Integrative Forest Management according to Pro Silva principles

„How to link forest yield with biodiversity support in an era of global climate change“

Tomáš Vrška

Wien, October 23rd, 2024


New Board of Prosilva elected


Guidelines on Closer-To-Nature Forest Management


Pro Silva Annual Meeting Slovakia 2024

- PRO SILVA is a European federation of foresters who advocate forest management based on natural processes.

- PROSILVA promotes forest management strategies which optimise the maintenance, conservation and utilisation of forest ecosystems in such a way that the ecological and socio-economic functions are sustainable and profitable.

We integrate:

- conservation of ecosystems, biodiversity
- protection of soil and climate
- production of timber and other products
- recreation, amenity, and cultural aspects

- More than 6000 members, practitioners dominates
- „Pro Silva is the club of dot-makers“

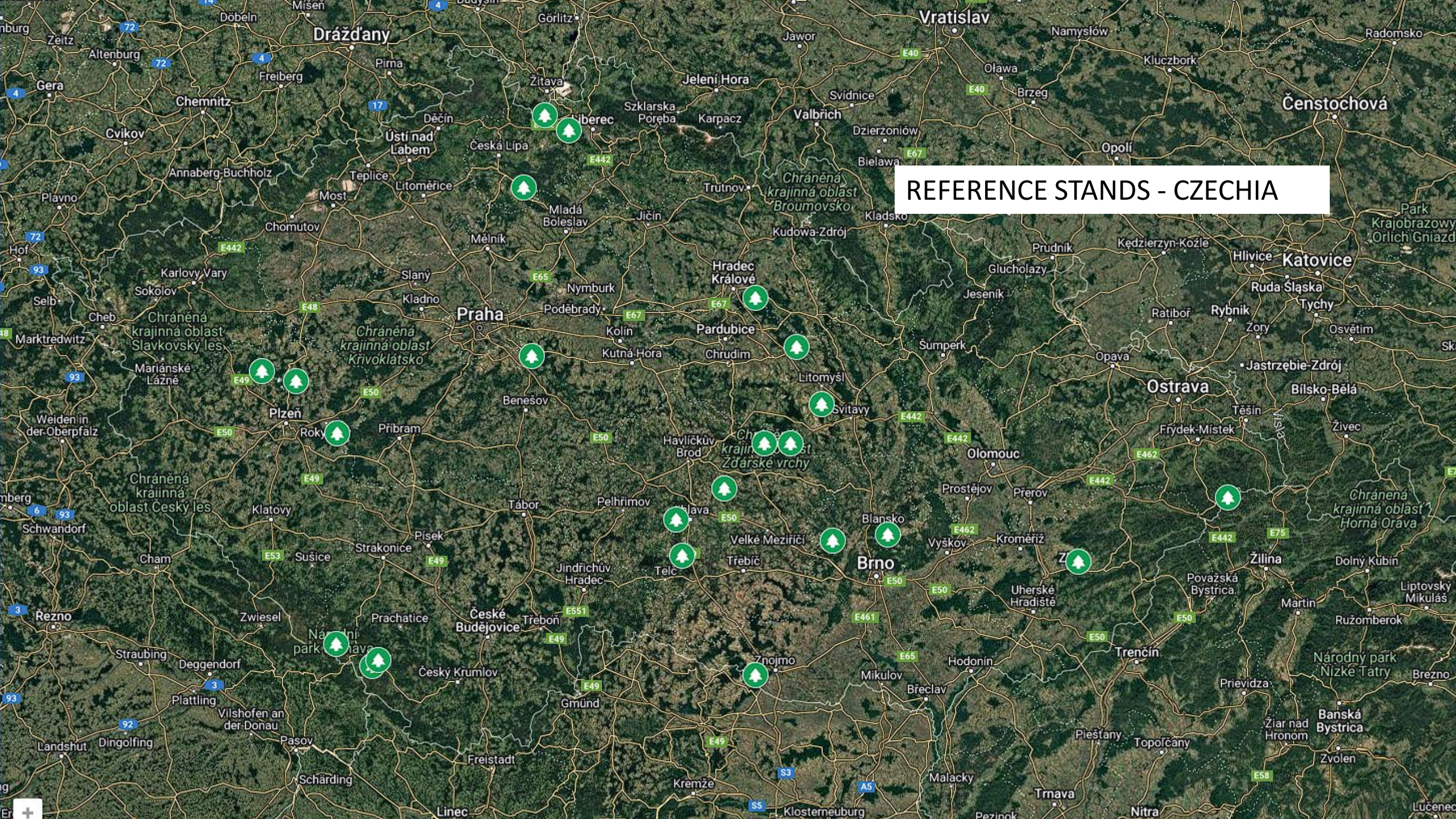
EDUCATION

- Exemplary Forests = 100 ha+
- Reference stands ´= 5 ha+
- Training plots – operational data, Martelloscopes
- combinations

ANW-Beispielbetriebe

EXEMPLARY FORESTS - GERMANY

Karte | Übersicht | Details

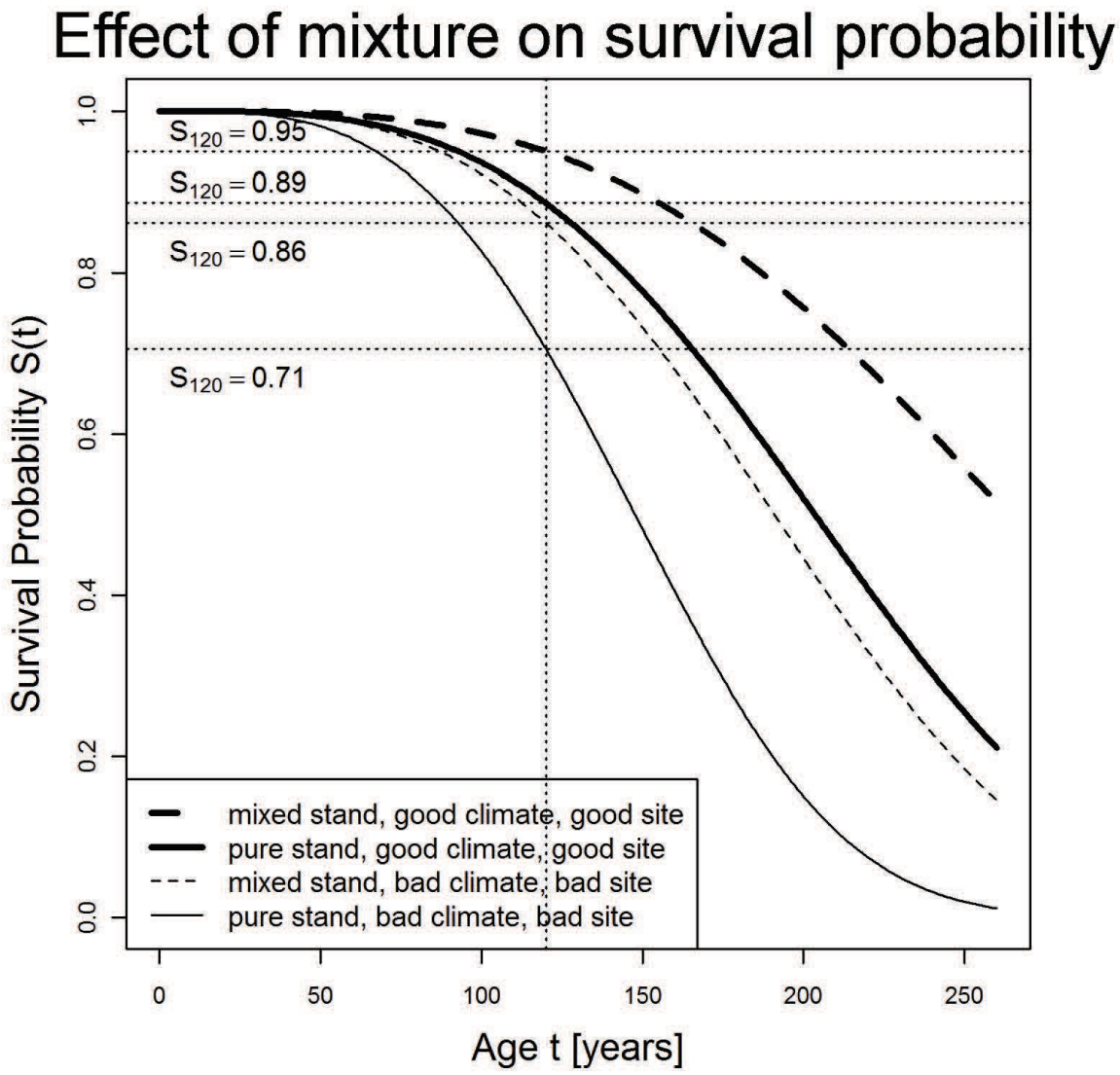

REFERENCE STANDS - CZECHIA
Praha
Brno
Ostrava
Plzeň
Katovice
Hradec Králové
Pardubice
Olomouc
Liberec
Jelení Hora
Vratislav
Częstochová
Drážďany
Chráněná krajinná oblast Broumovsko
Chráněná krajinná oblast Křivoklátsko
Chráněná krajinná oblast Slavkovský les
Chráněná krajinná oblast Český les
Chráněná krajinná oblast Horná Orava
Národný park Nízke Tatry
Národní park Šumava

Uncertainty: Tree mortality

Forestry is a field that currently works with the highest level of uncertainty!

How much time do we have to change the forests?

40-70 years?



Neuner et al. 2014. Global Change Biology 21: 935-946

Three big questions:

1. How to adapt current stands?
2. How to manage new forest stands in succession after the calamities?
3. How to connect everything into a functional system on the landscape scale?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GRC


MENDELU
University Forest
Enterprise Masaryk
Forest in Křtiny
• EXEMPLARY FOREST
• REFERENCE STANDS
• TRAINING PLOTS (incl. MARTELOSCOPES)
Praha
Brno
Plzeň
Drážďany
Vratislav
Linec
Chráněná krajinná oblast Broumovsko
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Národný park Nízke Tatry

frontiers | Frontiers in Forests and Global Change

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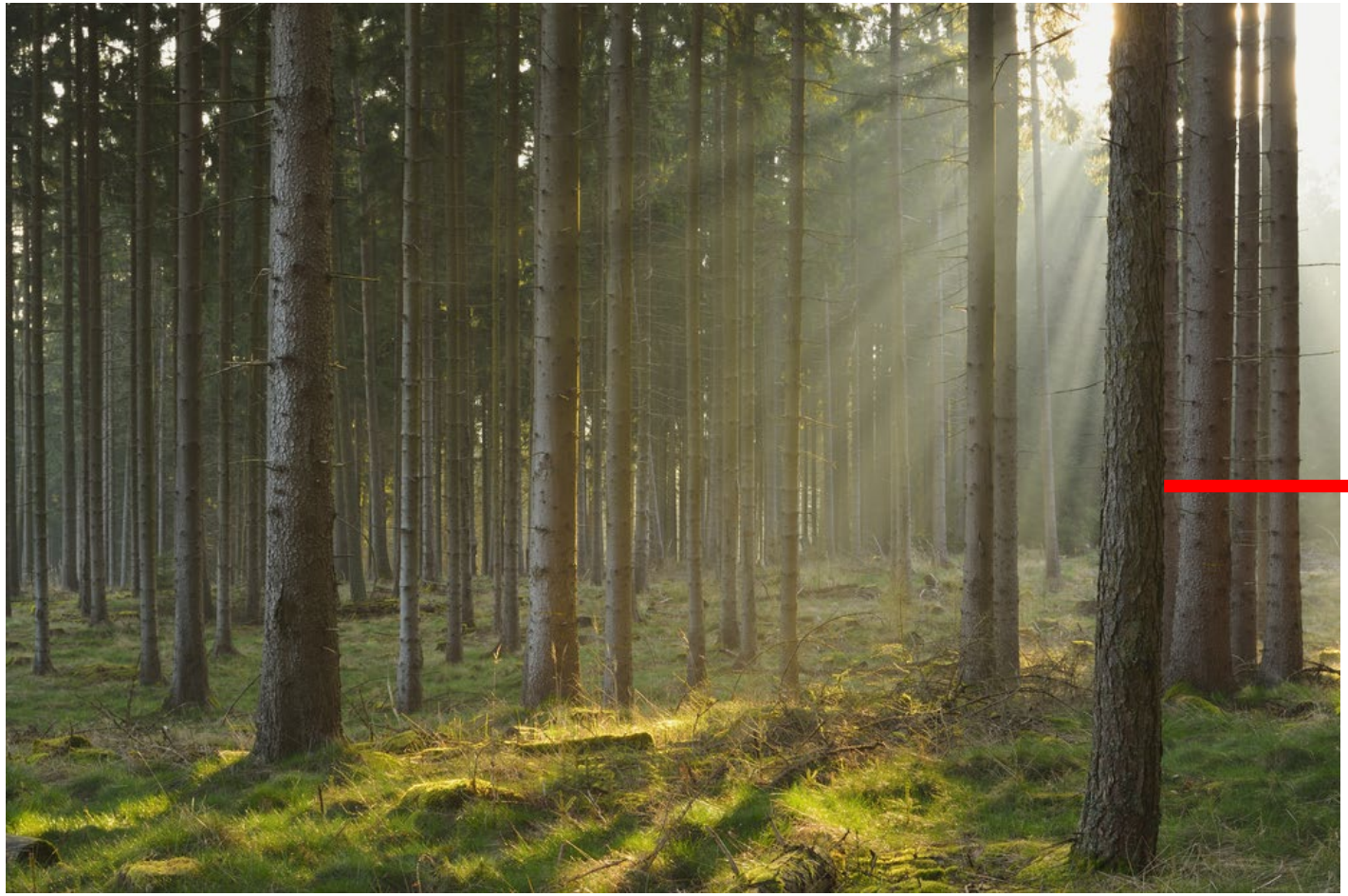
Stand structure is more important for forest productivity stability than tree, understory plant and soil biota species diversity

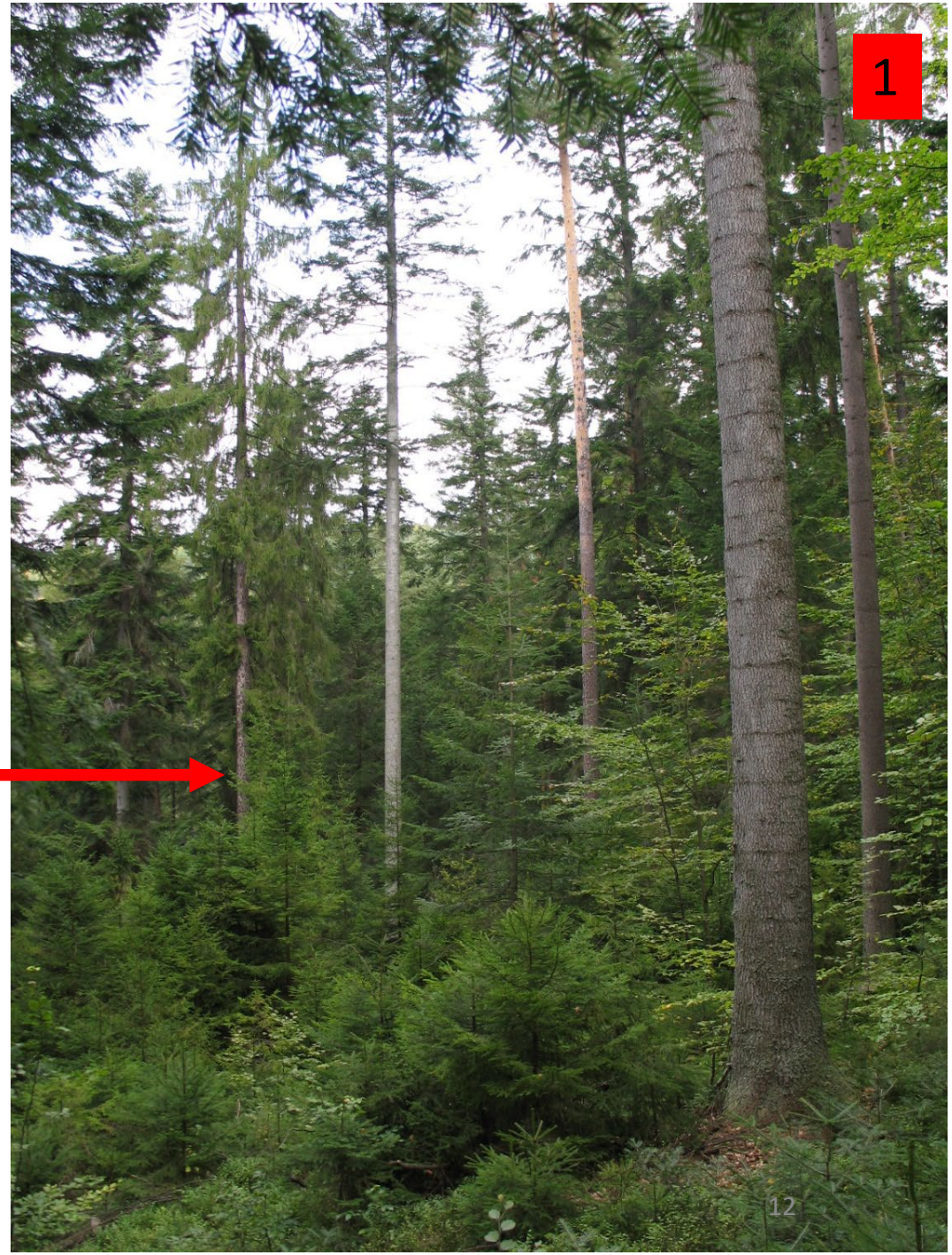
Tao Wang, Lingbo Dong and Zhaogang Liu*

Key Laboratory of Sustainable Forest Ecosystem Management-Ministry of Education, College of Forestry, Northeast Forestry University, Harbin, China

- the structure of the stand is more important than the species composition for the stability of production in the future
- we can not say the composition doesn't matter, but structure is a priority
- we can change the spatial structure faster than the species composition !!!

- MENDELU
  - University Forest
    - Enterprise Masaryk
      - Forest in Křtiny





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RESEARCH ARTICLE

Competition-induced tree mortality across Europe is driven by shade tolerance, proportion of conspecifics and drought

Niko Kulha[1] | Juha Honkaniemi[1] | Julien Barrere[2] | Susanne Brandl[3] | Thomas Cordonnier[2,4] | Kari T. Korhonen[1] | Georges Kunstler[2] | Carola Paul[5,6] | Björn Reineking[2] | Mikko Peltoniemi[1]

Journal of Ecology | BRITISH ECOLOGICAL SOCIETY

In general:

- to plant mixed stands at the level of individual interspecies mixing (does not have the same neighbor)
- to plant species with a greater amplitude of light/shade tolerance
- to work with lower number of trees that will have large crowns (they will not be suppressed)

- MENDELU
  - University Forest
    - Enterprise Masaryk
      - Forest in Křtiny

2

Irregularity – in number of trees per ha, intensity of thinning, patches creation…

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Perspective

Management diversity begets biodiversity in production forest landscapes

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[c] Geomatics and Landscape Ecology Research Laboratory, Department of Biology, Carleton University, Ottawa, Ontario, Canada

- biodiversity protection and promotion is often adored without economic context
- it can be linked = habitat matrix + spatial diversification of silvicultural models
- uneven-aged silvicultural models can increase increment - partial compensation of the loss for the biodiversity matrix

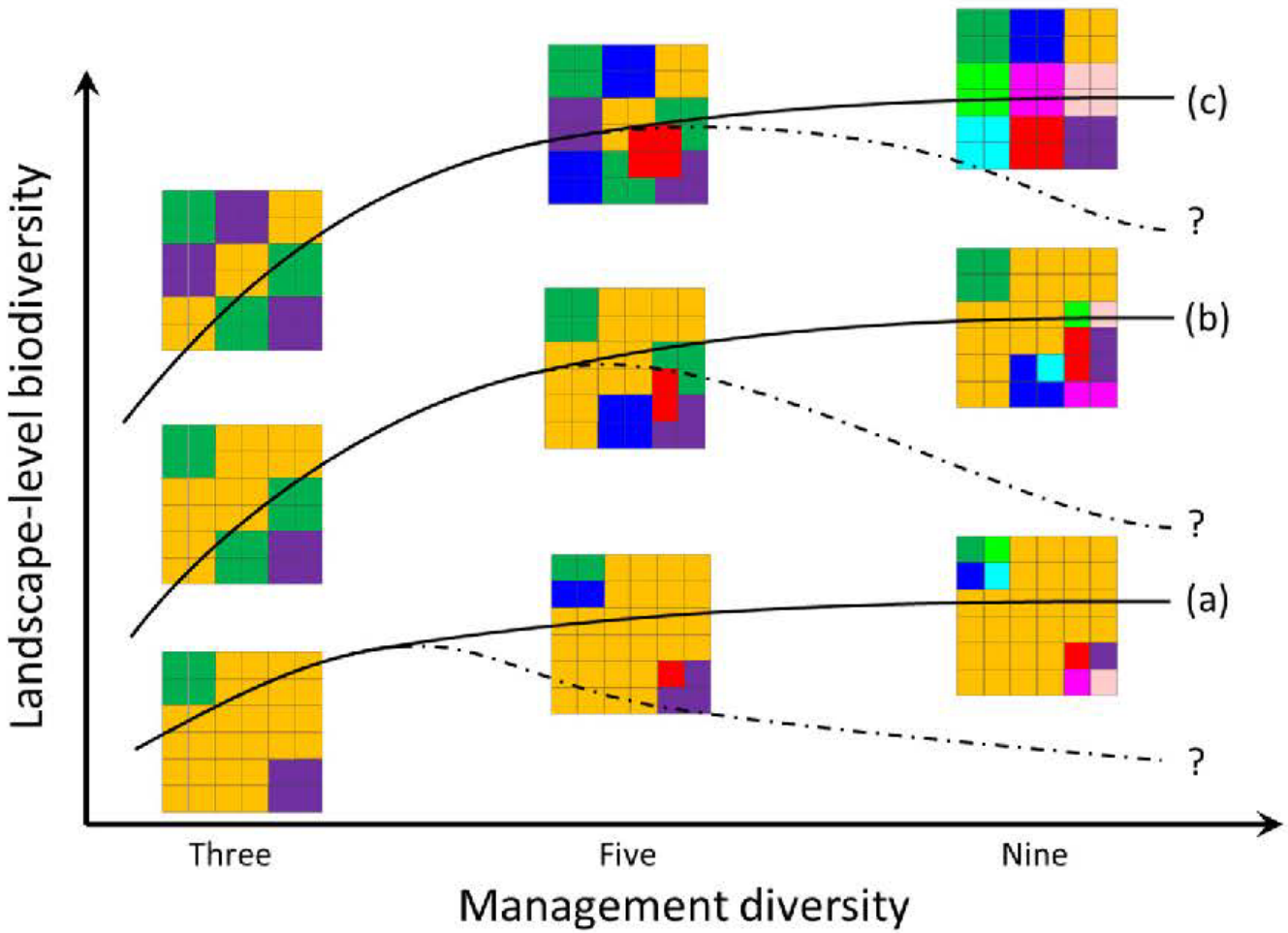
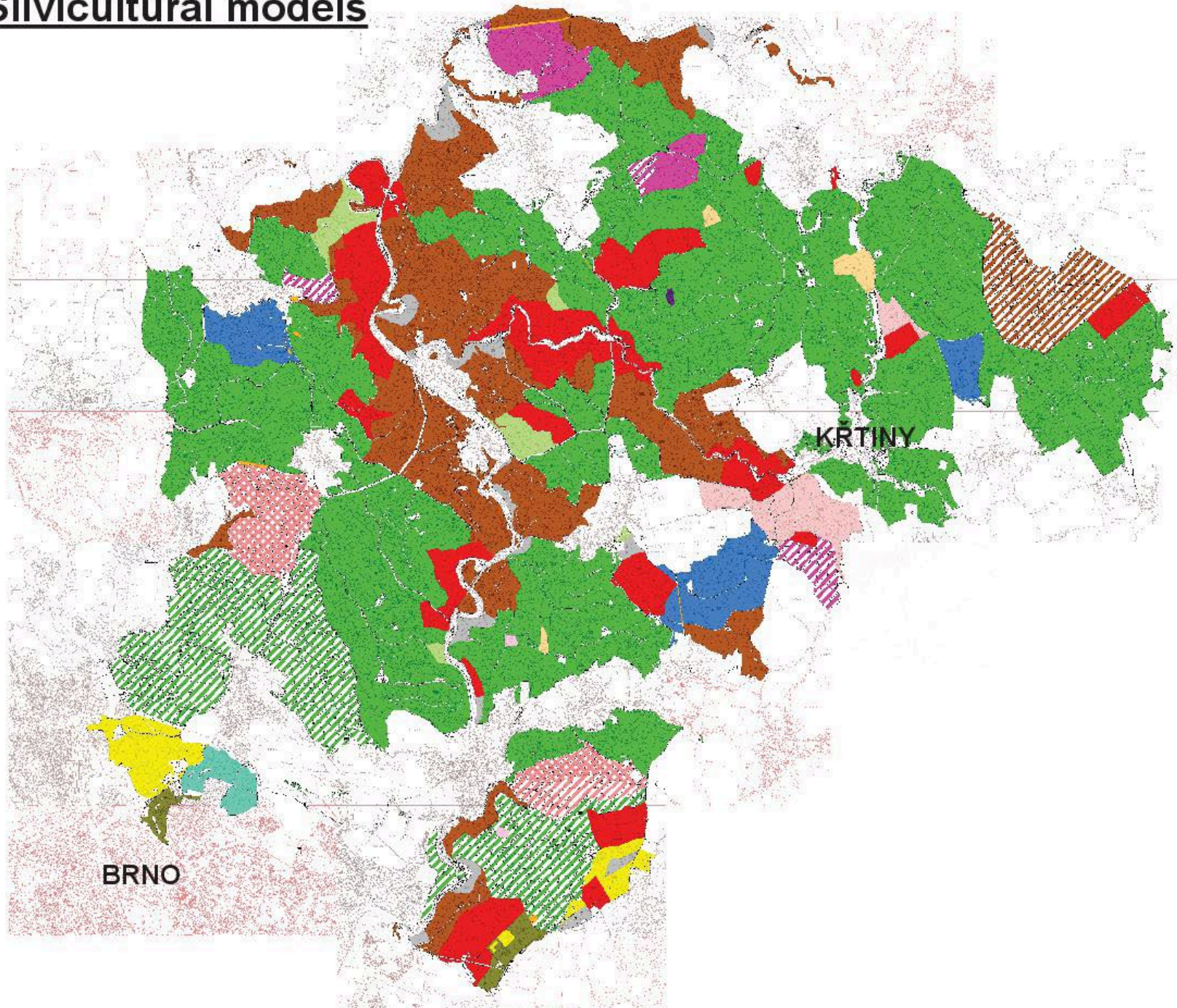


Fig. 1. Landscape-scale (gamma) biodiversity as a function of management diversity at (a) low, (b) intermediate, and (c) high evenness (in proportion of area) among management regimes. Hypothetical landscapes show examples with three, five or nine management regimes. At a constant level of management diversity, an increase in evenness among management regimes increases species diversity. As different forest management regimes are suitable for different species, increased diversity of management regimes at a landscape scale should increase overall biodiversity. However, beyond a certain threshold the area-heterogeneity trade-off could lower the benefits of management diversity (dashed line), especially when management is highly uneven (a) – see Discussion Section 3.1.

- biodiversity protection and promotion is often adored without economic context
- it can be linked = habitat matrix + spatial diversification of silvicultural models
- uneven-aged silvicultural models can increase increment - partial compensation of the loss for the biodiversity matrix

Silvicultural models



Legend

- Uneven-aged "Dauerwald"_beech-spruce-larch (45%)
- Uneven-aged "Dauerwald"_oak-pine (9%)
- Mosaic forest_beech and oak (3%)
- Selection forest_fir and spruce (2%)
- Selection forest_beech (1%)
- Value increment silviculture_beech (2%)
- Value increment silviculture_oak (1%)
- Value increment silviculture_oak and beech (2%)
- Coppice with standards_oak-hornbeam-lime (2%)
- Coppice_oak-hornbeam-lime (1%)
- Extensive forest_beech-oak-hornbeam (1%)
- Forest with high rotation_beech-larch (0,1%)
- Soil-protected forest_beech-oak-hornbeam (1%)
- Even-aged shelterwood on slope_beech (15%)
- Even-aged shelterwood_conifers (2%)
- Unmanaged forest reserves_broadleaves (8%)
- Christmas trees (0,1%)
- Seed orchard_larch, pine (0,1%)
- Arboretum (0,4%)
- Recreation forest (0,6%)
- Agroforest (0,1%)
- Game enclosure for pheasants_floodplain forestry (1%)
- Game enclosure for deers (0,5%)

Production + biodiversity = integration

Triple „R“ concept: reserve – retain - restore

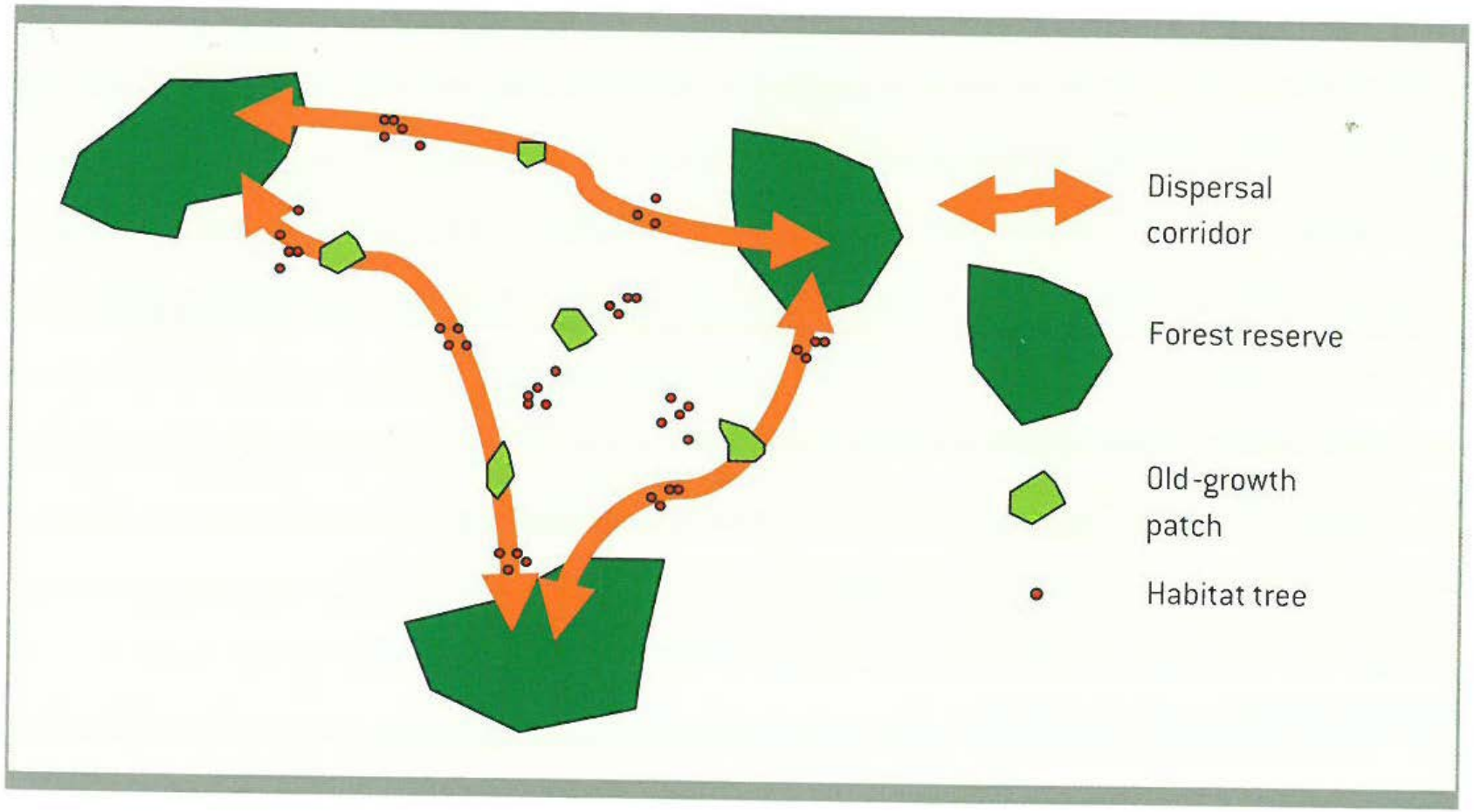
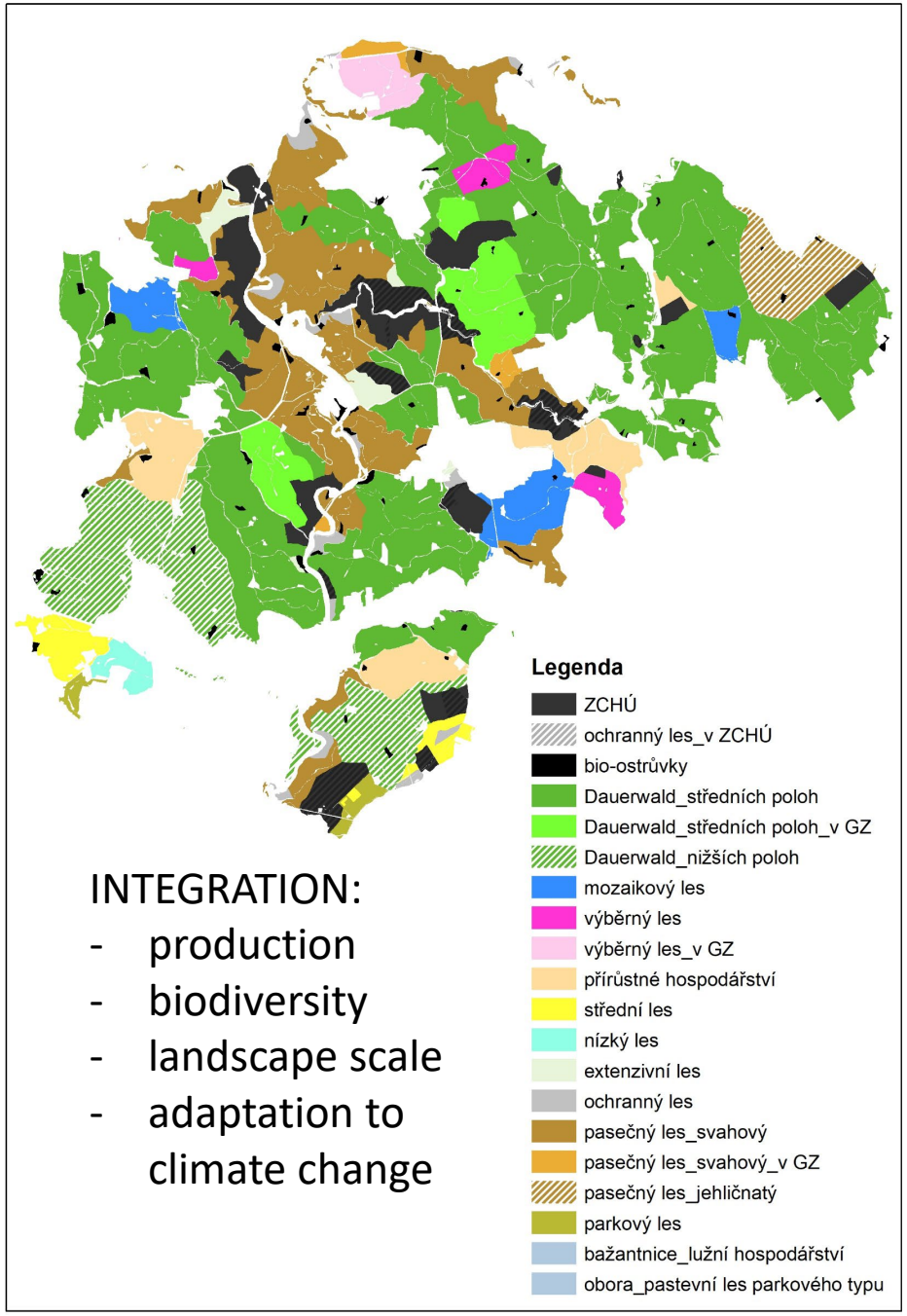


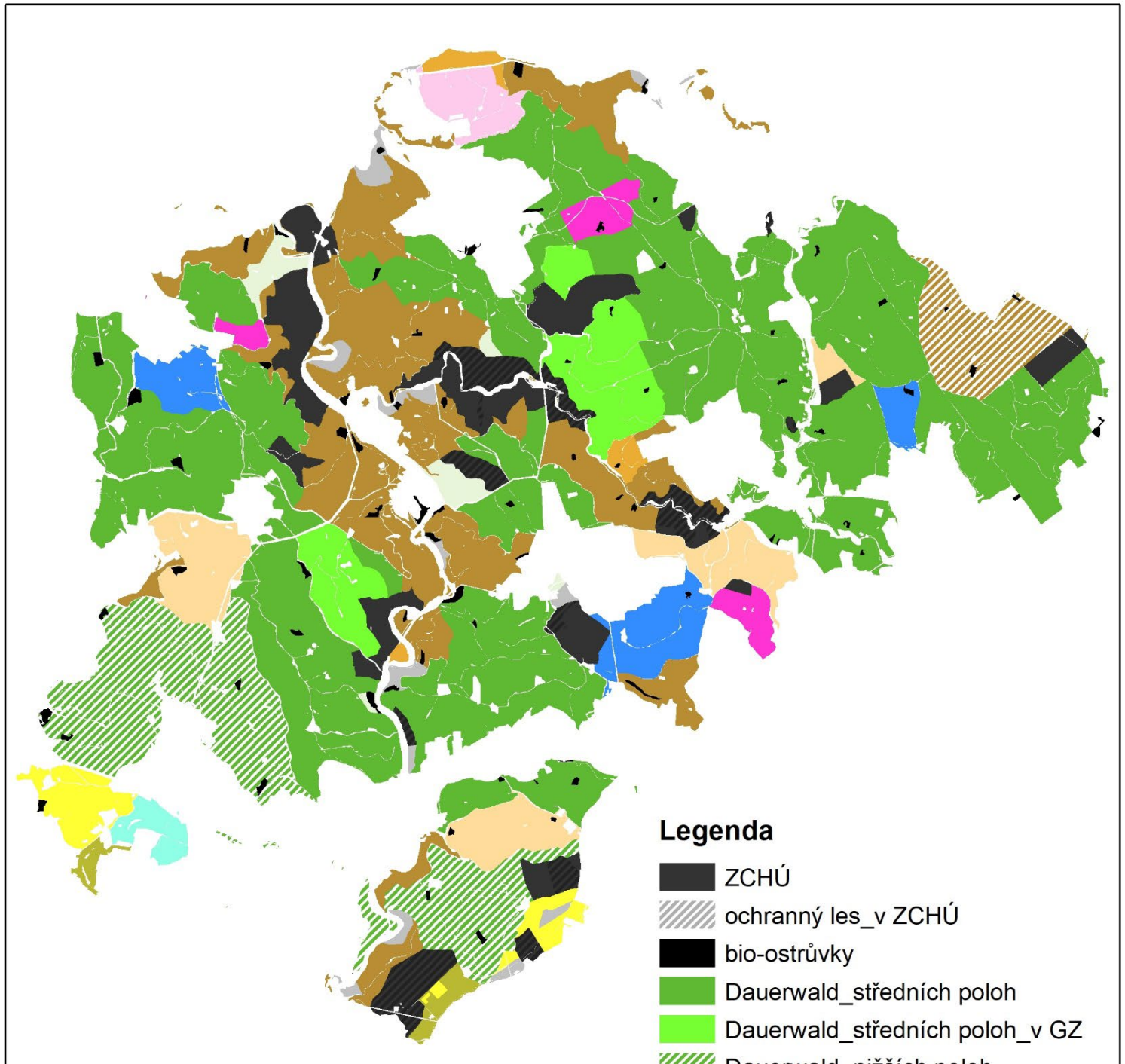
Figure 30. Schematic representation of a functional network of old-growth elements: larger set-asides (reserves >10 ha) are interconnected through set-aside patches (1–5 ha) and individual habitat trees. Areas with higher densities of habitat trees can form "corridors", but a qualitative "matrix" can also be crossed by most target species. Source: Lachat and Bütler 2007.

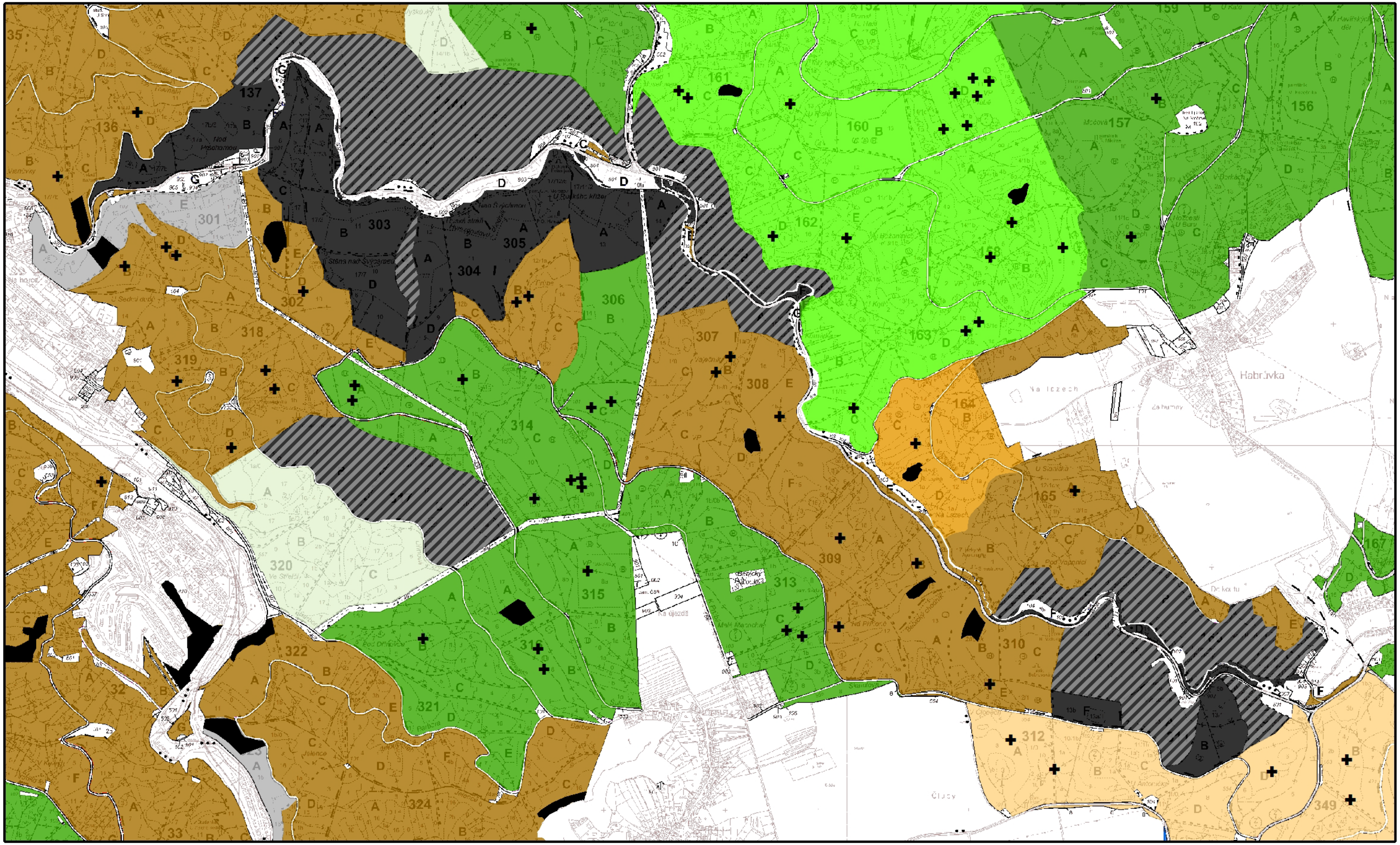
Krumm et Kraus eds. 2014



INTEGRATION:

- production
- biodiversity
- landscape scale
- adaptation to climate change

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Habrůvka
Na lozech
Za humny

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CONTINUITY 1923-2023

" The form of forests and their resistance and resilience in difficult challenges, whether it is severe frosts, drought, climate change, or bark beetle or monk outbreak, are ***predetermined by the steps of foresters and the management of the enterprise decades earlier****."*

Josef Opletal, 1923

- Pro Silva brings together the most practical foresters in Europe

who have experience with CTNF.

- We can offer more trainings, excursions etc. out of our organization.

- The EU should focus its project and financial support more towards the practical transfer of experience than towards politics and science.

- We are ready to work on it!