

# Use or conserve the forest for climate change mitigation?

Managed forests or unmanaged forests



## Unmanaged

Heterogeneous structure

Old-growth

Natural disturbances

Lots of dead wood

Natural regeneration

## Managed

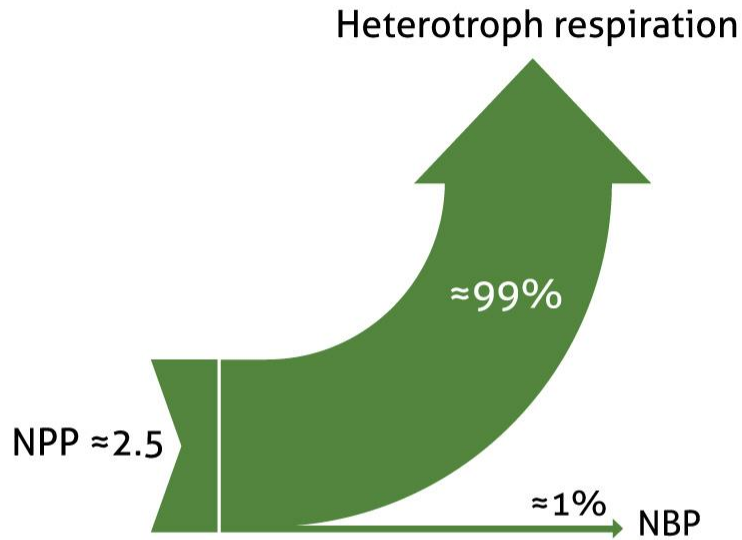
Even-aged stands

Even age class distribution

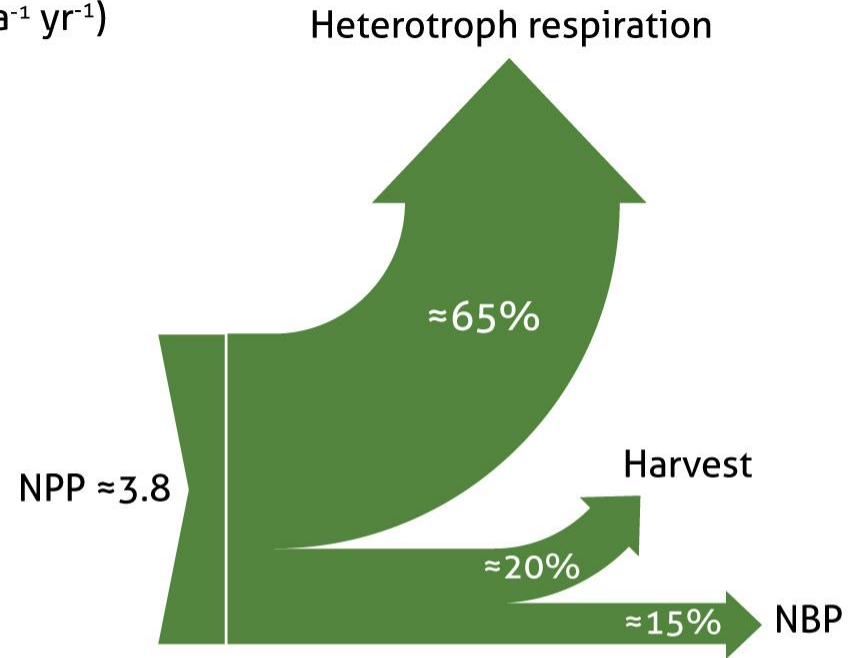
Rotations adapted to  
"maximize" mean annual  
production

Silviculture

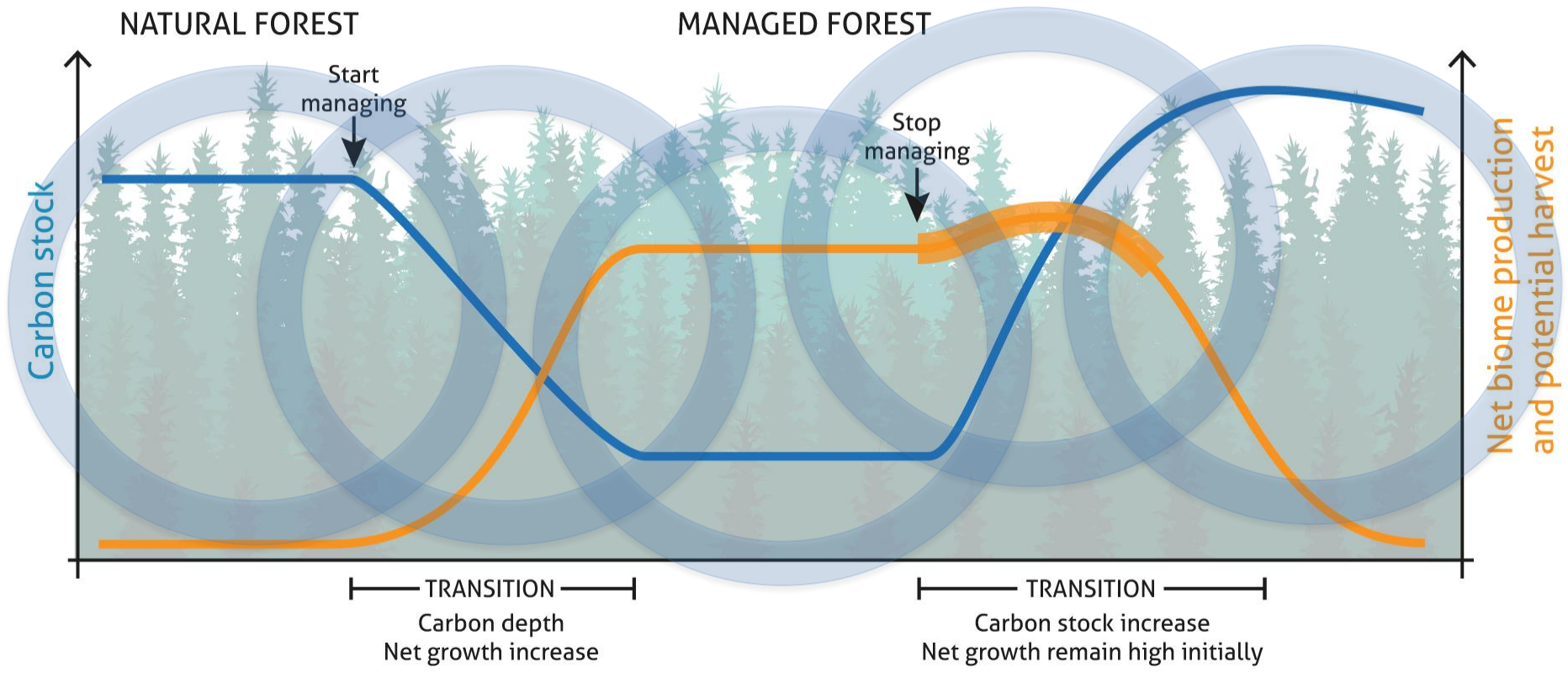
Fate of NPP  
(Mg ha<sup>-1</sup> yr<sup>-1</sup>)



UNMANAGED NATURAL FOREST



MANAGED FOREST



NATURAL FOREST

MANAGED FOREST

Carbon stock

Net biome production and potential harvest

Start managing

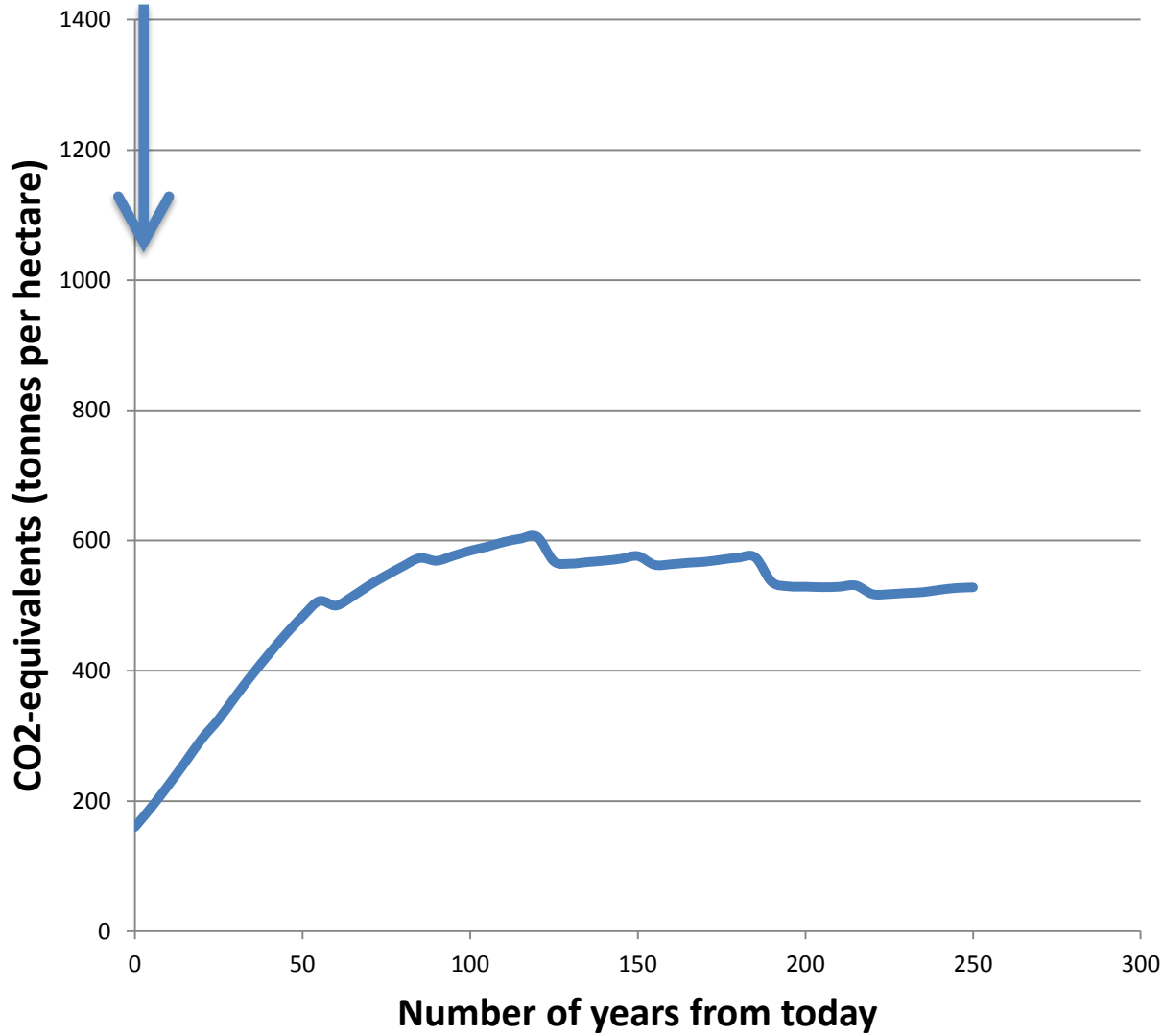
Stop managing

TRANSITION  
Carbon depth  
Net growth increase

TRANSITION  
Carbon stock increase  
Net growth remain high initially

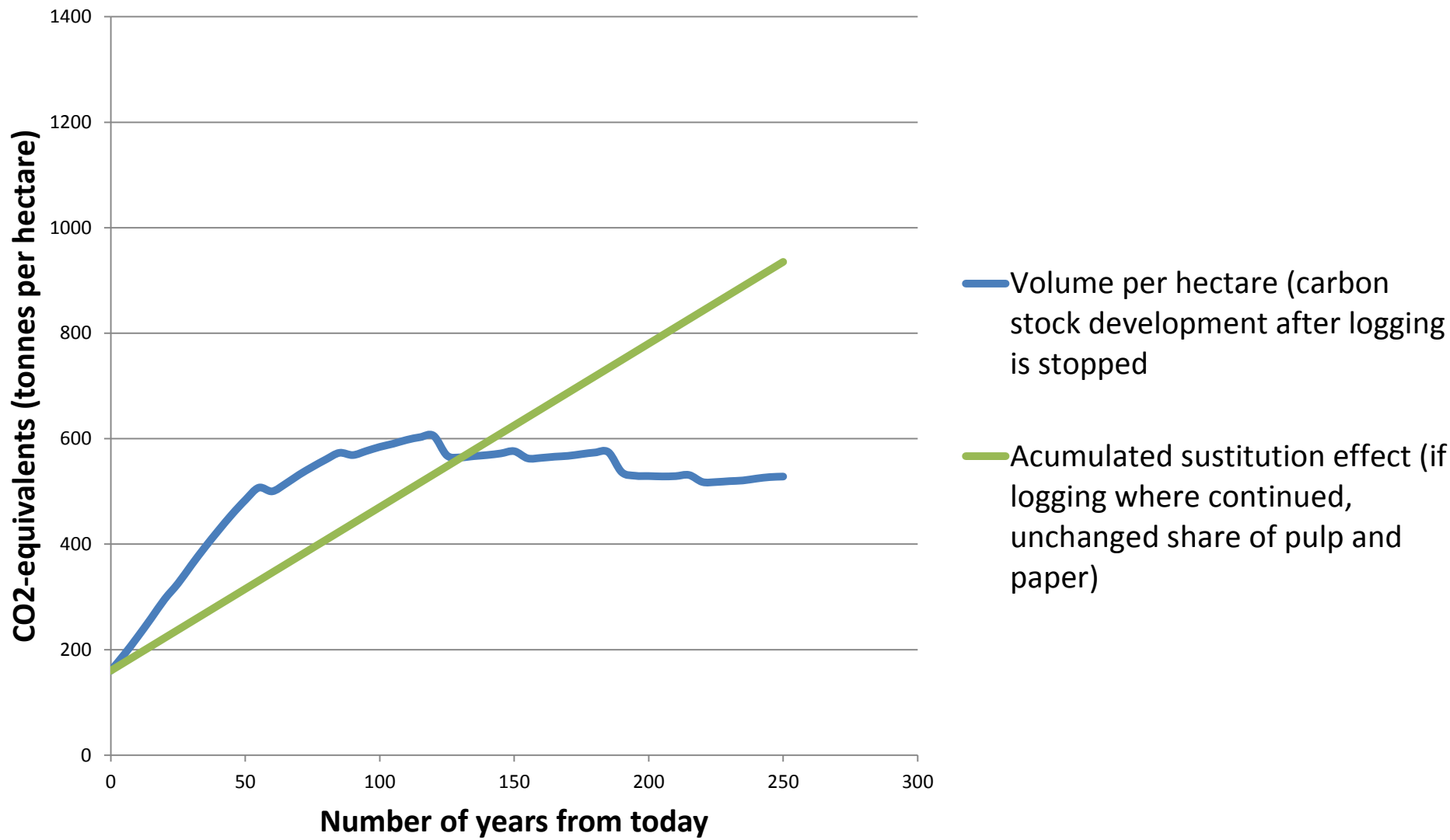
# Småland, south of Sweden

Stop logging

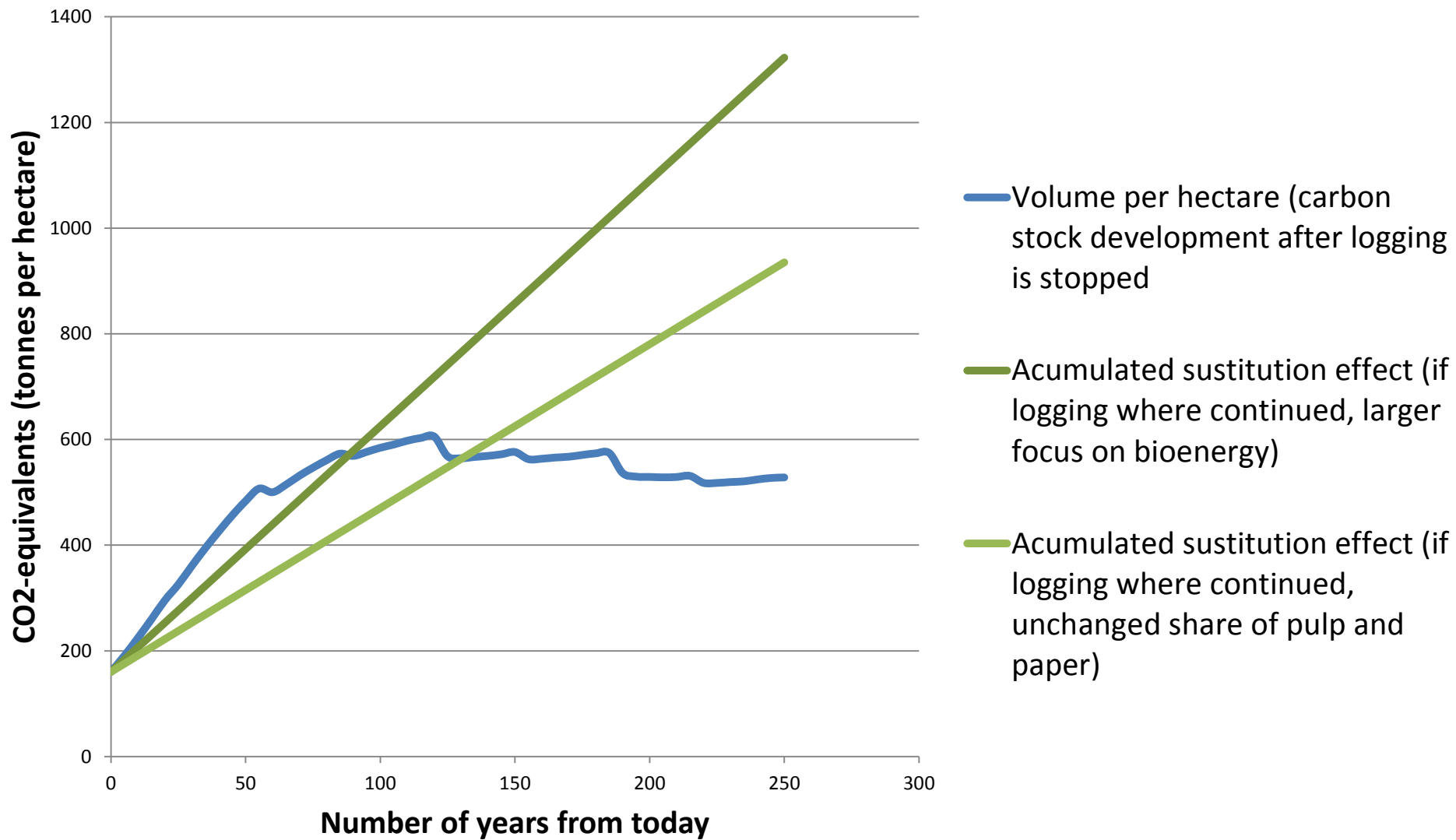


— Volume per hectare (carbon stock development after logging is stopped)

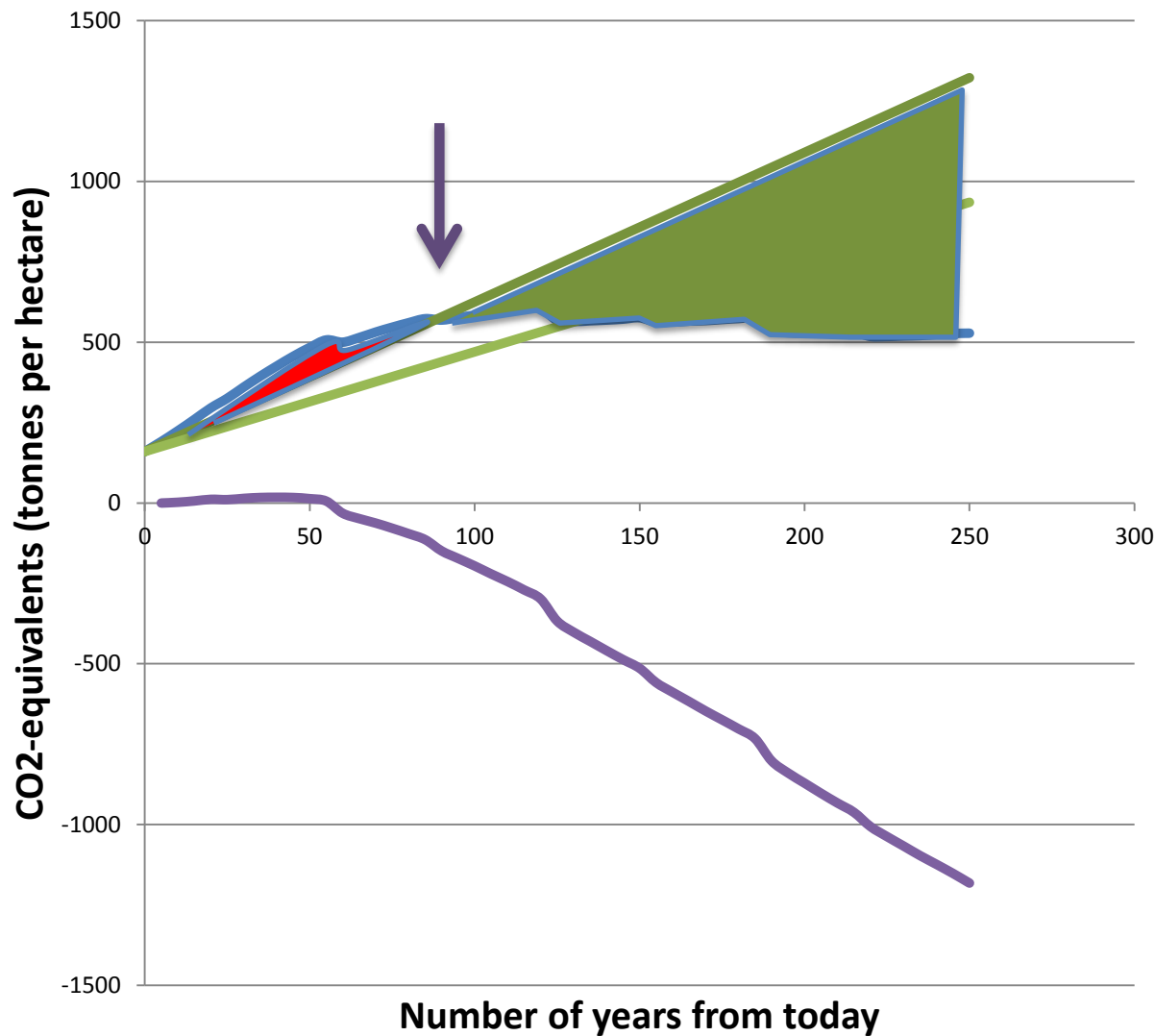
# Småland, south of Sweden



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— Volume per hectare (carbon stock development after logging is stopped)

— Accumulated substitution effect (if logging where continued, larger focus on bioenergy)

— Accumulated substitution effect (if logging where continued, unchanged share of pulp and paper)

— "Growth depth" (accumulated difference between actual annual growth and potential annual growth if forests were managed)



# Conclusions (1/2)

- Design of climate change mitigation portfolios in the forest sector should account for changes in C in **forest ecosystems**, in **harvested wood products**, and for **substitution benefits**, relative to a base case.
- Climate change mitigation efficiency varies among silvicultural activities, product use strategies and by region, and no single strategy is best everywhere.
- Time perspective and vision of future energy supply is crucial.

Albedo



# Conclusions (2/2)

- Forest managers do not control use of wood – effective mitigation activities need to integrate forest management with wood use strategies aimed at increasing life span of HWP and substitution of steel, concrete, plastics & fuels.
- Substantial mitigation potential by 2050 if the implementation of strategies starts soon.
- A forest that is not growing more than today can not make further climate benefit.
- As societies seek to reduce GHG emissions, the forest sector can make a meaningful and sustained contribution if social license to do so can be established & maintained.



# Use or conserve the forest?

it is a matter that is determined by what  
we think about the future