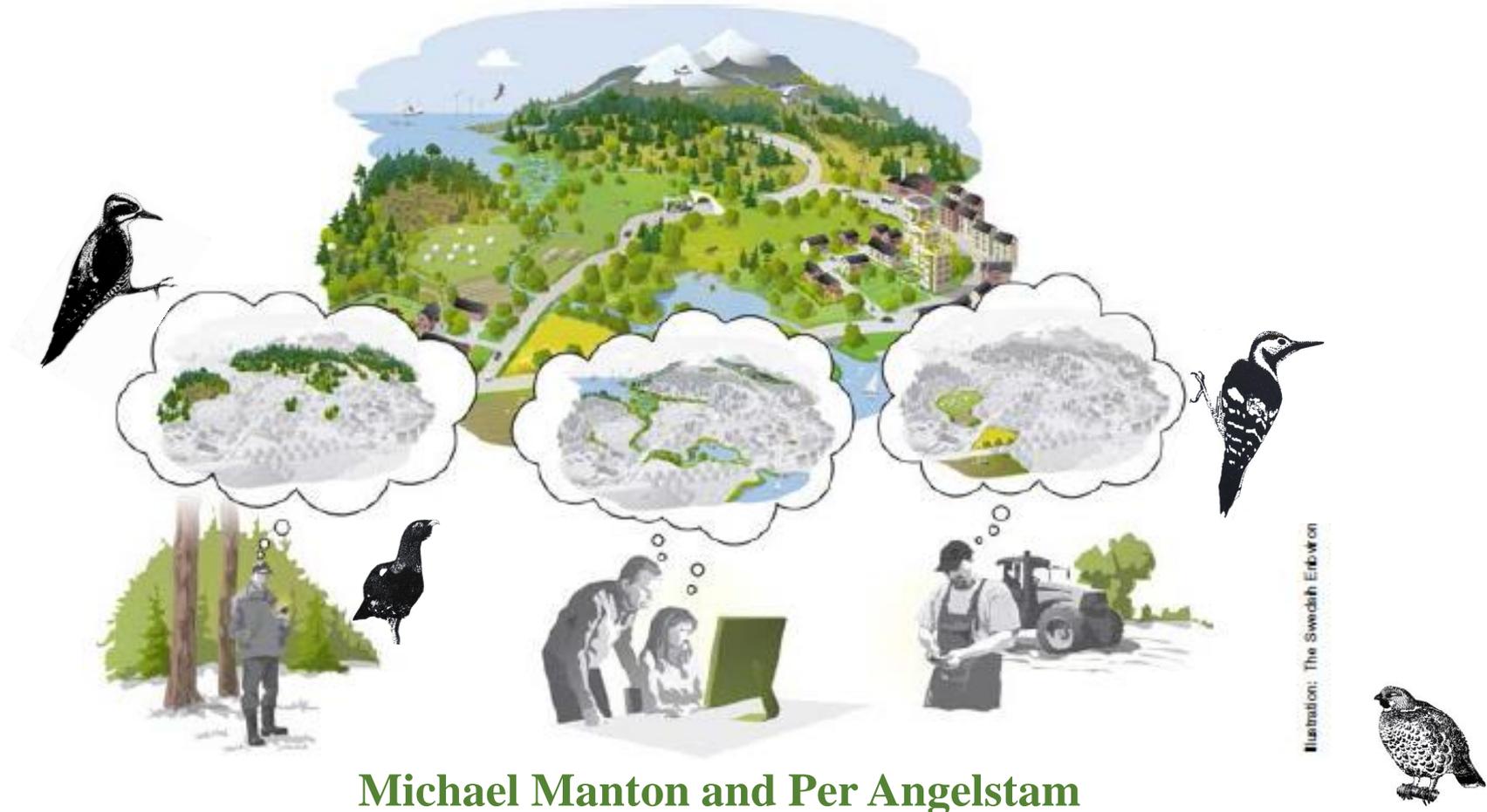




# Balancing wood production and biodiversity conservation in Pan-European boreal forests



**Michael Manton and Per Angelstam**



## Outline

Boreal forest

Competing benefits

Wood production



Biodiversity conservation

Birds as focal species



Solutions???





# Ecosystem services

**Provisioning services** - products obtained from ecosystems such as food, fresh water, wood, fiber, genetic resources and medicines

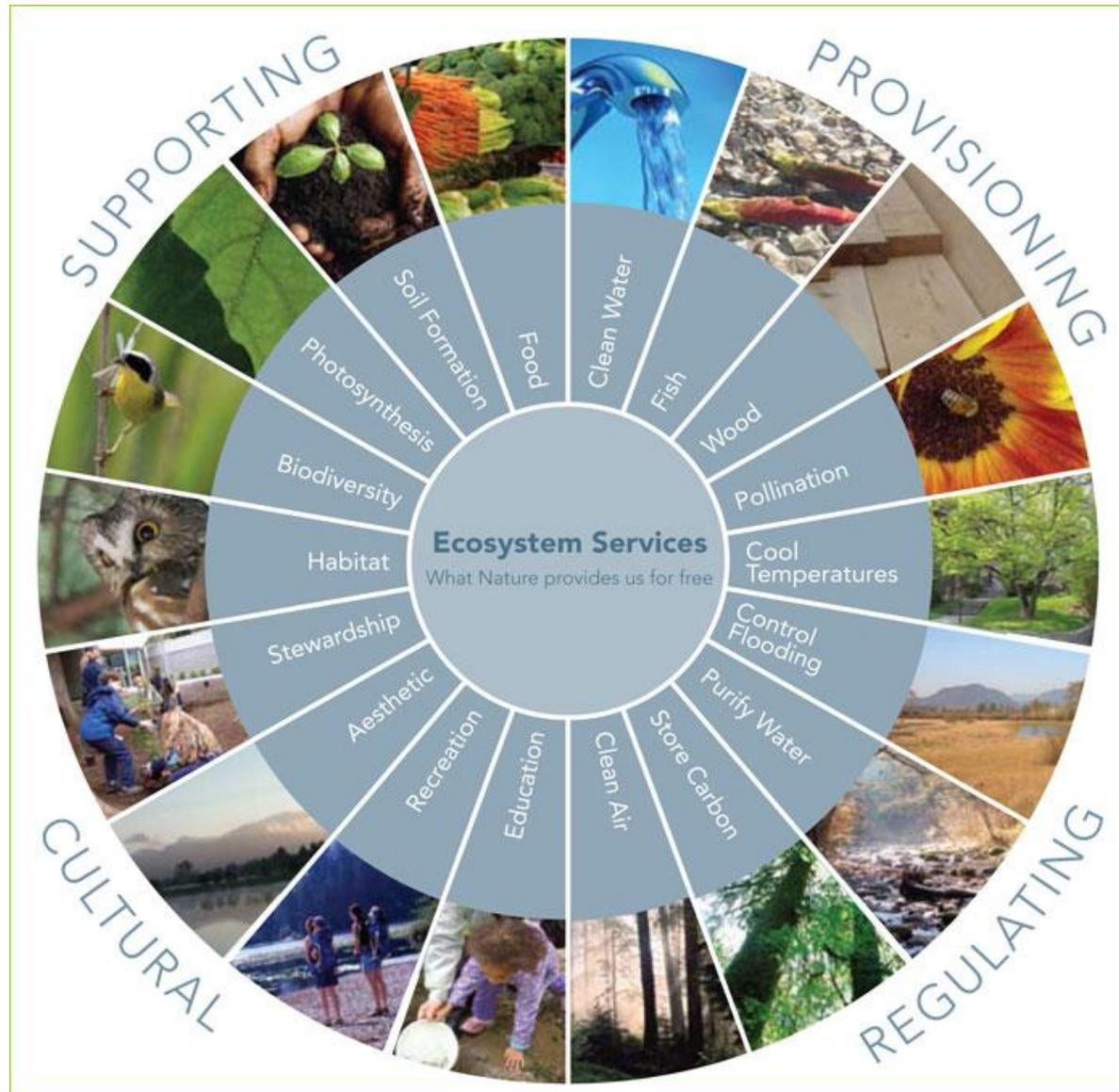
**Supporting services** - importance of ecosystems to provide habitat for species and human wellbeing

**Regulating services** - processes such as climate regulation, natural hazard regulation, water purification and waste management, pollination or pest control

**Cultural services** - non-material benefits that people obtain from ecosystems such as spiritual enrichment, intellectual development, recreation and aesthetic values



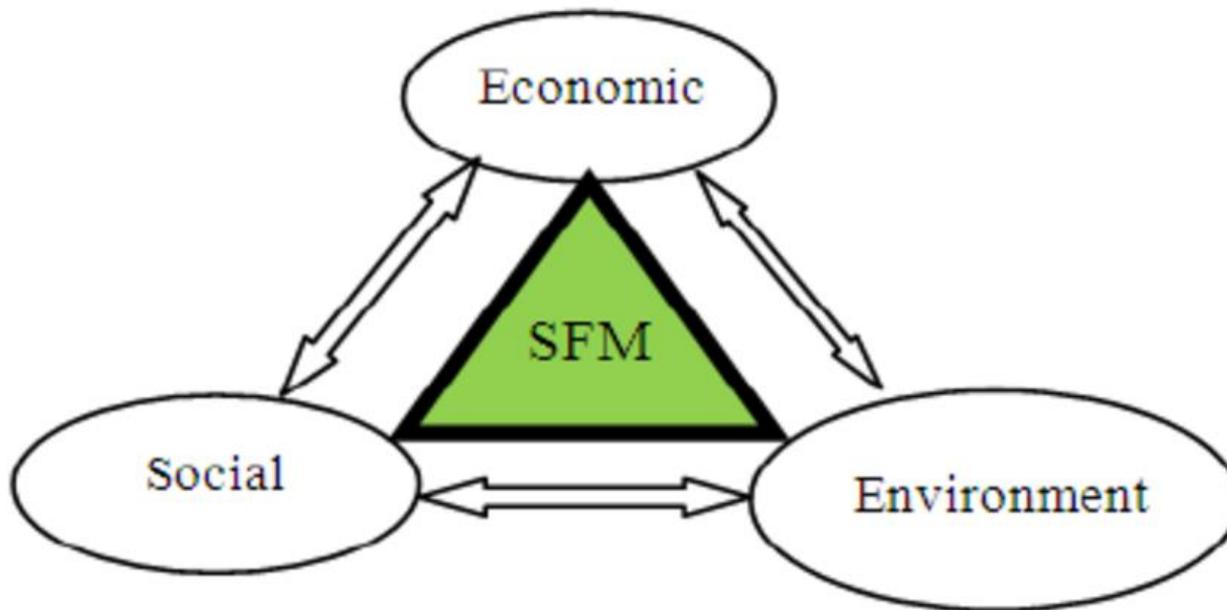
# Ecosystem services





# European Boreal Forest

Many different types  
Very diverse  
Diverse range of management

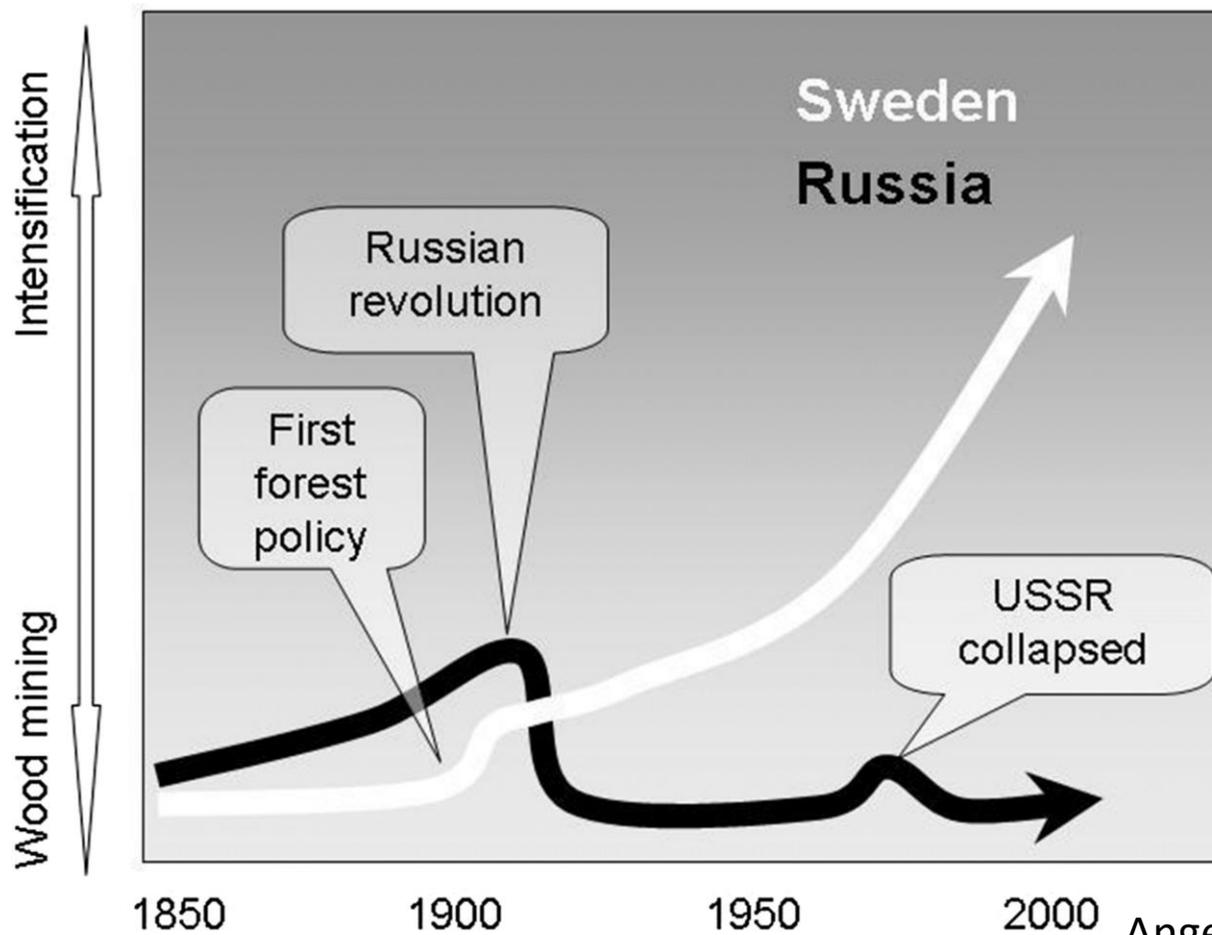


Sustainable forests management





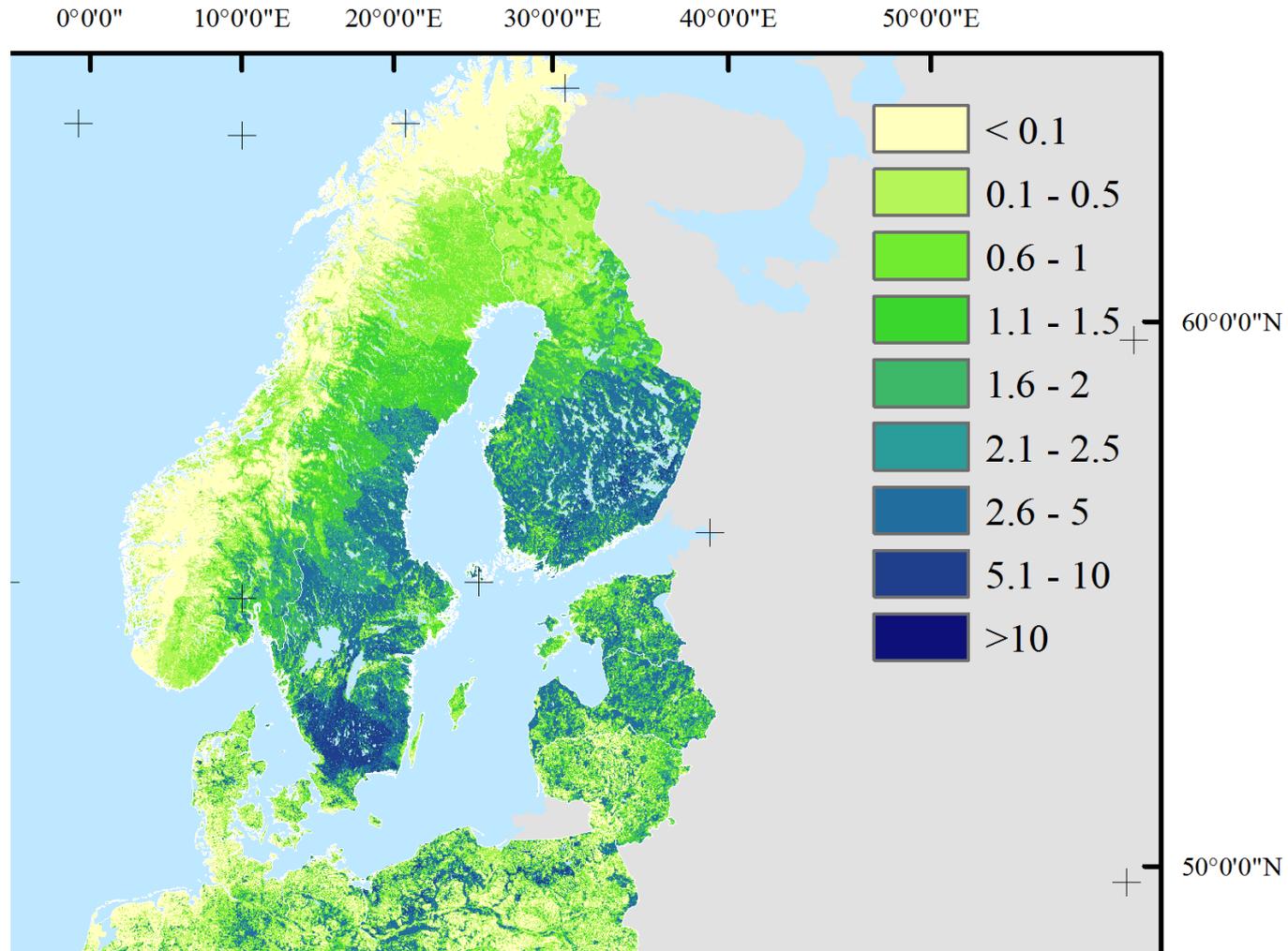
# Different development trajectories of forest production



Angelstam et al. 2016.

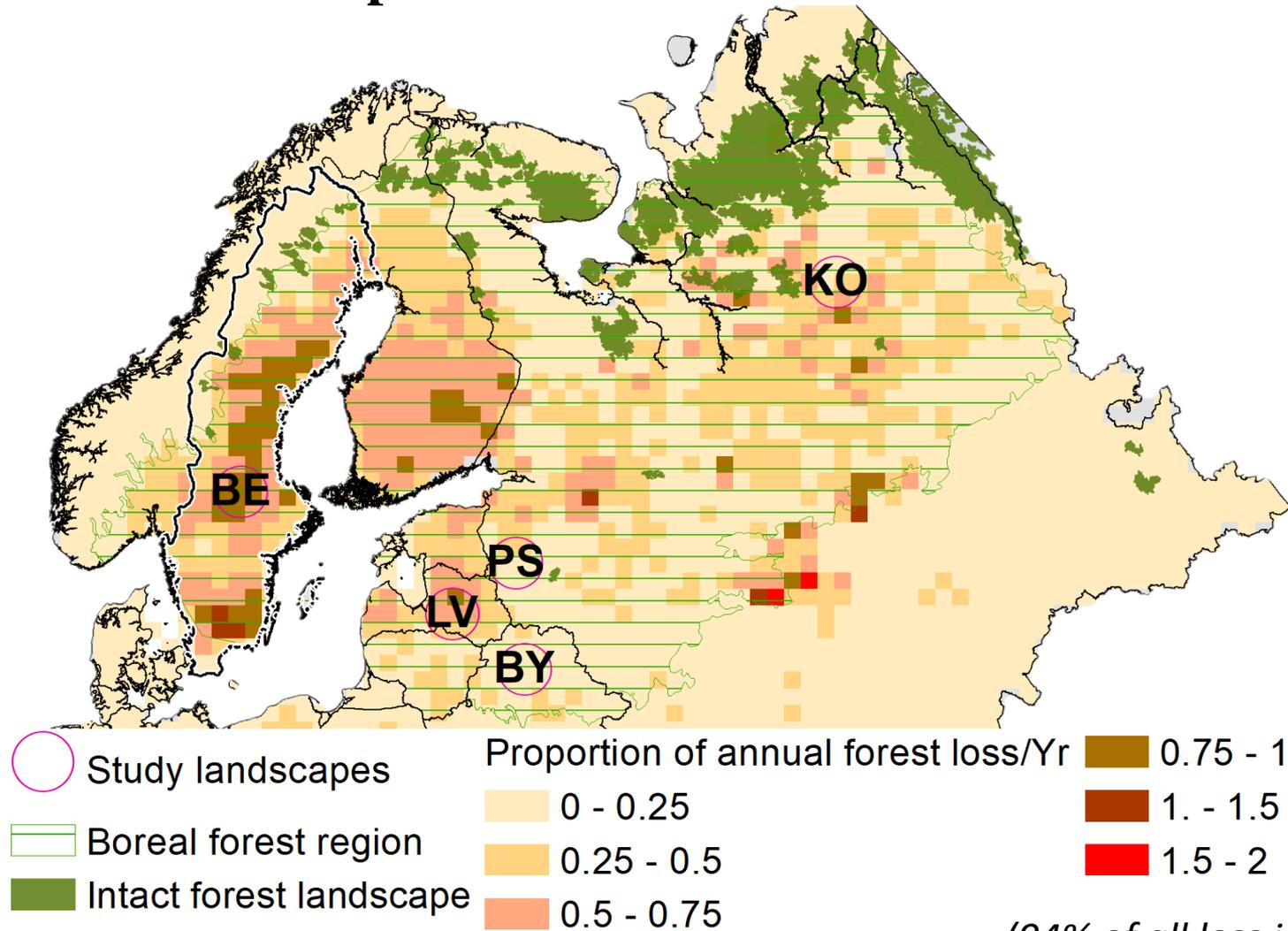


## Mean wood production M<sup>3</sup>/y 2000-2010 (EFI 2015)





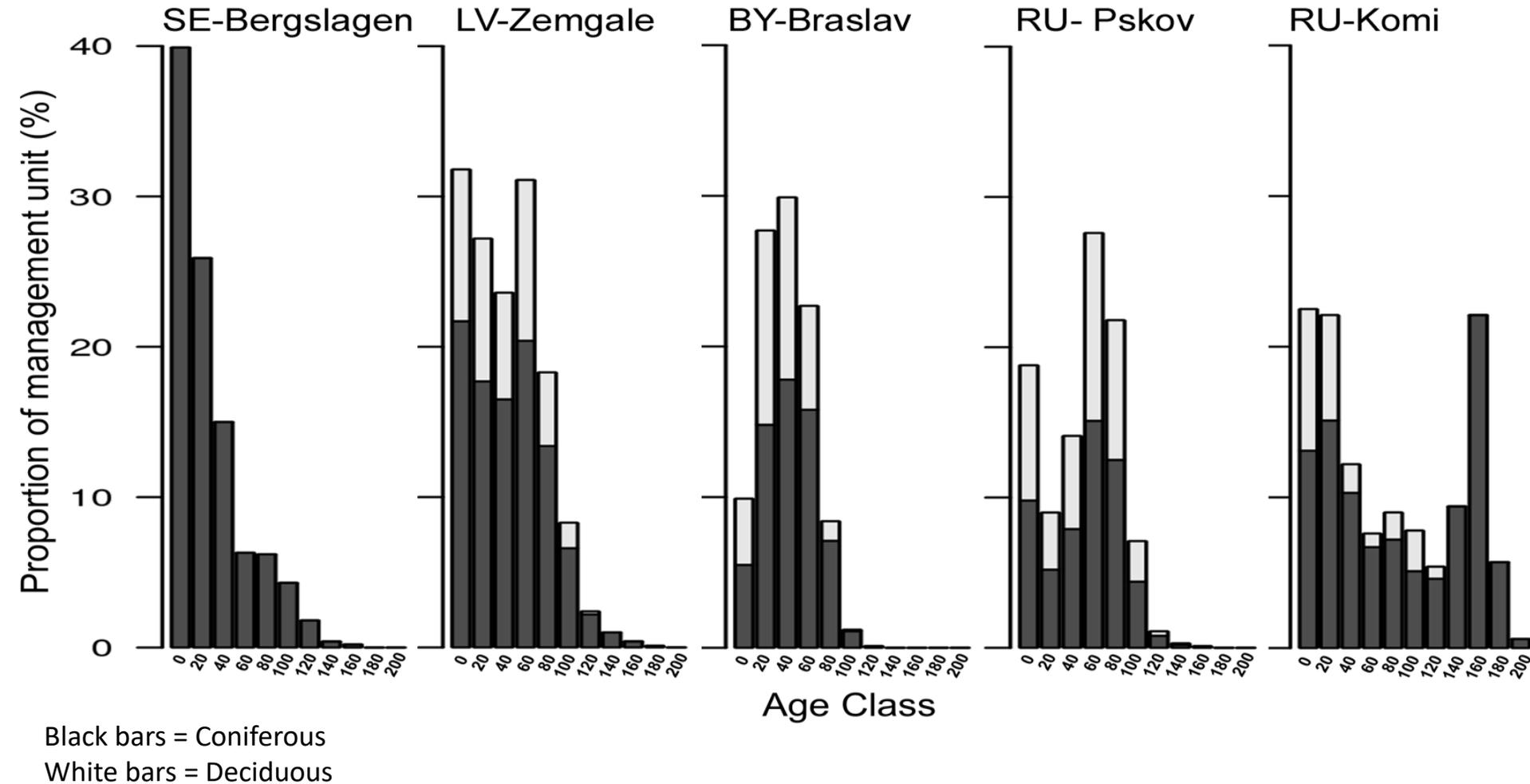
# Good example of different forest intensification



*(94% of all loss is logging)*

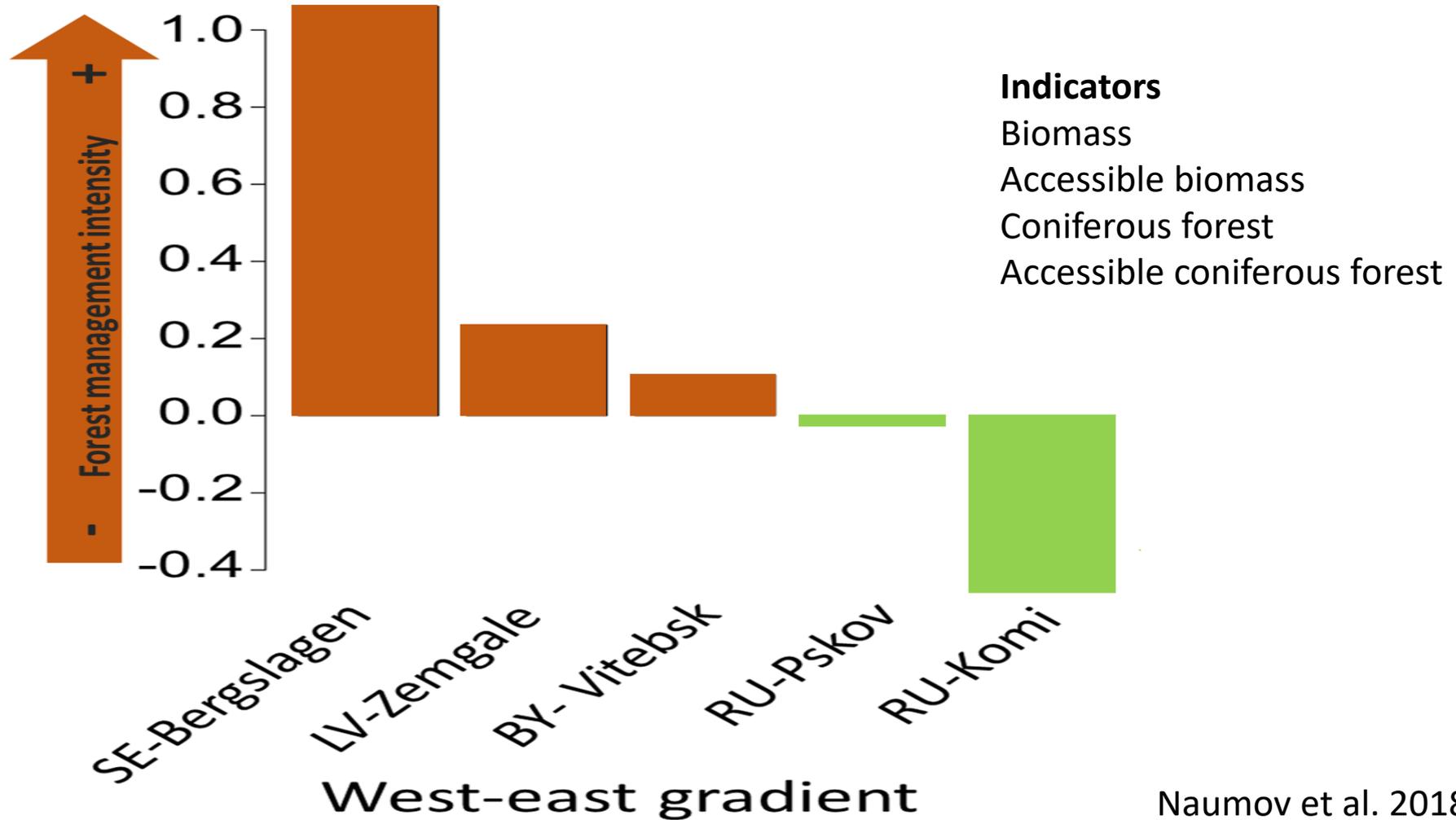


# Forest age distribution





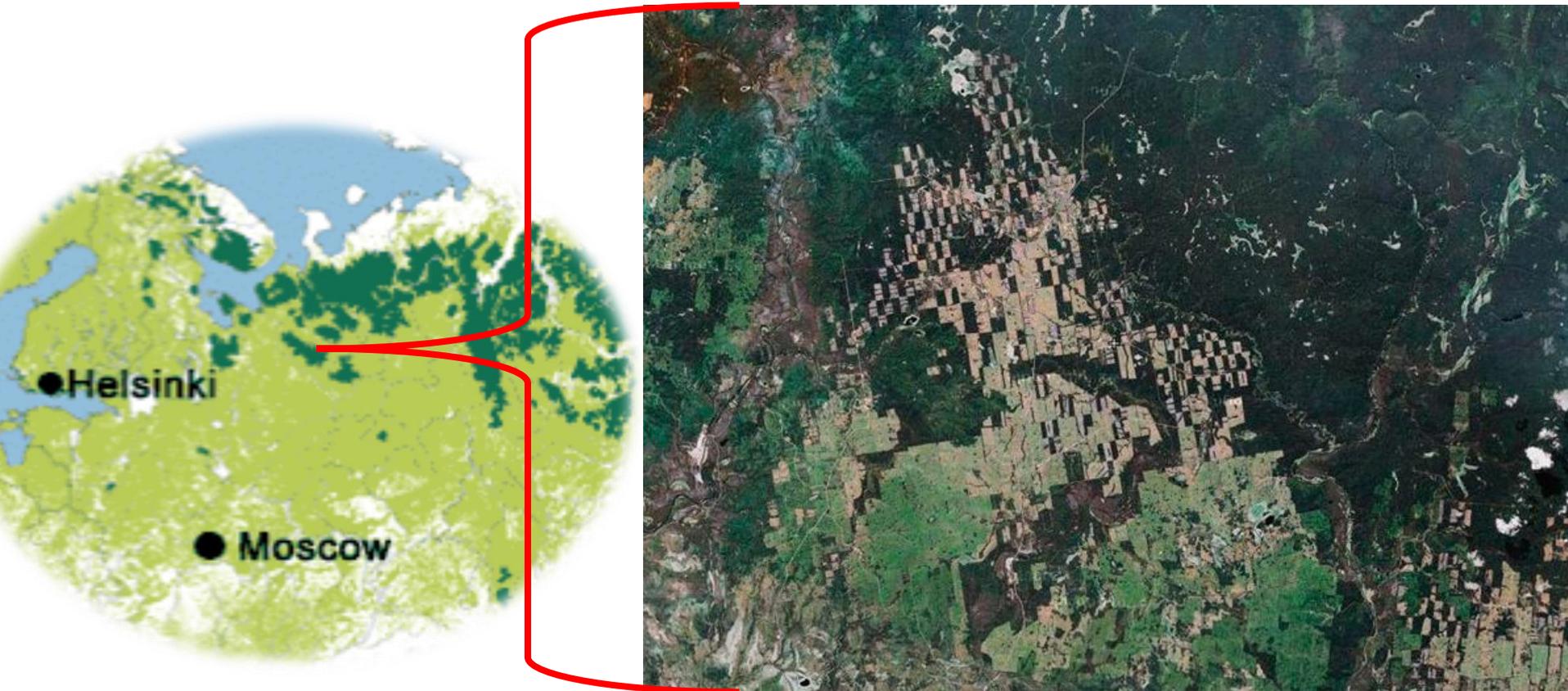
# Intensity of wood production



Naumov et al. 2018



## Current harvesting/wood mining in Komi





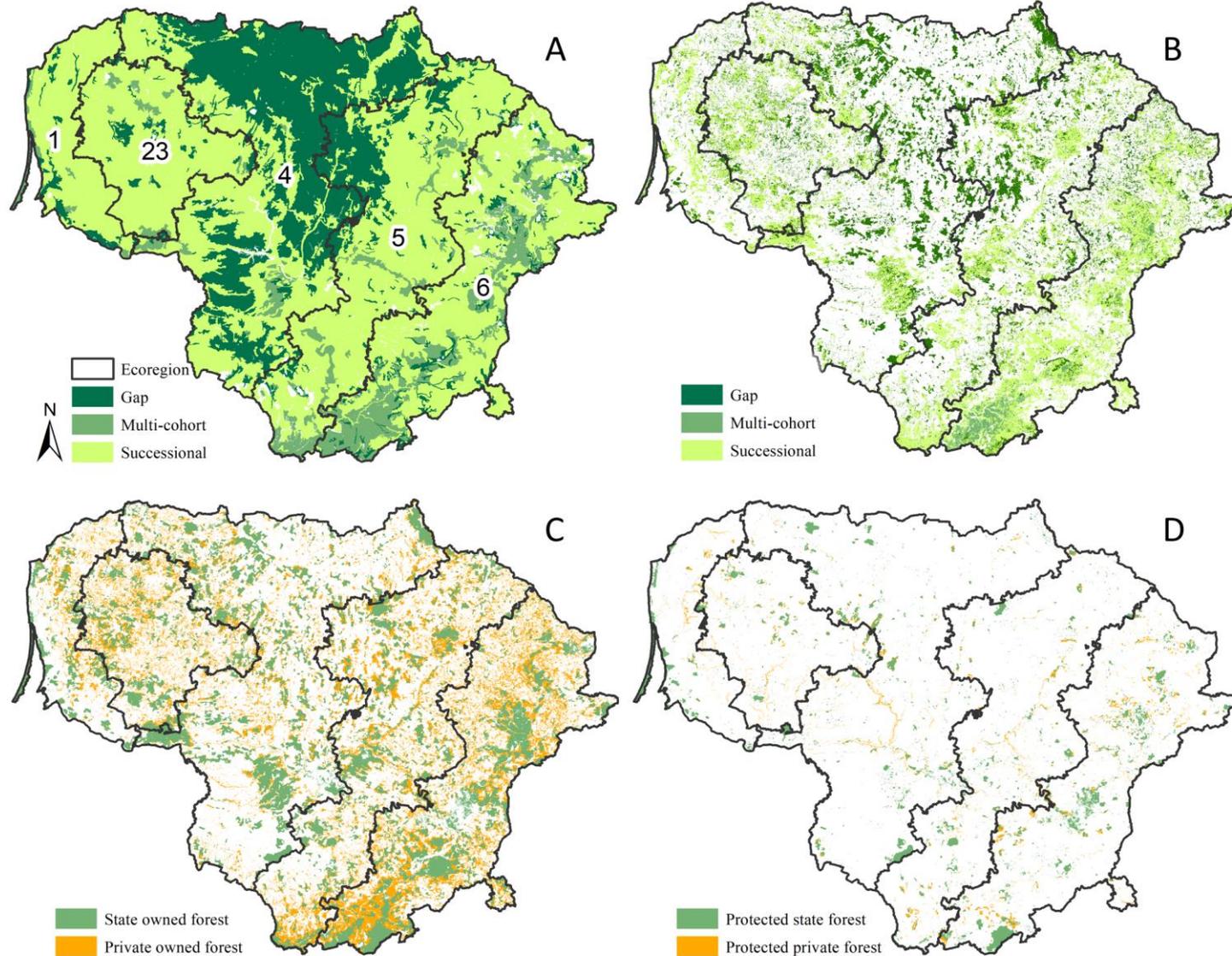
# Another story in Lithuania

## Wood production, independence and reforms



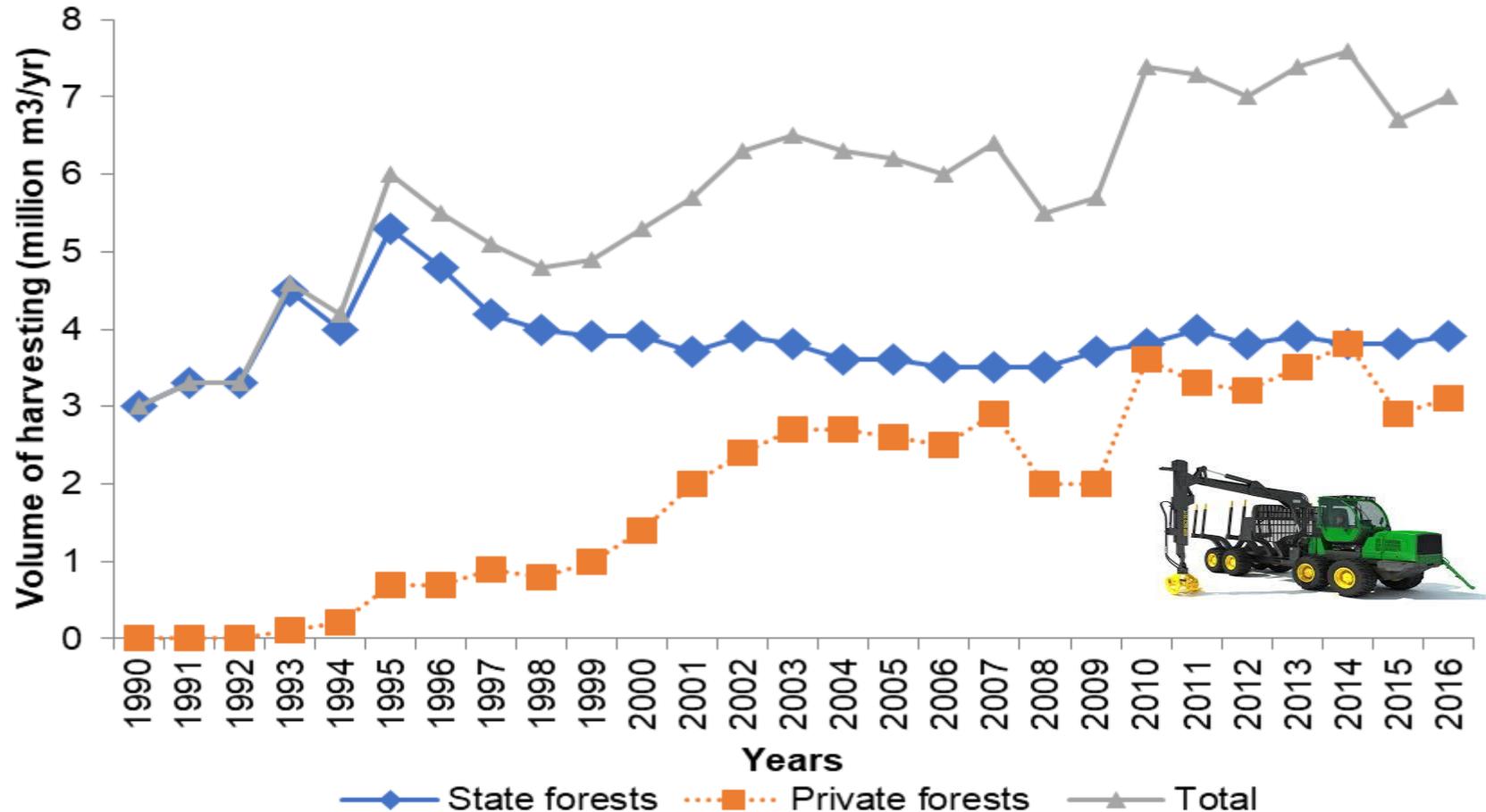


# Forestry in Lithuania



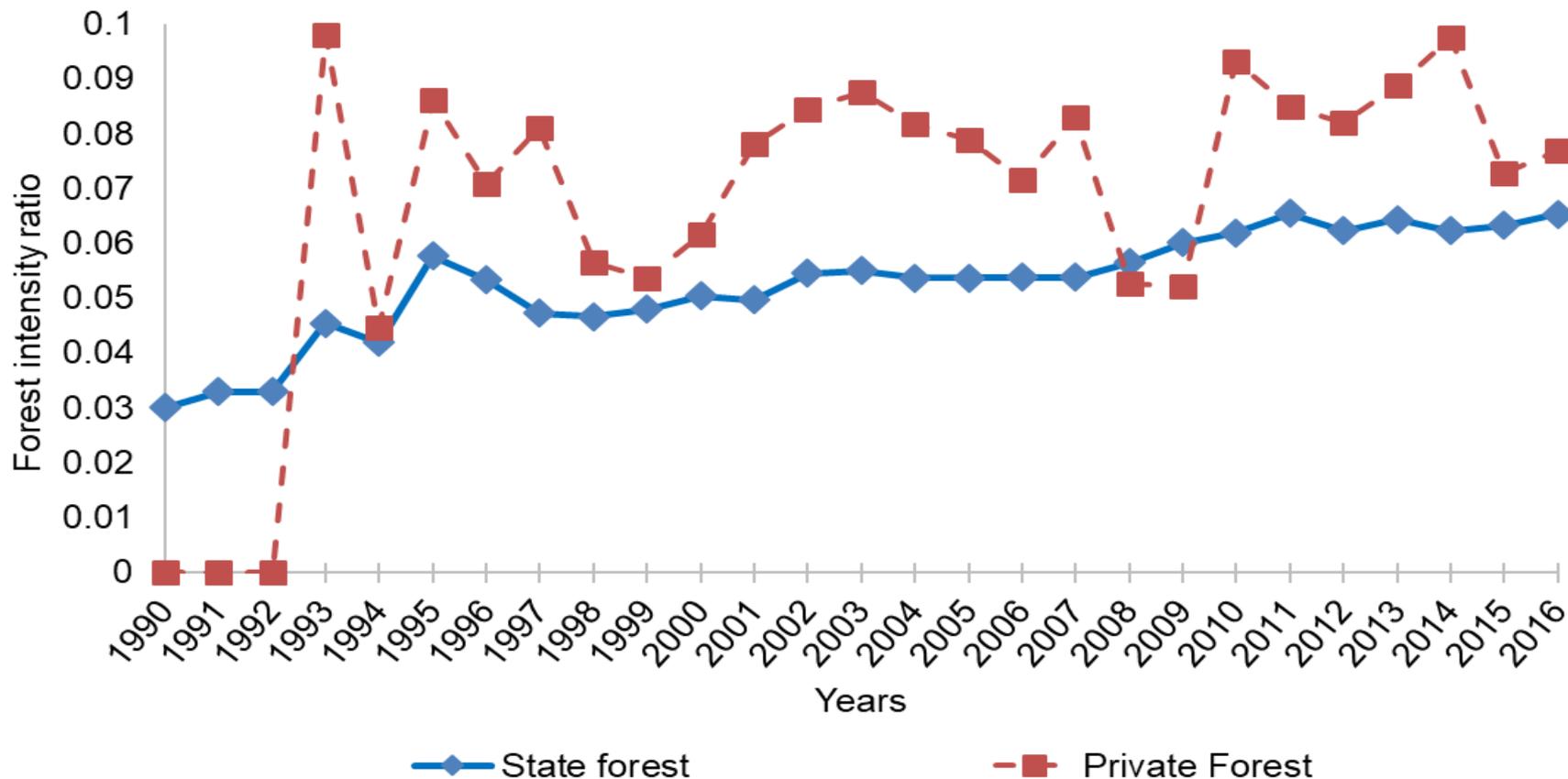


# LT wood production trends since independence



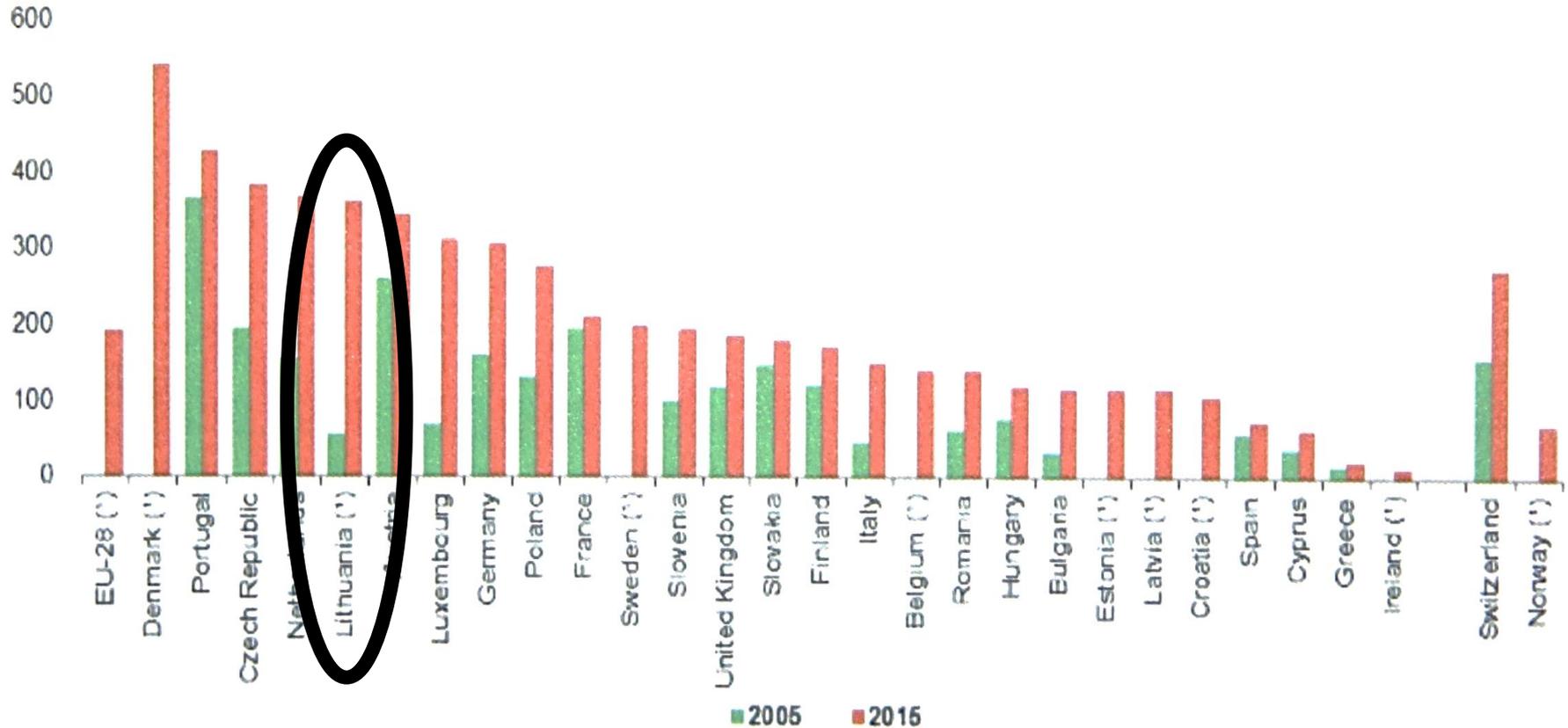


# LT Wood production trends since independence





# Value add product Eur/ha



Eurostat



# Wood development opportunities in Lithuania

- Current harvesting levels in Lithuania are below the maximum sustainable removal
- Intensive forest management would make it possible to increase the maximum sustainable removal by 15%
- There is room for expansion of industry and energy uses of wood

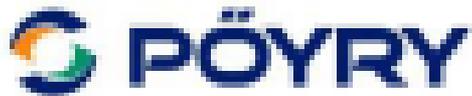




# Wood development opportunities in Lithuania



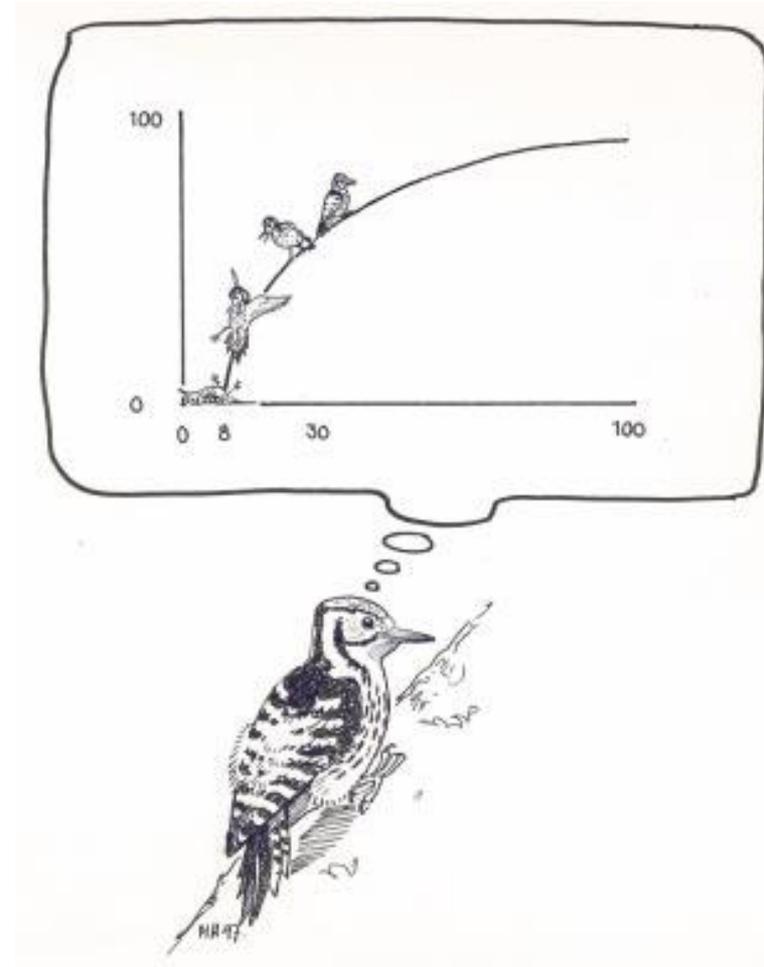
WHAT ABOUT  
US???





# Consequences on biodiversity?

- Land degradation
- Losses in biodiversity
- Changes in species composition
- Triggered policies
- International, national and local initiatives
- EU Green Infrastructure policy
- Convention of Biological Diversity
- Sveaskog Ekoparks in Sweden





# Green Infrastructure

- *Strategically planned network of natural and semi-natural areas*
- *Managed to deliver a wide range of ecosystem services*
- *GI is present in rural and urban settings*
- *Includes forest for wood production and the conservation of biodiversity*

*EU 2013*



# Convention of Biological Diversity

## Aichi targets



### Target 7

By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity



### Target 11

By 2020, at least 17 % of terrestrial areas of importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures



# Sveaskog Ekoparks

37 Large contiguous landscapes (approx. 5000 ha each)

High conservation values

High ecological ambitions (> 50 %)

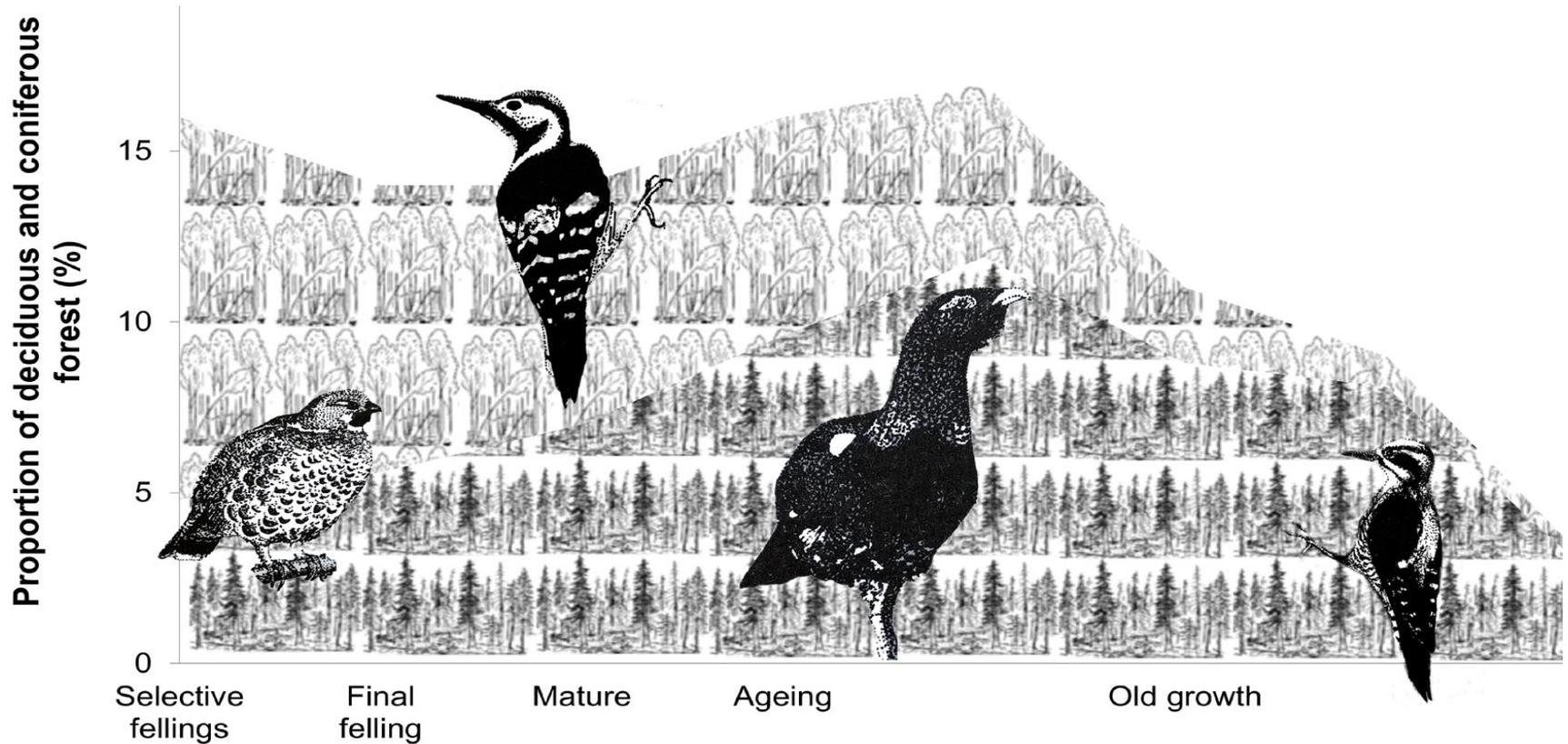
Active management

Yes forestry is permitted (< 50 %)





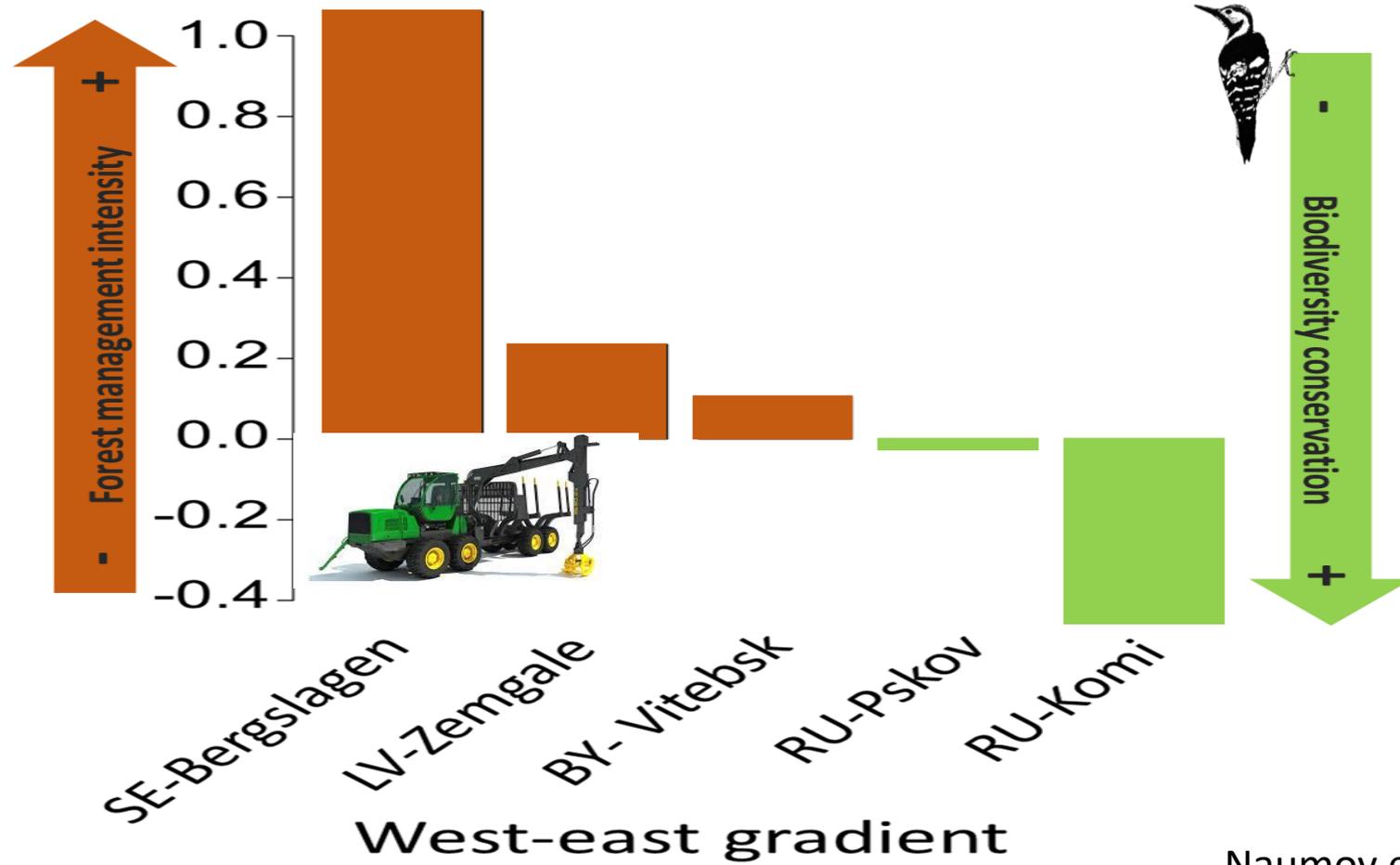
## Birds as focal species



Naumov et al. 2018



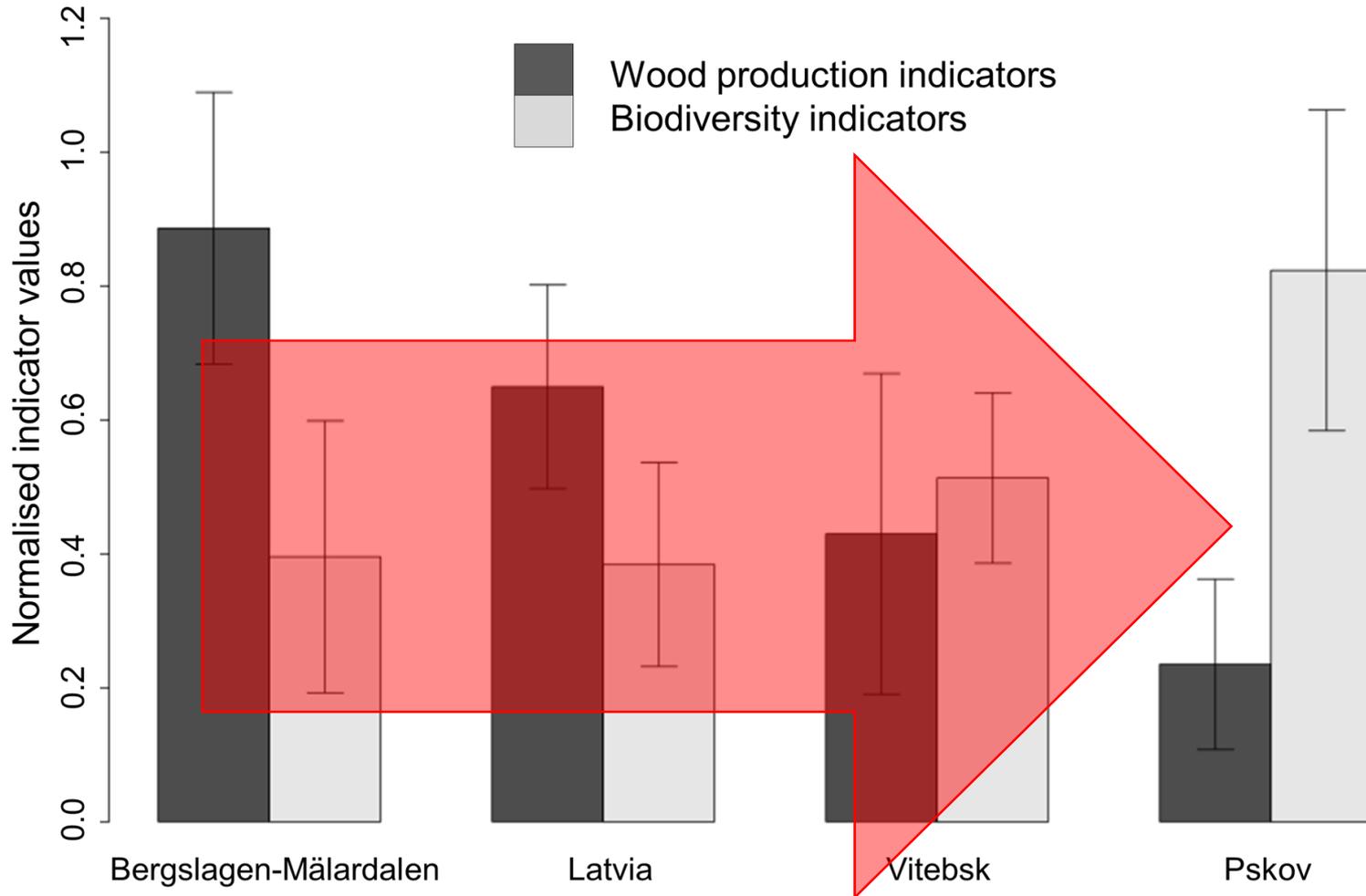
# Balancing wood production and biodiversity conservation



Naumov et al. 2018

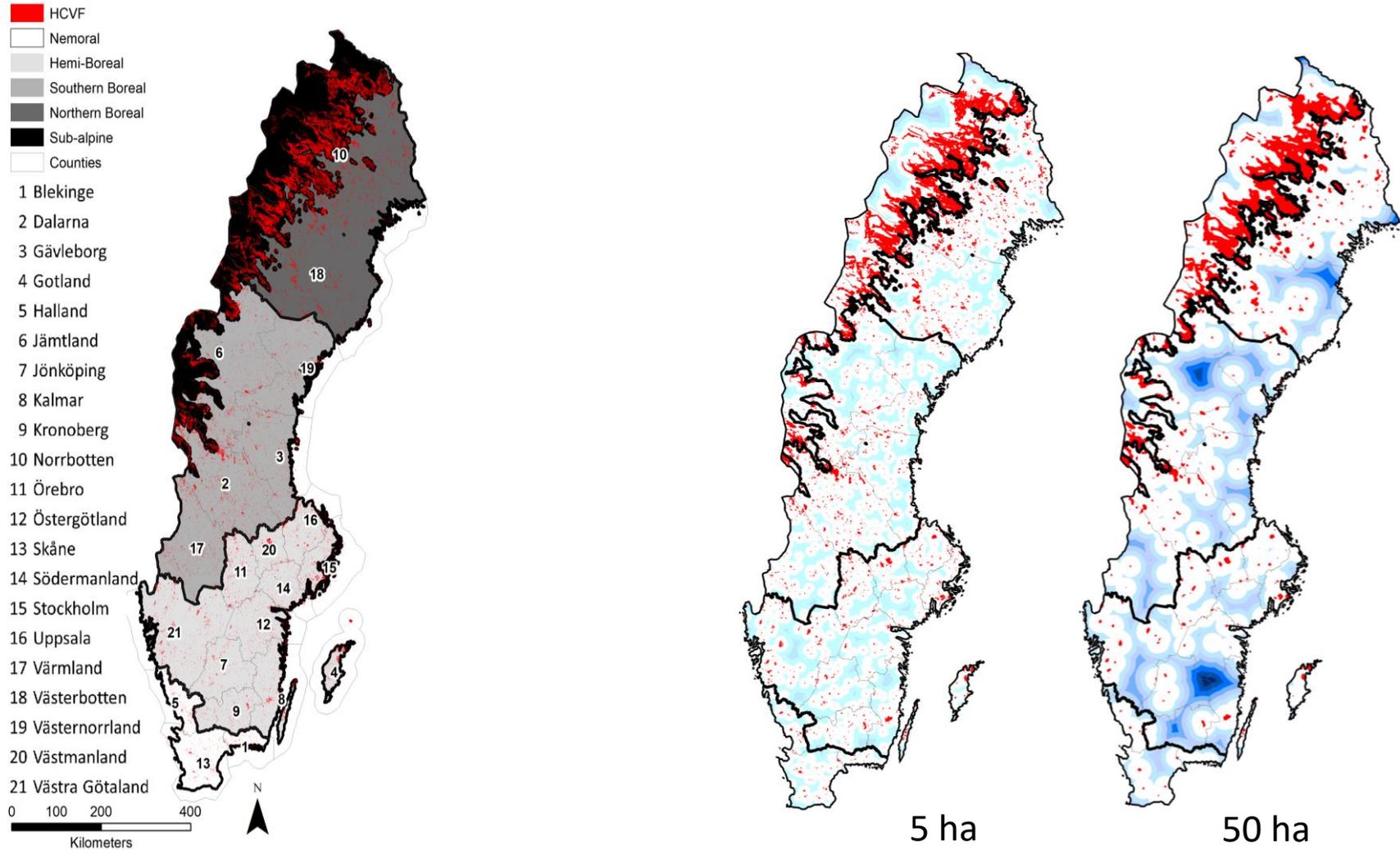


# Wood production vs. biodiversity





# Modelling high conservation value forest in Sweden





# Conclusions

Intensive forestry and biodiversity conservation are competing objectives

The net effect of biodiversity conservation efforts (tree retention, voluntary set-asides, protected areas) are not enough

Europe provides researches and managers a real playground to learn

Collaborative learning is needed (=landscape approach), combined with all policy implementation tools

Land sparing vs. land sharing approaches





# Forest ponderings

What do we want?

What does society want?

Are forest more than just EUROS

What is biodiversity worth?

What holds for our grandchildren?



# An example - Bavarian State Forestry Germany 2005

Conserve nature – Improve profits – Serve society

No clear cutting and minimise planting

Selective cutting with natural regeneration

Revenue is stable

Forests are returning natural mixed stands

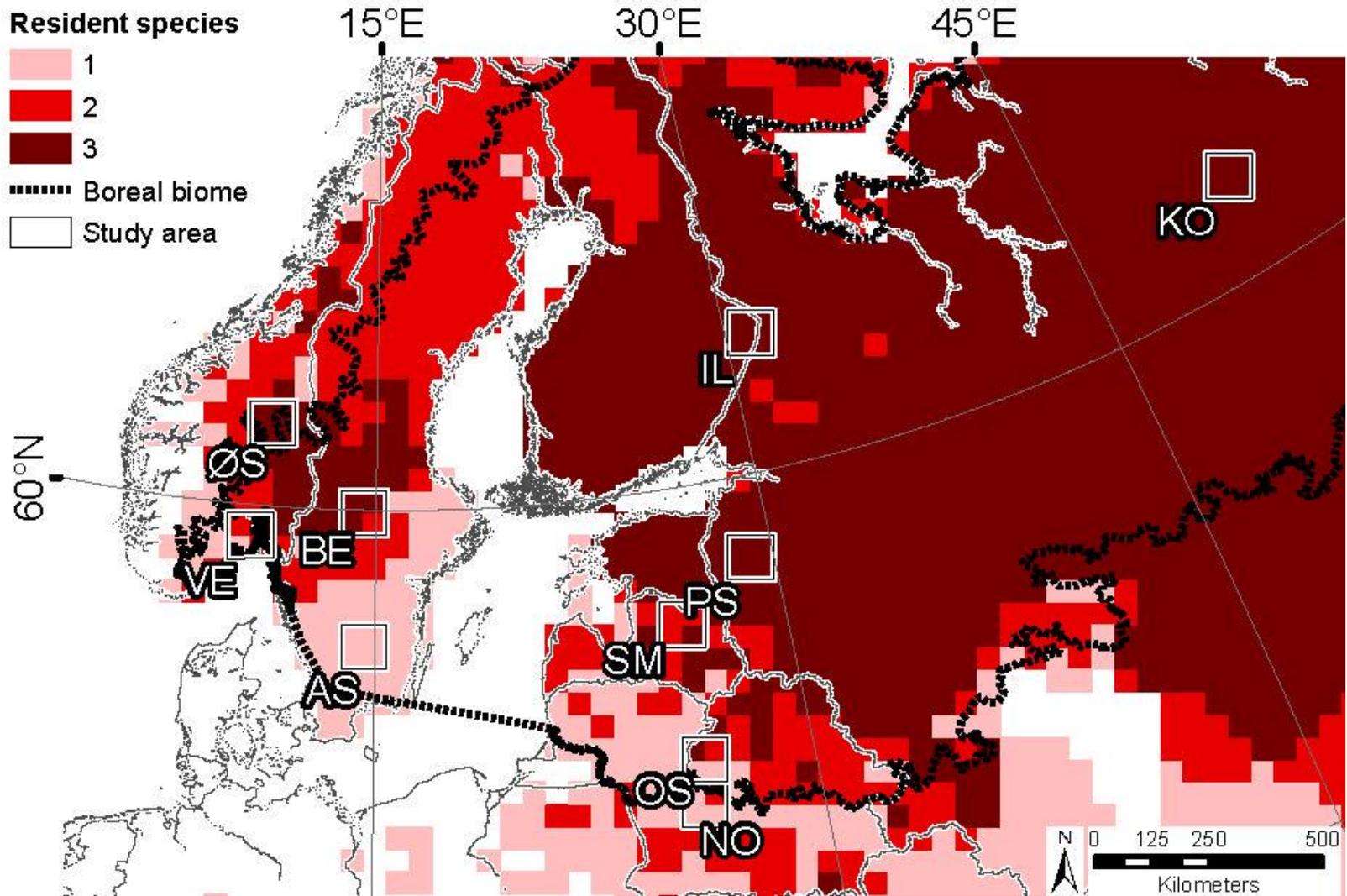
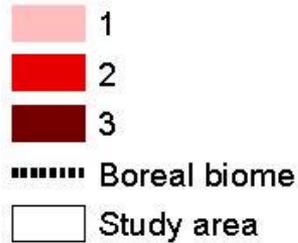
Increased biodiversity





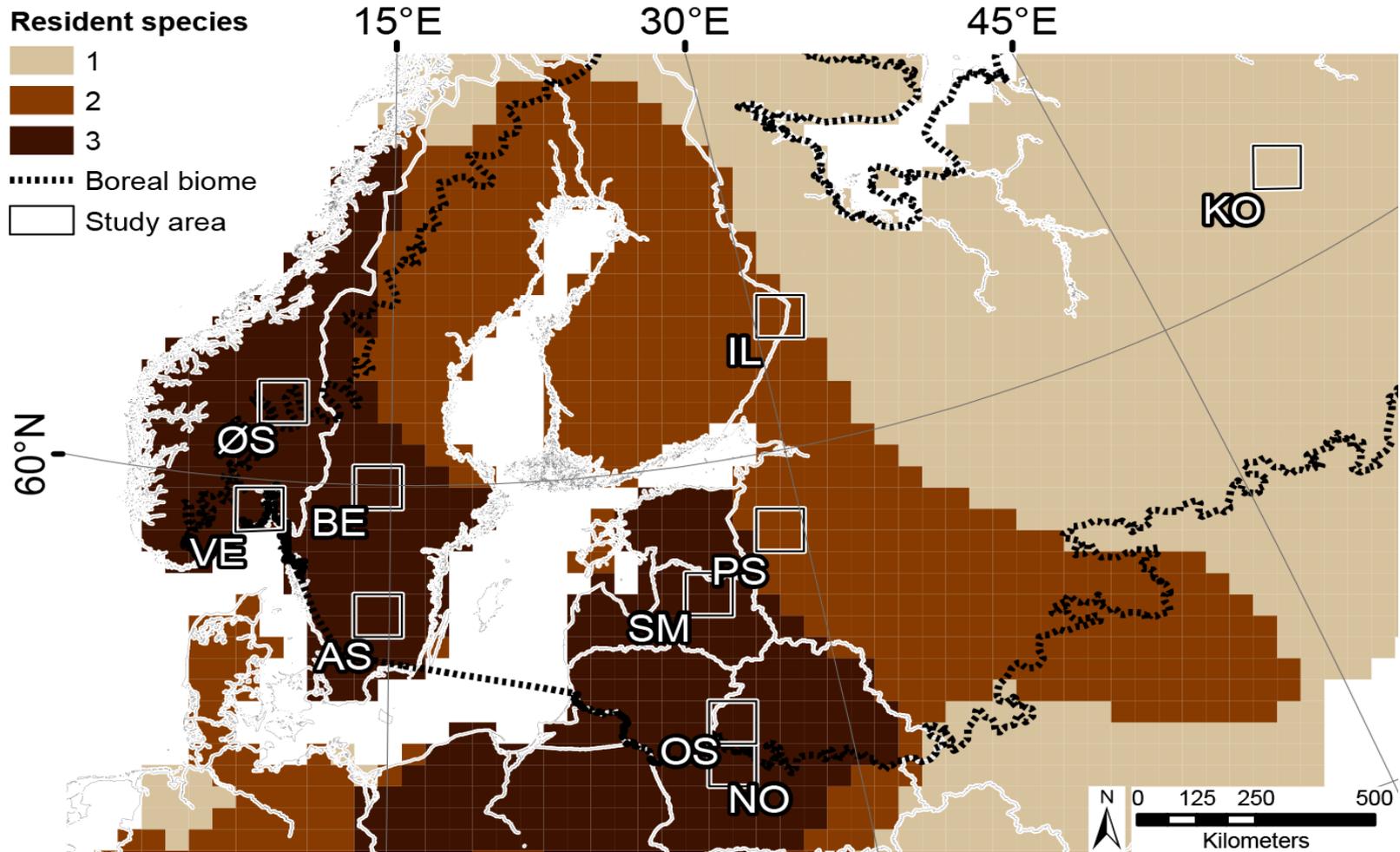
# Large predator occurrence

## Resident species





# Large herbivore occurrence





## Need a multiple target approach





# Thank you & Question

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Angelstam, P., S. Pedersen, and M. Manton. 2018. Macroecological Research in Boreal Forest Reveals the Effects of Moose on Economically and Ecologically Important Tree Species. *Lesnoy zhurnal [Forestry journal]* **4**:9-18.

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