

The past development, present status and likely futures of Norway spruce in Eastern and Central Europe

Initiative: Trilaterale Partnerschaften – Kooperationsvorhaben zwischen Wissenschaftler(inne)n aus der

Ukraine, Russland und Deutschland

Bewilligung: 30.06.2020

Laufzeit: 3 Jahre

Projekt-Website: www.surge-pro.eu

During recent centuries Norway spruce (*Picea abies*) was often favored in forest restoration activities in many Central, Northern and Eastern European countries since it was easy to establish and manage, had fast growth rates and was expected to provide high economic returns. While in Northwest Russia most of Norway spruce occurs within its natural range, in Western Ukraine and even more in Southwest Germany it reaches far beyond its assumed range. Due to environmental changes and changes in management aims, forest tree species composition is already changing. These changes will have an impact on wood production as well as on carbon sequestration, nutrient cycling, biodiversity, and resistance against storm, snow, drought, fires, insects and fungi. Associated compositional, structural and functional changes of forests will affect almost all goods and services provided by forests including secondary effects on income of forest owners and on the climate change mitigation potential of these forests. In Central and Eastern Europe Norway spruce is currently facing unprecedented severe threats by multiple abiotic and biotic stressors. The current forest health crisis points to the low resilience and adaptability of Norway spruce to climate change giving reason to question the size of the climate change mitigation potential of the future forests. In the research study, the past development and present status of Norway spruce in the three partner regions will be analysed and climate sensitive scenario-based mid-term projections of Norway spruce wood supply will be provided, with special focus on the transition to carbon-neutral green economies. The expected results will be unique and timely information on future availability of Norway spruce wood (particularly timber) in the three model regions which will be relevant for the forestry-wood sector and for the policy development towards transition to a green economy in Europe.

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