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Visitor segmentation in a mountain national park: the case of Karkonosze National Park in Poland

Abstract. As the number of people visiting national parks in Poland is constantly growing, it is important to recognise their varying motivations and preferences. This is particularly important in the most popular national parks, such as the *National Park in the Karkonosze Mountains* (KNP). KNP is visited by two millions tourists annually, which makes it the second most popular national park in Poland. The aim of study was to classify visitors of the national park in terms of their motivation to visit. Three main categories of visitors were identified: leisure seekers, nature lovers and active tourists. The category of leisure seekers was the largest and most diverse with respect to their preferences. Nature lovers knew a lot about the park, especially as regards its geodiversity and its fauna and flora. The number of active visitors keeps growing every year. Active tourism, especially in the KPN, requires advanced equipment and good physical fitness. The findings of the study tourism trends in mountain national parks and can provide insights for its management. The article ends with some predictions regarding future trends and changes in the classification of KPN visitors after the pandemic.

Keywords: tourist traffic, visitors, visitor classification, visitor behaviour, national park, Karkonosze National Park

JEL Codes: Z32, Q01; R11

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1. Introduction

The number of people visiting national parks in Poland keeps growing. Visitors tend to spend more time engaging in active tourism in natural areas. This means that tourist traffic and its impacts need to be monitored in order to guarantee public safety. This is particularly important in the most popular national parks, such as Karkonosze National Park (KNP). According to official statistics (Environment, 2021), in 2020 KNP was visited by 2.036 million tourists, which makes it the second most popular national park in Poland.

As can be expected, motivations and preferences of visitors vary. It can be assumed that factors motivating visitors to visit parks largely determine which places they choose to visit and which facilities to use. The objective of the study described in this article was to classify visitors of KNP on the basis of their main motivation using data collected in 2017-2018 and 2020. In particular the purpose of the study was to answer the following questions:

1. Does visitors' place of residence influence the frequency and season of their visits?
2. How did the behaviour of different categories of visitors change as a result of the COVID-19 pandemic?
3. How are preferences of different categories of visitors expected to change in the post-pandemic period?

It was assumed that the main reason for visiting parks determines visitors' behaviour. It will behave differently an cultural, active or nature-based tourist. Such a tourist may have different preferences in accommodation type, visiting spots or socio-demographic characteristics.

2. Literature review

Visitor behaviours in protected mountain areas is a common topic of research. Pietilä and Fagerholm (2016) identified visitors' norms within outdoor recreation settings in Oulanka National Park. Chiu, Chan, & Marafa (2016) investigated local residents' perceptions and preferences concerning the development of nature tourism in Hong Kong. Baral, Hazen, & Thapa (2017) examined whether visitors to Sagarmatha (Mt. Everest) National Park recognized it for its exceptional beauty and aesthetics. Moyle et al. (2017) examined potential visitors' preferences for nature-based visitor experiences that would alleviate pressure on the iconic summit of Mount Warning in Australia. Marques, Reis, & Menezes (2010) identified five distinct categories of visitors in protected areas in Portugal, taking into account their motivations to visit and the perceived importance of activities, facilities and services, frequency of visit and socio-demographic characteristics.

Konu and Kajala (2012) identified four categories of visitors in Finnish national parks: social self-developers, exercising nature explorers, nostalgia appreciative seekers of mental well-being and nature-oriented relaxation seekers. Sievänen, Neuvonen, & Pouta (2011) distinguished five groups of tourists in Finnish national parks: countryside and outdoor friends, safari riders, guided visitors, room and rental seekers and uninterested. Getzner (2019) estimated benefits of nature conservation programs in regard to different degrees of naturalness in two regions in the Austrian Alps. Lopes, Remoaldo, & Ribeiro (2019) categorized tourists on the basis of their involvement and tourism knowledge and analysed their perceptions of the impacts of tourism.

The classification of tourists is important from the perspective of the local economy in and around national parks. It is important to recognize customer behaviour in the market (Panasiuk, 2007) and territorial marketing of protected natural areas (PNA) (Kulczyk-Dynowska, 2012). Only by getting to know their visitors through the process of market segmentation will park managers be able to identify different visitor profiles and understand their motivations, expectations, and needs (Ferrari, Gilli, & Bollani, 2018). The problem of visitor classification is a common issue in national parks. Carvache-Franco, Segarra-Oña, & Carrascosa-López (2019) analysed motivations and segmentation of demand in a coastal national park and identified three groups of tourists: nature tourists, reward and escape tourists and multiple motives tourists. The segmentations was based on visitors' attitudes to tourism: from positive (e.g. lovers, enthusiasts, supporters, optimistic), through neutral (e.g. ambivalent and cautious, rational, passive observers), to negative (e.g. critics, opposes, protectionists, sceptics). Jones and Nguyen (2021) identified four types of visitors to a Japanese national park: 'enjoying nature with family or friends', 'improving physical health', 'discovering and learning' and 'escaping. Barić, Anić, & Bedoya (2016) categorized tourists visiting Paklenica National Park into activists and passivists. Classifications can also be based on the degree of visitors' affinity for a national park (Arnberger et al. 2012). A study by Jones and Ohsawa (2016) found that nature-based tourism was the fastest growing segment. Prószyńska-Bordas (2017) used k-means clustering to identify five segments representing motivations of tourists visiting 11 national parks in Poland: relaxation, nature, integration, sightseeing and physical activity. Taczanowska et al. (2019) distinguished four categories of people visiting Kasprowy Wierch in the Tatra Mountains. The impact of the COVID-19 pandemic on tourism in national parks is the newest line of research. McGinlay et al. (2020) identified the most important challenges for tourism in national parks during the COVID-19 period, which include: overcrowding, new visitor profiles, problematic behaviours, and conflicts between different stakeholder groups. According to Mandić (2021), "The decline in economic activities and tourism during the COVID-19 pandemic has reduced the pressure on the environment and protected area (PA) systems to some extent. However, the financial losses within nature-based

tourism due to travel restrictions and park closures will negatively impact tourism income-dependent PAs' management effectiveness". Niezgodna and Markiewicz (2021) examined "changes triggered at different stages of restrictions introduced by the government to prevent the spread of the pandemic" and offered predictions about "how the pandemic may affect the development of tourism in terms of supply". Finally, Rogowski and Rusztecka (2021) and Rogowski (2022) studied the impact of the COVID-19 pandemic on the behaviour and the number of visitors in KNP.

The segmentation study described in this article concerns visitors of Karkonosze National Park. Similar studies have been conducted in other national parks in Poland: Tatra National Park (Baścik, Czubernat, & Pociask-Karteczka, 2007; Czochoński & Szydarowski, 2000; Hibner, 2012, 2013, 2014; Mokras-Grabowska, 2016; Pociask-Karteczka, Baścik, & Czubernat, 2007), Bieszczady National Park (Prędko 2006, 2012), Gorce National Park (Prószyńska-Bordas & Markiewicz, 2011), Stołowe Mountains National Park (Prószyńska-Bordas, 2008; Rogowski, 2017). Such studies often rely on data collected using various visitor tracking systems (Rogowski, 2018, 2020).

Previous studies of tourism in KNP (Wieniawska, 2004; Wieniawska-Raj, 2007, 2010) have revealed that the number of visitors is the highest in July and August and the lowest in December and March. The most popular spots in KNP include the highest peak (Śnieżka), the subalpine plateau Równia pod Śnieżką and two waterfalls: Kamieńczyk and Szklarki. According to Erlebach and Romportl (2021) in Czech part of Karkonosze Mts. the highest number of visitors were in February, January, July and August and the lowest in April. According to Hibner (2013), the majority of tourists visiting KNP were young people with higher education, most trips lasted more than three days and the majority of respondents came from the province where the national park was located and from the neighboring provinces. According to Fąk and Jarecka (2014), tourists come to Karkonosze Mountains to go sightseeing, to look for adventure, and improve their health. Michalczak and Wojcierska (2014) identified 3 main categories of tourists: individual tourists arriving in large numbers, sentimental tourists, and recreation-oriented tourists. The outcomes of Čihař and Trebický (2000), Čihař, Štursa, & Třebický (2002) and Bartoš and Čihař (2010) works are: the most visitors arrived in Karkonosze Mts. by car and stayed at pensions and hotels. First results of current study was presented by Żyto and Rogowski (2019).

3. Tourism in Karkonosze Mountains

The Karkonosze Mountains are the highest and the largest range of the Sudetes, extending across the Czech-Polish border region. Their highest peak, Śnieżka (1603 m), is also the highest peak of the Sudetes. Karkonosze are the highest

mountain range of the Central Uplands, which “extend east-west across central Europe and include western France and Belgium, southern Germany, the Czech Republic, and parts of northern Switzerland and Austria” (National Geographic, b.d.). “Thanks to their geographical location, exceptional landforms and moist climatic conditions, Karkonosze are home to so-called post-glacial relics, i.e. plant and animal species typically found in the glacial period, which have survived until present times”. The mountains are inhabited by a number endemic species (KPNMAB, b.d.). KNP was established in 1959 and has an area of 55.76 km², with nearly 34 km² covered by forests. In 1992, KNP with the neighbouring Czech Krkonošský národní park became part of the Krkonose / Karkonosze biosphere reserve under UNESCO’s Man and the Biosphere (MaB) programme. Karkonosze are a major tourism destination in Poland (Lijewski, Mikułowski, & Wyrzykowski, 2002), first category tourism destinations in Poland (Wyrzykowski 1986), and one of the most popular Polish national parks (Kruczek 2014). The number of visitors in KNP is currently determined by counting entrance fees charged at eight entrances to the park: 839,673 visitors were registered in 2017, 949,673 in 2018 and 1,245,237 in 2020. In order to get a more accurate estimate, fee-based counts were compared with data from other sources as shown in Table 1. Counts in the “Data” column included: above mentioned entrance

Table 1. Monthly numbers of visitors in KNP in 2017, 2018 and 2020

Month	2017		2018		2020		Percentage of annual total		
	Data	Estimate	Data	Estimate	Data	Estimate	2017	2018	2020
Jan	45 912	55 094	41 817	50 180	113 155	135 786	4.4	3.4	6.7
Feb	67 245	80 694	62 679	75 215	125 583	150 700	6.4	5.1	7.4
Mar	25 658	30 790	26 091	31 309	28 325	33 990	2.5	2.1	1.7
Apr	44 825	53 790	63 997	76 796	2 817	3 380	4.3	5.2	0.2
May	108 093	129 712	160 451	192 541	66 286	79 543	10.3	13.0	3.9
Jun	132 021	158 425	117 846	141 415	154 152	184 982	12.6	9.5	9.1
Jul	206 282	247 538	226 658	271 990	372 056	446 467	19.7	18.3	21.9
Aug	243 543	292 252	256 740	308 088	375 950	451 140	23.3	20.7	22.1
Sep	90 457	108 548	137 828	165 394	253 707	304 448	8.6	11.1	14.9
Oct	50 260	60 312	83 470	100 164	117 589	141 107	4.8	6.7	6.9
Nov	13 924	16 709	33 100	39 720	39 860	47 832	1.3	2.7	2.3
Dec	18 110	21 732	28 243	33 892	47 999	57 599	1.7	2.3	2.8
Total	-	1 255 596	-	1 486 704	-	2 036 975	100.0	100.0	100.0

Source: KNP data (unpublished) and own research.

fees, electronic entrance fees, the Big Family Card¹ (*Karta Dużej Rodziny*), ski lifts tickets in Kopa Ski Arena and Ski Arena Szrenica and data from pyro-electric sensors located at 22 non-ticketed park entrances. These pyro-electric sensors are located on less popular trails. All data were provided by KNP. However, these counts are still incomplete as they do not include 11 other park entrances to KNP and all park entrances to the Krkonošský národní park (KRNAP) in the Czech Republic. As a result, KNP park managers suggested they should be increased by 20% to obtain a more realistic total of visits (the Estimate column in Table 1).

The months of July and August are the high season: the total number of visitors (after a 20% upward correction) during these two months in 2017 was estimated at 539.8 thousand (42.9% of annual visitors) and 580.1 thousand (39.0%) in 2018. The monthly share in May, June and September ranges from 8 to 10%, while during the low season months – from 2 to 5%. In July and August 2020 the combined number of visitors was close to 900,000, which accounted for about 44.1% the annual total. Later on in that year, the number of visitors decreased to 304.4 thousand in September and 141.1 thousand in October, but it was still higher than that recorded in the same months 2 and 3 years earlier. This is because, with restrictions on foreign travel still in effect, September was also treated as a holiday season.

4. Research procedure

Questionnaires surveys are a common method of data collection in order to measure characteristics of large populations. Random sampling is used to select a group of respondents whose characteristics are representative for the population. According to Kajala et al. (2007), questionnaires are used in surveys to produce sets of data that accurately describe visitors, their visits, and their mode of travel to the park.-

A PAPI² survey, including a questionnaire used by the Monitoring System of Tourist Traffic (MSTT) (Rogowski 2020), was used in 2017-2018 to collect information about the behavior and socio-demographic characteristics of visitors. The survey was conducted at several frequently visited spots in KNP close to Karpacz (near the Wang Temple, Samotnia, Strzecha Akademicka, Śląski Dom and Szklarska Poręba), near Szklarka and Kamieńczyk waterfalls, Hala Szrenicka and the Szrenica shelter. Respondents were interviewed between 9 a.m. and 6 p.m. on 16 randomly selected days (8 weekdays and 8 weekend days) in each of the four seasons (mid-spring, mid-summer, mid-autumn and mid-winter). A CAWI

¹ Big Family Card is a social programme of the Polish government enabling families with three or more children to use various discounts or benefit from free access to recreation.

² Pen and Paper Personal Interview

survey³ was conducted in 2020 using an online questionnaire posted on the park's official website and the page on Facebook (<https://www.facebook.com/KarkonoskiParkNarodowy>). 1886 questionnaires were collected in total: 560 in 2017, 659 in 2018 and 582 in 2020.

5. Results

5.1. General visitor characteristics

The sample included respondents from provinces in the western part Poland, with similar proportion of men and women. The mean age of the respondents in the two reference periods varied: 33.68 in 2017-2018 to 36.58 in 2020. The most numerous group of respondents in 2017-2018 were aged 20-29, followed by those aged 30-39 and 40-49. In 2020, most numerous group was 30-39, then 40-49 and 20-29 (Table 2).

65% of respondents in 2017-2018 came from 3 provinces: Wielkopolskie, Dolnośląskie and Mazowieckie (Fig. 1). In 2020, 45% of visitors came from Dolnośląskie, because the use of accommodation facilities was limited by the COVID-19 restrictions, and one-day trips were the preferable option (Fig. 2).

Most visitors arrived at the KNP region by car and approximately every fourth by public transport. In 2020, the role of own car transportation rightly increased. Bus transportation declined, while the train transportation was similar. KNP visitors seemed to believe that rail transportation is safer than bus transportation in terms of epidemiological considerations. Almost half of visitors stayed in Karpacz and Szklarska Poręba. Fewer visitors stayed in villages in middle part of region: Ściegny, Przesieka, Sosnówka, Borowice, Podgórzyn, Staniszków, Piechowice and Miłków. All accommodation places are located at the distance of 5 km from KNP border. The most popular in accommodation was guesthouse and hotels in 2017-2018. In 2020 the most popular accommodation facilities in the KNP area were mountain shelter (24.2%). First time visitors noted renting private apartments (15.2%) in the park area due to their ability to offer safer health-related conditions. The guesthouse facilities were also quite popular. Private rooms in private homes (9.9%) and hotels (9.4%) were less popular. Hotels had the largest loss of business in this year. The choice of accommodation was determined by price, location in a quiet neighborhood and possibility to book via website. In 2020 the most important factor to choice of accommodation was health-related conditions:

The share of first time visitors has decrease in recent years. As can be expected, the frequency of visits increases with the declining distance from visitors' place of residence. This is especially evident in the case of first-time visitors: in 2017-2018

³ Computer-Assisted Web Interview

Table 2. Characteristic of KNP visitors surveyed in 2017-2018 and 2020

Characteristic	2017-2018 (%)	2020 (%)
Women	53.4	52.1
Men	46.6	47.9
< 19 years old	7.7	3.3
20-29	29.1	24.2
30-39	27.1	39.6
40-49	22.5	25.6
50-59	5.4	5.0
60-69	3.3	2.2
>69 years old	0.7	0.0
Arrived by car	77.1	81.7
Arrived by train	12.3	13.8
Arrived by bus	11.4	1.2
First time visitors	26.8	10.6
Once-a-year visitors	44.7	52.4
Frequent visitors	28.5	37.0
Spring	37.1	31.7
Summer	56.3	67.4
Autumn	32.1	22.4
Winter	30.1	10.9
1 day	7.5	13.8
2-3 days	42.1	32.4
4-7 days	43.9	39.6
> 7 days	6.5	14.2
Average length of stay	4.28	5.75
Guesthouse	32.0	21.2
Holiday resort	8.8	4.1
Hotel	24.8	9.4
Apartment	0.0	15.2
Private room	12.1	9.9
Mountain shelter	13.6	24.2
Camping site	1.2	0.9
Visits with family	41.6	40.6
Visits with friends	30.5	13.0
Alone	2.1	6.5

Source: own research.

28.1% of them came from the Masovian province, while first time visitors from Wielkopolskie accounted for only 14.4%. The majority of tourists visit KNP in the summer season, which was also the case in 2020 because of the declining number of COVID-19 infections and the removal of most pandemic restrictions. In 2020,



Fig. 1. KNP visitors surveyed in 2017-2018 by province of residence

Source: own research.



Fig. 2. KNP visitors surveyed in 2020 by province of residence

Source: own research.

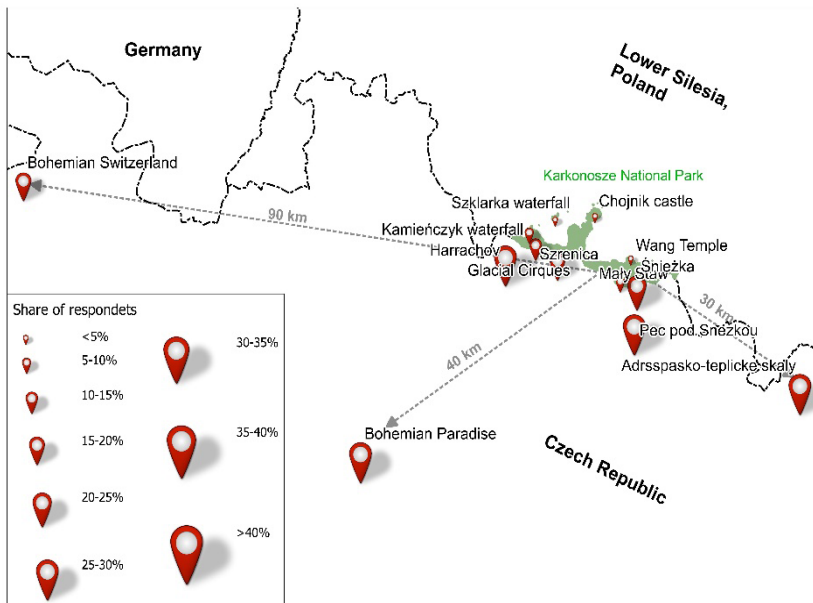


Fig. 3. Most visited sites in and around KNP in 2017-2018

Source: own research.

the percentage of frequent visitors was higher than in 2017-2018, mainly as a result of the influx of one-day visitors from Dolnośląskie in the summer season. Compared to 2017-2018, the percentage of respondents who visited KNP in spring, autumn and winter was lower in 2020. In autumn 2020 the biggest percentage of visitors came from Dolnośląskie (47.3%) and in winter from Wielkopolskie (48.1%). The survey data indicate that outside vacation periods the majority of visits are short and are mostly undertaken by people living in the relative vicinity of the KNP. Visitors from more distant regions came mostly during vacation periods. The biggest percentage of visits in the reference years lasted between 4 and 7 days, which was even bigger in 2020. The smallest percentage of tourists visited the park either for one day or for more than one week, but in 2020 the frequency of such visits increased. The average length of stay, which in 2017-2018 was 4.28 days, increased to 5.75 days in 2020. Family visits were the most common and a third of respondents in the surveys came with friends. The popularity of family visits remained the same in 2020 (40.6%). Owing to health concerns, the percentage of individual visitors in 2020 grew to 6.5%, while the percentage of visits with friends declined substantially to 13.0%.

The most frequently visited sites included Śnieżka, Szrenica, Mały Staw and "Samotnia", the Wang Temple, Szklarka and Kamieńczyk waterfalls (Fig. 3). In

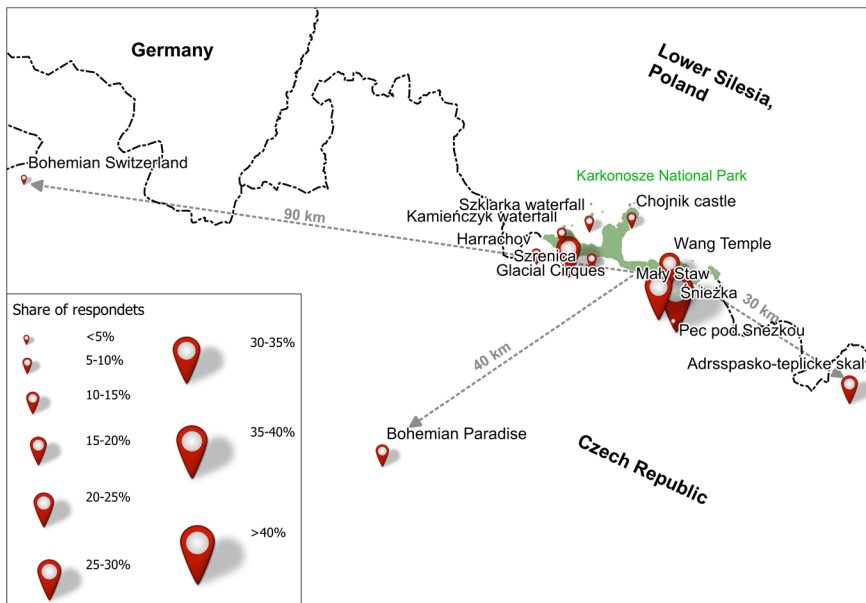


Fig. 4. Most visited sites in and around KNP in 2020

Source: own research.

2020 fewer tourists mentioned the most popular attractions while the number of other attractions visited instead increased, including those outside the national park, which had been less popular in previous years (Fig. 4). In 2017-2018 about a half of attractions visited by surveyed respondents were located outside the KNP. The average number of visited attractions was 35, while 91.1% of tourists visited the 10 most popular attractions. The total number of attractions in the KNP area that tourists surveyed in 2020 claimed to have visited was 148, while the top 10 attractions were visited by only 53.2%. This indicates that tourist traffic was dissipated over the entire Karkonosze Mountains and the surrounding area. This new pattern can be explained by people's desire to visit places not visited previously and avoid the most popular tourist sites.

5.2. Segmentation of KNP visitors

The main reason for visiting the KNP included leisure, contact with nature and physical activity (Table 3). Other motivations were selected much less frequently. It was hypothesized that respondents classified into each of the three segments would be characterized by different behavior patterns (Tables 3 and 4).

Table 3. The main motivation of visitors to the KNP

Main motivation	All respondents (n = 1806) (%)	2017-2018 (n = 1220) (%)	2020 (n = 586) (%)
Leisure	51.4	64.3	24.4
Contact with nature	25.7	14.7	48.5
Physical activity	17.9	16.6	20.7
Other	5.0	7.4	6.4

Source: own research.

Table 4. Demographic profile of visitors segments in KNP

Characteristic		Leisure		Contact with nature		Physical activity	
		2017-2018 (n = 785) (%)	2020 (n = 143) (%)	2017-2018 (n = 137) (%)	2020 (n = 284) (%)	2017-2018 (n = 202) (%)	A2020 (n = 121) (%)
Sex	Women	56.9	62.0	60.4	56.9	49.2	49.0
	Men	43.1	38.0	39.6	43.1	50.8	51.0
Age	< 19 years old	6.3	3.8	6.1	1.4	12.9	0.5
	20-29	30.0	22.4	31.6	19.5	27.5	20.7
	30-39	26.5	35.9	23.5	38.2	29.8	43.4
	40-49	25.0	27.8	22.4	27.9	15.8	26.8
	50-49	8.5	7.6	11.2	9.8	8.8	7.6
	60-69	3.5	1.7	5.1	2.6	4.7	0.5
	>69 years old	0.1	0.4	0.0	0.6	0.6	0.5
Frequency of visits	First time visitors	26.6	12.2	41.4	11.5	16.3	7.5
	Once-per-year visitors	45.2	33.3	27.9	37.1	51.1	43.5
	Frequent visitors	28.2	54.4	30.6	51.4	32.6	49.0
Season of stay	Spring	43.1	33.1	35.1	24.4	43.2	24.8
	Summer	57.4	67.8	60.4	53.1	60.5	48.9
	Autumn	37.6	23.8	24.3	16.0	36.8	17.3
	Winter	29.0	10.0	19.8	6.4	55.1	9.0
Length of stay	1 day	6.2	5.9	13.5	12.9	3.2	14.0
	2-3 days	31.1	27.1	22.5	29.9	20.0	34.0
	4-7 days	57.0	55.7	56.8	43.4	63.2	38.5
	> 7 days	5.7	11.3	10.8	13.8	13.5	13.5
	Average length of stay	4.3	5.9	4.5	4.9	5.8	5.6
Type of accommodation	Guesthouse	33.1	21.3	30.5	21.0	28.5	19.9
	Hotel	27.6	11.1	18.9	7.8	16.3	7.5
	Mountain shelter	11.0	20.9	17.9	21.6	23.2	24.9
	Private room	8.4	9.6	9.5	12.4	8.7	9.5
	Holiday resort	11.0	5.4	14.7	4.9	16.8	2.5
	Camping	8.8	0.4	8.4	0.6	6.4	1.0

Source: own research.

Segment I – Leisure

Leisure visitors are the largest group of tourists in the KNP. Most respondents in this segment were aged 20-49. They came mainly from the Western part of Poland mainly from Wielkopolskie and Dolnośląskie (Fig. 5 and 6).

As can be expected, the biggest percentage of visitors are residents of Dolnośląskie. Two thirds of them visit the park at least once a year, preferably in the summer when days are longer, temperatures are higher and there is a lot of sunshine. In 2020 the percentage of visitors who came in the summer was higher. Leisure stays last most often 4 to 7 days, less often 2 to 3 days. The average length of stays lengthened from 3.9 to 5.9. Leisure visitors stays at various quality stays accommodation and following years chosen higher quality of stays – hotels and guesthouses also more often use restaurant services. In 2020 the percentage share of this segment considerably declined (24.4% vs. 64.3% in 2017-2018) because many leisure facilities were either closed or operated on a limited basis, e.g. waterparks. In 2020 the average length of stays increased, mainly because the percentage of stays longer than 7 days doubled. 42% of all leisure tourists stayed at guesthouses and mountain shelters, while the use of hotels and holiday resorts decreased significantly.



Fig. 5. Leisure visitors surveyed in 2017-2018 by province of residence

Source: own research.



Fig. 6. Leisure visitors surveyed in 2020 by province of residence

Source: own research.

Segment II - contact with nature

Visitors seeking contact with nature are the second largest segment. They are particularly interested in the assets of national parks and play a key role in sustainable tourism. The main areas of interest were identified for this group of respondents: geoheritage (83%) and the desire to learn about local flora and fauna (17%). As in the case of segment I, most respondents in this segment were aged 20-49 and came mainly from Wielkopolskie and Dolnośląskie (also Mazowieckie in 2017-2018) (Fig. 7 and 8).

Visitors in this segment prefer to discover new regions rather than return to areas that they have already visited, so they are usually first-time visitors. Compared to the previous surveys, in 2020 the percentage of frequent visitors in this segment increased to over 51%. There is also a clear preference for the summer season. Compared to 2020, a bigger percentage of tourists visited in the spring and autumn of 2017-2018 (40% vs 59%). As in the case of segment I, most respondents in this category arrived for 4-7 days. The percentage of visitors classified into this segment was considerably higher in 2020 (48.5% vs 14.7% in 2017-2018).



Fig. 7. Visitors seeking contact with nature surveyed in 2017-2018 by province of residence

Source: own research.



Fig. 8. Visitors seeking contact with nature surveyed in 2020 by province of residence

Source: own research.

Segment III – physical activity

In 2017-2018 active tourists were the second largest segment of visitors in KNP (16.6%). A third of respondents in this group linked their stay with health-related activities and used wellness & spa resorts. As in the other two segments, the majority of visitors are aged 20-49, and mainly come from Wielkopolskie and Mazowieckie (Fig. 9), where the KNP is located.

Active visitors are loyal – more than half of them come to KNP at least once a year, especially in summer and winter seasons. Their stays usually last between 4 and 7 days, with the longest average length of the three groups. Active tourists most often stay at guesthouses or private rooms, mountain huts and in wellness & spa resorts. This group is more interested in being close to nature and away from urban areas than in having a high quality hotel experience. In 2020 active tourists were young and middle-aged inhabitant of Dolnośląskie (Fig. 10).

Active visitors arrived mainly in summer and spring and one per year. The average length of stays decreased in 5.6 days. The most popular accommodation facilities were mountain shelter and guesthouse.



Fig. 9. Active visitors surveyed in 2017-2018 by province of residence

Source: own research.



Fig. 10. Active visitors surveyed in 2020 by province of residence

Source: own research.

6. Conclusions

A comparison of the above results provides a number of key differences to consider. The results are consistent with findings of studies mentioned in the literature review (e.g. Bartoš and Čihař, 2010; Fałk & Jarecka, 2014; Hibner, 2013; Michalczak & Wojcierska, 2014; Prószyńska-Bordas, 2017; Raport analityczny z badań, 2019; Rogowski, 2015). Although visitor preferences in each segments vary, these differences were either small or did not exist at all. In particular, the percentage of first time visitors was the biggest among tourists in segment II. Visitors in this group were more interested in exploring new destinations than returning to the same place again, in contrast to active tourists who preferred to visit the same destinations. The same preference was identified among visitors in the leisure segment. The summer was the most popular season for visitors from all the segments but a bigger percentage of visitors seeking contact with nature also came to KPN in the spring and autumn.

Leisure visitors tend to use higher quality accommodation. Visitors seeking contact with nature tend to use average quality accommodation and active visitors choose accommodation of different quality.

Three visitor segments were identified in the study: (1) leisure visitors, (2) visitors seeking contact with nature (3) active visitors. Leisure visitors are the largest segment, which is characterized by the most diverse behavior patterns. They do not use special equipment and their knowledge about the park is limited, which is not to say they are passive or preoccupied with consumption. They need to be provided with tourist information that can help them to appreciate the natural assets of the region. Leisure visitors are often young and middle-aged people from various regions. They are loyal visitors who make multiple and short visits and use high quality accommodation with diverse services and amenities. The percentage of the leisure segment decreased in 2020 as a result of the pandemic restrictions. Active visitors use advanced equipment and are usually physically fit. The diversity of landforms in the KNP enables the pursuit of various forms of physical activity. They also take part in sports events organized in the KNP. Active visitors are the most loyal group, they prefer the summer and winter seasons and their stays tend to be of medium length, although, on average, they stay the longest of all the segments. Active visitors usually choose to stay at guesthouses or private rooms and at mountain shelters that are conveniently located. Visitors seeking contact with nature are the most desirable group for national parks because of their interest in sustainable tourism. They tend to have the biggest knowledge about the KNP resources. They tend to be young, middle-aged women, and come to the KNP mainly from Wielkopolskie and Dolnośląskie also Mazowieckie. For most of the respondents it is their first visit, and they mostly choose the summer season. They make short visits and select various types of accommodation.

Regarding the specific aim of study, the following conclusions can be drawn:

1. Visitors' place of residence affects the frequency and seasons of their visits. The farther away from the park they live the less frequently they visit it. This is especially true in the case of first-time visitors. In periods other than the summer, short visits prevail, mostly made by inhabitants of Lower Silesia,

2. The COVID-19 pandemic has greatly affected visitor behavior. The share of visitors who came more than once a year increased, mostly thanks to short stays made by inhabitants of Dolnośląskie. One-day visits, also known as staycation, and visits longer than one week were more frequent. The average length of stay increased. Visitor flows in the KNP were less concentrated because people looked for sites they had not visited previously and avoided the most popular ones. In 2020 health-related conditions were the most decisive factor determining the choice of accommodation. Mountain shelters were chosen because they are in remote locations and can only accept a limited number of guests. According to new rules published in 2020, the number of guests per room could not exceed two. As a result, tourists who were able to reserve a room in a mountain shelter could enjoy a more comfortable setting and smaller crowds. Guesthouses and apartments were often chosen because they offered self-contained and separate rooms and living units.

3. The active segment period is likely to increase in the post-COVID-19, along with the public's growing emphasis on health and active lifestyle. Especially the winter season is likely to see an increasing number of visitors. Active visitors practice skiing, hiking with winter equipment, such as crampons and pickaxes, cross-country skiing, and ski-touring. Leisure visitors are probably going to remain the biggest segment in KNP. The number of visitors seeking contact with nature will also probably increase in the post-COVID-19 period. Moreover, the segment will split in to geotourists and flora and fauna fans.

Quantitative and qualitative characteristics of tourist traffic are important indicators of changes in tourist behaviors and need to be taken into account in decisions associated with the management of protected areas. Further work would be required to estimate the economic impact of tourism in the KNP region, the role of main visitor segments in the local economy and the impact of COVID-19 vaccination on visitor behavior in the KNP. Data from such studies could help to estimate future trends and changes in the behavior of KNP visitors, which is important from the perspective of sustainable management of tourism.

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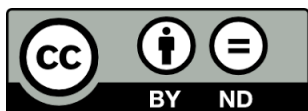
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Segmentacja odwiedzających górski park narodowy na przykładzie Karkonoskiego Parku Narodowego w Polsce

Streszczenie. Parki narodowe przyciągają coraz większą liczbę odwiedzających, których motywy przyjazdu i preferencje są zróżnicowane. W związku z tym istotne jest ich rozpoznanie i zrozumienie. Dotyczy to szczególnie obszarów o największej popularności, takich jak Karkonoski Park Narodowy (KPN), który każdego roku odwiedzają ok. 2 miliony osób. Celem artykułu jest klasyfikacja osób odwiedzających Karkonoski Park Narodowy ze względu na główny motyw przyjazdu. Na podstawie głównych motywów wyodrębniono trzy segmenty odwiedzających: (1) wypoczywających, (2) miłośników przyrody i (3) turystów aktywnych. Kategoria turystów wypoczywających była najliczniejsza i najbardziej zróżnicowana pod względem zachowania. Kategoria miłośników przyrody charakteryzuje się dużą znajomością zasobów KPN, zwłaszcza w zakresie przyrody nieożywionej i ożywionej. Trzecia grupa, obejmująca turystów aktywnych, rośnie z roku na rok. Turystyka aktywna, w szczególności w KPN, wymaga zaawansowanego sprzętu i kondycji fizycznej. Wyniki badań potwierdzają trendy w turystyce na terenie górskich parków narodowych i mogą pomóc zarządzaniu nią. Na koniec podjęto próbę prognozowania zmian w segmentacji ruchu turystycznego w KPN po pandemii.

Słowa kluczowe: ruch turystyczny, odwiedzający, segmentacja odwiedzających, zachowanie odwiedzających, park narodowy, Karkonoski Park Narodowy



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