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—
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VISITOR MONITORING IN THE PROTECTED AREAS OF THE CZECH REPUBLIC IN YEARS 2015 AND 2016

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Abstract

The contribution presents a comparative overview of the visitor monitoring results for the year 2015 from all large-scale Protected Landscape Areas of the Czech Republic. The number of visitors is measured by means of year-round automatic counting using monitoring sensors in a countryside environment. The text also presents the current results of visitor monitoring in 2016. Last but not least, the paper summarizes the current experience with this method of counting visitors in the protected landscape areas and discusses its use in the future, especially in the context of the alternative methods of collection of data on visitor numbers.

Key words: visitor, monitoring, management, protected area

Introduction

There is no doubt that visitor monitoring of natural attractions in Protected Landscape Areas can be described as a quickly developing research field. In the first half of the last decade, the data about number of visitors of the natural regions were collected by nature protection staff rather sporadically and the predominantly used method was manual counting. The number of visitors of selected localities was recorded by authorized staff on a few days of the years at most and the data on numbers of visits were subsequently converted into estimates of annual visitors numbers. Naturally, the quantity and the monitoring methods (and thus the amount of resources invested into this type of research) reflected the existing demand for such data at that time. The information about the number of visitors was actually utilized by researchers or individual protected area rangers who were taking care of extremely sensitive areas or areas endangered by visitors.

Nowadays, however, the situation in this field has changed significantly. The information about the number of visits in protected areas is used by two thirds of the protected areas in the category PLA (Protected Landscape Areas) and NP (National Parks). In the vast majority of cases, sophisticated methods of automatic data collection are used which enable to monitor the number of visitors 24 hours a day, 365 days a year. The monitoring is funded by NP and PLA administrations in charge through grants, but in most cases (especially in the case of PLA) from their own budgets.

One of the first protected areas where the visitor monitoring was carried out systematically and analysed were the NP České Švýcarsko (2005), PLA Beskydy (2009), and PLA Jeseníky (2009). In all three cases, the development of the visitor monitoring system was funded by EEA/Norway Grants.

The results of this research type which is financed by nature protection organizations are nowadays used abundantly also by local self-government, destination management, businessmen in tourism, etc. The information about the number of visitors of our Protected Landscape Areas, possibly also comparison with

the number of visitors in famous European or overseas natural destinations is also presented in media more and more.

In summary, the demand for the information about the number of visitors is so high that nature protection does not hesitate to invest considerable financial means into their gathering. Who would have said that fifteen years ago?

Methodical approaches to visitor monitoring in protected areas using outdoor counters and their analysis

The following data represent the comparison of the visitor monitoring results in 2015 in the natural areas where the visitor monitoring is conducted by PLA or NP administration. Those areas where visitor monitoring is conducted by institutions other than NP or PLA administration are not included in the comparison (e.g. counting devices operated by regional governments, non-profit organizations, etc.). Only the areas were included where the number of visits is monitored year-round using automatic outdoor counters and where other methods of data collection are only complementary. The results do not involve data from counting devices operated by NP Krkonoše administration. The local visitor monitoring using outdoor counters enables counting only part of the year due to rough climatic conditions (usually from April to November). In contrast to other mountain protected areas (e.g. Beskydy, Jeseníky, Jizerské hory), the visitor monitoring is not handled for the rest of the year, which excludes the area from the comparative analysis of annual visitor number.

Visitor traffic is monitored primarily by pyrosensors or infrared sensors which are installed on the key tourist infrastructure in the area. The sensors react to the passing of visitors on paths or roads. The basic unit of research is usually the number of people passing or riding in front of it. The method itself therefore does not take into account the situation when the path is used by the same visitor more than once. This can be factored in in the results only in those areas where it is evident that the monitored area is used repeatedly by most of the visitors (e.g. mountain tops with a single access path). According to the requirements of the individual protected areas, the counting devices in some localities are equipped with specialised sensors which enable to distinguish between individual group types (pedestrians, cyclists, cars) or between directional distributions of visitors on the path.

The basic automatic monitoring is usually complemented by regular manual counting which provides information about the accuracy of automatic counting. Potential breakdowns (climatic influence, vandalism, etc.) are counted in with the aid of mathematical and statistical methods. The recalculation is done with the use of the following data: the average number of visitors before and after the breakdown, the results from reference counting devices, the results of manual counting in the time of breakdown and their extrapolation for the period in question, etc.

The extent of visitor monitoring in protected areas in CR in 2015 and 2016

In 2015 (which is the main focus of this paper) the number of visitors was monitored in 118 natural areas (including devices in NP Krkonoše). 55 of the sites were located in National Parks (NP) and 63 in Protected Landscape Areas (PLA). The monitoring was conducted in 3 out of 4 National Parks and in 13 Protected Landscape Areas (out of total of 25 in 2015).

In 2016 the number of sites with visitor monitoring increased even more. Visitor monitoring was conducted at 154 sites. It was newly introduced in NPA Brdy, Blanský les, Broumovsko, Labské Pískovce, Pálava and Železné hory. While the

number of monitored sites in National Parks remained the same, the number of sites in PLAs rose to 99 in 18 PLAs (out of total of 26 in 2016).

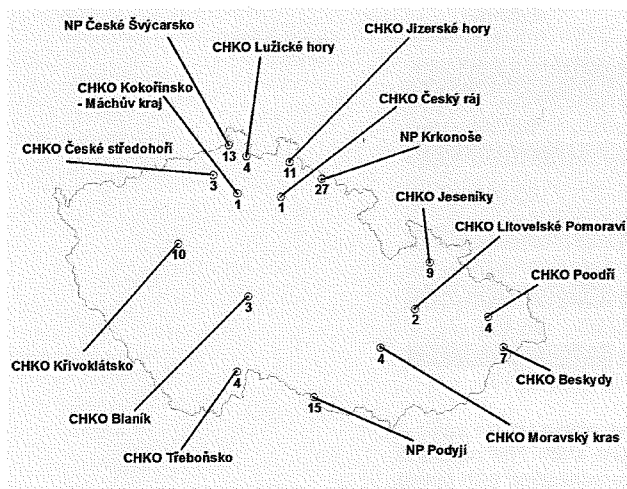


Fig. 1: The number of sites with automatic visitor monitoring in National Parks and Protected Landscape Areas of the Czech Republic in 2015

The results of visitor monitoring in protected areas in 2015

The most frequented monitored tourist route in a protected area in 2015 was the ridge path leading from Pustevny to Radegast statue in PLA Beskydy. It is an undemanding route east of the National Nature Reserve Radhošť and in 2015 around a quarter million visitors were counted there (see Fig. 2). Slightly lower figure was recorded on the main access route to the highest peak of Moravskoslezské Beskydy mountains, Lysá hora (PLA Beskydy). It must be mentioned that the local visitor traffic is influenced by a number of organized events for public which have a tradition on Lysá hora (group mountain climbs, mountain marathons, etc.). The third most frequented monitored path was a route through Edmund's gorge (Edmundova soutěska) in NP České Švýcarsko. The recorded number of passing visitors was more than 180 000.

Apart from the official tourist infrastructure, 11 unofficial unmarked paths were monitored in 2015 as well. The most frequented path was a forest path along the Kačírek pond in National Nature Reserve (NNR) Polanská niva (PLA Poodří). Despite the fact that this path is off limits because of its level of protection and the visitors caught there could be penalized, the total of 42 941 passing pedestrians and cyclists was counted there. Another unofficial path was monitored in PLA Beskydy. It was the access path to the peak Kněhyně in NNR Kněhyně - Čertův Mlýn. Despite the mechanical barrier at the beginning of the path, 4 205 visitors trespassed. Off limits paths in PLA Křivoklátsko are monitored in NNR Vůznice and NNR Týřov. In 2015, 11 461 trespassing visitors were counted on 6 paths.

Rank	Site	Protected Area	Counted number of passing visitors
1.	Pustevny - Radegast	PLA Beskydy	250 761
2.	Lysá hora - from Ostravice	PLA Beskydy	232 182
3.	Edmundova Soutěska	NP České Švýcarsko	183 732
4.	Tři prameny	NP České Švýcarsko	155 352
5.	Lysá hora – northern access	PLA Beskydy	140 027
6.	Gabriélina stezka	NP České Švýcarsko	140 043
7.	Praděd	PLA Jeseníky	131 675
8.	Bílá Opava Valley	PLA Jeseníky	99 637
9.	Knežpa - Pod Jizerou	PLA Jizerské hory	96 443
10.	Mezní můstek - Mezná	NP České Švýcarsko	93 207

Fig. 2: Ten most visited touristic paths in protected areas in 2015.

Visitor monitoring of off limits paths which run through areas where visitor traffic is problematic serves as efficient feedback for nature protection staff. The results of monitoring suggest how successful they are in terms of communication with public, or how they succeed in defending the protected areas against public.

The following overview (see Fig. 3) presents the average visitor number in individual protected areas for one counting site (only official tourist infrastructure). It is necessary to realize that in each area a different number of sites is monitored and it is not always the aim to choose the most frequented paths in the area. The most frequented paths chosen for monitoring were located in PLA Beskydy. Two main access routes to Lysá hora, the ridge paths on Velký Polom, Smrk and Radhošť and the educational trail in NNR Salajka were monitored there. A monitoring device in PLA Český ráj monitored a path through Plakánek valley and the counted number was 88 thousand passing pedestrians a year. The third most frequented site were paths monitored in PLA České Švýcarsko. The lowest average visitor traffic was found on the paths in PLA Blaník. However, it must be mentioned that all three local counters were located on the paths running through ecologically sensitive sites where there could arise a conflict between visitor traffic and the subject of protection (Nature Reserve Malý Blaník, National Nature Monument Medník a National Nature Monument Drbákov - Albertovy skály). They were not primarily chosen in order to record a high number of visitors. Sites such as Velký Blaník or Kaňk by Kutná hora, which are the most interesting tourist sites, were monitored in the area PLA Blaník until 2016.

If we compare the average number of visitors on official tourist trails monitored in Protected Landscape Areas with the trails monitored in National Parks, a surprising fact becomes clear. Whereas the average number of visitors of the trails monitored in PLAs was 45 409, the trails in NP had 43 063 visitors on average. Consequently, the monitored sites in PLA had a higher average number of visitors than sites monitored in NP which are generally more visited. It can be assumed that the result would change significantly if visitor monitoring data from paths popular by tourists in NP Krkonoše or Šumava were included in the comparison. Visitor monitoring in those protected areas is not conducted yet.

Protected area	The average number of passing visitors at one site
PLA Beskydy	111 714
PLA Český ráj	88 552
NP České Švýcarsko	64 733
PLA Kokořínsko - Máchův kraj	52 354
PLA Jeseníky	53 516
PLA České středohoří	39 638
PLA Jizerské hory	35 308
PLA Třeboňsko	34 454
PLA Litovelské Pomoraví	31 378
PLA Lužické hory	27 830
PLA Poodří	26 727
NP Podyjí	23 320
PLA Křivoklátsko	16 942
PLA Blaník	5 661
Total average	43 723

Fig. 3: Protected areas according to the average visitor number on one official tourist route in 2015

Finally, the last piece of information about the number of visitors of protected areas in 2015 concerns the time when most visitors arrived. Aggregate data from all available counters show that most tourists were on Protected Landscape Areas and National Parks paths in August (636 328 counted visitors) and July (602 175 people). On the other hand, the paths were most deserted in January (123 014 people) and November (127 175 people). In 2015 the total number of passing visitors on the 118 monitored corridors was 3 460 540.

Visitor monitoring in 2016

While this text is being written (April 2017), the data from all sites monitored in 2016 are not available yet. However, some current partial results are already available and it is possible to publish them. An interesting and evidential correlation of visitor number in relation to the locality in question was recorded in NNM Medník (PLA Blaník).

While the visitor traffic at most of the monitored sites is found to be the highest in the summer, when the conditions for hiking are the best, the visitor traffic at Medník site was highly disproportional, favouring March and April when almost 50% of the annual visitor number was recorded (see Fig. 4).

The subject of protection in this woody area is an endemic monocotyledonous plant *Erythronium dens-canis*. In the Czech Republic the plant is found only in the Medník area. The considerable seasonal peak of visitor traffic in this area corresponds closely to the blooming season of this unique plant species which begins in mid-March and ends in mid-April.

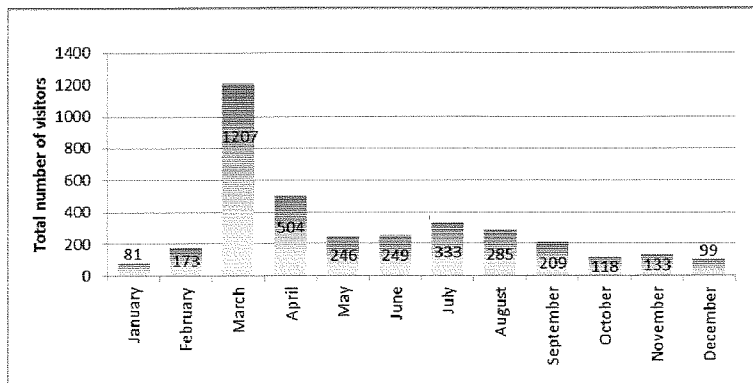


Fig. 4: Distribution of the visitor traffic in NNM Medník (PLA Bláník) in 2016

The future of visitor monitoring in protected areas

Nowadays, outdoor counter systems can be seen as a well-established tool for visitor monitoring, not only in the Czech Republic but also in other countries in Western Europe or North America. Recently, another method of visitor monitoring has become more widely known. It is visitor monitoring using residual positioning data from mobile networks. In a simplified way, the method is based on the principle that users' SIM cards are detected according to users' position by diverse transmitters and the mobile operator disposes of more or less accurate information about the number of clients who are at the given time in the space cell delimited by the range of the transmitter.

Compared to monitoring in the field with the help of sensors, the use of this method for the purpose of nature protection can be seen as arguable so far. Whereas the counters capture the real situation at the site (with higher or lower deviation), the residual data method represents in principle a qualified estimate of visitor number. It is because the operator in the target area registers only "his" users (SIM cards) and the remaining visitor number is counted up according to the operator market share. The aim of this kind of monitoring may appear questionable as well. From the perspective of protected areas management, the desirable data include information about visitor traffic on specific paths and their sections. The method of residual data does not usually manage to provide such subtle differentiation. Moreover, the financial aspect of residual data method compared to counting sensors does not appear so attractive. Despite all these facts, the residual data method represents an incredibly interesting segment in the field of visitor traffic research and it will certainly be interesting to follow what possibilities its development will bring in the future.

A pilot project of Nature Conservation Agency of the Czech Republic focused on visitor monitoring of selected areas ends in 2017. It has been carried out in those Protected Landscape Areas whose management was interested in this type of research. In the second half of spring 2017, a seminar focused on the evaluation of the benefits of the current model of visitor monitoring data collection will take place at the Agency headquarters and its continuation will most likely be discussed. It might be expected that the number of visitors of protected areas of the Czech Republic will continue to be counted with the aid of outdoor counters. Another thing

which pleads in favour of this method is the existence of historical data which can serve as a point of departure for future visitor monitoring.

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Souhrn

Text představuje výsledky monitoringu návštěvnosti za rok 2015 ze všech velkoplošných chráněných území České republiky, kde je návštěvnost měřena metodou celoročního automatického sčítání návštěvníků prostřednictvím terénních sčítacích senzorů. Rovněž jsou uvedeny vybrané zcela aktuální výsledky monitoringu z roku 2016. V neposlední řadě text shrnuje stávající zkušenosti s touto metodou sčítání návštěvníků chráněných území a zamýšlí se nad jejím uplatněním v budoucnu, a to zejména v kontextu alternativních metod sběru dat o návštěvnosti

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