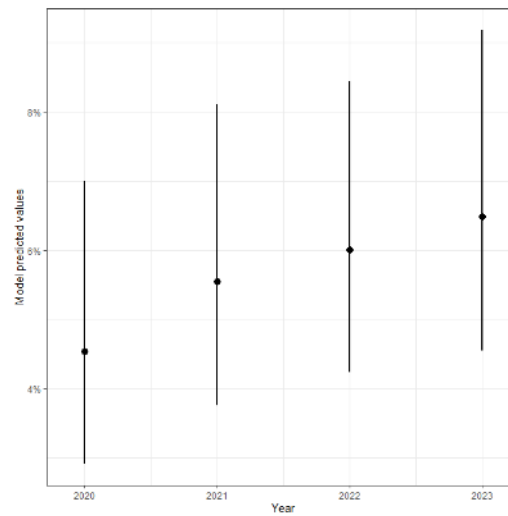
Aerial Sampling sites

Observations

- Empty
- Feathers
- Geese



*Model predicted values
of occupancy frequency
and numbers of moulting
Bean Goose in Northern
Finland*



Thank you!



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