

Sampling strategies, techniques and curation of the **Swedish Environmental Specimen Bank**

Anna Jerve, Linnea Brokmar & Sara Danielsson



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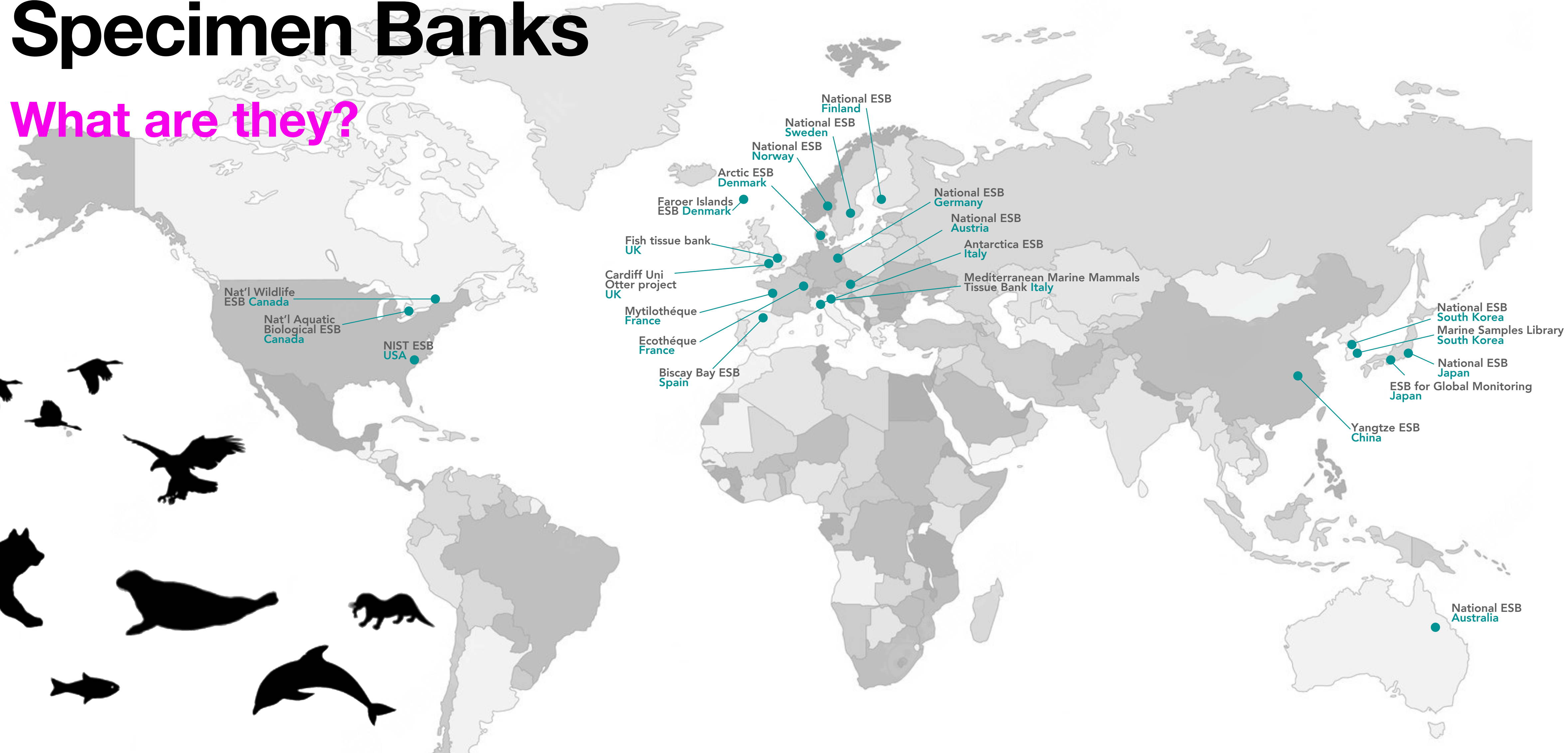




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Environmental Specimen Banks

What are they?



The Swedish ESB

What is it?

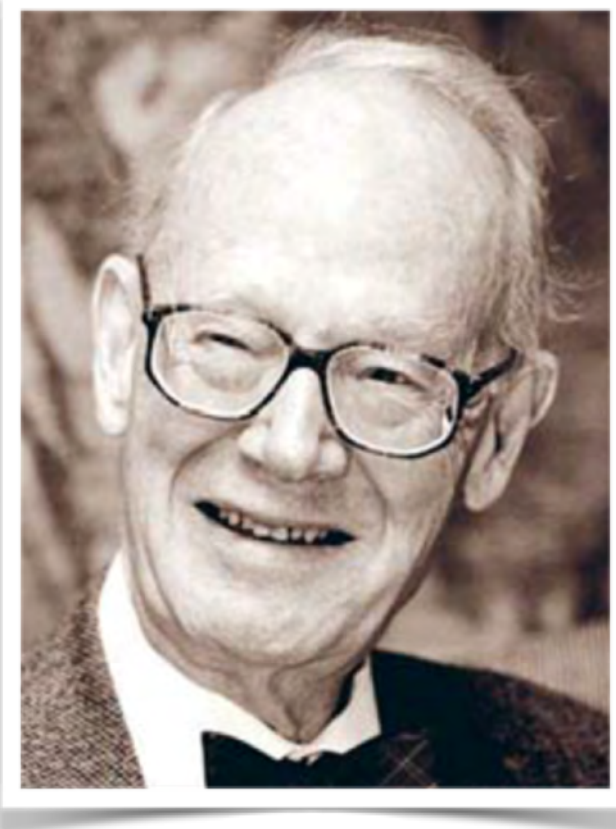


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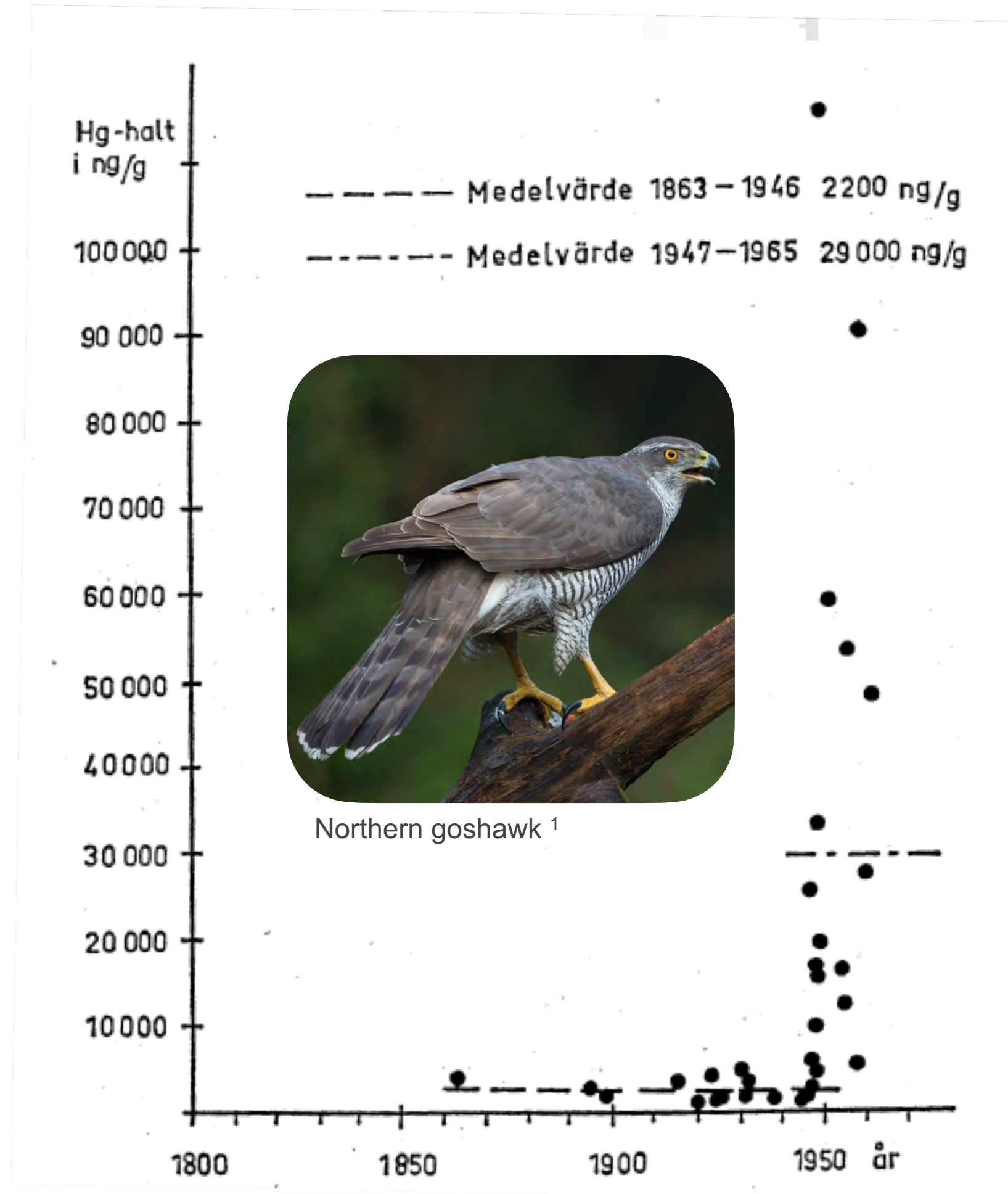


The Swedish ESB

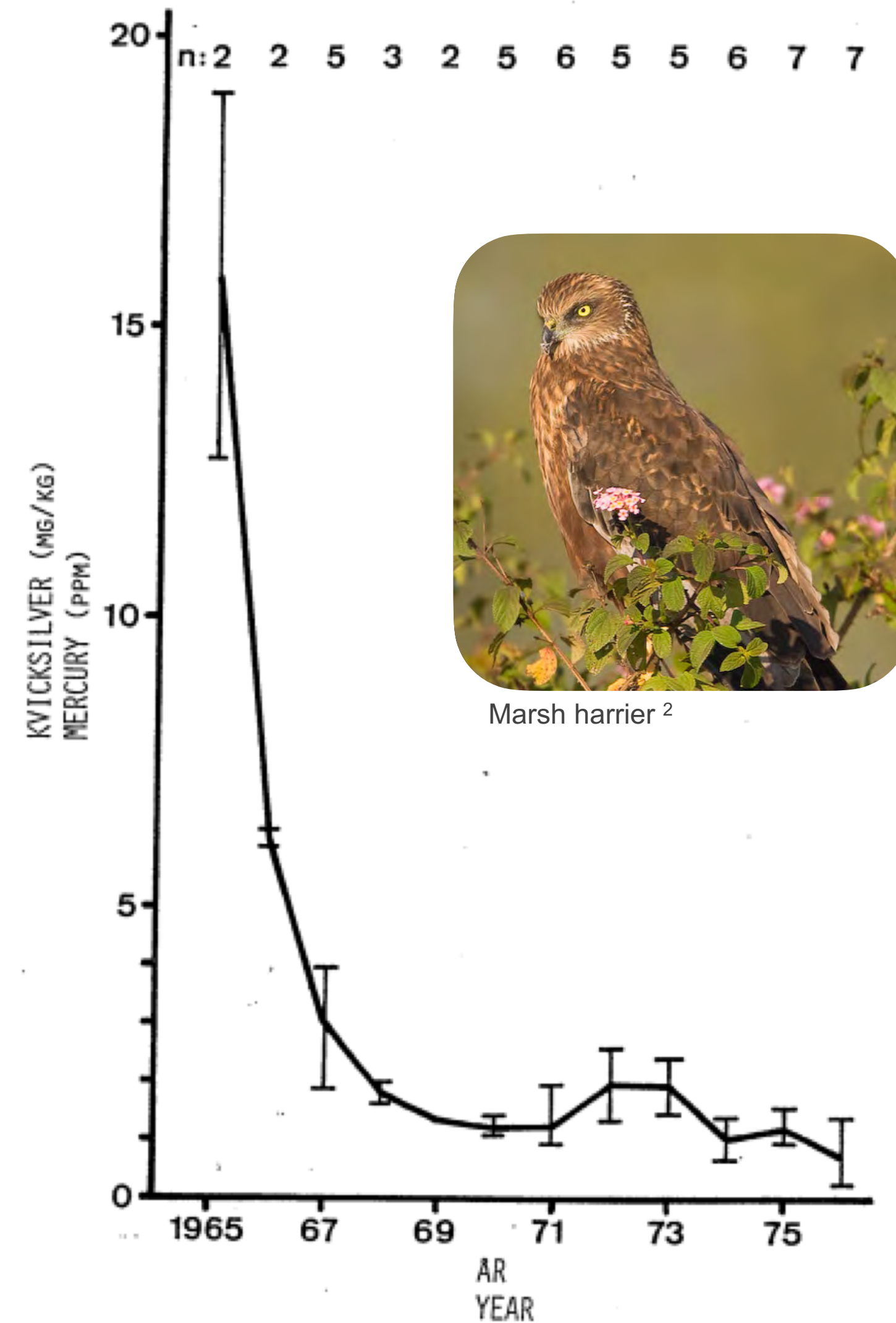
Origins and development



Alf Johnels
Professor, Zoology
NRM 1958-1982



Birke et al. 1967 (Fig 1)



Odsjö & Sondell 1977

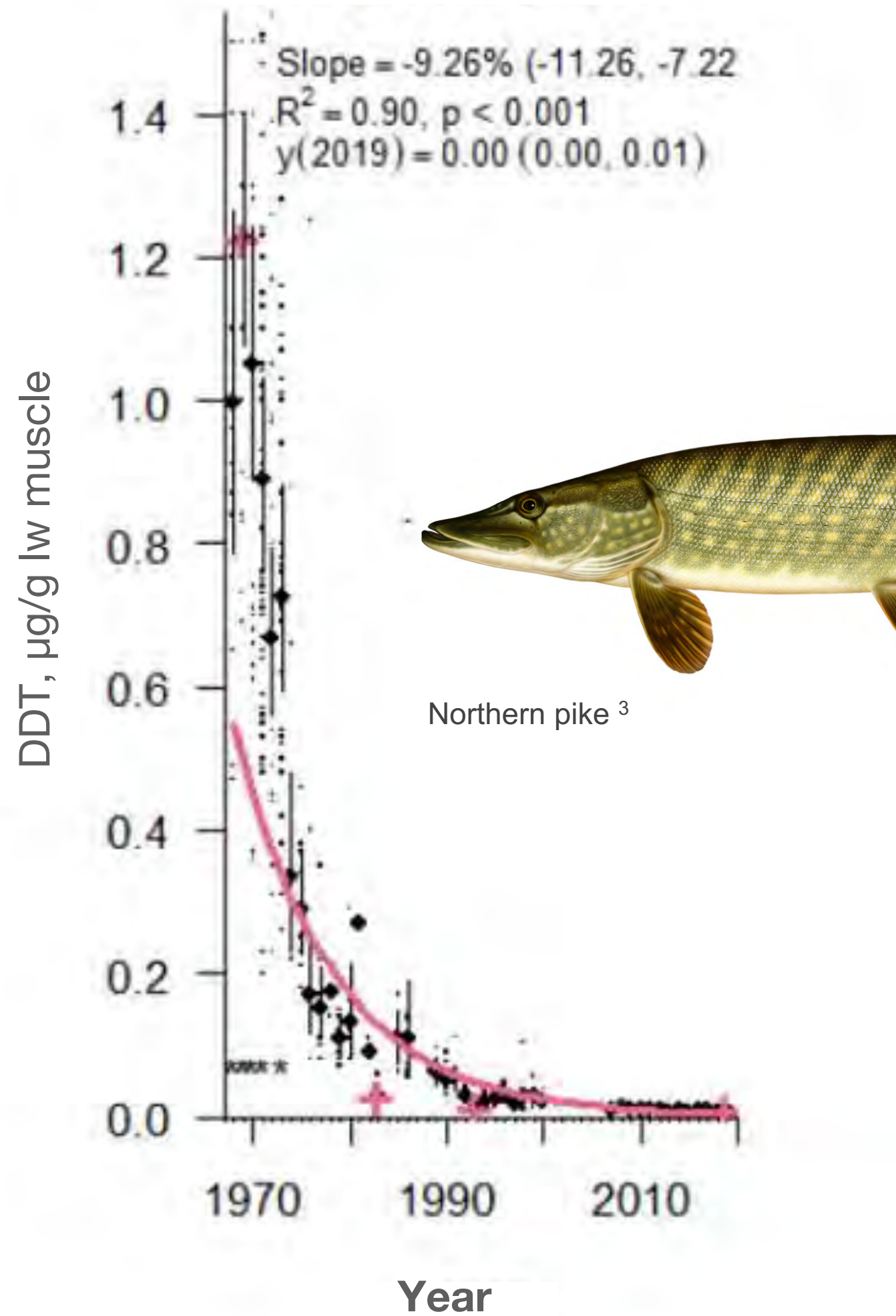
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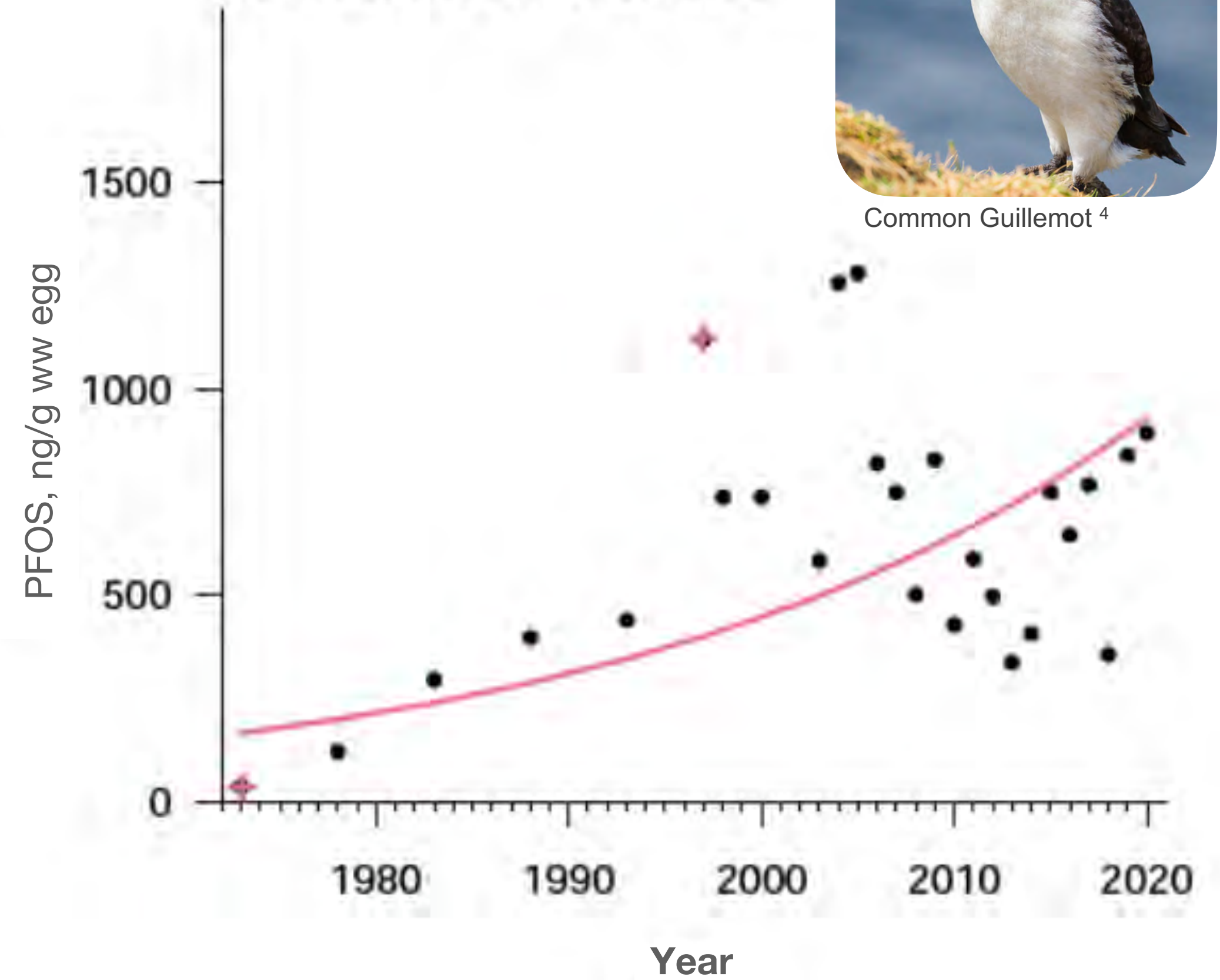
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Purpose

Storvindeln, Pike



Stora Karlsö, Guillemot



From internal reports



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What is collected for the ESB?

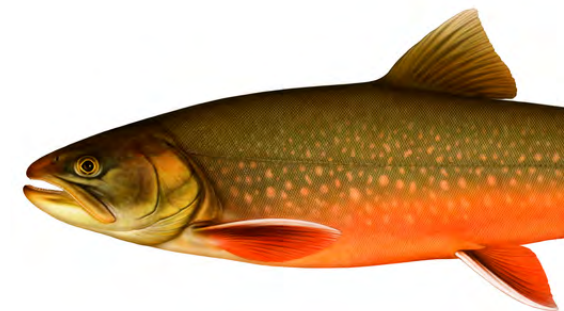
Fish



European perch ³



Northern pike ³



Arctic char ³



Atlantic herring ³



Atlantic salmon ³



Atlantic cod ⁵



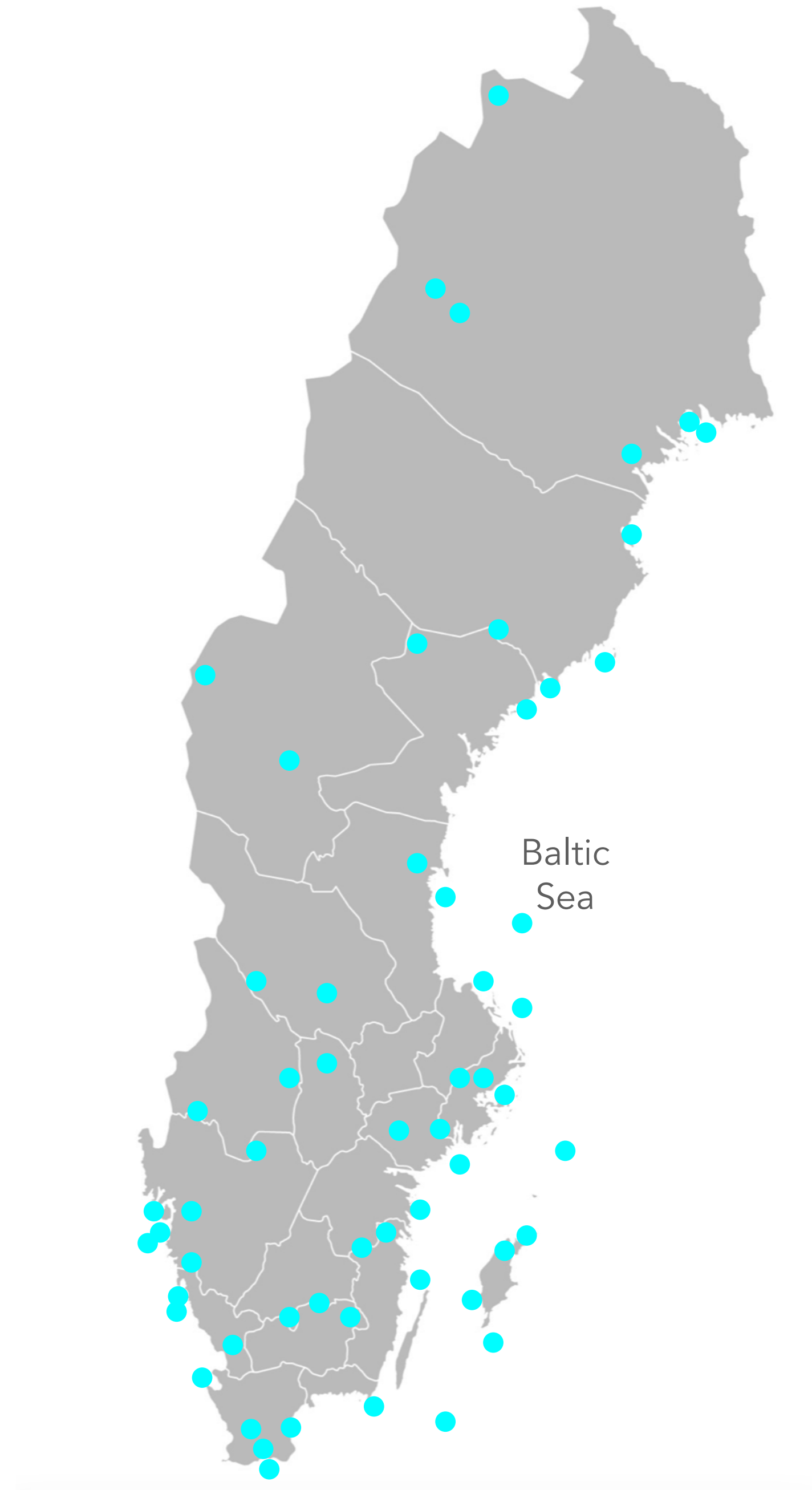
Common dab ⁵



European flounder ⁵



European eelpout ⁵





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What is collected for the ESB?

Mammals



Eurasian lynx ⁶



Reindeer ⁷



Wolverine ⁸



Porpoise ⁹



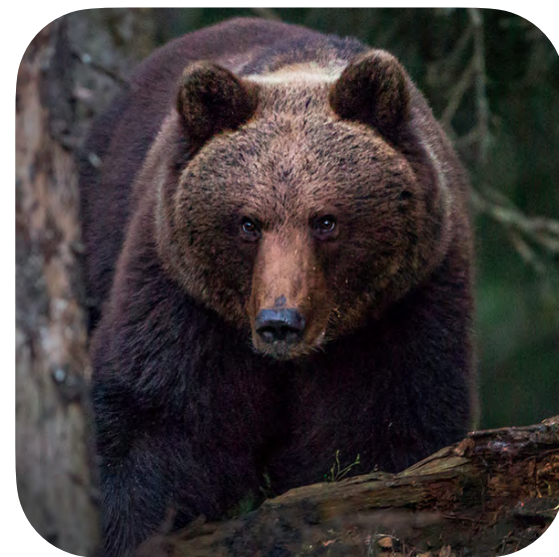
European otter ¹⁰



Grey seal ¹¹



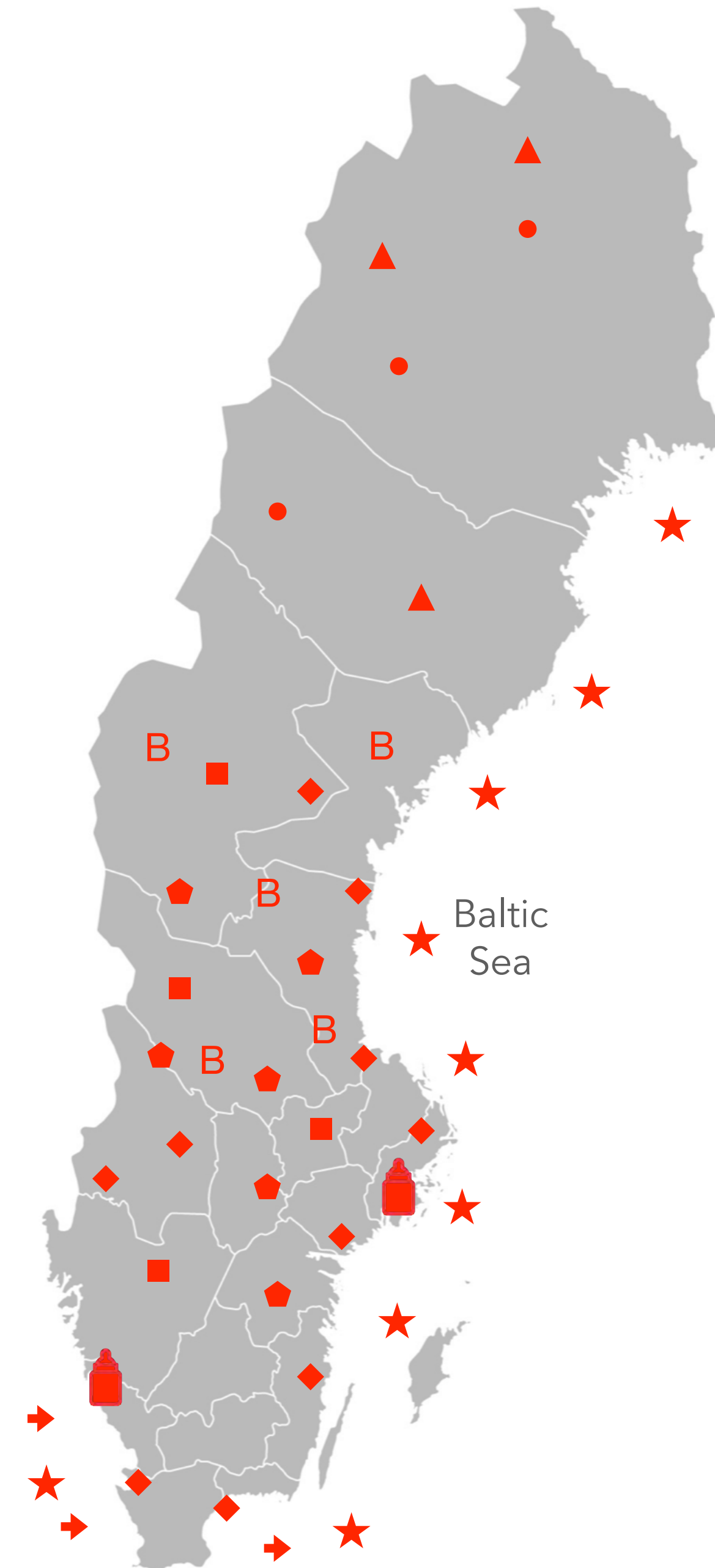
Wolf ¹²



Brown bear ⁸



Human ¹³



- Lynx
- Reindeer
- ▲ Wolverine
- ➔ Porpoise
- ◆ Otter
- ★ Seal
- ⬠ Wolf
- B Bear
- 🍼 Breastmilk



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What is collected for the ESB?

Birds



White-tailed eagle ¹⁴



Golden eagle ¹⁵



Kite ¹⁶



Common Guillemot ⁴



Peregrine Falcon ¹⁷



Great grey owl ¹⁸



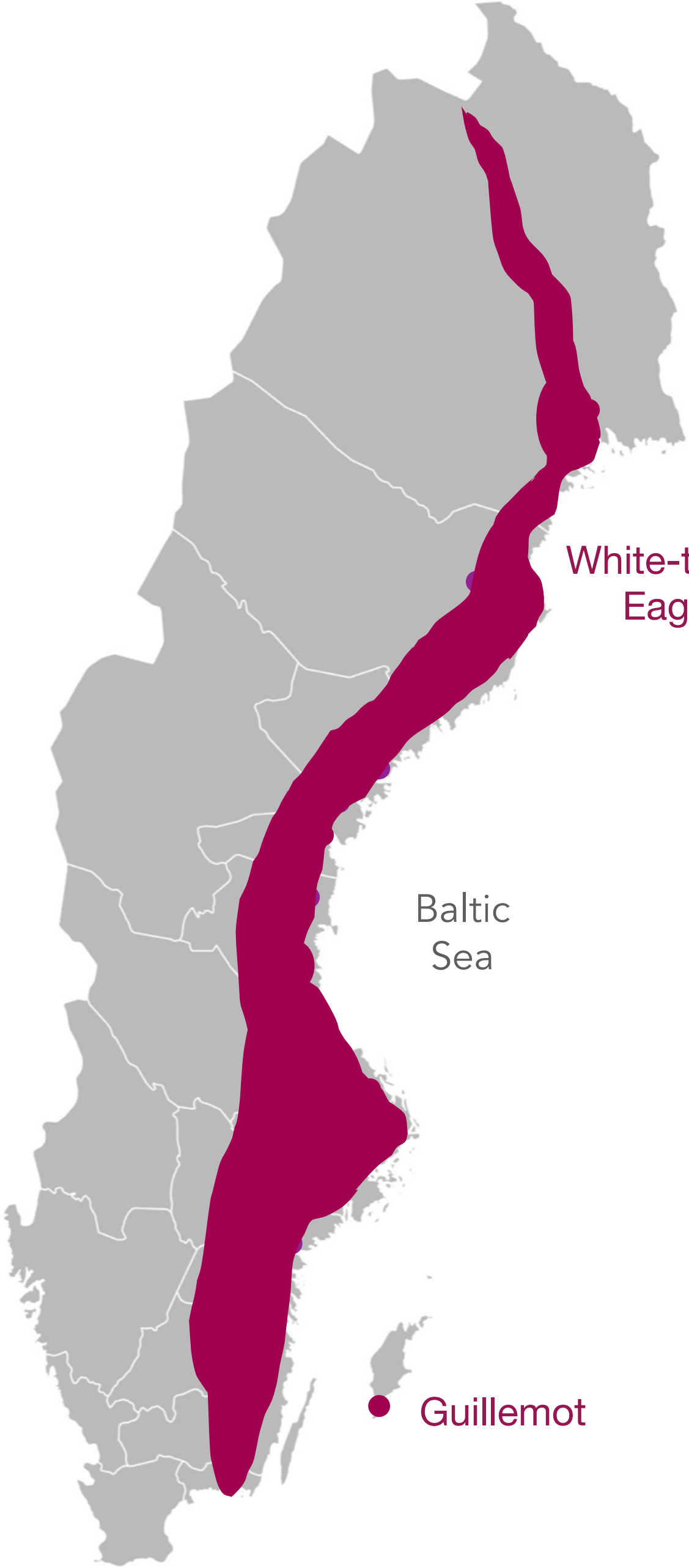
Ural owl ¹⁹



Tawny owl ²⁰



Eurasian eagle owl ²¹





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What is collected for the ESB?

Plants & other materials



Glittering woodmoss ²²



Red-stemmed feathermoss ²³



Humus ²⁴



Sewage sediments ²⁵



Blue mussels ²⁶



Wheat ²⁷



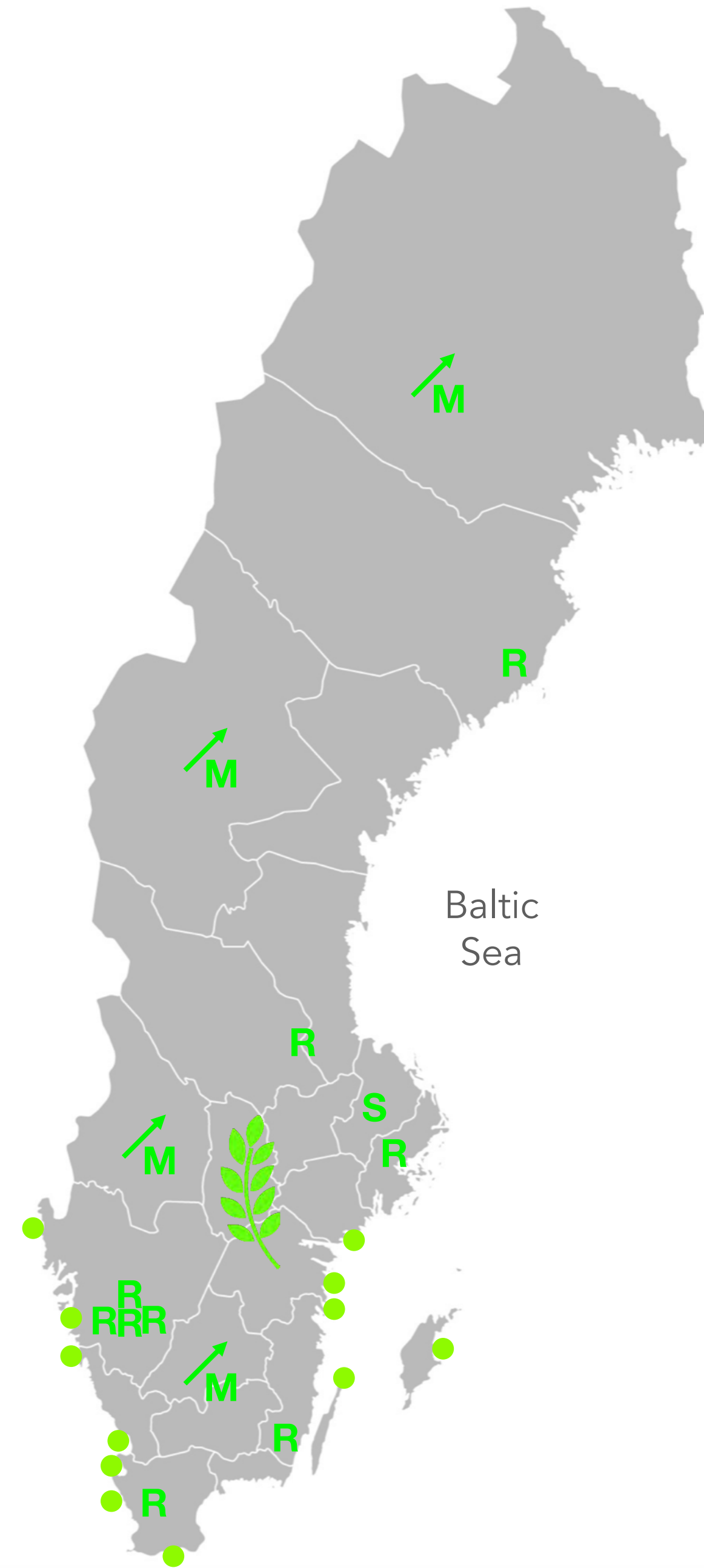
Rye ²⁸



Soybeann ²⁹



Rice ³⁰



- Blue mussels
- R Sewage sediments
- ↗ M Moss
- 🌿 Grains & seeds
- S Soil

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Specimen acquisition



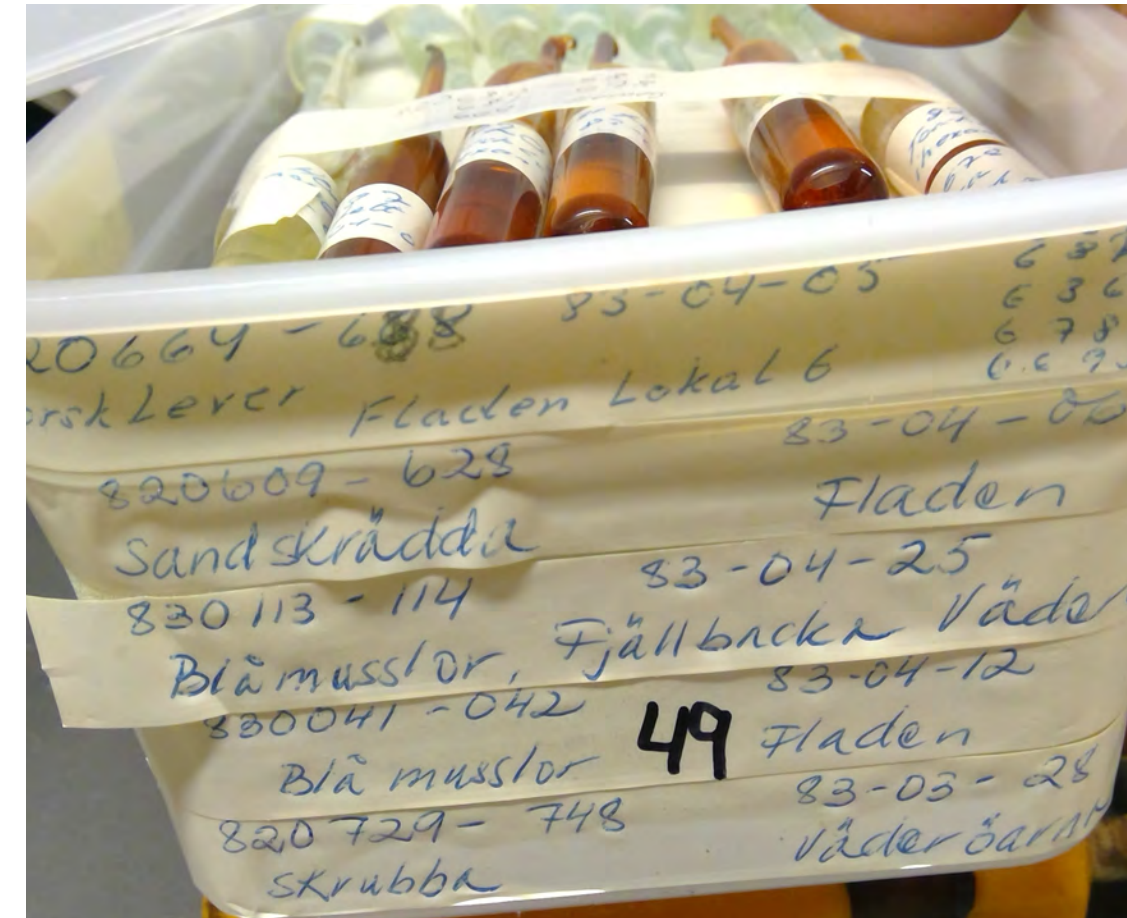
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Fieldwork



Public reporting



Donation



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SLU

ivl Swedish Environmental Research Institute

Havs och Vatten myndigheten

Stockholm University

Länsstyrelserna

Umeå University

...

External contractors & Nat'l Monitoring Programs

The Swedish ESB

Specimen storage



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Freezers (-25 C)



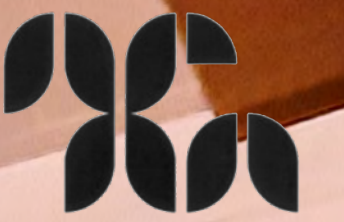
Low temperature freezers (-80 C)



Dry Collection

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-25°C Freezers



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-80°C Freezers



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Freezer storage



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Freezer storage



3

Whole fish



11

Animal tissues



4

Egg homogenate



27

Blue Mussels



26

Sewage sediments



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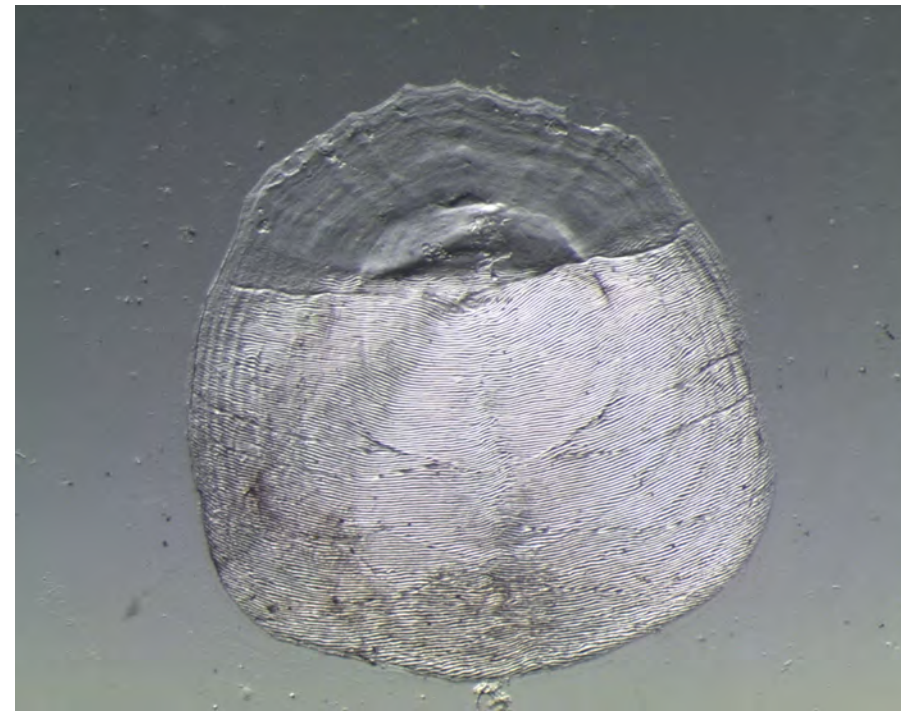
Dry Collection



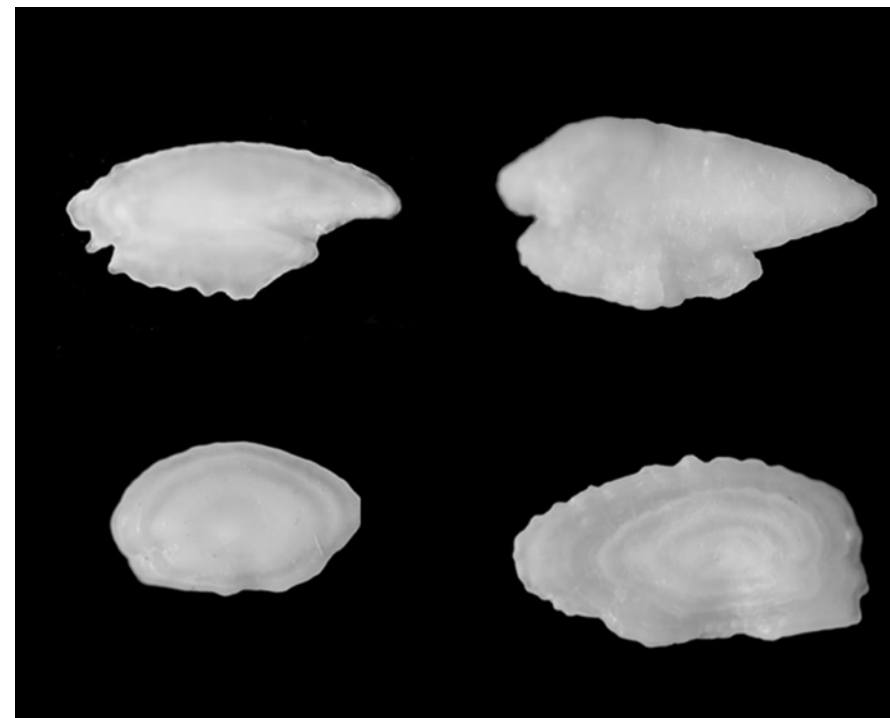
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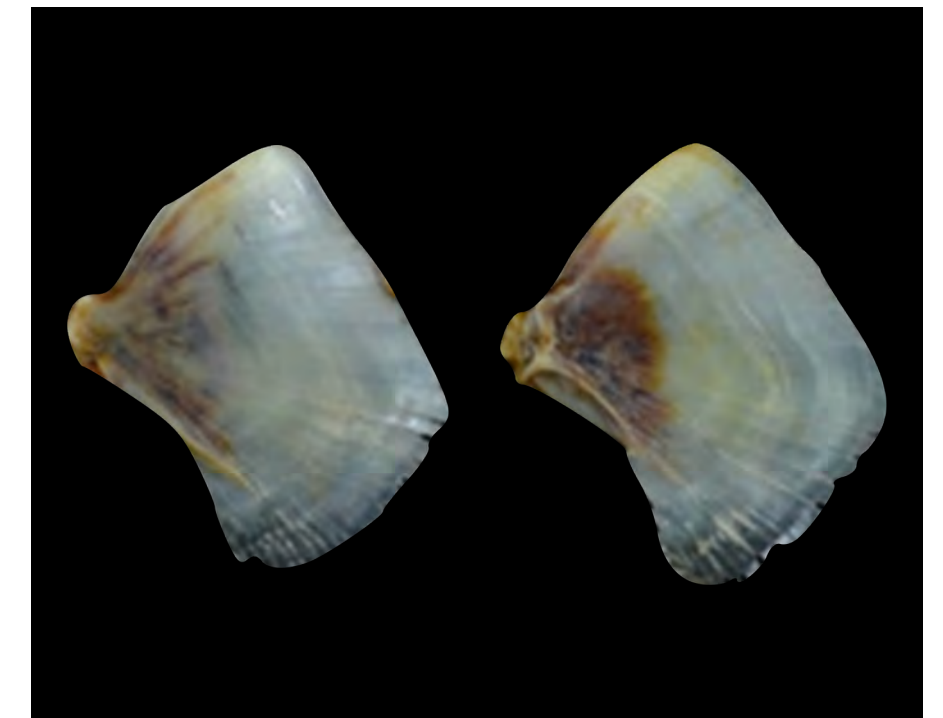
3



Scales



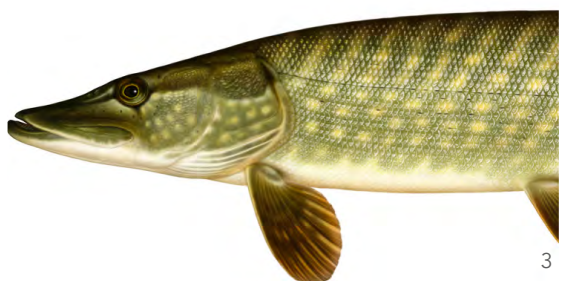
Otoliths



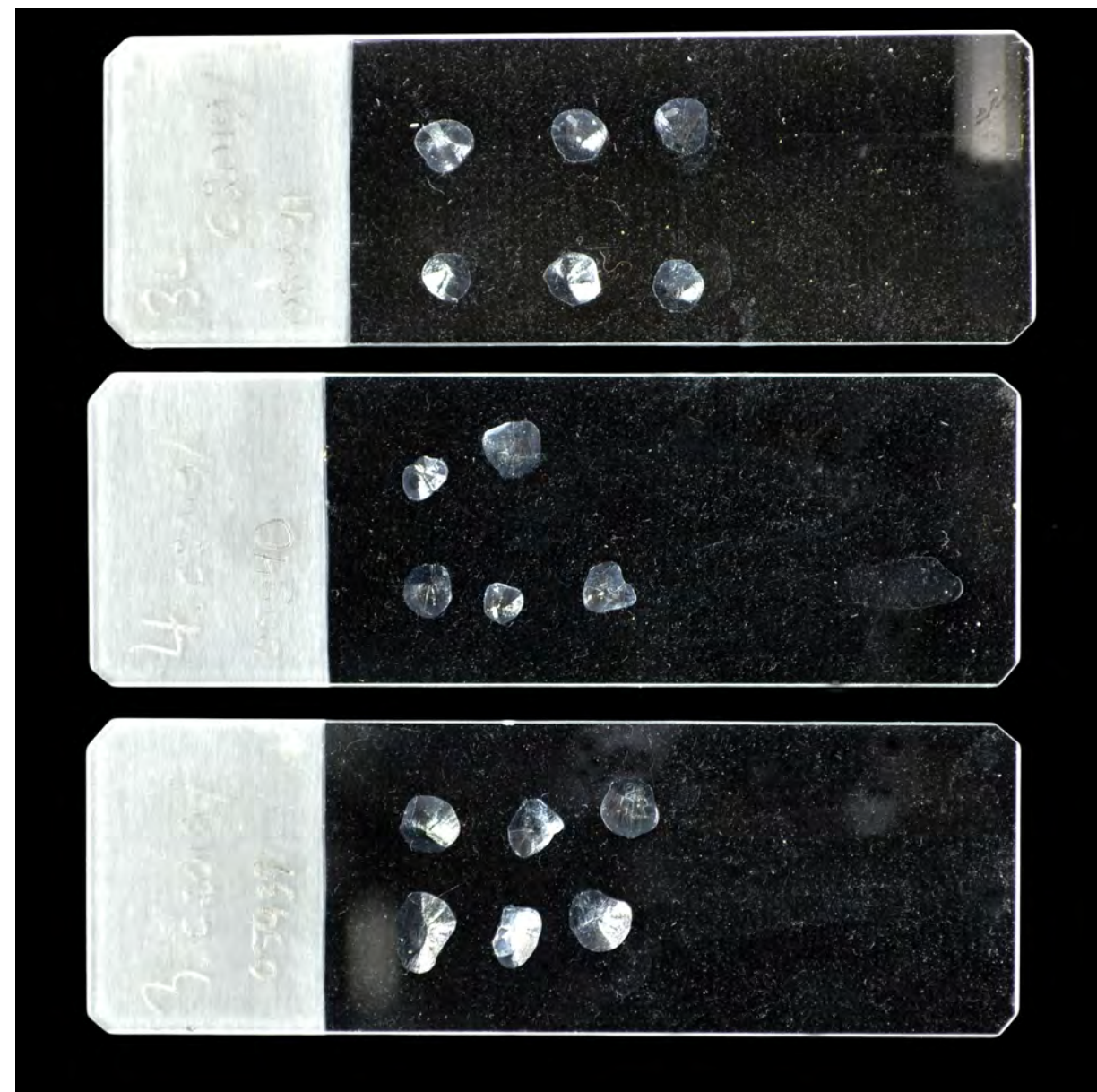
Opercula



3



3



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Dry Collection



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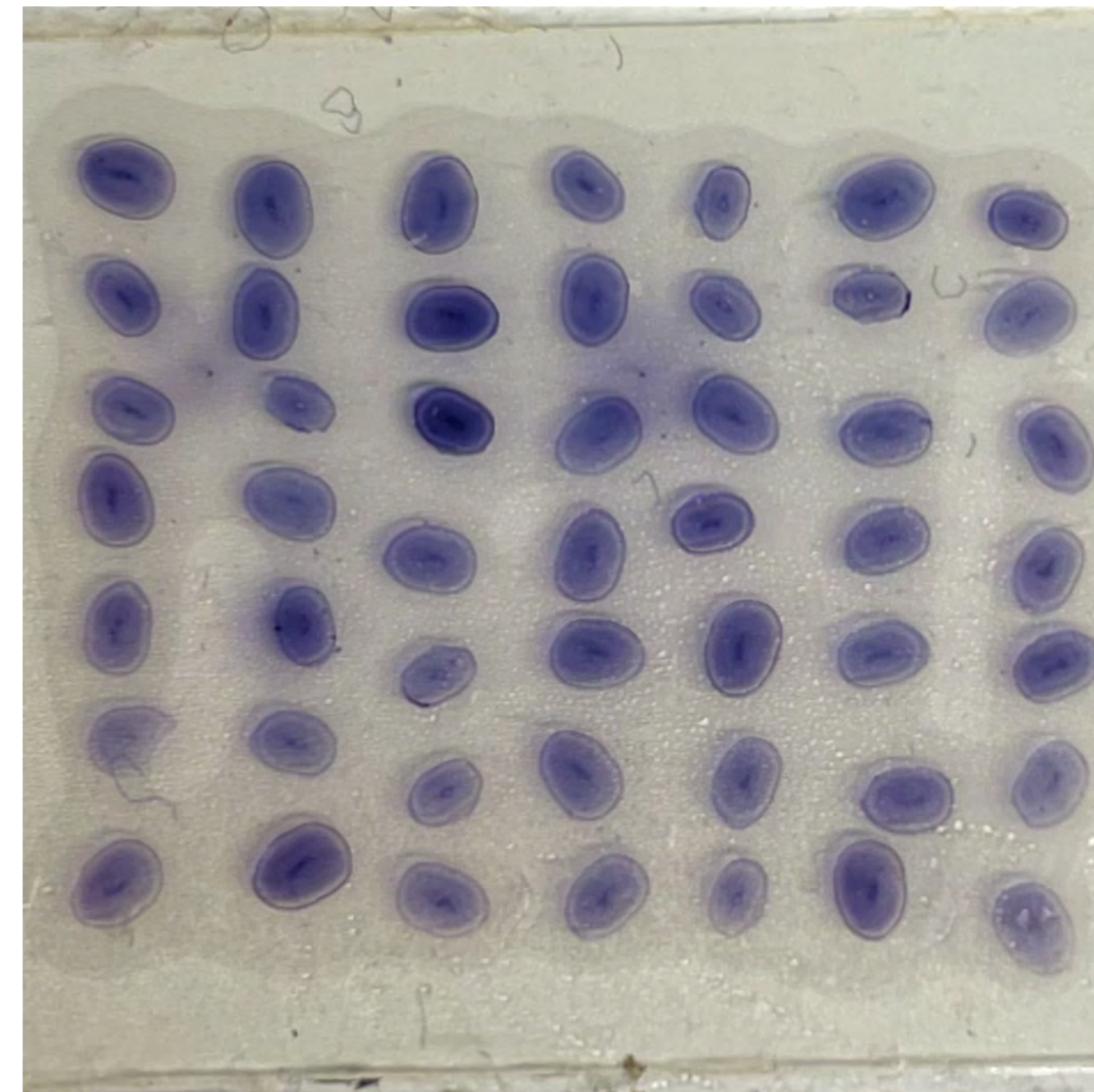
Bones



Teeth



Organs



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Dry Collection



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Eggshells

Feathers



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Dry Collection



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Blue Mussel shells



Moss



Grains and seeds



Sewage sediments



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Loans



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Collections

Research library

Publications

Report animals

The research department

Bioinformatics and genetics

Botany

Geoscience

Environmental research and
monitoring

Our research

Report animals

Report bird ring

Report pod

Center for Genetic
Identification

Environmental toxin monitoring

Miljöprovbanken

Loans from Miljöprovbanken

[Application for a loan](#)

The ring marking center

Game monitoring

Publications

Loan of materials

You are welcome to send in your application for a loan of materials from Miljöprovbanken.

Under the heading "Desired material", there are two possibilities to indicate which material the application applies to. You can either fill in individual fields or if the application concerns more species / stations / tissue types, attach a file with the desired information.

Questions marked with an asterisk (*) are mandatory and must be completed. Incomplete applications will not be processed.

When borrowing materials from Miljöprovbanken, applicants undertake to follow [the conditions for borrowing materials](#).

Project title *

Project manager *

Institution

First name

Surname

Address

ZIP code

The Swedish ESB



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Sampling Fish



Provberedningsprotokoll (fisk)

Provista	Provnr	Metalltyp	Provnr (2)	Metalltyp (2)	Provnr (3)	Metalltyp (3)	Provnr (4)	Metalltyp (4)	Provnr (5)	Metalltyp (5)
C2015/03117	18									
	19									
	20									
	21									
	22									
	23									
	24									
	25									
	26									

Provberedningsprotokoll (fisk)

Provista	Provnr	Metalltyp	Provnr (2)	Metalltyp (2)	Provnr (3)	Metalltyp (3)	Provnr (4)	Metalltyp (4)	Provnr (5)	Metalltyp (5)
C2015/03117	18									
	19									
	20									
	21									
	22									
	23									
	24									
	25									
	26									

Serieaccession Fisk

Abborre C2015/03117-03140

Perca fluviatilis Antal accessioner: 51

Miljöövervakning, L2015, Thomas Karlsson Ramsefall 175 590 81 Gullringen 070-3839963

Insamlad: 2015-08-01 - 2015-08-17

Skärjölen, xy-koordinater: 6406090, Skärjölen Gullringen SM-Småländ H-Kalmar län Sverige 1486730

Thomas Karlsson Ramsefall 175 590 81 Gullringen 070-3839963

Insamlad av: Thomas Karlsson Ramsefall 175 590 81 Gullringen 070-3839963

Intgår i serien C2015/03117-03167

Metall: L5181-L5190

Hg: M5181-M5190

160012

160013

M5181-M5190
C2015/03117-03126
Abborre löst
Skärjölen, SM
Hg-metall - ACES

L5181-L5190
Abborre löst
Skärjölen, SM
C2015/03117-03126
metaller-lever - ACES

C2015/03117	C2015/03125	C2015/03133
C2015/03118	C2015/03126	C2015/03134
C2015/03119	C2015/03127	C2015/03135
C2015/03120	C2015/03128	C2015/03136
C2015/03121	C2015/03129	C2015/03137
C2015/03122	C2015/03130	C2015/03138
C2015/03123	C2015/03131	C2015/03139
C2015/03124	C2015/03132	C2015/03140

3117

3129

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Sampling Eggs



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Sampling Porpoises



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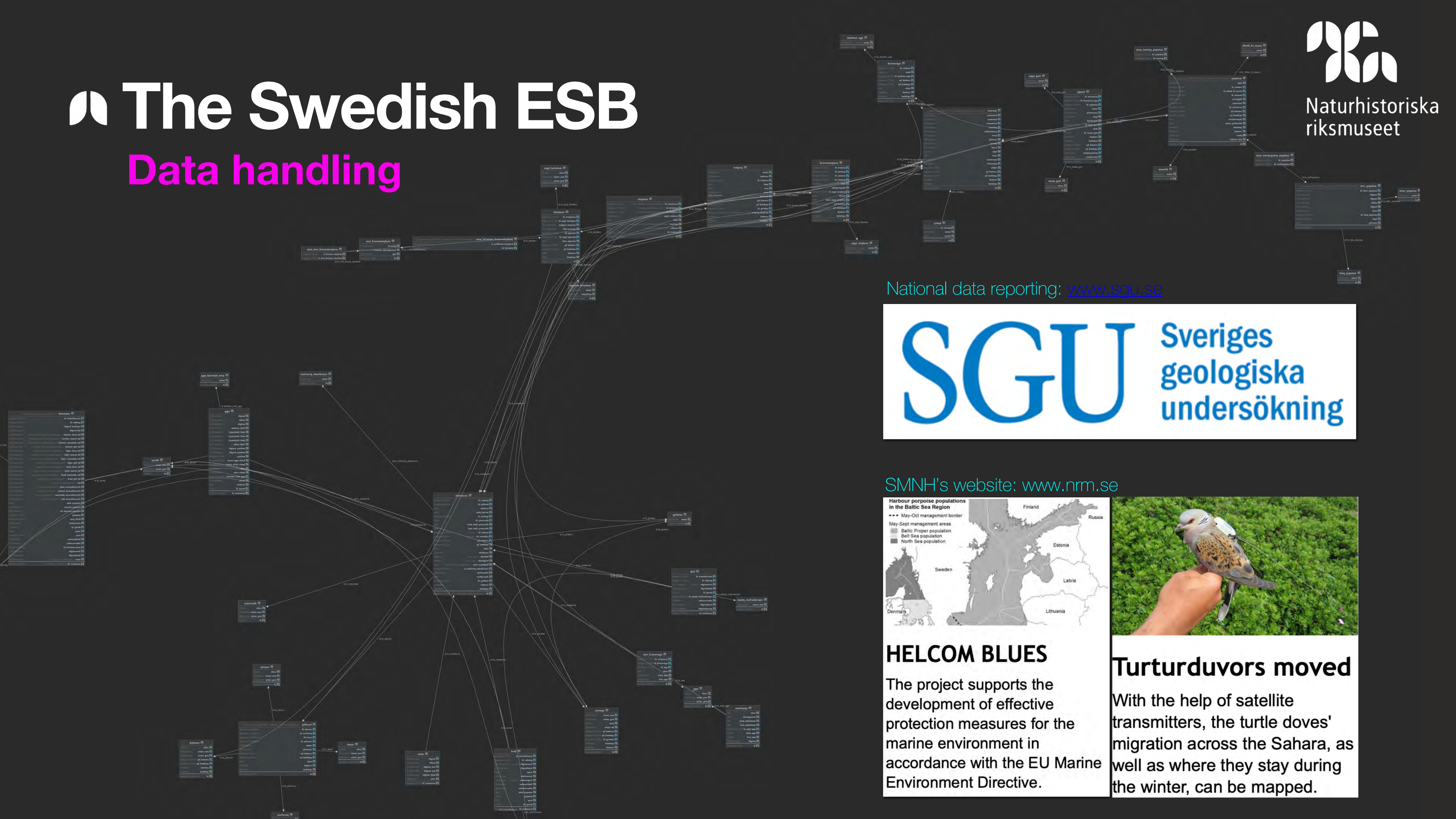


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Data handling



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National data reporting: www.sgu.se



SMNH's website: www.nrm.se



HELCOM BLUES

The project supports the development of effective protection measures for the marine environment in accordance with the EU Marine Environment Directive.



Turturduvors moved

With the help of satellite transmitters, the turtle doves' migration across the Sahara, as well as where they stay during the winter, can be mapped.

Thank you!

We would like to acknowledge

- ☛ Riksmuseivänner stipend
- ☛ Samlingsvårdsrådet, SMNH
- ☛ Dept. of Environmental Research and Monitoring, SMNH
- ☛ Dept. of Zoology, SMNH
- ☛ The Swedish Environmental Protection Agency

Questions? miljoprovbanken@nrm.se



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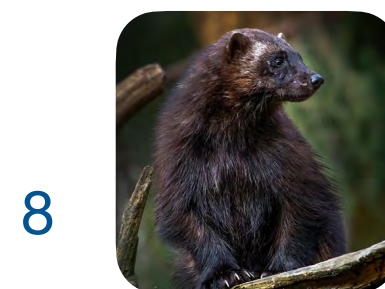
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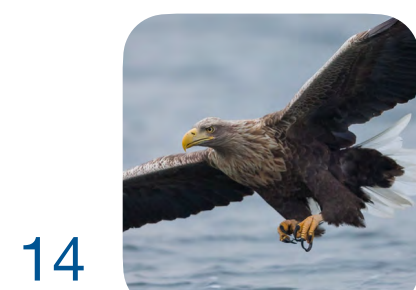
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[https://www.babycareadvice.com/
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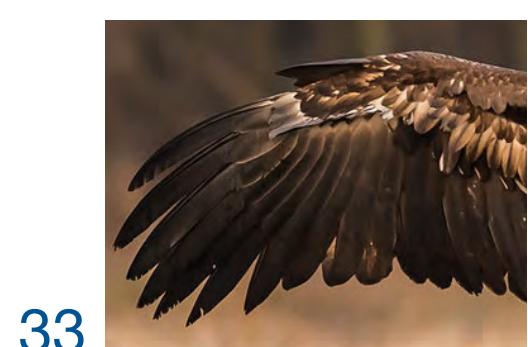
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