Input data files for habitat network analyses of amphibians in the Gothenburg region

SND-ID: 2024-51. **Version**: 1. **DOI**: https://doi.org/10.5878/dn29-z128

Download data

Habitat_Network_InputData_Amphibians_GothenburgRegion_2024-03-27.zip *(5.17 MB)*

Associated documentation

Readme.docx *(19.59 KB)*

Download all files

2024-51-1.zip *(~5.19 MB)*

Citation

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Creator/Principal investigator(s)

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Description

This data package includes two related data files that can be used as input for habitat network analyses on amphibians using a specific habitat network analysis tool (HNAT; v0.1.2-alpha):

1. AmphibianHabitatNetwork_Parameters.xlsx
2. BiotopeMap_GothenburgRegion_withPondsRoadsAndBuildings.tif

HNAT is a plugin for the open-source Geographic Information System QGIS (https://qgis.org/en/site/). HNAT can be downloaded at https://github.com/SMoG-Chalmers/hnat/releases/tag/v0.1.2-alpha. To run the habitat network analyses based on the input data provided in this package one must install the plugin HNAT into QGIS. This software has been created by Chalmers within a research project financed by the Swedish government research council for sustainable development, Formas (FR -2021/0004), within the framework of the national research program "From research to implementation for a sustainable society 2021".
The Excel-file contains the parameters for amphibians and the GeoTiff-file is representing a biotope raster map covering the Gothenburg region in western Sweden. SRID=3006 (Sweref99 TM). Pixel size =10x10 metres. The pixel values of the biotope map correspond to the biotope codes listed in the in the parameter file (see column “BiotopeCode”). For each biotope the parameter file holds biotope specific parameter values for two alternative amphibian models denoted “Amphibians_NMDWater_ponds” and Amphibians_NMDWater_ponds_NoFriction”. The two alternative parameter settings can be used to demonstrate the difference in model prediction with or without the assumption that amphibian movements are affected by barrier effects caused by roads, buildings and

certain biotopes biotope types. The “NoFriction” version assumes that amphibian dispersal probability declines exponentially with increasing Euclidian distance whereas the other set assumes dispersal to be affected by barriers. Read the readme file for details on each parameter provided in the parameter file.

The GeoTiff-file is a biotope mape which has been created by combining a couple of publicly available geodata sets. As a base for the biotope map the Swedish land cover map NMD was used (https://geodata.naturvardsverket.se/nedladdning/marktacke/NMD2018/NMD2018_basskikt_ogeneraliserad_Sverige_v1_1.zip). To achieve a greater cartographic representation of small ponds, streams, buildings and transport infrastructure relevant for amphibian dispersal, reproduction and foraging, NMD was complemented by information from a number of vector layers.
In total, 20 new biotope classes representing buildings of different height ranging from less than 5 m up to 100 m, were added to the basic land cover map. The heights were obtained by analyzing the LiDAR data provided by Swedish Land Survey (for details see Berghauser Pont et al., 2019). The data was rasterized and added on top of existing pixels representing buildings in the Swedish land cover map.
The roads were separated into 101 new biotope classes with different expected number of vehicles per day. Instead of using statistics from the Swedish Transport Administration on observed number of vehicles per day relative traffic volumes were predicted based on angular betweenness centrality values calculated from the road network using PST (Place Syntax Tool, Stavroulaki et al. 2023). PST is an open-source plugin for QGIS (https://www.smog.chalmers.se/pst). Traffic volumes are expected to be correlated to the centrality values (Serra and Hillier, 2019). The vector layer with the centrality values was buffered by 15 m prior to rasterization. After that the new pixel values were added to the basic Land cover raster in sequence following the order of centrality values.
Information on small streams with a maximum width of 6 m was added from a vector layer of Swedish streams (https://www.lantmateriet.se/en/geodata/geodata-products/product-list/topography-50-download-vector/). These lines where rasterized and added to the land cover raster by replacing the underlaying pixel values with new class specific pixel values.
Small pondlike waterbodies was identified from the NMD data selecting contiguous fragments of the original NMD biotope class 61 with a smaller area than 1 hectare. Pixels representing the smaller water bodies was then changed to 201.

References
Berghauser Pont M, Stavroulaki G, Bobkova E, et al. (2019). The spatial distribution and frequency of street, plot and building types across five European cities. Environment and Planning B: Urban analytics and city science 46(7): 1226-1242.
Serra M and Hillier B (2019) Angular and Metric Distance in Road Network Analysis: A nationwide correlation study. Computers, Environment and Urban Systems 74: 194-207.
Stavroulaki I, Berghauser Pont M, Fitger M, et al. (2023) PST Documentation_v.3.2.5_20231128, DOI:10.13140/RG.2.2.32984.67845.

Data contains personal data

No

Language

English

Data format / data structure

Geospatial

Other

Species and taxons

Amphibia

Geographic spread

Geographic location: Göteborg Municipality, Mölndal Municipality

Geographic description: Gothenburg region

Funding

- Funding agency: Swedish Research Council for Environment Agricultural Sciences and Spatial Planning (FORMAS)
- Funding agency's reference number: 2021-02438_Formas
- Project name on the application: Development of a digital tool for integrated impact assessment of social, economic, ecological and cultural-historical values in transport infrastructure planning in urban environments
- Funding information: This project aims to develop a digital tool to predict potentials and sensitivities linked to infrastructural changes in urban environments. The new analysis tool will integrate socio-economic modelling with methods handling green and blue infrastructure, including ecological corridors and ecosystem services, and cultural historical values and functions. The development will take place in collaboration between researchers at Chalmers University of Technology and two consulting firms that work with natural and cultural environmental issues in urban planning, as well as the Swedish Transport Administration and Gothenburg Region. Together, the project group constitutes a very strong team with solid knowledge of how today's working methods for transport infrastructure planning can be improved to contribute to sustainable solutions. Through the development of a digital tool, the project is expected to contribute to integrating socioeconomic, ecological, and cultural-historical issues early in the planning process as well as to facilitate collaboration between different actors in transport infrastructure planning and their communication with the public. The project is designed to effectively disseminate new scientific knowledge about urban planning, digitalization, and impact assessment in a digital tool aimed at actors - the Swedish Transport Administration, regions and municipalities, consultants - involved in transport planning.

Research area

Ecology (Standard för svensk indelning av forskningsämnen 2011)

Biota (INSPIRE topic categories)

Keywords

Animal habitat, Habitat mapping, Species distribution, Habitat, Habitat network model

Polygon (Lon/Lat)

11.660357, 57.6026

12.147875, 57.6026

12.147875, 57.780959

11.660357, 57.780959

11.660357, 57.6026

Accessibility level

Access to data through SND
Data are freely accessible

Use of data

Things to consider when using data shared through SND

License

CC0 1.0

Versions

Version 1. 2024-03-27

Contact for questions about the data

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This resource has the following relations

Requires Habitat Network Analysis Tool (Github)

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DataCite
DDI 2.5
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Citation (CLS)
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