Interreg Alpine Space

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PlanToConnect

Project of local ecological network in the Goriška Statistical Region, Slovenia

Mapping report identifying the GBI elements, barriers, connectivity measures in pilot areas

Activity 2.3 Case Studies 2nd step: To design a GBI network for connectivity across administrative boundaries or transnational cross-border areas in pilot sites

Reference in AF: D.2.3.1

Tim Gerdin, Andrej Gulič, Sergeja Praper, Damjana Gantar
Urban Planning Institute of the Republic of Slovenia (SI)
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GLOSSARY

Connectivity (structural and functional)

Connectivity comprises two components, structural and functional connectivity. It expresses how landscapes are configurated, allowing species to move. Structural connectivity, equal to habitat continuity, is measured by analysing landscape structure, independent of any attributes of organisms. […]. Functional connectivity is the response of the organism to the landscape elements other than its habitats (i.e. the non-habitat matrix). This definition is often used in the context of landscape ecology. A high degree of connectivity is generally linked to low fragmentation." (EUROPEAN COMMISSION - Technical information on Green Infrastructure (GI), 6.5.2013, Glossary)

(Definition of connectivity see also Deliverable 1.1.1, chapter 1.1 and chapter 8)

G(B)I – Green (and blue) infrastructure

Green infrastructure (GI) on the European level is defined as 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. It incorporates green spaces (or blue if aquatic ecosystems are concerned) and other physical features in terrestrial (including coastal) and marine areas. On land, GI is present in rural and urban settings.*" (EUROPEAN COMMISSION - Green Infrastructure (GI) — Enhancing Europe's Natural Capital, 6.5.2013)

GI is also present at the state level in Slovenia and is defined in the Resolution of the spatial development strategy of Slovenia 2050 (ReSPR50) (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 72/23 of 3 July 2023) as a strategically designed and managed network of natural and semi-natural areas and the links between them. On land, it includes green and waterscape features and green spaces in settlements. In the coastal zone, it includes the sea and parts of the coast. GI ensures the conservation of biodiversity and the achievement of nature conservation objectives, increasing the resilience of space to climate change, improving the functioning of ecosystems, providing benefits to the population, especially in terms of health, safety, quality of life, and strengthening spatial identity. GI also provides benefits for the economy, particularly in the conservation and restoration of natural resources. It links urban and rural areas, the sea and coast to the hinterland. GI is planned at regional level through regional green systems and at local level through green systems for settlements.

(Definition of GI see also Deliverable 1.1.1, chapter 6)

Ecological Conservation Areas (SACA1)

SACA1 areas were the basis for ecological connectivity modelling in the PlanToConnect project. The term was developed in the ALPBIONET2030 project and is defined as "*areas, that still have considerable space for connectivity with non-fragmented surfaces and where connectivity should be conserved*". According to Plassmann et al. (2019), currently 61% of the Ecological Conservation Areas within the Alpine Convention perimeter are located in protected areas, which means there is a big potential for protection of these areas.

Ecological Intervention Areas (SACA2)

The main focus in the PlanToConnect project lies on areas for possible interventions to improve ecological connectivity. The ALPBIONET 2030 project simulated such areas with very large extension and developed the term "Ecological Intervention Areas". These are areas "*with a high potential for connectivity in which larger, more or less natural non-fragmented zones could be created, especially by connecting protected areas, Natura2000 sites or other precious biotopes. Ecological connectivity is currently working to some extent in these areas but would benefit from enhancements*" (Plassmann et al. 2019).

Connectivity Restoration Areas (SACA3)

"*They are areas where fragmentation has already progressed so far that realizing (sic!) interlinked habitats and a permeable (sic!) landscape matrix is no longer a realistic option using reasonable, viable interventions, and solutions would entail extreme financial and political effort. They represent important barriers between Ecological Conservation Areas*" (Plassmann et al. 2019). The realization of punctual interventions at very targeted locations to mitigate negative barrier impacts is recommended (ibid.).

Priority connectivity areas for spatial planning

"Priority connectivity areas" for spatial planning are areas important for the overall Alpine ecological network, where specific provisions aimed at preserving or re-establishing ecological connectivity should be included in national and regional spatial plans.

It is possible to define different types of priority connectivity areas from large-scale level to small-scale level:

Table 1: Types of priority connectivity areas at various scales

Macro - regional	1) Large scale "connectivity areas" (for the definition see ALPBIONET), where measures are still needed
Transregional to regional	2) SACA1 areas not protected and outside the Natura2000 Network
	3) Potential ecological linkages
Local	4) "Potential corridors" <5km of the Alpine Parks 2030 project*, which are currently not protected or managed. *The Alpine Parks 2030 project defined potential corridors through intersecting buffer zones of 2,5km around SACA1 areas, if they are within an SACA2 area (Ecological Intervention Area) defined by the ALPBIONET2030 project. Within SACA2 areas there is a high potential for connectivity.

Hot spots of ecological connectivity

Hot spots of ecological connectivity are near natural areas on a local level, with a high landscape permeability characteristic, important for ecological connectivity. The project defines "hot spots" as concrete areas on a local level, which mostly are limited in extension.

Green system

The Spatial Management Act (ZUreP-3) (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 199/21 of 22 December 2021) defines a green system (in Slovenian, *zeleni sistem*) as a comprehensively planned framework for the protection and development of green spaces and other natural and man-made structures, which functionally interconnect and complement each other; it is designed to ensure a high quality living environment and to fulfil social, environmental, ecological, climatic, economic, cultural, structural and design functions at the level of settlements, regions and the country. Additionally, it incorporates the planning of green infrastructure.

Spatial planning

Spatial planning is a continuous interdisciplinary process that encompasses strategic-level and implementation-level spatial planning, and the regulation of space at the operational level. Spatial planning is implemented through the elaboration and preparation of spatial planning acts and through national spatial planning procedures.
(For definitions of other spatial terms see D2.1.2)

Ecologically important areas

The Decree on ecologically important areas (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 48/04 of 30 April 2004) defines an ecologically important area as an area of a habitat type, part of a habitat type or larger ecosystem unit that makes an important contribution to the conservation of biodiversity.

EXECUTIVE SUMMARY

In this report, elements of structural and functional ecological connectivity in corridors between core areas (SACA1) are mapped, analysed and evaluated at regional scale for 9 corridors inside the Goriška Statistical Region (Slovenia) or in its immediate vicinity. These include GBI elements, protected nature areas, forest functions and existing habitats and migration routes of brown bears, red deer and griffon vultures. The analysis included modelling in GIS software (QGIS) and a review of relevant legislative, management, planning and research documents.

The analysis is based on the Alpine Wide Structural Connectivity Model and least-cost-path (LCP) method prepared by EURAC (D1.1.1). The mentioned method is grounded on the results of the AlpBioNet2030 project (2019) in which an integrative concept for the protection of ecosystems and biodiversity in the Alps was prepared and Strategic Alpine Connectivity Areas (SACA) defined (SACA1 - Ecological conservation areas, SACA2 - Ecological Intervention areas and SACA3 - Connectivity restoration areas).

The landscape in the region comprises an area from an alpine in the north to a flatland landscape of the Vipava Valley and the hilly karst landscape in the south. It represents a critical connection between the Dinarides and the Alps, especially the axis of Kras (Karst Plateau) – Trnovo Forest Plateau – Triglav National Park. It is crucial to maintain, protect and ameliorate the quality of these connections with a high risk of landscape fragmentation from settlement expansion and the introduction of new or expansion of existing transport or energy infrastructure to enable future structural and functional ecological connectivity in the region. This is especially important in the Vipava Valley and along the Soča River where intensive agricultural use and urbanisation tendencies are highest, in a region otherwise covered by forests and smaller pockets of extensive land use.

REPORT

1 Introduction

In this document, ecological connectivity primarily refers to structural connectivity, which denotes permeability of SACA2 areas covered by the corridors linking SACA1 core areas.

The analysis is based on the Alpine Wide Structural Connectivity Model and least-cost-path (LCP) method prepared by EURAC (D1.1.1). The mentioned method is grounded on the results of the AlpBioNet2030 project (2020) in which an integrative concept for the protection of ecosystems and biodiversity in the Alps was prepared. The AlpBioNet2030 project defined three types of Strategic Alpine Connectivity Areas (SACA). SACA1- Ecological conservation areas where ecological connectivity already works quite well and where the ecological connectivity should be conserved. SACA2 - Ecological Intervention areas that represent important links between SACA1 areas (ecological conservation areas). Connectivity is currently working to some extent but would benefit from enhancements. In these areas, improvement / restoration measurements are needed. SACA3 - Connectivity restoration areas represent important barriers between SACA1 areas (ecological conservation areas). More information about SACA areas can be found on the website jecami.eu (Joint Ecological Continuum Analysing and Mapping Initiative 2.0 on ecological connectivity).

SACA1 areas in the Goriška Statistical Region pilot area include important and protected habitats or natural areas as well as forest reserves, ecologically important areas, Natura 2000 sites, Triglav national park and other protected zones. To a lesser extent, we included elements of functional connectivity in the analysis. As functional connectivity considers how well species can actually move through or use the corridors, we have used available data of three types of key species that would serve as indicator for others. These species are the brown bear (representing the order of Carnivora), the red deer (representing the order of Artiodactyla) and the griffon vulture (representing the class of Aves). As such structural ecological connectivity is compared to the existing functional connectivity.

The objective of the SACA1 areas is structurally linking core areas to promote greater ecosystem and habitat migration during expected future climate developments and more acutely, permitting the migration of flora and fauna in the Goriška Statistical Region. In accordance with the character of the pilot site, which is a statistical region, it was decided to present and analyse all corridors. This decision is further substantiated by the fact that the documents produced during the PlanToConnect project could be utilised as one of the background studies during elaboration of the scheduled regional spatial plan.

Nevertheless, we would like to bring to attention two corridors which are particularly important. In the first one linking the Trnovo Forest Plateau and Kras (the Karst Plateau) there is an expressway that passes through the corridor, the effect of which is however mitigated by the fact that the expressway is perforated and permits structural and functional connectivity by means of tunnels and bridges. The second connects the Trnovo Forest Plateau and Triglav National Park. This corridor is of high significance because it connects the Dinarides with the Alps. Both are classified as high importance, high risk corridors.

As stated in the previous paragraph ecological network connectivity as defined in this project could be used as a source for the design of the “green system” when preparing the new regional spatial plans. The creation of these plans is foreseen by the Spatial Development Strategy of Slovenia 2050 (ReSPR50) as an instrument to restart the practice of regional spatial planning in Slovenia. Ecological connectivity is also mentioned in other state strategies and legislature, e.g. the forest management plans (where acting in a way that promotes ecological connectivity it is strongly preferred), and to various degrees in the municipal spatial plans.

2 Pilot region

2.1 Goriška Statistical Region

The area of interest are all the corridors in the Goriška Statistical Region that covers an area of 2,325 km^2. In 2022, it accounted for around 6% of Slovenia's population and it is one of the most sparsely populated regions, with an average of 51 inhabitants per km^2 of its surface.

The land cover in the pilot site mostly includes broadleaf, coniferous and mixed forests. This is especially evident on the Trnovo Forest Plateau where the forest matrix is barely interrupted by other more intensive land uses. There are some exceptions to this general state, notably in the southernmost and largest valley in the region called the Vipava Valley. The valley bottom is wide and has the highest concentration of intensive agriculture in the region. It also includes linear elements like the Vipava River and the most prominent barriers in the pilot area. A part of the region similarly used for intensive agriculture purposes is the viticulture landscape of the Goriška Brda. Areas used extensively are the Soča River Valley, Banjšice Plateau and the ridge of Mount Stol. There are areas of naturally preserved alpine habitats in the Triglav National Park in the north of the region. The eastern part of the region covers a pre-alpine area of forested hills where smaller settlements and farms have carved out agricultural land in their vicinity. There are numerous ravines carved by the rivers that flow in that part of the region. There we can also find a railway which is a smaller linear barrier in the landscape.

2.2 Relation to the alps-wide structural connectivity

The Goriška Statistical Region is in the south-east of the Alpine region (Figure 1). It is a border region and includes international corridors that link core areas situated in Slovenia as well as in Italy. The pilot area predominately covers SACA2 areas and SACA1 areas. There are some SACA3 areas present in the Vipava Valley.

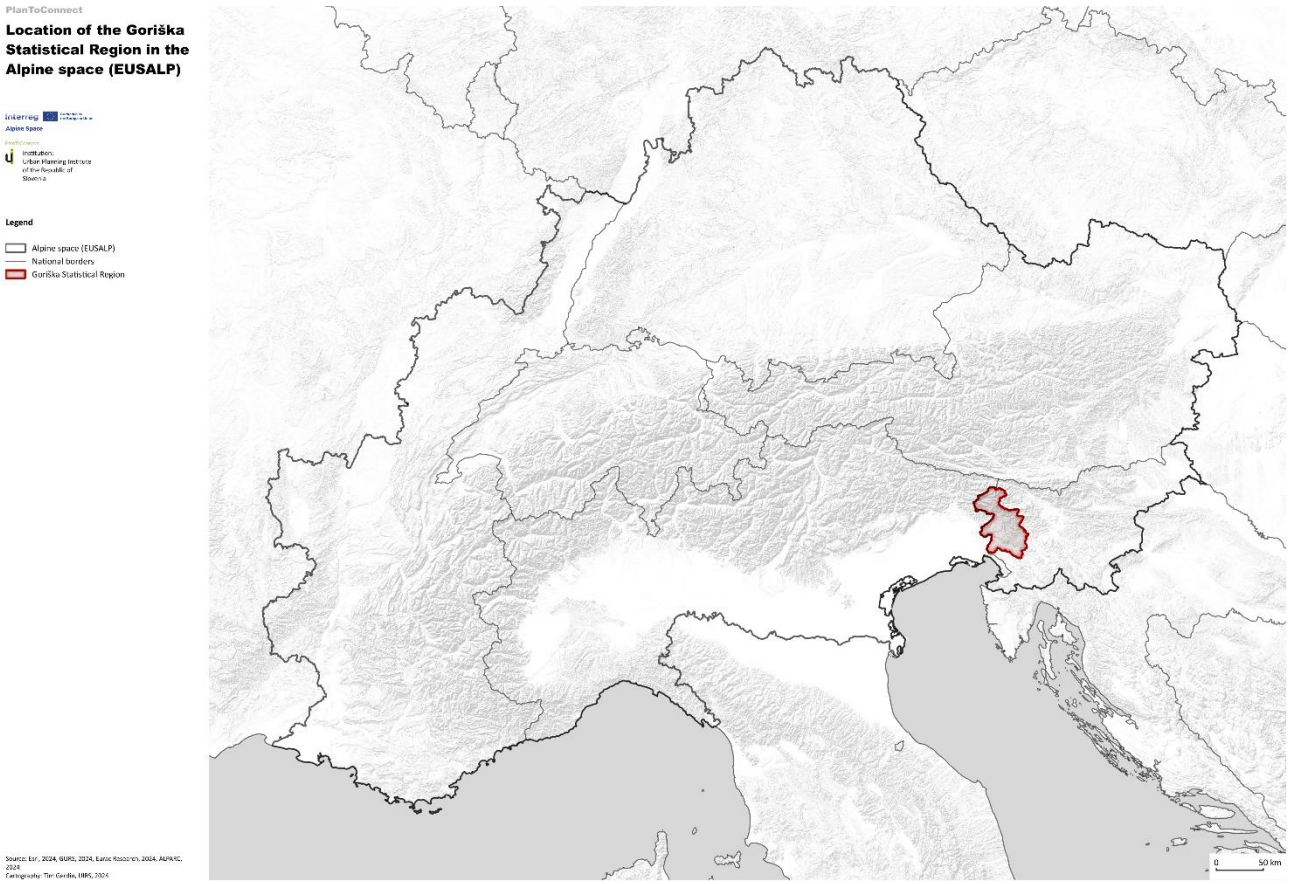

Figure 1: Location of the Goriška Statistical Region in the Alpine space (EUSALP)

2.3 Objectives for ecological connectivity

The main objectives for the pilot region are:

1. **Ensuring ecological connectivity between protected areas** by maintaining or establishing natural connections between protected areas and Natura 2000 sites to enable species movement and gene flow.
2. **Reducing habitat fragmentation** by addressing barriers caused by infrastructure (e.g., roads, urban expansion) and promote spatial planning at a regional level that avoids further fragmentation.
3. **Improving, establishing or restoring ecological corridors** (e.g., green bridges, forested pathways) to facilitate species movement between core habitat areas.
4. **Promoting species-specific connectivity** with targeted strategies to support the movement of key species, such as large mammals (e.g., deer, wild boar, bears) and other sensitive species.
5. **Integration with spatial planning** by incorporating ecological connectivity objectives into regional (and local) spatial plans, ensuring alignment with green and blue infrastructure development.

6. **Promoting long-term resilience of ecosystems** to adapt to climate change and other environmental pressures through increased connectivity.
7. **Mitigating human activities**, such as tourism, infrastructure expansion, and settlements, by maintaining green zones or ecological buffers.

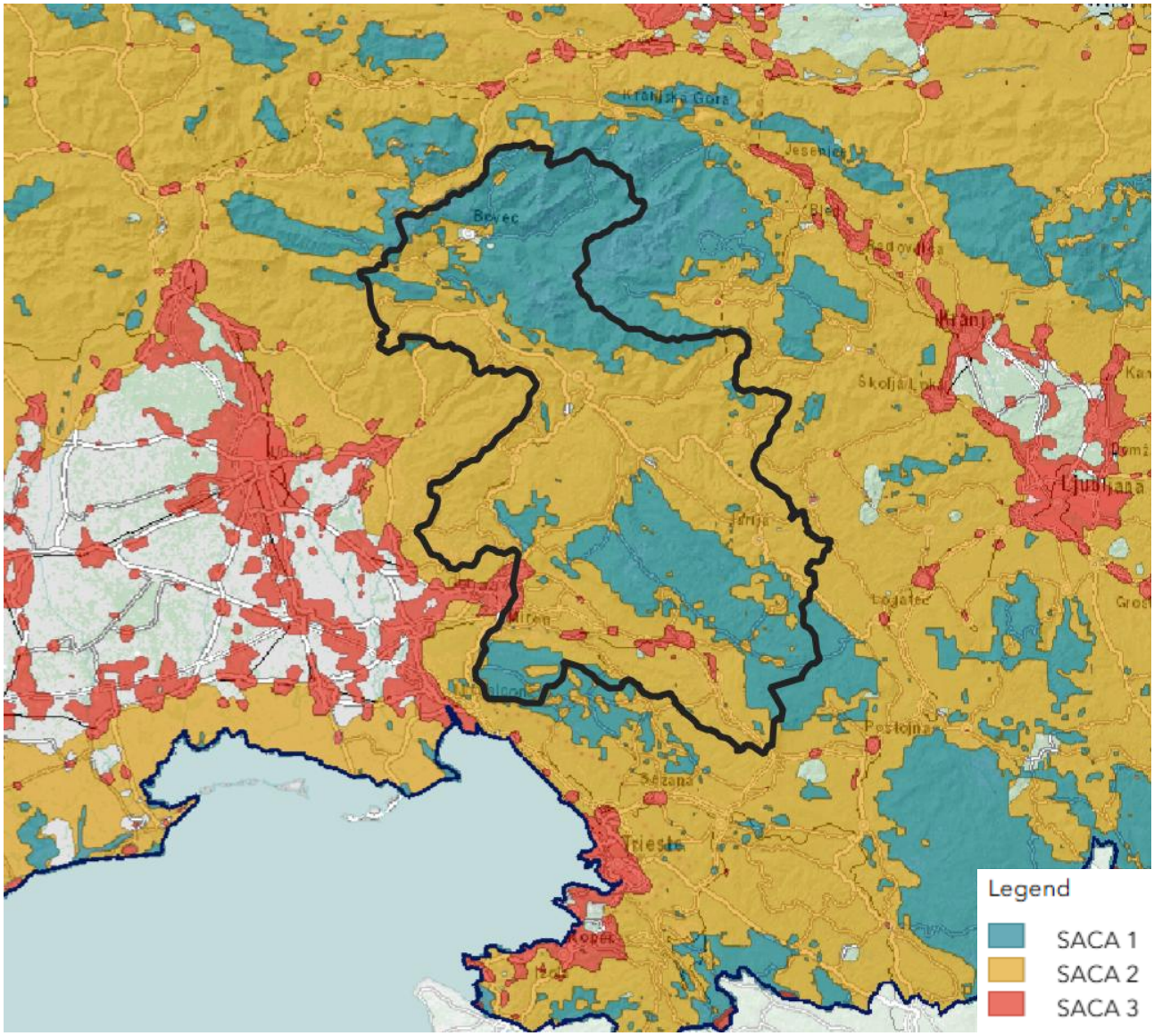

Figure 2: Overview – Location of the pilot area and SACA areas

3 Methodical approach in the pilot area

3.1 Methodical approach

The methodology includes a review of the legislation at the European, national, regional and local level as well as relevant forest and hunting management plans, national spatial plans and other research projects. The methodology also includes a cartographic analysis by using QGIS. It includes the compilation and analysis of data that pertains to the ecological connectivity in the pilot area. The result of this step are maps showing contents of ecological connectivity at alpine, national and regional scale.

3.2 Data used

The data used for the cartographic overview and analysis is:

1. **Esri**: Esri Terrain basemap (2024)
2. **GURS (Surveying and Mapping Authority of the Republic of Slovenia)**: national, regional and municipal borders (2024), roads, railways and other infrastructure (2024), hydrology (2024)
3. **Eurac Research**: Alpine Wide Structural Connectivity Model (2024)
4. **ALPARC**: Alpine space perimeter (2024)
5. **MKGP (Ministry of Agriculture, Forestry and Food)**: Register of the actual use of agricultural and forest land (2024)
6. **Copernicus**: CORINE Land Cover (2018)
7. **ZGS (Slovenia Forest Service)**: forest functions (2024), forest reserves (2024), species core areas and corridors (2024)
8. **ARSO (Slovenian Environment Agency)**: protected areas (2024)
9. **DRSV (Slovenian Water Agency)**: ecological types of surface water (2024)
10. **ZRSVN (Institute of the Republic of Slovenia for Nature Conservation)**: mapping of habitat types in the soča valley (2007)

Textual documents reviewed:

1. **International level**: Alpine convention, EU biodiversity strategy for 2030, DINALPCONNECT.
2. **National level**: Spatial Development Strategy of Slovenia 2050 (ReSPR50), Spatial Management Act (ZUreP-3), Nature Conservation Act (ZON), Decree on ecologically important areas, Decree on the protection of endangered species, Management strategy for the brown bear (*Ursus arctos*) in Slovenia, Decree on types of natural values, Slovenia – CAP Strategic Plan 2023-2027, National spatial plan for the Most na Soči bypass, Landscape guidelines from the Mandatory expert bases for regional spatial plans (UIRS, 2024).
3. **Regional level**: Biennial plan for xii. west high-country hunting management area for the years 2023 and 2024, Biennial plan for xi. Triglav hunting management area for

the years 2023 and 2024, Forest management plan for the Tolmin forest management area (2021-2030).

4. **Local (municipal) level**: Municipal spatial plans of Miren – Kostanjevica, Renče – Vogrsko, Šempeter - Vrtojba, Vipava, Ajdovščina, Nova Gorica, Idrija, Kanal, Tolmin, Kobarid, Bovec.

3.3 Working steps

Table 2: Description of working steps

Working Step	Description
1	**Definition / refinement of objectives for ecological connectivity**
	In a first step, previously set goals and objectives are refined and further defined.
2	**Compilation and analysis of GBI elements within the corridor (connectivity evaluation)**
	In a second step, all GBI elements (based on the categories of CORINE Land Cover (2018) and the Registry of actual use of agricultural and forest land (MKGP, 2024)) within the whole pilot area, in the SACA 1 core areas and in the corridors are listed and analysed in their respective cover classes: • Built areas • Intensive agricultural areas • Extensive agricultural areas • Forest • Other natural habitats • Water bodies
3	**Compilation of the protected areas, existing habitats and forest functions within the pilot region and the**
	Relevant information of protection status, habitats and forest functions is described for the whole pilot region.
4	**Overview and analysis of European, national, regional and local data and legislation**
	The inclusion of ecological connectivity is verified in various research project reports, municipal spatial plans, decrees and all other legislative documents. The main findings of each document are noted and later summarized.

Working Step	Description
5	**Corridor and barrier analysis**
	A more detailed description of each corridor is carried out, describing different attributes of the corridor, which include an evaluation of the corridor type and description of anthropogenic pressures and barriers among others (as per A1.2).
6	**Conclusions and next steps**
	Key conclusions are drawn and possible next steps for incorporating ecological connectivity into future regional spatial plans are recommended.

4 Results

4.1 GBI elements in the corridors

The GBI elements were identified by means of the CORINE Land Cover (2018) and the Register of the actual use of agricultural and forest land (MKGP, 2024) datasets. The former shows GBI elements with a Pan-European dataset comparable with all countries included in the survey. The latter shows more detailed national data. The classes of both datasets were standardised to enable their comparison and to categorise all land use classes (44 CLC and 25 MKGP dataset classes) into different cover classes (Table 3).

Table 3: Distribution of CORINE Land Cover (2018) and MKGP dataset (2024) land use classes into cover classes

Cover classes	**Land use classes**	
	CORINE Land Cover (2018)	**MKGP dataset (2024)**
Built areas	Continuous urban fabric; discontinuous urban fabric; industrial and commercial units; road and rail networks and associated land; port areas; airports; mineral extraction sites; dump sites; construction sites; green urban areas; sport and leisure facilities.	Built-up and related land.
Intensive agricultural areas	Non-irrigated arable land; vineyards; fruit tree and berry plantations; olive groves.	Arable land; hop field; permanent crops on arable land; greenhouses; vineyards; intensive orchards; olive orchards; other permanent crops; plantations of forest trees.
Extensive agricultural areas	Pastures; complex cultivation patterns; land principally occupied by agriculture, with significant areas of natural vegetation; natural grasslands.	Pastures; complex cultivation patterns; predominantly agricultural areas with large areas of vegetation; natural meadows.
Forest	Broad-leaved forest; coniferous forest; mixed forest; transitional woodland-shrub.	Trees and shrubs; agricultural land covered with forest trees; forest.

Cover classes	Land use classes	
Other natural habitats	Moors and heathland; sclerophyllous vegetation; beaches, dunes, sands; bare rocks; sparsely vegetated areas; glaciers and perpetual snow; inland marshes; salt marshes; salines.	Moorland; reedbed; other waterlogged land; dry open land with special vegetation cover; open land with no or insignificant vegetation cover.
Water bodies	Water courses; water bodies; sea and ocean.	Water.

As seen in Figure 3 and Figure 4, the first representing CORINE Land Cover (2018) and the second the national data of MKGP (2024) land use in the core areas consists of forest and other natural habitats, while in the corridors it consists mainly of forest and areas of extensive agriculture. Apart from the greater detail of the MKGP data, there are no major differences from the CORINE Land Cover (2018).

Detailed areas and percentages of cover classes are presented in Table 4 and Table 5.

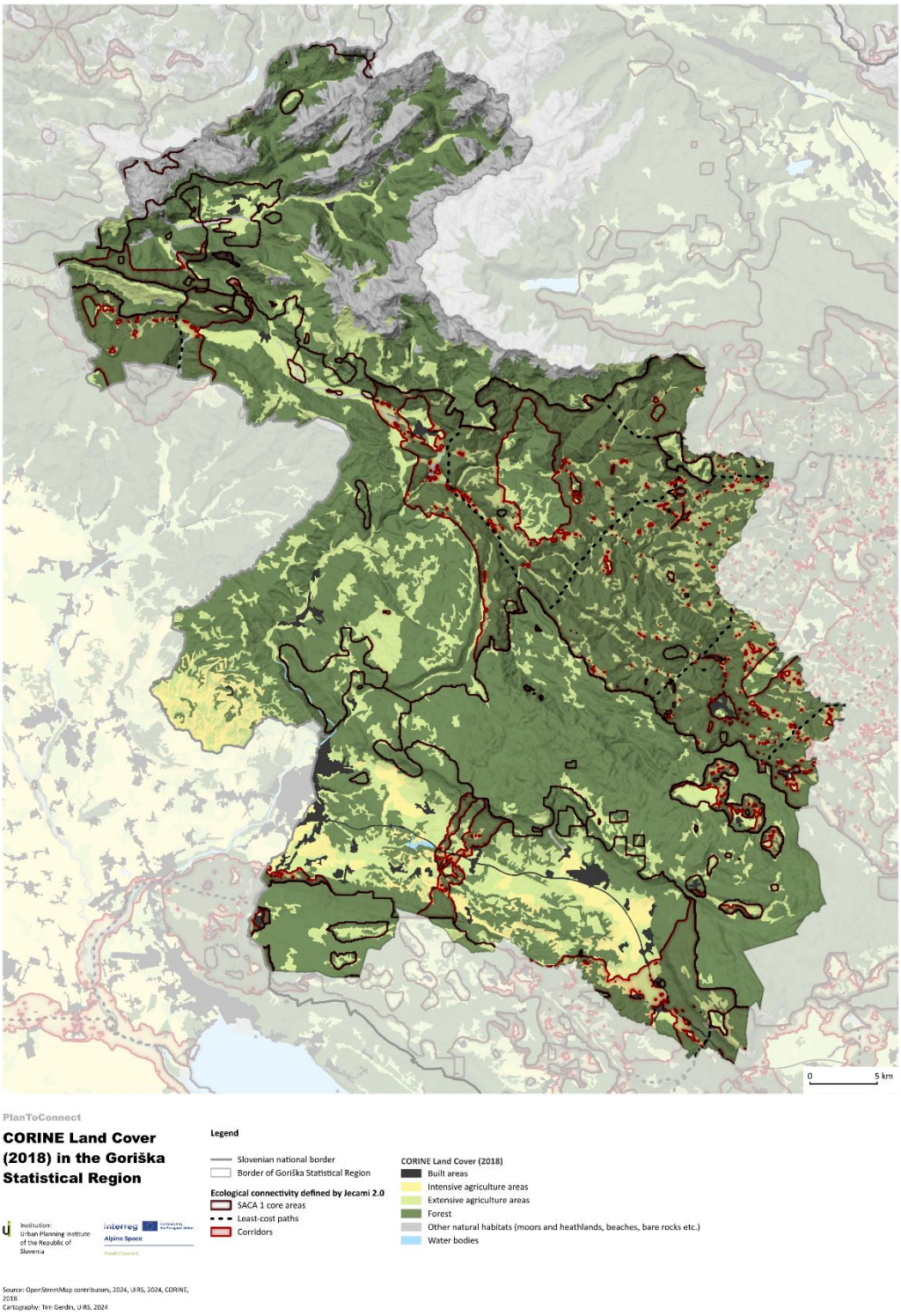

Figure 3: CORINE Land Cover (2018) in the Goriška Statistical Region

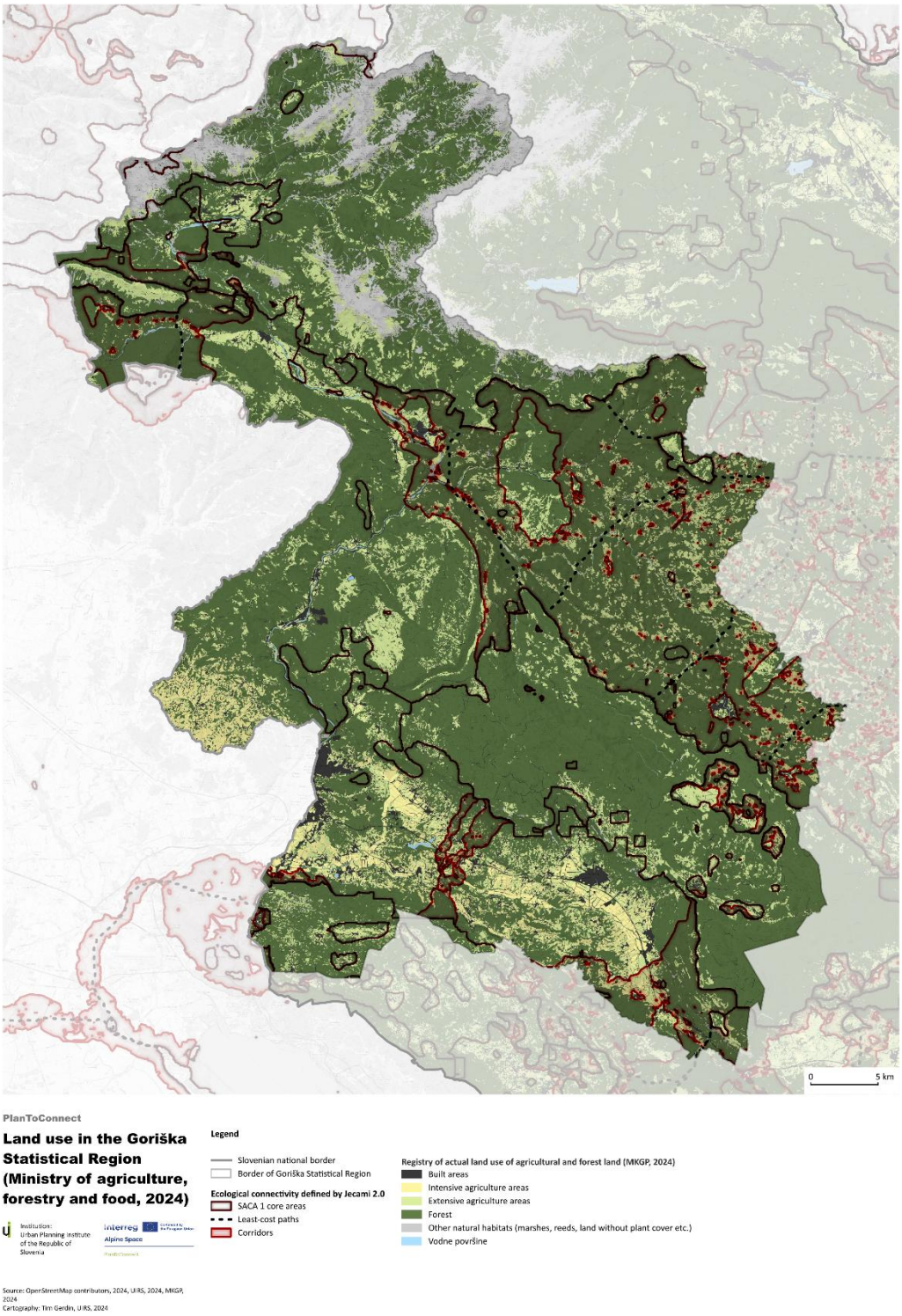

Figure 4: Register of actual use of agricultural and forest land (MKGP, 2024) in the Goriška Statistical Region

Table 4: Analysis of surface area by cover class for the CORINE Land Cover (2018)

Cover classes	Area (ha) in the Goriška Statistical Region	Area (ha) in core areas (SACA1)	Percentage (%) in core areas (SACA1)	Area (ha) of the area in the connecting corridors	Percentage (%) in connecting corridors
Built areas	3.461,7	44,6	1,3	194,1	5,6
Intensive agricultural areas	7.089,7	1,7	0,0	359,4	5,1
Extensive agricultural areas	45.440,71	9.323,1	20,5	12.678,3	27,9
Forest	150.330,3	58.713,7	39,1	46.559,3	31,0
Other natural habitats	25.988,2	22.214,2	85,5	1.300,9	5,0
Water bodies	204,5	26,2	12,8	42,5	20,8

Table 5: Analysis of surface area by cover class for the MKGP dataset (2018)

Cover classes	Area (ha) in the Goriška Statistical Region	Area (ha) in core areas (SACA1)	Percentage (%) in core areas (SACA1)	Area (ha) of the area in the connecting corridors	Percentage (%) in connecting corridors
Built areas	7.487,1	795,5	10,6	1.127,4	15,1
Intensive agricultural areas	8.267,6	94,9	1,1	542,4	6,6
Extensive agricultural areas	37.865,4	9.947,2	26,3	10.935,4	28,9
Forest	164.503,2	67.204,3	40,9	47.956,5	29,2
Other natural habitats	13.059,6	11.976,9	91,7	160,5	1,2
Water bodies	1.332,3	304,6	22,9	412,3	30,9

4.2 Protected areas in the pilot site

The Goriška Statistical Region has several protected areas with different regimes (forest reserves, national park, natural values, ecologically important areas, Natura 2000, landscape parks, nature reserves and nature monuments).

Forest reserves cover only a small part of the Goriška region, but they are subject to a strict protection regime. These are areas of preserved natural forests left to develop naturally, which will in the future give rise to primeval forests and have not been managed in the past. They lie almost entirely within the core areas of SACA1.

A large part of the Triglav National Park, the only national park in the Republic of Slovenia, is also located in the region and mostly within the northern core area of SACA1. The Triglav National Park is a type of the most strictly protected nature areas. These are parts of nature that are distinguished by exceptional biodiversity or other outstanding features of parts of living or non-living nature and have been recognised as such and officially declared by the adoption of a protection act by the government or a competent local authority. Triglav National Park is the only national park in the Republic of Slovenia.

The third type of sites are natural values, i.e. geological phenomena, minerals and fossils and their deposits, surface and sub-surface karst phenomena, underground caves, gorges and sinkholes, and other geomorphological phenomena, glaciers and glacial action, springs, waterfalls, rapids, lakes, marshes, streams and rivers with their banks, seashores, flora and fauna, their outstanding specimens and their habitats, ecosystems, landscapes and designed nature. They are found in SACA1 and in corridors, but also beyond.

Ecologically important areas are mostly located within core areas. To the south-east of Nova Gorica, they extend beyond the core areas. An ecologically important area is defined under the Nature Conservation Act as an area of a habitat type, part of a habitat type or a larger ecosystem unit that makes a significant contribution to the conservation of biodiversity (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 96/2004, 2004).

A large part of the Goriška Statistical Region is covered by Natura 2000 sites, a European network of special protection areas declared in the Member States of the European Union with the primary objective of preserving biodiversity for future generations. Special Protection Areas are designed to conserve animal and plant species and habitats that are rare or threatened at European level as a result of human activity.

Last but not least, several locally protected areas have been identified at local level, such as the Zgornja Idrijca Landscape Park and the South Trnovo Forest Landscape Park, as well as nature reserves and nature monuments.

Detailed surface data is described in Table 6.

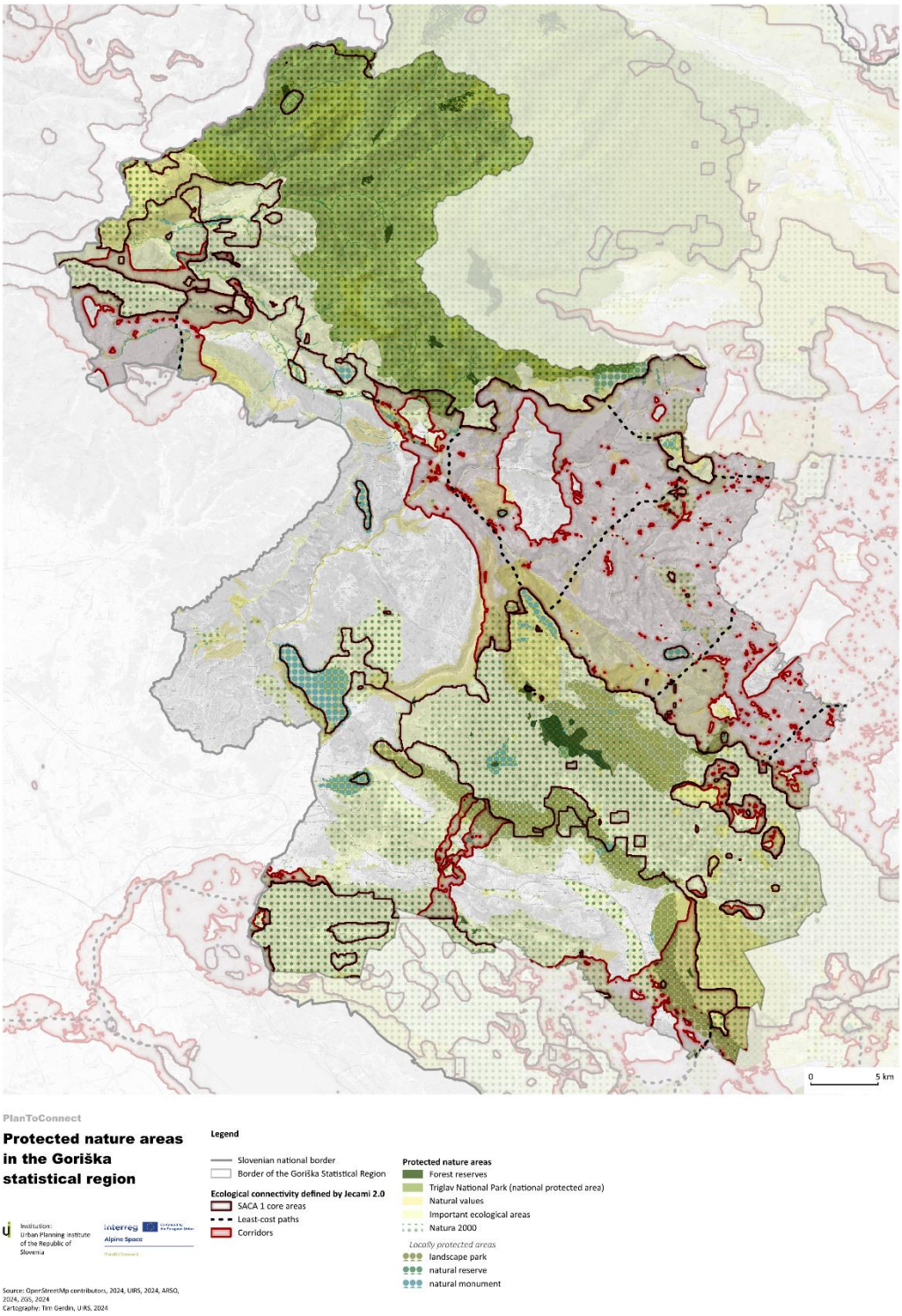

Figure 5: Protected nature areas in the Goriška Statistical Region

Table 6: Surface of protected nature areas in the pilot area

Protected area	Surface (ha) (and percentage (%)) of area in Goriška statistical region	Surface (ha) (and percentage (%)) of area in core areas (SACA1)	Surface (ha) (and percentage (%)) of area in corridors
Important ecological areas	148.108,5 (13,7)	89.873,3 (8,3)	24.757,6 (2,3)
Natura 2000	115.755,9 (15,1)	81.519,1 (10,6)	13.491,1 (1,8)
Natural values	44.839,75 (18,2)	22.455,7 (9,1)	11270,0 (4,6)
Triglav national park (national protected area)	35.437,8 (22,5)	34.390,1 (21,8)	444,5 (0,3)
Forest reserves	1.409,2 (14,9)	1.289,7 (13,7)	54,4 (0,6)
Locally protected areas	17.931,8 (18,5)	10.742,7 (11,1)	2.928,3 (3,0)

4.3 Animal habitats and corridors

Core habitats and areas of importance for ecological connectivity were identified in the targeted research project Identification of ecological corridors at the national level to support spatial development planning and management of nature and other resources (Penko Seidl et al., 2023). Data has been prepared for three indicator (model) species, i.e. bears, ungulates and birds (Figure 6).

The areas are present in the entire Goriška Statistical Region, except in the south in the Vipava Valley, where human presence is also highest. They are largely located within the SACA1 core areas, which is most evident from the sensitive areas of the Griffon vulture, but also in the brown bear. Deer are more generally present in the region.

There are also some corridors in the region identified by the Forest Service of Slovenia (ZGS) (Poljanec et al., 2023). Only one ZGS corridor is located within the corridors of alps-wide structural connectivity area.

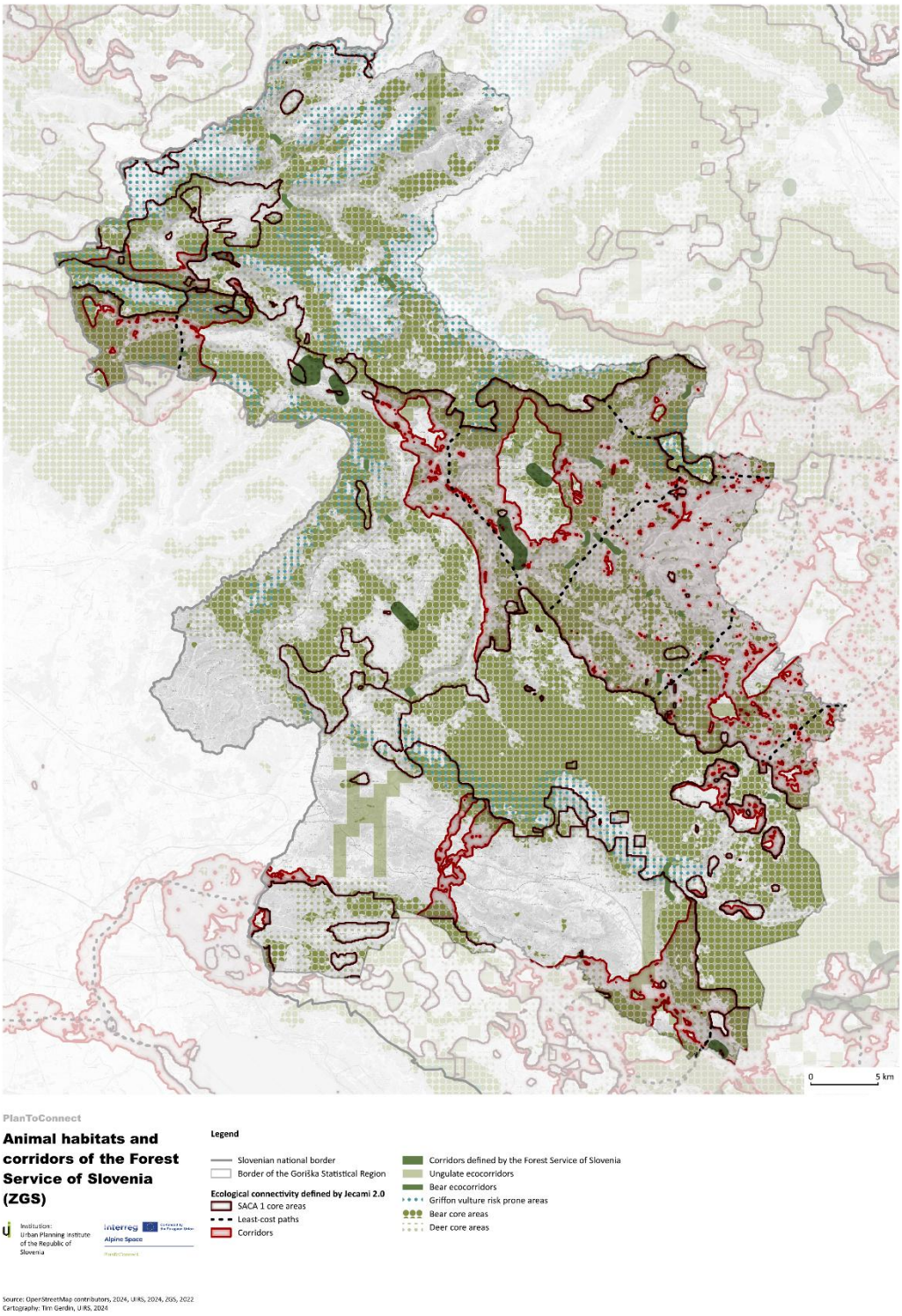

Figure 6: Animal habitats and corridors of the Slovenia Forest Service in the Goriška Statistical Region

4.4 Forest functions

Forests have several functions, which are divided into three classes, namely ecological functions, social functions and productive functions. The functions are shown by three maps (Figure 7, Figure 8 and Figure 9) with a single class showing all the functions, and a synthesis map showing the three classes of forest functions together (Figure 10).

The social functions of forests are mainly found within the core areas, with the exception of forests with a protective function, which are mainly found on the slopes in the corridor encompassing the Idrijca River, and forests with an aesthetic function, which are found in the vicinity of Nova Gorica and Goriška Brda.

Forests with an ecological function are also largely located within SACA1 areas, which is most evident in the case of forests with a biotic function.

Forests with a productive function are located to a similar extent throughout the entire area of the Goriška Statistical Region, except in the Vipava Valley and the highest elevations. This is particularly true for those with a timber-processing function, while forests with a function of extracting other forest goods are located outside corridors and core areas. Forests with a hunting-management function are located in the SACA1, which covers the Triglav National Park.

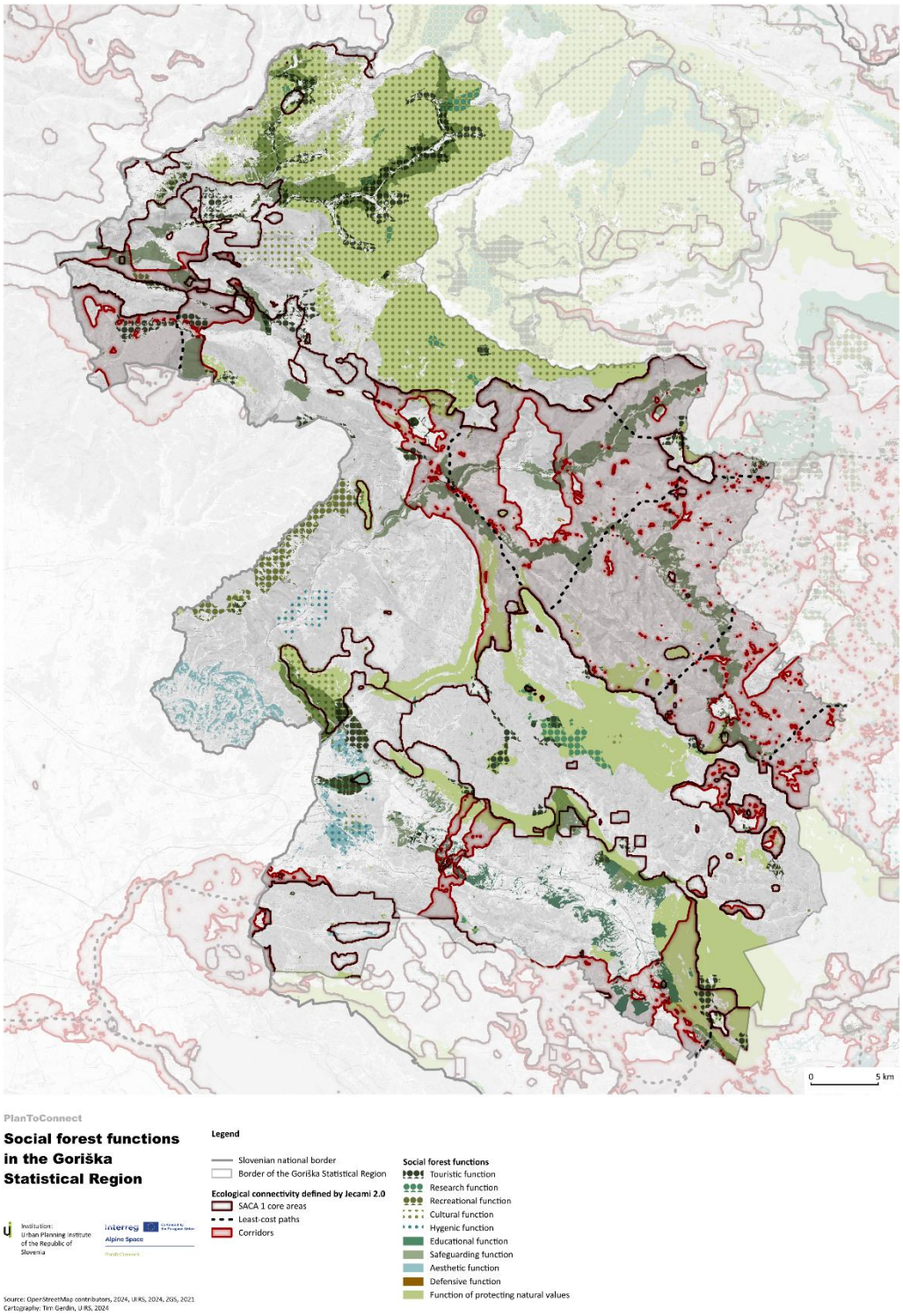

Figure 7: Social forest functions in the Goriška Statistical Region

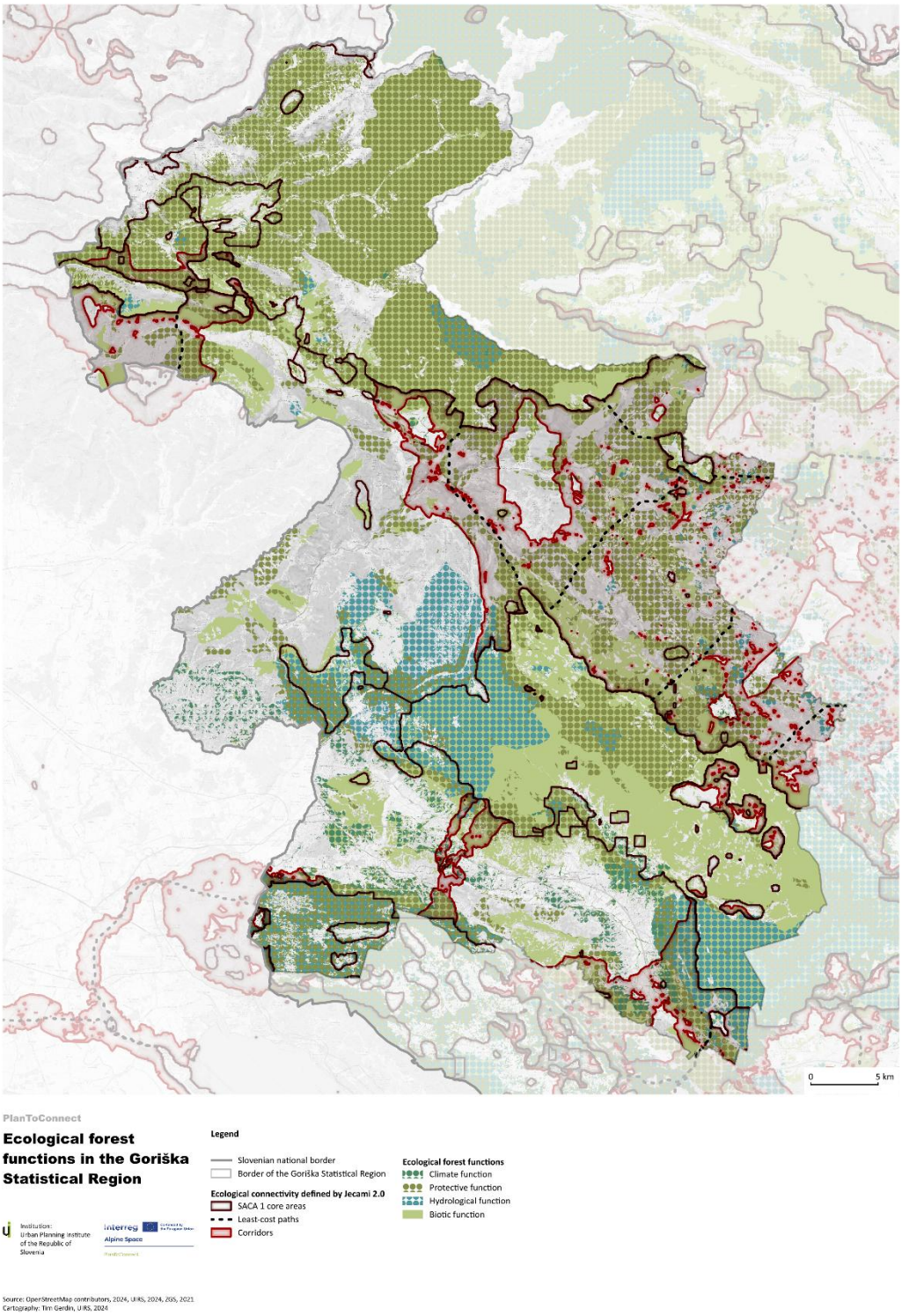

Figure 8: Ecological forest functions in the Goriška Statistical Region

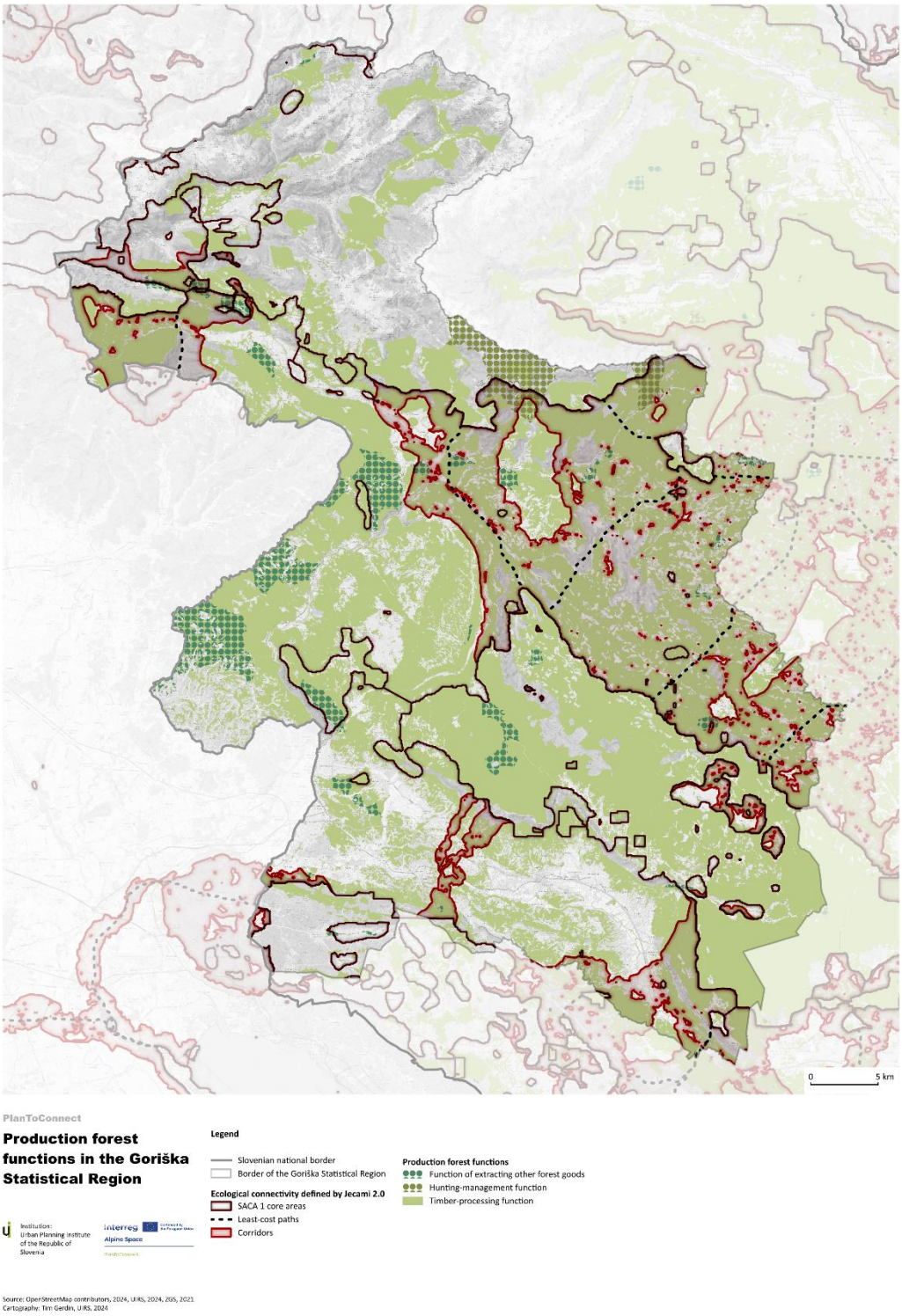

Figure 9: Productive forest functions in the Goriška Statistical Region

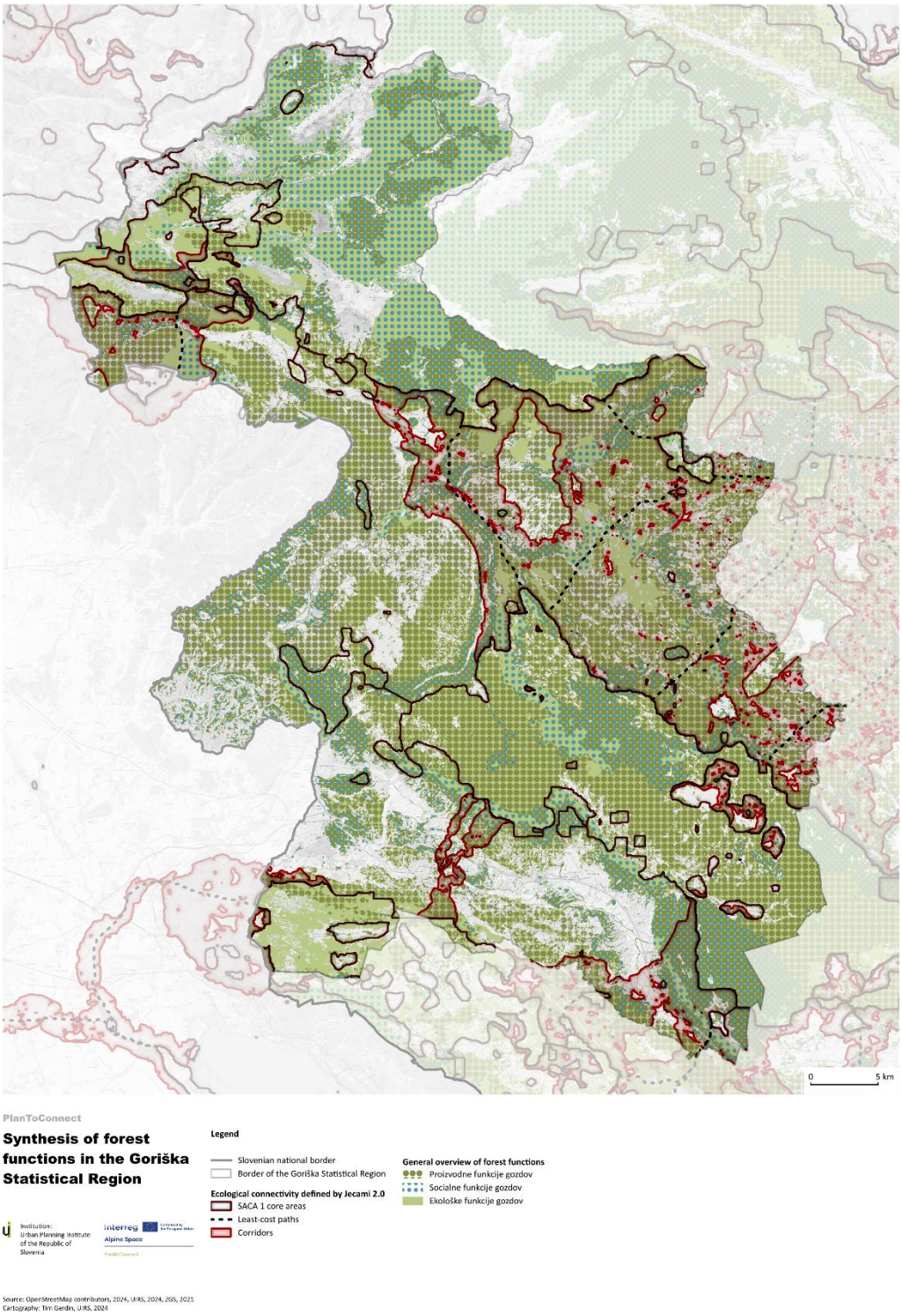

Figure 10: General overview of forest functions in the Goriška Statistical Region

4.5 Individual analysis of corridors and their barriers

The pilot area of the Goriška Statistical Region is less urbanised and includes fewer areas of intensive agriculture and fewer substantial infrastructure obstacles and threats (expressways, construction of solar power plants etc.) in comparison to other statistical regions. The existing obstacles therefore moderately or negligibly impede ecological connectivity between protected areas and NATURA 2000 sites. The northern part of the pilot area, largely encompassing the Triglav National Park and NATURA 2000 sites, characterized by sparse settlement and less developed transport infrastructure, lesser fragmentation compared to the southern part — particularly the Vipava Valley area, where the highway represents a significant obstacle for establishing ecological connectivity between protected areas.

There are 9 least-cost paths in the Goriška Statistical Regions and its vicinity in total. 7 least-cost paths run through the upper less fragmented landscape and 1 in the southern more agriculturally intensive part and 1 in Italy. They link SACA1 core areas within the region, as well as areas in different regions and areas in Italy. The least-cost paths are named in Table 7 and represented on a map (Figure 11).

The overall barrier typologies are presented in Table 8 and the evaluation template used to describe the corridors is shown in Table 9.

Table 7: Least-cost path names

No. of least-cost path	Name
1	Mount Stol ridge – Mount Mija (Italy)
2	Trnovo Forest Plateau - Triglav National Park
3	Trnovo Forest Plateau - Mount Porezen
4	Mount Porezen - Triglav National Park
5	Mount Porezen - Mount Blegoš
6	Trnovo Forest Plateau - Mount Blegoš
7	Trnovo Forest Plateau - Polhov Gradec Hills
8	Trnovo Forest Plateau - Kras
9*	Kras (Italy) - Soča River Mouth Natural Reserve (Italy) (*least-cost path completely in Italy)

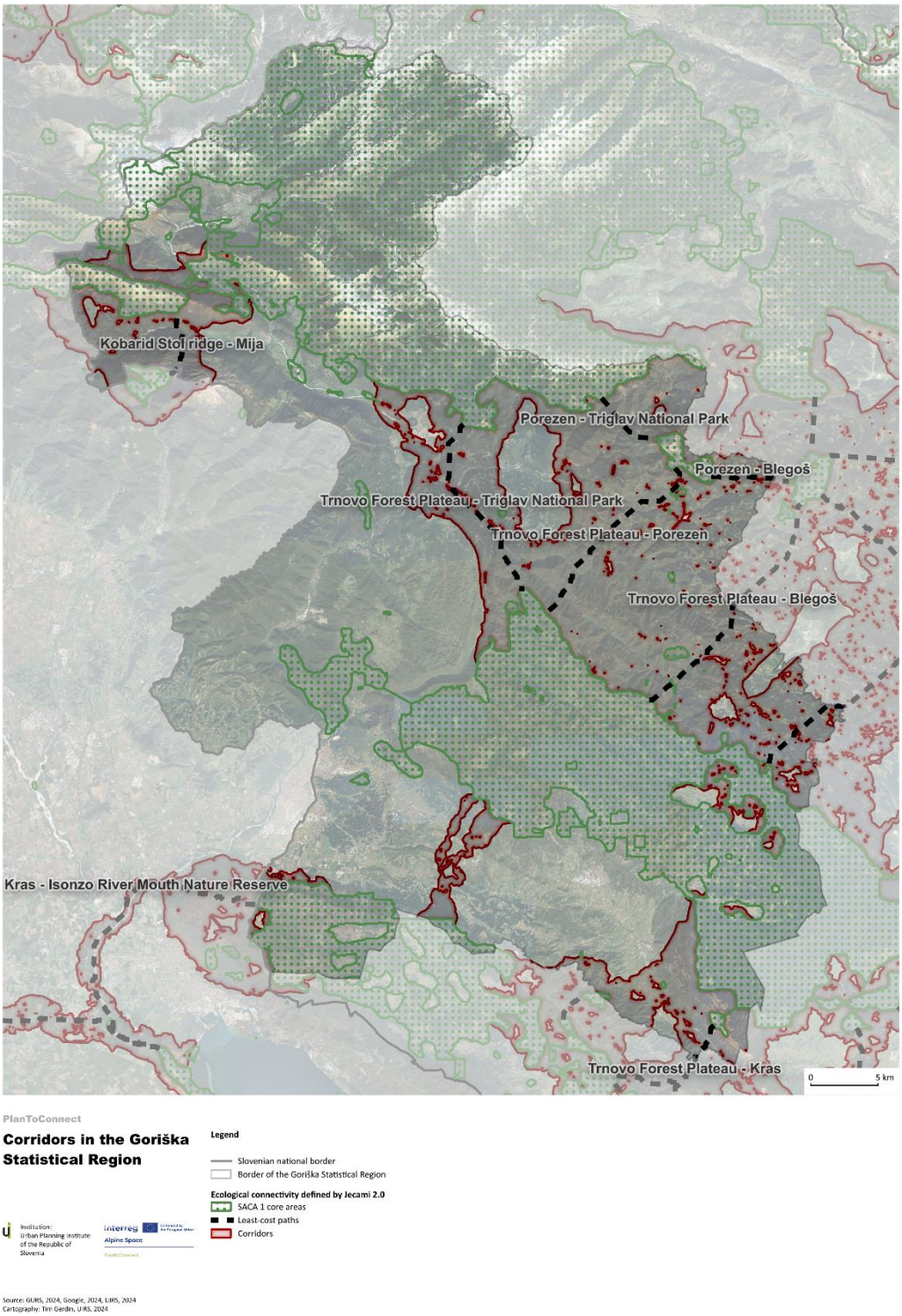

Figure 11: Corridors in the Goriška Statistical Region

Table 8: Main barrier types in the pilot area

Barrier	Representation
Expressway* **(Google, 2024)** **A** .	
Main road **(Google, 2024)**	
Regional road **(Google, 2024)**	
Village **(Google, 2024)**	

Table 9: Evaluation template for corridors

Attributes to be described	Instructions
Importance of connection (Scale)	Please choose the scale you are working on: • Local, • regional • trans-regional
Location:	Please choose one or more: • Inner alpine, • pre-alpine, • flatland • karst
Corridor type	Please choose one or more of the following list: • stepping stone corridor, • linear corridor or • landscape corridor
Habitat types*	Please choose one or more of the following list: • Rocky habitats • Heath and scrub • Forests • Sclerophyllous scrubs • Grasslands • Freshwater habitats • Bogs, mires and fens • Dunes habitats • Costal habitats
Typical connecting GBI elements	Please select GBI typologies (Type 1 to 6) and respective land – use categories from the D1.1.1 deliverable(page 69-72), which are typical on your corridor. (it is not necessary to conduct a GIs analysis, but it is rather an estimation of your local knowledge.
Typical anthropogenic pressures	Please select the most important anthropogenic pressures according to your opinion: • agricultural practices, • urban development, • forestry, • natural processes, • alien and problematic species, • human-induced changes in water regimes, • extraction of resources, • energy production. • transport

4.5.1 Corridor from the Kobarid Stol ridge to Mount Mija (Italy)

Table 10: Description of the Kobarid Stol ridge to Mount Mija corridor

Attributes to be described	Corridor from the Kobarid Stol ridge to Mount Mija (Italy)
Importance of connection (Scale)	**Local** *Description: The* corridor is of local importance. It is however an international corridor as it connects to a SACA1 core area of the Mija mountain in Italy.
Location	**Pre-alpine** *Description:* The corridor is located in the pre-alpine area. Starting from the north it descends the Stol and Krasji vrh south faces, crossing the Breginjski kot and the Nadiža River. It then ascends for a short distance over Borjanske livade and links directly with the SACA core area of Mija or running down Gladko čelo where it joins the Nadiža River Valley. It continues along the river almost to the national border where it climbs up Gošče and crosses the Poljana stream that marks the Slovenian national border. A short distance later it links to Mija.
Corridor type	**Stepping stone corridor** *Description:* Despite the corridors short length and relatively small area it does have a landscape quality as it does not have a uniquely linear character. It is however connecting Mija, a smaller area, with the SACA1 that encompasses the Triglav National Park. It is therefore primarily a stepping stone corridor.
Habitat types	**Mixed forests, Grasslands, Freshwater habitats, Rocky habitats (in limited quantity)** *Description:* The corridor is situated at various altitudes (250 to 1600 meters) and covers different land uses and habitats. Primarily it covers a matrix of forest and pastures or other extensive agricultural areas.
Typical connecting GBI elements	*Description:* Most important GBI elements and land uses in the corridor, are: **GBI Type 2 - Possible restoration zones:** Managed grassland – Pastures. **GBI Type 3 - Sustainable use zones:** Seminatural grassland – Meadows. **GBI Type 4 - Green urban and peri-urban areas:** Low density settlement areas. **GBI Type 5 - Natural connectivity features:** Coniferous tree cover, Broadleaf tree cover, Mixed tree cover, Alpine and sub-alpine natural grasslands. **GBI Type 6 - Artificial connectivity features: /**
Typical anthropogenic pressures and barriers	*Description:* The existing anthropogenic pressures in the corridor are roads which are located in the Nadiža River Valley and on the foot of Mount Stol. The pressures are: 1 main road that links Kobarid with Italy and 1 regional road. The main road is linking Kobarid with towns in Italy. It joins and runs with the least-cost path in the Nadiža River Valley but it does not cross it (Figure 13). The regional road, which crosses the least-cost path is between the villages Potoki and Borjana, both of which lie on the foot of the mountain (Figure 14).

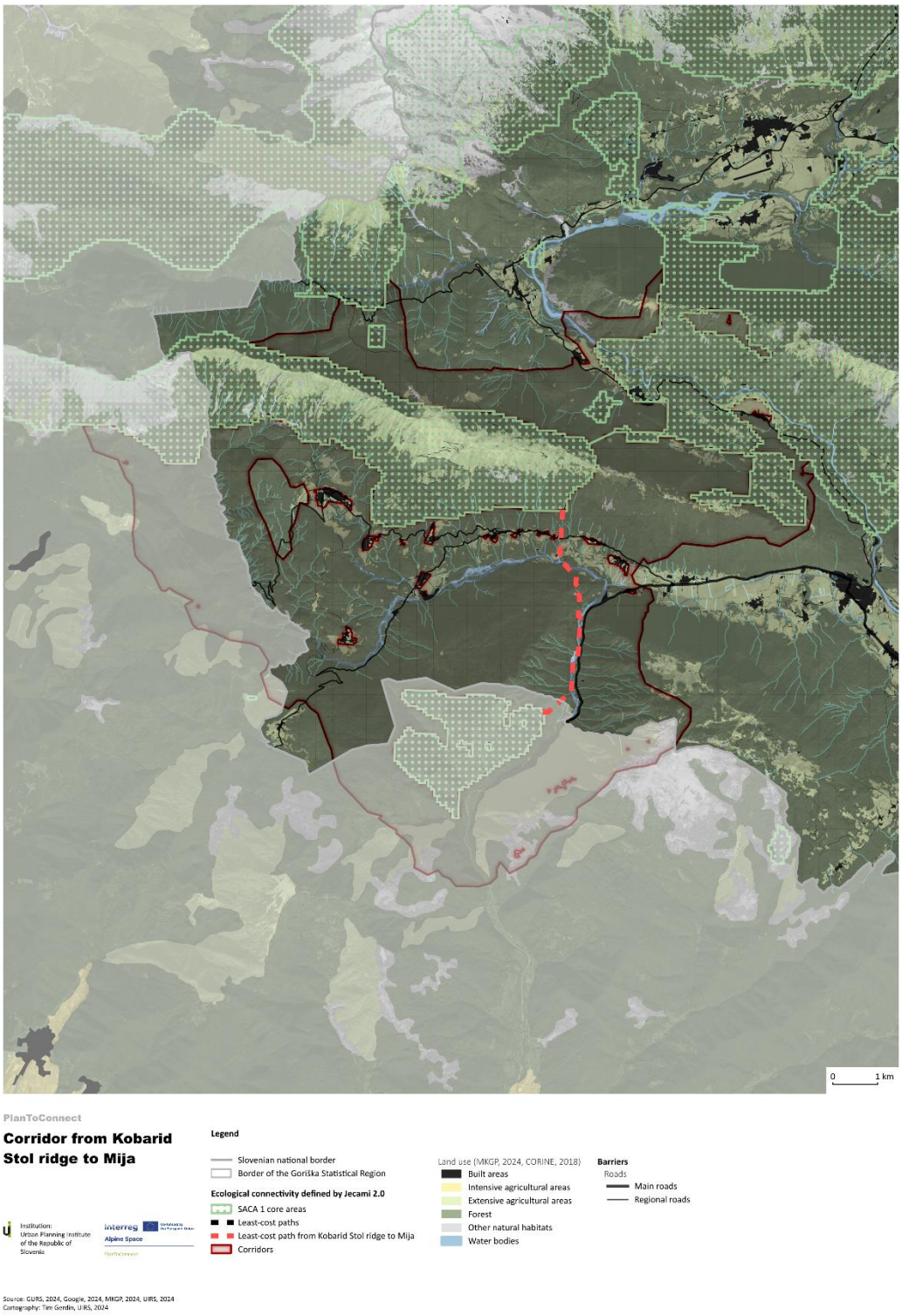

Figure 12: Corridor from Kobarid Stol ridge to Mija

Figure 13: Main road connecting Kobarid with Italy in the Nadiža River Valley (Google, 2024)

Figure 14: Regional road from Potoki to Borjana (Google, 2024)

4.5.2 Corridor from the Trnovo Forest Plateau to Triglav National Park

Table 11: Description of the Trnovo Forest Plateau to Triglav National Park corridor

Attributes to be described	Corridor from the Trnovo Forest Plateau to Triglav National Park
Importance of connection (Scale)	**Regional** *Description: The* corridor is of regional importance. It connects the extreme northwest part of the Dinarides with the Julian Alps.
Location	**Pre-alpine** *Description:* The corridor is in the pre-alpine area. Its least-cost path starts of in the Trebuša River and then climbs over Vojančevo brdo. It then descends once more where it runs along the Idrijca River with its tributaries. There are pre-alpine hills on both sides of the valley (parts of the Banjšice Hills and Idrija Hills). Together with 5 corridors running to Porezen, Škofja Loka Hills and Polhov Gradec Hills to the east it forms a larger connectivity area.
Corridor type	**Landscape corridor** *Description:* The corridor has a landscape character. It does not follow a linear feature There is little anthropogenic pressure (rail and road network, built areas etc.) even in the valleys. The corridor links important landscape areas, notably it the South Trnovo Forest and Zgornja Idrijca Landscape Parks (both in the southern SACA1 area) with the Triglav National Park (in the northern SACA1 area).
Habitat types	**Mixed forests, Grasslands, Freshwater habitats, Rocky habitats (in limited quantity)** *Description:* The corridor includes areas from 200 to 1000 meters in elevation and covers different land uses and habitats. The majority land use is a matrix of forest and pastures or other extensive agricultural areas.
Typical connecting GBI elements	*Description:* Most important GBI elements and land uses in the corridor, are: **GBI Type 2 - Possible restoration zones:** Managed grassland – Pastures. **GBI Type 3 - Sustainable use zones:** Seminatural grassland – Meadows. **GBI Type 4 - Green urban and peri-urban areas:** Low density settlement areas. **GBI Type 5 - Natural connectivity features:** Coniferous tree cover, Broadleaf tree cover, Mixed tree cover, Alpine and sub-alpine natural grasslands. **GBI Type 6 - Artificial connectivity features:** Railway viaduct.
Typical anthropogenic pressures and barriers	*Description:* The most important existing anthropogenic pressures in the corridor primarily appearing in the valley bottoms. There is a main road running in the Idrija River Valley parallel to the least-cost path (Figure 17). The impact of this road on ecological connectivity is probably limited. An area with a higher impact on connectivity is the junction of the main and regional road as well as the Bača train station (Figure 19). There is also a railway line in this junction, but it does not degrade the ecological connectivity in the immediate vicinity of the least-cost path as it crosses the valley on a viaduct (Figure 16).

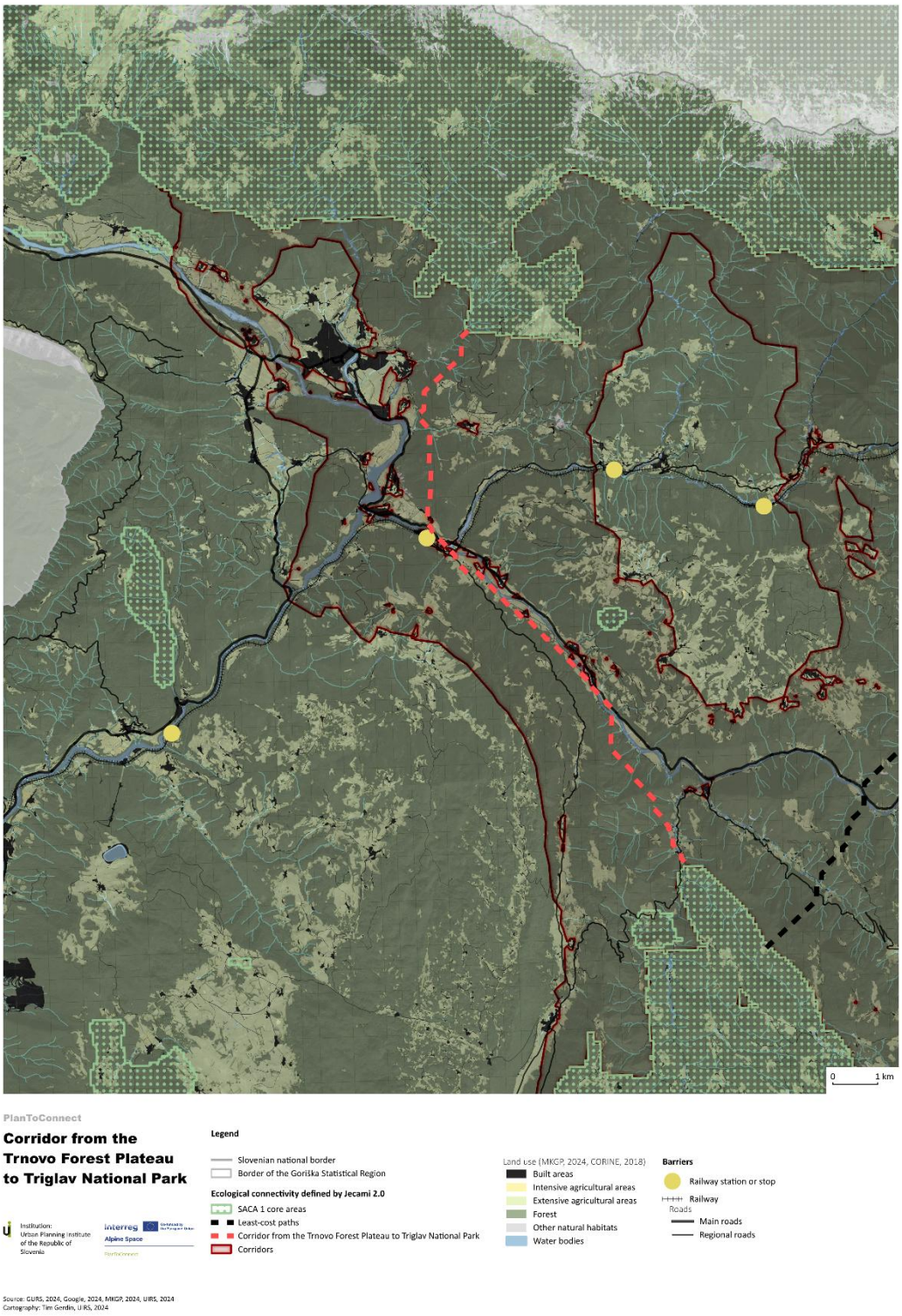

Figure 15: Corridor from the Trnovo Forest Plateau to Triglav National Park

Figure 16: Viaduct in Bača pri Modreju (Yerpo, 2010)

Figure 17: Main road from Dolenja Trebuša to Bača pri Modreju (Google, 2024)

Figure 18: Regional road in Bača pri Modreju (Google, 2024)

Figure 19: Most na Soči train station (Google, 2024)

4.5.3 Corridor from the Trnovo Forest Plateau to Mount Porezen

Table 12: Description of the Trnovo Forest Plateau to Mount Porezen corridor

Attributes to be described	Corridor from the Trnovo Forest Plateau to Mount Porezen
Importance of connection (Scale)	**Local** *Description:* The corridor is of local importance. It connects the extreme northwest part of the Dinarides with Mount Porezen and its surrounding area as well as touching a SACA1 stepping stone near Trebenče.
Location:	**Pre-alpine** *Description:* The corridor is found in the pre-alpine area. Starting at the western end of the corridor, its least-cost path descends from the Trnovo Forest Plateau and crosses the regional road linking Dolenja Trebuša and Spodnja Idrija. It then crosses the same main road going from Dolenja Trebuša to Idrija 3 times, refraining from following the river valley and preferring to ascend into the Idrija and Cerkno Hills. The path passes by Ravne pri Cerknem, continuing to the SACA1 stepping stone near Trebenče and not long after finishes at Porezen.
Corridor type	**Landscape corridor** *Description:* The corridor has a landscape character. There is little anthropogenic pressure (rail and road network, built areas etc.) even in the valleys. The corridor links an important landscape area with a smaller SACA1 area that also has a stepping stone quality. It forms a larger connectivity area with 5 other corridors.
Habitat types	**Mixed forests, Grasslands, Freshwater habitats** *Description:* The corridor includes areas from 200 to around 1000 meters in elevation. The majority land use is forest with a smaller percentage of pastures or other extensive agricultural areas, particularly in the east.
Typical connecting GBI elements	*Description:* Most important GBI elements and land uses in the corridor, are: **GBI Type 2 - Possible restoration zones:** Managed grassland – Pastures. **GBI Type 3 - Sustainable use zones:** Seminatural grassland – Meadows. **GBI Type 4 - Green urban and peri-urban areas:** Low density settlement areas. **GBI Type 5 - Natural connectivity features:** Coniferous tree cover, Broadleaf tree cover, Mixed tree cover. **GBI Type 6 - Artificial connectivity features:** /
Typical anthropogenic pressures and barriers	*Description*: The only potential barrier in this corridor are the two roads, one is classed as a regional road (Figure 21), the other is a main road (Figure 22).

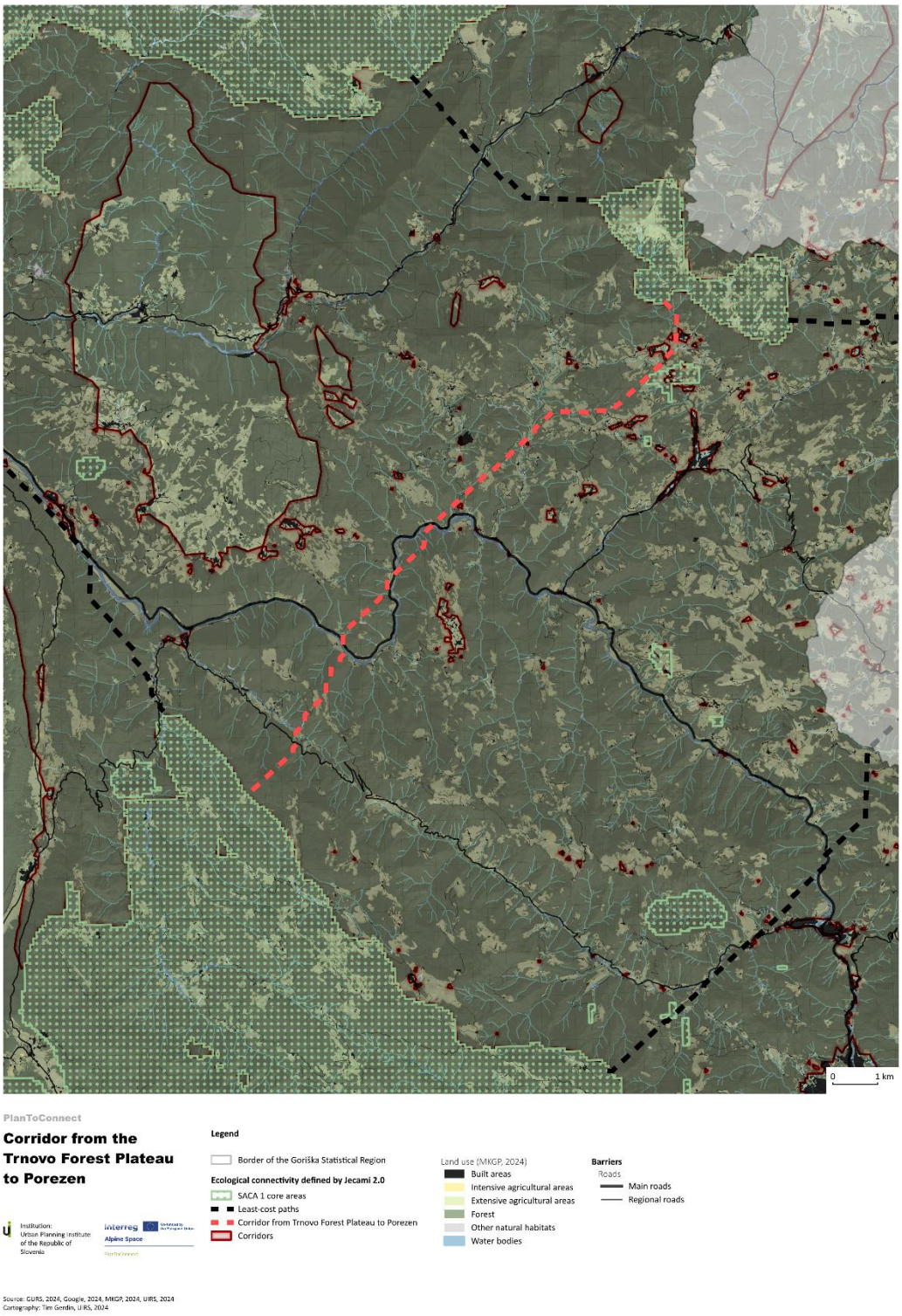

Figure 20: Corridor from the Trnovo Forest Plateau to Mount Porezen

Figure 21: Regional road at Hotenja (Google, 2024)

Figure 22: Main road from Dolenja Trebuša to Idrija (Google, 2024)

4.5.4 Corridor from Mount Porezen to Triglav National Park

Table 13: Description of the Mount Porezen to Triglav National Park corridor

Attributes to be described	Corridor from Mount Porezen to Triglav National Park
Importance of connection (Scale)	**Local** *Description:* The corridor is locally important. It connects Mount Porezen and its surroundings with Triglav National Park.
Location:	**Pre-alpine** *Description:* The corridor is found in the pre-alpine area. Starting in the Škofja Loka Hills the corridor's least-cost path descends to the Bača Ravine, then passes the village Znojile and links to the national park near Lonik, a secluded farm east of Rut village.
Corridor type	**Stepping stone corridor** *Description:* The corridor has a landscape character, because it does not follow any linear feature. But because of its short length it is a stepping stone corridor. The corridor links an important landscape area with Porezen which is a smaller SACA1 are with a stepping stone quality. It forms a larger connectivity area with 5 other corridors.
Habitat types	**Mixed forests, Grasslands, Freshwater habitats** *Description:* The corridor runs through elevations from 400 to around 1200 meters in elevation. The vast majority land use is forest with a negligible percentage of pastures or other extensive agricultural areas.
Typical connecting GBI elements	*Description:* Most important GBI elements and land uses in the corridor, are: **GBI Type 2 - Possible restoration zones:** Managed grassland – Pastures. **GBI Type 3 - Sustainable use zones:** Seminatural grassland – Meadows. **GBI Type 4 - Green urban and peri-urban areas:** Low density settlement areas. **GBI Type 5 - Natural connectivity features:** Coniferous tree cover, Broadleaf tree cover, Mixed tree cover. **GBI Type 6 - Artificial connectivity features:** /
Typical anthropogenic pressures and barriers	*Description:* The only barrier in this corridor is found in the Bača Ravine, where the least-cost path crosses the Bača River, a railway and a regional road (Figure 24).

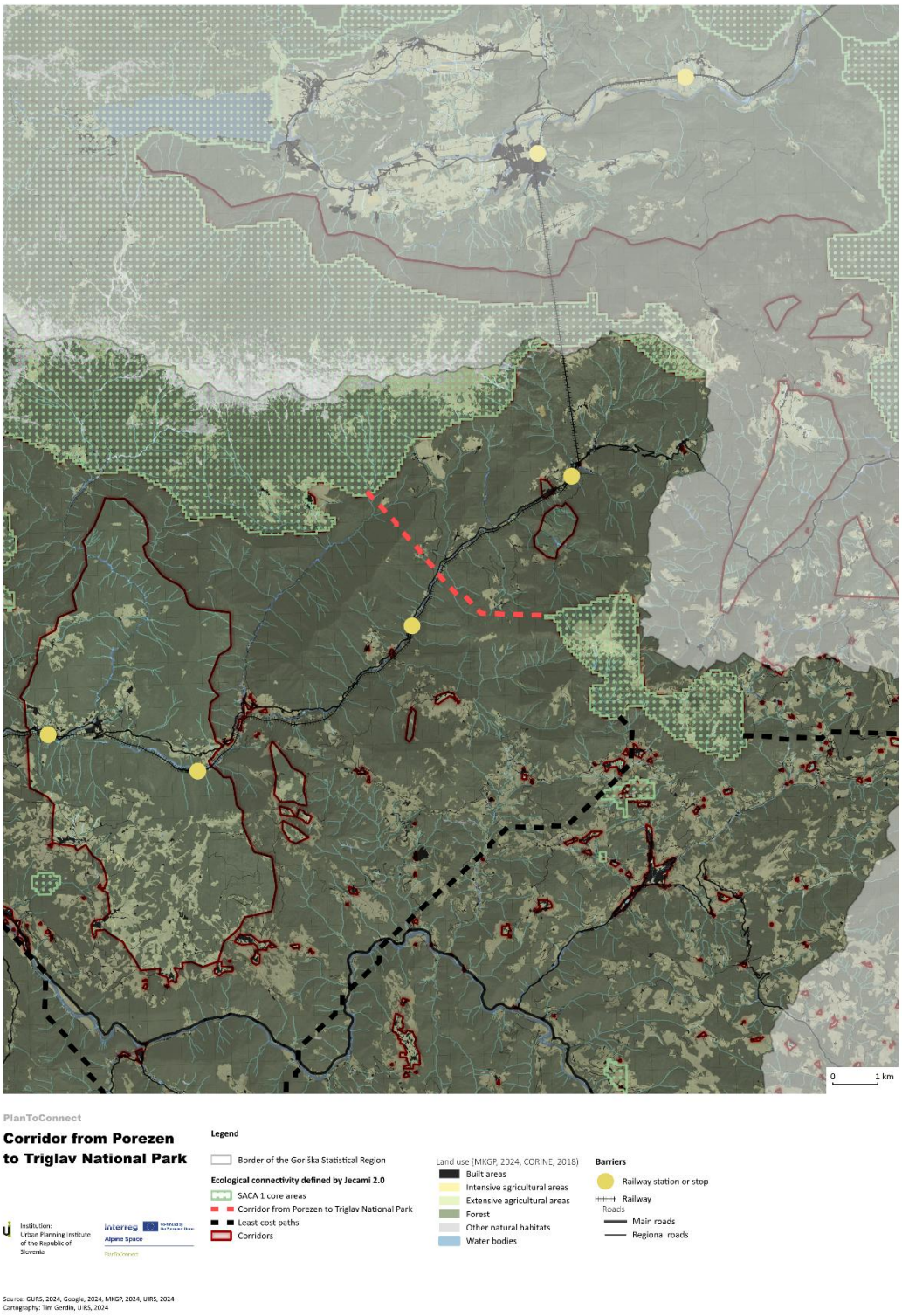

Figure 23: Corridor from Mount Porezen to Triglav National Park

Figure 24: Barriers in the Bača Ravine (Google, 2024)

4.5.5 Corridor from Mount Porezen to Mount Blegoš

Table 14: Description of the Mount Porezen to Mount Blegoš corridor

Attributes to be described	Corridor from Mount Porezen to Mount Blegoš
Importance of connection (Scale)	**Local** *Description:* The corridor is locally important. It connects Mount Porezen and Mount Blegoš.
Location:	**Pre-alpine** *Description:* The corridor is located in the pre-alpine Škofja Loka Hills (Figure 26). The corridor's least-cost path travels westward from Porezen to Blegoš, passing Črni vrh in between.
Corridor type	**Stepping stone corridor** *Description:* The corridor is short and connects two relatively small SACA1 areas which serve mostly as intermediate stops between larger areas, it is therefore a stepping stone corridor.
Habitat types	**Mixed forests, Grasslands, Freshwater habitats** *Description:* The corridor is found on an average elevation 1000 meters. Almost all the land is covered by forests with a negligible percentage of pastures or other extensive agricultural areas near smaller settlements.
Typical connecting GBI elements	*Description:* Most important GBI elements and land uses in the corridor, are: **GBI Type 2 - Possible restoration zones:** Managed grassland – Pastures. **GBI Type 3 - Sustainable use zones:** Seminatural grassland – Meadows. **GBI Type 4 - Green urban and peri-urban areas:** Low density settlement areas. **GBI Type 5 - Natural connectivity features:** Coniferous tree cover, Broadleaf tree cover, Mixed tree cover. **GBI Type 6 - Artificial connectivity features:** /
Typical anthropogenic pressures and barriers	*Description:* There are no manmade pressures or barriers in this corridor.

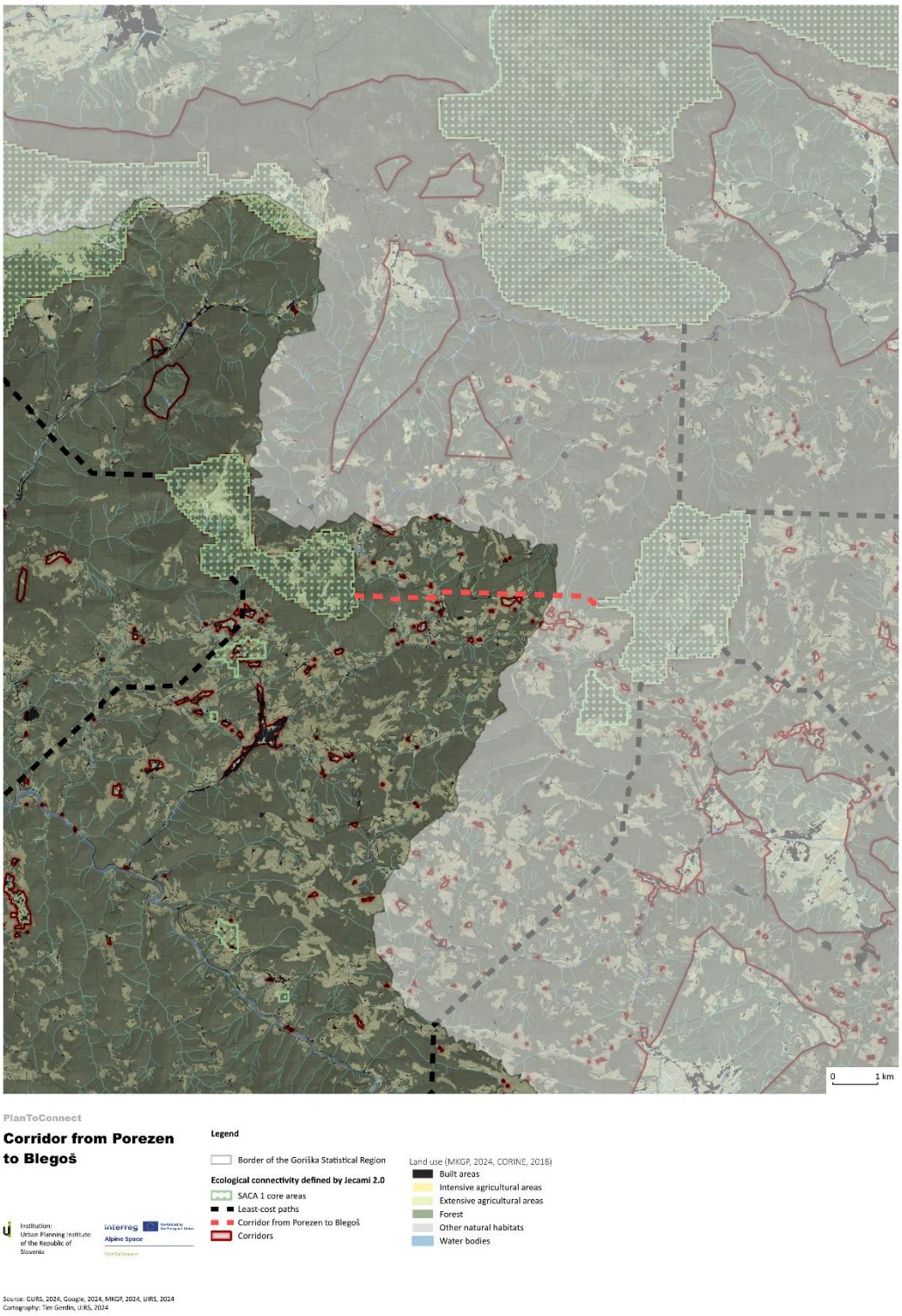

Figure 25: Corridor from Mount Porezen to Mount Blegoš

Figure 26: View of Mount Porezen from Črni vrh (Google, 2024)

4.5.6 Corridor from the Trnovo Forest Plateau to Mount Blegoš

Table 15: Description of the Trnovo Forest Plateau to Mount Blegoš corridor

Attributes to be described	Corridor from the Trnovo Forest Plateau to Mount Blegoš
Importance of connection (Scale)	**Local** *Description:* The corridor is locally important. It connects the Trnovo Forest Plateau with Mount Blegoš.
Location:	**Pre-alpine** *Description:* The corridor is located in the pre-alpine Idrija and Škofja Loka Hills. The corridor's least-cost path descends to the Kanomljica River and follows it nearly to Spodnja Idrija. It then crosses a main road and enters the Cerkno Hills from where it continues and crosses the Hobovšica River and the regional road in its valley before ascending into the Škofja Loka Hills. Before connecting to Mount Blegoš it crosses another smaller river named Kopačnica. It is part of a larger connectivity area formed by 5 other corridors.
Corridor type	**Stepping stone corridor** *Description:* While the corridor is long, it connects an important SACA1 area which covers the Trnovo Forest Plateau with a smaller area which serves as a stepping stone between the Trnovo Forest Plateau and the Sorica Plateau which is part of the Triglav National Park SACA1 area.
Habitat types	**Mixed forests, Grasslands, Freshwater habitats** *Description:* The corridor covers elevations from around 300 meters and 1000 meters. The majority land use are forest areas especially in the western part of the corridor. Moving to the east the forest matrix then becomes increasingly perforated by pastures, other extensive agricultural areas and secluded farms or hamlets. The corridor also includes several small streams and rivers.
Typical connecting GBI elements	*Description:* Most important GBI elements and land uses in the corridor, are: **GBI Type 2 - Possible restoration zones:** Managed grassland – Pastures. **GBI Type 3 - Sustainable use zones:** Seminatural grassland – Meadows. **GBI Type 4 - Green urban and peri-urban areas:** Low density settlement areas. **GBI Type 5 - Natural connectivity features:** Coniferous tree cover, Broadleaf tree cover, Mixed tree cover. **GBI Type 6 - Artificial connectivity features:** /
Typical anthropogenic pressures and barriers	*Description:* There are 3 linear barriers in the corridor. A small regional road in the Kanomljica River Valley (Figure 28), a main road linking Idrija and Tolmin (Figure 29) and a small regional road following the Hobovšica River (Figure 30).

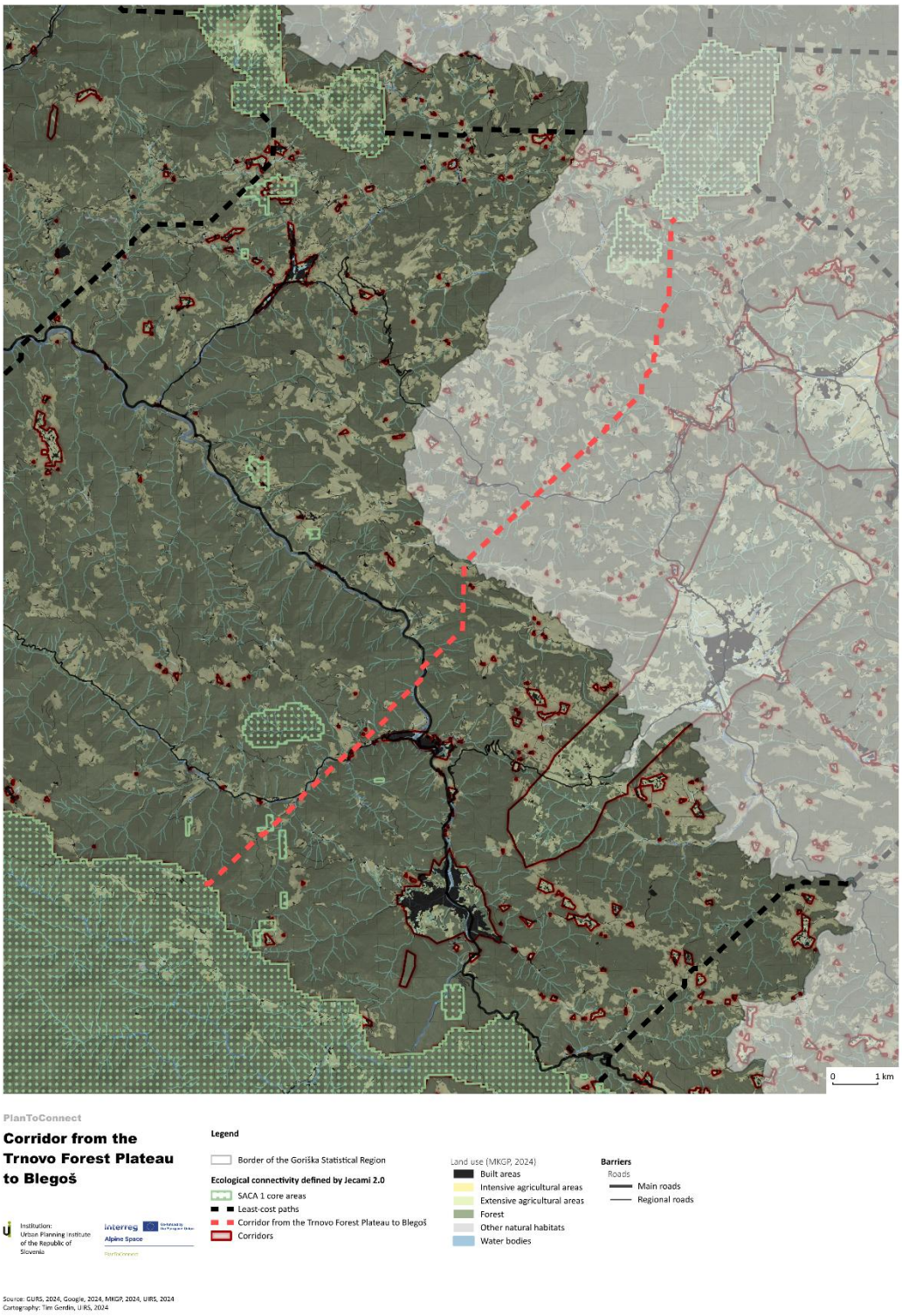

Figure 27: Corridor from the Trnovo Forest Plateau to Mount Blegoš

Figure 28: Regional road by the Kanomljica River (Google, 2024)

Figure 29: Main road from Idrija to Tolmin (Google, 2024)

Figure 30: Regional road by the Hobovšica River (Google, 2024)

4.5.7 Corridor from the Trnovo Forest Plateau to the Polhov Gradec Hills

Table 16: Description of the Trnovo Forest Plateau to the Polhov Gradec Hills corridor

Attributes to be described	Corridor from the Trnovo Forest Plateau to the Polhov Gradec Hills
Importance of connection (Scale)	**Local** *Description:* The corridor is locally important. It connects the Trnovo Forest Plateau with a smaller core area that covers part of the Polhov Gradec Hills
Location:	**Pre-alpine** *Description:* The corridor is located in the pre-alpine Rovte and Polhov Gradec Hills. The corridor's least-cost path starts near the Črni Vrh Plateau in the west. It continues to the north-east via the Rovte Hills. It enters into the Polhov Gradec Hills near Suhi Dol where the Rovte Hills seamlessly transition to the Polhov Gradec Hills. Not long after it joins the SACA1 area at the Potrebuježev graben River. The corridor is part of a larger connectivity area formed by 5 other corridors to the north.
Corridor type	**Stepping stone corridor** *Description:* Despite the corridor's length, it connects an important SACA1 area of the Trnovo Forest Plateau with a smaller area which serves as a stepping stone between the Dinarides and the Alps.
Habitat types	**Mixed forests, Grasslands, Freshwater habitats** *Description:* The corridor is mostly situated at altitudes between 600 meters and 800 meters. It covers a forest matrix that is interrupted by pastures, meadows and small water streams.
Typical connecting GBI elements	*Description:* Most important GBI elements and land uses in the corridor, are: **GBI Type 2 - Possible restoration zones:** Managed grassland – Pastures. **GBI Type 3 - Sustainable use zones:** Seminatural grassland – Meadows. **GBI Type 4 - Green urban and peri-urban areas:** Low density settlement areas. **GBI Type 5 - Natural connectivity features:** Coniferous tree cover, Broadleaf tree cover, Mixed tree cover. **GBI Type 6 - Artificial connectivity features:** /
Typical anthropogenic pressures and barriers	*Description:* There are 2 potential linear barriers in the corridor. A main road that leads from Idrija to Logatec (Figure 32) and a small regional road by the Poljanska Sora River (Figure 33). There is one other regional road that is found in the corridor but its impact as a landscape fracture is negligible.

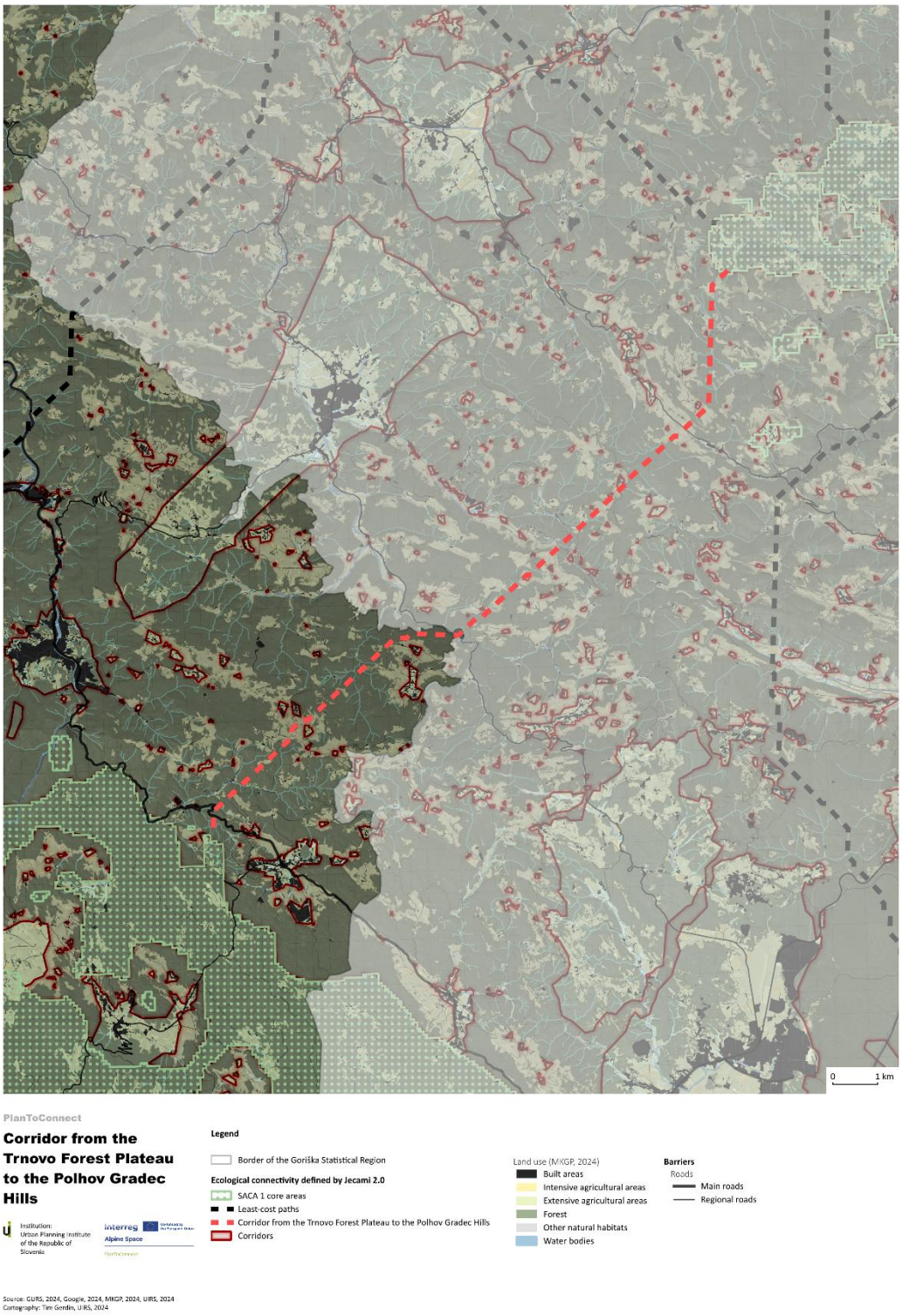

Figure 31: Corridor from the Trnovo Forest Plateau to the Polhov Gradec Hills

Figure 32: Main road from Idrija to Logatec (Google, 2024)

Figure 33: Regional road by the Poljanska Sora River (Google, 2024)

4.5.8 Corridor from the Trnovo Forest Plateau to Kras

Table 17: Description of the Trnovo Forest Plateau to Kras corridor

Attributes to be described	Corridor from the Trnovo Forest Plateau to Kras
Importance of connection (Scale)	**Regional** *Description:* The corridor is important on a regional scale. It connects the Trnovo Forest Plateau to Kras (the Karst).
Location:	**Costal** *Description:* The corridor links two karst landscapes. Its path starts off on the Nanos Plateau, it then descends its western face called Debela stena. It then encounters the expressway and a regional road, the largest barrier present in all of the corridors in the Goriška Statistical Region. After passing the two roads in the Vipava Valley it continues to Vrhe in the vicinity of the Raša River. It joins the Kras SACA1 area at Jakobov dol west of Griže.
Corridor type	**Landscape corridor** *Description:* The corridor connects two karst areas with a high ecological value in a non linear manner.
Habitat types	**Mixed forests, Grasslands, Freshwater habitats** *Description:* The corridor spans altitudes between 200 meters and 1000 meters. It includes mixed forests, grasslands, pastures and some freshwater habitats.
Typical connecting GBI elements	*Description:* Most important GBI elements and land uses in the corridor, are: **GBI Type 2 - Possible restoration zones:** Managed grassland – Pastures. **GBI Type 3 - Sustainable use zones:** Seminatural grassland – Meadows. **GBI Type 4 - Green urban and peri-urban areas:** Low density settlement areas. **GBI Type 5 - Natural connectivity features:** Broadleaf tree cover, Mixed tree cover. **GBI Type 6 - Artificial connectivity features:** 8 bridges and 4 tunnels on the expressway.
Typical anthropogenic pressures and barriers	*Description:* The barriers in this corridor are the most considerable obstacles in all of the corridors in this region. They are located one besides the other and could be considered as one barrier. The expressway is a traffic heavy road, but it can be passed beneath, where it presents itself on a bridge. It can also be passed above where it enters a tunnel.

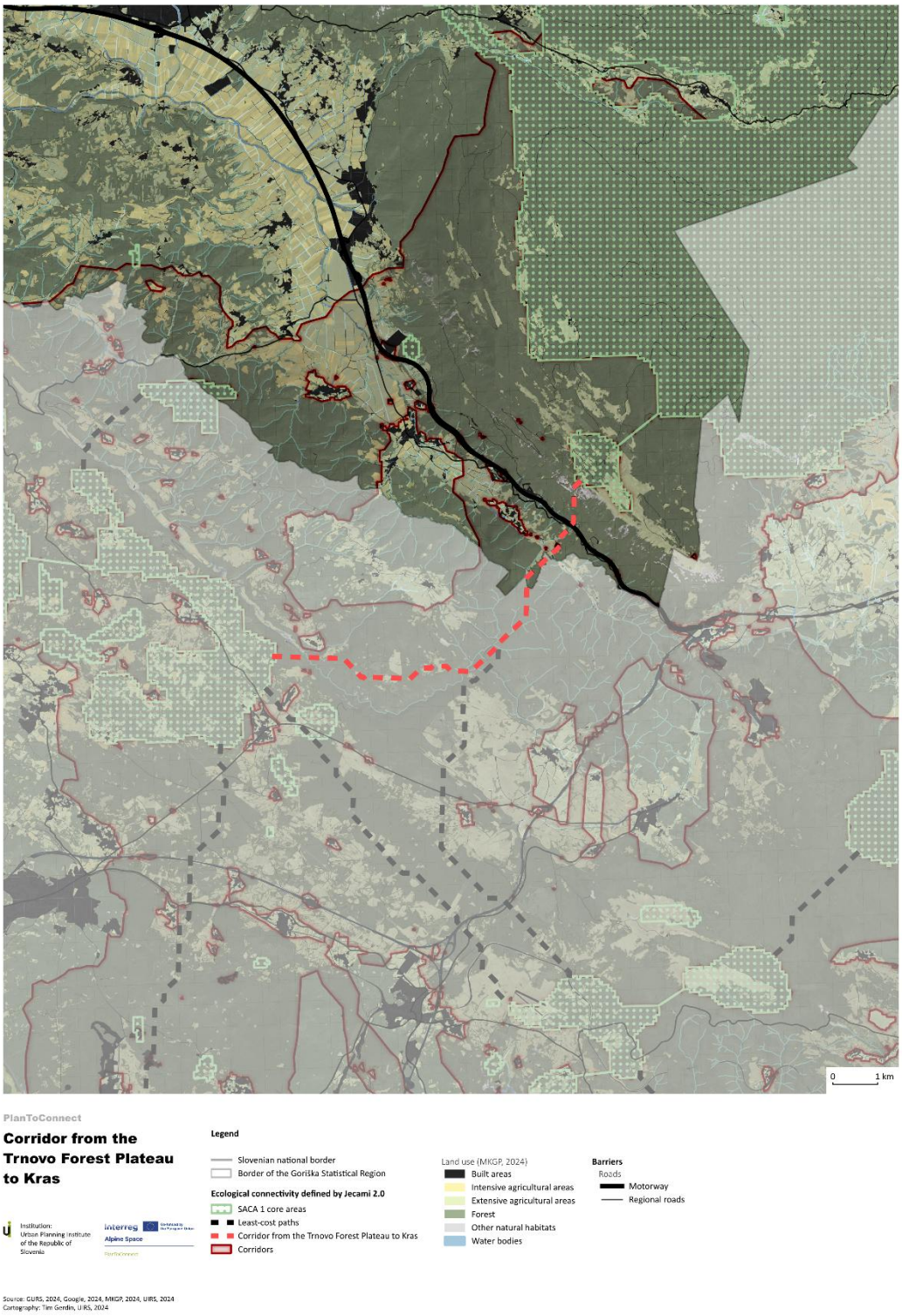

Figure 34: Corridor from the Trnovo Forest Plateau to the Polhov Gradec Hills

Figure 35: Expressway in the Vipava Valley (Google, 2024)

Figure 36: Regional road parallel to the expressway (Google, 2024)

Figure 37: Underpass of one expressway bridge (Google, 2024)

Figure 38: Expressway tunnel and bridge in the proximity of Hrašče (Google, 2024)

4.5.9 Corridor from Kras (Italy) to the Soča River Mouth Natural Reserve (Italy)

Table 18: Description of the Kras to Soča River Mouth Natural Rreserve corridor

Attributes to be described	Corridor from Kras (Italy) to the Soča River Mouth Natural Reserve (Italy)
Importance of connection (Scale)	**Local** *Description:* The corridor is important on a local scale. It connects Kras (the Karst) to the natural reserve at the mouth of Soča River.
Location:	**Costal** *Description:* The corridor is found completely in Italy. It is in a costal area that includes many freshwater and also some saltwater habitats. Its least-cost path starts right after the the Slovenian national border at the edge of the Kras SACA1 area that juts into Italy for some 100 meters. It then descends to the Soča River, which it follows downstream past the confluence with the Ter River right to the beginning of the river's outfall in the natural reserve.
Corridor type	**Linear corridor** *Description:* The corridor predominately linear, because it runs along the river for the majority of its length.
Habitat types	**Freshwater habitats, Wetlands, Riverbed, Mixed forests and Grasslands (near Kras)** *Description:* The corridor mostly covers habitats in the vicinity to the Soča River. It includes freshwater habitats, wetlands, adjacent agricultural areas and some mixed forests and grasslands at the start in Kras.
Typical connecting GBI elements	*Description:* Most important GBI elements and land uses in the corridor, are: **GBI Type 2 - Possible restoration zones:** Cultivated areas - Arable land - Annual crops. **GBI Type 3 - Sustainable use zones:** Land principally occupied by agriculture, with significant areas of natural vegetation. **GBI Type 4 - Green urban and peri-urban areas:** / **GBI Type 5 - Natural connectivity features:** Riverbed, Wetland, Water bodies, Beaches, dunes, sands. **GBI Type 6 - Artificial connectivity features:** /
Typical anthropogenic pressures and barriers	*Description:* It seems that the corridor does not include any substantial barriers. A more detailed analysis should be done with Italian infrastructure data.

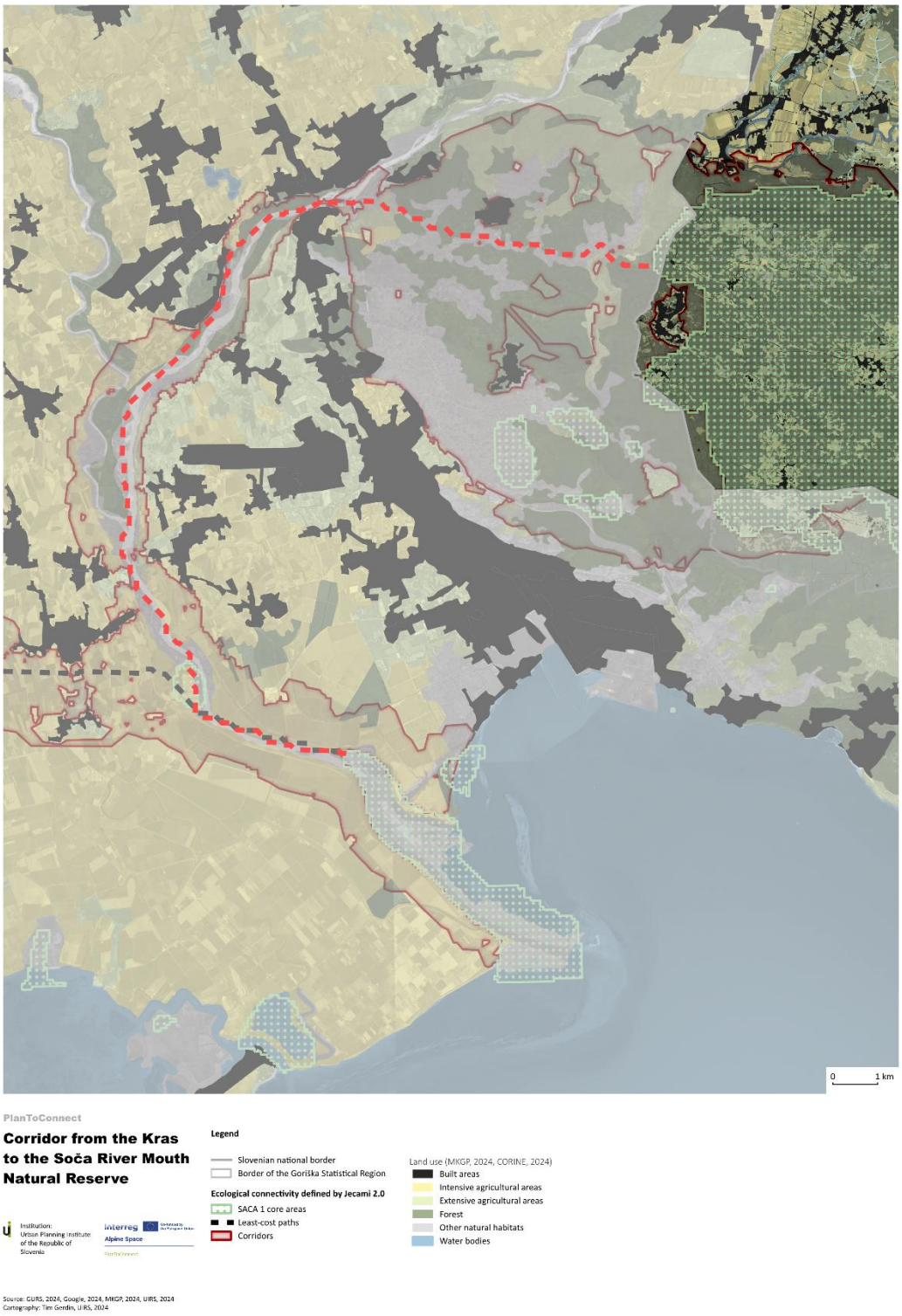

Figure 39: Corridor from Kras to the Soča River Mouth Natural Reserve

Figure 40: Confluence of rivers Soča and Ter (Alex Cabas, 2018)

Figure 41: Regional road parallel to the expressway (Google, 2024)

5 Detailed analysis of the Trnovo Forest Plateau to Triglav National Park corridor contents

Generally, the regional corridor network is well preserved and structurally continuous with little significant barriers. However, as the corridor from the Trnovo Forest Plateau to Triglav National Park represents a key link between the Alpine and Dinaric mountain ranges it was identified as the most important corridor in the region. It was therefore chosen to be analysed in-depth in this chapter.

Starting from the Trnovo Forest Plateau this corridor begins on the Trebuša River, climbing over the Vojnačevo brdo ridge and then traveling along the Idrijca River Valley. This valley represents most of the the corridor's length and gives it its principal direction. Its left bank is framed by steeper northeastern slopes are covered by forest, in contrast, the right bank features less steep hillsides where a matrix of forest is more heavily perforated by (extensive) agricultural land. Both slopes transition into plateaus, each retaining respective land use patterns. Near Bača, the corridor encounters a hill near the Soča River and overcomes it quickly. It then ascends briefly before connecting to the SACA 1 corea area of Triglav National Prak.

Figure 42: Aerial view of Idrijca River Valley's slopes and their differing land uses (Google Earth, 2025)

5.1 Forest composition

Forested land makes up the majority of the corridors area, and it is important to give further insight on the type of forest that is found here.

Most of the corridor's length is found north of Dolenja Trebuša on the steep hillsides of the Idrijca River Valley where we find a forest consisting of pioneer noble deciduous forest. It occurs on a potential growth site of the submontane beech forest and has a very diverse tree composition. The tree layer includes noble deciduous trees such as linden, sharp-leaved maple and mountain maple. In addition to these, the typical thermophilic tree species black hornbeam and small ash are also present. These stands also contain mesophyll tree species such as beech, hornbeam and field maple. It is important to emphasise that these types of pioneer stands will undergo change in the future as they are primarily found on former arable land and hay fields in potential sites of submontane beech forest (*Ornithogalo pyrenaici-Fagetum)* in western Slovenia (Bovec surroundings, Breginjski kot, Baška dolina, Kanalski Kolovrat, Idrija Valley). As such they are described as an association *Ornithogalo pyrenaici-Fraxinetum* (Čušin et Dakskobler, 2007).

A stand of linden with rock-rush (*Saxifrago petraeae-Tilietum platyphylli*) above the troughs of the Zadlaščice (Skakalce) River near Tolmin is present. The undergrowth layer is dominated by curly-leaved grey (*Tephroseris pseudocrispa*).

In the vicinity of mountain rivers present in the corridor a stand of shrubby or rarely forest stands of grey, red and white willow are present. This is further illustrated with limited cartographic material in Figure 43.

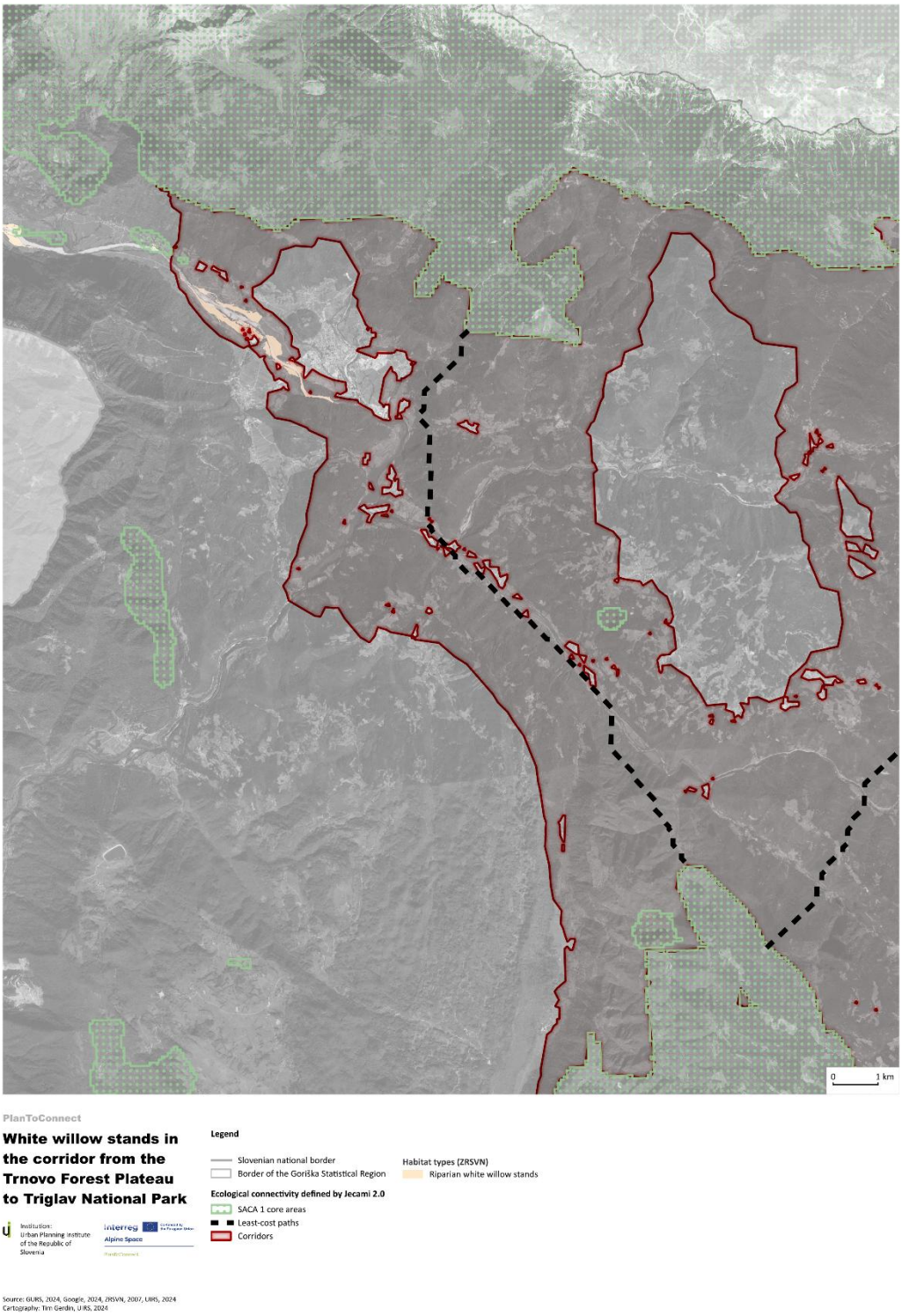

Figure 43: Mapped white willow stands in the Trnovo Forest Plateau to Triglav National Park corridor

5.2 Agricultural land abandonment

Like elsewhere in Slovenia, agricultural land abandonment is present in the corridor (Figure 44). Although land is not being overgrown at an alarming pace, this process affects the structural connectivity of grassland areas, such as prairies and extensively managed pastures and meadows. In an environment dominated by forests the few grasslands that do exist, represent important stepping stones between SACA 1 core areas.

5.3 Surface water

Although not structural, shows types of ecological surface water (rivers). Different types of waterways (classed by their size, source and other characteristics) are present in the corridor (Figure 45). The corridor is crossed by various rivers of small and medium size and a larger river (Soča). The types of rivers are:

- small intermittent rivers in Sub-Mediterranean mountain ranges with surface runoff,
- small rivers with a karst source in the Carbonate Alps contributing to the Adriatic basin,
- small rivers in the Carbonate Alps contributing to the Adriatic basin,
- small rivers in the pre-alpine hills contributing to the Adriatic basin,
- medium sized rivers in the Carbonate Alps contributing to the Adriatic basin,
- medium sized rivers in the pre-alpine hills contributing to the Adriatic basin,
- Soča.

5.4 Energy infrastructure

There is no major or locally important energy infrastructure in the corridor apart from one small hidro power plant lying right at the western edge of the corridor (Figure 46). Transmission lines are mostly small and do not hinder ecological connectivity. In fact, they are probably promoting structural connectivity where grassland is needed to be maintained for accessibility and safety purposes. There are some small hydro power plants on the Bača River and Soča River but not near the least-cost path. An overview of renewable energy infrastructure at regional scale is available in Deliverable 2.4.1.

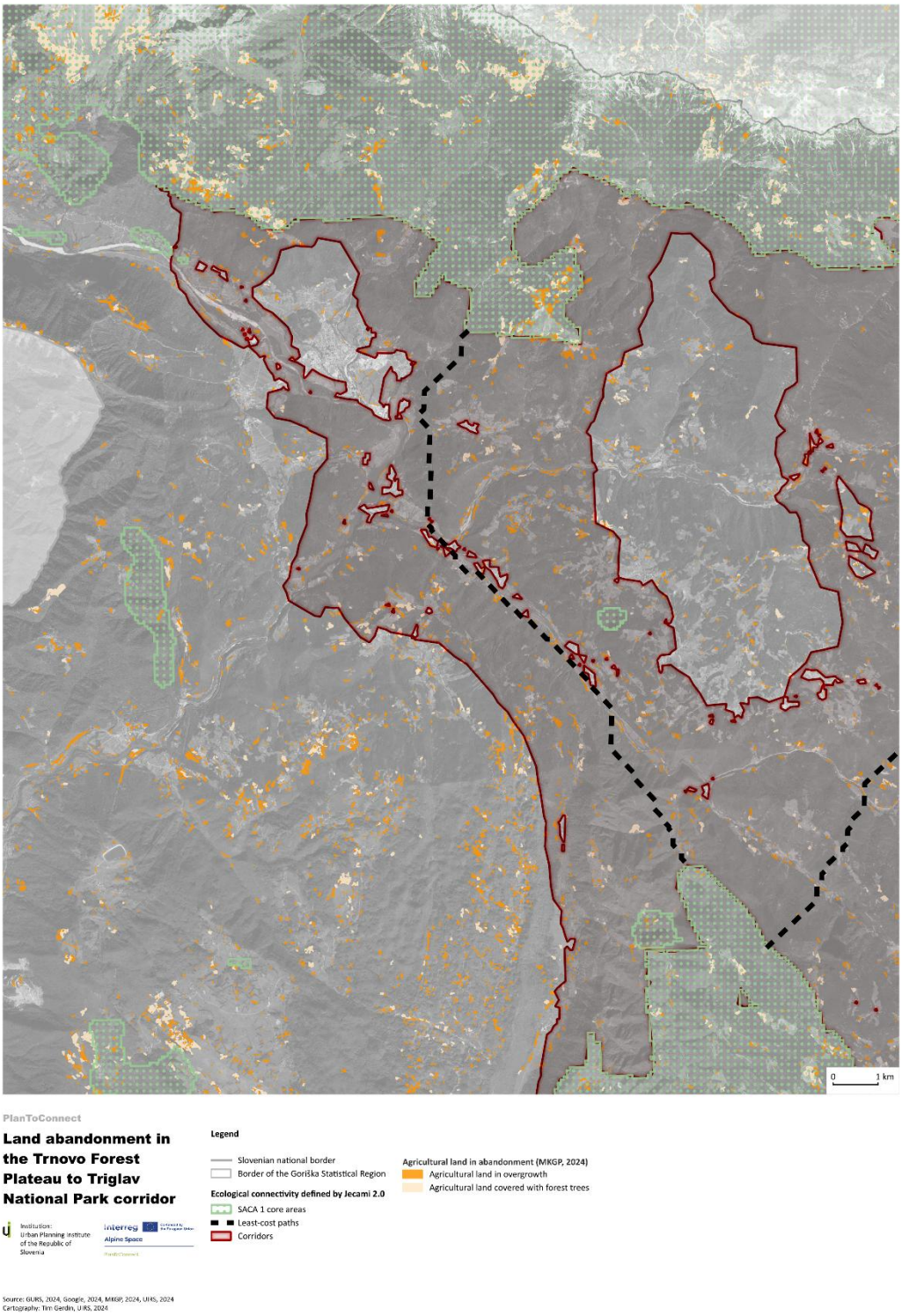

Figure 44: Agricultural land abandonment in the Trnovo Forest Plateau to Triglav National Park corridor

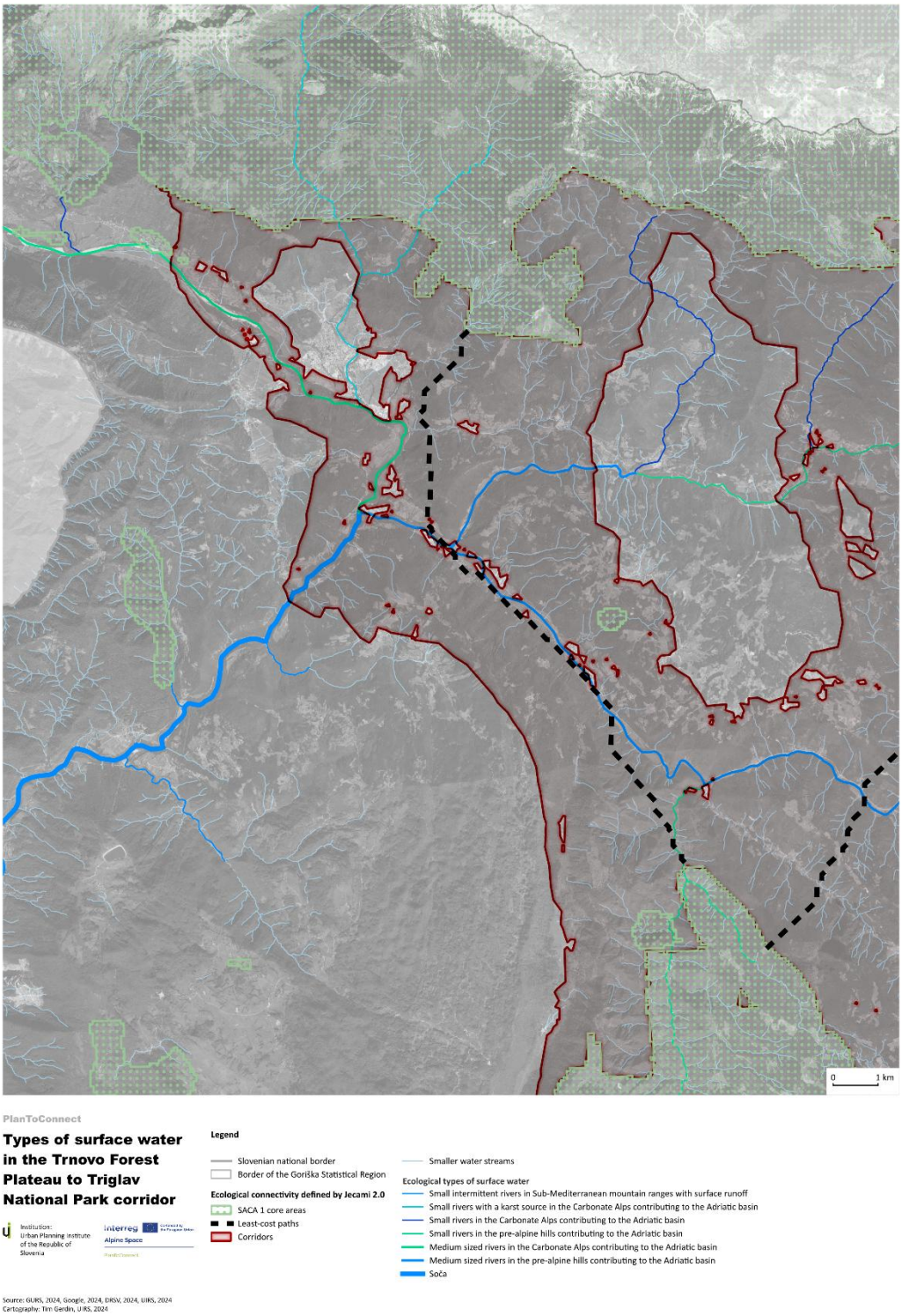

Figure 45: Ecological types of surface water in the Trnovo Forest Plateau to Triglav National Park corridor

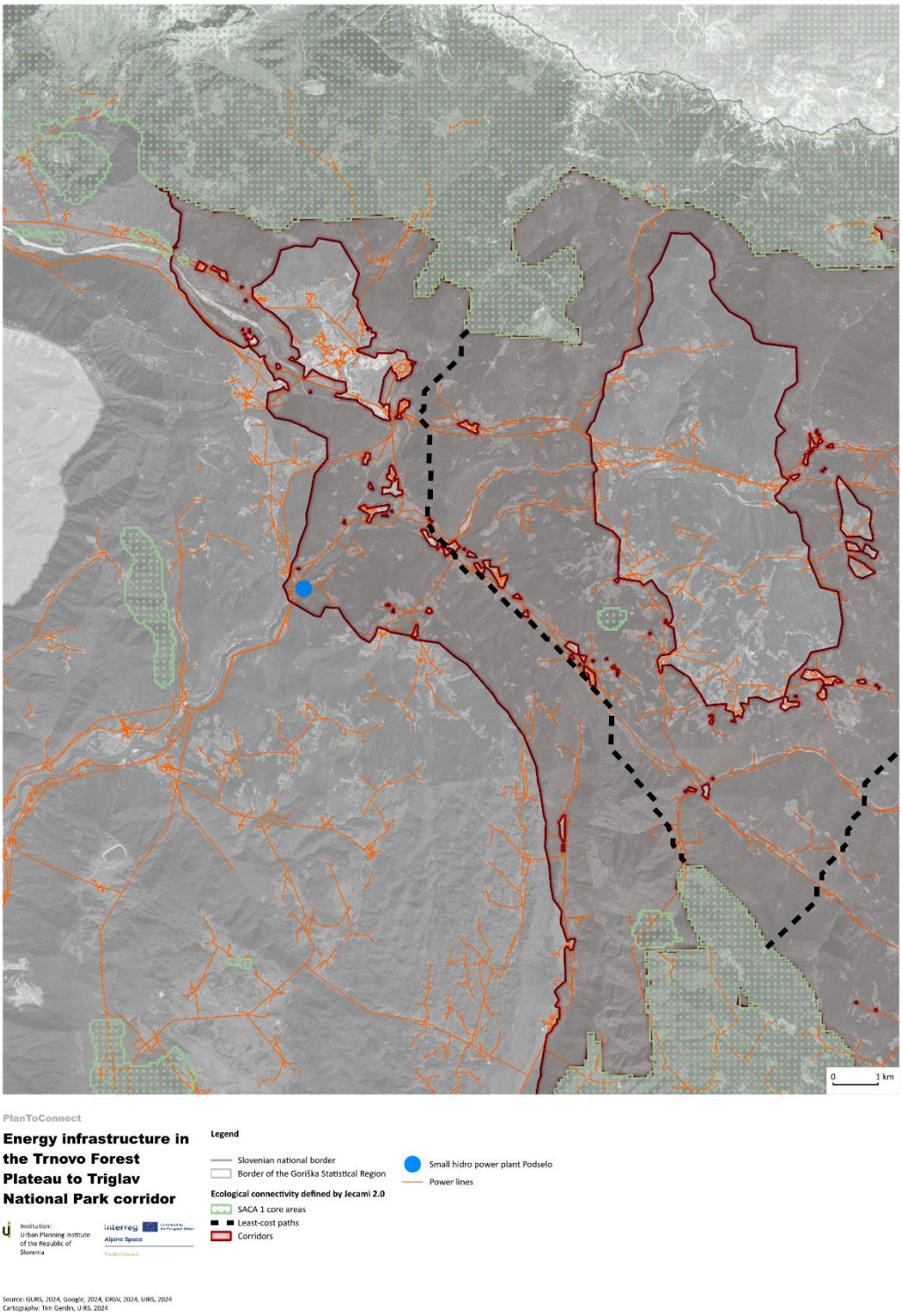

Figure 46: Energy infrastructure in the Trnovo Forest Plateau to Triglav National Park corridor

6 Conclusions and next steps

This report analyses GBI elements, protected nature areas, habitats and barriers in the alps-wide ecological connectivity network to serve as a base at enhancing structural and functional ecological connectivity in the Goriška Statistical Region. The results provide a foundation for ecological planning and a reference that can be used as a source for upcoming regional spatial plans.

Generally, the regional corridor network is well preserved and structurally continuous with little significant barriers. However, important corridors, such as the Trnovo Forest Plateau to Kras and the Trnovo Forest Plateau to Triglav National Park, are susceptible to fragmentation. The former crosses the only larger infrastructure barrier in the region, that being the Vipava expressway, while the latter being at risk of urbanisation and infrastructure development in the valley bottom. The Trnovo Forest Plateau to Triglav National Park was chosen to be analysed.

Further steps will focus on providing a more detailed analysis of the Trnovo Forest Plateau to Triglav National Park corridor contents, such as the condition of forest and grassland areas, as well as a structural analysis of the road and rail barriers and identification of degraded areas. Based on this assessment, spatial measures aiming to ameliorate the condition of structural ecological connectivity that lessen the negative effects of pressures in the valley bottom to lessen the negative effects of pressures in the valley bottom will be provided. On a larger scale, guidelines incorporating findings presented in this report for the development of the future regional spatial plans will also be performed in the subsequent phases.

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Project of local ecological network

Author(s)
Tim Gerdin, Urban Planning Institute of the Republic of Slovenia, timge@uirs.si
Andrej Gulič, Urban Planning Institute of the Republic of Slovenia, andrejg@uirs.si
Sergeja Praper, Urban Planning Institute of the Republic of Slovenia, sergejap@uirs.si
Damjana Gantar, Urban Planning Institute of the Republic of Slovenia, damjanab@uirs.si

Layout
Tim Gerdin, Urban Planning Institute of the Republic of Slovenia, timge@uirs.si

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Plan to Connect project partners:

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Asters, organisation for the conservation of natural areas in Upper Savoy (FR)
Eurac Research (IT)
ifuplan - Institute for Environmental Planning and Spatial Development (DE)
University of Würzburg (DE)
Salzburg Institute for Regional Planning and Housing (AT)
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