



SPATIAL DEVELOPMENT OF TOURISM IN THE SELECTED PROTECTED AREAS OF BOSNIA AND HERZEGOVINA AND SLOVENIA

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Strunjan Cliff, Strunjan Landscape Park, Slovenia
(photography by Miha Koderman)

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Preface

Cooperation between geographers from the University of Sarajevo and the University of Primorska has a long-standing and fruitful tradition. It began formally in 2004 with a bilateral cooperation project and continued successfully in 2005 during the co-organisation of the international conference *Dayton - Ten Years After: Conflict Resolution and Co-operation Perspectives*, which attracted significant attention among the academic community, policy makers and the general public in both countries. This important event marked the beginning of long-term cooperation, resulting in numerous academic mobilities of professors and students from both institutions, as well as joint field work of students from Bosnia and Herzegovina in Slovenia and vice versa. Members of the Department of Geography, Faculty of Science (University of Sarajevo) and the Department of Geography, Faculty of Humanities, together with colleagues from the Faculty of Tourism Studies – Turistica (University of Primorska) have also conducted joint research work, which has received funding from national research agencies on several occasions.

One of the most recent outcomes of joint research conducted by colleagues from the aforementioned institutions in Sarajevo and Koper/Portorož is this scientific monograph. It was prepared as part of bilateral project entitled *Comparative analysis of spatial development of sustainable tourism in protected areas of Bosnia and Herzegovina and Slovenia*, which was implemented from 2021 to 2023. The monograph reflects the shared commitment of geographers and tourism researchers from the participating institutions to explore the spatial and environmental dimensions of tourism in protected areas. It builds upon a multidisciplinary approach that incorporates geographical, environmental, economic, and cultural perspectives, and is particularly enriched by the application of spatial analysis and GIS-based methodologies, which enable a deeper understanding of tourism development in ecologically sensitive areas.

The editors of the monograph owe our sincere thanks to all the contributing authors, who successfully summarised the results of their research in protected areas into well-rounded chapters. Due to the aforementioned features, the book may serve as a valuable resource for researchers investigating the phenomenon of tourism in protected areas. Its findings could also be potentially interesting for preparation of strategic documents in the field of tourism planning and management in protected areas.

Special thanks for the successful conclusion of this international project must be given to the representatives of the protected areas of the Sutjeska National Park, the Protected Landscape Bijambare, and the Nature Park Hutovo Blato in Bosnia and Herzegovina, as well as the Notranjska Regional Park, the Seasonal Lakes of Pivka Nature Park, and the Landscape Park Strunjan in Slovenia. Their contribution has significantly enhanced the quality of this monograph, particularly through their support in gathering field data and providing valuable contextual insights based on direct experience within the protected areas. These colleagues have also contributed generously to the findings of this monograph through their professional expertise, the provision of relevant data, and their knowledge of the specific characteristics of the areas in which they operate.

Last but not least, the editors express sincere gratitude to the reviewers, Prof. Dr. Samir Đug and Prof. Dr. Vuk Tvrtko Opačić, whose thorough professional evaluations further improved the quality and scientific value of the text.

The editors hope that this monograph will further encourage scientific collaboration between geographers and other scholars in Bosnia and Herzegovina and Slovenia and contribute to the development of sustainable tourism in protected areas in both countries. Moreover, the findings presented herein aim to support the ongoing discourse on sustainable tourism development and protected area management, bridging the gap between academic research and practical applications – for the benefit of both countries, and potentially, beyond.

Editors
Sarajevo, Koper, October 2025

Chapter 1

Introduction to the Tourism Research in Protected Areas of Bosnia and Herzegovina and Slovenia

Miha Koderman, Edin Hrelja, Simon Kerma, Amina Sivac

Although there are many different categorisations of protected nature areas in the world, their main purpose remains universal: protection of natural habitats and nature, as well as preservation of its geodiversity. According to the International Union for Conservation of Nature (hereinafter IUCN), a protected area can be officially defined as *‘a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values’* (Dudley & Stolton, 2008; UNEP-WCMC & IUCN, 2024, 10).

Protected areas are continuously gaining in importance, as can be concluded from an analysis of the available data on the increasing number and total surface area of all protected areas in the world. According to the *World Database on Protected Areas*, which represents the largest assembly of data on the world's terrestrial and marine protected areas, protected areas covered 16.34% of terrestrial and inland waters globally (a total of 284,421 protected areas), and 8.35% of marine protected areas (a total of 18,888 protected areas) in the autumn of 2024 (Protectedplanet.net, 2024). According to the IUCN, one of the main goals of this umbrella organisation is to establish 30% coverage of all land and seas with protected areas by 2030 (UNEP-WCMC & IUCN, 2024).

The basic purpose of protected areas is therefore the protection and conservation of nature, as well as the protection of cultural heritage. Equally important from the perspective of raising awareness is the protected area's role in promoting education and sustainable development for the benefit of local communities and facilitating and directing visits to these sensitive environments. Sovinc (2017, 13–14) finds that despite the above-mentioned purpose of protection of species and habitats, ecosystem services, natural processes, and associated cultural values, protected areas can also deliver other objectives, including those related to the use of natural resources. This does not also imply, however, that all human activities are incompatible with the goals of conservation; the problem arises when the level and extent of human activities exceed the primary management objectives for safeguarding species and habitats and ecosystems for which the protected area was established.

In this regard, it is necessary to distinguish among protected areas in terms of their specificities, according to which the regimes and forms of protection are defined, and thus also the possibilities and restrictions regarding tourism development are determined (Kerma & Vranješ, 2020). Protected areas therefore have a clear formal, legislative and administrative framework, which, among other things, also determines

the possible types and scope of tourism, but it is necessary to be aware that these frameworks are primarily based on the confrontation of social values (Eagles et al., 2002; Kerma & Vranješ, 2020). The development of tourism in a protected area is also an expression of its natural characteristics or material conditions, geographical location, location of markets, economic development and trends in global tourism in general, but at the same time it reflects the changing relationship between society, culture and nature. Historically, the very emergence of protected areas is associated with a change in the socio-cultural view of nature, which is the basis for the development of tourism: it is the emergence of the valuation of so-called “unspoiled” nature through its aesthetic and human-enjoyment function (Kerma & Vranješ, 2020). The first protected areas thus became areas of (relative) wilderness, intended primarily for visiting or recreation and not for protecting nature for the value of nature itself (Strom, 1980; Wearing & Neil, 1999, 40; McManus, 2000, 532–533).

Historically, the reasons for establishing protected areas have shifted from a focus on human utilitarian needs (enjoying the aesthetics of and recreation in the nature) to a focus on nature conservation. The development of tourism, however, has followed the opposite path. In the past, recreation and visits to protected areas were relatively limited, but since the 1990s, with increased mobility, purchasing power, changing lifestyles and increased environmental awareness, the number of visitors has increased so rapidly that today, in many protected areas, the main issue is not the ‘diversification’ of tourism, but rather management, i.e. limitation and direction of visits (Wearing & Neil, 1999; Kerma & Vranješ, 2020) and maintenance of balance between the ‘protective’ and ‘developmental’ aspects of tourism, taking into account both positive and negative effects on the environment (Holden, 2013; Opačić & Koderman, 2020). Tourism can without doubt be seen as major opportunity but, at the same time, also a threat for protected areas and their biodiversity. A lack of support for biodiversity conservation, a low level of understanding of the importance of biodiversity in delivering ecosystem services, and weak understanding of the ecological needs of species and habitats is often reflected in negative impacts of tourism activities on biodiversity in protected areas (IUCN, 1994; Sovinc, 2017, 13–14). Balanced future development of protected areas where combined simultaneous functions of nature protection, tourism and recreation, as well as education are intertwined, cannot be implemented without an efficient and institutionalised management (Hribar et al., 2011).

The resources of protected natural areas are frequently perceived through the lens of their traditional modes of exploitation. Decision-makers are often unaware of the full range of benefits that can be derived from the preservation of these resources—not only in terms of maintaining the ecological functionality of protected areas but also in contributing to the sustainable development of the communities in which these areas are situated. The benefits of protected natural areas are primarily assessed through the concept of ecosystem services. These areas, by providing such services, offer a wide array of advantages for society and the economy at local, regional, national, and global scales. They play a vital role in addressing the challenges posed by climate change, contribute to maintaining water quality, support the preservation of natural

pollinators, and help safeguard the values of biodiversity, geodiversity, and landscapes. Additionally, they underpin the development of tourism, recreation, and other related sectors. Analyses from more than 10 years ago already indicated that the estimated annual value of ecosystem services provided by the Natura 2000 ecological network ranged between €200 and €300 billion. Furthermore, it has been estimated that designated Natura 2000 sites receive between 1.2 and 2.2 billion tourist visits annually, generating economic benefits valued at approximately €5 to €9 billion each year (European Commission, 2013).

As Mowforth and Munt (2009, 109) argue, protected areas can also be used ‘as tools or techniques of sustainability’, through which, for example, a designation of an area of land as a national park or as some other category of protected area can be seen as a tool of sustainable tourism. In this regard, the countries with a higher proportion of their land under some form of legislated protection can have better chances to practice a more sustainable tourism than those with lower proportions of protected land. This assumption can also be debatable, since in addition to the formal protection of the natural area, it is also necessary to provide adequate sources of financing, which are necessary for the effective management of these protected areas. Although the establishment of protected areas has many beneficial effects on natural areas as well as local communities, it is necessary to first answer the question of who is protecting the area, for whom, and from whom (Mowforth & Munt, 2009, 111). Experiences have shown that a declaration of protected status alone is not enough to actually protect an area (Dudley et al., 1999), and we can unfortunately find several cases where the status of protected area is simply a ‘paper shield’, including in Slovenia (e.g. the landscape parks Zajčja Dobrava, Udin Boršt, and Šturmovci), as also shown by Koderman et al. (2020, 246).

The growing global trend of interest in the development of tourism and recreation in protected areas is also reflected in protected areas of Bosnia and Herzegovina and Slovenia. Whose research is interesting and relevant on different levels, not just because they have faced a continuous growth of visitors and tourists during the past years, but also because the two countries shared a similar socio-economic development context during the former Socialist Federal Republic of Yugoslavia. Today's situation is different in many aspects: Slovenia is a full member of the European Union with an established concept of sustainable tourism in protected areas (for example with the ‘Green Scheme of Slovenian Tourism’, which has also become a model for the entire European Union), while protected areas of nature in Bosnia and Herzegovina are still to a high degree exposed to unplanned (tourism) development. Despite these facts, protected areas of both countries face many significant developmental challenges, as the authors of this book explain in the next chapters.

Methodological Explanations

The analysis of the spatial development of tourism in the selected protected areas of Bosnia and Herzegovina and Slovenia was based on a series of quantitative and qualitative research methods. Use of these methods was coordinated between authors

of both research groups, so that the case studies of protected areas could be studied using the same standardised methodology. In areas where standardisation and unification of methods was not possible due to different processes of data collection or other circumstances, the authors strived to use those methods that allowed the highest level of comparison.

The selection of the protected areas analysed in this study was based on a comprehensive review of the available relevant literature, which included not only academic and research publications but also spatial planning documents, management plans, thematic maps, remote sensing imagery, and accessible statistical data.

Based on the synthesis of this body of literature, three protected areas in Bosnia and Herzegovina were selected for detailed analysis: the Sutjeska National Park, the Bijambare Protected Landscape, and the Hutovo Blato Nature Park. Similar selection of protected areas was also made in Slovenia, where the Notranjska Regional Park, the Seasonal Lakes of Pivka Nature Park and the Landscape Park Strunjan were chosen as case studies for research analysis. These particular areas were chosen in order to illustrate the impacts of tourism, models of management, and opportunities for sustainable development across protected areas within different protection categories. Additionally, one of the basic criteria in selecting these areas was the recognition of their specific physical-geographical and socio-geographical characteristics, which influence both their tourism appeal and their potential for tourism valorisation.

In general, the authors commonly used the method of analysis of relevant literature and sources, as well as of administrative regulations in the field of nature protection. Under the current administrative structure of Bosnia and Herzegovina, nature protection is not implemented at the state level, but rather at the entity, cantonal, or municipal level, depending on the category of the protected area. Consequently, due to the absence of a unified national register of protected areas, the authors from Bosnia and Herzegovina relied on data provided by the competent entity-level ministries and institutes, specifically the Federal Ministry of Environment and Tourism of Bosnia and Herzegovina and the Republic Institute for the Protection of Cultural, Historical, and Natural Heritage. In addition, spatial planning documentation, development strategies, and the legal and sublegal frameworks of the responsible institutions at lower administrative levels, as well as those governing the management of the selected protected areas, were thoroughly analysed.

Given the specific characteristics of the protected areas and the limited availability of data in Bosnia and Herzegovina, in addition to standard materials and methods employed in their analysis, modern geoinformation technologies were extensively utilised. Beyond their role in supporting insights into the physical and human geographical components of protected natural areas, Geographic Information Systems (GIS) played a particularly important role in the analysis of geoeological imbalances and the spatial effects of socio-economic development. In this context, georeferencing and digitisation of infrastructure and amenities were carried out for all selected

protected areas in Bosnia and Herzegovina, with special attention given to their spatial distribution in relation to established protection zones and the legal regulations that define permissible activities within them. To further examine geoeological pressures on protected natural areas, a comparative spatial analysis was conducted between the distribution of actual forest vegetation from 1979 and the Corine Land Cover data from 2018. This analysis enabled the quantification of forest cover change intensity over nearly four decades. The data were processed using GIS-based geoprocessing models and subsequently visualised through cartographic representation. The results of this analysis were used to assess the degree of natural vegetation degradation and to establish correlations between the observed changes and both natural and anthropogenic driving factors within the analysed protected areas of Bosnia and Herzegovina.

The research on protected areas of Slovenia was based on the available spatial and other data of different national institutions, which were analysed with different geoprocessing tools in the *ArcGIS Pro 3.3* software. For the purpose of analysis of land use within the protected areas, the Land Use database, managed by the Ministry of Agriculture, Forestry and Food of the Republic of Slovenia, was used. In the analysis, a comparison between different land use categories was performed, taking into account datasets of two different time periods: the year close to the establishment of the protected area (in our cases 2002 and 2014) and the last available year (2024). Due to the large number of land use categories and some incompatibilities between them, categories with a share of less than 1% were merged and included in the general categories 'Other agricultural land' and 'Other land'. The analysis of tourist accommodation establishments within the protected areas was based on the Register of Accommodation Establishments, which is operated by the Agency of the Republic of Slovenia for Public Legal Records and Related Services. The phase of data pre-processing included a selection of those tourist accommodation establishments which were identified as active and inactive (for example, seasonal establishments, such as camping grounds) in December 2024. Because of specific characteristics of the Notranjska Regional Park, where most of the settlements are excluded from the protected area, all tourist accommodation establishments in the Municipality of Cerknica were the subject of the analysis.

As part of the research, joint fieldwork was conducted, including on-site visits to all selected protected areas in both countries. During these field visits, theoretical findings, established in the earlier phases of the research, were validated through direct observation. This process also enabled the collection of additional scientific material, which included, among other aspects, the identification of the touristic values of each area, as well as the recognition of geoeological issues they face—with particular emphasis on the challenges stemming from tourism development.

This was followed by structured in-depth interviews that were conducted with the representatives of selected protected areas. For this purpose, the members of both research groups commonly coordinated and prepared a unified structured questionnaire, which had several content sections. The latter included an analysis of

the situation with basic data and specificities of the protected area, analysis of data and types of tourism and management of the protected area, interpretation of the specificities of the protected area, attitude towards the local community and cooperation with various stakeholders in the protected area, and problems and threats in the environment of the protected area, as well as potentials of and perspectives on the protected area.

The application of a comprehensive and harmonised methodological framework facilitated comparability across the selected case studies and contributed to a clearer understanding of the complex relationship between tourism development and nature protection. This approach may also provide a useful reference point for future research in comparable settings.

Protected Areas of Bosnia and Herzegovina: Conservation Status and Development Prospects

The territory of Bosnia and Herzegovina belongs to the Dinaric Mountain belt, which was formed during the Alpine orogenic phase. As part of the Alpine orogenesis, a complex geological structure of the terrain was created, shaping specific geomorphological landforms that have greatly influenced the climatic characteristics and the development of the river network of this area, and the formation of a diverse pedological substrate, as well as the zonal and azonal distribution of vegetation. The high degree of diversity in Bosnia and Herzegovina, conditioned by its physical-geographical specificities along the horizontal profile, has shaped different types of landscapes that are reflected in the ecological heterogeneity of the area.

The geomorphological, hydrological, and landscape diversity, along with the specific geological history and climatic conditions, have given rise to exceptionally rich plant and animal life, which constitutes a main indicator for the designation of protected areas within the territory of Bosnia and Herzegovina. This biological and landscape richness has called for appropriate forms of protection, which have been realised through the establishment of protected areas and other protection categories aimed at ensuring the survival and safeguarding of habitats and species. Nature protection in Bosnia and Herzegovina, as in other countries of the region, began in the second half of the nineteenth century, initially through the protection of certain game species. The first officially protected area in Bosnia and Herzegovina was established in June 1954, in the southwestern part of the country, within the catchment of the Perućica stream. Just two months later, in August 1954, the National Institute for the Protection of Cultural Monuments and Natural Rarities of the People's Republic of Bosnia and Herzegovina, based on the 1947 Law on the Protection of Cultural Monuments, designated Prokoško Lake on Mount Vranica as a natural rarity. Also in 1954, an ornitho-faunal reserve was established in the Hutovo Blato area.

A few years later, in 1962, the first national park in Bosnia and Herzegovina—Sutjeska National Park—was established, with the Perućica forest serving as its

protection core (Drešković et al., 2018). The 1964 Nature Protection Law defined protection categories, including strict nature reserves, nature reserves, national parks, special reserves, protected natural landscapes, natural monuments, plant species, and protected animal species such as songbirds, wetland birds, and birds of prey. In accordance with these legal provisions, protected areas were established and proclaimed across Bosnia and Herzegovina, with the first legally designated national parks being Sutjeska, followed by Kozara in 1967.

By 1990, in accordance with the Nature Protection Law of 1970 and the Law on the Protection of Cultural, Historical, and Natural Heritage, only 0.55% of the territory of Bosnia and Herzegovina was under protection—comprising 253 zones totalling 28,127 hectares. The Spatial Plan of Bosnia and Herzegovina for the period 1981–2000 envisioned a more comprehensive approach to the conservation and management of valuable natural areas and landscapes. From this perspective, it was projected that by the year 2000, around 8,300 km²—or approximately 16.2% of the total area of Bosnia and Herzegovina—would be brought under various regimes and levels of protection (Drešković et al., 2018).

All protected natural areas in Bosnia and Herzegovina have been designated based on the categorisation developed by the IUCN, the principles of which have also been incorporated into the entity-level environmental legislation. The main purposes for the designation and management of protected areas include scientific research, wilderness protection, conservation of species and genetic diversity, maintenance of ecosystem services, protection of specific natural and cultural features, tourism and recreation, education, sustainable use of resources from natural ecosystems, and preservation of cultural and traditional attributes. According to the current IUCN categorisation, which was officially adopted in 1994 and recognised in Bosnia and Herzegovina in 2003, six categories of protected areas are defined in accordance with their primary management objectives (Hrelja, 2017). Based on this categorisation, a total of 46 protected areas have been designated in Bosnia and Herzegovina. These include: 2 strict nature reserves (Category Ia), 4 national parks (Category II), 21 natural monuments (Category III), 3 habitat/species management areas (Category IV), 13 nature parks – protected landscapes (Category V), and 3 resource management areas – forest parks (Category VI) (Table 1), with a combined spatial coverage of 160,082.91 hectares (1,600.83 km²). Recently, approximately 18% of the protection targets outlined in the Spatial Plan of Bosnia and Herzegovina for the period 1981–2000 have been achieved through the designation of areas under various categories of protection. According to the IUCN classification system, the majority of protected natural areas in Bosnia and Herzegovina—63.35% of the total protected area—belong to Category V (Protected Landscapes/Seascapes). The second-largest share of protected territory is made up of national parks (Category II), accounting for 28.78% of the total. In comparison to these two dominant categories, significantly smaller proportions are designated under Category III (6.73%), Category IV (0.72%), Category Ia (0.37%), and Category VI, which accounts for just 0.04% of the total area under protection in Bosnia and Herzegovina.

Table 1: Categories of protected areas in Bosnia and Herzegovina, together with their number and surface area in 2024.

Category of protection	IUCN Category	Number of areas	Surface (km ²)	Share (%)
Strict nature reserve	Ia	2	5.93	0.37
National park	II	4	460.75	28.78
Natural monument	III	21	107.75	6.73
Habitat/species management area	IV	3	11.6	0.72
Protected landscape	V	13	1,014.14	63.35
Managed resource protected area	VI	3	0.66	0.04
Total		46	1,600.83	100.00

Sources: Federal Ministry of Environment and Tourism of Bosnia and Herzegovina (2024); Bosna-S & Elektroprojekt (2011); Republic Institute for the Protection of Cultural, Historical, and Natural Heritage, (2024).

Protected areas currently cover only a small percentage of the country, with sites scattered throughout Bosnia and Herzegovina (Figure 1). The total area of protected natural zones classified under the IUCN framework covers only 3.13% of the national territory, highlighting a relatively low level of spatial coverage of protected areas in relation to the overall surface area of the country. In addition to the aforementioned system of nature protection in Bosnia and Herzegovina, three Ramsar sites have been designated: Hutovo Blato (designated in 2001, covering an area of 7,824.01 ha), Bardača (designated in 2007, covering 3,500 ha), and Livanjsko Polje (designated in 2008, covering 45,868 ha), with a total surface area of 111.29 km². Furthermore, Janj Rainforest (295 ha) and Vjetrenica Cave (4,710.17 ha) have been recognised as UNESCO natural sites of outstanding universal value, while several other natural areas—such as the Perućica Strict Nature Reserve and the Blidinje Natural and Historical Area—are currently included on the Tentative List of UNESCO World Heritage Sites (UNESCO World Heritage Centre, n.d.).

In line with the European Directive on the establishment of the Natura 2000 ecological network, Bosnia and Herzegovina has initiated the process of identifying, documenting, and mapping the most important natural habitats, along with plant and animal species that require protection, in order to preserve the country's rich biological and geological diversity. One of the most important tasks in Bosnia and Herzegovina's approach to developing the Natura 2000 network is the establishment of Important Bird Areas (IBAs), which are essential for bird conservation and broader biodiversity goals. Four IBA sites have been identified within the country: Hutovo Blato, Bardača, Boračko Lake, and Livanjsko Polje.



Figure 1: Spatial distribution of protected areas in Bosnia and Herzegovina in 2024 by IUCN categories.

Data sources: Federal Ministry of Environment and Tourism (2024); Bosna-S & Elektroprojekt (2011); Republic Institute for the Protection of Cultural, Historical and Natural Heritage (2024).

Additionally, in accordance with the Bern Convention (Convention on the Conservation of European Wildlife and Natural Habitats), which was adopted by the Council of Europe, approximately thirty potential Emerald sites have been recognised within the territory of Bosnia and Herzegovina.

Finally, the territory of Bosnia and Herzegovina contains a large number of highly valuable natural areas that have been earmarked for future protection through spatial planning documents at the entity, cantonal, and municipal levels. An analysis of planning documentation at the entity level reveals that approximately 17% of the total area of the Federation of Bosnia and Herzegovina, and around 15.5% of the total area of the Republic of Srpska, have been designated for protection. According to the Amendments to the Spatial Plan of the Republic of Srpska until 2025 (2013), the aim was to place 15 to 20% of the entity's territory under protection by 2025. At the national level, this would amount to approximately 16% of the total territory of Bosnia and Herzegovina (Drešković et al., 2018).

Despite the existing strategic framework, the current state of nature protection in Bosnia and Herzegovina falls markedly short of the set targets, suggesting that additional efforts by policymakers will be required to ensure their achievement.

Protected Areas of Slovenia: Current Situation and Perspectives

The idea of nature protection in Slovenia dates back to the nineteenth century, when the first scientific and conservation-minded individuals began advocating for the preservation of natural sites. One of the earliest initiatives was the establishment of the Alpine Conservation Park in the Seven Lakes Valley in 1924, located below the mountain of Triglav (2864 m) in the western part of the Julian Alps, making it one of the first protected areas in the Kingdom of Yugoslavia (Hafner, 1924). At this time, conservation efforts were generally sporadic and driven by individual scientists and naturalists. However, the idea of national parks and protected areas was not fully integrated into national policy until the second half of the twentieth century. In 1961, the aforementioned territory became a part of the newly established Triglav National Park, which currently covers nearly 4% of the country's land area (Triglav National Park, 2024) and can be considered as the crown jewel of Slovenian conservation efforts.

According to Smrekar et al. (2020, 313), a key step in the efforts to ensure comprehensive nature conservation was taken through the adoption of the 1999 Nature Conservation Act (Official Gazette of the Republic of Slovenia, No. 56/99 and 31/01), which presented the legal framework for establishing protected areas in Slovenia and provided actions for biodiversity conservation and a system to protect natural values in order to contribute to nature conservation in Slovenia. It provided a legal regulation in Slovenian legislation and determined the bodies responsible for protecting nature, which include the Ministry of the Environment and Spatial Planning, the Slovenian Environment Agency, and the Water Directorate of the Republic of Slovenia. Today, Slovenia is among the European countries with the best-preserved natural environment and the greatest biological and landscape diversity

(Ciglič & Perko, 2013). This is, among other things, also reflected by the size of Slovenian territory that is protected: as of 2020 more than 52% (approximately 10,500 km²) of the country lies within ecologically important areas and more than 37% (approximately 7,700 km²) within Natura 2000 sites (Smrekar et al., 2020, 313).

Additionally, Slovenia has become an active participant in international environmental agreements, such as the Ramsar Convention, the Bern Convention, and the EU Habitats Directive, which has furthered the protection of its natural heritage. Slovenia's efforts to integrate its protected areas into global conservation networks have also resulted in the fact that among five UNESCO World Heritage sites in Slovenia, there are two entries (the Škocjan Caves and the Primeval Beech Forests) inscribed as natural sites, while the other three are cultural sites. Furthermore, Slovenia is home to four biosphere reserves included in UNESCO's Man and the Biosphere Programme: the Julian Alps, the Karst Plateau, the Kozjansko and Obsočje area, and the Mura River. These regions, diverse in geology, climate, and culture, are united by their rich biodiversity and the seamless blend of natural values and cultural heritage (National Committee of the Man and the Biosphere Programme of Slovenia, 2025). As previously mentioned, the field of nature protection in Slovenia is regulated by the Nature Conservation Act (Official Gazette of the Republic of Slovenia, No. 56/99 and 31/01), which represents a fundamental legal act that has been amended several times since its inception. According to the act, protected areas in Slovenia are divided into broader (national, regional and landscape parks) and narrower protected areas (strict nature reserves, nature reserves and natural monuments). Protected areas in Slovenia covered a total of 2914,84 km² in 2024, thus encompassing 13.31% of the country's territory, while together with Natura 2000 protected areas they cover over 40% of the territory of Slovenia (Institute of the Republic of Slovenia for Nature Conservation, 2024).

According to Lampič et al. (2011, 60–61), protected areas in Slovenia can be classified into four groups regarding their relationship between environmental protection and development: (1) protected areas where protection excludes development (strict nature reserves, IUCN types Ia and Ib); (2) the 'balanced' group, where protection and development are equally important (regional and landscape parks, IUCN type V); (3) conservation-oriented protected areas, where protection takes priority over development (national parks, IUCN type II; natural monuments; IUCN type III); and (4) development-oriented protected areas, where development takes priority, taking into account protection regimes, biodiversity and important habitats (Natura 2000 areas and ecologically important areas).

As Table 2 shows, the largest share of Slovenia's territory is protected within the category of landscape park, an area with a traditional interaction between humans and nature, which has great ecological, biotic or landscape value (Official Gazette of the Republic of Slovenia, No. 56/99 and 31/01). There was a total of 47 landscape parks in Slovenia in 2024, and they represented over 45% of the total protected territory. The last landscape park was established in 2023, when the Government of the Republic of Slovenia declared protection of a dense lowland forest and smaller

wetlands in the area of the municipalities of Domžale and Lukovica in Central Slovenia as the Landscape Park Češeniške in Prevojske gmajne (Natura 2000, 2025).

Table 2: Categories of protected areas in Slovenia, together with their number and surface area in 2024.

Category of protection	IUCN Category	Number of areas	Surface (km ²)	Share (%)
National park	II/V	1	839.82	28.81
Regional park	V/II	4	486.71	16.70
Landscape park	V	47	1,319.48	45.27
Strict natural reserve	I	1	0.02	0.00
Nature reserve	IV	60	60.27	2.07
Natural monument	III	1167	208.55	7.15
Total		1280	2,914.84	100.00

Source: Environment Agency of the Republic of Slovenia (2024).

The second largest category, with almost 29% of the total protected area, is represented by one single national park, more specifically the Triglav National Park. The only national park is named after Triglav (2864 m), Slovenia's highest peak, and overlaps almost completely with the area of the Eastern Julian Alps in north-western Slovenia. It covers the area of approximately 840 km², which represents about 4% of Slovenia's surface area. It is one of Europe's oldest parks, with the first protection dating back to 1924, when the Alpine Conservation Park was established (Triglav National Park, 2025).

The category of regional park is the third most extensive category of protected areas in Slovenia, as it covers 16.7% of the total protected area. A regional park is by definition a large area of regionally characteristic ecosystems and landscapes with large parts of pristine nature and areas of natural value that intertwine with human influence, but are balanced with nature (ZON, 1999). Dating from April 2024, there are four regional parks in Slovenia: the Notranjska Regional Park, the Kozjansko Regional Park, the Pohorje Regional Park, and the Škocjan Caves Regional Park.

A good 7% of Slovenia's protected territory is covered by the category of natural monument. This category comprises one or more natural values that have an exceptional shape, size, content or location, or are a rare example of a natural value (Official Gazette of the Republic of Slovenia, No. 56/99 and 31/01). A total of 1,167 natural monuments can be found in all regions of the country, as shown by Figure 2, including within categories of other protected areas, such as the Triglav National Park or the Notranjska Regional Park. The registry of protected areas shows that around 88% of natural monuments are of local importance, while the remaining share is represented by natural monuments of national importance (Environment Agency of the Republic of Slovenia, 2024).

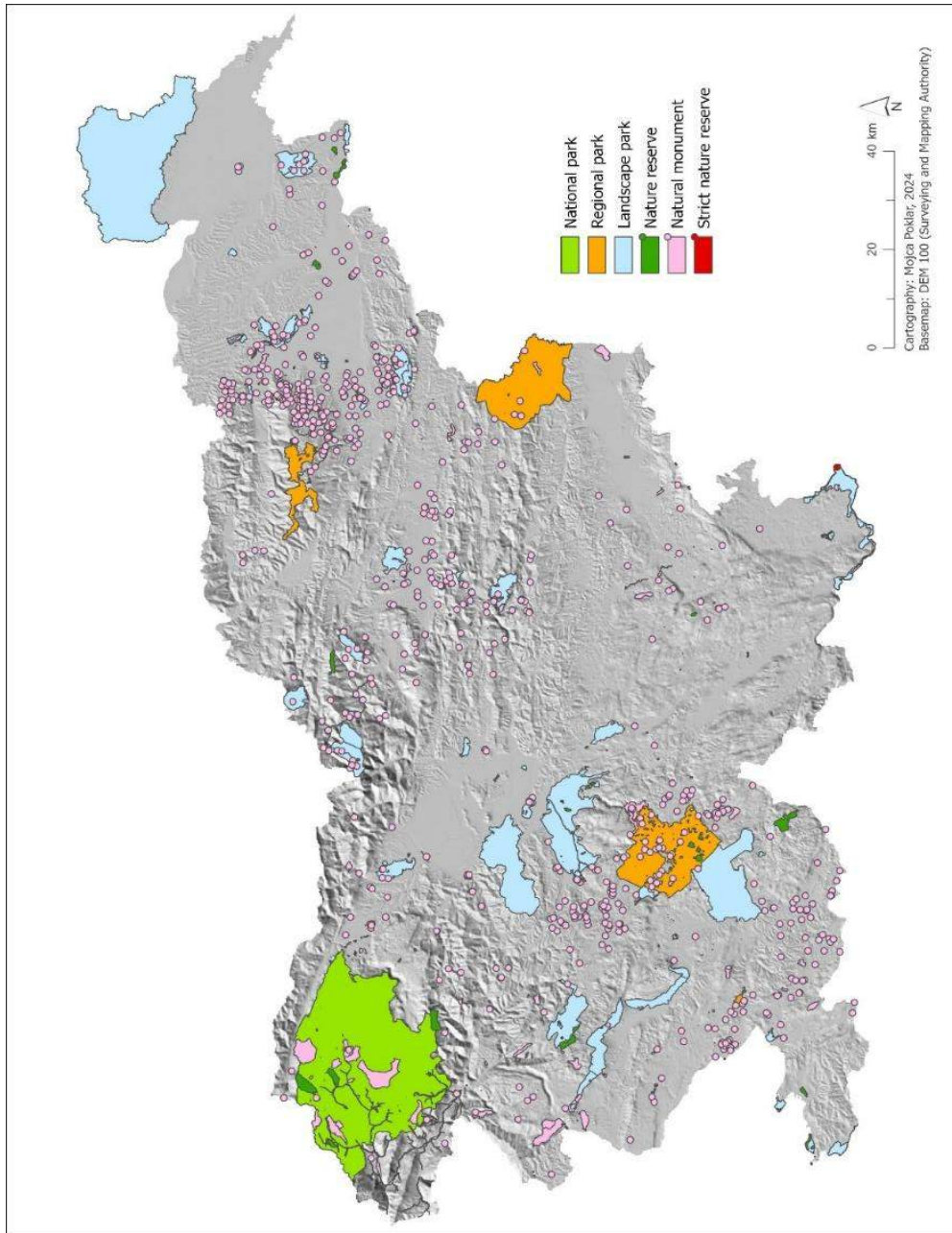


Figure 2: Spatial distribution of protected areas in Slovenia in 2024.

Data source: Slovenian Environment Agency (2024).

The smallest shares of the protected areas can be found in the categories of natural reserve and strict natural reserve, within which about 2% of Slovenia's territory is protected. A nature reserve is an area of importance for the preservation of biodiversity, where geotopes, habitats of endangered, rare or typical plant or animal species, can be found. While nature reserves are maintained through balanced human

activity in nature, there can be only natural processes without any human influence in the category of strict natural reserves (Official Gazette of the Republic of Slovenia, No. 56/99 and 31/01). There was a total of 60 natural reserves and 1 strict natural reserve (Hrastova loza in the Landscape Park Kolpa in south-eastern Slovenia) registered in Slovenia in 2024; many of them are also located within other categories of broader protected areas (Environment Agency of the Republic of Slovenia, 2024).

Structure of the Book

This research collection primarily focuses on a comparative analysis of the spatial development of tourism in selected protected areas of Bosnia and Herzegovina and Slovenia from an interdisciplinary viewpoint. The authors used their knowledge and expertise in the field of tourism and nature conservation to determine the state and developmental perspectives of their case studies, aiming to uncover both similarities and differences among the selected protected areas.

For the purpose of clarity and thematic coherence, the book is structured into two parts. The first part includes case studies from Bosnia and Herzegovina, while the second part is dedicated to selected protected areas in Slovenia. This division enables a more focused analysis of each country's spatial, environmental, and institutional specificities, while still allowing for meaningful comparisons in the concluding chapter.

The book opens with an introductory chapter that provides a brief theoretical overview of tourism in protected areas and outlines the current state of tourism development in such areas in both countries. Part I then presents three case studies from Bosnia and Herzegovina, each highlighting a different type of protected area with distinct ecological, spatial, and management features.

The second chapter presents Bosnia and Herzegovina's oldest national park, the Sutjeska National Park, renowned for its exceptional natural and cultural value. The analysis begins with an overview of the park's geomorphological and biological diversity, including the primeval forest Perućica and the highest mountain peak in the country, Maglić. In addition to its physical and ecological significance, the park holds major historical importance as the site of the Battle of Sutjeska during World War II. The chapter explores how this dual identity, natural and memorial, has shaped the park's development trajectory, emphasising the role of tourism in revitalising the local economy, and the potential of adventure and educational tourism within the framework of sustainable development.

Focusing on the Bijambare Protected Landscape near Sarajevo, the third chapter explores one of the most emblematic karst areas in Bosnia and Herzegovina. It highlights the region's geological uniqueness, including numerous caves and swallow holes, and its high levels of biodiversity and geodiversity. Attention is given to the history of speleological research, legislative frameworks, and protection regimes that shape the use and management of the area. The chapter also addresses the area's social

and economic significance, particularly its role in developing alternative forms of tourism, such as speleotourism and rural tourism, and stresses the importance of local involvement and sustainable tourism planning.

The fourth chapter examines the Nature Park Hutovo Blato, a Ramsar site and one of the most important wetland habitats in the region. The analysis emphasises the park's ecological functions, particularly as a nesting, wintering, and resting site for migratory birds. It also investigates the transformation of land use and the role of water in shaping both the ecosystem and tourism practices in the area. The chapter addresses the main challenges related to environmental pressures, water management, and governance, while presenting possible paths for revitalising sustainable tourism and fostering community engagement in conservation efforts.

Following the analysis of selected protected areas in Bosnia and Herzegovina, Part II turns to the cases of Slovenia, with the aim of providing a comparative perspective on the development of tourism in protected areas.

The fifth chapter focuses on the Notranjska Regional Park, which is widely known for its exceptional Lake Cerknica, one of the largest intermittent lakes in Europe. This protected area covers the entire territory of the Municipality of Cerknica, excluding built-up and unbuilt-up land, planned for settlement and industrial expansion. This specific fact presents an important challenge from the perspective of managing the protected area, which is developing intensively in terms of tourism and has recorded a significant increase in the number of visitors in recent years, especially at the most recognisable points of interest (Lake Cerknica, the Rakov Škočjan Landscape Park and the Križna Cave). The park administration is striving to strengthen cooperation with local residents, who have different views on the development of the area.

The following chapter presents one of the youngest protected areas in Slovenia, the Seasonal Lakes of Pivka Nature Park, which was established in 2014 by the Municipality of Pivka. The area's main natural attraction is a group of 17 seasonal lakes, a unique feature of this area. Although most of them are only inundated during intense floods, their territory is mainly unsuitable for agriculture but is still occasionally used by the locals for obtaining hay for livestock. The park is managed by the Municipality of Pivka and the Pivka Tourism Public Institute, which has contributed importantly to the nature protection, as well as the economic development and promotion of this area over the last decade.

The seventh chapter of this book is devoted to the Strunjan Landscape Park, a protected area along the northeastern part of the Adriatic Sea, which is renowned for its flysch cliffs and salt pans, where salt is extracted using the traditional method. This Mediterranean part of Slovenia is faced with significant pressures of tourism during the summer season, when the park is visited by hundreds of thousands of tourists and daily visitors. Nature protection and conservation of these marine and terrestrial aquatic environments with specially adapted life forms therefore remains an important

challenge, as do pressures stimulated by tourism stakeholders and part of the local community.

The final chapter brings together the key findings from the previous chapters and incorporates them into a synthesis of results and recommendations for the future development of tourism in protected areas in Bosnia and Herzegovina and Slovenia, aligned with the principles of sustainable development.

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PART I:
SELECTED PROTECTED AREAS
OF BOSNIA AND HERZEGOVINA

Chapter 2

Sutjeska National Park: A European Primeval Forest and WWII Memorial

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Geographical Location

Sutjeska National Park is located in the far southeastern part of Bosnia and Herzegovina, along the border with Montenegro, and covers an area of 16,052.34 hectares. It lies within a high mountain region of Bosnia and Herzegovina that includes four of the eleven highest peaks in the country, all exceeding 2,000 metres in elevation. This section of the Dinaric Alps is characterised by intensely dissected relief, featuring deep canyons and gorges over which towering mountain peaks rise dramatically (Figure 1).

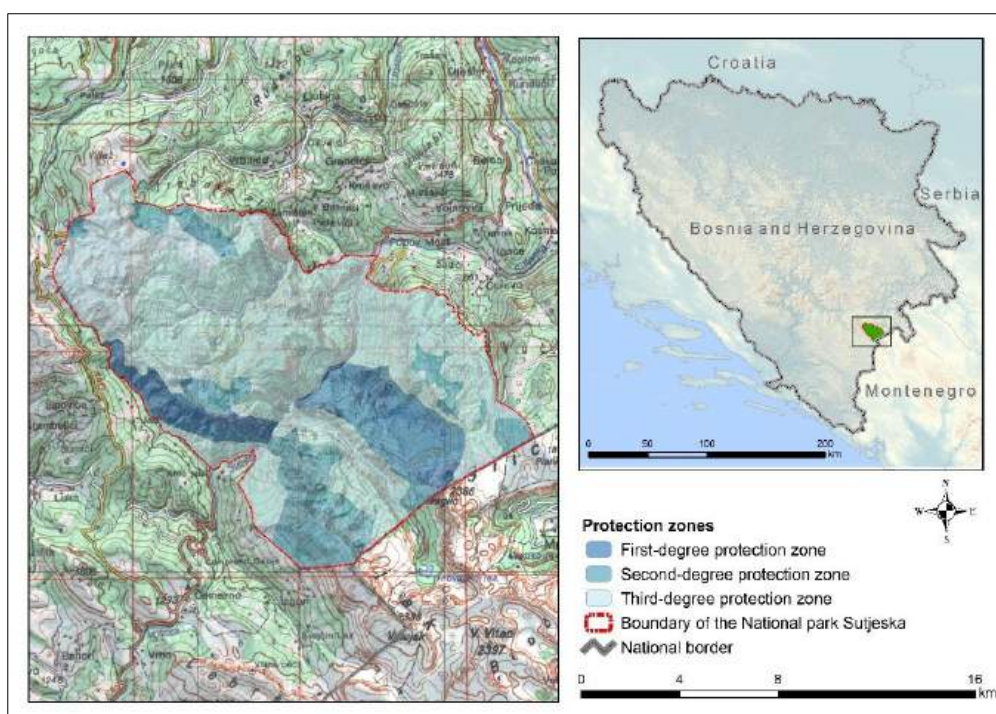


Figure 1: Geographical position and internal zoning of the Sutjeska National Park in Bosnia and Herzegovina.

Data sources: Military Geographical Institute in Belgrade (1984); National Park Sutjeska (n.d.).

The protected area extends across two administrative-territorial units—the municipalities of Foča (population 19,811 in 2013) and Gacko (population 9,734 in 2013). The nearest urban centre is Foča, which serves as a subregional hub (population 12,334 in 2013) and concentrates the majority of the park's surrounding population. The area is defined by a transit-oriented geographical position, located along the main road corridor Belgrade – Višegrad – Goražde – Foča – Tjentište – Bileća – Trebinje – Dubrovnik.

Origin and Development

Sutjeska National Park is the oldest national park in Bosnia and Herzegovina. It was established by the Law on the Proclamation of Sutjeska National Park, adopted by the Assembly of the Socialist Republic of Bosnia and Herzegovina on January 13, 1962, and published in the Official Gazette of Bosnia and Herzegovina No. 5/62 on February 9, 1962. However, the scientific and educational value of the ancient Perućica forest, located within the park, had already been recognised. On May 17, 1952, the Government of the People's Republic of Bosnia and Herzegovina adopted a decision to exclude Perućica (1,234 ha) from regular forest management, designating it as a forestry site for scientific research and educational purposes (Ministry for Spatial Planning, Construction, and Ecology of the Republic of Srpska, 2013b).



Figure 2: Memorial complex at Tjentište, Sutjeska National Park.

In the foreground stands the Memorial House of the Battle of Sutjeska, while the Monument to the Battle of Sutjeska is prominently visible in the background. This spatial composition illustrates the intertwining of cultural remembrance and natural landscape within the oldest national park in Bosnia and Herzegovina.

Photo by A. Sivac, 2022.

The designation of the area as a national park served as a catalyst for tourism development, which resulted in a series of spatial interventions, including the construction of transportation and hiking infrastructure, accommodation facilities, and other supporting amenities. In parallel, memorial monuments dedicated to the National Liberation War were erected, further contributing to the shaping of the contemporary landscape (Figure 2). From a sustainable development perspective, it is important to note that tourism infrastructure was primarily concentrated in the Tjentište area, which contributed to the preservation of natural vegetation and the ecological system across the wider park territory. The touristification of the park encouraged more dynamic economic and urban development. Between 1957 and 1990, all major tourism facilities were constructed. In parallel with the park's establishment, water supply and electrification infrastructure were also developed across the studied area. This wave of tourism development was accompanied by a steady increase in the number of visitors, reaching up to 900,000 visits annually in the pre-war period. The war in the 1990s and the associated destruction of material infrastructure—including both tourism and road systems in the park and the broader functional region—led to a drastic decline in tourism, falling to around 6,000 visits in the mid-1990s (Ministry of Spatial Planning, Construction and Ecology of the Republic of Srpska, 2013a), a number comparable to the early 1960s. As a result, the park's positive contributions to the economic and general development of the surrounding region significantly diminished. Many tourism facilities were destroyed, and due to the deteriorating financial conditions of the local population, natural resources were overexploited, which had a considerable impact on the landscape integrity of the protected area.

In recent years, especially following the adoption of the IUCN classification system in 2003, the situation has gradually improved. Thanks to its outstanding and well-preserved natural values, Sutjeska National Park has been designated as a Category II protected area under the IUCN framework. Damaged tourism infrastructure and supporting facilities are being restored, laying the groundwork for a new phase of tourism development. Due to its strategic transit-geographical location in the Upper Drina region, the full tourism valorisation of the park will largely depend on future geopolitical developments, as well as on the revival of the pre-war traffic intensity along the Drina corridor between the country's interior and the Adriatic coast. This process is also expected to benefit from the strengthening of integration within the Adriatic–Ionian Initiative and the formation of a future economic-geographic (development) region.

Physical-Geographical Characteristics and Values

Sutjeska National Park was designated under this category of protection primarily due to its memorial significance related to the National Liberation War, but also owing to its complementary natural-geographical features, which include rare elements and a rich diversity of its natural heritage—geological, geomorphological, and biological. This complementarity between highly valuable natural heritage and the memorial site is reflected in the park's marked spatial distinctiveness, which forms the foundation

of its touristic appeal and underscores the necessity of its evaluation and preservation as a protected natural area (Sivac et al., 2023). From a geological perspective, the broader area of Sutjeska National Park is predominantly composed of Mesozoic sedimentary and clastic rocks, with the presence of magmatic rocks as well. The oldest geological formations date back to the Lower Triassic, forming the wider surroundings of Tjentište and the Sutjeska River (Trubelja & Miladinović, 1969). Middle Triassic (Anisian) deposits are found in the northwestern and southeastern parts of the park. Lithologically, these terrains consist primarily of limestones and dolomites, with local occurrences of sandstones, marls, cherts, and eruptive rocks. The central section of the park, particularly the upper course of the Hračvka River, is built of Middle and Upper Triassic formations, composed of dolomites and limestones interbedded with cherts, tuffs, silicified sandstones, claystones, and calcarenites. These formations extend southwards, over the northeastern slopes of Volujak, reaching the southern boundary of the park. To the east, Lower Triassic deposits extend from Gradina (northeast), across Perućica, to Jelovci. These include sandstones, conglomerates, breccias, marls, claystones, schists, and limestones. Lower Triassic layers are also found in the easternmost part of the park, northeast of Pogledalo. A narrow zone of Upper Triassic deposits extends from Osoje in the southern part of the park, across Perućčki Brijeg and along the Sutjeska River valley to Krekovi in the north. These deposits are composed of white-grey to yellowish limestones and dolomites, locally interbedded with marls and sandstones. The unsubdivided Middle Triassic is represented by layered and massive limestones, with dolomites and dolomitic limestones occurring to a lesser extent. These formations are distributed from the northeastern slopes of Maglić, across Pogledalo and Tjentište, to Lupoglav in the north. Unsubdivided Upper Cretaceous formations cover the southwestern, southern, and eastern slopes of Tovarnica, as well as the southern, western, and northern parts of Volujak. These areas are composed of limestones, marls, dolomites, and flysch sediments. Jurassic formations are significantly less widespread compared to the Cretaceous and Triassic. The Lower and Middle Jurassic, found in the central part of Maglić and in a narrow zone from Perućica to Ozren, consists of grey limestones interbedded with dolomites, and, more rarely, sandstones, marls, and cherts. The unsubdivided Upper Jurassic, lithologically built of massive, banded, and layered reef limestones, with subordinate dolomites, is found in a narrow belt in the central zone of the park, extending from Perućica to Ozren (Hrelja, 2022).

Sutjeska National Park is located in the highest mountain zone of Bosnia and Herzegovina, in the northeastern section of the geomorphological region of the High Central Dinarides (Lepirica, 2009). From a morphostructural perspective, this high-mountain belt of the Central Dinarides is dominated by relief forms that emerged during the Alpine orogenesis, characterised by neotectonic thrust-fold mountain massifs and ridges. These landforms are manifested through compressional structures of folded strata and extensive thrust zones, generally oriented southwestward toward the Adriatic foreland. From a geotectonic standpoint, the area belongs to two tectonic units: the Durmitor overthrust zone and the flysch sediments (considered autochthonous) of the upper courses of the Sutjeska and Jabučnica Rivers (Trubelja & Miladinović, 1969). Under the influence of dynamic tectogenesis, these structures

have been further dissected by microtectonic features, notably longitudinal and transverse faults (Lepirica, 2012). As a result, antiform structures such as anticlines, horsts, and overthrusts separate isolated surfaces incised into limestone and dolomite formations, which—genetically—display prominent karst-corrosive characteristics (Lepirica, 2009). The intensity of tectogenesis has led to strong exogenous slope modelling, with denudational, erosional, and corrosional processes prevailing. In addition to derasional and gravitational processes, glacial and periglacial landforms, as well as subnival karst, are more prominently developed at higher elevations. This nivation-related morphosculpture appears on slopes higher than 1,500 metres above sea level (Bušatlija, 1969; Marković, 1970), and becomes dominant above 1,700 metres (Lepirica, 2012), rendering this high-mountain belt of the Central Dinarides the largest glaciated region in the mountain systems of Bosnia and Herzegovina (Marković, 1970). Within the broader area of the park, three major relief types can be distinguished: ridges and elevations above 1,500 m, mountain plateaus, and valleys. Ridges and crests in the area are the result of neotectonic uplift that occurred at the end of the Tertiary and the beginning of the Quaternary period. The mountain plateaus (highland surfaces) are remnants of former extensive Tertiary paleoplanation levels. The most prominent example of this type of relief within the park is the gently inclined Vučevo Plateau, located north of Maglić, the highest peak in Bosnia and Herzegovina (Figure 3). This surface was polygenetically formed at an elevation of around 1,400 metres above sea level and represents a fragment of an extensive Neogene planation level, to which the present-day Piva and Jezero plateaus also belonged, along with smaller highland surfaces and piedmont steps such as Obzir and Ljubišnja in neighbouring Montenegro.



Figure 3: Viewpoint panorama from Perućica Primeval Forest, National Park Sutjeska.

The photograph captures the dramatic landscape of the Perućica primeval forest, with the Skakavac waterfall cascading through the dense forest canopy.

Photo by E. Hrelja, 2022.

Neotectonic fault movements led to the uplift and fragmentation of this paleoplanation level into smaller units. From the exogeomorphological perspective, this was

accompanied by the deep fluvial incision of mountain watercourses and the formation of gorge- and canyon-like valleys—those of the Tara, Piva, Upper Drina, Sušica, Draga, and Sutjeska rivers (Lepirica, 2012). Relief characteristics are a core factor in the spatial planning process. In this context, four aspects are analysed and evaluated: morphogenetic, morphological, morphometric, and morphographic features of the terrain. Morphogenetic relief forms in the studied area are highly diverse, resulting from its geological complexity and the influence of specific physical-geographical forces, agents, and factors. The relief clearly exhibits denudational, fluvial, karst, nivational, and glacial landforms. The first four types are both inherited and active, while the glacial forms are relict and subject to transformation (Bušatlja, 1969). This part of the Bosnian-Herzegovinian Dinarides is strongly marked by karst and fluviudenudational landforms. The study area features surfaces of sharp (bare) and blocky karst, separated by valleys and flatlands, with the presence of lapies fields and fissures. In addition to lapies, sinkholes and smaller uvalas are common. Karst landforms are especially prominent in the areas of Volujak, Maglić, Hadžića Ravni, Tovarnica, and Zelengora, and are equally represented in both forested zones and high mountain pastures and barren lands, where karst features intermingle with nivational relief forms. Alongside lapies and sinkholes, endokarst landforms, primarily pits (ponors), are also present, although in smaller numbers. The most prominent fluvial relief form is the valley of the Sutjeska River and its largest tributary, the Hrčavka River. In the southwestern section of the park, the Sutjeska Valley takes on the characteristics of a transverse gorge, with a distinctly canyon-like section in the limestone formation of Prosječanica (Vratar). Downstream, the valley cuts into the Werfen formation and takes on a more gorge-like appearance. Denudational processes are particularly pronounced within the national park, represented by processes of mass wasting, scree formation, landslides, surface wash, and gully erosion. Numerous talus slopes and scree deposits can be found in the upper sections and valleys of the Sutjeska and Hrčavka Rivers. The most common nivational relief forms include scattered rock blocks, stone seas, rock streams, snow hollows, frost-shattered rock faces, stone ledges, and similar features. In this high mountain zone (over 1,500 metres above sea level), karst relief merges with nivational and slope-related forms. Traces of Pleistocene glaciation have been confirmed on Volujak, Maglić, Zelengora, and Tovarnica. On the shaded slopes of these mountain peaks, cirques, glacial troughs, and moraines have been identified, partially modified by nivational and denudational processes (Bušatlja, 1969).

Morphological characteristics are evaluated in terms of the diversity and attractiveness of the relief. The morphometric and morphological constraints and advantages of the terrain significantly influence patterns of human settlement, the construction of housing and transportation infrastructure, lifestyles, and tourism-related activities. To assess their potential, limitations, and/or suitability, parameters such as elevation, slope gradient, degree of relief dissection, and slope aspect are used. The high altitudinal zone, along with other physical-geographical specificities of the area, represents a limiting factor for intensive anthropogenic use of the protected natural area. Analysis of relief energy and slope gradients provides the basis for natural hazard prevention and the mitigation of destructive processes.

In accordance with the geological structure of the terrain and the endogenous and exogenous geomorphological processes active within it, the resulting relief is highly dissected and marked by steep gradients—features which, on the one hand, contribute to the touristic appeal of the area, while on the other, represent significant constraints for anthropogenic exploitation.

The hydrogeological characteristics of the bedrock and the area's vertical dissection influence the drainage patterns of both surface and groundwater within the park. The orographic structures of Lelija and Zelengora form the watershed divide between the Upper Neretva River and the tributaries of the Drina River. Groundwater fills networks of underground karst conduits and emerges at karst springs and wells. From a hydrogeological perspective, the massifs of Zelengora, Volujak, Vilenjak, Maglić, and Snježnica represent primary underground aquifers (Zubčević, 1969). The studied area is predominantly drained by the Sutjeska River, along with its most important tributaries—the Hrčavka and Perućica—although certain areas are governed by karst hydrographic regimes. The Sutjeska River is a left tributary of the Drina River, with a catchment area of 322 km². It originates from several springs located between Lebršnik and Volujak, and flows through a composite, polymorphic, and polyphase valley (Zubčević, 1969), with an overall elevation drop of 1,150 metres. The river valley comprises the Čemerno Basin in the upper course and the Tjentište Basin in the lower course, with the canyon section of Sutjeska (Prosječanica) in between. Its narrowest upper section, Vrtar, is just 15 metres wide at the base and stretches over 2.5 kilometres, with valley walls rising up to 1,200 metres in height. Downstream from Prosječanica, the Sutjeska flows through the fluvio-denudational basin of Tjentište (Zubčević, 1969; Marković, 1970). The Hrčavka River, the most significant left-bank tributary, is 11.6 kilometres long and has a catchment area of approximately 55 km² (Ministry of Spatial Planning, Construction and Ecology of the Republic of Srpska, 2013a). The Hrčavka basin and valley are alternately incised into limestones and non-carbonate formations. In limestone-dominated segments, canyon-like sections have developed, while gorge-like forms appear where other lithologies prevail (Bušatlija, 1969). The Perućica stream is the largest right-bank tributary of the Sutjeska and is home to a waterfall approximately 75 metres high.

The high mountains of eastern Bosnia and Herzegovina contain several glacial and karst lakes. On the Zelengora Plateau, eight mountain lakes are located, of which five lie within the boundaries of the park: Crno (Black), Bijelo (White), Orlovačko, Donje Bare (Lower Bare) and Gornje Bare (Upper Bare). In addition to glacial processes, the genesis and evolution of these lake basins were also shaped by karst, fluvio-denudational, and gravitational processes. All lakes are situated at altitudes over 1,400 metres above sea level (Orlovačko Lake at 1,438 m, Crno Lake at 1,440 m, Bijelo Lake at 1,450 m, Donje Bare at 1,475 m, and Gornje Bare at 1,683 m). The largest lake by surface area is Donje Bare (2.3 ha), followed by Orlovačko (2.1 ha), Crno (1.01 ha), Gornje Bare (0.91 ha), and Bijelo, which is the smallest at 0.51 ha. Orlovačko Lake is the deepest, with a maximum depth of 4.9 metres, followed by Donje Bare (4.5 m) and Crno Lake (3 m), while Bijelo and Gornje Bare reach a little over 2 metres in maximum depth. During the warmer part of the year, lake water

temperatures range between 14.8°C and 15.5°C. Due to intensified eutrophication processes, the lakes of Zelengora are in the final phase of their evolutionary development, transitioning toward marsh formation (Spahić, 2001). Sutjeska National Park is situated at the intersection of Mediterranean and continental climatic influences, which results in abundant, frequent, and evenly distributed precipitation throughout the year (Milosavljević, 1969; Muftić-Bašagić & Mičević, 1969). The climate exhibits characteristics of the temperate geographic zone. According to the Köppen-Geiger classification, and depending on the prevailing influencing factors and thermal conditions (based on data from Tjentište, Čemerno, and Suha), both temperate warm and humid climates (C) and temperate cold climates (D) alternate across the area. The lowest average temperatures are recorded in January: -4.5°C in Čemerno, -3.1°C in Suha, and -1°C in Tjentište. The highest values occur in July and August, with average temperatures of 13°C in Suha, 14.9°C in Čemerno, and 18°C in Tjentište. Annual average temperatures are 8.6°C in Suha, 6°C in Čemerno, and 8.4°C in Tjentište (Milosavljević, 1969; Muftić-Bašagić & Mičević, 1969; Federal Hydrometeorological Institute, 1967). The average annual precipitation is 1,527 mm in Čemerno, 1,428 mm in Suha, and 1,280 mm in Tjentište. The highest levels of precipitation are recorded during the winter months, with a peak in December (e.g. 200 mm in Tjentište), while the summer months are relatively dry, with a minimum in July and August (Milosavljević, 1969; Muftić-Bašagić & Mičević, 1969; Federal Hydrometeorological Institute, 1967).

Sutjeska National Park is an area of exceptional floral and faunal diversity. Its biogeographical distinctiveness is largely a result of the interplay between the continental and Mediterranean climatic influences. Vertical ecological zoning reveals clearly distinguishable vegetation belts, ranging from alpine pastures, natural grasslands, transitional scrub zones, shrublands, and deciduous forests, to coniferous forests, mixed forests, wetlands, heathlands, areas with sparse vegetation, and exposed rock surfaces. One of the most significant natural features of the park is Perućica, one of the largest remaining primeval forests in Europe, covering 1,434 hectares (Marković, 1970; Ministry of Spatial Planning, Construction and Ecology of the Republic of Srpska, 2013a). Within this strict nature reserve, several forest communities are protected, including beech, fir, and spruce forests; subalpine beech stands, either pure or in combination with mountain maple; subalpine spruce forests; and vegetation of mountain pine (*Pinus mugo*) and alpine grassland communities (Ministry of Spatial Planning, Construction and Ecology of the Republic of Srpska, 2013a).

Demographic and Economic Characteristics

Due to the orographic structure and geomorphological features of the terrain, accessibility is largely restricted to river valleys and mountain passes, which has led to a channelised transportation network and, consequently, has influenced the anthropogeographical development within the protected area. Since the early periods of craft production and trade, goods were transported by caravans, necessitating the construction of roads and supporting infrastructure along these routes (Kafedžić, 2005). The Drina River Valley represents the main transportation corridor in eastern

Bosnia and has, since ancient times, formed part of a major trade route that stretched from the Adriatic coast, passing through Trebinje, Bileća, Gacko, Čemerno, Tjentište, and Foča, continuing along the Drina River. This route held particular importance in antiquity, when Roman forces advanced through the region, and in the medieval period, when merchants from Dubrovnik extended their trade networks into this part of Bosnia and Herzegovina, establishing commercial settlements along the way (Živojević, 2009). Beginning in 1376, the entire region came under the rule of Bosnian Ban (later King) Tvrtko I, and following his death, it was governed by powerful feudal families, including the Hranić and Kosača lineages. The Ottoman conquest of the area in 1465 resulted in the establishment of Herzegovina as a separate sanjak (district) with Foča as its administrative centre, significantly accelerating the town's development. Under Ottoman rule, a network of caravan routes was expanded, among which one of the most prominent was the so-called 'Dubrovnik Road', which connected Istanbul and Dubrovnik and passed directly through the area of today's Sutjeska National Park (Kafedžić, 2005). The larger settlements within the park area historically developed along river courses, primarily on alluvial plains, enabling agricultural communities to remain close to their landholdings. Within the interior of the park, individual residential structures were constructed by local inhabitants, particularly those who retreated during the Ottoman conquests. These dwellings were accompanied by small, irregularly shaped agricultural plots, shaped largely by the relief of the terrain. The Austro-Hungarian occupation of Bosnia and Herzegovina in 1878 fundamentally transformed the traditional way of life. Long-standing traditions, religious practices, and moral and ethnic values, built over centuries, came into stark contrast with the new capitalist, monetary, and market-oriented systems introduced by the Austro-Hungarian administration. This shift triggered a mass migration of Bosniaks to Turkey. Furthermore, the new administrative order facilitated internal migration from economically underdeveloped peripheral areas—including the broader region of Sutjeska National Park—towards more developed parts of Bosnia and Herzegovina, where employment opportunities were expanding and investments were being made in infrastructure, transportation, mining, and thermal resorts.

The depopulation of rural areas resulted in a decline in traditional resource use, particularly the reduction of agricultural and pasture lands that had been created by human activity over previous centuries. The road connection via Tjentište was re-established during the Austro-Hungarian period, when numerous macadam roads were constructed in accordance with the military and economic needs of the time. To facilitate the exploitation of timber and other mineral resources, the East Bosnian Railway was constructed, and in 1939, a narrow-gauge railway was extended from Ustiprača to Foča (Kafedžić, 2005; Živojević, 2009). During the socialist period, nearly all macadam roads were paved, which contributed to improved resource accessibility and significant economic development of the Upper Drina region (Živojević, 2009). As a result of these developments, a more dynamic economic and urban expansion led to a rise in population within the area of Sutjeska National Park, increasing from 135 residents in 1961 to 393 in 1991. This population growth and rising agrarian overpopulation prompted extensive land clearing for the expansion of existing, and creation of new, pasture areas.

After a period of growth linked to tourism, the recent decades have been marked by population decline, caused by two main factors: the war in Bosnia and Herzegovina during the 1990s, and the ongoing processes of deruralisation and rural-to-urban migration. According to the 2013 census, the settlement of Tjentište had only 88 permanent residents, representing a 77.6% decrease compared to 1991. However, estimates from the Public Institution of Sutjeska National Park suggest a slightly higher number—between 300 and 350 permanent and temporary inhabitants. The population residing within the protected natural area is primarily engaged in primary economic activities, especially traditional forms of agriculture specific to the region, with a particular emphasis on livestock farming, forestry, and the exploitation of forest resources. Additionally, a portion of the population is employed in tertiary sector activities, mostly related to tourism and hospitality services offered within the framework of Sutjeska National Park.

Evaluation and Planning of Sustainable Tourism Development

In the territory of Sutjeska National Park, the planning of sustainable tourism development is carried out in accordance with the established protection regime defined by the IUCN, as well as the designated protection zones: Zone I (strict protection zone), Zone II (active protection zone), and Zone III (use zone).

The designation of Zone I – strict protection is aimed at preserving the core natural phenomena of such areas. This zone includes areas of exceptional significance, characterised by intact natural values, high levels of biodiversity, geodiversity, and landscape diversity, the preservation of which is of the utmost importance and which require no or only exceptional human intervention. Permitted activities in the strict protection zone are limited to scientific research, monitoring of conservation status, and interventions under extraordinary circumstances. The strict protection zone in Sutjeska National Park encompasses the broader area of the Perućica primeval forest reserve and the Jabučke Stijene area on Zelengora, covering 18.6% of the park's total area. These are the segments of the park distinguished by original and undisturbed geosystems.

Zone II – active protection includes areas of high natural value, within which conservation activities such as maintenance, revitalisation, or the creation of natural values important for nature preservation are allowed. Permitted activities include area surveillance, scientific research, habitat monitoring, and limited, controlled visitor access along marked tourist trails, with the development of minimal tourism infrastructure (e.g. construction of trails, facilities for education, interpretation, and similar functions). This zone encompasses the broader area of Maglić (excluding Perućica), Volujak, and the majority of Zelengora, accounting for 78.9% of the park's surface area. Within this zone, natural spaces of significant geoecological value have been identified areas that have remained largely unaffected by human activity.

Zone III – the use zone includes areas of lower conservation value, or those in which a certain degree of traditional land use is already present, and which are managed primarily for other purposes relevant to the development and functionality of the

protected area. This zone serves as a buffer area, shielding the core conservation zones from external influences and negative impacts, and contributing to the spatial integration of the protected natural area into a coherent whole. In doing so, it ensures the long-term sustainable preservation of geoeologically valuable areas that are not under significant anthropogenic pressure. The use zone represents a compromise between conservation and utilisation, and its management must align with the principles of sustainable development, without undermining the purpose and objectives of the protected area. Within this zone are settlements, areas of traditional agriculture, infrastructure corridors, and developed zones designated for recreation and tourism. These are areas of more intensive land use and human presence, where permitted activities include the development of sustainable tourism, traditional agricultural production, and infrastructure development and renewal, as well as spatial interventions aimed at improving the visitor management system in line with ecological standards and defined carrying capacities. The use zone accounts for 2.5% of the park's total area, encompassing those parts of the park with lower geoeological value that have been modified by human activity, and where traditional economic activities, the construction of residential and tourism facilities, and supporting infrastructure are already present. This zone includes the central part of Zelengora (Donje Bare), and the northeastern Pelučka Valley (Zamrštenski and Lučki Katun), as well as the Tjentište tourism complex.

The Spatial Plan for the Special Purpose Area of Sutjeska National Park is currently in draft form (parliamentary procedure initiated in 2013), and as such, the park's managing authority operates in accordance with the current legal framework under the jurisdiction of the relevant Ministry of Spatial Planning. The Forest Management Base and Game Management Plan serve as the fundamental planning documents for the functioning of these respective activities (Nogo, 2023). The planning and management of tourism development largely depend on available financial resources. Sutjeska National Park is funded through the entity-level budget, in addition to other legally defined sources and the implementation of development projects. Tourism products are developed primarily through project-based initiatives, focusing on the establishment and maintenance of hiking and cycling trails, scenic viewpoints, attractive locations, and infrastructure managed by the Public Institution of Sutjeska National Park. Partnerships with tourism agencies are formalised through contracts involving the organisation of visits and group tours to the park, primarily with agencies from within the country and neighbouring regions. The existing accommodation and hospitality facilities managed by Sutjeska National Park are considered satisfactory and are undergoing continuous renovation and improvement. The private sector operates along the park's periphery, with several private accommodation providers located within the park boundaries, particularly along the main regional road (Nogo, 2023). With the aim of enhancing its tourism offer, the specifically established Sector for Development, Improvement, and Presentation within the Public Institution Sutjeska National Park continuously implements activities focused on the improvement of tourism-related infrastructure and services. These activities include the upgrading of outdoor furniture, renovation of the information centre, regular updating and maintenance of the official website, and the

maintenance of trails and green areas. Special attention is devoted to harmonising all interventions with the natural environment, with a strong emphasis on the use of natural materials. The interpretation and presentation of individual natural values, cultural heritage elements, and other attractions is designed in accordance with their function, significance, genesis, level of attractiveness, and protection regime—ranging from local to regional, national, and international importance. Stimulating private investment in ecotourism within the park is another activity aimed at establishing the park as an attractive destination for visitors, meeting their expectations, promoting healthy lifestyles, supporting nature conservation, and contributing to the regional economy. These activities are implemented through partnerships between the entity government and the private sector. Tourism concessions represent a core element of long-term sustainability, and both the park administration and the competent ministries are engaged in various efforts to ensure compliance with minimum international standards required for promotion. The current vision of the Sutjeska National Park administration is oriented toward the sustainable management of both the area and the facilities under the park's jurisdiction. Preservation of natural and cultural-historical heritage, promotion and responsible management of tourism and recreational potential, and contributions to local and regional socio-economic development are among the main objectives defined in the park's Management Plan. Management activities are directed toward the protection and preservation of natural and cultural-historical values, cross-border cooperation (particularly the Sutjeska–Durmitor–Tara transboundary area), and the development of tourism, sports, education, and scientific research—which can be realised through coordinated action with relevant ministries within the park's managed area. Plans for improving collaboration between the park administration and other space users include joint funding initiatives for selected activities and spatial usage models, developed through partnerships between the park authority and land users. Greater involvement of local communities and other stakeholders in the sustainable development of the protected area is also promoted through their integration into the provision of transportation and accommodation services, local food production and supply, guided tours, and similar tourism-related activities.

Cooperation with the local population is currently at a satisfactory level, with a significant number of local residents being either directly or indirectly employed by Sutjeska National Park. As part of development projects, efforts are made to encourage and support the establishment of small, family-run hospitality and tourism businesses, which are oriented toward the developmental needs of the protected natural area. This has had a positive effect in mitigating emigration trends from the region. The local community is actively involved in planning and decision-making processes related to the implementation of activities in Sutjeska National Park, with the goal of enhancing the development of sustainable tourism. Educational programmes for local residents and other stakeholders are periodically organised, covering areas such as agrobusiness, rural household tourism, and similar activities. However, the local population is not as actively engaged as it could be in the various events and activities organised within the park. The vast majority of local residents hold a positive attitude toward tourism development in the protected area, as the past

decade has demonstrated multiple benefits for the community, both in terms of support received from the park administration and the improved functioning of the protected area as a whole.

Tourism in Sutjeska National Park

From the establishment of Sutjeska National Park until the 1990s, tourism development was primarily based on the area's cultural and historical heritage, particularly that related to the National Liberation Struggle during the period 1941–1945. The Battle of Sutjeska is considered one of the most significant events of the anti-fascist resistance during World War II. Following the war, this battle became one of the main motivations for the park's proclamation, and in the ensuing years, a memorial complex with numerous commemorative monuments was constructed. Initially, a memorial ossuary and a monument to the Battle of Sutjeska (Figure 4) were built, followed by a museum, which together form the central section of the memorial complex. To enhance the tourism offer, a youth centre, along with numerous accommodation and hospitality facilities, was also constructed. During this period, annual visitor numbers approached one million, with the legacy of the National Liberation Struggle serving as the primary tourism attraction. In more recent years, tourist demand has shifted progressively toward the park's natural attractions. In this context, adventure tourism has become an increasingly attractive segment in the last several years. Visitors interested in this form of tourism seek destinations that offer well-preserved environments and unique natural experiences, for which Sutjeska National Park is particularly well known.



Figure 4: Monument to the Battle of Sutjeska.

The central memorial complex commemorating the 1943 Battle of Sutjeska represents one of the most significant symbols of antifascist heritage in Southeast Europe. Its dramatic form, set within a mountainous forested landscape, powerfully conveys the fusion of natural and cultural values within the oldest national park in Bosnia and Herzegovina.

Photo by E. Hrelja, 2024.

This is especially due to the presence of one of the largest primeval forests in Europe—Perućica, alongside the richness of natural grasslands and relatively intact forest complexes throughout the park's territory. Sutjeska National Park encompasses a distinctly mountainous area, marked by numerous biogeographical, hydrographic, geomorphological, and climatic particularities. Hydrographically, the area is defined by the rivers Piva, Drina, and the source of the Neretva, with an abundance of natural watercourses and lakes. Geomorphologically, the landscape is characterised by mountain massifs such as Bioč, Vučevo, Maglić, Volujak, Lebršnik, and Zelengora. Climatically, the area is recognised as an 'air spa', due to the interplay of continental and maritime influences, as well as the distinctive mountain climate. These conditions have positioned Sutjeska as a favourable destination for health and wellness tourism, particularly for visitors seeking cleaner air, tranquillity, and altitude-related health benefits. Although not yet systematically developed as a spa resort in the traditional sense, the park's reputation for therapeutic air quality attracts individual tourists and smaller organised groups, often from urban centres in Bosnia and Herzegovina and neighbouring countries. These visitors typically combine their stay with recreational and nature-based activities, such as hiking, visiting Perućica primeval forest, exploring glacial lakes on Zelengora, or engaging in soft adventure tourism, thereby contributing to a diversified tourist experience within the park.

The unique tourism potential of Sutjeska National Park, which forms the foundation for the development of adventure tourism, includes the following assets: the highest mountain peak in the country—Maglić (2,386 m); the largest primeval forest in Europe—Perućica; the first officially protected natural area in Bosnia and Herzegovina—Perućica watershed (1954); the oldest national park in the country—Sutjeska (est. 1962); mountain lakes—Crno, Bijelo, Orlovačko, Donje Bare, and Gornje Bare; canyons and gorges—Sutjeska, Hračvka, and Jabučnica; cultural and historical heritage—the Sutjeska Memorial Complex; and a large outdoor swimming pool (Hrelja et al., 2020). In line with the above, the following types of adventure tourism have been developed within Sutjeska National Park:

- Canoeing and kayaking (in the Sutjeska River valley during April and May, coinciding with high water levels),
- Canyoning (in the Hračvka River canyon),
- Hiking and trekking (a pedestrian trail has been established along Route IX, with a total length of 45 km),
- Off-road vehicle races, organised by local automobile clubs,
- Paragliding (at Volujak, Maglić, and Zelengora),
- Mountain biking (on marked mountain trails in the park, totalling approximately 25 km),
- Horseback riding on Zelengora (offered by the private sector),
- Photo safaris, including birdwatching and observation of large game on Zelengora,
- Rock climbing (on designated climbing routes),
- Mountaineering and camping (organised campsites at Orlovačko Lake and in Tjentište),

- Guided walks through the Perućica primeval forest, which are permitted only with an official guide (Figure 5).



Figure 5: Scenic viewpoint above the Perućica primeval forest.

Visitors enjoying the panorama of the Sutjeska National Park, with the Skakavac waterfall, an iconic landscape that reflects the harmony between untouched nature and sustainable visitation.

Photo by A. Sivac, 2022.

In addition to the activities already offered, new forms of adventure tourism are being planned, such as ‘survival experiences’ in the Perućica forest, modelled after global wilderness survival shows filmed in extreme environments (Hrelja et al., 2020). The most frequented areas include the Memorial Zone, scenic viewpoints such as Dragoš Sedlo, Prijedor, and Borić, and marked hiking trails leading to Maglić, Trnovačko Lake, and the Zelengora plateau (including Bregoč, Uglješin Peak, Orlovačko Lake, and Donje and Gornje Bare). The trail through the Perućica primeval forest is also highly visited, but strictly regulated, both due to the sensitive habitats it contains and for visitor safety and prevention of illegal activities. The main road that traverses the park is 12 km long, following the Sutjeska River canyon and providing access to hiking trails leading toward Perućica, Volujak, Maglić, and the Donje Bare plateau. Other points of interest include Suha, the Vrtar Canyon, and the Ninkovići stećak necropolis (Nogo, 2023).

According to data on overnight stays in Sutjeska National Park, a clear seasonal pattern in tourism can be observed, with the summer season generating the highest number of tourist arrivals and overnight stays across all categories of accommodation facilities. July and August, which constitute the core of the summer tourist season, account for more than half of the total overnight stays, which can be directly linked to the fact that most tourism activities take place during the summer months, aligned with the main attractions offered by the park. In recent years, a noticeable increase in the number of accommodation facilities within this protected area has been recorded. Newly built tourism structures tend to be larger than traditional mountain lodges, are well integrated into the natural landscape, and offer greater comfort for visitors. The expansion of accommodation capacity within legally designated development zones contributes not only to an increase in the number of visitors, but also to the diversification of tourism supply, all with the aim of supporting the financial self-sustainability of the park.

The absence of comprehensive statistical data limits the ability to analyse tourism trends, not only in terms of tourist arrivals and overnight stays, but also in relation to the extent of infrastructure development and diversification of tourism services. Based on field data collection and interviews conducted with representatives of the park's management, there is evidence of increasing involvement of the local community and households in the organisation of accommodation and hospitality services, as well as in the coordination of events and festivals, all of which contribute to the broader diversification of Sutjeska National Park's tourism offer. The spatial organisation of the park, including protection zones and the distribution of tourist facilities and attractions, is shown in Figure 6. The recorded number of overnight stays during the winter season indicates a growing interest in seasonal tourism, particularly through various forms of alternative (niche) tourism.

The number of tickets sold for visits to the Battle of Sutjeska Memorial Complex represents an important indicator of tourism activity in Sutjeska National Park, especially within the context of the pandemic caused by the COVID-19 virus and the post-pandemic period. The highest number of tickets is consistently recorded during the summer season, which correlates positively with the number of overnight stays. During the COVID-19 pandemic, the number of tourist visits declined significantly, in part due to the relatively remote geographical location of the park in relation to major outbound tourism markets. During this period, most visits were conducted by local residents from the municipalities in which the park is located. In the post-pandemic period, the number of tickets sold for the Memorial Complex has increased by approximately 30%, rising from 1,488 in 2020 to 2,085 in 2022, which reflects the park's reintegration into broader tourism flows.

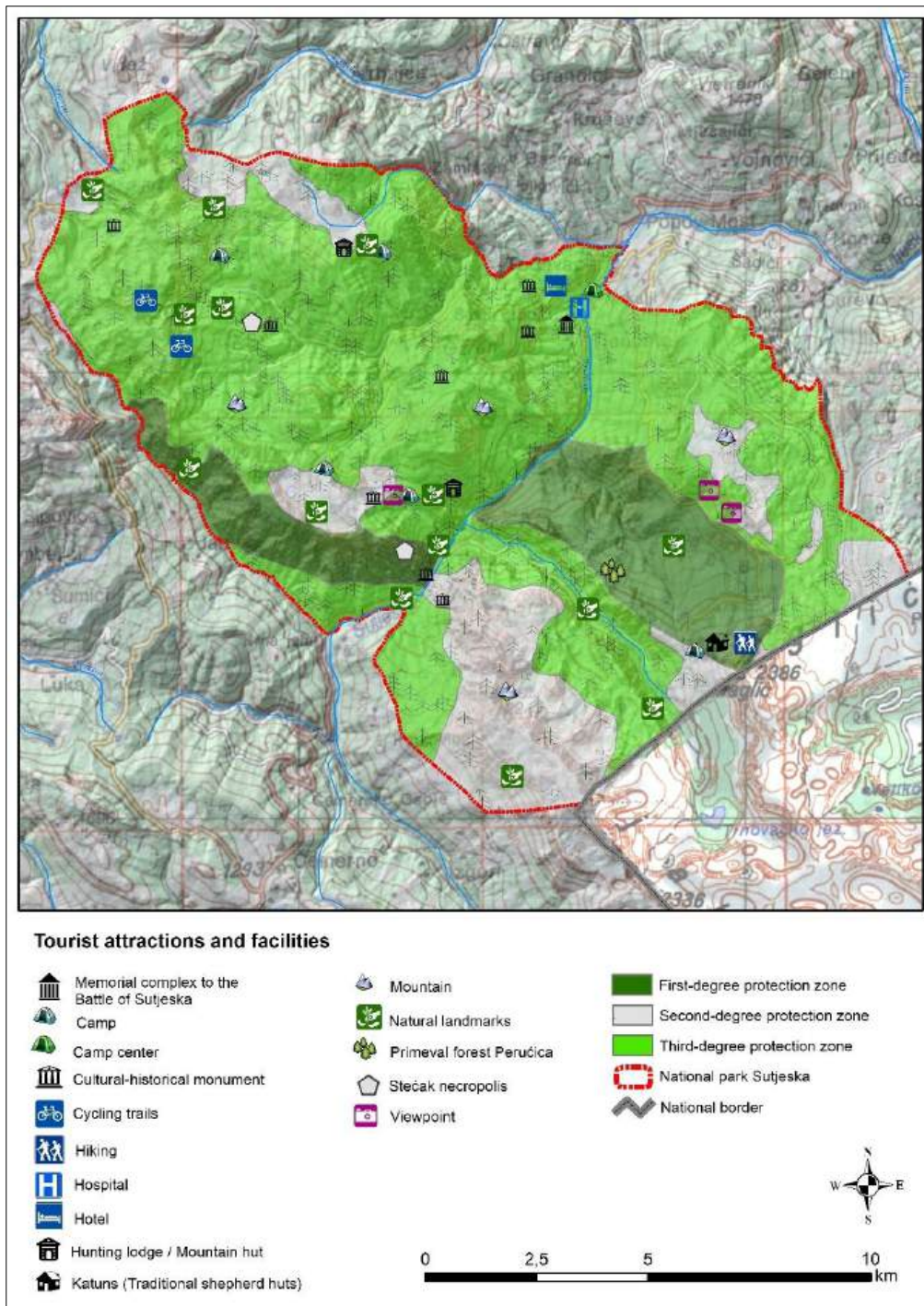


Figure 6: Spatial distribution of natural-geographical and cultural-historical tourist attractions within the Sutjeska National Park.

Data sources: Military Geographical Institute in Belgrade (1984); National Park Sutjeska (n.d.).

Given that Sutjeska National Park is a transit area with multiple points of entry, the actual number of visitors is significantly higher than the number of tickets sold for the Memorial Complex alone. It is difficult to determine the exact number of tourist visits, as entrance fees are charged only at specific zones within the park. Guided tours are tracked through a reservation system, based on pre-arranged contracts with tour operators, organisations, and associations. Upon entering the park, visitors are required to purchase entrance tickets at designated locations, including the Info Centre, the Battle of Sutjeska Museum, and the checkpoints at Borovno, Košur, and Suha.

The park's ranger service is responsible for monitoring visitor activity in the field. In addition, frequently visited sites and facilities are equipped with surveillance cameras, which serve as reliable tools for monitoring visitor movement, vehicle traffic, and potential illegal activities. A large number of visitors organise their visits and overnight stays independently, often outside officially designated camping zones. According to official statistics, in the post-pandemic year of 2022, which saw an overall increase in tourist arrivals across Bosnia and Herzegovina, 8,661 overnight stays were recorded in registered accommodation facilities within the park. However, the actual number of overnight stays is believed to be significantly higher. Sutjeska National Park is considered one of the most important domestic tourism destinations, although this cannot be fully confirmed statistically, due to its spatial particularities and the lack of comprehensive data on tourist visits, overnight stays, and especially the demographic profiles of visitors. In order to enrich the tourism offer and attract visitors, the park organises a variety of cultural, historical, sports, and even economic events, contributing to the diversification of tourism services within this protected area. However, in the context of sustainable tourism development, it is essential that such activities remain aligned with the park's primary objectives—namely, the conservation of natural values and the environmental education of visitors. National parks should not be managed primarily as tourism generators, but rather as spaces where tourism serves as a tool for raising awareness and supporting conservation efforts, without compromising ecological integrity. Most of these events take place during the summer months, with June and July being the most active period. The most visited events are those that combine cultural and sports components, attracting a wider audience and encouraging longer stays. Sutjeska National Park maintains cross-border cooperation as well as partnerships with other protected areas within Bosnia and Herzegovina, particularly with other national parks. These collaborative efforts are geared toward the shared goals of biodiversity conservation and the protection of cultural-historical heritage. One of the main outcomes of these partnerships is joint application to various funding sources that support the implementation of nature conservation and sustainable development projects. An example of such cooperation can be seen in the initiated process of certifying the Sutjeska area for organic agricultural production. The introduction of standards, initial certification, and the signing of agreements related to inspection and certification procedures represent the first phase of this process. Future activities are oriented toward the implementation of training programmes for the collection of specific medicinal herbs, mushrooms, and wild fruits (Nogo, 2023).

Geographical Impacts of Socio-Economic Development

The cumulative anthropogenic impact throughout the historical-geographical development of the area is reflected in the existing vegetation cover of the park, specifically in the discrepancy between the potential (climazonal) and actual vegetation. Based on an analysis that used vegetation cover structure as an indicator (i.e. the relationship between changes in natural vegetation and anthropogenically modified areas), it was determined that anthropogenic activities have led to a reduction and transformation of plant communities (Hrelja et. al, 2018). Over the past forty years (1979–2018), the area covered by natural vegetation has decreased by a total of 6.22%. The main factors contributing to these environmental changes include:

- Logging of forest resources,
- Construction of tourism-related facilities such as weekend houses and supporting infrastructure,
- Agricultural development, primarily through land cultivation and expansion of agricultural activity on previously unused or marginal agricultural land.



Figure 7: Extensive agricultural practices within Sutjeska National Park. *Traditional forms of agriculture, including small-scale livestock grazing and crop cultivation, are still practiced within certain zones of the park, contributing to the creation and maintenance of cultural landscapes.*

Photo by E. Hrelja, 2024.

The total area used for agriculture is relatively small (504.85 ha or 3.14% of the park's territory) and is mainly characterised by extensive land use practices, involving minimal or no use of artificial fertilisers, pesticides, or herbicides (Figure 7). As a result, while these activities have contributed to the reduction of natural vegetation and some degree of visual landscape degradation, they have not caused significant negative effects on other components of the ecosystem (Hrelja, 2022). Until 2010, commercial forest management was practiced in the park area, which included timber harvesting and transport operations (Ministry of Spatial Planning, Construction and Ecology of the Republic of Srpska, 2013b). This management approach required the construction of forest roads and other related infrastructure, which had a negative impact on environmental quality, primarily through land occupation and forest degradation.

Significant negative impacts on the sustainable functioning of the national park, particularly in terms of landscape transformation, have also resulted from the construction of artificial surfaces, including settlements and structures intended for tourism-related use of the space. Administratively, the park territory spans two municipalities—Foča and Gacko—with Tjentište, located within the municipality of Foča, being the only inhabited settlement in the park. The total area occupied by tourist facilities is very small, amounting to only 3.43 hectares, or 0.02% of the park's total surface area (Figure 8). The majority of these facilities, covering 3.083 hectares, have been constructed within designated development zones, specifically in transition areas under the third protection regime. However, a source of concern—despite the small area of 0.39 hectares—are private tourism capacities, primarily second homes, which are often accompanied by supporting infrastructure and are being developed outside of the designated protection zones, without adherence to the guidelines set forth in the Spatial Plan and the Management Plan for the protected area.

According to the management of the Public Institution Sutjeska National Park, there are currently no illegally constructed buildings within the protected area. Reconstruction, adaptation, and restoration activities are primarily carried out on existing structures in both public and private ownership. In coordination with the competent ministry, renovation projects are being planned for buildings and tourism infrastructure used for accommodation, recreation, and educational purposes (Nogo, 2023).

In addition to the aforementioned negative effects of socio-economic development, it is also important to highlight geoeological challenges related to water management and solid waste disposal within the park. Outdated and deteriorating infrastructure for the collection and transport of sanitary wastewater generated by administrative, accommodation, tourism, and hospitality facilities in Sutjeska National Park poses a serious threat to the quality of nearby watercourses (Spatial Plan of National Park Sutjeska, 2011). Moreover, the lack of a proper wastewater collection and treatment system, as well as the uncontrolled discharge of wastewater into natural water bodies—particularly lakes—has led to the onset of eutrophication processes (Hrelja, 2017).

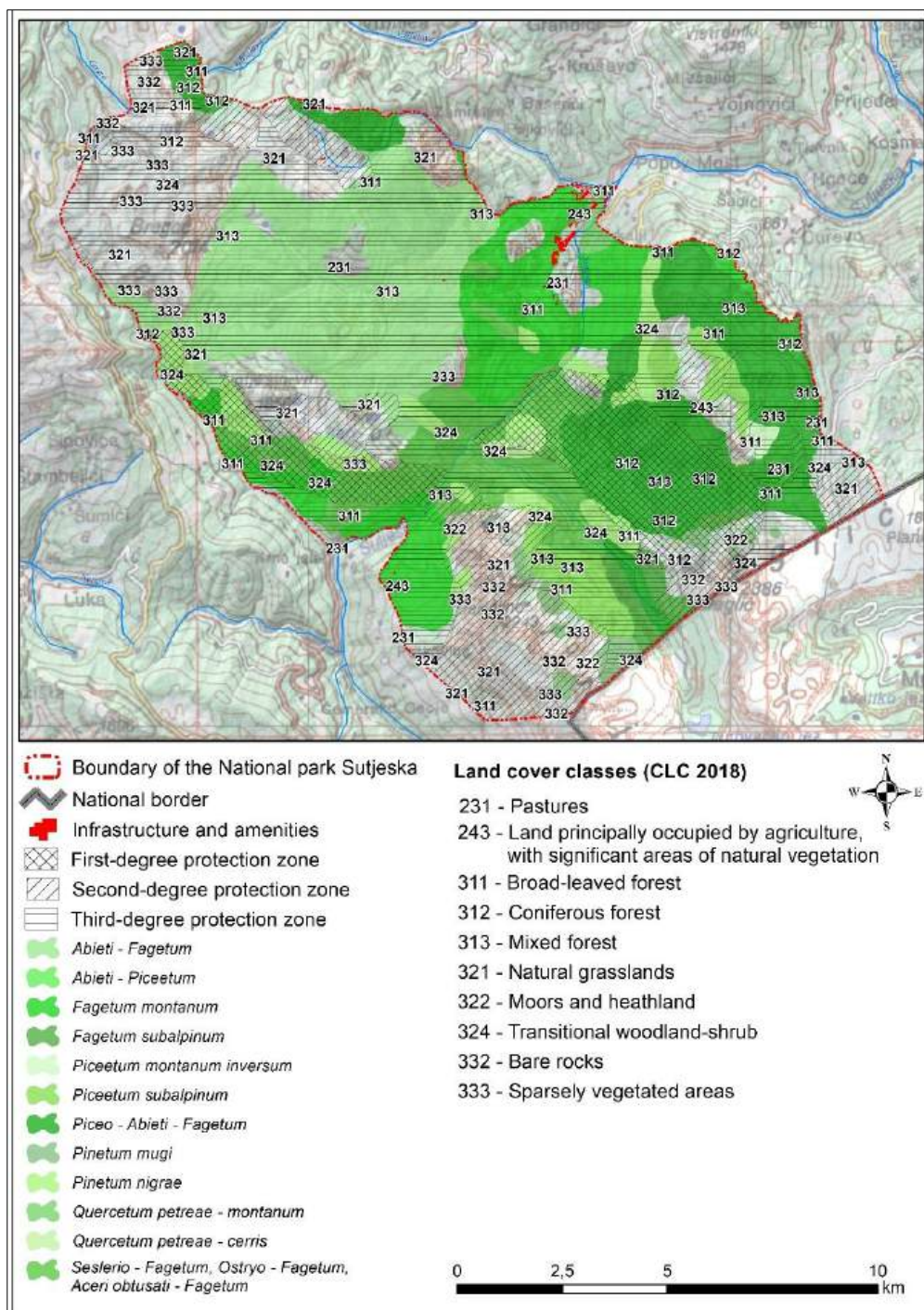


Figure 8: Land use transformation and infrastructure within protection zones of the Sutjeska National Park (1979–2018).

Data sources: Military Geographical Institute in Belgrade (1979, 1984); European Environment Agency (2018).

There is a growing interest in the use of the park's surface watercourses for energy production. The construction of small hydropower plants—two on the Sutjeska River and three on the Hračavka River—was declared a project of public interest by the entity-level government. The concession for the construction of these small hydropower plants within Sutjeska National Park was granted as early as 2006. However, the environmental impact studies were not approved, primarily due to non-compliance with legal procedures related to the preparation of such studies, and especially because the process was initiated without an existing spatial plan for the special-purpose area of the national park. According to the management of the Public Institution Sutjeska National Park, illegal waste disposal sites were previously present in the park, but these have since been removed, and regular cleanup actions are now carried out in cooperation with non-governmental organisations. The national park currently lacks a wastewater treatment system, and a sewage network has existed only in the settlement of Tjentište since the 1970s. A register of potential polluters has not yet been established. To date, no systematic mapping of species, flora, fauna, or habitats has been conducted, although such activities are planned as part of future projects to be implemented in cooperation with higher education institutions (Nogo, 2023). A particularly pressing issue in Sutjeska National Park is the management of solid waste. Due to the park's extensive area, the presence of a major transit road, and the high number of transit visitors and day-trippers, illegal dumping sites occasionally emerge throughout the territory of the park. These waste disposal sites are predominantly located along the main road between Foča and Gacko, as well as in the interior of the park at popular picnic spots, thereby significantly contributing to the visual degradation of the landscape. In addition to visitors who discard packaging and food-related waste, the presence of household waste originating from local residents is also noticeable at these dumping sites.

The municipal utility service of Foča has so far not provided waste collection and removal services in the park area. As a result, the removal and remediation of illegal dumpsites has been carried out by the park administration itself (Ministry of Spatial Planning, Construction and Ecology of the Republic of Srpska, 2013b). Recently, Sutjeska National Park has also faced financial difficulties, including employee strikes in 2021 and disruptions in park operations, which have had both direct and indirect effects on the management of this protected natural area due to insufficient resources for adequate administration. In addition to anthropogenic pressures on the protected natural area, the management of the Public Institution Sutjeska National Park has identified climate change as one of the most significant natural threats, exerting multiple effects on the functioning of the geosystem and biodiversity of the park. These impacts are particularly evident through the occurrence of droughts, which lead to a significant reduction in water levels in hydrological systems and reservoirs during the summer months, as well as through increased precipitation during the winter, which contributes to the intensification of torrential flows and erosion processes.

As a combined consequence of climate change and anthropogenic influence, forest fires have become increasingly frequent. In 2024, a wildfire in Sutjeska National Park affected approximately 150 hectares of forest, seriously threatening the survival of Perućica, one of the largest and oldest primeval forests in Europe—an event that could

have had irreversible consequences. To address accumulated environmental problems and achieve sustainable development of national parks, it is essential to implement proper management strategies aimed at resolving existing issues and shaping future sustainable development trajectories. The planning of sustainable development for all protected natural areas must be aligned with the geoecological values of individual spatial units. Such planning should involve spatial and functional reorganisation, leading to reclassification of land quality categories (e.g. upgrading highly valuable areas to the most valuable, converting predominantly low-value areas into moderately valuable, and unsuitable into predominantly unsuitable land units). Sustainable management can be achieved through the development and adoption of long-term strategic plans, coupled with the rational use of the most valuable and highly valuable spatial resources (as well as other land categories), while restricting socio-economic activities that negatively affect sustainable development.

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Chapter 3

The Bijambare Caves: A Protected Subterranean Landscape

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Geographical Location

The Bijambare Protected Landscape, located in the central part of Bosnia and Herzegovina, lies within the region of the Central Dinarides and covers an area of 497 hectares (Figure 1). It is bordered by Mount Zvijezda to the north and northeast, the Čemerno Mountains to the west and southwest, and Mount Ozren to the south and southeast. The area is situated approximately 25 kilometres north of Sarajevo (Drešković & Đug, 2006; Drešković & Mirić, 2017).

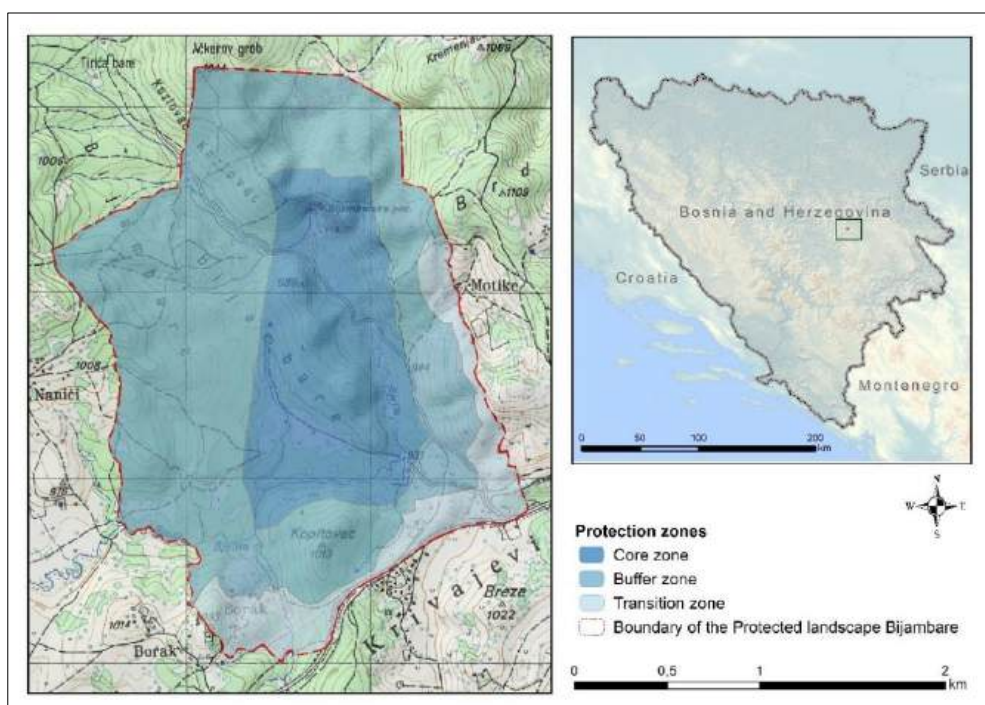


Figure 1: Geographical position and internal zoning of the Bijambare Protected Landscape in Bosnia and Herzegovina.

Data sources: Military Geographical Institute in Belgrade (1984), Cantonal Public Institution for Protected Natural Areas of Sarajevo Canton (n.d.).

Origin and Development

In the second half of the twentieth century, significant research efforts into the karst areas of Yugoslavia began to emerge. Among the most prominent researchers of the

Bijambare caves were Fukarek and Ržehak (1956), who, within the framework of the National Institute for the Protection of Cultural Monuments and Natural Rarities of the People's Republic of Bosnia and Herzegovina, addressed the challenges of cave protection and their valorisation as tourist sites (Mulaomerović & Osmanković, 2010). They considered the Bijambare caves to be of exceptional importance for both science and tourism, emphasising that the development of tourism infrastructure, coupled with permanent supervision, was the only viable method for the protection of these caves (Fukarek & Ržehak, 1956). Baučić and Ržehak (1959), as part of their research aimed at preparing Bijambare for development as a tourist complex, provided a detailed description of the climatic and meteorological conditions, the genesis of the caves, and each individual speleological feature. Within the former Yugoslavia, a total of 42 caves were developed for tourism, with Bijambare and Vjetrenica (in Popovo Polje) being the leading locations for speleotourism in Bosnia and Herzegovina (Mulaomerović, 2009). According to the Register of Protected Areas, in line with the Law on the Protection of Natural and Cultural-Historical Heritage of the Socialist Republic of Bosnia and Herzegovina, the Bijambare Cave was classified as a special geological reserve, Đuričina Cave as a geomorphological natural monument, and the Upper Bijambare Cave as a paleontological natural monument (Dalmatin et al., 2010).

Based on the high natural values of the broader Bijambare area, the Law on the Proclamation of the Bijambare Protected Landscape was adopted in 2003, initially covering an area of 367.36 hectares. The Management Plan for the Bijambare Protected Landscape for the period 2008–2018 was adopted in 2008, describing the area's natural and cultural-historical specificities, and assessing needs and risk factors. The plan serves to guide the development of strategies and specific actions in accordance with identified threats. The Spatial Plan for the Area of Special Features of the Bijambare Protected Landscape was adopted in 2009, with corrected boundaries. Based on this plan, a new Law on the Proclamation of the Bijambare Protected Landscape was adopted in 2010, expanding the area to 497.00 hectares. This law defines the protection categories, boundaries, spatial zoning, protective measures, and types of interventions, as well as the use and management of the area (Cantonal Public Institution for Protected Natural Areas of Sarajevo Canton, n.d.).

According to the Law on Nature Protection of the Federation of Bosnia and Herzegovina, aligned with the IUCN methodology for the categorisation of protected areas, the Bijambare Protected Landscape is classified as Category V – Protected Landscapes/Seascapes. Under the IUCN Framework for Categorising Protected Areas (1999), Category V includes areas shaped through long-term interactions between people and nature, characterised by ecological, biological, cultural, and aesthetic values. Maintaining this interaction, while preserving the associated natural and cultural assets, is key to the protection and long-term sustainability of the area (Ministry of Communal Economy et al., 2021). In accordance with the Law on the Proclamation of the Bijambare Protected Landscape, and based on the level of protection, three protection zones have been established:

Zone I (Core zone) encompasses the central part of the area, characterised by high levels of geodiversity and biodiversity, and includes the Srednja, Gornja, Donja,

Đuričina, Dimišina, Lednjača, Ledenica, and Nova caves, the ridge above the Bijambare cave, and the Bjelila stream with an educational centre. Within this zone, complete preservation of the natural environment is mandated. Prohibited activities include deforestation, mineral and fossil resource exploitation, hunting and fishing, harvesting of medicinal and edible plants, forest fruits, and mushrooms, collection of wild flora and fauna specimens, introduction of invasive species, grazing, construction near springs or in the watershed area, draining of peatlands, alteration of watercourses, use of motor vehicles (except emergency or specially authorised ones), open flames, and solid waste disposal.

Zone II (Buffer zone) serves as the intermediary space between Zones I and III. A particularly important segment of this zone is the stećci necropolis 'Mramorje', listed as a National Monument of Bosnia and Herzegovina since 2008. Conservation of ecosystems is permitted, alongside research and educational activities. Prohibited activities include logging (except sanitary felling), hunting and fishing, harvesting of medicinal and edible plants, forest fruits, and mushrooms—except by private landowners for non-commercial purposes—collection of wild flora and fauna, introduction of invasive species, motor vehicle use (without special permits), construction near springs, and any interventions that may alter hydrological conditions, the shape of riverbeds, natural flow, and surrounding landscape relations. All other activities that could interfere with the specified protective measures and zoning-based land use designations are also prohibited.

Zone III (Transition zone) includes the area along the southern and eastern boundaries, consisting mostly of privately owned land in the marginal settlements of Borak and Krivajevići. Protection measures here focus on preserving Zones I and II, with a ban on intensive economic activity, agriculture, and construction that would degrade natural values. Traditional housing is allowed, along with limited tourism development. The adopted law and management plan define Bijambare as a significant natural resource, enabling its sustainable use and the promotion of speleotourism.

The Management Plan is structured into three main chapters:

- I. Management Objectives and Policy,
- II. Guidelines for Sustainable Management, including assessment of the area, conservation concept, monitoring approaches, valuation of natural and cultural resources, and permitted activities per zone,
- III. Implementation Guidelines, outlining spatial and temporal planning and economic considerations.

This comprehensive approach to managing the Bijambare Protected Landscape contributes to the preservation of natural and cultural values, while laying the foundation for tourism valorisation in accordance with sustainability principles. Effective management and a balanced relationship between conservation and resource use are essential for the future overall development, particularly the tourism-related advancement of this unique natural area.

Physical-Geographical Characteristics and Values

From a geological standpoint, the area is predominantly composed of Lower Triassic Werfen shales, Middle Triassic limestones, and alluvial deposits. This block of limestone is bounded to the southwest by a flysch zone, which belongs to the Jurassic-diabase-chert formation, and the entire geological substrate was formed through overthrust processes (Temimović & Jahić, 2018). The diversity of landforms is the result of the varied petrographic composition of these rocks. Shales, marls, sandstones, and alluvial sediments, which retain water, have led to the formation of gentle and rounded relief features, while limestones have given rise to terrain with a more pronounced vertical component (Drešković et al., 2015).



Figure 2: Interior of the Middle Bijambare Cave.

The interior of the Middle Bijambare Cave illustrates the rich speleological features of this karst area, highlighting its geological value and potential for scientific and tourism interpretation.

Photo by A. Sivac, 2022.

According to Temimović and Jahić (2018), the contact zone between limestone layers and other formations is marked by a steep ridge of more resistant limestones, along which the softer Werfen deposits have been eroded and transported through subterranean fissures within the limestone. Due to the predominantly limestone composition of the terrain and pronounced karstification processes, the area is rich in a variety of karst features. Among the most notable elements of the natural heritage are the caves—Srednja (Figure 2), Gornja, Ledenjača, Ledenica, Dimišina, Đuričina, Donja, and Nova—which, along with several sinkholes in the northern part of the area, played a crucial role in the designation of this protected landscape. In terms of hypsometry, the broader area represents a distinct mountainous region, with elevations

ranging from 915 to 1,109 metres above sea level. Given its regional geographical position within the Mountainous-Basin Region of Bosnia and Herzegovina, this area is subject to the interaction of moderately continental climatic influences from the north and mountain climate influences from the south, resulting in a complex climatic profile. The average annual temperature is approximately 6.5 °C, while the average annual precipitation reaches 959 mm (Hrelja et al., 2021).

The hydrographic backbone of the Bijambare Protected Landscape is the Bjelila watercourse (Figure 3), which flows through the central part of the Nišići plateau and enters the Bijambare valley via a narrow gorge. In addition, Brodić stream contributes to the drainage of the area towards several sinkholes located near the Bijambare cave complex. Within the protected area, several water springs are found, albeit with relatively low discharge. Among them, the Studenac, Junakovac, and Babina Voda springs have been captured for use.

The interdependence between physical-geographical conditions and biotic factors in this area has resulted in the development of a large number of habitat types and a high level of biodiversity. A total of 133 different plant community associations have been identified, comprising more than 800 species of higher plants (Redžić et al., 2001). Based on their development and moisture regime, the soils within the protected area belong to the automorphic and hydromorphic soil divisions.



Figure 3: Swallow hole of the Bjelila Stream, Bijambare Protected Landscape. *This photograph captures the location where the Bjelila stream disappears underground through a karst swallow hole (ponor), a process characteristic of Dinaric karst systems. The visibly low water level and desiccated soil point to natural climatic pressures, increasingly threatening hydrological stability in protected areas.* Photo by A. Džaferagić, 2022.

Demographic and Economic Characteristics

The earliest evidence of human settlement within the Bijambare Protected Landscape is the discovery of flint artifacts in the Upper Bijambare Cave (Figure 4), considered to be the first Paleolithic cave site in the entire territory of Bosnia and Herzegovina, thus confirming the presence of prehistoric inhabitants. From a historical-geographical perspective, the broader Bijambare area did not attain significant importance until the 1920s. Although a medieval trade route connecting the Olovac parish with other regional centres (such as Sutjeska, Vrhbosna, and Dubrovnik) passed through the area, it remained sparsely populated. With the arrival of the Austro-Hungarian Monarchy, Bijambare and its surroundings were recognised as an important resource base, utilised for the exploitation of forestry and mineral resources. The discovery of the Bijambare caves in 1923 enhanced the touristic and speleological significance of the area.



Figure 4: View from the Upper Bijambare Cave.

The view from the Upper Bijambare Cave opens toward a forested mountain plateau, demonstrating the visual and ecological harmony between speleological and landscape values.

Photo by A. Sivac, 2021.

An analysis of the social characteristics and processes within the Bijambare Protected Landscape refers to a wider zone of influence, functionally encompassing parts of the municipalities of Ilijaš (Sarajevo Canton) and Olovo (Zenica-Doboj Canton). The protected area includes parts of the settlements of Kamenica, Krivajevići, Duševina, and Nišići, while the broader zone of influence comprises five local communities—Srednje, Kamenica, Gajevi, Dragoradi, and Ljubina—as well as the settlements of Bakići and Ajdinovići in the municipality of Olovo. These settlements are generally economically underdeveloped, and the Bijambare Protected Landscape represents the most promising economic asset for mitigating regional development disparities.

Demographic analysis indicates that there are no permanent residents within the protected area itself, which is primarily attributed to its functional designation for conservation and protection. The most populated adjacent settlement is Kamenica, with over 700 inhabitants according to the most recent 2013 census in Bosnia and Herzegovina. Depopulation of the broader Bijambare area has been further exacerbated by the armed conflict of the 1990s and the ongoing demographic transition. Migration patterns reveal a mobility of the population from rural areas to urban centres, primarily under the gravitational influence of nearby Sarajevo. In more recent years, trends such as the rising cost of urban real estate and the tertiarisation of the economy have led to some repopulation processes, although these remain insufficiently strong to reverse the post-war migratory trends. The area experiences intensive daily and weekly migration, while demographic aging is present but relatively moderate, due to higher birth rates (14.1‰) in the municipality of Ilijaš compared to the national average (9.2 ‰) (Agency for Statistics of Bosnia and Herzegovina, 2016).

The majority of the economically active population in the municipality of Ilijaš is employed in the secondary economic sector. Residents of the surrounding settlements are primarily engaged in subsistence agriculture, while additional income is partially generated through the rental of tourist accommodation. The natural conditions of the area are favourable for the cultivation of various agricultural crops. The Nišići or Crnoriječka depression is particularly known for the cultivation of cereal crops, especially buckwheat, as well as for the production of dairy products and the harvesting of forest fruits. However, land fragmentation remains a major constraint for more intensive agricultural activity.

‘The highest concentration of employment in the municipality of Ilijaš is in the manufacturing industry, where 2,085 workers were employed in 43 business entities in 2019. The total number of employees in legal entities based in the municipality of Ilijaš is 3,064, including all business entities headquartered within its territory’ (Municipality of Ilijaš, 2022). A smaller proportion of residents is employed in the tertiary and quaternary sectors, primarily in nearby urban centres. The ongoing tertiarisation of the economy includes the development of tourism, which has a notable impact on the landscape and land-use transformation. In general, economic

activity in the Bijambare Protected Landscape's zone of influence is on par with the national average, supported by a favourable transport-geographic location.

The morphological and physiognomic character of the settlements has been primarily shaped by physical-geographical factors. The area is dominated by small rural settlements composed of discontinuous clusters of residential units, occasionally more compact in structure depending on the natural environment. Recently, settlement concentration has increasingly followed the pattern of developed transportation infrastructure, with particular emphasis on the importance of the main road connecting Sarajevo and Tuzla. In earlier times, settlement patterns were mostly determined by natural conditions, such as the availability of arable land and water sources, which still affects the quality and sustainability of development in the protected area.

A noticeable trend in recent years, as noted in the Development Strategy of the Municipality of Ilijaš (2022), is the increase in the number of second homes and seasonal settlements, both spontaneously and intentionally constructed, displaying distinct spatial patterns. An example of a planned tourist resort is Ajdinovići, centred around a sports and recreational complex that offers facilities and infrastructure for multi-day stays by visitors and tourists. Although located outside the boundaries of the protected area, the proximity and content of this settlement contribute to a complementary tourism offering for the Bijambare Protected Landscape. The sustainable development of tourism in the area is grounded in alternative forms of tourism, including excursion-based, speleological, rural, and sports tourism. The protected area also holds significant educational value, owing to its rich geodiversity and biodiversity, as well as ethnological elements. In the past, log cabins made from locally sourced wood were commonly constructed in the area, but many of these traditional structures have since been replaced by buildings made from industrial materials, negatively impacting the traditional appearance of settlements. Nonetheless, in recent years, efforts have been made to preserve local architectural heritage, particularly for the purpose of accommodating tourists and generating economic benefit. This is exemplified by the construction of traditional rural log houses for tourism, such as in Begovo Ethno Village, which—with its structures and supporting infrastructure—represents an attempt to showcase the traditional architectural and cultural heritage of the region to visitors. The cultural and historical values of the Bijambare Protected Landscape also include a necropolis of medieval tombstones—stećci—known as 'Mramorje', which was designated as a national monument in 2008 by the Commission to Preserve National Monuments of Bosnia and Herzegovina. This necropolis has been located within the Bijambare Protected Landscape since 2013, having been relocated from its original site in Donji Čevljanovići to enable the construction of the Sarajevo–Tuzla main road.

According to the Decision on the Designation of the National Monument (Commission to Preserve National Monuments of Bosnia and Herzegovina, 2008), the protection measures for the stećci necropolis include the following:

- Permission for research and conservation-restoration works, including the presentation of the monument, subject to the approval of the competent ministry and expert supervision;
- Ensuring the openness and accessibility of the site to the public for educational and cultural purposes;
- Prohibition of infrastructure works without prior approval from the competent ministry;
- Authorisation for site arrangement and damage remediation works only upon the preparation of a detailed plan and with the ministry's approval;
- Prohibition of waste disposal and cleaning of the stećci from lichens and moss;
- Requirement for the installation of an appropriate fence to provide physical protection of the monument.

According to the Draft Management Plan for the Bijambare Protected Landscape (Ministry of Communal Economy et al., 2021) the overall condition of the cultural and historical values within the Bijambare Protected Landscape has been assessed as good, with an emphasis on the need for continuous maintenance and research in order to preserve and enhance their value.

Evaluation and Planning of Sustainable Tourism Development

The evaluation of natural and cultural resources, along with the planning of sustainable tourism development in the Bijambare Protected Landscape, is carried out in accordance with the *Draft Management Plan for the Bijambare Protected Landscape 2021–2030* (Ministry of Communal Economy et al., 2021) and the Law on Nature Protection of the Federation of Bosnia and Herzegovina (Official Gazette of Sarajevo Canton, 2010). In the context of sustainable tourism development, the Draft Management Plan identifies specific categories of natural and cultural-historical values, as well as recreational-tourist facilities and existing infrastructure. In addition, the plan defines permitted and prohibited activities for each established protection zone. Accordingly, and in line with the goal of enhancing both protection and tourism development within this protected natural area, the following activities are permitted in Zone I (the core zone):

- Removal of diseased trees to improve the health of forest stands,
- Mowing and ecological restoration of existing watercourses (especially the Bjelila stream),
- Spiritual recreation,
- Improvement of infrastructure (paths, benches) for spiritual and nature-based recreation, provided that such interventions align with the area's carrying capacity and do not compromise established natural and cultural values,
- Installation of electrical infrastructure in a manner that is harmonised with the ecological and spatial character of the landscape,
- Use of designated vehicles, subject to official approval,
- Development of centralised waste management, with an emphasis on minimising the use of waste bins and avoiding excessive littering,

- Installation of informative and interpretive signage, made from appropriate materials,
- Construction of traditional watermills as a reflection of local heritage,
- Conversion of the existing mountain lodge into a protected area management facility, in line with the Spatial Plan for the Area of Special Features.

In Zone II (the buffer zone), permitted activities include:

- Sanitary logging,
- Mowing,
- Recreational activities,
- Educational and scientific research,
- Construction of educational centres,
- Vehicle access, subject to prior approval,
- Development of tourism infrastructure, provided it is visually and environmentally integrated into the surrounding landscape,
- Maintenance of existing transport infrastructure.

Furthermore, in accordance with spatial planning and legal regulations, permitted activities in Zone III (the transition zone) include:

- Organic agricultural production,
- Livestock grazing, permitted for landowners and under official supervision,
- Development of small-scale businesses and traditional crafts,
- Construction of buildings in accordance with the Spatial Plan for the Area of Special Features,
- Use and management of the area's resources in a way that supports sustainable development.

The management of the Bijambare Protected Landscape and the implementation of planned activities are entrusted to the Cantonal Public Institution for Protected Natural Areas of Sarajevo Canton, in accordance with the Law on Nature Protection, the Management Plan, the Spatial Plan for the Area of Special Features, and all other relevant legal provisions. All users of the Bijambare Protected Landscape are required to comply with the Law on the Proclamation of the Bijambare Protected Landscape and the Law on Nature Protection of the Federation of Bosnia and Herzegovina, as well as associated bylaws and regulations. In accordance with earlier spatial planning documentation, an expansion of the Bijambare Protected Landscape has been proposed. Any potential redefinition of the area's boundaries and protection measures, which should unquestionably be based on professional and scientific expertise, would contribute to the optimisation of legal protection for the unique natural unit formed by Mount Zvijezda and the Bijambare Protected Landscape. These activities would have positive effects both in terms of preserving this natural integrity and enabling the development of various forms of tourism aligned with sustainability principles. Moreover, such an approach would encourage greater involvement of the local community in activities aimed at preserving the natural and cultural values of the area, as well as in the advancement of tourism and broader economic development of the region. Field research and analysis of spatial planning documentation have confirmed that there are no permanently inhabited settlements within the Bijambare Protected

Landscape. However, in support of preservation and tourism valorisation, certain elements of infrastructure have been partially developed. Some existing facilities, such as the former military barracks complex, are currently inadequate in terms of infrastructure and lack clearly defined functions. The management plan and spatial planning documents envisage the repurposing of such structures to serve the objectives of nature conservation and sustainable tourism development. At the same time, several facilities are in relatively good condition, including the recently renovated parking area with an entrance toll booth, an educational and forest trail, park furniture, children's playgrounds, and the paths leading through the Srednja and up to the Gornja Bijambare Cave.

The primary indicative factor for the designation of the Bijambare area as a protected site, and for its subsequent tourism valorisation, is the Srednja Bijambare Cave. In addition to this cave—recognised for its exceptional tourism value—other caves and peatland in the area (Figure 5) have also contributed to its tourism potential. A variety of additional facilities have been developed to ensure an optimal tourist experience, including mountain shelters and park infrastructure for outdoor recreation and relaxation, children's play areas, an educational centre, and thematic trails, all of which enhance the overall quality of the visitor experience.



Figure 5: Bijambare peatland.

High-altitude peatland in the Bijambare Protected Landscape represents a rare geomorphological and biogeographical phenomenon, shaped under specific geological and climatic conditions. The composite image illustrates both an aerial perspective (left) and a ground-level view (right), highlighting the structure and vegetation of these sensitive habitats. The presence of Sphagnum mosses underlines the ecological significance of their preservation in the face of climate change.

Photo by E. Hrelja, 2024.

Future planning and development of complementary tourism amenities will focus on the transition zone, which—according to spatial and legal documentation—offers the possibility of establishing such facilities, in line with modern nature protection concepts. The Bijambare Protected Landscape possesses significant spatial potential for the development of ecotourism, with particular emphasis on sports-recreational

and event-based tourism. In order to improve both the protection of natural and cultural values and the quality of the tourism supply, more substantial financial investments and stronger cooperation among all relevant stakeholders, including the local community, are required. In this context, several projects have undertaken activities aimed at promoting greater local community engagement.

Business plans have been developed for various ideas that could positively contribute to the sustainable development of tourism. However, for the successful implementation of these project concepts, additional support and involvement from different levels of government is essential. Sports-recreational tourism is feasible across much of the protected area, where such activities are permitted, and primarily includes cycling and nature walks, for which conditions are ideal. Event-based tourism mainly refers to environmentally themed events, organised to coincide with significant ecological dates. It is crucial, however, to define carrying capacity limits in order to determine the optimal number of visitors and to reduce ecological pressures on the area. These pressures generally stem from high concentrations of visitors within relatively small zones, resulting in physical damage to natural and cultural assets, along with increased levels of noise and solid waste. Such negative spatial impacts are most pronounced in the main access zone, particularly in Zones II and III, and in the peripheral parts of Zone I, which are also the areas with the highest visitor frequency (Jukić et al., 2020, 49).

To improve the management of natural and cultural-historical values within the Bijambare Protected Landscape, the *Draft Management Plan for the period 2021–2030* (Ministry of Communal Economy et al., 2021) proposes, among other measures, the following:

- Re-evaluation of the area, aimed at aligning the protection regime with nature conservation goals and preserving the interaction between people and nature;
- Continuous monitoring of flora and fauna, along with the development of a comprehensive biodiversity database;
- Preservation of landscape values and prevention of changes in agricultural land structure;
- Implementation of long-term monitoring of speleological sites;
- Adaptation of forestry practices during sanitary felling operations;
- Preservation of surface water quality through coordinated water management.

To realise these goals, additional financial investments are necessary in all aspects of spatial protection, including the improvement of sustainable tourism development. This also implies the reconstruction of existing tourism infrastructure, in accordance with nature protection principles and the landscape architecture of the region. Such an approach facilitates active involvement of the local community in the overall concept of sustainable development, offering opportunities for the growth of various economic activities, the creation of new jobs, and the preservation and enhancement of environmental and scenic values—ultimately contributing to the overall attractiveness of this protected area.

Tourism in the Bijambare Protected Landscape

The Cantonal Public Institution for Protected Natural Areas of Sarajevo Canton was established in 2010 and manages five protected areas that were designated between 2002 and 2017, one of which is the Bijambare Protected Landscape. The institution permanently employs 26 staff members, with an additional 15 working on a project basis. It is funded through the budget of Sarajevo Canton, its own revenues, and project-based funding obtained through various applications (Čolaković, 2023). The Bijambare Protected Landscape is distinguished by its natural and cultural-historical values. It is organised into protection zones, each with clearly defined restrictions and permitted activities. A Spatial Plan for the Area of Special Features has been adopted for Bijambare, further regulating land use and planning. The management plan and spatial planning framework for the protected area are not in conflict with any higher-level strategic or developmental planning documents. The number of visitors to the Bijambare Protected Landscape is recorded through the ticketing system for entry into the protected area. Due to its proximity to Sarajevo and other smaller urban centres, the area experiences high visitor frequency, with an average of approximately 65,000 visitors annually. In 2024, a total of 74,124 visits were recorded, indicating a clear positive trend in visitor growth. Most visits are day trips, primarily by domestic visitors, while visits by international visitors are typically part of a complementary tourism package. Tourism activity is seasonal, occurring mostly from late spring to early autumn. The institution operates internal transportation within the protected area (a tourist train) and organises guided tours to the main Bijambare Cave. During the 2020–2021 period, when epidemiological measures related to the COVID-19 pandemic were in effect, there was a decrease in visits by foreign visitors and organised school groups, which negatively affected the institution's ability to fund certain planned activities. However, there was a notable increase in visits by the local population, resulting in higher maintenance and monitoring costs. With strengthened oversight of tourism activities, nature conservation guidelines are being followed appropriately, and no major issues have been reported. The main challenge remains the regulation of stationary traffic, due to the lack of parking space and the common habit of visitors arriving in private vehicles. Another issue is the generation of large volumes of municipal waste by visitors. Although the carrying capacity of the protected area has not yet been formally established, a visitor management plan is currently under development, which will include a detailed assessment of visitor limits and carrying capacity. Direct supervision of conservation compliance is conducted by an officially designated monitoring and enforcement unit, established in accordance with the Regulation on the Organisation, Operational Procedures, and Powers of the Nature Protection Supervision Service in the Federation of Bosnia and Herzegovina, which outlines the rights and responsibilities of personnel within the service.

Promotion and interpretation of individual natural values, cultural heritage, and other attractions within the Bijambare Protected Landscape are conducted via the institution's official website and social media platforms, as well as through interpretive boards placed throughout the site. In accordance with the staffing

framework for protected natural areas, a permanent, qualified guide is employed within the Bijambare Protected Landscape to lead guided cave tours and to present the area's biodiversity, geodiversity, and thematic trails to visitors (Čolaković, 2023). Cooperation with the local community within the protected area is assessed as positive. The conservation of nature and the cultural landscape, as the primary mandate of the management institution, is a highly complex task due to diverse stakeholder interests and the wide range of activities required for the overall advancement and sustainable development of the area. A management plan is adopted for each protected natural area, which includes action plans defining how specific activities are to be implemented. Its adoption is legally mandated, involving a public consultation process and public hearings, in which all land users, including the local community, are invited to participate.

The inclusion of the local population through various thematic workshops, organised meetings, and individual consultations on topics of specific interest allows for the education of residents and other stakeholders within the protected area. In line with this approach, a variety of scientific-professional, educational, and cultural events are regularly held within the Bijambare Protected Landscape to encourage the active participation of the local community in all aspects of the area's conservation and development. Among these, the traditional event Colors of Autumn (*Boje jeseni*) stands out, showcasing local products and fostering community engagement through the sale of handicrafts and traditional goods. The Cantonal Public Institution for Protected Natural Areas cooperates successfully with numerous associations and non-governmental organisations focused on the protection and promotion of natural values. This collaboration includes technical assistance in event organisation, coordinated in accordance with available resources and local capacities. The local population expresses a positive attitude toward the development of tourism within the protected area and actively supports its promotion. Currently, no conflicts with space users have been reported. However, certain challenges remain, particularly related to restricted vehicle access to some facilities and locations. An additional concern is the proper management of wastewater in areas that are not connected to the sewer system. This issue is especially relevant given that the study area lies in a karst landscape, which is highly susceptible to water percolation, thereby potentially affecting other geosystem components. Tourism providers have not yet been directly involved in projects within the protected area. As such, tourism development is primarily based on spatial and management plans and the expert and scientific assessments conducted within the protected area itself. Cooperation between the protected area's administration and tourism providers, based on shared interests, could significantly contribute to the development of sustainable tourism and the overall improvement of the tourism sector. Cooperation with government authorities at all levels is also assessed as positive. Currently, the institution does not have the staffing capacity required to initiate and maintain the procedures necessary for membership in the EUROPARC Federation or similar organisations, although such membership would likely bring substantial benefits to the development of the area. Nonetheless, the institution is actively involved in cross-border projects and is already a member of the regional network 'Parks Dinarides', which connects protected areas in the Western

Balkans. This network enables enhanced cooperation among protected areas in the region and contributes to the strengthening of nature conservation efforts. There is notable potential for further development within this regional association, as well as for greater integration with other similar networks—all of which can facilitate the transfer of best practices in both natural and cultural heritage conservation and tourism development. Currently, the institution does not implement structured programmes to support economic activities within the protected area, aside from occasional promotional efforts. Moreover, a territorial brand specific to the study area has not yet been developed (Čolaković, 2023). To enhance the tourism offer and ensure the sustainable development of the protected natural area, the cooperation of all stakeholders, including various levels of government, is essential. Unfortunately, this is often lacking in practice. For instance, there is potential for the reconstruction of certain structures within the Bijambare Protected Landscape, which falls under the jurisdiction of Sarajevo Canton, as the legal owner of the facilities. However, cantonal authorities have not undertaken any significant actions in this regard for an extended period. Should the reconstruction of these facilities eventually take place, further development and management would fall under the responsibility of the Cantonal Public Institution for Protected Natural Areas. In addition to the threat posed by climate change, one of the most serious obstacles to the future development of the area is the insufficient understanding of the concept of sustainability among various stakeholders. This deficiency has direct consequences for the effective functioning and preservation of the area's environmental, cultural, and spatial components. Another major concern is the absence of a clearly defined carrying capacity, that is, the maximum number of visitors the protected area can accommodate without causing significant negative impacts on its geodiversity and biodiversity. Furthermore, there is a notable shortage of qualified personnel and financial resources, which hinders the implementation of activities outlined in the management plan.

The institution has adopted a Management Plan for Protected Natural Areas, which is implemented through annual programmes based on detailed yearly action plans. If the aforementioned challenges and threats are adequately addressed, the future development of the area will proceed in line with the objectives established in the planning documents. There is a strong need for intensified efforts in education and intersectoral coordination, in order to foster better collaboration between the management authority and other land users within the protected area. Similarly, for the active participation of the local community and other stakeholders in the sustainable development of Bijambare, greater efforts must be made to motivate and engage residents in addressing common spatial development issues. The Management Plan also includes visitor and tourism infrastructure development strategies, as well as frameworks for cooperation with tourism service providers. As for the 'open-air' tourism infrastructure, annual maintenance and improvements are carried out regularly. These activities are either undertaken as part of the institution's regular responsibilities or through project implementation, with applications submitted to various domestic and international organisations and institutions. The spatial distribution of natural-geographical and cultural-historical tourism attractions within the Bijambare Protected Landscape is presented in Figure 6.

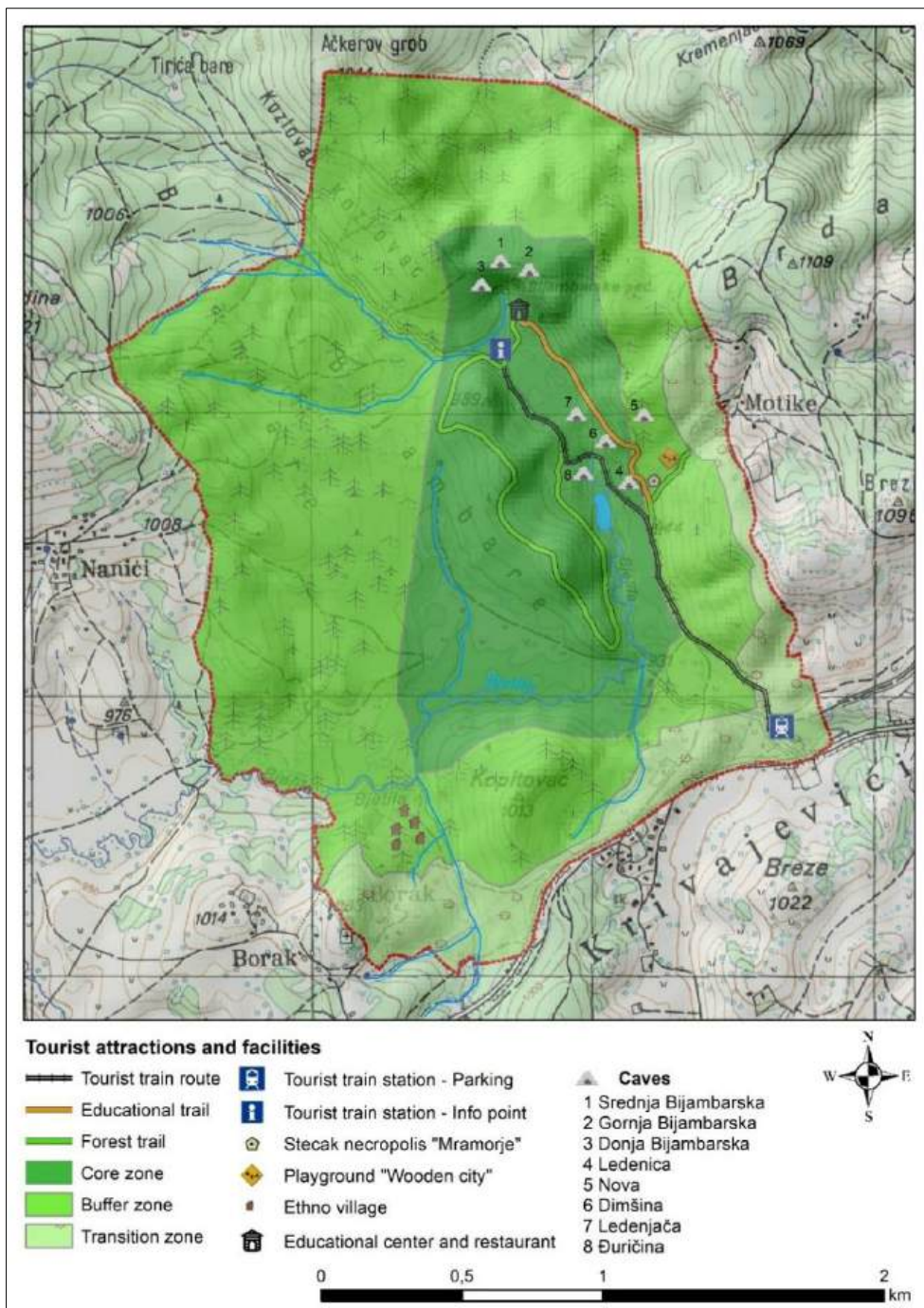


Figure 6: Spatial distribution of natural-geographical and cultural-historical tourist attractions within the Bijambare Protected Landscape.

Data sources: Military Geographical Institute in Belgrade (1984); Cantonal Public Institution for Protected Natural Areas of Sarajevo Canton (n.d.).

Geographical Impacts of Socio-Economic Development

Throughout its historical and geographical development, the natural system of the Bijambare Protected Landscape has not been significantly disrupted by anthropogenic impact. This preserved natural balance is evident in the existing land cover, where subtle yet noticeable differences between climazonal and actual vegetation remain. The protected area of Bijambare features a diverse mosaic of land types, including pastures, cultivated plot complexes, and coniferous and mixed forests. The area is predominantly covered by coniferous forests, which occupy 324.64 hectares, or 65.19% of the total surface area. Pastures are the second most prominent land cover type, comprising 77.88 hectares, or 15.11% of the protected landscape. Mixed forests cover approximately 58.27 hectares, or 11.70%, while cultivated land parcels account for the smallest share, with around 40.06 hectares, or about 8% of the total area. An analysis of land cover changes based on CORINE Land Cover (CLC) datasets from 2000 and 2018 revealed that no major changes occurred in the vegetation cover during this period. Specifically, no significant reduction in plant communities was detected. The area occupied by pastures decreased only marginally (by 0.01 ha), in favour of cultivated parcels—representing the only notable change in land cover in the recent period. However, a comparative analysis of real forest vegetation maps from 1979 and CLC data from 2018 revealed a total reduction of 35.29 hectares in forest cover within the Bijambare Protected Landscape—equivalent to about 7% of its total area—indicating more substantial long-term changes in forest vegetation. More specifically, the analysis showed that the forest-covered area was reduced by 64.76 hectares in the central zone along the main walking trail, which extends in a northwest–southeast direction from the entrance of the protected area to the vicinity of the educational centre located in the core zone (Figure 7).

This intensive reduction in forest area can be attributed to both logging activities associated with trail expansion for visitors, and the impacts of wartime and post-war military actions in the immediate vicinity of a former military barracks located within the protected area. At the same time, forest cover increased by 29.47 hectares across several discrete spatial segments—notably in the immediate vicinity of the entrance gate, as a result of planned afforestation, and in the westernmost sections and central part of the protected area along the Bijelila stream. This increase can be attributed to the natural process of forest regeneration, which has occurred due to reduced human and livestock activity, as well as the cessation of agricultural land cultivation. Figure 7 provides an overview of the main ecological challenges currently facing this protected area. As a consequence of the armed conflict during the 1990s in Bosnia and Herzegovina, this area was heavily affected by warfare, resulting in the presence of a considerable number of unexploded ordnances. This has significantly hindered the tourism potential and development of the region (Mirić et al., 2016).

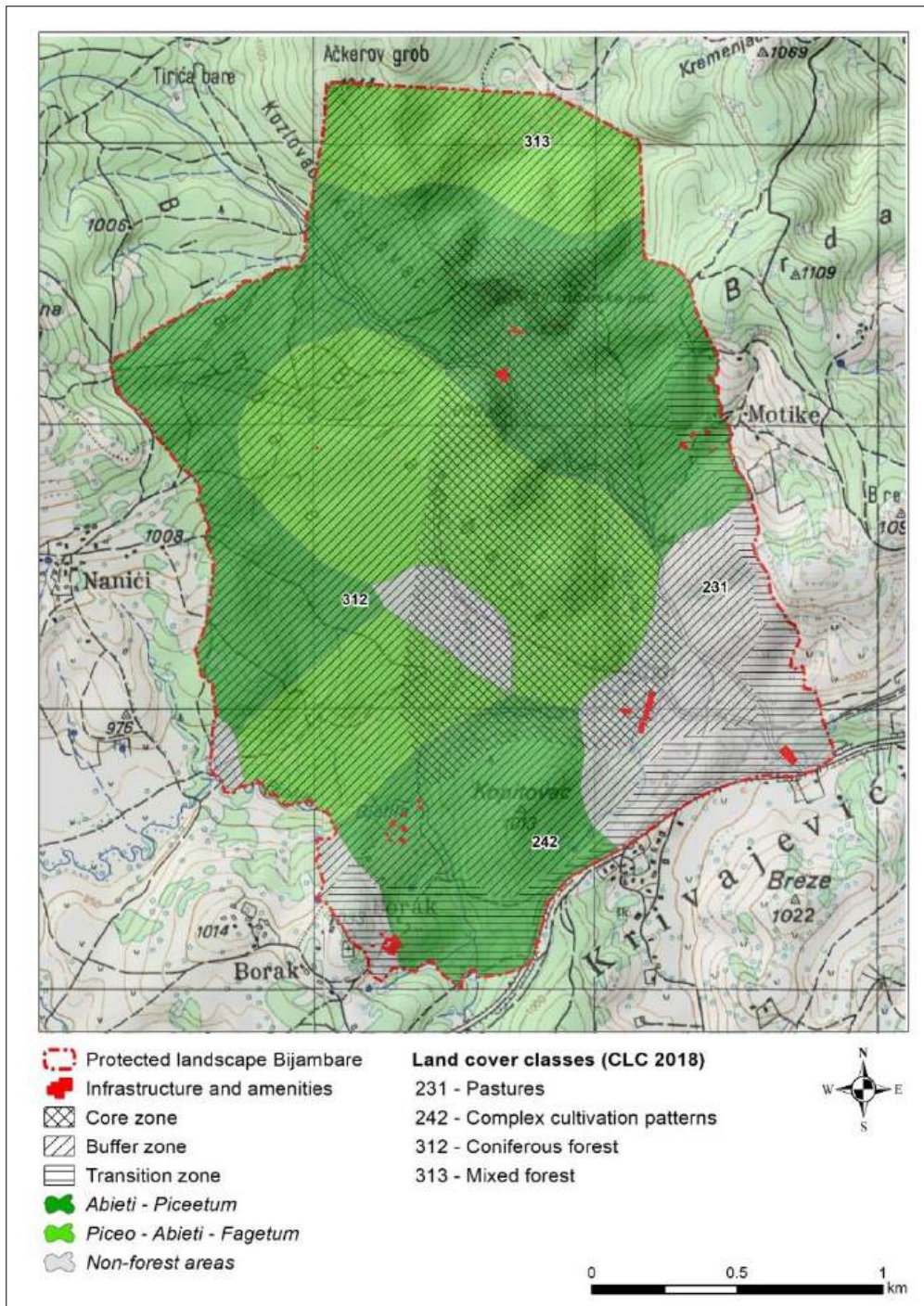


Figure 7: Land use transformation and infrastructure within protection zones of the Bijambare Protected Landscape (1979–2018).

Data sources: Military Geographical Institute in Belgrade (1979, 1984); European Environment Agency (2018); Cantonal Public Institution for Protected Natural Areas of Sarajevo Canton (n.d.).

Recently, there has been an intensification of sanitary logging in the study area, primarily due to the presence of bark beetle infestations. This phenomenon can be partially attributed to climate change, which has led to higher average air temperatures, favouring the prolonged survival of bark beetles. However, the sanitary felling of infested trees has had negative consequences for both biodiversity and geodiversity, particularly in relation to the vulnerability of peatlands. Specifically, the movement of vehicles used for sanitary logging has led to artificial soil trenching in peatland zones. Such activities directly contribute to water drainage and the drying out of peatlands, thereby threatening this highly valuable natural phenomenon (Figure 8).



Figure 8: Ecological pressures on the Bijambare.

Degraded peatland in the Bijambare Protected landscape, showing rutting and drainage caused by vehicle movement during sanitary logging operations.

Photo by E. Hrelja, 2023.

The built-up areas within the Bijambare Protected Landscape are very limited in size, occupying just 0.74 hectares, or 0.15% of the total surface area. These areas include structures for permanent and seasonal residence, an educational centre, park furniture for excursionists, children's playgrounds, a fairground space, tourist and educational trails, open sports courts for volleyball, basketball, and football, an educational-recreational camp under construction (on the site of the former military barracks), and parking areas. However, more than half of the built infrastructure—specifically 53%, or 0.392 hectares—is located in the first protection zone (Zone I), the core zone of the protected landscape. This zone is of highest geographical importance, characterised by geological, hydrological, and floristic diversity, as well as natural heritage values that must be fully preserved.

Zone II, the buffer zone, contains the smallest share of built infrastructure, with only 0.086 hectares, or 12% of the total built area. This zone primarily includes individual secondary residential structures used by the population on a temporary basis.

The transitional Zone III encompasses 0.026 hectares, or 35% of the total built infrastructure within the protected landscape. Built structures in this zone are

predominantly concentrated in the Borak area (home to the Ethno-Village Begovo Selo) and in the Motike area. This figure also includes several devastated structures—damaged or destroyed during the war—which have not yet been rehabilitated, resulting in additional visual degradation of the protected landscape.

A particular concern regarding the existing built structures within the Bijambare Protected Landscape is the fact that the core zone (nucleus)—specifically the educational centre—serves as a major tourist node within the protected area. Located in close proximity to the primary tourism development driver of the site—the Gornja, Srednja, and Donja Bijambare Caves complex—the educational centre is accompanied by supporting infrastructure such as a restaurant, public restrooms, and a children's playground, all of which attract a large number of visitors throughout the year. In 2019 alone, the protected area received over 68,000 visitors, with approximately 25,000 visiting the Srednja Bijambare Cave. These figures underscore the urgent need to define the site's carrying capacity and regulate visitor numbers. Such measures are crucial for ensuring sustainability, preventing further degradation of natural landmarks, and preserving the quality of plant and animal life in the area.

The planned construction of an ecological educational camp on the site of the former military barracks is envisioned as a relief mechanism for the nucleus. By developing tourist reception and accommodation infrastructure in the transitional area between the buffer zone and the nucleus, pressure on ecologically sensitive parts of the protected landscape would be significantly reduced, contributing to the preservation of its natural values. The tourism and communal infrastructure within the Bijambare Protected Landscape is currently at a relatively satisfactory level. At the entrance to the protected area, an oil and oily runoff separator has been installed for preventive purposes. Additionally, within Protection Zone I, a grease and organic oil separator has been installed to capture pollutants from wastewater generated by the nearby hospitality facility (Figure 9).

Wastewater treatment in this facility is conducted in accordance with legal regulations governing the discharge of wastewater into the environment and public sewage systems. According to these regulations, the Cantonal Public Institution for Environmental Protection is required to conduct biannual monitoring of wastewater quality at this site. A bio-purifier for sanitary and faecal wastewater with aeration has also been installed, serving as a positive example of efforts by responsible institutions to prevent the degradation of hydrological resources. However, there is no centralised sewage network in place. Wastewater is only partially treated through the use of septic tanks, the coverage of which remains insufficiently documented. Environmental supervisors are limited to compiling official reports, which only allow for inspection and enforcement after problems arise—such as stream contamination caused by wastewater discharge from private properties.



Figure 9: Wastewater treatment infrastructure in the Bijambare Protected Landscape. *Biological treatment unit with a grease and oil separator located in the core tourist zone of the Bijambare Protected Landscape.*

Photo by A. Sivac, 2022.

This lack of systematic monitoring and infrastructure highlights the need for urgent and comprehensive measures to ensure the full protection of water resources within the protected landscape. The hospitality facility located within the nucleus of the Bijambare Protected Landscape, and operating as part of the educational centre, is equipped with a septic tank covering an area of 30 m². In 2019, the Institute for Public Health of Sarajevo Canton conducted monitoring of the Bijelila stream, including physico-chemical and microbiological testing. The results revealed the presence of pathogenic microorganisms in water samples collected during the spring and autumn seasons (Ministry of Communal Economy et al., 2021). These microorganisms were found to be inconsistent with the standards prescribed by regulations governing the quality of natural mineral and spring waters, indicating serious water quality issues. Such findings necessitate urgent intervention and remedial measures to improve the condition of water resources, in order to protect ecosystem health, safeguard the well-being of the local population, and prevent further environmental degradation. Within the protected area, there is a notable lack of public toilets, especially given the increasing number of visitors. At present, only one public restroom is available, clearly underscoring the need to construct additional sanitary facilities. It is recommended that these facilities be built in designated areas where such interventions are permitted—preferably near the parking lot at the entrance to the protected area—and be connected to a public sewage system.

Waste management infrastructure within the Bijambare Protected Landscape is characterised by the presence of a larger number of wooden waste bins, which are evenly distributed throughout the area, and a smaller number of waste collection

containers. Waste removal is carried out regularly, in accordance with the area's needs. Notably, no illegal dumping sites have been identified, which reflects effective waste management practices within the protected area. In order to safeguard and preserve the geodiversity and biodiversity of the Bijambare Protected Landscape, a system of continuous monitoring of natural values has been established. This process is conducted in coordination between the area's managing authority and the scientific/academic community, as well as through the individual engagement of experts from relevant scientific disciplines. While there is no formal register (cadastre) of potential polluters, long-term monitoring activities have identified several potential sources of pollution, which are now under continuous observation. In this context, the managing authority has established a WebGIS viewer with the aim of mapping the distribution of invasive species and threatened habitats, and for the purpose of assessing the level of endangerment of native habitat types and species. The viewer is continuously updated, and a spatial database of existing habitats and species has been developed. As part of the manager's regular operations, the identification and removal of invasive species is also carried out.

To further improve infrastructure quality and preserve the natural values of the Bijambare Protected Landscape, additional steps are necessary. Although the current tourism and utility infrastructure is relatively satisfactory, the presence of water pollution and the lack of an appropriate sewage system highlight the need for urgent interventions. It is recommended that additional sanitary facilities be constructed, and that existing wastewater treatment systems be upgraded, in order to reduce pressure on hydrological resources and enhance the overall ecological quality of the area. Moreover, the continued monitoring and data updates via the WebGIS platform are crucial for tracking biodiversity status and preventing the spread of invasive species. Activities of this nature—especially when supported by enhanced coordination with local communities and collaboration with relevant experts—contribute to the preservation and sustainable development of this protected area. In doing so, they help to ensure its long-term sustainability and attractiveness for visitors.

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Chapter 4

Hutovo Blato: A Protected Mediterranean Wetland and a Habitat for Migratory Birds

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Geographical Location

Hutovo Blato Nature Park is located in southern Bosnia and Herzegovina, within the physiognomic region of Low Herzegovina, and spans 7,824 hectares. It lies east of the lower Neretva River, within the Čapljina–Hutovo cryptodepression (Figure 1). The wetland complex is divided by a limestone ridge into two parts: the Upper Wetland (Deransko Lake) and the Lower Wetland (Svitavsko Blato). The Upper Wetland, covering 2,130 hectares, includes Deransko Lake, along with the areas of Jelim, Radanovac, Orah, Drijen, and Škrka Lake to the west. The smaller Lower Wetland comprises Svitavsko Blato and Svitavsko Lake (Aganović, 1952; Hrelja et al., 2021).

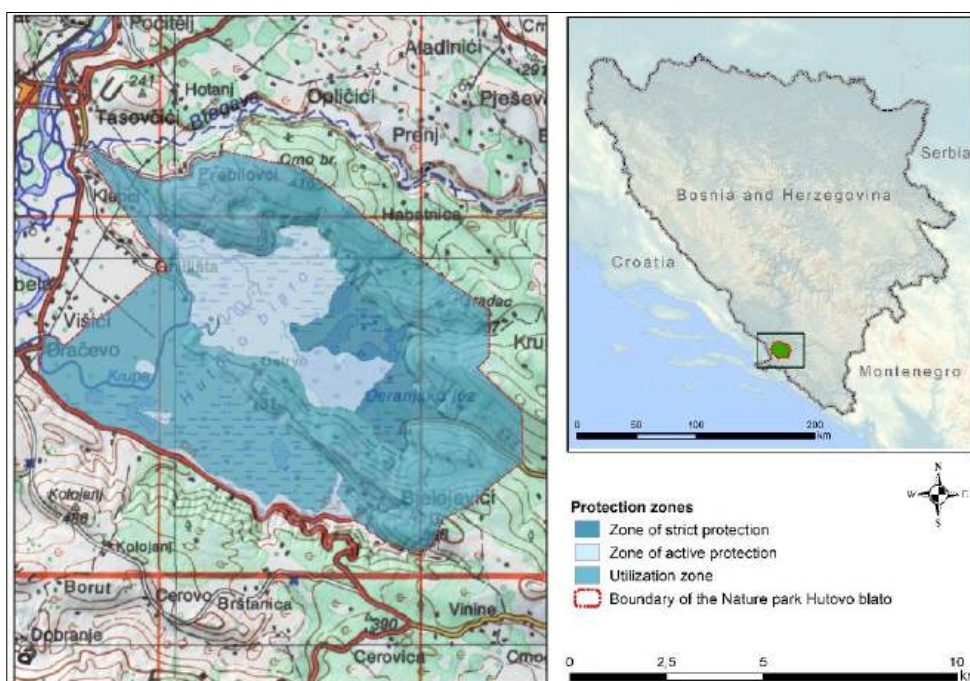


Figure 1: Geographical position and internal zoning of the Hutovo Blato Nature Park in Bosnia and Herzegovina.

Data sources: Military Geographical Institute in Belgrade (1984); Elektroprojekt d.d., & Eco Plan d.o.o. (2013).

Origin and Development

Due to its specific physical-geographical characteristics, which have enabled the development of rich flora and fauna, the area of Hutovo Blato has long been recognised as a significant habitat for numerous plant and animal species (Bukvić et al., 2021). From this perspective, various attempts have been made throughout history to place it under different protection concepts. The first forms of pseudo-protection were established after World War II, when the area was declared an elite hunting ground, primarily catering to international visitors from Italy. More concrete protection efforts began in 1954, when an ornitho-faunal reserve was established, covering an area of 6,144 ha, within which a strict bird reserve, Škrka (350 ha), was delineated and entirely closed to hunting, fishing, and other economic activities.

Given that Hutovo Blato serves as a resting and feeding site for migratory birds travelling from northern parts of Europe toward the south, the area was recognised as internationally important. In 1971, it was included in the 'List of Wetlands of International Importance', followed in 1980 by its inclusion in the Mediterranean Wetlands Conservation Programme. Despite this recognised international importance, Hutovo Blato remained an elite hunting area until 1995, when, on March 30, it was officially declared a Nature Park (Dalmatin et al., 2008). Additionally, since 1988, this protected area has been listed by the International Council for Bird Preservation (ICBP) and is recognised as an Important Bird Area (IBA). In 2001, Hutovo Blato was included on the list of wetlands of international importance according to the Ramsar Convention methodology (Gekić et. al, 2022). With the adoption of the Nature Protection Act in 2003, Hutovo Blato received an official IUCN categorisation as a Category V protected area (Nature Park). It is also included on the Provisional List of National Monuments of Bosnia and Herzegovina.

The park is a member of the Dinaric Parks Association, which includes over 150 protected areas from seven countries. The park administration continuously invests efforts into improving collaboration and integrating into relevant international and regional associations dedicated to nature conservation. One such example is the ongoing initiative to join the EUROPARC Federation, the leading European network of protected areas. This initiative would enhance institutional support, facilitate the exchange of experiences, and enable the implementation of modern approaches to natural heritage protection. Moreover, according to the park administration, several initiatives have been launched during national gatherings dedicated to Bosnia and Herzegovina's protected areas—such as the annual Dinaric Parks Conferences and meetings of protected area managers—to establish a Bosnia and Herzegovina Parks Association. Although such an association would represent a significant step forward in strengthening cooperation and coordination among protected areas, previous efforts have yet to result in a concrete institutional outcome. Since 2003, a large number of scientific and professional studies, as well as a Management Plan and a Spatial Plan, have been developed for this area. These documents provide the foundation for planning and implementing all sustainable development activities carried out within the park. The Spatial Plan and the Management Plan of Hutovo Blato Nature Park, implemented for the period 2013–2023, are based on the principles of protection and

self-sustainability. Tourism plays a particularly important role, as it is one of the primary economic sectors capable of stimulating the development of other economic activities such as agriculture, livestock breeding, and beekeeping. These activities are encouraged in a way that allows local residents to engage in sustainable economic endeavours defined by the park's protection framework (Zovko, 2023).

Physical-Geographical Characteristics and Values

The broader area of Hutovo Blato Nature Park is predominantly composed of Upper Cretaceous bedded limestones and dolomites, which are water-permeable rocks characterised by fractured and cavernous porosity aquifers. The southern part of the Ostrovo area, stretching from Hutovo Blato in the northwest to the Stolovi range in the southeast, is composed of Upper Eocene deposits. Lithologically, these terrains consist of nummulitic limestones, which also feature cavernous-fractured porosity aquifers. The Eocene flysch in the wider Hutovo Blato area represents only a partial remnant of what was once a much more extensive flysch zone. This zone has been significantly altered by post-Eocene orogenic movements, and especially by erosion during the late Tertiary and Quaternary. As a result, the Eocene flysch appears only in narrow zones between the Cretaceous limestones. Paleocene–Eocene formations, lithologically represented by massive and bedded limestones, sometimes brecciated or marly, which are low-permeable to impermeable rocks, form the southern part of the park, from Doljani in the southwest, across Kolonjani and Vinina to Crnoglav in the southeast. The central part of the nature park, specifically the area of Hutovo Blato (encompassing the broader Deransko and Svitavsko Lake area), is composed of Quaternary deposits, lithologically made up of alluvial sediments and marsh deposits (gravel, sand, and clay). From a geomorphological perspective, Hutovo Blato Nature Park belongs to the macroregion of the External Dinarides, within which it is distinguished by its accumulation-tectonic and polje–depression relief (Lepirica, 2012). At the end of the Tertiary period, the aquatic complex of Hutovo Blato was affected by intense orogenic-tectonic movements. These tectonic subsidence processes continued even after the Pleistocene, and the cryptodepression of Hutovo Blato is considered clear evidence of neotectonic downwarping of the terrain (Spahić, 1986). Hutovo Blato is a cryptodepression formed by the submergence of the Adriatic coast and is both tectonically and hydrologically closely linked to the Neretva Delta. Morphologically, it is open toward the west (towards the Neretva River), while on other sides it is enclosed by hill ranges: Slibanica, Kolanja, and Cerovica on the southern edge, Stolovi and Bačnik to the east, and Klepci, Crno Brdo, and Gradac to the north. The neotectonic subsidence of the depression is of geodynamic origin, caused by ‘enormous deposits of Neogene and Paleogene sediments originating from neotectonically uplifted thrust anticlines’ (Allen, 1986, as cited in Lepirica, 2012). Hypsometrically, Hutovo Blato Nature Park is situated at low altitudes, ranging from 2.18 metres to 584.1 metres above sea level. Considering the geological structure of the terrain, from a morphogenetic standpoint, the broader area of the park is dominated by karst morphological features. Due to the diversity of karst forms, the karst of this area exhibits characteristics of holokarst. The relief is dominated by surface karst forms: karst fields (e.g. Popovo Polje), karst depressions, and sinkholes. The

hydrological conditions of the area are primarily determined by the lithological composition and overall geological structure. Since the broader catchment area of Hutovo Blato is composed of Cretaceous limestones, which are heavily karstified at the surface, these parts of the catchment lack a developed surface hydrographic network that would naturally drain toward the aquatic complex. Several lakes exist within the area of Hutovo Blato, which are hydrologically connected via channels and the Krupa River, the latter of which drains the waters of Hutovo Blato into the Neretva River. However, Svitavsko Lake (or Lower Blato) has been transformed through anthropogenic interventions into a technical hydrosystem—a compensation basin for the Čapljina Hydropower Plant—thereby disrupting the natural regime of the entire hydrographic system (Spahić, 2001). A unique hydrological feature of this area is the reversed flow of the Krupa River: under normal water levels, the Krupa flows into the Neretva, but when the Neretva's water level rises, it pushes back the Krupa River all the way to its source – Deransko Lake (Aganović, 1952).

Due to its geographical location, Hutovo Blato is characterised by pronounced Mediterranean climatic features, with mild winters and long, warm summers. According to the Köppen–Geiger climate classification, the area of Hutovo Blato Nature Park falls under the Cfa climate type (temperate, humid climate with hot summers). The mean annual temperature is 12.5°C, with the lowest values recorded in January at around 2.0°C, and peak temperatures in August averaging 24.0°C. The annual precipitation total is approximately 1,640 mm. These relief, climatic, and hydrographic characteristics create favourable conditions throughout the year for the existence of a large number of animal and plant species (Zmaić & Miholjek, 2013). An analysis of the vegetation cover along the vertical profile clearly reveals distinct vegetation belts, ranging from wetlands, heathlands, and sclerophyllous vegetation at the lowest elevations near the aquatic complex of Hutovo Blato, across natural grasslands and transitional zones of forest regrowth and shrub vegetation, to deciduous forests found at the highest altitudinal zones. The Neretva River basin holds special ecological value due to its remarkable biological diversity of freshwater fish species and high degree of endemism, making it one of only four such regions in the entire Mediterranean. Because of its exceptional natural values, particularly its rich fish fauna, the Hutovo Blato wetland has been acknowledged as one of the most ecologically significant parts of the Neretva River. In recognition of this, it was proclaimed a Nature Park in 1995, and in 2001, it was included in the Ramsar Convention list as a wetland of international importance. Scientific research has confirmed the presence of 43 fish species, belonging to 36 genera and 19 families. Native species account for more than half of all recorded fish, including 15 endemic species with very narrow distribution ranges, while 15 species are classified as allochthonous (non-native). A notable feature of the ichthyofauna of Hutovo Blato is the presence of several marine fish species which occasionally inhabit this freshwater ecosystem. A significant number of species from this inventory fall under various threat categories defined by the IUCN, with the majority being endemic species (Tutman et al., 2012).

Demographic and Economic Characteristics

Archaeological research conducted within Hutovo Blato Nature Park, particularly at the Desilo spring site, has revealed a continuity of settlement dating from the Early Bronze Age, through the Iron Age and the period of the Illyrian tribe Daorsi, to the Roman domination and Late Antiquity (Zmaić & Miholjek, 2013), continuing up to the present day. In prehistoric times, the lake itself did not exist, as indicated by the architectural remains discovered at a depth of 6 metres. During different historical periods, the entire explored area was likely submerged, with a navigable trade route passing through Hutovo Blato. This is supported by the large number of amphorae found at the bottom of the lake. In addition to sustained trade relations with the Roman Empire, rural estates of settlers were established in the area, contributing to the Romanisation of the indigenous population. The abundance of amphora fragments, the presence of flowing water—which served as the foundation for artisanal and production facilities—and the remains of Roman tiles and bricks, suggest the existence of a rural economic complex in the area (Zmaić & Miholjek, 2013). It is assumed that there was a trade station in Hutovo Blato, which in Roman times was connected via a navigable trade route along the Neretva River. One of the most important monuments from the Roman period in the vicinity of the park, which indirectly influenced the shaping of the landscape through agricultural use, is the villa rustica Mogorjelo. This agricultural estate demonstrates a strong relationship between residential and production functions. A villa rustica is defined as a building or group of buildings with surrounding land, located outside or on the outskirts of urban areas, fulfilling the basic residential and economic needs of the owner (Busuladžić, 2011).

The continuity of agricultural production and its significant influence on landscape shaping continued throughout the Ottoman period. After centuries of Ottoman occupation, the people of Lower Herzegovina rose up in 1875, which led to the Austro-Hungarian annexation three years later. Following the Austro-Hungarian occupation in 1878, visible improvements were introduced in economic and cultural domains. A significant development was the construction of a narrow-gauge railway in 1883 between Sarajevo and Ploče, which facilitated the development of the timber industry, tobacco production, and the exploitation of rock salt and coal. During World Wars I and II, the region suffered heavy population losses, resulting in the expansion of extensive agricultural production and livestock farming. This mode of land use also influenced the structure of the landscape, with landholdings fragmented into numerous small plots, thereby complicating access and cultivation. In the post-war period, the use of modern agricultural measures, such as land reclamation and marsh drainage, contributed to the expansion of arable land, significantly shaping the current appearance of the protected area. The modern appearance of Hutovo Blato can largely be attributed to the construction of the Čapljina Hydropower Plant and the land reclamation works carried out during the 1960s (Zmaić & Miholjek, 2013).

Until 1995, Hutovo Blato functioned as a commercial hunting ground, primarily attracting tourists for bird hunting, while during summer months, when hunting was prohibited, photo-safaris were organised. In 1995, Hutovo Blato was declared a

Nature Park. However, despite its protection status, agricultural development and the construction of artificial surfaces (non-contiguous urban zones, tourist facilities, and supporting infrastructure) continue to significantly shape the landscape. From an administrative and geographical standpoint, Hutovo Blato Nature Park extends over the territories of three municipalities: Čapljina, Stolac, and Neum. According to official statistical data, the park area includes 12 settlements (9 within Čapljina municipality, 1 in Neum, and 2 in Stolac). Compared to 1991, the settlement of Dubravica (Čapljina) has no permanent residents. According to the Agency for Statistics of Bosnia and Herzegovina and the Federal Institute for Statistics, the current population living within the Nature Park amounts to 2,771 inhabitants, representing a 17.1% decrease compared to the 3,344 inhabitants recorded in 1991. From an economic-geographical perspective, the Hutovo Blato area plays a significant role for the surrounding urban centres in terms of natural resource utilisation. Important forms of resource use include forest logging, mineral resource exploitation, and agriculture on larger cultivated areas. Owing to its natural and human-geographic potential, as well as its strategic location (2.5 km from Čapljina, 33 km from Neum, 25 km from Stolac, and 4.5 km from Metković), the area of the park represents an important tourism asset, contributing substantially to local and regional economic development. Hutovo Blato Nature Park is situated east of the regional road Čapljina–Metković, and south of the main asphalt road Čapljina–Stolac. The area lies outside regional traffic corridors that connect larger urban centres. The total road network within the park measures 54.7 km.

Evaluation and Planning of Sustainable Tourism Development

The Management Plan for the Hutovo Blato Nature Park defines the main goals of sustainable development for this protected area, among which the greater involvement of the local community in economic activities—primarily tourism—holds a prominent place. In line with this objective, different protection zones have been established, within which permitted and prohibited activities are clearly defined. Three protection zones have been designated within the park: a Strict Protection Zone, an Active Protection Zone, and a Utilisation Zone. These zones are designed to guide the conservation and sustainable management of the area, as well as the development of designated economic activities. The criteria used for delineating these zones include the degree of preservation, ecological value, and importance of specific parts of the Hutovo Blato complex, particularly with respect to the protection of flora, fauna, and the hydrological regime, with the aim of improving conservation efforts for the most valuable areas. The current management plan (as well as spatial planning frameworks) for the park is not in conflict with higher-level spatial, strategic, or development documents. However, a revision of the management plan has been proposed in response to the continuing degradation of the wetlands caused by alterations to the hydrological regime. In this context, the revitalisation of all source zones, streams, canals, gullies, and lakes is considered necessary (Zovko, 2023). The Strict Protection Zone is intended exclusively for the preservation of ecologically valuable natural phenomena. All human activities that could disturb natural processes are strictly prohibited within this zone, and no infrastructure development is allowed. This zone

encompasses the northern portion of the aquatic complex—specifically, the wider area of Deransko Lake located north of the Krupa River and the Babino oko spring, including the localities of Orah, Drijen, and Kućine. The Active Protection Zone also includes areas of significant natural features and processes. However, within this zone, certain carefully regulated tourism activities are permitted, along with the construction of essential tourist infrastructure, provided that such development does not disturb the natural environment. This zone encompasses Deransko Lake, the broader area of the Gornje Blato wetlands, and meadow ecosystems of Donje Blato. Additionally, it includes the spring zone near Svitavsko Lake in the southern part of the park. The Utilisation Zone, which encompasses the largest spatial area within the park, includes territories traditionally used for agricultural purposes, water management, fishing, forestry, and sports-recreational and tourism-related activities.

Within the framework of the Management Plan, zones of sustainable tourism development have been clearly defined, with the following categories distinguished: the No Tourism Activity Zone, the Limited Tourism Activity Zone, the Moderate Tourism Activity Zone, and the Intensive Tourism Activity Zone.

The No Tourism Activity Zone and the Limited Tourism Activity Zone correspond to the Strict Protection Zone and the Active Protection Zone of the park. Tourism activities are significantly restricted in these zones, and only organised and supervised visits are permitted, accompanied by the park's official tour guides.

The Moderate Tourism Activity Zone refers to navigable waterways of the Krupa River, upstream from Karaotok and Deransko Lake, as well as the peripheral areas around Svitavsko Lake. In these areas, tourism activities that do not align with the principles of nature conservation are strictly prohibited.

The Intensive Tourism Activity Zone includes areas with existing tourism infrastructure, where sports and recreational activities, along with hospitality services, are already established and operational.

Within the defined tourism zones, the tourism offer is aligned with elements of sustainable tourism development and includes activities such as photo safaris, sport fishing, birdwatching, cycling, and boat tours through the channels, wetlands, and lakes (Figure 2). The Park Administration has initiated the development of new tourism products based on ecotourism, including the establishment of botanical and ornithological collections, an aquarium, an educational and research centre for scientific and instructional studies, an educational-recreational park (Figure 3), and other facilities that comply with the principles of nature protection and sustainable tourism. Among the notable features of the park is the existence of five natural lakes and one artificial reservoir across its 8,000 hectares, along with the Krupa River and a network of gullies, channels, and streams. The area is characterised by high biodiversity: 256 species of birds, several of which are endangered (e.g. the ferruginous duck, the red-crested pochard, and the pygmy cormorant), 43 species of fish (12 of which are endemic), and over 800 species of plants, with approximately 30 listed on the Red List (Zovko, 2023).



Figure 2: Aquatic vegetation and wetland habitat in Hutovo Blato Nature Park. *A typical view of a water channel surrounded by dense reed beds and floating vegetation in Hutovo Blato, illustrating the ecological richness and habitat complexity of this internationally important protected site.*
Photo by E. Hrelja, 2022.



Figure 3: Educational-recreational facility within Hutovo Blato Nature Park. *As part of the diversification of tourism supply and efforts to engage younger visitors, this facility was recently established within the protected area of Hutovo Blato. Integrated into the forest setting, it offers low-impact features for physical activity and environmental education.*
Photo by E. Hrelja, 2025.

In addition to developing its own tourism offer, the park's efforts are also oriented toward establishing connections with neighbouring tourist destinations on the local, regional, and international levels. This is supported by the site's proximity to numerous attractions in Bosnia and Herzegovina—such as Mogorjelo, Kravice Waterfalls, Međugorje, Mostar, Stolac, Trebinje, the Vjetrenica Cave, and the coastal town of Neum—as well as many tourist sites and destinations in the neighbouring Republic of Croatia. As a result of these initiatives, there has been a noticeable increase in the number of visitors, particularly among nature enthusiasts and ecotourism-oriented tourists, as well as those motivated by specific interests such as birdwatching. Furthermore, the activities of the Park Administration have contributed to a rise in visitors seeking to enhance their understanding of natural processes and phenomena within this protected area. Another segment of the park's tourism supply relates to training camps for sports teams, facilitated by the area's favourable Mediterranean climate and the availability of sports facilities and related infrastructure. In addition to the aforementioned initiatives, thematic routes have been developed based on the experience and research of park staff and collaborators from scientific-research institutions. One such initiative is the recently established 'Water Trail', which spans the entire Deransko area (Zovko, 2023).

In addition to the nature-based tourism offer, it is essential to highlight the significance of the broader area's cultural and historical heritage. The long history of anthropogenic activities in the park (described in more detail in the chapter 'Demographic and Economic Characteristics') has left a large number of artifacts from various historical periods. These have been valorised for tourism purposes, allowing visitors to explore and experience the associated archaeological and historical sites. The planning, management, and evaluation of this protected natural area are carried out at the cantonal level, in accordance with the IUCN classification and the administrative structure of Bosnia and Herzegovina. The responsibilities for implementing planning and management activities are entrusted to the Public Enterprise 'Nature Park Hutovo Blato' Ltd. Čapljina. The park employs 14 full-time staff, while additional personnel are engaged through domestic and international projects. Nature protection and conservation are carried out by a ranger service comprising a head ranger and five field rangers.

The funding sources for park management include regular grants from the founding authority (the Government of Herzegovina-Neretva Canton), as well as domestic and international funding programmes. Through participation in international projects, additional training and capacity building for park staff are conducted, with a focus on enhancing interpretative skills, aiming to improve the overall presentation and communication of tourism-related content (Zovko, 2023). In the planning and evaluation processes of this protected area, in addition to the Park Administration and other public and private stakeholders, the local community plays an active role by participating in the creation and implementation of spatial planning activities. Furthermore, the local community is involved in the governance structure through representation on the Supervisory Board of the Public Enterprise, thereby contributing

to decision-making processes. In this context, continuous education of community members is carried out through organised educational activities.

Local residents, associations, sports clubs, economic actors, and local councils are regularly invited to participate in various sports and cultural events—such as Park Day and World Wetlands Day—as well as volunteer actions organised by the Park Administration. These include activities such as waste collection, afforestation, fish stocking, and cereal sowing. The local population supports the development of tourism within the protected area and enjoys multiple benefits from it, including the sale of homemade products and the provision of hospitality and accommodation services. Importantly, the Park Administration actively supports the organisation of various events aimed at promoting the protected area, as well as the many initiatives implemented by local community members (Zovko, 2023). The Park Administration plans to intensify cooperative efforts with legal entities, particularly in cases where disputes exist regarding compensation or fee payments. Currently, the Administration's most focused activities relate to the support of rural tourism development, with the aim of integrating a larger number of local residents into the overall tourism development framework. This is expected to generate new employment opportunities for skilled professionals. Plans are underway for the construction of new, and the renovation of existing, tourist facilities. Additionally, the Park Administration recognises the importance of building partnerships with other protected areas in Bosnia and Herzegovina and neighbouring countries, especially those sharing similar natural and geographical characteristics, in order to better understand shared challenges and identify common solutions. Such cooperation also offers opportunities for increased access to financial resources from various funding mechanisms, particularly European Union funds, which would significantly facilitate the management and operation of the protected area (Zovko, 2023).

Tourism in the Protected Area of Hutovo Blato

The tourism offer in the protected area of Hutovo Blato is aligned with the established protection zones, designated tourism zones, and the tourism potential of the area. Visitor monitoring is conducted based on records maintained by the Public Enterprise (Figure 4). The highest concentration of tourist activity occurs at the entrance to the protected area, specifically at the Karaotok site, which serves as the central visitor reception zone. The most popular tourist activity within the park is the photo safari, organised since 1986. This activity involves observing the surrounding landscape and bird species during boat rides and is favoured by both domestic and international tourists.

According to the Spatial Plan, the park has a maximum annual visitor capacity of 70,000, of which, on average, only 10–15% is currently utilised. The highest recorded visitation in the past two decades occurred in 2017, when approximately 11,000 visitors were registered. The lowest number of visits was observed in 2020 and 2021, due to the restrictions associated with the COVID-19 pandemic. An analysis of the visitor structure between 2008 and 2022 reveals a significant proportion of visits by schoolchildren and university students. These visitors typically arrive on one-day

excursions, school-in-nature programmes, and educational trips, often as part of a stopover on their way to other destinations. According to the Park Administration, many visitors also come to attend seminars, conferences, and team-building events.

A significant development opportunity identified by the Hutovo Blato Nature Park lies in the promotion of birdwatching, an alternative form of tourism that enjoys considerable popularity globally. The park is home to many rare and endangered bird species, such as the ferruginous duck (*Aythya nyroca*) and the pygmy cormorant (*Microcarbo pygmaeus*). The development of birdwatching tourism would also allow for an extension of the tourist season, as bird activity peaks during spring, autumn, and winter. The Park Administration is actively working on promoting this form of tourism and developing the necessary infrastructure. Two birdwatching huts have been constructed, appropriate boats acquired, and a comprehensive field guide describing the observable bird species has been produced.

As in other protected areas in Bosnia and Herzegovina, a persistent challenge within the Hutovo Blato Nature Park is the lack of reliable statistical indicators regarding realised visits and overnight stays. This issue is largely attributable to the fact that a portion of accommodation facilities is privately owned, and the associated tourism statistics are not comprehensively or reliably reported. Furthermore, a considerable number of visitors arrive independently, without registering through official channels, and only approximately 10% of the total number of visitors request the services of official tour guides.

Tourist visits exhibit a pronounced seasonality, primarily due to an underdeveloped year-round tourism offer, low summer water levels, and high air temperatures during the peak tourist season. Measures are currently being undertaken to improve the tourism offer during the winter months and to address issues related to navigability caused by low water levels. A significant challenge remains the insufficient capacity of accommodation and tourist reception facilities for longer stays, both within the protected area itself and in the surrounding municipalities that form its gravitational zone. This situation is further exacerbated by the lack of complementary tourism infrastructure and suprastructure, such as conference halls, accessible facilities for persons with disabilities, and auxiliary accommodation units. Improvements to the tourism offer and related infrastructure are being financed through domestic and international funding sources. The construction and equipping of a new visitor centre is currently underway. Within the interpretation centre, there will be ornithological, ichthyological, and botanical exhibits showcasing valuable, rare, endangered, and endemic species, as well as displays on traditional fishing practices and gastronomy. An aquarium featuring endemic fish species is also planned, with many of the exhibits designed to be presented interactively. An educational trail is being developed with accompanying informational boards, while efforts are being made to enhance the accessibility of tourism facilities for persons with disabilities. In this regard, all content will be adapted accordingly, and it is planned that materials will also be available in Braille for blind and visually impaired persons (Zovko, 2023).

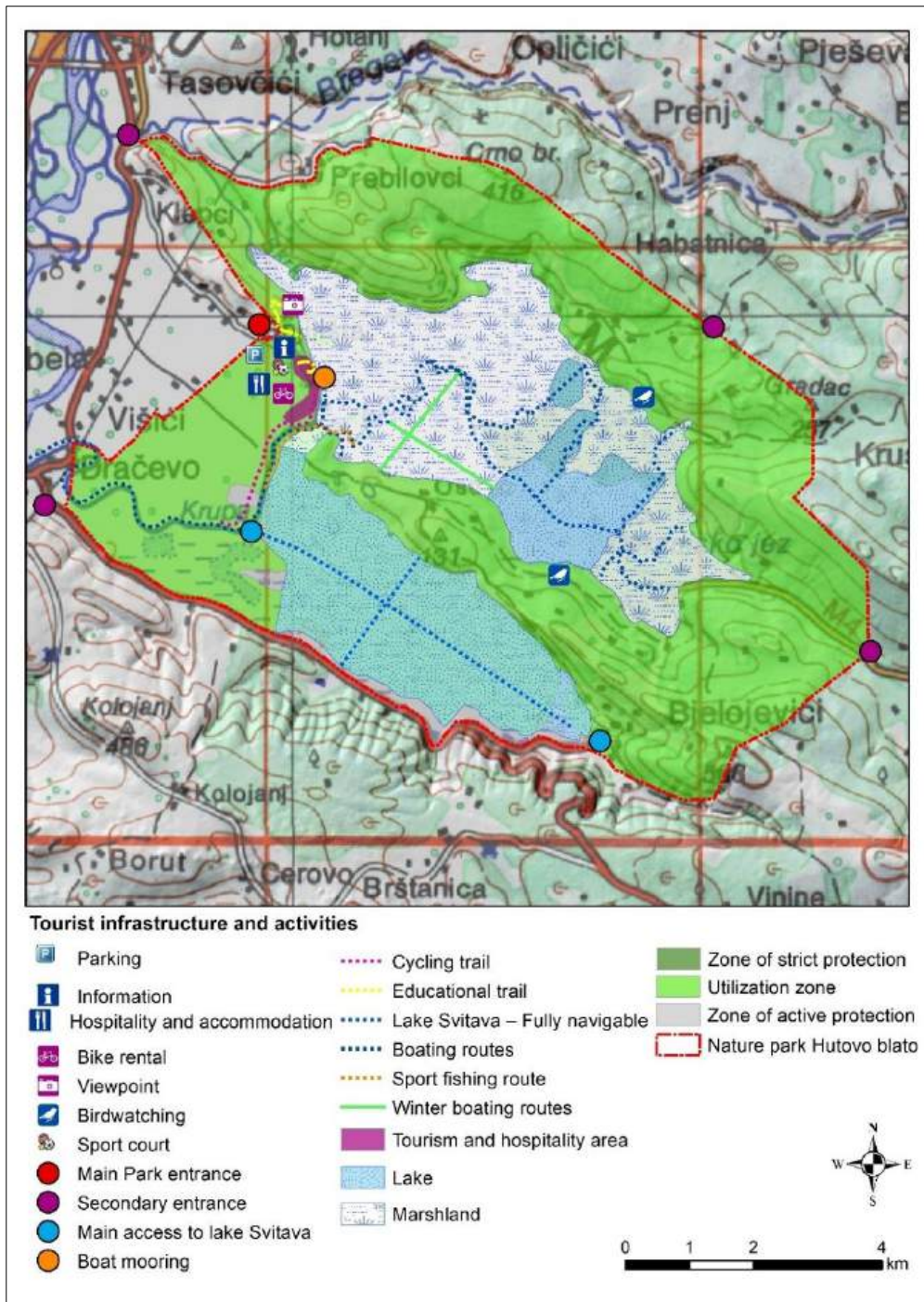


Figure 4: Spatial distribution of tourist infrastructure and facilities within Hutovo Blato Nature Park.

Data sources: Military Geographical Institute in Belgrade. (1984); Elektroprojekt d.d., & Eco Plan d.o.o. (2013).

The cooperation with tourism service providers within the Hutovo Blato Nature Park is mutual and beneficial, and its further development and enhancement is necessary, in line with the growing tourism demand. Local and regional tour operators and travel agencies rely on the Park Administration when organising visits and stays within the protected area, primarily due to the interest of their clients in safari boat rides and nature-based leisure. The park's Information Centre provides visitors with comprehensive information not only about the park's offer, but also about complementary tourism activities and nearby destinations within the broader surroundings.

In recent years, collaboration with educational and research institutions has intensified, fostering the development of additional content oriented toward special interest tourism. These initiatives contribute to the extension of the tourism season and facilitate longer visitor stays. Local tourism providers have been involved in park-related projects focusing on livestock farming and dairy production, beekeeping, and the development of rural tourism. This cooperation between the Park Administration and tourism providers is mutually beneficial, as it supports both tourism development and the conservation of nature. Local residents are increasingly aware of the importance of individual natural resources and their potential for additional valorisation beyond traditional uses. Collaboration with governmental institutions at all levels is functional; however, it is most effective at the local level. At higher levels of government, bureaucratic procedures often hinder more fluid cooperation with the Park Administration, particularly when it comes to timely responses to environmental changes and emerging challenges (Zovko, 2023).

All future development projects will be based on enhancing the tourism offer through the valorisation of natural assets and the sustainable protection of the area, as outlined in the Spatial Plan of the Hutovo Blato Nature Park. Medium-term goals include the construction of a wooden pedestrian bridge across the Krupa River, improved connectivity via hiking and cycling trails and fire-prevention routes around the entire Deransko area, as well as the revitalisation of wetland areas and the restoration of navigability. In the long term, the establishment of additional tourism zones is planned in locations such as Londža, Koščela, Grlić, and Škrka. Hutovo Blato holds considerable potential and could become a self-sustaining destination through the implementation of sustainable tourism practices, with full consideration of nature protection and visitor carrying capacity (Zovko, 2023).

Geographical Impacts of Socio-Economic Development

Historically, the area of Hutovo Blato Nature Park has represented a significant source of natural resource exploitation, primarily through fishing and hunting. In contemporary times, processes such as urbanisation, the intensification of tourism-related activities, expansion of agriculture, and particularly planned hydrological interventions in the upper catchment area, stand out as the most prominent threats to the preservation of the landscape, geodiversity, and biodiversity. The natural condition of Hutovo Blato began to change more significantly in 1959 with the construction of an embankment along the right bank of the Krupa River. In its lower course—

specifically in the Kilavice area—the embankment severed the river’s natural meandering path, thereby shortening and straightening the watercourse. This intervention led to a substantial reduction in the wetland area. The Kilavice zone had previously played a vital ecological role, serving as a migration corridor for migratory and salmonid fish species, a spawning ground for cyprinids, and a wintering habitat for birds. The area that was lost as a result of these interventions amounted to approximately one-third of the total surface area of Hutovo Blato, or about 3,000 hectares. In this zone, arable land was developed for the purposes of intensive agriculture and the construction of farm infrastructure. These agricultural plots were improved through drainage measures, including a network of canals and the installation of pumping systems (prokop) designed to transfer high, subterranean, rainwater, and wastewater into the Krupa River (Zovko, 2023). An analysis of changes in land cover—specifically, an assessment of the degree of natural vegetation degradation—was conducted by comparing the structure of vegetative cover (real forest vegetation) from 1979 with anthropogenically transformed areas based on CORINE Land Cover (CLC) data from 2018. This analysis confirmed that, as a consequence of anthropogenic activity, notable alterations occurred in the plant cover, manifesting as a reduction in native vegetation communities. During the observed period (1979–2018), the area covered by natural vegetation—predominantly downy oak (*Quercus pubescens*) and oriental hornbeam (*Carpinus orientalis*)—decreased by a total of 10.8%, with these surfaces having been replaced by anthropogenised land uses. The previously noted degradation of natural vegetation in Hutovo Blato Nature Park has been caused by a range of anthropogenic factors, including deforestation, the construction of artificial surfaces (non-contiguous urban areas, tourist facilities, weekend houses, and accompanying infrastructure), the exploitation of mineral resources, and agricultural development (Hrelja et al, 2019). The latter includes the expansion of non-irrigated arable land, vineyards, pastures, cultivated parcel complexes, and extensive agricultural lands. According to official statistical data, there are a total of 12 settlements within the boundaries of Hutovo Blato Nature Park. However, within the Deransko Lake zone—which accounts for approximately two-thirds of the park’s territory—there are only around ten active households, with a permanent population of just 15 residents. In the broader area surrounding Svitava Lake, only two settlements exist, with a significantly larger population of approximately 300 inhabitants. The park gravitates toward the urban centres of Čapljina and Stolac, which collectively have a population of around 60,000. According to estimates by park management, about 1,000 residents from these urban areas occasionally utilise the park for agricultural purposes, including the cultivation of private land parcels and engagement in farming, orcharding, animal husbandry, beekeeping, and fishing (Zovko, 2023). Built-up areas within the park currently occupy a total of 418.91 hectares. During the development of artificial surfaces—such as permanent and secondary settlements and related infrastructure—and overall anthropogenic land use, the spatial delineations of designated protection zones are not consistently respected. As a result, constructed facilities occupy 0.056 ha within the strict protection zone, 18.55 ha in the active protection zone, 70.63 ha in the usage zone, and 329.68 ha in the transitional zone (Figure 5).

According to the Park Administration, there are no permanent structures built illegally within the park. However, temporary unauthorised structures do appear seasonally in the lower course of the Krupa River and other attractive locations, typically erected by local residents for the purposes of recreation and leisure in nature. These activities are monitored, and appropriate enforcement measures are within the jurisdiction of the park's supervisory service and environmental inspection authorities. Activities within the park are carried out in accordance with the Spatial Plan, which was adopted in 2016 for the planning period 2013–2023. For the central tourist zone of Karaotok, a detailed urban development plan was prepared in 2022. According to this plan, some buildings (such as the relay station) are designated for demolition and removal, while others are slated for comprehensive reconstruction and rehabilitation in a manner aligned with the environmental context of the protected area and the increasing demand for tourism services (Zovko, 2023).

The reduction of natural vegetation cover in Hutovo Blato Nature Park, as previously noted, is primarily the result of the intensive expansion of agricultural activities across an area of 3,541.9 hectares, which accounts for 31.96% of the park's total surface. The negative impacts are reflected in the enlargement of agricultural land—particularly through the expansion of non-irrigated arable fields, vineyards, pastures, complexes of cultivated parcels, and large-scale agricultural zones—alongside the development of intensive conventional agricultural production.

The main objective of this type of agricultural practice is to maximise crop yields per unit area, relying heavily on the use of artificial fertilisers and agrochemical products. Within the boundaries of the protected area, there is a functioning dairy farm as well as a company engaged in fruit growing and viticulture. Fruit plantations have been established on more than 1,000 hectares of state-owned land under concession. Additionally, adjacent to the park's boundary lies a dairy farm with more than 1,000 head of cattle. This farm produces forage crops—including clover and cereals—within the park boundaries over an area of approximately 1,000 hectares.

Both fruit cultivation and forage production for dairy cattle are carried out using intensive agro-technical practices, including the application of mineral fertilisers, pesticides, and herbicides. Despite certain negative environmental impacts associated with these practices, a compromise has been reached with the local population through cooperative arrangements, allowing unrestricted access to the park for the continuation of traditional agricultural activities. These include hay mowing, livestock grazing, beekeeping, fishing, and recreational stays within the park area (Zovko, 2023). Due to the geological permeability of the terrain, water from cultivated agricultural lands percolates into the subsurface, thereby affecting the overall quality of the ecosystem. The preservation of the biological and ecological phenomena of the Hutovo Blato Nature Park's wetland habitat is of international importance. The quality of this ecosystem is directly linked to the maintenance of the hydrological regime of the karst fields in this region of Bosnia and Herzegovina.

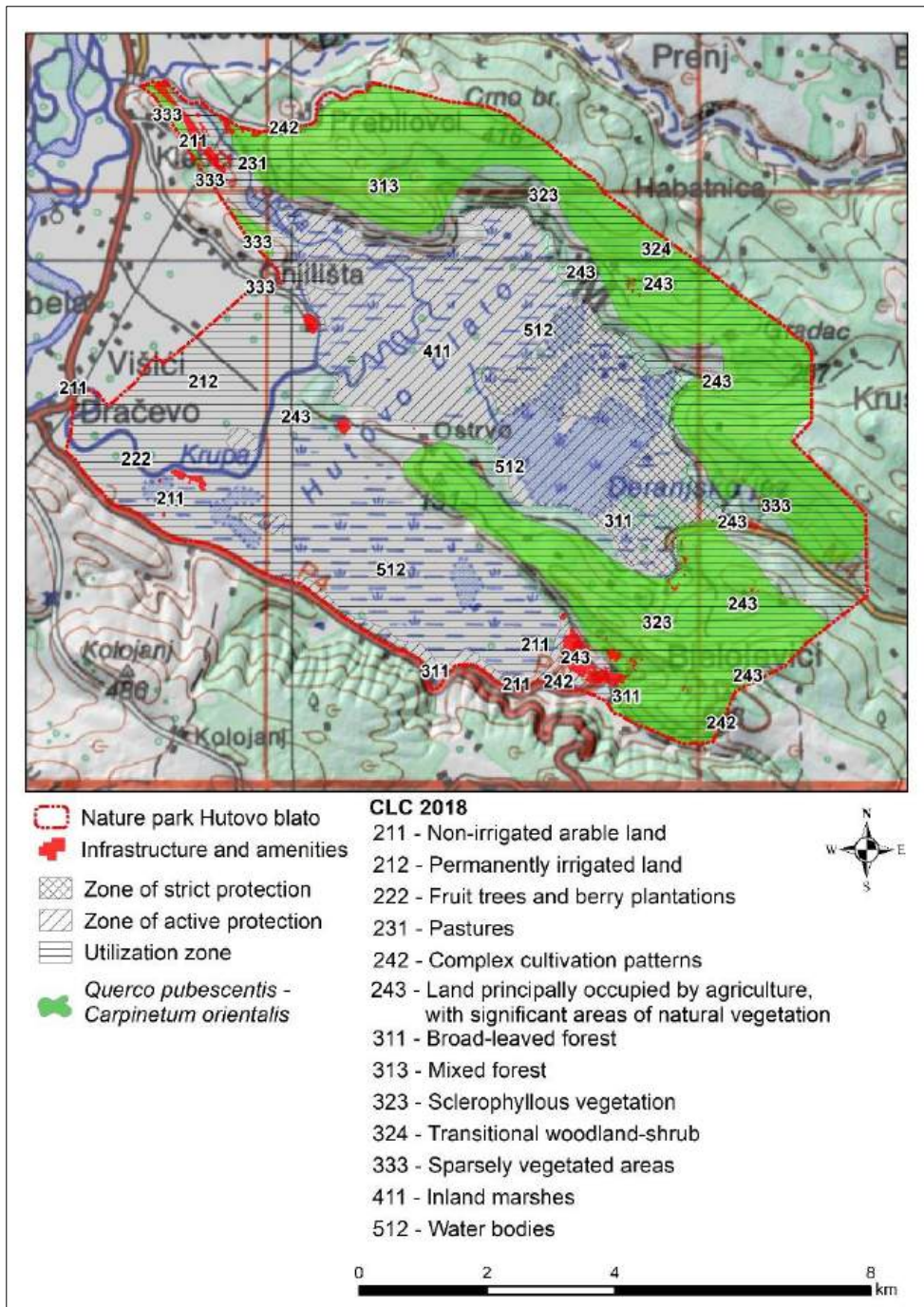


Figure 5: Land use transformation and infrastructure within protection zones of the Hutovo Blato Nature Park (1979–2018).

Data sources: Military Geographical Institute in Belgrade (1979, 1984); European Environment Agency (2018); Elektroprojekt d.d., & Eco Plan d.o.o. (2013).

However, due to intense anthropogenic interventions—including the water diversion project in the Upper Horizons during the 1960s, various hydro-melioration activities, the construction of hydroelectric infrastructure, the concreting of the Trebišnjica riverbed, and the establishment of the Svitavsko Lake compensation basin to serve the needs of the Čapljina Hydroelectric Power Plant (in 1972)—the groundwater levels have significantly decreased. Consequently, water levels in Hutovo Blato have also dropped, leading to a dramatic alteration of the natural landscape. As a result of these changes, many ambient and biological values have been irreversibly lost. According to data provided by the World Wildlife Fund and the Hutovo Blato Nature Park, approximately 45% of the former wetland area has been lost over recent decades due to river engineering and hydrological modifications throughout Herzegovina (Hrelja, 2017). The preparatory works preceding the construction of the Čapljina Hydroelectric Power Plant (HE Čapljina) brought about significant transformations to the natural landscape of the Svitavsko Blato area. The original Svitavsko Lake and the Matica River, along with a network of natural gullies and canals, were submerged. A weir was constructed at the confluence where the Matica flowed into the Krupa River, elevating the water level of the artificial lake by 3.20 metres above that of the Krupa. This intervention substantially altered the natural flow regime of the river.

During the discharge of water from the reservoir, wave surges occur along the Krupa River, which begins to reverse its flow direction back towards Deransko Lake. This reverse flow has led to considerable water pollution, sedimentation, and overgrowth in Deransko Blato—the only remaining natural wetland in the area. The most critical threat remains the ongoing reduction of water inflow to Hutovo Blato and the continued construction of hydro-energetic infrastructure in the Upper Horizons. The original Svitavsko wetland area, encompassing approximately 1,000 hectares, along with the Svitavsko Lake and Matica River, has been encircled by embankments and now serves as the Lower Compensation Basin of the Čapljina Hydroelectric Power Plant. Cooperation with the managers and owners of HE Čapljina has not been established on the basis of mutual understanding, particularly regarding the conservation of natural values. The plant's operations have caused significant disruption to the natural hydrological regime of Hutovo Blato, accelerating processes of sedimentation and eutrophication in the Deransko Lake area, which remains under considerable impact (Zovko, 2023). All significant anthropogenic activities within natural systems substantially disrupt the functioning of physical-geographical processes and phenomena. This is particularly critical in karst areas, which, due to their geological structure, serve as hydrological collectors. Any human activity targeting groundwater in such areas must be conducted with utmost caution. In earlier phases, anthropogenic exploitation of groundwater in karst regions has notably impacted the functioning of entire geosystems. These interventions are often inconsistent with national and international sustainability goals, legal frameworks, and spatial and management plans implemented at various levels of governance. Hydrological interventions, such as water retention in the upper horizons, reduce both underground and surface runoff towards downstream basins. This contributes to the reduction of freshwater availability in the lower hypsometric levels of the Neretva River basin—particularly its delta—and facilitates the intrusion of saline water from

the Mediterranean Sea through underground channels into the river valley. Such processes lead to the salinisation of both surface water and agricultural land, resulting in the gradual loss of arable soil. Additionally, the loss of potable water poses a major concern, as numerous springs and water sources dry up completely during the summer months—an issue expected to worsen due to further anthropogenic interventions. These hydro-technical modifications, aside from their component-based impacts, profoundly affect the holistic functioning of the geosystem.

In the lower Neretva Valley, the consequences are already evident: the salinisation of soil has led to the desiccation of certain fruit species and a reduction in vegetable production areas. Moreover, aquaculture has suffered due to altered salinity regimes in coastal zones, particularly affecting shellfish farming. The decline in freshwater flow from inland areas has disrupted salinity balances, rendering waters increasingly unsuitable for aquaculture. The number of viable species for cultivation in brackish waters continues to diminish, and such environments may soon become entirely unproductive. These adverse effects will impact not only Bosnia and Herzegovina but also the Republic of Croatia—most notably in the lower Neretva River basin. Expected consequences include further salinisation of water and soil, loss of agricultural land and freshwater sources, and collapse of aquaculture systems. Additionally, the Ombla spring—fed by karst fields in Bosnia and Herzegovina and part of a transboundary karst aquifer system—is at risk.

Should additional hydro-melioration works proceed, driven by economic or political lobbying, it is essential that the circulation of both surface and groundwater be maintained at sustainable levels to preserve geosystem functionality. It is imperative to consult relevant experts—geographers, biologists, geoecologists, geologists, agricultural scientists, spatial planners, and others—and base all final decisions on scientifically grounded research and recommendations to ensure the most appropriate solutions are implemented. Over the past decades, the trophic status of the Hutovo Blato wetland has significantly changed due to a series of anthropogenic activities, resulting in serious ecological consequences. The current condition of the fish fauna in the wetland and its surrounding areas is considered threatened. In addition to anthropogenic influences such as hydrological disturbances—including soil drainage in the Višići settlement and the creation of the artificial Svitavsko Lake—habitats of endemic species are further endangered and degraded through the continuous introduction of non-native fish species (Tutman et al., 2012). Presently, the ichthyofauna of the Hutovo Blato wetland is characterised by a notable increase in allochthonous (non-native) species in comparison to native and migratory fish. The ongoing practice of introducing new species, often with the goal of enhancing the economic value of the wetland and adjacent water bodies, poses a serious threat to the survival of indigenous fish populations and the overall integrity of the wetland ecosystem (Glamuzina et al., 2001). Effective habitat protection, coupled with improved water management and measures aimed at preventing the spread of invasive species, is crucial to safeguarding the high ichthyological value of this wetland.

Poaching has traditionally been a significant issue in areas rich in biodiversity and well-preserved natural resources. The intensity of this activity has increased due to

wartime disruptions and the low socio-economic standards of the local population. A further environmental concern is the growth of the black market in rare and endemic species. Birds of prey are most commonly targeted, although other rare fauna such as amphibians, reptiles, and mammals are also affected. The most frequent offences include night-time fishing using harpoons and nets, as well as illegal hunting of species such as coots and wild boar. Preventive measures (such as warnings) are applied alongside repressive actions, including legal proceedings before municipal courts or reports submitted to the cantonal inspector for nature protection (Zovko, 2023). Hutovo Blato is also increasingly affected by wildfires, which have caused substantial ecological damage. Vast areas of the park have been destroyed, displacing or killing numerous birds, mammals, and reptiles. The vegetation cover—an essential component of local habitats—has been completely eradicated over an area of 2,000 hectares, significantly disrupting the food chain and degrading the overall ecological balance of the park.

A prelude to the aforementioned geoecological challenges in recent years was the cessation of funding for the Public Enterprise ‘Hutovo Blato Nature Park’, which faced the threat of closure. Park rangers and employees were left without salaries, sending a signal to individuals with malicious intent that they could freely engage in poaching, illegal cultivation of narcotic plants, waste dumping, and various other forms of environmental degradation. Monitoring of environmental conditions is most frequently conducted through specific projects with which the park applies for domestic and international funding. These monitoring efforts are primarily focused on biodiversity and geodiversity and are generally initiated in response to negative phenomena affecting the natural state of the area. The most serious threats to this protected area are the altered hydrological regime caused by hydropower production, wildfires, and invasive species. Monitoring is carried out with the engagement of external scientific experts and collaborators. To date, a register of polluters has not been established, although its development is of essential importance. Mapping of invasive species distribution and endangered habitats has been conducted through various domestic and international projects. The removal of invasive species is carried out on a continuous basis in cooperation with research institutions; however, the intensity of these efforts is insufficient. Within the territory of the Hutovo Blato Nature Park, the most effective methods for eradicating invasive plant species and allochthonous fish species are still not in use. Illegal landfills that exist in this area are the result of irresponsible behaviour by certain segments of the local population, as well as some legal entities—primarily hospitality establishments—operating in the park’s transition zone. Several waste clean-up and landfill remediation initiatives have been organised, especially around Earth Day, with the participation of volunteers, institutions, and non-governmental organisations. Most recently, household and greenhouse waste landfills in the Svitavsko Lake zone were remediated and transported to the municipal landfill, co-financed by the Environmental Protection Fund of the Federation of Bosnia and Herzegovina.

As a long-term solution, regular waste collection from the surrounding and affiliated settlements to the municipal landfill has been established through cooperation with

the City of Čapljina and the Public Utility Company of Čapljina. Nevertheless, these efforts have not fully resolved the problem, as smaller illegal dumps are still observed at several locations. The park's management believes that resolving this issue requires additional support through repressive measures implemented by supervisory services and environmental inspection bodies. The Park Administration has also addressed the issue of wastewater management from one of the largest hospitality and accommodation facilities within the park by installing a wastewater treatment plant (collector) in the central tourist zone of Karaotok. Additionally, for improved waste management, a bio-septic tank of adequate capacity is currently being installed in the new interpretation centre building (Zovko, 2023).

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PART II:
SELECTED PROTECTED AREAS
OF SLOVENIA

Chapter 5

The Notranjska Regional Park: A Protected Area Within the Municipal Border

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The Notranjska Regional Park was established by the Municipality of Cerknica at the 18th ordinary session of the Municipal Council on 23 July 2002 on the basis of Article 49 of the Nature Conservation Act (Official Gazette of the Republic of Slovenia, No. 56/99 and 31/01), Article 9 of the Act on the Protection of Cultural Heritage (Official Gazette of the Republic of Slovenia, No. 7/99), and on the basis of Article 18 of the Statute of the Municipality of Cerknica (Official Gazette of the Republic of Slovenia, No. 3/00). The Notranjska Park covers the entire area of the Municipality of Cerknica, excluding building land, planned areas of settlement expansion and areas of current and planned industrial zones. The park also excludes road infrastructure and areas designated for stationary traffic, sand pits, railways, and the Bloška polica military training ground and shooting range. The protected area covers a total of 222 km². It is managed by the Notranjska Regional Park Public Institute, which brings together three areas: nature conservation (management of the Notranjska Regional Park), culture (the Cerknica Cultural Centre) and tourism. Between 2014 and 2023, it was managed by Matevž Podjed, a sociology graduate, who was also interviewed in depth as part of the present protected area research. The Municipality of Cerknica contributes about one third of the necessary funding for the operation of the Institute, with projects being the main source of funding in the period 2016–2022. In 2023, the public institution employed 12 people, plus 10 project staff (Podjed, 2023), and in 2024, 15 people, plus 4 more in the field of tourism and 2 people in the Cerknica Cultural Centre (Notranjska Regional Park, 2024).

The most important reason for the establishment of the protected area is the karst phenomenon of Lake Cerknica, the value of which is already demonstrated by its inclusion in the list of Ramsar sites (Ramsar Sites Information Services, 2024). The intermittent Lake Cerknica, the underground cave system of the Križna Cave, the cave systems of Karlovice and Zelške Caves, as well as Rakov Škocjan with the Tkalca Cave, were inscribed among the world's Ramsar List of Wetlands of International Importance in 2006. The entire protected area covers 72 km², which is almost a third of the total area of the Municipality of Cerknica (Detailed management plan for the Cerknica Lake project area, 2009). In addition to the intermittent lake, the protected area of the Notranjska Regional Park also includes its hinterland. The reason for the protection is not only the exceptional biodiversity, but also the geomorphological, hydrological and speleological features that have had a significant impact on the habitats. The Cerknica polje is classified as a nature conservation site of national importance, and within it there are 24 different nature conservation sites of local, and

29 of national, importance. The hydrological and geomorphological underground natural values, such as springs, sinkholes, potholes, watercourses, etc., are predominant. There are 20 caves in the area of the intermittent lake and its edge, which are natural values of national importance (Detailed management plan for the Cerknica Lake project area, 2009). The extensive mixed forests with a predominance of beech, which are habitats of large carnivores, are also of great value in the protected area (Notranjska Regional Park, 2024).

The mission of the Notranjska Regional Park is to preserve the natural and cultural values of the area. Among its objectives, in addition to protecting nature (habitats, endangered species), is to prevent negative impacts, including mass visitation and tourism. The park aims to become a showcase for good practices of successful coexistence. In cooperation with key stakeholders in the use of ecosystem services, their intent is to develop a programme for the development of the region, establish a common brand for the Notranjska Regional Park, expand the protected nature area and, in the long term, establish a national park (Notranjska Regional Park, 2024).

Geographical Outline of the Protected Area

The central part of the Notranjska Regional Park is the Cerknica polje, which is often considered a lake due to its long-lasting and regular flooding. It is part of the Notranjska Podolje region in south-western Slovenia. It covers an area of approximately 70 km² and stretches in a dinaric direction from north-west to south-east, with its lowest part at an altitude of around 550 m. The Cerknica polje and its surroundings are made up of Triassic and Jurassic dolomites and Jurassic and Cretaceous limestones, which are heavily weathered. The limestones form the major part of the catchment area of the Cerknica polje, mainly in its western and southern periphery, and form an extensive karst-fractured aquifer. The well-bedded limestones form the Javorniki Hills, with a total thickness of about 2800 m. The bottom of the Cerknica polje is overlain by Holocene alluvial deposits, which were washed down from higher ground by watercourses, and form an inter-granular aquifer. Clay, rubble and some gravel are present, most of which are at the top of the Cerčniščica spring. The thickness of the deposit is 3–4 m, sometimes up to 15 m (Pleničar, 1953; Gospodarič & Habič, 1979), which partially delays the outflow of water into the karst subsoil.

The Cerknica polje is a spring-sink type of karstic polje, characterised by its bed in an area of changing groundwater levels and crossed by surface watercourses flowing from the spring to the sinkholes. These watercourses also receive surface-flowing tributaries from adjacent non-crustal areas. Depending on the origin of the water, 80% of the water in the Cerknica polje is karstic. During heavy rainfall and snowmelt, when the groundwater level rises, the lower part of the polje, i.e. the Zadnji kraj, becomes flooded (Figures 1 and 2). The lake Cerknica is formed as a result of prolonged seasonal flooding and is the largest and most typical intermittent lake in Slovenia. The water drains from the polje area through numerous sinkholes and siphons on the

periphery or through estuaries on the bottom of the lake (Gams, 2004; Stepišnik, 2020).

Several hundred entrances to caves and cave systems are known in the Cerknica polje area and its surroundings. Most of them are in the area between Cerknica polje and Rakov Škocjan. The lowest-lying caves are usually water caves or at least occasionally water caves, while the higher-lying caves are mainly corrosion chasms with no direct connection to the hydrological functioning of the lake. The cave systems at the lake level play a key role in the supply and discharge of water and thus in the filling and overflow of the lake (Gospodarič, 1970; Kranjc, 1986). The cave systems of Križna Cave (8273 m long), Karlovice (9510 m), and Zelške Caves (7338 m) in Rakov Škocjan are among the fifteen longest caves in Slovenia (E-register of caves, 2024).

The Cerknica polje and its surroundings lie in an area with a very humid submontane climate (Ogrin et al., 2023). At the climatological station Nova vas, which is slightly higher than Cerknica polje, the mean air temperature in 1991–2020 was 8.2 °C, while in January it was -1.7 °C and in July 18.1 °C. October mean temperatures were higher than April. The average annual rainfall over the period 1991–2020, measured at the Cerknica rainfall station, was 1,587 mm. Precipitation is evenly distributed throughout the year, with a high in autumn and a low in winter. In the period 1991–2020, there was an average of 53 days of snow cover per year (Environment Agency of the Republic of Slovenia, 2024a).

The volume and duration of the lake varies according to the distribution of precipitation and snowmelt. High water levels occur in the spring and late autumn months, while the lake usually dries up in the summer months. In wetter years the lake does not dry up, but in dry years the area can be dry for several months; on average the lake usually lasts 8 months. The lake area can cover about 26 km² and at an average depth of 2.7 m, it can hold up to about 70 million m³ of water (Kranjc, 1986). Based on the differences in water levels in the hydrological year 1975, Kovačič (2010) estimated that the mean annual inflow/outflow from the lake was 23.7 m³/s, the maximum outflow 92 m³/s and the maximum inflow 232 m³/s. The excess of inflow over outflow (about 140 m³/s) is represented by flood waters.



Figure 1: Cerknica polje with the Zadnji kraj area in the foreground in summer.
Photo by M. Blatnik, 2022.



Figure 2: The Zadnji kraj and the lake area of the Cerknica polje, which can cover about 26 km².
Photo by M. Blatnik, 2019.

The central watercourse in the polje area is the Stržen, which receives its water from several abundant karst springs in the south-eastern part of the area, such as the Obrh or Jezerščica stream. The most abundant springs of the Stržen are Obrh, Cemun and

Laški studenec. These springs are of the vaclusian type, which means that the water flows to the surface under pressure from submerged siphon tunnels. The total mean flow of these springs together was estimated at around 15 m³/s and the maximum flow at around 85 m³/s. There is also a significant inflow of water from surface watercourses (Cerkniščica, Martinjščica, Grahovščica, Žerovniščica, and Lipsenjščica), which are fed from the less shrubby dolomite area of Slivnica and the karst plateau of Bloke. The mean flow of all inflows from the east is about 2.5 m³/s, while the maximum flow can be over 70 m³/s (Kranjc, 2002; Kovačič, 2010).

The largest surface tributary on the polje area is the Cerkniščica River, which collects water from the Otava, Bloke, and Vidovska planota plateaus and joins with the Stržen at higher water levels in the Jamski zaliv bay. The Cerkniščica River has pronounced torrential characteristics and its average flow in the period 1961–2020 was around 1 m³/s (Environment Agency of the Republic of Slovenia, 2024b). Lake Cerknica has no surface outlets, so all the water from the lake drains through the caves, ground sinkholes and estuaries. The most important sinkhole area is the Jamski zaliv bay, which is an area along the north-western side of the Cerknica polje. It is characterised by numerous large and small cave entrances in the steep rocky slope on the western and southern sides of the Jamski zaliv bay. Some of the cave entrances are filled in with subsoil material, and blind valleys and chambers in the rubble are preserved. The largest sinkholes are Velika and Mala Karlovica, and Svinjska jama, but there are also many others. The most hydrologically active today is Velika Karlovica with Rakovski Mostek – Nova Karlovica, which was artificially excavated in the period of 1969–1970. As the main entrance of Velika Karlovica was closed up almost to the ceiling with a concrete barrier during the experimental damming in 1969, the Cerkniščica flows on past Mala Karlovica to the Svinjska Cave sinkhole, where it becomes submerged. In the central part of the polje area there are several very large sinkholes, the largest of which are Rešeto, Sitarica, Retje, and Velika and Srednja Ponikva, located between the Cerknica spring and the rocky area of Otočec (also called Drvošec). These are large basins with a large number of sinkholes and openings through which water drains. One such example is Rešeto, which covers an area of about 6 ha and consists of 35 small sinkholes in the alluvium and 6 sinkholes in the bedrock. Some of the water flows directly towards the sources of the Ljubljanica River at the edge of the Ljubljana Marshes, some of it flows underground towards the Planinsko polje area, and some flows to the surface from the Zelške Caves as the Rak River in Rakov Škocjan. From Rakov Škocjan, the water flows through the underground tunnels of the Tkalca Cave towards the Planina Cave, where it joins the Pivka River. The third area of water runoff from the Cerknica polje, where the flood water stays for the longest time, is the Zadnji kraj area. Water drains through numerous estuaries, rock fissures and sinkholes (there are more than 200 small depressions), and when the water level rises, water flows through them and floods this area first. When the polje area is dry, the water level remains 10–15 m below the surface of the Zadnji kraj area. It is estimated that around 40% of the water drains directly into the Ljubljanica River springs, while 60% of the water from the Cerknica polje drains first into the Planinsko polje and then into the Ljubljanica River springs (Gospodarič & Habič, 1979; Kranjc, 2002; Kovačič, 2010).

The Cerknica polje is surrounded on all sides by hills and plateaux, richly covered with forests. On the northern periphery rises the 1,114 m high Slivnica, mostly covered with a thermophilous beech community (*Ostrya-Fagetum*), replaced in degraded areas by an equally thermophilous community of black hornbeam and downy oak (*Quercus-Ostryetum*), and in some places only by grassland vegetation. Along the southern edge of the Cerknica polje stretch the ridges of the Javorniki Hills, with mighty forests of beech and fir (*Abieti-Fagetum dinaricum*) (Zupančič & Puncer, 1982). In areas not subject to regular flooding, meadows predominate, while areas subject to regular flooding are predominantly covered with marsh plants. Where water stays for a shorter time and soils are well watered for longer, marsh communities such as common reed (*Phragmites australis*), lake sedge (*Scirpus lacustris*), water horsetail (*Equisetum limosum*), stiff sedge (*Caricetum elatae*), riparian sedge (*Caricetum ripariae*), beaked sedge (*Caricetum rostratae*), marsh sedge (*Eleocharitetum palustris*) and reed canary grass (*Phalaris arundinacea*) are developed. These plant communities cover between 60 and 70% of the lake. There are 302 species of algae in the waters of the lake, 17 species of aquatic plants, 34 amphibian species and 23 bog species among the seeds. There are also 7 species of mosses (3 on the Red List of Threatened Species of the Republic of Slovenia). Around 420 plant species have been found in the immediate area of the lake. So far, 267 bird species have been observed and recorded on Lake Cerknica. Of the total number of birds observed, around 110 are breeding permanently or occasionally in the area of Lake Cerknica or in its immediate vicinity. A total of 45 species of mammals have been recorded, of which only two are water-bound. The lake is an important source of food for otters. The great crested newt is a frequent visitor and is an important food source for many birds of prey, such as owls. There are 9 species of reptiles in the Lake Cerknica area. All 13 amphibian species present in the lake are on the Red List of Threatened Species of the Republic of Slovenia; three of them are also protected by the Nature 2000 Habitats Directive. Altogether, 9 fish species occur in the lake and its tributaries. Invertebrates are particularly abundant in the Lake Cerknica area. For example, there are at least 33 species of juvenile moths, 11 species of monotremes, 36 species of dragonflies, 127 species of diurnal butterflies, over 750 species of nocturnal butterflies, 800 species of beetles, 58 species of bees, 52 species of locusts, 21 species of water fleas, one species of fairy shrimp, 15 species of cephalopods, and 44 species of molluscs (Detailed management plan for the Cerknica Lake project area, 2009).

Lake Cerknica is part of the Natura 2000 nature conservation network (Natura 2000, 2024) due to its importance for the conservation of endangered birds. Under the Special Protected Area Directive (SPA), in order to protect endangered bird species and regularly occurring migratory bird species, the southern area of the park with Lake Cerknica is protected, while the wider southern area is part of the Special Area of Conservation (SAC), which includes Planinsko polje, the area above the Postojna cave system, Rakov Škocjan, Cerknica polje and the Križna Cave system. The above-mentioned area is also an ecologically important one, which extends into the Notranjska Regional Park and is a part of the 'Central Large Carnivore Habitat Area'.

In fact, all three large carnivores—brown bear, lynx and wolf—occur in the park (Detailed management plan for the Cerknica Lake project area, 2009).

As shown in Figure 3, within the boundaries of the landscape park there are several smaller protected areas with different levels of protection, namely, four nature reserves (Dujice, Levišča, Osredki, Zadnji kraj), three nature monuments (Križna Cave, Zelške Caves, and the gorges of the Iska and Zala rivers), and the Rakov Škocjan Landscape Park (Environment Agency of the Republic of Slovenia, 2024c). The management of the individual areas does not differ and the regulation on the zoning of the Notranjska Regional Park was still under preparation at the time of the present study. Three zones are foreseen, namely Zone A for the more strictly protected Lake Cerknica, i.e. the flooded part of the Cerknica field, and Zone B for the rest of the already protected area, while the settlements are currently excluded from the protected area, although in the future they are to be included in Zone C (Podjed, 2023).

The main special feature of the Notranjska Regional Park is the ‘lake culture’, the coexistence of man and intermittent lake with its floods, which is considered very important by the park director, although it is not highlighted in the protection documents (Podjed, 2023). Notwithstanding the prohibitions in the decree establishing the Inner Lake Park, landowners are allowed to manage their land and waters. Once the lake is dry, extensive agricultural activities (mowing, grazing) are allowed, and motor vehicles may be used for agricultural purposes.

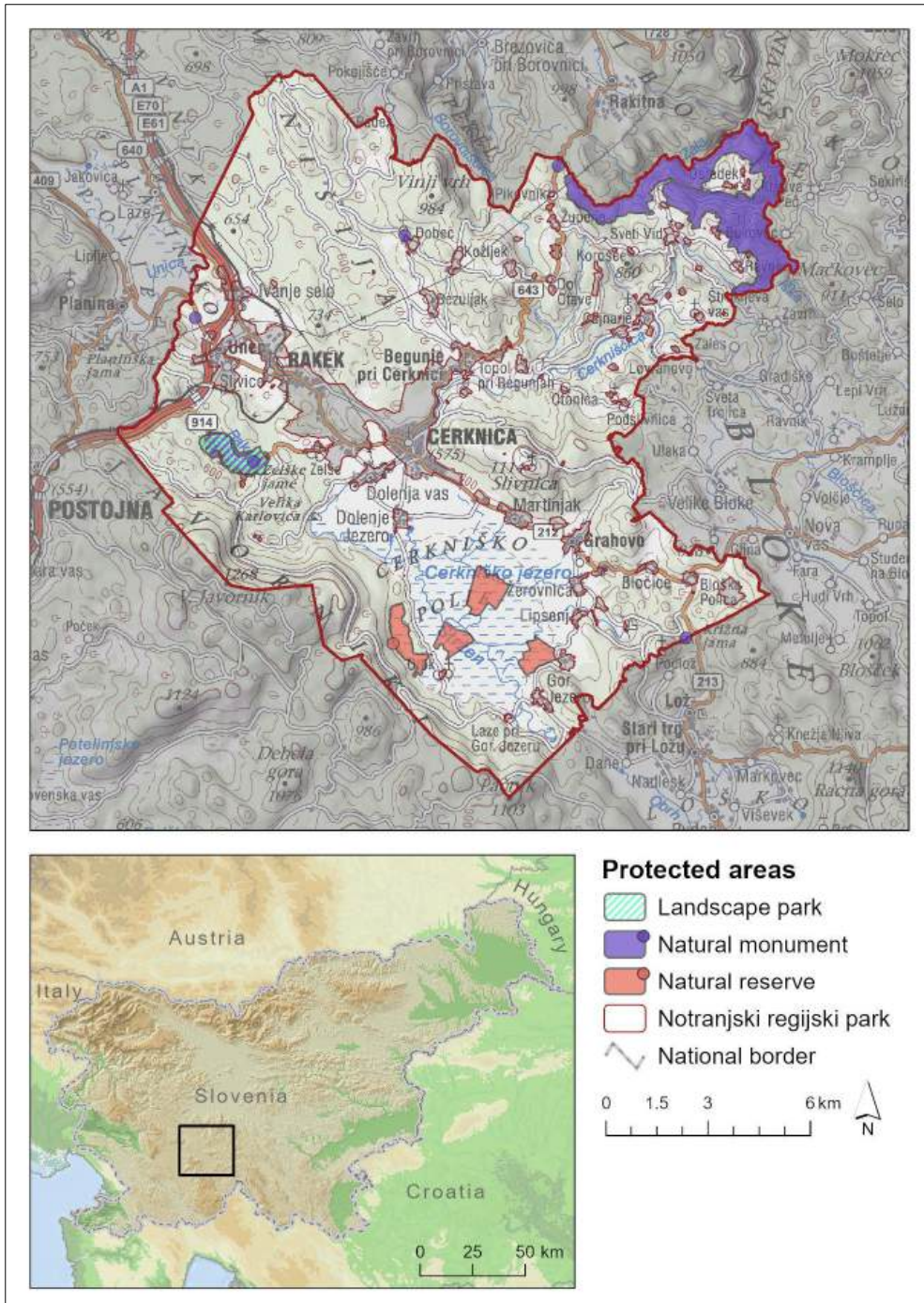


Figure 3: Location of the Notranjska Regional Park showing the specific wider and narrower protected areas within it.

Data sources: Environment Agency of the Republic of Slovenia (2018, 2024d); Surveying and Mapping Authority of the Republic of Slovenia (2008, 2017, 2023); Esri, FAO, NOAA, USGS, GEBCO and Garmin (2024); Eurostat (2024); U.S. Geological Survey (2020).

Motor vehicles are allowed to use the existing road network, and maintenance and reconstruction of the existing infrastructure are also allowed. Similarly, regulated hunting and fishing are also permitted in the nature reserve area (Detailed management plan for the Cerknica Lake project area, 2009).

Changing water conditions have been perceived as a limiting factor for development in the past, which is why the Cerknica polje has been the site of several attempts at drainage and lake restoration. In the agrarian era, the main focus was on drainage, as this would allow the field to be put to more intensive agricultural use, while in the industrial era, there was a tendency towards more permanent lake drainage, which would allow electricity generation, as well as tourist and other uses (Smrekar, 2002). In the period from the first half of the nineteenth century to the World War II, attempts were made to achieve permanent drainage by regulating water flows, and by cleaning and enlarging sinkholes. Several kilometres of river channels were deepened and channelised, and the entrances to the largest (Malo and Velika Karlovica) and some other smaller karst caves systems were enlarged. Dams have been built along some stretches of the watercourses for local water retention. These interventions have resulted in a shorter duration of the intermittent lake, which initially retained its water in some areas of the lake throughout the year, but only for about eight months after the interventions. In this way, the growing period in the meadows was extended for about three months (Kranjc, 1986).

However, at the beginning of the twentieth century, opposing views began to emerge, that people would benefit more from a more permanent lake. This could be achieved mainly by damming the main outflow channels. The 'Conceptual Project for the Permanent Lake Cerknica' of 1956 envisaged, among other things, the development of tourism. The experimental damming of the sinkholes in the late 1960s extended the duration of the lake, but did not ensure the permanent lake formation that was planned as part of the 'Upper Adriatic' project. The latter planned to build up the Cerknica-Dolenje Jezero-Otok tourist area with 1,000 tourist beds. The tourist offer would have been based on the lake, namely swimming, sailing on the lake in various types of boats, fishing, and in winter also ice-skating. However, the realisation quickly prevailed that a permanent lake was difficult to achieve. When one sinkhole was sealed, another one appeared, or the water found another way underground. In the 1980s, the project 'Multi-purpose Cerknica Lake Reservoir' was developed, which foresaw a water reservoir in the upper part the lake with the construction of a 14 m high and 3.5 km long sealing embankment. This would separate the 17 km² reservoir from the sinkholes, interrupt underground flows and channel the water from the reservoir through an 11 km long tunnel to the Planinsko polje area, where the hydroelectric power plant would be located. Part of the water would be used to supply water to the Karst and the Istria region. Although Lake Cerknica would no longer be an intermittent lake and a natural feature, it would have other positive effects, according to the planners (Smrekar, 2002).

This major project was not realised. There were many concerns and more and more opponents or conflicts of interest. By this time, environmental movements had already

begun to gain strength, opposing such a large-scale intervention in the natural environment. In 1992, on the initiative of the planning company that had led the project to establish the park, part of the concrete barrier for the outflow of water into the Mala Karlovica sinkhole was removed, and the expert service for the management of the water regime drew up rules for the operation of the (partly remaining) barrier. The water regime of Lake Cerknica is expected to return to the situation before the damming measures. Many experts and enthusiasts are working to remove all unnatural structures in Lake Cerknica (Smrekar, 2002). Today, attempts are also being made to reduce the impact of the drainage interventions and, to this end, renaturation of the watercourses is being carried out. The aim is to allow the water to flow through the former meanders or old channels, an objective which has also been pointed out by the park director (Podjed, 2023).

The Cerknica polje with its hinterland and the Bloke Plateau is a Complex Cultural Heritage Conservation Area due to the presence of humans or the unique interaction of human activities with the environment. The area has a higher concentration of spatially and contextually interconnected cultural elements. The use of the area is traditional, with a well-preserved cultural landscape, urban layout of settlements and built heritage. The cultural landscape of Lake Cerknica shows a high degree of correspondence between land use and the natural characteristics of the area. The cultural landscape is given a special expression by the changing water regime throughout the year, which limits its use to mowing. The edge of the area belongs to the mosaic of arable landscape and the settlements which are embedded in the hillsides. The area contains a number of archaeological sites, cultural heritage sites and objects (Detailed management plan for the Cerknica Lake project area, 2009).

In terms of population, the protected area is directly linked to the residents of the Municipality of Cerknica, which is a centre of intermunicipal importance (Nared et al., 2017) and had a total population of 11,870 in 2024 (Statistical Office of the Republic of Slovenia, 2024a). The relatively good transport connections of the Municipality of Cerknica, with the motorway connection and the proximity of the capital, have influenced the relatively rapid population growth in the settlements of the municipality, which in the last 15 years has exceeded the national average by almost 3 index points (Figure 4).

Despite the predominantly agrarian orientation of the municipality, the local economy of the Municipality of Cerknica had a well-developed wood-processing industry during the Socialist Federal Republic of Yugoslavia, which was one of the most important in the country. After the not entirely successful restructuring of the aforementioned industry during the period of the independent state, the local population, similar to many other areas of predominantly rural municipalities, is today mostly tied to daily migration to larger employment centres (Bole et al., 2020). From the perspective of the local economy, the Podskrajnik Industrial Zone is important, located in the western part of the municipality along the Unec–Bloška polica regional road and measuring 66.8 ha, which is considered one of the largest such areas in Slovenia (Municipality of Cerknica, 2024).

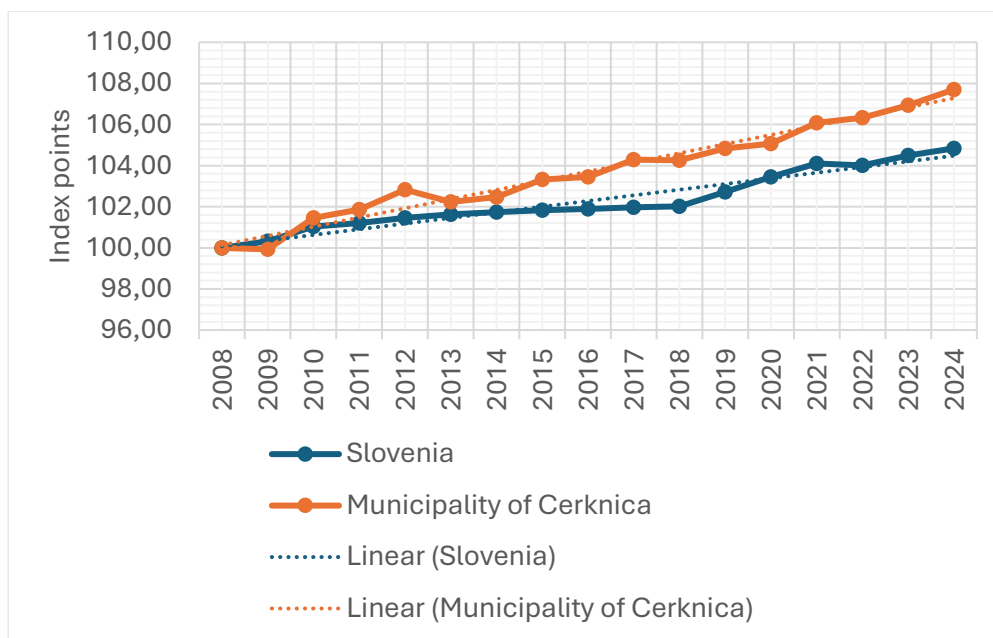


Figure 4: Population trends in the Municipality of Cerknica and Slovenia between 2008 and 2024.

Source: Statistical Office of the Republic of Slovenia (2024a).

The Notranjska Regional Park does not have an integrated management plan. In 2009, a Detailed management plan for the Cerknica Lake project area was prepared, which, in 250 pages, presents the natural geographic features, the diversity of flora and fauna, measures for their protection, cultural heritage, water management and quality, fisheries, forestry, hunting and ecosystem services of Lake Cerknica. It presents spatial and other plans, land ownership and use, habitat types in great detail, activities within the project area, changes in the water regime due to human interventions in the past, conservation objectives, guidelines and measures to achieve them, restoration, objectives and measures for the favourable status of habitat types and species, a SWOT analysis and an implementation plan for management (Detailed management plan for the Cerknica Lake project area, 2009). All of the above relates only to the project area of the intermittent Lake Cerknica, and does not cover the park as a whole.

According to the park's director, there are no conflicts with spatial/strategic/development documents, as the protected area is not populated or, more precisely, is excluded from settlements, nor does it have significant economic importance. There are also no spatial interventions foreseen in the protected area. The landowners have in the past adapted their agricultural use to the natural conditions, with mixed agricultural use predominating in most cases, and with pasture and wet meadows in the floodplain, and have followed the instructions of the park managers. The director considers the cooperation with landowners to be good. The protected area is to some extent affected by noise from overflights by aircraft and helicopters at the Central Training Area of the Slovenian Armed Forces Poček, located in the

neighbouring Municipality of Postojna. It is foreseen that in the future, most of the protected area will be covered by the water protection area of the Malni karst spring, located on the edge of the Planinsko polje (Podjed, 2023). This abundant source of drinking water supplies the municipalities of Postojna and Pivka and has not been protected to date, although it is threatened by various human activities. It can be assumed that the establishment of a water protection regime will also have a number of positive effects on the protected area.

Looking at the land use in the Notranjska Regional Park in 2024 (Figure 5), we can see that 70% of the protected area is covered by forests. They are predominant in the northern and southern hilly periphery of the park and are also highlighted among the park's values in the specific form of preserved beech forests. The director mentioned that, in view of the exceptional richness of the forests, it would be wise in the future to take a more active part in their management and to establish a forest-woodland chain (Podjed, 2023). Permanent grassland accounts for 23% and arable land for only 1.1%. Trees and shrubs cover 1.5% and 1% of agricultural land under overgrowth, while other land use categories are represented with less than 1% of the area (Ministry of Agriculture, Forestry and Food, 2024).

An analysis comparing the land use at the time of the park's establishment in 2002 with the current situation in 2024 shows negligible changes, which cannot be quantified precisely. This is due to the different land use categories and their numbers: 14 in 2002 and 19 in 2024. A total of 7 categories have been added (agricultural land covered with forest trees; uncultivated agricultural land; forest tree plantation; dry open land with special vegetation cover; permanent crops in arable land; greenhouse; and vineyard), while two have been dropped (marshy meadow and bog). The proportion of forest remained the same between the two years compared (70%), while the proportion of permanent grassland increased from 16% in 2002 to 23% in 2024. The 7% difference was previously accounted for by several wetland categories. The proportion of reedbeds has decreased significantly, the categories of bog and marsh meadow are no longer present, and there has been a significant decrease in the remaining wetland. In the 2024 land use figure (Figure 5), permanent grassland covered most of Cerknica polje, including the area of the floodplain or intermittent lake. The arable area has decreased from 1.6% to 1.2%, with a slight increase in the proportion of agricultural land under overgrowth and trees and shrubs, which together account for 2.5%, and a small increase in built-up land (Ministry of Agriculture, Forestry and Food, 2024).

Tourism and Visitation of the Notranjska Regional Park

The authors of the Detailed management plan for the intermittent Lake Cerknica area wrote in a 2009 study that the aforementioned area is very attractive for tourism and visitors, as their number is increasing year by year (at that time, around 30,000 daily visitors were recorded annually). At the same time, they stated that despite its natural potential, the area is poorly developed in terms of tourism, and tourist activities are concentrated in only a few of the most attractive, smaller areas (mainly in the area of

Lake Cerknica south of the settlement of Dolenje Jezero and in Rakov Škocjan). They highlighted the fact that the area has great potential for the development of research and nature tourism, as well as tourism related to the preservation of ethnological and cultural-historical heritage. From the perspective of tourism development, they also highlighted the areas and settlements along Lake Cerknica and Menišija, which, together with Slivnica and Rakov Škocjan, offer opportunities for the development of “soft” forms of tourism and overnight stays (Detailed management plan for the Cerknica Lake project area, 2009).

In the analysis of tourist visits and infrastructure, we found that the total number of tourists who spend at least one night in the Municipality of Cerknica has been strongly affected by the COVID-19 pandemic in the past six years (Table 1). In 2018 and 2019, there were around 10,000 tourist arrivals registered annually, and then the number almost halved in 2020 (only 5,369 arrivals were recorded). In the following years, the number of tourist visits grew, and in 2023 amounted to 12,235 tourist arrivals, thus exceeding the number of tourists from the (previously record) year 2018. A similar balance is consequently also shown by tourist overnight stays: in 2018, their number exceeded 25,000 for the first time, followed by a decline in the seasons marked by the COVID-19 pandemic, and then the number exceeded the aforementioned milestone again in 2022, and in 2023 reached over 28,000 overnight stays (Statistical Office of the Republic of Slovenia, 2024b).

Table 1: Selected tourism indicators for the Municipality of Cerknica between 2018 and 2023.

Year/indicator	2018	2019	2020	2021	2022	2023
Tourist arrivals	10,109	9,696	5,369	7,057	10,339	12,235
Overnight stays	25,037	22,525	14,274	17,971	25,143	28,113
Number of tourist bed places	-	411	412	402	442	494
Average length of stay	2.48	2.32	2.66	2.55	2.43	2.30
Average occupancy rate of bed places	-	15.02	9.49	12.25	15.58	15.59

Source: Statistical Office of the Republic of Slovenia (2024b; 2024c).

A closer look at the tourism indicators shows that the average length of stay and average occupancy rate of tourist beds in the period under review are mostly lower than the national average, which in 2023 was 2.6 days for the average length of stay of tourists in the country and 23.2% for the average occupancy rate of tourist beds. The indicator for the number of tourist beds shows that in the last five years the number of tourist beds in the Municipality of Cerknica has increased by 20 percent (by a total of 83 beds), which has consequently also affected the growth of tourist arrivals and overnight stays (Statistical Office of the Republic of Slovenia 2024b).

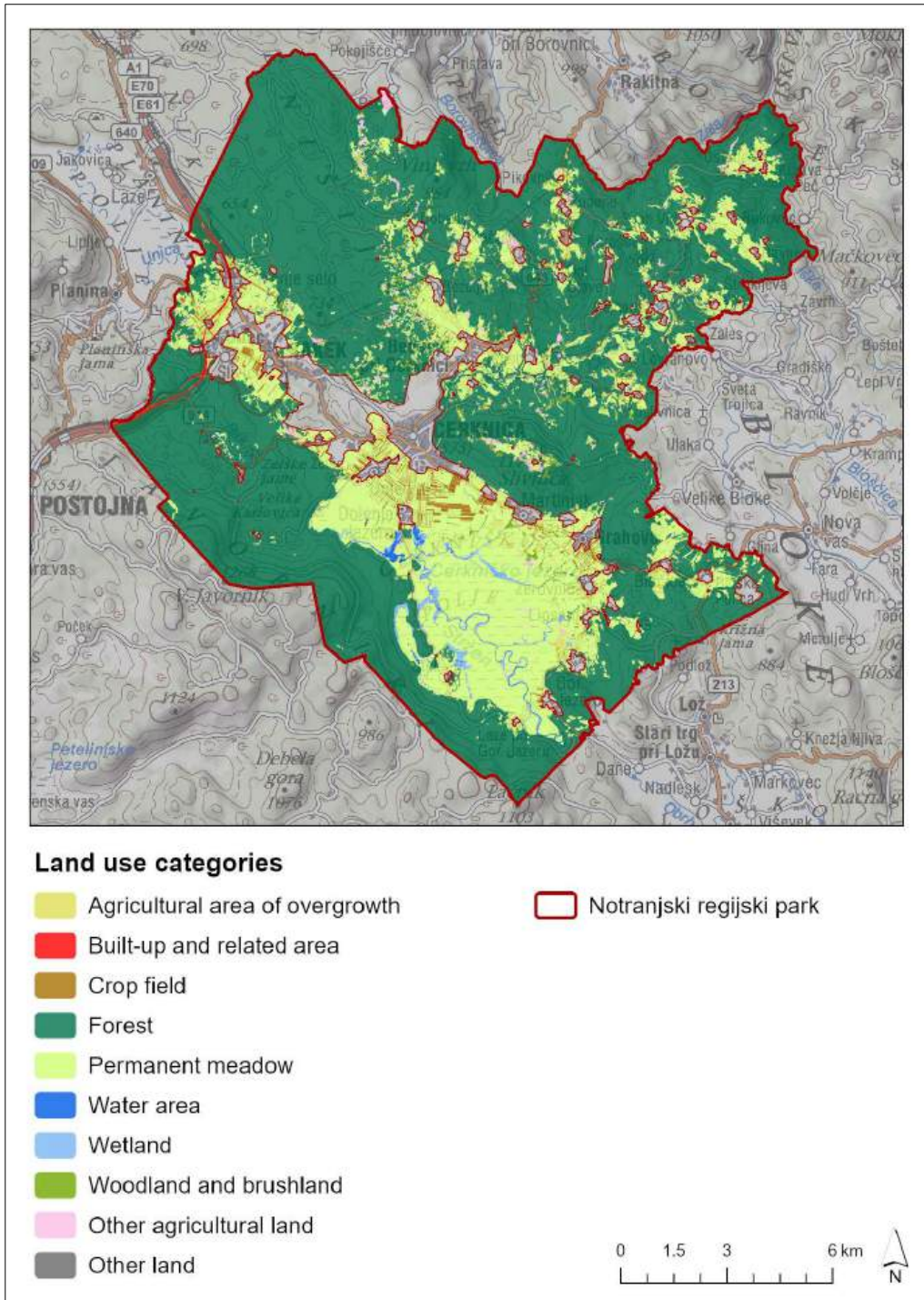


Figure 5: Land use in the Notranjska Regional Park area in 2024.

Data sources: Environmental Agency of the Republic of Slovenia (2018); Surveying and Mapping Authority of the Republic of Slovenia (2023); Ministry of Agriculture, Forestry and Food (2024).

The relatively noticeable increase in the number of tourist beds is also important to highlight from the perspective of the COVID-19 pandemic, which has brought numerous challenges to the tourism sector: investors in the municipality have nevertheless clearly recognised the tourism potential in the park area and directed their investments towards increasing the accommodation infrastructure.

The structure of accommodation providers is also shown in Figure 6, which shows the concentrations of accommodation establishments and types of this infrastructure. In the analysis of data from the Register of Accommodation Establishments (Agency of the Republic of Slovenia for Public Legal Records and Related Services, 2024), it was found that in December 2024, there were 51 operating tourist accommodation facilities in the area of the Municipality of Cerknica, for most of which providing accommodation is not a primary activity. In total, they offered tourists 498 beds in various categories of accommodation facilities. Most of them were in apartments, namely 117, followed by tourist farms with 78 beds and guesthouses with 83 beds. In Rakov Škocjan, there is the only hotel in the municipality, which offers 29 beds; the mountain hut in Slivnica has 33 beds; and the remaining beds are available in the form of rooms for rent, holiday apartments, overnight stays, a campsite and the Rak Centre for School and Outdoor Education, registered as 'Other establishment' in Figure 6 (Agency of the Republic of Slovenia for Public Legal Records and Related Services, 2024). A stop for campers and motorhomes was also arranged in the settlement of Podskrajnik (Notranjska Regional Park, 2024).

In addition to accommodation and catering service providers, the COVID-19 pandemic period also severely affected the Notranjska Regional Park and brought valuable experience to the park's administration. As already mentioned, the number of tourist arrivals and their overnight stays in the municipality decreased, while the number of day visitors or excursionists increased significantly, and the ratio between domestic and foreign guests also changed in favour of domestic visitors. According to the park's director, in 2020, they recorded around 60 to 70% of domestic visitors. On the one hand, they were satisfied that residents of Slovenia got to know the natural and cultural heritage in the park area, but on the other hand, they experienced uncontrollable visits over several consecutive weekends. An exceptionally large number of people visited the park and the administration was criticised for contributing to the excessive burden on the protected area with their promotional campaigns. The period was a stressful experience for the administration of the park, but it was also positive, as they learned about the 'carrying capacity' limits of the area and saw the dangers that excessive development of tourist visitation could bring to the park (Podjed, 2023). It is worth mentioning that the possible harmful impacts of tourism and recreational activities, which may represent a significant threat to the favourable conservation status of habitat types and species, were already highlighted by the authors of the Detailed management plan for the intermittent Lake Cerknica area in 2009. At that time, they defined driving motor vehicles in the natural environment of the lake as a threat to recreational and tourist activities, as well as uncontrolled sports activities, including boating and flying motorised kites over the lake, which can have a harmful impact on birds in general and especially during the

nesting period, as well as on habitat types and natural heritage (Detailed management plan for the Cerknica Lake project area, 2009).

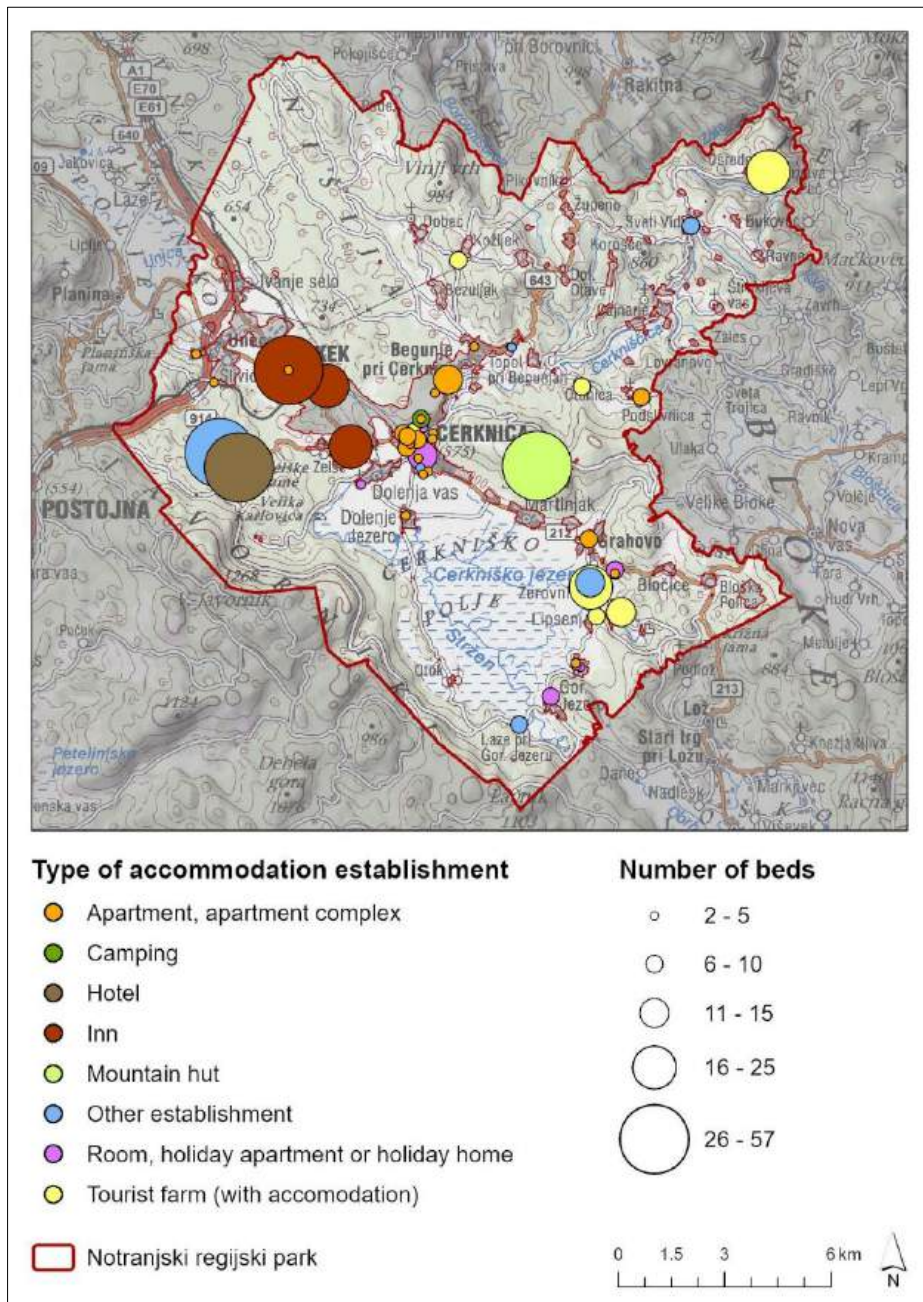


Figure 6: Tourist accommodation establishments in the Municipality of Cerknica in December 2024.

Data sources: Agency of the Republic of Slovenia for Public Legal Records and Related Services (2024); Environmental Agency of the Republic of Slovenia (2018); Surveying and Mapping Authority of the Republic of Slovenia (2023).

The administration of the protected area does not have detailed data on the number of visitors to Notranjski Park, as the area is not physically delimited and it is possible to enter the park at many places. However, they do have data on visits to Križna Cave, which is one of the most beautiful tourist karst caves in Slovenia (Notranjska Regional Park, 2024). Visits are organised with a cave guide and an entrance fee is paid. They also have data on guided tours. In 2022, the number of participants approached 2,000, with groups of schoolchildren dominating. The operator sees great potential in this area and predicts that the number of visitors could rise to 5,000. In the past, they did not have an employee who would deal mainly with this segment, but in 2023 it became the main responsibility of one of the park's employees (Podjed, 2023).

In 2015, the park administration attempted to assess the number of visitors based on counting individuals or their vehicles at the most visited locations within the park, which included Lake Cerknica, Rakov Škocjan, Slivnica and the aforementioned Križna Cave. The assessment was also based on visits to the Visitor Centre at Lake Cerknica and Information Point in Rakov Škocjan, where visitors and parked vehicles were periodically counted, as well as by automated machine counters that recorded pedestrians and cyclists. Initial estimates ranged from 40,000 to 50,000 visitors, while later estimates ranged from 80,000 to 100,000 visitors annually. The Visitor Centre, which records visitors to Lake Cerknica, and Rakov Škocjan, have around 20,000 visitors each, while Križna Cave has about the same number, and the rest were recorded in other parts of the park. The park administration plans to expand the locations by installing automated machine counters, which would allow for more accurate monitoring of visits (Podjed, 2023).

The main period when tourists visit the Municipality of Cerknica (and the Notranjska Regional Park area) is the summer season, as clearly shown in Figure 7, although the figure excludes day visitors to the area of municipality. In the four months between June and September 2023, a total of 7,582 tourist arrivals were recorded in the municipality, which means that 62% of all tourists in the year in question were recorded in this period. The phenomenon of seasonality is consistent with the trends in tourist visits at the national level. The ratio between locals and foreign tourists in the aforementioned year was 1 : 2.4 in favor of foreign visitors (Statistical Office of the Republic of Slovenia, 2024d).

As the park director notes, they do not develop tourist destination themselves, but want the latter to be shaped in cooperation between locals and the park, which would allow 'community-based tourism' to come to life, based on providers from the local environment. In 2017, they began implementing thematic weekends with the aim of educating local providers, as part of the Life project. They wanted to empower locals to establish and implement practices for visiting the protected area that would be consistent with the park's operating principles. In doing so, they also provided concrete financial support for their selected tourist products.

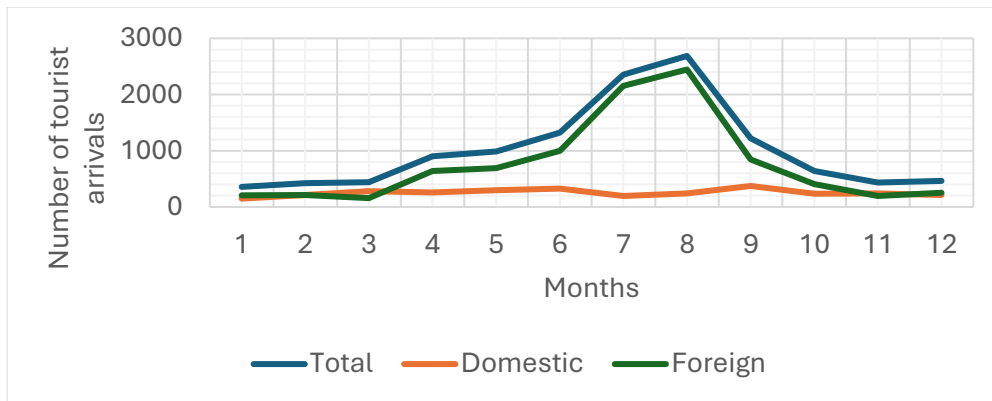


Figure 7: Number of tourists in the Municipality of Cerknica in 2023 by month and origin (domestic, foreign, total).

Source: Statistical Office of the Republic of Slovenia (2024d).

In 2023, they had five tourist products in various stages of use. These were: shorter canoe trips called ‘canoe safaris’, a guided trip to the Javorniki forest area with an emphasis on learning about the possibilities for ‘survival in nature’, a guided boat tour of the lake called ‘lake adventure’, and the offer was rounded off by thematic tours of the Drvošec trail and guided ornithological excursions (Podjed, 2023). In addition to the aforementioned products, visitors can choose from several other specific options for a visit to the protected area on the park's website: bird watching and bear watching, riding a traditional wooden boat, visiting the House of Tradition, which offers a demonstration of making a traditional wooden boat, and activities such as hiking along 11 thematic circular trails and several mountain trails, cycling along 10 guided tours of varying difficulty, fishing, and cross-country skiing in winter. Visitors are also offered tours of the Museum of Lake Cerknica and exhibitions in the Heritage House (Notranjska Regional Park, 2024).

The Notranjska Regional Park Public Institution does not have nature conservation supervisors, and only one employee has received appropriate training in this area, but he is currently involved in project work and does not operate in the field. The park director believes that it would be necessary to regulate supervision and sanctioning of violators at the state level, merge various inspectorates and increase their operational efficiency. All protected areas in the country face similar problems with violations of visitor rules. Nature conservation supervisors should have clearly defined regulations and greater authority, be properly equipped, and trained to be able to function well (Podjed, 2023).

Parking regulation has proven to be very important for regulating visits. When paid parking lots were established during the COVID-19 pandemic, the pressure on the closest areas of Lake Cerknica decreased. As a result, entry to the park became more dispersed, especially among cyclists. The Visitor Centre also made a significant contribution to dispersing visits. Here, visitors receive information about what else they can visit and do in the park, which has reduced the pressure on the most publicly

recognisable places by the lake. In the future, the park administration is also considering categorising parking infrastructure and charging varying fees at different locations. Such a fee would also include the entrance to the Visitor Centre and individual tours of the park. Upon entering the area of the Municipality of Cerknica, visitors could receive information on the number of available parking spaces in areas of the park via roadside signs, and they could also reserve a space online, while the administration would thus obtain information on the number of visitors (Podjed, 2023).

Interpretation of Natural and Cultural Heritage in a Protected Area

Initially, information boards were prepared for the interpretation of the natural and cultural heritage in the Notranjska Regional Park, the production of which was entrusted to an external contractor. The director expressed dissatisfaction with them due to the lack of didactic content presenting to visitors the uniqueness and specificity of the nature and cultural heritage in the Lake Cerknica area. After consulting with employees, a decision was made to undertake the interpretation of the heritage themselves with the help of experts in selected fields. The park's overall graphic image was thus created in 2022, upgrading the previous online presentation created in 2015 and 2016. This was no longer appropriate, as it only informed website visitors about the natural and cultural attractions and, to a lesser extent, about the offer for visitors, and above all, it did not enable their active involvement. Currently, in addition to the website, the overall graphic image also includes presentations on social networks (Facebook, Youtube, Instagram and the X network). The content of the website was prepared by park employees, while the design was entrusted to an external contractor. Several employees have editing rights, and one person is responsible for adding, removing or changing content. Various disciplines were included in the design of the content, in addition to biology, geology, geography, karstology, archaeology, history, ethnology and communication studies (Podjed, 2023).

In addition to basic information about the park, its mission and goals, the website presents nature (natural attractions, plants and animals) and culture (Museum of Lake Cerknica, Heritage House of Tradition, architectural heritage and monuments, archaeology, cultural landscape, traditional crafts and activities, and Notranjska Regional Park through time), as well as projects that have been or are still being implemented in the park, and information for visitors. The presentation also includes the Visitor Centre, a range of occasional events, including the Carnival in Cerknica event, activities (hiking, cycling, boating, animal observation, etc.) and nine different tourist experiences. Information is available on the range of accommodation and catering, the tastes of Notranjska (breakfasts and lunches at selected providers in July and August), and products of local and artisanal crafts (Notranjska Regional Park, 2024).

An important activity of the park authorised guides is personal interpretation of heritage during guided visits, which most often take place when visiting the Visitor Centre, the Museum of Lake Cerknica, or guided tours along thematic trails. The

director highlighted the importance of personal interpretation in explaining the processes that make Lake Cerknica special, allowing visitors to learn about the complex system of water flow and the phenomenon of the lake drying up, and that guides can adapt the interpretation to the age and level of knowledge of visitors (Podjed, 2023). A list of a large number of guides is also available on the park website, offering guided tours in different languages (Notranjska Regional Park, 2024).

Cooperation Between the Protected Area and the Local Community

As mentioned above, in 2024 the total population of the Municipality of Cerknica was 11,870. Although the settlements are not included in the protected area of the Notranjska Regional Park, they are in direct contact with it, surrounded and influenced by the protected area, and many of the inhabitants are also landowners in the protected area itself. According to the director, the park had very little communication with local people until 2014, and their attitude towards the protected area was unknown. With more active management in the last decade, more active communication has taken place, which has led to a situation where the park has gained both supporters and opponents. He believes that more than half of the population has an indifferent attitude towards the protected area, which is reflected in a general inactivity or lack of interest in the park's activities, which are also carried out for the benefit of the local population. In his view, they have made several mistakes in their communication with the local community in the past, because they wanted to communicate too much and to be transparent with them. They sought consensus and involved local people, which, among other things, led to a negative reaction. Today, he believes that the proportion of residents who see progress in the park is increasing every year, and that support for the park is also increasing, with some residents benefitting directly and others seeing progress that benefits them too (Podjed, 2023).

Local people are key stakeholders in protecting nature and preserving the cultural landscape. The park manages around 500 hectares of land, but the rest is privately owned and without the participation of the owners, the objectives of nature and cultural landscape protection cannot be achieved. The park provides them with technical support and is a political actor in the formulation and implementation of relevant policies. The park tries to converge views and reach consensus with them on the appropriateness of actions. The director considers that in recent years there has been very good cooperation with landowners, the municipality, the administrative unit and consultants on certain activities, such as the restoration of watercourses, but weak cooperation in some other fields, such as the creation and design of the facilities in the Visitor Centre and the thematic trails. In his view, better quality results could have been achieved through more intense cooperation. Agricultural stakeholders, tourism stakeholders and a section of the general public who are nature, landscape, and culture lovers are the groups with whom the park staff works most closely. Tourism stakeholders are the most active, as they are interested in the development and management of the protected area. Several workshops and presentations for stakeholders are organised each year (at least 10 in the year 2022), and focus groups are formed to discuss project work and funding. There is intensive contact with

landowners and farmers, as well as with the agrarian community, while there is no landowner community on the lake. In the director's view, it is particularly important to have 'opinion leaders' with whom they have intensive discussions and thus 'manage' a wider range of stakeholders. He believes that in the past, farmers have been 'unfairly' neglected in their cooperation with the park, and often seen as opponents with whom they did not want to engage, which was wrong. Today, as a manager, he values and respects their experience. He feels that the park should selectively draw knowledge from them and adapt this knowledge to scientific and professional expertise. This would mean progress and integration of experience, which should become part of the working process (Podjed, 2023).

The park participates in most of the events in Cerknica (e.g. Carnival in Cerknica, Cerknica Half Marathon, Christmas Fair), which attract both the local community and visitors. Some events are coordinated by the park representatives together with local people, e.g. Cinema in the Open Air, Fairy Tales Under the Canopy, and thematic weekends between 15 April and 15 September (Podjed, 2023).

Local people have different attitudes towards tourism development in connection with the park, and it is their participation or involvement that has divided them. Older and more traditional locals are opposed to tourism and see visitors as a nuisance, while locals involved in the catering, room and apartment rental business are supportive of such development. Among the latter are also locals who run tourist farms or act as guides or sell their products (handicrafts). The director considers that it would be difficult to give an estimate of how many are opposed to tourism and how many are supporters. Among the supporters of tourism development are also employees of the municipality, commuters working in the Ljubljana area and in other places, i.e. those who have free time. Through various activities, park staff have managed to appeal to a very wide range of local people, including those who are keen on tradition, such as beekeepers, hunters and fishermen. Local beekeepers have set up a honey vending machine in the park to increase the sale of bee products. Similarly, in cooperation with hunters, bear watching was offered as an experience in the park; the park administration allocated funds for this and the hunters responded as a good partner. They also work well with fishermen. They would like to see more networking with local businesses, which are important stakeholders and often provide financial support to the park (e.g. in the Life Stržen project). The cooperation with the Municipality of Cerknica is good, but at national level they would like to see more intensive and, above all, more operational cooperation (Podjed, 2023).

According to the park director, there are no obstacles for cooperation with tourism providers, but it could be even more intensive, e.g. following the example of the Škocjan Caves Park, where a part of the entrance fee is allocated to the restoration and maintenance of cultural heritage, and even to accommodation facilities. The park administration would like to set up a support mechanism and thus standards could be developed (Podjed, 2023). Renting out rooms or apartments is not enough; a higher level of service, e.g. including food, would bring a higher added value: *'If we could make a support scheme, we could also make standards. A room or an apartment does*

not give enough in this area and we need to strengthen this segment. A higher added value, a higher level of service, which is at least a bed and breakfast.'

The park administration works with tourism providers to carry out workshops, evaluations, presentations as part of projects, or to organise individual events, such as 'Park Days' and themed weekends in the past. Tourism providers create the offer, which is also supported by the park through the Visitor Centre and their marketing. The park management, in cooperation with the mayor, the Tourism Department and representatives of the various municipal associations, tourist farms and accommodation establishments, has prepared a Sustainable Tourism Development Strategy for 2021–2026, which sets out, inter alia, operational objectives and measures at the destination management level, operational objectives and measures at the tourism development level, and operational objectives and measures at the promotion level (Sustainable Tourism Development Strategy, 2021).

The Notranjska Regional Park is a member of the Dinaric Arc Parks and SavaParks Network. The director explained that in the past, the management board has supported membership in those associations where there was interest and potential for project cooperation. In the past, they did not support joining the Europark Federation, nor was the focus on cross-border cooperation, but rather on the expansion of the park in the neighbouring municipalities of Postojna and Logatec (Podjed, 2023).

Agriculture is one of the areas that the park's management pays a lot of attention to. Mowing at the right time is important for biodiversity conservation, and they support this type of farming practice with financial incentives. In the future, it will also be important for farms to cooperate and benefit from this, developing activities that are compatible with the park's objectives. This is not just a matter of land use, but of wider development. The administration acknowledges the need to draw up a plan, a strategy for the development of agriculture in the park. There are also a considerable number of organic farms in the area of the Notranjska Regional Park. The park administration is currently not thinking about creating a brand for the products originating in the park, because they do not have enough financial and other resources. This is the domain of the umbrella destination brand 'Zeleni kras', which represents the brand of the area of the Littoral–Inner Carniola Statistical Region and is the result of cooperation between the municipalities of Bloke, Cerknica, Ilirska Bistrica, Loška Dolina, Pivka, and Postojna (Zeleni kras, 2024). The director considers that they are increasingly recognised as the destination brand of the Notranjska Regional Park (Podjed, 2023).

Biodiversity and geodiversity monitoring is not regularly carried out in the Notranjska Regional Park. Within the protected area, monitoring is implemented at the national level, some of which is carried out with the participation or involvement of park staff, but otherwise, similar activities are carried out as part of several projects. The distribution of invasive species in the park area is not systematically monitored, and they are only occasionally removed, nor are threatened biotopes monitored. However, they do have an inventory of wild landfills and the situation here is quite good, according to the director. The settlements in the park's area of influence do not have

satisfactory public amenities. Cerknica has a wastewater treatment plant, the efficiency of which is questionable according to the interviewee, and in smaller settlements septic tanks are prevalent. The director considers that regular monitoring of water quality at different water levels and monitoring of potential pollutants is necessary, but there are no funds available for implementation (Podjed, 2023).

There are no problems with illegal construction in the park. The director assumes that such constructions are potentially located in settlements and are the result of expanding activities, but the area of settlements is excluded from the protected area of the park. There are also no illegal second homes in the protected area. According to the director, there is also no tendency or pressure to change the function and use of land in the park, as this concerns mostly the immediate surroundings of the settlements (Podjed, 2023).

Perspectives for the Development of the Protected Area

According to the director, the main challenges for the development of the Notranjska Regional Park protected area are related to stable financing, a balance between nature protection and tourism development, and the expansion of the protected area. Stable financing would provide sufficient funds for the implementation of various measures, activities, and planned development. This would make the park less dependent on individual projects or sponsorship funds. He also sees no obstacles for obtaining more financial resources from revenues, related to the implementation of a stricter and more expensive parking regime for visitors within the area of the park. Tourism as an activity has development potential, is compatible with agriculture, and provides employment for locals. In his opinion, if the development of tourism is well planned, this activity is also compatible with nature protection (Podjed, 2023).

“If the park management decided that only tourism should be developed, nature protection would be the victim; on the other hand, we also had a period when the park administration inhibited any attempts for tourism development or the creation of tourist services, which is also not right. In other words, a balance is needed, and there must also be a critical self-examination.” (Podjed, 2023)

The director of the protected area added that the park should play a more decisive role in the further development of tourism in the coming years. In his opinion, tourism development should not be directed by external decision-makers. Even more active participation of the park is needed in agriculture, where it must be more directly involved in, for example, the formation of forest-timber production chains. The expansion of the park to the neighbouring municipalities of Logatec and Postojna, perhaps even wider to the Snežnik area, with the vision of creating another national park, is, in the opinion of the director, a challenge with realistic possibilities of implementation. Thus, measures for the management of intermittent lakes, forests, and groundwater would apply in a wider area (Podjed, 2023).

After a detailed analysis of the Notranjska Regional Park in light of the increasing tourist visits and the pressures on the natural environment, we can conclude that it would be welcome and very advisable for the park to adopt a comprehensive management plan, in accordance with the guidelines and restrictions in the zones of the protection regime. The plan, which was not implemented over the last two decades, would not bring any major changes for the central area (planned Zone A), but for the optimisation of the current wider protected area of the park (Zone B), such a document would bring important provisions, for example, for the appropriate development of agriculture and more active forest management.

As the director pointed out, the greatest progress would be made by implementing zoning for settlements and infrastructure, which would thus be integrated in Zone C of the protected area of the park. This would greatly contribute to achieving the goal of the Notranjska Regional Park becoming a model of coexistence of people, including their activities, and nature protection. Such a practice was successfully implemented in Slovenia in the case of the Kozjansko Regional Park. This would also limit or even reduce pressures on the protected area in the long term, while at the same time provide the necessary monitoring, enable an assessment of the carrying capacity of the environment, and strengthen goals that would ensure the sustainable development of the Municipality of Cerknica across various fields.

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Chapter 6

The Seasonal Lakes of Pivka Nature Park: A Dinaric Protected Area as a Generator of Local Development

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The Seasonal Lakes of Pivka Nature Park (hereinafter referred to as SLPNP) was established in May 2014 by the Municipality of Pivka through the adoption of the Landscape Park Decree. The municipal authorities of the Municipality of Pivka decided to implement the procedures and activities for establishing the protected area step by step, actively involving the interested public. The trigger for the establishment of the park was the prolonged wastewater contamination in 2011 and 2012 when several cases of spilled digestate from biogas plants were observed in the Pivka area. During the two-year process of formation, meetings were organised with representatives of professional organisations and institutions from national, regional, and local levels, including the Ministry of the Environment and Spatial Planning, the Ministry of Agriculture, Forestry and Food, the Institute of Nature Conservation of the Republic of Slovenia, the Karst Research Institute, the Agricultural Advisory Service, the Environment Agency of the Republic of Slovenia, the Ministry of Defense, the Forest Service of Slovenia, hunters, and water managers. The local community was also involved as an important actor in the process. Lectures and workshops were organised for the residents, to inform them about the significance of the nature conservation area, opportunities for networking and encouraging agricultural activities, and the possibilities for the development of sustainable tourism. Through their comments and suggestions, the local community actively participated in the preparation of the decree establishing the landscape park. Meetings were also held with representatives of farmers, landowners, and hunters, who contributed their comments to the decree. This thoughtful inclusion of the local population, the cooperation, and effective communication between various stakeholders serves as a good example of the establishment of a landscape park by the local community (Seasonal Lakes of Pivka Nature Park, 2024; Kogovšek, 2023; Kovačič, 2023).

The main goal of the landscape park is to preserve natural values and cultural heritage. The conservation objectives include the preservation of the characteristic geomorphological and hydrological karst landscape along the Pivka River with its intermittent lakes, dry grasslands, wetlands, and the dense forests of the Javorniki Mountains, as well as the biodiversity of flora and fauna species and their habitats. In addition to preserving the diversity of the cultural landscape, the park also aims to improve the quality of life for the local population by promoting sustainable development, new employment opportunities, and development prospects in tourism and other sectors. By preventing further environmental burdens, the preservation of natural resources, cultural heritage, and cultural values is made possible. Another important objective of protection is to provide opportunities to research, educate, raise

awareness, visit and experience the park (Official Gazette of the Republic of Slovenia, No. 43/2014).

The origins of the landscape park date back to 1969 when the Institute for Monument Protection Nova Gorica conducted a survey and evaluation of natural phenomena in the area of the then Postojna Municipality. Two years later, the proposal was adopted as a Decree on the Nature Conservation Monument Order for the Postojna Municipality, which envisioned two levels of protection for the lakes. The first level, where a strict prohibition of damage or threat applied, included non-living natural monuments of Class II with national importance (Palško Lake, Petelinjsko Lake). The second level, where certain interventions in nature were allowed with the approval of the competent nature conservation service, included non-living natural monuments of Class III with local importance (Veliko and Malo Drskovško Lake, Veliko and Malo Zagorsko Lake, Parsko, Kalško, and Bačko Lake). Despite regulations and conservation guidelines, some areas around the lakes were used as military training grounds, with negative environmental impacts. With the adoption of the still valid Decree on the Proclamation of Cultural and Historical Monuments and Natural Sites in the Postojna Municipality (1984), Palško, Petelinjsko, Veliko, and Malo Drskovško Lakes were proclaimed natural monuments. However, in the areas of Palško and Petelinjsko Lakes, protection regimes continued to be disregarded during military training (Seasonal Lakes of Pivka Nature Park, 2024).

During a later inventory of natural heritage in the municipalities of Pivka and Postojna, the protection was extended to 13 lakes. The Nature Conservation Act (Official Gazette of the Republic of Slovenia, No. 56/99 and 31/01) defines systems for protecting natural values and measures that contribute to the conservation of biodiversity with the purpose of nature conservation (Cernatič Gregorič & Gorkič, 2005).

The park is managed by the Municipality of Pivka and the Pivka Tourism Public Institute. The Municipality of Pivka is responsible for the activities and project applications, while the Pivka Tourism Public Institute handles the promotional and marketing aspects (Ecomuseum of the Seasonal Lakes of Pivka and Dina Pivka – Centre for Large Carnivores) and infrastructure maintenance (Kogovšek, 2023). This collaboration between the two institutes is also reflected in the employment structure and work organisation. In 2025, the landscape park employs two full-time staff in the fields of forestry and biology, one of whom is also the park manager. They are accompanied by an employee from the tourism sector, who, in addition to working in the landscape park, also deals with municipal matters not directly related to the park. All those working in the park are employed by the Municipality of Pivka and cooperate well with other municipal services (Kovačič, 2025).

Due to a lack of financial resources, the park's management plan has not yet been prepared, but it is a priority. For now, the Temporary Management Guidelines for the SLPNP (Modri koraki za zeleno prihodnost, 2016; Kovačič, 2023) are in use.

The management plan will include a description and analysis of the state of natural values and biodiversity in the landscape park, the objectives of the development measures, and the vision and management programme of the landscape park. The management objectives will be implemented in the areas of nature and water resource protection, promotion of sustainable agriculture and tourism, promotion and marketing, education and awareness-raising for the local population and visitors, traffic management, and the realisation of development projects. One of the important objectives is to encourage, support, and raise awareness of sustainable development among the local population, thus improving the quality of life in the landscape park, which is balanced between nature protection, nature use and local traditions (Modri koraki za zeleno prihodnost, 2016; Kogovšek, 2023; Kovačič, 2023).

In November 2024, SLPNP received the Natura 2000 Award in the category of socio-economic benefits as an example of good practice in the dedicated management of a protected area in cooperation with the local population. The exceptional nature of the Pivka Seasonal Lakes is also reflected in the nomination alongside other karst locations for inclusion on the UNESCO World Heritage List (Seasonal Lakes of Pivka Nature Park, 2024), as *'nowhere in the world are there so many seasonal lakes in such a small area. The Municipality of Pivka is the municipality with the most lakes in Slovenia'* (Kogovšek, 2023; Širca, 2024).

Geographical Outline of the Protected Area

The SLPNP (Figure 1) has an area of 140 km² and is composed of two major geographical units, namely Upper Pivka and a part of Javorniki, which extend into the municipality of Pivka.

The bed of the Upper Pivka basin has been shaped by the Pivka River, above which rises a terraced karst plain, and in which are sunken basins which, at high water, become lake basins, giving rise to the 17 seasonal lakes of Pivka. Of these, 11 are located in the SLPNP, most of them between Zagorje and Parje. These lakes are: Kljunov ribnik, Malo and Veliko Zagorsko Lake, Veliko and Malo Drskovško, Parsko and Radohovsko Lake, Klenski dol, Palško and Petelinjsko Lake, and Krajnikov dol. The largest of these are Petelinjsko and Palško Lake (Official Gazette of the Republic of Slovenia, No. 43/2014).

Looking at land use the SLPNP in 2024 (Figure 2), we can see that forests cover 72% of the protected area. They are located in the northern and western part of the park, dominated by beech and fir forests. Permanent grassland accounts for 22%; agricultural land covered with forest trees and overgrown comprises 3.4%. Trees and shrubs cover 1.8% of the protected area, and built-up and related land accounts for 1%. Interestingly, arable land accounts for only 0.3%. The other categories (uncultivated agricultural land, extensive or under cultivation) are not covered by trees and shrubs.

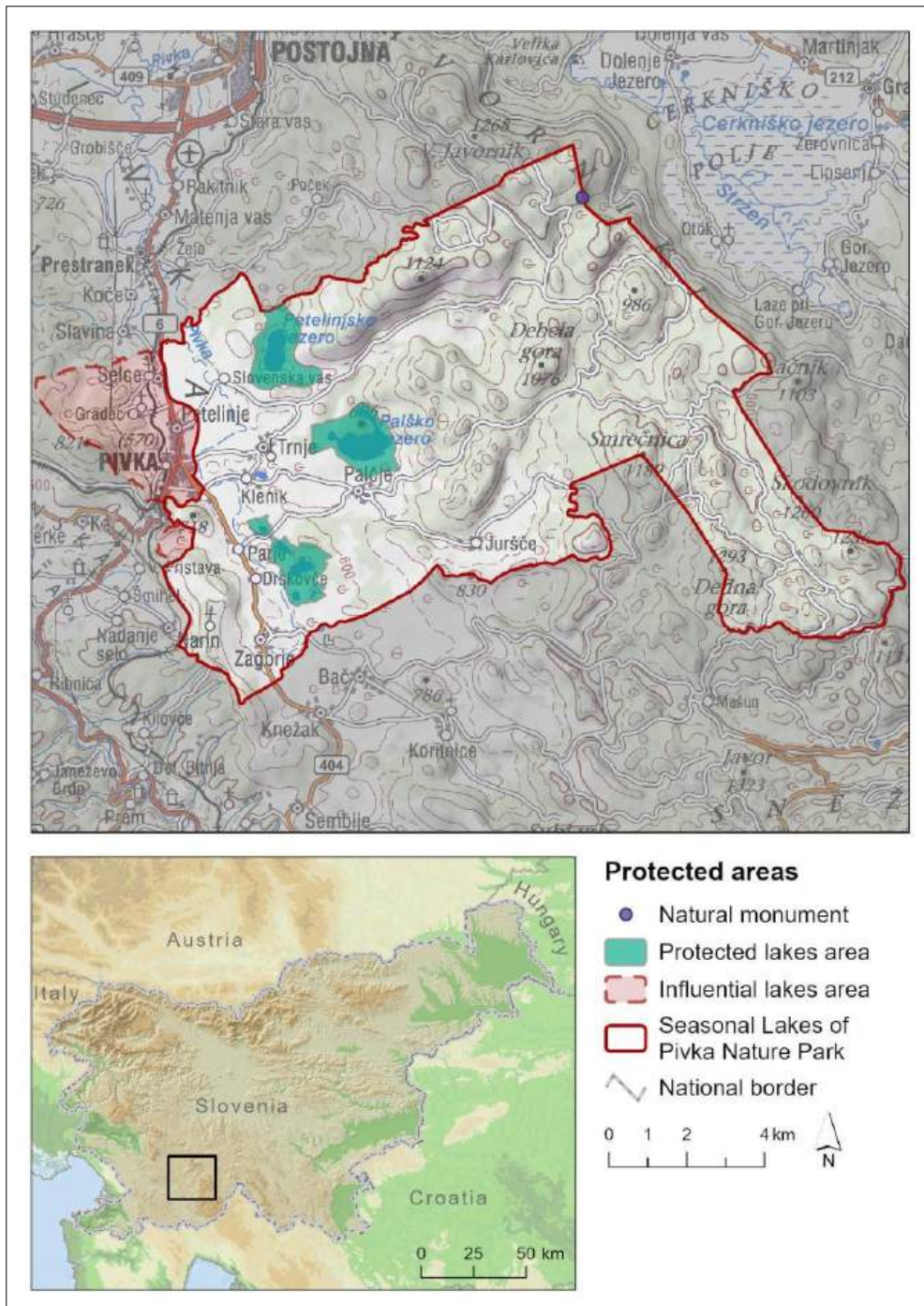


Figure 1: The SLPNP area and its location in Slovenia.

Data sources: Environment Agency of the Republic of Slovenia (2024); Surveying and Mapping Authority of the Republic of Slovenia (2008, 2017, 2023); Esri, FAO, NOAA, USGS, GEBCO and Garmin (2024); Eurostat (2024); Seasonal Lakes of Pivka Nature Park (2025); U.S. Geological Survey (2020).

An analysis comparing land use at the time of the park's establishment in 2014 and the current situation in 2024 shows negligible changes that cannot be precisely identified. The proportion of forest decreased by 0.6% between the two years compared, while the proportion of trees and shrubs increased by 0.6%. Grassland decreased from 0.6% to 0.3% (Ministry of Agriculture, Forestry and Food, 2024).

The landscape park contains 117 natural values, 17 priority habitat types, 5 natural monuments, 3 ecologically important sites, the Javorniki – Snežnik special conservation area and the Snežnik – Pivka special protection area (Natura 2000 sites). The landscape park also includes the forest reserves Ilov klanec, Dedna gora and Bička gora (Official Gazette of the Republic of Slovenia, No. 43/2014).

The area of the landscape park is characterised by high biodiversity. The interaction between water, humans' extensive use of meadows and pastures and the sub-Mediterranean location creates the conditions for a diverse fauna and flora. In different habitat types such as intermittent lakes, wet and dry meadows, pastures, mainly beech and fir forests, and karst caves, researchers have counted 182 species of plants, 211 species of beetles, 106 species of diurnal butterflies (e.g. the scarce large blue (*Aculeina teleius*)) and 133 species of birds (e.g. corn crake (*Crex crex*), red-backed shrike (*Lanius collurio*)). Large carnivores, such as the bear (*Ursus arctus*), wolf (*Canis lupus*) and lynx (*Lynx lynx*), have also found their habitat in the forests of the Javorniki Mountains and in the lakes (Šabec Korbar et al., 2024).

As special representatives of the fauna of the area, it is necessary to highlight the small crayfish (*Chirocephalus croaticus*), endemic to the Petelinjsko Lake (Figure 3), and the human fish (*Proteus anguinus*), endemic to the Pivka underground. The lakes do not support fish because during the summer dry season the water is hidden underground (Seasonal Lakes of Pivka Nature Park, 2024; Modri koraki za zeleno prihodnost, 2016). In the plant world, it is worth mentioning the Illyrian swordwort (*Gladiolus illyricus*), the whole-leaved sow-thistle (*Clematis integrifolia*), the Siberian iris (*Iris sibirica*), the leather-leaved sow-thistle (*Peucedanum coriaceum*), the edged meadow (*Allium angulosum*) and the blue cone (*Molinia caerulea*) (Šabec Korbar et al., 2024).

The Pivka Basin is a depression area located between the following high karst plateaus: the Nanos, the Hrušica, the Javorniki, the Slavenski plain and the Snežnik, as well as the catchment area of the Notranjska Reka. The basin is home to a number of karst phenomena. During major rainfalls, the karst ground water rises and seasonal lakes are formed in depressions of various dimensions, whose basins have been transformed by flood waters through edge and ground corrosion. The karst caves that predominate in the area are short and dry (Mulec et al., 2005).

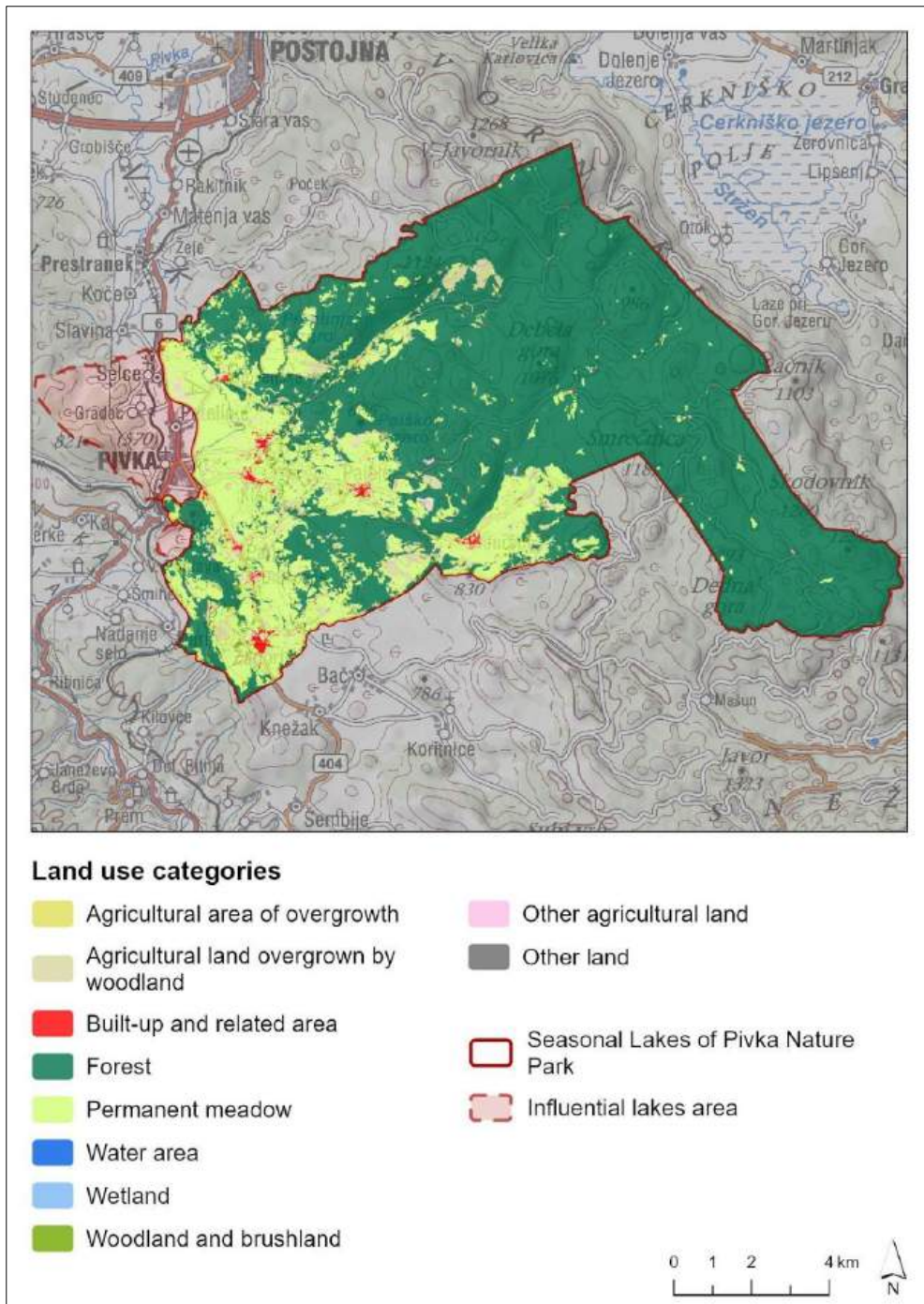


Figure 2: Land use in the SLPNP area in 2024.

Data sources: Environment Agency of the Republic of Slovenia (2018); Surveying and Mapping Authority of the Republic of Slovenia (2023); Ministry of Agriculture, Forestry and Food (2024); Seasonal Lakes of Pivka Nature Park (2025).

The northern part of the basin, the Lower Pivka, is made up of impermeable, surface-draining, flysch rocks, while the southern part, the Upper Pivka, developed on a limestone surface and contains some features of a karst field. Upper Pivka can be further divided into two parts; the first part is the flat valley bed, which is the lowest valley part along the Pivka River. Its bedrock is covered by a layer of clayey or sandy sediments. There are no sinkholes, but this is not the case for the numerous and morphologically indistinct sinks and springs. The second part of the Upper Pivka is a rocky terrace above the basin bed, which runs between the basin bed and along the Javorniki Mountains. Its northern part is 3 km wide and narrows to 1.5 km at Petelinjsko Lake. It widens again at the village of Zagorje, where it is 4 km wide. The terraced area slopes south-westwards, with an altitude of 650–670 m and 550–570 m at its western edge. The terraced area slopes south-westwards, with an altitude of 650–670 m and 550–570 m at its western edge. The northern part of the terrace is already heavily dissected in parts, with isolated clustered peaks and many sinkholes. Larger sinkholes are found along the western edge, where larger-scale basins have also formed, in which the Seasonal Lakes of Pivka occur (Mulec et al., 2005; Stepišnik, 2017).



Figure 3: Comparison between full and empty Petelinjsko Lake.

Photo by M. Krebelj, 2022.

The basins of the seasonal lakes of Pivka were formed by the transformation of sinkholes, or relief depressions, the bottom of which extended below the level of groundwater fluctuations. The bottom of the ponds is fossiliferous, covered by an average 0.5 m thick layer of sediment and soil, which is more than the average thickness of soil on the karst surface. Of the 17 seasonal lakes (Table 1), the largest are Petelinjsko Lake and Palsko Lake, with a bed length of more than 1.5 km. The remaining basins are smaller, 100–300 m across, and much larger than the sinkholes,

above which the flood water does not extend. During heavy rainfall, water rises to the surface through the cracks, damming up the canyons and the Pivka spring and riverbed. The lake water dissolves the limestone mainly laterally, resulting in widened basin bottoms and morphologically distinct folds of the basin slopes (Mulec et al., 2005; Stepišnik, 2017).

Table 1: Main characteristics of the 17 seasonal lakes.

Lake name	Lake bottom (m above sea level)	Mean lake level (m)	Lake area (ha)	Lake volume (m ³)
Šembijsko Lake	558.8	1.2	1.24	11,274
Bačko Lake	560.4	2.1	3.3	64.6
Laneno Lake	570.2	x	x	x
Veliki dol	553.8	1.2	1.5	26,792
Kljunov ribnik	549.5	1.5	0.07	80.0
Kalsko Lake	553.8	1.2	5.6	26,813
Veliko Zagorsko Lake	549.0	1.0	1.7	19,920
Malo Zagorsko Lake	544.2	3.8	3.9	83,100
Veliko Drskovško Lake	541.7	3.3	18.6	441,427
Malo Drskovško Lake	539.2	0.8	4.1	52,593
Parsko Lake	538.0	2.0	2.9	46,060
Radohovsko Lake	534.2	1.8	1.6	22,434
Klenski dol	544.0	1.0	0.36	1,330
Palško Lake	542.3	12.7	102.8	7,144,854
Petelinjsko Lake	532.2	12.8	73.6	6,891,976
Krajnikov dol	537.0	x	x	x
Jeredovce	537.5	x	x	x

Source: Official Gazette of the Republic of Slovenia, No. 43/2014.

Three levels of protection regimes have been established in the area of the Landscape Park. The first applies to settlements within the park and the zone of influence and prohibits all interventions that could endanger drinking water and the environment. The general protection regime applies to the whole area of the park, except for the villages within it, and includes more stringent restrictions. Activities that could have a negative impact on plant and animal species and on the characteristic landscape diversity are prohibited, such as: cultivation of genetically modified organisms, alteration of watercourses and wetlands, pouring of digestate from biogas plants, filling gravel roads with unnatural materials, construction of new infrastructure facilities for transit or renewable energy sources outside building land, and other activities that could endanger the environment (Official Gazette of the Republic of Slovenia, No. 43/2014).

The most stringent protection regime applies to the lake protection area. In addition to the above restrictions, the following activities are additionally prohibited: new hydro-remediation, certain agro-remediation, intensification of agricultural works, land excavation which would damage extensive meadows, mechanical vegetation clearing by mulching (except in certain cases between September 30 to March 1), the use of plant protection products for soil improvement, the introduction of non-native species, the construction of new thoroughfares, the attachment of foreign objects to trees, the construction of new buildings, the taking-off and landing of powered aircraft, paragliders, kites, balloons or the launching of model aircraft and similar devices. It is also prohibited to drive motor vehicles, except for agricultural, forestry and hunting activities, as is camping, tenting, burning, and the organisation of picnic, exercise or recreation areas, as well as mass events, except those intended to raise awareness (Seasonal Lakes of Pivka Nature Park, 2024).

The main socio-geographical characteristics of the Municipality of Pivka in terms of the conditions for the development of nature and other forms of tourism are as follows. The Municipality of Pivka, created in 1994 with the division of the Municipality of Postojna, is a medium-sized municipality and is located in the Primorje-Notranjska statistical region. In terms of area, it ranks 22nd among Slovenian municipalities. According to the latest data (2024), it has 6,162 inhabitants, 52% of whom are men and 48% women. In terms of population, it ranks 86th among Slovenian municipalities. The average density per square kilometre was 28 inhabitants, lower than in the country as a whole (104 inhabitants per km²). The population of Pivka has remained constant over the years 2008–2024 with no significant fluctuations (Figure 4). The average age of the population in Pivka was 44.9 years. Among the inhabitants of Pivka, the oldest population aged 65 or older exceeded the number of those aged 15 or younger (Statistical Office of the Republic of Slovenia, 2024a), which indicates an ageing trend of the population, typical for the entire country of Slovenia.

In the economic sector, the area of the present-day municipality of Pivka was dominated by the wood-processing and meat-processing industries, as well as agriculture after World War II. Due to global economic changes, the Javor wood-processing factory ceased its operations in 2003. On the degraded site of the former factory, the production of caravans started in 2023 in the renovated premises of the Javor business zone, promoting development opportunities for the municipality and the local population (Municipality of Pivka, 2024). The driving economic sector is the poultry meat processing industry Pivka Perutninarstvo JSC, which has been operating successfully since 1959 and employs 430 workers (Pivka Perutninarstvo, 2024). The dominant agricultural industries are cattle breeding, sheep breeding and horse breeding for tourism and recreational purposes. The local population is increasingly aware of the importance of sustainable tourism and its related accompanying activities such as organic farming and promotion of small business and crafts.

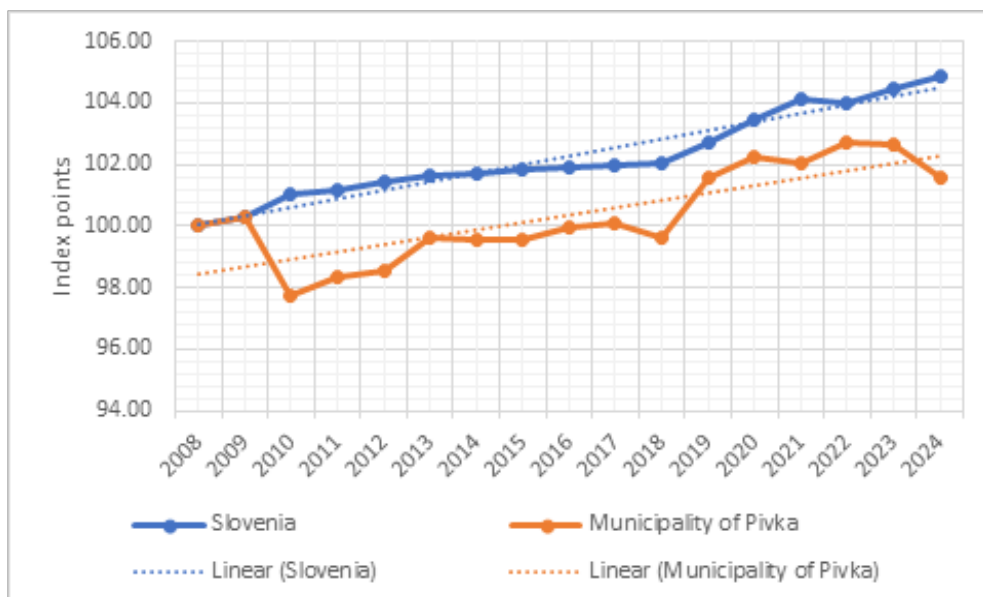


Figure 4: Population trends in the Municipality of Pivka and Slovenia between 2008 and 2024.

Source: Statistical Office of the Republic of Slovenia (2024a).

The efforts of the Municipality of Pivka to improve the quality of life of the local population are reflected in the fact that it has been awarded the ISSO Gold Certificate for economic stimulation, improvement of the standard of living and environmental initiative (Municipality of Pivka, 2024).

Tourism and Visitation of the Seasonal Lakes of Pivka Nature Park

The development of tourism in the SLPNP area started even before the establishment of the park in 2014, with the opening of the Ecomuseum of the Seasonal Lakes of Pivka in 2013, which symbolised the entry point to the park and set the guidelines for the further development of tourism in the park, being the main stepping stone. The effects of increased tourist arrivals are also being felt by local providers in the surrounding area: cheese producers, caterers and accommodation providers, who are coming together to form a comprehensive tourism offer. Information boards in the park have also been upgraded and the number of organised events has increased.

The number of tourist arrivals more than tripled and the number of overnight stays more than doubled between 2018 and 2023 (Table 2). Overnight stays and on-site visits are dominated by foreign active visitors from European countries, especially the French, Belgians, Dutch, Germans, but also Austrians, Spaniards and British people with camper vans. Visits to the Ecomuseum and the Dina Centre are dominated by domestic guests. In spring and autumn, when the lakes are full of water (Figure 5), there are many more local visitors. Foreign tourists predominate in the summer period, although in July and August the lakes are the least interesting in terms of biodiversity.

Summers are very hot and the landscape is consequently scorched. The park is at its most attractive in spring, when the meadows and pastures are surrounded by flowers. It is also beautiful in autumn, when the colours of the landscape change intensely.



Figure 5: Four seasons at Petelinjsko Lake.
Photos by U. Stepišnik, 2017, 2018, 2019.

Table 2: Number of tourist arrivals and number of overnight stays in the Municipality of Pivka between 2018 and 2023.

Year/indicator	2018	2019	2020	2021	2022	2023
Tourist arrivals	4,795	9,189	4,483	10,017	15,147	14,822
Overnight stays	10,538	14,129	7,517	15,488	21,532	21,985
Number of tourist bed places	–	374	398	367	394	385
Average length of stay	2.20	1.54	1.68	1.55	1.42	1.48
Average occupancy rate of bed places	–	10.35	5.17	11.56	14.97	15.64

Source: Statistical Office of the Republic of Slovenia (2024b).

Since 2018, when only 62 beds were registered in the Municipality of Pivka, there has been a noticeable increase in the number of beds, to 444 in 2024, especially for smaller providers of beds in private rooms, apartments and other accommodation facilities in Pivka, Trnje, Narin, Palčje, Parje, Klenik, Kal, Selce and Juršče, along with innovative tourism supply—for example, an apitherapeutic beekeeping apiary or wildlife

watching in nature accompanied by a hunter. Tourist farms have been operating in Narin for a long time, the longest active being the organic tourist farm Pri Andrejevih, which emphasises local cuisine and excursions in the surrounding area. Some of them have ceased their activity due to lack of successors. However, some new ones have been set up, which, in addition to excursions in the surrounding area, also offer sleeping on hay, and local agricultural products such as cheese, cured meats, jams and honey. In addition to Narin, there are tourist farms in Parje, Juršče and Suhorje. In the Municipality of Pivka, three campsites are available near or in the park area: The Sunrise Hill in Drskovče, Penzion Na Meji in Trnje and Plana in Selce. Many also offer horse riding and cycling. To this end, the municipality of Pivka has planned and developed a network of cycle paths, which is also linked to the national cycle path network. There are also long-established taverns with local cuisine and some with accommodation along the transit roads to the Croatian coast in the settlements of Selce, Pivka, Zagorje, Gornja Košana and Buje.

Table 3: Number of permanent beds by accommodation category in the Municipality of Pivka in 2024.

Category	Number of permanent beds
Apartment	70
Pension	24
Room, holiday apartment or holiday home	60
Tourist farm with accommodation	39
Camping	200
Other accommodation	51
TOTAL	444

Source: Kovačič (2025).

The SLPNP management generally does not monitor field visits, except for a few attempts made ten years ago. The number of visitors to the Visitor Centre of the Ecomuseum of the Seasonal Lakes of Pivka is monitored (Table 4). The Ecomuseum, which was opened in Slovenska vas in September 2013, tells the story of water in the karst world of the Upper Pivka region. It was designed by a team of volunteer enthusiasts in cooperation with external collaborators. Even back then, the content was presented in a modern, interactive way (Kovačič, 2023). The highest number of visitors was recorded in the first year after the opening of the museum. Later, the number of visitors declined and gradually began to rise again until the pandemic. In May 2022, the museum was closed for renovation. As part of the project PIVKA. KRAS. PRESIHA, it was reopened to visitors on 3 February 2024 with enhanced content, an interactive approach and adaptations for people with mobility impairments, the blind and visually impaired, and the deaf.

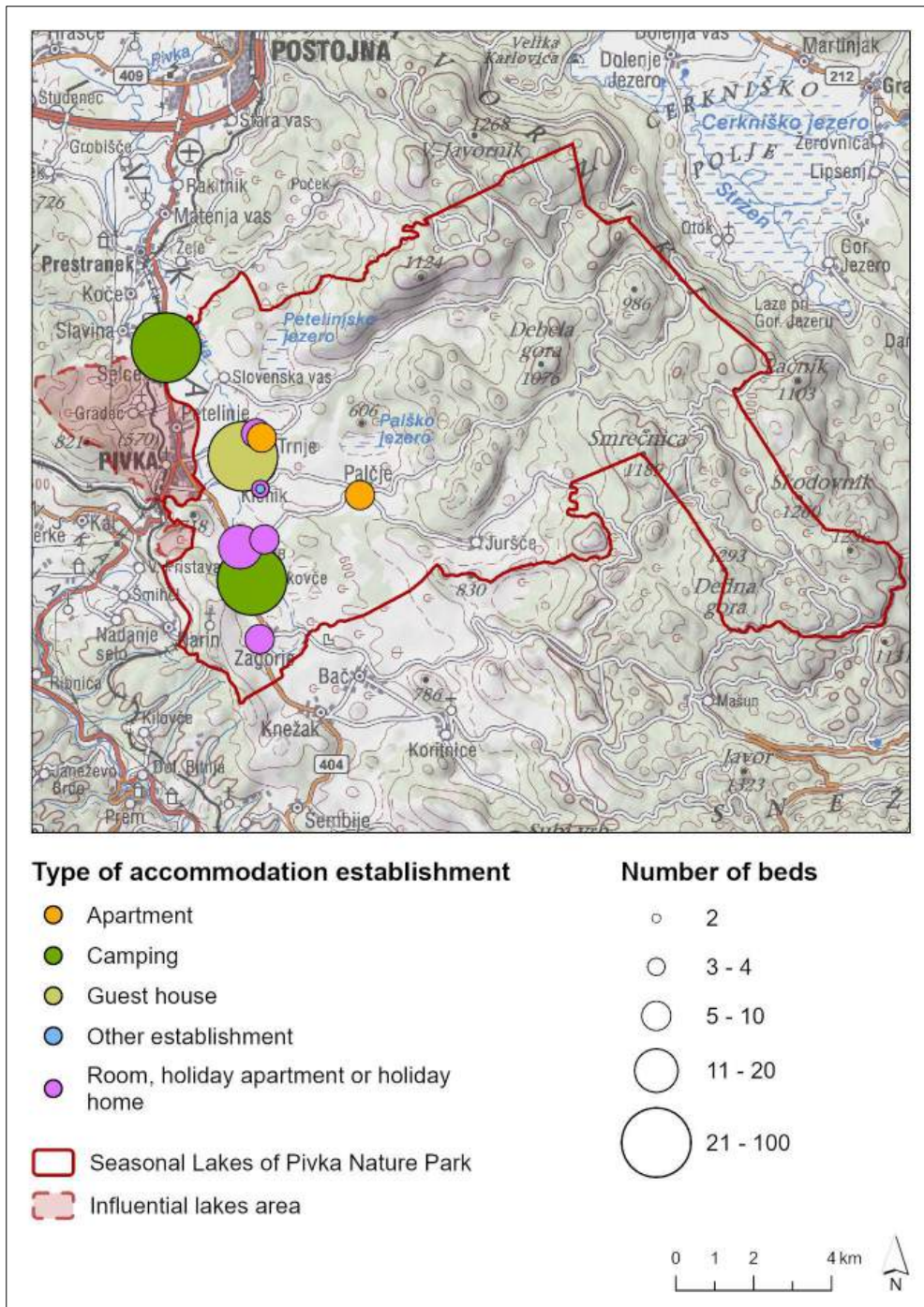


Figure 6: Accommodation facilities in the Seasonal Lakes of Pivka Nature Park.
Data sources: Agency of the Republic of Slovenia for Public Records and Services (2024); Environment Agency of the Republic of Slovenia (2018); Surveying and Mapping Authority of the Republic of Slovenia (2023); Seasonal Lakes of Pivka Nature Park (2025).

The majority of visitors to the Ecomuseum are Slovenian. The highest number of visitors is recorded during the spring and autumn months, when the lakes are full of water, while the summer months are dominated by foreign visitors, as can be seen from the number of overnight stays (Table 2; Kovačič, 2023). The largest share of visits to the Ecomuseum consists of organised groups, mainly Slovenian school groups, who visit the museum as part of natural science days.

Table 4: Number of visitors to the Visitor Centre of the Ecomuseum of the Seasonal Lakes of Pivka.

Year	Number of visitors
2013	1,900
2014	4,873
2015	2,682
2016	3,852
2017	4,463
2018	3,013
2019	2,294
2020	1,677
2021	2,417
2022	1,089 (from May 1, 2022)
2023	Closed for renovation
2024	4,840 (re-opened February 3, 2024)
Total	33,100

Source: Kovačič (2025).

The Dina Centre for Large Carnivores, created within the Carnivora Dinarica project, has been open since July 2021. The number of visitors has increased from 4,776 (2022) to 6,930 (2024) visitors per year in three years. Visitors are mainly Slovenian guests, mostly school groups, but also families and individuals during weekends (Kovačič, 2025).

Counters were already planned in one of the projects, but were later abandoned because they were still in the early stages of testing. Park management are now paying more attention to the management of the routes. This is to guide visitors and is also more suitable for measuring and monitoring visits. Some of the most critical points are monitored vigilantly, e.g. Šilentabor is well visited, as is the top of the Holy Trinity

Hill and the lakes when they are full. Visitors are mostly photographers and outdoor enthusiasts, dominated by foreign tourists. Most are accommodated in luxury motorhomes around the campsites, but they can also stop over in the rural part of the park. In such cases, there may be negative impacts on the local population or the natural environment when camping next to cemeteries where drinking water is available, or in the case of active tourists with modern off-road vehicles equipped with a tent on the roof, camping right on top of the Holy Trinity Hill. The Military History Park has a complete supply of caravans, and parking is allowed in the car park at the info centre in Slovenska vas, but there are no utility connections.

Interpretation of Natural and Cultural Heritage in the Protected Area

The SLPNP is aware that, in addition to preserving the protected area, working closely with the local community, promoting sustainable agriculture and tourism, and raising awareness among local people and visitors is essential. Raising awareness in an (inter)active visitor-friendly way is one of the key principles of quality heritage interpretation. It is not just about presenting expert and scientific knowledge, but about revealing the meaning of heritage in a way that is tailored to different target groups. Authentic fact-based interpretation incorporates educational, emotional and behavioural objectives.

The beginnings of interpretation at the SLPNP date back to the creation of the interactive Ecomuseum (2013), which was one of the first of its kind in Slovenia. The interactive content replaced the traditional rectangular panels with extensive texts. The design was carried out by a team of employees from different backgrounds with the help of an external provider (Kovačič, 2023). In the renovated Ecomuseum (Figure 7), the interpretation of natural features and cultural heritage was upgraded, so that visitors of all ages can explore the plant, animal and karst world and life along the intermittent lakes in a fun way through various sensory experiences and activities, with updated educational programmes (Kogovšek, 2023; Širca, 2024).



Figure 7: The renovated Ecomuseum.
Photos by M. Sinkovič, 2025.

Great importance is attached to personal interpretation, as the museum has an established internal guiding service to lead visitors through the Ecomuseum and lakes. They have also prepared internal training and a comprehensive handbook for guides and interpreters. Among the guides, it is worth mentioning the interpreter guide, who, among other things, imitates Martin Krpan (a popular fictional Slovenian character), a character who particularly delights visitors, especially children and the elderly (Kovačič, 2023).

The Ecomuseum is the starting point for hiking and cycling trails, which visitors can discover using the Pivška jezera web app, which is available in seven languages and offers seven trails with different themes. The park is very satisfied with the application based on Google maps as it allows them to easily upgrade the content and thus avoid the need to install informative and interpretive boards within the protected area. Hikers can independently discover the beauty of the area on the marked research trail Lake Hunting from the Ecomuseum to Petelinjsko Lake, using the map available at the Ecomuseum. In fact, the park notes that very few visitors use and can read printed maps (Kogovšek, 2023; Kovačič, 2023).

To make orientation easier, the park has informative boards at various locations, with maps, descriptions of routes and sights, and pictograms illustrating appropriate behaviour in the protected area. The aim is to keep the number of boards to a minimum, except at exposed and important orientation points such as junctions or viewpoints. On the website, which is available in Slovenian and English, it is possible to follow live events from Petelinjsko and Palško Lake using webcams. The park also cooperates well with other museums in the municipality of Pivka, offering discounts for visits to the Ecomuseum, the Dina Centre for Large Carnivores and the Park of Military History Pivka.

At the Dina Centre, interpretation is designed in a way that allows the visitor to explore the world of large carnivores through fun learning (edutainment) and from the perspective of the large carnivores themselves. The visitor can actively experience the life of large carnivores with virtual reality goggles, beastbook profiles (bear, lynx, wolf), quizzes and films about large carnivores and coexistence (Figure 8). For private groups, educational workshops with a hunter or beekeeper are provided. The website offers teaching materials such as didactic manuals, e-lessons, brochures, and leaflets, which have been produced in the framework of various projects and are written for schools and all those interested in large carnivores (Dina Pivka, 2025).



Figure 8: Fun learning (Edutainment) in the Dina Centre.

Photos by M. Sinkovič, 2025.

One of the important factors of interpretation is to raise awareness among the local population and visitors about safe, responsible and sustainable behaviour in nature and coexistence with large carnivores. The Dina Centre demonstrates appropriate behaviour when encountering large carnivores, especially bears, in an entertaining and educational way (Figure 8). The Dinalp Bear project has established a cross-border (SLO-HRV) Bear Friendly label, which supports the coexistence of man and bear and is granted in three categories: agriculture, tourism and souvenirs. It is aimed at breeders of grazing animals, beekeepers, fruit growers, farmers, tourism providers (accommodation, guided programmes), craftsmen, artisans and businesses and, last but not least, buyers who support local products (Dina Pivka, 2025).

The Živa wastewater treatment plant operates in the SLPNP area where, within the project of 2016, a learning path at the Živa wastewater treatment plant was established, in accordance with the objectives and temporary management guidelines of the SLPNP. The trail also includes an interpretation room where visitors, mainly school groups, discover in an interactive way the importance of protecting water resources in the karst region and of healthy drinking water (Visit Pivka, 2025).

Cooperation Between the Protected Area and the Local Community

The local community worked closely with the Ministry of Agriculture and the Environment and the Nature Conservation Agency to establish the park. The active involvement of the local population in the establishment process is one of the key factors in raising awareness of nature protection and the conservation of the cultural landscape. The establishment process took two years, but according to our respondents, the communication between the stakeholders was very constructive. Lectures and workshops were organised to illustrate aspects of daily life in the protected area. The local community's participation in the drafting of the decree was also a major contribution (Kogovšek, 2023; Kovačič, 2023).

The park itself is home to 1,500 inhabitants in 11 settlements. Part of the population is engaged in agriculture, which is crucial for the preservation of the cultural

landscape. Organic farming covers 40% of the agricultural area, which is very high compared to the national average of 7%. The geological characteristics do not allow intensive agricultural use. The small livestock, cattle and horses grazing along the lakes and pastures ensure that the landscape does not become overgrown (Modri koraki za zeleno prihodnost, 2016). The SLPNP provides technical support, guidance, advice, part-financing and subsidies to farmers and helps them to prepare documentation for subsidies. Positive and effective communication between the SLPNP and the local population is emphasised, as 'all parks are created by the inhabitants', and they have good experience in this. They are aware that it is not only the local population that is crucial for nature conservation and protection, but also the support of the municipality, the mayor, and a stable political situation.

In the framework of various projects (e.g. Explore the Wondernature), high quality lectures and workshops on flora and fauna, habitats, nature conservation and land use have been organised for farmers, landowners, local tourist guides, tourism providers, project partners and other interested partners. In the past, there was a lot of interest, but the situation has changed with the Covid pandemic, and recently individual consultations have become predominant, especially in the agricultural sector (Kogovšek, 2023). The nature conservation project PIVKA. KRAS. PRESIHA. has been very successful, implementing conservation measures for the habitat type of seasonal lakes. By purchasing environmentally significant land in the area of the seasonal lakes, meadows were restored and thus the area of extensive meadows increased. However, the maintenance of these meadows can only be ensured through close involvement and cooperation with local farmers (Šabec Korbar et al., 2024).

In cooperation with the local community, the SLPNP also organises events, such as the Taste of Lakes Pivka, which is organised specifically for the park's inhabitants, who have positively accepted the protected area. The origins of the event date back to the celebration of the first birthday of the Ecomuseum in Slovenská vas. The event has grown beyond volunteer work and contributions, and so there has been a change in the concept and the holders of the event. The clean-up campaigns and the organised hikes and bike rides between the Pivka Seasonal Lakes, which usually end in front of the Ecomuseum with a rich offer of local homemade products and delicacies, have also met with a very positive response among the local population (Kogovšek, 2023; Kovačič, 2023; Seasonal Lakes of Pivka Nature Park, 2024). The park does not have any nature conservation surveillance. Violations are observed in the form of littering, wild dumping of waste and inadequate fertilisation. They intend to set up an intermunicipal police in the near future (Kogovšek, 2023).

The park works closely with educational institutions at all levels, from primary schools to universities. The cooperation with higher education institutions such as the Faculty of Biotechnology and Faculty of Forestry of the University of Ljubljana, and the Faculty of Mathematics, Natural Sciences and Information Technologies of the University of Primorska is focused on summer schools, camps, field exercises and projects. They have also positive experiences with professional institutions and institutes such as the Institute of Forests, Institute of the Republic of Slovenia for

Nature Protection, Agricultural Advisory Service, Karst Research Institute, and Biodiva Society of Conservation Biologists (Kogovšek, 2023).

A year after its foundation, the SLPNP joined the Community of Nature Parks, which today comprises 15 protected areas. The common goal is to preserve nature and cultural heritage and to ensure a balance between the different activities within protected areas. The association promotes networking and cooperation between parks (Nature Parks of Slovenia, 2024). The cooperation with the neighbouring Škocjan Caves Park and the Notranjska Regional Park is exemplary. Cross-border cooperation with Croatia is the most important in the framework of various projects (Carnivora Dinarica, Nature & Wildlife, Life lynx, etc.). SLPNP is a member of the international Network of Dinaric Arc Parks, which links parks of the Dinaric protected areas from the Alps to Albania. In the future, they hope to become a member of Europarc, the European Federation of Nature and National Parks (Kogovšek, 2023).

Perspectives for the Development of the Protected Area

A SWOT analysis of natural and anthropogenic resources showed that, in terms of tourism development, most of the advantages of the SLPNP are in the areas of natural and cultural landscapes, fauna and nature protection (Šabec, 2020). The favourable location of the area in relation to the major tourist spots in the region and its good transport accessibility, both by car and by train, are also major advantages. The disadvantages are mainly in the area of less developed tourist infrastructure and the lack of development initiatives, which can be linked to the absence of a tourist tradition due to the long-standing presence of the army. Development is also hampered by a lack of human and financial resources, which is already reflected in an increase in offences due to a lack of supervision and the initial stages of environmental degradation. Nevertheless, the protected area also offers a number of opportunities for the further development of tourism. The area is visited by many day and transit visitors during the peak summer season, and could offer new accommodation options, as well as sports equipment hire and guided tours of local attractions. In addition, there is potential for the development of new types of tourism, such as educational and culinary tourism, as well as for the upgrading of hiking, cycling and horse riding. There is also an opportunity for development by building on the interconnection of providers and the local product offer. Threats that could have a dampening effect on tourism include military presence, natural disasters, economic and political instability and possible major infrastructure projects of national importance (e.g. the motorway towards Croatia). The rapid development of tourism in the SLPNP could lead to an uncontrolled increase in the number of tourists and have negative impacts on the sensitive and protected nature; therefore a gradual and manageable development of sustainable tourism is more acceptable.

For the further development of the SLPNP itself, we consider it sensible to integrate it even more closely with the protected areas in the neighbourhood, the Notranjska Regional Park and the Škocjan Caves Regional Park, and to link it into a new national park, which would also include the as yet unprotected area of Snežnik Mountains in

the neighbouring municipality of Ilirska Bistrica. This initiative is also supported by the management of the Notranjska Regional Park and would also represent the realisation of the Snežnik Regional Park, already planned in the 1990s, and would link one of the most forested and karst areas of Slovenia with a similar one in Croatia (Gorski kotar and Risnjak National Park).

The vision of the park is the sustainable development of the whole area, in close cooperation with agriculture and tourism and nature conservation (Kogovšek, 2023). This can only be achieved by continuing to work closely with the local community by raising awareness of the exceptional development opportunities presented by the SLPNP protected area.

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Chapter 7

The Landscape Park Strunjan: A Dynamic Flysch Coastal Area at the Crossroads Between Nature Protection and the Pressures of Tourism

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The Landscape Park Strunjan was established on 2 February 1990 by the Decree on the Proclamation of the Landscape Park Strunjan (Official Gazette of the Municipalities of Ilirska Bistrica, Izola, Koper, Piran, Postojna and Sežana, 1990), by the Municipalities of Izola and Piran, on the basis of the Law on Natural and Cultural Heritage in force at that time. In 1999, a new fundamental regulation for nature protection in Slovenia was adopted, the Nature Conservation Act (Official Gazette of the Republic of Slovenia, No. 56/99 and 31/01). On the basis of this Act, in 2004 the Government of the Republic of Slovenia adopted the Regulation on the Landscape Park Strunjan (Official Gazette of the Republic of Slovenia, No. 107/04, 114/04, 83/06, 71/08 and 77/10). This transferred the protection of the natural heritage in the park area from the local communities to the state, while the protection of the cultural heritage remained under the remit of the local communities. In 2008, an amendment to the Decree provided that the Government of the Republic of Slovenia would establish a public institution to manage the park. The Public Institute Landscape Park Strunjan was established at the end of 2008 by the Decision on the Establishment of the Public Institute Landscape Park Strunjan (Official Gazette of the Republic of Slovenia, No. 76/08 and 100/08), which started operating on 1 January 2009. The Public Institute performs a public service in the field of nature protection in the area of the park, manages databases relating to the park within the framework of its public powers and carries out direct nature conservation supervision in the area of the park (Public Institute Landscape Park Strunjan, 2018, 11).

From 1 July 2022, Landscape Park Strunjan will (again) be managed by Marko Starman, a Master of Laws, who became the director and responsible person of the park when the Public Institute was established, and managed it for the first two mandates, i.e. until 2017. In March 2023, we conducted a longer in-depth interview with Director Starman, while individual staff members of the park were willing to help us by providing some internal information and expert guiding around the park. According to the data for 2023 (Public Institute Landscape Park Strunjan, 2024), the Public Institute received just over 73% of its total revenue from the state budget for the management and activities of the public service, mostly from the Ministry of Natural Resources and Spatial Planning. A much smaller share of public funding came from other ministries, the Employment Service of Slovenia and the two municipal budgets (for the co-financing of public works). Other sources of funding were EU budget appropriations (16% of total revenue), own-source revenue from the sale of

goods and services as part of the provision of the public service (less than 10%), and less than one per cent of revenue from the sale of goods and services on the market and from donations (Public Institute Landscape Park Strunjan, 2024). In 2023, the Public Institute had 10 employees (Starman, 2023), six full-time and two project staff. In addition, one job was arranged through the public works programme and one through the Climate Change Fund. Student work was also organised to provide additional assistance to monitoring by authorised nature conservation officers, in the form of guidance and information for visitors during the tourist season, in areas most exposed to tourist pressure. An information service has been set up, directly funded by the two municipalities of Izola and Piran. Two students have been on student traineeships with the Public Institute, while three people have successfully carried out work of general interest. At the end of 2024, the Public Institute had 11 employees; an additional person was employed to work on the project (Public Institute Landscape Park Strunjan, 2023). The area of the Landscape Park Strunjan encompasses the entire Strunjan peninsula, from Simon's Bay to the outlet of the Strunjan Stream (Roja Stream), including a 200-metre strip of sea, the inner part of the Strunjan Bay, the Strunjan Salt Pans, and the Stjuža Lagoon (Turk, 2018; Figure 1).



Figure 1: Panoramic view of Landscape Park Strunjan.

Photo by S. Kerma, 2015.

The protected area covers 428.6 ha. The larger part of the park, including part of Strunjan settlement, lies in the municipality of Piran, while a smaller part, including part of Dobrava settlement, lies in the municipality of Izola. The ownership structure of the land is also important for the management of the protected area. Public ownership accounts for over 42% of the land, private ownership accounts for less than 54%, and mixed ownership accounts for just under 4% (Public Institute Landscape

Park Strunjan, 2018, 14). There are three smaller protected areas in the larger protected area. The marine part of the area covers approximately 176 ha and the terrestrial part 252 ha (Table 1).

Table 1: Area of the Landscape Park Strunjan and of the smaller protected areas within the park.

Landscape Park area	Size of area [ha]	Share of area [%]
Terrestrial part of LP Strunjan	252.1	58.8
Marine part of LP Strunjan	176.5	41.2
Total area	428.6	100.0
Smaller protected areas		
Strunjan Nature Reserve	124.4	29.0
Strunjan Stjuža Nature reserve	34.1	7.9
Pinjjev drevored Natural Monument	1.3	0.3
Size of smaller protected areas	159.8	37.2
Size of area outside smaller protected areas	268.8	62.8

Source: Public Institute Landscape Park Strunjan (2018).

The main purpose of the Landscape Park Strunjan is to protect biodiversity, populations of endangered and internationally protected wild flora and fauna species and habitat types. The landscape, with its mosaic landscape composition, the ecological characteristics of the salt marshes, lagoon and seashore, and the natural processes and connections between the intertidal zone and the infralittoral zone are preserved in the park area. The park manager (Public Institute), together with the inhabitants or local communities and other stakeholders in the park area, directs the activities in the park. The Public Institute promotes activities to the extent and in forms that support the conservation or enhancement of nature and the mosaic landscape characteristic of the park, while at the same time enabling the development of the local community. The Landscape Park Strunjan is to be maintained as a unique marine protected area. Priority is given to preserving the natural parts of the seashore and, in the secondary habitats of the marine lagoon and salt marshes, to maintaining, through management measures, suitable living conditions for the characteristic plant and animal species. Natural resource management activities in the park are to be carried out in such a way as to maintain the characteristic mosaic landscape of the park. Modern park infrastructure is being developed to direct visitors to less vulnerable areas of the park and to support sustainable forms of tourism (Public Institute Landscape Park Strunjan, 2018; Parkstrunjan.si, 2024).

Geographical Outline of the Protected Area

The Landscape Park Strunjan is located in the south-western part of Slovenia, right next to and partly on the Adriatic Sea. The park covers the area of the Strunjan peninsula, which gently falls into the Gulf of Trieste between Izola and Piran. The peninsula slopes gently down to the south-west into the Strunjan valley, the plain of

the Roja stream, along which the settlement of Strunjan has developed, and to the north-east and slightly higher ground of the settlement of Dobrava. Along the northern and north-eastern boundaries of the mainland, abrasion processes have formed a rugged and steeply cliffed sea shore with the capes of Kane, Ronek and Strunjan. Between the latter lies the Bay of Sveti Križ (also known among the inhabitants as the Moon Bay – Mesečev zaliv). The western and sloping seashore has been transformed by the construction of salt pans and a lagoon. The Landscape Park Strunjan is the only wider protected area in Slovenia that includes a marine part, including a two-hundred-metre strip of the coastal sea and the whole of Strunjan Bay up to Pacug. There are three smaller protected areas in the park: the Strunjan Nature Reserve, the Strunjan Stjuža Nature Reserve and the Pinijev drevored Natural Monument (Table 1). To the south, the park is bounded by the Dobrava-Valeta main road and the Strunjan-Beli križ local road; to the north, the park extends out to sea, where the boundary is marked by yellow buoys. In the east, the park starts approximately in front of the Belvedere hotel complex, and in the west, the marine boundary of the park ends at the settlement of Pacug (Public Institute Landscape Park Strunjan, 2018; Figure 2).

The Strunjan peninsula combines many of the natural features of the Slovenian coastline, as well as those that have been shaped by humans over the centuries. The floodplain of the Strunjan Stream is made up of miniature salt pans and a lagoon that was once used for extensive fish farming. Today, the Stjuža lagoon, together with the Strunjan salt pans, is important for the conservation of endangered habitat types and has therefore been identified as both a Special Area of Conservation (Habitats Directive) and a Special Protection Area (Birds Directive) under Natura 2000, which covers less than 50% of the total area of the park (Public Institute Landscape Park Strunjan, 2018, 23).

The steep northern shoreline of Strunjan Bay is the longest contiguous stretch of natural coastline in the entire Gulf of Trieste. Its most distinctive feature is the precipitous cliffs, up to 80 metres high, built of soft phreatic layers that are constantly shaped and modified by the sea, wind and rain. The upper edge of the cliff and individual erosion gullies are covered with typical sub-Mediterranean tree and shrub species: black hornbeam, small ash, rowan, and reed canary grass (*Arundo donax*).

The more distinct Mediterranean characteristics of the area are highlighted by the natural vegetation at Cape Ronek, where you can find native Mediterranean plants such as berry bushes and myrtle. The gravel terrace at the foot of the precipitous cliffs is a very attractive walking path at low tide and an educational display of geological and geomorphological phenomena. However, walking and lingering under the cliffs can also be quite dangerous, as large and small pieces of rock falling from the higher-lying cliffs is quite common (Public Institute Landscape Park Strunjan, 2018).

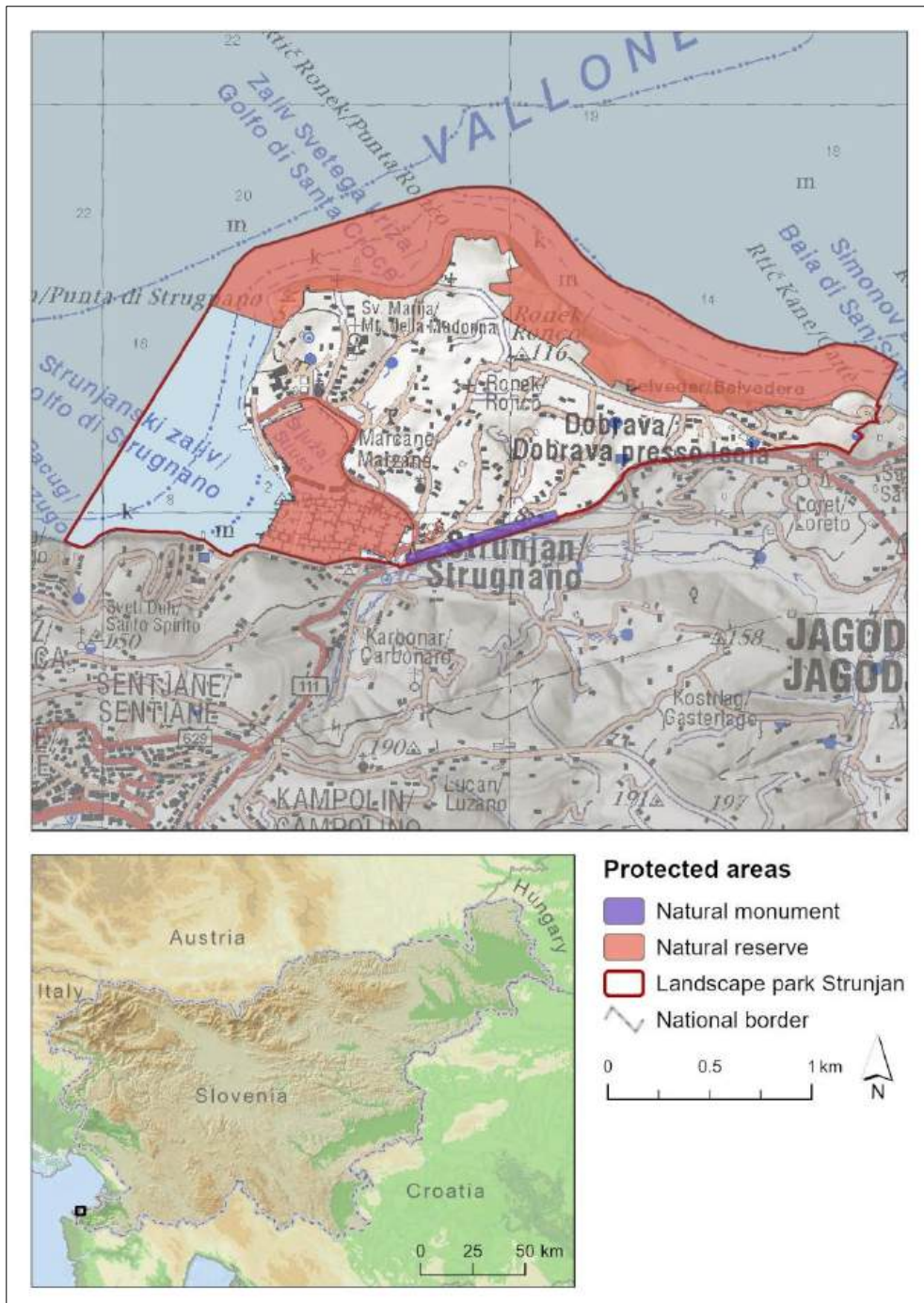


Figure 2: Geographical position and location of the Strunjan Landscape Park showing the wider and narrower protected areas.

Data sources: Environment Agency of the Republic of Slovenia (2018); Surveying and Mapping Authority of the Republic of Slovenia (2008, 2017, 2023b); Esri, FAO, NOAA, USGS, GEBCO and Garmin (2024); Eurostat (2024); U.S. Geological Survey (2020).

The marine part of the reserve is characterised by its preserved ecological processes, the presence of cold-loving and Mediterranean flora and fauna, and the resulting high diversity of species and communities. Particularly noteworthy are the meadow at the bottom of the Bay of Sveti Križ and the brown algae communities of the cystosira on the hard bottom in front of Cape Ronek. This makes the entire area of the nature reserve to be of outstanding importance for the conservation of the diversity of flora and fauna and the natural values of the Slovenian sea and coastline, as well as the integrity of the marine ecosystem in the Gulf of Trieste (Turk, 2018).

The area in question has the broad characteristics of a transitional climate type, due to the meeting of Mediterranean and continental climatic influences (Ogrin et al., 2012; Orožen Adamič, 1998). However, it differs from the typical Mediterranean climate in the distribution of precipitation and in the lower winter temperatures. The proximity of the sea, which radiates heat in autumn and winter, means that average annual temperatures are higher, also due to the many hours of sunshine and the greater amount of energy received. In spring, the land warms up more quickly and the sea cools the air, alleviating the summer heat. Autumns are therefore noticeably warmer than springs (Brečko Grubar & Kovačič, 2021). Summer droughts are common, while snowfall is very rare. Annual precipitation is slightly lower than the average in Slovenia, at just under 1,000 millimetres per year, taking into consideration long-term average data from two nearby meteorological stations (Koper and Portorož Airport) (Environment Agency of the Republic of Slovenia, 2025). The average annual temperature at the above-mentioned meteorological stations differs slightly (it is slightly higher in Koper, where measurements are recorded at an altitude 50 m higher than at Portorož Airport). For the Landscape Park Strunjan, it can thus be safely assumed that in the period 1991–2020 the average air temperature was just over 14 °C, with January temperatures around 5 °C and July temperatures around 24 °C. October average temperatures are higher than April temperatures (Environment Agency of the Republic of Slovenia, 2025). The precipitation regime of the two stations is moderately Mediterranean, with a peak in autumn and lows in summer and winter. The wettest month is September and the least wettest is January. The highest rainfall over the 30-year period 1991–2020 was from September to December, with slightly higher than average rainfall in late spring, May and June (Environment Agency of the Republic of Slovenia, 2025). The lowest rainfall is therefore during the transition from winter to spring, and July and August are also low rainfall months, when droughts can occur. Rainfall is often very intense and much of it falls in a short period of time, leading to rising stream waters and flooding (Brečko Grubar & Kovačič, 2021).

Geological features are an important aspect of the park, as most of the natural values belong to either the geological or the surface geomorphological categories. The dominant sedimentary rock type in the park is sandstone and marl, which in some areas have well-preserved sedimentary cycles, sedimentary textures, fossil traces of organisms (ichnofossils) and lithological variations, of which the most important feature is the sandy limestone mega-layer, which is most visible between the capes of Strunjan and Ronek (Placer, 2009, as cited in Public Institute Landscape Park

Strunjan, 2018). The park's marine riparian zone is one of the richest deposits of Eocene ichnofossils in Slovenia, which makes it stand out from other parts of the marine riparian zone in the Gulf of Trieste (Jurkovšek, 2009, as cited in Public Institute Landscape Park Strunjan, 2018).

A geomorphologically important and picturesque feature is the Strunjan cliff, which has a distinct break in the form of a valley train between the capes of Kane and Ronek. The cliff is the highest and steepest where the layers are horizontal, reaching a height of 80 metres in Cape Ronek. The cliff ends in folds in front of Strunjan Bay and in an underwater landslide in front of Simon Bay (Cape Kane). These are the two largest geological attractions in the park. Erosional formations in the surface relief are visible as more or less pronounced depressions on the upper edge of the cliff. There are also some shallow undermines beneath the sandy limestone mega-layer (Placer, 2009, as cited in Public Institute Landscape Park Strunjan, 2018). The preservation of the natural seashore and the unvegetated, overgrown upper edge of the cliff is crucial for the preservation of the abrasion processes of the Strunjan cliff and the pioneer plant communities. The preservation of the cultural terraces, whose existence may be threatened by the abandonment of restoration and the removal of retaining walls, is essential for maintaining the soil or preventing erosion on the mostly sloping land of the cultural landscape area (Public Institute Landscape Park Strunjan, 2018).

The Strunjan peninsula area is part of the Adriatic rivers' basin with the sea. The substrate of the fluvial sediments is impermeable and provides a well-developed network of surface flows (Kolbezen & Pristov, 1998). Within the park boundaries, the Roja stream flows into the salt pans. In the western part of the park flows the Borgola stream, which empties into the Stjuža lagoon. In addition to the alluvial plain in the Strunjan valley, the Roja stream has also created a shallow area in the Strunjan Bay through its deposits. The Roja and Borgola streams have been regulated over the centuries to meet the needs of agriculture and land drainage, while the Roja stream was also regulated to build salt pans. The construction of the dykes of the Stjuža lagoon and the salt pans gave the inner part of the Gulf of Strunjan the characteristics of a salt marsh, separated from the coastal sea. The creation of this wetland allowed the growth of salt-tolerant plants and thus the creation of habitat types that are of great importance for nature conservation today. The wetland also plays an important role in ensuring the flood safety of the Strunjan valley. In addition to watercourses, wetlands and marshes, the Landscape Park Strunjan also includes the sea. The northern shoreline of the Strunjan peninsula, with the associated two-hundred-metre strip of coastal sea and the inner part of the Strunjan Bay, is prioritised for conservation, with natural parts of the seashore and natural processes and connections between the intertidal zone and the infralittoral (Public Institute Landscape Park Strunjan, 2018).

On a national scale, the Landscape Park Strunjan is important mainly for its well-preserved coastal habitats, which are rare in Slovenia (Lipej et al., 2004, as cited in Public Institute Landscape Park Strunjan, 2018). The different types of substrates on the seabed and the different depths of the sea have allowed the development of diverse algal communities and communities of seagrass meadows. Twelve different marine

habitat types have been identified in the Strunjan Nature Reserve, the most common of which are brown algae associations with *Cistosira cystosa* and underwater meadows of *Cimodoceae nodosa*. This area is characterised by an exceptional diversity of macro- and microhabitat types and the highest species richness of macrobenthic algae and flowering plants compared to other protected parts of the Slovenian coastal sea (Lipej et al., 2007, as cited in Public Institute Landscape Park Strunjan, 2018). On land, pioneer, forest and grassland communities can be found around the cliff and its hinterland. Five forest communities, ten pioneer communities and ten grassland communities were inventoried at the cliff face. The most common tree species in the assemblage of probably primeval forest, the only remnant of which can be found on the eastern edge of Cape Ronek and from there towards Belvedere, are the holm oak (*Quercus cerris*) and black hornbeam (*Ostrya carpinifolia*), and the most common among the herbaceous vegetation is the autumnal elm (*Sesleria autumnalis*). Above the Gulf of Sveti Križ there are two forest communities: one dominated by black hornbeam, the other by the colonised Aleppo pine (*Pinus halepensis*) with tree of heaven (*Ailanthus altissima*). On the northern slope of the cliff at Cape Strunjan, there is a forest dominated by maritime pine (*Pinus pinaster*) and shrubby clover (*Coronilla emerus*). On the western slope of the cliff at Cape Strunjan, there are also two forest communities. The northern one is dominated by the species bush clover, Aleppo pine and the non-native big sagebrush (*Ailanthus altissima*), while the southern one is dominated by the common laurel (*Laurus nobilis*) and the non-native bay laurel (*Viburnum tinus*) (Vidmar, 2006, as cited in Public Institute Landscape Park Strunjan, 2018). Although the large spider ash is not the only non-native species among the dominant species of the Strunjan forest communities, it should be singled out as a strong invasive species. In the central part of the park, where the cultural landscape is predominant, various permanent plantations, arable fields and grassland, forest and shrubland communities are present. The communities in this part are influenced by human activities and by some elements of the cultural landscape (e.g. cultural terraces with supporting dry-walled terraces), which have been built due to the sloping land (Public Institute Landscape Park Strunjan, 2018).

The settlement pattern in the Landscape Park Strunjan is uneven. It is one of the most densely populated protected areas in Slovenia, although it retains a mosaic or dispersed settlement type and is more densely populated than the national average (101 inhabitants per km²). According to the Statistical Office of the Republic of Slovenia, 454 people lived in the park area in 2012, while in 2024 there will be almost 1,000 people (Public Institute Landscape Park Strunjan, 2018; Statistical Office of the Republic of Slovenia, 2024). However, it should be noted that this number also includes residents who are permanently registered in holiday homes, but do not actually reside in the park. The park managers estimate that the actual number of permanent residents is lower (Starman, 2023). Within the park, there has been only a slight increase in the number of residents in the Strunjan part over the years, and occasionally even a slight decrease in the number of residents in the Izola part. Throughout the park, the population increased slightly between 2008 and 2018, with a more significant increase in the years from 2019 onwards (Figure 3).

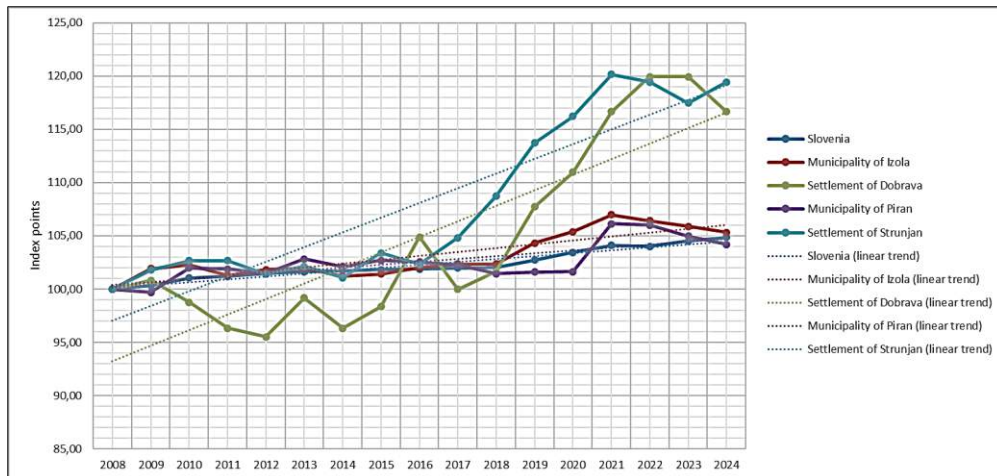


Figure 3: Population trends in Slovenia, the municipalities of Izola and Piran, and the settlements of Dobrava and Strunjan.

Source: Statistical Office of the Republic of Slovenia (2024a).

In the park area, agriculture is one of the three main traditional activities (along with fishing and salt production) that have a significant impact on the cultural landscape of the Strunjan peninsula. Agriculture is almost entirely focused on the cultivation of agricultural crops on permanent and non-permanent plantations, while only one agricultural holding in the park area is focused on livestock farming. The amount of agricultural land has decreased over the past decades and the number of agricultural holdings has declined sharply. Farming practices have also changed, becoming more intensive with the increase in permanent crops. As a result, certain landscape elements associated with traditional agriculture, such as drywoods and meadows, are being lost in the park area, but it is encouraging that the area under organic farming is increasing (Public Institute Landscape Park Strunjan, 2018).

The park area is characterised by parcel and ownership fragmentation of agricultural land. This makes it difficult to pursue farming as a primary activity, and for most of the inhabitants farming is only a complementary or subsistence activity. This, and the fact that many of the owners or tenants of agricultural land are not residents of the park or its immediate surroundings, reduces the amount of work involved, and the shift to crops that require less cultivation. These are mostly permanent crops, i.e. olive groves, vineyards and orchards. Traditional agriculture is also changing due to the immigration of new inhabitants who are not involved in agriculture. There is also the use of agricultural land for purposes other than its intended use, e.g. for caravanning, the erection of private caravans and simple or less complex residential buildings (Public Institute Landscape Park Strunjan, 2018; Starman, 2023; Figure 4).

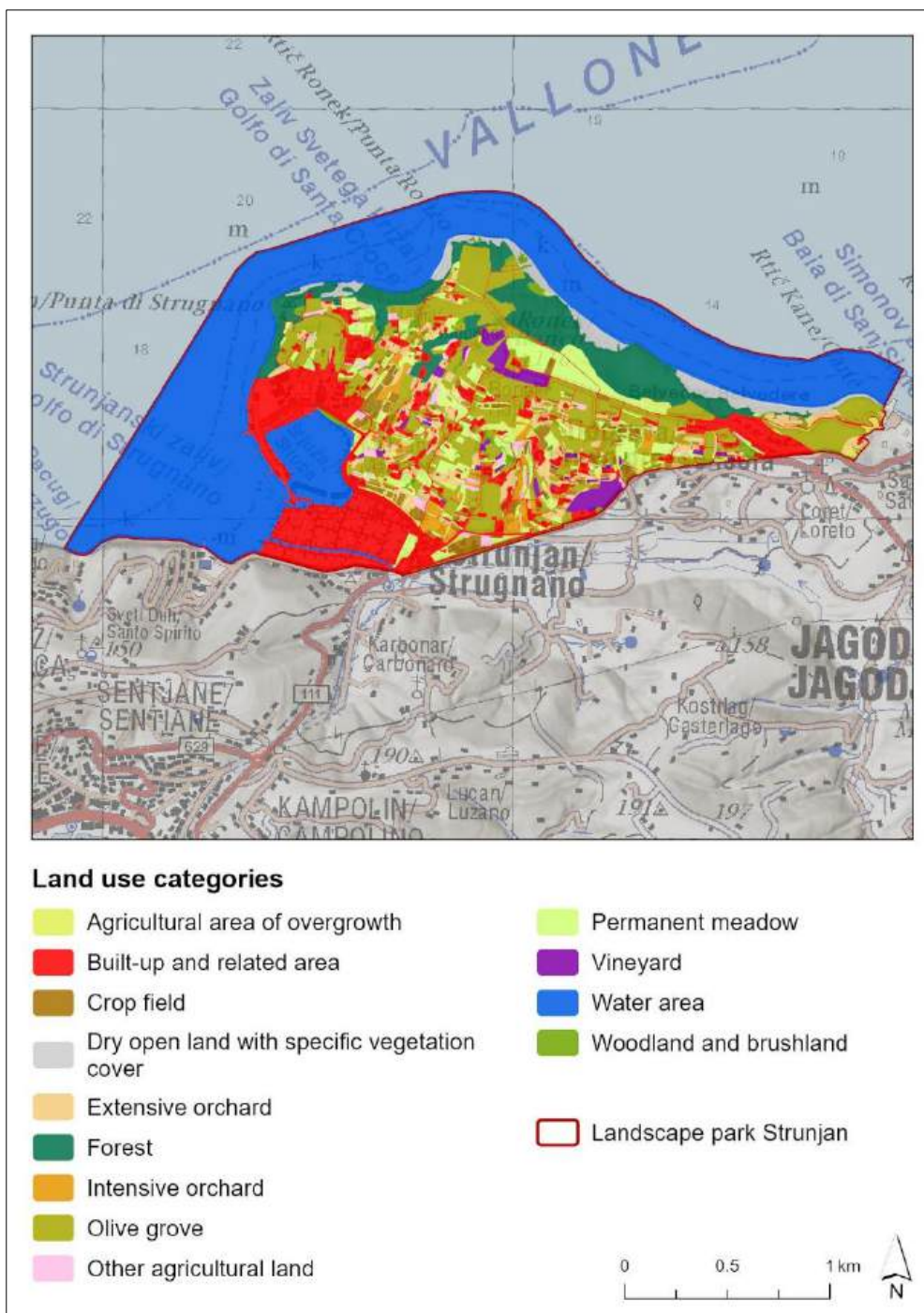


Figure 4: Land use in the area of the Landscape Park Strunjan in 2024.

Data sources: Environment Agency of the Republic of Slovenia (2018); Surveying and Mapping Authority of the Republic of Slovenia (2023b); Ministry of Agriculture, Forestry and Food (2024).

The Strunjan peninsula has retained its agrarian character, but the intensive urbanisation that has engulfed the Slovenian coast in recent decades has largely bypassed the landscape park. The area thus combines all the characteristic elements of the coastal area's flysch landscape. On the southern slope of the peninsula, typical residential and farm buildings are scattered among carefully cultivated farmland. The agricultural areas have been transformed into terraces by means of carefully constructed or stacked stone walls. In this way, the farmers levelled the cultivated areas and thus prevented water run-off and the fertile soil from being carried away (Turk, 2018).

The protected area status and the efforts made to ensure its transparent and proactive management, in which the Public Institute Landscape Park Strunjan plays a key role, should be highlighted as a very important factor in preserving the aesthetic values, natural values and cultural heritage of the Strunjan peninsula. In addition to the basic data and analytical background for the management plan, the Landscape Park presents the objectives and management measures for the period 2018–2027, a detailed definition of the protection regimes, the protection and development orientations for each activity, and a concrete programme for the implementation of the management plan with a financial framework and evaluation for the measures and activities envisaged (Public Institute Landscape Park Strunjan, 2018). In short, it is an integrated approach to the protected area and the management of the park as a whole, with the involvement of various stakeholders. This is also evident from other documents available on the park's website that present its activities, such as the Work Programme and Financial Plan of the Public Institute Landscape Park Strunjan, and the Substantive and Financial Report on the work of the Public Institute Landscape Park Strunjan by individual years (Parkstrunjan.si, 2025).

The park's website also contains other important strategic documents, regulations and laws that provide the framework for the protected area. In this context, we were also interested to know whether there are any contradictions or conflict situations in the management plan in relation to the parent spatial acts. Director Starman (2023) points out as a key problem the absence of new-generation municipal spatial plans in both municipalities, Izola and Piran, which represents 'serious holes' in the spatial regulations. 'First of all, the problem is that the park was protected in 1989 as a combined natural and cultural heritage at that time. It was protected as a natural and cultural monument. The natural one was then transformed into a landscape park as a protected nature area, but the cultural content was not upgraded in terms of protection.' (Starman, 2023).

Over time, the protection of the cultural landscape and cultural heritage as once defined has become irrational, as things have changed in some places to the point where protection has become meaningless. The problem therefore lies in the deficiencies of the old, also internally conflicting, spatial planning acts of the two municipalities, especially Piran. The director also mentions the problem of the salt pans, which have not been declared a cultural monument of national importance (like the Sečovlje salt pans), but a cultural monument of local importance, which means

that they do not have a buffer zone, where the transition from protected to unprotected area is made in a gradual, continuous and less radical way. According to Starman, the salt pans as a cultural monument should therefore be a dominant feature in the protected area, not a hotel. The issue of conflict, which has spatial implications, thus relates to the lack of protection of cultural heritage in the park (Starman, 2023).

The Strunjan salt pans have been a traditional salt-producing area since at least the thirteenth century. The salt pans are underlain by recent sediment, most of which was deposited in Strunjan by the Roja stream. The sediment is the basic material for the construction of the salt structures, such as dykes and canals. The embankments are partly lined with wood or stone and in some places overgrown with salt-loving vegetation, which reduces erosion. Brine ponds in evaporation areas have clay bottoms. The crystallisation beds have a clay base covered with a layer of petola (algal-bacterial biofilm). The sea salt pans are a technological facility that needs to be maintained on an ongoing basis. The salt marshes' protective embankments also protect the areas in the salt marshes' hinterland, i.e. the inhabited area, the agricultural areas and the road. The Regulation on the Landscape Park Strunjan provides for the maintenance and restoration of the salt marshes, which must ensure that the water regime remains unchanged in order to preserve the diversity of habitats for plant and animal species typical of salt, brackish or freshwater coastal wetlands and to maintain biodiversity. For the same reasons, traditional salt production is maintained in the area. The salt infrastructure has been in a poor state of repair for some time due to deterioration, and regular annual and seasonal maintenance works are mandatory (Public Institute Landscape Park Strunjan, 2018).

Sea fishing is one of the more important traditional activities in the park area. The well-maintained Strunjan mandrač provides a few more local fishermen with quality infrastructure for their activities. Commercial fishing here is mainly carried out with standing gillnets and trammel nets, and less frequently with pot nets. The following species account for the largest share of the catch by weight: sole (*Solea solea*), cuttlefish (*Sepia officinalis*), gilt-head seabream (*Sparus aurata*), flounder (*Platichthys flesus*), osprey (*Pegellus erythrinus*), seabass (*Dicentrarchus labrax*), brown scorpionfish (*Scorpaena porcus*) and headed cyprinid (*Mugil cephalus*). Fish occurrence and catches vary from year to year, but due to the relatively small area and scale of the fishery, it is difficult to identify the causes of these fluctuations (Public Institute Landscape Park Strunjan, 2018).

The marine (aquatic) element is a particular feature among protected areas in Slovenia, especially if it is the dominant land use category among all registered ones (Figure 4). According to the Ministry of Agriculture, Forestry and Food in 2024, 40% of the area in the Landscape Park Strunjan is covered by water (mostly sea), with built-up (and related) land and olive groves accounting for 15% each, while forest covers 7.8% of the total area (Ministry of Agriculture, Forestry and Food, 2024). The forest area in the park is rated as having the first level of emphasis on the aesthetic function. Forests and related ecosystems mask aesthetically disturbing objects or degradation processes in nature and also contribute greatly to the beauty of the

landscape, both on cliffs and in the form of individual forest islands (Public Institute Landscape Park Strunjan, 2018).

Of the other land use categories, which are quite varied and diverse, permanent grassland (6.3% of the area), extensive or grassland orchard (3.8%), arable land (2.6%), dry open land with special vegetation cover (2.3%) and vineyard (1.7%) are also of note. The share of the other categories is smaller (Ministry of Agriculture, Forestry and Food, 2024). A comparison of land use in 2002 with the situation at the end of 2024 shows the following significant changes: the share of water areas has decreased from 43.5% in 2002 to 39.9% in 2024; the share of built-up and related land has increased from 11.0% to 15.6%; the share of olive groves has almost doubled (from 8.8% to 15.1% of the land area); and the share of extensive or cultivated land has also increased relatively sharply (from 8.8% to 15.1% of the land area). The area under extensive grassland orchards also increased significantly (from 1.5% to 3.8%), as have dry open land with special vegetation cover (from 0.5% to 2.3%), while the area under arable land and vineyards have decreased considerably (from 7.6% to 2.6%, and 4.0% to 1.7%, respectively). Forest areas and permanent meadows also decreased to a slightly lesser extent (Ministry of Agriculture, Forestry and Food, 2024).

Tourism and Visitation of the Landscape Park Strunjan

The park area offers many opportunities for the development of sustainable tourism, based on the preserved and rich natural and cultural heritage and the historical legacy of traditional activities of the inhabitants. The location of the landscape park is very favourable from a tourism and marketing point of view because of its good transport links, strong hinterland due to its proximity to major coastal towns, and the general attractiveness of the sea and the favourable maritime climate. The authors of the Landscape Park Strunjan Management Plan for 2018–2027 make it quite clear that tourism with leisure activities is one of the main activities in the protected area (Public Institute Landscape Park Strunjan, 2018).

The beginnings of tourism in Strunjan can be traced back to pilgrimages in the nineteenth century. Later, at the beginning of the twentieth century, tourism began to develop more rapidly. This was due to the establishment of the Parenzana (Porečanka) narrow-gauge railway and the influence of the already developed spa tourism in Portorož. With the development of tourism, various buffets and shops were set up; the area where the Salinera Hotel is today was once the Santo Spirito Hotel, and the Villa Tartini was also used for tourism purposes. Later, after World War II, several accommodations and hotels developed in Strunjan. The beginnings of excursion tourism can be seen in this period; the place became a destination for union holiday tourism and rehabilitation tourism developed within the framework of health tourism (Mandalenič, 2010).

Today, the landscape park is home to spa, holiday and excursion tourism. Hotels offer a range of wellness services in addition to the basic ones, and there is a significant

increase in the number of day visitors, especially in the summer season. The park as a destination is in a highly developed tourist environment of coastal municipalities. According to the Statistical Office of the Republic of Slovenia, the municipalities of Izola and Piran, where the park is located, were visited by 766,598 tourists in 2024 (of which just over 505,000 were from abroad), generating a total of more than 2,430,000 overnight stays (Statistical Office of the Republic of Slovenia, 2025). The park area is well accessible by road, as the main road connecting the coastal towns also passes very close to the towns of Strunjan and Dobrava. There are bus stops in both settlements, in Strunjan and Dobrava (at Belveder). The nearest railway station is in Koper, and Portorož airport is also close by, although it has a shorter runway and is only usable for smaller aircraft. The good transport links (and other tourist infrastructure, facilities and services) have resulted in a high number of visitors to the park, which means that sustainable principles need to be introduced into tourism development (Brazzati, 2021). The management plan also states that the Landscape Park Strunjan should be promoted as a natural area for peaceful activities and relaxation, and that tourism providers should be encouraged to strengthen sustainable forms of tourism (Public Institute Landscape Park Strunjan, 2018, 53).

In the planning and implementation of tourism and leisure activities, the manager of the Landscape Park Strunjan, the Public Institute, advocates specific guidelines that primarily promote cooperation between the manager and providers of tourism services and facilities, with the aim of joint and coordinated planning in the field of tourism. Tourism activity and further development should be based on the preservation of the area's assets: its natural values and the quality created (cultural heritage, park planting, agricultural products, etc.). In particular, it should be possible to promote forms of recreation and visitation that are in keeping with the area's natural features, that have the least possible impact on the area and the least possible burden on it, and that do not require significant environmental impact as a result of the construction of additional tourist or recreational infrastructure (e.g. hiking, cycling, swimming). New paths and rest areas will be planned only in exceptional circumstances and should be located outside areas where they could threaten natural values and biodiversity. Public events that do not cause a permanent or temporary exceedance of the noise limit levels may be allowed to take place in the park area, while noise-generating leisure activities are directed outside the park area. Minor infrastructure (e.g. info-points) and signage in the landscape park (signs, signposts, etc.) will be located outside the smaller-protected areas or in such a way as not to affect the natural features and to integrate as little as possible into the landscape. The offer of various forms of accommodation in the park area is to be encouraged, especially those which provide direct income for the local population (tourist farms, rooms, guesthouses, etc.). Camping sites in the park area will give priority to short-term pitching of tents and caravans, and the number of permanently pitched caravans are to be progressively reduced. All activities not directly related to the objectives of the park are also restricted (Public Institute Landscape Park Strunjan, 2018, 67).

The presence of tourism in the Landscape Park is based on the analysis of selected indicators of total tourist arrivals in Dobrava (Izola municipality) and Strunjan (Piran

municipality) between 2018 and 2023 and the existing tourist (accommodation) infrastructure in the park. Data on registered visits were obtained from the tourist associations of both municipalities (Tourist Board of Izola and Tourist Board of Portorož-Piran). These are recorded visits and overnight stays from all providers of tourist accommodation in Dobrava and Strunjan, including those that are not formally within the park (but are on the border or in the immediate vicinity). The total number of tourists who have stayed at least once in one of the two settlements is quite high for a protected area (Table 2). Surprisingly, the COVID-19 pandemic has not had such a dramatic impact on total visits and overnight stays. Only in 2020 was visitation slightly lower (75% of the previous year), but this was offset to some extent by more overnight stays or a higher average length of stay (4.3 days) than the previous year (3.8 days). In the most critical years, 2020 and 2021, although fewer beds were available, the number of arrivals and overnight stays in 2021 was still at the level of 2018, i.e. just over 79,000 arrivals and over 321,000 overnight stays generated, which is certainly due to the 'merit' of the tourism vouchers used by significantly increased number of domestic guests. The highest number of arrivals and overnight stays in the period analysed was in 2022, with a slight decline again in 2023 (Table 2). According to Director Starman, the situation then also became 'more bearable'. Previously, when this was acceptable in the epidemiological context, the Slovenian coast was flooded with both stationary visitors (using tourist vouchers) and many day visitors. The situation was critical and almost catastrophic for the park itself. As a positive exception in those 'crazy times', the director cites the municipality's measure to finance a seasonal bus and the installation of a temporary car park, with visitor information officers employed through student work (Starman, 2023).

Table 2: Selected tourism indicators for Strunjan and Dobrava (combined) between 2018 and 2023.

Year/indicator	2018	2019	2020	2021	2022	2023
Tourist arrivals	79,831	85,885	63,797	79,493	85,016	79,809
Overnight stays	309,878	323,975	271,396	321,658	328,259	324,634
Number of tourist bed places	1,939	2,076	1,680	1,760	2,113	2,198
Average length of stay	3.9	3.8	4.3	4.0	3.9	4.1
Average occupancy rate of bed places (%)	43.8	42.7	44.3	50.1	42.6	40.5

Sources: Tourist Board of Portorož (2024); Tourist Board of Izola (2024).

A closer look at the selected tourism indicators also shows that the indicators of the average length of stay and the average occupancy rate of tourist beds in the period under consideration show much higher values compared to the national average, which in 2023 was 2.6 days for the average length of stay of tourists in the country (4.1 days in the park) and 23.2% for the average occupancy rate of tourist beds (40.5% in the park). The highest average occupancy was during the COVID-19 pandemic in 2021, at 51.1% (Tourist Board of Portorož, 2024; Tourist Board of Izola, 2024; Statistical Office of the Republic of Slovenia, 2024b; Statistical Office of the Republic

of Slovenia, 2024c). The number of tourist beds has increased significantly (by almost a fifth) in the two years following COVID-19, exceeding the total number of tourist beds in 2019 (by 122 beds), but this has not had a significant impact on the increase in tourist arrivals and overnight stays (Table 2).

If we restrict ourselves exclusively to the tourist accommodation establishments located within the landscape park (their spatial distribution and categorisation at the end of 2024 is shown in Figure 5), there are 49 active establishments offering a total of 1,437 beds. Three concentrated areas of accommodation offer in the park can be highlighted. The first is at Belveder (Dobrava) in the east of the park, where there is a major hotel complex (two hotels) and a campsite, with a total of more than 600 beds. The other two areas of concentration are in Strunjan. One is in the village on the hill (near the parish and primary school), where the Rog Strunjan Holiday Home, the Stella Maris Pastoral Home and the Elvira Vatovec Strunjan Training Centre accommodation are located. There are a total of 190 beds available. The other major area of concentration in Strunjan is lower down near the sea and the Stjuža lagoon, where the Terme Krka hotel complex (five hotels) and the Vila Tartini protocol accommodation facility are located, with a total of 443 beds. Other accommodation establishments are spread evenly over the park area; they are mostly apartments and holiday rooms or houses, offering a total of 326 beds (Agency of the Republic of Slovenia for Public Legal Records and Related Services, 2024). Other major tourist accommodation providers (not shown on the map) are in the immediate vicinity of the park, namely on the south-western edge along the local road by the salt pans and Strunjan Bay, respectively. These are the AMD 'Pinko Tomažič' Piran campsite and the Lavender, Oleander and Salinera hotels, which together have an additional 896 beds (Agency of the Republic of Slovenia for Public Legal Records and Related Services, 2024).

Other tourism infrastructure alongside accommodation facilities is also important, as it is key to tourism. These are facilities for food, recreation, entertainment and care. The number of catering establishments in the park is much smaller than the number of accommodation establishments, nine in total (Parkstrunjan.si, 2025), but they nevertheless give the place an identity and an additional tourist offer through their services. Strunjan has a bathing area, namely the Strunjan beach near the Stjuža lagoon, which is managed by the public company Okolje Piran and rented by Terme Krka. Nearby, outside the park's boundaries, is Salinera beach, which is in a hotel resort of the same name. Both beaches are partially concrete in the offshore zone; the entrance to the water is accessed by steps (Brazzatti, 2021). All other parts of the beach or coastline are natural, and responsible use is encouraged (e.g. the Adopt a Coast project), as the Republic of Slovenia is also a signatory to the Barcelona Convention. Cycling in the park is allowed on marked paths but is prohibited in some parts. In this context, the Parenzana cycle path, which runs along the southern edge of the park, is worth mentioning.

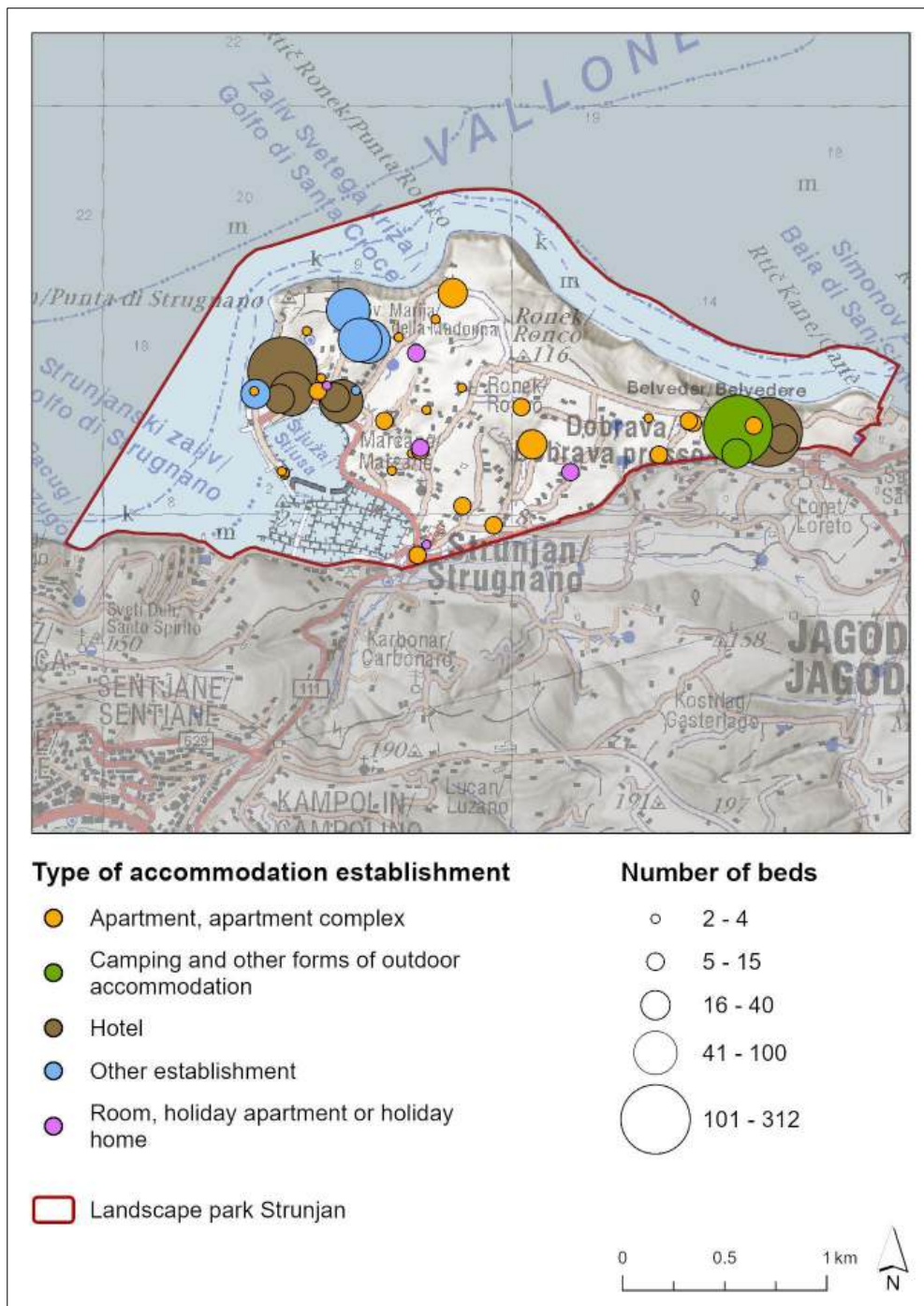


Figure 5: Tourist accommodation facilities in the Strunjan Landscape Park, December 2024.

Data sources: Agency of the Republic of Slovenia for Public Legal Records and Related Services (2024); Environment Agency of the Republic of Slovenia (2018); Surveying and Mapping Authority of the Republic of Slovenia (2023b).

There are five car parks in the park or close to it, and the Strunjan Landscape Park Visitor Centre is in the salt pans, where the park administration is also located and where an interactive exhibition about the park can be viewed. Near the centre, there are mooring places for boats up to 5 metres in length (Parkstrunjan.si, 2025). Visitors to the park can book a guided tour, which is either a one-hour tour of the cliff or the salt pans and lagoon, or a two-hour tour of the cliff, salt pans and Stjuža lagoon. Alternatively, they can visit the circular nature trail, which is 5.2 km long and has 15 points of interest. The trail runs from the Strunjan salt pans to the cliff and then ascends to the Belvedere hill, before ending again in the salt pans. In addition to the circular trail, there is a trail leading to the Bele skale bathing area near the Belvedere Hotel Complex. The path is approximately 500 metres long and is equipped with steps, a dry stone wall and guard rails (Parkstrunjan.si, 2025).

Data on the number and overnight stays of stationary guests in the park are therefore more or less known, but there is no accurate information on the number of total visitors to the park or on the average daily trend in the number of visitors to the protected area. The park area is open, with several entry/exit points with constant visitors throughout the year. In addition, the openness to the sea and the number of boat visits to the park, which are not recorded by the park manager, should be taken into account. It is estimated that during the summer season between 200 and 300 vessels enter the marine part of the park daily, which represents about 10% of the total number of visitors. In any case, these estimates vary between 300,000 and 500,000 visitors per year and are based on the Public Institute's simulation of overnight stays, fees collected, vehicles parked or parking fees paid, and the interpretation of the meters installed in 2022 at the two busiest locations. The most attractive and frequented locations in the park are the salt pan area and the cliff above the Moon Bay / the Bay of Sveti Križ (Starman, 2023; Knez, 2025).

Regarding the ratio of domestic to foreign visitors (including stationary guests), the data suggest a predominance of domestic visitors, which is estimated to be around 70% (Knez, 2025). More reliable data are the number of visitors who have attended organised guided tours by the employees of the Strunjan National Park. We obtained data for the last ten-year period, 2015–2024 (Table 3).

Compared to the total number of visitors to the park on an annual basis (estimated), the proportion of organised guided tours is small (approximately 1% of the total). Most visitors are primary and secondary school pupils, and to a lesser extent university students, members of various associations and professional groups. Guiding involves specialised preparation with teaching sheets and appropriate interpretation; in short, it is a purely educational (and also awareness-raising) and professional aspect of the park guided tours (Starman, 2023). Table 3 shows that guided visits are fairly constant until 2020 (and the emergence of the COVID-19 pandemic), then, for pandemic-related reasons, they drop dramatically and then increase again more significantly from 2022 and 2023 onwards. In 2024, the number of visitors on guided tours was slightly lower due to problems with the application of the website through which the guided tours are booked. This was due to the decision

of the park management not to conduct guided tours in the middle of the day during the warmest months because of excessive air temperatures. The specificity of the organised guided visits to the park is also reflected in the fact that they take place outside the main season, mainly in spring and autumn with school visits. Nevertheless, in summer, the park is under high pressure from stationary guests and day visitors due to its attractive seaside location and the range of tourist services on offer (Knez, 2025).

Table 3: Number of visitors to guided tours organised by the Public Institute Landscape Park Strunjan by year.

Year	Number of visitors
2015	2,960
2016	3,229
2017	3,000
2018	2,817
2019	3,030
2020	897
2021	2,094
2022	4,042
2023	4,145
2024	3,559

Source: Knez (2025).

The distinct seasonality of visitors to the park is mitigated by various measures and activities, such as physically restricting access to certain locations, introducing a minibus and a temporary car park, and employing information officers during the summer months to direct visitors away from the most visited attractions (Starman, 2023; Knez, 2025). As a contribution to off-season visitation, the park director highlighted support for local festivals (e.g. the artichoke festival in spring and the persimmon festival in autumn) and their being held over several days, rather than just on one day. In this context, the local offer of typical agricultural products and produce is supported through the development of the park brand and the establishment of a local market in Jagodje at Belveder (Starman, 2023).

Public Institute Landscape Park Strunjan does not develop its own tourism products, nor does it (yet) link up with travel agencies. As mentioned above, its programme can mainly accommodate schools and only a limited number of guided tours along the trail, as the Public Institute staff are kept busy with other work. Finally, the park, together with the Morigenos association, has developed worksheets for the so-called marine (underwater) guided tours, which, according to the director, are not so much touristic (they do not market them), but are for natural history and educational purposes. The Underwater Learning Trail was thus launched in cooperation with some diving clubs, which can use the Underwater Learning Trail but organise their own groups and guided tours, and in return participate in the clean-up campaigns. As a public institution, the park has developed adequate infrastructure for visitors, and

there is exemplary cooperation with the Oleander Hotel in the rental and use of e-bikes (Starman, 2023).

“Our message is not a mass visit that generates revenue, but an informed, meaningful, responsible visit to the protected area. So ... we should be more, in the local way, ‘dabbling’ in other tourist offerings, in the sense of giving them a programme with content etc., and participating in that with some minimal income. We need our people in different areas, primarily in the field of conservation, we cannot employ them for tourism purposes exclusively.” (Starman, 2023)

The park manager is therefore not opposed to tourist activities in the park, but it is essential to follow the nature conservation guidelines. This is a very complex task and a challenge every time, as these guidelines are certainly not always followed. In order to minimise deviations and to prevent environmental degradation caused by the negative effects of tourism, the park has planned measures and developed various activities. In 2020, the visitor carrying capacity for the Strunjan Salt Pans’ natural value was calculated at a maximum of 208 visitors per day. In 2021, the visitor carrying capacity for the natural value of the Bay of St. Croix (Moon Bay) was calculated at 104 visitors per day. These calculations are not available for the whole protected area, and the methodology is still rather incomplete (Starman, 2023), but to determine the actual load on the most visited natural values in the Landscape Park Strunjan, continuous monitoring is necessary, i.e. monitoring of the tourist flow in several locations, which was started in 2022 (Knez, 2025).

Nature conservation monitoring is very important. In the wild, direct control over compliance with the prohibitions laid down in the Nature Conservation Act and the regulations issued on the basis of it is carried out by inspectors and nature conservation officers (four from the park staff). The tasks of direct supervision in the area of the Landscape Park Strunjan are: direct monitoring of the situation in the park, supervision of the implementation of the protection regimes, and ascertaining the actual situation of violations of the prohibitions laid down in the Nature Conservation Act and the regulations adopted on the basis thereof, taking into account the rules of conduct and the protection regimes laid down in the Regulation on the Strunjan Landscape Park. The tasks also include informing the competent inspection bodies and alerting individuals to the protection regimes in order to prevent criminal behaviour.

The Nature Conservation Service of the Landscape Park cooperates functionally with the Inter-Municipal Administration of Istria (assistance in issuing fines in the summer months), with the Piran and Izola Police Stations (especially in the case of criminal offences), the Maritime Administration of the Republic of Slovenia and the Coastal Sea Protection Sector (assistance at sea), the Agricultural Inspectorate (in the event of landowners objecting to the imposition of fines on offenders), and the Building, Environmental, Agricultural and Forestry Inspectorates (for areas in which the Public Institute has no competence). Due to its coastal location, the Landscape Park Strunjan is particularly exposed to visitor pressure in summer. All of the stand-out factors

threatening the natural values are of anthropogenic origin, namely: littering, noise, walking off the authorised paths, burning and camping, fish poaching, the introduction of invasive non-native species, with the most notable being unauthorised encroachments on the natural seashore below the cliff in the form of stacking stones and the construction of large fortified structures. In addition, the summer season is often characterised by a high risk of fire in the natural environment (Knez, 2025).

In recent years, the Nature Conservation and Surveillance Service has focused on enforcing bans on driving vehicles in natural areas. There has been a marked improvement in the situation regarding irregular parking of cars outside designated areas. Physical barriers have been erected at two new locations to prevent improper parking. As a consequence, the number of land patrols has been reduced and field surveillance by vessel has been stepped up, as well as nature conservation surveillance at weekends and on public holidays. Alteration of the natural seafront is prohibited in accordance with the Regulation on the Landscape Park Strunjan (Knez, 2025). Moving and stacking stones on the seafront or any permanent disturbance of the seafront and riparian vegetation is also prohibited in the nature reserve area, as is loitering from sunset to sunrise. In addition to direct monitoring in the field, violations of the Agreement on the Method of Implementation of Commercial Fishing in the Strunjan Nature Reserve are to be verified in the field. Supervisors with ID cards have attended the complementary professional training for nature conservation supervisors, and the offence application is fully operational for field work and now allows for the issuance of payment orders and decisions, which all employed nature conservation supervisors have been trained to issue. An electric mountain bike, an electric scooter and a watercraft are used for field surveillance. Activities on which the Nature Conservation Service places particular emphasis, are (Knez, 2025):

- Acting against motor vehicle owners for driving off national and local roads, except residents, landowners and tenants, and for parking outside designated areas,
- Prosecution of illegal parking on agricultural land by prior agreement with landowners; assistance in solving problems by imposing sanctions,
- Regularly informing the municipal wardens about illegal parking on roads, driveways and other public areas,
- Enhanced surveillance by the Institute's vessel at sea,
- Carrying out field patrols at weekends, especially to prevent tent pitching and burning within the Strunjan Nature reserve and staying in violation of the prescribed conditions for visiting and staying in the park (especially cyclists riding off the cycle paths and dog owners walking dogs without a lead on the footpaths within the two Nature reserves). The above offences are given the greatest attention during the summer tourist season. The same applies to the removal of plants and wildlife from the countryside, the stacking of stones on the natural seashore, etc.,
- Publication of articles, news and strengthening of communication on the ground by distributing leaflets and wearing uniforms to raise awareness about the site manager.

Interpretation of Natural and Cultural Heritage in the Protected Area

The park management (Public Institute) attaches great importance to the proper interpretation of the natural and cultural heritage in the park in general. Much of the content is very well presented on their website (www.parkstrunjan.si), where a virtual tour and walk through the park is also available. In 2021, the redesigned website was edited by the Public Institute itself, updated with relevant information and activities, and the editorial policy and communication was agreed accordingly. They are responsive to criticism and suggestions, and some are very committed to this. The Landscape Park Strunjan is also presented through social media (Facebook, Instagram). When the Landscape Park Strunjan was founded in 2008, the aim was to set up a visitor centre as soon as possible. The opportunity to renovate and adapt two saltwork houses for this purpose was offered by the European programme for increasing the competitiveness of the tourism economy, under which the Public Institute applied for and was awarded the project Strunjan Landscape Park Information Centre. The renovation of the two saltwork houses lasted from the end of 2012 until autumn 2013. The smaller one now houses the park's administration headquarters and a room for visitors. Director Starman highlights the renovation of the saltwork house for visitors, which was also furnished as part of the project, and defined the interpretation there (Figure 6). The idea was to present all the main features of the protected area in one place, which was then upgraded by designing and creating educational trails, setting up information boards in the field, and producing worksheets for the needs of school groups. As already pointed out, they focus on awareness raising and education, which is their main concern and characteristic for an interpretation that is professionally grounded and personal (Starman, 2023).



Figure 6: Multimedia presentation of the protected area in the Visitor Centre with personal interpretation by the park's nature conservation officer.

Photos by S. Kerma, 2022.

In 2015, the park came up with the idea of a circular educational trail called 'Strunjan in the Images of the Sea', which starts and ends at the Visitor Centre and has 15 thematic stopping points. First, they defined the trail and determined what they actually wanted it to be. The collaborators come from different professional profiles

(anthropology, biology, geography, law, tourism studies). The educational trail is designed in a sufficiently informal way to allow each of the staff or trainees to lead the way. According to Director Starman, all the ideas for interpretation and explanation, all the slogans, are the result of internal brainstorming, so they come from the house, from the staff.

The park has started to build on the unified interpretation with the NEXTO electronic companion application. They want to fully computerise or digitalise the circular route, so that as few traditional information boards as possible are needed to guide visitors around the park (cf. Figure 7). They have already tried a few digitalisation projects in the past, but without success, and are now doing this together with the Tourist Board Portorož. However, Director Starman still attaches great importance to the role of personal interpretation and guiding with adaptation to different groups. This is an important part of their mission, but above all it gives them a presence on the ground. Last but not least, this engagement also means an additional source of income, which is not negligible (10,000–20,000 euros per year); it is generated by the employees of the Public Institute through their guidance (Starman, 2023).



Figure 7: Information board and visitor signs on the cliff above the Moon Bay (Bay of Sveti Križ), between the capes Strunjan and Ronek.
Photos by S. Kerma, 2025.

Cooperation Between the Protected Area Management and the Local Community

Cooperation between different stakeholders is one of the basic conditions for the successful development of a protected area, which must be sustainable and responsible. These may be linked to the landscape park in different ways and at different levels, directly and indirectly, as international, national and/or regional or local actors. The greatest number of stakeholders comes from the local environment, where the Public Institute also has the greatest influence in protecting nature and communicating its plans and activities to local people (Brazzatti, 2021).

Cooperation with the local community in the park is multifaceted and takes place on several levels. The first is the institutional level, where it is legally stipulated that in

public institutions (in the management) of protected areas, representatives of local communities (from the municipality or local community) are obligatory as participating members of the Council of the institution. Thus, in the nine-member Council of the Public Institute Landscape Park Strunjan, there are as many as three representatives of the local community. One is appointed by the Local Community of Strunjan, and one each by the Municipalities of Izola and Piran. The Nature Conservation Act deliberately included this co-management of the local community so that the protected area does not become a stranger in the community, but is seen as an opportunity for the local community rather than an obstacle or a problem (Starman, 2023; Parkstrunjan.si, 2025).

In this sense, the director said, they have built trust and opened up opportunities for cooperation from the start. On a concrete (implementation) level, the Public Institute, as the operator or manager, 'became a factor' in the eyes of the local community when investments in the area came up. 'Without investments that benefit the locals, it will be difficult to show the advantage of the protected area' (Starman, 2023). One such investment is the *mandrač* (local berth), which was financed by the municipality of Piran, but the Public Institute prepared and managed the whole project (obtaining permits, state consent, as it is state land, etc.), which ultimately enabled the installation of 150 mooring places—primarily for locals. All the mooring needs of the local population were thus covered. Something that had previously been very modestly arranged was transformed by the park administration into a proper, sustainable marina. The creation of mooring places that also provide space for the needs of local fishermen is an asset that would not have existed without the protected area status. This has certainly gained the trust and support of the local community in the protected area (Starman, 2023).

In general, problems arise when it comes to unclear restrictions in planning acts: inconsistencies, selective treatment, some people find their way around and find loopholes in the rules, others find it difficult to regulate anything. *'You don't let me, you let someone else. The one who finds a hole, especially the one from Ljubljana. I can't make an extension so that my son stays at home or my daughter. But I want tourism.'* Spatial regulation and objective differences in treatment, and not prosecuting offenders as the locals perceive it, can be a serious grievance in all protected areas in general (Starman, 2023). The director stresses the need for a proactive approach by the manager when dealing with a local problem. He illustrates this with the example of unwanted roadside fruit and vegetable vendors (i.e. hawkers) who are not really pursued. This is why the administration has arranged for a market in Jagodje and Strunjan for local vendors with truly local (home-grown) produce and products, which has been well received. 'This is an objective benefit that people get in a protected area, and you try to present it so that people understand it that way. The basic philosophy is that if you are in a protected area, it should not be a handicap, but an added value' (Starman, 2023).

One of the biggest challenges for both the park manager and the park's inhabitants is the pressure on space during the summer tourist season. According to the manager,

they are all 'slaves and hostages of this tourism season' (Starman, 2023). If the management manages to alleviate the summer problems of the local community, at least to some extent, they also gain trust and mutual cooperation is strengthened. But proactive action, the presence of a team on the ground, adequate supervision, targeted projects and concrete investments are needed. This is helped by a lot of communication, training and thematic workshops. The Public Institute communicates with the local population through social media, with representatives of the local communities of Strunjan and Jagodje-Dobrava, and with the Tourist Association Solinar. Through news about the park, the park manager informs residents about investments in the park's infrastructure, invasive species, and works with residents on various projects, such as the revival of the native strawberry variety 'fragoloni', which has been identified and seedlings distributed to park residents. The manager also cooperates with local fruit and vegetable growers and fishermen, who have been granted exclusive fishing rights in the marine reserve (Brazzatti, 2021; Starman, 2023).

As regards good mutual cooperation, Director Starman emphasises the Public Institute's support for the initiatives of the local community. In particular, there is the Kaki Days (Feast of persimmon fruit), a local festival that has become a tradition and has been around since the beginning of the Public Institute's operation. During the event, they help with transport and offer free guided tours. In addition, they want to give a modern twist to certain established practices and traditions and to highlight the nature conservation message each time. This is why they were among the first protected areas in Slovenia to develop their own brand, which is an exemplary case of cooperation. They started from local needs and the initiative of local people, and it was important to respond, to help build on the initiative and to create a network for the benefit of the local community. Then the local community also responds to the initiatives of the park administration, mobilising the population in clean-up actions and having a special agreement with fishermen regarding exclusive fishing rights and catch monitoring, which acts as a form of co-management (Starman, 2023).

People living in the park have gradually accepted the fact that they live in a protected area and that there are certain restrictions, but also advantages and opportunities when you have someone to turn to if you have a problem. Awareness of the importance of the park has increased, living in the park is no longer seen as a handicap by most locals, and, importantly, tourism providers are also becoming more aware of the benefits of being in a protected area.

Prospects for the Development of the Protected Area

As mentioned above, good cooperation between the various stakeholders in the park is the basis for the further development of the protected area. One of the main objectives in this respect is to make tourism in the park more sustainable, which basically means that the positive effects of tourism outweigh the negative ones. The manager's efforts are thus directed towards strengthening nature conservation awareness and the need for sustainable mobility, especially during the summer season

when pressures on the environment are at their highest. The electric bike rental system is only a small part of the solution. Sustainable mobility in a protected area is an issue that goes beyond the competence of the park manager or even of a single municipality. It would be necessary to establish a wider public transport network, which does not exist (Izola does not have its own public transport, Piran has limited public transport). In connection with the park, a parking system outside the protected area should be enforced and access by sustainable public transport should be regulated, as there is no room for more vehicles in the park. The gradual improvement of the situation requires the extension and improvement of the turning points for buses so that they do not get tangled up in the park, the slowing down of traffic and the improvement of the cycle path. The desire of the operator is thus to transform the car park in the middle of the park into green spaces, and that Terme Krka should finally make space for its underground garage. The park therefore has many ideas and concrete plans to improve the situation; one of the solutions would be sea public transport. But a comprehensive approach requires cooperation between the two municipalities, for example, a park and ride (P+R) system in Lucija, Belvedere, and Izola, from where buses would then go to the beach in the Landscape Park Strunjan in the middle of the main tourist season (Starman, 2023).

In addition, the Public Institute management is working through various projects to unify the signage and further strengthen the park's image through its own branding. An example of good practice is the unified labelling of tourist farms and the signs leading to them. These are the park's brand promoters and tourists are encouraged to walk or cycle to them to get something local. Strengthening the brand by involving even more promoters, local providers, is therefore an instrument to encourage sustainable cooperation today and must be seen in perspective. In this respect, it would also be extremely useful if, when adopting the Municipal Spatial Plans in the municipalities of Izola and Piran, the decision-makers would also adopt ordinances that define the appearance/look of the landscape, as this is now foreseen and allowed by the Law on Spatial Planning. This is very important for a landscape park to make it possible to prescribe in advance how the buildings and structures in the area should look. However, this should be regulated and promoted by the municipalities, possibly in the form of subsidies for investments in improving the appearance or external image (Starman, 2023).

One of the major challenges for the future of the park is the Maritime Spatial Plan (MSP), which foresees the development of maritime public transport. It also includes a commitment to expand the marine protected area. Starman (2023) believes that it is this marine area that needs to be strengthened in terms of protection, which means co-management of this area with fishermen, and very strict control of tourist fishing or fishing in general. A larger and strictly monitored marine reserve would bring positive changes and concrete development benefits, as in the case of the Miramar Marine Reserve near Trieste.

Starman (2023), in addition to the expansion of the marine reserve, also advocates the expansion of the park's sphere of influence, so that the sphere of influence under

Belvedere is then regulated, and the campsite in Strunjan as well, so that the hill is regulated in terms of infrastructure, and so that local fishermen and farmers have some kind of privileged access to the market. It is important that the irrigation system is regulated, so that local crop varieties, or those that are perhaps less sensitive to climate change, are promoted. This represents a concrete challenge for the future. The park manager is promoting a little more innovation, so that the protected area serves as an example of how to enable development beyond the park boundaries, i.e. as a kind of laboratory or incubator of good practice, at least for agriculture and fisheries, as well as nature conservation. However, this concerns a broader understanding of the whole situation, which also includes the link between coastal protected areas. It is undoubtedly an appropriate challenge to better connect and integrate all protected areas in the future, including those without management (extension to Cape Madona and co-management with fishermen). The cooperation between the three landscape parks (Debeli Rtič, Sečovlje Saline and Strunjan) and the nature reserve (Škocjanski zatok) is good and project-oriented; however, it could be further strengthened through the most characteristic element of this common space—the sea.

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Chapter 8

Conclusion: Tourism Pressures, Management Challenges, and Development Opportunities in the Protected Areas of Bosnia and Herzegovina and Slovenia

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Both Bosnia and Herzegovina and Slovenia are rich in biodiversity and natural heritage, and their protected areas aim to conserve ecosystems, landscapes, and cultural values. In both countries, protected areas include adapted IUCN categories, also sharing common conservation goals. However, they differ significantly in implementation, funding, and administrative capacity. Slovenia has a more developed and integrated system of protected areas, supported by EU legislation and funding. In contrast, Bosnia and Herzegovina has a more fragmented and less centralised system due to its complex administrative structure. This often results in uneven protection standards, limited funding, and weaker implementation.

Bosnia and Herzegovina: Abundant Natural Attractions and Complex Realities of Tourism Development

In Bosnia and Herzegovina, protected areas are managed by public authorities, following a model similar to that employed in several other European countries. While this model has proven to be effective and sustainable in economically developed nations, the situation in Bosnia and Herzegovina is more complex due to limited financial resources and competing priorities in other sectors. As a result, the management of protected areas is often marginalised. Public enterprises tasked with overseeing these areas frequently operate under significant financial constraints, owing to insufficient governmental support. This, in turn, affects not only the effective conservation of natural resources but also the development of related economic activities, such as tourism.

Each protected area in Bosnia and Herzegovina has distinct characteristics that served as indicators for its designation. For instance, the Sutjeska National Park—the oldest national park in the country—was primarily established due to its historical significance related to the anti-fascist resistance during World War II. The park encompasses the country's highest mountain region, including Maglić (2,386 m), Bosnia and Herzegovina's highest peak. It is also home to deep river canyons, the Skakavac waterfall, and a cluster of eight glacial lakes on the Zelengora mountain, often referred to as the 'mountain eyes'. The park's exceptional biogeographical value is highlighted by the Perućica primeval forest, one of the oldest and largest of its kind in Europe, which constituted a key rationale for the park's formal establishment.

The Bijambare area represents an intramontane depression characterised by distinct geomorphological, pedological, and biogeographical features. Its most notable

attractions include eight identified caves, the most prominent being the Bijambare Cave. In addition to these geomorphological formations, the presence of rare mountain peat bogs—formed on silicate soils and dominated by *Sphagnum* mosses under submontane and montane climatic conditions—adds to the site's ecological value.

Hutovo Blato Nature Park is a unique wetland ecosystem in Bosnia and Herzegovina, geomorphologically defined as a cryptodepression filled with interconnected lake basins. Its specific hydrological and climatological conditions provide ideal habitats for a wide range of plant and animal species. Accordingly, the area has been recognised not only under the IUCN system but also as a Ramsar Site and an Important Bird Area (IBA).

One of the core challenges to sustainable management of protected areas in Bosnia and Herzegovina is the lack of both vertical and horizontal coordination, stemming from the country's complex administrative and political structure. There is a notable misalignment between legal frameworks and planning documents, as well as insufficient rule of law in terms of enforcement. Responsibilities for protected area management are distributed across various administrative levels: the state, entities, cantons, and municipalities. At the state level, the mandate is limited to coordinating and fulfilling Bosnia and Herzegovina's international environmental obligations. Effective management is delegated to the entities—the Federation of Bosnia and Herzegovina, Republika Srpska, and the Brčko District. Within the Federation, these responsibilities are further devolved to cantonal governments, while in Republika Srpska they are transferred to the municipal level.

The initial set of environmental protection laws was enacted at the entity level in 2003. Since then, numerous legal and regulatory acts have been introduced across all administrative levels. However, these legal frameworks remain poorly coordinated—vertically (gaps between state, entity, and cantonal levels) and especially horizontally (differences between the environmental laws of the two entities), as highlighted in the 2011 Review of the Legal and Institutional Framework for Environmental Protection (United Nations Environment Programme [UNEP], 2011). This fragmentation significantly hampers sustainable environmental governance. While entity-level documents define the status, principles, and management goals for protected areas through spatial and strategic plans, cantonal strategies provide further operationalisation. Even so, there are substantial differences among cantons regarding the scope and depth of coverage of protected areas. At the municipal level, environmental responsibilities are governed by the Law on Principles of Local Self-Government in the Federation of Bosnia and Herzegovina (Official Gazette of the Federation of Bosnia and Herzegovina, No. 49/06) and in Republika Srpska (Official Gazette of the Republic of Srpska, Nos. 97/2016, 36/2019, and 61/2021).

This legal and institutional fragmentation has created a deep disconnect between the formally developed regulatory framework and its actual applicability and effectiveness. Consequently, the management of protected areas often relies on ad hoc expert recommendations issued by authorities at various administrative levels. The

lack of coherence between legal provisions and implementation contributes to a deteriorating geoeological balance in many protected areas. These negative trends manifest through various forms and intensities of sustainability challenges. At the root of the problem lies an overemphasis on certain socio-geographical functions that place unsustainable demands on spatial resources, surpassing the ecological and, ultimately, economic capacity of these areas. Such anthropogenic pressures overload ecological systems and disrupt the integrity of protected landscapes.

The most invasive socio-geographical functions currently threatening protected areas include leisure activities (primarily tourism), residential development (particularly the construction of second homes), and economic exploitation (notably extractive industries). Among these, recreational functions exert the most significant direct pressure. The expansion of tourism-related infrastructure—both within and near protected areas—has rapidly transformed land use, altered the balance between natural and cultural landscapes, and impacted the visual and compositional character of the scenery. These changes are further intensified by deforestation and mineral extraction, processes often tied to the development of tourist facilities.

A notable characteristic of many protected areas in Bosnia and Herzegovina is the presence of permanent settlements within their boundaries. As a result, livelihood-related functions such as agriculture, forestry, and extractive industries—as well as residential development—exert continuous pressure on the environment and landscape. In addition to the more immediate and often seasonal environmental impacts of tourism, the ecological integrity of protected areas is increasingly affected by the everyday needs of resident populations. The combination of permanent and seasonal users, each with potentially conflicting livelihood interests, leads to lasting and sometimes irreversible environmental degradation. These pressures contribute to the reduction of natural vegetation cover (especially forests), the spread of secondary vegetation, and the degradation of cultural landscapes that once reflected a more harmonious human–nature interaction.

A comparison between the natural vegetation cover recorded in 1979 and the data derived from the 2018 Corine Land Cover classification indicates a significant decline in zonal forest vegetation across all analysed areas. This ongoing process represents a major ecological threat to the ecosystems of protected areas in Bosnia and Herzegovina—ecosystems upon which the long-term sustainable development of these regions depends.

At the same time, centuries of human presence have shaped a distinctive cultural landscape. In addition to supporting traditional economies, this landscape contributes to habitat diversity and offers an additional basis for tourism valorisation. Through continuous anthropogenic influence, each of the protected areas has developed a unique cultural landscape that, when combined with its natural features, enhances its attractiveness. However, contemporary models of spatial valorisation are increasingly degrading traditional landscapes and cultural values, thereby threatening the long-term sustainability of these areas—particularly through the erosion of spatial identity.

The analysis reveals significant variations in the degree of ecosystem and cultural landscape vulnerability among the selected protected areas. These differences are primarily shaped by geographical factors, including accessibility and proximity to urban centres that generate tourism demand. Equally important are current administrative affiliations and the level of institutional organisation, including the scope, structure, and capacity of the public bodies responsible for area management. Furthermore, physical-geographical features—such as geomorphology, hydrology, and climate—strongly influence the intensity of anthropogenic pressures. For example, the contrast between Hutovo Blato and Sutjeska National Park illustrates how climate directly affects development dynamics: Sutjeska's harsh mountainous climate limits year-round tourism and infrastructure development, unlike the more favorable Mediterranean conditions of Hutovo Blato. These differences result in distinct sustainability challenges, highlighting the need for tailored management approaches rooted in the unique ecological, cultural, and socio-political context of each protected area.

Slovenia: Diversity of Tourism in Wilderness, Rural and Maritime Areas

In Slovenia, a protected area can be established by the Government or by a single municipality. In the establishment and operation of a protected area, communication and cooperation with local communities is an extremely important factor in the ongoing and open cooperation between the park administration and the local population. This fosters positive attitudes towards the protected area and contributes to a broader and better public understanding of nature conservation objectives. Management plans set out the rules of conduct in the protected area through which the objectives and purposes of the protected area are met (Institute of the Republic of Slovenia for Nature Conservation, 2025). However, not all protected areas in Slovenia have a management administration.

In general, the system of protected area management in Slovenia is therefore relatively decentralised, especially for protected areas that are of a lower category of protection, which is the result of a bottom-up approach. Apart from Triglav National Park, public institutions founded and financed by the state administer all regional parks, a few landscape parks, and also one of the 56 nature reserves. There are advantages to the existing type of management of lower-rank protected areas (in Slovenia) in terms of creating opportunities for stronger implementation of participative approaches, involving all shareholders in the local community with the goal of integrating a given protected area into the spatial and social development of the wider area in which it is located (Koderman et al., 2020, 246).

Regarding the analysed case studies in Slovenia, we can highlight the following several and specific challenges.

The development of the Notranjska Regional Park faces three main tasks: securing stable financing, balancing tourism with nature conservation, and expanding the protected area. The director of the park emphasised the importance of long-term funding to reduce reliance on short-term projects and sponsorships. Tourism in the

protected area, if carefully planned, can align with environmental goals, support agriculture, and offer employment opportunities for locals. The director believes the park authorities should lead tourism development rather than external stakeholders. He also advocates for the park's active role in agriculture, especially in forest and timber-related industries. There is a vision to expand the park to the nearby municipalities of Logatec and Postojna, and possibly to the wider Snežnik area, potentially forming a new national park. This would allow for broader environmental management, including forests, lakes, and groundwater. Despite growing tourism and environmental pressures, the park still lacks a comprehensive management plan, which would help optimise agricultural development and forest use in the wider area. Such a strategy would ease pressure on protected areas, support environmental monitoring, and foster sustainable development in the Municipality of Cerknica.

On the other hand, analysis of the Seasonal Lakes of Pivka Nature Park revealed that the park's strengths for tourism development lie in its rich natural and cultural landscapes, diverse wildlife, and strong focus on nature conservation. Its location near major tourist destinations and good transport links are additional advantages. However, weaknesses include underdeveloped tourist infrastructure, limited development initiatives, and a lack of tradition in tourism due to the area's former military use. Financial and staff-related shortages also hinder progress, leading to increased rule violations and early signs of environmental damage. Despite these challenges, the Seasonal Lakes of Pivka Nature Park offers many opportunities: high numbers of day and transit visitors in summer could support the establishment of new accommodation facilities, guided tour offers, and sports equipment rentals. There is also potential for developing educational, culinary, and active tourism, as well as stronger collaboration among local providers and promotion of local products. Key threats include continued military activity in the vicinity of the park and disruptive national infrastructure projects like a planned motorway to Croatia. Rapid, unmanaged tourism growth could damage the fragile ecosystem, so a controlled and sustainable approach is preferred. To improve the park's development, stronger integration with nearby protected areas—the Notranjska Regional Park, the Škocjan Caves Regional Park, and the unprotected Snežnik Mountain area—is proposed. This could lead to the creation of a new national park, reviving earlier plans for a Snežnik Regional Park and connecting forested karst landscapes across the Slovenian-Croatian border.

In the case of Landscape Park Strunjan, the future development of the area depends on strong cooperation among stakeholders, with a focus on sustainable tourism. The goal is to ensure tourism benefits outweigh environmental impacts, especially during the peak summer season. The park promotes sustainable mobility—such as electric bike rentals—but broader solutions like a regional public transport system are needed, as local infrastructure is limited. Ideas include relocating parking outside the park and introducing a park-and-ride system from surrounding towns like Lucija and Izola. According to the park's director, there is an ambition to turn the central car park into green space and to encourage the main stakeholder, the Terme Krka hotel complex, to complete its underground garage. Sea-based public transport is also being considered,

but coordinated municipal support is crucial for these plans. The park is working on consistent signage and building a strong local brand through recognisable labels and signs for tourist farms and local providers, and encouraging walking and cycling. Sustainable branding is seen as a long-term tool for encouraging local participation. Another key issue is the Maritime Spatial Plan, which includes expanding marine protected areas and developing marine public transport. The park director stresses the need for stricter marine protection, co-management with fishermen, and strong regulation of tourist and general fishing, following successful examples like the Miramar Marine Reserve near Trieste. The park aims to be an innovative example of sustainable development in agriculture, fisheries, and nature conservation—a model that could extend beyond its boundaries. Stronger integration and collaboration of all coastal protected areas has also been recommended.

Concluding Reflections on Identified Similarities and Differences

In the introductory chapter, we presented the main features concerning the current state of nature/environmental protection in Bosnia and Herzegovina and Slovenia, with a special focus on the protected areas of both countries. There are significant differences in the proportion of the total area of protected areas in relation to the area of national territory, and there are also large discrepancies in the number, size and extent of the individual IUCN categories. Bosnia and Herzegovina's national territory is 2.5 times larger than Slovenia's, and yet the total size of protected areas in Slovenia is almost twice as large as in Bosnia and Herzegovina. Comparison by IUCN categorisation highlights the largest discrepancy in the size of protected areas for category V (in Slovenia these are classified as regional and landscape parks, in Bosnia and Herzegovina they are called protected landscapes). Bosnia and Herzegovina has four national parks, which together are smaller in area than the only national park in Slovenia. It is the total number of all protected areas in the two countries that shows the main difference, especially in category III (natural monument); Slovenia has 1,167 natural monuments, while Bosnia and Herzegovina has only 21.

A common characteristic of both countries, as former parts of Yugoslavia, is the early onset of nature protection efforts—both began designating protected natural areas in the second half of the nineteenth century. The overall intensity and scope of protection remained relatively comparable until the early 1990s. However, the political instability and armed conflicts that accompanied the disintegration of Yugoslavia in the 1990s significantly impacted the protection of nature across the region.

Among all the successor states, Bosnia and Herzegovina suffered the most severe consequences of the war, which negatively affected the designation and establishment of new protected areas during and after the conflict. The country's current *sui generis* administrative and political structure has resulted in a highly decentralised system of protected area governance. In contrast, Slovenia's accession to the European Union played a crucial role in strengthening its nature conservation framework. EU membership provided easier access to environmental funding mechanisms and introduced clear obligations and guidelines for nature protection. As a result, in

addition to the IUCN categorisation of protected areas, Slovenia has established other forms of protection, such as the Natura 2000 ecological network. In Bosnia and Herzegovina, as a non-EU member state, such mechanisms have yet to be introduced.

Regarding the categorisation of protected areas, Slovenia has retained its national system alongside international frameworks. Bosnia and Herzegovina, however, does not have a unified national classification system for protected areas. Instead, all designated areas are aligned with international conventions and standards for nature protection, such as those defined by the IUCN, the Ramsar Convention, Important Bird Areas (IBA), and other global initiatives.

The size, categorisation, tourism development and other development opportunities also dictate the way the protected areas are managed. In other words, the situation found is (in the case of development opportunities and ambitions) the result of more or less good quality management. In this respect, we note certain similarities, but above all, particularities and differences in management of the individual protected areas within each of the two countries. Comparatively, however, between Bosnia and Herzegovina and Slovenia there are—due to different legislation, regulation and supervision at the administrative level, and other socio-economic and political circumstances—quite significant elementary differences in the management of protected areas.

The various models of protected area management include state, private, partnership-based, and indigenous-led governance. Some countries implement a single model, while others combine multiple approaches to suit their specific needs and contexts. Management of protected areas is a cyclical process, whereby goals are reached by carrying out pre-arranged activities within a set framework (Dudley et al., 1999). In order to successfully protect an area, influence over the activities taking place within it is necessary. Therefore, the management of protected areas depends on the management of economic (and other) activities taking place therein, whereby activities should either be restricted or encouraged, depending on the needs of the space. There is significant emphasis in management on protecting natural diversity and cultural heritage, education and recreation, and strengthening local communities. Assessment of planning (or aspects and goals of planning) consists of an analysis of all relevant information for a given area, forming the basis for the definition of management goals and activities (Koderman et al., 2020, 243–244).

The future of protected areas in Bosnia and Herzegovina and Slovenia depends on the establishment of a coherent and functional management system that integrates environmental, cultural, and socio-economic dimensions. Only through coordinated action, strengthened institutional frameworks, and community-based approaches can these landscapes continue to serve as reservoirs of biodiversity, bearers of cultural identity, and foundations for sustainable development. The vision of all debated protected areas is rooted in sustainable development and cooperation between tourism, agriculture, and nature conservation, and can be achievable only through active involvement and awareness within the local community.

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Excerpts from Reviews

"The content of the manuscript represents an original scientific work, combining contemporary theoretical research with the authors' own results from desk and field analyses. It consistently applies modern scientific methods, including the integration of GIS into spatial analyses and qualitative approaches through stakeholder interviews. In this way, the manuscript provides both a theoretical and applied basis for understanding the complex relationships between tourism and the protection of natural areas, as well as for developing appropriate management models in Bosnia and Herzegovina and Slovenia. Thus, the monograph makes a significant contribution to scientific knowledge, while also serving as a valuable addition to the literature used in higher education and in the international practice of planning and managing protected areas."

Dr. Samir Đug, Full Professor

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"The manuscript comprehensively addresses and deepens the highly relevant issue of tourism development in protected natural areas, both from an empirical and an applied perspective. Its particular value lies in the clearly defined and implemented problem-oriented geographical approach, which involves an in-depth analysis of spatial challenges related to the tourism-geographical valorization of protected natural areas, rather than a mere encyclopedic listing of data. The conclusions are applicable not only to the management of protected areas in Bosnia and Herzegovina and Slovenia, but also in neighboring countries with similar historical trajectories of nature protection. In this respect, the monograph provides a strong applied contribution and reaches beyond the boundaries of the geographical scientific community."

Dr. Vuk Tvrtko Opačić, Full Professor

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