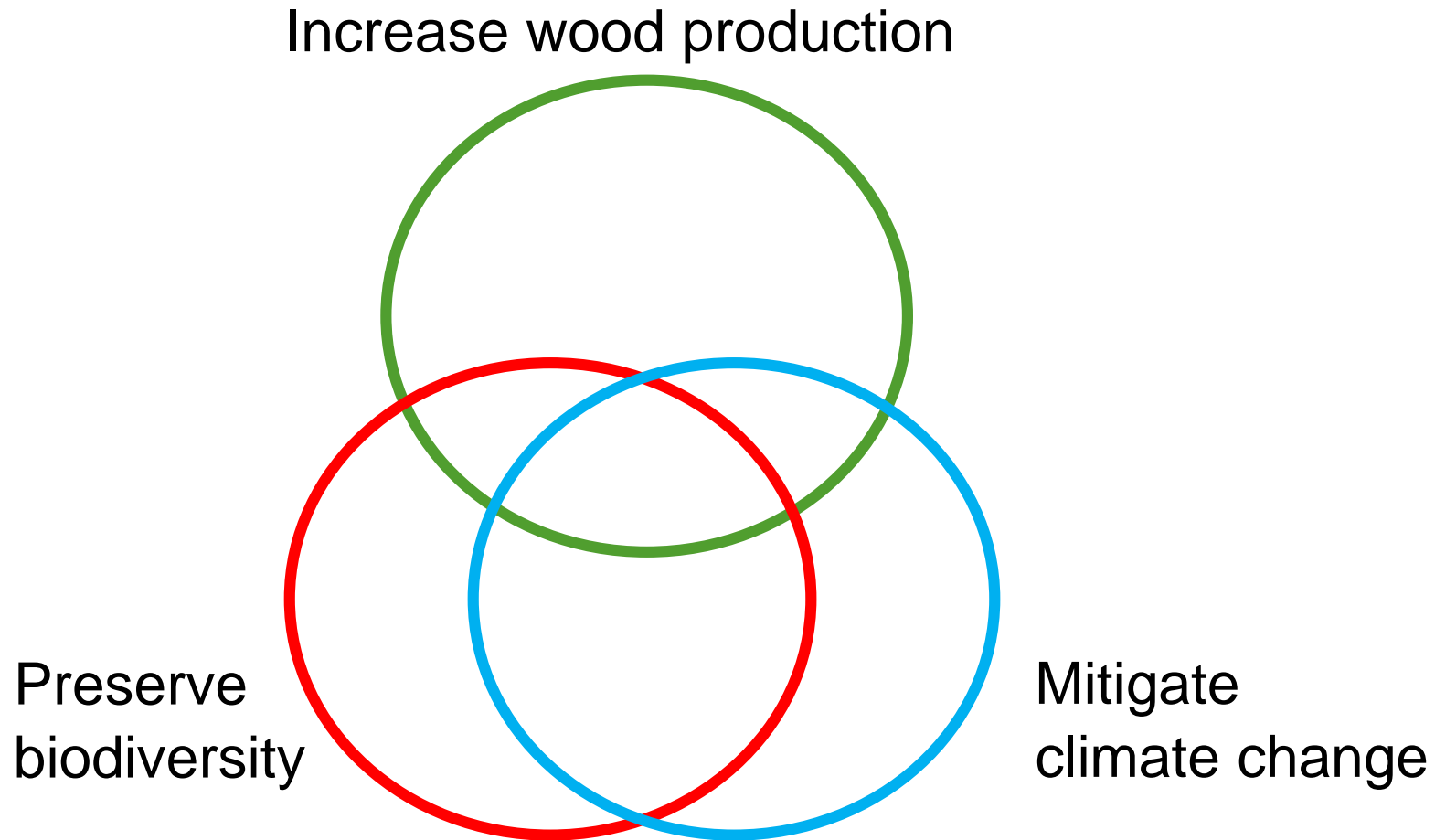


Sustainable and multifunctional use of forest biomass

Tord Snäll

Trade-off & synergies between objectives for the forest



Example questions answered

How should the Swedish forest be managed to cost-efficiently maximizing the occurrence of conservation indicator species by 2050 by slowly decreasing the harvest level?

What is the consequence on the future harvest level?

What is the future climate impact?

Conversely:

How will the conservation indicator species and harvest level develop with a forestry that cost-efficiently reach the climate LULUCF-regulation target by 2030 and beyond?

Projection of forest dynamics and management

Activities e.g.:

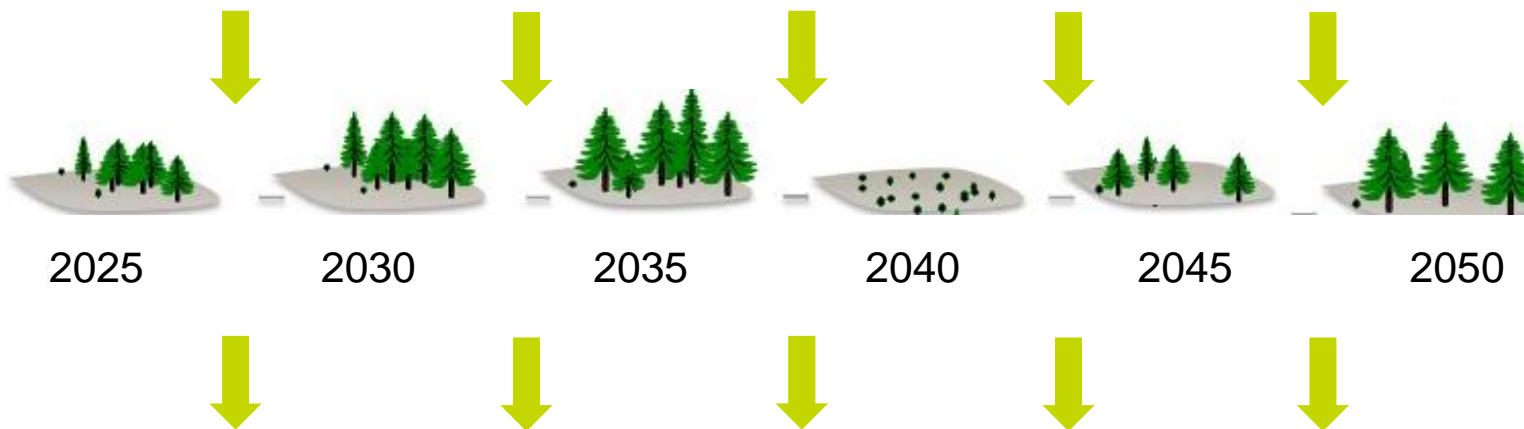
- Planting
- Thinning
- Partial cutting (e.g. CCF)
- Final cutting

Models for e.g.:

- Growth
- Ingrowth
- Natural mortality
- Dead wood decomposition



stand 1



Variables describing the living stand, the deadwood, harvest assortments, e.g:

Harvested wood
Fuelwood for energy
Carbon storage in the forest
Volume of pine
Volume of dead spruce



Basis for prediction of

- species
- balance of GHG (climate impact analysis)

Projection of conservation species for the NFI plots

M. Krikorev



Amylocystis lapponica
Vulnerable

wikipedia.c



Phlebia centrifuga
Vulnerable

M. Krikorev



Fomitopsis rosea
Near Threatened

M. Krikorev



Phellinus ferrugineofuscus
Near Threatened

M. Krikorev



Phellinus nigrolimitatus
Near Threatened

T. Hallingbäck



Lophozia ascendens
Vulnerable



Crossocalyx hellerianus
Near Threatened



Dicranum fragilifolium



Herzogiella seligeri



Buxbaumia viridis



National Forest Inventory
(31000 plots)

Climate impact of the forest and its use

- Climate impact (balance of CO₂-equivalents) is determined by four factors:
 - **Changes in forest stock carbon**
 - Fossil emissions embodied **in processing wood**
 - "Decomposition" of carbon from **use of wood (with delay)**
 - Fossil emissions **avoided in substitution** of alternative products for wood
- Emissions embodied and avoided are considered in **displacement factors**
- Displacement factors that represents the **use of wood on the European market** (Hurmekoski et al. 2023)

Climate impact sensu LULUCF-regulation

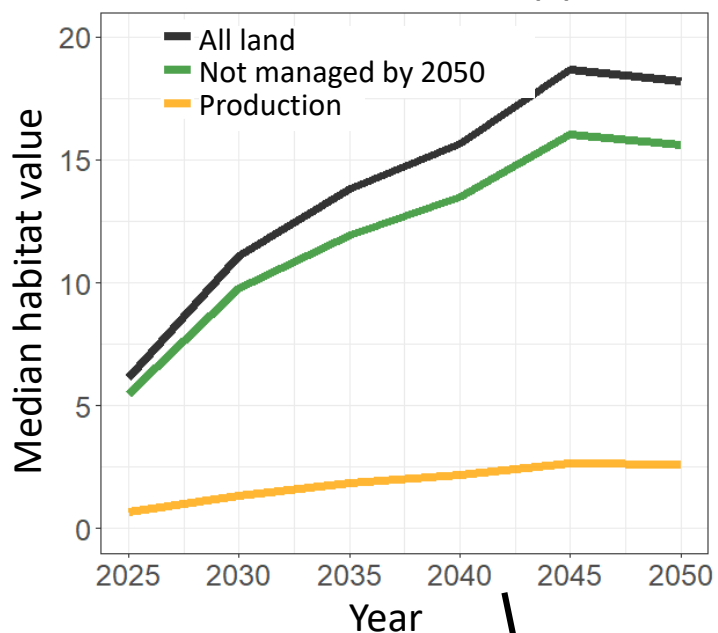
- Climate impact (balance of CO₂-equivalents) is determined by four factors:
 - **Changes in forest stock carbon**
 - Fossil emissions embodied in **processing wood**
 - "Decomposition" of carbon from **use of wood (with delay)**
 - Fossil emissions **avoided in substitution** of alternative products for wood
- Emissions embodied and avoided are considered in **displacement factors**
- Displacement factors that represents the **use of wood on the European market** (Hurmekoski et al. 2023)

Many ways to manage 31000 NFI plots

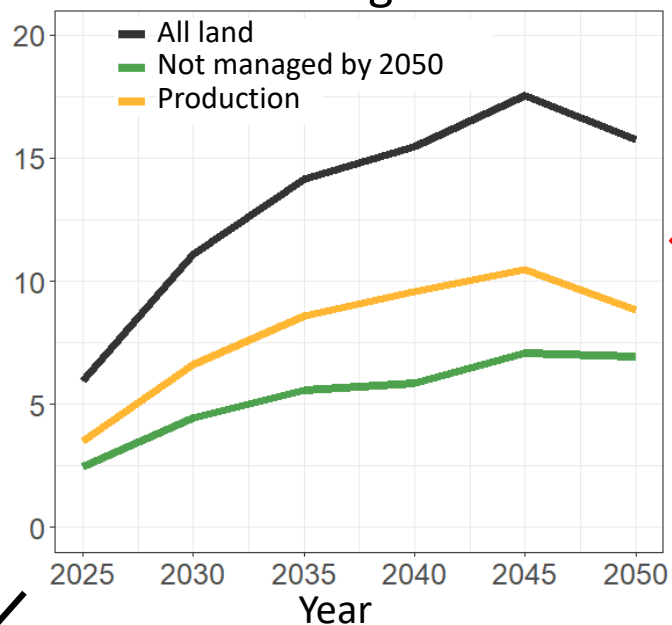


Objective: Conservation spp or LULUCF regulation

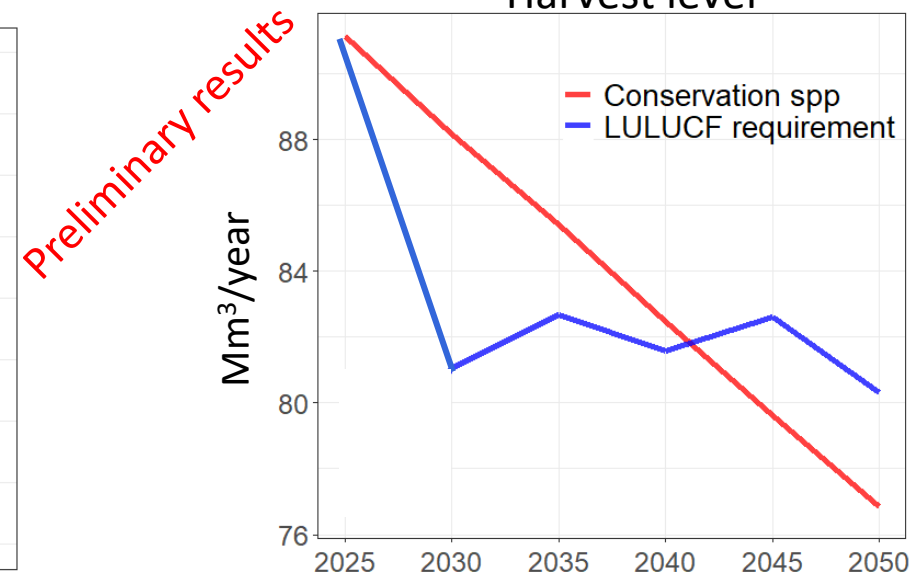
Conservation spp



LULUCF regulation

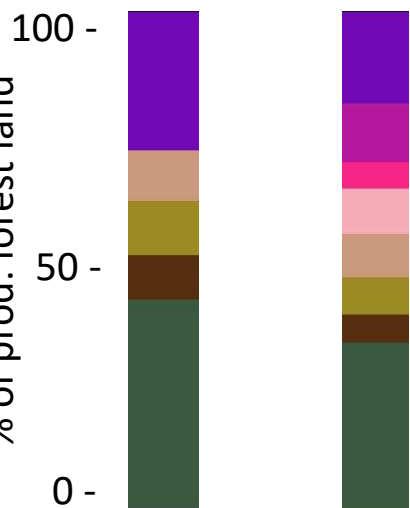


Harvest level



Preliminary results

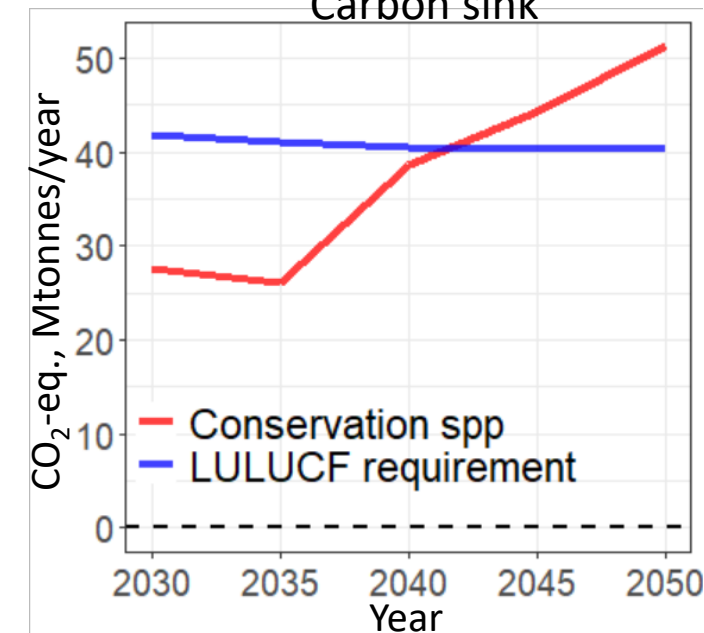
% of prod. forest land



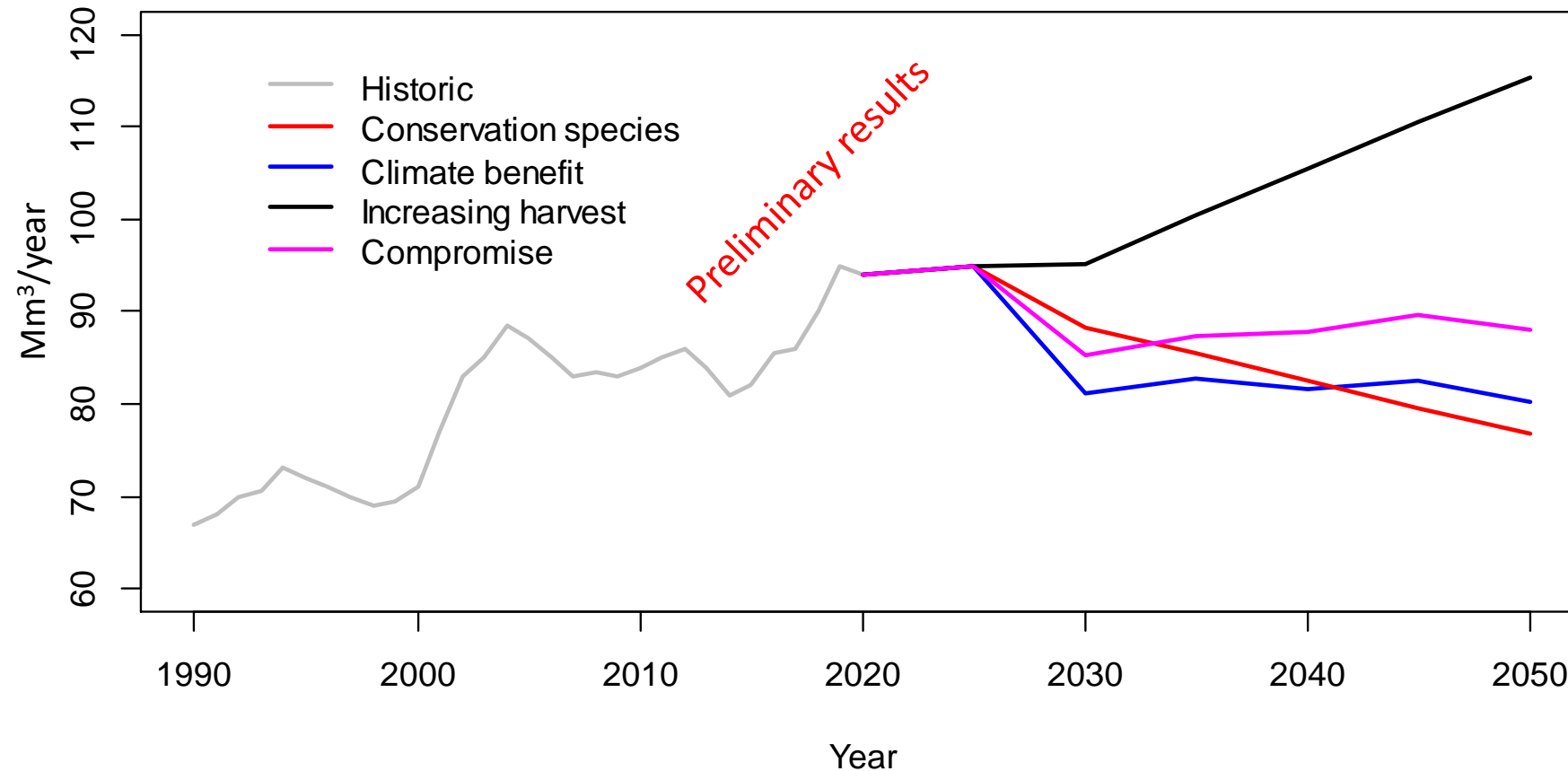
Management regime

- BAU even-aged managem.
- BAU, no thinning
- BAU, prolonged rotation
- BAU, emphasis on broadleaves
- BAU, adapted to reindeer herding
- CCF shelterwood (pine-dominated)
- CCF (spruce-dominated)
- Not managed by 2050

Carbon sink



Projected harvests, also showing past Sweden-levels



Synthesis report *“Climate- and biodiversity-informed forestry and conservation in Fennoscandia”*

- meant to a broad range of non-scientific knowledge users, will describe the main findings and their implications to future forest management
- a simplified knowledge synthesis: “systematic map” or “rapid evidence assessment”
- PICO framework to help identify the key concepts, and to structure a literature review
- co-production with a Nordic stakeholder group

Work steps:

Compile and integrate relevant information

Objective, based on facts

Inclusive: input from key knowledge users

Relevant for knowledge users

Clear, understandable, non-technical

Cover a broad range of forest uses

Cover relevant spatial and temporal scales

Stakeholders

Norway

Statskog

NORSKOG

Norges Skogeierforbund

Norwegian Bioenergy Association Nobio

WWF Norway

Norwegian Biodiversity Network SABIMA

Finland

Tapio

Finnish Energy Authority

WWF Finland

Finland's Nature Conservation Association

Sweden: corresponding to Norway & Finland¹¹

Thank you!

Tord Snäll

Swedish University of Agricultural Sciences

SLU Swedish Species Information Centre

tord.snall@slu.se

www.slu.se/artdatabanken/tordsnall



Funded by
the European Union

Grant agreement ID: 101094340



S. Soimakallio
SYKE, FI



J. Nordén
NINA, NO



L. Nybakken
NMBU, NO

*climate-
forestry*



F. Lingua

*biodiversity
-forestry*



C. Montalvo-Mancheno

Climate LCA



J. Niemi

<https://forestvalue.org/>