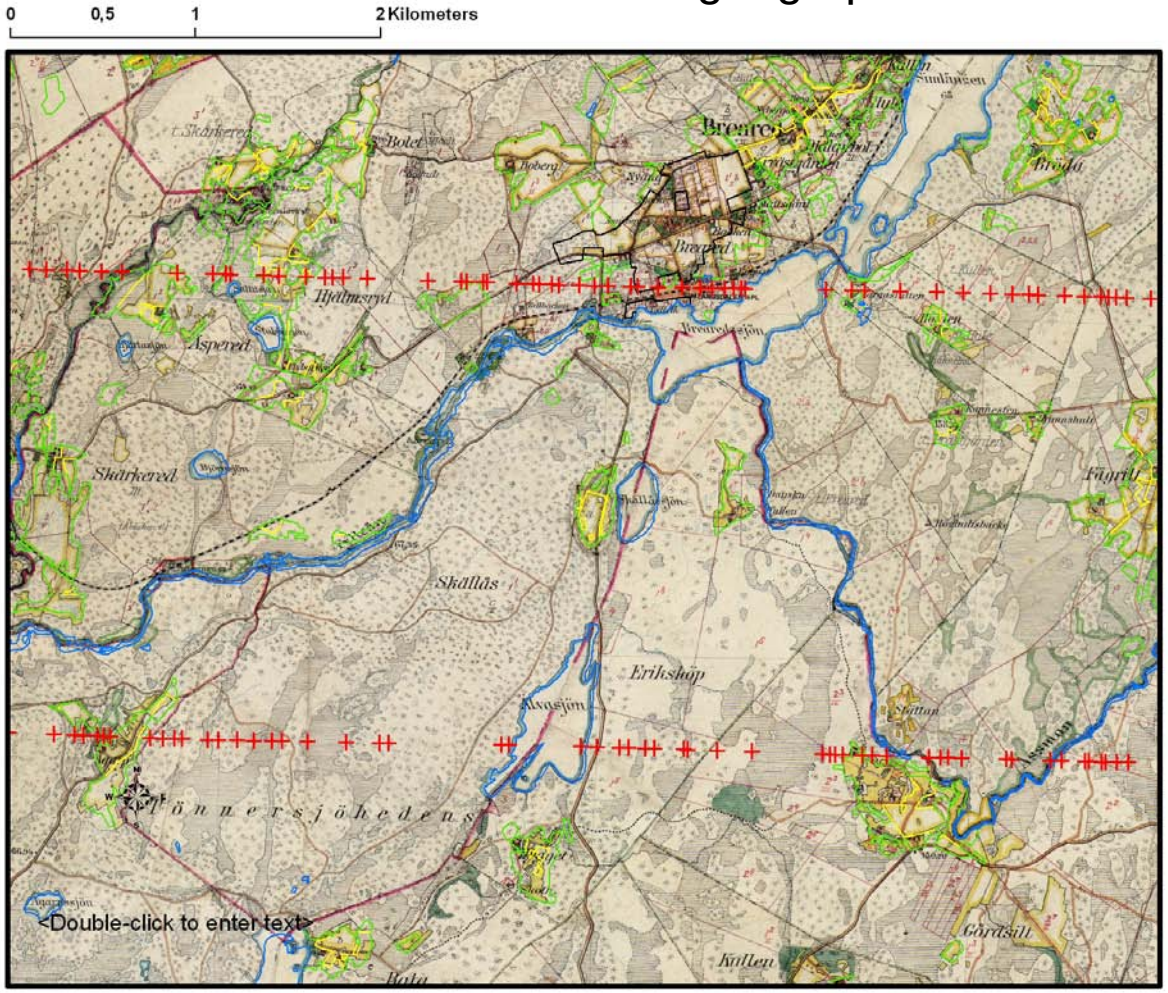
Modelling earlier forest landscapes

by combining forest inventory data with historical maps
and other geographic information



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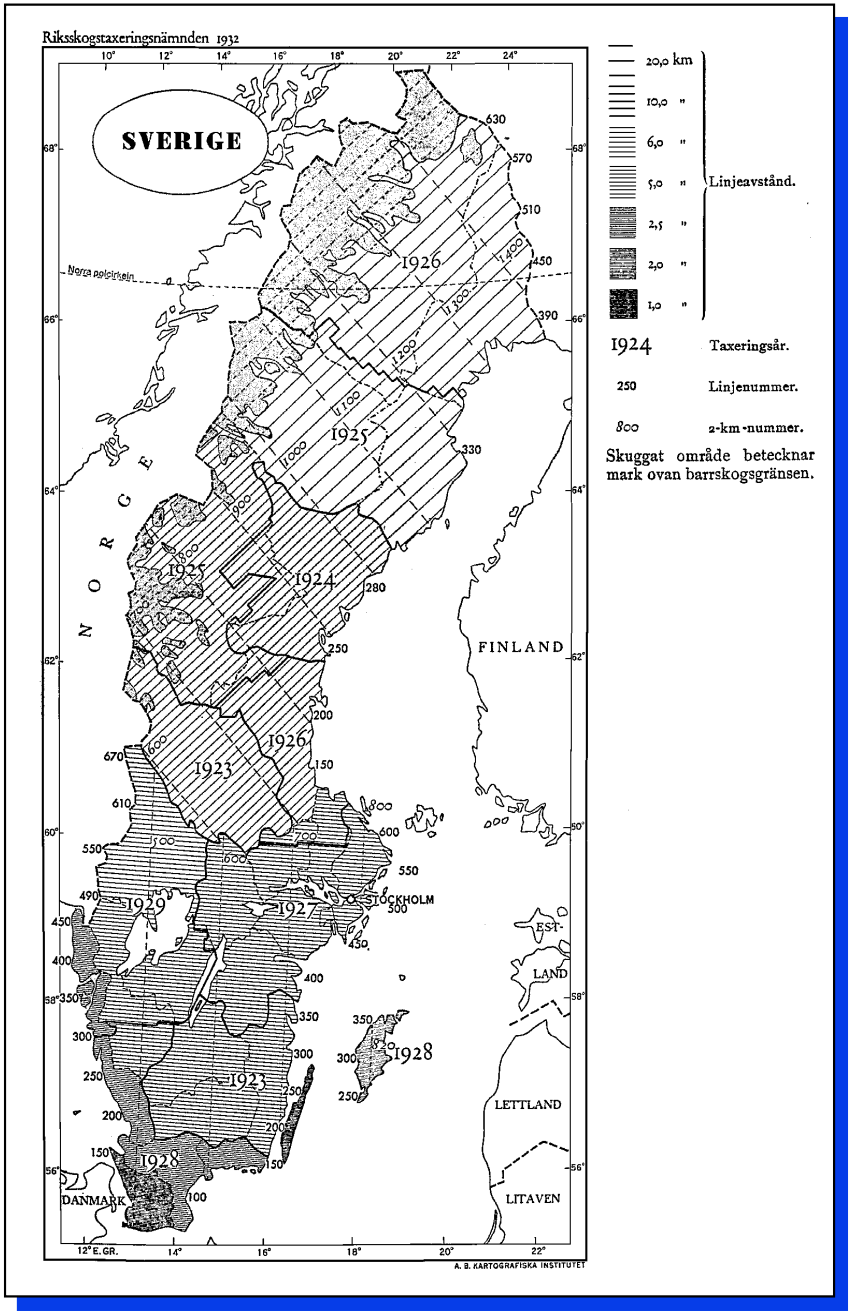

Data from National Forest Inventories

- Started in 1910s, still ongoing
- Useful at various scales
- Suitable for upscaling & modelling
- Sample based approach/error estimations
- Continuous transect sampling

→ Spatial data at stand/habitat level !

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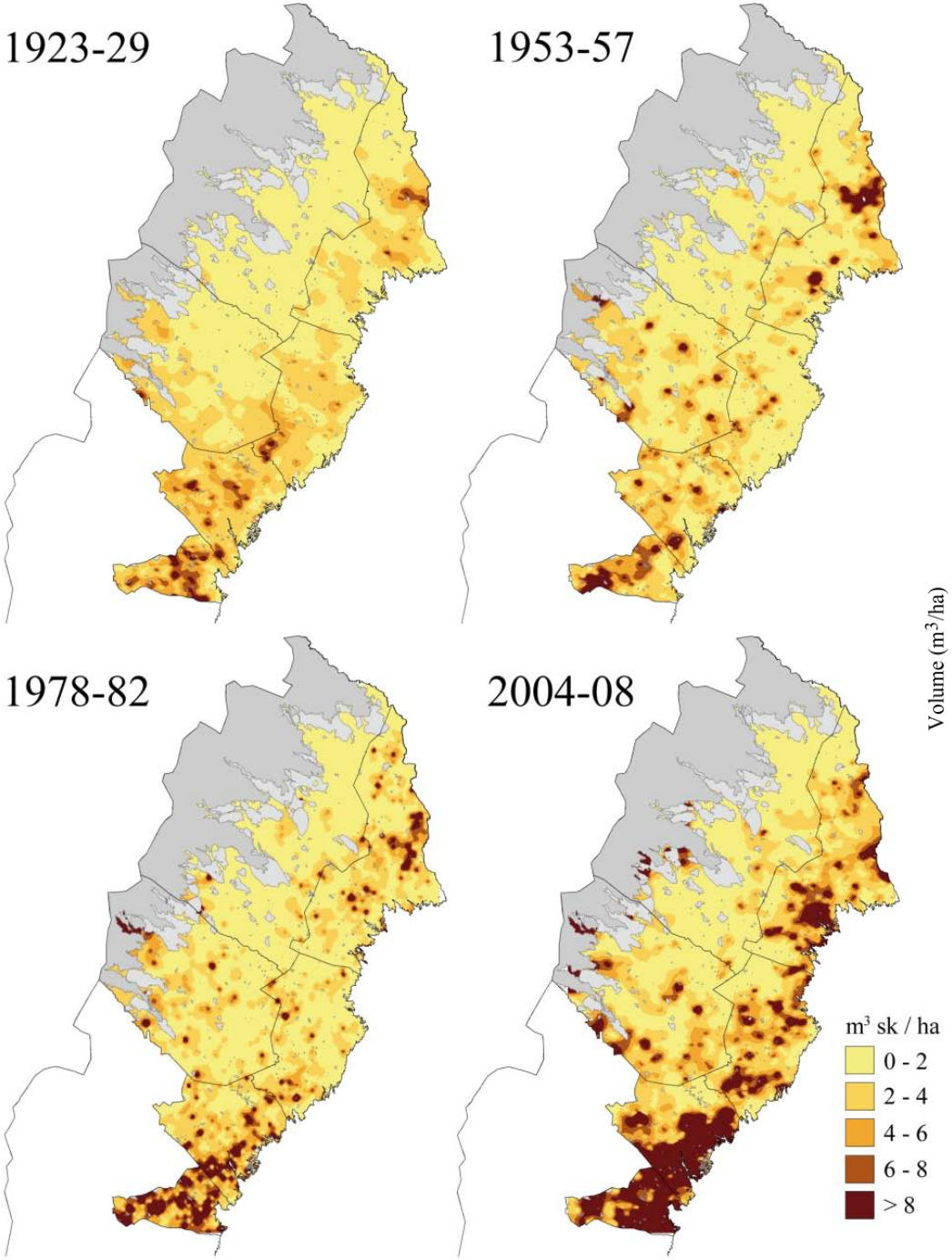
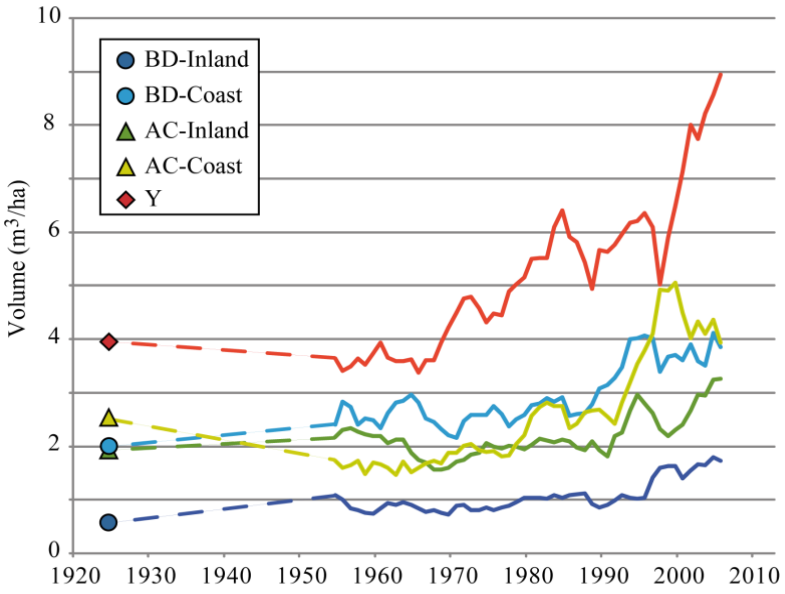
Large deciduous trees (>20 cm DBH)





Axelsson & Cory. Temporal and spatial variation of large deciduous trees in boreal Sweden 1925-2008. Manuscript

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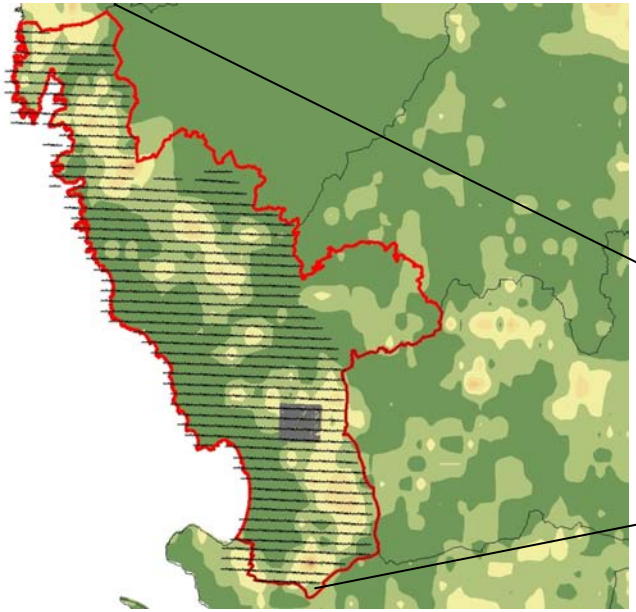
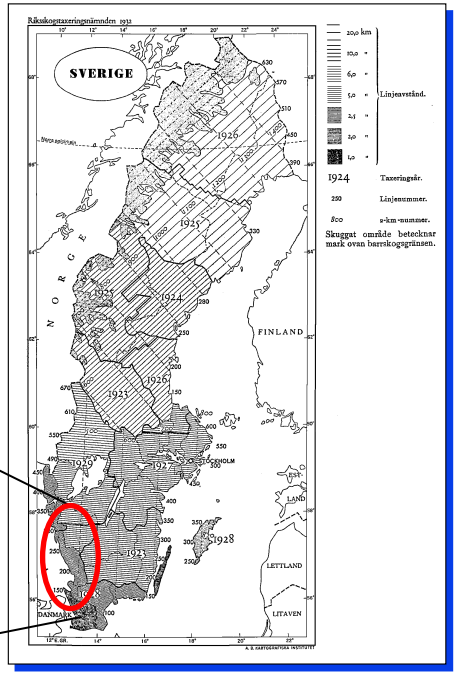
Goal: Historical forest/habitat map 1920s

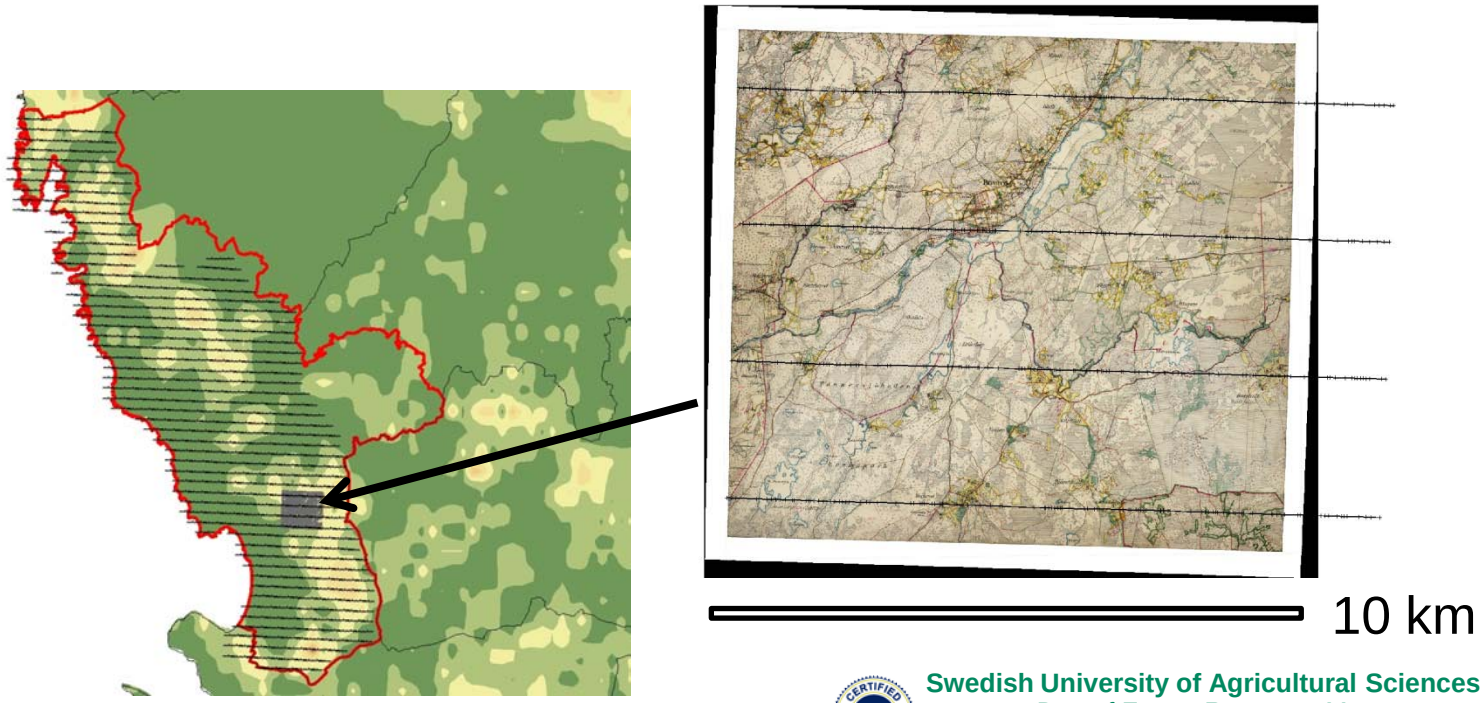
- Useful for landscape modelling
- Strategic nature conservation planning.
- Possibility to visualize earlier forest cover and change
- Case study: County of Halland





Why Halland ?

- Dramatic changes since the 1920s
- Well documented forest history
- County economic map 1919-1925



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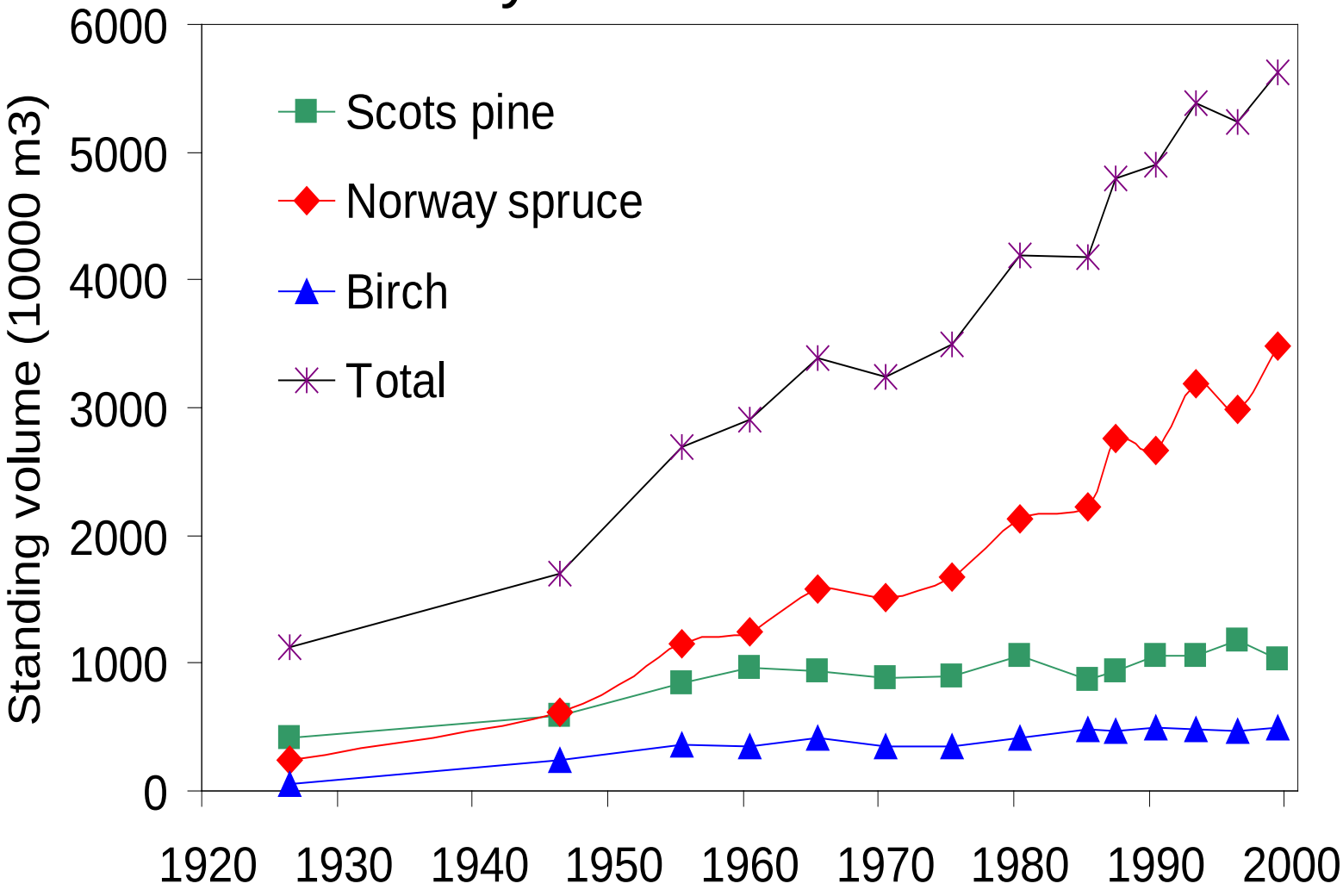
Change in standing forest volume
County of Halland 1928-2000



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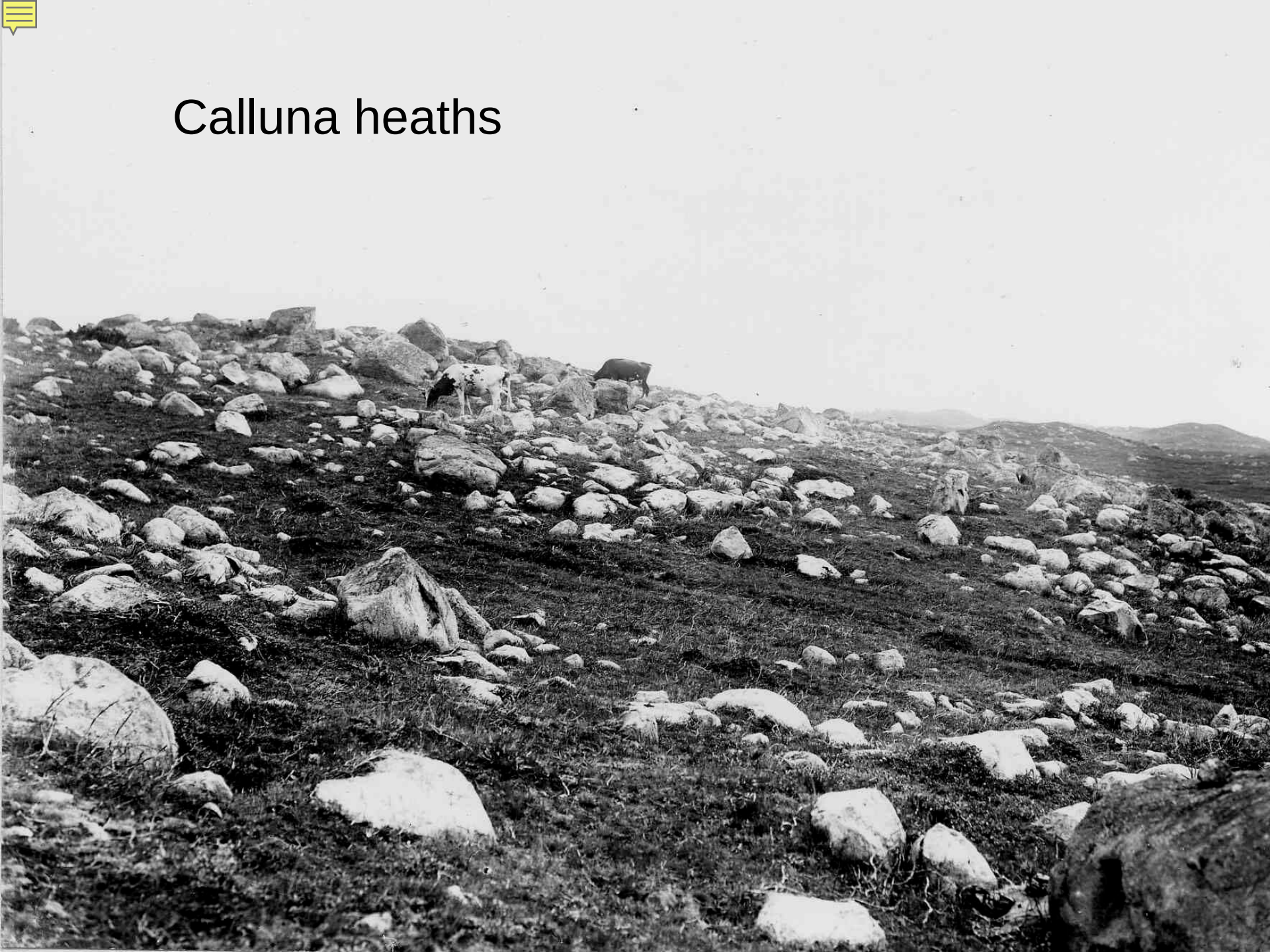
Calluna heaths



Tree planting

Proud foresters

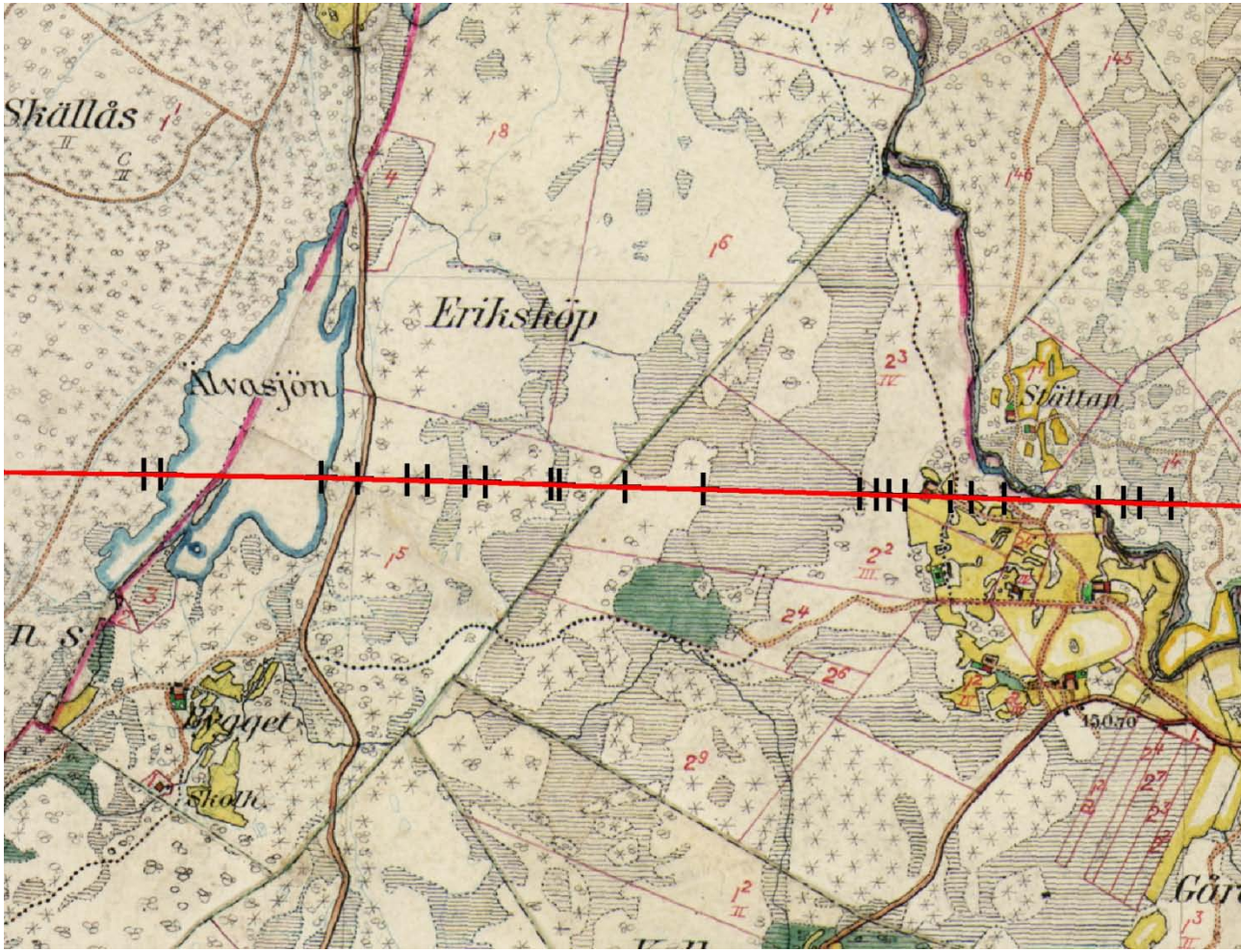
Historical data

NFI forest stand database 1928

10 m wide transect

2,5 km transect distance = 0,4 % of total area

County economic map 1923-1925



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Historical data

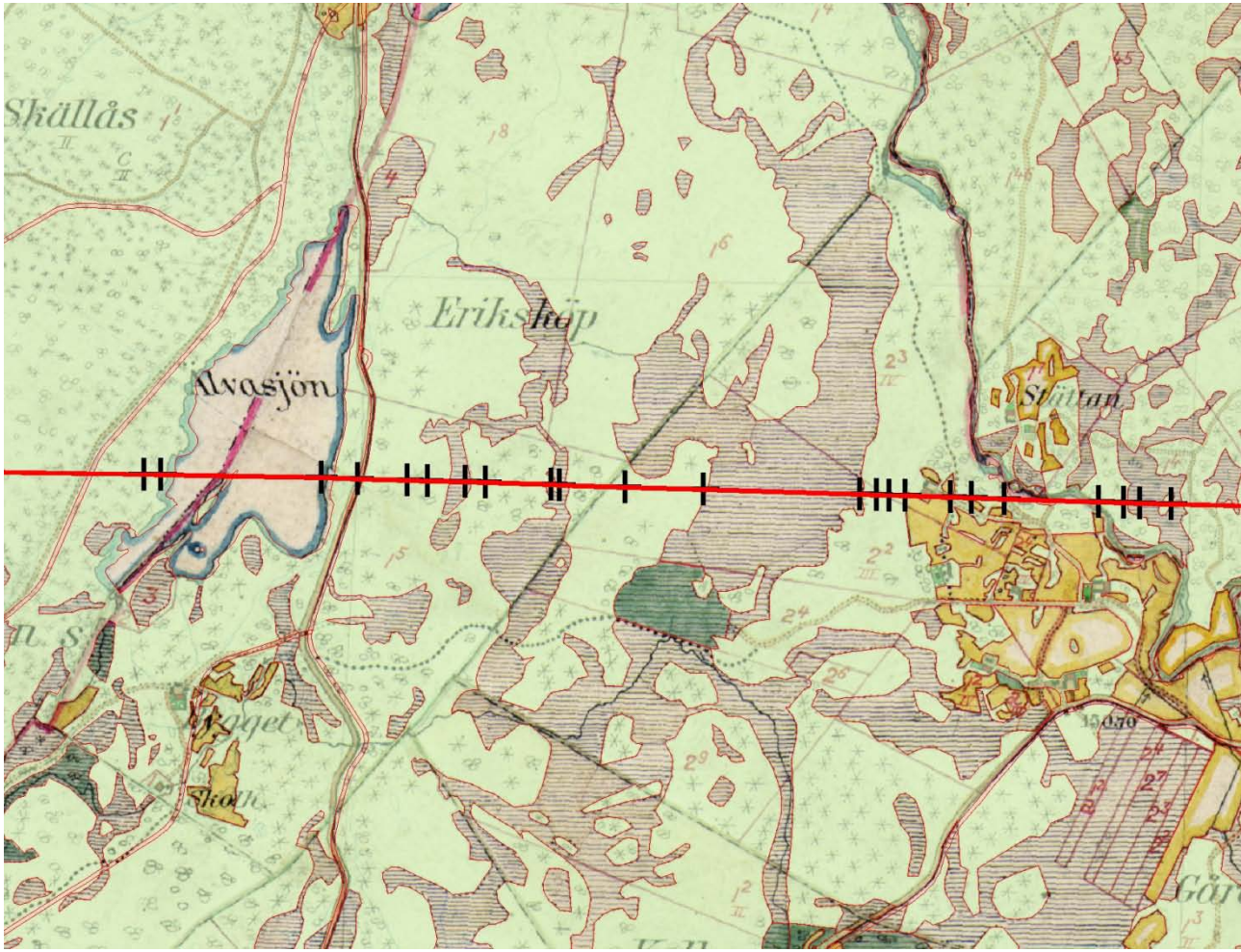
NFI forest stand database 1928

10 m

2,5 km transect distance = 0,4 % of total area

County economic map 1923-1925

• Landcover/Landuse (polygons)

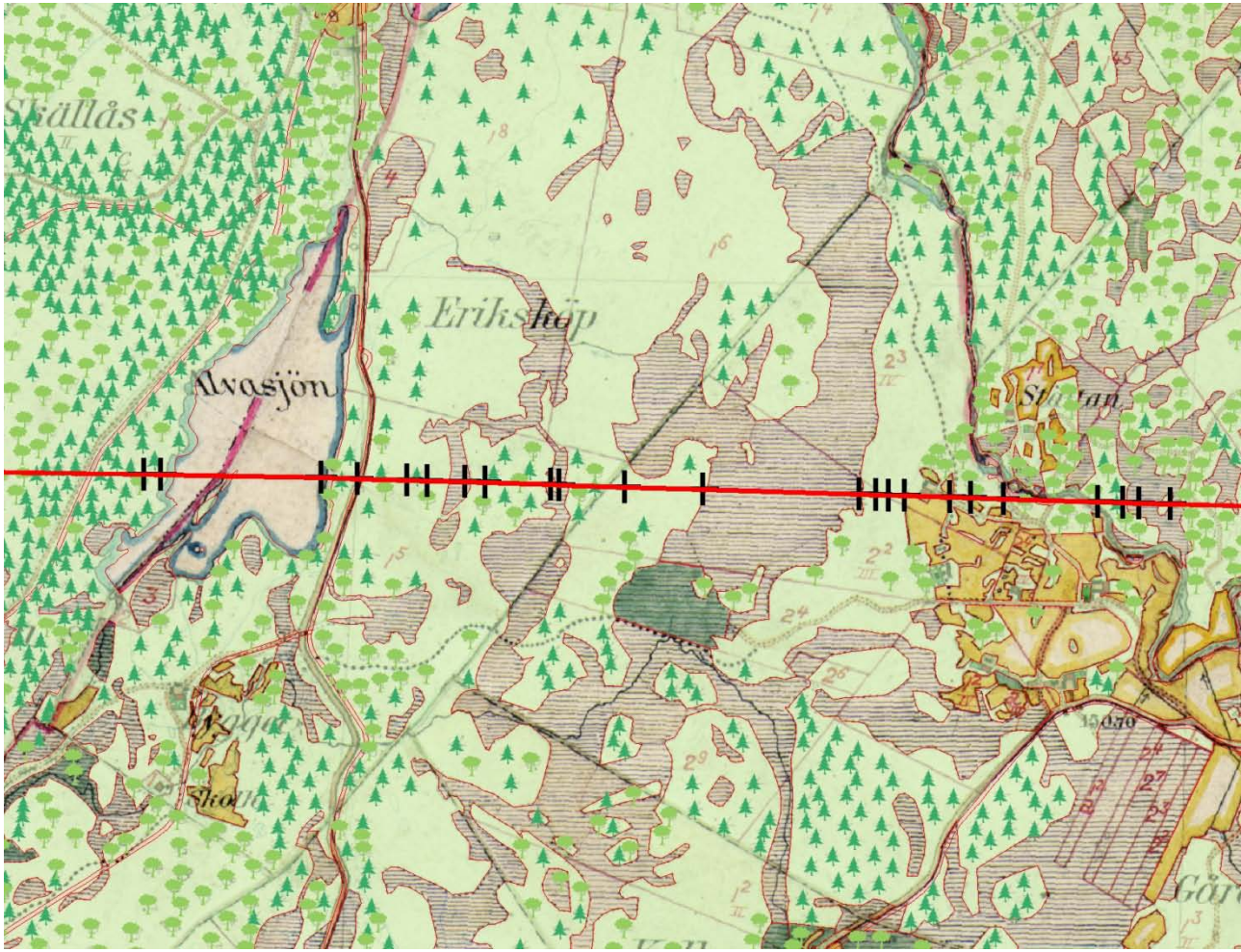


Historical data

NFI forest stand database 1928

10 m

2,5 km transect distance = 0,4 % of total area



County economic map 1923-1925

- Landcover/Landuse (polygons) - forest
- Tree symbols (points)

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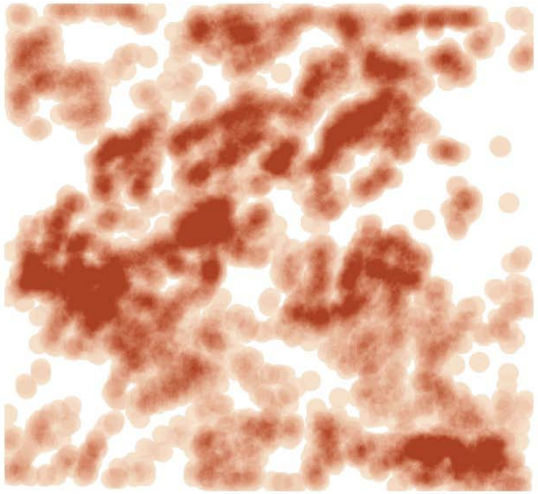
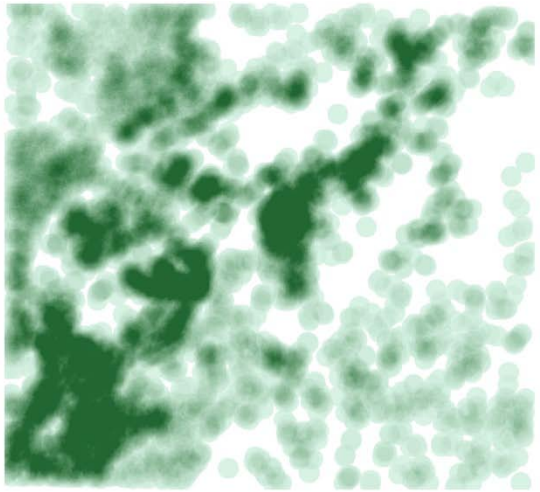
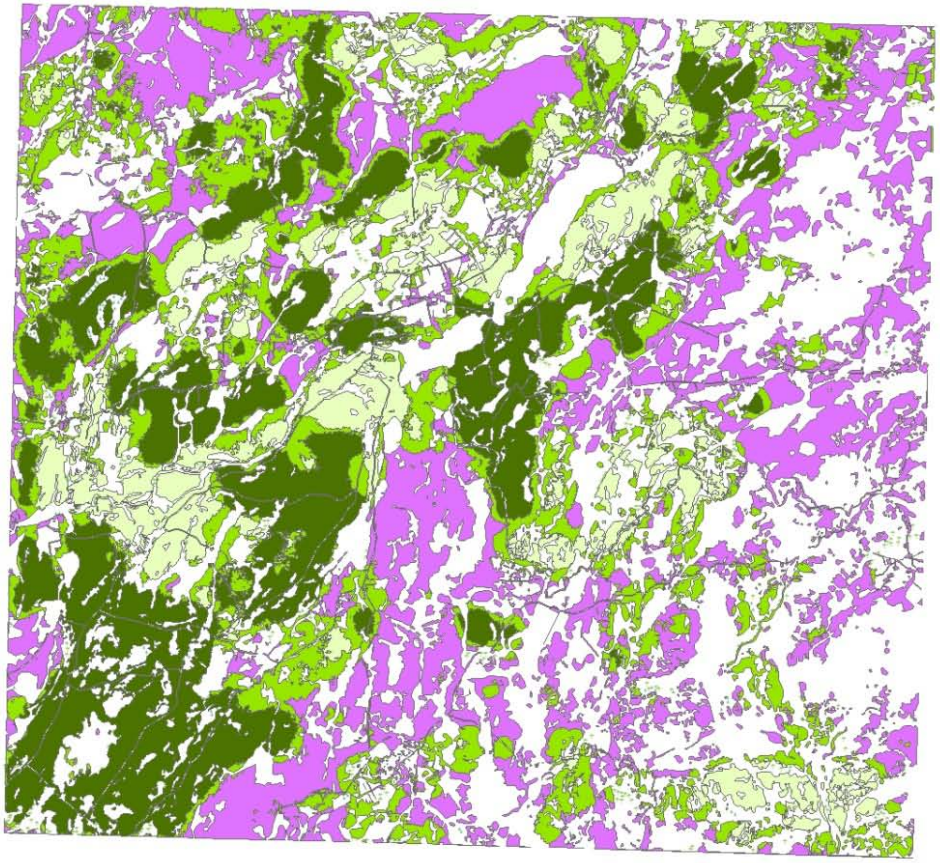
Classification of 1920 tree symbols (county economic map)

Deciduous



Coniferous





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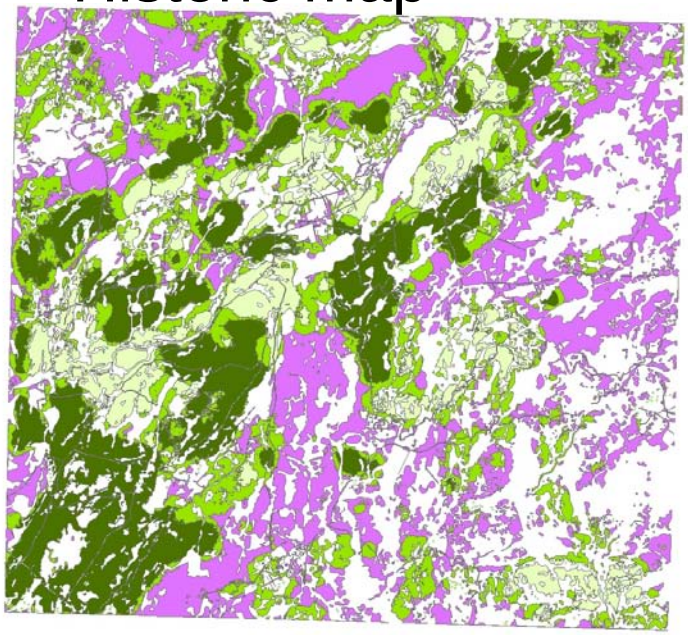
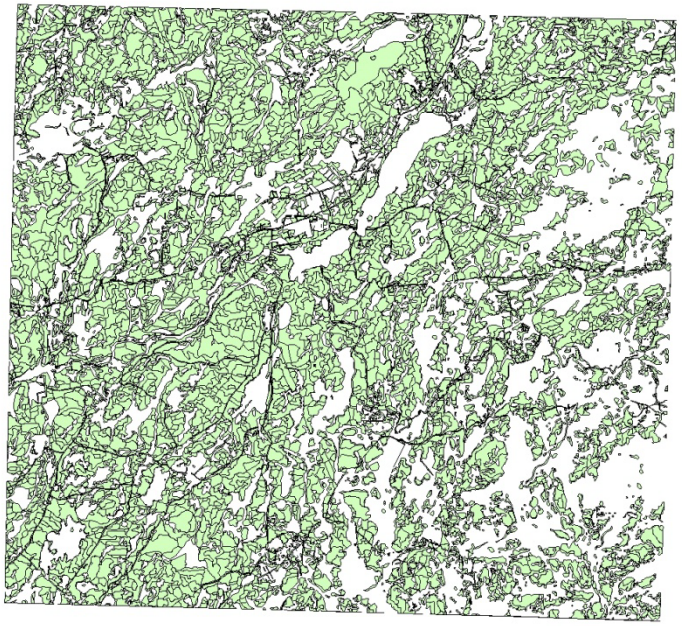
First tests…..

Historic map



Modern stand borders



Proportions from NFI data

	Dec	Con	Mixed	Heath	Totalt
sparse	2	0	0	36	38
open	10	5	4	1	20
closed	12	16	3	10	42
Totalt	**24**	**21**	**7**	**48**	**100**

1. Forest type
2. Openess
3. Stand age

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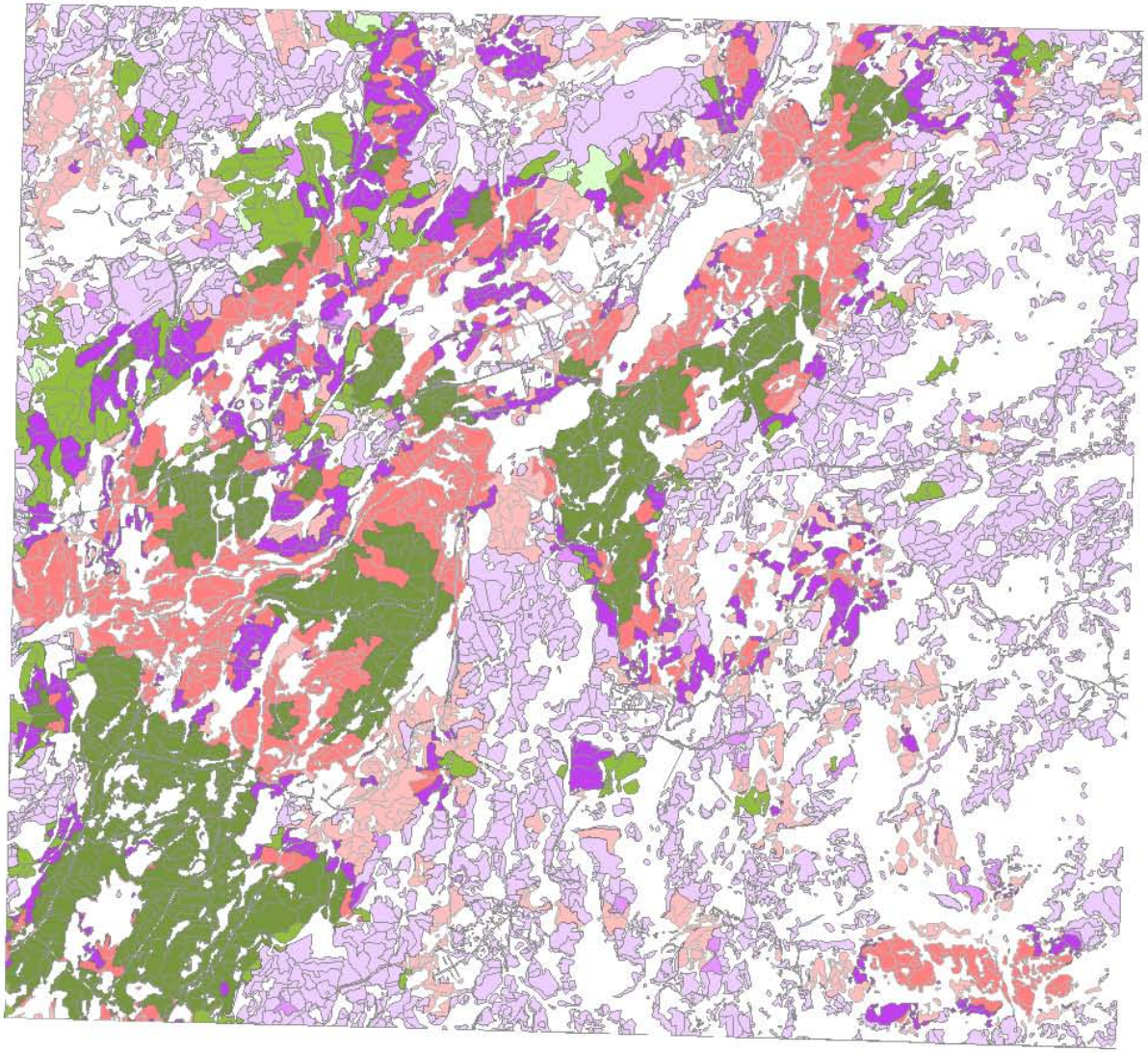
The resulting map…



Coniferous

- Closed Conifer <40 years old
- Closed Conifer >40 years old
- Open Conifer <40 years old
- Open Conifer >40 years old
- Sparse Conifer

Heathland

- Closed Heathland <40 years old
- Open Heathland <40 years old
- Sparse Heathland

Deciduous

- Closed Deciduous <40 years old
- Closed Deciduous >40 years old
- Open Deciduous <40 years old
- Open Deciduous >40 years old

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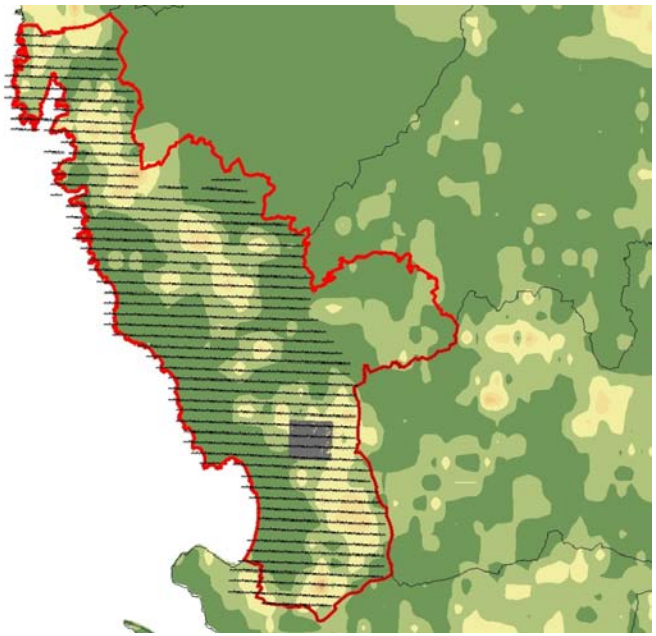
Two possible modelling approaches

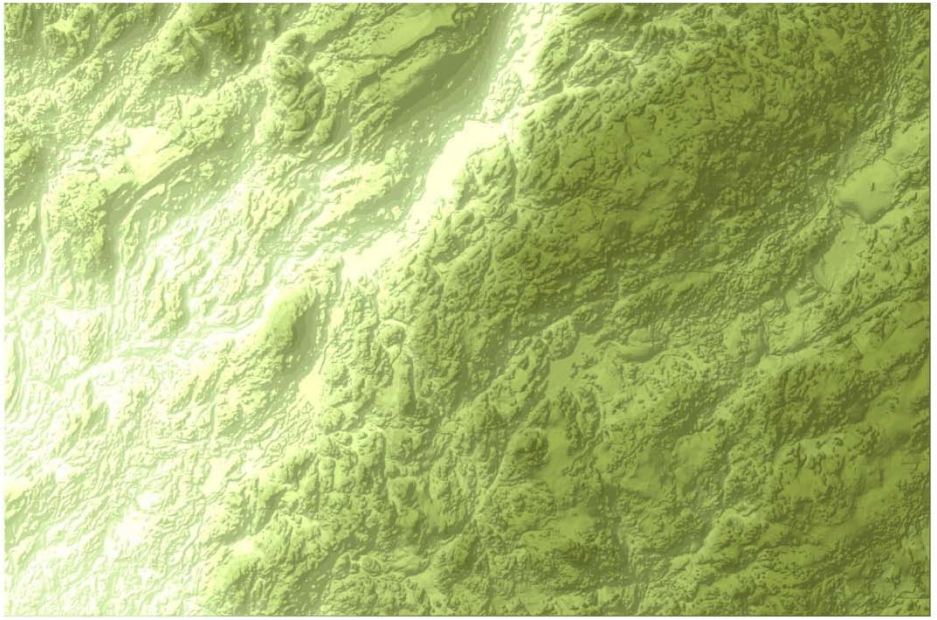
- Small area
  - NFI-transects
  - Digitized historical map
  - Modern datasets



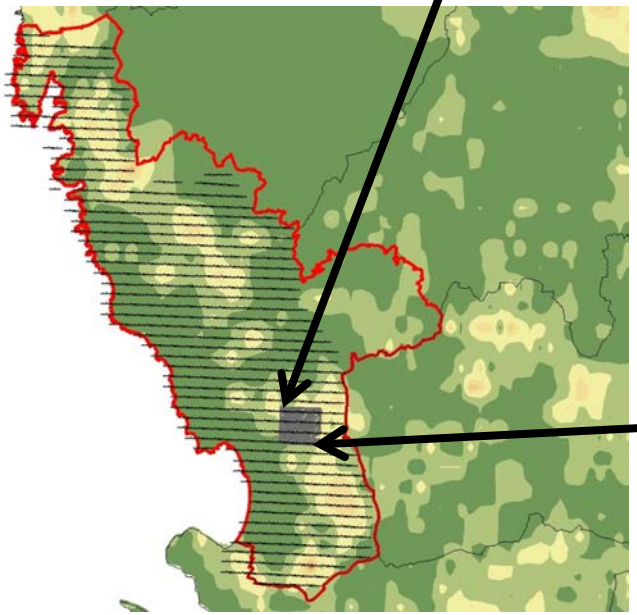
- Large area
  - NFI-transects
  - Modern datasets
  - Possibility to use case studies to validate model
  - Automated regognition?

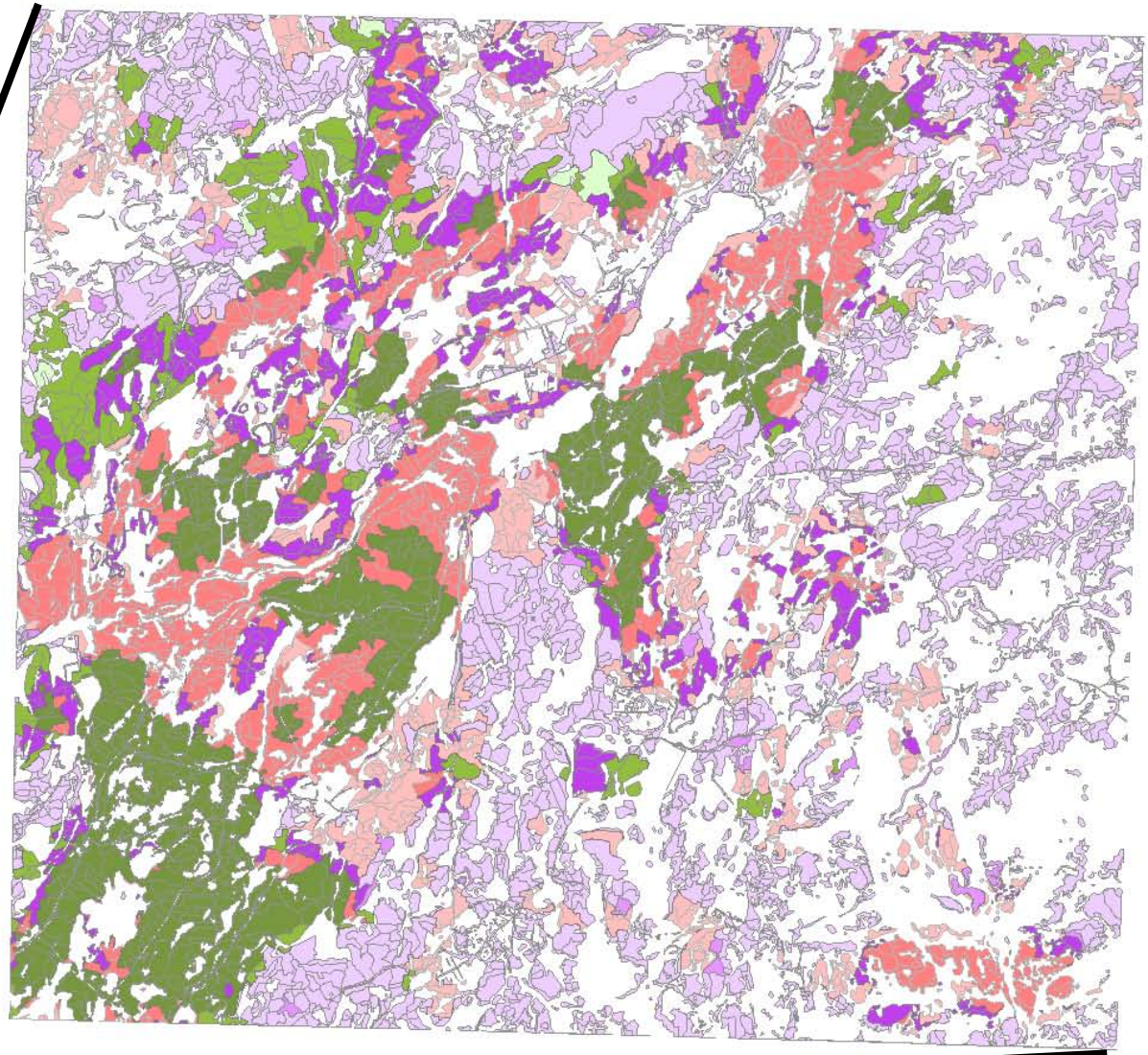
More data to be included…

- Evevation data/TWI
  - New National DEM 2,2 x 2,2 m resolution (Laser)
- Geological map (soil types)
- Additional NFI data
- Distance to nearest farm ?



1920s forest landscape





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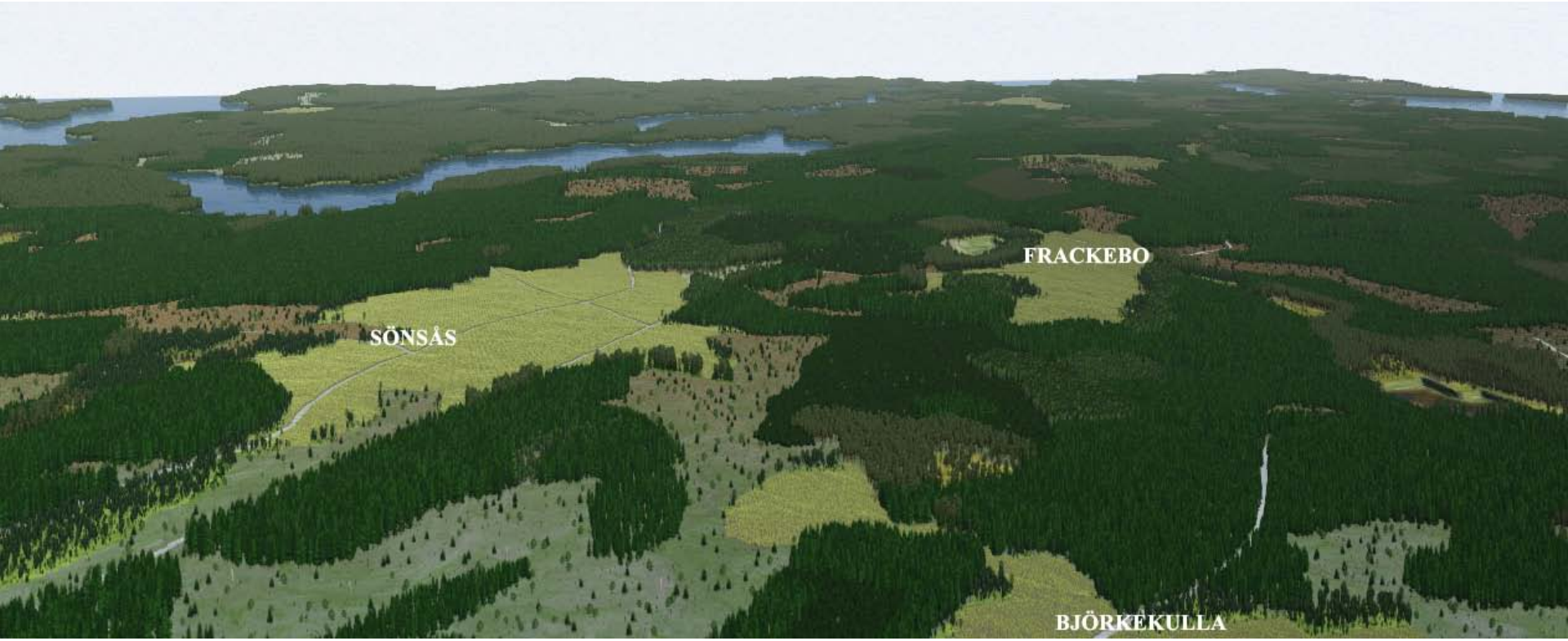
Historic landscape visualization



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Thank you !

Visit our homepage

www.slu.se/historical-data