

How natural are Swiss beech forests?

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Introduction

In Switzerland, potential conflicts between wood production and nature conservation are highest in the natural area of beech forests (28% of Swiss forests).

Question

The Swiss National Forest Inventory (NFI) proves that most forest habitat indicators developed positively in the last two decades. The state of many forests is comparable to that of Swiss forest reserves. But what is the difference to primeval forests?

Methods

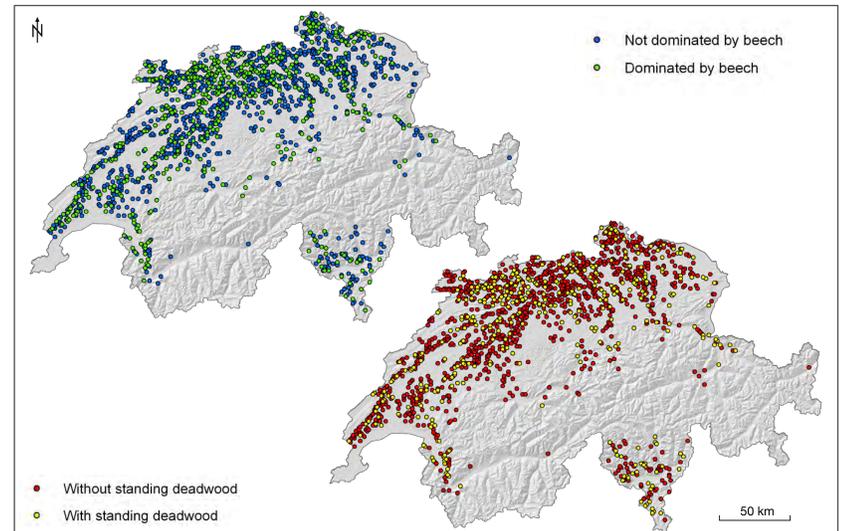
In 2010, an inventory of the primeval beech forest of Uholka-Shyrokyi Luh (USL) was carried out using the methods of the 3rd Swiss NFI (2006). The USL data is compared to NFI data from the potential natural area of beech forests actually dominated by beech (NFI-B) or other Species (NFI-O).

Results

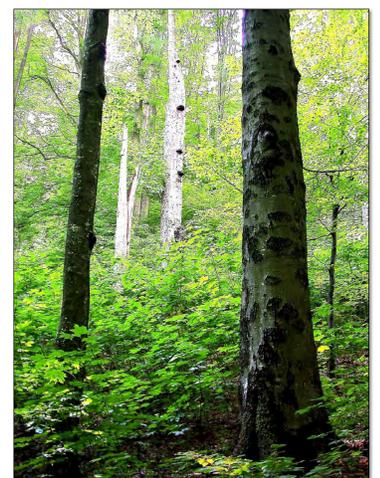
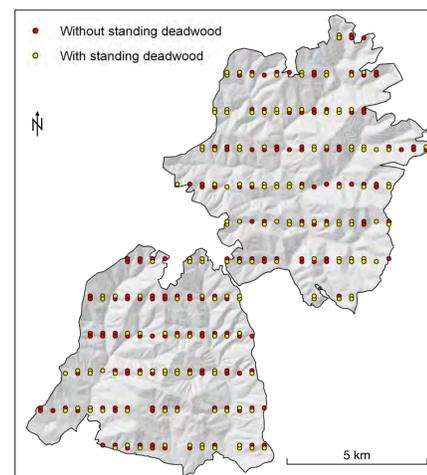
- ◆ The amount of standing deadwood in USL is three times and that of lying deadwood even six times as much as in Swiss beech forests.
- ◆ Standing deadwood was found on 49% of USL plots but only on 27% of NFI-B plots.
- ◆ Even if NFI beech forests have more plots with low density (gaps) than USL, the number of trees per ha is much higher on NFI plots since trees are in average thinner (younger).
- ◆ Giant trees with a dbh of ≥ 80 cm are very rare in Swiss beech forests compared to USL.
- ◆ Moreover, tree damages, which are important as microhabitats, are up to six times less frequent in NFI-B than in USL.

Conclusions

- ◆ Even if the natural area of beech forests is stocked with relatively natural stands, most typical features of undisturbed forests are much less frequent in Swiss beech forests than in USL.



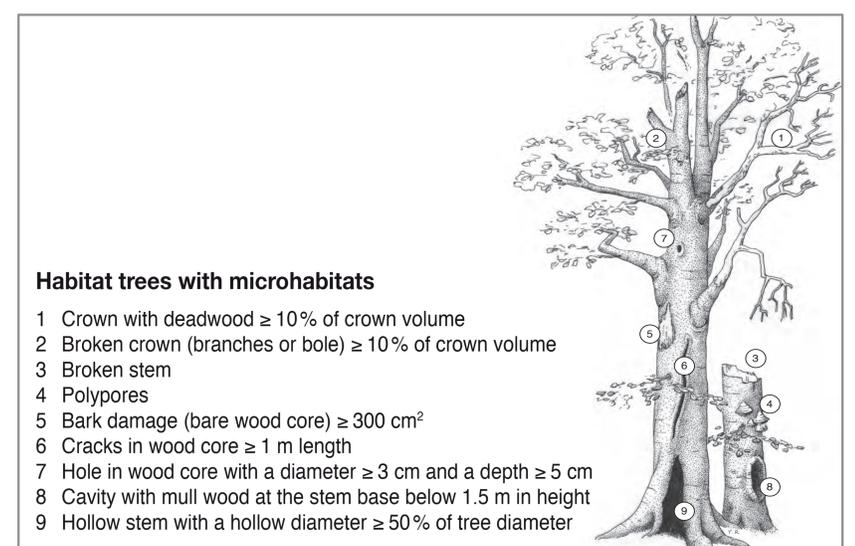
Location of the 1456 Swiss NFI plots analysed in the area of beech forest dominated by ● beech or ● other species



Location of the 314 plots of the Inventory 2010 in the primeval beech forest of Uholka-Shyrokyi Luh (Ukraine)

Indicator	unit	Inventory area		
		USL	NFI-B	NFI-O
Deadwood standing	m ³ /ha	19.2 ± 1.9	7.1 ± 0.7	5.9 ± 0.6
Deadwood lying	m ³ /ha	135.5 ± 7.5	20.1 ± 1.8	17.5 ± 1.1
Plots with standing deadwood	%	49.4	27.2	24.2
Plots with low stand density (SDI ≤ 400)	%	20.4	33.5	29.3
Living trees dbh ≥ 12cm	n/ha	270.9 ± 6.5	384.9 ± 12.0	424.9 ± 9.4
Living trees dbh ≥ 52 cm	n/ha	62.0 ± 2.0	23.2 ± 1.3	30.4 ± 1.2
Living trees dbh ≥ 80 cm	n/ha	9.9 ± 0.9	0.3 ± 0.1	1.1 ± 0.2
Living trees with microhabitats:				
· large bark damage ≥ 600 cm ²	n/ha	9.6 ± 1.1	12.8 ± 1.3	9.0 ± 0.8
· crack in wood core ≥ 1 m length	n/ha	8.4 ± 0.9	3.7 ± 0.6	1.9 ± 0.3
· broken crown ≥ 10% of volume	n/ha	22.8 ± 1.5	6.0 ± 1.0	6.2 ± 0.8
· broken stem	n/ha	5.1 ± 0.6	0.8 ± 0.3	0.3 ± 0.1

Results for Uholka-Shyrokyi Luh and Swiss beech forests



References

Commarmot B, Brändli UB, Hamor F, Lavnyy (eds) (2013) Inventory of the Largest Primeval Beech Forest in Europe. A Swiss-Ukrainian Scientific Adventure. WSL/UNFU/CBR, 69p.

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