

# RECREATIONAL USE OF FOREST ROADS IN THE TERRITORY OF NATIONAL PARKS AND PROTECTED LANDSCAPE AREAS

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<https://doi.org/10.11118/978-80-7509-904-4-0237>

## Abstract

Free use and entrance into the landscape has been allowed for centuries in Czech Republic. Nowadays, recreation use of forests is gaining importance. At the same time, the most interesting parts of the landscape are protected in the form of large-scale protected areas such as National parks or Protected landscape areas (PLA). Significant part of the recreation usage is concentrated on marked hiking trails, cycle paths and other routes in the forest. In protected areas, it is important to preserve the most valuable parts of these areas, and therefore to direct visitors on hiking trails. Forest roads and other forest transport routes are used for these purposes. The presented study analyzes the influence of recreation on forestry infrastructure, especially regarding to the limitation of its use, using the example of National Parks and Protected landscape areas territories.

**Key words:** forest (haul) road, forest road, recreation, national park

## Introduction

As already stated in the author's previous contributions (Bystrický 2020, Bystrický 2021), recreation and leisure use of the forest is a growing phenomenon of modern times. At the same time, this use means a significant limitation in the economic use of the forest and further conflicts arise between the often-conflicting requirements for the forest use. In previous articles, we focused on tourist and cycle tourism use of forest roads from the point of view of regions and natural forest areas.

The most important locations of interest from the point of view of recreation are large-scale protected areas - National parks and Protected Landscape Areas. This is also place, where the greatest number of conflicts arise between different interests – nature protection in general, economic use, and the interests of visitors in terms of recreation and use of free time.

These facts are also reflected in the importance of forest roads in these areas. This is primarily not about the economic use of forest roads and forests in general, but about:

- controlled routing of visitors around the territory,
- enabling economic and conservation activities etc.
- access to the territory from the point of view of the Integrated Rescue System.

This point was highlighted by the fire in České Švýcarsko National Park in 2022.

So what is the situation in national parks and protected landscape areas in terms of the use of forest paths for recreation? What proportion of forest roads is used as a hiking or cycling route?

Tab. 1: National Parks in Czech Republic

NP	Podyjí	6 279
NP	České Švýcarsko	7 928
NP	Krkonošský národní park	36 352
NP	Šumava	68 460

Source: AOPK 2023

Tab. 2: Protected Landscape Areas in Czech Republic

Blaník	4 029
Poodří	8 153
Pálava	8 536
Litovelské Pomoraví	9 330
Moravský kras	9 682
Český kras	13 226
Český ráj	18 170

Blanský les	21 962
Orlické hory	23 323
Labské pískovce	24 261
Lužické hory	27 072
Železné hory	28 473
Brdy	34 501
Jizerské hory	37 415
Kokořínsko - Máchův kraj	41 037
Broumovsko	43 233
Český les	46 555
Slavkovský les	61 109
Křivoklátsko	62 497
Třeboňsko	68 745
Žďárské vrchy	70 889
Jeseníky	74 367
Bílé Karpaty	74 688
Šumava	99 521
České středohoří	106 892
Beskydy	120 510

Source: AOPK 2023

### Materials and methods

Similar to the previous contributions (Bystrický 2020, 2021), the basic hypothesis is based on map research, where it can be said that at least part of the hiking routes, cycle routes and other routes use forest transport routes of class 1 L or 2 L.

This fact can be relatively objectively quantified and qualified and is not burdened by subjective assessment or incorrect understanding of a specific criterion. The problem is the different geometry of the linear objects of forest haulage roads and hiking routes, because the analysed data did not come from the same sources and were digitized on different bases.

To assess the similarity of the geometry, the overlap of forest haulage roads and individual types of routes can be used. Only hiking trails and cycle paths within 20 meters of the line of the forest access road will be assessed for verification. All lines at a distance of more than 20 m will be considered as separate lines that do not restrict forest traffic.

The aim of all work and analysis will be:

- To assess the consistency of the course of hiking routes, cycle routes and routes of forest haulage roads,
- To evaluate and to quantify the use of forest access roads for recreation for selected territorial units: national parks and protected natural areas.

The first step to achieve the goals was to assess the geometric similarity or difference in the course of hiking routes, cycle routes and forest transport routes. For this purpose, strips of 5/20 m width - the so-called buffer, where the intersection of the line of these routes with this belt created around the forest roads was investigated.

The second step was quantification – an analysis of the concurrence of hiking routes, cycle routes and forest transport routes at the National Parks and Protected Landscape Areas level and a specific calculation of the length of forest routes that simultaneously serve as hiking routes or cycle routes for recreation.

The third step was the evaluation of the initial results of the previous steps and their comparison.

GIS software was used for all steps. GIS analyses enabled a comprehensive approach to the problem and its objective evaluation.

In all analyses, data from the Regional Forest Development Plan - forest road network and data from the mapy.cz map portal containing TZCH data (marked hiking trails data) and cycle routes in vector display form from mapy.cz/seznam.cz from 2016 were used.

## Results

To evaluate the use of forest roads for recreational purposes - for marked hiking routes and cycle routes, the same procedures as for regions and natural forest areas of the Czech Republic were used. It was based on the assumption that the recreational use of the territory can be objectively measured by the length of various hiking, cycling and other types of routes and its overlap with the tracing of forest roads. By comparing their overlap, it was possible to determine the intensity of use of the forest transport network and to determine the degree of restriction in the use of forest roads (Bystrický 2020).

Tab. 3: Length of forest roads in National parks and Landscape protected Areas [km]

	Length of forest roads	Length of forest roads	Length of forest roads
	L1L	L2L	Total
CHKO	4 170	6 491	10 660
NP	580	734	1 314
celkem	4 750	7 224	11 974

Source: ÚHÚL 2022,

Tab. 4: Length of hiking routes of forest roads in national park and Landscape protected Areas [km]

HIKING TRAILS				
Category	Name	Length of LOC km	TZCH po LOC km	Share (%)
CHKO	Beskydy	1 869,85	389,11	20,81
CHKO	Bílé Karpaty	370,07	97,68	26,40
CHKO	Blaník	12,31	4,14	33,63
CHKO	Blanský les	303	59,14	19,52
CHKO	Brdy	537,16	61,59	11,47
CHKO	Broumovsko	187,07	67,53	36,10
CHKO	České středohoří	278,92	143,73	51,53
CHKO	Český kras	23,01	12,04	52,33
CHKO	Český les	658,86	185,24	28,12
CHKO	Český ráj	78,56	63,74	81,14
CHKO	Jeseníky	1144,78	295,03	25,77
CHKO	Jizerské hory	406,88	224,43	55,16
CHKO	Kokořínsko - Máchův kraj	242,63	124,41	51,28
CHKO	Křivoklátsko	543,53	126,71	23,31
CHKO	Labské pískovce	178,85	70,37	39,35
CHKO	Litovelské Pomoraví	122,39	18,22	14,89
CHKO	Lužické hory	246,47	116,1	47,11
CHKO	Moravský kras	83,38	46,58	55,86
CHKO	Orlické hory	291,28	90,79	31,17
CHKO	Pálava	41,81	0,33	0,79
CHKO	Poodří	4,66	0,28	6,01
CHKO	Slavkovský les	373,91	142,86	38,21
CHKO	Šumava	1128,94	346,02	30,65

HIKING TRAILS				
Category	Name	Length of LOC km	TZCH po LOC km	Share (%)
CHKO	Třeboňsko	800,31	138,15	17,26
CHKO	Žďárské vrchy	579,47	153,76	26,53
CHKO	Železné hory	152,24	45,93	30,17
NP	České Švýcarsko	73,29	53,54	73,05
NP	Krkonošský národní park	473,17	227,31	48,04
NP	Podyjí	27,23	21,31	78,26
NP	Šumava	740,16	322,39	43,56
	Celkem	11 974,19	3648,46	36,58

Sources: ÚHÚL 2022, mapy.cz 2016

It is clear from the attached documents and analysis that, on average, approx. 37 % of all forest access roads in the National Park and Protected Landscape Areas protected by recreation are occupied by the use of marked tourist routes for their needs. Only the Brdy, Pálava and Poodří PLAs show a low level. On the contrary, higher than average values are achieved by all NPs, but also by the Český Ráj or Jizerské hory PLAs.

Tab. 5: Length of cycling/biking routes of forest roads in national park and Landscape protected Areas in km

CYCLOTRAILS				
Category	Name	Length of LOC (km)	Cyclotrails of LOC (km)	Share (%)
CHKO	Beskydy	1869,85	304,75	16,30
CHKO	Bílé Karpaty	370,07	61,84	16,71
CHKO	Blaník	12,31	0,75	6,09
CHKO	Blanský les	303	69,3	22,87
CHKO	Brdy	537,16	45,19	8,41
CHKO	Broumovsko	187,07	63,87	34,14
CHKO	České středohoří	278,92	34,06	12,21
CHKO	Český kras	23,01	0,09	0,39
CHKO	Český les	658,86	200,52	30,43
CHKO	Český ráj	78,56	44,86	57,10
CHKO	Jeseníky	1144,78	317,22	27,71
CHKO	Jizerské hory	406,88	152,77	37,55
CHKO	Kokořínsko - Máchův kraj	242,63	91,58	37,74
CHKO	Křivoklátsko	543,53	42,21	7,77
CHKO	Labské pískovce	178,85	35,89	20,07
CHKO	Litovelské Pomoraví	122,39	25,67	20,97
CHKO	Lužické hory	246,47	66,56	27,01
CHKO	Moravský kras	83,38	33,21	39,83
CHKO	Orlické hory	291,28	74,32	25,51
CHKO	Pálava	41,81	0,22	0,53

CHKO	Poodří	4,66	0,73	15,67
CHKO	Slavkovský les	373,91	127,3	34,05
CHKO	Šumava	1128,94	220,13	19,50
CHKO	Třeboňsko	800,31	71,28	8,91
CHKO	Žďárské vrchy	579,47	70,06	12,09
CHKO	Železné hory	152,24	35,48	23,31
NP	České Švýcarsko	73,29	58,74	80,15
NP	Krkonošský národní park	473,17	288,17	60,90
NP	Podyjí	27,23	22,3	81,89
NP	Šumava	740,16	261,01	35,26
	Celkem	11974,19	2820,08	27,37

Source: ÚHÚL 2022, mapy.cz 2016

Similarly, it can be said that approx. 27% of the LOC is used for cycle paths. Only the PLA Brdy, Pálava and Blaník show a low level. On the contrary, higher than average values are achieved by all NPs, but also by the Český Ráj or Moravian Karst PLAs.

## Discussion

It is clear from the analyzes that the use of forest haulage roads for recreational purposes is far more significant in the NP than in the PLA. Their use exceeds the average values for all protected areas. Also, some PLAs such as Jizerské Hory and Český ráj use forest haulage roads to a large extent for the management of hiking routes and cycle routes. Unfortunately, this creates conflicts between individual types of sports, but also between forest users and individual types of vacationers. Areas heavily used by tourists require different access to the forest transport network, different surfaces and a different mode of use by forest management.

## Conclusion

The submitted contribution concludes a basic series of analyzes that evaluated the use of forest transport routes for the needs of tourism and recreation. Analyzes point to the fact that specially protected areas such as NP or PLA use forest roads more than the average for the Czech Republic. In particular, NPs use Forest Road Network very intensively to guide recreation. The ongoing bark beetle calamity has not yet fully manifested itself in terms of limiting the use of TZCH or cycle routes. It can be assumed that this will happen.

## References

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## Souhrn

Turistika a jízda na kole jsou jedny z nejoblíbenějších aktivit obyvatelstva v ČR. Podmínky pro tyto druhy rekreace jsou vynikající. Je to možné i díky volnému užívání a vstupu do krajiny. Významná část tohoto užívání je koncentrována na lesní odvozní cesty a ostatní trasy pro lesní dopravu.

Z předložených podkladů a analýz je zřejmé, že průměrně je využito v rámci ZCHÚ cca 37 % všech lesních cest pro turistiku a cca 27 % pro cyklotrasy. Z hlediska využívání lesních cest je velký rozdíl mezi NP a CHKO. NP využívají lesní odvozní cesty daleko intenzivněji než CHKO. V rámci CHKO jsou velmi specifická rekreačně exponovaná území jako jsou Jizerské hory, Český ráj nebo Moravský kras.

Vznikají konflikty mezi jednotlivými druhy využití území navzájem, ale také mezi uživateli lesů a jednotlivými druhy rekreatantů. Území silně turisticky využívaná vyžadují jiný přístup k lesní dopravní síti, jiné povrchy a jiný režim využívání ze strany lesního hospodářství (Bystrický 2020). Lze říct, že v porovnání s pěší turistikou je využívání lesních cest cyklistikou nižší, ale s většími extrémy.

Cílem příspěvku bylo zhodnotit objektivně zatížení území cykloturistikou a rekreací v rámci ZVCHÚ a jak uvádí Bystrický, vytvořit předpoklady pro další zkoumání a pro návrh opatření a postupů

v jednotlivých druzích území tak, aby došlo ke zmírnění tlaků a minimalizaci rozporů mezi různými druhy využívání lesa, které ve svém důsledku takřka znemožňují jeho smysluplné a racionální obhospodařování.

Tyto podklady se již postupně využívají v nově zpracovávaných OPRL. Tak bude možné definovat současná i budoucí konfliktní místa v síti lesních cest a využití území a navrhnout koncept opatření na jejich odstranění a ekonomické dopady jeho realizace (Bystrický 2020).

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