



The potential of georeferenced planting and large dataset analysis for close-to-nature forest restoration

Boris Rantaša, Katja Kavčič Sonnenschein, Natalija Dovč, Saša Ogorevc, Marjana Westergren, and Hojka Kraigher

Slovenian Forestry Institute, Department of Forest Physiology and Genetics, Slovenia (boris.rantasa@gozdis.si)

The Interreg Central Europe project RE-ENFORCE policy brief advocates accelerating forest restoration in Central Europe through the harmonization of definitions, policies, action plans and monitoring. It further calls for the development of a common EU-wide framework for assessing forest restoration success, based on ecosystem-specific indicators that capture biodiversity, structural complexity, and regeneration outcomes. In this context, we propose an adapted approach that explicitly considers local biological diversity, including genetic diversity, in forest restoration and the establishment of close-to-nature forests. To increase future adaptability, naturally occurring local regeneration should be enhanced with enrichment planting using forest reproductive material (FRM) from tree species and provenances that are potentially adapted to future climates.

This approach should be supported by field testing, modern monitoring techniques and decision support methods and should include long-term monitoring of forest restoration projects, enrichment plantings and provenance or common garden trials. In Slovenia, we are developing systems for georeferenced planting and monitoring of local and regional FRM, combined with climate and soil data to evaluate tree species and provenance suitability and resilience when using different restoration techniques.

In our contribution, we present a system for georeferenced planting using highly accurate GNSS antennas and QGIS software, as well as a system design for nationwide forest restoration and FRM suitability monitoring and evaluation in Slovenia. The system also helps address the requirements of the new Regulation on the production and marketing of FRM in the EU regarding the preparation and regular updating of national contingency plans to ensure proactive and effective action against risks arising from climate change and the spread of pests and diseases.