THE NATURAL RESOURCES OF THE PRIMEVAL FOREST PERUĆICA AS THE BASIS OF NATURE-BASED TOURISM

Edin Hadžimustafić[17]
Dževad Mešanović[18]

DOI: 10.35666/25662880.2024.10.56
UDC: 338.483.11GIS(497.6 Perućica)

Abstract: The subject of research in this paper is the identification of natural resources in the primeval forest Perućica, and their valorization in nature-based tourism. The natural resources of this region attract a significant number of tourists from the country and abroad and provide the basis for the development of nature-based tourism, such as: walking tourism, cycling tourism, adventure tourism, fishing, bird and wildlife watching, ecotourism, SAVE tourism. The geomorphological, climatic, hydrogeographical, biogeographical potentials, as well as the natural landscapes of the area, were analyzed. Mountaineering and cycling trails, viewpoints, caves, waterfalls, water sources, streams, endemic plant and animal species, etc. are singled out. The research area is the primeval forest Perućica, which is located in the southeast of Bosnia and Herzegovina on the border with Montenegro. This protected nature reserve is located on the western slopes of Mount Maglić and is part of the Sutjeska National Park. The goal of the research is to comprehensively analyze and evaluate natural tourist resources in order to recognize and distinguish existing and potential tourist resources in the protected area of the Perućica primeval forest. Different research methods have been applied, from field research of the area, to the use of data obtained by remote sensing that are processed and analyzed in geographic information systems. A tourist map of the geographical distribution of natural resources of the Perućica primeval forest was made. The obtained research results will bring this unusual attractive area closer to nature lovers, which will have a positive effect on the additional strengthening and development of tourism in the primeval forest Perućica, as well as in Bosnia and Herzegovina.

Key words: natural resources, nature-based tourism, primeval forest Perućica, Geographic information systems, Bosnia and Herzegovina

INTRODUCTION

In this paper, the natural potentials of the Perućica primeval forest were identified and analyzed. The aim of this paper is to determine the possibilities of valorization of the identified natural resources in nature-based tourism. This area was chosen because it represented special value of Bosnia and Herzegovina in the world. Under the influence of

[17] Associate Professor, Department of Geography, Faculty of Natural Science and Mathematics, University of Tuzla, Urfeta Vejzagića 4, 75000 Tuzla, edin.hadzimustafic@untz.ba
[18] Associate Professor, Department of Geography, Faculty of Natural Science and Mathematics, University of Tuzla, Urfeta Vejzagića 4, 75000 Tuzla, dzevad.mesanovic@untz.ba

economic development, industrialization, urbanization, and the increase in the number of inhabitants on Earth, untouched nature is increasingly difficult to find anywhere in the world. Primeval forest Perućica is one of the last two saved primeval forests in Europe (UNESCO). The Perućica primeval forest is classified as the largest category of protected areas - Strict nature reserve (IUCN category Ia), according to the International Union for Conservation of Nature (IUCN) categorization of protected areas (Dudley, 2008). The Perućica primeval forest is at the same time a "double protected area", because it is located within the Sutjeska National Park (IUCN category II).

In 1952, Perućica was declared a strictly protected part of nature. Two years later, in 1954, it was placed under state protection as a nature reserve (Decision of the National Institute for Protection of Cultural Monuments and Natural Rarities of Bosnia and Herzegovina). The Sutjeska National Park was founded in 1962, and the Perućica primeval forest became an integral part of it (Stupar, Milanović, 2017).

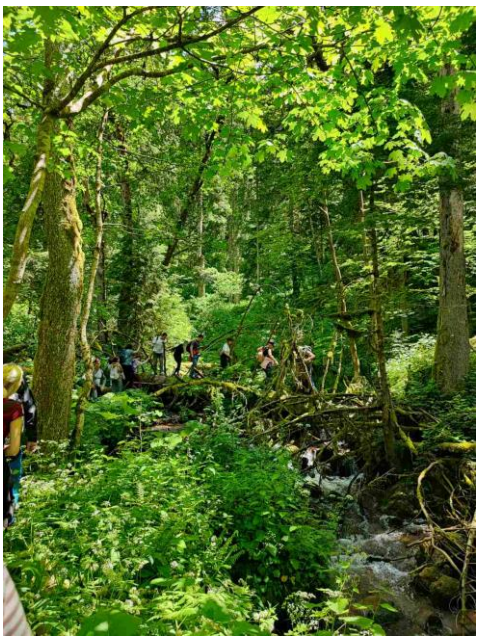

Fig. 1. Field research in the Perućica

Sutjeska National Park was formed due to preserving the memory of one of the most important battles in the 2nd World War (the Battle of Sutjeska). However, primeval forest Perućica was put under protection for the extremely preserved diversity of geological, geomorphological and biological values. Natural landscapes with numerous valleys, colossal mountain peaks, river canyons, deeply incised watercourses, mountain pastures, waterfalls, numerous endemic plants, diverse fauna are the characteristics of this area.

Perućica is protected primarily to be visited for scientific and educational purposes (Fig. 1.). In this paper, the boundary of the Perućica protected area was used, which exceeds the boundaries of the strictly protected area of the Perućica primeval forest, and such a limited area can be valorized in nature-based tourism.

Natural tourism resources

In the scientific and professional literature, natural tourism resources are most often divided into: geomorphological, climatic, hydrogeographic, biogeographic and landscape (natural landscapes). Natural tourist resources were created independently of the will of man, that is, they were created by the action of two basic types of natural forces on our planet - endogenous (earth's gravity and earth's heat) and exogenous (solar heat and gravitational effect of the Sun and Moon) forces of the Earth. They have one or more types of tourist attractions and condition the corresponding types of tourism. Natural tourism values are the basis of the development of recreational types of tourism (swimming, nautical, hunting, spa, mountain, coastal, lake, river, etc.) (Mešanović, Hadžimustafić, 2023).

Geomorphological tourism resources represent the relief and its forms, the way they influence the tourist offer, tourist infrastructure, construction of roads, tourist accommodation capacities, etc. The most significant are the mountains, which differ in the vertical dissection of relief, morphometry and morphogenesis. Relief is one of the climatic abiotic factors that significantly affects climate processes, altitudes modify temperatures, which is especially visible in areas with increased relief dissection, such as the area researched in this paper.

Climate is a complementary tourist resource, which can often be put first in terms of importance. In different ways, the weather and climate, that is, the variability of climatic elements, influence the choice of a tourist destination. It affects the human organism in a variety of ways, positively and negatively. Among the climatic elements that most favorably affect humans are insolation, air temperature, relative humidity, precipitation and winds, while the most significant climatic elements are air temperature and precipitation.

Hydrographic resources are also very attractive, because water covers 70% of the Earth's surface, and water is indispensable for the normal functioning of the human body. Hydrographic tourism resources include oceans, seas, lakes, rivers, thermal mineral springs, wetlands and glaciers. In this paper, two rivers flowing through the researched area, several springs, and two waterfalls were analyzed.

In the geographical envelope, the biosphere is distinguished, which consists of plant and animal life. In addition to the importance of fauna, as an integral part, the flora is more valued in the context of tourism development.

Landscape resources

The tourist value of landscape resources is directly dependent on the degree of tourist development as well as the equipment of the landscape itself. The National Park is an area with a large number of diverse natural ecosystems of national importance, prominent landscape features and cultural heritage in which man lives in harmony with nature, intended for the preservation of existing natural values and resources (Stojanović, 2011). These natural areas have several attractive attributes that attract tourists, and they can be linked to special objects in their composition that have motive characteristics: mountains, gorges, canyons, forest complexes, springs, rivers, lakes, endemic plants, animal species, etc. (Kadušić et al., 2018).

The concept of Nature-based tourism

Under the influence of globalization, more and more people live an urban life and separate themselves from the traditional life in the countryside in harmony with nature. The perception of people who produce food, catch fish, grow cotton for the clothes we wear is lost. The seasonality of fruit and vegetables virtually has ceased to exist; and the furniture in our homes is impossible to picture as the trees from which it came (Kuenzi, McNeely, 2008). People are part of nature and returning to nature is a primal need that we all strive for, regardless of modern "obstacles".

Tourism is one of the largest and fastest growing economic sectors in the world, and nature-based tourism is one of the fastest growing sectors of tourism.

There is no universal definition of nature-based tourism, it can be most simply defined as a trip during which the traveler enjoys the natural environment leaving his permanent place of residence. It can be said very succinctly that: Nature-based tourism is primarily concerned with the direct enjoyment of some relatively undisturbed phenomenon of nature (Valentine, 1992).

It has considerable growth potential and its development can concurrently ensure tourist satisfaction with the nature experience, profit for tourism providers, funds for environmental protection and an improvement in living standards in local communities (Žafran, 2023).

Nature-based tourism is determined and modelled by both anthropic and natural factors such as socio-demographic attributes, cultural values and financial aspects, biotic and abiotic elements (unique fauna, flora, often spectacular geology and hydrography of an area, etc.), infrastructure (access, utilities, and services), as well as objectives (endemic species, pristine wilderness, serene landscapes, monuments of nature, and man-made elements of touristic attraction within a natural setting) (Donici, Dumitras, 2024).

Nature-based tourism sector developed rapidly, at the time of the emergence of the global pandemic of COVID-19, when the demand for visits to nature increased strongly (Derks et al., 2020, Ferguson et al., 2022).

Examples of Nature-based tourism are: walking tourism, cycling tourism, adventure tourism, fishing, bird and wildlife watching, photography, stargazing, ecotourism, SAVE (Scientific, Academic, Volunteer and Education) tourism.

MATERIALS AND METHODS

Study area

The Perućica primeval forest is located in the Sutjeska National Park, in the southeast of Bosnia and Herzegovina. It stretches in a southeast-northwest direction, from the border with the Republic of Montenegro, to the Sutjeska River (Fig. 2.). Perućica is located in the Middle Bosnia macroregion, i.e. in the Upper Drina Mesoregion. In the administrative division, it is on the territory of the municipality of Foča. It has a favorable traffic-geographical position, because it is located next to the main road Višegrad - Goražde - Foča - Tjentište - Bileća - Trebinje - Dubrovnik. The protected area of Perućica has an area of 3,091 ha, while the strictly protected area of the Perućica primeval forest covers 1,434 ha.

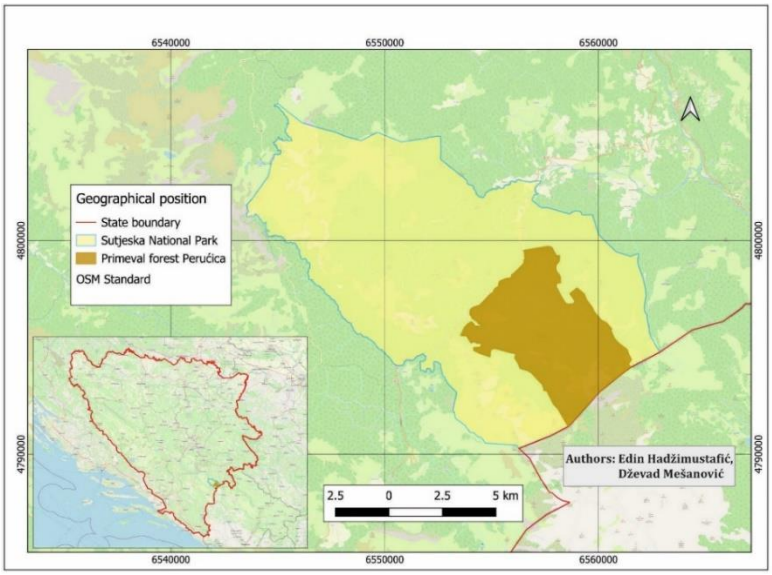

Fig. 2. The geographical position of the primeval forest Perućica

Classic tourist-geographical methods were applied in this work: analytical-synthetic, spatial, comparative, systematization and classification method, mathematical-statistical, as well as cartographic method. Field research in the area of the Perućica primeval forest was conducted in May 2024, when numerous natural heritage sites were analyzed (Fig. 3.).

Fig. 3. Fieldwork in the Perućica primeval forest

In the preparatory phase of the research, existing scientific and professional literature, cartographic material and other information (statistical data, photographs, satellite and aerial photographs, etc.) were analyzed. Geographic data for analysis in geographic information systems are collected from different sources and in different ways. The borders of the Sutjeska National Park, as well as the Strict nature reserve of the Perućica primeval forest, were taken from the geographic data repository of the European Environment Agency (EEA). Data on land cover, i.e. the eight classes of land found in this area (Broad-leaved forest, Coniferous forest, Mixed forest, Natural grasslands, Moors and heathland, Transitional woodland-shrub, Bare rocks and Sparsely vegetated areas), were taken from Corine Land Cover (CLC) 2018 database (CLC). For terrain analysis and visibility analysis, the global SRTM Digital Elevation Model with a spatial resolution of 30 m was used (USGS). Data of roads, mountain tops, viewpoints, shelters, were taken from the Open street map site (OSM). Data of watercourses, as well as springs, were digitized from a topographic map at a scale of 1:25,000 (Topo map). Data analysis was conducted in geographic information systems, software QGIS 3.34.3. An analysis of elevations, slopes, aspects, and terrain visibility was conducted. Topographic and hydrographic cross profiles were created using a digital elevation model with a spatial resolution of 30 m.

RESULTS AND DISCUSION

The relief is made of sedimentary and clastic rocks of Mesozoic age, dominated by limestone and dolomite. Perućica is located in the highest mountain range of Bosnia and Herzegovina, in the northeastern part of the geomorphological region High Central Dinarides (Lepirica, 2009). The formation of today's relief forms is conditioned by the action of the Alpine orogeny, when the folded-thrusted massifs of Zelengora (2,015 m above sea level), Maglić (2,386 m above sea level) and Volujak (2,297 m above sea level) were formed. The terrain is criss-crossed by numerous faults and is characterized by pronounced vertical relief dissection.

Denudation-erosion-corrosion exogenous geomorphological processes, with gravity processes at higher altitudes, modeled the slopes. On the slopes above 1,500 m, glacial, periglacial and nivation forms of relief are represented. The valley of the river Sutjeska was formed by fluvial erosion, and in the researched area there is a gorge. Remains of the Pleistocene glaciation, cirques, glacial trough and moraines were found on mountain Maglić.

The recreational properties of geomorphological motifs are reflected in height differences, convenient viewpoints, the width of the horizon and the appearance of the landscape, which affect tourists psychologically and aesthetically. Terrain analysis is the best way to get to know existing and discover potentially new relief natural tourism resources. Therefore, we performed a hypsometric analysis, an analysis of terrain slope and aspect, as well as an analysis of terrain visibility.

The lowest measured altitude in the Perućica primeval forest is 578 m above sea level, while the highest is 2,386 m above sea level at Maglić (Fig. 4.). The lowest hypsometric zone 578 – 1,000 m above sea level occupies an area of 6.15 km^2, which is 20.4% of the total area. We divided the middle mountain belt into two classes. The first, 1,000-1,500 m above sea level covers the largest area of 16.2 km^2, or 53% of Perućica. The second class, 1,500 – 2,000 m above sea level has a smaller area of 7.7 km^2, that is, 25% of the territory. The smallest areas are in the high mountain zone of 2,000 - 2,386 m, only 0.78 km^2, which is 2.6% of the researched area.

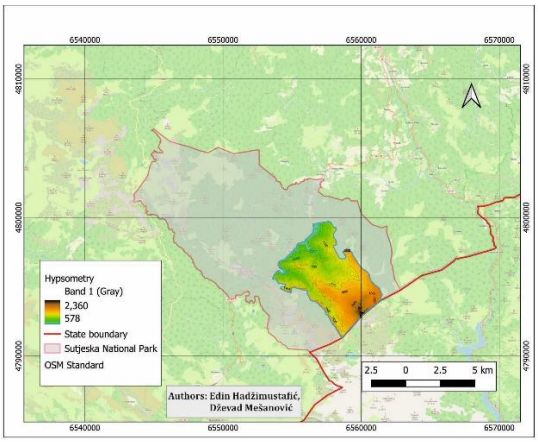

Fig. 4. The hypsometric map of Perućica

The slopes of the terrain were analyzed because they have a special importance for activities in nature such as hiking, mountaineering, mountain biking. Possibilities for these activities are expressed in the Perućica primeval forest by numerous hiking trails and roads, which allow movement. We have created a slope classification that best suits the terrain of Perućica (Fig. 5.). Smaller terrain slopes are less demanding to move, while larger slopes require more

effort to overcome. The gentlest slopes of the terrain (Nearly flat) of 0°-5° are intended for easy walks, which can be used by people of all ages. Gentle slopes of 6°-11° are the most suitable for easy picnic walks. These two classes are the least represented with 12.9% on the surface of 385.08 ha. Slopes of 12° - 20° represent mild ascents (Moderately sloping), while moderately difficult mountain ascents (Moderately steep) on terrain slopes of 20° - 32. Moderately sloping has an area of 746.8 ha or 25%, while Moderately steep is the most represented with 947.9 ha, which is 31.7% of Perućica. On terrains with slopes of 33° - 55° (Steep), great physical strength is required, as these are difficult mountain climbs with free climbing. They occupy one quarter of Perućica (26.43%) with an area of 789.4 ha. Slopes over 55° (Very steep) are reserved for free climbing and alpinism, they have a small area of 1.17 ha, which is 3.91% of Perućica.

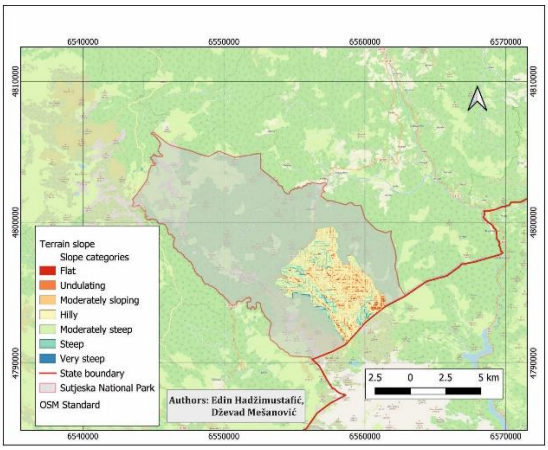

Fig. 5. The slope map of Perućica

The importance of the aspect analysis is because they are used for orientation, they play an important role in the spatial distribution of plant species and the length of the vegetation period. Differently oriented slopes receive an unequal amount of short-wave solar radiation (Hadžimustafić, 2023). Southern aspect are sunnier and receive more solar energy, while northern aspect receive less solar energy and are cooler. The northern aspect (north, north-east, north-west) have the largest area of 1,435 ha, which is conditioned by the general from south-east to north-west direction of Perućica. Slopes with southern aspects (southeast, south, southwest), which receive the greatest amount of solar energy, occupy a quarter of the researched area or 749.7 ha (Fig. 6.). Sunnier slopes are more pleasant for movement and stay in nature, and have better prerequisites for nature-based tourism.

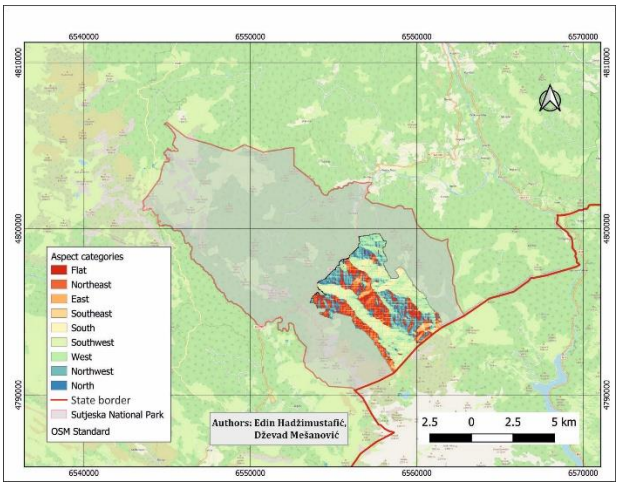

Fig. 6. The aspect map of Perućica

Primeval forest Perućica has great potential for movement in a special natural environment, almost untouched nature. All forms of movement (hiking, trekking and mountaineering) are possible on marked trails. The path that starts from Dragoš sedlo, descends and crosses the Perućica river, climbs the Tunjemir hill, and descends steeply towards the Suški stream, is the main path for scientific research, education in nature, academic visits and studies of flora and fauna. Considering it's importance and the position it occupies, we named it ‘’The heart of Perućica path’’ (Fig. 7.).

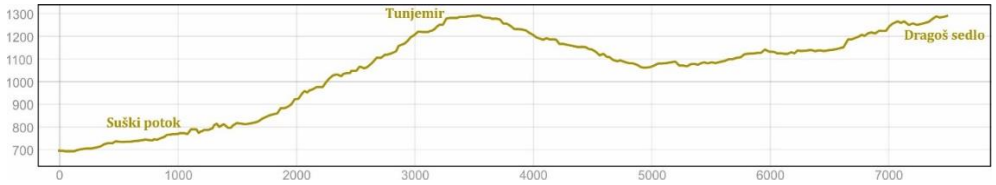

Fig. 7. Hiking path ‘’The heart of Perućica’’ (Dragoš sedlo - Perućica river - Tunjemir - Suški potok)

From the locality of Prijevor, the trails heading to the highest peak of Bosnia and Herzegovina, Maglić (2,386 m above sea level). From the regional road that passes through the Sutjeska National Park, all the way to Prijevor, there is a unpaved road, which is used both for hiking and mountain biking, also for landscape photography and enjoying scenic beauty. That road leads to Prijevor locality were is the beginning of the path towards Maglić peak (2,386 m above sea level). That peak is particularly important because it represents the starting point towards the highest peak of Bosnia and Herzegovina, so it is a special honor to visit this trail and climb Maglić mountain.

From the tops of mountains and hills, there is an extraordinary view of the relief composition and natural and cultural landscapes. In this area, there are several viewpoints from which one can enjoy spectacular views. Viewpoints are suitable, in addition to enjoying the extraordinary beauty of the landscape, for bird and wildlife watching, photography, stargazing. Most viewpoints are located in the northern part of Perućica, on Beškita hill (1,274 m above sea level) and Dragoš saddle.

Fig. 8. „Beškita“ viewpoint

There are two viewpoints on Beškita, but the view is better from the higher viewpoint, which is located at 1,250 m above sea level, just below the top of Beškita (Fig. 8.). It offers a view of the entire Perućica primeval forest, Maglić, Volujak, Prijevor, Zelengora (Fig. 9.).

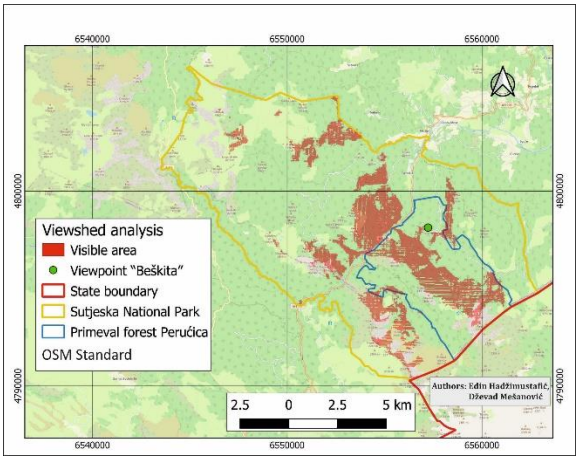

Fig. 9. Terrain visibility from the „Beškita“ viewpoint

A special curiosity is the view of the Skakavac waterfall. The Skakavac waterfall is best seen from the Skakavac viewpoint, located on the slopes of Mokra greda, so one can enjoy its beauty from the closest distance. In the southeastern part of Perućica, in the wider area of Prijevor, at 1,645 m above sea level, there is a viewpoint. In its vicinity, between Prijevor

and Makaze (1,683 m above sea level), at an altitude of 1,654 m, there is a tower, from which one can see the Perućica primeval forest from the southeast, and the mountains Maglić, Volujak and Zelengora also (Fig. 10.). It is located on the opposite side of Beškita, and since it is at a higher altitude, a larger area can be observed from it. For the purposes of the analysis, two terrain visibility maps were created from the aforementioned viewpoints, Beškita and Prijevor (tower). The maps show parts of the Perućica terrain that can be seen from the viewpoints, as well as parts that cannot be seen.

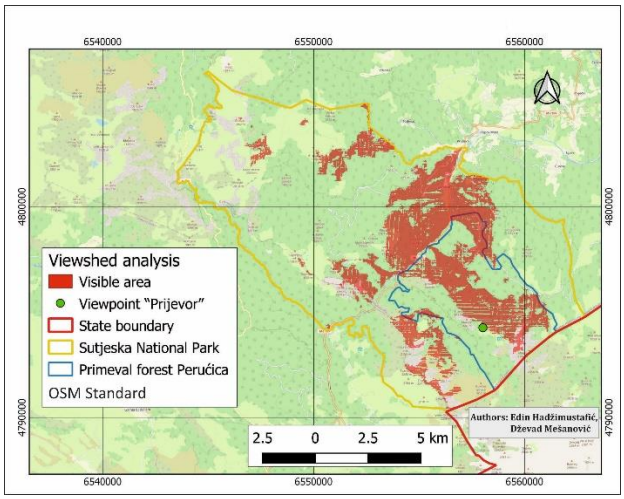

Fig. 10. Terrain visibility from the „Prijevor“ viewpoint

The protected area of Perućica is located on the western slopes of Maglić, and the influence of the Mediterranean climate from the south and the continental climate from the north can be felt in this area. Mountain climate prevails at higher altitudes. Winters are long and cold, and spring and summer are short. The lowest temperatures are in January (Čemerno -4.5°C, Suha -3.1°C and Tjentište -1°C), and the highest are in July and August with 13°C (Suhoj), 14.9°C (Čemerno), and 18°C (Tjentište) (Hrelja et al., 2020). The annual amount of precipitation is from 1,500 to 2,000 mm, depending on the altitude. Rainfall is frequent and evenly distributed throughout the year. Snow stays for three to six months. The mountain climate has a beneficial effect on the human body, it increases the number of red blood cells, it is suitable for asthmatics, anemic people, people who do a lot of intellectual work, staying in fresh and clean air has a beneficial effect on people who exchange urban environments with the natural environment.

Among the hydrographic tourist resources in the Perućica primeval forest, we single out the Perućica watercourse and the less attractive Suški potok. The rivers have a pluvial-nival regime with the highest water levels in March and April, and the lowest from June to October. Suški stream dries up in the period from June to October. The main right tributary of the Perućica river is the Kondžilski stream, and the Prijevorski stream flows in from the

left side. The attractiveness of rivers is usually related to certain curious hydrological phenomena, such as waterfalls. Waterfalls represent an exceptional natural rarity and beauty. On the Perućica stream, there is one of the highest permanent waterfalls in Bosnia and Herzegovina, the Skakavac waterfall, which falls from a height of 75 m (Fig. 11.). Perućica is also rich with many natural water sources.

Fig. 11. Skakavac waterfall

The Perućica river valley is a hanging valley cut into the lower western slopes of the Maglić massif. The Perućica River rises at 1,582 m above sea level, and flows into Sutjeska, as the right tributary, at an altitude of 615 m. It is 6.8 km long with a height difference of 967 m from the source to the mouth, with a pronounced slope of the river bed. It flows in a southeast-northwest direction and in its basin is the Perućica primeval forest. The river bed of Perućica is evenly cut into the topographic surface, except for the part where a cascade is created from which the water of the Skakavac waterfall falls (Fig. 12.).

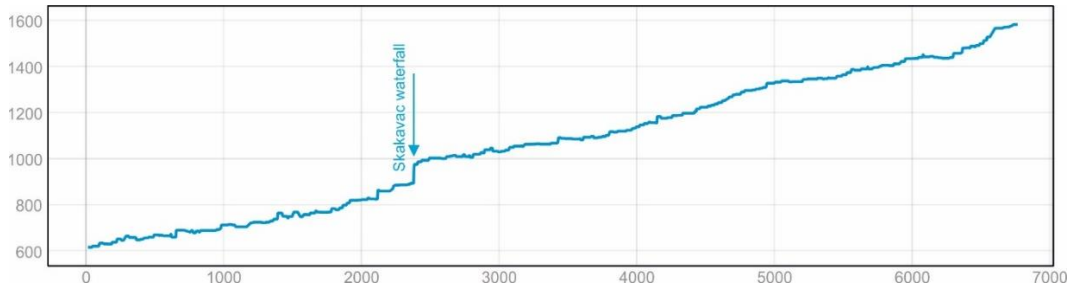

Fig. 12. Longitudinal elevation profile of the Perućica river

Skakavac waterfall was created by tectonic movements. Downstream from the Skakavac waterfall, the valley narrows and changes into a canyon valley, all the way to the mouth of the Sutjeska river. In the far south of Perućica, on the border with Montenegro, there is a water reservoir called Suha Jezerina, which is of a periodic nature, as it dries up from April to October. It has a small area, is relatively difficult to access, and is attractive mostly for mountaineers.

Plant life in tourism can be used in several ways: first aesthetically, then decoratively, hygienically and recreationally. Broad-leaved forest covers 986 ha or 31.9%, while Coniferous forest is much less widespread at 284 ha, which is 9.2% of Perućica. The largest area is covered by mixed forest with 1,286.42 ha, which is 41.61% of the territory. Compared to forests, the areas of Natural grasslands are small, 73 ha or 2.36%. Bare rocks are visible on 149.4 ha or 4.83% of Perućica (Fig. 13.).

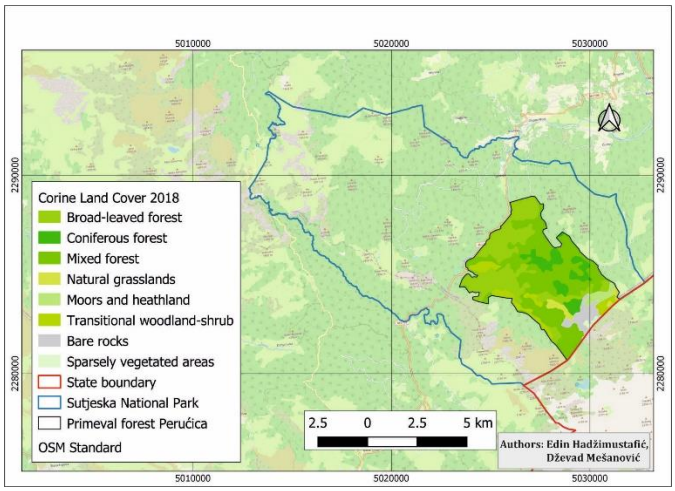

Fig. 13. Perućica Land cover

In the area of Maglić we find all the most important species of mammals that live in Bosnia and Herzegovina: chamois (Rupicapra rupicapra), roe deer (Capreolus capreolus), wild boars (Sus scrofa), wolves (Canis lupus), bears (Ursus Arctos Bosniensis), wild cats (Felis silvestris lybica), foxes (Vulpes vulpes) and martens (Mustelidae). The golden eagle (Aquila chrysaetos) and Eastern imperial eagle (Aquila heliaca) nest on the high cliffs. Peregrine falcon (Falco Peregrinus) and Eurasian goshawk (Accipiter gentilis) dominate the lower areas. In the coniferous forests we also find numerous forest hens such as: western capercaillie (Tetrao urogallus) and hazel grouse (Bonasa bonasia) in warmer places, and in the meadows: red-winged blackbird (Agelaius phoeniceus) and rock partridge (Alectoris graeca). A total of 114 different species of birds were recorded. So far, over 170 species of trees and shrubs and over 1,000 species of herbaceous plants have been registered in Perućica, many of which are endemic (Balijan, 2017).

The natural tourism potential of this area has been researched in a broader sense, with works that treat the Sutjeska National Park (Hrelja et al., 2020) and the Upper Podrinje mesoregion (Lepirica, 2010). As a result of research of the Perućica primeval forest, in the context of Nature-based tourism, a tourist map was created, which synthetically presents natural tourist resources (Fig. 14.).

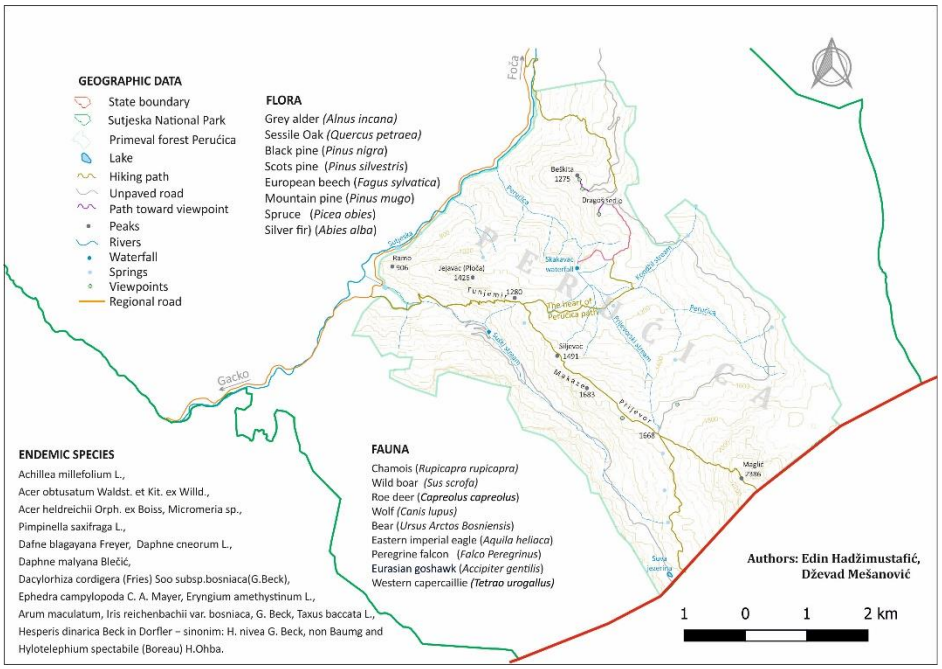

Fig. 14. Touristic map of primeval forest Perućica

Tourism in protected areas brings certain benefits, but also degrading elements. Potential benefits of tourism in the Perućica primeval forest are: employment for the local population, increased income, stimulation and diversification of the local economy, encouragement of local production, contribution to the preservation of natural heritage, support for environmental education of tourists, visitors and local residents, etc. Negative effects are associated with environmental degradation, loss of biodiversity, excessive number of tourist visits, etc. The development of tourism in the Perućica primeval forest implies adapting to the specificities and protection regimes of this area. Tourism must be carefully regulated, in small groups of visitors, primarily interested in scientific and ecological education and recreation. This is achieved by implementing the concept of environmentally friendly tourism, which will not degrade natural resources and which will ensure quality contact between tourists and pristine natural values.

CONCLUSION

Perućica primeval forest, as an integral part of Sutjeska National Park, is a protected area of national interest: scientific, educational and touristic and recreational. The Perućica primeval forest is protected primarily to be visited for scientific and educational purposes. Given that the protected area of Perućica is larger than the primeval forest itself, it is possible to develop different forms of tourism based on natural tourist resources, respecting above all, the uniqueness of the preserved diversity of geological, geomorphological and biological values. It has excellent predispositions for adrenaline tourism (mountaineering, hiking, camping,

bird watching, ecotourism, photo safaris, orienteering, etc.), geotourism, sports-recreational, sustainable tourism, etc.

The Perućica primeval forest is a unique gem of Bosnia and Herzegovina's natural heritage. With its natural beauty and landscapes, it attracts a significant number of tourists and visitors, both from Bosnia and Herzegovina and from abroad. The research results obtained in this paper will bring this unusually attractive area closer to nature lovers, which will have a positive effect on the additional strengthening and development of tourism in the Perućica primeval forest, as well as in Bosnia and Herzegovina.

REFERENCES

1. Balijan, D. (2017). Zemlja planina Bosna i Hercegovina, FMC Svjetlo riječi, Sarajevo.

2. Corine Land Cover (CLC) 2018, Version 2020_20u1; 2020. https://land.copernicus.eu/en/products/corine-land-cover/clc2018, last accessed 2024/2/10

3. Derks, J., Giessen, L., & Winkel, G. (2020). COVID-19-induced visitor boom reveals the importance of forests as critical infrastructure. Forest Policy and Economics, 118, 1–2. https://doi.org/10.1016/j.forpol.2020.102253

4. Donici, D.S., Dumitras, D.E. (2024). Nature-Based Tourism in National and Natural Parks in Europe: A Systematic Review. Forests, 15, 588. https://doi.org/10.3390/f15040588

5. Dudley, N. (Editor) (2008). Guidelines for Applying Protected Area Management Categories. Gland, Switzerland: IUCN. x + 86pp. WITH Stolton, S., P. Shadie and N. Dudley (2013). IUCN WCPA Best Practice Guidance on Recognising Protected Areas and Assigning Management Categories and Governance Types, Best Practice Protected Area Guidelines Series No. 21, Gland, Switzerland: IUCN. xxpp. https://portals.iucn.org/library/sites/library/files/documents/pag-021.pdf

6. EEA (European Environment Agency). Nationally designated areas (CDDA), version 21; 2023. http://www.eea.europa.eu/data-and-maps/data/nationally-designated-areas-national-cdda-10.

7. Ferguson, M. D., Lynch, M. L., Evensen, D., Ferguson, L. A., Barcelona, B., Giles, G., & Leberman, M. (2022). The nature of the pandemic: Exploring the negative impacts of the COVID-19 pandemic upon recreation visitor behaviors and experiences in parks and protected areas. Journal of Outdoor Recreation and Tourism, https://doi.org/10.1016/j.jort.2022.100498

8. Hadžimustafić, E. (2023). Uvod u geografske informacione sisteme. Udruženje geografa u Bosni i Hercegovini, Sarajevo.

9. Hrelja E., Drešković, N., Mirić, R., Čaušević, A. (2020). Adventure tourism in Sutjeska National Park. Journal of Tourism and Hospitality Management, Year 6, Vol. 6, Department of Geography, Faculty of Science, University of Sarajevo, Sarajevo, pp. 59-65. DOI: 10.35666/25662880.2020.6.59

10. Kadušić, A., Smajić, S., Mešanović, Dž. (2018). Turistička geografija - Fizičkogeografske i društvenogeografske osnove turizma, OFF-SET Tuzla i Geografsko društvo Tuzlanskog kantona, Tuzla.

11. Kuenzi, C., McNeely, J. (2008). Nature-Based Tourism. In: Renn, O., Walker, K.D. (eds) Global Risk Governance. International Risk Governance Council Bookseries, vol 1. Springer, Dordrecht. https://doi.org/10.1007/978-1-4020-6799-0_8

12. Mešanović, Dž., Hadžimustafić, E. (2023). Ekonomska geografija, Udruženje geografa u Bosni i Hercegovini, Sarajevo.

13. Lepirica, A. (2009). Reljef geomorfoloških makroregija Bosne i Hercegovine. Zbornik radova Prirodno-matematičkog fakulteta, Svezak Geografija, Godina VI, Broj 6, Univerzitet u Tuzli, PMF. Tuzla. 7-52.

14. Lepirica, A. (2010). Prirodni uslovi i mogućnosti za razvoj turizma u mezoregiji Gornje Podrinje, Zbornik radova Prirodno-matematičkog fakulteta, Svezak Geografija, Godina VII, Broj 7, Univerzitet u Tuzli, PMF. Tuzla. 57-79.

15. OSM, https://www.openstreetmap.org/#map=9/44.608/17.581

16. Stojanović, V. (2011). Turizam i održivi razvoj, Prirodno-matematički fakultet, Departman za geografiju, turizam i hotelijerstvo, Novi Sad.

17. Stupar, V., Milanović, Đ. (2017). Istorijat zaštite prirode na području nacionalnog parka Sutjeska, Glasnik Šumarskog fakulteta Univerziteta u Banjoj Luci, No. 26, 113–128.

18. Topographic map, scale 1:25 000 (Gacko 576 1-4).

19. UNESCO, https://whc.unesco.org/en/tentativelists/6260/

20. USGS, https://earthexplorer.usgs.gov/

21. Valentine, P. S. (1992). Review: nature-based tourism. In: Weiler, Betty, and Hall, Colin Michael, (eds.) Special interst tourism. Belhaven Press, London, Great Britain, pp. 105-127.

22. Žafran, I. (2023). Suvremeni razvoj turizma temeljenog na prirodi – obilježja i aspekti proučavanja. Hrvatski geografski glasnik, 85 (1), 149-180. https://doi.org/10.21861/HGG.2023.85.01.06