

Measuring spatial structure and its effects on biodiversity in Finland

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METLA

Outline

- Changes in the species abundances in Finland
- Changes in the forest structure
- Species habitat requirements and availability of suitable habitat patches
- Ongoing projects & future plans



Material and Methods

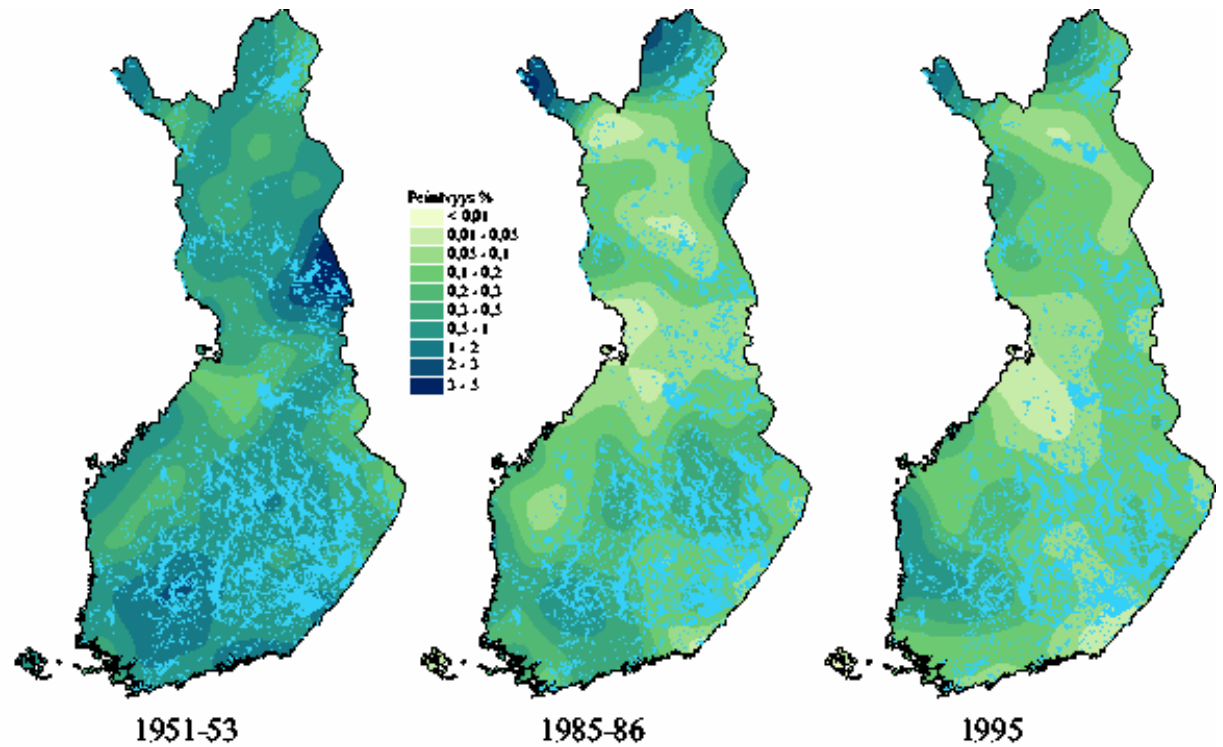


Nationwide vegetation data collected in the National Forest Inventories on years 1951-53, 1985-86, and 1995



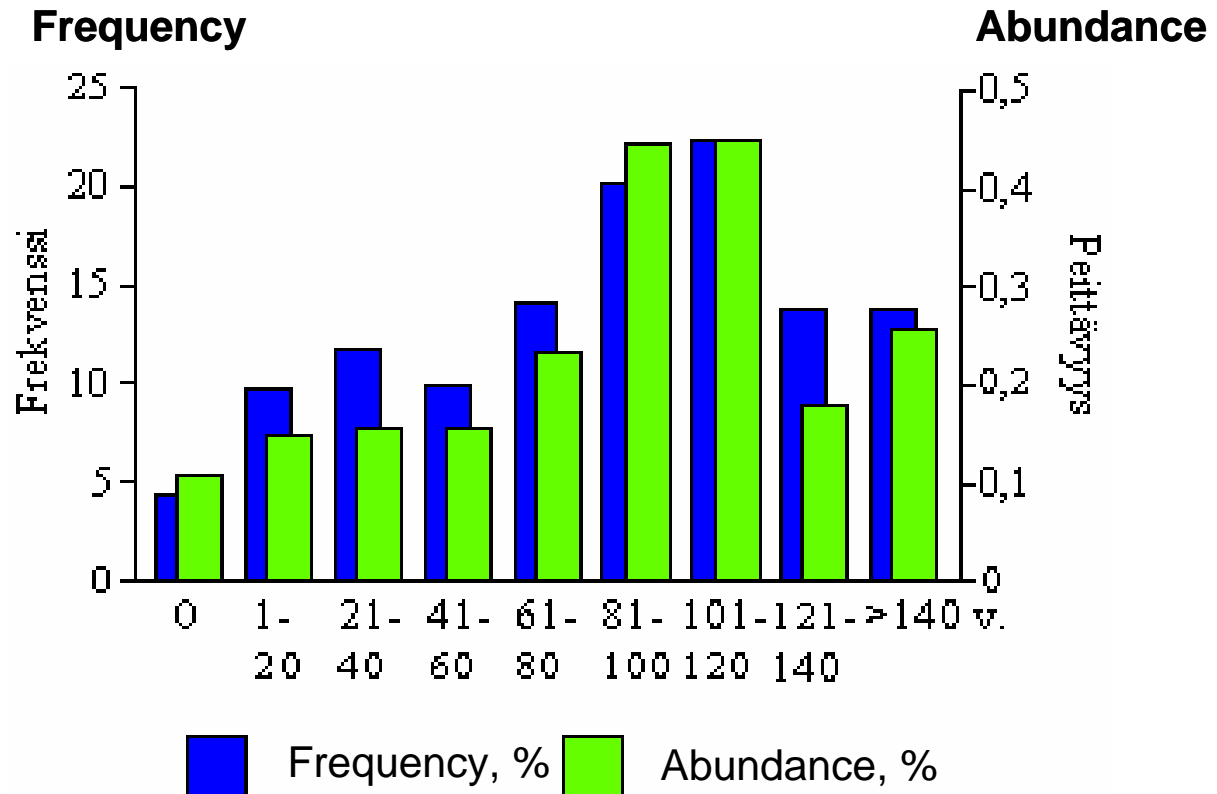


Abundance of *Linnaea borealis*



Source: Reinikainen, Mäkipää et al. (eds). 2000. Kasvit muuttuvassa metsäluonnossa. Tammi.

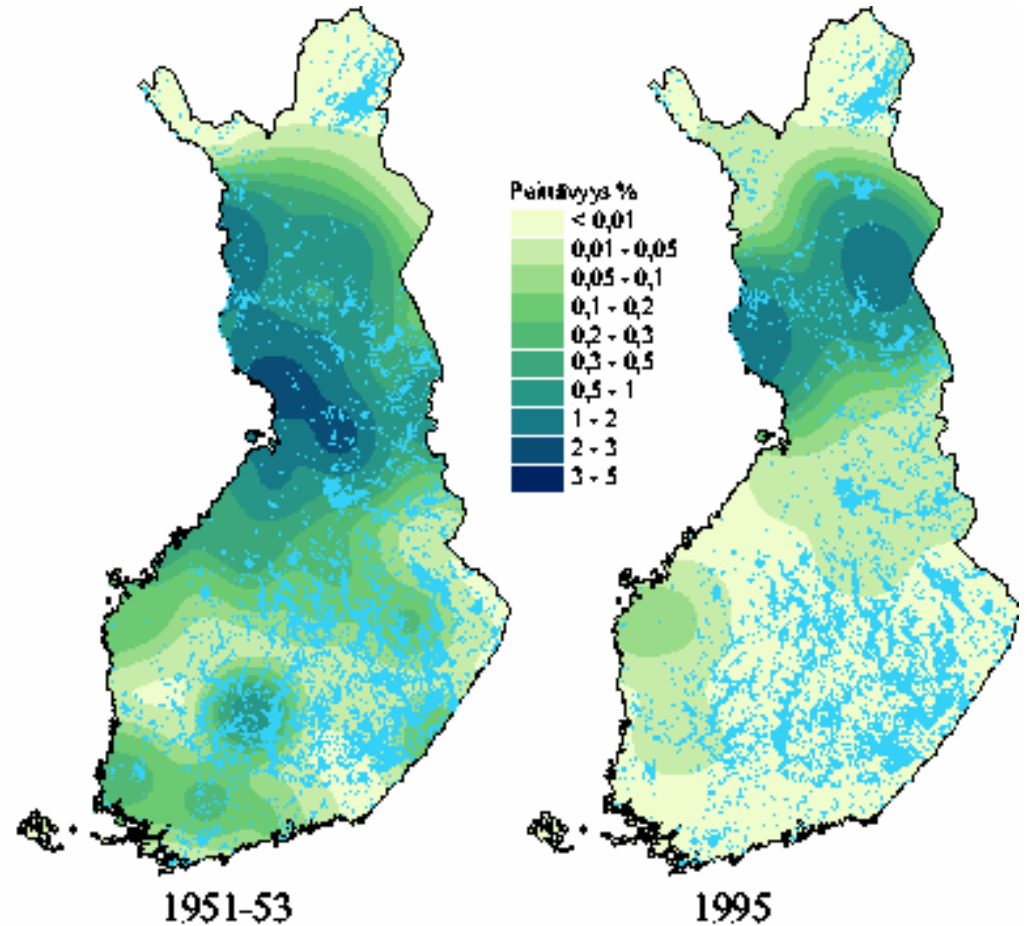
Linnaea borealis by stand age class



Source: Reinikainen, Mäkipää et al. (eds). 2000. Kasvit muuttuvassa metsäluonnossa. Tammi.

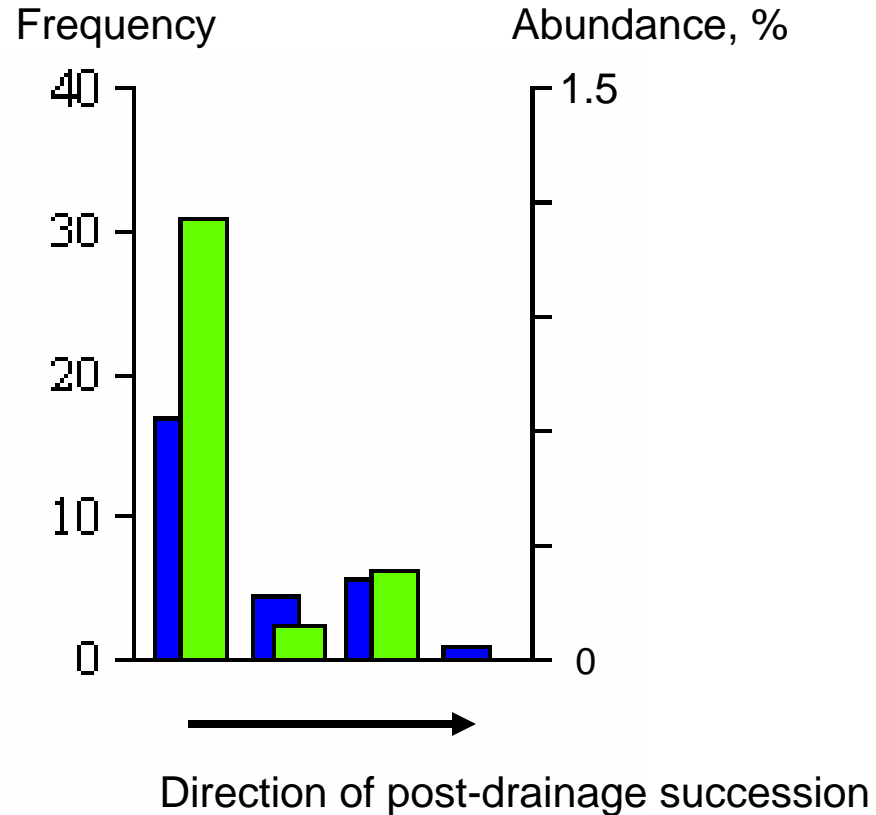


Abundance of *Menyanthes trifoliata*



Source: Reinikainen, Mäkipää et al. (eds). 2000. Kasvit muuttuvassa metsäluonnossa. Tammi.

Menyanthes trifoliata on peatlands by post-drainage succession stage



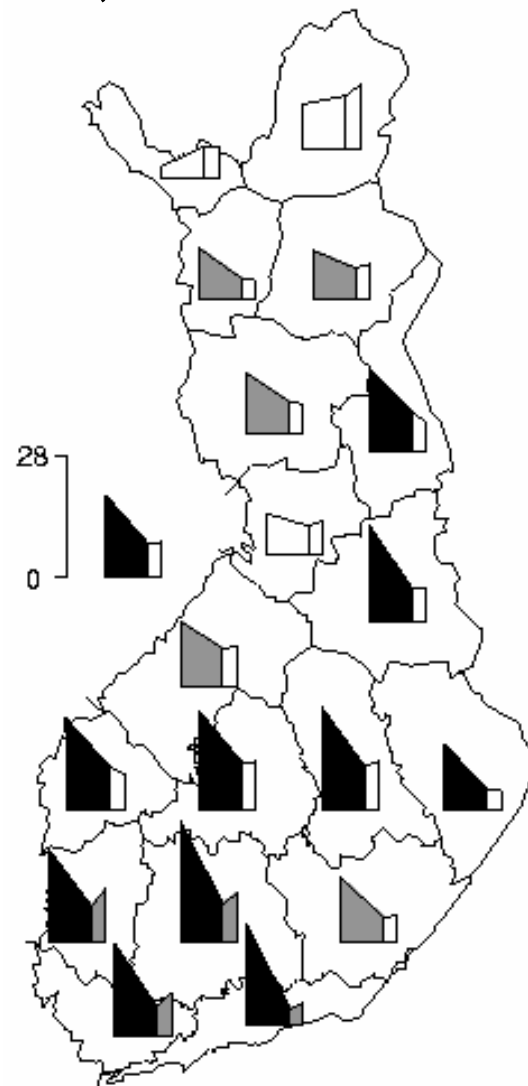
Frequency, %

Abundance, %

Relative abundance of *Hylocomium splendens* by biogeographical provinces in 1951-53, 1985-86 and 1995

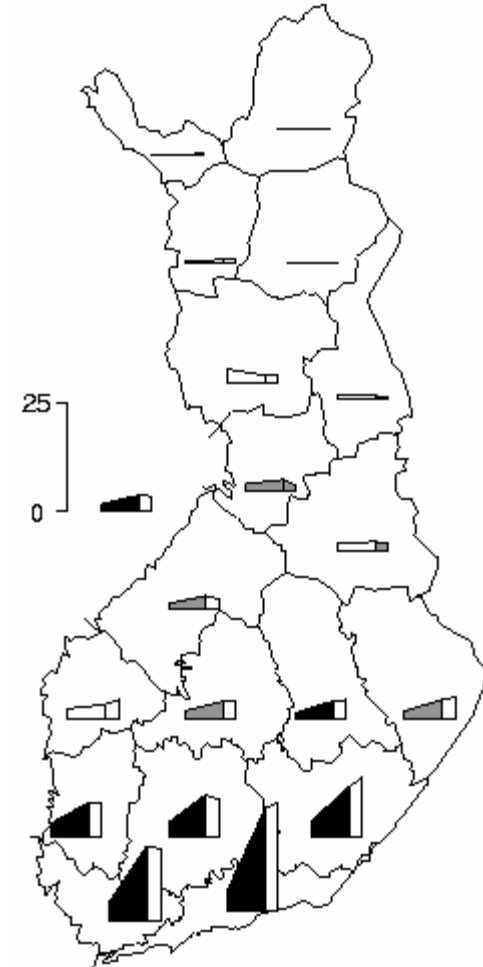


Significance of changes between the sampling occasions is indicated by dark/grey shading of the bar.



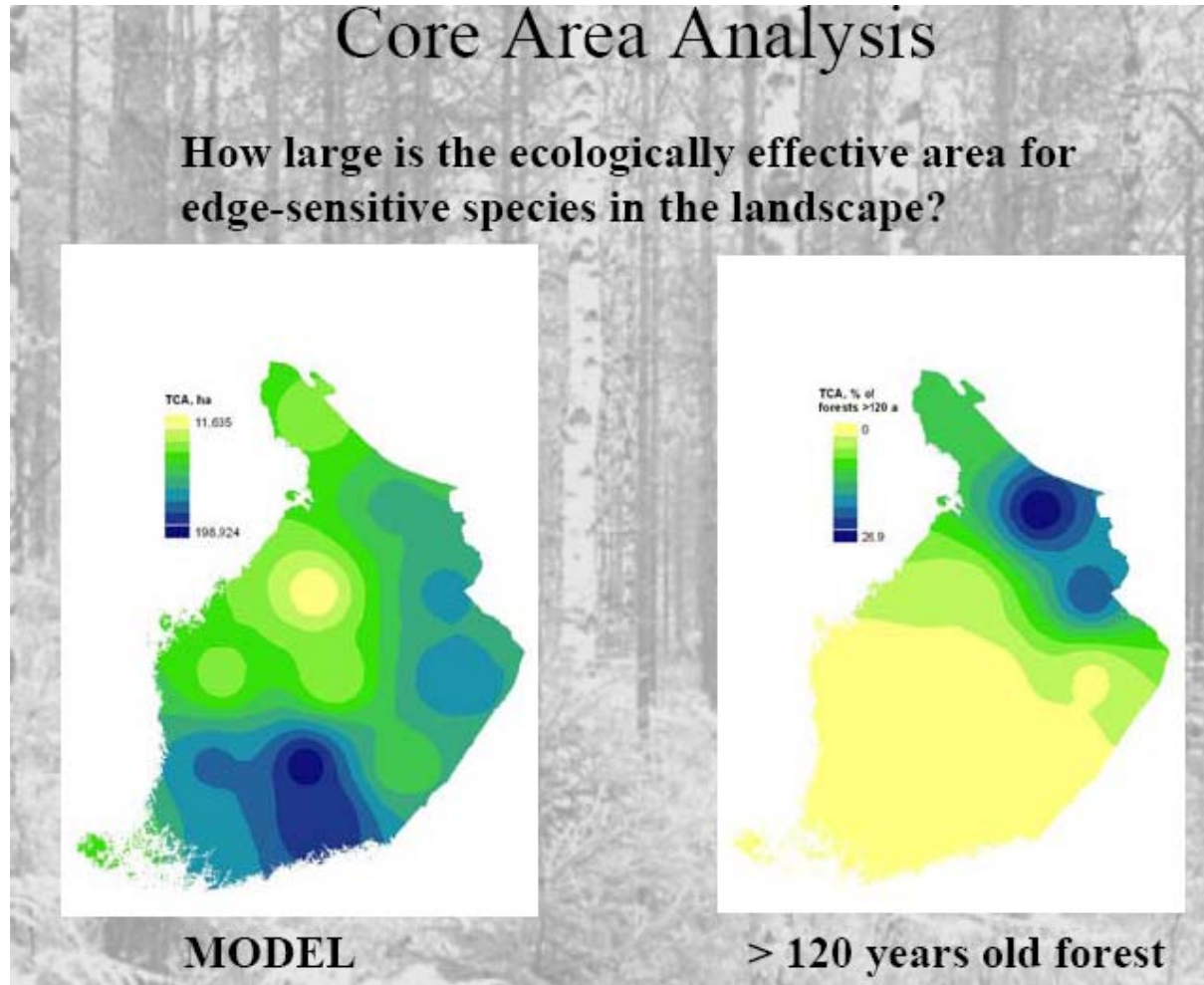
Source: Mäkipää & Heikkinen, 2003. JVS

Relative abundance of *Dicranum polysetum* by biogeographical provinces in 1951-53, 1985-86, and 1995



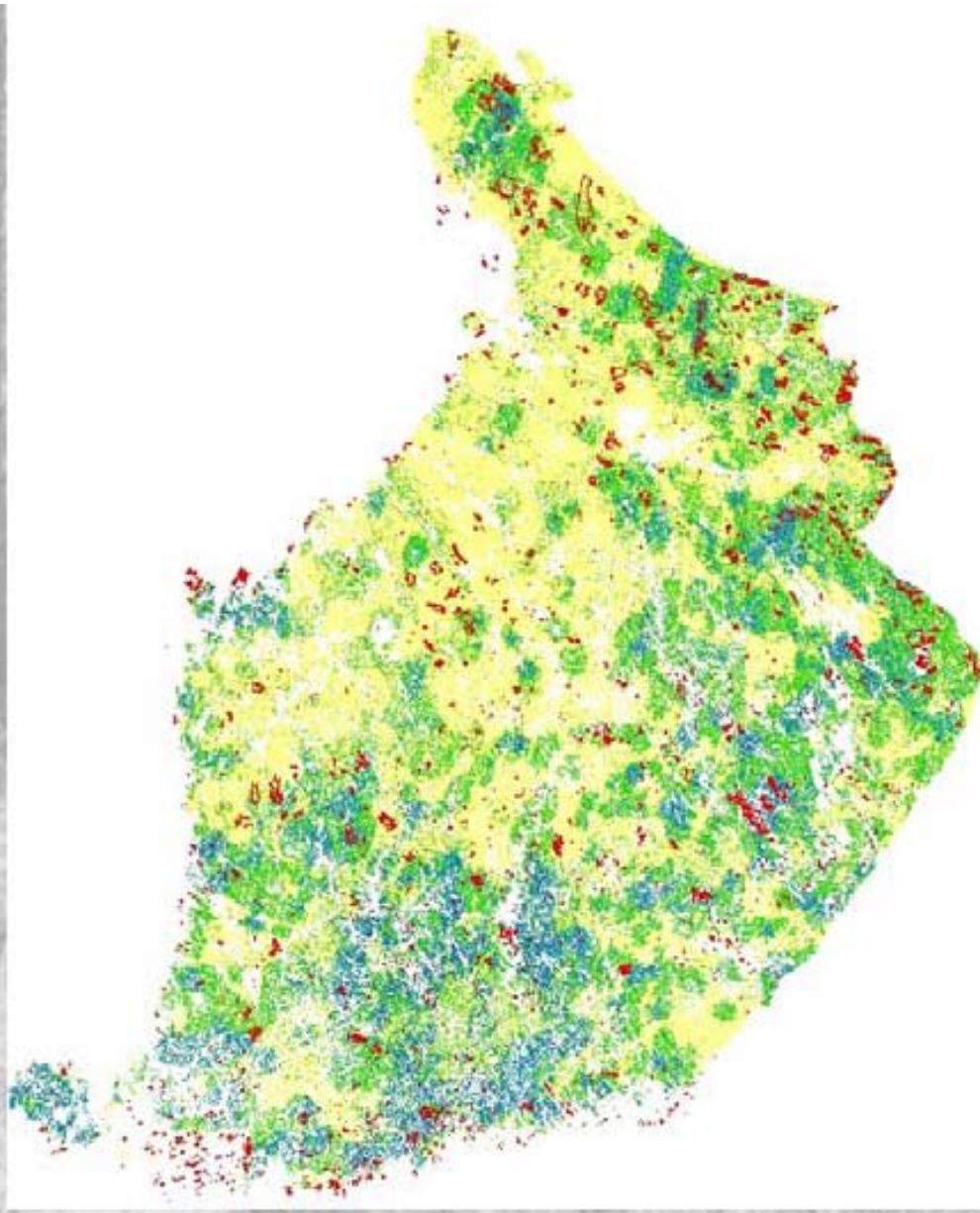
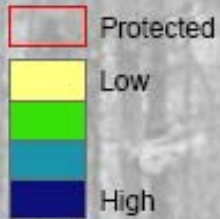
Source: Mäkipää & Heikkinen, 2003. JVS

Herb-richHabitat Quality Model



Source: Sandra Luque et al. PROHAB-project

Actual Protected areas and the model



Source: Sandra Luque et al. PROHAB-project

Habitat requirements (1)

Frequency of target species according to decay class

Phellinus nigrolimitatus, aarnikäöpä

Photo by Olli Manninen

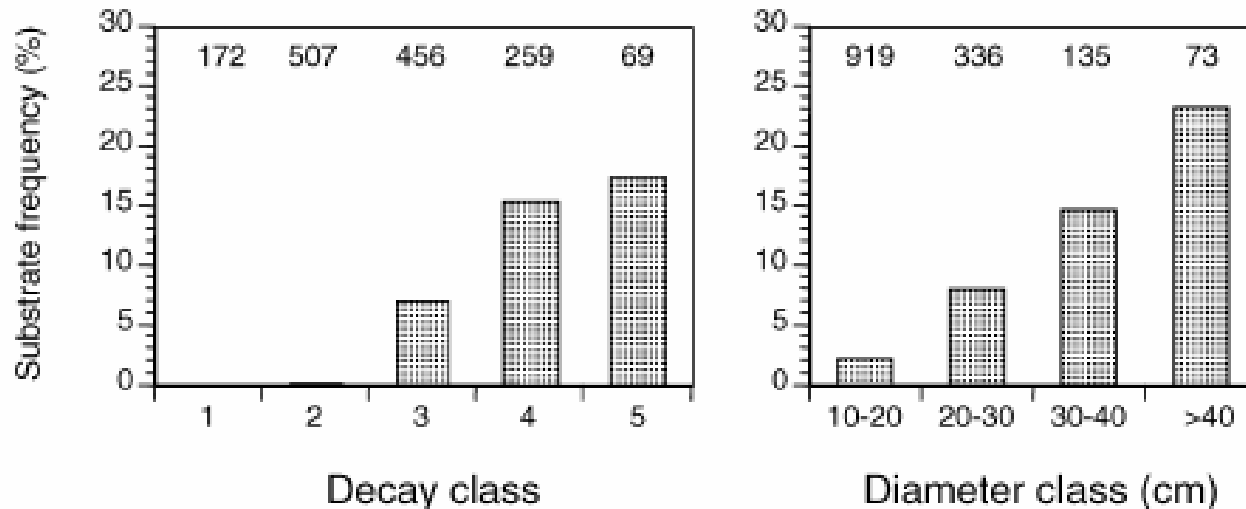
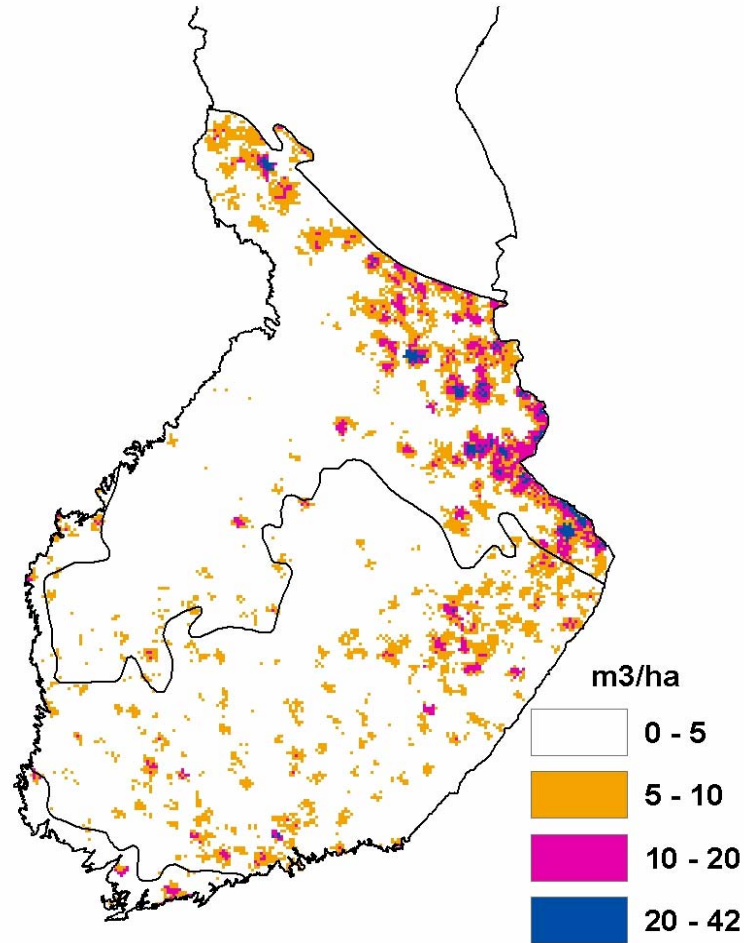


Fig. 1. Univariate frequency of *P. nigrolimitatus* on *P. abies* logs: (a) subdivided on different decay classes; (b) subdivided on different diameter classes. The number above each column indicates the number of investigated logs.

Source: Stokland et al 2004. For.Ecol. Management

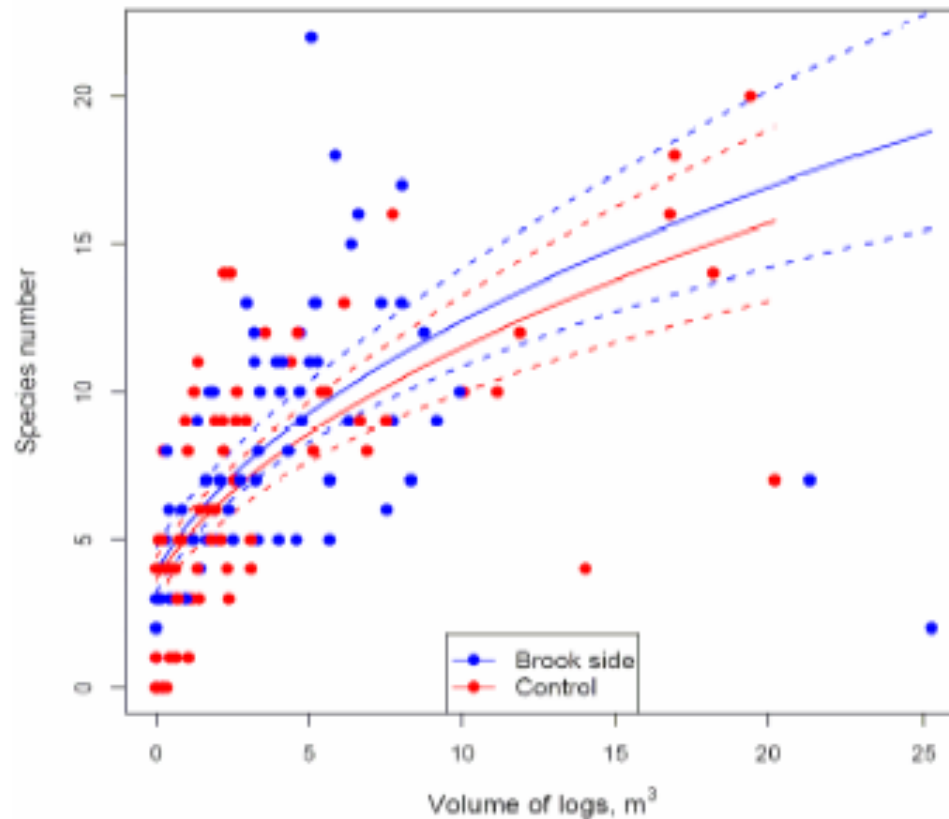
Resource availability: Amount of dead wood in Southern Finland

Kriging
interpolation
from 53 000
NFI plots



Source: Luque & Vainikainen, in press

Diversity of wood inhabiting species as a function of quantity of dead wood



Source: Metla

Siitonen & Hottola

...other driving factors, (i) quality of dead wood, (ii) diversity of dead wood, (iii) spatio-temporal continuation of dead wood resource, (iv) ???, to be studied.

Current projects and future plans

- To model habitat requirements of wood inhabiting fungi based on
 - observed fruiting bodies
 - fungi identified directly from dead wood samples by DNA amplification and sequencing
- To model dead wood dynamics in managed and unmanaged forests
- To analyse relationship between rate of decomposition and species diversity of wood decaying fungi
- To model spatial and temporal availability of suitable dead wood substrate
- To analyse population viability in fragmented landscape



Photo by Erkki Salo

Research team and collaborators

Research team, Finnish Forest Research Institute (METLA)

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- Mikko Peltoniemi
- Tiina Rajala
- Taina Pennanen
- Tapio Linkosalo
- Juha Siitonen



in co-operation with

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- Håkan Berglund, SLU, Sweden
- Sandra Luque, Cemagref, France
- Jari Liski, SYKE, Finland

Thank you for your attention



Photo: METLA/Erkki