Interreg Danube Transnational Programme
REFOCuS

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Output 3.2: Spatial analysis of the riparian corridor habitats

The output is available for download at: https://danubeforesthealth.eu/dat/Output3.2.zip

This output provides the spatial overview of the Mura-Drava-Danube Biosphere Reserve (MDD-BR). It contains the following maps:

- Forest cover map (1 map)
- MDD BR zonation map (14 maps)
- Forest habitat biodiversity map (4 maps)
- Habitat connectivity map (2 maps)
- Map of gaps in the habitat connectivity (4 maps)

All maps are provided as GIS layers, either as vector layers in ESRI shape format or as raster layers in IDRISI raster format.

Methodology:

A unified binary forest cover map (i.e., forest / non-forest) of MDD BR was generated by the Austrian team by interpreting the Sentinel-2 satellite imagery. Subsequently this map was spatially generalized by morphological filtering whereas all forest polygons closer than 100 m to each other have been merged. Finally, the polygons smaller than 0.25 ha were filtered out from the forest map.

In order to glean the forest coverage percentages per country and per protection level the forest map has been intersected in each country by the MDD BR zoning maps, which divide the MDD BR into three different protection levels: the core area, the buffer area, and the transition area.

Forest habitat biodiversity in the MDD BR was mapped using occurrence data of the 7 target tree species: *Fraxinus excelsior, Fraxinus angustifolia, Populus nigra, Quercus robur, Alnus glutinosa, Ulmus laevis/glabra, Ulmus minor*.

Habitat connectivity was analysed according to different values of the critical distance between the habitat patches (100 m and 1000 m) and according to different values for the minimum viable habitat patch size (1 ha and 100 ha). The connectivity maps for the entire MDD BR were computed in a raster GIS environment with a spatial resolution of 25 m.

The gap analysis identified forest habitat patches / fragments that are isolated / disconnected from the habitat matrix due to their remoteness. The habitat matrix (sensu Forman) was defined according to the same parameters as the connectivity maps (the critical distance between habitat patches and the minimum viable habitat patch / fragment size).

Both the habitat connectivity maps and the gap analysis results are agnostic in relation to species, i.e., they can be employed for any species for which the listed critical distance thresholds and minimum habitat patch sizes are valid.

The **GIS layers** available in the output:

1. Map of forest cover in the MDD BR, based on interpretation of Sentinel-2 satellite imagery. Binary map (forest, non-forest) with a minimum mapping unit 0.25 ha. ESRI shape format.

2. Maps of protection zones in the MDD BR (core, buffer, transition). ESRI shape format.

3. Maps of biodiversity (tree species occurrence). Attributes: presence/absence values for the seven target tree species (FE, FA, PN, QR, AF, UG, UM), and number of present target tree species (SUM). ESRI shape format.

4. Distances to the nearest habitat patch (= forest fragment). Distances in meters are computed for two different generalization levels of the satellite-based forest map: minimum mapping unit size of 1 ha and 100 ha. Idrisi raster format.

5. Connectivity of habitat patches (= forest fragments). Codes: 1 … buffer 1000 m, 2 … buffer 100 m, 3 … forest. IDRISI raster format.

6. Maps of habitat gaps (= isolated habitat patches / fragments). Gaps are computed for two different generalization levels of the satellite-based forest map and for two different distance thresholds. Both values are evident from the name of a GIS layer. Codes: 0 … Non-forest, 1 … connected forest fragment, 2 … isolated forest fragment. IDRISI raster format.

7. Maps of bark beetle attacks 2003 to 2018. GEOTIFF raster format. Available at https://www.zdravgozd.si/projekti/podlubniki/modis.aspx.

8. Corine Land Cover database for the MDD BR, release v18_5. ESRI shape format.

Credit and citing

When using the GIS layers, you must give credit to: Andrej Kobler, Gábor Illés, Mladen Ivanković, Miran Lanšćak, Markus Löw, László Nagy, Markus Sallmannshofer, Silvio Schueler, Srdjan Stojnić, Marjana Westergren and the REFOCuS DTP2-044-2.3 project co-financed by the European Union funds (ERDF, IPA).