

Use of oaks in the adaptation of Czech forests to climate change

The output addresses the urgent need of forest adaptation to climate change via change in tree species composition. The output focuses on the use of oak species, which are expected to expand their distribution under warmer and drier climate in Central Europe and can thus maintain the provision of forests ecosystem services under aggravating climate change.

The measures are proposed for 19 widespread Forest Management Units, which are commonly used in forest management planning in the Czech Republic. We indicate for each management unit (i) an overview of processes, which are likely to occur in response to climate change, (ii) a concise summary of the proposed adaptation options, (iii) and the desired structure of the final forest stands.

The proposed measures address the following aspects of forest adaptation to climate change: (i) supporting the inherent adaptive mechanisms of forests through the increased diversity of stands; (ii) reducing the share of vulnerable monocultures and overmatured stands; (iii) increasing the share of drought tolerant species in lower and medium elevations; (iv) adjusting tree species composition to track the projected shift of species production optima to compensate for the anticipated decrease in forest production; (v) decreasing the currently applied rotation periods.

The originality of this material arises mainly from the holistic view of adaptation to climate change, which takes into account both the climatological and forest management perspectives. An important innovative aspect is the use of dynamic simulations of forest development to identify sites suitable for wider use of oaks and the use of modern mathematical apparatus for adjusting forest rotation periods. The result is processed in a way compatible with standard planning procedures used in current forest management to find a rapid application in forestry practice. Implementation of here proposed recommendations may enhance the stability and resilience of the Czech forests and secure the sustainable provision of valued ecosystem services.



This study is complementary the previous research of Hlásny et al. (2016), which focused on the adaptation of spruce forests in the Czech Republic.