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biodiversa



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

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smallFOREST



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Potential present of biodiversity



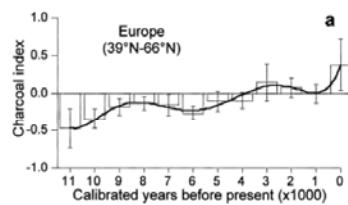
Without humans



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)



Loss of forests

900a

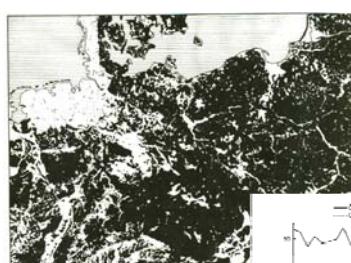
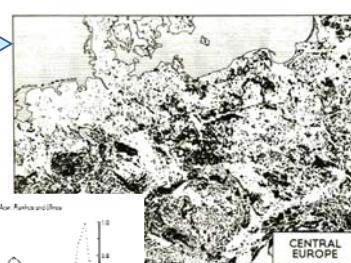
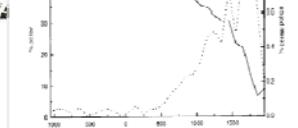


Figure 4.1 Central European forests ca 900.

1900a



(Grigg 1987)

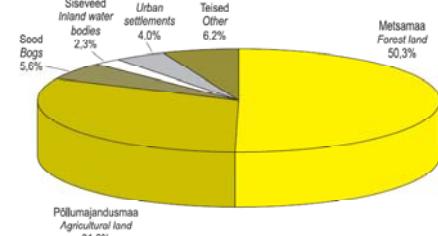


(Lindbladh et al. 2000)



Estonian forest

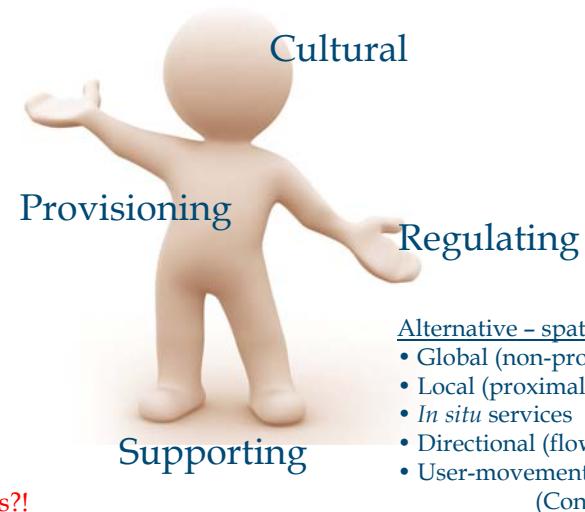
Forest land (48-52%)



(Adermann, Estonian Forest 2009, 2011)



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)



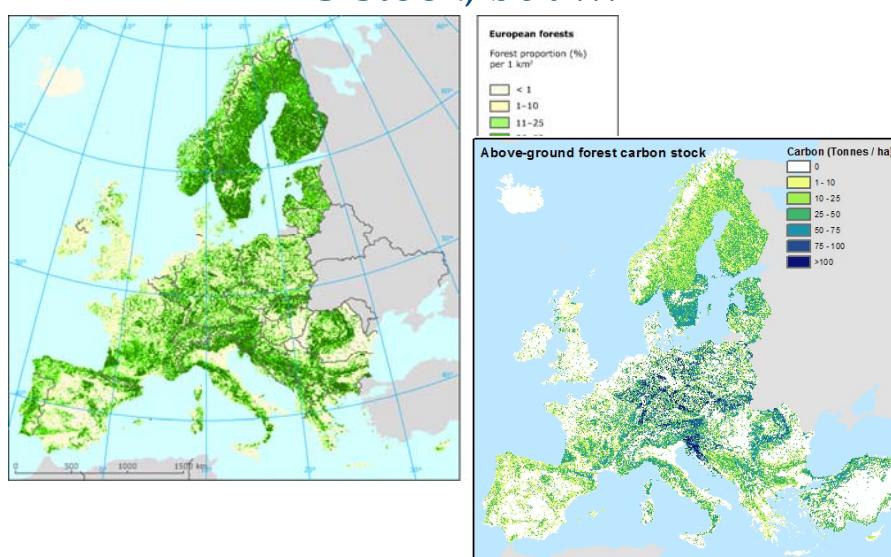
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Services provided by forest



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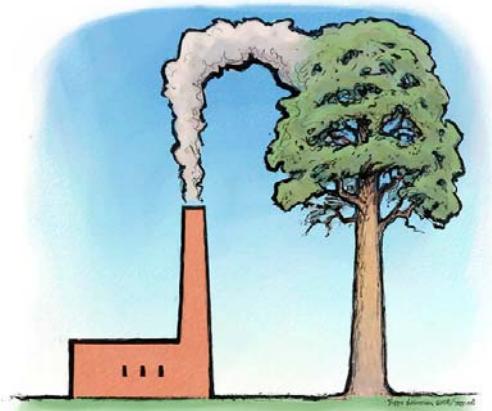
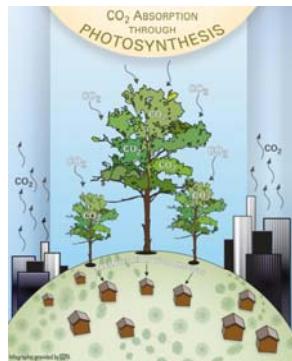
C-stock, but ...





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... but there is a C-cycle

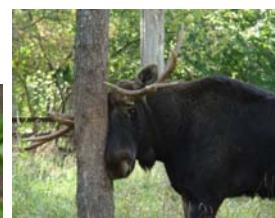


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Provision



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/>



Mid-field forests

For what?

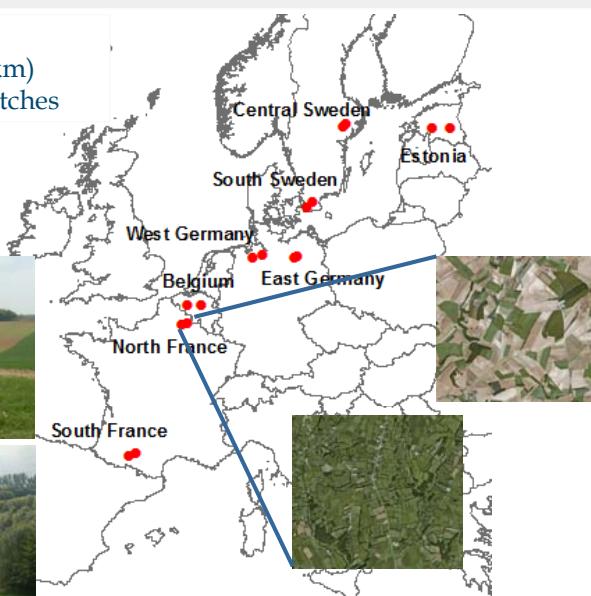
- Leftovers
- Biodiversity harbors
- Service or Disservice providers
- Landscape greening vs obstacles



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



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



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Small portraits of researchers:

- Prof. Dr. Guillaume Decocq (UPV)
- Dr. Olivier Chabotie
- Dr. Frédéric Resiller (UPV)
- Dr. Deborah Cloosterman-Kopp (UPV)
- Dr. Jérôme Burdane (UPV)
- Dr. Jonathan Lemire (UPV)
- Dr. Alicia Valdes (UPV)
- Dr. Vincent Le Roux (UPV)
- PhD Student Sihla Wassef (UPV)
- Ms. Emilia Gallet Moreno (UPV)
- Marina Austin (UPV)
- Prof. Dr. Martin Dokken (Bremen University)
- Dr. Anette Kobb (Bremen University)
- PhD Student Iogard Lense (Bremen University)
- Prof. Dr. Jörg Bräuer (SLU Swedish University)
- Mr. Kent Hansson (SLU Swedish University)
- Dr. Irina Prokofeva (Centre Technologie Forestal Catalunya)
- Inst. Dr. Michael Schenck (Freiburg University)
- Prof. Dr. Jürgen Bachus (Freiburg University)
- PD Dr. Marcus Panning (Freiburg University)
- Dr. Stefanie Gartner (Freiburg University)
- Dr. Karin Hansen (SLU IVL Swedish Environmental Research Institute Ltd.)
- Dr. Philip Moldan (IVL Swedish Environmental Research Institute Ltd.)
- Prof. Dr. em. Dr. Monika Wall (Leibniz-Zentrum für Agrar- und Umweltforschung)
- Dr. Tobias Neufeld (Leibniz-Zentrum für Agrar- und Umweltforschung)
- Prof. Dr. Sara Cousin (SLU Swedish University)
- Ms. Jessica Lindgren (SLU Swedish University)
- Dr. Juan Liira (Tartu University)
- PhD Student Taavi Paul (Ghent University)
- Prof. Dr. ir. Kris Verheyen (Ghent University)
- Dr. Pieter De Frenne (Ghent University)
- Prof. Dr. Martin Hermy (K.U. Leuven)
- Prof. Dr. Baet Mays (K.U. Leuven)
- Dr. Marc Decocq (INRA Toulouse)
- Dr. Hervé (INRA Toulouse)
- UNIVERSITÉ de Picardie Jules Verne
- edysan
- UNIVERSITEIT GENT
- UNIVERSITY OF BRISTOL
- Dynafor
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Ecosystem service

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

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

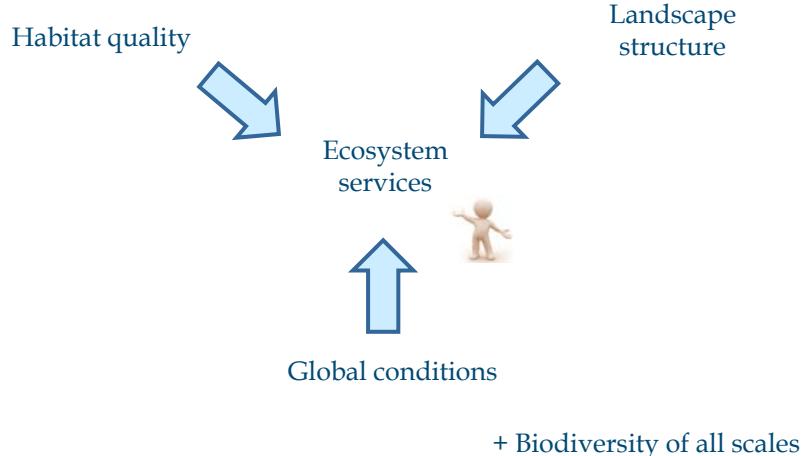
Landscape Q = (Matrix; connectivity)

Global C =f(Lat-long; climate)

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

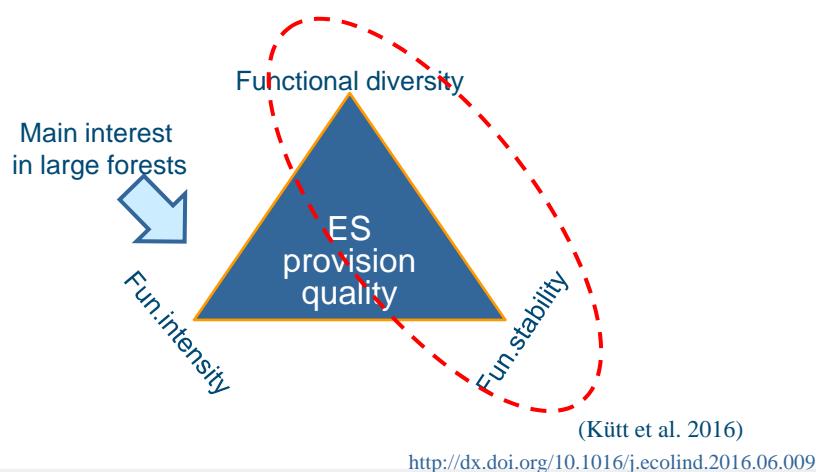


Ecosystem service – scale!



Service quality

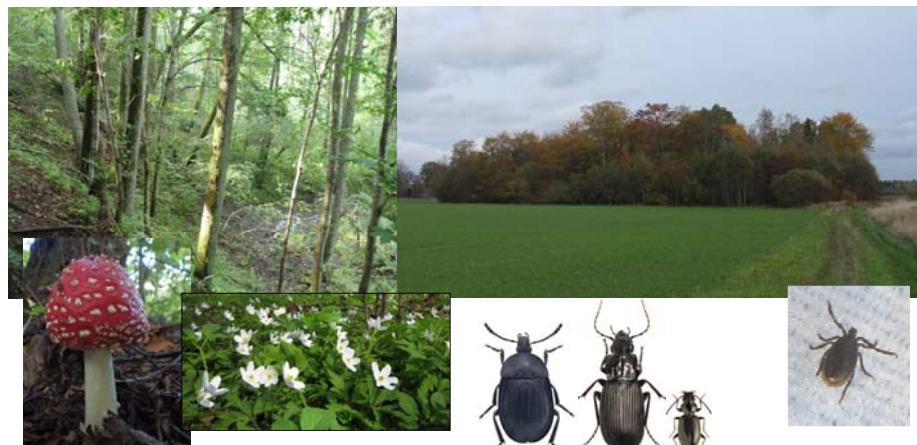
Biodiversity- vs functional trait-based properties





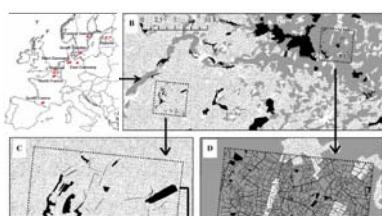
Forest patch properties

Forest core & edge
Ancient & Recent habitat



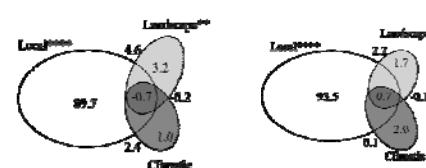
Forest plant biodiversity

Richness



Forest specialists

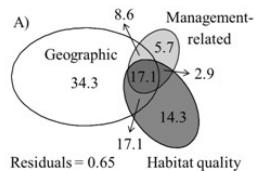
Forest generalists



(Valdes et al. 2015)

<http://dx.doi.org/10.1111/geb.12345>

Composition



(Valdes et al. subm)

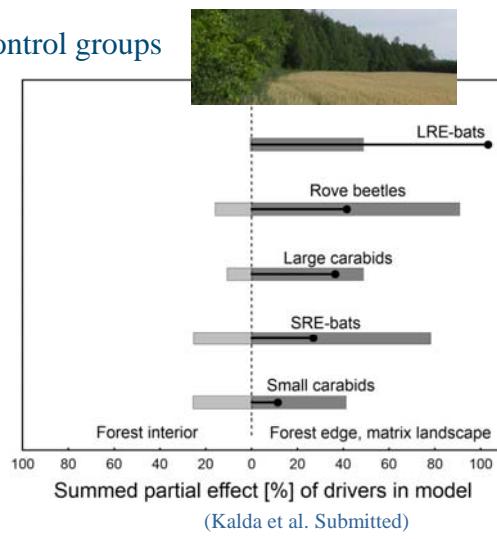


Biocontrol

Abundance of biocontrol groups



Rauno Kalda

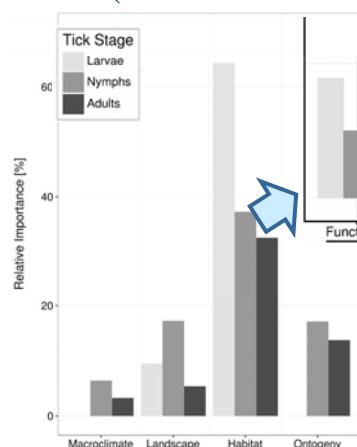


(Kalda et al. Submitted)
+ <http://dx.doi.org/10.1016/j.agee.2014.08.028>

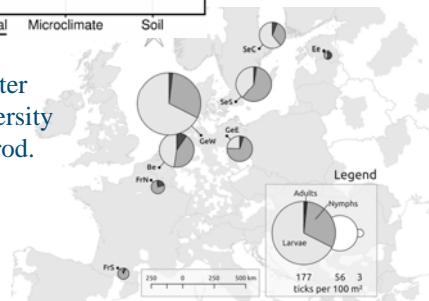


Disservice

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!



Oliver Kalda

Taavi Paal



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