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TOURIST TRAFFIC IN NATIONAL PARKS IN POLAND

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ABSTRACT: The article aims to assess the size of tourism in national parks in Poland in 2004-2017, with particular emphasis on the Tatra National Park (TPN), a park with high tourist attendance. The study investigates the dynamics of tourism in national parks as well as the size, character and spatial distribution of tourism in the TPN. It also shows the conditions of tourist traffic management in national parks and its importance both for nature and for the budget of these organizational units. The analysis was based on data from the studies of the Central Statistical Office concerning environmental protection and data concerning the access to the Tatra National Park. The dominant features of tourism include its dynamic growth in the period under study and record attendance in the Tatra National Park, especially around August 15 on the trail leading to the Morskie Oko lake and the Valley of Five Polish Lakes (Dolina Pięciu Stawów Polskich).

KEY WORDS: national park, tourist traffic, Tatra National Park

Introduction

The Act on Nature Conservation establishes forms of nature protection binding in Poland, which include national parks, nature reserves, landscape parks, "Natura 2000" areas, protected landscape areas, nature monuments, documentation sites, ecological grounds and natural and landscape complexes (Act of 16 April 2004, Article 6). The areas covered by the indicated forms of protection cover 32.5% of the country's area. So far, 23 national parks have been created in Poland. They occupy a total area of 315.1 thousand hectares, which is 3.1% of the area covered by nature conservation and 1% of the country. The largest one is the Biebrza River National Park (59,233 ha), while the smallest one is the Ojcowski National Park which covers 2,145.7 ha (GUS, 2018, pp. 104, 107, 108).

A national park is defined in the Act on Nature Conservation (Article 8(1) and (2)) as an area distinguished by a specific natural, scientific, social, cultural and educational values, with an area of not less than 1000 ha, on which all nature and landscape values are protected. It is created to conserve biodiversity, resources, formations and components of inanimate nature and landscape values. It aims at maintaining the proper condition of natural resources and restoring distorted natural habitats, plants, animals, or fungi. National parks are the most valuable areas in terms of nature resources; therefore, they are covered by the highest level of protection. Their natural and cultural riches have gained recognition worldwide. The Biebrza River, part of the Karkonosze, Narew River, Poleski, Słowiński, Wigry and Warta River parks are covered by the Convention on Wetlands, also known as the Ramsar Convention, of international importance, especially as the living environment of aquatic birds. The natural value of these areas was also confirmed by UNESCO, which entered the Babia Góra, Białowieża, Bieszczady, Bory Tucholskie, Kampinoski, Karkonosze, Poleski, Roztocze, Słowiński, and the Tatra national parks as Biosphere Reserves, and recognized the Białowieża National Park as World Heritage site (GUS, p. 107; Grabowski, Kotyła, 2019).

Initially, the most important tasks of national parks were nature conservation and conducting natural scientific studies. Today, however, parks have acquired new tasks that cause certain effects of economic and social character. Currently, the main task of national parks is to (the Act of April 16, 2004, Article 8b item 1):

- conducting protective measures in ecosystems of the National Park, aiming to achieve the purpose for which national parks were established, and thus preserve their biodiversity, resources, formations and elements of inanimate nature and landscape values, restore the proper state of

resources and elements of nature, reconstruct distorted natural habitats of plants, animals or fungi,

- making the area of the national park available to the public on terms specified in the plan of protection or conservation tasks and in the ordinances of the director of the national park,
- conducting activities related to education regarding nature.

The aim of the article is to assess the size of tourism in national parks in Poland in 2004-2017, with particular emphasis on the – Tatra National Park (TPN), a park with high tourist attendance.

Determinants of making national parks available for tourism

National Parks are areas located in the most attractive places in Poland in terms of natural resources and landscapes. Therefore, the task of making them available for tourism is very demanding. In order to meet this challenge with the least possible damage to nature, tourist trails are maintained as is appropriate infrastructure (hostels, shelters, camping sites and grounds), and sanitary facilities are built.

According to the Act on nature conservation, a park area should be made available in such a way that tourism does not adversely affect the protection of nature. There is a problem of tourist overload, which is caused by the same factor as the establishment of each of the parks. The fact that nature is protected for the tourist and against the tourist at the same time is being discussed more and more. Management of tourist traffic in national parks, especially in the most crowded ones, is a very difficult task. Despite channelling tourist traffic by creating a network of hiking trails, too much tourism hurts nature. Tourists themselves are a threat to the protected nature if they break the rules and lack good manners. Loud behaviour, feeding animals, littering, picking plants, going off the marked trails, which, among other things, triggers erosion, defecation and urinating outside the designated facilities, the devastation of natural objects by carving out inscriptions do not facilitate the implementation of this task. A large number of visitors in a protected area exposes it to destruction, becoming a reason for the increasing devastation of the natural resources of such areas.

Making national parks available to the public generates significant revenues from business activities. Ticket fees make up for a third of the total revenues from economic activity and nearly 13% of the total budgets of national parks. Understandably, these revenues are varied in each of the parks. The most popular national park in Poland is the Tatra National Park. Entrance fees are 44.4% of its total revenue (Pater, 2018).

The possibility of charging admission fees is addressed in Article 12.3 and 4 of the Act on Nature Conservation and in the Regulation of the Minister of the Environment of 2013. The law, however, is not quite clear on this issue, because it does not specify whether and where entrance fees are mandatory. Article 12 item 3 of the Act indicates that entry can be paid, and in item 10, a requirement is stated for the Minister of the Environment to issue a special regulation concerning some of the parks or areas within them where charges are to be charged. There are, however, parks, for example, the Stołowe Mountains National Park, in which fees are charged for admission (two sites: Szczeliniec Wielki and Błędne Skały), although they are not mentioned in the regulation. A legal basis for tolling is indicated Article 12 item 3 of the Act Nature Conservation, providing the possibility of tolling (Regulation of the Minister of Environment of 18 March 2013; NIK, 2014; Radecki, 2012). The Act indicates that the upper limit of the fee for one-time entry to a national park is PLN 6 (adjusted for inflation), additionally, the director is obliged to exempt children under 7 years of age, persons conducting scientific research in the field of nature protection, pupils and students taking part in classes, inhabitants of the communes and adjacent to the park, persons going to places of religious worship and to beachgoers from the fee. A 50% discount for a ticket should be provided to students, pensioners, disabled persons and soldiers in active service (Act of 16 April 2004, Article 12 item 5, 7, 8).

Data sources and methods

The study included all the National Parks in Poland, with particular focus on the Tatra National Park. Annual data from studies on tourism in national parks, made available by the Central Statistical Office (GUS) in studies entitled *Ochrona Środowiska* (Environmental Protection) for 2005-2018, containing data for 2004-2017, were used. These data were used to show the changes in the volume of tourist traffic, its dynamics and structure. Data were also obtained from the Tatra National Park. They concerned the number of daily ticket sales. However, due to the underestimation for non-ticketed entries, data with a higher degree of aggregation (monthly and annual) plus non-ticketed entries were used for the years 2013-2018.

The annual data on the number of entries to the Tatra National Park [TPN] was analyzed on a trend basis. The resulting time series is characterized by a steady upward linear trend. The linear model expressing the trend is (Aczel, Sounderpandian, 2018, p. 796):

$$Z_t = \beta_0 + \beta_{1t} + a_t \quad (1)$$

where: t – time, t_a – random error, the coefficients β_0 and β_{1t} are, respectively, the intersection of the vertical axis and the slope of the regression function. The equation of simple linear regression is matched to the data by the method of least squares. Estimation of seasonal fluctuations was carried out using the additive model. Its general formula has the following form (Aczel, Sounderpandian, 2018, p. 805):

$$Z_t = T_t + S_t + C_t + I_t \quad (2)$$

where: T is the trend-cycle component, S is the seasonal component, C is a calendar component, and I is the irregular component. In order to eliminate trend *centred moving average* have been used (due to the very low coefficient of determination for the linear regression model for monthly data) The raw absolute level of seasonal fluctuations is calculated as the sum of differences between empirical values and the corresponding moving average values divided by the number of subperiods in an aligned series. If the sum of the calculated raw levels of seasonal fluctuations is different from zero, a correction factor should be entered, so we get cleansed absolute levels of seasonal fluctuations (Sobczyk, 2010, p. 197).

For monthly data on the number of entries to the TPN, relative and absolute increments, as well as dynamic indices, were calculated.

Tourist traffic in national parks in Poland in 2004-2017

In the national parks, tourist traffic is channelled, entrance is allowed only to designated hiking trails, educational trails, walking paths, public roads and other accessible areas. Tourists can visit the parks using hiking trails with a length ranging from 16.7 km in the Warta River National Park to 550 km in the Kampinoski National Park. In the analyzed period, the number of visitors to national parks in Poland exceeded 10 million annually. In 2004, national parks were visited by 10.4 million tourists, and in 2017, there were already 13.3 million visitors, which is an increase of 27.4%. In 2015, the number of visitors to national parks exceeded 12 million and had increased since then (figure 1).

In 2017 compared to 2016, tourist attendance increased by 3%. The observed increase in attendance results not only from the increase in the pressure of tourists on national parks but also from a more careful recording of the number of visitors. The number of tourists is estimated on the basis of the number of tickets and booklets sold, the number of cars parked in the car parks and direct counting of people crossing entrances to the park. In some parks, e.g. Karkonosze and Warta River, electronic sensors have been installed

to monitor tourist traffic (NIK, 2014, p. 35). Despite this, it seems that the number of tourists visiting national parks in Poland has not been thoroughly estimated. The number of tourists and the dynamics of tourism in the parks is presented in table 1.

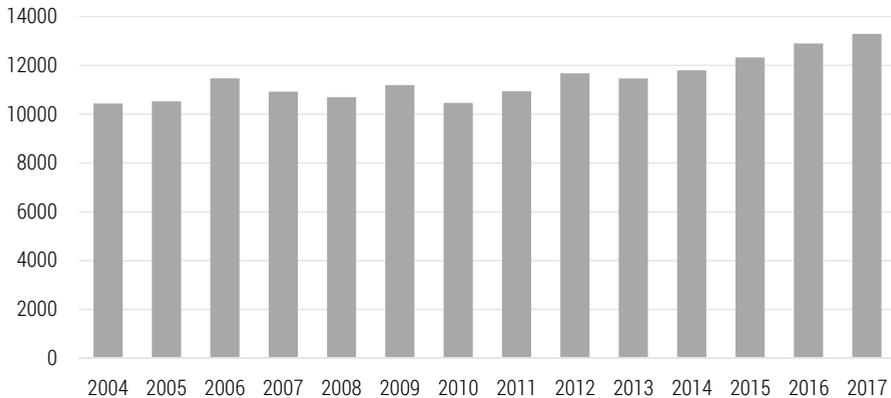


Figure 1. Diagram for the number of tourists in national parks in the years 2004-2017 [in thous.]

Source: author's work based on the GUS data.

Table 1. The number of tourists in national parks in Poland in the years 2004-2017

National park	No. of tourists [in thous.]			Growth rate (2017)		Structure 2017 [in %]
	2004	2016	2017	Id, $t_0=2004$	Id, $t_0=2016$	
Babia Góra	70	114	83.3	119	73.1	0.6
Białowieża	220	163.4	248.7	113	152.2	1.9
Biebrza	33.3	41	46.7	140.3	113.9	0.4
Bieszczady	215	487	513	238.6	105.3	3.9
Bory Tucholskie	20	34.5	31.8	158.9	92.1	0.2
Drawa River	11.3	16	13	115	81.3	0.1
Gorczański	50	80	90	180	112.5	0.7
Stołowe Mountains	349	286	515	147.56	180.1	3.9
Kampinoski	1,000	1,000	1,000	100	100	7.5
Karkonosze	1,500	2,000	2,000	133.3	100	15
Magurski	58	50	50	86.2	100	0.4
Narew	4.9	20	19	387.8	95	0.1

National park	No. of tourists [in thous.]			Growth rate (2017)		Structure 2017 [in %]
	2004	2016	2017	Id, $t_0=2004$	Id, $t_0=2016$	
Ojcowski	350	428	430	122.9	100.5	3.2
Pieniny	700	931	898	128.3	96.5	6.8
Poleski	14.7	44	49	333.3	111.4	0.4
Roztocze	80	186.7	203.4	254.2	108.9	1.5
Słowiński	182.2	323.4	317.2	174.1	98.1	2.4
Świętokrzyski	195	144	144	73.9	100	1.1
Tatra	2,662	3,683.1	3,779.2	141.9	102.6	28.4
Warta River	20	43.2	34.4	172.0	79.6	0.3
Wielkopolski	1,200	1,200	1,200	100.0	100	9
Wigry	100	125	125	125.0	100	0.9
Wolin	1,400	1,500	1,500	107.1	100	11.3
Total	10,435.4	12,900.3	13,290.6	127.4	103	100

Source: author's work based on Ochrona środowiska 2005, p. 272; Ochrona środowiska 2016, p. 269; Ochrona środowiska 2018, Section 5, tabl. 4(163).

Parks in the mountains are the most popular with tourists: the Tatra National Park (3,779.2 thousand), and Karkonosze (2,000 thousand); ones at the seaside: Wolin (1,500 thousand); as are ones located near big cities: Wielkopolski (1,200 thousand) and Kampinoski (1,000 thousand). In 2017, the smallest number of tourists was recorded in the Drawa River (13 thousand) and Narew River (19 thousand) national parks. Interestingly, the Narew River National Park, despite the low turnout, noted a record, almost fourfold increase in the number of tourists in 2004-2017. Nevertheless, its share in the number of tourists visiting national parks, in general, is almost imperceptible, and stands at 0.1%. What is surprising is the low share of the Białowieża and Babia Góra national parks in the total number of tourists. The Babia Góra National Park is highly popular, located not far from Kraków, and a well-known destination for day trips to admire the sunrise on Babia Góra. Yet, the number of visitors is estimated at only 83.3 thousand in 2017, which is only 0.6% in the tourist structure of national parks in 2017. However, in 2016 compared to 2017, the number of tourists fell by 36.9%. Nevertheless, the data for the years 2004–2017 shows that the year 2016 was the record year for park attendance. In other years, the number of tourists ranged from 52 to 83.3 thousand of tourists annually. Meanwhile, the Białowieża National

Park, the crown jewel in the Polish national parks and a World Heritage site have only a 1.9% share in the structure of tourism in 2017. This small popularity, compared to other national parks, turns out to be surprising given the natural resources protected there. It is worth mentioning its history as the Tsars' hunting grounds, and Nazi attempts to destroy these natural treasures. It should be noted that an increase in the number of tourists in the Białowieża National Park was noted in 2017 compared to 2016 by as much as 52.2%. The Tatra National Park has enjoyed record popularity, and not only did it see a big upsurge of interest in 2004–2017 by 41.9%, but even in 2017 compared to 2016 by another 2.6%. In 2017, it was visited by nearly 4 million people.

Table 2. Hiking trails in the national parks in Poland in the years 2004-2017

National park	Trails in general [in km]		Growth rate (2017)	Number of tourists per 1 ha	Number of tourists per 1 km of trail
	2004	2017	id, $t_0=2004$		2017
Babia Góra	53	55	103.8	24.5	1,514.6
Białowieża	38.5	44.3	115.1	23.7	5,613.3
Biebrza	431.8	498.9	115.5	0.8	93.6
Bieszczady	206	465	225.7	17.5	1,103.2
Bory Tucholskie	108.5	93	85.7	6.9	341.6
Drawa River	77	241.3	313.4	1.1	53.9
Gorczański	66.5	169	254.1	12.9	532.5
Stołowe Mountains	161.8	109	67.4	82	4,724.8
Kampinoski	360	550	152.8	29.5	1,818.2
Karkonosze	117.6	125.9	107.1	336	15,885.6
Magurski	85	94	110.6	2.6	531.9
Narew	0.6	54	9000	0.4	351.9
Ojcowski	23	37.4	162.6	199.5	11,497.3
Pieniny	34.7	35	100.9	379	25,657.1
Poleski	35	127	362.8	5.0	385.8
Roztocze	60.3	29.3	48.6	24	6,940.6
Słowiński	144.3	165.7	114.8	14.7	1,914.3
Świętokrzyski	41	41	100	18.9	3,512.2
Tatra	245	275	112.2	178	13,742.6
Warta River	12.6	16.7	132.5	4.3	2,059.9

National park	Trails in general [in km]		Growth rate (2017)	Number of tourists per 1 ha	Number of tourists per 1 km of trail
	2004	2017	id, $t_0=2004$	2017	
Wielkopolski	87.5	233	266.3	158	5,150.2
Wigry	218	272.6	125.0	8.3	458.5
Wolin	44	50.1	113.9	137	29,940.1
Total	2,651.7	3,782.2	142.6	1,664.5	3,514

Source: author's own work based on Ochrona środowiska 2005, p. 272; Ochrona środowiska 2016, p. 269; Ochrona środowiska 2018, Section 5, tabl. 4(163).

In 2004-2017, 20 out of the national parks 23 expanded their networks of hiking trails (table 2). Due to the fact that according to the law tourists can only walk along designated hiking trails, annual congestion is well-illustrated by the number of tourists per 1 km of trail. Given the length of the hiking trails, the most frequented routes were found in the Wolin National Park (29,940.1 pers./km) and the Pieniny National Park (25,657.1 pers./km). Other highly crowded trails are found in the Karkonosze National Park (15,885.6 pers./km), the Tatra National Park (13,742.6 pers./km) and the Ojcowski National Park (11,497.3 pers./km). The least frequented trails included the Biebrza River National Park (78.7 pers./km) and the Drawa River National Park (91.2 pers./km). The data presented in table 2 are annual data, which means that in the months of peak season density of tourists on the trails is much greater.

The annual density of tourists per hectare of the park is also an interesting indicator. It allows you to observe tourist pressure and compare its strength in the individual parks. It should be remembered that this is an illustration indicator only because not all of the park areas are available for tourism, but it shows the tourist pressure on the park area during the year. GUS data from 2017 show (table 2) that the highest density of tourists in relation to the park area was recorded in the Pieniny National Park (379 pers./ha), the Karkonosze National Park (366 pers./ha), and the smallest of the Polish national parks – Ojcowski (199.5 pers./ha). The lowest density was noted in the Narew River National Park (0.4 pers./ha), the Biebrza River National Park (0.8 pers./ha), and the Drawa River National Park (1.1 pers./ha).

Results of the tourist traffic research in the Tatra National Park in 2013-2018

According to the Tatra National Park data, in 2018, nearly 4 million people visited the park. Determining the number of tourists is not easy as there are several ways to get to the park. The number of visitors is determined on the basis of the number of tickets sold by TPN (both at points of sale and e-tickets), the number of tickets for entering the Kasprowy Wierch by cable car and the number of tickets sold at the entrance to the Chochołowska Valley and the Lejowa Valley (these data come from the Forest Community of the 8 Eligible Villages in Witów, which charges fees at this point). In addition to these data, the Tatra National Park assesses the annual number of free of charge entries including:

- entries outside the periods of operation of the ticket sales points (1.5% of the total number of tickets sold),
- entries by residents and other persons exempt from fees (based on the CCTV operating by agents),
- free of charge entries 3% (entries to the TPN in places where there are no ticket sales points and intentional bypasses),
- entries by hostel residents (TPN estimates are based on the numbers of people buying single entrance ticket to the park and staying in the park for more than 1 day),
- Large Family Card entries,
- ski touring entries (based on CCTV input).

The Tatra National Park is the most visited park in Poland, and its popularity among tourists is constantly growing. In comparison with 2013 the number of tourists increased by 1,028 thousand, giving an increase of 35% in just 5 years. To evaluate the effect of the passage of time on the number of tourists visiting the TPN, a linear regression model is used. As shown in table 3 from year to year, the number of tourists increases an average of 216 thousand people. It is worth paying attention to a very high value of R^2 . It says that up to 98% of the number of tourists visiting the TPN variation can be explained by the passage of time. This indicates a very good fit of the model to the actual data.

Tourist arrivals to the TPN are varied during the year. Over the whole period covering the years 2013-2018 most visits in the Park took place in August. In 2018, as many as 820 thousand visitors were noted, which gives an average of 26.5 thousand tourists a day. The analysis of entrances on a daily level shows that park entrances are also differentiated according to the day of the week. The most entrances occur on weekends. For years, the

busiest time in August has been around the bank holiday of 15 August,¹ especially if this day is near the beginning or end of the week, resulting in a so-called long weekend. Despite the growing number of tourists in the park, when it comes to August, the highest number of visitors to the TPN was recorded in August 2016 (895 thousand tourists). The number of tourists visiting the TPN on a monthly basis is shown in figure 2.

Table 3. Assessment of parameters of the linear model describing entries to the Tatra National Park

Specification	Parameter	Standard error	Statistics t	p-value
Constant	2,713,952	59776.45	45.4017	0.000001
Time	215,615	15349.17	14.0473	0.000149

R= 0.9900 R^2=0.9801 Corr. R2= 0.9752 F(1,4)=197.33 p<0.00015

Source: author's work.

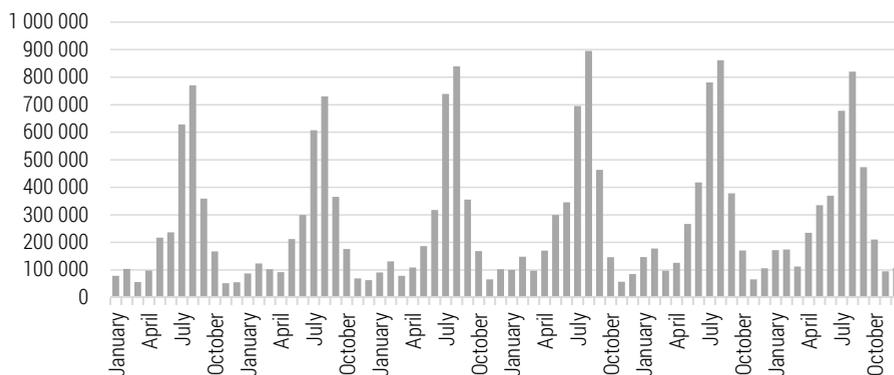


Figure 2. Number of monthly entries to the Tatra National Park in the years 2013 to 2018

Source: author's work.

The analysis of figure 2 shows that the number of visits in April (increase by 140% in 2018 compared to 2013) and January (increase by 119% compared to 2013) has been the largest in the period under review. The increase in the number of January arrivals is associated with, among other things, the popularization of ski touring, while April entries means that more and more people come to Zakopane and the surrounding area every year to spend

¹ In Poland, August 15 is a bank holiday because of a double holiday, civil one, which is the Polish Army Day and a religious one, which is the Assumption of the Blessed Virgin Mary.

Easter there (the figure shows an increase in March or April depending on the month in which that holiday fell in a given year). Interestingly, a strong increase in the number of visitors to the TPN was also noted in November and December (an increase of 84% and 95% respectively in 2018, compared to November and December in 2013). While in December the increase in the number of tourist entries can be associated with Christmas, New Year's Eve and the beginning of the ski tourist season (1,874 such entries to the TPN were recorded in December 2018), the increase in the interest in mountain trips in November can only be explained by the popularization of hiking and love for the mountains.

The lowest growth was observed in the summer vacation season (8% growth in July 2018 compared to July 2013 and 6% in August 2018 compared to August 2013). This is due to limited accommodation, road and parking infrastructure and a large number of tourists on the trails, especially easy ones that do not require advanced skills and equipment.

The number of entries to the Tatra National Park is also geographically diversified. Figure 2 shows the number of tickets sold per year at each toll station. The presented data do not include seven-day tickets and electronic tickets due to the impossibility of their geographical allocation.

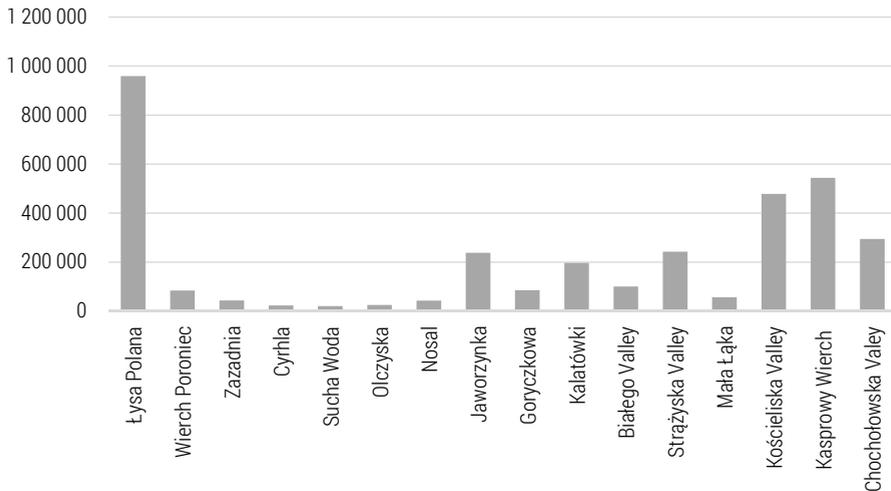


Figure 3. The annual number of tickets sold at various entry points to the TPN in 2018

Source: author's work.

The above figure clearly shows that almost 70% of the tickets are sold at the TPN's four ticket sales points: Łysa Polana, Dolina Kościeliska, Dolina Chochołowska and for the Kasprowy Wierch cable car rides. The all-year-round cableway to Kasprowy Wierch transported 544 thousand passengers

in 2018. In the analyzed period, the number of tourists riding to Kasprowy Wierch grew on average by almost 20 thousand every year (Cf. table 4).

Table 4. Evaluation of parameters for the linear model of the number of entrances to the Tatra National Park in selected points

Specification	Parameter	Standard error	Statistics t	p-value
Kasprowy Wierch				
Constant	422,952.5	10181.17	41.54262	0.000002
Time	19,945.5	2614.28	7.62943	0.001585
R= 0.9673 R ² =0.9457 Corr. R ² = 0,919652 F(1,4)=58,208 p<0,00158				
Łysa Polana*				
Constant	551,386.8	25645.50	21.50033	0.000028
Time	72,810.1	6585.16	11.05669	0.000380
R= 0.9840 R ² =0.9683 Corr. R ² = 0,9604 F(1,4)=122,25 p<0.00038				

* The start of the trail leading to Morskie Oko lake and to the Dolina Pięciu Stawów Polskich valley
Source: author's work.

The distribution of the number of people using the cable cars on a monthly basis is similar to the distribution of the total number of TPN entrances. The highest number of tourists use the cable cars in the summer. In July 2015, almost 105 thousand people took a ride to the peak of Kasprowy Wierch. However, considering the percentage of tickets purchased at the valley station within the number of tickets to the TPN sold in total, the situation is different, as figure 4 shows.

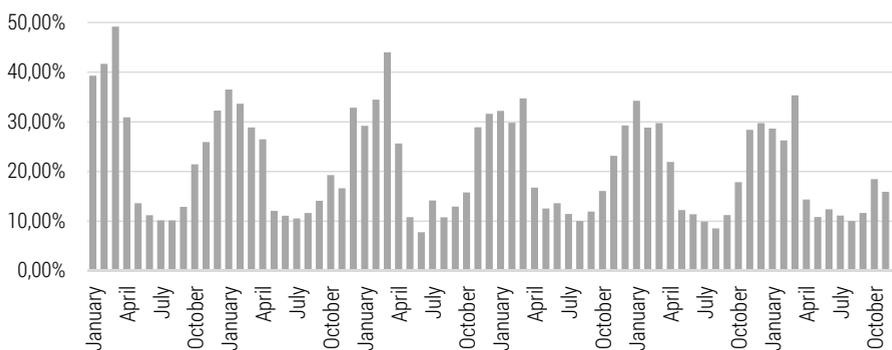


Figure 4. The share of the number of tickets sold at the sales point at Kasprowy Wierch in the number of entries to the Tatra National Park in total

Source: author's work.

The largest percentage of tourists enter the Park using cable cars in winter. In the 2017/18 season from December to March, tourists using the cable cars constituted 26% to 35% of all entries to the TPN. For comparison, in the summer season of 2018, this percentage constituted 10-11%. The reasons for this should be attributed to several factors. First of all, in the summer season, the total number of tourists is much higher than in the winter season, which results in a smaller percentage of people riding to the peak, even at high absolute values. Secondly, two beautiful alpine ski slopes begin at Kasprowy Wierch, therefore many tourists visit the Park just to practice downhill skiing, and the cable car is the easiest way to get to the top.

Access to data regarding the number of entries to TPN on a monthly basis has allowed the decomposition of time series and estimation of seasonality indicators. Cleansed levels of seasonal fluctuations in the number of tourists visiting TPN in total and in selected points are presented in table 5.

Table 5. Cleansed absolute levels of seasonal fluctuations in the total number of tourists visiting TPN and the number of tourists registered in Łysa Polana and Kasprowy Wierch

Specification	Total	Łysa Polana	Kasprowy Wierch
January	11 035	1 714	4 629
February	30 129	8 551	9 540
March	-48 115	-13 087	-2 648
April	-41 666	-17 281	-4 499
May	-25 132	-1 257	-7 580
June	-106 888	-23 640	-12 908
July	146 724	32 535	17 931
August	279 619	69 658	21 995
September	-43 508	-9 084	-3 246
October	-100 166	-23 377	-6 160
November	-78 688	-19 976	-13 338
December	-23 344	-4 757	-3 717

Source: the author's work.

The greatest impact of seasonality was observed in August. The number of tourists visiting TPN in August was higher than the level resulting from the trend by almost 280,000. As a result of seasonality, almost 70,000 more tourists passed through the gateway in Łysa Polana than the trend level showed,

and 22,000 more tourists visited Kasprowy Wierch. Positive seasonality indicators are also observed for July, January and February, which coincides in time with summer and winter school holidays. In the remaining months, the number of TPN visitors is lower than the level resulting from the trend.

The distribution of the number of entries in each month is similar to the total number of entries in most of the entry points to the Tatra National Park. However, an interesting anomaly here is the Chochołowska Valley, for which in recent years the distribution of the number of entries on a monthly basis can be described as bimodal. Special interest in this valley increases in the spring. In April 2018, the number of tickets sold to the Chochołowska Valley was 58,000, while in July it was 44,000, and in August – 55,000 (with the annual traffic amounting to 294,000). The reason for this situation is a fad to take one's photos against the background of crocuses which bloom in large numbers in this area just around April. These flowers bloom, of course, also in many other places in the Tatras, but it is the Chochołowska Valley that has become the "crocus Mecca" of tourists in recent years.

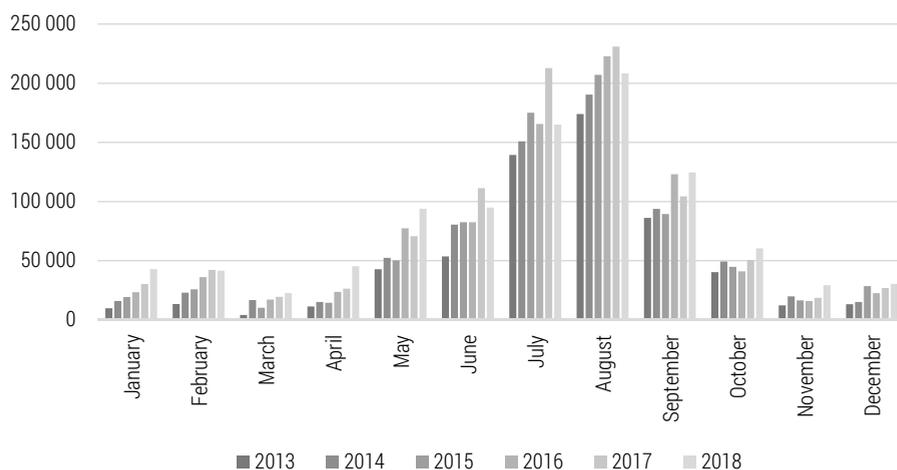


Figure 5. Number of entries to the TPN in Łysa Polana in individual months during the years 2013 to 2018

Source: author's work.

Finally, the gateway to the Tatra National Park must be mentioned through which the largest number of tourists pass every year: the toll point in Łysa Polana. This is where the trail to the Morskie Oko lake and to the Valley of the Five Polish Lakes begins. In 2018, 959 thousand people bought entrance tickets to the Park in Łysa Polana, 208 thousand of them in August. This means that on an average August day there were about 6.7 thousand

people on the road from Palenica Białczańska to the Wodogrzmoty Mickiewicza waterfall (the common part of both trails). This applies only to the tourists who have bought traditional tickets, not counting those who enter with the Large Family Card, those who are exempt from fees, those who have bought seven-day tickets, and so on. As can be seen in Table 4, in the period 2013-2018, the number of tourists entering the Park in Łysa Polana grew year on year by an average of 72.8 thousand annually. The exact number of entries in each month of the period is shown in figure 5.

As can be seen in Figure 5, the increase in the number of entries to the Park in Łysa Polana in the studied period applies to all months, with the largest absolute increase in the number of entries in 2018 recorded in May (increase by 51 thousand compared to May 2013) and the smallest in November (increase by 17.1 thousand compared to November 2013) to December (increase by 17.3 thousand compared to December 2013). In total, this gives a 60% increase in the number of entries in 2018 compared to 2013. More dynamic growth in the number of entries was recorded only for the Wierch Poroniec toll point (increase by 323% compared to 2013), but it should be remembered that the number of tickets sold there in 2013 amounted to 20 thousand annually.

Conclusions

The analysis shows that tourism in national parks is growing. In the period 2004-2017, a 27% increase in the number of tourists visiting national parks was observed. The highest tourist pressure is on the Tatra National Park, which in 2018 recorded almost 4 million entries. The trail leading along the Dolina Rybiego Potoku valley (road to the Morskie Oko lake), which enjoyed the greatest popularity, has noted record attendance rise, from 23 thousand visitors in March 2018 to 208 thousand in August 2018.

The growing tourist traffic in national parks, on the one hand, significantly supports the budget of these entities and on the other hand, it is a challenge for park managers in terms of the implementation of the parks' protective functions. Traffic control in the Tatra National Park is associated with a particular dilemma. Theoretically, from the legal standpoint, it is possible to take action to reduce the number of tourists coming to the park, however, it would be very difficult (or impossible) from the organizational point of view. Such a regulation would also be met with strong protests from both visitors and residents of the surrounding municipalities who depend on tourism for their livelihoods. For this reason, the Tatra National Park does not take any action to relieve the traffic on the road to Morskie Oko, thus

moving it to other, less frequented areas of the park. From the point of view of nature conservation, a better solution is to concentrate traffic along an asphalt road than disperse such a huge number of tourists across a relatively small area. It is also beneficial from the point of view of mass tourism safety.

Taking into account the growing rise of interest in visiting national parks, it is necessary to discuss the future of tourism in these most valuable natural and landscape sites. Due to the growing interest in areas with special natural values, dilemmas concerning the organization of tourism, which today mainly concern the Tatra National Park may become a challenge for other parks in the near future.

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