Interreg Danube Region

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SCAN-DANUBE

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Strategies for Conservation of narrow-leaved ash populations (*Fraxinus angustifolia*) in the Danube basin

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SCAN-Danube: Strategies for Conservation of narrow-leaved ash populations (*Fraxinus angustifolia*) in the Danube basin

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The SCAN DANUBE project deals with narrow-leaved ash (*Fraxinus angustifolia*), a stand composing tree species native to alluvial forests of Central and South Europe, where it plays a crucial role in the ecosystems of the Danube region, offering ecological, economic, and social benefits. The species is endangered by unsustainable human activities and climate change issues, such as extreme temperatures, shifts in precipitation patterns and fluctuating water tables throughout the year, by invasive pathogens (e.g. *Hymenoscyphus fraxineus*) and by a frequently observed loss of natural reproduction. Considering the lack of guidance on how to manage these forests, a significant decrease in abundance of narrow-leaved ash can be expected in near future with consequent economic losses, destabilization of stands and loss of alluvial forests biodiversity. Having this in mind, a coordinated international approach is needed to enhance the resilience of narrow-leaved ash forest resources and ecosystem services in the Danube region, with a strong emphasis on sustainable forest management and conservation of this species genetic resources.

Therefore, overall objective of SCAN-DANUBE is to counteract narrow-leaved ash forests decline in the Danube region by providing novel strategies and guidelines for forest management and conservation of this tree species in both commercially used and protected alluvial forests of the Danube area. The SCAN-DANUBE consortium consists of 6 project partners and 9 associated partners from Austria, Bosnia and Herzegovina, Croatia, Czech Republic, Serbia and Slovenia, geographically covering the largest part of the natural distribution of narrow-leaved ash in the Danube region, and is led by the Mendel University in Brno.

SCAN-DANUBE includes 3 thematic special objectives (SOs):

1) interpreting and advancing the knowledge regarding the narrow-leaved ash past and the present status in the Danube region,

2) enhancing management and conservation of this species across the thematic region, and

3) implementing novel monitoring system and breeding strategies to enhance the vitality and preservation of narrow-leaved ash in the partner's countries.

To address these specific objectives, the SCAN-DANUBE focuses on the following goals:

i) to overview the current and past status of narrow-leaved ash in the partner countries, as well as to contribute to the better understanding of drivers leading to the decline of narrow-leaved ash forests across the Danube region and their dependence on specific climate and habitat conditions and management history,

ii) to develop the strategy/Action plans and guidelines for sustainable management and conservation of narrow-leaved ash forest resources, including improvement of natural regeneration by enhancing seed production and addressing factors affecting fruiting patterns and germination,

iii) to establish a monitoring network, based on novel Internet of Things (IoT) technology, able to automatically generate data of trees vitality in a near real-time, iv) to produce the guideline providing best practices for plant selection, propagation, and plantation establishment,

iv) to increase and share the science-based knowledge among state authorities, nature conservation officers, national park managers, forest companies and private forest owners, in order to increase decision security while managing and protecting narrow-leaved ash forests across the Danube region.

The SCAN-DANUBE focuses on the following RESULTS:

The expert capacity of the collaborating organisations will be enhanced with knowledge and new data on the current status of NA and recent historical changes. This includes the ecological conditions of NA forests, the influence of biotic, abiotic and management (history) on NA forest decline, and the status of NA genetic resources in the Danube region. In addition, protocols and guidelines based on this new data and knowledge will increase the expert capacity of project stakeholders.

The dendrometry monitoring network as well as Thematic Knowledge Website will enable long-term cooperation and data/knowledge sharing among PPs, ASPs and stakeholders beoynd the project's lifetime.

The implementation of the SCAN-DANUBE project will enable tailored conservation and management approaches to monitor and sustainably mitigate causal factors (pests, diseases, and losing fertility) of the NA decline, thus preserving biodiversity in alluvial forest ecosystems. The key stakeholders in all PPs:

1) National Forestry / Nature conservation / Phytosanitary authorities will implement AP in Forest management plans of relevant Forest districts / Strategy of conservation of the NA stands to keep associated biodiversity / Red list of endangered species;

2) Administrations of the NA stands in the area of forest inventory, practical measures for “in situ” and “ex situ” conservation, and measures for eradication of quarantine pests;

3) Economic forest administrations will also benefit from plans and practical measures for planted forest establishments, genetic resources of the NA in progeny plots;

4) Forest nurseries will use tool to detect and monitor harmful airborne plant pathogens.

Gathering the data on the vitality of trees in forest stands, monitoring health status and applying artificial regeneration of these stands by tolerant/less susceptible genotypes through selection, breeding and propagation (Specific objectives of the project 1-3), preservation of NA in the Danube region will be enabled.

The forestry authorities/foresters, seed production entities will test and validate and further implement the new solution (O.3.4).

The established dendrometry network will produce a novel dataset with high temporal resolution over large spatial distances, offering detailed insights into tree-climate interactions and enabling predictions under various climatic scenarios. Likewise, the network will enable the detection of emergent patterns that would not be visible from isolated analyses of individual sites. It will provide a unique and long-term “ground-truthing” platform for testing drone- and satellite-based indicators. Although the forest managers and policy makers will be the key actors involved, production of daily nowcasts of FA growth and water deficit across the partner counties will be freely available to the stakeholders at large through the open-access online platform, even beyond the project lifetime, to ensure data transfer to target groups. Selected pilot study sites will be maintained by PPs in cooperation with the ASPs as future demonstration areas to be used for training as national reference areas.

PROJECT PARTNERS

Lead partner:

- **Mendel University in Brno**
  Associated partners:
  - Agentura ochrany přírody a krajiny České republiky
  - Lesy České republiky, s.p.

Project partners:

- **Austrian Research Centre for Forests**
- Associated partners:
  - GUTS- &FORSTBETRIEB WILFERSDORF, LIECHTENSTEIN GRUPPE
  - Institut für Forstentomologie, Forstpathologie und Forstschutz (IFFF) Department für Wald- und Bodenwissenschaften, Universität für Bodenkultur Wien (BOKU)

- **Slovenian Forestry Institute**

- **University of Zagreb Faculty of Forestry and Wood Technology**
  Associated partners:
  - Ministarstvo gospodarstva i održivog razvoja, Republika Hrvatska,
  - Hrvatske šume d.o.o.

- **University of Banja Luka**
  Associated partners:
  - JPŠ "Šume Republike Srpske" a.d. Sokolac,
  - Ministarstvo poljoprivrede, šumarstva i vodoprivrede Republike Srpske (BiH)

- **Institute of Lowland Forestry and Environment**
  Associated partner:
  - Javno preduzeće „Vojvodinašume "