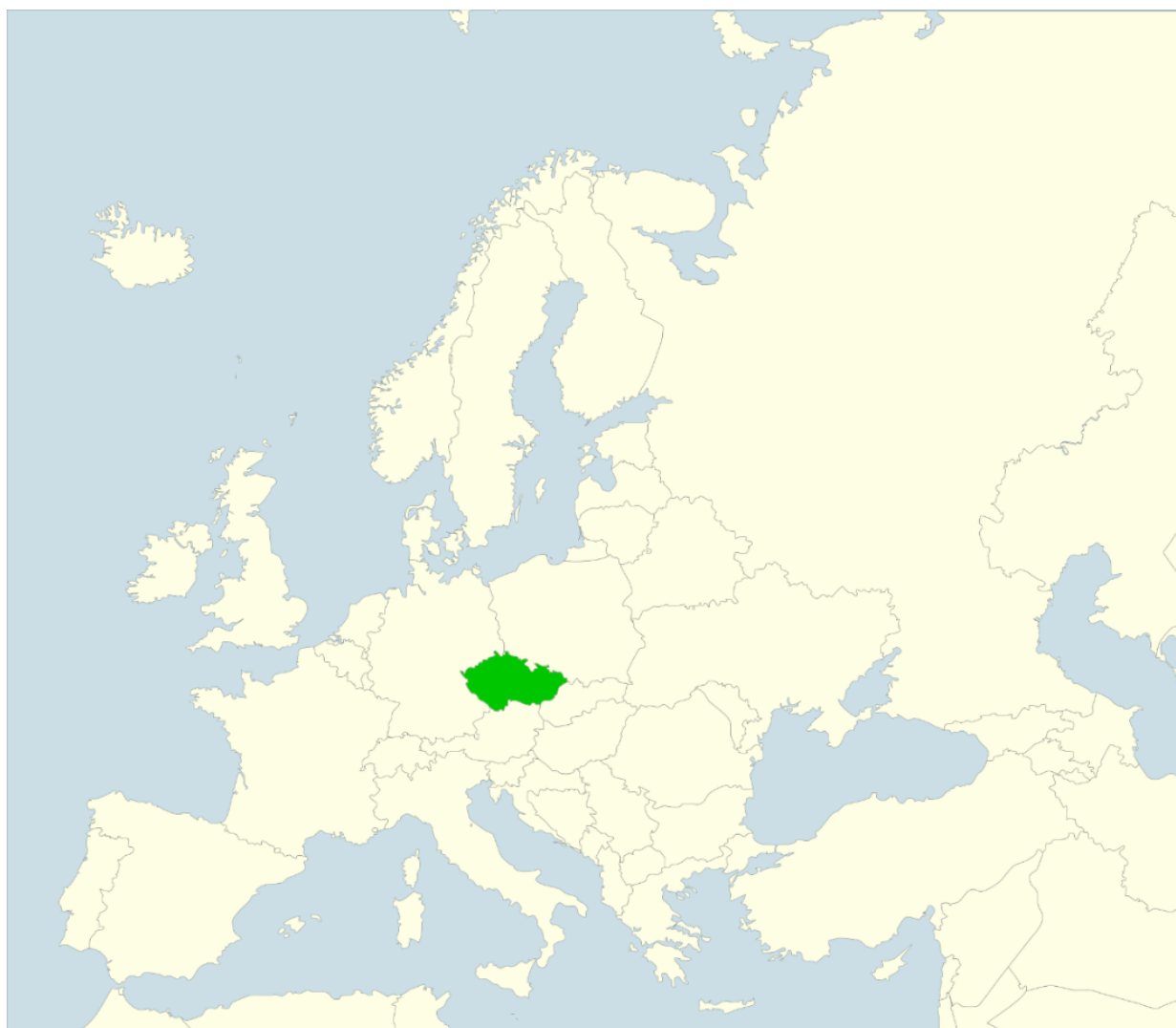


THE IMPACT OF THE COVID-19 PANDEMIC ON TOURISM IN A RURAL BORDERLAND NATIONAL PARK: EVIDENCE FROM BOHEMIAN SWITZERLAND

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Abstract: This paper examines how the COVID-19 pandemic reshaped the volume and spatial distribution of recorded passages in a rural borderland national park, using the Bohemian Switzerland National Park as a case study. The region is embedded in transnational day-trip and cross-border mobility systems and is therefore particularly sensitive to disruptions of international movement. The paper questions the widespread assumption that rural tourism is inherently resilient during the pandemic. The analysis utilizes automatic pedestrian counter data from 2019 to 2022, with 2019 serving as the baseline, combined with spatial analysis and a functional–visibility typology of monitoring locations. Quantitative results are contextualized by desk research on mobility restrictions and accommodation statistics. The findings reveal a pronounced and lasting decline in recorded passages at monitored sites, particularly during periods of border closures, with the greatest losses occurring at flagship attractions that rely heavily on foreign day-trippers. A temporary redistribution toward peripheral routes occurred but weakened as restrictions eased, indicating that tourism resilience in border regions is highly context-dependent.

Keywords: tourism geography, visitor behavior, data analysis, pedestrian counter data, COVID- 19 pandemic, Bohemian Switzerland National Park, Czech Republic

Souhrn: Tento článek zkoumá, jak pandemie onemocnění COVID-19 proměnila objem a prostorové rozložení pohybu pěších turistů ve venkovském pohraničním národním parku, a to na příkladu Národního parku České Švýcarsko. Destinace je zakotvená v systémech přeshraniční mobility a jednodenních výletů, a je proto mimořádně citlivá na narušení mezinárodního pohybu osob. Článek zpochybňuje rozšířený předpoklad inherentní odolnosti venkovského cestovního ruchu během pandemie. Analýza vychází z dat automatických sčítačů pěších návštěvníků za období 2019–2022, přičemž rok 2019 slouží jako referenční základ, a kombinuje je s prostorovou analýzou a funkčně-viditelnostní typologií sledovaných lokalit. Kvantitativní výsledky jsou zasazeny do kontextu prostřednictvím analýzy sekundárních zdrojů zaměřené na omezení mobility a statistiky ubytovacích kapacit. Zjištění ukazují významný a dlouhodobý pokles zaznamenaných průchodů v lokalitách monitorování, zejména v obdobích uzavření státních hranic, přičemž největší ztráty byly zaznamenány u klíčových atraktivit závislých na zahraničních jednodenních návštěvnících. Dočasná redistribuce návštěvníků směrem k perifernějším trasám postupně slábla s uvolňováním restrikcí, což naznačuje, že odolnost cestovního ruchu v pohraničních regionech je výrazně kontextově podmíněná.

Klíčová slova: geografie cestovního ruchu, chování návštěvníků, analýza dat, data z automatických sčítačů chodců, pandemie COVID-19, Národní park České Švýcarsko, Česká republika

Highlights

- COVID-19 led to a decline in recorded passages at monitored sites.
 - Border closures reduced visitation at flagship attractions reliant on day-trippers.
 - Temporary visitor redistribution favored peripheral sites during peak restrictions.
 - Visitation levels shifted repeatedly across pandemic phases within one destination.
 - Rural tourism resilience proved context-dependent rather than inherent.
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1. Introduction

The effects of the COVID-19 pandemic on tourism, including a decline in visitation levels and shifts in visitor behavior, as well as bankruptcies of tourism-related enterprises, are still evident in many places. Several studies have examined the impact of the pandemic on tourism in general or specific regions (Tiwari, Seraphin & Chowdhary, 2020; Abbas et al., 2021; Eslami & Namdar, 2022; Falk, Hagsten & Lin, 2022; Ciesielski et al., 2023; Szilágyi, Bujdosó & Szabó, 2025). A few researchers investigated the situation in the Czech Republic (Vaishar & Šťastná, 2020; Tittelbachová et al., 2022; Makáň et al., 2023).

Bohemian Switzerland National Park (BSNP) can be analytically classified as a rural region based on a combination of demographic, functional, and spatial criteria commonly used in rural studies (Cloke, 2006). Despite the growing body of research on tourism during the COVID-19 pandemic, the dynamics of tourism in BSNP have received only limited scholarly attention. BSNP experienced a steady increase in visitation levels between 2014 and 2019 (CZSO, 2024). The peak of the season is traditionally in July and August, which are school holiday months in the Czech Republic, as well as in neighboring Germany and Poland (Nagel, 2020). The region has faced a polycrisis over the last decade, including a prolonged bark beetle infestation, overtourism, the COVID-19 pandemic, and a massive wildfire in 2022. The findings can contribute to a deeper understanding of visitor spatial preferences in rural borderland locations, which is crucial for adequate preparation for future crises.

The main objective is to examine and conceptualize the impact of the pandemic on a rural borderland national park, using the BSNP as an analytically transferable case. This task involves analyzing the situation shortly before the pandemic's outbreak to establish a baseline. The impact is then compared with previous findings on the pandemic's effect on rural tourism. This objective is operationalized through the following sub-objectives:

- To characterize the BSNP in terms of its localization and realization factors related to tourism.
- To review the Czech government measures that affect the movement of people and the operation of tourist facilities.
- To analyze the spatial distribution of tourism.

The authors formulate these research questions:

- RQ1 – To what extent did the COVID-19 pandemic affect recorded passages in the BSNP?
- RQ2 – Did the COVID-19 pandemic lead to a spatial redistribution of visitors within the national park, favoring less frequented and more peripheral locations?

The following section develops the study's theoretical framework by reviewing research on tourism crises, rural tourism resilience, and mobility disruptions during the pandemic. In this way, the Introduction defines the broader research problem and study rationale, while the next section situates the analysis within the relevant literature.

2. Theoretical Background

This study is grounded in a critical realist metatheoretical perspective, which assumes that observed changes in tourism flows reflect deeper causal mechanisms shaped by health risks, mobility regulations, and spatial context (Sayer, 1992). From this perspective, changes in recorded passages are not merely interpreted as statistical trends but as outcomes of interactions between regulatory frameworks, infrastructural constraints, cross-border mobility regimes, and individual behavioral responses to perceived risk. In empirical terms, pedestrian counter data capture observable patterns of movement within the BSNP. These patterns are interpreted in relation to actual events, such as border closures, mobility restrictions, trail closures, and seasonal reopening of tourism facilities. Observed declines or shifts in counter data represent empirical events, whereas border closures, access restrictions, and perceived crowding serve as generative mechanisms that shape visitor behavior. The uneven spatial outcomes across typological categories reflect how these mechanisms interact with pre-existing infrastructural and relational conditions, rather than uniformly producing consequences across space. The analysis is further informed by relational geography, which conceptualizes tourism destinations as nodes embedded within wider networks of mobility, accessibility, and institutional arrangements (Sheller & Urry, 2006). This perspective is particularly relevant in borderland national parks, where visitor flows are also shaped by transnational connectivity and border regimes. From the standpoint of rural tourism research (Lane, 1994), this approach allows rural destinations to be understood not as static territorial units but as relationally constituted systems shaped by mobility regimes, infrastructural constraints, and dependencies on external demand.

Although tourism and disasters may appear unrelated, they share a deeply interconnected and complex relationship that has been observed for decades. Disasters have a significant impact on the functioning of tourism in any region (Smorfitt, Harrison & Herbohn, 2005). The tourism

industry's vulnerability to catastrophes stems from its inherent characteristics, including the transient nature of visitors and the communication barriers they may encounter during crises (Nguyen, Imamura & Iuchi, 2016). Catastrophic events can have both immediate and long-term impacts on tourism. In the short term, they can lead to a sharp decline in tourist arrivals and revenue, as well as disruptions to travel plans and operations. In the long term, they can also shift tourist perceptions and preferences, potentially diverting tourism flows away from affected destinations (Biran et al., 2014). Research indicates that outbreaks of diseases have led to pronounced declines in tourist arrivals and revenue (Okafor, Khalid & Burzynska, 2021). The observed decline was driven by heightened health concerns, travel restrictions, and changing consumer behavior, as visitors became increasingly risk-averse amid potential health threats. They became more inclined to prefer domestic tourism, smaller-scale experiences, and slow tourism, which focuses on local populations and sustainability (Wen et al., 2021). The fear and anxiety related to health risks can significantly influence travel intentions and behaviors (Zhang et al., 2020).

Rural tourism is often associated with rural areas characterized by small-scale accommodation, a strong reliance on domestic demand, and comparatively limited exposure to global tourism shocks. These characteristics have led to the widespread assumption that rural destinations exhibit relatively high resilience during crises such as the COVID-19 pandemic (Romagosa, 2020; Silva, 2022). However, recent research shows that rural tourism systems are far from homogeneous and may differ substantially in terms of their functional orientation, market dependence, and spatial embeddedness (Saarinen, Rogerson & Hall, 2017). Empirical observations during the pandemic further indicate that tourism outcomes varied considerably depending on the structure of tourism demand and the role of international mobility. In particular, rural destinations may contain localized hotspots of intense visitation where infrastructural constraints, spatial concentration, and temporal crowding create vulnerabilities comparable to those observed in urban tourism systems (Boháč & Drápela, 2022). This internal heterogeneity suggests that the resilience of rural tourism cannot be treated as an inherent property of rural destinations but must instead be understood as context-dependent and shaped by the specific mobility regimes and tourism structures in which destinations are embedded (Hall, Prayag & Amore, 2018).

The COVID-19 pandemic has significantly affected rural tourism, presenting both challenges and opportunities for development. As urban centers faced severe restrictions and declining tourist numbers, rural destinations emerged as attractive alternatives for travellers seeking safety, tranquillity, and natural experiences. The pandemic heightened awareness of mental health and well-being, leading many individuals to seek out rural environments that offer relaxation and a respite from urban stressors (Seraphin & Dosquet, 2020; Vaishar & Šťastná, 2020). Several studies (Gössling, Scott & Hall, 2020; Seraphin & Dosquet, 2020) have pointed to pandemic-related increases in domestic mobility, including the use of second homes and informal accommodation, which complicate the interpretation of tourism statistics and visitor flows in rural destinations. Ciesielski et al. (2023) also reported increased visitation during the pandemic,

using data from pedestrian counters in Polish recreational forests with lower levels of protection than those in national parks. Vaishar and Šťastná (2020) found, similarly to Seraphin and Dosquet (2020) in France, that rural areas experienced a relatively smaller impact due to their appeal to domestic visitors seeking safe travel options. Vaishar and Šťastná (2020) focused on accommodation statistics and, across several Czech microregions, found an increase in the number of visitors compared to 2019. These findings contributed to a broader narrative of pandemic-induced resilience in the tourism sector. According to Tittelbachová et al. (2022), inbound foreign arrivals in 2020 declined by approximately 75% compared to the pre-pandemic period.

The concept of resilience is central to this study, but it is not understood as simply returning to pre-crisis visitor levels. Instead, resilience is conceptualized as a differentiated and context-dependent process involving temporary adaptation, spatial reorganization of demand, and uneven vulnerability across destinations (Lew et al., 2016). Resilience may manifest as redistribution rather than recovery, and rural destinations are not inherently resilient. However, they may exhibit structural fragilities depending on their tourism profile, exposure to external markets, and degree of functional specialization. In this study, resilience is examined critically by distinguishing between destinations dominated by accommodation-based domestic tourism and flagship attractions embedded in international day-trip and transit tourism systems. The paper aims to partially challenge narratives of rural tourism resilience by demonstrating how rural, nature-based destinations in borderland contexts may experience pronounced vulnerability during crises that disrupt cross-border mobility (Gössling, Scott & Hall, 2020; Higgins-Desbiolles, 2020).

From a rural studies perspective, the tourism dynamics examined in this paper can be understood as manifestations of broader structural characteristics of rural and peripheral regions rather than as sector-specific phenomena. Rural areas are commonly conceptualized as relationally produced spaces shaped by limited economic diversification, demographic fragility, infrastructural constraints, and asymmetric dependence on external demand and mobility flows (Clope, 2006; Shucksmith, 2018). In this sense, tourism represents not merely an economic activity, but a key interface through which rural regions become functionally integrated into wider national and transnational systems. Borderland rural regions are distinct, as their peripherality extends beyond socioeconomic factors to include relational and political aspects, as everyday functioning often relies on cross-border labor markets, service provision, and short-term mobility regimes (Kühn, 2015). Such functional dependence may enhance development opportunities under conditions of openness, but simultaneously increases vulnerability to external shocks, including sudden disruptions of cross-border mobility. In this context, the pandemic can be understood as an external shock that provides an opportunity to examine how different types of rural tourism locations respond to disruptions in mobility regimes and cross-border flows.

Based on the literature on rural tourism resilience and pandemic-related mobility changes, two hypotheses, connected to the research questions, are formulated:

- H1 – Rural and nature-based destinations are relatively resilient to pandemic-related shocks due to their attractiveness for domestic tourism.
- H2 – During the pandemic, visitor activity temporarily redistributes from flagship attractions toward less popular and more peripheral locations.

3. Study Area and Context

BSNP is a region located in the northern Czech Republic in the Ústí nad Labem Region. It borders Saxony/Germany and is near the Polish border. Over the decades, the area, which was predominantly inhabited by ethnic Germans prior to World War II, has undergone substantial transformations in tourism development and in the spatial distribution of tourism facilities and services (Štěbetáková, Hruška & Raška, 2022). Nowadays, the most popular locations are often plagued by seasonal overtourism, which threatens sandstone reliefs (Drápela, 2021). Therefore, entrance fees have been implemented for the gorges and Pravčická brána. BSNP lies within the Labe Sandstone Mountains, which span the Czech Republic and Germany. The German side, Saxon Switzerland, forms a twin national park with BSNP. Covering 79.23 km², the BSNP features diverse geological formations, including towering cliffs, intricate canyons, and natural rock arches. The erosion of Cretaceous marine sediments shaped the region's rock formations, which were uplifted during the Quaternary period due to Alpine folding (Vařilová, Navrátil & Dobešová, 2011). Elevation ranges from 115 to 619 meters above sea level. BSNP is the fourth and most recently declared national park in the Czech Republic, established to protect its unique sandstone geomorphology and diverse ecosystems. Since 2020, it has been divided into four zones based on the extent of permitted human activity. The core natural zone (16% of the park) encompasses the most pristine areas, including the border with Saxony and the Kamenice Gorges, where human access is limited to designated trails. The second zone, which is close to the natural state (19%), includes partly artificial forests. The third zone (65%) comprises areas that have been significantly altered by human activity, such as meadows and woodlands. The fourth zone (1%) includes human settlements and areas of economic activity. BSNP features 166.4 kilometres of marked trails. Many of them follow asphalt-covered forest roads.

Approximately 8,000 people reside in the BSNP, with settlements concentrated along its borders, including small towns such as Krásná Lípa and Chřibská, as well as villages such as Doubice, Hřensko, Jetřichovice, and Růžová. The availability of public transport in the BSNP margins is quite good, mainly through bus connections. A few buses go through the territory of BSNP on the road between Hřensko and Jetřichovice. These connections are more frequent in July and August. Moreover, there are also train connections between inland Czech towns and Krásná Lípa, or the train stop Děčín-Čertova Voda, in combination with a ferry across the Labe River. The most important road is I/62, which runs through Hřensko along the Labe River and is crucial for transporting German visitors. The local road network reflects the area's complicated geomorphology. With the growing number of visitors with cars to the region, enormous pressure is placed on parking areas on the margins of the BSNP. Key parking lots are located in Hřensko and its settlement, Mezná, and smaller ones are situated in Jetřichovice and Krásná Lípa. Key

accommodation facilities are in Chřibská, Hřensko, Jetřichovice, and Krásná Lípa. The largest hotel in the BSNP is the emblematic Hotel Praha in Hřensko. Accommodation facilities are often fully booked during the main season. However, guesthouses, family-run hotels, and private apartments account for the majority of accommodation options.

Overall, the BSNP as a rural area is characterized by low population density and the absence of urban centers. Its economic base is weakly diversified and relies heavily on tourism, public services, and small-scale local activities. Previous studies have shown that tourism plays a crucial role in the local labour market and contributes significantly to municipal revenues through visitor spending and tourism-related services, such as accommodation, gastronomy, or guiding services (Štěbetáková, Hruška & Raška, 2022). The economic importance of tourism further increased after the establishment of the national park. BSNP also exhibits limited accessibility and infrastructure capacity, particularly in transport connectivity, which is typical of peripheral rural regions. Land use is dominated by forests and protected landscapes, with strict environmental regulations constraining urban development.

The COVID-19 pandemic is a global respiratory disease caused by the virus SARS-CoV-2. The virus was first identified in China in December 2019 and in the Czech Republic in March 2020. The pandemic has caused more than 6.5 million deaths (Johns Hopkins University, 2022). Government measures to combat the pandemic included border closures, lockdowns, quarantines, social distancing, testing, verifying vaccination status, and mask mandates. However, sometimes restrictions were implemented even without a declared state of emergency. Additionally, declaring and extending states of emergency often led to legal battles, so not all steps are immediately apparent to the unacquainted. The key indicator for government restrictions was the number of infected people (MZČR, 2024). The limitations of intrastate and interstate movement were crucial for tourism. In the studied region, Poles and, in particular, Germans, who make up one-third of visitors, are important (Vanžura, 2021). For analytical purposes, the researched period in the Czech Republic was divided into these four phases:

- Onset of the crisis (March 2020 – March 2021) – involved four emergency states. The general movement of the Czech population, which was limited to within 500 meters of home, was primarily due to job and health reasons, except during the summer months, when COVID-19 cases were fewer. Also, restaurants and hotels were closed or severely restricted. During the most stringent measures, traveling was impossible. Then, the Czech Republic followed the EU's five-category rating system. Those who have arrived from countries with a medium or high risk of infection should have a negative test result.
- Partial easing (April – September 2021) – no movement restrictions, tourism facilities functioned freely, but incoming tourism was still conditioned by tests and quarantines.
- Renewed escalation (October 2021 – April 2022) – involved a one-month state of emergency and a limitation of tourist services through the obligation to show vaccine certificates. Incoming tourism was limited.
- Return toward normality (May – July 2022) – all measures were gradually cancelled.

4. Methods and Research Process

The research employs a range of methods, including:

- Desk research of resources related to the BSNP, tourism, and anti-COVID-19 measures. All online information sources were last checked on January 30, 2025.
- Geographical analysis based on researching maps and timetables.
- Non-participant observation – the second author is a resident of the region and provided insights that are not achievable from literature or statistics.
- Data analysis is primarily based on the number of recorded passages (not publicly accessible) at locations equipped with pyroelectric automatic pedestrian counters (manufactured by Eco-Counter), as provided by the BSNP Administration in Krásná Lípa. The counters' locations are obvious from Fig. 1 in the section 5.3. Throughout the paper, the term recorded passages refers to mobility events captured by automatic pedestrian counters. These values should not be interpreted as exact counts of individual visitors, but rather as indicators of relative visitation intensity. Moreover, in tourism research, several related terms are used to describe people visiting a destination. In this paper, the term visitors is used as a general category encompassing both overnight tourists and day-trippers. The term guests is used specifically in relation to accommodation statistics. Eco-Counter devices record passage events rather than individual visitors, which may result in double-counting where visitors pass the same sensor repeatedly. Visitor behavior near counters and seasonal technical reliability may also affect recorded values. These limitations are addressed by focusing on relative temporal changes and spatial differences between locations rather than absolute visitor numbers. It is also important to note that pedestrian counter data do not include visitor details, such as place of residence, socioeconomic profile, or length of stay in the region. Consequently, interpretations regarding the role of cross-border tourism or the absence of foreign visitors cannot be directly derived from the counter data themselves. Instead, such interpretations are based on the broader contextual knowledge of the destination, secondary tourism statistics, and the well-documented importance of cross-border day-trip tourism in the region. The counter data capture observable mobility patterns, while explanations of underlying drivers should be understood as contextually informed interpretations rather than direct empirical measurements. The Power Query tool in the Microsoft Excel user interface was used for data aggregation and selection, which was necessary for analysis in the geoinformation software environment, specifically ArcGIS by Esri. After considering the number of infected people, the validity of the government's restrictive measures, and the wildfire, the study period was determined to be between March 2020 and July 2022, with 2019 functioning as a baseline. The year 2019 was selected as the reference baseline because it represents the last complete pre-pandemic tourism season unaffected by COVID-19 restrictions and reflects the stabilized visitation patterns that had developed in the destination during the preceding growth period. For

clarity in comparing the determined phases with a baseline, it is important to note that in cases when a phase spans two calendar years, the months of 2019 are included in a comparison in non-chronological order. For example, regarding the phase called renewed escalation (October 2021 – April 2022), total recorded passages of October, November, December of 2021, and January, February, March, April of 2022 are compared to the total recorded passages in January, February, March, April, and October, November, and December 2019. If the phase occurs within a single calendar year, a simple comparison of the total recorded passages of relevant consecutive months is used. On the basis of the comparison, the change in visitation for each site/counter is calculated. Importantly, the counters' data were supplemented by data from the Czech Statistical Office (CZSO, 2024), which monitors various tourism-related indicators over the long term.

- Comparison method – the relevant data obtained were compared across periods of different restrictions. Also, visitor behavior in particular localities was compared.

The surroundings (<500 m) of 17 counters can be distinguished on the basis of tourism visibility (based on counter data) and functionality (based on geographical analysis):

- High-visibility primary attractions (HVPAs) – Hřensko (municipality): Edmundova soutěska (Edmund's Gorge, famous gorge of the Kamenice River featuring towering tunnels and sections accessible by boat), Hřensko: Gabrielina stezka (Gabriela's Path, on a hiking trail leading to Pravčická brána, Europe's largest natural sandstone arch), Hřensko: Mezná (on the access route to the Kamenice gorges), Jetřichovice: Šaunštejn (near a rock castle ruin, located in a sandstone rock that offers a panoramic view).
- High-visibility transit points (HVTPs) – Chřibská: Saula (starting point for hiking trips with the BSNP information center), Hřensko: Tři Prameny (on the trail connecting the village of Hřensko with Pravčická brána), Jetřichovice–Ozdravovna (in map marked as Jetřichovice, on the hiking loop to famous rock lookouts, Mariina vyhlídka/Mary's Lookout, Vilemínina stěna/Vilemína's Wall, Rudolfův kámen/Rudolf's Stone, and the rock castle Falkenštejn), Jetřichovice: Soorgrund (on the trail between Mezná and Dolský mlýn, a renowned ruin of a watermill popular as a filming location).
- Low-visibility transit points (LVTPs) – Doubice: Klenotnice (in rock maze), Doubice: Zadní Doubice (a pedestrian border crossing into the Saxon Switzerland), Jetřichovice: Česká silnice (Czech Road, on one of the key routes in the BSNP, but far from visitor highlights), Jetřichovice: Eustach (in a remote area, known for its sandstone towers and rock formations), Jetřichovice: Panenská jedle (Virgin Fir, in the center of the BSNP without many attractions), Jetřichovice: Zadní Jetřichovice (a border crossing for hikers entering the Saxon Switzerland), Krásná Lípa: Sýrový potok (Sýrový Stream, on a trail in Kyjovské údolí/Kyjovské Valley, a canyon of the Křinice River, without a solid surface, featuring several stairs and ladders), Krásná Lípa: Turistický most (Tourist Bridge, a tourist crossroad

continuing to Germany, without major tourist landmarks), Růžová: Kamenická Stráň (Kamenická Slope, between the settlement of the same name and Dolský mlýn).

The distinction between HVPAs, HVTPs, and LVTPs captures not only differences in absolute visitation levels but also qualitatively distinct functions within the BSNP's tourism mobility system. The typology is based on pre-pandemic settings and does not reflect potential changes in visitor preferences and behavior. Primary attractions represent symbolic and experiential nodes that concentrate demand and are embedded in destination imagery. HVTPs serve as infrastructural connectors that channel flows toward flagship sites. LVTPs form the background mobility network. These categories reflect different positionalities within the tourism mobility network.

5. Results

5.1 Onset of the crisis (March 2020 – March 2021)

The first three months of the pandemic led to the closure of schools and a limitation on many jobs. However, it did not translate into increased visitation to the BSNP. The sharp decline in visitation likely reflects several concurrent factors, including the absence of foreign visitors, temporary closure of tourism services, mobility restrictions, and heightened risk perception associated with crowded attractions. This initial period of the pandemic was characterized by a 33% decline in recorded passages compared to the same months in 2019. There was a substantial decrease in most monitored locations, with a much larger drop in the HVPAs, including Mezná, Edmundova soutěska, and Gabrielina stezka, with decreases of more than 80%. The steepest decrease was recorded at the Soorgrund monitoring site, where the drop was 95.54%. Soorgrund, classified as an HVTP, recorded the steepest decline among all monitored locations. This pattern may suggest that transit points directly linked to flagship attractions can be vulnerable when access to primary attractions is restricted. The only location that saw an increase of up to 90% at the beginning of the crisis was Česká silnice, an LVTP. The increase may be related to its location on a central backbone route within the BSNP that provides access to several alternative attractions. This development supports the interpretation that spatial outcomes were shaped by network position rather than by intrinsic attractiveness alone.

A moderation of the decline in recorded passages characterized the subsequent period, as summer visitation gradually increased as mobility restrictions were eased. In many cases, the decline in recorded passages stopped, and on the contrary, this number increased in comparison to the same period in 2019. The general balance between June and September was positive, 9%. The positive trend was again registered mainly at LVTPs, such as Turistický most, Kamenická Stráň, or Česká silnice. From a typological perspective, recovery during the summer months was uneven. LVTPs and some peripheral routes experienced earlier stabilization or growth, while HVPAs recovered more slowly despite retaining dominance in absolute numbers.

With the onset of autumn 2020, the number of infected people increased dramatically (MZČR, 2024). At this time, the government resorted to limiting retail sales, banning gatherings of more

than twenty people, and prohibiting the operation of indoor spaces in catering services, among others (Silná, 2022). Recorded passages again fell significantly at HVPAs in the entire region. By contrast, for LVTPs, such as Turistický most, Kamenická Stráž, and Klenotnice, the decline was slower or even reversed. This may be partly attributable to the mild winter that prevailed, creating a better opportunity to visit alternative locations. Generally, HVPAs experienced renewed sharp declines, whereas several LVTPs exhibited slower declines or even temporary increases, suggesting renewed avoidance of symbolically crowded locations. The balance between October 2020 and March 2021 was negative, -12.89%, which does not include the extreme values of Šaunštejn. As an HVPA, Šaunštejn was an exception in its rise. For example, in December 2019, the Šaunštejn sensor recorded 41 passages at this location. In December 2020, it was 1106. The rock castle was closed to the public in April 2021 due to reconstruction, so it might seem that people were motivated to visit the place before its closure. Additionally, the castle is situated in a relatively remote area, making it seem safer during the pandemic.

5.2 Partial easing (April – September 2021)

With the subsidence of the first three waves, the number of infected people gradually decreased to approximately 10,000 cases per day (MZČR, 2024). This trend continued until September 2021, but did not lead to more recorded passages. If we compare this period (April–September) with the same period in 2020, we find that almost all locations experienced a significant decrease in recorded passages. The average drop in the whole BSNP was 19.28%. Unlike the initial phase of the pandemic, typological differences in visitation became less pronounced. Visitor mobility patterns increasingly resembled pre-pandemic spatial distribution (see Fig. 1). HVPAs, which previously showed larger declines than LVTPs, exhibited less negative values than alternative locations. One possible explanation may be changing risk perception among visitors. Visitors may have gradually become accustomed to pandemic conditions and associated health precautions. This may have contributed to their return to frequented locations, while interest in alternative destinations began to decrease. For example, Edmundova soutěska had a -4.8% balance and Česká silnice a -27% balance compared to the previous year. Only three locations experienced an increase in recorded passages compared to the same period during the last year. These locations are Mezná, Jetřichovice–Ozdravovna, and Sýrový potok. In particular, the Mezná location has seen a significant increase, which also supports the idea of returning visitors to popular destinations. The same can be said about Jetřichovice–Ozdravovna.

5.3 Renewed escalation (October 2021–April 2022)

After a calm summer period, the situation began to change rapidly again with the onset of winter. The number of active cases reached 256,455 on December 1, 2021, and peaked at 438,664 on February 2, 2022 (MZČR, 2024). Despite widespread vaccination, the government issued measures that slowed the spread of the infection. Unlike at the beginning of the crisis, the government did not restrict the free movement of people (Slabá, 2022). Although there were significant drops and some locations recorded a continuous decrease in all monitored months,

we also found places that strengthened compared to the pre-pandemic period. At the same time, most of the percentage drops were relatively moderate (see Fig. 1). A positive trend in the number of recorded passages was observed, particularly in Sýrový potok, which increased throughout the monitored period. Other successful locations included Česká silnice, Jetřichovice–Ozdravovna, and Klenotnice. All of these locations recorded a rise in six out of seven months. Except for Jetřichovice–Ozdravovna, relatively successful locations during this period belonged to LVTPs.

Nevertheless, the data show that the locations behaved very similarly, regardless of whether they were prominent locations or forest passages. From a typological perspective, differences between primary attractions, HVTPs, and LVTPs were less pronounced during this phase, reflecting off-season conditions and reduced overall mobility rather than targeted redistribution. Visitation patterns began to resemble those of the pre-pandemic period. The Panenská jedle and Soorgrund sites experienced the most dramatic declines, with average decreases of -76.70% at Panenská jedle and -69.96% at Soorgrund, compared with the corresponding months in 2019. The decline at both sites likely reflects the ongoing bark beetle disaster, which the national park has been struggling with for years. Therefore, the BSNP Administration began preparations for the trail closures in January 2021 (Salov, 2021). The decline of Panenská jedle (LVTP) and Soorgrund (HVTP) illustrates how exogenous environmental constraints can override typological resilience by disrupting network connectivity.

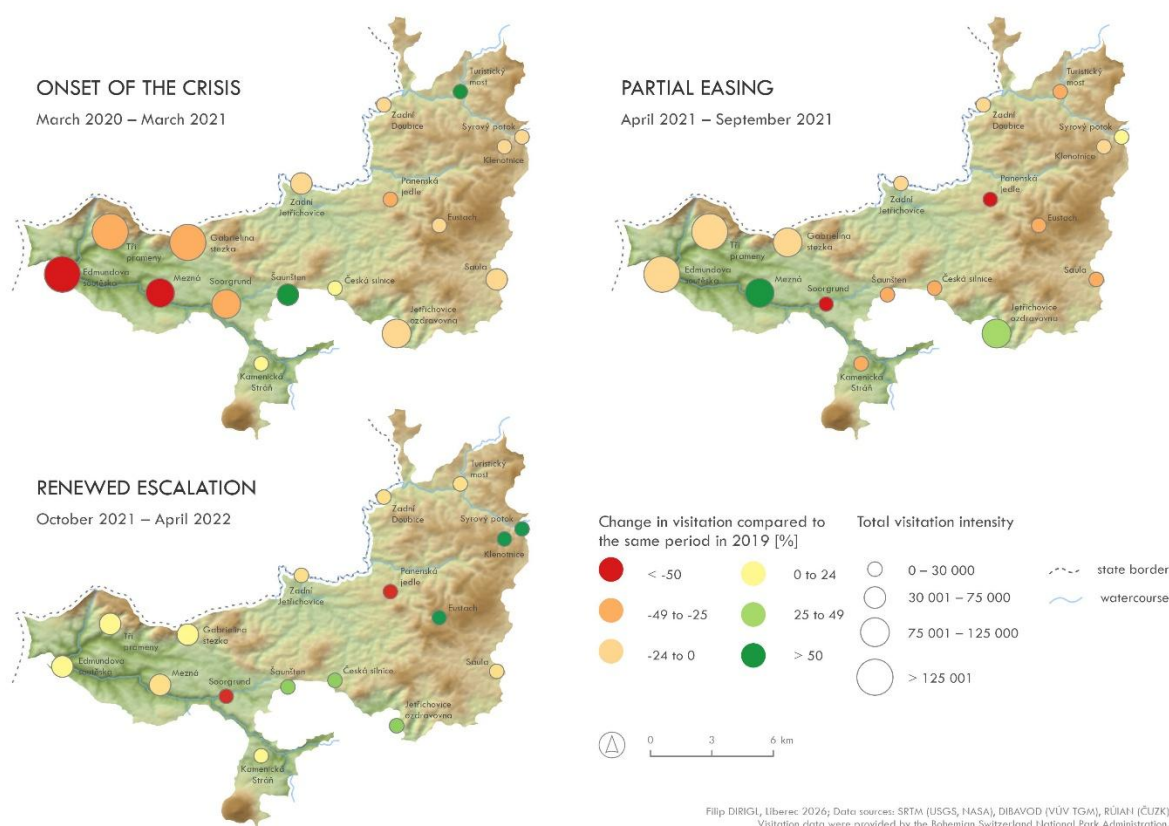


Figure 1. Overview of the changes in visitation in the analyzed periods in comparison to 2019. Source: own processing based on the BSNP Administration data

5.4 Return toward normality (May–July 2022)

With the arrival of spring, the situation slowly returned to normal. Case numbers dropped to a few thousand (MZČR, 2024). The government relaxed restrictive measures, and the tourism sector could expect increased demand. Recovery in May 2022 was led primarily by HVPAs and HVTPs, indicating a rapid re-concentration of demand. A total of 8 out of 17 measuring stations recorded an increase in recorded passages compared to May 2019. The Mezná location achieved the most significant growth. Mezná was followed by Edmundova soutěska and Jetřichovice–Ozdravovna. By contrast, the most significant drop was at the Soorgrund location, which was struggling with restrictions due to the bark beetle disaster. There was no rise in recorded passages in June, as was expected. Only Mezná recorded an increase compared to June 2019. However, a major shock hit the region. On July 24, a fire broke out near Hřensko, with no parallel in the Czech Republic in terms of its size and significant impact on tourism in the BSNP, particularly in its western part, affecting the areas around Tři prameny, Mezná, and Gabrielina stezka (Boháč & Drápela, 2023). This area was closed mainly during the summer months of July and August. The rest of the region was relatively freely accessible, but specific measures and negative media information also affected visitation levels.

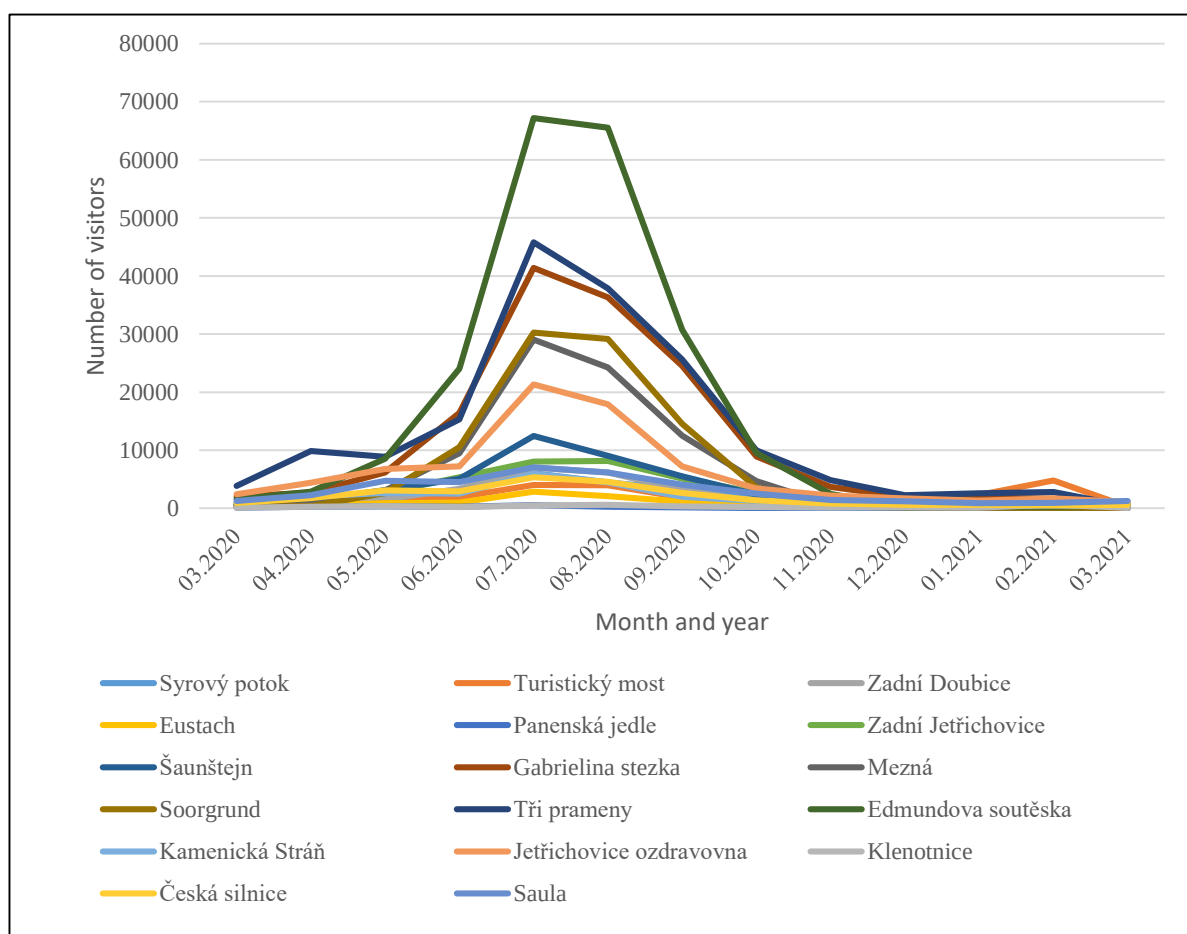


Figure 2. Development of numbers of visitors. Source: Development of numbers of visitors. Source: own processing based on the BSNP Administration data

5.5 Accommodation statistics and their relation to counter data

This research is also informed by accommodation statistics shown in Tab 1. However, administrative factors may have influenced accommodation statistics during the pandemic. In some cases, state support schemes introduced during the pandemic encouraged accommodation providers to formally register their establishments to become eligible for financial assistance. As a result, the number of officially recorded accommodation units may have increased independently of actual tourism demand. For this reason, accommodation statistics are used in this study as contextual indicators to interpret broader tourism dynamics based on counter data, not as direct measures of visitor mobility. There are no data for Růžová for the years 2019 and 2020, most likely due to statistical confidentiality rules and an insufficient number of reporting accommodation establishments, rather than the absence of tourism activity. The situation changed during the pandemic, when the statistical office became interested in accommodation details related to disease transmission prevention. Chřibská is notable for its steady rise in accommodation statistics in all observed years. It can be explained by its location between two tourist regions, Bohemian Switzerland and Lusatian Mountains, its function as a residential base rather than a day-trip destination, and its relative immunity to overtourism and restrictions. Tourism development in Hřensko between 2019 and 2022 followed a pattern of sharp decline due to the pandemic, with a notable decrease in 2020 (over 30% fewer guests and overnight stays), prolonged stagnation, and only partial recovery, reflecting the vulnerability of highly exposed, day-trip-oriented destinations. Similar trends were observable in Jetřichovice and Krásná Lípa. Small villages, such as Doubice and Růžová, reflected the vulnerability of small, peripheral rural destinations. Generally, the decline in the number of guests and overnight stays was not accompanied by a decline in the number of accommodation facilities or beds, suggesting that accommodation providers may have followed the strategy indicated above.

Table 1. Number of facilities/beds in key municipalities in the BSNP. Source: own processing based on the data from the CZSO (2024)

	2019	2020	2021	2022
Chřibská	7/111*	10/170	11/178	11/181
Doubice	6/75	6/76	5/74	6/80
Hřensko	12/155	15/177	15/229	13/222
Jetřichovice	18/263	22/299	20/283	22/309
Krásná Lípa	8/114	10/123	9/111	10/130
Růžová	2/n.r.**	3/n.r.	5/36	5/35
Total	53/718	66/845	65/911	67/958

* number of facilities/beds

**not reported

Table 2. Number of guests and overnight stays in key municipalities in the BSNP. Source: own processing based on the data from the CZSO (2024)

	2019	2020	2021	2022
Chřibská	4,145/11,849*	4,455/17,145	4,959/18,107	6,477/22,976
Doubice	5,269/14,513	3,210/10,363	2,906/8,444	4,118/13,375
Hřensko	19,794/45,616	13,355/29,631	13,476/32,341	16,313/34,826
Jetřichovice	17,729/46,193	12,025/34,202	12,719/38,167	18,747/52,507
Krásná Lípa	13,899/34,214	7,959/20,800	7,247/18,166	11,584/27,966
Růžová	n.r.**/n.r.	n.r./n.r.	1,494/2,683	1,843/5,538
Total	60,836/152,385	41,004/112,141	42,801/117,908	59,082/157,188

*number of guests/overnight stays

**not reported

The development identified based on accommodation statistics on guests and stays is broadly consistent with the trends recorded by counters in the respective municipalities' cadastral areas (Figure 2). In Chřibská, the continuous increase in the number of guests and overnight stays corresponds with relatively stable recorded passages at the Saula counter. In Hřensko, the sharp decline in guests and overnight stays in 2020, followed by only partial recovery by 2022, is entirely consistent with the extreme drops recorded by counters at Edmundova soutěska, Gabrielina stezka, and others. In Jetřichovice and Krásná Lípa, accommodation data indicate stagnation followed by gradual recovery, which corresponds to the heterogeneous trajectories observed in counter data. Central routes (e.g., Jetřichovice–Ozdravovna, Sýrový potok) recovered more quickly than peripheral or temporarily closed sites (e.g., Soorgrund, Panenská jedle). In Doubice and Růžová, fluctuating and relatively weak performance in accommodation statistics corresponds to unstable and low recorded passages at the relevant counters (Klenotnice, Kamenická Stráž). The correspondence between accommodation data and counter data further supports the interpretation that HVPAs are closely tied to day-trip tourism, whereas LVTPs capture more diffuse mobility patterns. Based on contextual evidence from the Hřensko area and previous tourism studies in the region, the decline in day-trip tourism or short overnight stays is likely related to the absence or limited presence of German visitors during periods of border closure.

6. Discussion

Because the analysis relies primarily on automatic pedestrian counters, the results should be interpreted as patterns of recorded passages rather than precise measurements of individual visitors. Consequently, the study focuses on relative temporal and spatial changes in mobility intensity. Regarding RQ1, the findings demonstrate that the pandemic had a substantial and sustained negative impact on recorded passages, particularly during periods of strict mobility

regulation and cross-border closure. The sharpest decline occurred during the initial phase of border closures and strict mobility restrictions in the spring of 2020. Compared to 2019, most monitored locations recorded declines exceeding 30%, with HVPAs experiencing even steeper losses. The sharp decline in visitation is consistent with the likely temporary absence of foreign visitors, particularly from Germany, which traditionally accounts for a substantial share of tourism flows in the region and whose mobility was strongly affected by cross-border restrictions during the pandemic. While domestic tourism may have partially compensated during summer periods, it did not fully offset the loss of cross-border flows. As a result, recorded passages remained below pre-pandemic levels throughout much of 2020 and 2021, contrary to narratives of rural tourism resilience. From a critical realist perspective, these declines can be interpreted not merely as statistical fluctuations but as patterns consistent with interacting causal mechanisms such as mobility restrictions, border closures, and changing perceptions of risk. The proposed causal mechanisms should therefore be understood as analytically informed interpretations linking observed visitation patterns with documented institutional and mobility-related changes during the pandemic. Beyond studies focusing specifically on rural tourism, the findings are consistent with broader evidence on the uneven and phase-specific impacts of the pandemic on tourism demand. Tiwari, Seraphin, and Chowdhary (2020) and Abbas et al. (2021) emphasize that the pandemic did not produce a uniform decline in tourism, but instead triggered differentiated responses depending on destination type, mobility constraints, and institutional regulation. The BSNP case supports this interpretation by demonstrating sharp initial declines during periods of strict mobility restriction, followed by partial and spatially uneven recovery during periods of easing. The findings thus align with the broader literature, highlighting that pandemic-induced tourism dynamics are contingent on both the temporal phase and destination embeddedness within wider mobility systems. Studies based on accommodation statistics in the Czech Republic (Tittelbachová et al., 2022; Makáň et al., 2023) report substantial declines in inbound tourism in 2020, accompanied by a partial substitution effect driven by domestic visitors. While these studies document aggregate trends at the national or regional level, the BSNP findings nuance this picture by revealing significant intra-destination differentiation that is not captured by accommodation data alone. Counter-based mobility data show that even when accommodation figures stabilized or partially recovered, HVPAs and HVTs linked to day-trip tourism remained disproportionately affected. BSNP corresponds to a hybrid rural destination combining accommodation-based domestic tourism with a strong reliance on international day-trip and transit tourism. This hybrid profile complicates assumptions derived from rural tourism studies, which primarily focus on overnight stays, proximity tourism, and small-scale rural enterprises. At the same time, alternative processes may also have influenced visitation dynamics during the pandemic. In many European rural regions, the pandemic was associated with increased use of second homes, informal accommodation, and other forms of non-registered tourism mobility that are only partially captured by official tourism statistics (Seraphin & Dosquet, 2020). Domestic tourism demand also fluctuated in response to changing mobility restrictions and perceived health risks. While these processes cannot be directly observed through pedestrian counter data, they represent plausible complementary factors

shaping visitor behavior during the pandemic. Therefore, the interpretation presented in this study focuses primarily on mobility-related disruptions, while acknowledging that multiple overlapping mechanisms may have contributed to the observed visitation patterns.

These findings directly relate to H1 and do not support it. While domestic tourism may have partially compensated for the decline in cross-border visitation, it did not offset the structural absence of German cross-border day-trippers who traditionally constitute a substantial share of visitation, particularly in the Hřensko area. This pattern corresponds with findings by Boháč and Drápela (2022), which show that iconic rural attractions function as structurally exposed hotspots whose dependence on concentrated flows amplifies sensitivity to external disruptions, including regulatory and mobility shocks. In relational terms, BSNP functions less as an isolated rural refuge and more as a node within a transnational tourism system. The results thus partially contradict earlier findings from accommodation-based studies in the Czech Republic (Vaishar & Šťastná, 2020) and France (Seraphin & Dosquet, 2020), which reported increased consumption through rural tourism and domestic arrivals, replacing foreign tourists. Additionally, the counter-based study (Ciesielski et al., 2023) from Polish non-border rural areas (one of the studied areas is near an impermeable border) reports stable or even increased visitation during the pandemic. However, findings from the BSNP demonstrate that rural destinations embedded in cross-border day-trip tourism systems followed a structurally different trajectory. The discrepancy underscores the importance of distinguishing between destinations oriented toward overnight domestic tourism and those embedded in international, high-frequency day-trip regimes. Similar context-dependent patterns were reported in other European rural destinations during the pandemic, where the balance between domestic tourism and international mobility strongly shaped tourism performance (Silva, 2022).

Regarding RQ2, the results indicate that redistribution of visitors within the BSNP, favoring less frequented and more peripheral locations, did occur, but in a temporary and phase-specific manner. During the initial phase of the pandemic and subsequent periods of heightened risk perception, several LVTPs recorded smaller declines or even relative increases in visitation. At the same time, HVPAs and HVTPs experienced disproportionate losses. This pattern resonates with Gössling, Scott, and Hall (2020), who argue that the pandemic exposed structural vulnerabilities in tourism systems heavily dependent on international mobility. In line with Higgins-Desbiolles (2020), the results therefore challenge narratives of crisis-induced transformation and resilience, instead highlighting how pre-existing structural dependencies condition the limits of adaptive responses. Evidence from Romania (Szilágyi, Bujdosó & Szabó, 2025) suggests that tourism resilience often manifests not as employment recovery but as rapid growth in turnover, accompanied by labor contraction and rising productivity, driven by structural shifts toward small-scale, short-stay accommodations and the spatial reallocation of activities. This confirms that resilience may involve reconfiguration rather than restoration, and that peripheral or less transit-exposed areas can temporarily outperform core nodes.

From a relational geography perspective, the observed changes in visitation patterns can be interpreted in line with Sheller and Urry (2006) as reconfigurations within a disrupted mobility

network rather than as isolated local responses. The BSNP findings illustrate how disruptions to border regimes and international mobility corridors reverberated through the entire tourism system, affecting not only flagship attractions but also transit routes. The temporary shift toward LVTPs during periods of heightened risk perception reflects adaptive rerouting within existing networks rather than the emergence of new tourism spaces. As restrictions eased, visitor flows gradually reconverged around symbolically central attractions, indicating the persistence of established relational hierarchies within the BSNP. Similar re-concentration dynamics have been documented in rural overtourism hotspots, where visitor dispersion into peripheral areas tends to be temporary and reverses once perceived risks decline (Boháč & Drápela, 2022).

The revealed pattern supports H2, albeit in a qualified form. Rather than representing a permanent shift in visitor preferences, the redistribution reflects short-term adaptive behavior driven by the avoidance of crowding and perceived health risks. The observed spatial redistribution of visitors during the pandemic aligns closely with the proposed visibility–function typology. In critical realist terms, observed spatial shifts can be explained as empirical manifestations of deeper mechanisms, including institutional regulation of access, concentration of visitors at flagship sites, and behavioral responses to uncertainty. However, as restrictions eased and visitors became habituated to pandemic conditions, the advantage of peripheral sites diminished. Visitor flows gradually re-concentrated around well-known attractions, indicating that the spatial reorganization of demand was situational rather than structural. Resilience in this case did not manifest as a return to pre-crisis patterns, but rather as a sequence of uneven and reversible spatial adaptations.

7. Conclusions

Although the findings are derived from a specific national park, their analytical relevance extends beyond the studied case. The study does not aim at empirical generalization in the statistical sense. Instead, its contribution lies primarily in analytical transferability, understood as identifying causal mechanisms and relational configurations that may operate in comparable contexts. Similar dynamics have been observed or are expected in other rural and protected destinations that rely on day-trip tourism and cross-border mobility. Within the Czech Republic, all national parks (e.g., Šumava/Bohemian Forest and Krkonoše/Giant Mountains) are situated in the borderland. However, the Šumava and Krkonoše national parks offer numerous attractions across large territories and have a higher likelihood of more extended tourist stays. The best case for comparison is the Podyjí National Park, which shares functional and structural similarities, is comparable in size and number of tourists, and is located along the border with a more economically developed neighboring country, Austria, with established flows of Austrian tourists. Similar patterns have been documented in borderland protected areas in Central and Western Europe (Stoffelen & Vanneste, 2017).

The study cautions against generalization to rural destinations dominated by accommodation-based domestic tourism. Rather than offering universal or place-invariant claims, the paper advances a relational understanding of tourism resilience, providing analytically transferable

insights into how crises disrupt interconnected tourism systems and induce uneven spatial adaptations within protected areas.

This study contributes to tourism geography and crisis research through three interrelated theoretical and methodological advances:

- It conceptualizes rural tourism resilience as a context-dependent and relational outcome rather than an inherent property of rural destinations, demonstrating that resilience cannot be assumed in borderland areas embedded in international mobility and day-trip tourism networks.
- It theorizes pandemic-induced change not merely as a temporary fluctuation in recorded passages, but as a mechanism-driven process leading to uneven spatial reconfiguration of visitor behavior within protected areas.
- It demonstrates the analytical value of integrating high-resolution counter data with a critical realist interpretation of visitor flows, allowing observed visitation patterns to be interpreted as outcomes of interacting structural conditions and situational visitor responses rather than as isolated empirical trends.

Generally, rural destinations cannot be treated as uniformly resilient or vulnerable. Instead, rural tourism resilience emerges as a differentiated outcome shaped by spatial position, functional specialization, and embeddedness within wider mobility and market systems. Rather than aiming for statistical generalization, the study offers analytically transferable insights relevant for rural destinations that share similar structural conditions. The findings are most applicable to borderland national parks and protected rural areas characterized by a strong dependence on cross-border day-trip tourism and functional integration with neighboring, economically stronger regions. Conversely, the conclusions do not extend to rural areas dominated by long-stay domestic tourism, agriculture-based economies, or remote peripheral regions with limited exposure to international mobility.

The limits of the research are primarily associated with the spatial distribution of counters within the BSNP. Despite the extensive network of these devices, coverage remains uneven, with a more pronounced absence of counters in the central areas of the protected landscape and informal paths. Another limitation concerns the lack of information on visitors' intrinsic motivations, which would allow a more fine-grained interpretation of location-specific visitation patterns. Addressing this limitation would require complementary qualitative approaches capable of capturing the meanings, constraints, and decision-making processes underlying observed mobility behavior. Future studies could further examine the impacts of COVID-19 on different types of rural tourism accommodations and tourism-related businesses in the region. More broadly, the analytical framework and methodological approach developed in this study are transferable to other rural and protected destinations characterized by concentrated visitor flows and sensitivity to external mobility disruptions.

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