Biodiversity-promoting measures

Jan Leugner, Jiří Souček, Dušan Kacálek, Ondřej Špulák,

Forestry and Game Management Research Institute, CZ
Bergen, 11th – 12th August 2015

Biodiversity-promoting measures used in Czech forests

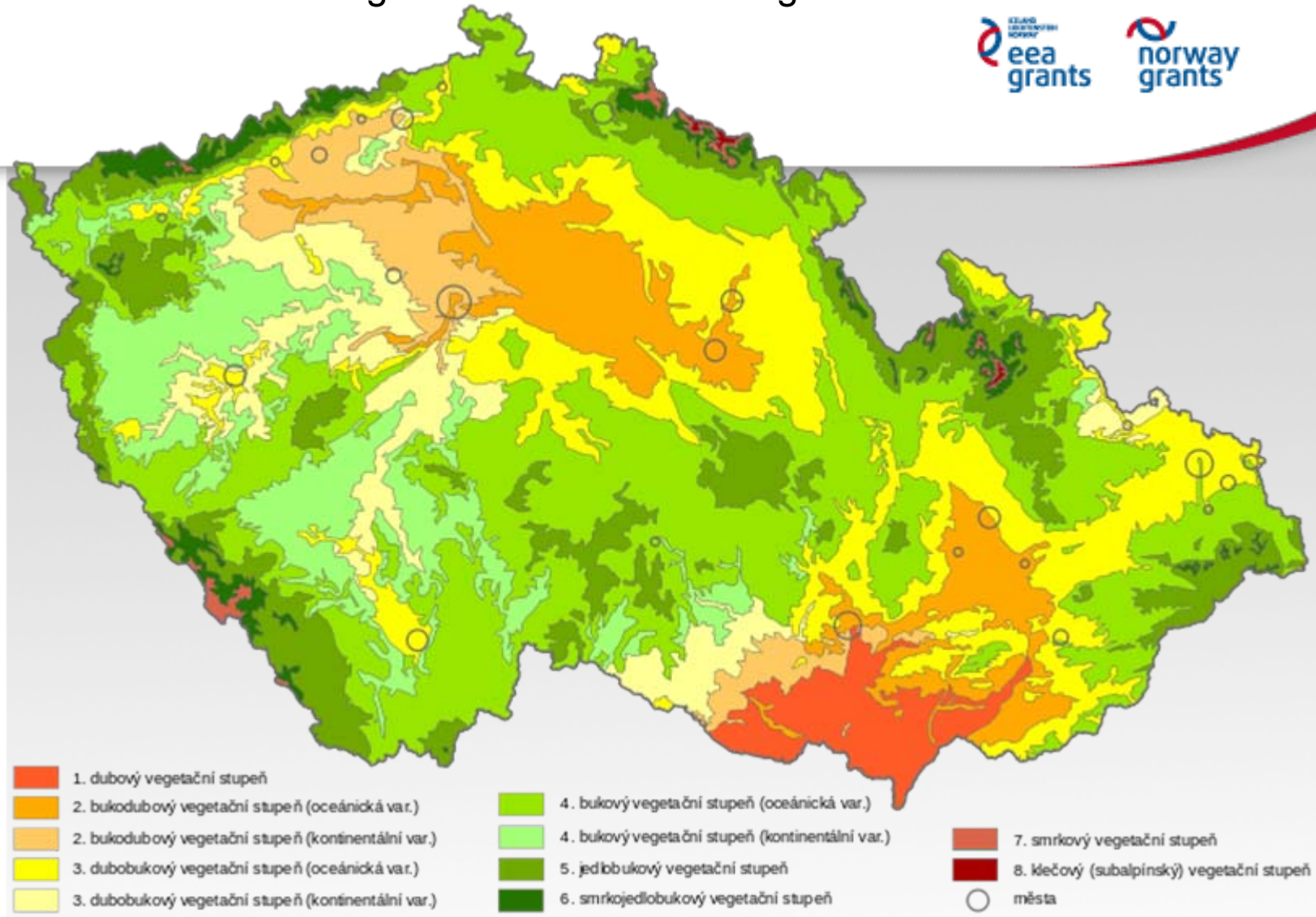
Biodiversity of Czech forests has been heavily affected by human activities in the past:

Loss of great herbivores such as aurochs (*Bos primigenius*), European bison (*Bison bonasus*);

Loss of omnivores (bear) and carnivores (wolf), a few remain in the East of the Czech Republic (migration from Slovakia);

Complete change of tree species composition.

Climate-altitude vegetation zones according to Zlatník



1. Oak

2. Oak with beech

3. Beech with oak

4. Beech

5. Beech with fir

6. Beech with fir and spruce

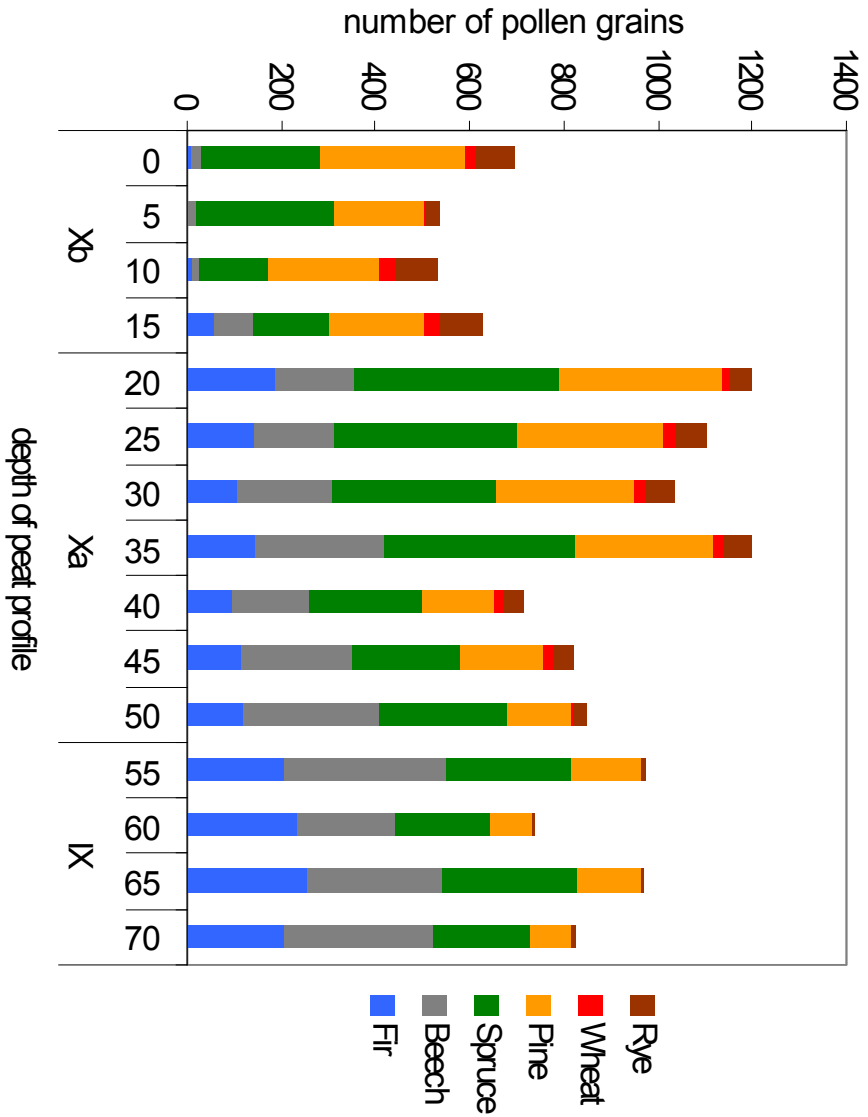
7. Spruce

8. Mountain pine

Source:
https://cs.wikipedia.org/wiki/Vegeta%C4%8Dn%C3%AD_stupe%C5%88_dle_Zlatn%C3%ADka

Changed tree species composition dates back to medieval colonization of mountain forests

Pollen records



12th – 13th century

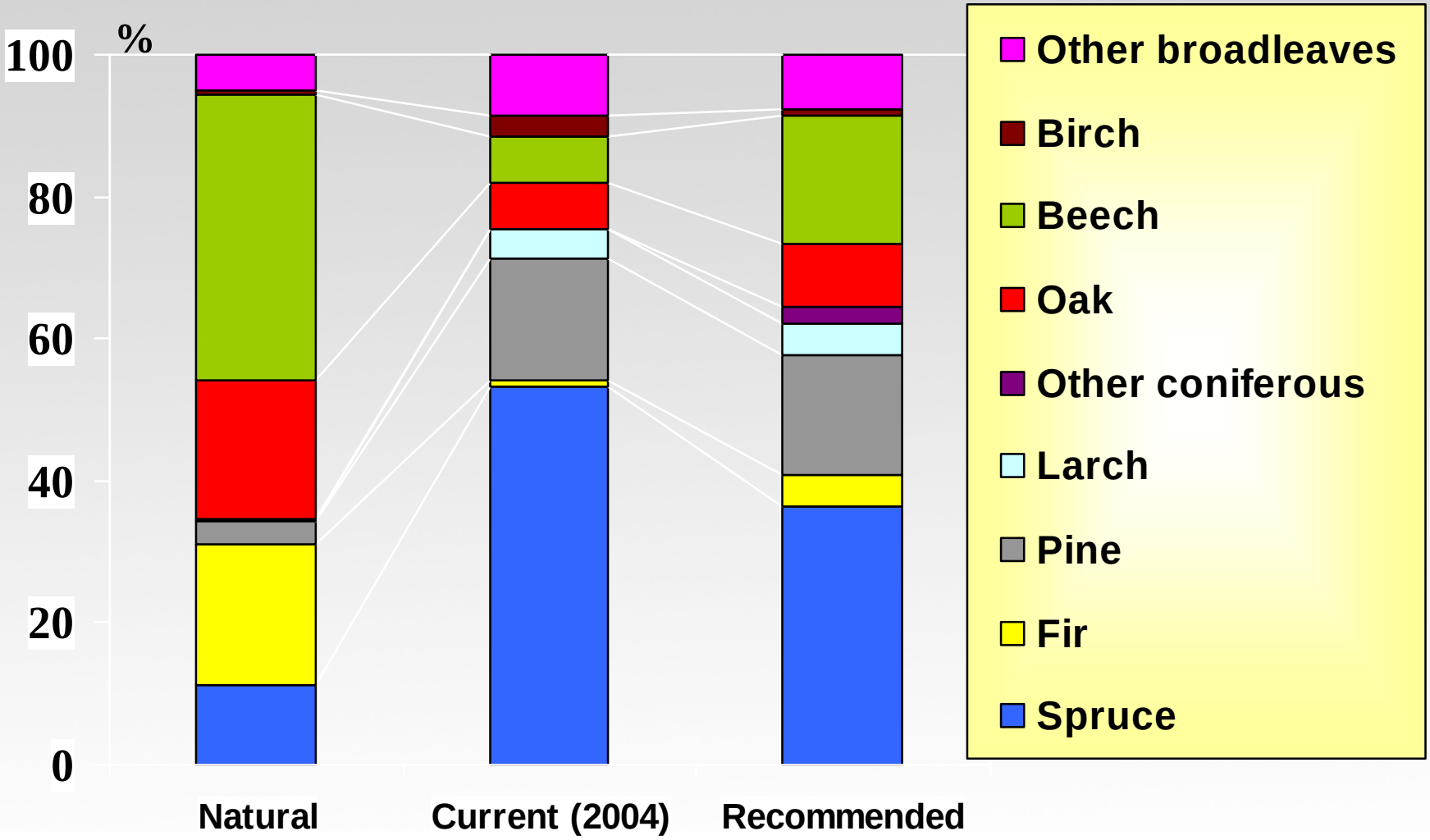
Original tree species composition

Analytical reconstruction of former tree species composition is based on number of pollen grains found in different depths of peat profiles; the pollen number reflects roughly which species shared composition in the past.

The red dart shows layer with decreased number of both fir and beech occurred. The decreased number of pollen grains is attributed to human colonization.

Source: Rybníčková (1966)

Tree species composition



How to achieve species composition change?

- Site classification;
- Reccommended tree species share (commercial and soil-improving tree species);
- Forest owners who manage their forests according to management plan are allowed to apply for a subsidy from state. The subsidy is intended to get at least minimum share of the soil-improving species.

Examples of sites and soil-improving tree species

- Natural Scots pine site: oak, birch, hornbeam, linden, fir, red oak;
- Higher altitudes on acidic soils: beech, fir, linden, Douglas-fir;
- Higher altitudes on water-logged soils: beech, fir, sycamore maple, alder, aspen;
- Mountain acidic sites: beech, fir, rowan.

Spruce-dominated mountain forest
(the Orlické hory Mts.)

Formerly air-polluted spruce mountain forest
(the Jizerské hory Mts.)

Formerly air-polluted spruce mountain forest
(the Orlické hory Mts.)

Spruce monoculture on former agricultural land

The interior of the same spruce stand

There is a great risk of the red rot fungus in spruces on rich, former agricultural site

Spruce dieback exposed soil surface to climate; this led to great danger of intro-skeletal erosion (the Krkonoše Mts.)

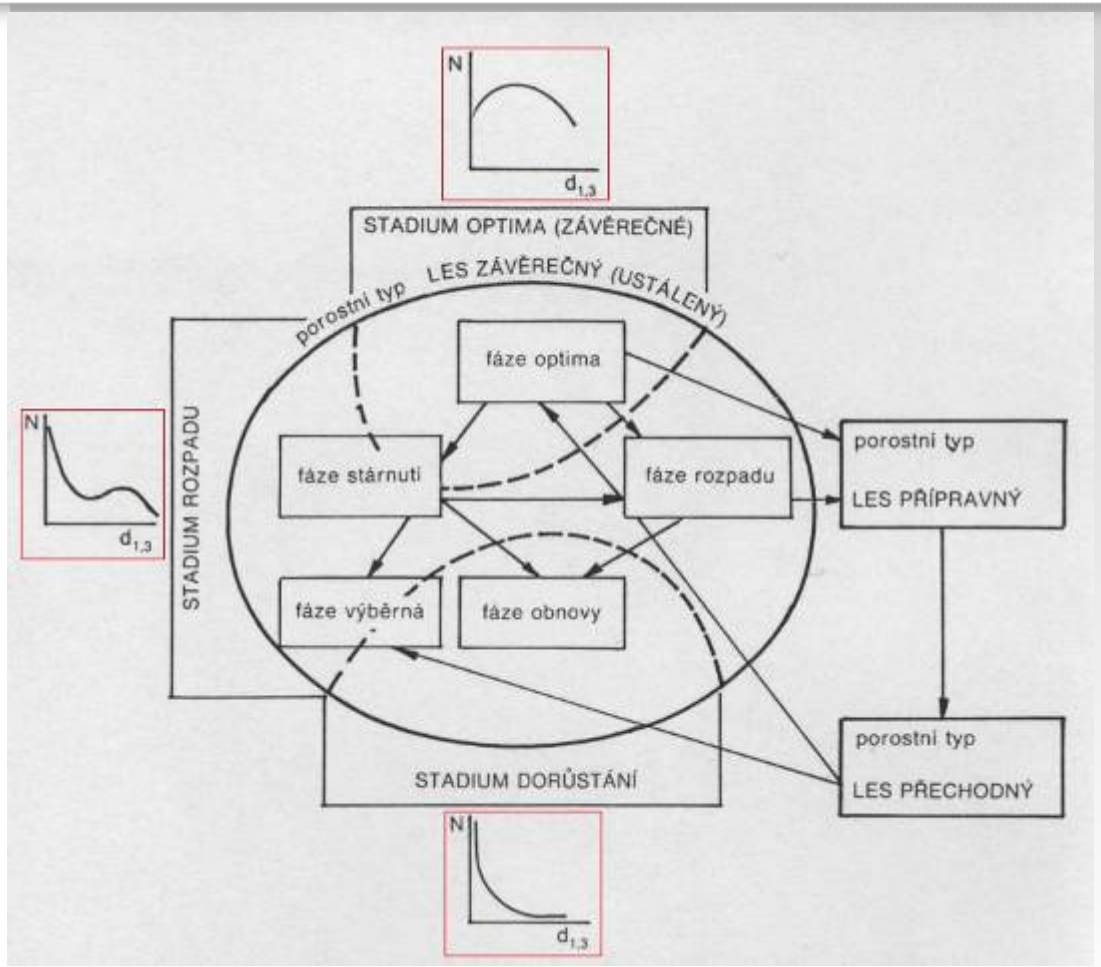
Water-logged patches situated within mountain forest can increase local biodiversity, the UDL experimental site, the Orlické hory Mts.

Forested balks between fields do also increase biodiversity (Mnichová, the Orlické hory foothills)

The interior of the forested balk

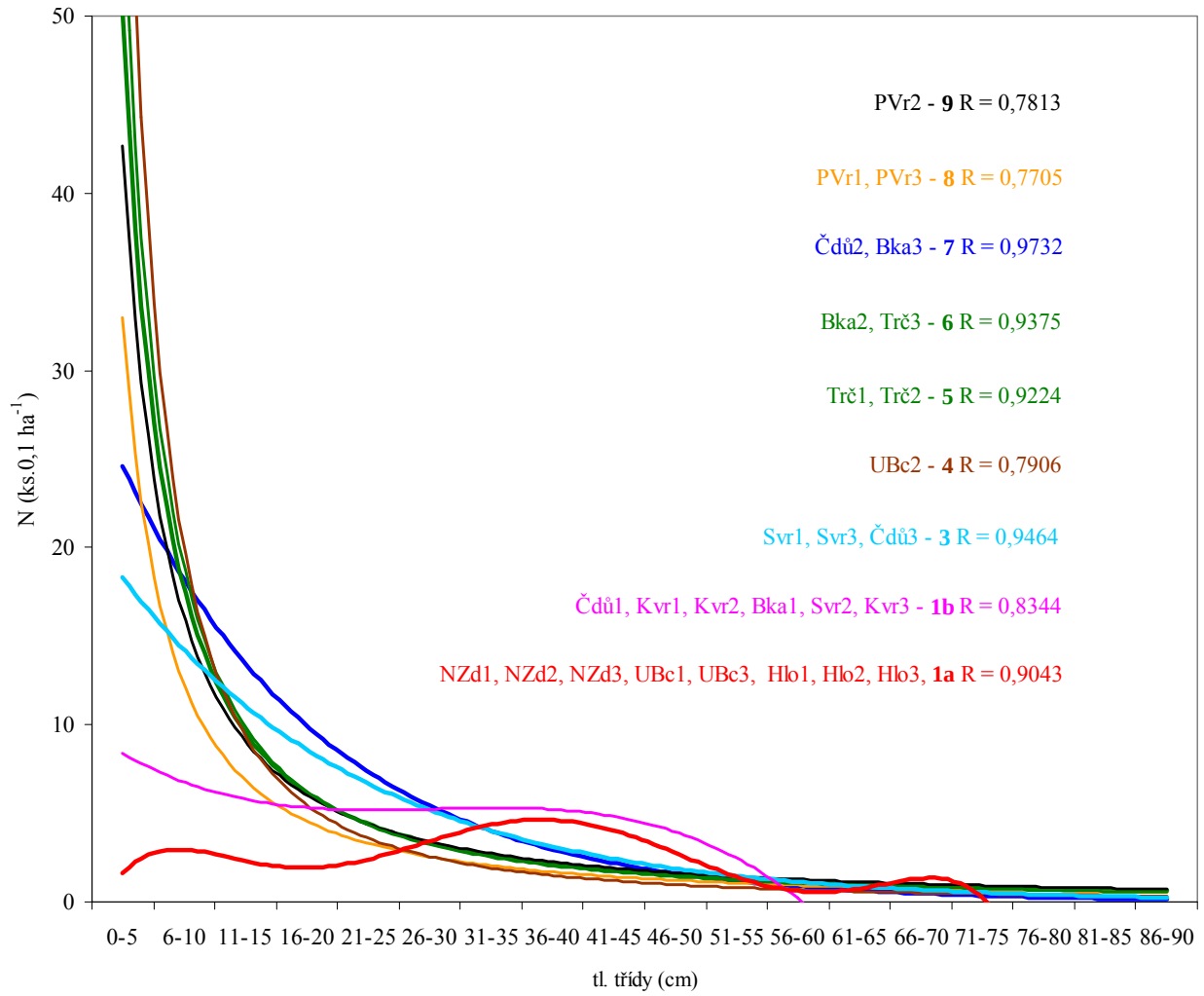
Shrubs create a belt increasing biodiversity on land between forest and field
Incorrect subsidy policy destroys habitats like this in the Czech Republic

Forest structures development



Source: Míchal et al. (1992)

Examples of near-natural forest structures (the Orlické hory Mts.)



Mixed unmanaged forest reserve Černý důl
(the Orlické hory Mts.)

Mixed unmanaged forest reserve Komáří vrch
(the Orlické hory Mts.)

Mixed unmanaged forest reserve Pod Vrchmezím
(the Orlické hory Mts.)

Mixed unmanaged forest reserve Bukačka
(the Orlické hory Mts.)

Mixed unmanaged forest reserve Sedloňovský vrch (the Orlické hory Mts.)

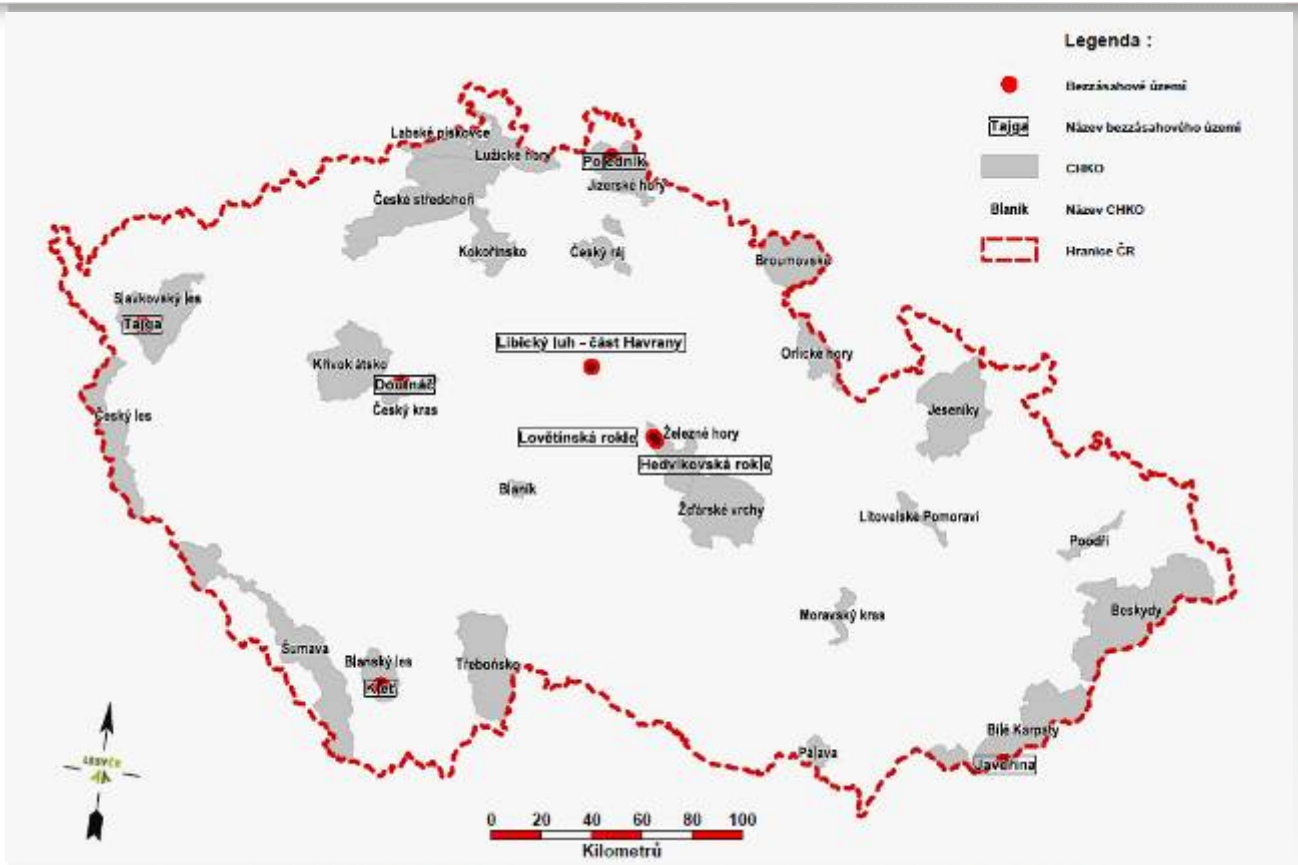
Mixed unmanaged forest reserve Trčkov
(the Orlické hory Mts.)

Example of tree species balanced commercial forest (the Orlické hory foothills)

Measures in practice

No protection from bark beetle (Šumava Mts.)

Areas being left without any forestry interventions (red patches) within Forests of the C. R., state enterprise



Signs announcing the „red“ areas or dangers

Source:
http://www.lesycr.cz/pece-o-les/ochrana-prirody-u-lcr/stranky/vymezovani-bezzasahovych-uzemi.aspx

Heavily thinned old coppice forest
(the Bohemian Karst)

Forest pasture trial (the Bohemian Karst)

Number of species in the Czech Republic

2 700 species of higher plants;
2 400 species of lower plants;
50 000 species of invertebrates;
380 species of vertebrates.

Threatened are 34% of mammals, 52% of nesting birds, 50% of reptiles, 52% of amphibians, 43% of fish, 60% of higher plants and 43% of mosses.

Source: http://www.mzp.cz/cz/ochrana_druhu

Thank you for your attention