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biodiversa

Forest in rural landscape – a multi-service provider and/or the harbour of biodiversity

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smallFOREST

TIPPUDE TIPPKESKUS ECOLCHANGE CENTRE OF EXCELLENCE

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Potential present of biodiversity

Without humans

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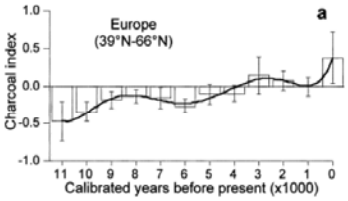
Real history with humans

Post-glacial immigration human migration and interference

- Habitat disturbance, or mostly, destruction
- Novel habitats
- Species extinction and immigration



(Carcaillet et al. 2002)

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Loss of forests

900a 1900a

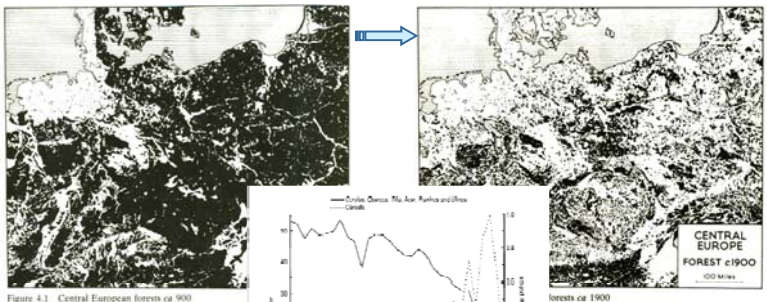

Figure 4.1 Central European forests ca 900

forests ca 1900

(Grigg 1987)

South-Sweden

(Lindbladh et al. 2000)

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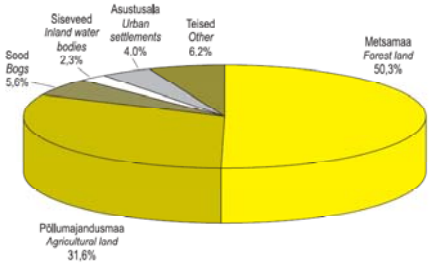
Estonian forest

Forest land (48-52%)

Within that:

- All deciduous (37.4%)
- Broad-leaved (3 - 5%)
- Natural-looking (1- 3.5%)



(Adermann, Estonian Forest 2009, 2011)

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Ecosystem services

Alternative – spatial def

- Global (non-proximal) services
- Local (proximal) services
- *In situ* services
- Directional (flow related)services
- User-movement related services

(Constanza et al. 2008)

Disservices?!

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Services provided by forest

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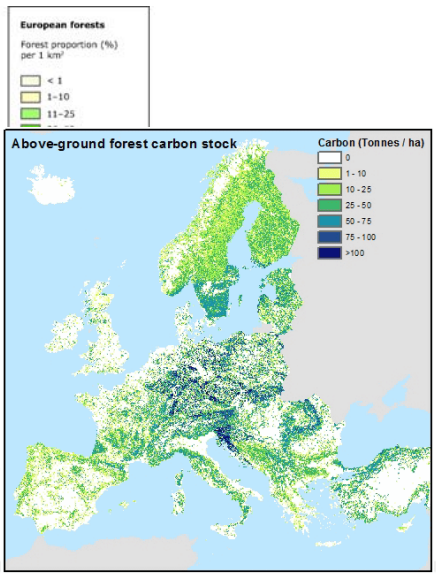
C-stock, but …



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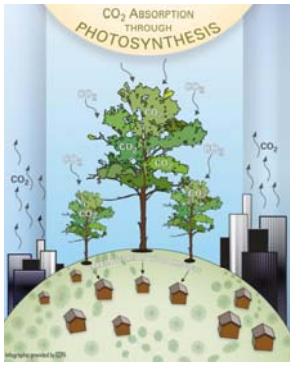
… but there is a C-cycle



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Provision

Allium ursinum

Laurus nobilis

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Cultural

Ivan Shishkin (1889)
Konstantin Savitsky
"Morning in
a pine forest"

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European network research project (ERA-net) 2012-2014 - Biodiversa project smallFOREST

- To characterize and quantify, but also link, biodiversity and ecosystem services of small forest fragments in agricultural landscapes of temperate Europe
- Interpretation - Multiservice value
- Quantify the relative importance of drivers

As biodiversity and services of large forests are well studied

http://www.biodiversa.org/119
https://www.u-picardie.fr/smallforest/

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Mid-field forests

For what?

- Leftovers
- Biodiversity harbors
- Service or Disservice providers
- Landscape greening vs obstacles

(Decocq et al. 2016)
http://dx.doi.org/10.1007/s40725-016-0028-x

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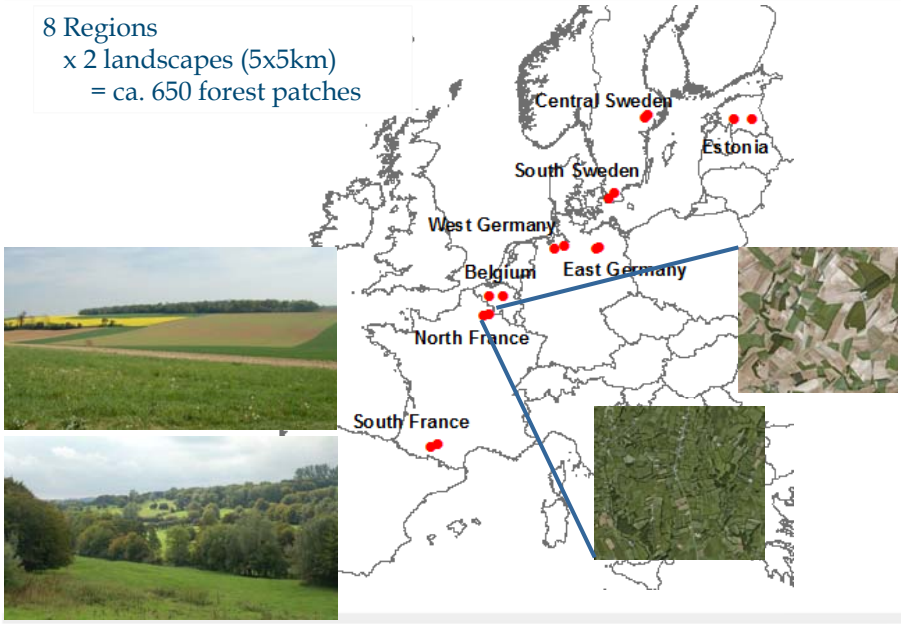
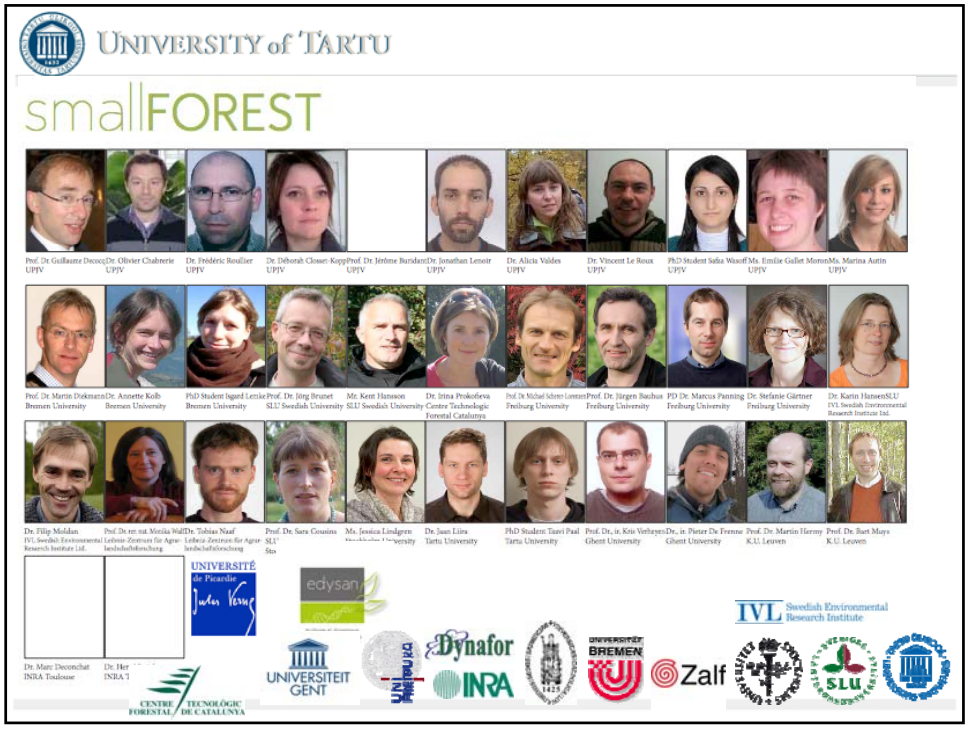
8 Regions
x 2 landscapes (5x5km)
= ca. 650 forest patches





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Ecosystem service

ES = f(Habitat Q; landscape Q; global C;+?BDiversity)

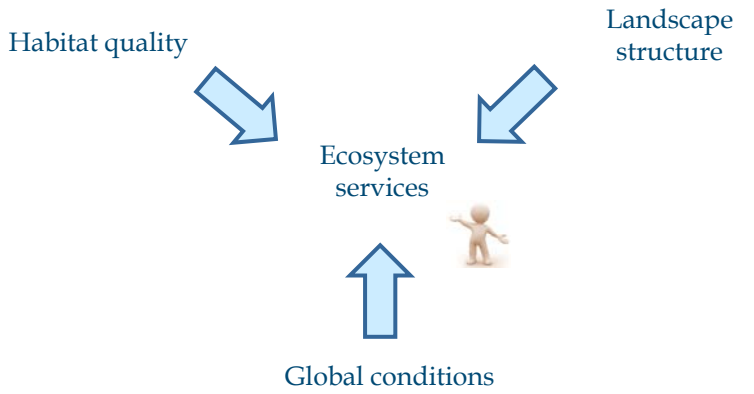
Habitat Q = f (history; management; size; environment; struct.heterogeneity)

Landscape Q = (Matrix; connectivity)

Global C =f(Lat-long; climate)

(Decocq et al. 2016)
http://dx.doi.org/10.1007/s40725-016-0028-x

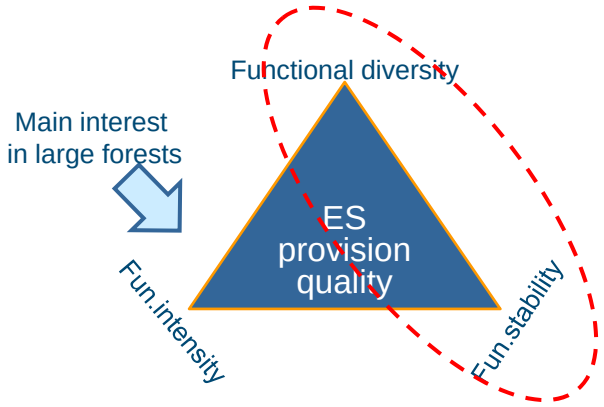
Ecosystem service – scale!



+ Biodiversity of all scales

Service quality

Biodiversity- vs functional trait-based properties



(Kütt et al. 2016)

http://dx.doi.org/10.1016/j.ecolind.2016.06.009

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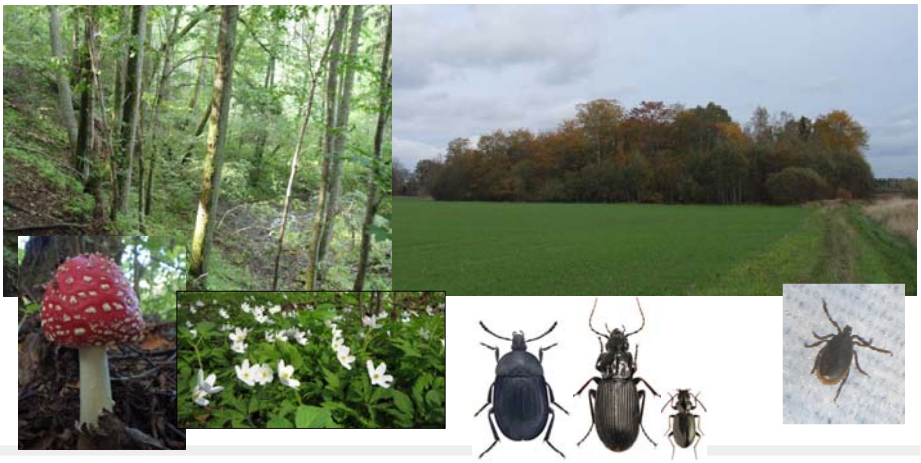
Forest patch properties

Forest core & edge

Ancient & Recent habitat



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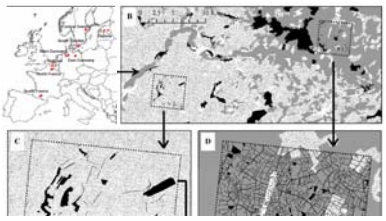
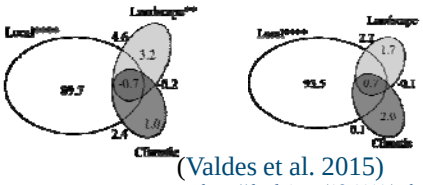
Forest plant biodiversity



Richness

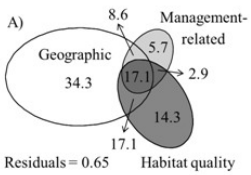
Forest specialists

Forest generalists



(Valdes et al. 2015)
http://dx.doi.org/10.1111/geb.12345

Composition



(Valdes et al. subm)

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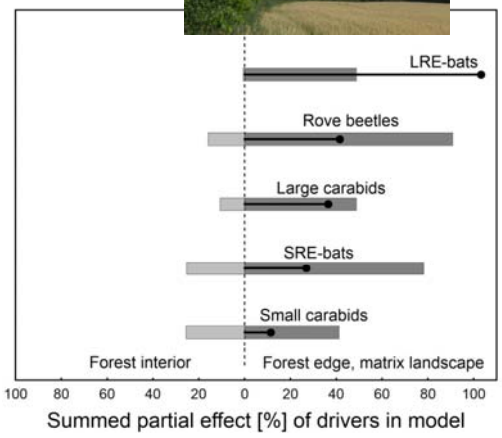
Biocontrol

Abundance of biocontrol groups

Rauno Kalda



(Kalda et al. Submitted)
+ http://dx.doi.org/10.1016/j.agee.2014.08.028

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Disservice

Ticks (*Ixodes ricinus*) abundance

e.g.
Tree-litter
Str-diversity
Seed prod.

(Ehrmann et al. 2017)
https://doi.org/10.1186/s12898-017-0141-0

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Disservice

Scopse snail (*Arianta arbustorum*)
=> Too many!

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https://www.etis.ee/Portal/Persons/Display/4955e43c-8178-4e59-995f-8eedffaff192?tabId=CV_ENG&lang=ENG