Ecological connectivity and green infrastucture in Hungarian spatial planning system, and CSOP implementation questions

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Kollányi László, PhD,
Hungarian Agricultural and Life Science University

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Questions regarding to CSOP

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Where could CSOP fit into the planning system?

What is a CSOP really, a regulatory plan, a development plan, a management plan, monitoring?

Which sectors should be involved in the preparation of a CSOP, how does it feed back into sectoral plans?

Who should prepare, finance and adopt the CSOP? What is the timeframe for the CSOP?

What is the relationship between CSOP and EIA, SEA (similarities, differences)?

What are the common cross-border tasks of the CSOP? Joint CSOP?

What is the minimum standardised content of CSOP (maps, scale, tools, indicators, DPSIR etc.) and legal framework?

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Where does CSOP fit into the planning system?

The Hungarian Spatial Planning system and National Ecological Network

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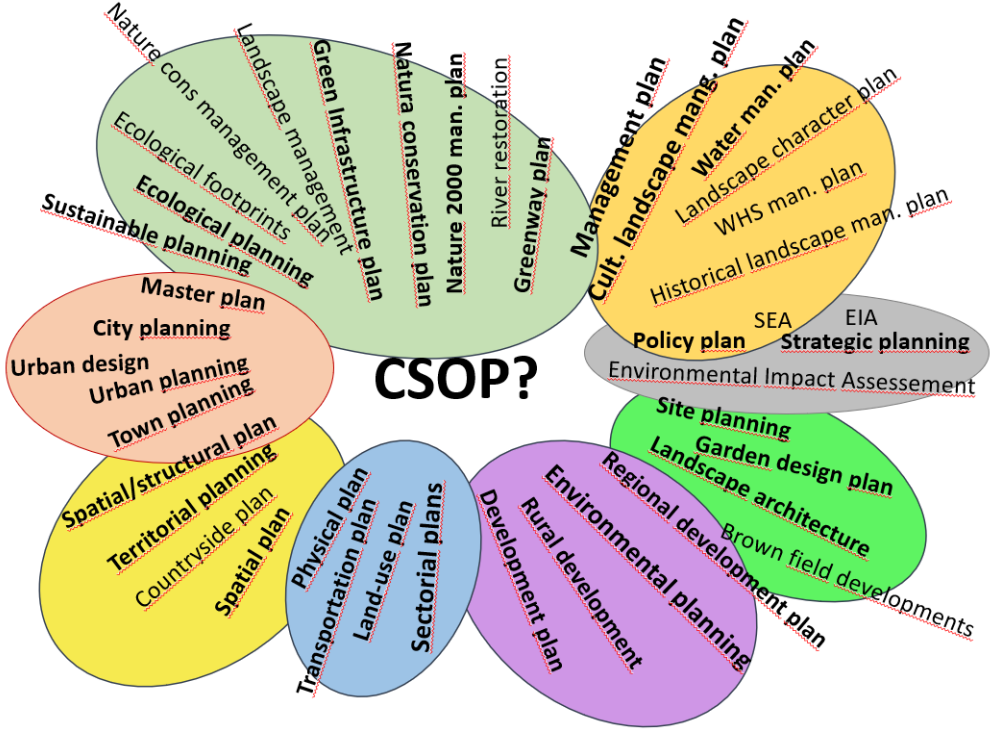
Relation of CSOP to other plan types ?



Hungary is a highly over-regulated country by European standards.
There are numerous types of plans that overlap with CSOP in terms of content.
Among the plans that exist in the **legal system**, there is more overlap with impact assessments, nature conservation management plans and spatial and urban plans.

National Spatial Plan
the highest level spatial plan

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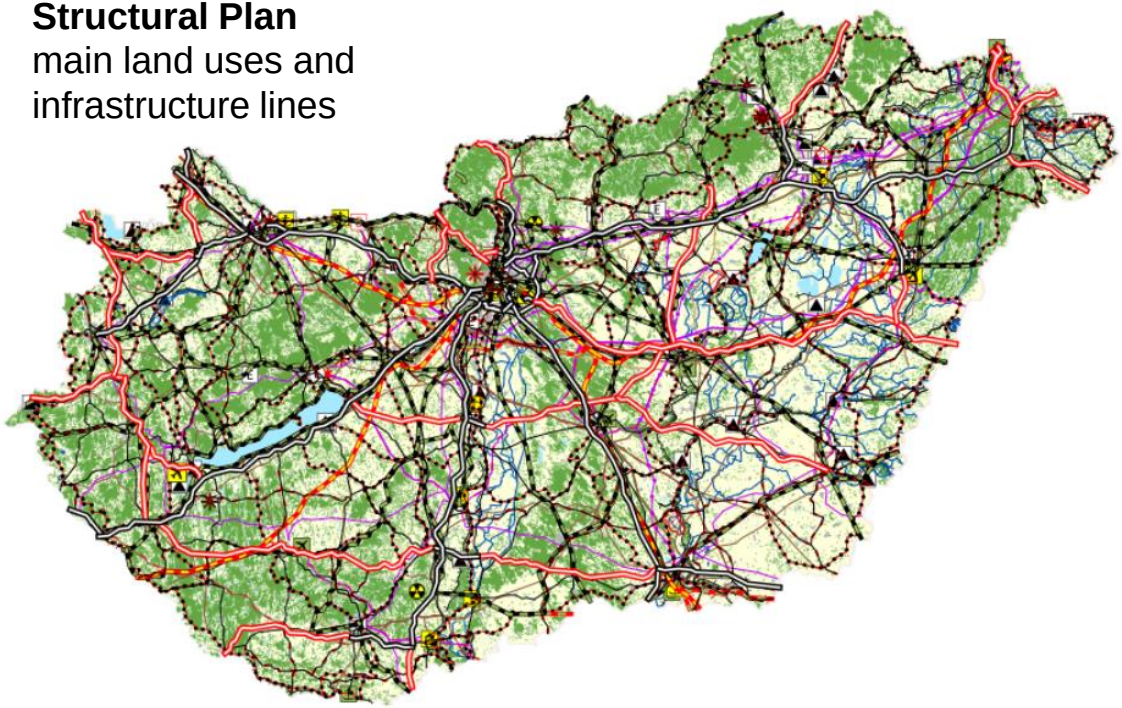
Structural Plan
main land uses and infrastructure lines



The **National Spatial Plan** defines the land use of each region for the whole country, and conditions for the different areas. It defines the coordinated spatial layout of the technical infrastructure network, taking into account sustainable development, territorial, landscape, natural, ecological and cultural assets, the conservation and protection of natural resources. Three level system: national, county level and municipal level.

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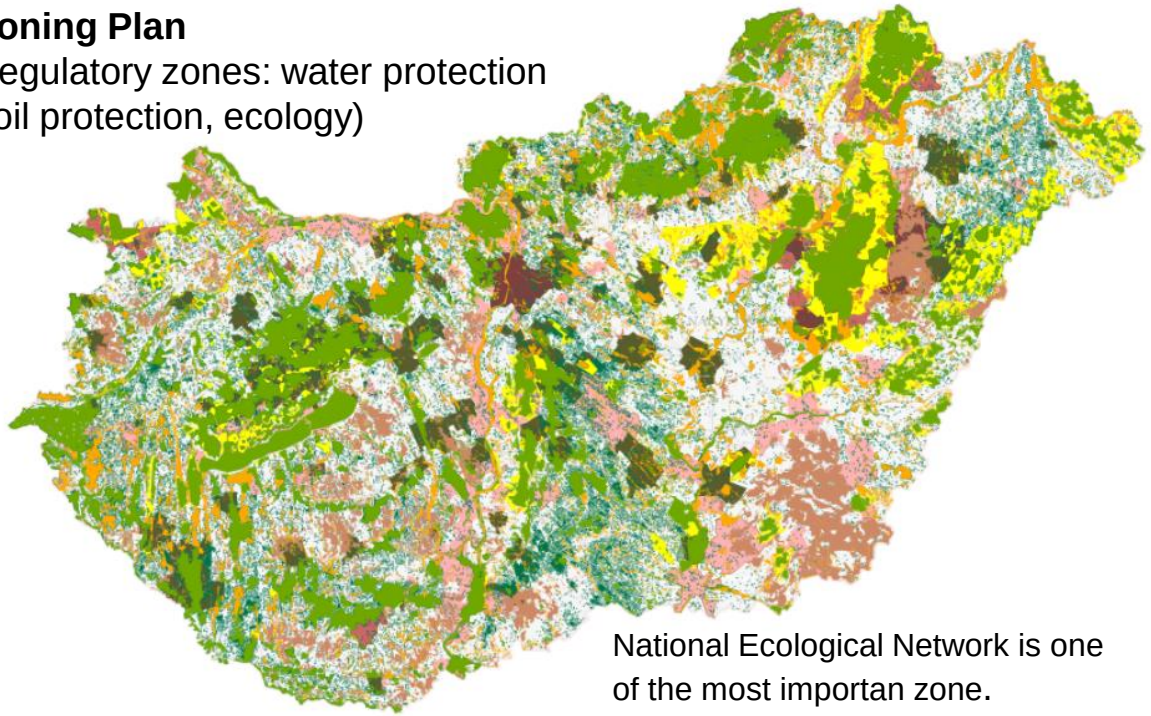
National Spatial Plan

Zoning Plan
(regulatory zones: water protection soil protection, ecology)



National Ecological Network is one of the most importan zone.

Three level system: national, county level and municipal level.

National scale:	1:50 000
Regional (county) scale:	1:50 000
Municipal scale:	1:5000
(loc. Infrastruct. plans):	1:400

Each lower level plan should implement and follows the higher level plan regulations.

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National Spatial Plan

National Ecological Network

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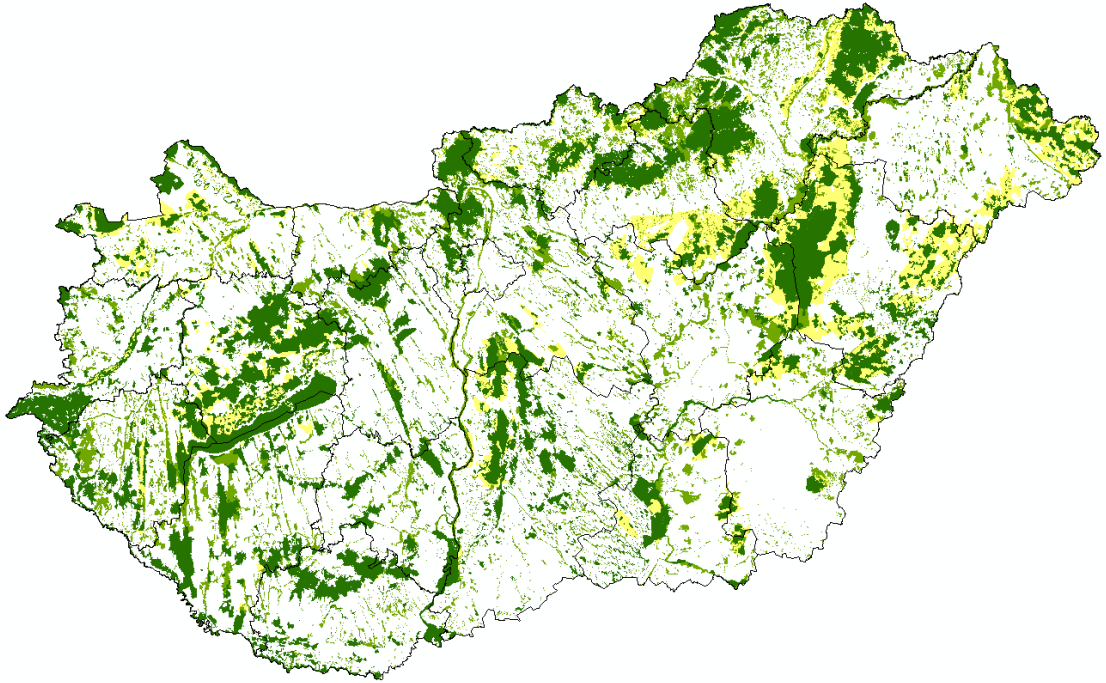

National Ecological Network: a zone established in **National Spatial Plan** (OTrT), which includes natural or semi-natural habitats that are capable of ensuring the long-term survival and living conditions of the natural fauna typical of the area and are home to several protected species or species of Community importance; Contain three different zones:

- Core zone
- Ecological corridor
- Buffer area

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National Ecological Network and nature protected areas

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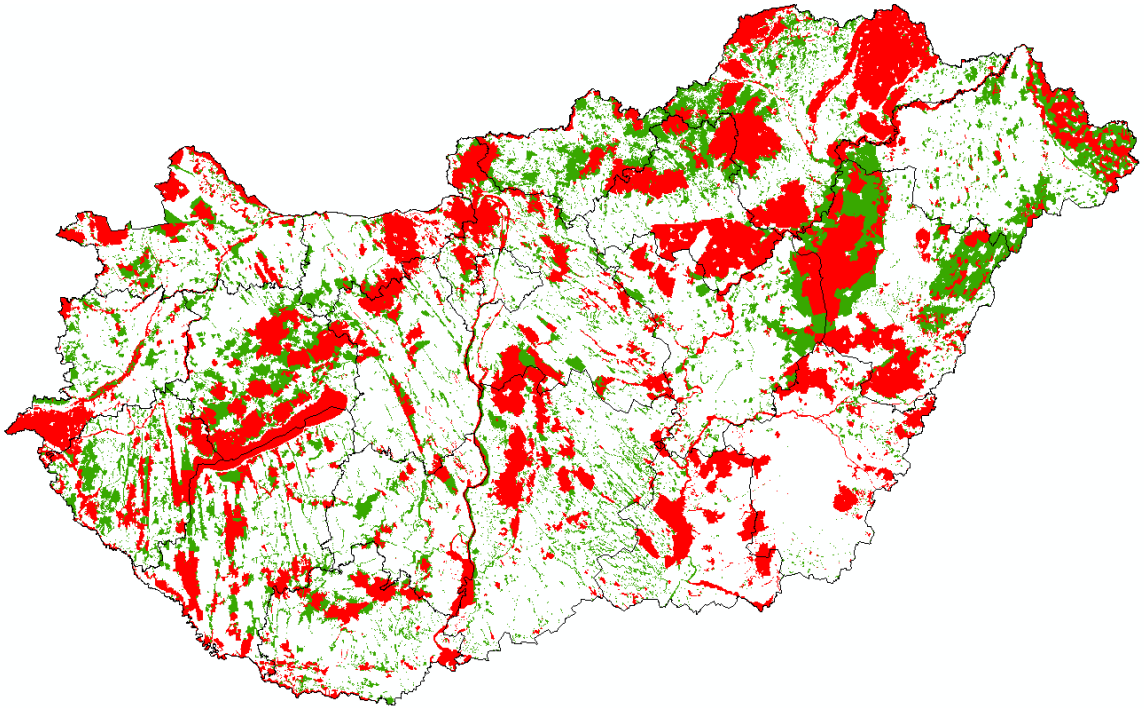
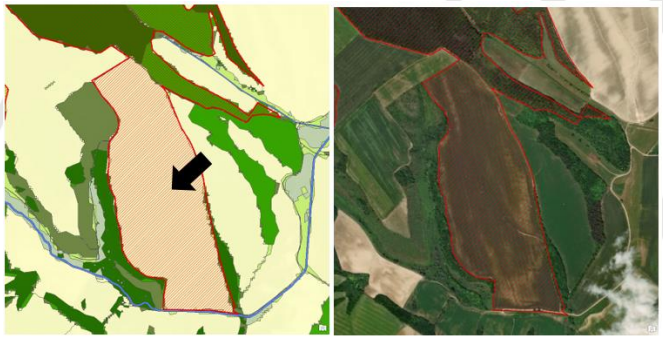


The ecological network (green) includes protected areas and Natura 2000 sites.
It is clear that the area of the ecological network is larger than the total area of nature protected areas (red).



Detailed database, almost parcel scale

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Problems with National Ecological Network

Road intersections with eco network

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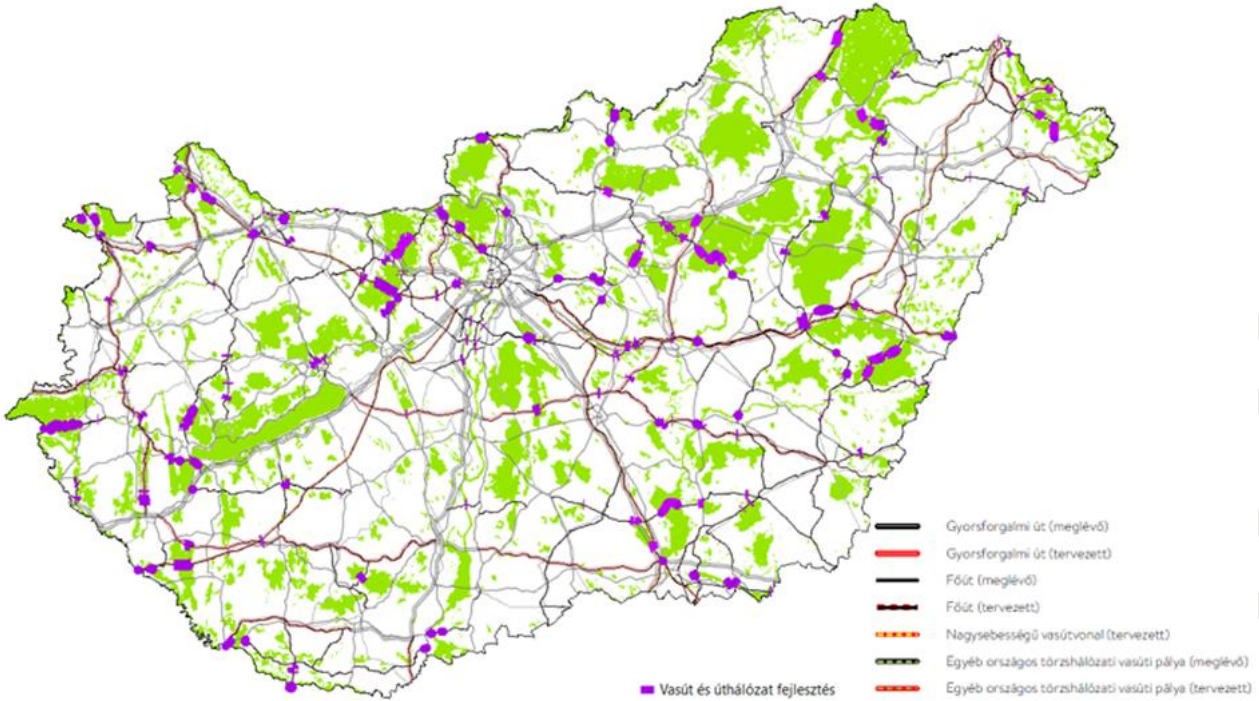

Several problems with the layout of National Ecological Network

The core area of the national ecological network is crossed by the road network development in several places (purple).
Protected natural areas are affected or cross protected areas in 98.8 km at about 61 sites, Natura2000 SPAs in 77 sites at about 256 km and Natura2000 SACs in 145 sites at 264 km.

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Problems with National Ecological Network
Missing pot. ecological corridors

The designation of the Ecological Network is based on **existing, current** values.
Development proposals and potential linkages are not included in the delineation.
This is a „regulatory type" plan and not a development type.

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Problems with National Ecological Network
Missing buffer zones

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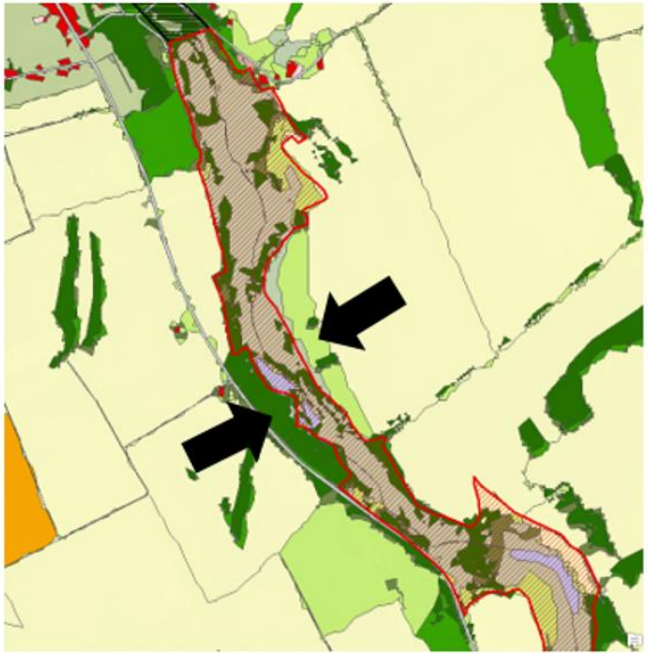

The existing ecological network elements should be complemented in a number of places. Based on the RS base map and spatial survey, it is often not clear on what basis boundaries and areas have been delimited. In the accompanying image, it would be worthwhile to designate new ecological network elements adjacent to the existing area.

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Problems with National Ecological Network
Missing network elements

New network elements would need to be designated alongside existing areas. In many places around watercourses there is no designated ecological network element, while in similar places the area falls into the category of an ecological corridor element or buffer area.

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Where does CSOP fit into the planning system?

What is a CSOP really, a regulatory plan, a development plan, a management plan, operational plan or monitoring?

The Hungarian Strategic Green Infrastructure Plan

(How CSOP fits into this plan)

Strategic Green Infrastructure Plan

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Four parts of national ecosystem and service mapping :

natura
a természet értékei

Strategic studies to underpin the conservation of biodiversity, our natural and landscape values

ökoszisztéma-szolgáltatás
a természet ajándékai

National ecosystem service mapping and assessment

Good frame for CSOP

zöldinfrastruktúra
a természet hálózatai

Strategic green infrastructure mapping for the conservation of natural and landscape values at landscape scale

tájkarakter
a természet arcai

Land character mapping

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Green Infrastructure Plan
(cubic model of the research)

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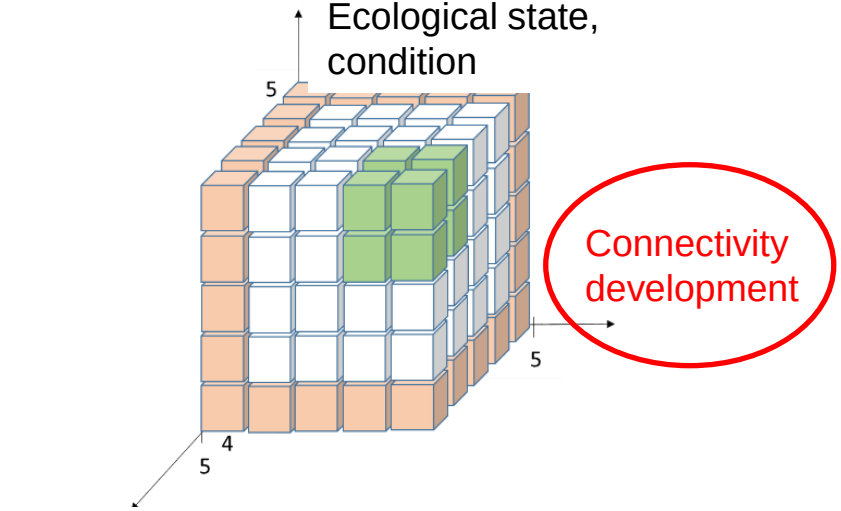

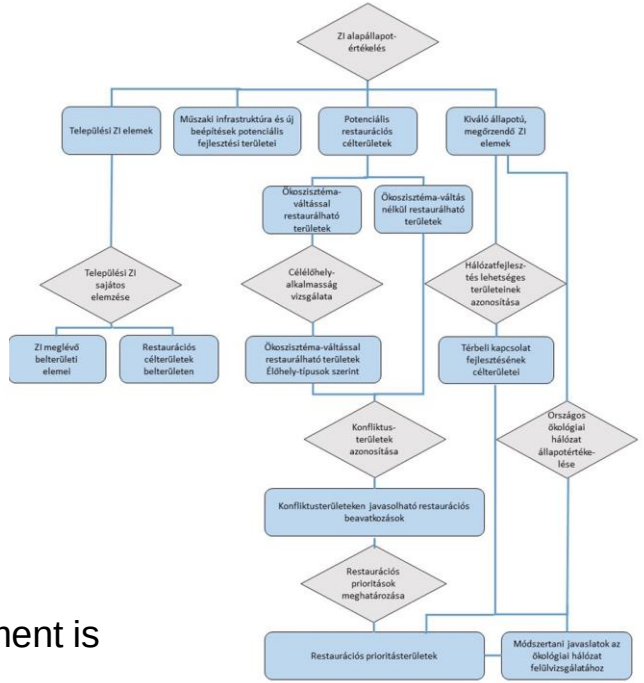

The mapping and assessement is based on three pillars.

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Green Infrastructure Plan
EU proposal for the development of the GI 2018

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1 level	2 level	3 level	4 level
near-nature	*slight degradation*	*strong degradation*	*heavily modified*

Any step up between levels counts towards the 15% restoration (EU BD Stratégia 2020)

Basic principle to improve step-by-step the ecological condition of sites

Restoration Prioritization Framework (Lammerant et al. 2013)

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Green Infrastructure Plan

Maintain >> develop the condition >> change the landuse

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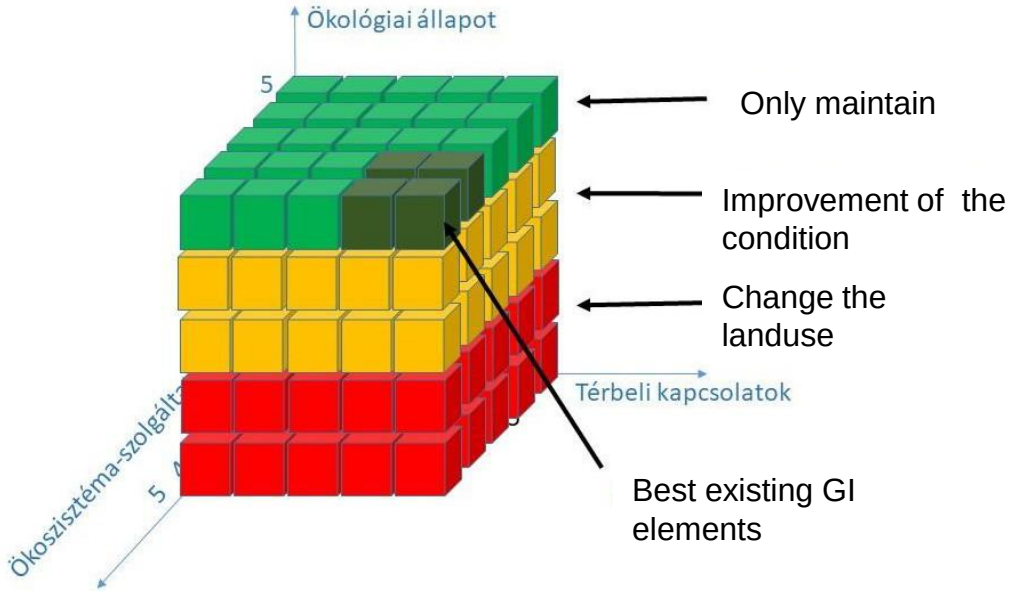
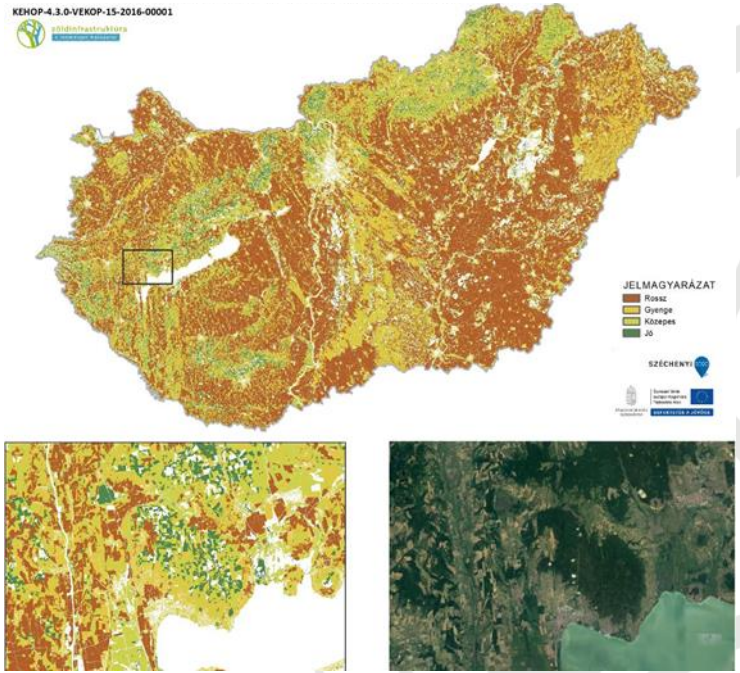
Maintain >> develop the condition >> change the landuse



Ecological condition or state



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Ecological connectivity analysis

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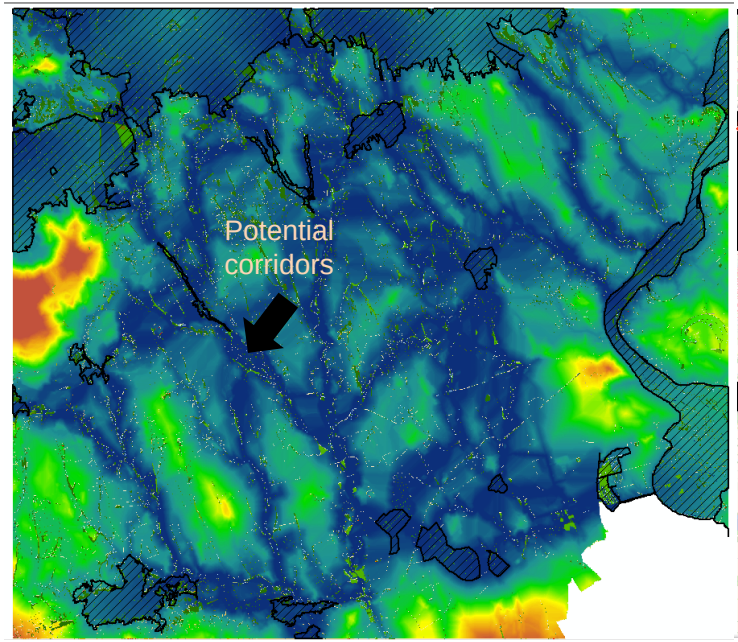
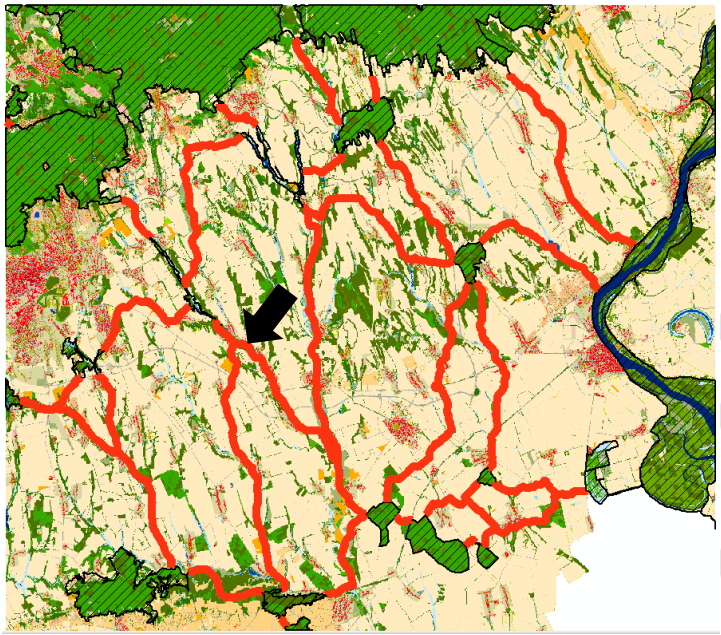


LCP analysis



Proposed new corridors

Ecological connectivity analysis based on Linkage Mapper modelling.
It is understood that these new potential corridors need to be locally validated according to real field conditions by planners, local stakeholders, municipals.

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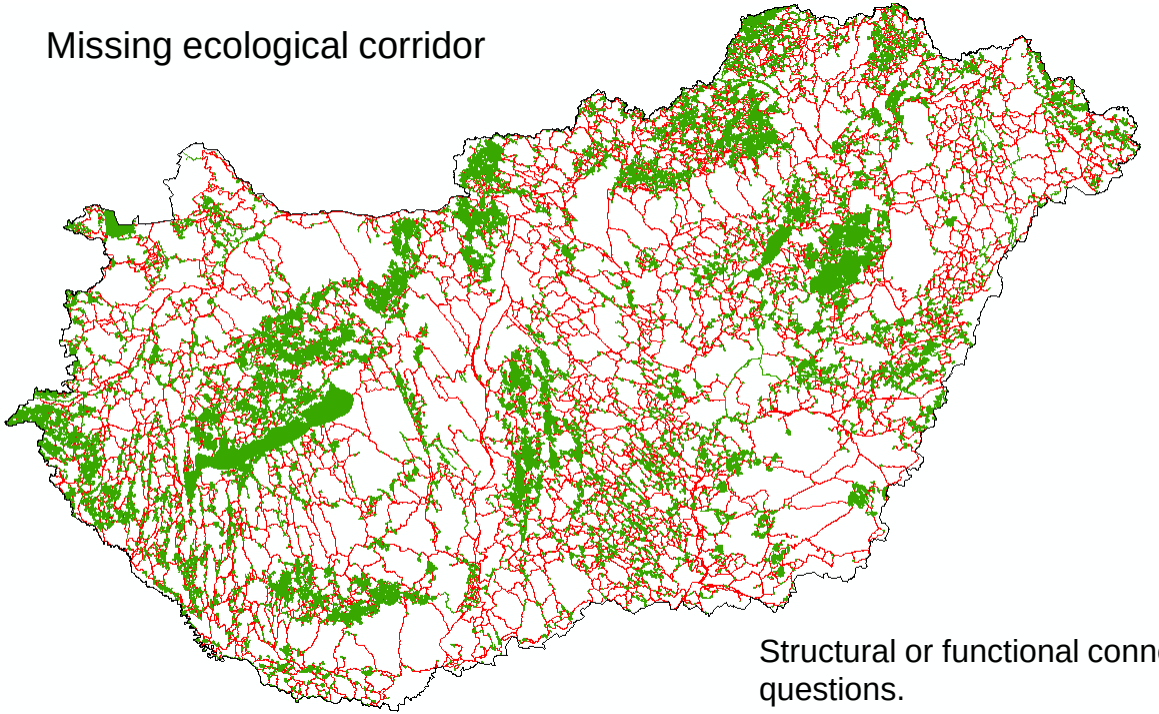
Missing ecological corridor



Structural or functional connectivity questions.

Selection, validation, evaluation of the national scale proposed ecological corridors.
It is understood that these new potential corridors need to be **locally validated** according to real field conditions by planners, local stakeholders, municipals.

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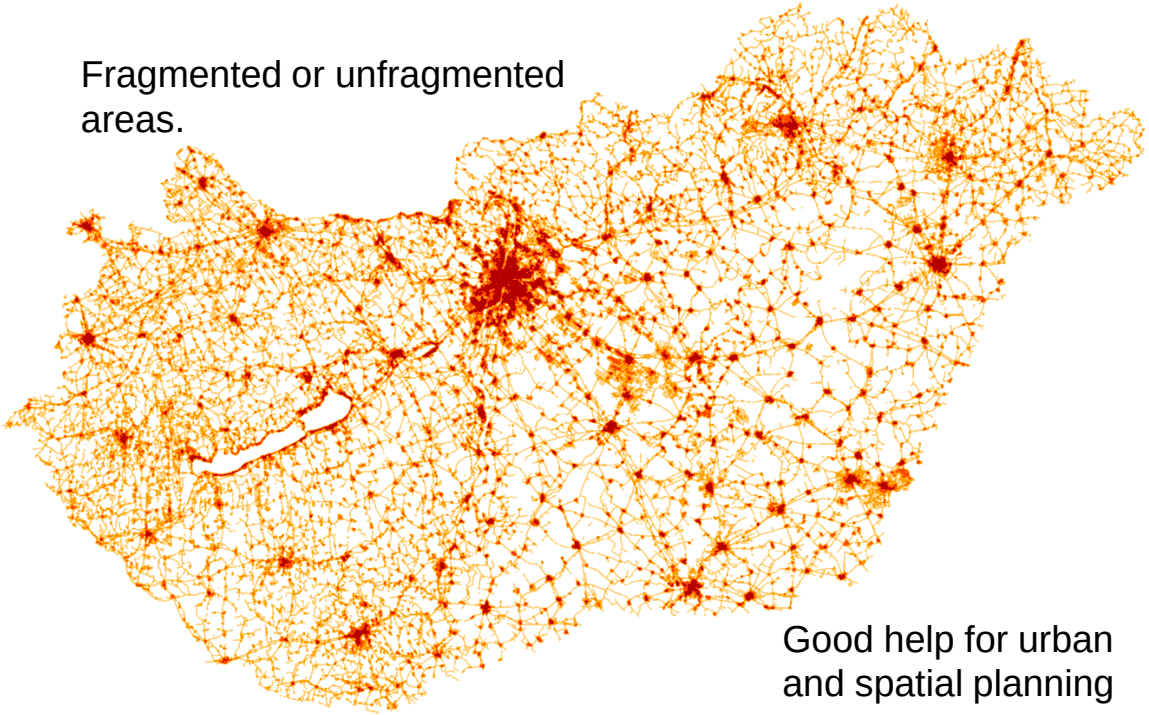
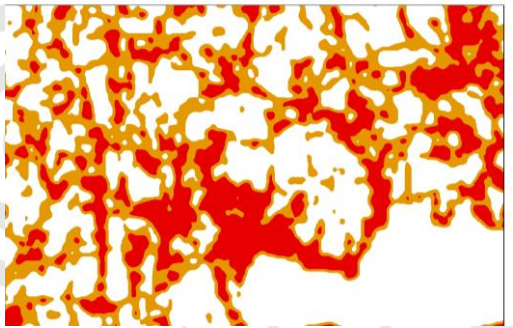
Fragmentation index analysis

Fragmented or unfragmented areas.



Good help for urban and spatial planning

Widely used method in the European Union is the measurement of the "effective mesh size", which measures the size of the area of the infrastructure that is fragmented by the mesh, rather than the length of the linear infrastructure.



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Green infrastructure plan for Hungary
Spatial connectivity of green infrastructure elements

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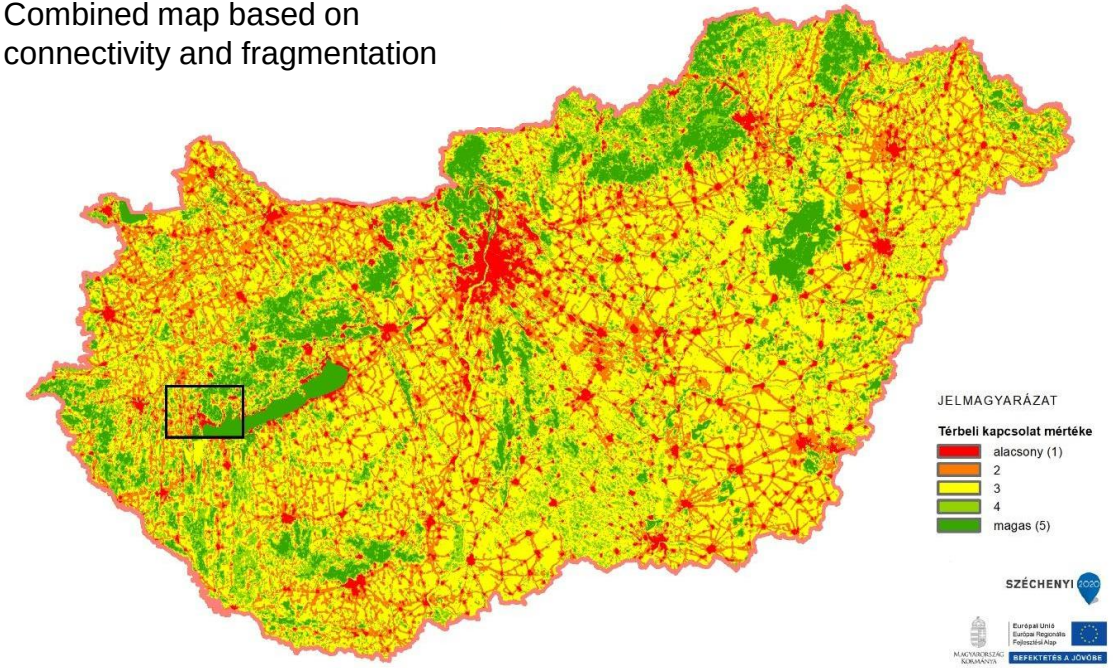
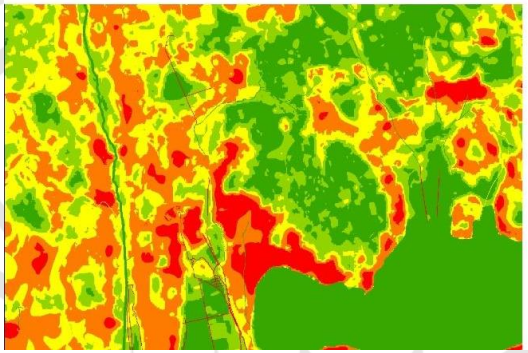
Combined map based on connectivity and fragmentation



The **spatial connectivity** of green infrastructure elements based on a five-level composite index of landscape connectivity and landscape fragmentation.



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Green infrastructure plan for Hungary

Connectivity analysis results

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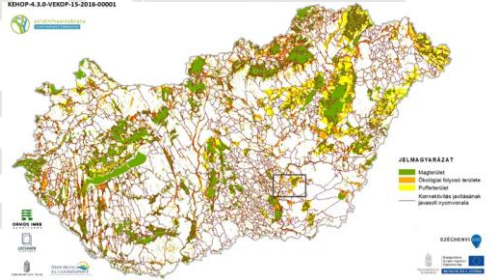
Connectivity analysis is already of great help in mapping ecological corridors at the local scale. These designated ecological corridors can be of great help in the preparation of the CSOP.
More then 167 thousand potential ecological corridor.



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Green infrastructure plan for Hungary

Comparison of potential landscape ecological corridors and the transport network

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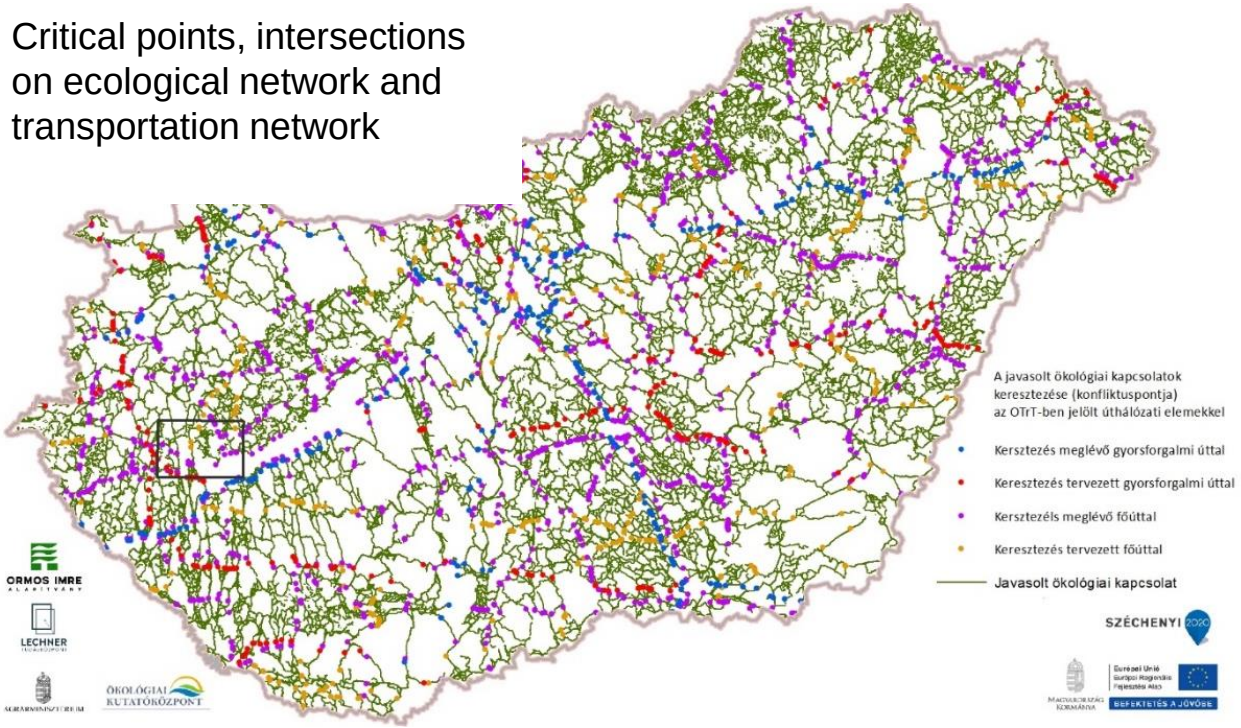
Critical points, intersections on ecological network and transportation network



A comparison of potential landscape ecological corridors and the transport network (existing and planned) of the OTrT. By identifying the **intersection points**, we can identify critical points where a technical element (ecological bridge, tunnel) could be installed with good ecological connectivity, connecting well functioning ecosystems with good or excellent ecological status, and where planned elements could be considered for trail correction.

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Green infrastructure plan for Hungary

Lack of wooded roads

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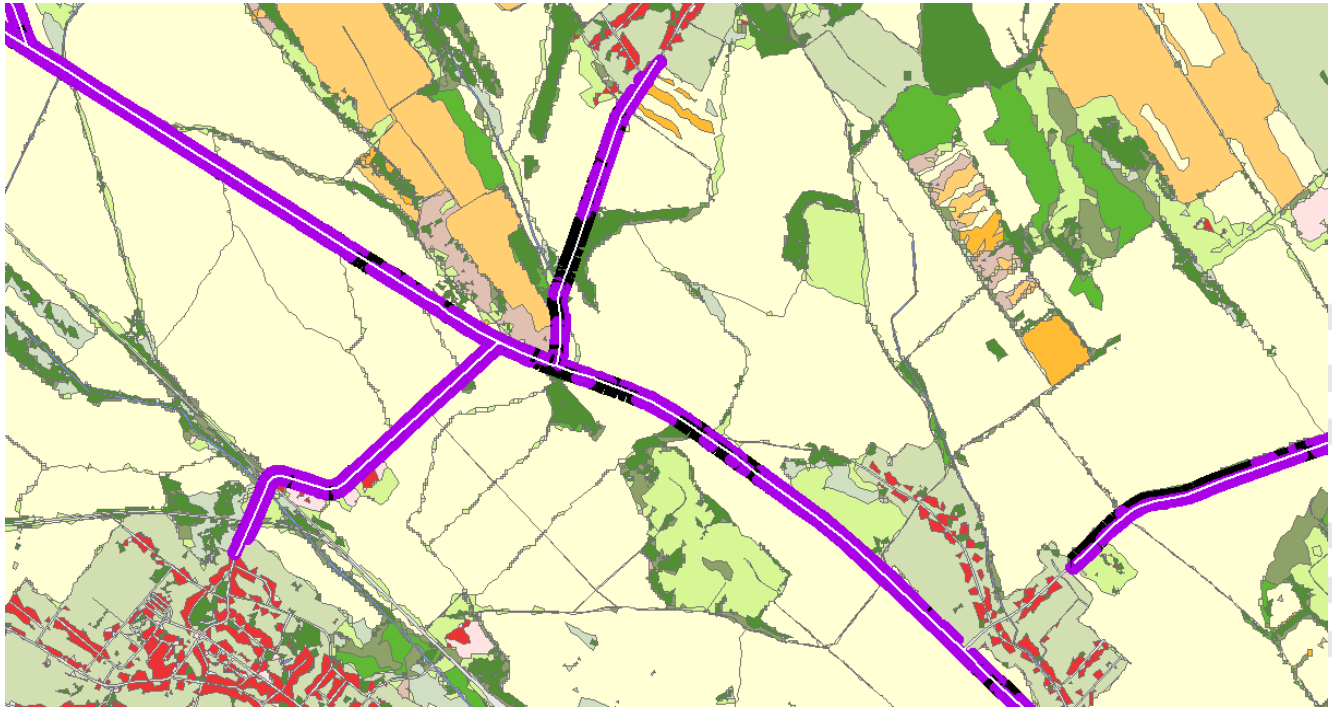
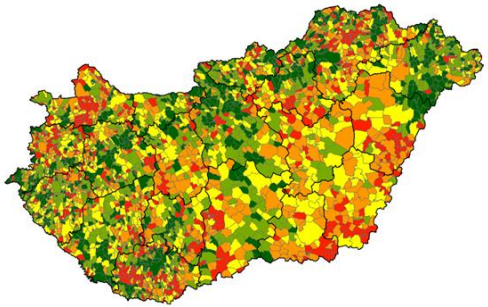


Smaller scale connectivity enhancement

The road forestry rate is only 28.4%, which effectively means that only slightly more than a quarter of the potential 100% theoretical tree cover is being used



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Green infrastructure plan for Hungary
Large agricultural fields

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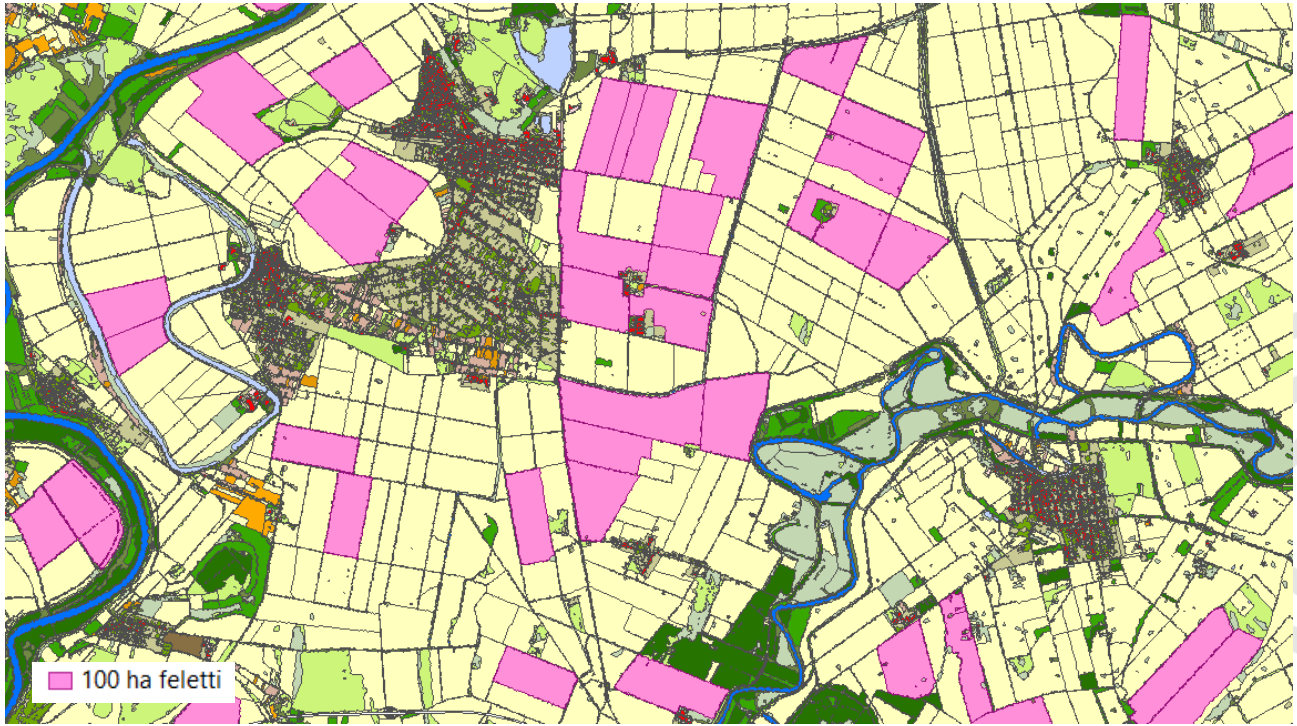

Large agricultural field sizes over 100 ha account for **almost 20% of total arable land**

Parce size classes	Total (ha)	%
10 ha below	419 thousand ha	9,8
10-50 ha	1723 thousand ha	40,3
50-100 ha	1287 thousand ha	30,1
100 ha above	844 thousand ha	19,7
Total land	4275 thousand ha	100

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Green infrastructure plan for Hungary
Missing field edges and forest strips

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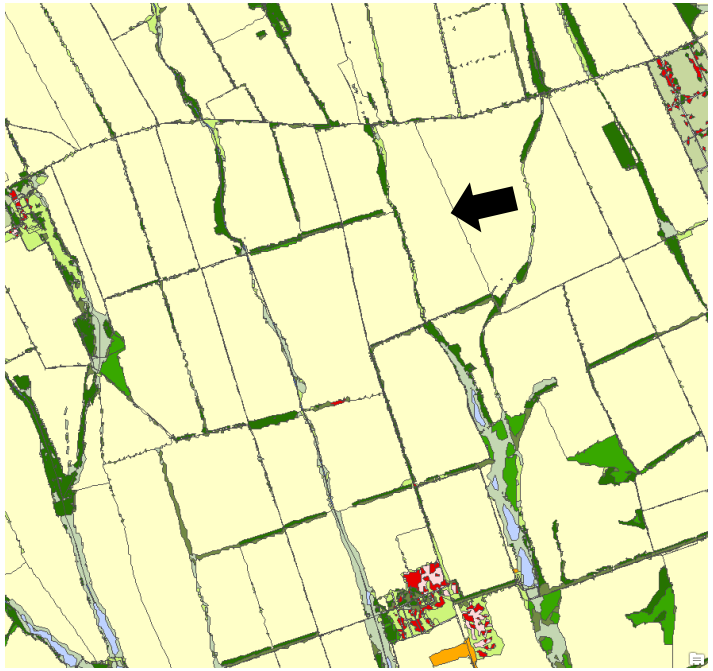

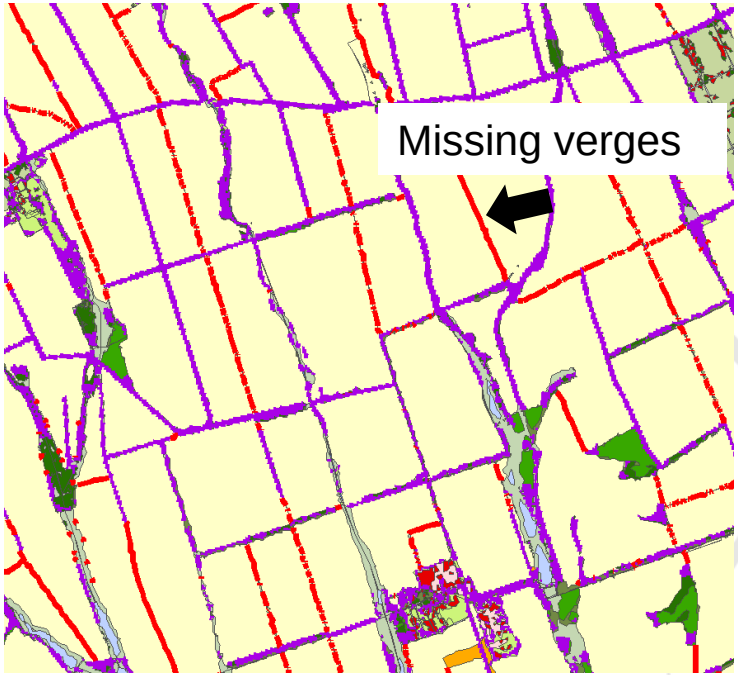

Restoring former field margins can greatly help to increase green infrastructure areas and **strengthen connectivity**. Within the framework of the research, the **missing field edges** and **forest strips** were also identified on a large scale.
This can be of great help for town and country planning.

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Field margins as connectivity areas

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According to the national CAP greening rules, it can be counted up to a maximum 10 m wide arable land for support. These field margins, edges cover an area of roughly 250-300 thousand hectares in a width of 20 m nationwide.

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Field margins as connectivity areas

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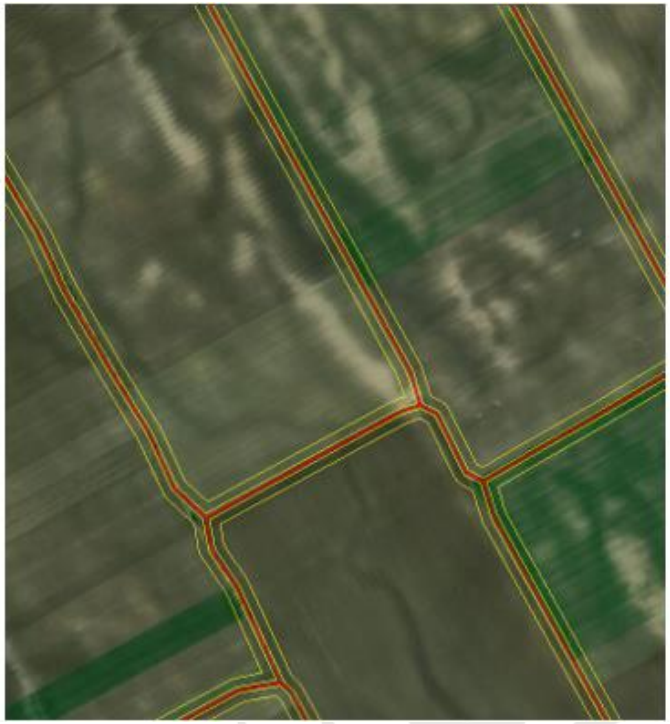
According to the national CAP greening rules, it can be counted up to a maximum 10 m wide arable land for support.

CSOP has a great possibility in cross sectoral issues in the new CAP support system.



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Restoration, conservation improve the condition

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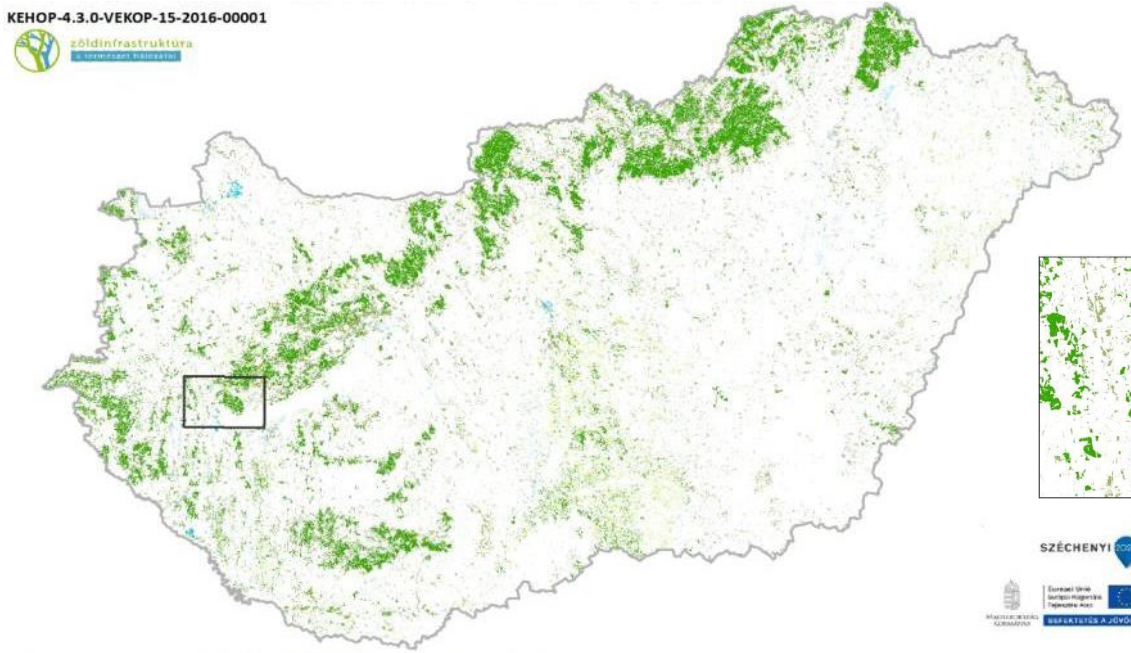

Areas where on smaller scale restoration, conservation improve the condition

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Areas of potential ecosystem change

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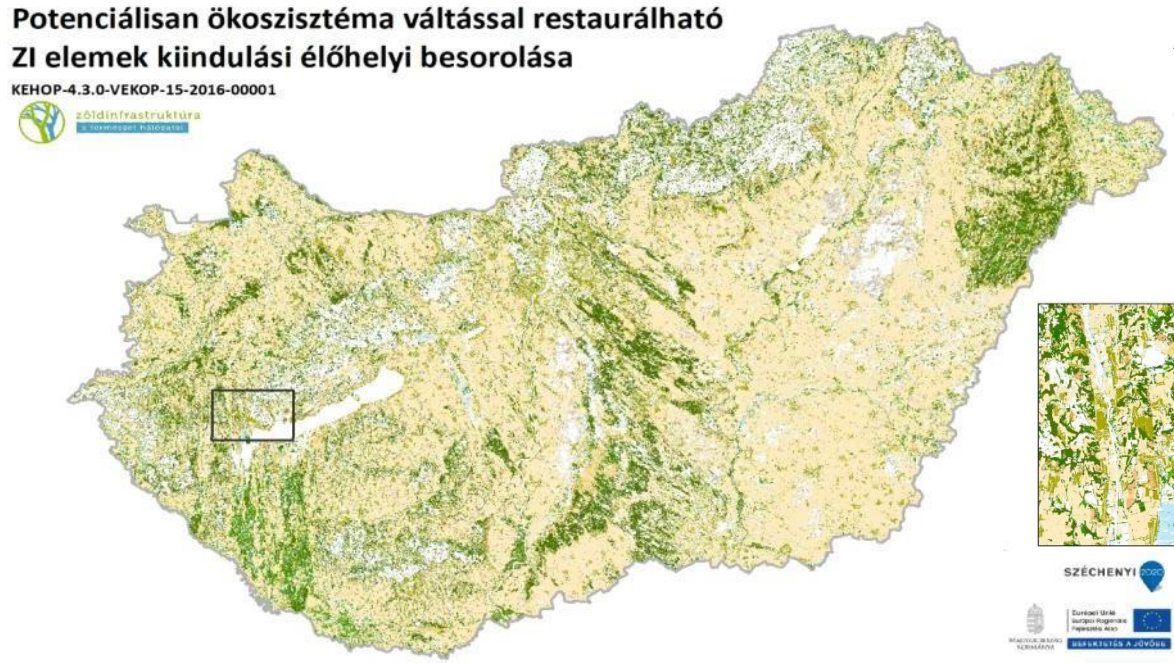

Areas of potential ecosystem change.
The areas (generally argricultural areas) can be changed and improved only with land use change.

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Potential areas for the creation of woodland habitats

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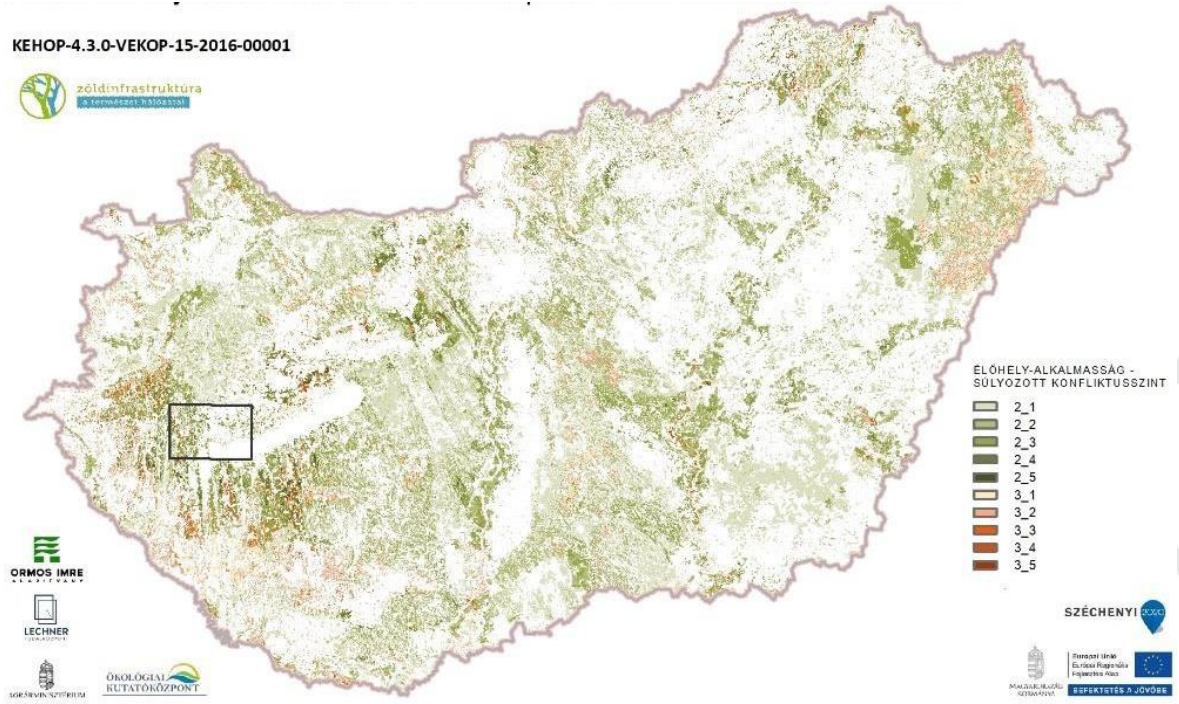

Potential areas for the creation of woodland habitats

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Potential areas for grassland habitat creation

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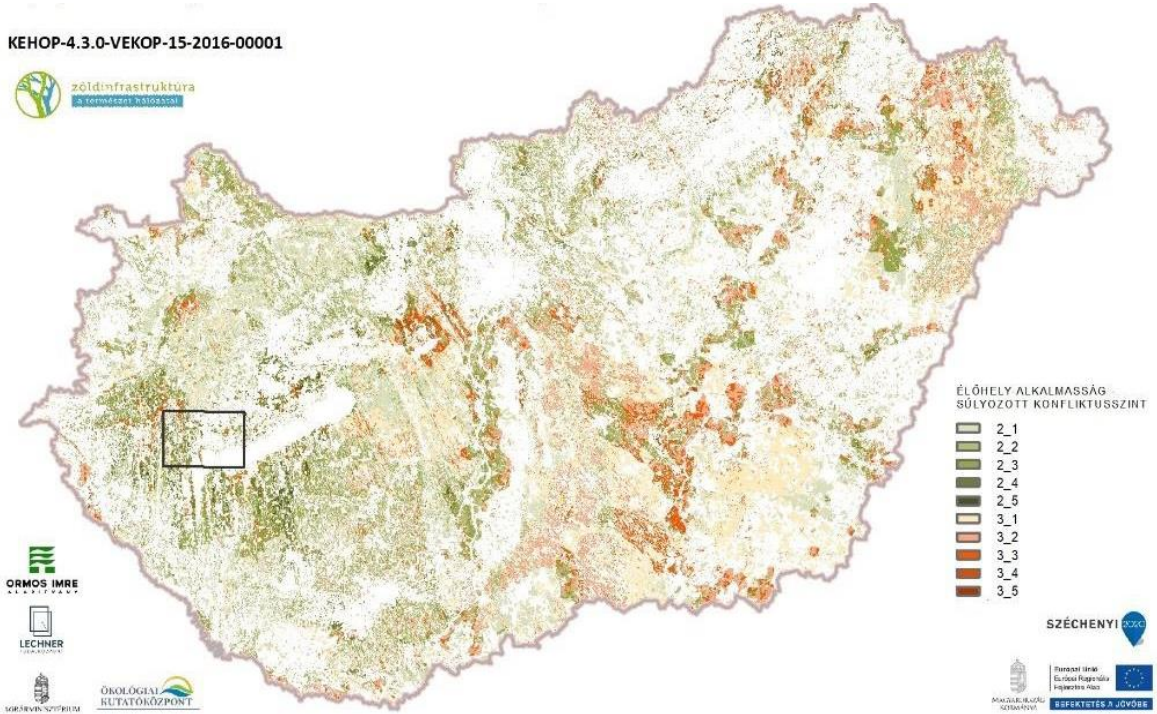

Potential areas for grassland habitat creation

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Complex regional GI priority maps on local scale

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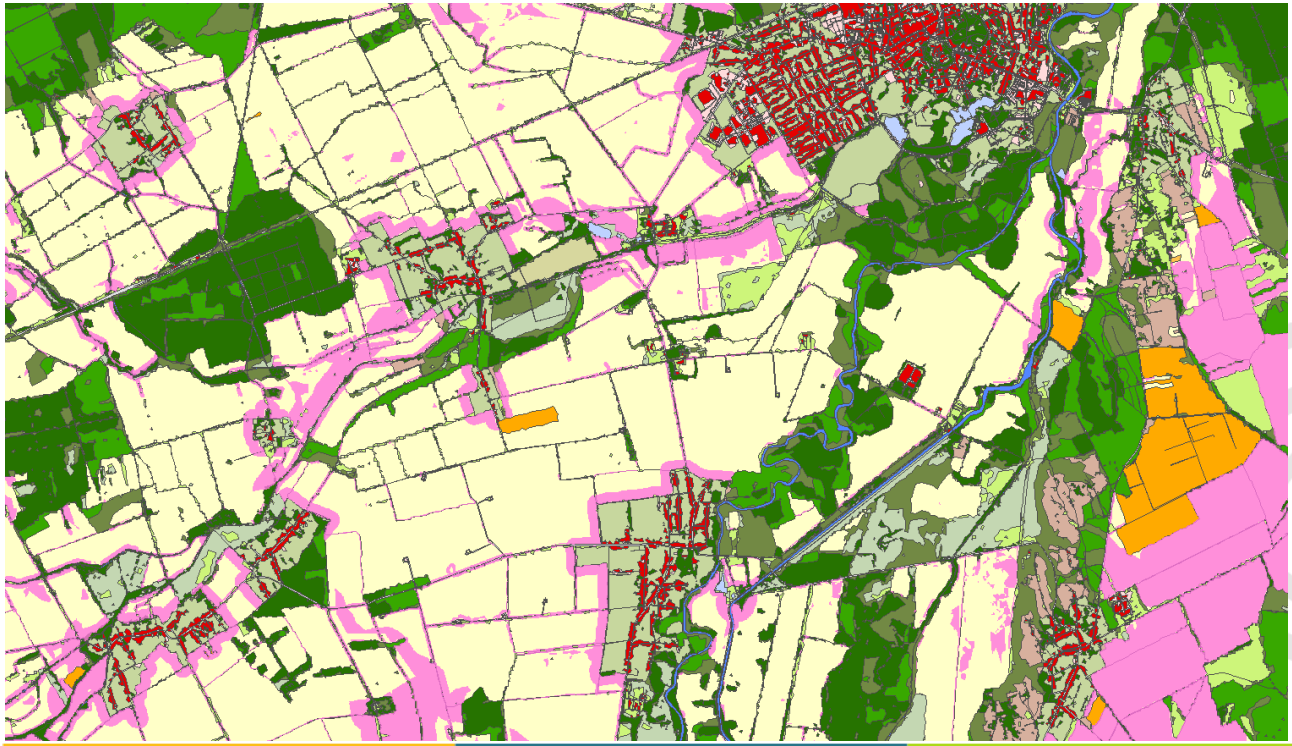
On local scale analysis of nearly 50 thematic layers were combined, asessessed into **8 priority maps** were created.

1. Agricultural areas
2. Ecology rehabilitation and nature conservation areas
3. Municipal and climate protection areas
4. Connectivity enhancement
5. Water conservation areas
6. Infrastructure protection areas
7. Forest protection
8. Recreation areas

	Indikátor név	konnektivást	településvédelmi	vízvédelmi	agrárgazdálkodási	infrastruktúra véd.	erdőgazdálkodási	rehabilitációs	rekreációs
8	Felszín alatti vízminőségvédelmi területek szántói			●	●				
9	Defláció veszélyeztetett szántók (10 ha nál nagyobb és 7,8,9,10 kategória)		●		●				
10	Természetvédelmi védettség alatt álló szántók.				●			●	
11	Vízfolyás, vizek melletti szántóterületek (50 m)	●		●	●				
50	Közút melletti szántók (2x20 m)				●	●			
12	Település melletti szántók (100 m)		●		●				
13	Állandó gyepterületek (Corine alapján)				●				
14	Időszakos gyep területek (Corine adatbázis alapján)				●			●	
51	Időszakos vizenyős gyepterületek (Corine adatbázis alapján)				●			●	
75	Kiváló szántók (OTrT szerint)				●				
52	Gyep ahol a valószínűség kisebb, mint 50% (Copernicus GRAVPI)							●	
16	Természetvédelmi védettségű gyepek, vizes élőhelyek				●				
56	Cserjésedő gyepterületek				●			●	
17	Környezeti szempontból érzékeny állandó gyepterületek (Natura2000 gyepek)							●	
21	Faültetvények területei				●		●		

GI development areas related on agriculture areas



The CSOP would provide a good opportunity to propose and prefer ecological management measures in these priority areas. However, it is not clear who should prepare these CSOP plans, who would finance them and for how long.
In the case of agriculture, it should be aligned with the CAP and the **new eco-scheme support** scheme within it.

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Ecology rehabilitation and nature protection areas as GI development areas

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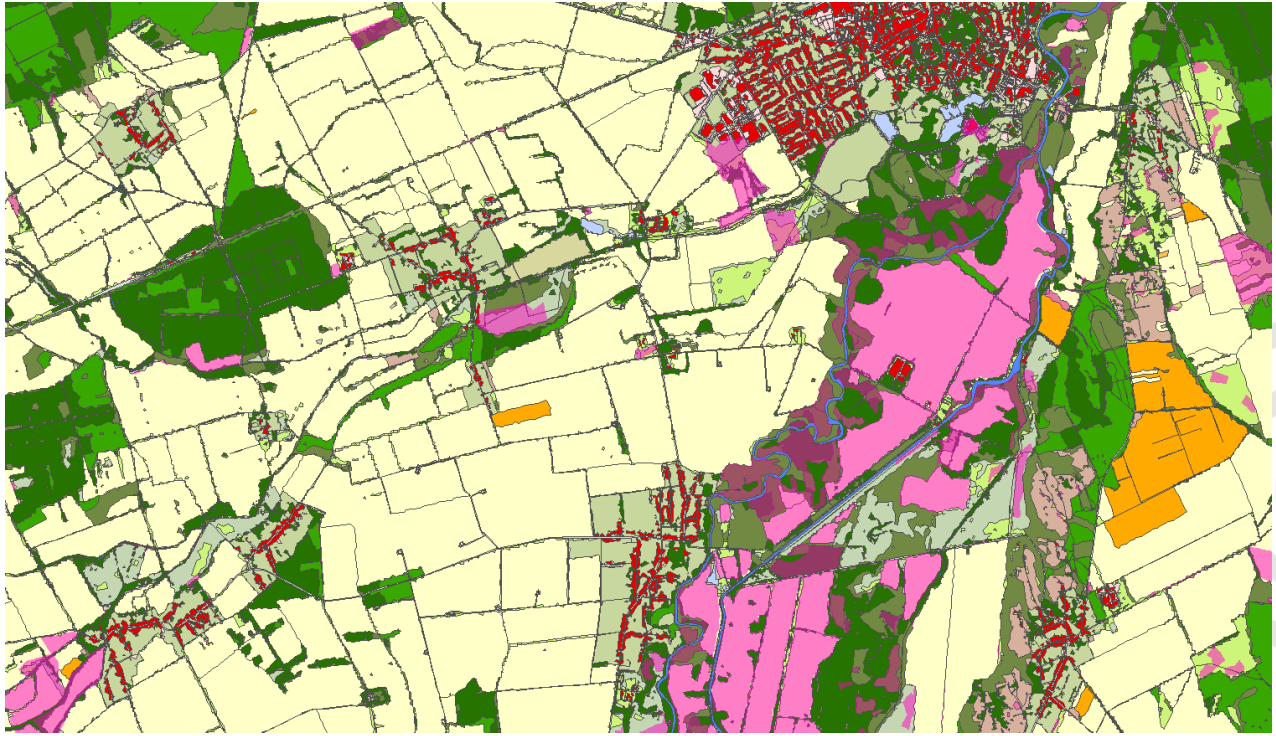

CSOP can help in the designation of new green infrastructure areas for nature conservation and in the preparation of management plans. Unfortunately, the preparation of **conservation management plans** (very similar to CSOP) is lagging behind in Hungary.

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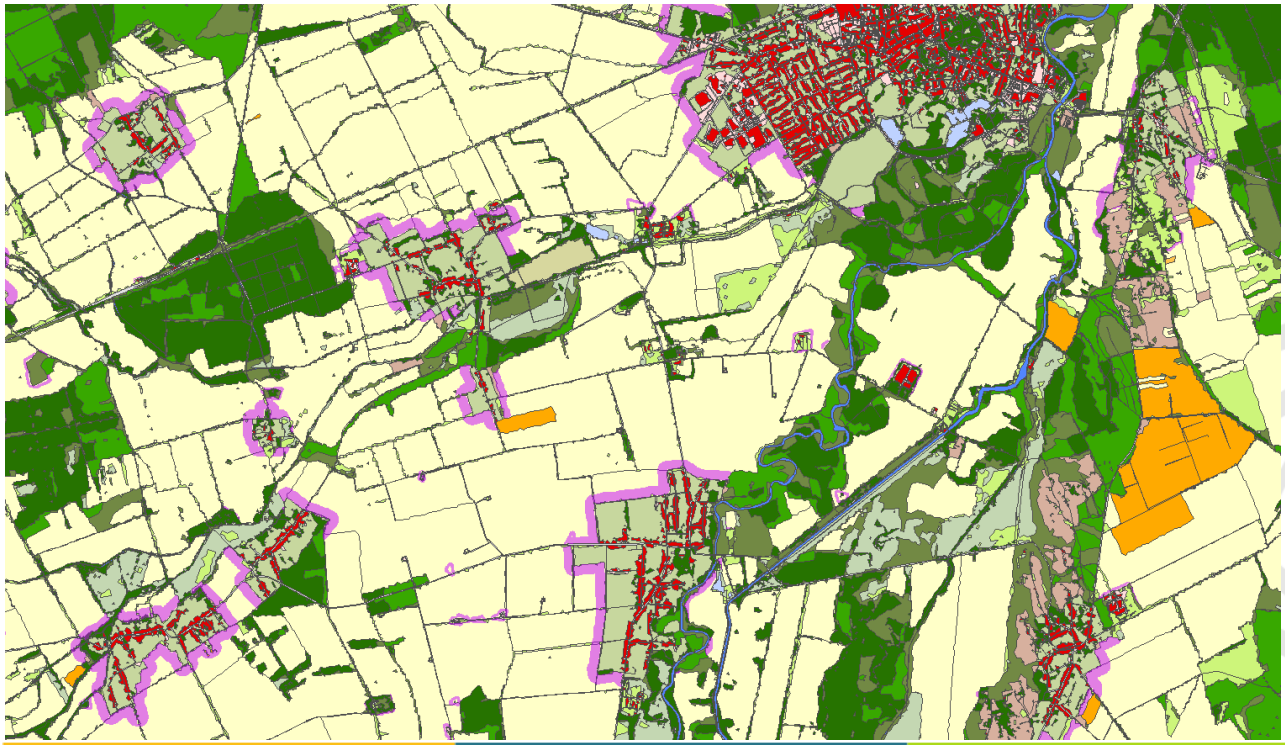
Urban and climate protection GI development areas



These are typical urban, municipal or sub-municipal transition areas. The role of CSOP can help in the conservation and management of existing natural assets.

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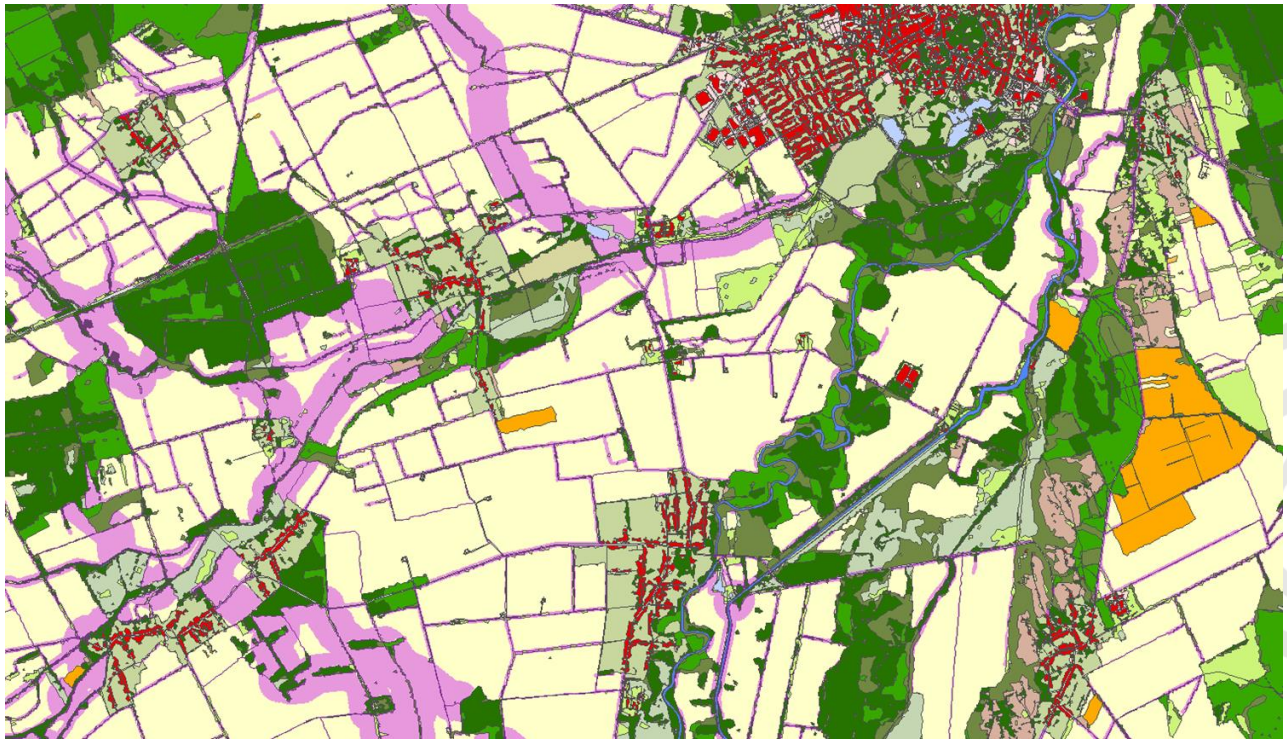
Ecological connectivity and networking development GI



CSOP can be of great help in preparing and monitoring detailed management plans for these areas.

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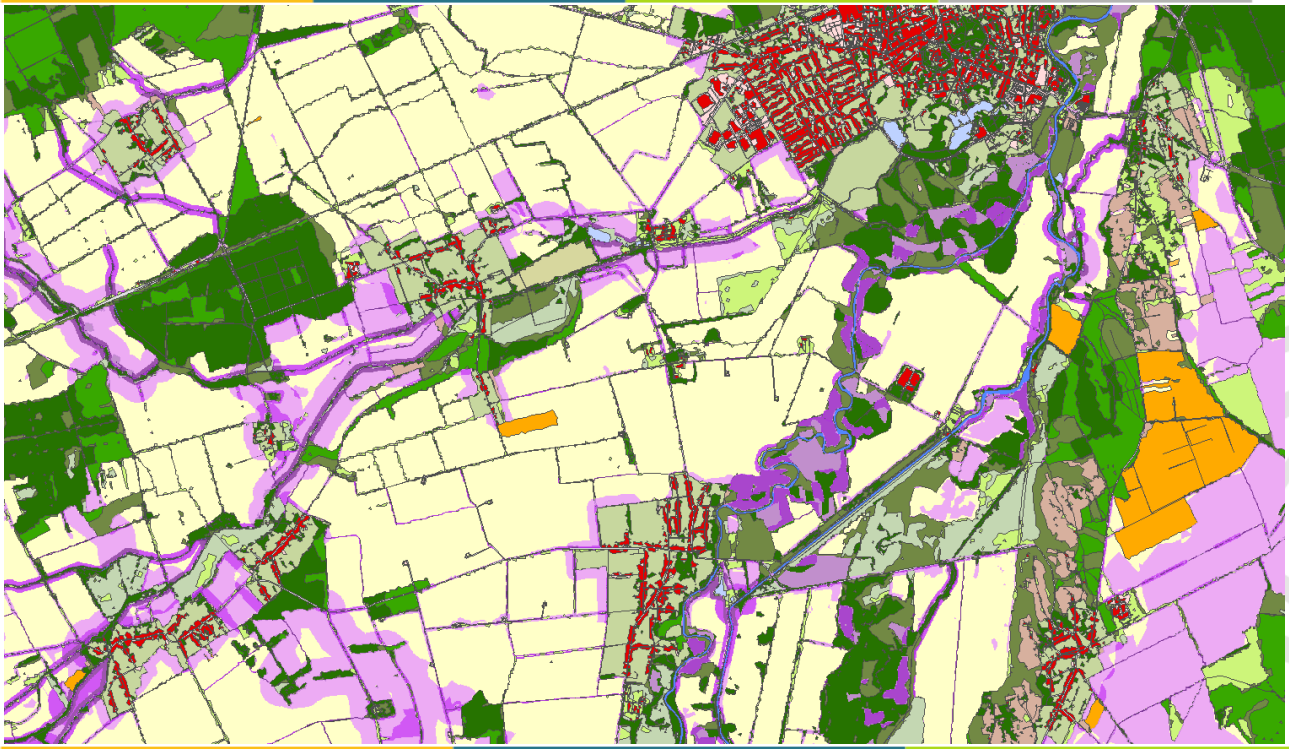
Green infrastructure development areas based on the aggregation of each priority (composite)



The aggregated maps can help the CSOP preparers to prioritise the areas and determine their importance and value. They can help to give a **broader picture** of the area.

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GI development priorities for urban and spatial planning (composite)

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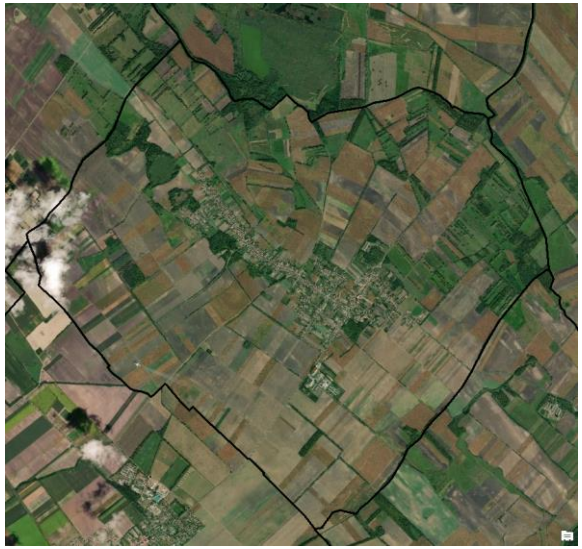
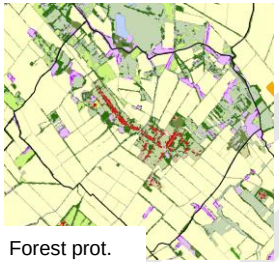


Agro-environment prot.

Connectivity enhancement

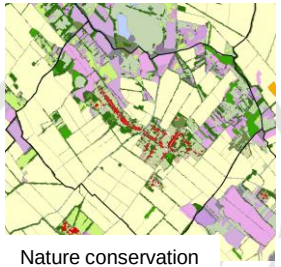
Water protection



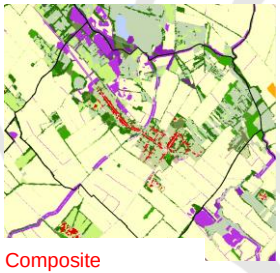
Forest prot.

Municipal and climate prot.

Infrastructure protection



Nature conservation



Composite

The plans only helps the landscape and urban planners to set GI priorities. GI development priority setting **is not a substitute** for planning process or local site surveys, consultations by farmers, stakeholders, municipals, it helps only to scientifically background the plan and to think in a GI network and connectivity.

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Potentional green infrastructure development areas on M2 pilot area

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Potential GI areas development in our pilot M2 area according to national GI assessement.

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Stakeholders, ownership of the proposed GI development areas along M2 pilot area

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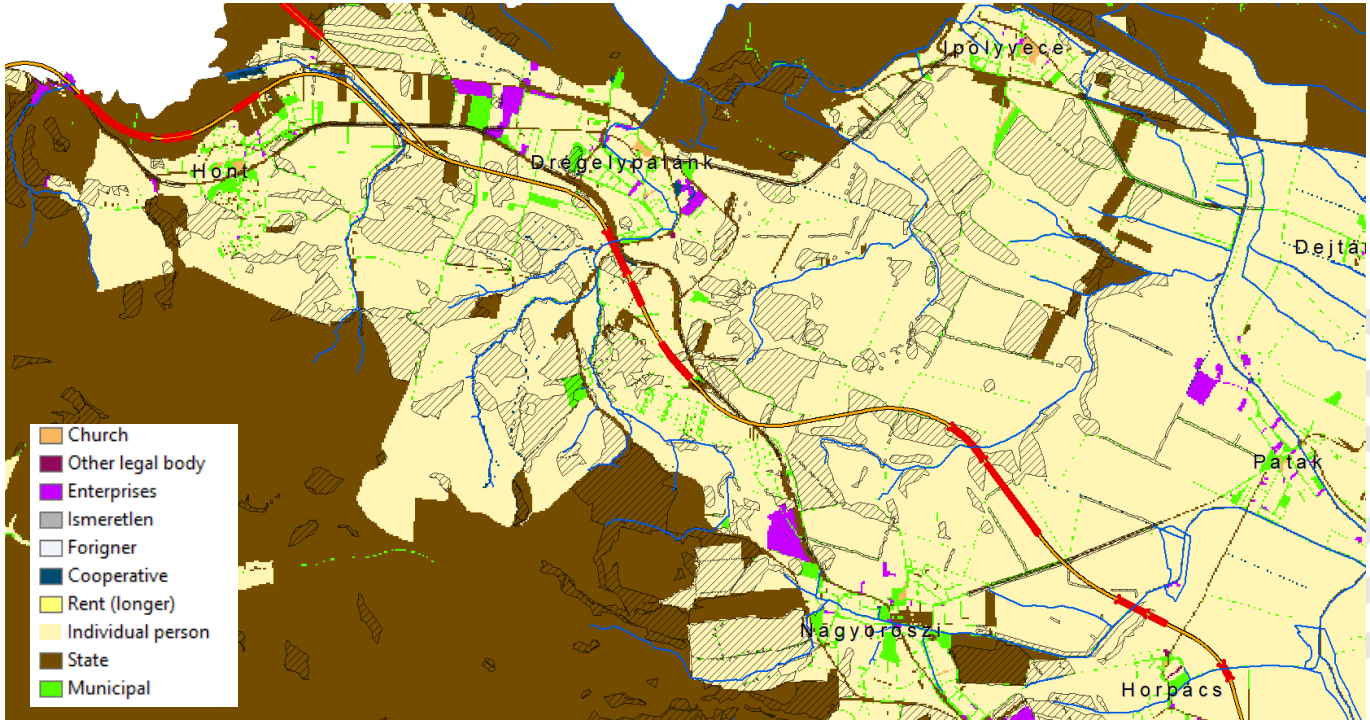

CSOP has to be refined by a number of parameters and factors that cannot always be examined due to **lack of time and data**, but which significantly determine the CSOP process itself. These include, for example, examining **ownership** and determining treatment by owner, tenant or operator.

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Remaining questions regarding to CSOP

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What is the relationship between CSOP and EIA, SEA (similarities, differences)?

Environmental Impact Assessement and CSOP

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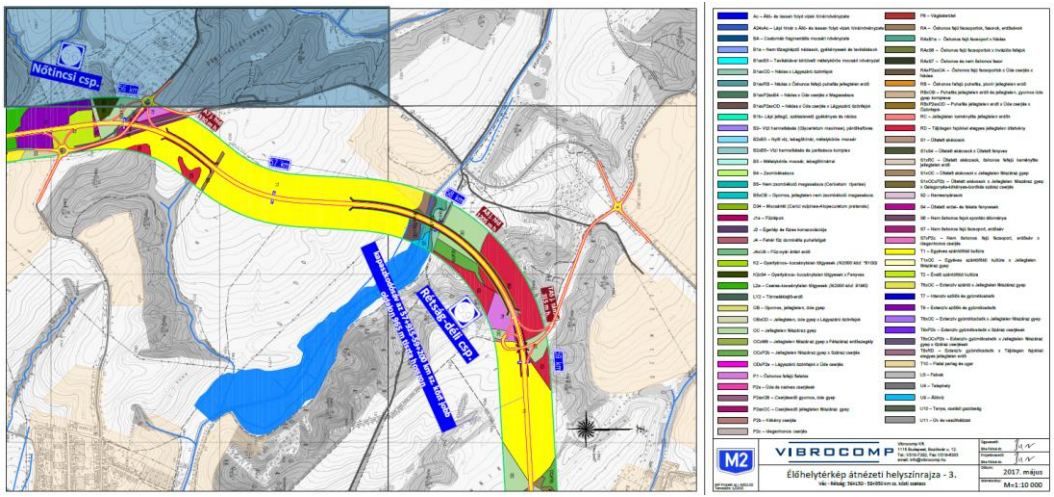
CSOP is perhaps the most similar to the Environmental Impact Assessment and Natura 2000 impact assessments.



Habitats analysation map in EIA of M2 road

But EIA has a <u>strict content, process and legal framework</u>.

The EIA is an **ex-ante** assessment, carried out before the investment. A CSOP can be both **ex-ante and ex-post** (?). In the latter case, it can also be considered a form of environment monitoring.

With EIA, it is clear who the client is, what the content is, the deadline, the process, who the expert is. With CSOP, these issues are not clear, but if we want to get CSOP more widely accepted, we need to approach this plan in the direction of the legal system.

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Remaining questions regarding to CSOP

Of course, lot of questions remain open, but perhaps we are closer to understanding how CSOP can fit into the existing Hungarian spatial and green infrastructure planning framework.

What is a CSOP really, a regulatory plan, a development plan, a management plan, monitoring or something else?

Who should prepare, finance and adopt the CSOP? What is the timeframe for the CSOP?

What are the common cross-border tasks of the CSOP? Joint CSOP?

What is the minimum, standardised content of CSOP (maps, scale, tools, indicators, DPSIR etc.) and legal framework?

Thank you for your attention!

Kollányi László
Hungarian Agricultural and Life Science University
Kollanyi.laszlo@uni-mate.hu

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