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CENTRAL EUROPE European Union
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MaGICLandscapes

TAKING
COOPERATION
FORWARD



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Milan, Italy | July 4th, 2019



Nature and society facing the Anthropocene
challenges and perspectives
for landscape ecology 



**Green Infrastructure at regional and local scale -
Assessing connectivity and functionality through stakeholder involvement.**



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Managing Green Infrastructure in Central European Landscapes

- Duration: 07/2017 - 06/2020
- Interreg Central Europe Programme (ERDF)
- 10 partners from AT, CZ, DE, IT, PL
- 9 case study areas
- 33 Associated Partners

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PARTNERSHIP



University of Vienna

Thayatal National Park



Silva Tarouca Research Institute for Landscape and Ornamental Gardening

Krkonoše Mountains National Park



Technische Universität Dresden (LP)

Leibniz Institute for Ecological Urban and Regional Development

Saxon Regional Foundation for Nature and the Environment



Metropolitan City of Turin

Italian National Agency for New Technologies, Energy and Sustainable Economic Development



Karkonosze National Park



Leibniz-Institut
für ökologische
Raumentwicklung



TECHNISCHE
UNIVERSITÄT
DRESDEN



Sächsische Landesstiftung
Natur und Umwelt

Akademie



universität
wien



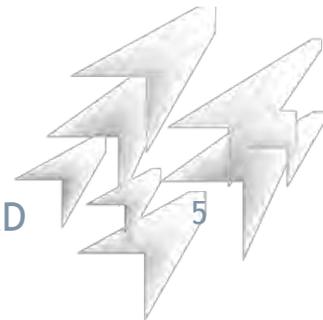
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CASE STUDY AREAS



- **Multiple demands for land use**
- **Climate change, conservation, social change → need for integrated planning approaches**
- **Concept of Green Infrastructure (GI): cross-sectoral approach**
- **Justify investments in GI by using assessment approaches that highlight the needs and opportunities for GI at all spatial levels**



WHAT IS GREEN INFRASTRUCTURE?

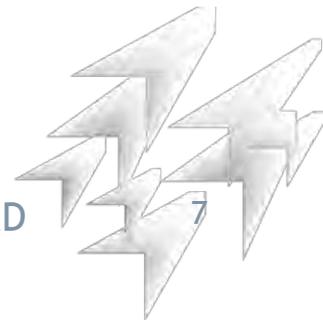
*‘Green Infrastructure is a **strategically planned network of natural and semi-natural areas** with other environmental features designed and managed to deliver a **wide range of ecosystem services and functions** such as water purification, air quality, space for recreation and climate change mitigation and adaptation. This **network of green (land) and blue (water) spaces** can improve environmental conditions and therefore citizens’ health and quality of life. It also supports a green economy, creates job opportunities and enhances biodiversity.’*

(DG Environment:

http://ec.europa.eu/environment/nature/ecosystems/index_en.htm)



- ➊ **Inventory of GI regarding its spatial structure, functionality and ecosystem services on transnational, regional and local level**
- ➋ **Integrated approach: considering cross-sectoral policy and planning objectives**
- ➌ **Providing decision support for politicians, planners, land users/managers and communities to invest in GI**
- ➍ **Raising awareness of the GI concept as (informal) aid for spatial planning**
- ➎ **Communicating the benefits of GI**



BENEFITS OF GI



ENHANCED EFFICIENCY OF NATURAL RESOURCES

- Maintenance of soil fertility
- Biological control
- Pollination
- Storage of freshwater resources

HEALTH & WELL-BEING

- Air quality and noise regulation
- Accessibility for exercise and amenity
- Better health and social conditions

AGRICULTURE & FORESTRY

- Multifunctional resilient agriculture and forestry
- Enhancing pollination
- Enhancing pest control

WATER MANAGEMENT

- Regulation of water flows
- Water purification
- Water provisioning

EDUCATION

- Teaching resource and 'natural laboratory'

TOURISM & RECREATION

- Destinations made more attractive
- Range and capacity of recreational opportunities

DISASTER PREVENTION

- Erosion control
- Reduction of the risk of forest fires
- Flood hazard reduction

CLIMATE CHANGE MITIGATION & ADAPTATION

- Carbon storage and sequestration
- Temperature control
- Storm damage control

INVESTMENT & EMPLOYMENT

- Better image
- More investment
- More employment
- Labour productivity

CONSERVATION

- Existence value of habitat, species and genetic diversity
- Bequest and altruist value of habitat, species and genetic diversity for future generations

LAND & SOIL MANAGEMENT

- Reduction of soil erosion
- Maintaining/enhancing soil's organic matter
- Increasing soil fertility and productivity
- Mitigating land take, fragmentation and soil sealing
- Improving land quality and making land more attractive
- Higher property values

LOW-CARBON TRANSPORT & ENERGY

- Better integrated, less fragmented transport solutions
- Innovative energy solutions

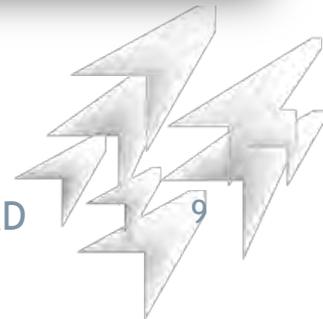
RESILIENCE

- Resilience of ecosystem services

Adapted From European Commission (2013). Green Infrastructure - Enhancing Europe's Natural Capital. (Commission Staff Working Document)

Austrian case study areas

Western Weinviertel & Eastern Waldviertel Nationalpark Thayatal



AUSTRIAN CASE STUDY AREAS

- Western Weinviertel & Eastern Waldviertel
- Nationalpark Thayatal



AUSTRIAN CASE STUDY AREAS

- Western Weinviertel & Eastern Waldviertel
- Nationalpark Thayatal



Districts Hollabrunn and Horn

24 + 20 = 44 municipalities

1011 km² + 784 km² = 1.795 km²

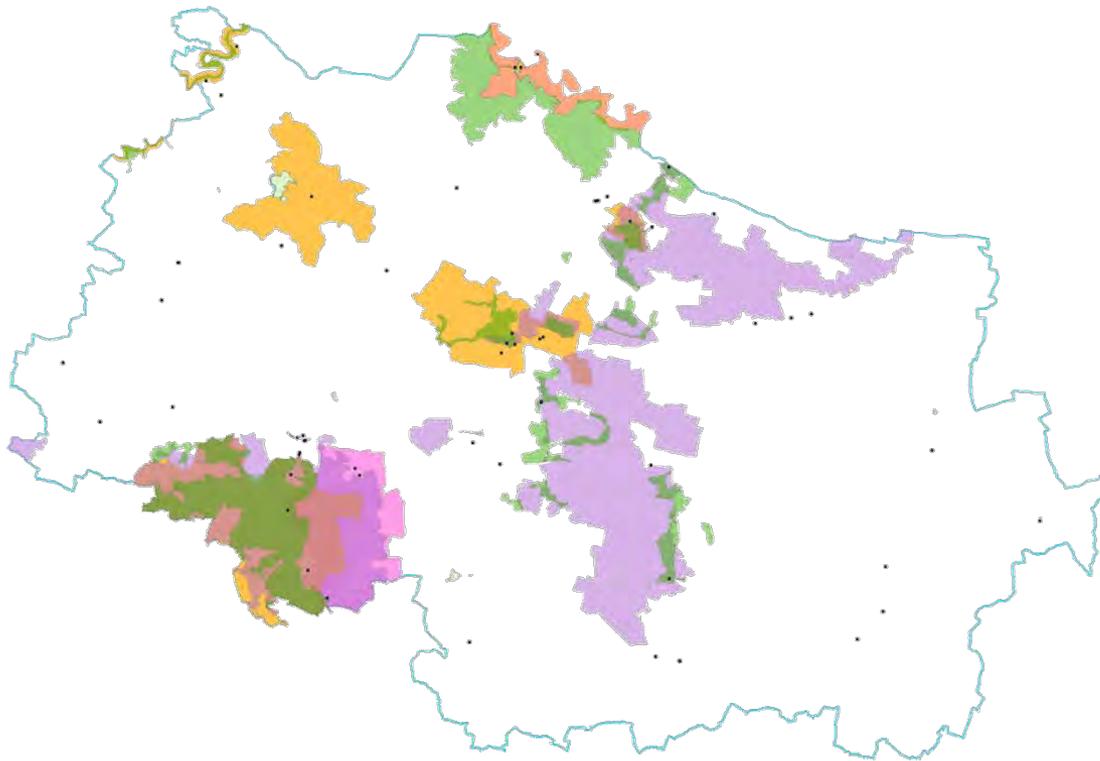
50.705 + 31.275 = 81.980 inhabitants

Population density: 50 inh./km² | 40 inh./km²



AUSTRIAN CASE STUDY AREAS

- Western Weinviertel & Eastern Waldviertel
- Nationalpark Thayatal

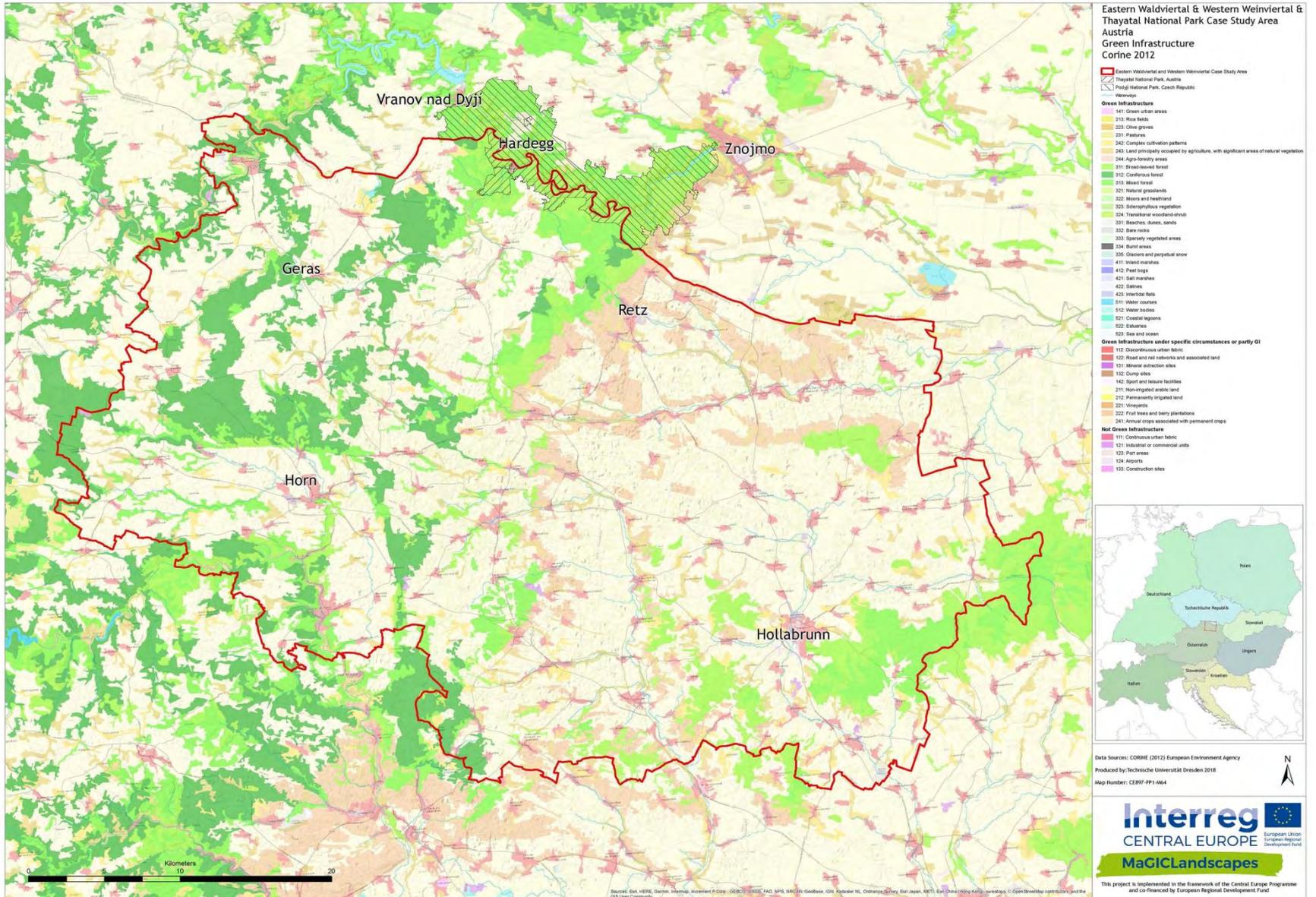


Protected areas

-  Nationalpark
-  Federal conservation area
-  Nature park
-  Natura 2000 Habitats Directive
-  Natura 2000 Birds Directive
-  Landscape conservation area
-  Natural monuments
-  Natural monuments (point)
-  Water protection areas



AUSTRIAN CASE STUDY AREAS



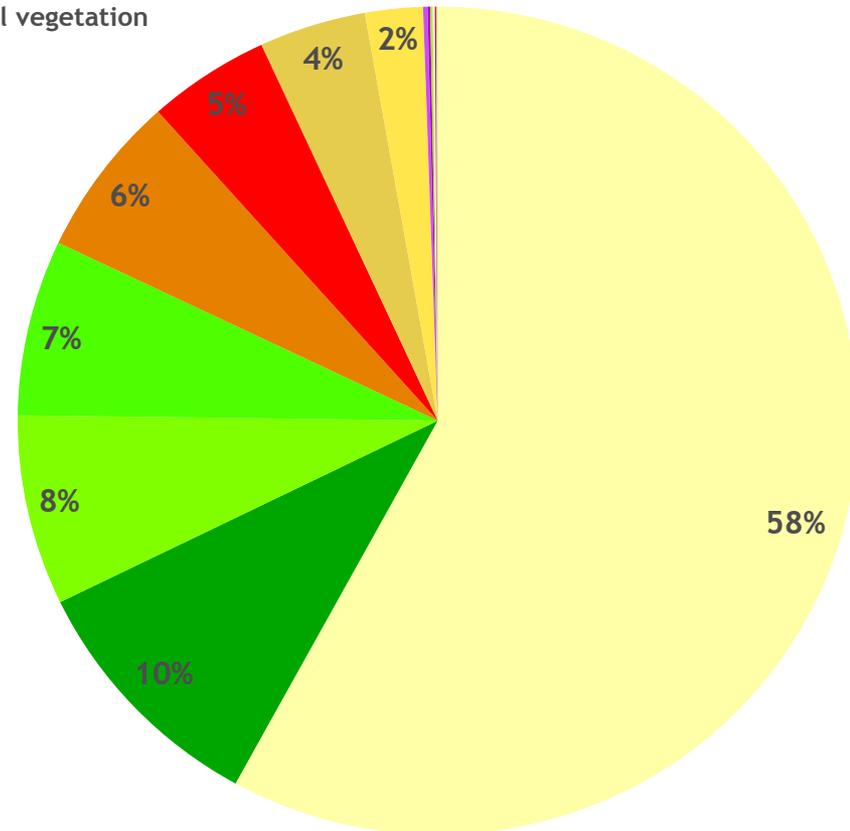
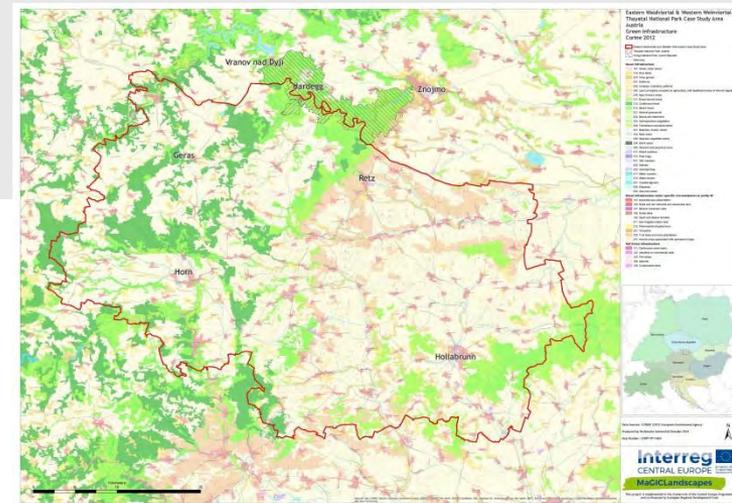
AUSTRIAN CASE STUDY AREAS

Landcover based on CORINE

Westliches Weinviertel und östliches Waldviertel & Nationalpark Thayatal

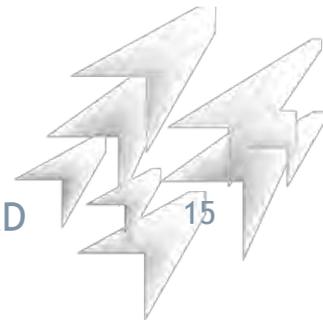
- 211: Non-irrigated arable land
- 312: Coniferous forest
- 311: Broad-leaved forest
- 313: Mixed forest
- 221: Vineyards
- 112: Discontinuous urban fabric
- 243: Land principally occupied by agriculture, with significant areas of natural vegetation
- 242: Complex cultivation patterns
- 121: Industrial or commercial units
- 131: Mineral extraction sites
- 324: Transitional woodland-shrub
- 142: Sport and leisure facilities
- 111: Continuous urban fabric
- 231: Pastures
- 512: Water bodies

~ 1/3 = GI



Development of an assessment method/tool

- for functionality of GI in terms of
 - **connectivity** and
 - provision of **landscape services**
- Easy to use decision support tool for politicians, planners, land users/managers and communities for investments in GI



Development of an assessment method/tool

- Application on three levels
 - **Transnational:** CORINE landcover (CLC)
 - **Regional:** CLC supplemented by available national and regional data
 - **Local:** Field mapping of EUNIS habitats



Three-staged key factors

Broader habitat types
&
connectivity



1.



Naturalness



2.



Ecosystem services



3.

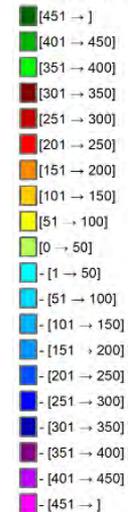


Analysis of connectivity

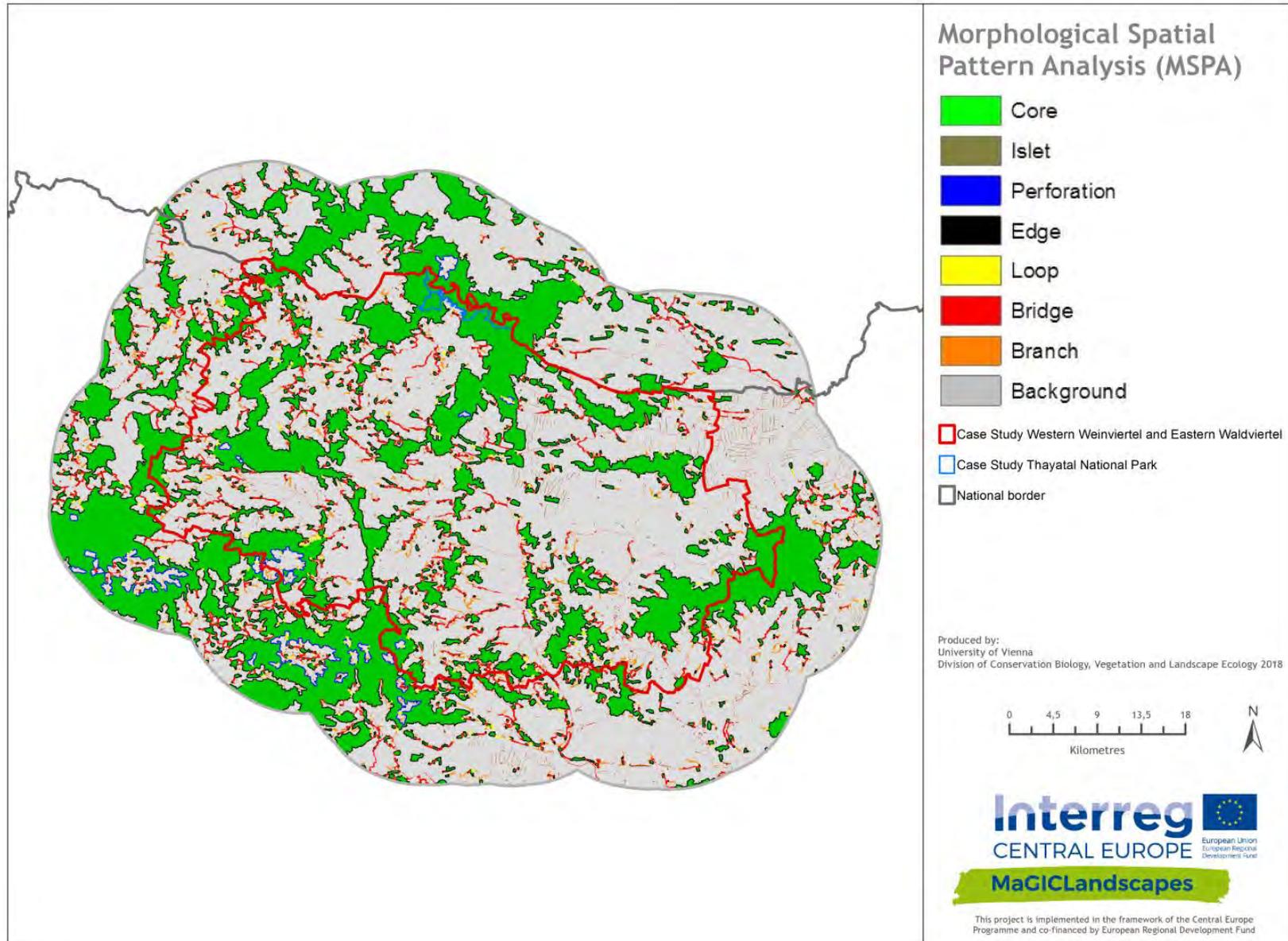
- **GuidosToolbox software package**
European Commission, Joint Research Centre (JRC)
 - **Morphological Spatial Pattern Analysis (MSPA)**
 - Facilitates the description of the geometry and connectivity of raster image components at any scale
 - **Measuring Euclidean Distance**
 - Measures the degree of intactness, shape and spatial arrangement of patches on a given binary map



Distance range groups in metres



MSPA (MORPHOLOGICAL SPATIAL PATTERN ANALYSIS)

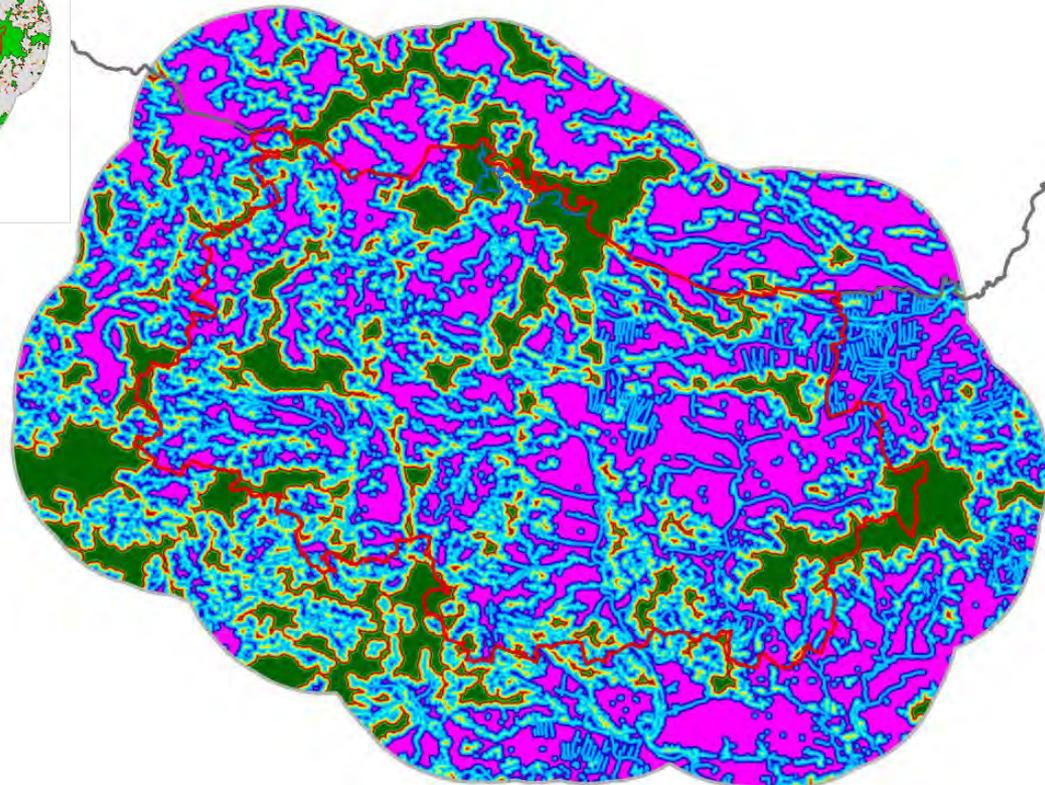


MSPA (MORPHOLOGICAL SPATIAL PATTERN ANALYSIS)

Examples of highly important bridges/links

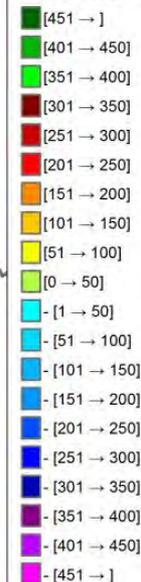


MEASURING EUCLIDEAN DISTANCE



Map of Euclidean Distance

Distance range groups in metres

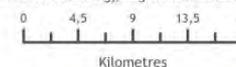


 Case Study Western Weinviertel and Eastern Waldviertel

 Case Study Thayatal National Park

 National border

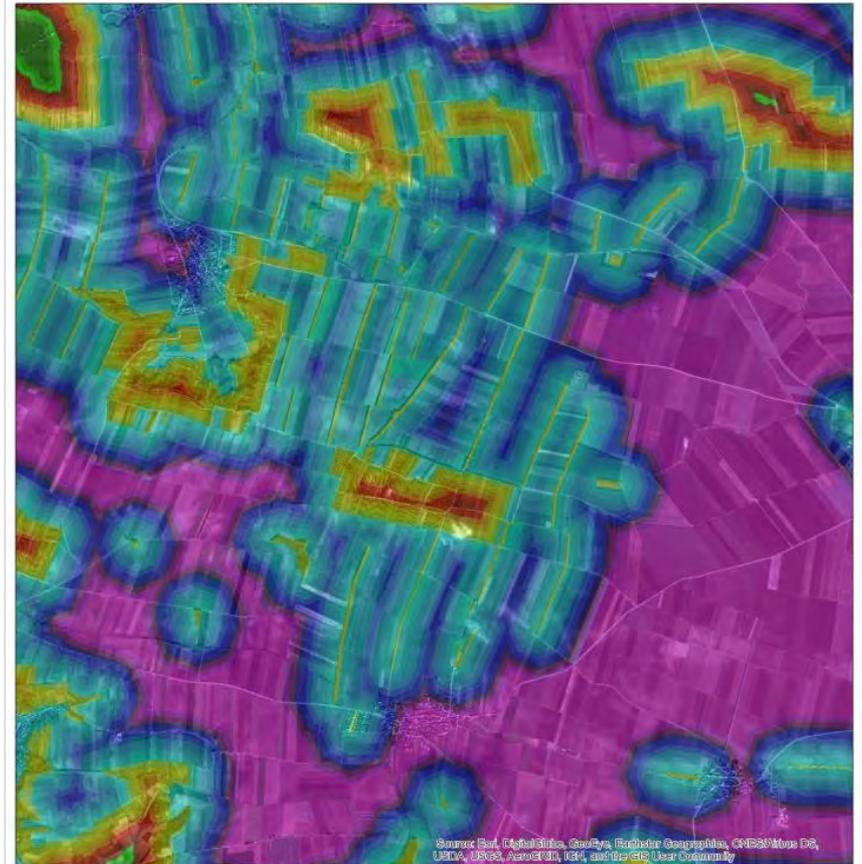
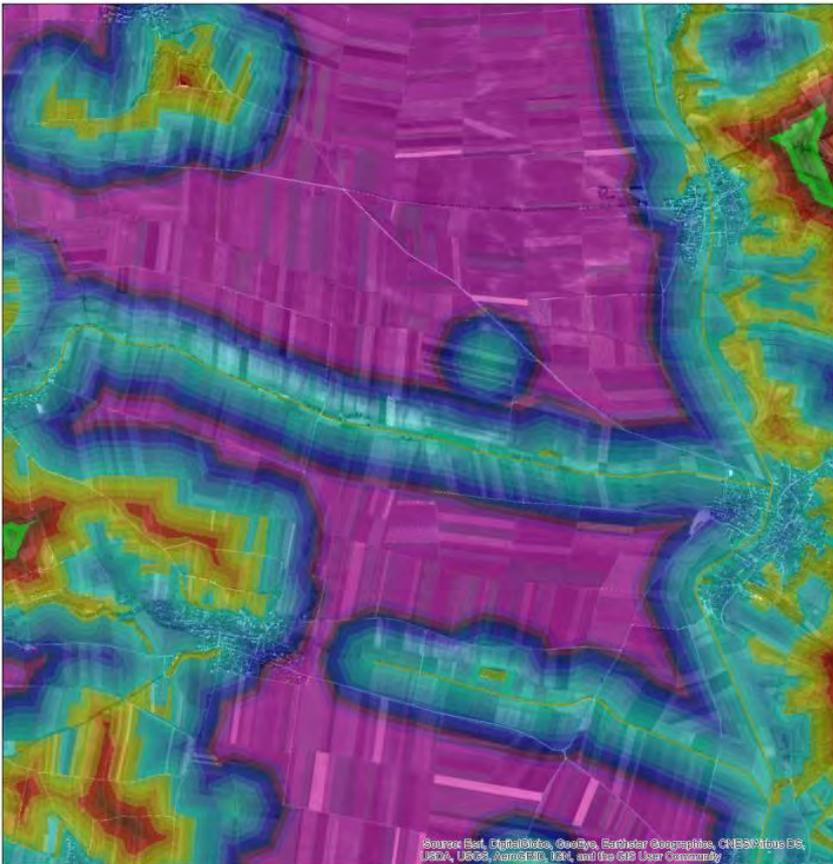
Produced by:
University of Vienna
Division of Conservation Biology, Vegetation and Landscape Ecology 2018



Hot spot/cold spot map of GI connectivity

MEASURING EUCLIDEAN DISTANCE

Examples of efficient links and connecting pathways in the network of GI



Field work: Identification of elements of GI

- External working contracts for 3 topics of interest
 - Woodland and remnants of forest
 - Wetlands and water bodies
 - Dry and semi-dry grasslands



STAKEHOLDER INVOLVEMENT

- Technical meetings & workshops for target groups



STAKEHOLDER INVOLVEMENT

- Specific cooperation with relevant institutions

Associated partners



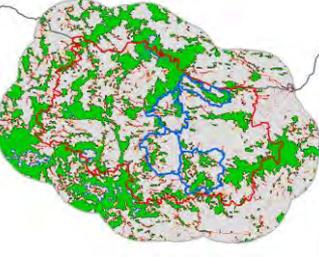
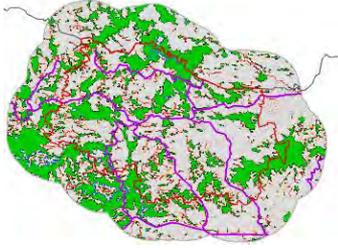
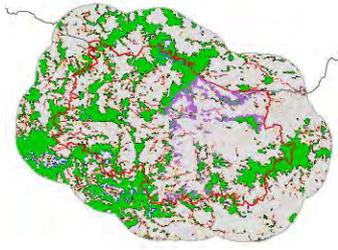
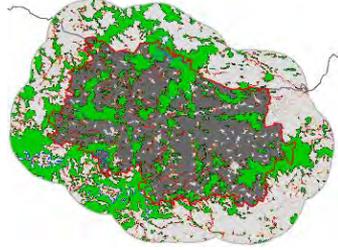
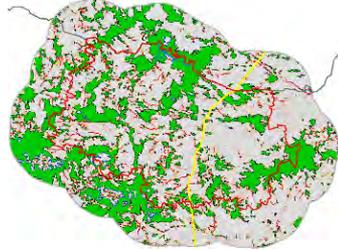
Technisches Büro für Biologie
Mag. Dr. Rainer Raab



Cooperation partners



RELATED MASTER THESES

Cycling paths ...	Railway lines ...	Vineyards ...	Shelter belts/ wind breaks ...	Power grids ...
 Weinviertel tourism agency	 Austrian Federal Railways	 Lower Austrian Association of Viticulture	 Lower Austrian Agricultural Authority	 Austrian Power Grid
by Judith Scherrer	by Anja Manoutschehri	by Markus Hofer	by Patricia Schmid	by Jacob Seilern
 	 	 	 	 



...as elements of regional green infrastructure



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www.interreg-central.eu/MaGICLandscapes
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