

# Understanding Summer Visitors and Their Attitudes to the Kopaonik National Park, Serbia

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## Abstract

Kopaonik Mountain is the oldest ski resort in Serbia and the most visited mountain as it has good facilities for both summer and winter outdoor recreation. Kopaonik is distinguished by a high level of biodiversity and it has been a national park since 1981. The aim of the present study is to understand the visitors' attitudes related to this area and to incorporate them with the purpose of improving the management of the natural and recreational resources of this protected area. A face to face survey was carried out in order to examine the ways, in which visitors use this area, to see if they are satisfied with the management of Kopaonik Mountain and to examine their attitudes towards the improvement of the recreational area of Kopaonik. The results show that middle-aged employers, who prevail among the tourists questioned, visit the mountain once per year (during spring or summer) and stay for 7-10 days. People mostly come from the capital city of Belgrade and visit the ski areas of Kopaonik Mountain for passive vacation and leisure activities (walking and enjoying nature). The findings indicate that some socio-demographic data such as gender and age are related to the use of the recreational areas. This case study provides some useful information and suggestions for the park managers to make improvements in the future.

**Keywords:** summer visitors, Mt. Kopaonik, visitor needs, ski areas, national park.

## Introduction

National parks have the privilege of being the highest ranked protected natural resources, because of their valuable and attractive natural attributes and their quality (Tomićević et al. 2012). Protected areas contribute to country social and economic objectives by supporting ecosystem services, promoting the sustainable use of renewable resources, as well as providing locations for tourism and recreation (Tomićević et al. 2012). Some studies emphasise the importance of understanding the recreational use of national parks for the effective management and sustainability of protected areas (George 2010, Tomićević et al. 2012).

The big challenge for nature management is to preserve areas with minimal human impact, in particular that of leisure activities, while at the same time zones must be found to satisfy recreational needs (Arnerberger et al. 2002). The development of a visitor management plan as a part of the management of protected and recreational areas is widely accepted by park managers as a way of reducing these conflicts. Protected area managers are required to balance the demand for a quality visitor experience with the need to protect the environment (Lacy and Whitemore 2006). However, if poorly planned and managed, tourism can contribute to the deterioration of the cultural landscape, threaten biodiversity, contribute to

pollution and degradation of ecosystems, diminish water and energy resources and cause poverty in local communities (Lacy and Whitemore 2006). Christ et al. (2003) show how tourism development can have a profound impact on biodiversity conservation with a strong correlation between biodiversity hotspots and popular nature-based tourism locations.

Therefore, in order for tourism in and around protected areas to be a tool for conservation, a careful and strategic implementation of policy, together with a proactive and effective management of tourism, is essential. This requires considerable capacity-building of protected areas staff and communities. It also requires a much better understanding of protected area visitation patterns, numbers and trends and of visitor motivation and satisfaction (Skeat and Skeat 2007).

Data on visitor use help to improve management in order to preserve or to improve the biodiversity of parks, while at the same time helping to satisfy the visitors' need for recreation and to provide them with the opportunity of finding the desired leisure and recreation experience in the respective visited area (Arnerberger et al. 2002). Useful data on visitor use contributes significantly to an optimal management of the protected area itself (Arnerberger et al. 2002).

In the past 15 years, published studies on visitor use and their needs, attitudes and perception of protected ar-

was mostly used data collected on-site by means of surveys using selected protected areas as case studies (e.g. Stursa 2002, Erkkonen and Sievanen 2002, Gorner and Cihar 2011, Tammes and Riviš 2011, Tomićević et al. 2012).

For example, Gorner and Cihar (2011) compared the views and attitudes of visitors to three key mountain national parks and Biosphere Reserves: Sumava National Park (Sumava NP, the Czech Republic), Krkonose National Park (KRNAP, the Czech Republic) and Karkonoski Park Narodowy (KPN, Poland). A large number of people visit these destinations both in the summer (e.g. hikers and cyclists) and in the winter (e.g. hikers and skiers). This threatens sustainability and creates problems regarding the management of these areas. Most research in these national parks is carried out during the summer season. Results show that tourists' attitudes and preferences are important because they predict tourist satisfaction and future behaviour.

In the research study of Tammes and Riviš (2011), a visitor survey was completed on the island of Aegna, which has been developed into a well-protected, widely known and highly valued area of Estonia. The island has a large variety of different landscapes, which is one of the reasons why people like to visit Aegna and spend their free time there. In order to balance the human impact with offering sustainable recreational activities, information about visitors is needed. This information includes numbers, origin, activities, expectations and satisfaction of the visitors. The results of the 2010 survey indicate that awareness of protected areas in Estonia is not very high. Land managers need to make efforts to improve people's awareness of protected areas and nature. It is possible that higher educated visitors result in less damage to nature; including less rubbish, trampling, vandalism and disturbance of birds and animals.

On the other hand, some papers focus more on the impact of summer visitors to ski areas within protected areas (Needham et al. 2004b, Needham et al. 2011). There has been a worldwide expansion of the use of ski slopes in the summer season (Needham et al. 2004b, Gössling and Hall 2006, Muhar et al. 2007), which provides access to people, who are not interested in winter tourism (Needham 2002). Concerns over the potential impact of climate change on mountain areas can be partially replaced by the opportunities provided by the use of ski slopes in the summer season (Beniston 2000, Elsasser and Messerli 2001). Ski slopes can occupy large areas and have a significant impact on alpine ecosystems (Tsuyuzaki 1994, Tenenbaum 2001, Ruth-Balaganskaya and Myllynen-Malinen 2000, Wipf et al. 2005, David et al. 2009). Ski slopes are linear grasslands designed for a mainly recreational function, lying at an angle for most of their length and extensively mowed and maintained (Petrović 2015). They can be used as paths, walking or picnic areas, a space for performing

physical exercise, a playground for kids, for grass skiing, collecting plants and fruits or for creating different activities and facilities at the free will of users (Petrović 2015). It is extremely important to consider environmental and social conditions in an open space intended for recreation (Manning et al. 2004, Manning and Valliere 2002, Smyth et al. 2007). The management of recreational areas and the ecosystems in these conditions depends on how the users perceive them and any improvements have to incorporate their views and opinions (Daily 2000, Schnurr and Holtz 1998, Redclift and Woodgate 1997, Petrosillo et al. 2007). People, who use different recreational areas, particularly mountain resorts or national parks, are different in many ways, including their personal characteristics and attitudes related to the recreational environment (Reinius and Fredman 2007). In this regard, it is necessary to consider the visitors' socio-economic status which, together with their past experiences, affects the overall experience of the quality of the environment (Renn et al. 1992). Data stemming from social analysis can be used to predict scenarios, simulate models and design the landscape in an integrated way (Folke et al. 2002, Walker et al. 2002).

This study presents an analysis of the spring/summer season use of Kopaonik national park as a case study with special emphasis on the importance of the use by, and the opinions of the visitors related to this particular tourist centre. Our objective is to understand the attitudes of the visitors to the mountain, given the importance of incorporating them in the management of the ski areas and the national park in general.

## Methods

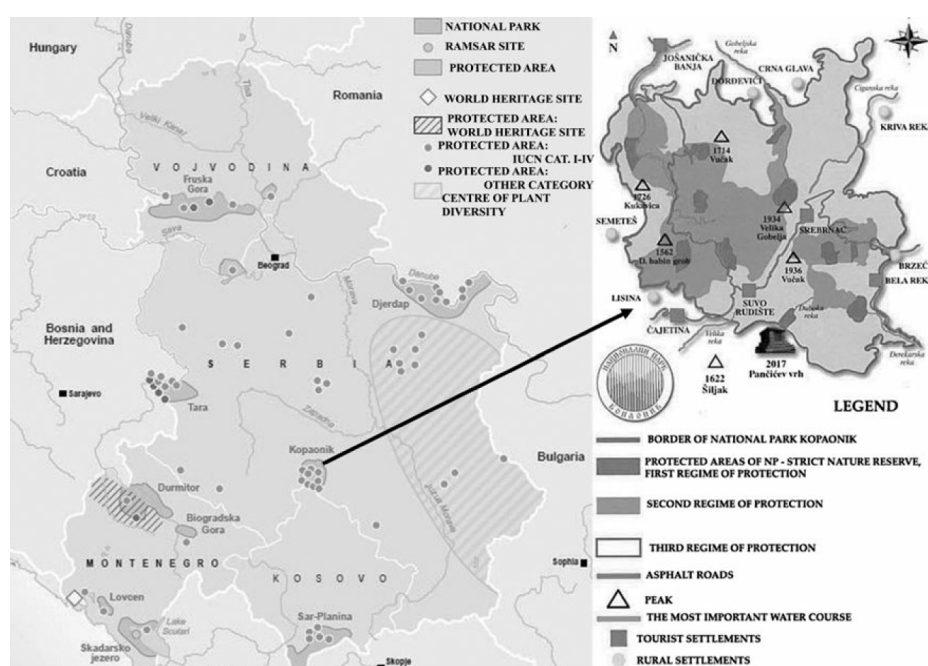
### *The study area*

Kopaonik NP contains the highest and most preserved areas of Mt. Kopaonik, which is located in the central part of southern Serbia and includes parts of the Brus and Raška municipalities (Figure 1). Its establishment was announced in 1981, and it covers an area of 11,809 ha, with a surrounding protected zone of 19,985 ha. Pančičev Vrh is the highest peak in the park (2017 m). Mt. Kopaonik is distinguished by a high level of biodiversity. The vegetation of Kopaonik is almost ideally differentiated into the altitudinal zones (Table 1). All the vegetation belts of high mountains of the central part of the Balkans are present. On the lower regions are thermophilic oak forests while, from 1,000-1,500 m above sea level, a climatogenous vegetation community represented by various types of mountain beech forests is present. In the transition zone between the beech and spruce belt altitudes there are mixed deciduous-coniferous forests. Following the beech belt, dense spruce forests have developed and above them subalpine shrub vegetation. Mountain pastures and grassland are above this vegetation belt.

The 2010 plan for the protection and development of Kopaonik NP noted 119 associations and 39 subassociations, with dominating grassland associations (66.9%), while forest formations represent 33.1%. Potential vegetation is present with 66.1%, while the remainder (33.9%) are secondary or tertiary types of vegetation. More than 1,600 species of vascular plants are found on Mt. Kopaonik (Amidžić 2007). Among the vegetation on Kopaonik NP, 91 endemic species and 82 subendemic species have been recorded, as well as 3 steno endemics that grow only on this area: *Sempervivum kopaonikensis*, *Viola kopaonikensis* and *Cardamine pancicii* (PE National Park Kopaonik 2010). In relation to the endemic alpine flora of the Balkan Peninsula, 11.9% endemics grow in Kopaonik NP,

meaning that this area is one of the most important centres of endemism in Serbia and the Balkans (PE National Park Kopaonik 2010). On the Serbia Red list there are 50 plant species among the flora of Mt. Kopaonik, with 4 of them on European Red list (PE National Park Kopaonik 2010).

A major, and the oldest, ski resort in Serbia is located on the Kopaonik Mountain, within the area of the National Park. The ski resort is located at a height of 1,770 m, with the lowest starting point at 1,057 m and an overall altitude difference between this and the highest starting point of 870 m. The ski resort offers approximately 50 km of ski slopes for alpine skiing, about 18 km for cross-country skiing, all of which are connected by 24 chairlifts and ski lifts. The total investment in the construction of



**Figure 1.** Geographic position of Kopaonik National Park in the Republic of Serbia (Tomićević et al. 2011)

**Table 1.** Vertical classification of the forest vegetation of Kopaonik (Krstić et al. 2014)

Exposition and height above sea level (m)		Forest belt		Existing forest communities	Dominant phytocoenosis
Northern	Southern				
< 750	< 1050		a) lower	Austrian Pine, Oaks, Beech	<i>Quercetum montanum s.lat.</i>
750-1000	1050-1150	I Hilly	b) upper	Beech, Sessile Oak	
1000-1100	1150-1250		a) lower	Beech	<i>Fagetum montanum</i>
1100-1500	1250-1550	II Mountain	b) upper	Beech-Fir, Spruce-Fir	<i>Abieti-Fagetum</i>
1500-1600	1550-1650		a) lower	Beech-Spruce, Spruce, Pre-Alpine Beech	
1600-1700	1650-1750	III High mountain	b) upper	Pre-Alpine Beech-Spruce, Spruce, Beech	<i>Piceetum excelsae</i>
1700-1850	1750-1850		a) lower	Pre-Alpine Spruce with Blueberry and Dwarf Juniper	<i>Vaccinio-Juniperetum sibiricae</i>
1850-1950	1850-1950	IV Subalpine	b) upper	Blueberry and Dwarf Juniper shrub	
> 1950	> 1950	V Alpine belt		Highland pastures	<i>Poetum violaceae</i>

new ski runs and chairlifts, between December 2004 and August 2009, amounts to about 20,000,000 € (Ristić et al. 2009). The ski resort has 19 easy, 10 medium and 6 difficult ski slopes. Almost all the runs are interconnected, giving a longest downhill run of 3.5 km. According to overnight stay statistics, approximately 233,000–366,500

guest nights were registered per annum during the period 2010–2015 (Table 2). The main segment of mountain tourism in Kopaonik NP is winter tourism (skiing, snowboarding and other winter sports). According to statistics, about 3,600,000–5,000,000 passes on active ski gates are issued per annum during the winter season (Table 3).

**Table 2.** Tourist arrivals and overnights on Mt. Kopaonik for the period of 2010–2015 (according to *Statistical Yearbook of the Republic of Serbia*)

Year	Tourists arrivals			Tourists overnights		
	Total	Domestic	Foreign	Total	Domestic	Foreign
2010.	57,990	52,596	5,394	233,912	210,032	23,880
2011.	65,874	59,350	6,524	270,535	241,557	28,978
2012.	67,185	59,345	7,830	298,432	261,477	36,955
2013.	80,375	70,301	10,074	341,299	293,746	47,553
2014.	72,433	61,496	10,937	323,133	271,763	51,370
2015. I-X	85,167	73,435	11,732	366,460	312,654	53,786

**Table 3.** Total annual number of passes issued to skiers on active ski trails during the winter season

Ski trails name	Total number of passes in winter season				
	2010 / 2011	2011 / 2012	2012 / 2013	2013 / 2014	2014 / 2015
Sunčana dolina	0	254,077	289,987	28,183	355,818
Suvo rudište	0	0	0	0	0
Malo jezero	182,658	182,205	205,651	187,116	197,224
Pančičev vrh	559,434	516,748	524,575	669,600	602,553
Duboka 1	335,009	292,300	289,525	325,925	263,321
Karaman greben	869,613	942,684	930,704	988,991	1,050,093
Mali Karaman 4	461,752	415,868	382,215	497,029	465,168
Mali Karaman	8,061	24,965	140,873	144,210	143,100
Marine vode	94,310	119,523	130,732	84,652	129,820
Karaman	84,935	90,911	116,963	155,871	106,451
Jaram	0	39,566	50,056	30,673	65,000
Gobelja relej	0	45,448	54,042	29,113	53,275
Gobelja greben	0	170,988	191,571	32,645	240,503
Kneževske bare	33,233	47,964	74,764	33,903	67,625
Bela reka 1	0	23,492	5,250	0	11,256
Bela reka 2	0	17,758	1,334	0	4,251
Ledenica	0	31,143	35,940	0	0
Gvozdac	0	52,486	70,086	74,162	142,189
Duboka 2	347,811	392,770	405,668	325,842	376,136
Krčmar	56,006	32,919	69,816	0	197,098
Mašinac	176,979	175,277	153,528	169,680	151,570
Children Ski line	7,998	6,882	8,727	9,115	9,401
Krst	391,657	329,004	341,588	417,267	392,361
Snow Park	0	5,892	2,407	0	0
Zip line	0	0	0	1,051	708
Tubing	0	0	0	24,486	20,569
Bob rail	0	0	0	22,610	16,047
TOTAL	3,609,456	4,210,870	4,476,002	4,252,124	5,061,537



### *Survey methodology and data analysis*

For the purpose of this study, the primary data was gathered by means of a face-to-face survey among visitors to Mt. Kopaonik. The survey respondents were selected using random sampling. The on-site survey was carried out on a voluntary basis among the visitors to the recreational areas (on the pistes or near the central resort of Konaci, as the most visited site).

The questionnaire was given to visitors to the territory of Mt. Kopaonik in March/June 2011 and June/July 2012. The survey was conducted over a period of ten days, including weekdays (Monday until Thursday) and the weekend (Saturday and Sunday). The times between which the surveys were conducted were 10:00-17:00. The respondents consisted of visitors from a variety of backgrounds and age groups.

The survey contained a combination of different types of questions, structured in such a way that the general questions were at the beginning of the survey followed by the more specific questions. The questionnaire consisted of closed questions (yes/no, multiple-choice or a Likert scale of evaluation) as well as open questions. The combination of different types of questions was employed to investigate the various dimensions of the views of the respondents and, particularly, to ensure that accurate information was obtained (Tomićević 2005). Generally, the fixed-response questions required one type of answer: a yes/no answer. Responses from these questions are presented as response frequencies. The results from the closed questions were subjected to basic statistics, whereas those from the open questions were content analysed.

The whole questionnaire comprised 19 questions divided into three sections. The first group of questions was related to socio-demographic characteristics, including gender, age group and occupation. The wording and order of the questions were carefully considered, in order to avoid asking leading questions and/or priming the interviewees for particular responses to later questions (Lofland 1971). As a result, it was decided to first ask socio-demographic questions, with the most important questions being asked at the end of questionnaire. In the

second group, the questions were related to information about how the area is used. The respondents were asked questions about the reasons for their visits, the frequency of the visits, the seasons in which they visit and the length of their stay. The third group of questions addressed the extent to which the respondents were satisfied with the management of the area, the equipment and the maintenance, security and infrastructure. This group of questions employed a Likert scale corresponding to a 1–5 rating (1-very bad, 2-bad, 3-acceptable, 4-good, 5-very good). In addition, this group contained questions relating to the visitors' opinions on the further improvement and maintenance of ski areas, as well as the interest of users in certain recreational activities. Issues relating to the improvement of the types of recreational area, based on a scale of 1-3 (1-not important, 2-important, 3-very important), as well as issues related to the activities offered in the recreation area, (1-not interested, 2-interested, 3-very interested), were also included here. In the questionnaire, the last question was an open-ended question whereby the visitors had the opportunity to provide personal comments about Mt. Kopaonik.

The data were analysed using Microsoft Office Excel 2007 and SPSS 17 (Statistical Package for Social Sciences version 17) and then presented in graphs and tables. A *Chi-square* test was used for investigating the interconnection of different categorical characteristics (socio-demographic characteristics of respondents), while the magnitude of this association was determined using a coefficient of contingency. Thus, the  $\chi^2$ -test in the contingency tables was used for testing the interconnection of the gender and age structure of the users of ski slopes and their reasons for visiting the recreational area.

## **Results**

### *Socio-demographic structure of visitors*

At the investigated area of Mt. Kopaonik, a total of the 123 visitors were surveyed, 61 were males while 62 were females. The basic socio-demographic characteristics are shown in Table 4. Among the surveyed tourists,

**Table 4.** Socio-demographic structure of visitors

Age (years)	No	%	Occupation	No	%	Education	No	%
< 18	5	4.10	Schoolchildren	5	4.10	Primary	3	2.40
18–24	11	8.90	Students	17	13.80	Secondary	45	36.60
25–34	51	41.50	Unemployed	13	10.60	College	14	11.40
35–44	19	15.50	Employed	82	66.70	University	61	49.60
45–54	23	18.70	Pensioner	6	4.90	No answer	/	
55–64	11	8.90						
> 64	3	2.40						

the highest number (51) falls into the age group of 25-34 year olds, while the over 64 age group is least present (3).

Among the surveyed visitors to Kopaonik, in terms of profession, employees make up more than half of the respondents (82), followed by students (17), while pupils are least present (3). Of the total number of surveyed users of ski-slopes, those with a university education make up the majority (61), followed by those with secondary education (43).

#### *Reasons for visiting Mt. Kopaonik*

The survey results show that the largest number of visitors to Mt. Kopaonik come from Belgrade (45), followed by those from regional towns (Kruševac, Kraljevo). The category named "other" lists all those towns, where one or two respondents come from (Figure 2).

Of the total number of the surveyed visitors to the ski slopes of Mt. Kopaonik, those who come with their families make up the majority (55), followed by those who come with friends (35), partner (19) or alone (13). The smallest number of visitors come exclusively for work (category "other"), with only 1 respondent.

The results of the survey show that the largest number of visitors come once a year (51), followed by the number of visitors, who come to Kopaonik twice a year (37) and three or more times a year (35) (Table 5). The results show that the largest number of visitors (53) has no specific sea-

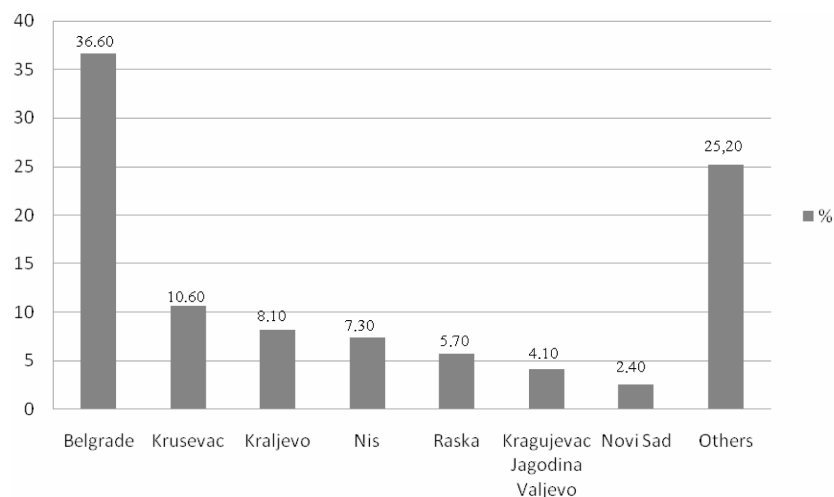
sonal period when they choose to come to Kopaonik or, to be more precise, they visit in all seasons equally. There are also a significant number of visitors who come solely during the spring / summer season (40). Most respondents stay on the mountain for 7-10 days (57), with a significant proportion who come just for the weekend (46). Of the total number of respondents, 75.60% come by car, while 22% use a bus as the preferred means of transport (Table 5).

The main reason for a visit to Mt. Kopaonik, according to the responses of the respondents, is passive recreation, namely enjoying nature and walking (Figure 3). Among the reasons for coming to Kopaonik, the least stated ones are running and organising picnics.

#### *Attitudes to the ski areas of Mt. Kopaonik*

Of the total number of the surveyed visitors, more than half (64.20%) are not satisfied with the management of the ski slopes on Mt. Kopaonik. During the evaluation of the equipment in the recreational area (benches, litter bins, lighting, information boards, road signs etc.), the average score of the satisfaction with the state of the equipment is 3.55. While evaluating the greenery in the recreational area (trees and shrubs), 74 visitors gave a positive assessment.

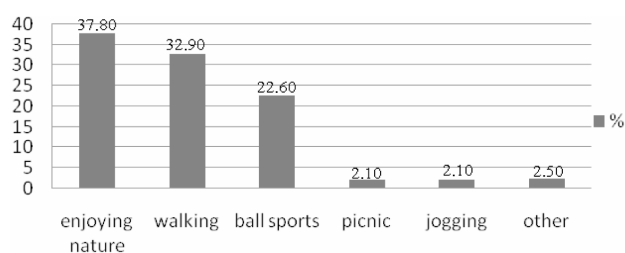
The average value of user satisfaction with the condition of the greenery on this particular recreational area is 3.85. The condition of the grass on the ski-slopes of



**Figure 2.** Cities from which people visit the ski slopes of Mt. Kopaonik

**Table 5.** Time dynamics and the mode of transport to Mt. Kopaonik

Frequency of visits	N	%	Season of visit	N	%	Duration of visit	N	%	Mode of transport	N	%
1 per year	51	41.5	Spring	40	32.5	weekend	46	37.4	By car	93	75.6
			Summer								
2 per year	37	30.1	Autumn	30	24.4	7-10 days	57	46.3	By bus	27	22
			Winter								
≥3 per year	35	28.5	No specific	53	43.1	≥15 days	20	16.3	By feet	3	2.4



**Figure 3.** Reasons for visits to Mt. Kopaonik

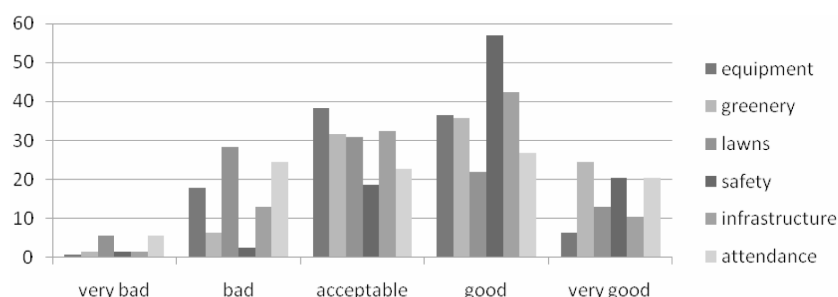
Kopaonik was rated by the users with an average score of 3.24. During the evaluation of the recreational area in terms of user safety, 95 respondents gave a positive assessment, thus contributing to the average value of visitor satisfaction of 3.80. The condition of the recreational area in terms of infrastructure was rated by the respondents with an average score of 3.47, with 65 users giving a positive assessment. During the evaluation of the recreational area in terms of frequency of visits, 58 respondents gave a positive assessment, and the average user satisfaction rating is 3.30.

The results of the user satisfaction survey related to the condition of the ski-slopes on Kopaonik lead us to a conclusion that the visitors are least satisfied with the con-

dition of the grass areas and the equipment, which are assessed as acceptable. Their satisfaction with the condition of other structural elements of the ski-slopes was defined by the respondents as very good, while they are most satisfied with security and safety (Figure 4, Table 6).

As far as maintaining the studied recreational area is concerned, the surveyed visitors find that regular cleaning of the area in terms of collecting waste, rubbish etc. is of most importance (26.80%), as well as regular maintenance of equipment (25.50%) i.e. repairing and replacing benches, bins, lighting, security fences, workout equipment, signposts, information boards etc. The maintenance of infrastructure (8.60%) and ensuring visitors' safety in the area (7%) are the least important activities, according to the survey results, when it comes to preparing the recreational areas on Kopaonik for the summer season (Figure 5).

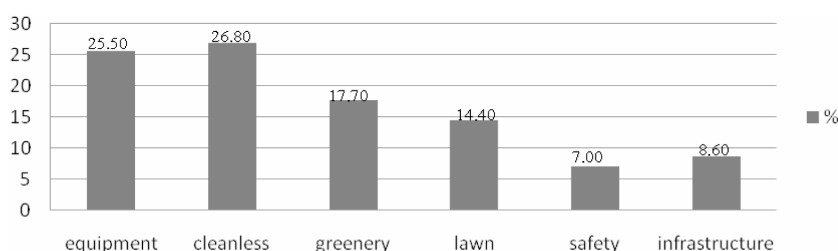
When preparing the ski slopes for use during the summer season, the surveyed visitors consider that putting up information boards and signposts is most important (Figure 6). Also, visitors to the ski-slopes give almost equal importance to solving the problems of erosion. Setting up educational boards with the names of plants is, according to the opinion of the visitors, the least important activity during preparation.



**Figure 4.** User evaluations of the recreational area of Mt. Kopaonik

**Table 6.** Descriptive statistical values showing user evaluation of Mt. Kopaonik

Evaluated element / Statistical values	equipment	greenery	lawns	safety	infrastructure	attendance
<i>StD</i>	0.858253	0.917871	1.104375	0.840196	0.886664	1.195039
<i>Me</i>	3	4	3	4	4	3
Mean	3.55	3.85	3.24	3.8	3.47	3.3
<i>Max (%)</i>	32.21	35.77	30.89	56.91	42.27	26.82
<i>Min (%)</i>	0.81	1.63	5.7	1.63	1.63	5.71



**Figure 5.** Research results showing user reviews of maintenance measures on Mt. Kopaonik

When choosing activities to carry out on ski slopes in the summer, the largest number of visitors stated an interest in walking tours or organising picnics (Figure 7). In third place among the activities they are interested in during the summer season, visitors rate watching wild animals and birds, as well as climbing and hiking.

Answering the last question in the questionnaire, which relates to the disclosure of personal opinions and comments regarding the ski slopes, visitors emphasised the need for the reseeded of the slopes, dealing with erosion, setting up the equipment (litter bins, benches, information boards, signposts), better marking of footpaths, improved sanitary facilities, the visitors' awareness of collecting their own litter and operating the cable cars during the summer.

The  $\chi^2$ -test in the contingency tables was used to examine the correlation between the variables of gender and age structure of the visitors with categorical indicators, i.e. the types of ski slope use (reasons for visiting). The analysis showed that an association of the age structure with the types of ski slope use does not exist. In fact, all age structures have the same reasons for visiting this recreational area (Table 7), which are related to the dominant activities, i.e. walking and enjoying nature.

There is a correlation between the variable of the gender of the respondents and the ways the ski slopes are used (Table 8). The *Chi-square* test of independence dem-

onstrated the connection between gender and running ( $\chi^2$  (1, N = 123) = 4.202,  $p$  = 0.04,  $\phi$  = 0.182) as well as the connection between gender and walking ( $\chi^2$  (1, N = 123) = 5.086,  $p$  = 0.02,  $\phi$  = 0.199). In addition, the  $\chi^2$ -square test of independence demonstrated the connection between gender and organising picnics ( $\chi^2$  (1, N = 123) = 4.202,  $p$  = 0.04,  $\phi$  = 0.182) as well as between gender and visiting for work (attending seminars) ( $\chi^2$  (1, N = 123) = 4.202,  $p$  = 0.02,  $\phi$  = 0.200).

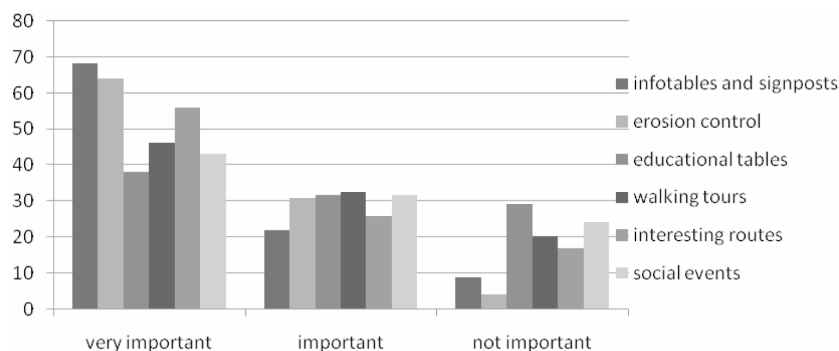
However, it should be noted that, according to Cohen's (1988) criteria, the obtained influence of the variables of gender on the types of ski-slope use is considered to be small (contingency coefficient values are less than 0.30).

**Table 7.** The significance of the relationship between the variables of age and usage of ski slopes

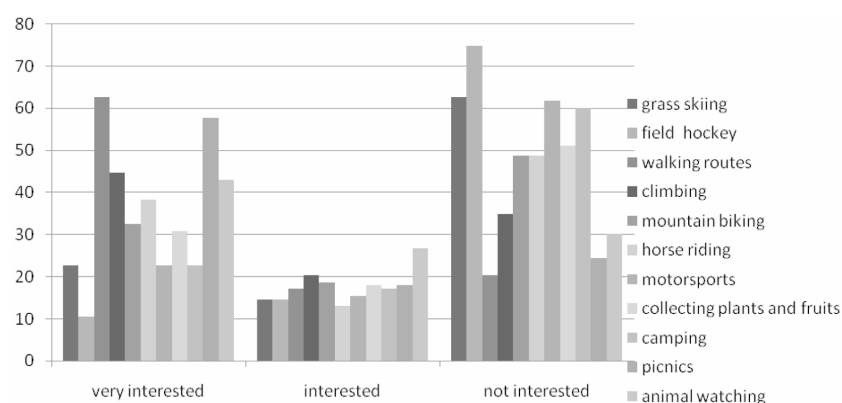
Usage of ski slopes	$\chi^2$	Df	Sig.
jogging	4.562 <sup>a</sup>	6	0.601
walking	10.841 <sup>a</sup>	6	0.093
enjoying nature	6.199 <sup>a</sup>	6	0.410
skiing / ball sports	9.374 <sup>a</sup>	6	0.154
Bicycle ride	1.423 <sup>a</sup>	6	0.964
picnic	3.147 <sup>a</sup>	6	0.790
work / visiting conference	2.994 <sup>a</sup>	6	0.810

\*  $p < 0.05$

**Figure 6.** Visitor responses on the measures for managing ski slopes



**Figure 7.** Visitors' interest in the offered activities on the ski areas of Mt. Kopaonik in summer





**Table 8.** The significance of the relationship between the variables of gender and usage of ski slopes

Usage of ski slopes	$\chi^2$	$Df$	Sig.	Coefficient of contingency	Gender distribution according to usage of ski slopes				
jogging	4.202 <sup>a</sup>	1	0.040*	0.182	gender	jogging			
						0	1	Total	
						male	57	4	61
						female	62	0	62
Total	119	4	123						
walking	5.086 <sup>a</sup>	1	0.024*	0.199	gender	walking			
						0	1	Total	
						male	34	27	61
						female	22	40	62
Total	56	67	123						
Enjoying nature	0.092 <sup>a</sup>	1	0.762						
skiing, ball sports	0.196 <sup>a</sup>	1	0.658						
Bicycle ride	0.992 <sup>a</sup>	1	0.319						
picnic	4.202 <sup>a</sup>	1	0.040*	0.182	gender	picnic			
						0	1	Total	
						male	57	4	61
						female	62	0	62
Total	119	4	123						
Coming on work/visiting conference	5.128 <sup>a</sup>	1	0.024*	0.200	gender	Work/ seminar			
						0	1	Total	
						male	61	0	61
						female	57	5	62
Total	118	5	123						

\*  $p < 0.05$ 

## Discussion

Recreation and tourism activities in nature reserves, natural parks and wilderness areas offer a growing management challenge (Tammes and Rivas 2011). It is important to combine the protection of natural resources with the opportunities offered by recreational activities (Mingyu et al. 2009). Managers need to balance the visitors' use and environmental protection. For that, the needs and desires of the visitors and the impact of their visits have to be collected (Cole and Daniel 2003). Visitor characteristics include numbers, origin, activities, expectations and satisfaction, and are determined principally from on-site visitor surveys (Tammes and Rivas 2011). On-site visitor surveys on Mt Kopaonik were a suitable method for gathering information related to the visitors' attitudes, the features of the visited area and socio-demographic data.

Our study shows an equal participation of tourist gender visiting Mt. Kopaonik. This result is in correlation with the same dominant activities on the mountain of

relaxation and enjoying nature reported by Tammes and Rivas (2011). Almost half of the surveyed tourists belong to the 25-34 age group. The distribution of visitors to the ski slopes of Mt. Kopaonik by age is explained by the fact that the most common categories actually possess the best working and recreational capacity and need more relaxation in a peaceful environment, where they can isolate themselves from urban areas, on one hand, and active holidays in a natural surrounding, on the other (Roovers et al. 2002). The dominant presence of the category of employees, with more than half of the respondents, can be explained by the significant cash expenditure required for travelling to and relaxing on the mountain. Since the research was conducted mainly during the school year in Serbia, it is expected that the obtained results show a minimum participation by the category of pupils. Our results show the same tendency as a study done by Tomićević et al. (2012) on Tara National park in Serbia. The largest number of visitors from Belgrade can be related to the fact that it is the city with the largest population and the

highest average cash income. On the other hand, a high share of visitors from the regional towns is related to the proximity, i.e. the availability of Mt. Kopaonik compared to other tourist centres. Mountain recreation centres are important tourist destinations and their selection depends on a number of factors, with average income and travelling distance among the most important (Žabkar et al. 2010, Mendes and Proenca 2011).

The number of visits is connected with the availability of free time and cash resources. As most of the respondents belong to the category of employees, it is expected that they are unable to visit the mountain on a more frequent basis. Therefore, they most often choose to come less frequently (once a year) and stay longer (7-10 days). Spending more days on the mountain (7-10 days) is in compliance with the findings of Reinius and Fredman (2007), which imply that a visit to a national park must be planned in advance because it is usually a longer trip, which requires more investment in time and money. Research carried out on Mt. Tara NP (Tomićević et al. 2012) shows a similar pattern of frequency and duration of visits to the mountain. Also, the observed correlation is in connection with the distance between the destination area and the place of permanent residence, with the research showing the largest number of visitors coming from Belgrade. More than two thirds of the respondents travel to Kopaonik National Park by car. The possibility of access to the national park by car and its use in the park itself significantly increases the visitors' mobility, as Hallo and Manning (2009) point out. Data provided by the National Park Service in the United States from 2006 (US National Park Service 2007), shows that the largest number of visitors arrive in their own vehicles. In addition to transport, cars can serve as a means of exploring a national park (Hallo and Manning 2009).

Visiting national parks in mountain regions for passive recreation and enjoying nature has also been reported by other authors in their research works (Heberlein et al. 2002, Needham et al. 2004a, Needham et al. 2004b, Reinius and Fredman 2007, Needham et al. 2011). According to Reinius and Fredman (2007), tourists come to national parks to enjoy nature, peace and quiet and to hike, and these are the typical elements of the natural environment in national parks. Also, Vistad (2009) points out that walking and enjoying nature are the components that determine personal quality of life and contribute to a better psychological state.

Research data about satisfaction with the management of the ski slopes on Mt. Kopaonik are very similar to data gathered by Needham et al. (2004b). Needham et al. (2004b) stated that 62% of the visitors to ski-slopes in Canadian alpine regions are not satisfied with their design. The importance of solving the problems of erosion on ski slopes is recognised by summer season visitors in our re-

search. Some authors (Ristić et al. 2011, 2012), who have studied the erosion processes in the ski centres of Serbia, stated that the most evident examples are on the ski slopes of Mt. Kopaonik. Erosion on the ski slopes of Mt. Kopaonik is a significant factor in the degradation of the landscape (Radić 2014) as a consequence of unplanned works on the ski slopes, especially during the period from April to October. The importance of the restoration and revegetation of eroded areas in the national park has been recognised by visitors in our research. Also, research by Ristić et al. (2012) and Bjedov et al. (2011) states the importance and necessity of restoration of the ski slopes in the largest ski-centres in Serbia (Mt. Kopaonik and Mt. Stara Planina). In their work, Needham et al. (2004b) report that solving erosion problems, as a very important activity on those ski-slopes intended for use during the summer, was recognised by 62% of the respondents, who visit ski resorts during the summer season in Canada.

The research shows that walking and hiking stand out as the dominant activities on ski slopes in the summer, a fact which is also indicated by other authors (Opaschowski 2004, Muhar et al. 2007). Results show that the surveyed visitors of Mt. Kopaonik are not interested in activities, which can be found in the future summer season's offering: field hockey, grass skiing, motorsports and camping stand out. These results are encouraging from the standpoint of nature protection considering that walking / hiking and watching wildlife are all peaceful activities (Needham and Rollins 2005) in contrast to motorsports (Hallo and Manning 2009) or camping (Freimund et al. 2002). Research showed that tourists have mostly the same opinion regarding the evaluation of the touristic offer, whereby high values are given to recreation in nature, long walks and diverse sport activities, in addition to animal and plant viewing. It is clear that these results represent a form of advice for the management of Kopaonik National Park. It indicates the need for the diversification of the touristic offers, which would respond to the demands of the visitors and, at the same time, be in accordance with nature protection. Understanding the motivations and attitudes of summer visitors to ski slopes and identifying their satisfaction of the management of these areas can allow managers to identify the market segments of clients and tailor the opportunities and location characteristics to their motivations (Needham et al. 2011).

Sociological surveys carried out on the ski-slopes of Kopaonik are one of the first surveys of this kind in Serbia and represent a separate case study. Therefore, the results and recommendations can be applied to the study area and could be of great importance to the management of Kopaonik National Park. The applicability of these findings to other ski areas and national parks, therefore, remains a topic for further empirical investigation.

## Conclusion

In this study, we assessed the summer visitors' attitudes and the types of use of the ski slopes on Mt. Kopaonik. The results suggest that having knowledge of the visitors' attitudes is highly valuable in the process of planning and managing ski areas. A suggestion for the park managers and government agencies is to focus on more efficient management strategies and to support those activities prioritised by tourists, whilst maintaining the preservation and protection of the environment. A visitor survey primarily produces information for solving practical problems related to the maintenance and management of ski areas and can facilitate a decision-making process. In order to improve the quality of recreational activities and, at the same time, protect the natural environment, it is important to consider visitor's suggestions and, if possible, make changes or improvements. Communication with the visitors in mountainous areas and the acknowledgement of their demands needs to be enhanced, which will further lead to an increased awareness of the importance of nature protection, especially the protection of national parks and other protected areas.

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## References

- Amidžić, L. 2007. National Park Kopaonik. In: Amidžić L., Krasulja S., Belij S. (Editors), Protected natural resources in Serbia. Ministry of Environmental Protection and Institute for Nature Conservation, Belgrade, p. 23–27.
- Arnerberger, A., Brandenburg, Ch. and Muhar, A. 2002. Monitoring and Management of Visitor Flows in Recreational and Protected Areas, Conference Proceedings, Bodenkultur University Vienna, Austria, Institute for Landscape Architecture and Landscape Management, Bodenkultur University Vienna: p. I-II.
- Beniston, M. 2000. Environmental Change in Mountains and Uplands. Arnold. London, 172 pp.
- Bjedov, I., Ristić, R., Stavretović, N., Stevović, V., Radić, B. and Todosijević, M. 2011. Revegetation of ski runs in Serbia: Case studies of the Mts. Stara planina and Divčibare, *Archive of Biological Science* 63 (4): 1127–1134.
- Christ, C., Hillel, O., Matus, S. and Sweeting, J. 2003. Tourism and Biodiversity: Mapping Tourism's Global Footprint. UNEP and Conservation International, Washington, DC., 66 pp.
- Cole, D.N. and Daniel, T.C. 2003. The science of visitor management in parks and protected areas: from verbal reports to simulation models. *Journal for Nature Conservation* 11: 269–277.
- Daily, G.C. 2000. Management objectives for protection of ecosystem services. *Environmental Science & Policy* 3: 333–339.
- David, G.C.L., Bledsoe, B.P., Merritt, D.M. and Wohl, E. 2009. The impacts of ski slope development on stream channel morphology in the White River National Forest, Colorado, USA. *Geomorphology* 103: 375–388.
- Elsasser, H. and Messerli, P. 2001. The vulnerability of the snow industry in the Swiss Alps. *Mountain Research and Development* 21: 335–339.
- Erkkonen, J. and Sievänen, T. 2002. Standardisation of Visitor Surveys-Experiences from Finland, In: Arnerberger, A., Brandenburg, Ch., Muhar, A. (editors), Monitoring and Management of Visitor Flows in Recreational and Protected Areas, Bodenkultur University Vienna, Austria, Institute for Landscape Architecture and Landscape Management, Bodenkultur University Vienna, Conference Proceedings: p. 252–257.
- Folke, C., Carpenter, S., Elmqvist, T., Gunderson, L., Holling, C.S., Walker, B., Bengtsson, J., Berkes, F., Colding, J., Danell, K., Falkenmark, M., Gordon, L., Kaspersen, R., Kautsky, N., Kinzig, A., Levin, S., Mäker, L.G., Moberg, F., Ohlsson, L., Olsson, P., Ostrom, E., Reid, W., Rockström, J., Savenije, H. and Svedin, U. 2002. Resilience and sustainable development: building adaptive capacity in a world of transformations, Background Paper for WSSD. ICSU Series for Sustainable Development No. 3. Johannesburg. Resilience Alliance for the Swedish Environmental Advisory Council and the International Council for Science, 37 pp.
- Freimund, W.A., Vaske, J.J., Donnelly, M.P. and Miller, T. 2002. Using video surveys to access dispersed backcountry visitors' norms. *Leisure Sciences* 24: 349–362.
- George, R. 2010. Visitor perceptions of crime-safety and attitudes towards risk: The case of Table Mountain National Park, Cape Town. *Tourism Management* 31: 806–815.
- Gorner, T. and Cihar, M. 2011. Seasonal Differences in Visitor Perceptions: A Comparative Study of Three Mountainous National Parks in Central Europe. *Journal of Environmental Protection* 2: 1046–1054.
- Gössling, S. and Hall, M. 2006. Tourism and global environmental change: ecological, social, economic, and political interrelationship. Taylor & Francis e-library, UK, 344 pp.
- Hallo, J. and Manning, R.E. 2009. Transportation and recreation: a case study of visitors driving for pleasure at Acadia National Park. *Journal of Transport Geography* 17: 491–499.
- Heberlein, T., Fredman, P. and Vuorio, T. 2002. Current Tourism Patterns in the Swedish Mountain Region. *Mountain Research and Development* 22: 142–149.
- Krstić, M., Cvjetičanin, R., Smailagić, J. and Govedar, Z. 2014. Climate-vegetation characteristics of Kopaonik mountain in Serbia, *Carpathian Journal of Earth and Environmental Sciences* 9 (3): 135–145.
- Lacy, T. and Whitmore, M. 2006. Tourism and Recreation. In: M. Lockwood, G. L. Worboys, A. Kothari (editors), Managing Protected Areas: A Global Guide. IUCN, p. 497–527.
- Manning, R., Lawson, S., Newman, P., Budrick, M., Valliere, W., Laven, D. and Bacon, J. 2004. Visitor perceptions of recreation-related resource impacts. In: R. Buckley (editors), Environment impacts of ecotourism. CAB International, Cambridge, MA, p. 259–272.
- Manning, R. and Valliere, W. 2002. Coping in outdoor recreation: Causes and consequences of crowding and conflict among community residents. *Journal of Leisure Research* 33: 410–426.
- Mendes, I. and Proenca, I. 2011. Measuring the Social Recreation Per-Day Net Benefit of the Wildlife Amenities of a National Park: A Count-Data Travel-Cost Approach. *Environmental Management* 48: 920–932.
- Mingyu, Y., Hens, L., Xiaokun, O. and De Wulf, R. 2009. Impacts of recreational trampling on sub-alpine vegetation and soils in Northwest Yunnan, China. *Acta Ecologica Sinica* 29: 171–175.

- Muhar, A., Schauppenlehner, T., Brandenburg, C. and Arnerberger, A. 2007. Alpine summer tourism: the mountaineers' perspective and consequences for tourism strategies in Austria. *Forest Snow and Landscape Research* 81 (1/2): 7–17.
- Needham, M.D. 2002. The 'other' season at ski hills: Applying the limits of acceptable change (LAC) to a study of summer alpine recreation on and adjacent to Whistler Mountain, British Columbia. Master's thesis, University of Victoria, Canada, 542 pp.
- Needham, M.D., Rollins, R.B. and Wood, C.J.B. 2004a. Site-Specific Encounters, Norms and Crowding of Summer Visitors at Alpine Ski Areas. *International Journal of Tourism Research* 6: 421–437.
- Needham, M.D., Wood, C.J.B. and Rollins, R.B. 2004b. Understanding Summer Visitors and Their Experiences at the Whistler Mountain Ski Area, Canada. *Mountain Research and Development* 24 (3): 234–242.
- Needham, M.D. and Rollins, R.B. 2005. Interest group standards for recreation and tourism impacts at ski areas in the summer. *Tourism Management* 26: 1–13.
- Needham, M.D., Rollins, R.B., Ceurvorst, R.L., Wood C. J. B. K. E. Grimm, K. E. and Dearden, Ph. 2011. Motivations and Normative Evaluations of Summer Visitors at an Alpine Ski Area. *Journal of Travel Research* 50 (6): 669–684.
- Lofland, J. 1971. Analyzing Social Settings: A Guide to Qualitative Observation and Analysis. Wadsworth Publishing Company, Inc, Belmont, CA, USA, 304 pp.
- Opaschowski, H.W. 2004. Deutschland 2020: wie wir morgen leben – Prognosen der Wissenschaft [German 2020: How we live tomorrow- predictions of science]. VS Verlag für Sozialwissenschaften, Wiesbaden, Germany, 138 pp. (in German).
- PE National park Kopaonik (2010): Programme for the protection and development of NP Kopaonik for the period 2006-2010, Public Enterprise National Park Kopaonik, Kopaonik, 42 pp. (in Serbian).
- Petrosillo, I., Zurlini, G., Corliano, M.E., Zaccarelli, N. and Dadamo, M. 2007. Tourist perception of recreational environment and management in a marine protected area. *Landscape and Urban Planning* 79: 29–37.
- Petrović, J. 2015. Strukturna, ekološka i sociološka istraživanja travnjaka rekreativnih površina [Structure, ecology and social study of lawns in recreational areas]. Doctoral thesis, 499 pp. (in Serbian).
- Radić, B. 2014. Erozija kao faktor degradacije predela u skijaškim centrima Srbije [Erosion as factor of landscape degradation in Serbian ski-resorts]. Doctoral thesis, 281 pp. (in Serbian).
- Redclift, M. and Woodgate, G. 1997. The International Handbook of Environmental Sociology. Edward Elgar, Cheltenham, UK, 434 pp.
- Reinius, S.W. and Fredman, P. 2007: Protected areas as attractions. *Annals of Tourism Research* 34 (4): 839–854.
- Renn, O., Burns, W.J., Kasperson, J.X., Kasperson, R.E. and Slovic, P. 1992. The social amplification of risk: theoretical foundations and empirical applications. *Journal of Social Issues* 48 (4): 137–160.
- Republic Institute for Statistics (2010-2015): *Statistical Yearbook of the Republic of Serbia* Republic for period 2010-2015. Institute for Statistics, Belgrade (in Serbian).
- Ristić, R., Radić, B. And Vasiljević, N. 2009. Restoration of eroded surfaces in Serbian ski-areas. *Bulletin of the Faculty of Forestry* 100: 31–54.
- Ristić, R., Marković, A., Radić, B., Nikić, Z., Vasiljević, N., Živković, N., Dragičević, S. 2011. Environmental impacts in Serbian ski resorts. *Carpathian Journal of Earth and Environmental Sciences* 6 (2): 125 – 134.
- Ristić, R., Kašanin-Grubin, M., Radić, B., Nikić, Z. and Vasiljević, N. 2012. Land Degradation at the Stara Planina Ski Resort. *Environmental Management* 49: 580–592.
- Roovers, P., Hermy, M. and Gulinck, H. 2002. A Survey of Recreation Interests in Urban Forests the Influence of Travel Distance, Monitoring and Management of Visitor Flows in Recreational and Protected Areas. In: Monitoring and Management of Visitor Flows in Recreational and Protected Areas. Conference Proc., 2002: 277–283.
- Ruth-Balaganskaya, E. and Myllynen-Malinen, K. 2000. Soil nutrient status and revegetation practices of downhill skiing areas in Finnish Lapland - a case study of Mt. Yllas. *Landscape and Urban Planning* 50: 259–268.
- Schnurr, J. and Holtz, S. 1998. The Cornerstone of Development: Integrating Environmental, Social and Economic Policies. Lewis Publishers, Boca Raton, Ottawa, 43 pp.
- Skeat, A. and Skeat, H. 2007. Systems to make tourism and others contribute to protected areas- The Great Barrier Reef. In: Bushell, R. and Eagles, P.F.J. (editors): Tourism and protected areas: benefits beyond boundaries. The V IUCN World Parks Congress. CABI Publishing, Wallingford, 349 pp.
- Smyth, R.L., Watzin, M.C. and Manning, R.E. 2007. Defining Acceptable Levels for Ecological Indicators: An Approach for Considering Social Values. *Environmental Management* 39: 301–315.
- Stursa, J. 2002. Impacts of Tourism Load on the Mountain Environment: A Case Study of the Krkonose Mountains National Park- the Czech Republic. In: Arnerberger, A., Brandenburg, Ch., Muhar, A. (eds.): Monitoring and Management of Visitor Flows in Recreational and Protected Areas, Bodenkultur University Vienna, Austria, Institute for Landscape Architecture and Landscape Management, Bodenkultur University Vienna, Conference Proceedings: 364–370.
- Tamme, T. and Rivas, R. 2011. Monitoring and management of visitor flows in recreational and protected areas – a case study from Aegna island, Estonia. *Journal of Coastal Research* SI 64: 1302 – 1305.
- Tenenbaum, D.J. 2001. The Slippery Slope of Ski Expansion. *Environment Health Perspective* 109 (3): A112–A115.
- Tomicević, J., Bjedov, I., Gudurić, I., Obratov-Petković, D. and Shannon, M. A. 2012. Tara National Park – Resources, Management and Tourist Perception, In: Sladonja Barbara (editor) Protected Area Management, InTech, Rijeka, Croatia, p. 73–92.
- Tomicević, J., Bjedov, I., Obratov-Petković, D. and Milovanović, M. 2011. Exploring the Park–People Relation: Collection of *Vaccinium Myrtillus* L. by Local People from Kopaonik National Park in Serbia. *Environmental Management* 48: 835–846.
- Tomicević, J. 2005. Towards Participatory Management: Linking People, Resources and Management, A Socio-Economic Study of Tara National Park. Institut für Landespflege der Albert-Ludwigs-Universität Freiburg: Freiburg, Germany, 186 pp.
- Tsuyuzaki, S. 1994. Environmental deterioration resulting from ski-resort construction in Japan. *Environmental Conservation* 21: 121–125.
- US National Park Service 2007. 2006 Statistical abstract. Available from: <http://www2.nature.nps.gov/stats/>
- Vistad, I. 2009. Mental effects of walking. Health and recreation in forest and landscape. Conference Proc., 2009: 1–3.
- Žabkar, V., Makovec Brenčič, M. and Dmitrović, T. 2010. Modelling perceived quality, visitor satisfaction and behavioural intentions at the destination level. *Tourism Management* 31: 537–546.
- Walker, B., Carpenter, S., Anderies, J., Abel, N., Cumming, G.S., Janssen, M., Lebel, L., Norberg, J., Peterson, G.D. and Pritchard, R. 2002. Resilience management in social-ecological systems: a working hypothesis for a participatory approach. *Conservation Ecology* 6 (1): 14.
- Wipf, S., Rixen, C., Fischer, M., Schmid, B. and Stoeckli, B. 2005. Effects of ski piste preparation on alpine vegetation. *Journal of Applied Ecology* 42: 306–316.

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