

INEFFECTIVE ZONING IN PROTECTED AREAS OF BOSNIA AND HERZEGOVINA – CASE STUDY NP KOZARA

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Abstract

Ineffective zoning in protected areas of Bosnia and Herzegovina – case study NP Kozara

This paper aims to examine inadequate zoning in protected natural areas in Bosnia and Herzegovina, case study - National park Kozara. Protected natural areas are under increasing anthropogenic impact, therefore their adequate zoning is the key to sustainable development. The performed zoning of the Kozara National Park, as well as most of the protected areas in Bosnia and Herzegovina, is inadequate and it is mainly established in order to exploit natural resources. As a confirmation of the above, it indicates that the zone III of protection level, where traditional economic activities are permitted, the construction of housing and tourist infrastructure, occupy a significant part in protected areas. General and specific geographical methods and techniques of research are used in this paper. The main focus is GIS method because throughout which is established significant database and maps of inadequate protection zones in the parks.

Key words

NP Kozara, Bosnia and Herzegovina, protected areas, zoning, ineffective.

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1. Introduction

National Park Kozara is proclaimed as protected area in 1967 and it is one of the four national parks in Bosnia and Herzegovina. Kozara Mountain (National Park) is located in the northwestern part of Bosnia and Herzegovina. It is a low, island mountain located between the Pannonian plain in the north and the south of the Dinarides, and bordered by the rivers Sava, Una and Vrbas. This area characterized by rare natural geographic elements, which make it unique enough to get a status national park.

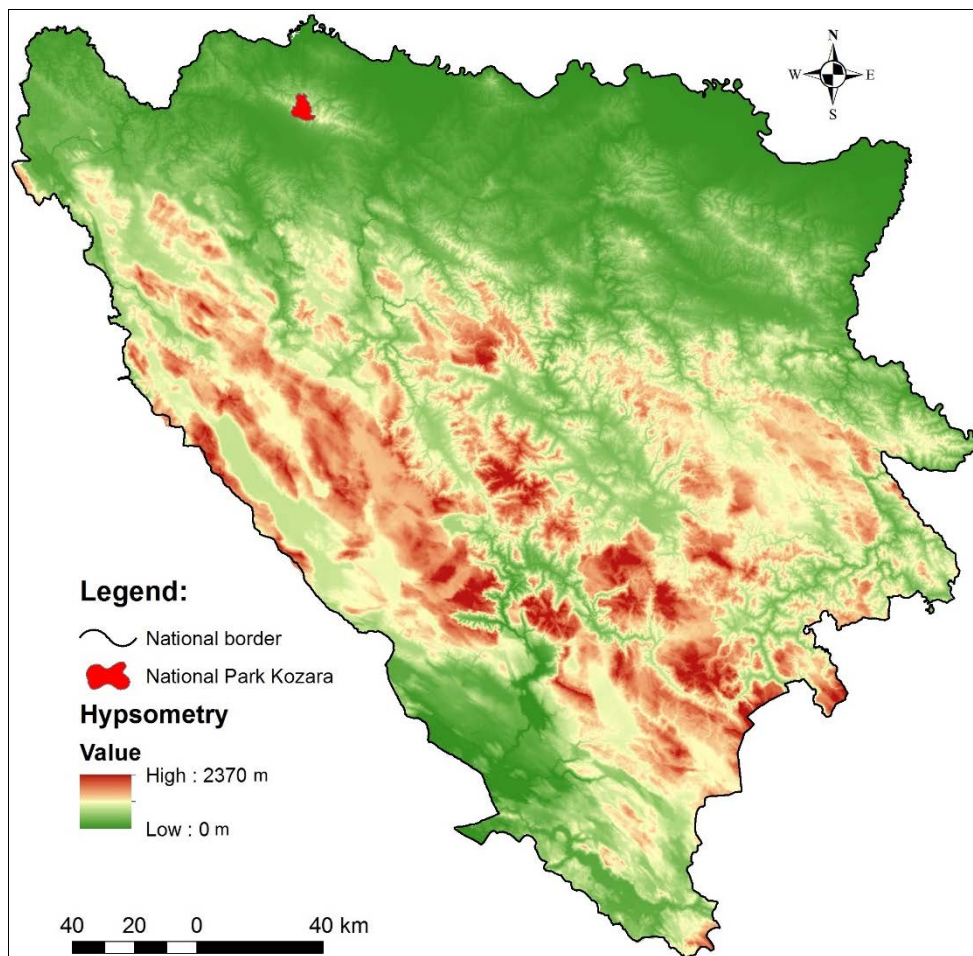


Fig. 1: Location of National Park Una.
Source: Authors.

Physical geographic uniqueness of studied area is emphasized through component geocological, geomorphological, climate, hydrological and biogeographical elements, all of which makes this National Park an area of complex landscape diversity. Beside natural components, this area also have rich cultural and historical heritage, which contributes to attractiveness in the context of tourism development (Hrelja 2017).

Natural values in the National Park are protected by the law on nature protection, while the areas of cultural significance are regulated in accordance with law provisions about cultural heritage. According to the Law on National Perk Kozara, territory of 3.907,54 ha in total size is divided into three different zones - nucleus zone or zone of protection of the basic phenomenon, active protection zone and zone of use.

2. Protected Natural Areas in Bosnia and Herzegovina

On the territory of Bosnia and Herzegovina, the first officially protected area was established in June 1954 in the southwestern part of the country in the Perućica stream. After that, in August 1954, the National Institute for the Protection of Cultural Monuments and Natural Rarities of the Republic of Bosnia and Herzegovina, protected Prokoško Lake on the mountain Vranica as a natural rarity (The Law on the Protection of Cultural Monuments from 1947). A few years later, in 1962, the first national park of Sutjeska in Bosnia and Herzegovina was established. Perućica was the nucleus of the protection of this park.

By the establishment of laws at the national level in 1964, categories of protection have been defined: a strict nature reserve, a nature reserve, a national park, special reserves, a protected natural landscape, a monument of nature, plant species, protected species, birdwatchers, wetlands, birds of prey. Protected areas in Bosnia and Herzegovina were established and declared in accordance with the defined legal provisions, where the national parks, Sutjeska and then Kozara in 1967 were first allocated as protected areas.

Until 1990, in accordance with the Law on Nature Protection and the Law on the Protection of Cultural, Historical and Natural Heritage, only 0.55% of the territory of Bosnia and Herzegovina was protected. According to the Spatial Plan of Bosnia and Herzegovina for the period of 1981-2000, it is planned that by the year of 2000, around 8,300 km² which is 16.2% of the total area of the country will be placed under different regimes and levels of protection.

The modern concept of protection in Bosnia and Herzegovina is in line with IUCN (International Union Conservation Nature). Based on the IUCN categorization six categories of natural areas have been identified in Bosnia and Herzegovina, within 29 areas are protected, of which 2 are strict nature reserves (category Ia), 4 national parks (category II), 16 nature monuments (category III), 5 nature parks - protected landscapes (category V) and 2 areas for resource management - park forest (category VI) on a total area of 127,557.4 hectares.

In addition to previously mentioned concept of protection, three Ramsar areas have been established in Bosnia and Herzegovina: Hutovo blato, Bardača and Livanjsko polje with total area of 0,6 km². In accordance with the European Directive for the Establishment of the European Ecological Network, the process of establishing NATURA 2000 has been initiated in Bosnia and Herzegovina, where all the most significant natural habitats have been identified, listed and mapped.

In addition, there are a large number of highly valuable natural areas on the territory of Bosnia and Herzegovina, which are planned for future protection, for the planning documents of entity, cantonal and municipal level. Analyzing the planning documentation at the entity level, it is planned to protect about 17% of the total area

in the Federation of Bosnia and Herzegovina, about 15.5% of the total area in the Republic of Srpska, which is 16% of the total country territory.

Tab. 1: Protected natural areas in Bosnia and Herzegovina.

	Name	Entity	IUCN categorization	Area in hectares
A Strict Nature Reserve				
1	SNR Prašuma Janj	RS	I a	295,00
2.	SNR Prašuma Lom	RS	I a	297,82
Special Nature Reserve				
1.	SNR Gromiželj	RS	I b	831,33
2.	SNR Lisina	RS	I b	560,64
National Park				
1.	NP Kozara	RS	II	3.907,54
2.	NP Sutjeska	RS	II	16.052,34
3.	NP Una	FBiH	II	19.800,00 + 14970,21
4.	NP Drina	RS	II	6315,32
Monument of Nature				
1.	MN Pećina Orlovača	RS	III	27,01
2.	MN Pećina Ljubačevo	RS	III	45,45
3.	MN Žuta bukva	RS	III	0,50
4.	MN Pećina Rastuša	RS	III	11,39
5.	MN Prokoško jezero	FBiH	III	2.119,00
6.	MN Skakavac	FBiH	III	1.430,70
7.	MN Tajan	FBiH	III	3.591,98
8.	MN Vrelo Bosne	FBiH	III	603,00
9.	MN Jama Ledana	RS	III	28,26
10.	MN Vaganska pećina	RS	III	12,00
11.	MN Pećina Đatlo	RS	III	43,42
12.	MN Pavlova pećina	RS	III	13,40
13.	MN Girska pećina	RS	III	25,37
14.	MN Pećina pod lipom	RS	III	6,10
15.	MN Pećina Ledenjača	RS	III	7,40
16.	MN Velika pećina	RS	III	820,92
Nature Park - Protected landscape				
1.	NP Blidinje	FBiH	V	35.800,00
2.	NP Hutovo blato	FBiH	V	11.093,98
3.	NP Konjuh	FBiH	V	8.016,61
4.	NP Bijambare	FBiH	V	367,36
5.	NP Trebević	FBiH	V	400,20
Resource Management Area				
1.	RMA Univerzitetski grad	RS	VI	27,38
2.	RMA Slatina	RS	VI	35,73
Total protected areas at the RS level				29.364,32
Total protected areas at the FBiH level				98.193,04
Total protected areas at the level of Bosnia and Herzegovina				127.557,4

Source: Authors.

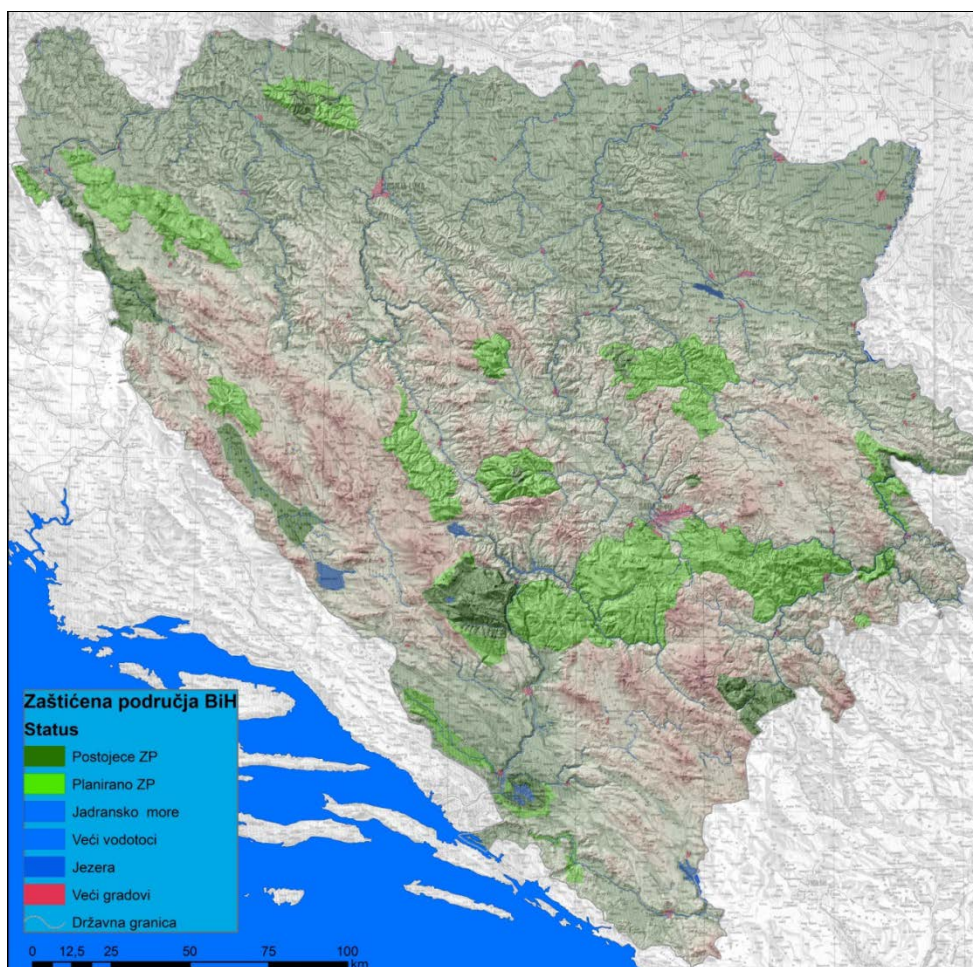


Fig. 2: Protected natural areas of Bosnia and Herzegovina.
Source: Authors.

2. Causes and Consequences of Inadequate Zoning in Protected Natural Areas - Case Study NP Kozara

There is still no defined strategy for the establishment and management of protected natural areas at the state level in Bosnia and Herzegovina. Considering recent political and administrative arrangements in Bosnia and Herzegovina, spatial planning, planning documents and environmental management have been reduced to the entity, cantonal and municipal levels. Spatial planning (separation of protection zones) and environmental management is regulated by laws, as well as a number of regulations at the level of the Federation of Bosnia and Herzegovina, the Republika Srpska and the District of Brčko. Jurisdiction is transferred from the entity to the cantonal and municipal levels in the Federation of Bosnia and Herzegovina and at the municipal level in the Republic of Srpska. In the complex management structure, each of the cantons has competent ministries and their respective laws on spatial planning and environmental protection, and for each municipality there are specific decisions on spatial planning and protection of the environment. Municipalities in both entities

usually perform their responsibilities over environmental protection through various departments within municipalities such as utilities, spatial planning, urban planning, development, inspections, etc.

The first set of legal documents in the field of environmental protection were adopted at the entity level in 2003. There are a large number of laws and by-laws on environmental management at the state, entity and cantonal levels. However, the existing legislation is often not harmonized vertically (there are many gaps between laws at the state, entity and cantonal level), and even less horizontally (the environmental legislation differs at the entity level), which contributes to many disadvantages to sustainable environmental management. The largest number of protected nature areas in Bosnia and Herzegovina have been established on the basis of the categorization of the International Union for Nature Conservation (IUCN), whose principles are based on entity laws. Currently, the zoning of protected natural areas is inadequate and is mainly established in order to exploit natural resources, but not by law (Đug et al 2007).

In all protected areas in Bosnia and Herzegovina, only three management zones are separated: nucleus zone or zone of protection of the basic phenomenon, active protection zone and zone of use. The separation of the strict protection zone aims to preserve the fundamental phenomena of such areas. Activities that can be performed in the zone of strict protection are scientific research, monitoring of the protection, and interventions in extraordinary circumstances.

The zone of active protection includes areas of great value for which the conservation is permitted to carry out activities of maintenance, revitalization or creation of natural values important for nature conservation. The allowed activities are focused on area surveillance, scientific research, habitat monitoring, and restricted and tracked access to visitors on restricted and marked tourist routes. The use area includes areas of lower preservation value or areas where a certain degree of use is traditionally present and is mainly managed for some other purposes significant for the development and functions of a protected natural area. In this zone there are settlements, areas of traditional agriculture, infrastructure corridors and areas for recreation and tourism.

As a confirmation that the performed zoning of protected natural areas is inadequate and is mainly established in order to exploit natural resources, it indicates that the zones of use or the third zone of protection, in which traditional economic activities are permitted, the construction of residential and tourist infrastructure, occupy significant areas in the Parks.

Thus, a case study found that 80% of the total area of NP Kozara belongs to III protection zone or zone of use. The Law on the Protected Area and Spatial Plan have enabled the exploitation and usurping of natural assets on the significant surface of the protected area (Hrelja 2017).

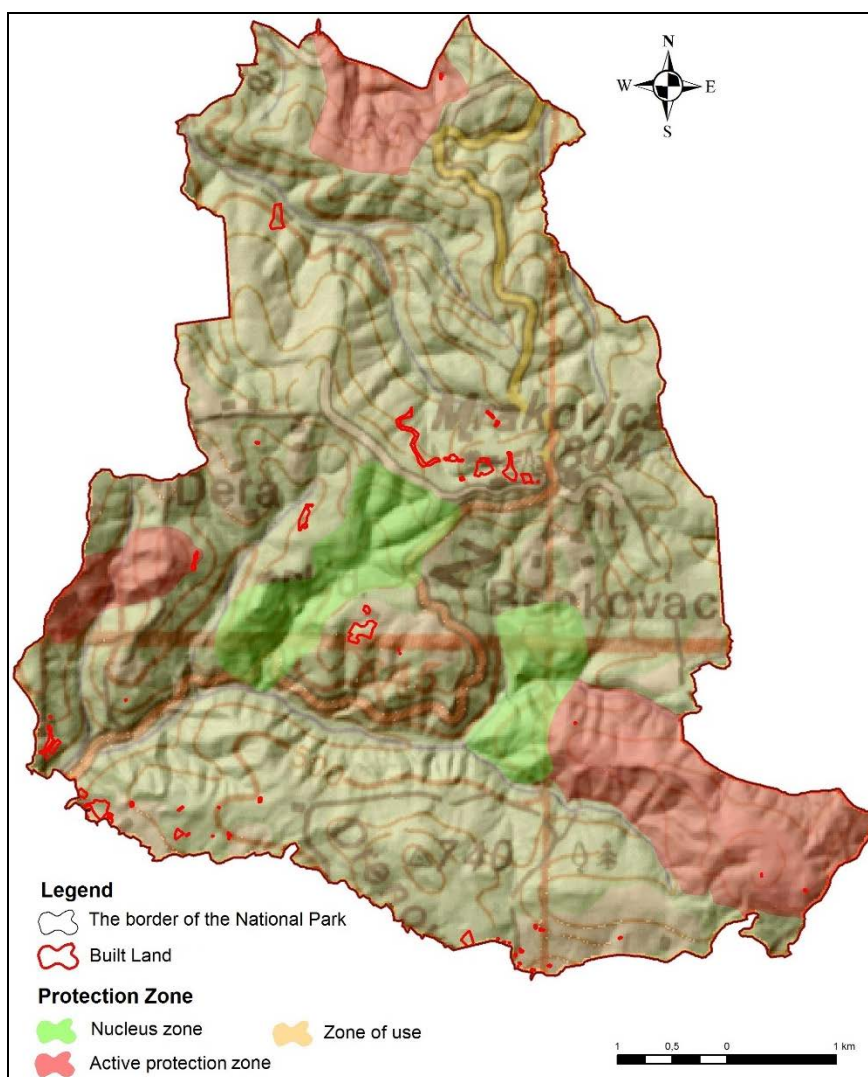


Fig. 3: NP Kozara – selected zone of protection.

Source: Hrelja, 2017.

As a result of inadequate zoning of protected natural areas in Bosnia and Herzegovina, there is a significant number of settlements with permanent population, which through the function of work (agriculture, forestry, extractive industry) and housing (construction of residential and auxiliary facilities or infrastructure) is inevitably reflected in the environment. The survey found that in the area of national parks and nature parks in Bosnia and Herzegovina, according to the last census in 2013, there were 35 permanent settlements with 7,789 inhabitants. In addition to direct and indirect - more or less seasonal - impact of tourism, the space and environment of the parks is, to a considerable extent, burdened with the existential functions of their permanent population (Hrelja 2017).

Functional diversification of protected natural areas (function of free time) is the results of inadequate zoning. Considering this, significant area of space is spent on construction of cottages and accompanying infrastructure, and the construction of recreational and other tourist facilities. Also, in such areas, significant consumption and illegal use of natural goods is reflected through: collection and harvesting of plants, hunting and collected land animals, non-selective felling of forests, exploitation of mineral resources.

Analysis, where the vegetation cover structure was used as an indicator (the relationship between natural vegetation cover and anthropogenic surfaces) it has been found that there was a change in plant cover (reduction of plant communities). Natural vegetation in the period from 1979 to 2012 it was reduced in the total area from 6.7% (Fig. 4).

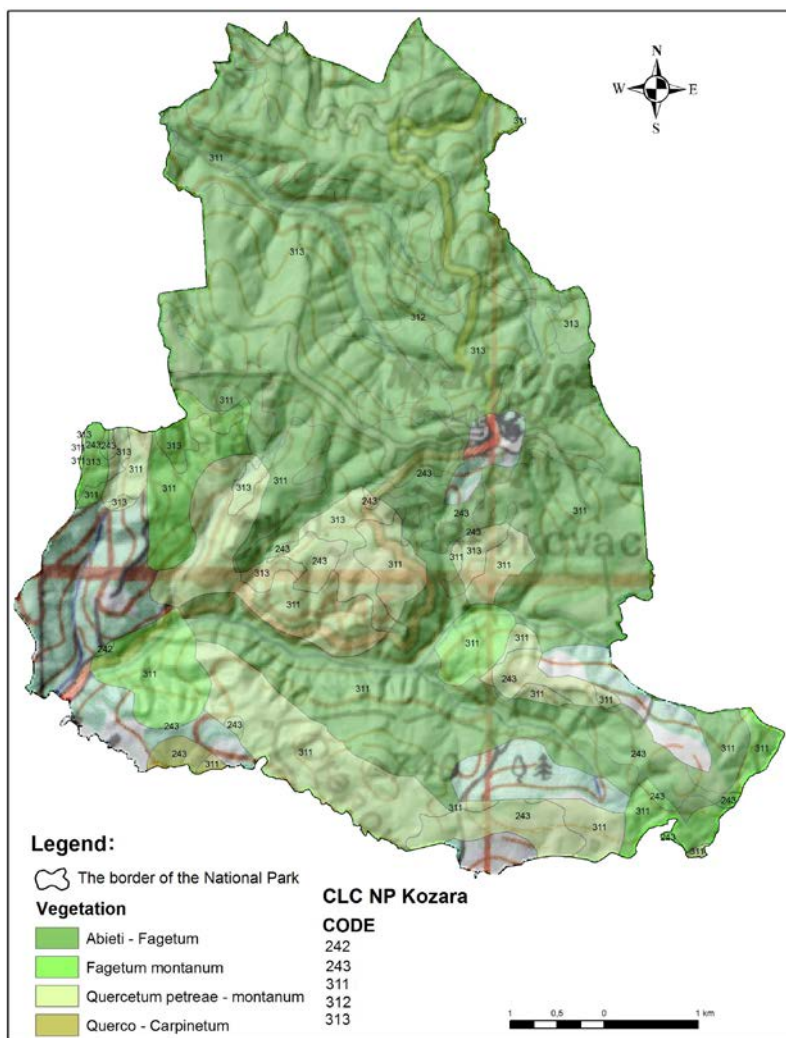


Fig. 4: Degree of degradation of natural vegetation in Kozara National Park. Source: Hrelja, 2017.

As the main factors that have affected the changes in the natural environment the non-selective harvesting of forest resources and agriculture is allocated, which is the result of inadequate zoning in the National Park.

3. Conclusion

Based on the conducted research, it can be concluded that the development of protected natural areas, based on inadequately separated zones, is unsustainable. It results in the expansion of areas for economic activities and building valuation, at the expense of protecting the underlying natural phenomena in protected areas.

Zoning in protected areas in Bosnia and Herzegovina is inadequate and has been done on the basis of earlier use of space without adequate analysis of environmental, social and economic indicators. Also, zoning was carried out only within protected natural areas, without using spatially oriented zoning models to a wider area of influence, or without integrating protected areas with the environment.

The analysis shows significant differences on the level of vulnerability of ecosystems in protected natural areas of Bosnia and Herzegovina. They are function of differences in accommodation and geographical position, especially traffic availability and the vicinity of urban agglomerations as emitting centers of some national parks and nature parks, but also their recent political and territorial affiliation.

Therefore, in order to improve the concept of protection it is necessary to establish the management and zoning of protected natural areas in accordance with the principles of the International Union for Nature Conservation (IUCN), which would include the cooperation of all (interestingly different) stakeholders in the evaluation of the area.

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Summary

The aim of the research is to identify inadequate zoning in the protected natural areas in Bosnia and Herzegovina, with a special focus on the area of Kozara National Park. Protected natural areas are increasingly anthropogenically-influenced, which makes the adequate zoning a key to creating sustainable development. The first officially protected area in Bosnia and Herzegovina was established in 1954, while the first national park (Sutjeska) was distinguished in 1962. A few years later, Kozara National Park was declared a protected area and is one of four national parks in Bosnia and Herzegovina. The distinguished area is characterized by rare natural-geographical and socio-geographical elements that make it unique enough to obtain a status of a national park. The contemporary conservation concept in Bosnia and Herzegovina is in line with the IUCN (International Union for Conservation of Nature). Based on the IUCN categorization, six categories of natural areas have been identified in Bosnia and Herzegovina, within which 29 areas are protected over a total area of 127,557.4 hectares. According to the Kozara National Park Act, the territory of 3,907.54 ha is divided into three different zones - the nucleus zone, the active protection zone and the zone of use. However, the zoning of Kozara National Park, as well as most of the protected areas in Bosnia and Herzegovina, was established in order to exploit natural resources. In support of this statement is the fact that the zone of protection level III, in which traditional economic activities, the construction of residential and tourist infrastructure, are allowed, occupies most of the area in protected areas. Thus, the research found that 80% of the Kozara National Park area is in the III protection zone. With inadequate zoning, a significant part of the area is changed by the construction of residential infrastructure, the development of forestry, agriculture and tourism. Studies have identified the negative effects of inadequate management, which are reflected in the reduction of natural vegetation by 6.7% of the total area in the last thirty years. If a protected natural area is to be managed sustainably, the imperative is to resonate the area with the aim of protecting it, which is why the area was designated as such. The contemporary conservation concept in Bosnia and Herzegovina is in line with the IUCN (International Union for Conservation of Nature). Based on the IUCN categorization, six categories of natural areas have been identified in Bosnia and Herzegovina, within 29 areas are protected, of which 2 are strict nature reserves (category Ia), 4 national parks (category II), 16 nature monuments (category III), 5 Nature Parks - Protected Landscapes (Category V) and 2 Protected Area with sustainable use of natural resources - Forest Park (Category VI) over a total area of 127,557.4 acres.

