



Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

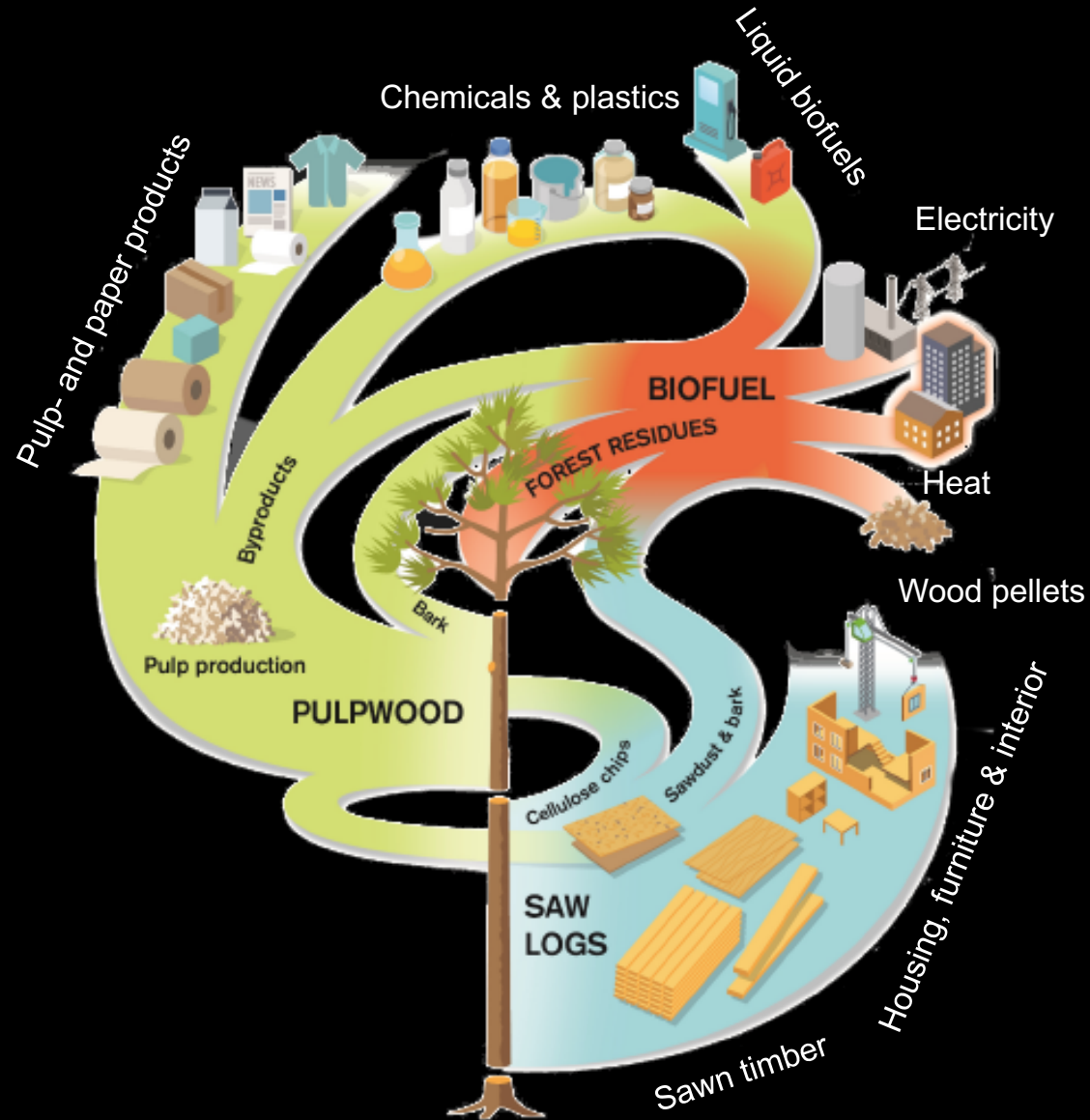
**THE NORDIC FORESTRY MODEL – A SUSTAINABLE
WAY TO TAKE LEAD TOWARDS A FOSSIL FREE
EUROPE**

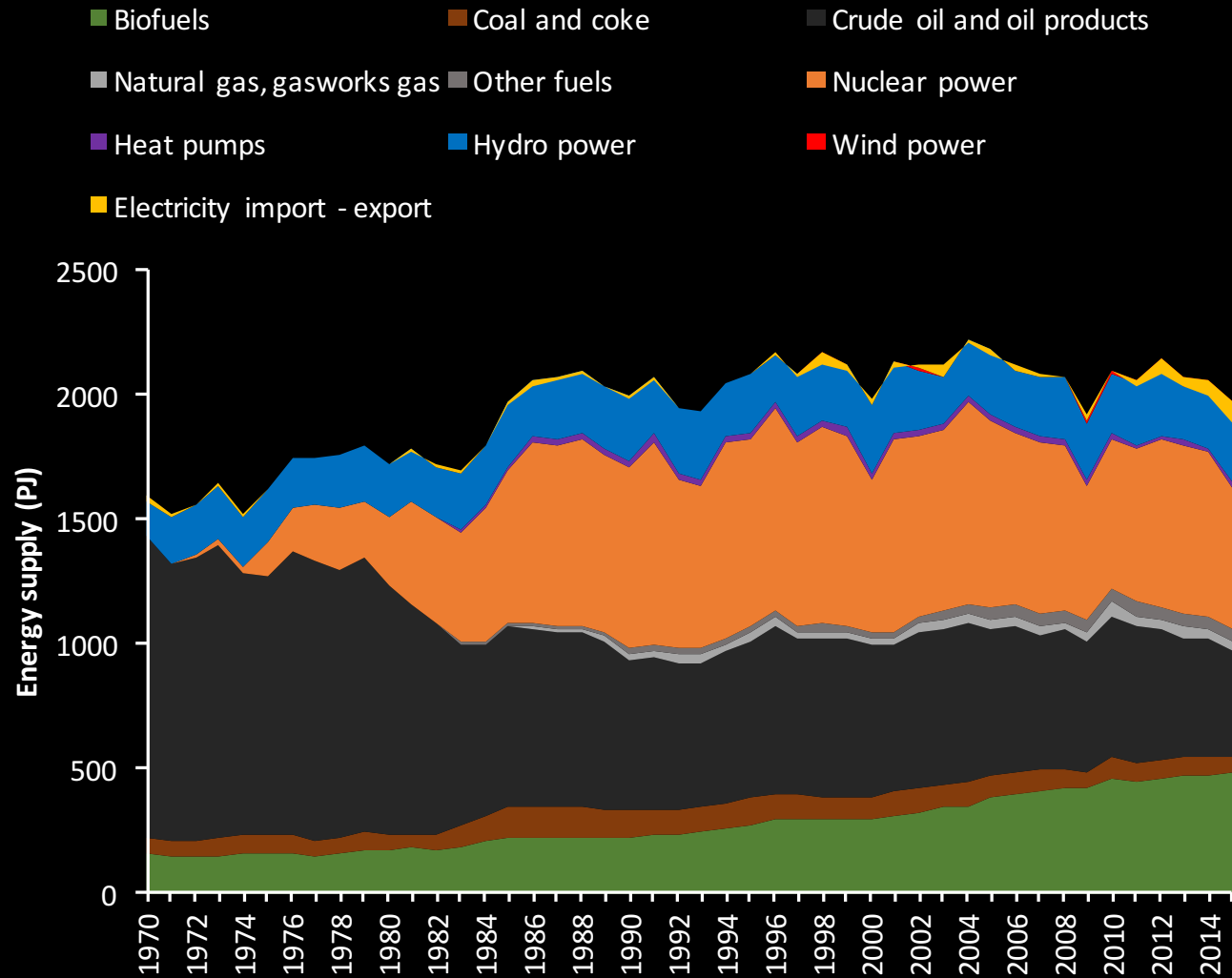
**Parallel event at the European Biomass Conference &
Exhibition, Stockholm, June 12-15, 2017**

BIODIVERSITY AND BIOFUELS

Gustaf Egnell, Dept. of Forest Ecology and Management

Forest biomass

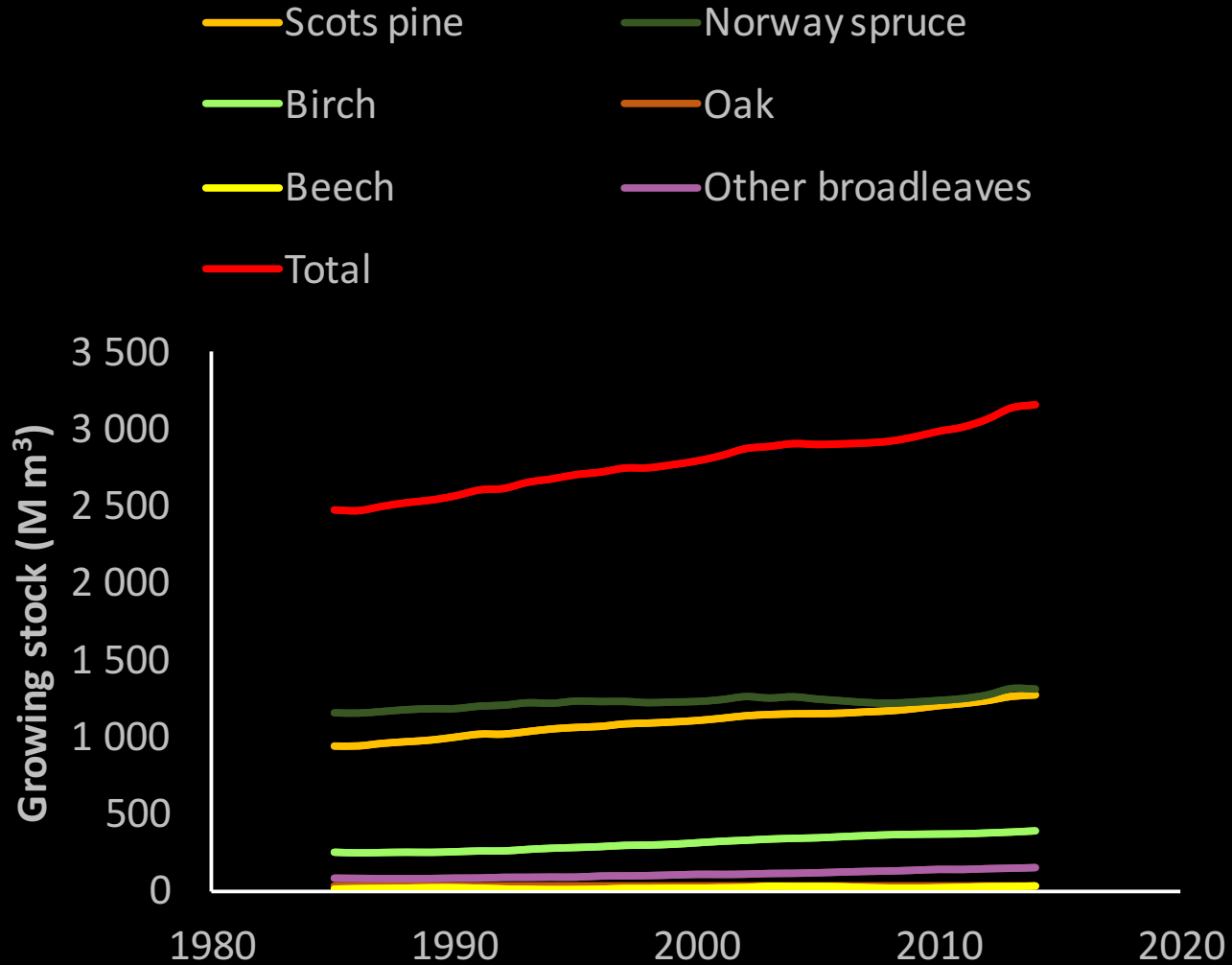




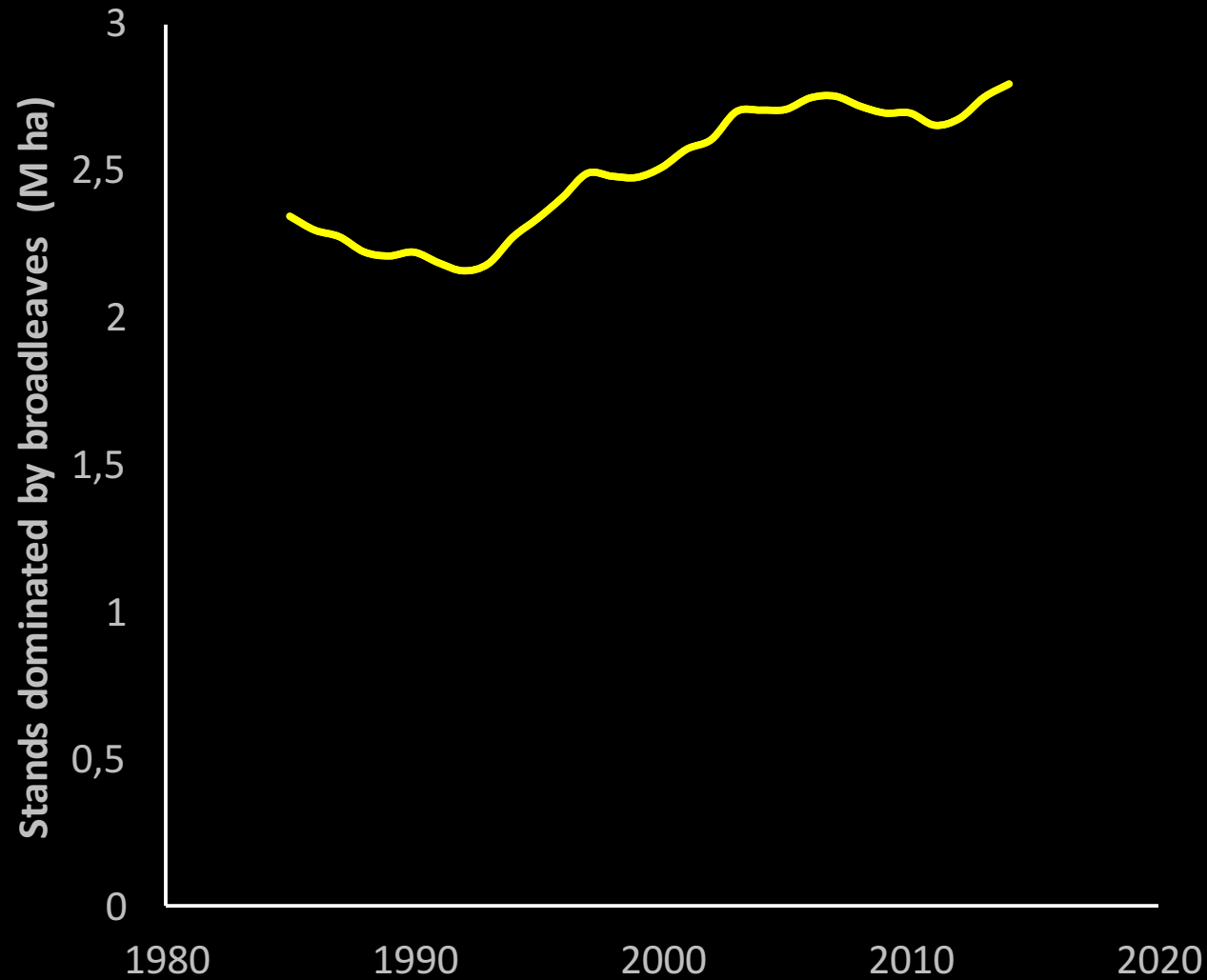
Swedish energy supply by source 1970-2015.
 Source: The Swedish Energy Agency and Statistics Sweden

Important structures for biodiversity identified as deficient in managed forests

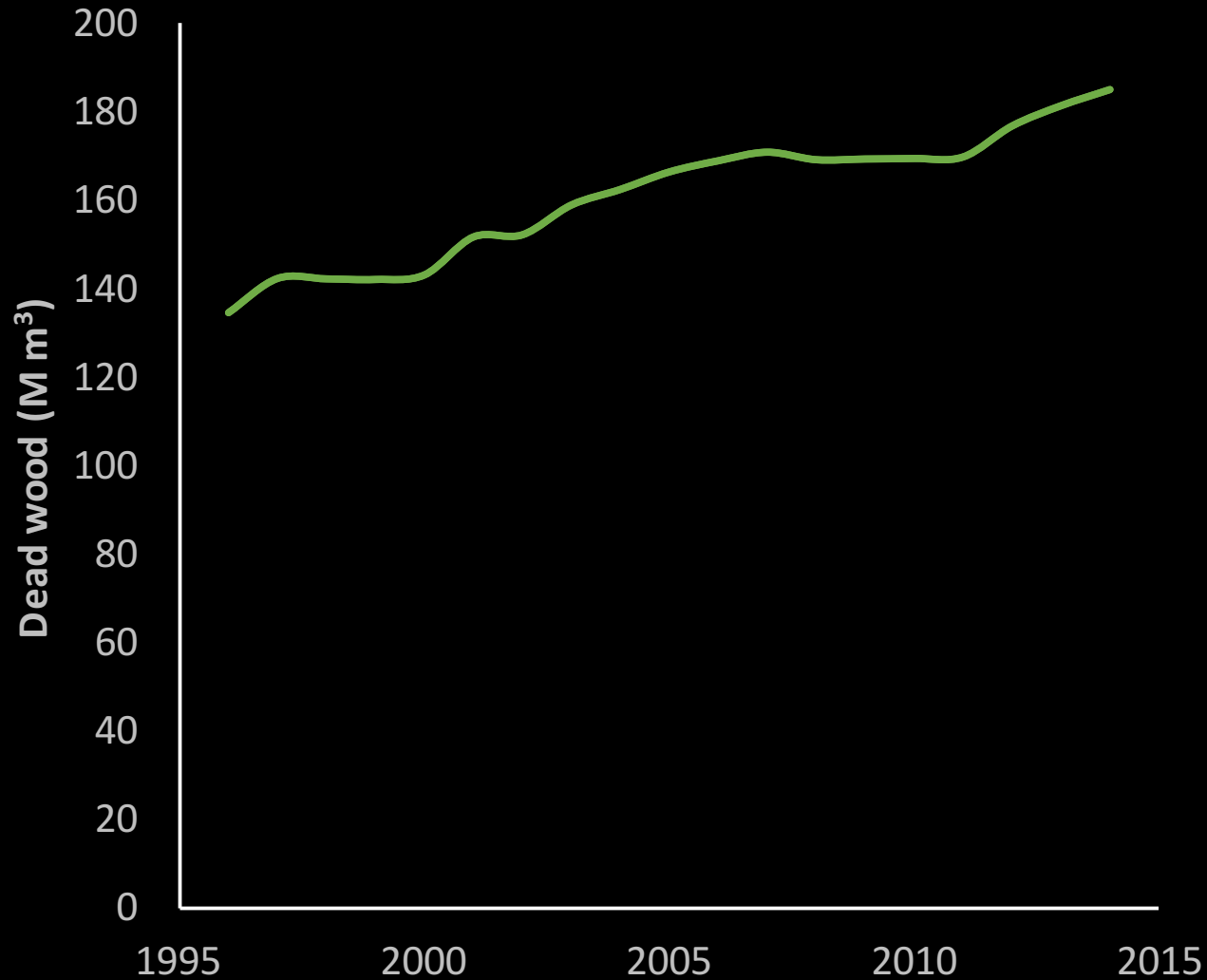
- Proportion of broadleaves in the spruce and pine dominated managed forest landscape
- Old growth forests
- Amount of dead wood



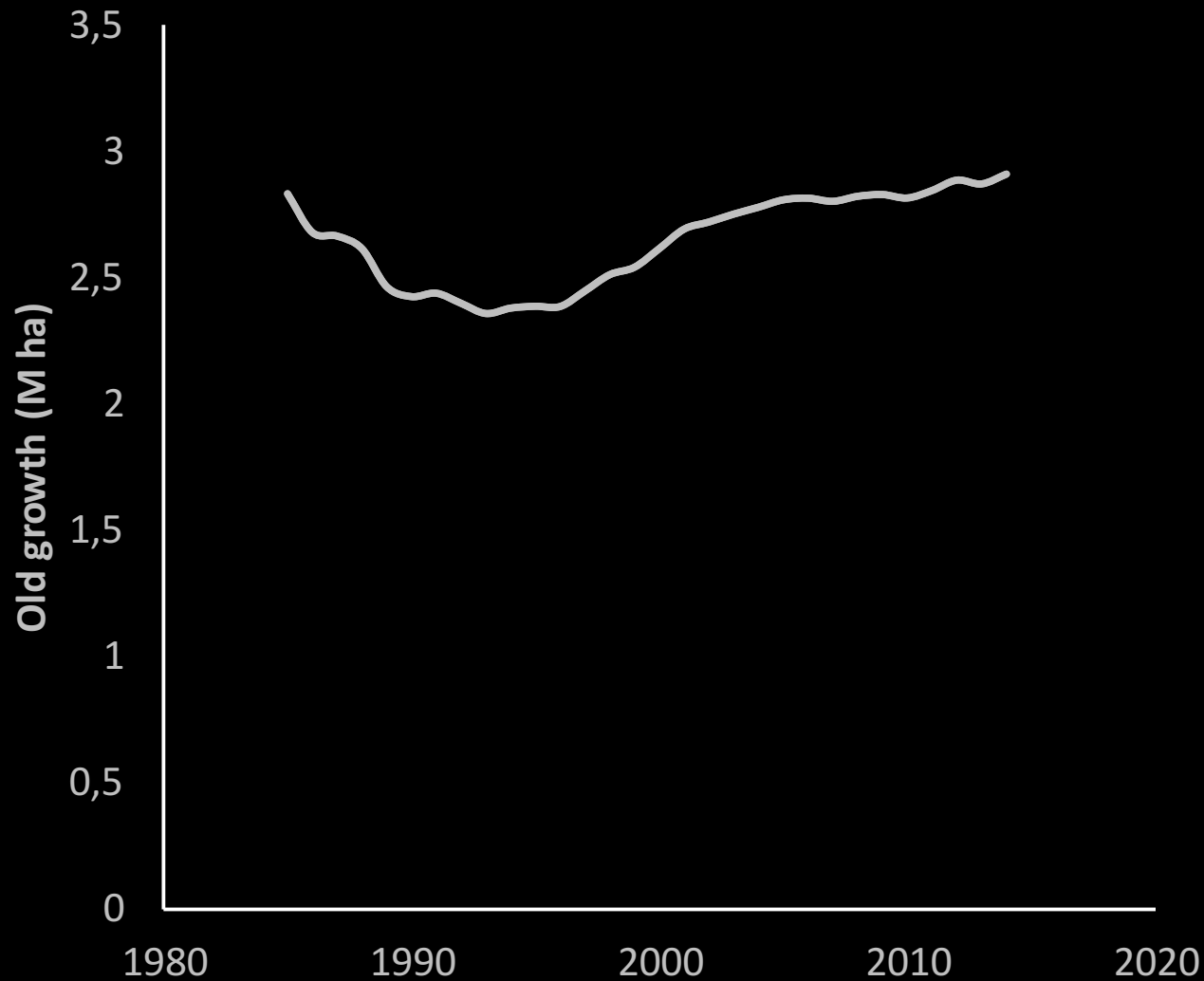
Growing stock by tree species on productive forests land in Sweden 1983 - 2016 (Million cubic meters).
 Source: The Swedish National Forest Inventory, Swedish University of Agricultural Sciences.



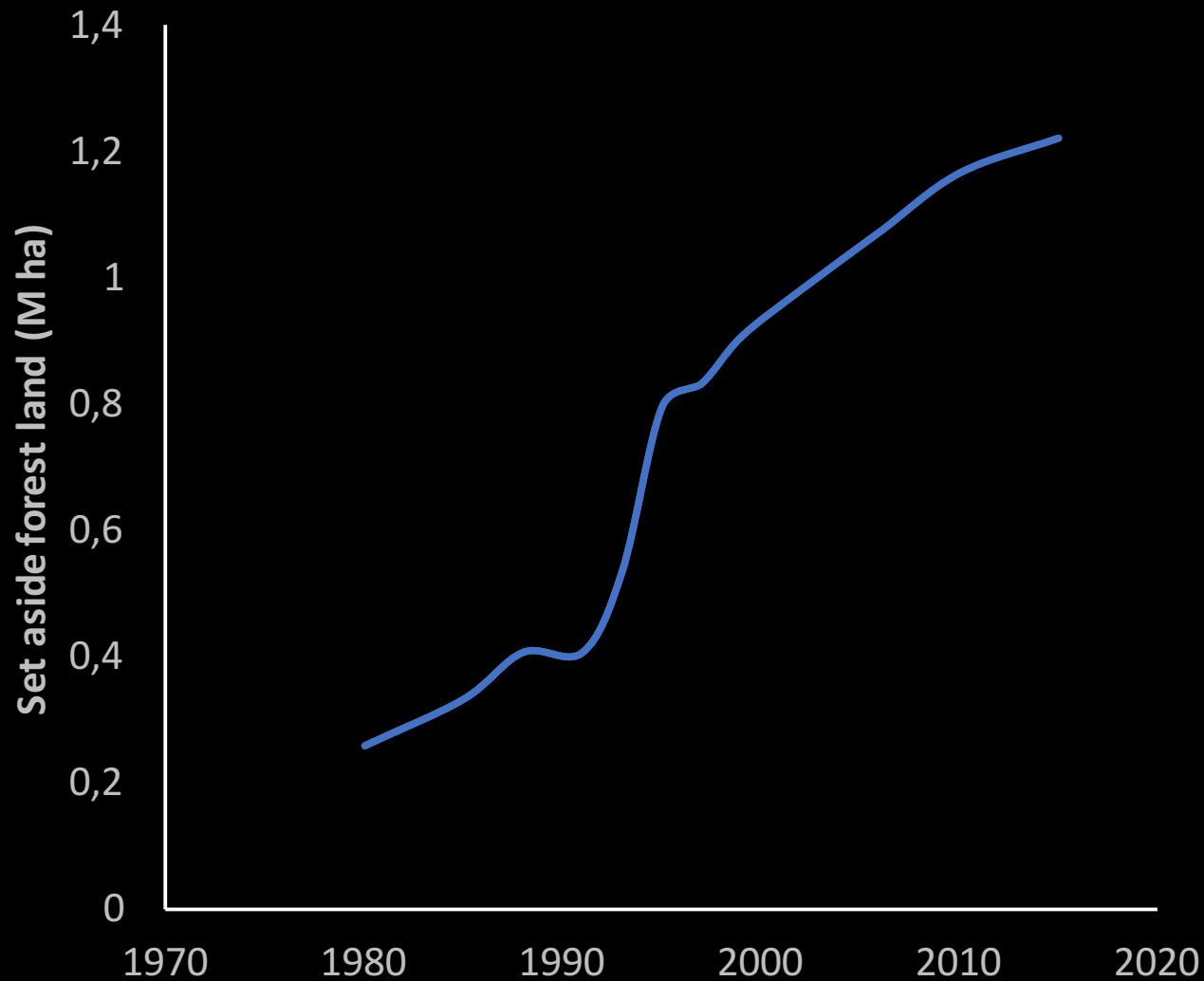
Area of broadleaf-dominated stands (> 50%) on productive forest land in Sweden 1983 - 2016 (Million hectares). Source: The Swedish National Forest Inventory, Swedish University of Agricultural Sciences.



Volume of dead wood on productive forest land in Sweden 1993 - 2016 (Million cubic meters), five year averages. Source: The Swedish National Forest Inventory, Swedish University of Agricultural Sciences

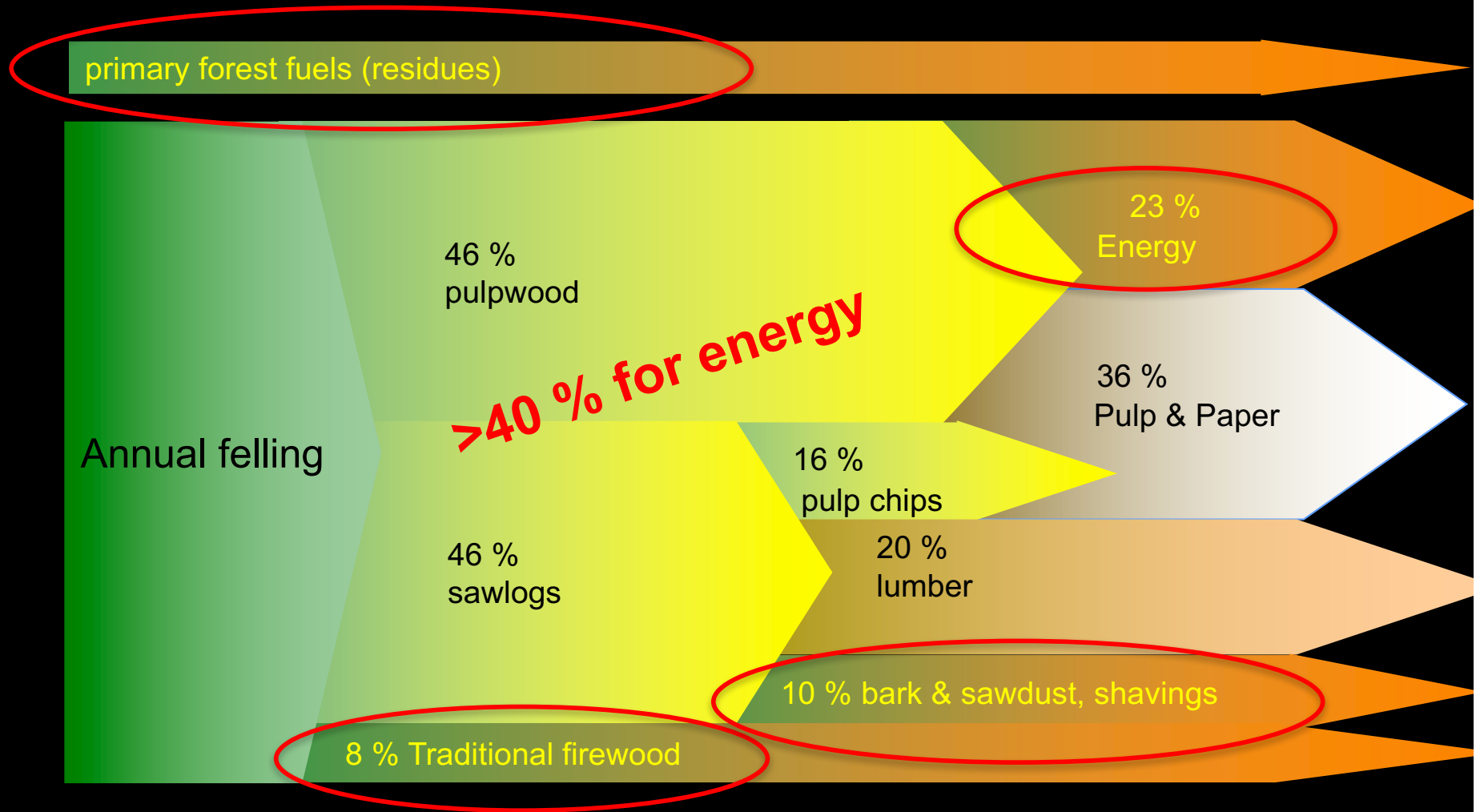


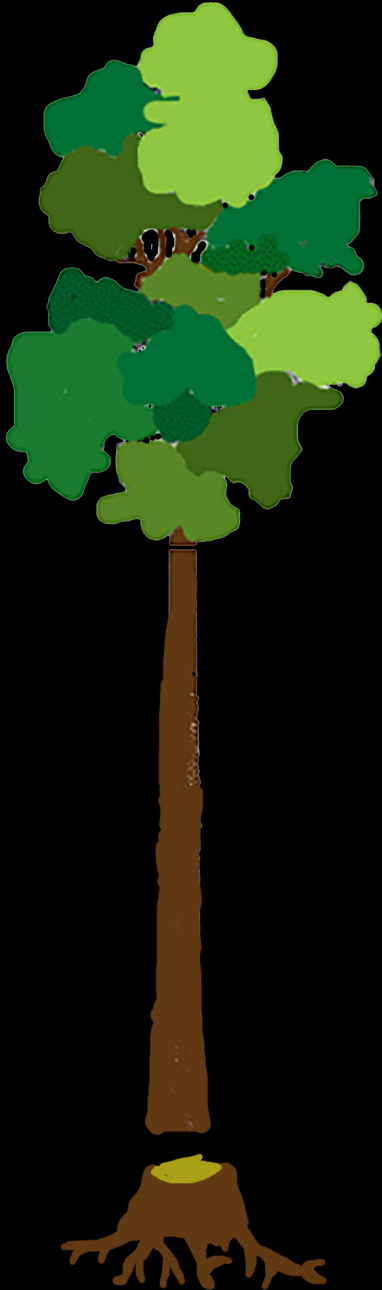
Area of old growth forests (> 120 years) on productive forest land in Sweden 1983 - 2016 (Million hectares), five year averages. Source: The Swedish National Forest Inventory, Swedish University of Agricultural Sciences.



Area of set aside productive forests land in Sweden 1980 - 2015 (Million hectares). Source: The Swedish National Forest Inventory, Swedish University of Agricultural Sciences.

Swedish wood use ...





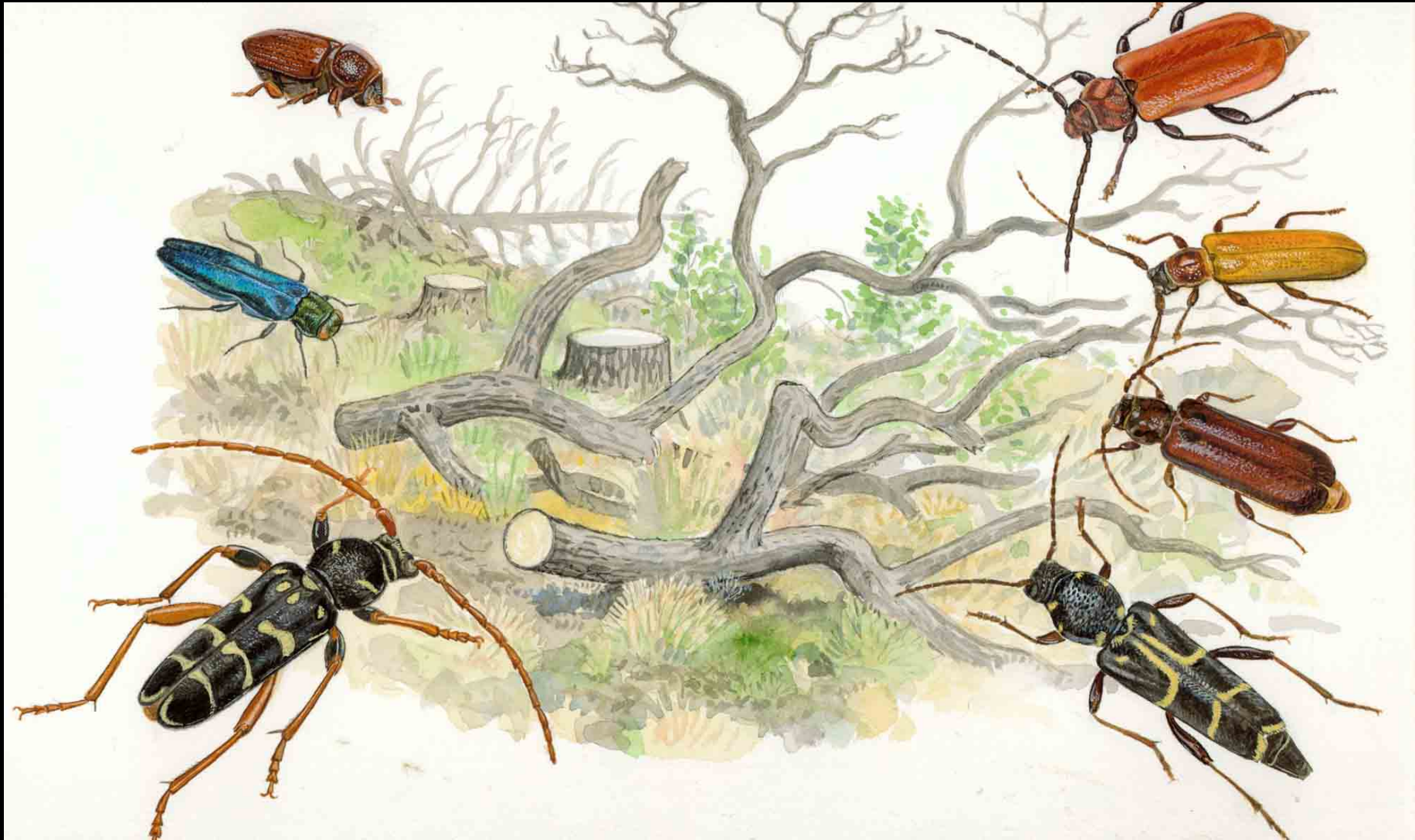
Branches & top 20%

Stemwood 60%

Stump & coarse roots 20%



To reach biodiversity goals ambitions to increase structural diversity in the managed forest cannot be challenged by increased demand for biomass.



There is still a potential to extract more logging residues – but for biodiversity there are residues that are more valuable than residues from the by far dominating tree species Norway spruce and Scots pine



For biodiversity stumps is a more critical feedstock – but given that stump extraction in Sweden is down to 0, there is room for expansion for stump biomass from common tree species. .



Random events like forest fires, storms and pests offers feedstock for the bioenergy industry – but these events are also important for biodiversity and certain amounts of dead wood has to be left in the forest



A lot of the biodiversity qualities is linked to former landuse. Here biomass extraction can be part of the solution to maintain these qualities

We demonstrate that an increase in harvesting of logging residues by 2.5 times might be sustainable

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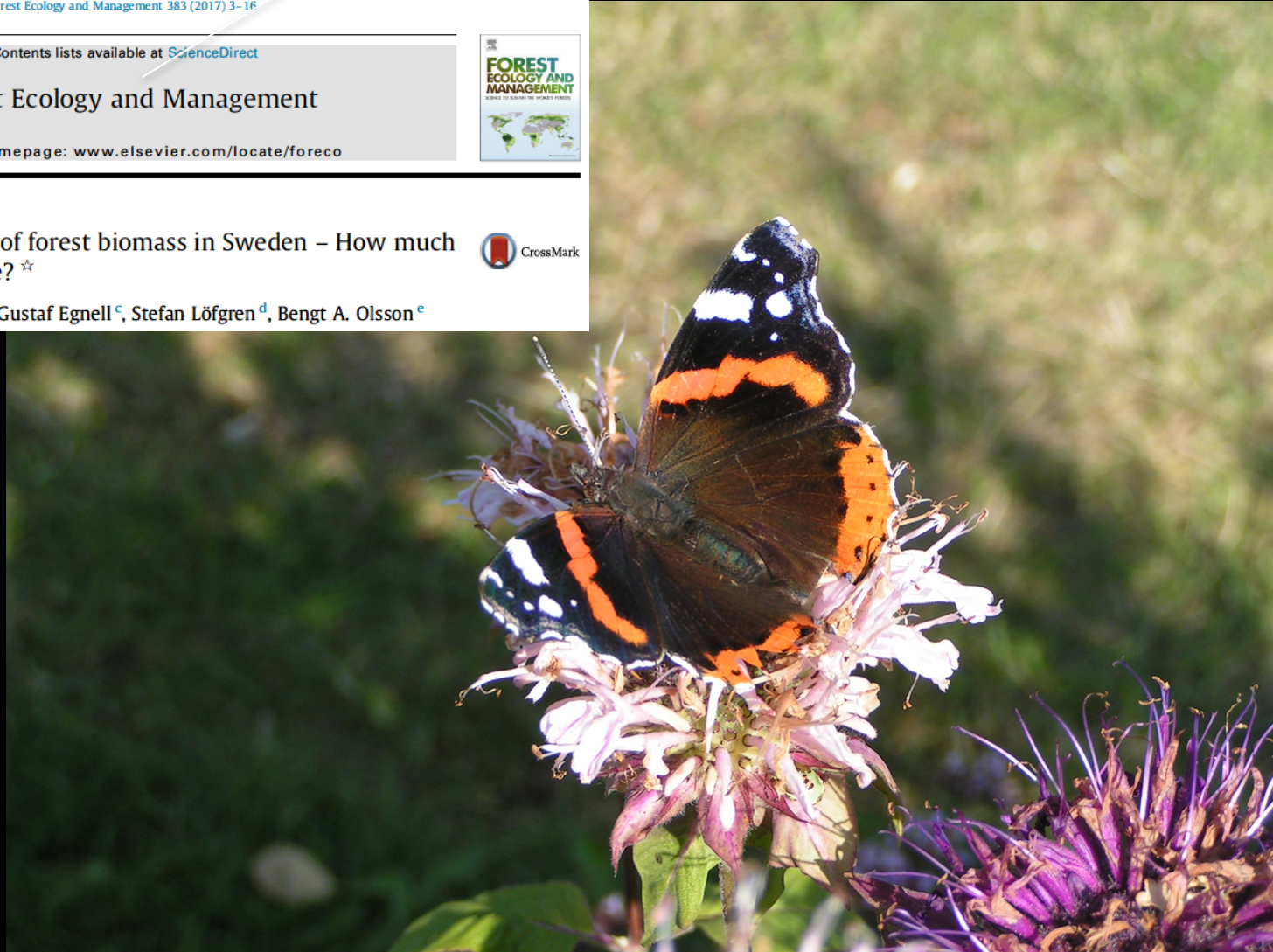



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Realizing the energy potential of forest biomass in Sweden – How much is environmentally sustainable? ☆

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With good policies in place more biomass can be procured from managed forest in the Nordic countries without putting biodiversity at stake – but there is a limit