Distance sampling the Swedish Arctic: The effect of palsa mires (and other habitats) on the density of breeding birds

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Háskólinn á Akureyri

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Arbetar tillsammans för att bevara Sveriges arktiska vadare

BirdLife Sverige

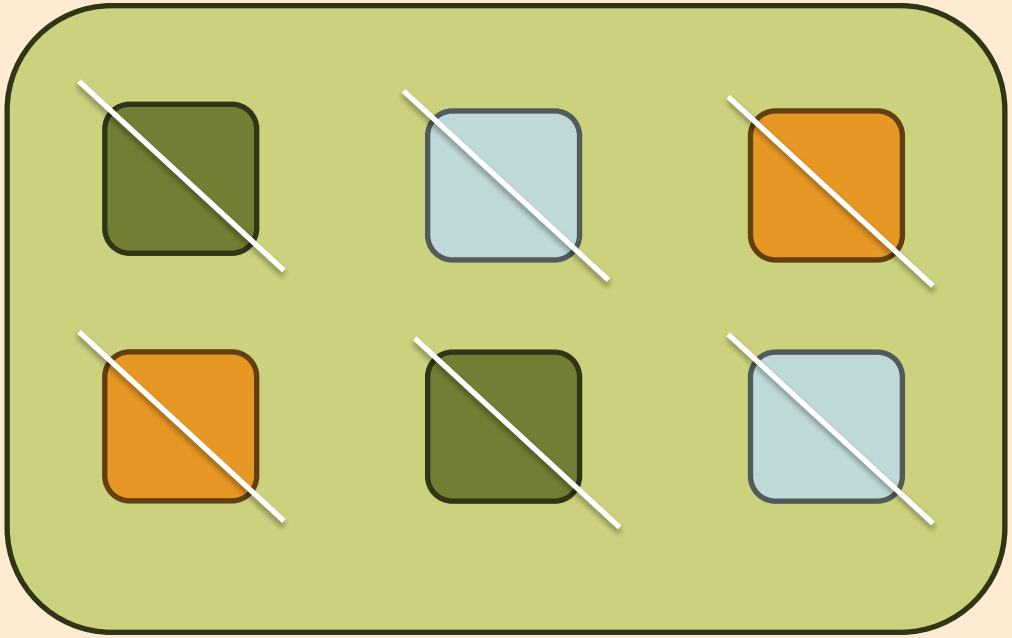
Our AIM

How does the presence of palsa mires affect bird species composition and abundance?

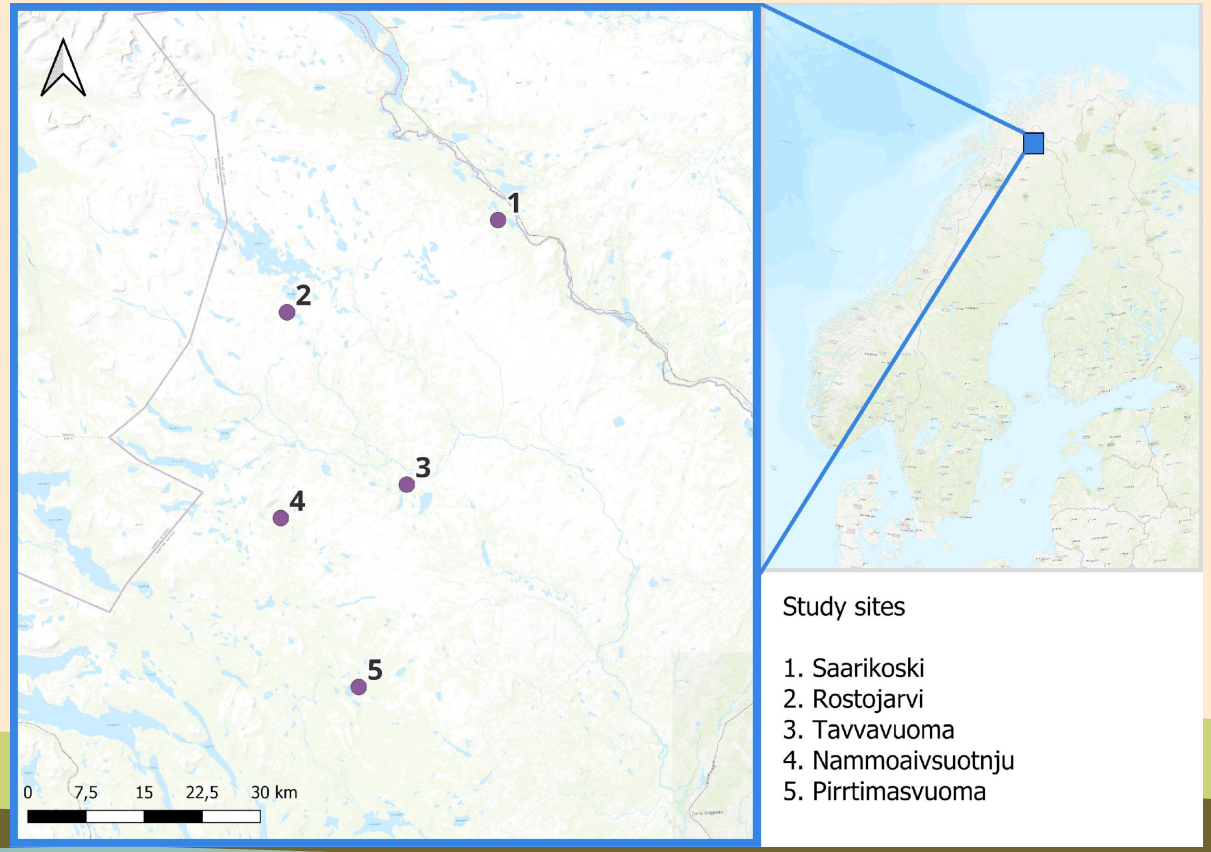
What is a Palsa Mire?

What is a Palsa Mire?

The data of our dreams



Data collection



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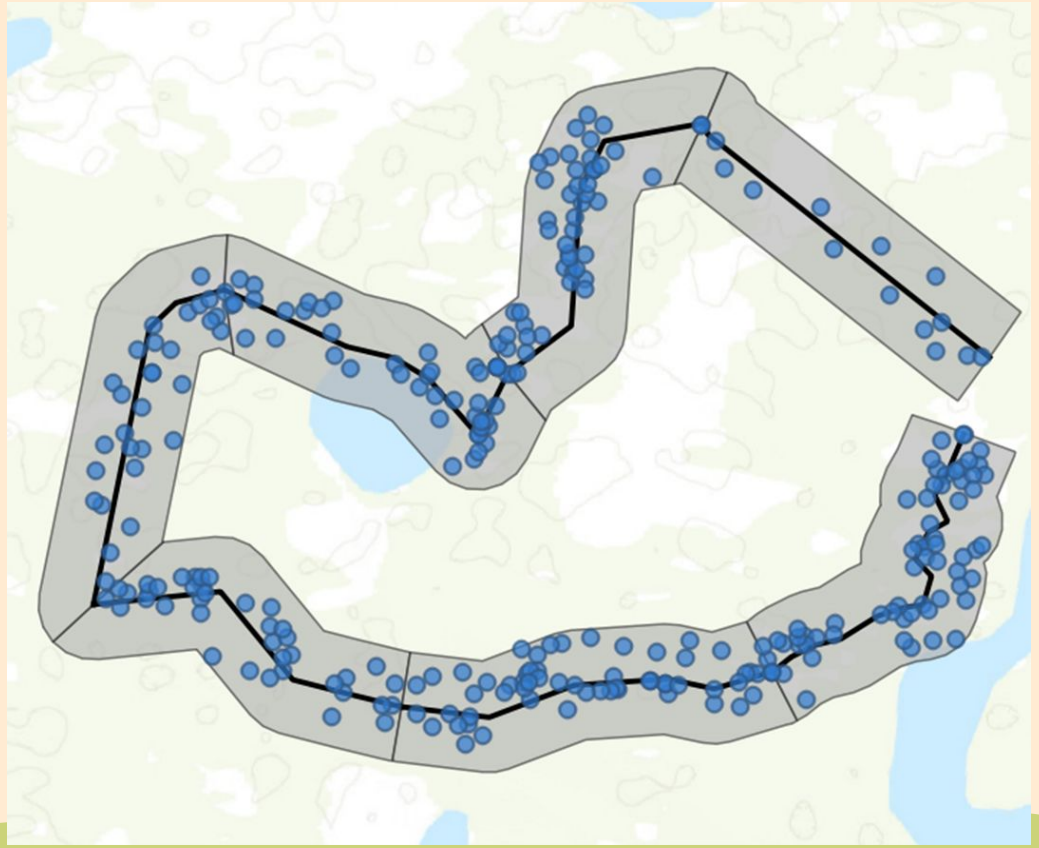
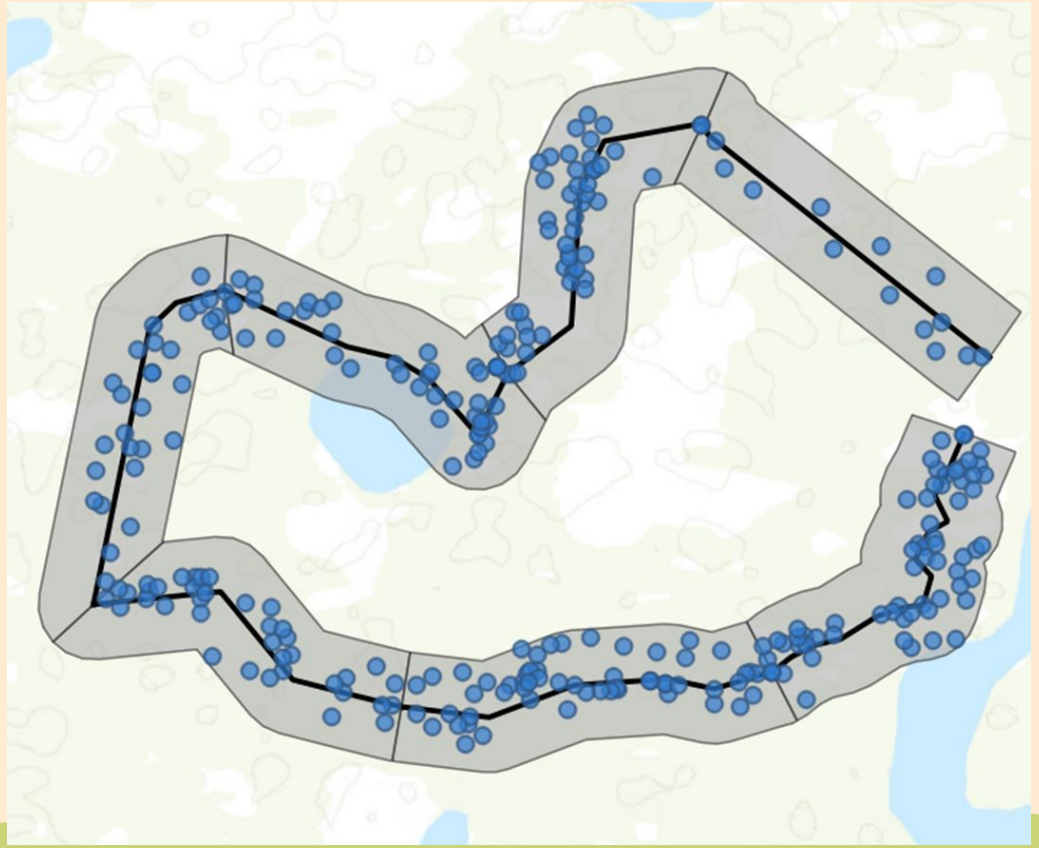


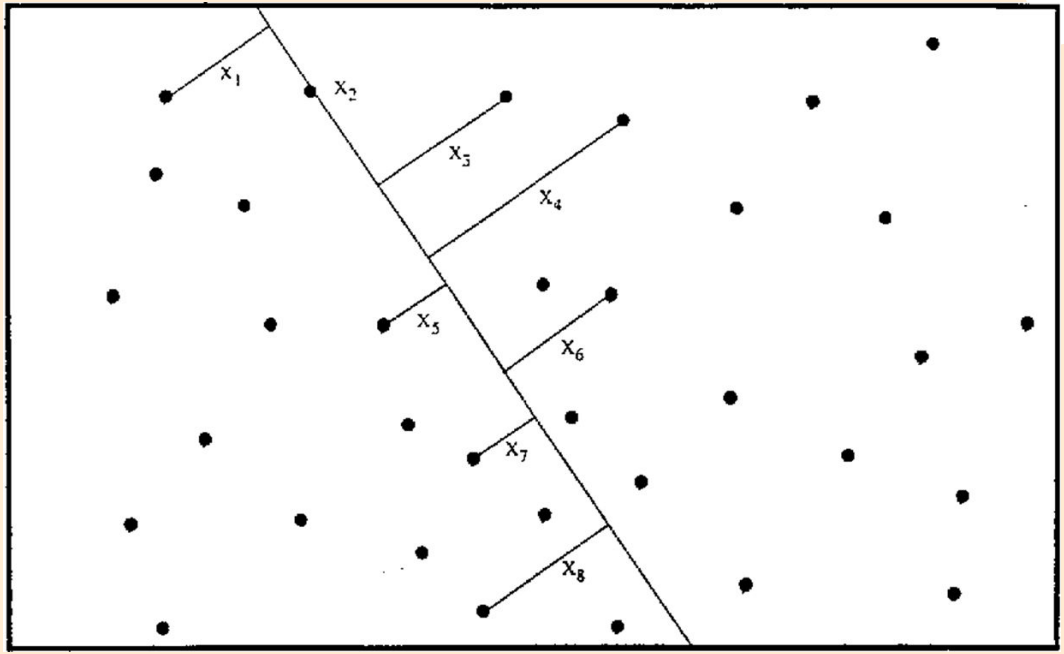
Data set

- Data was collected from 163 sub-transects, each approximately 1000 meters long,
- 5623 bird observations of 69 species.
- 18 species had more than 70 observations and were suitable for density estimation.

Line transect distance sampling



Line transect distance sampling

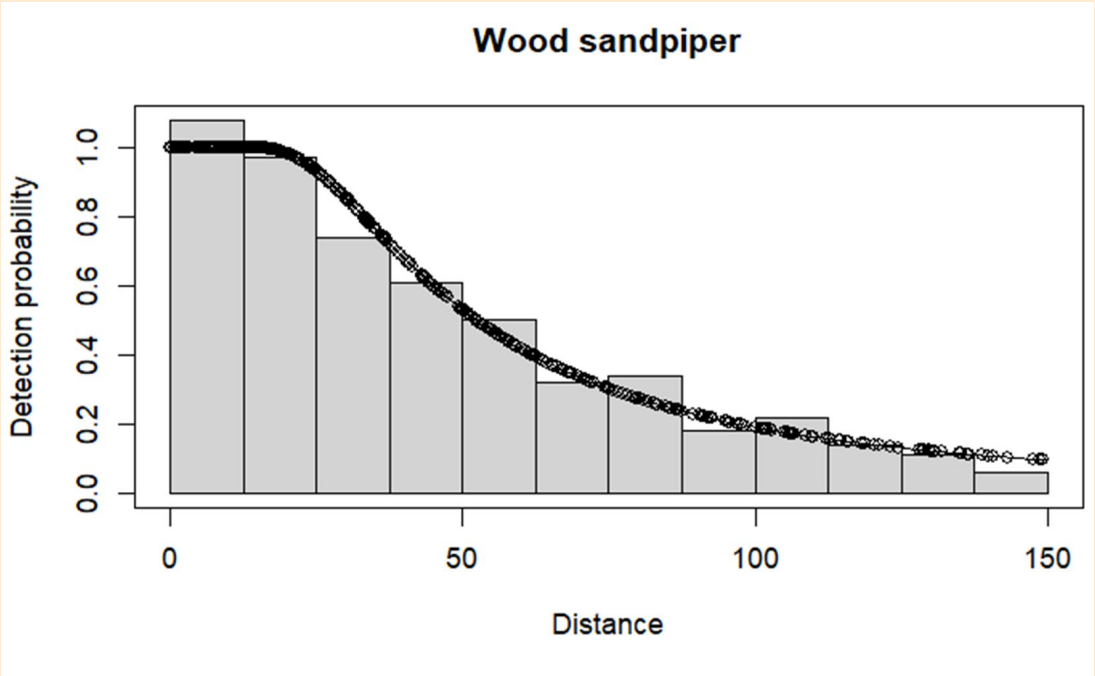


Data set

Species	Sub-transect	Distance	Palse mire	Other mire	Heath	Grassland	Betula forest	Salix scrub	Lake	Alpine rivers
Wood sandpiper	Tavva_8b	136,2	60	10	0	0	20	0	10	0
Wood sandpiper	Tavva_8b	86,9	60	10	0	0	20	0	10	0
Wood sandpiper	Tavva_8b	38	60	10	0	0	20	0	10	0
Wood sandpiper	Tavva_8c	109,8	50	10	10	0	10	10	0	10
Wood sandpiper	Tavva_8c	24,1	50	10	10	0	10	10	0	10
Wood sandpiper	Tavva_8c	24,1	50	10	10	0	10	10	0	10
Wood sandpiper	Tavva_8c	50	50	10	10	0	10	10	0	10
Wood sandpiper	Tavva_8e	138,8	0	0	40	0	40	0	0	20
Wood sandpiper	Tavva_8e	101,8	0	0	40	0	40	0	0	20
Wood sandpiper	Tavva_8f	36,2	5	35	55	0	5	0	0	0

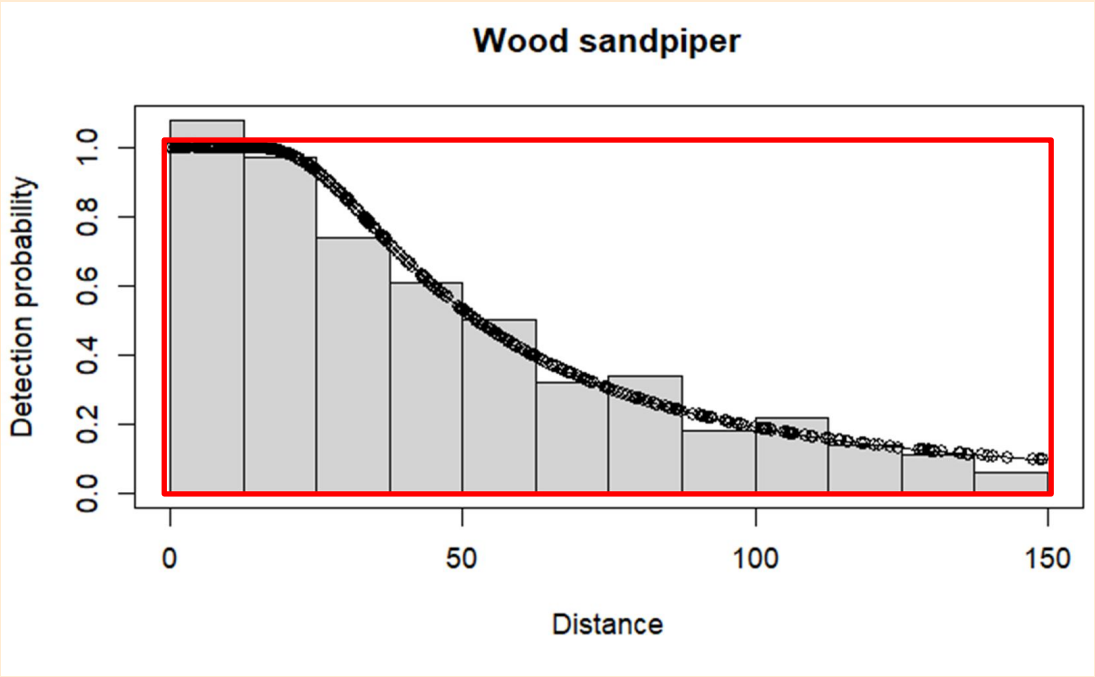
{Distance}

Analysis in R



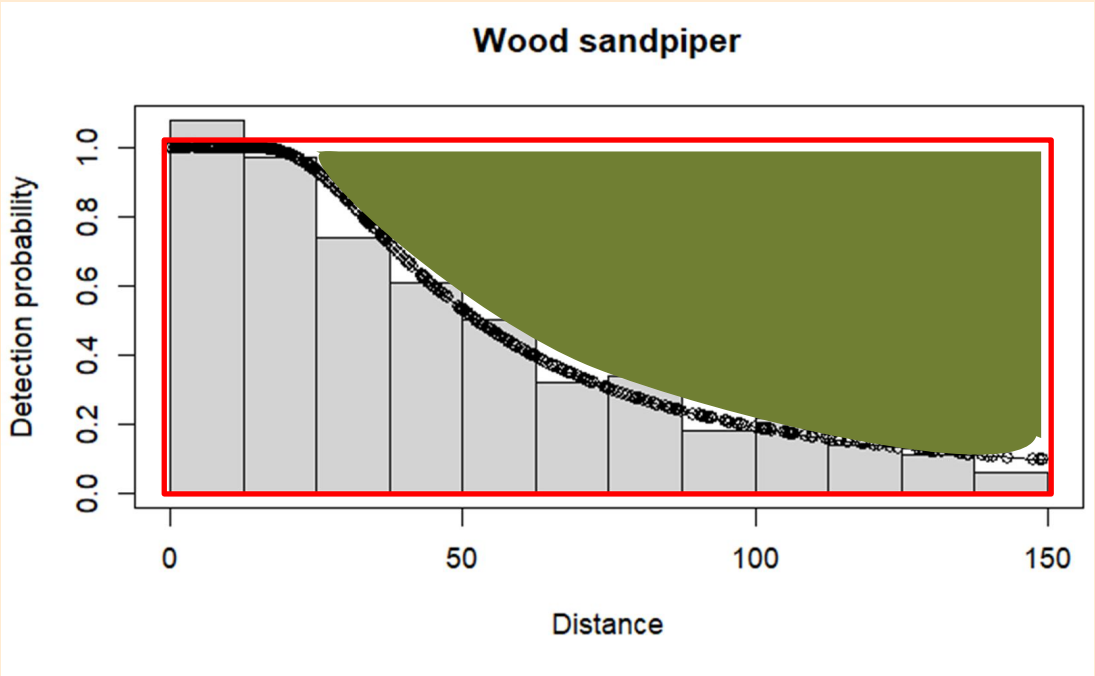
{Distance}

Analysis in R



{Distance}

Analysis in R



Density estimations

	Individuals per hectare
Tavva_1b	0,42
Tavva_1c	0,34
Tavva_1d	0,55
Tavva_1e	0,41
Tavva_1f	0
Tavva_1g	0,26
Tavva_1h	0,17

Data set

Species	Sub-transect	Distance (m)	Palsa	Other mire	Other mire	Heath	Grassland	Betula forest	Salix scrub	Lake	Alpine rivers
Wood sandpiper	Tavva_8b	136,2	60	10	0	0	20	0	10	0
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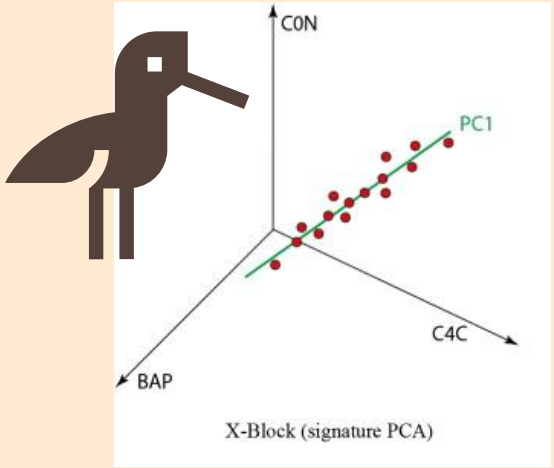
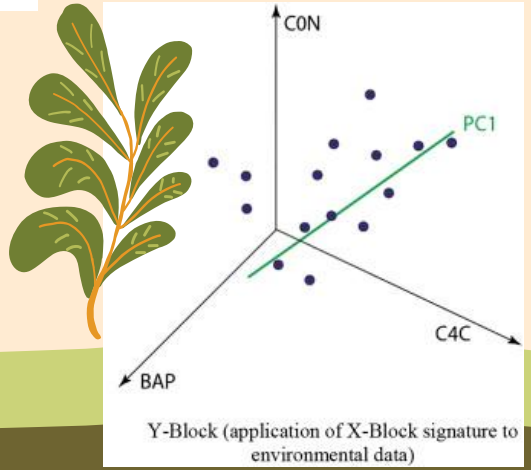
Analysis in R

- **Multidimensional analysis**
- **Testing effect of explanatory variables on result variables**

- **Bootstrapping 10 000 times**



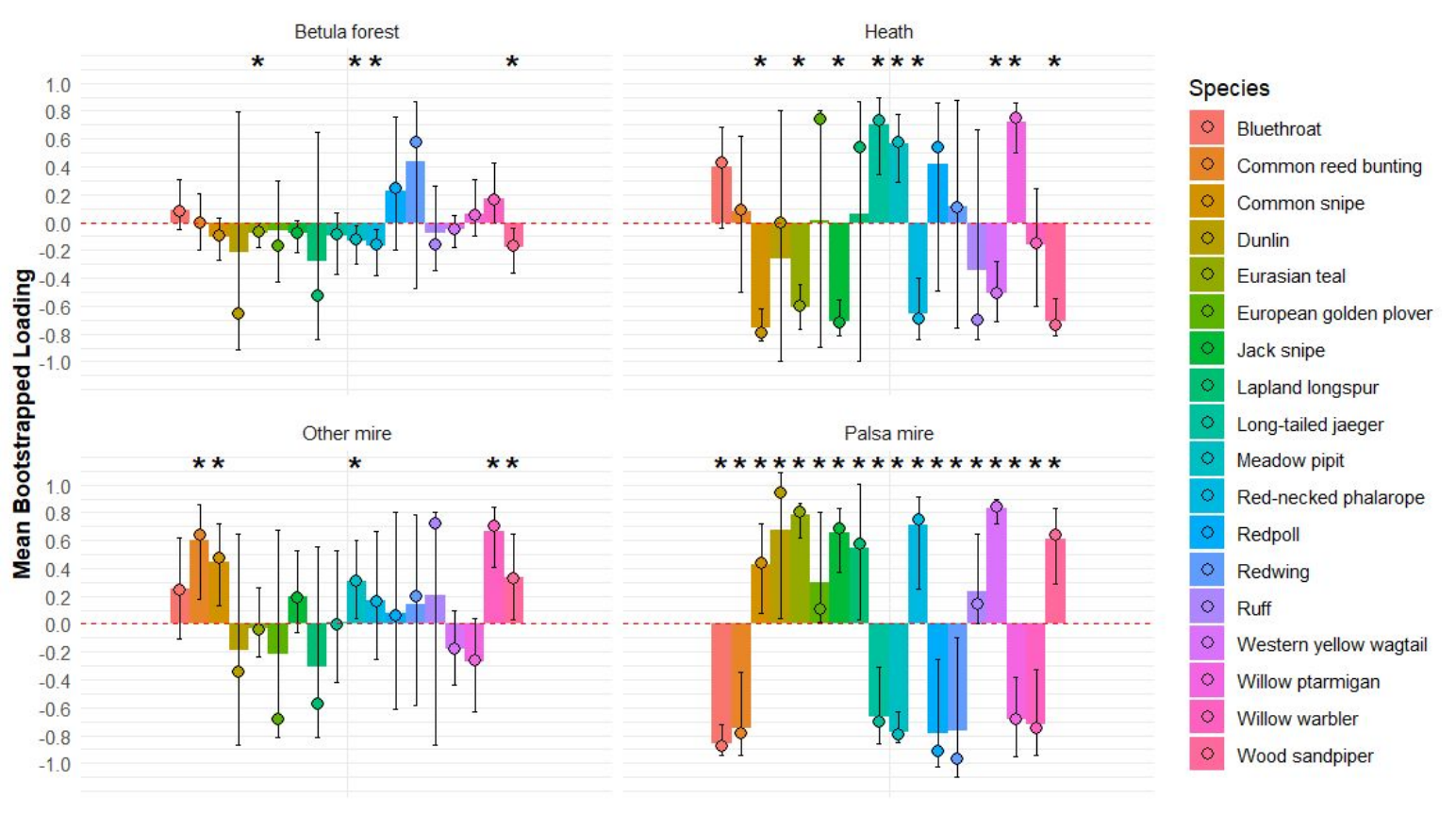
X-Block (signature PCA)



Y-Block (application of X-Block signature to environmental data)

Results

Density estimation



Results

Palsa mire has a significant effect on all species

Positive effect on all wader birds

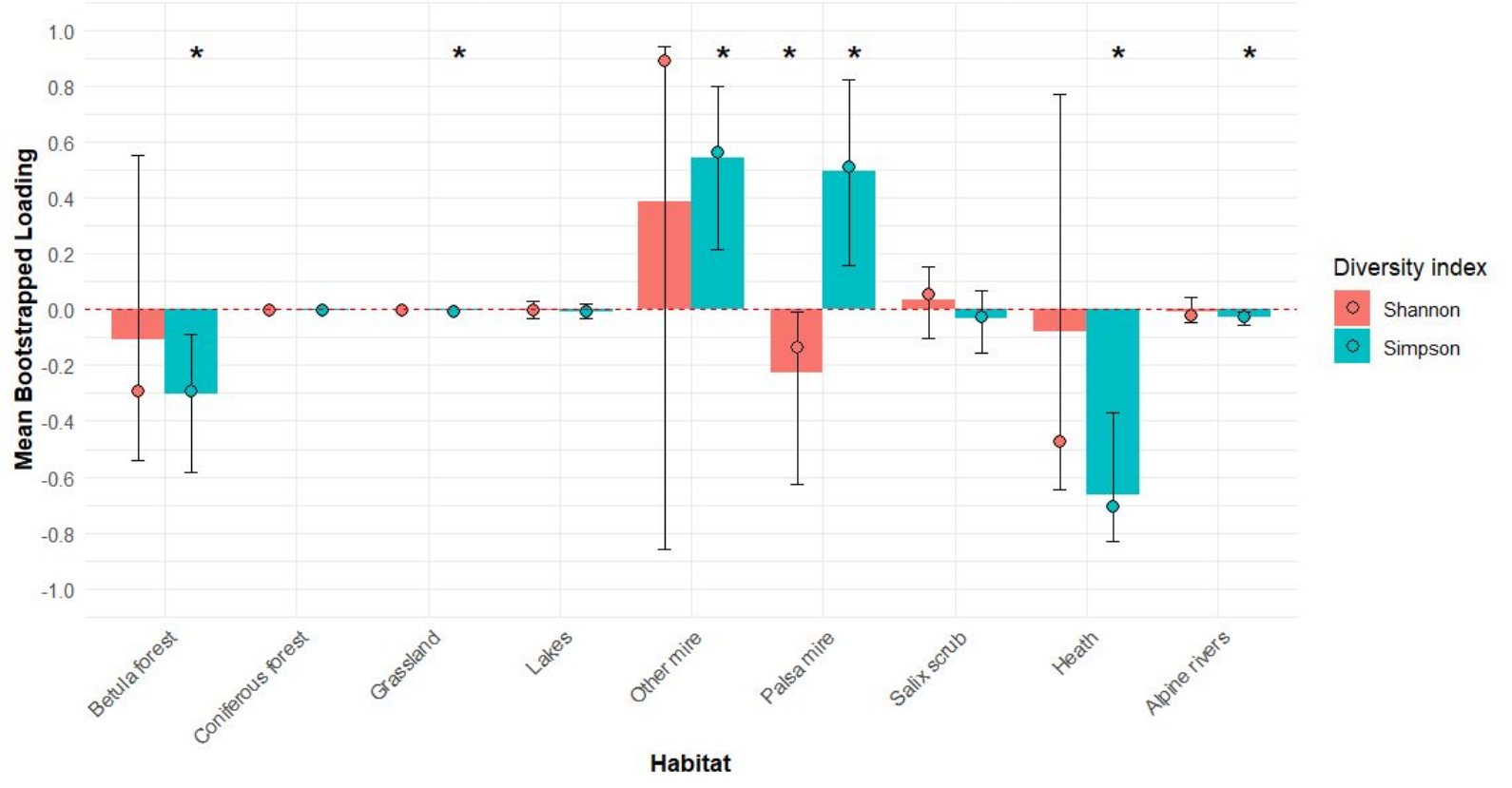
Results

Wader birds are commonly associated to wetlands

Common snipe and wood sandpiper have positive effect of other mire aswell

Results

Species diversity



Take-aways

Betula forest, heath, other mire and palsa mire has large effect on species composition

We found positive relationships between palsa mire and the density of 10 species

We need to understand the relationships between species and habitats

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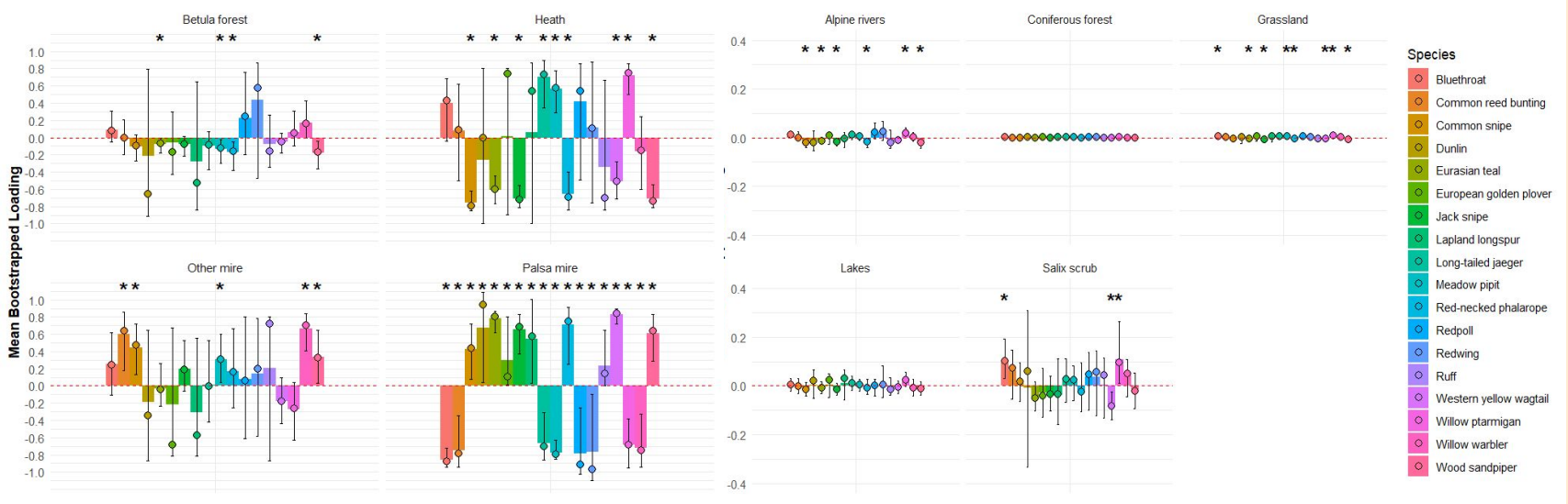
Results

Density estimation