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10th IALE World Congress, July 1-5 2019, Milano, Italy



Territorial system of ecological stability as a regional example for Green Infrastructure planning in the Czech Republic

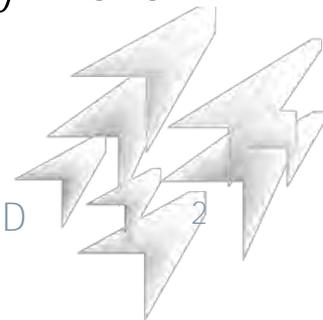


Hana Skokanová, Tomáš Slach, Silva Tarouca research Institute

TERRITORIAL SYSTEM OF ECOLOGICAL STABILITY (TSES) - BACKGROUND



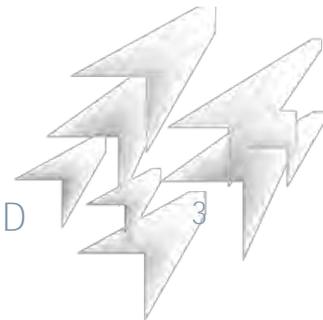
- Interconnected system of natural as well as modified but near natural ecosystems keeping natural balance = existing as well as non-existing designed network
- Integral part of municipalities' territorial plan
- Goals: sources of the natural genetic material, support of ecological stability, support of landscape-forming functions
- Purpose:
 - To delineate large enough plots supporting survival of species
 - To delineate routes with relatively undisturbed species movement
 - To create optimal spatial distribution of ecologically more stable plots
 - To divide ecologically less stable plots



TERRITORIAL SYSTEM OF ECOLOGICAL STABILITY (TSES) - BACKGROUND

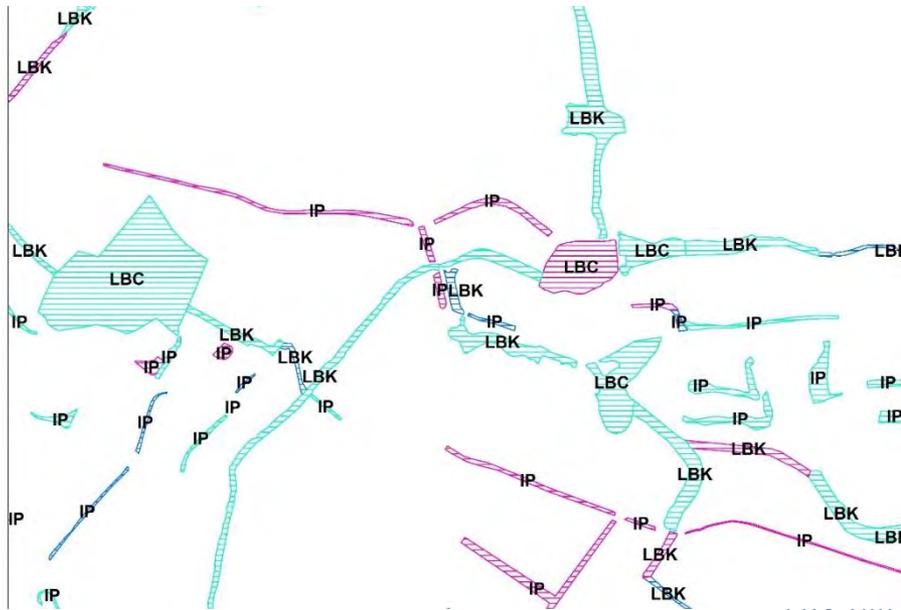


- Delineation based on many different ecological & landscape ecological theories
- Different typology:
 - According to biogeographic significance
 - local,
 - regional,
 - supra-regional
 - According to degree of anthropogenic impact
 - natural (e.g. forests),
 - dependent on anthropogenic activities (e.g. meadows)
 - According to types of natural environment
 - terrestrial,
 - water

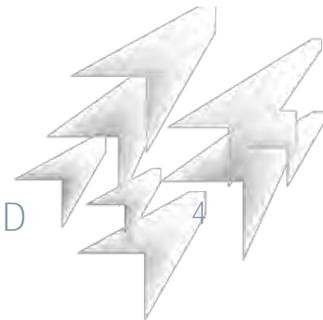


TERRITORIAL SYSTEM OF ECOLOGICAL STABILITY (TSES) - BACKGROUND

- Three parts:
 - bio-centres - plots that due to their size & state of ecological conditions enable permanent existence of species & communities,
 - bio-corridors - plots/corridors enabling movement of organisms between bio-centres which they physically connect,
 - interaction elements - stepping stones for migration/permanent existence of organisms, smaller than bio-centres & bio-corridors, usually linear



Example of designed TSES network in a Kyjovsko municipality of **Kelčany**



TERRITORIAL SYSTEM OF ECOLOGICAL STABILITY (TSES) - BACKGROUND

- Three levels - local, regional, supra-regional - differ in size - minimal spatial parameters

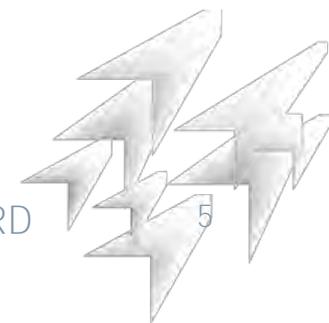
Bio-centre

level	type of habitat	minimum size in ha
Local	forest	3
	wetland	1
	meadow	3
Regional	forest	20-46*
	wetland	10
	meadow	30
Supra-regional	forest	1000

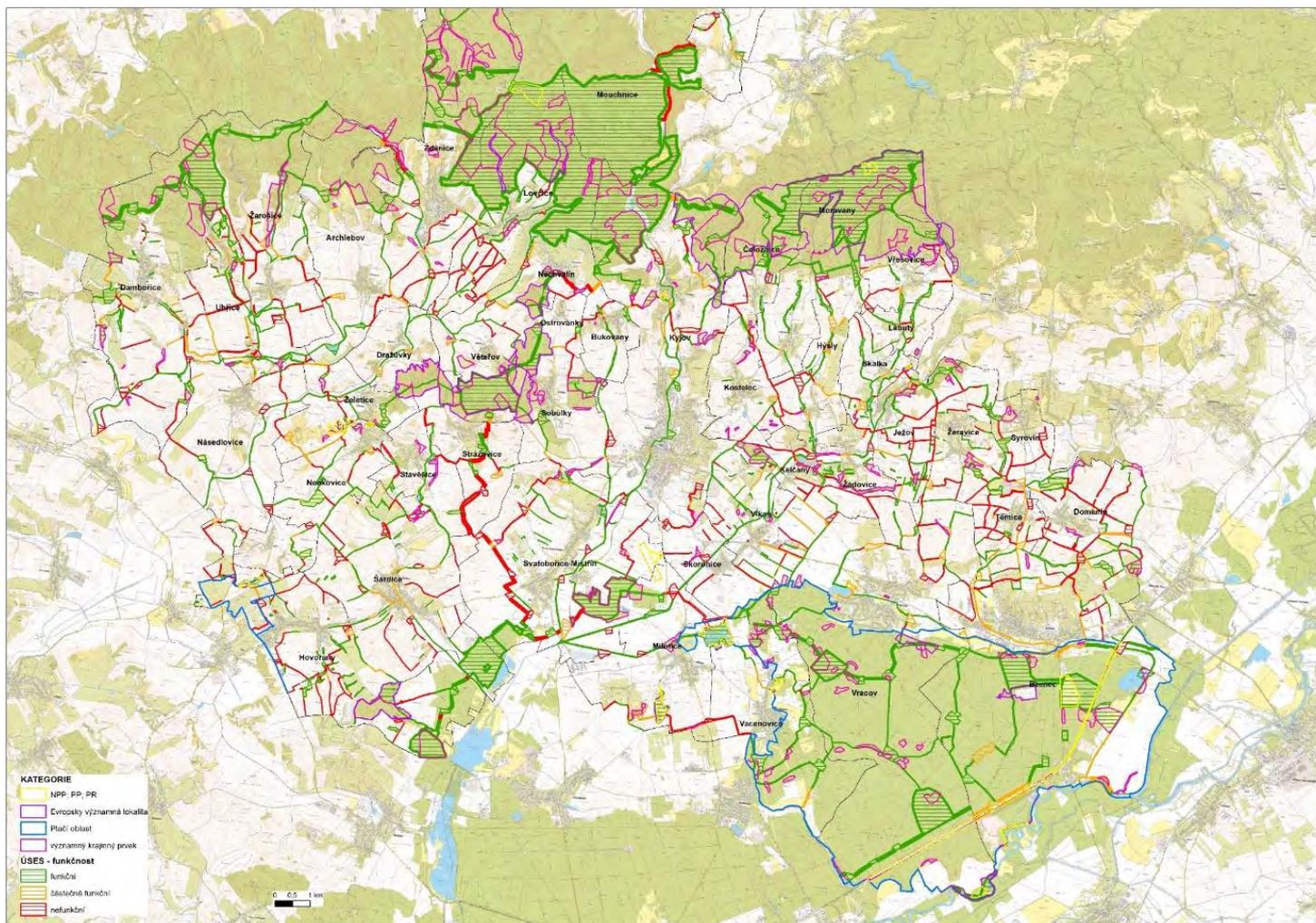
Bio-corridor

level	type of habitat	minimum width in m	maximum length in m
Local	forest	15	2000
	wetland	20	2000
	meadow	20	1500
Regional	forest	40	700
	wetland	40	1000
	meadow	50	500-700
Supra-regional	forest	40	8000

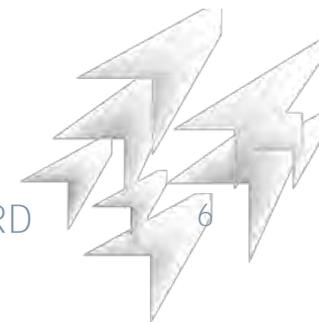
* Depends on vegetation grade, and type of biochore



CASE STUDY KYJOVSKO



- 42 municipalities, 470 km²
- Lowland area (200-300 m ASL)
- Very warm and dry
- 67 % used for agriculture - large arable fields (54%), very few GI elements
- forests 22 %



SOURCES AND METHODS

- Territorial plans of municipalities - different period of creation (1999-2017)
- 6 municipalities - in vector formant, the rest (38) necessary to vectorize
- Categorization - existing, partly existing, non-existing - based on ortophoto 2016
- Based on territorial plans acquisition of target habitats -forest, grassland, water, wetland, non-forest woody vegetation

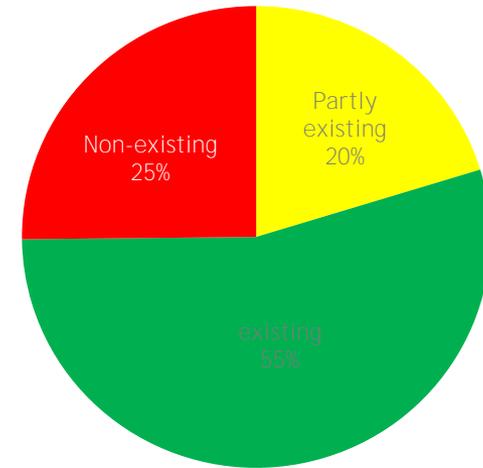
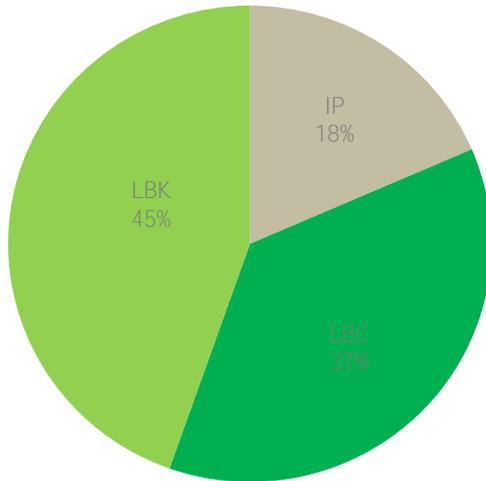
- Land cover - combination of data from LPIS, cadastre, biotope mapping, **ZABAGED, ÚHUL**, manual vectorization & verification based on 2016 ortophoto

- GI - two groups:
 - Narrow - only grasland, woody vegetation, water & wetland elements
 - Broader - also small holdings, vineyards, orchards, ruderal vegetation

- GUIDOS toolbox - MSPA analysis and Euclidian distance analysis for connectivity - comparison of narrow GI, broader GI, narrow GI with TSES and broader GI with TSES



RESULTS - PRESENCE OF TSES ELEMENTS



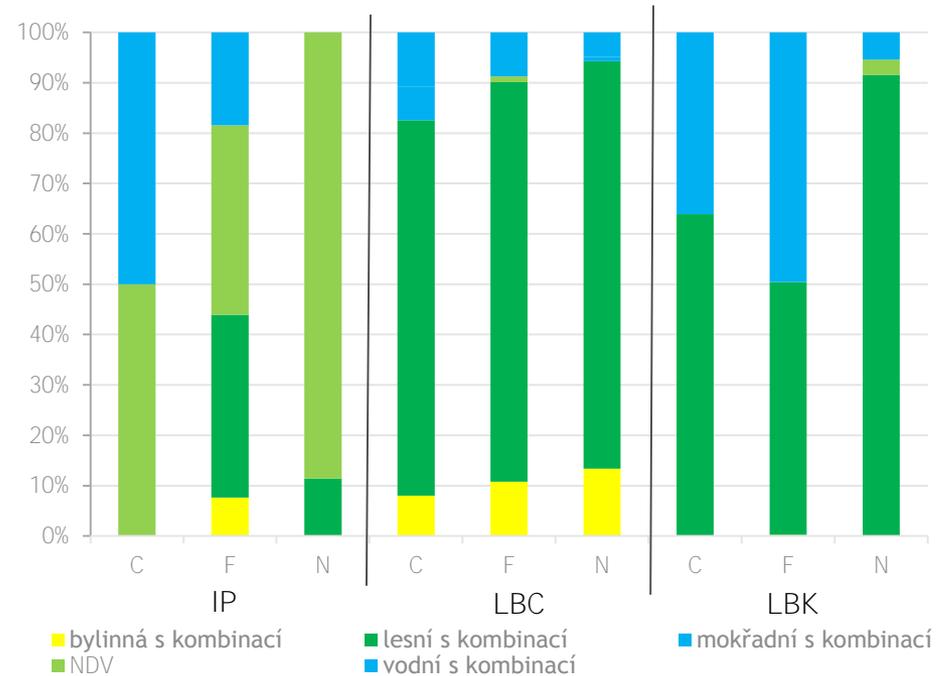
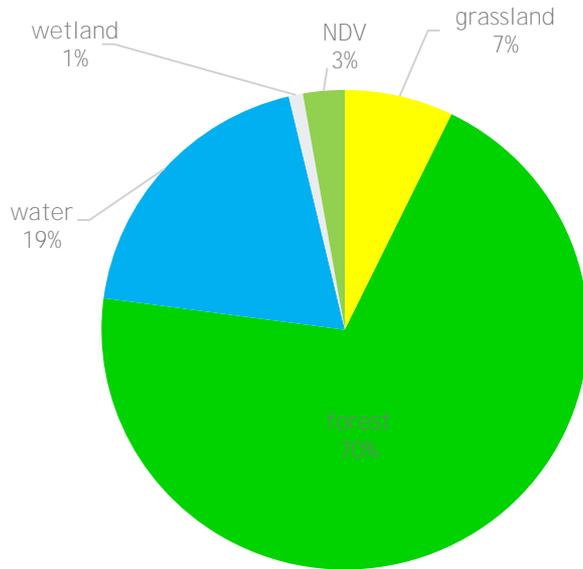
Share on individual categories



Share on overall TSES



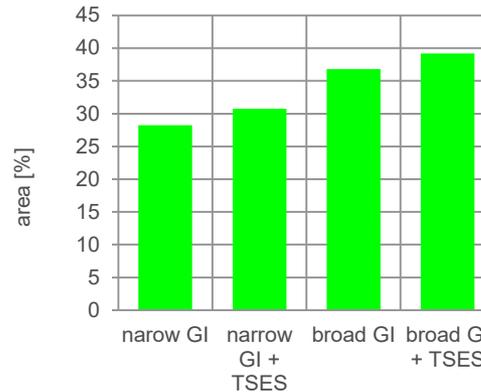
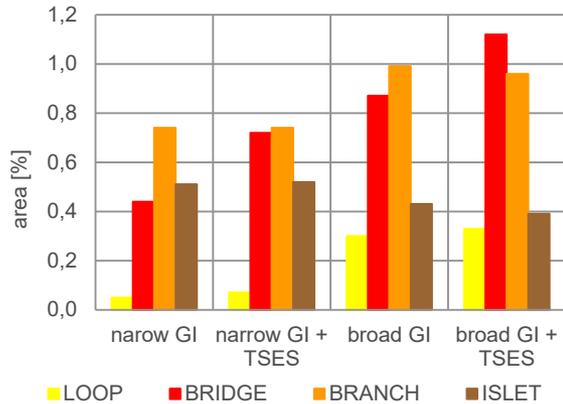
RESULTS - TARGET HABITATS



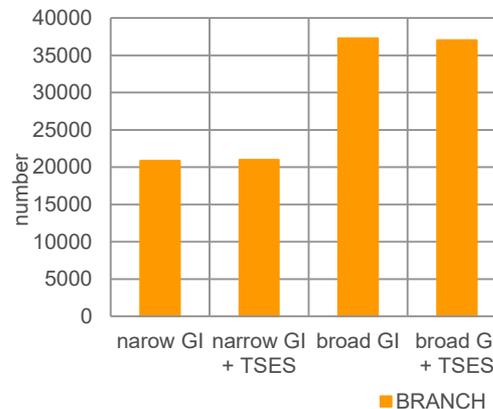
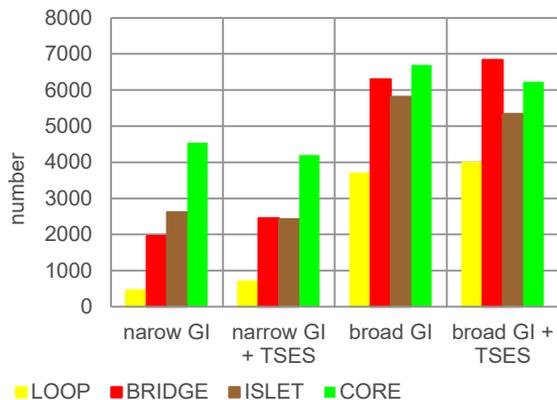
- Not all TSES elements have recorded target habitats, target habitats specified for 46 %, mainly bio-centres & bio-corridors
- Forest dominate, also highly present grassland, water with combination of other habitats (riparian vegetation, grasslands, forests)



RESULTS - MSPA ASSESSMENT



- Narrow x broad GI
- Increase in the areas & numbers of cores & bridges - better connectivity
 - Increase in the area & numbers of branches & loops (loops - usual gardens)
 - Decrease in the area & numbers of islets

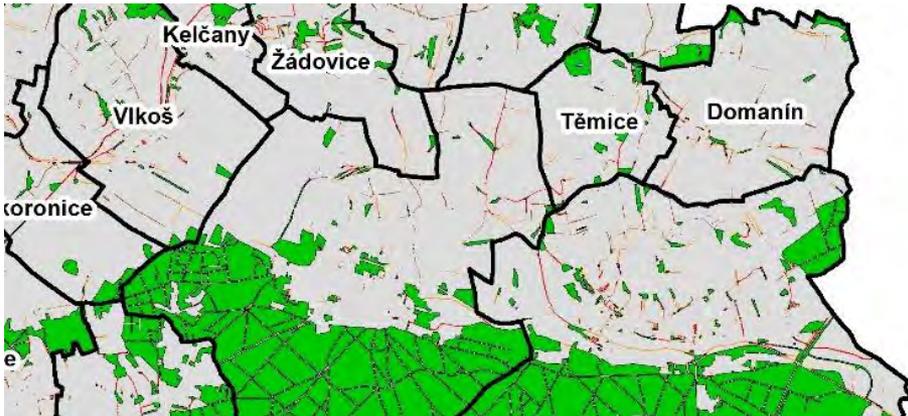


- GI & TSES
- Decrease of areas & numbers branches - TSES elements (bio-corridors) connect GI elements
 - Increase in areas but decrease in numbers of cores - TSES elements broaden and unite existing cores

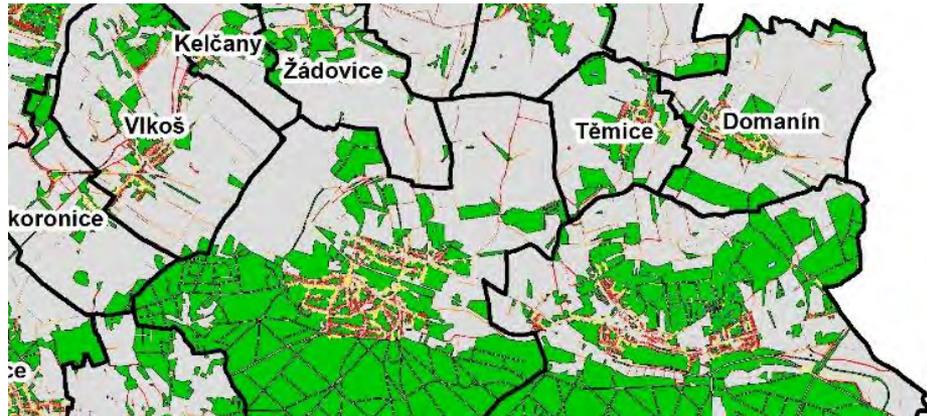


RESULTS - MSPA ASSESSMENT

GI narrow - grassland, woody, water, wetland



GI broad - small holdings, vineyards, orchards, ruderal



GI narrow - grassland, woody, water, wetland + TSES



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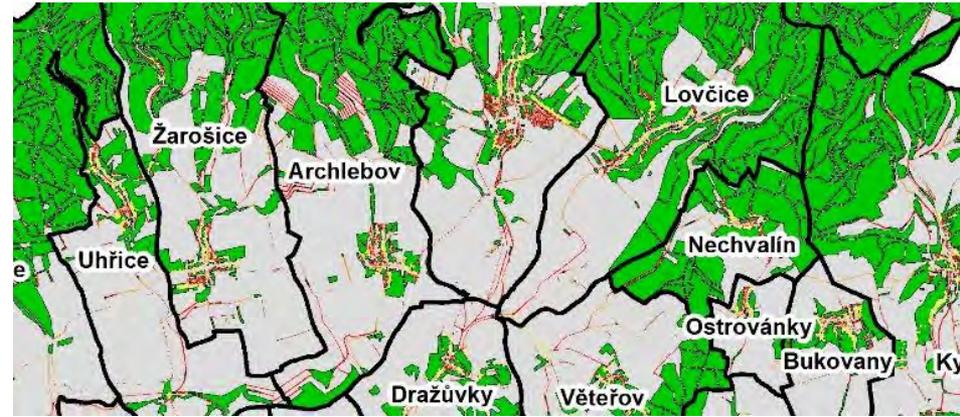


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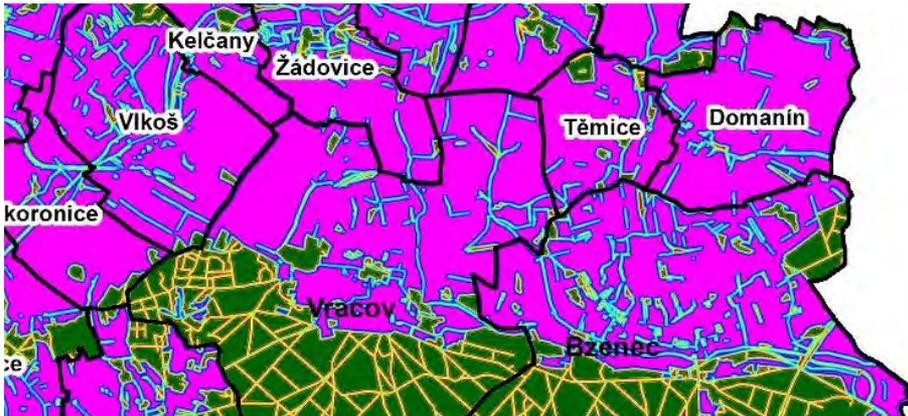
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RESULTS - EUCLIDIAN DISTANCES

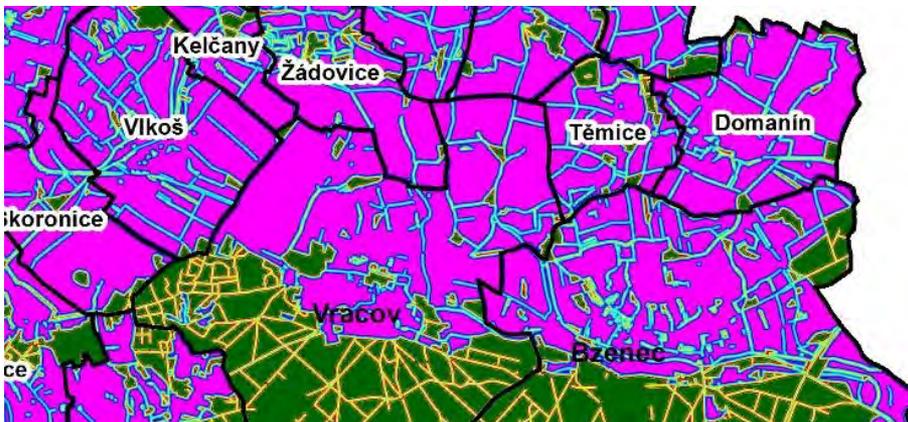
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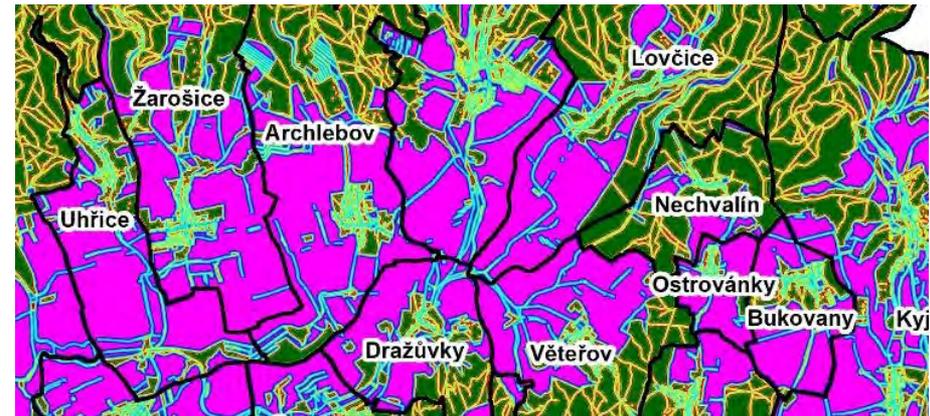
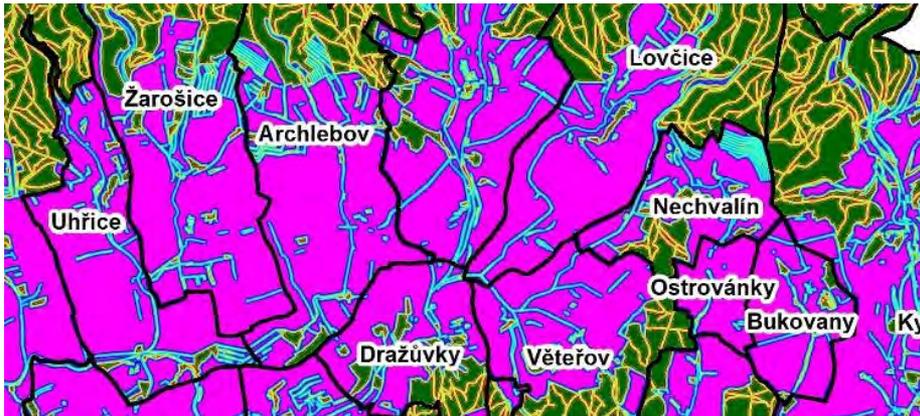
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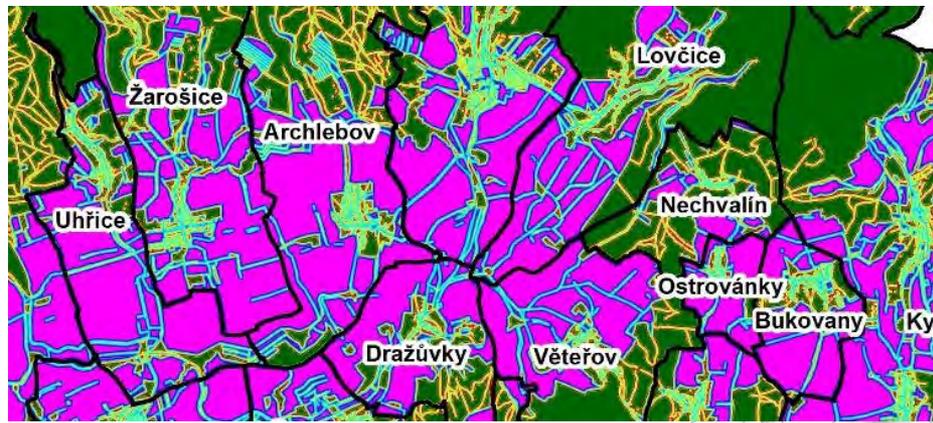
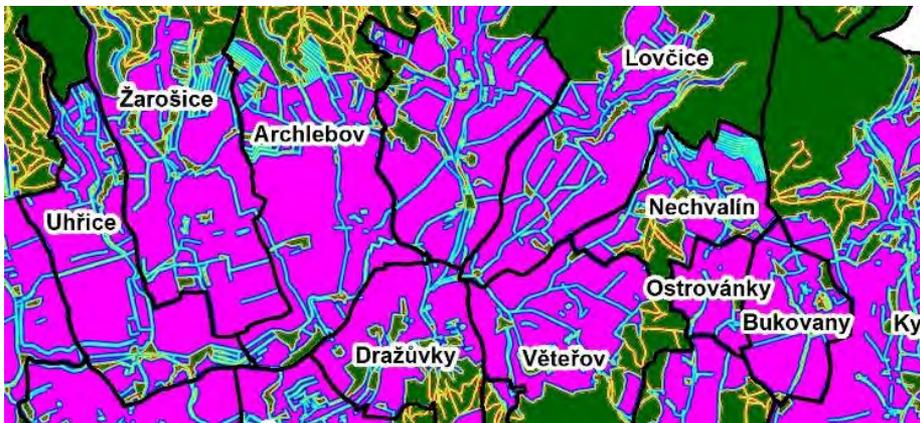
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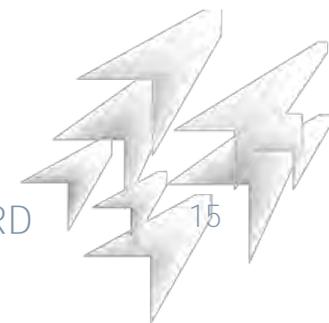
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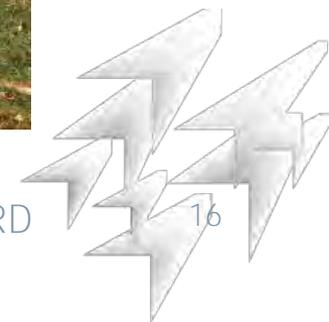


RESULTS - EXAMPLES

One of the first planted corridors in the CZ between **Vracov and Vlkoš**, realized in the early 1990s - the biotope is fully developed



Newly planted bio-corridor in Vlkoš municipality



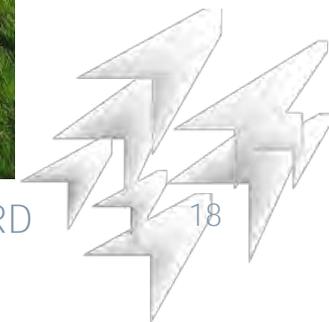
RESULTS - EXAMPLES

Newly planted bio-centre in Vlkoš municipality



RESULTS - EXAMPLES

Bio-centre as well as protected area near Bohuslavice



RESULTS - EXAMPLES

Sometimes already existing GI elements are declared as bio-centres, example from Bohuslavice



RESULTS - EXAMPLES

Landscape near **Čeložnice** where a new bio-corridor is supposed to be planted



RESULTS - EXAMPLES

Landscape near Bohuslavice where a new bio-corridor is supposed to be planted - between vineyards



THANKS FOR LISTENING



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