

Implementation of innovative forest regeneration procedures on large-scale clearings with regard to the support of biodiversity

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Background

The extreme drought in recent years and the associated bark beetle outbreaks have led to a dramatic increase in harvested volume of wood (Fig. 1) and the formation of large-scale clearings (Fig. 2). The Czech forestry has thus found itself in an unprecedented situation, when it is necessary to establish new forest stands on a large area, resistant to predicted climate change and at the same time fulfilling all ecosystem and economic functions. The knowledge schemes used so far are difficult to apply in these circumstances.

Forestry and Game Management Research Institute (FGMRI) together with Forest Cooperative of Municipalities (FCM) Přebyslav is now working on the project "Implementation of innovative forest regeneration procedures on large-scale clearings with regard to the support of biodiversity and increasing the functionality of forest ecosystems".

Aim of the project

is to implement a pilot forest restoration on calamitous clearings on the forest property of FCM Přebyslav leading to higher species, age and spatial diversity of emerging stands and promoting biodiversity through the preserving of habitat trees and active management of dead wood. This will provide an example of good practice for other forest owners whose property has been affected by bark beetle outbreak.

Solution period 15/4/2022-30/4/2024

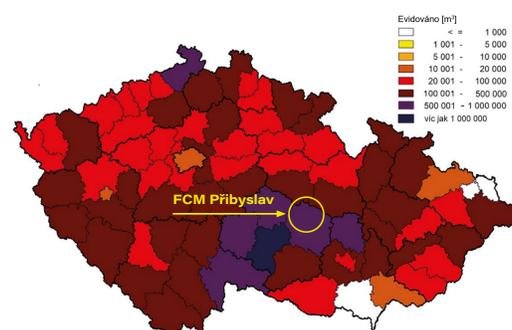


Fig. 1 Recorded volume of spruce wood [m³] infested by bark beetles in 2020 in individual districts of the Czech Republic.



Fig. 2 Large-scale clearing on the cooperative's forest property (FCM Přebyslav)



Fig. 3 Two-phase regeneration using nurse stand formed by silver birch (*Betula pendula*)



Fig. 4 Unconventional tree species mixture formed by cherries and birches

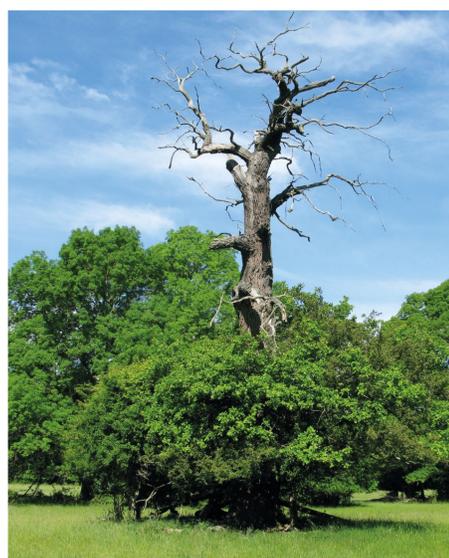


Fig. 7 Habitat tree

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Methods

- 1. Mapping of site conditions** and potential of natural regeneration on large-scale clearings (presence of mother trees, existence of natural regeneration)
- 2. Assessment of biodiversity parameters** within the tree layer and ground vegetation, selected groups of invertebrates, birds and soil fungi, including information on the presence of protected, endangered or rare species
- 3. Design of differentiated forest regeneration procedures** including
 - two-phase regeneration using nurse stands formed by pioneer tree species with subsequent under-planting with target tree species (Fig. 3)
 - establishment of diverse tree species mixtures (Fig. 4) using combined regeneration (i.e. combination of natural regeneration and artificial afforestation)
 - establishment of advanced restoration elements (gaps) in adjacent spruce monocultures (Fig. 5)
- 4. Proposal for supportive measures to increase biodiversity** including
 - leaving part of the deadwood (logging residues and whole trunks) in the forest (Fig. 6) for spontaneous settlement by other organisms
 - selection and preservation of habitat trees (Fig. 7)
 - boosting of forest retention function through the care of naturally wet areas



Fig. 5 Advanced restoration element (beech gap) in the spruce stand



Fig. 6 Logging residues left on piles

