



Economic considerations in forest management to provide environmental services in the future

Mainly based on Danish experiences

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Adapting forest management to maintain the environmental services: Carbon Sequestration, Biodiversity and Water

Koli National Park, Finland



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Introduction

- Until now, discussed the production of Env. Services from a natural science perspective.
- However, their use and provision interferes with humans as also Schroeder pointet out. So:
 - What level of provision is desirable?
 - How do we choose between levels of provision of different goods and services?
- Here I will present an economic perspective of how to analyse the provision and limits of provision





Outline

- Estimating the *value* of the services
- How forest management may influence the value provision
- Limits of 'optimal' socio-economic provision
- Economic tools for adjusting the level of provision





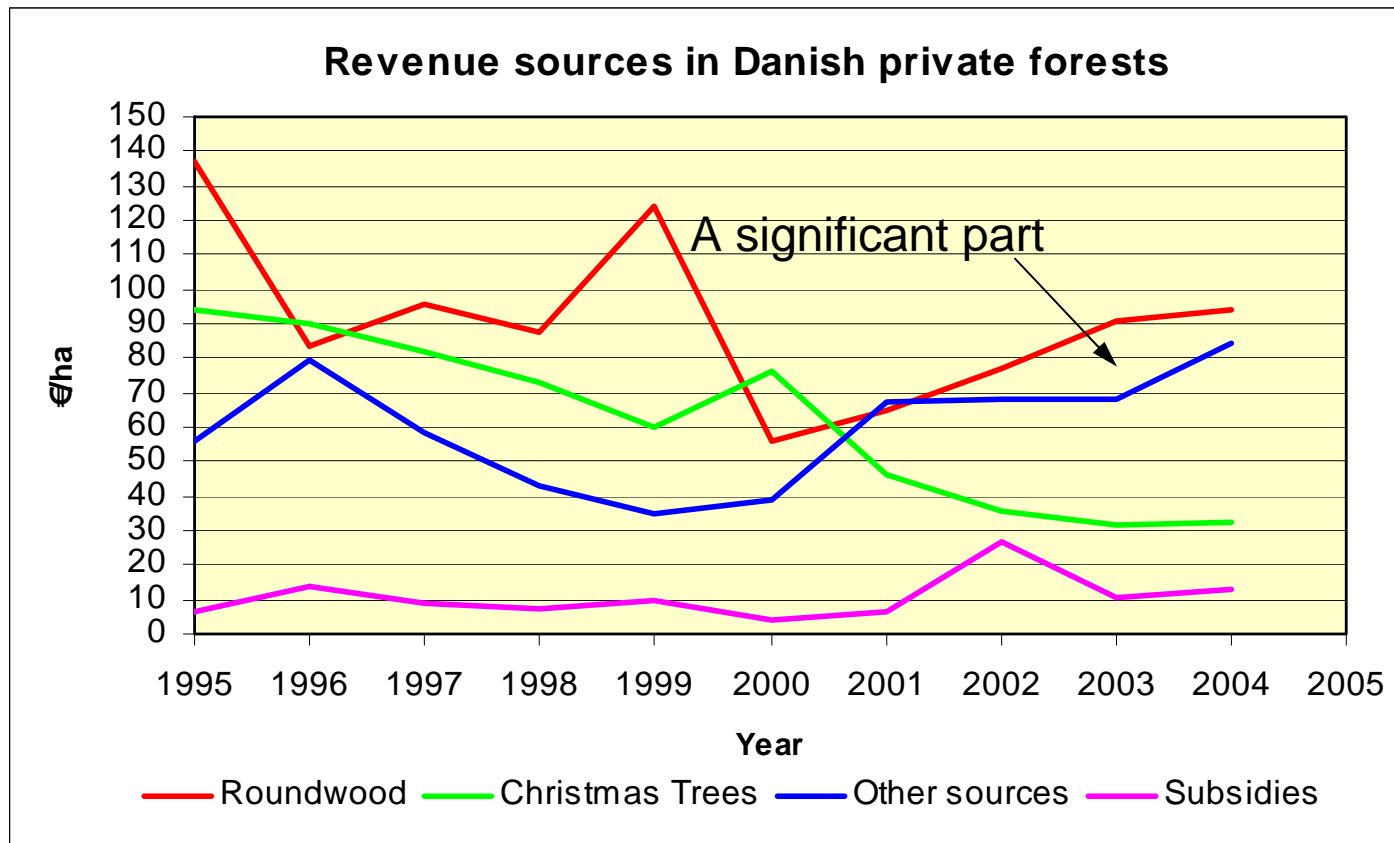
Estimating the value of the services

- Antropocentric perspective
- Held, assigned and felt values. All are values also in an economic sence. Central is trade-off's.
- In a narrow view, revenue is the value of forests:





Looking at the revenue sources in Danish private forests





Knowledge on different forest environmental services

-Carbon sequestration

- Traded and priced under the Kyoto Protocol and on the voluntary market
- Socio-economic estimation of long-term consequences of releasing C, i.e. damage assessment, and consideration of marginal influence

-Water

- Increasing examples of public-private and private-private markets
- WTP study illustrating the potential

- Biodiversity and habitat protection

- Mainly driven by public provision and public-private MBI's
- A few examples of private capital funds entering
- Quite some valuation studies made...



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The value of biodiversity

- Related to services biodiversity provides
- Related to the existence *per se*. The focus here



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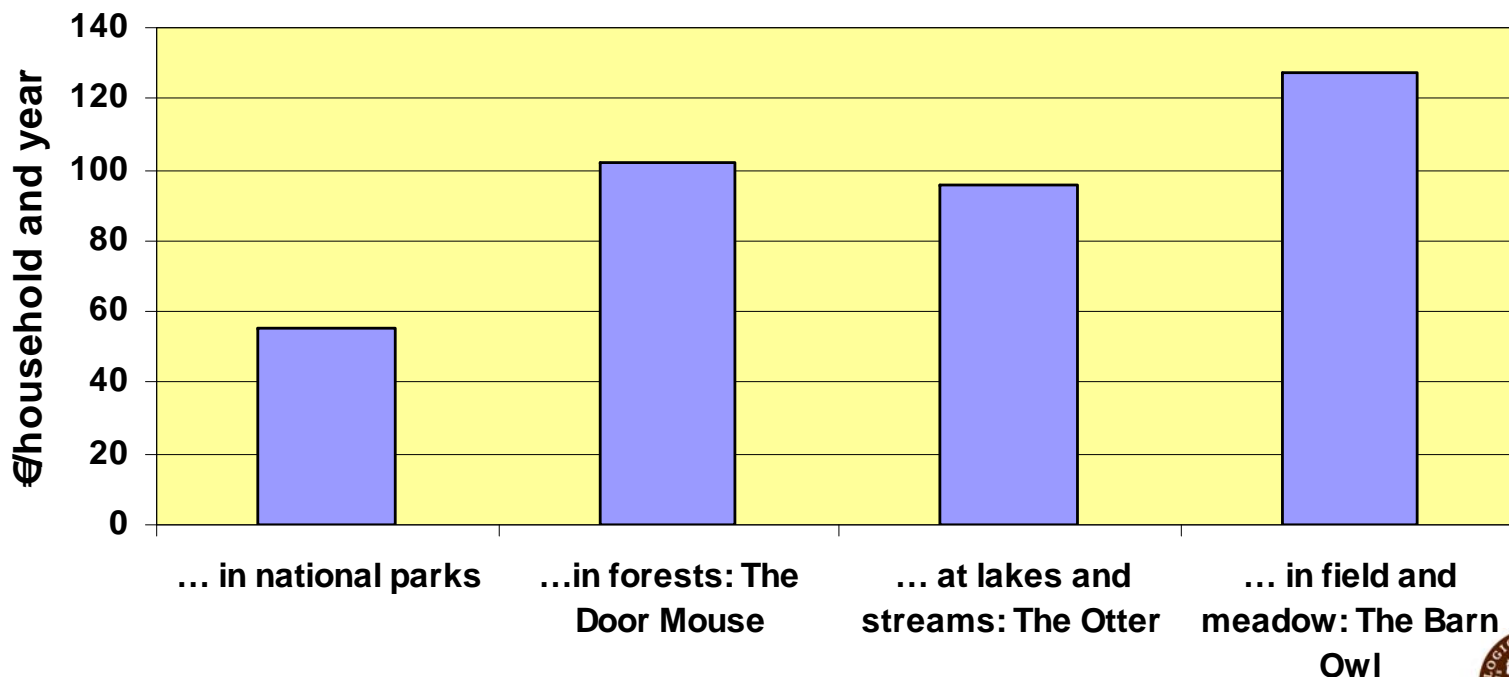


The value of protecting threatened species:

-Several studies, but usually addressing more than forests:



Willingness-to-pay for preserving threatened species:



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Jacobsen et al., 2006 and 2009; Jacobsen & Thorsen 2009



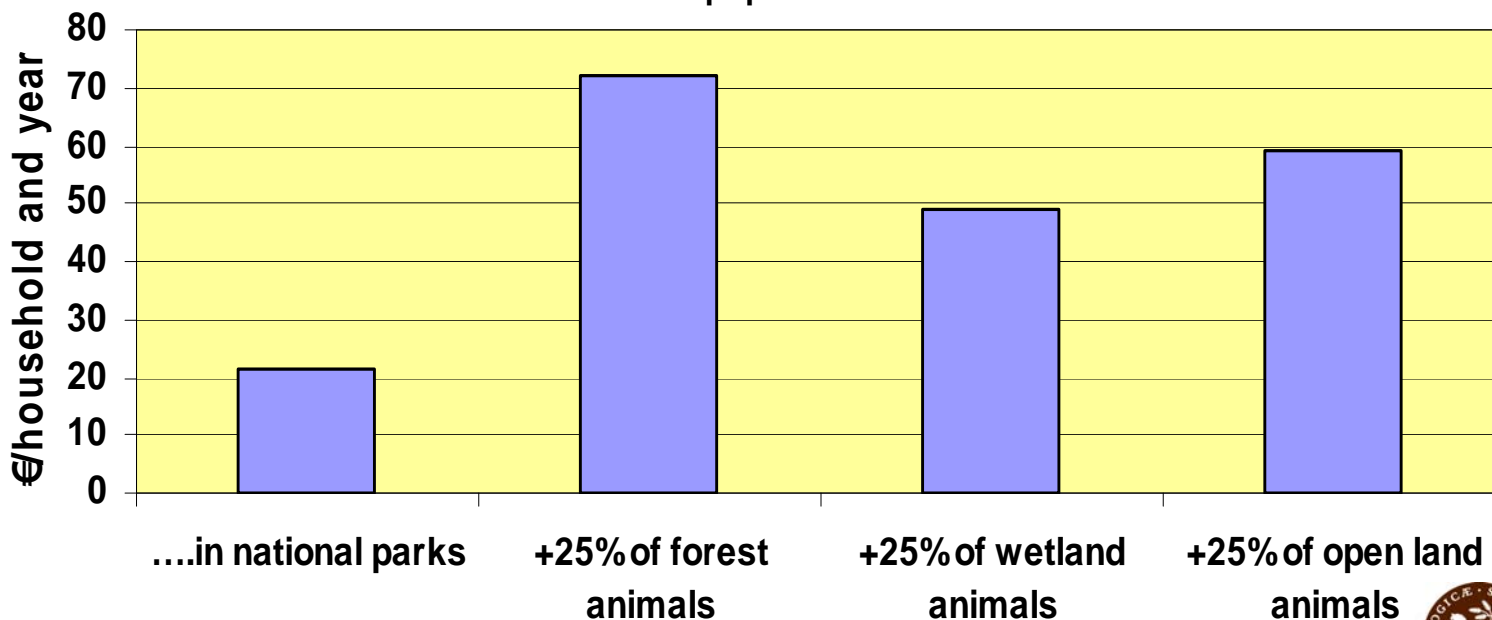


... habitat protection and general wildlife...

- ... for general habitat protection and wildlife, the numbers are usually somewhat lower, but still significant...



WTP for improved habitat protection
and increased populations of common wildlife



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Jacobsen et al., 2006 and 2009; Jacobsen & Thorsen 2009

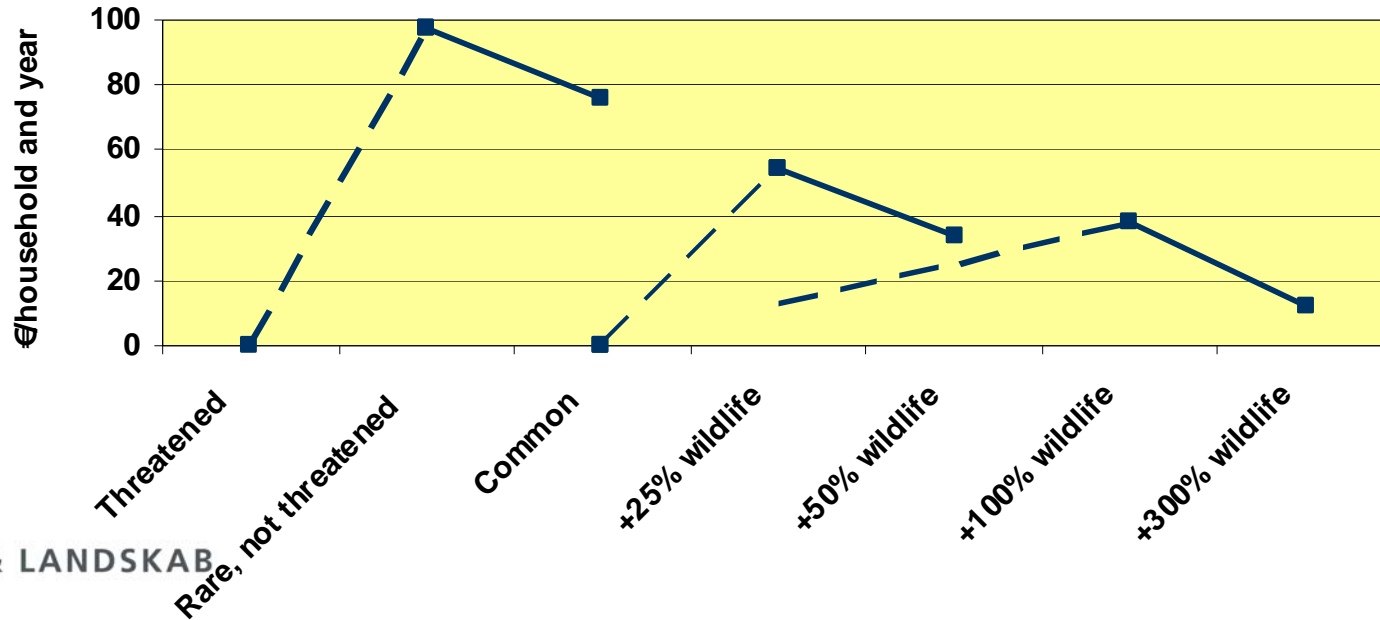




But this is a difficult issue...

- People feel strongly about preserving diversity and protecting nature
- But these questions are tough questions: To be or not to be?
- One could fear that people overstate their actual utility gain

WTP for population increases of threatened and common wildlife in a habitat (Jacobsen et al (2009) in prep)



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Nevertheless,

-Values are not totally unrealistic. E.g. we obtain stated WTP for recreational access in the surrounding of estimates of realised travelcosts



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A “helicopter estimate” at the value of biodiversity preservation...

In Denmark, forest habitats are home to a dominant part of the threatened land-based species.

Some rough, conservative estimates based on several studies:

- Improved protection of threatened species would be worth 6-800 mill/€ annually to the Danish people

- An improved protection of the general nature and wildlife would be worth 4-550 mill/€ annually to the Danish people



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So a help for decision makers, but

-Does not replace political decisions, like e.g. distribution

-This leads to the matter of problems in providing the 'optimal' social level of environmental services:

-Given that some people have the 'right' to a service or resource

-More and more: Market based instruments (MBI)

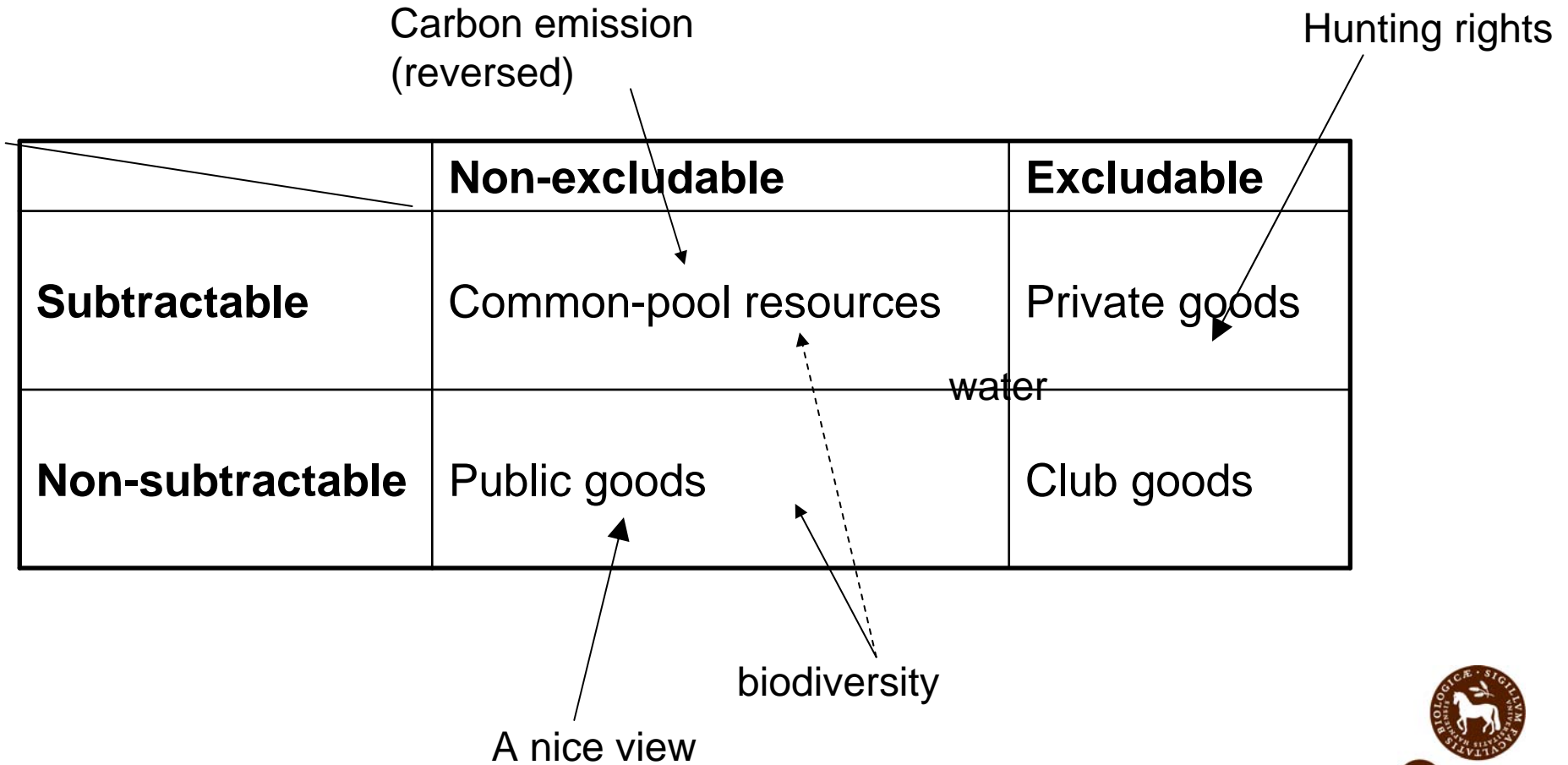


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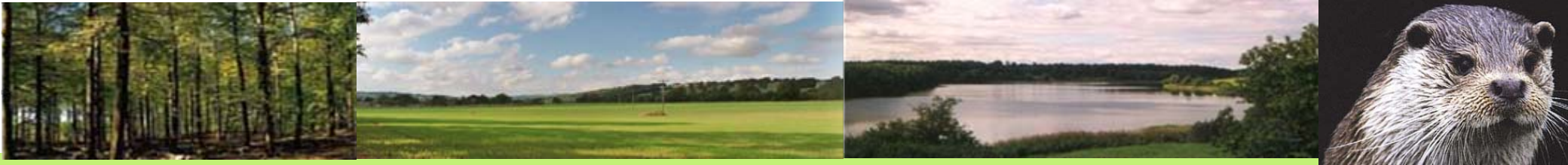


Frame conditions – rights and the nature of goods:



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Carbon sequestration

- Trade with carbon: Only if *extra* sequestration as compared to BAU
- Currently in DK only counted in afforestation
- Expected to be changed, let's see after December
- In the voluntary market wider range, example, changed FM in the tropics may offset cost of RIL



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MBI's in use for preserving the groundwater...

- There is a huge spatial variation in the available clean ground water resource.
- Where the resource is scarce we have seen different instruments being used.

Private-to-private:

- Private water providers pays forest owners for changing forest management to preserve groundwater quality – few examples, some at 100 €/ha and year
- Private bottled-water companies have their wells on forest land, few examples

Public-to-private:

- Public water providers have also paid forest owners for changing forest management to preserve groundwater quality – few examples
- Public water providers engage in large scale afforestation projects on top of watersheds – several examples



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MBI's in use to preserve forest habitats and biodiversity...

Public-to-private payments:

- The Danish private forest sector receives ca. 10 -15 €/ha in subsidies and support for specific mgt. changes aimed at environmental services and habitat protection
- These include: Changing species to native ones, setting a side forest as nature reserves, habitat protection, the use of env. friendly silvicultural techniques, etc.
- Several of these instruments are related to the EU-policies.

Public-to-public

- Public ownership and provision is sometimes a tool used deliberately to increase preservation efforts
- Recently 100-200 mill. € have been set aside for specific large-scale restoration projects



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MBI's in use to preserve forest habitats and biodiversity...

Private-to-private payments:

- In recent years, some large capital funds have started to buy up nature areas and forested land with the specific aim to enhance habitat and wildlife protection.
- Apart from that, more than 400.000 Danes have a membership in one of the five main NGO's fighting for wildlife and nature preservation

Private-to-public payments:

- Fees for hunting and fishing licences are in place. Funds are channelled back to preservation, restoration, monitoring and R&D
- Taxes on pesticides, N etc works towards forest biodiversity and groundwater



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So to conclude:

- The conference has shown the potential for environmental services from forests
- Economics can be used for assigning values to these services, in order to:
 - Emphasize the value of non-marketed goods
 - Make trade-offs between the provision of different services
 - Create instruments for provision of the services



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