

thij

Tourism and **H**ospitality
International **J**ournal



III Jornadas Científicas Internacionais de **Turismo_ISCE 2014:**

Produtos, Mercados
e Destinos Turísticos

www.isce-turismo.com

Organização:



Departamento
Turismo@ISCE

Apoios:

Travelport 



Volume 3 | Número 3 | Novembro 2014
Volume 3 | Number 3 | November 2014
Volume 3 | Número 3 | Novembro 2014

Carrying capacity and spatial plan as a condition for sustainability: The National Park Tara

259

Brankica Todorovic

School of Economics, Uzice, Serbia

Todorovic, B. (2014). Carrying capacity and spatial plan as a condition for sustainability: The National Park Tara. *Tourism and Hospitality International Journal*, 3(3), 259-272.

A opção de escrita pelo acordo ortográfico é da responsabilidade dos autores.

Abstract

The national parks around the world are under the special protection regime which is being implemented in accordance with the legislation in this area. The National Park Tara is an area of special purpose and conditions of the Republic of Serbia. This national park has the potential of regional and international importance which gives it a leading role in the development of Republic of Serbia. The key issue of sustainability is reflected in the definition of the conditions for the sustainable development of resources and natural resources as well as the conditions for the controlled use of natural resources which requires checking of border facilities for specific purposes and functions. Analysis in this paper is aimed at testing the existence of a conflict between divergent goals: tourism development and sustainable development. Rating tourism development is given based on the movement of tourist traffic, construction of accommodation facilities and quality of the tourism offer. Assessment of sustainable development is given based on the analysis of legal documents that protect biodiversity and allow the development of tourism. The goal of the analysis is to point out the possibility of tourism development in line with the carrying capacity of the territory with respect to spatial constraints leading to sustainable development.

Keywords: Carrying capacity, Spatial plan, The National Park

1. Introduction

Areas that have a strong geological, biological, ecosystem and/or landscape diversity can be declared as protected areas of common interest.

In the regime of protected areas in Serbia following forms are classified: national parks, strict nature reserves, special nature reserves, natural monuments, protected habitats, landscapes of exceptional quality and nature parks.

National parks are areas with a large number of diverse ecosystems of national significance that have specific landscape features and cultural heritage of the area which people can live in harmony with nature.

The National park Tara (NP Tara) is one of five national parks in Serbia that covers most of the mountain of Tara which is located in the far west Serbia. Tara was declared a national park because it is among the most wooded mountains of Europe (75%) but also because of the large number of relict and endemic plant and animal species to have her natural habitat.

Natural resources are degraded due to economic activity and pollution. Therefore, a decrease in reserves of non-renewable resources must take more account of the expenditure of natural capital in the park.

Concept development and establishment of a database for strategic planning for sustainable development in the future, carrying capacity and spatial plan can be a function of biodiversity

conservation in NP Tara. In this way it will not restrict tourism development which in addition to the qualitative and quantitative characteristics should be sustainable.

2. Tourism Development in Accordance with the Carrying Capacity

Carrying capacity is the maximum number of visitors an area could accommodate without there being excessive deterioration of the environment or declining visitor satisfaction (Hovinen, 1982).

The World Tourism Organization (WTO, 1992) defines carrying capacity as being:

fundamental to environmental protection and sustainable development. It refers to maximum use of any site without causing negative effects on the resources reducing visitor satisfaction or exerting adverse impact upon the society, economy and culture of the area. Carrying capacity limits can sometimes be difficult to quantify, but they are essential to planning for tourism and recreation.

The World Tourism Organization in 1983 defined guidelines are expressed in terms of visitors per day and per hectare. These guidelines are as follows forest parks: up to 1,5 visitors per day and per hectare; natural suburban parks: 15-70 visitors; high-density picnic areas: 300-600; low-density picnic areas: 60-200;

sports/team sports: 100-200 and golf: 10-15.

Carrying capacity is the maximum number of people who can use a site without an unacceptable alteration in the physical environment and without an unacceptable decline in the quality of the experience gained by the visitors (Mathieson & Wall, 1982).

According to O'Reilly (1986) and Farrell (1992), there are at least four different dimensions of carrying capacity. The four types of capacity are:

- economic carrying capacity-the extent of the dependency of the economy upon tourism,
- psychological carrying capacity-the expressed level of visitor satisfaction associated with the destination,
- environmental carrying capacity-the extent and degree of impact of tourism upon the physical environment and
- social carrying capacity-the reaction of the local community to tourism.

The four carrying capacities are not independent of each other, but it may be possible to exceed the threshold limit of one capacity for a limited amount of time without there being necessarily a detrimental effect upon another type of capacity.

Holden (2000) asserts that the impacts of tourism in an area can be analyzed in terms of three major components forming the TCC dimensions including: physical-ecological, socio-demographic and political-economic (Kovacic, 2007; Geneletti & Duren, 2008).

Physical carrying capacity is the maximum number of tourists that can be accommodated physically. Physical carrying capacity is the limit of a site beyond which environmental problems will arise.

All types of carrying capacities are interrelated. Economic carrying capacity is in an interdependent relationship with physical carrying capacity and can be determined based on it. Measuring these may not only be a subjective exercise, it can also prove extremely difficult due to the degree of interdependency among them.

2.1. Tourism Traffic as an Indicator of Development

Organized tourism in the mountain of Tara is 101 years and is connected to the writer Milovan Glisic who is recovering. The first one who noticed and proved natural features of Tara was a scientist Joseph Pancic from 1875.

Getting organized in tourism at Tara is tied to a monk Zechariah Milekic who built the first accommodation facilities at Tara which is called the apartment (between the two world wars).

The development of tourism in Tara role played a famous businessman in Serbia at the beginning of the 20th century an engineer Milos Savcic. It is on behalf of Transport Bank to Tara built the first lift and the first forest railway for timber exploitation. This system started working in 1908.

The construction of the railway Uzice-Visegrad 1925 Tara became more attractive tourist resorts. The first state institution for the development of tourism issued by the Ministry of Public Health in 1928.

The first dedicated facility for the development of tourism was the coach home in Raca Sljivovica 1956. It is made of wood and the mountain style.

In 1966 in Tara registered 2.299 tourists who made 12.796 overnight stays and 40 foreign tourists with 63 nights.

In the seventies of the 20 th century there was an increased building weekend houses and hotel facilities. In 1966 so in 1975 the turnover of tourists and overnight stays at Tara show a significant increase. Faster economic growth contributes to the construction of Hydropower plants "Bajina Basta". The number of inhabitants in Perucac growing between in 1971 and 1981 and the number of households involved in tourism which orients the development of tourism in addition to Tara and the valley of the Drina River.

Military Institution (MI) Tara was established of 7th of July in 1977 and in 1979 the construction of Child resorts Mitrovac. In addition to hotel services, MI has long been engaged in agricultural production and the military economy sinkhole and was especially known for the production of seed potatoes.

Since 1981 tourism Tara is developed in accordance with the rules of the management and development of the National Park which was declared 13 July in 1981. The main activity of the park, in

addition to basic, relating to the protection and preservation of natural value is forestry. National Park is the raw material wood base for a dozen mini plant timber industry. In addition to forestry, permitted a planned hunting, fishing and tourism. Data on tourist traffic from 1981 to 2010 are given in Table 1.

Events in the former Yugoslavia during the 90's of the 20th century lead to reduced tourist traffic. Between 1990 and 2010 there were no major shifts in tourist traffic. Greater increase in tourist arrivals and overnight stays in 1998 may be due to some improvements in living standards.

Insignificant number of foreign tourists and overnight stays consequence of the unstable socio-political situation in our country, as well as, to the tourist offer of Tara is not well represented on the tourist market.

Since 2007¹, there is a tendency of increase in arrivals of domestic tourists whose number is higher than in 1981. The only year in which the tourist traffic increased compared to 1981 in 1998.

2.1.1. Characteristics of Tourists who Visit the National Park Tara

Promulgation Tara of national park influenced the specification of tourism demand. Tara is gradually shifting from mass tourism destinations in sustainable tourism destination visited by

¹ About tendencies of tourist traffic of Tara see Todorovic, B. (2012). Comparative analysis of tourist traffic Zlatibor and Tara, p. 439-446.

environmentally conscientious tourists who prefer individual experience.

Some characteristics of the tourist traffic of Tara are²:

- In the period from 2000 to 2013, the largest number of tourists visited Tara in May. In addition to May, visited the moon is October, which means that the primary reason for the visit Tara is not mountain tourism.
- The average length of stay at Tara is 5 days. The average length of stay of domestic tourists was 5,3 days. The average length of stay of foreign tourists was 1,2 days. Foreign tourists staying longer than 1991 (5 days).
- From 2010 to increase the length of stay of foreign tourists to 3 days. In recent years an increasing number of foreign tourists in the hotels "Spruce" and "White Pine". Foreign tourists in hotels VU "Tara" staying on average 2,5 days and 3,5 days domestic tourists. Members of the Ministry of Defense and the Serbian Armed Forces, on average, spend about 5 days.
- Health reasons, prices, clean air and unspoiled nature as the main reasons why the area by the lake.
- The main drawbacks are the lack of trash cans, shops and facilities for children. As the problem is stress

and poor roads and approach roads and infrastructure generally. There are also complaints about the accommodation (aging) and the brightness.

- Opening of the National Ecological Centre at Zboriste, the highest peak of Tara, 2011 year, intended for the organization of educational and promotional programs of seminars and workshops related to *environmental protection* and "The Magic Mountain" hotel creates the opportunity to visit and educate both domestic and foreign tourists.

2.2. Carrying Capacity of NP Tara

During more than 70 years since the construction of the first building to accommodate tourists, the material basis of tourism on Tara is still adapted to the concept of mass tourism (school trips, vacationers, travelers in transit) and the average age of the buildings is 34 years old with dilapidated infrastructure.

In the last decade of the 20th century, there was a significant violation by the number and quality of the properties, which was created as a result of reduced investment and a modest tourist traffic to these facilities.

The characteristics of the load-bearing capacity of Tara are: Storage capacities has 1.526 beds (Spruce hotel 370, Hotel White Pine 230, Maple Annex 50, Child resort 560 and farm 316). Utilization of accommodation facilities VU Tara in the last ten years is approximately 38%. The

² The presented results are part of the statistical analysis for the reported doctoral dissertation, "The role of mountain destinations in the tourism development of the Zlatibor District," Todorovic, B.

largest accommodation capacity utilization was achieved in 1990 (83%).

In the structure of guests within the VU Tara dominate the Republic of Serbia citizens (85%), members of the Ministry of Defense and the Serbian Armed Forces and their families (10%) and foreign guests (5%).

Hotels Spruce, White Pine and Maple Annex are part of VU Tara. Since 2001, when the implementation of the Law on Privatization of the territory of the Republic of Serbia, military assets are not alienated, but it is not invested in the modernization and equipment facilities. Therefore, at Tara appears insufficient accommodation facilities, none of which 4 or 5 stars.

Carrying capacity NP "Tara" around 146.000 tourists per year (National Parks 1 or 2 visitors per hectare per day, Farrell 1992). However, over the years the most popular (in 1988 and 1989). stayed at Tara around 72.000 tourists and early 21 century about 45.000 tourists. The years with the largest attendance with about 50% utilization of accommodation facilities which indicates a relatively small number of tourists and less chance of damaging the environment. On Mitrovac and Kaluderske Bare in which resides the bulk of tourists and day visitors concentration of tourists is much higher and can range to 30 to 50 per acre which causes a lot of negative consequences.

3. Spatial Plan as a Function of Biodiversity Conservation and Sustainable Development

The beginnings of nature protection in the area that today cover NP "Tara" dating back to the 19th century. The first written document found in the first basis for forest management unit Star. On this basis the forests on the canyon side of the mountain stars, according to the Drina river and creek bilberry determine the protective forests in prohibiting and planned utilization. In the 20th century made the decision on the protection of individual sites and the area of Tara was declared a National park in 1981 "The Law on the National Park Tara" ("RS Official Gazette" no. 41/81).

3.1. The Need of Sustainable Development of NP Tara

Sustainability NP Tara is conditioned by the need of preserving biodiversity. Ecosystem, species and genetic diversity classified Tara in areas of great importance to the protection of biodiversity.

Different forest ecosystems cover more than 75 % of the total territory of Tara mountain. Serbian spruce (*Picea spruce*) is known as the "queen of all endemics of Europe". All forests in which it occurs spruce on Tara mountain area protected as a unique habitat and presentation of rigorous scientific nature reserves.

The area is characterized by the existence of a unique forests of beech, fir

and spruce (Picea-Abieti-Fategum). Previous research on Tara has found over 1000 vascular plant species of which 66 endemic species. Determined by the number of bird species to date is 135 species and over 40 species of mammals, 10 species of amphibians, and nine species of reptiles. Of special value are the salmonid species characteristic of highland aquatic ecosystems: brown trout (*Salmo trutta* L.) and shoot (*Hucho* L.). In the area of Tara was noted 115 species of butterflies and 23 species are listed in the Red book of butterflies Serbia.

Tara area is recognized as an internationally important area for:

- 1) Tara wider area has been identified as an area of significant plant (Important Plant Areas-IPA);
- 2) TARA IBA, IBA CODE: IBA026SRB recognized as an important bird area (Important Bird Areas-IBA). IBA encompasses the wider environment of Tara;
- 3) The area of the National Park Tara is a selected area for butterflies in Serbia (Prime Butterflies Areas in Serbia-PBA).

Bearing in mind the importance of preserving biodiversity in the area of the mountain Tara, there is a need zoning protect with the prescribed activities and striving to develop tourism in the intended area and space and according to the load-bearing capacity.

3.2. Characteristics of Spatial Planning

Spatial plan of special purpose "Tara" is a space that contains the values of the republic, regional and other significance. The values of republican significance are: Tara National Park, Nature Park "Sargan-Mokra Gora" area of exceptional importance "Zaovine" and part of the Nature Park Zlatibor.

The protection and development of the planning area are (Spatial Plan of Special Purpose "National Park Tara", 2010):

- protection of natural resources and cultural heritage while respecting the demands arising from the functions of special purpose
- establishing zones of special purpose
- creating conditions for sustainable development of resources
- determine the conditions and modes of construction, development and use of the area in protected areas for complementary activities
- revitalization, improvement and further development of rural areas and their involvement in activities related to the primary purpose of protected areas
- creating conditions for the controlled use of natural resources, which is requesting to check the capacity limit for a particular purpose and functions and
- mutual alignment concept planning solutions in protected areas and concepts of planning decisions maintenance and improvement of

water use, water quality protection and protection from the harmful effects of water.

The main modes of protected areas are:

1. I level, the highest, involves the most stringent protection of natural, cultural and historical values, as well as elements of the natural environment of strict protection,
2. II level implies a lower level of immediate, interim protection around the area in the first instance, the protection of particularly valuable whole environment,
3. III level, the lowest level, involves selective use of limited natural resources and controlled interventions and activities in the area including *tourism development functions* of recreation and sports, water, clean energy, renewable energy and transportation;
4. regulates forestry and animal husbandry, *fully functions of tourism*, recreation and sport, water, clean energy, renewable energy and transportation.

In line with the defined levels of protection are defined and permitted activities in protected areas (Table 2).

New legal procedure provides two protection zones within the degree of protection:

Ia-degree strict protection, which is being conducted on the part of the protected area with the original, unmodified or slightly modified ecosystems of great scientific and practical

importance which allows only natural succession and

Ib degree-strict protection with the ability to manage populations to preserve in order to improve the current state of the ecosystem.

Protection regime II level protection is implemented on the part of the protected area with partially altered ecosystems of great scientific and practical importance. Mode III level of protection is defined as in previous legal proceedings but they were specifically enumerated types of activities in accordance with the principles of sustainable tourism development.

Zone and extent of cover 2948.75 ha, 15,37% of the total area of the National Park, and to the protected area of nature, natural resources and cultural assets: ten nature reserves and natural curiosities (Table 3).

From plants, scarcity of natural character of particular importance for the national park with Serbian spruce (*Picea spruce* Punch), Holly and holly (*Ilex aquifolium* L), Bear hazel (*Corylus colurna* L), Jeremicak (*Daphne blagayana* Frey), Peony (*Paeonia Corralina* Retz), Yew (*Taxus baccata* L), Big blue gentian (*Gentiana acaulis* var. *dinarica* Beck), Yellow gentian (*Gentiana lutea* L), Black hellebore (*Veratrum nigrum*) and others.

Regional Plan and safeguards to protect all habitats Serbian spruce along the plot on which they are located.

Character of natural rarities, protected by law are among others: the peregrine falcon (*Falco peregrinus* Sharp), Honey Buzzard (*Pernis apivorus* L), Short-toed

Eagle (*Circaetus gallicus* GM), Golden eagle (*Aquila shrysaetos* L), Eagle Owl (*Bubo bubo* L), Tawny Owl (*Strix aluco* L).

Significantly the presence of the whole series of rare (in parts of Europe already extinct), sparse or in scientific terms important species (chamois, bear, alpine shrew, live-lizard, et al.).

The second level of protection includes 7732,29 ha, or 40,33 % of the total area of the National Park and is an area of natural reserves, natural monuments that make up the landscape background to the values of the first mode of protection. This includes protecting forests, seed facilities, park forest, experimental fields, springs and streams and springs of water, hunting-breeding and hunting-research reserves (bear, deer and chamois) and cultural-historical sites Sedaljka and Rastiste and wider area around Raca Monastery.

Zone III level of protection cover 8493,86 ha, 44,30 % of the total area of the National Park which there are state forest outside of first and second degree, agricultural land (1,300 ha) and building area tourist centers: Kaluderske Bare, Mitrovac, Oslusa, weekend zone villages and hamlets Solutusa.

4. Conclusion

There is a conflict between two different interests in the national parks related to environmental protection and tourism development. Intensification of tourist activity increases and the pressure that it creates a protected area. The

importance of tourism carrying capacity, as well as the control concept based on the principles of sustainability, is that it greatly contributes to the improvement of tourism development and nature conservation activities in protected areas.

This paper analyses the six protection of the National Park Tara in Serbia in terms of defining the zones that define permissible activities and supporting tourist facilities.

Tourism development is carried out according to the spatial plan for the area of the protection regime III.

An example of this national park shows the importance of spatial planning that aligns the requirements of contemporary space, ecology and sustainability as well as process monitoring and visitor management and biodiversity.

In the example of NP Tara is observed stagnation of tourism development that has not reached the bearing capacity of the area in the third zone of protection. It can therefore be optimally plan the sustainable development of tourism as well as the entire area.

References

- Agenda 21 (1999). Programme for Action for Sustainable Development
- Geneletti, D. & Duren, I. V. (2008). Protected areas zoning for conservation and use: A combination of spatial multicriteria and multiobjective evaluation. *Landscape and Urban Planning*, 85, 97-110.

- Holden, A. (2000). *Environment and tourism*. London and New York: Routledge.
- Jennings, G. (2001). *Tourism research*. Milton: Wiley.
- Kovacic, M., Dundovic, C. & Boskovic, D. (2007). Natural tourism development through integrated planning. *Pomorstvo* (1), 195-196.
- Law on Environmental Protection, ("Official Gazette of RS", no.66/91 and 36/09).
- Law on National Parks ("Official Gazette of RS", no.39/93 and 44/93, 53/93, 67/93, 48/94 and 101/2005).
- Law on the National Park Tara ("Official Gazette of RS", no.41/81).
- Management Plan SRP Zasavica 2012-2022.
- National Environmental (2007). Institute for Nature Conservation of Serbia.
- Nature Protection Act ("Official Gazette of RS" no.36/2009 and 88/2010).
- PPPPN "Tara National Park" 2010 ("Official Gazette of RS", no.100/10)
- Report on the World Summit on Sustainable Development, Johannesburg, South Africa. (2002). New York: UN Department of Public Information.
- Spatial Plan of the National Park Tara ("Official Gazette of RS", no.3/89).
- Todorovic, B. (2012). Comparative analysis of tourist traffic Zlatibor and Tara. In *Thematic Proceedings Tourism-Challenges and Opportunities (VII)* (pp.439-446). Scientific conference with international participation, Trebinje, Economic Institute Belgrade.
- Statistical Yearbooks, Republic Statistical Office of Serbia, Serbia.

Table 1

Arrivals and nights of 1981-2010

Year	Arrivals	Nights	Sum	Index (1981=100)
1981.	50.200	323.800	374.000	100
1982.	46.600	328.000	374.600	100,16
1983.	60.000	361.000	421.000	112,57
1984.	52.537	361.730	414.267	110,77
1985.	59.676	371.463	431.139	115,28
1986.	69.563	460.596	530.159	141,75
1987.	67.721	399.864	467.585	125,02
1988.	72.066	415.094	487.160	130,26
1989.	71.138	443.204	514.342	137,52
1990.	67.536	397.650	465.186	124,38
1991.	35.450	190.099	225.549	60,31
1992.	52.147	329.023	381.170	101,92
1993.	12.907	66.517	79.424	21,24
1994.	17.743	94.896	112.639	30,18
1995.	13.651	65.235	78.886	21,09
1996.	26.101	112.851	138.952	37,15
1997.	31.363	126.213	157.576	42,13
1998.	73.469	362.526	435.995	116,58
1999.	29.234	120.421	149.655	40,01
2000.	45.033	176.210	221.243	59,16
2001.	45.444	206.976	252.420	67,49
2002.	46.003	194.770	240.773	64,38
2003.	44.863	198.397	243.260	65,04
2004.	45.801	165.920	211.721	56,61
2005.	50.865	193.097	243.962	65,23
2006.	47.905	157.799	205.704	55
2007.	56.866	193.856	250.722	67,04
2008.	56.041	182.701	238.742	63,83
2009.	50.097	165.386	215.483	57,62
2010.	51.007	160.760	211.767	56,62

Source: Statistical Yearbooks, Republic Statistical Office of Serbia

Table 2

Permitted activities in accordance to the prescribed regime of protection

Degree of protection	Permitted Activities ³	Permitted Activities new Law on Environmental Protection ⁴
I	Scientific research will include scientific field of biology, soil science, physical geography, agriculture, medicine, veterinary medicine, forestry, the unique program	Ia degree - strict protection
		Excludes all forms of space utilization and activities other than scientific research and controlled education. An exception may be intervention activities of emergency with approval Ministry
		Ib degree-strict protection with the ability to manage populations
	Possible only scientific research, controlled education and activities aimed at preserving and improve the current condition of the ecosystem (controlled grazing, mowing, regulation of the water regime, etc.)	
II	Activity in the area of may be made to the extent that allows the improvement of the condition and presentation of natural good without prejudice to its primary values	Possible control interventions for restoration revitalization and overall improvement of the natural resource, without prejudice to primary value of its natural habitats, populations and ecosystems, as controlled and traditional activities that during his unscrewing not threaten the primary value of space
III	Controlled interventions and activities in the area, if they comply with the functions of protected natural resource or linked to inherited forms of traditional performing economic activities and housing, including tourism development	Be selective and limited use of natural resources management interventions for restoration, rehabilitation and improvement of the overall good, sustainable use, development and improvement of rural households, arranging objects of cultural and historical heritage and traditional architecture, the preservation of the traditional activities of the local population, infrastructure development in line the values, the potential and capacity of the protected area intended development, rural, health, sports and recreation, and other forms of tourism in accordance with sustainable development principles

³ The study of nature, done by the Institute for Nature Conservation of Serbia, March 2009. year, based on the legislative art. 49 Law on Environmental Protection, "RS Official Gazette", no. 66/91, which was at the time the Study was valid, defines the protection regimes I, II and III degree, ie, activities that are prohibited in the natural resources and national parks.

⁴ "Official Gazette of RS", no. 36/09

Table 3

Area NP "Tara" according to the degree of protection

Natural values and cultural heritage	Level I	Level II	Level III
Total ha	2.948,75	7.732,39	8.493,86
%	15,37	40,33	44,30