ARTDATABANKEN

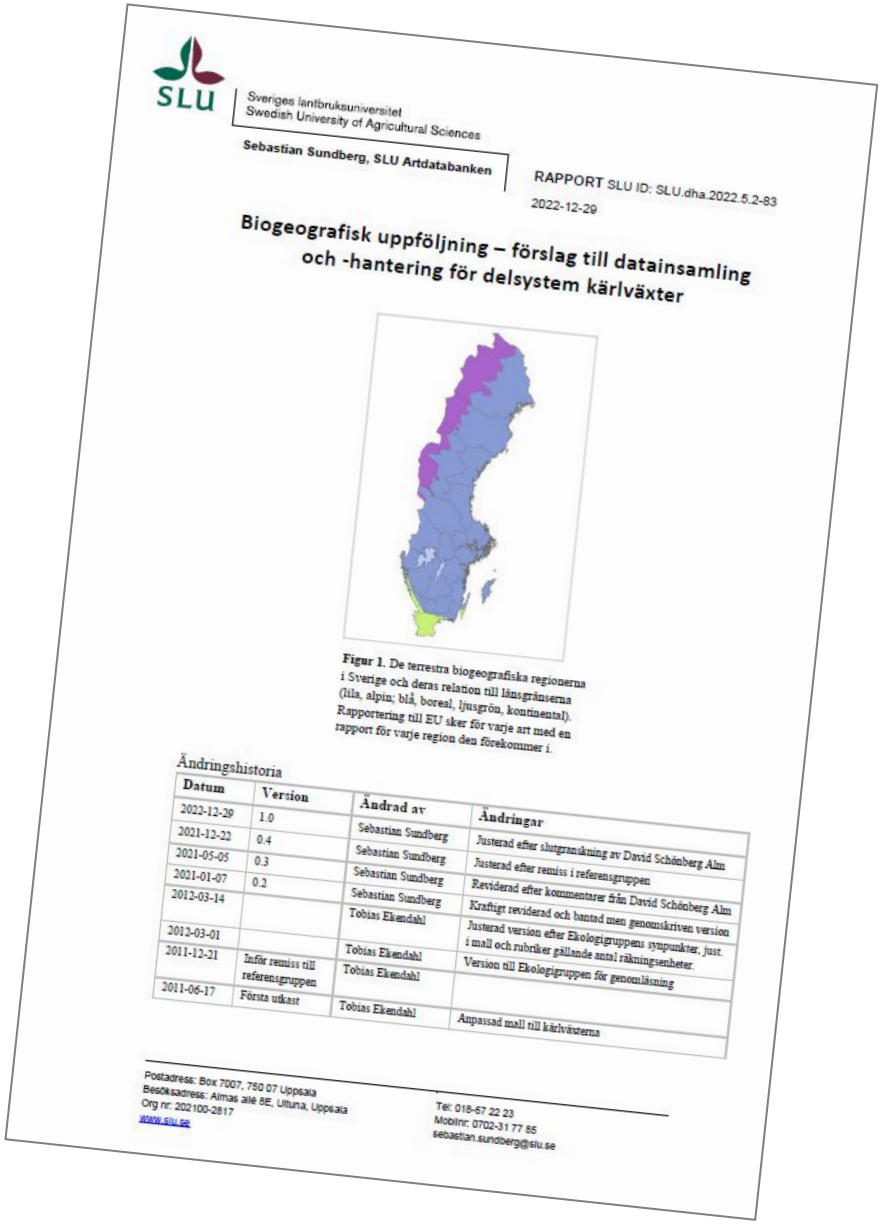
Plant surveillance case study:

Monitoring of vascular plants in Sweden

Sebastian Sundberg
Swedish Species Information Centre (SLU Artdatabanken)

Organisation

- Plan finished December 2022
- Artdatabanken (Adb) co-ordinates biogeographical monitoring on commission from Swedish EPA
- Adb allocates assignments and resources to Floraväktarna, county administrations, consultants
- Important: cooperation between non-profit and professional actors



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Swedish University of Agricultural Sciences

Sebastian Sundberg, SLU Artdatabanken

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2022-12-29

Biogeografisk uppföljning – förslag till datainsamling och -hantering för delsystem kärlväxter

Figur 1. De terrestra biogeografiska regionerna i Sverige och deras relation till länsgränserna (lila, alpin; blå, boreal, ljusgrön, kontinental). Rapportering till EU sker för varje art med en rapport för varje region den förekommer i.

Ändringshistoria

Datum	Version	Ändrad av	Ändringar
2022-12-29	1.0	Sebastian Sundberg	Justerad efter slutgranskning av David Schönberg Alm
2021-12-22	0.4	Sebastian Sundberg	Justerad efter remiss i referensgruppen
2021-05-05	0.3	Sebastian Sundberg	Reviderad efter kommentarer från David Schönberg Alm
2021-01-07	0.2	Sebastian Sundberg	Kraftigt reviderad och bantad men genomskriven version
2012-03-14		Tobias Ekendahl	Justerad version efter Ekologigruppens synpunkter, just. i mall och rubriker gällande antal räkningsenheter.
2012-03-01		Tobias Ekendahl	Version till Ekologigruppen för genomläsning
2011-12-21	Inför remiss till referensgruppen	Tobias Ekendahl	
2011-06-17	Första utkast	Tobias Ekendahl	Anpassad mall till kärlväxterna

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Different kinds of monitoring

- Flora guardians – majority (ca 30) of the species
  - Complete survey 9 spp
  - Sampled sites 21 spp – random, spatially stratified (max 107 sites/species and 6 yrs)
- Professional 19 spp – alpine, 2 aquatic + a few other sites
- Large sites (9 spp), systematic sampling within sites – professional
- Flora guardian camps: fill in gaps in areas with few people and great needs
- *Lycopodium* sp. (Annex 5): NFI, NILS

 Generally, each site one visit per 6 yrs (per 12 yrs in many alpine species)

 Max16 sites per species monitored at least every 2 yrs

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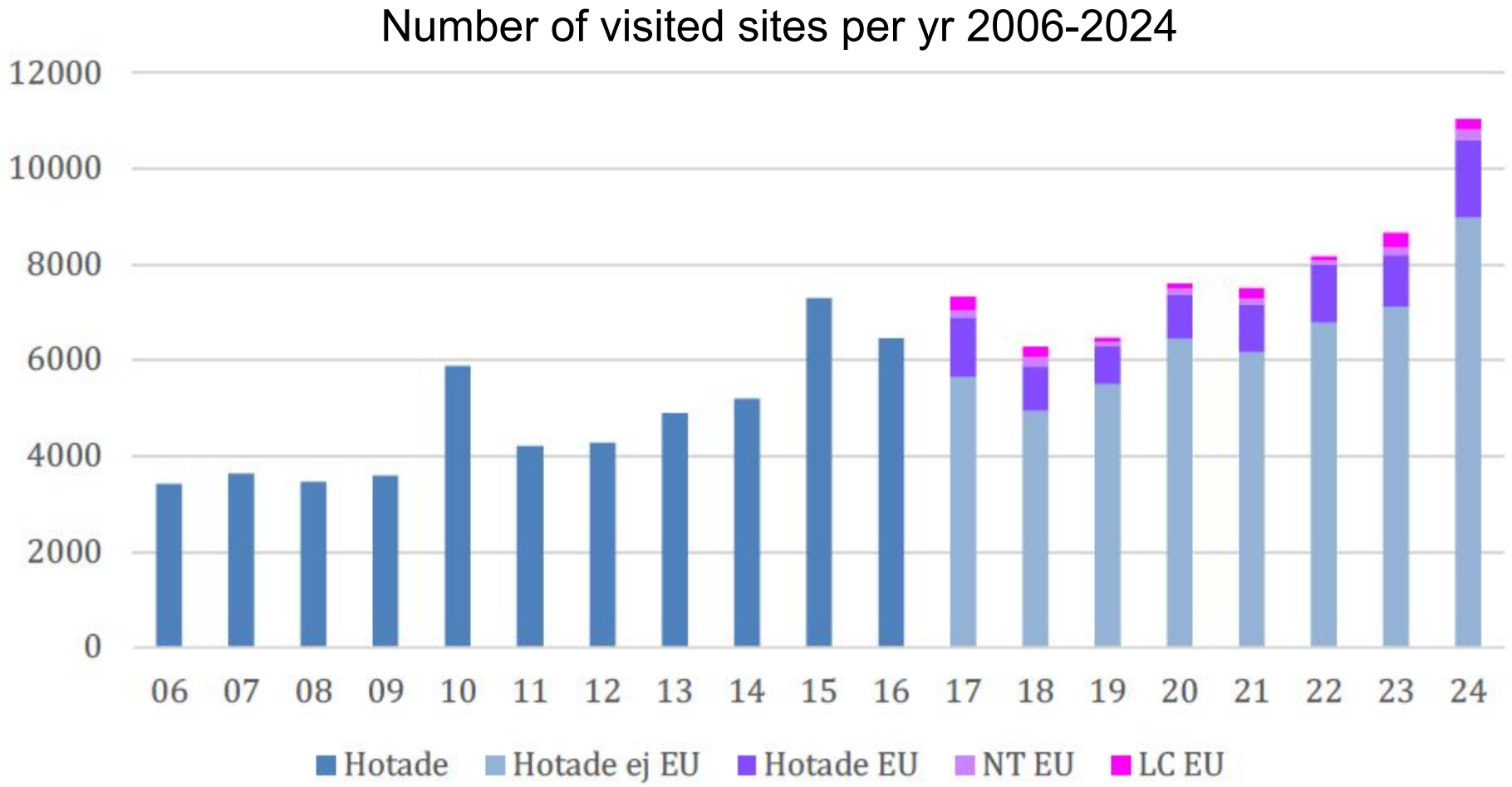
Floraväktarna (Flora guardians)

- Founded 1987 (WWF)
- Non-profit network co-ordinated by the Swedish Botanical Society
- Monitor threatened vascular plants incl. Annex species – too rare to be captured by systematic env. monitoring like NFI, NILS
- Simple method: count specified units at defined sites (>80 000 unique sites)
- Special project Floraväkteri Sverige in Artportalen (Swedish Species Observation System)
- App simplifies site search and reporting via cell phone/tablet in the field
- SLU finances a half-time co-ordinator – key to success!

Floraväktarna, continued

- 2024: 560 reporters



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Data storage at site level in Artportalen

- Project Floraväkteri Sverige
- Includes classification (1-4) of site habitat quality for the species
    1. Good (satisfactory)
    2. Ok but can be improved
    3. Bad
    4. Destroyed

    + Comment on site quality

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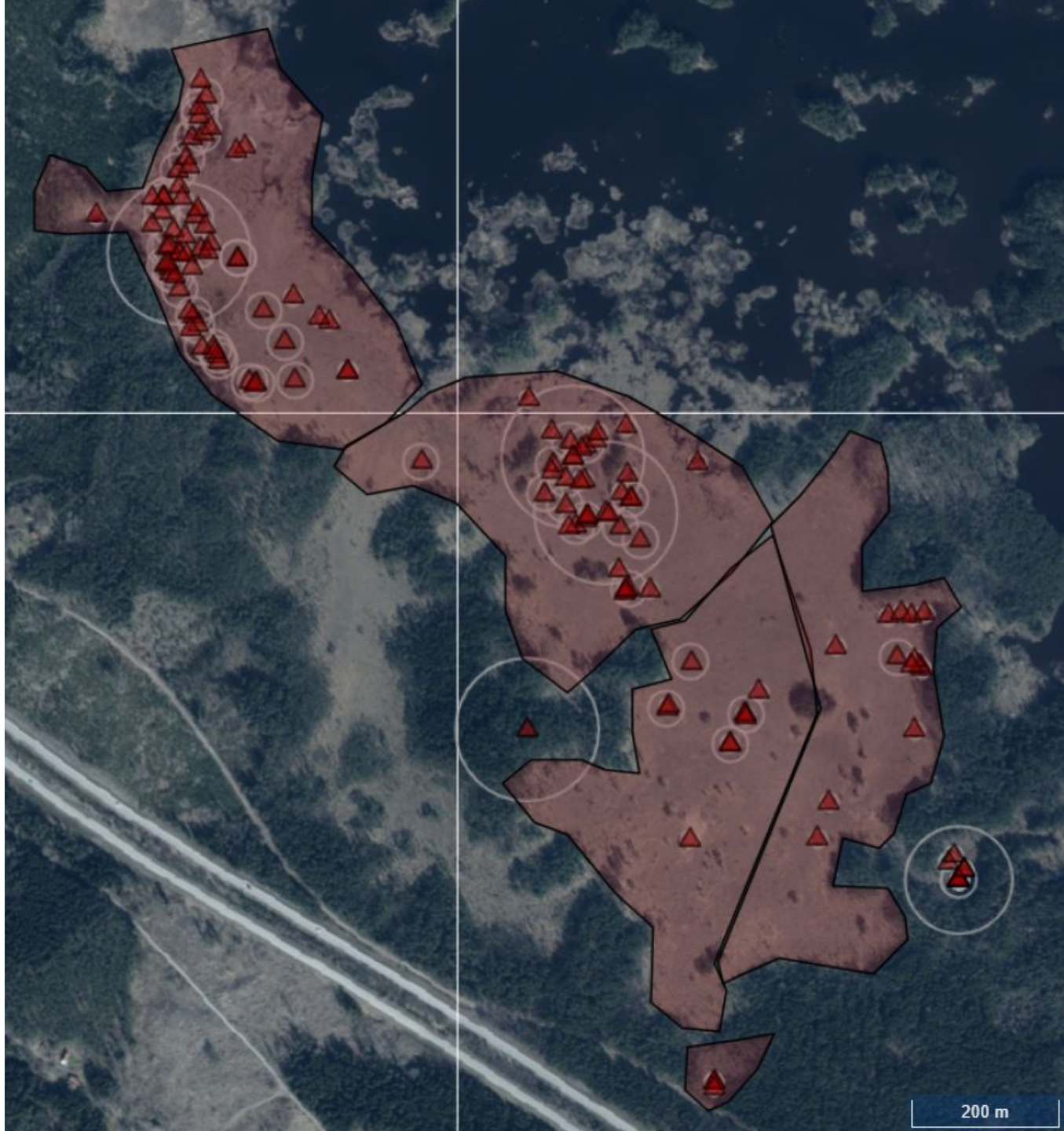
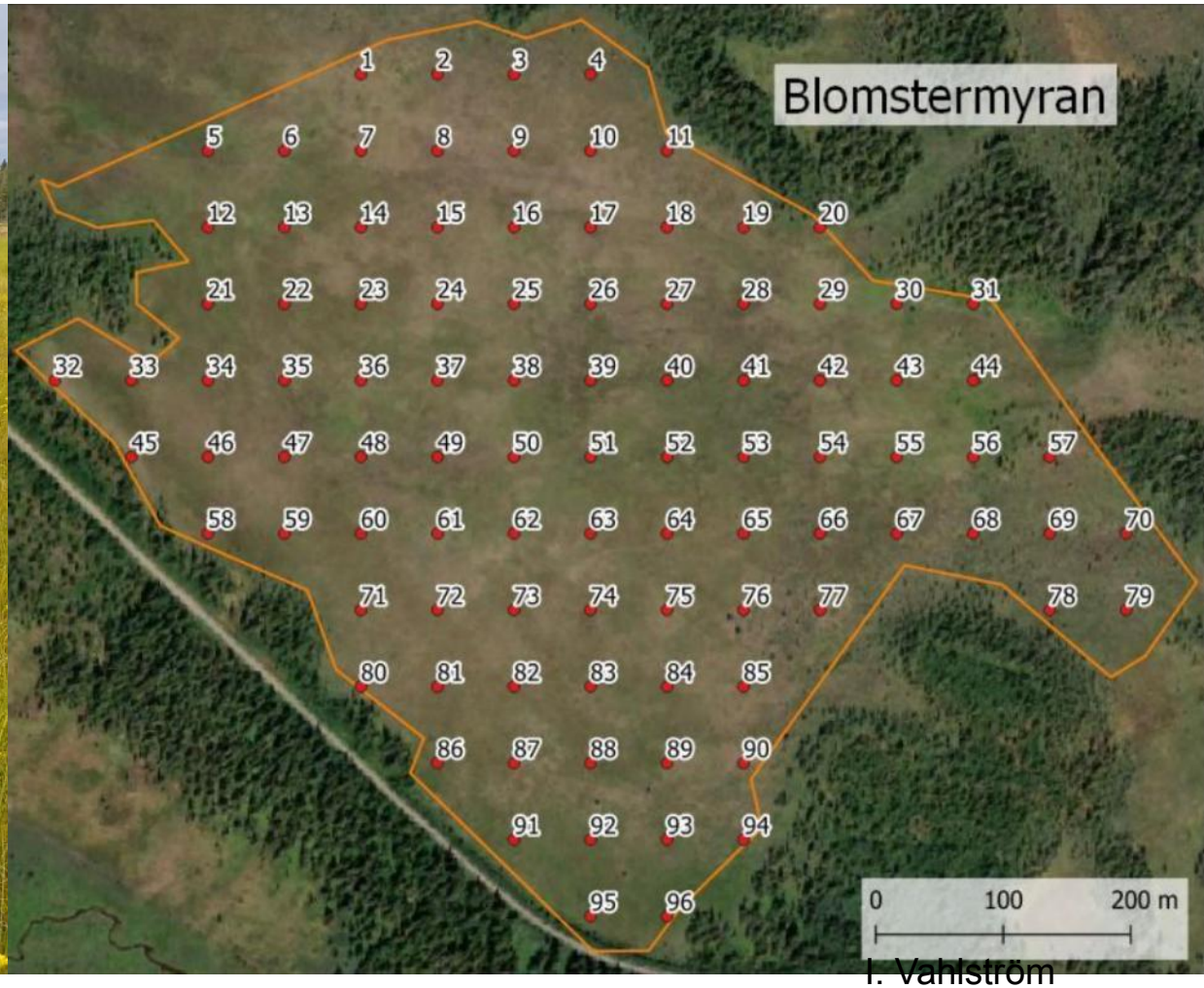
Division of large areas

- 100 co-ordinates
- 6 flora guardian sites (*Liparis loeselii*)



Large site: 33.5M *Saxifraga hirculus* at Blomstermyran



I. Vahlström

(2023)

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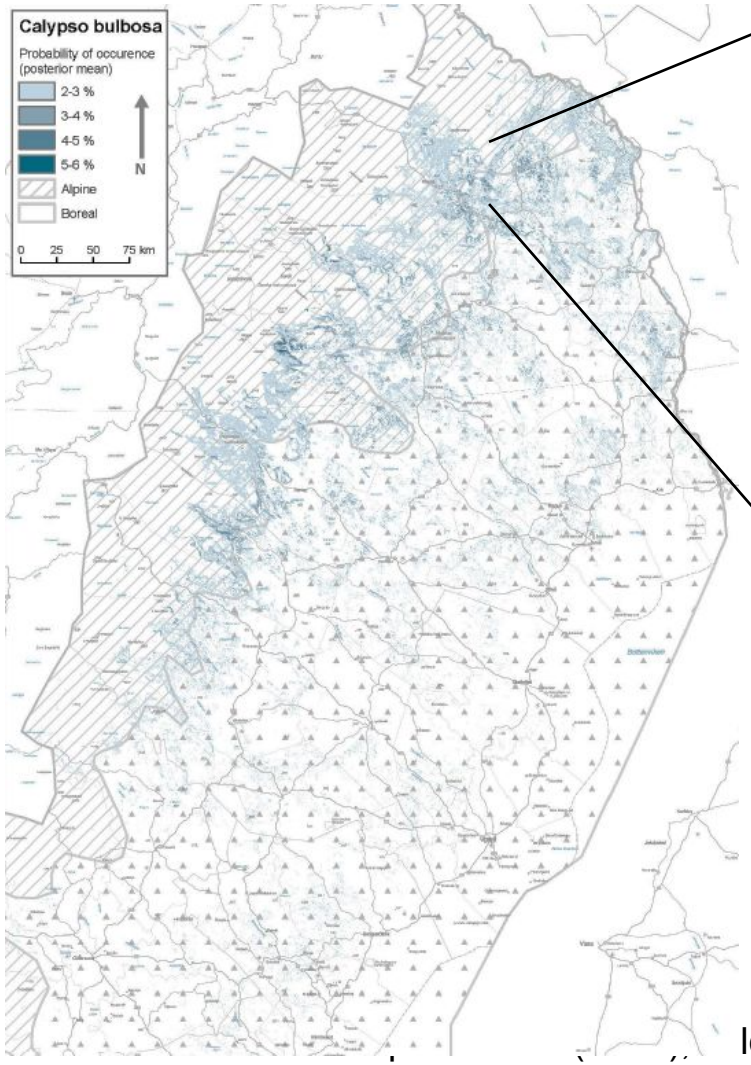
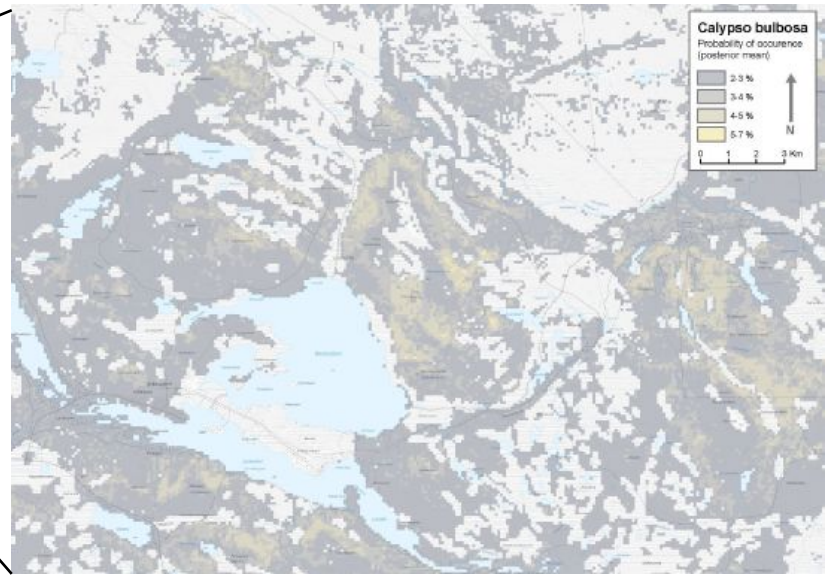
Modelling plant distribution: *Calypso bulbosa*





Method: forward model selection using a Bayesian species distribution model,

113 □ 11 explanatory variables

ld tested by BSc:s Doorly (2023) and Larsson (2023)

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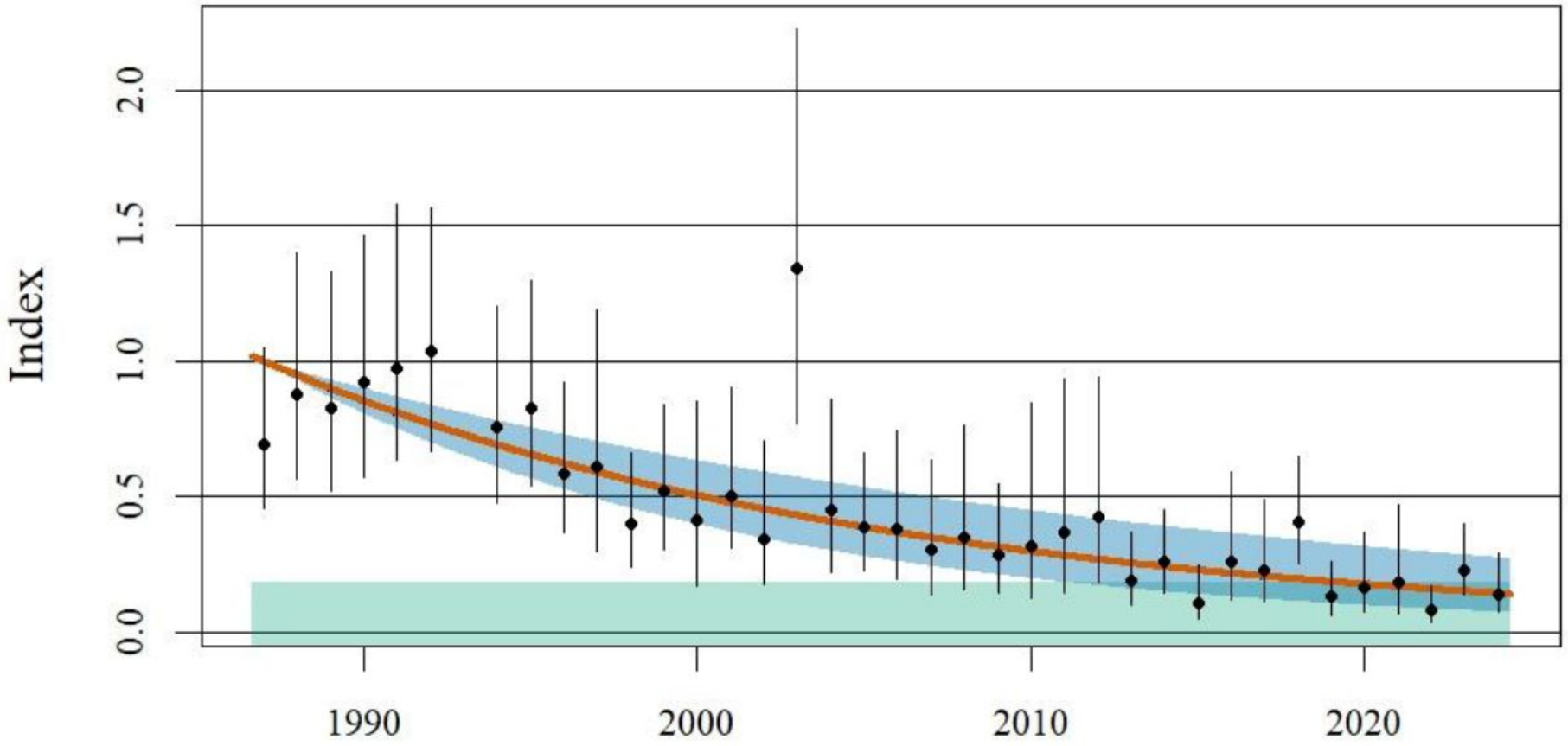
New: trend assessments by GAMM in R

Lycopodium (*Diphasiastrum*) *tristachyum*, BOR

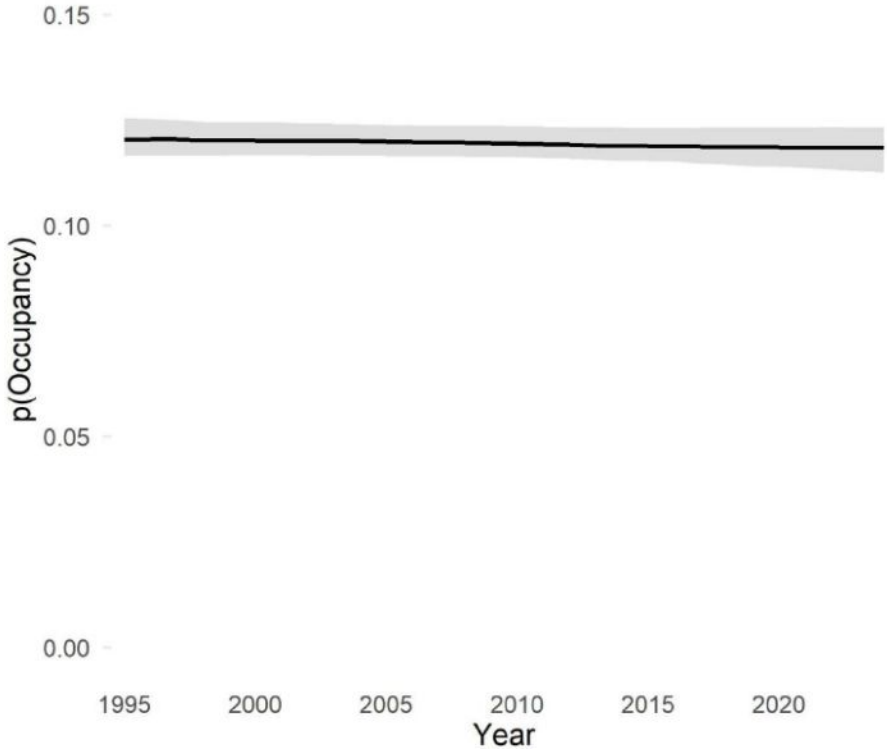


generalized additive mixed models (Knape 2016, J Appl Ecol), ran by Marander (2025), unpublished

Trend estimates with Bayesian random walk on design-based data of e.g. *Lycopodium* spp. from NFI (10-yr cycle)

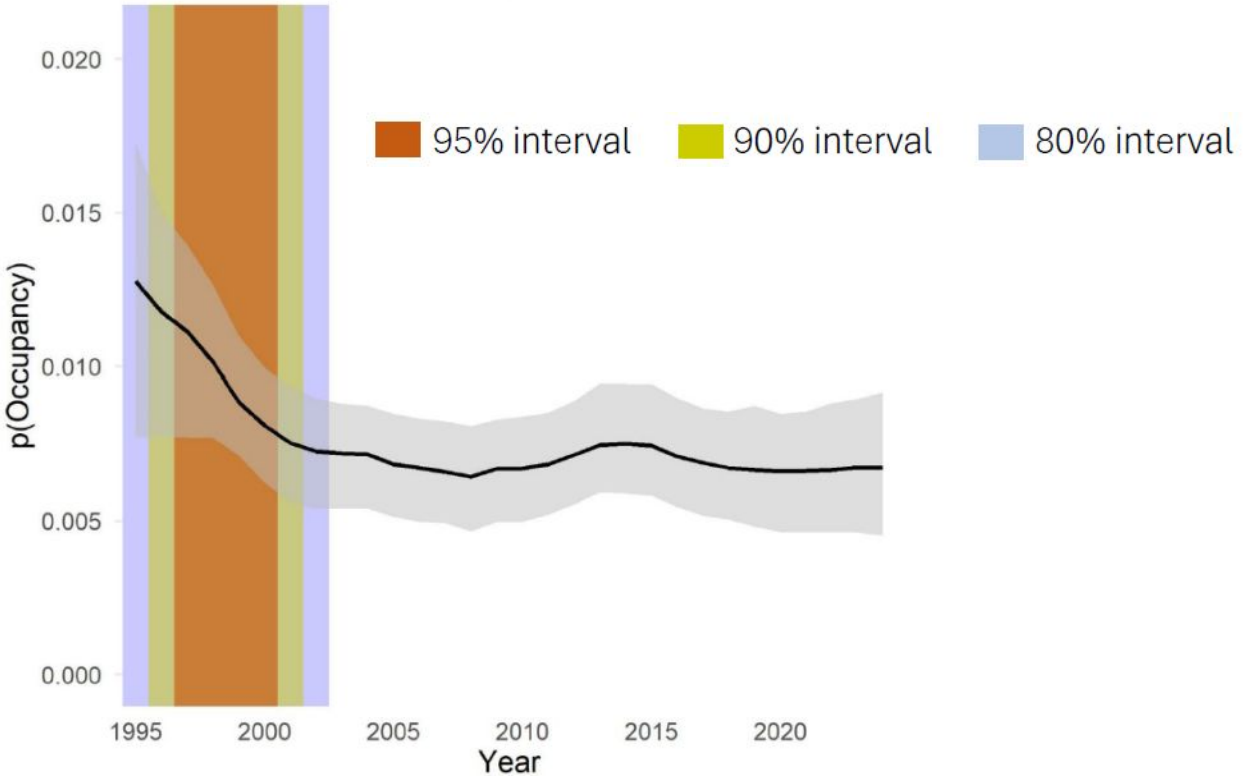
Lycopodium annotinum

Overall change: -1.1% (-8.4%, 2.3%)
Annual change: -0.04% (-0.29%, 0.08%)



*Goodyera repens****

Overall change: -34.4% (-57%, -0.4%)
Annual change: -1.19% (-1.96%, -0.01%)



Montras Janer & Berglund, unpublished (2025)

Thank you!

Saxifraga osloënsis