

Ochrana přírody

2026 Czech Nature Conservation

Network of Houses of Nature
Sika Deer in the Slavkov Forest
Protected Landscape Area

The Czechoslovak First Land Reform
Fire Prevention in the Bohemian
Switzerland National Park

Ecosystem Accounting:
Services of Pollinators
70 years of the Bohemian Paradise
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Cover Photo: Bohemian Paradise – Morning from the
Mariánská Viewpoint. © Zdeněk Patzelt



Dear Readers, Dear Colleagues

You are now holding the latest issue of the *Ochrany přírody/Nature Conservation Journal* for 2025 in English.

I would like to add that this issue is being published in 2026 when in the Czech Republic the “Year of Protected Landscape Areas” initiative under the auspices of the Czech Commission for UNESCO has been implemented. The Czech Republic has 27 Protected Landscape Areas (PLAs); the Nature Conservation Agency of the Czech Republic (NCA CR) manages 25 of them, five of which are commemorating significant anniversaries of their establishment. Protected Landscape Areas harbour diverse, unique nature and the landscape where fragments of close-to-natural ecosystems often join managed

landscapes and cultural monuments as well (according to the IUCN Category V).

In this issue, you will find a diverse collection of articles addressing what we consider important issues in nature conservation and landscape protection. Thus, we commemorate the 70th anniversary of the designation of the Český ráj/ Czech Paradise, the oldest PLA in the Czech Republic, where fragments of unique natural landscapes—particularly rock formations—historical monuments, and sustainable forms of landscape management are seamlessly integrated in an exemplary manner.

Significant insights are also provided by articles focusing on the landscape, e.g. limiting the destructive impact on biodiversity caused by overpopulated game ungulates, restoring the water regime, or protecting the insect diversity associated with old-growth trees in forests. A report on the successful collaboration between a landowner and forest manager in a stream floodplain and the State Nature Conservancy, namely the NCA CR, demonstrates the expansion of desirable cooperative management of valuable habitats. Current topics include the prevention of wildfires in National Parks as part of providing the proper management of local forests. Interesting are also the articles concerning the legal framework for close-to-nature forest management, the return of the Ukrainian lamprey, perspectives on ecosystem services provided by pollinators, the visitor infrastructure system in Protected Landscape Areas, and the

history of land reform in Czechoslovakia in relation to nature conservation.

Nature conservation, in the context of the broader framework of social change and the geopolitical situation, faces and will face fundamental challenges, and addressing them is not and will not be a trivial matter. However, this will not be possible without fully integrating the reality that nature conservation—based on scientific and expert evidence—is one of the key priorities for human society, regardless of political and electoral preferences. The quality of information can easily be overshadowed by its quantity. Moreover, a well-educated society should respond to these challenges more rationally than a poorly educated one. We are, in fact, more dependent on the nature and its associated processes/functions/services than we want to admit to ourselves. Anyone who believes the exact opposite should brush up on his/her basic knowledge of general ecology.

I would like to thank everyone who has been involved in promoting more effective nature conservation, whether as a professional or volunteer conservationist, or as a responsible forest or agricultural manager.

I hope you enjoy reading this.

František Pelc

*Director of the Nature Conservation Agency
of the Czech Republic*

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The Český ráj/Bohemian Paradise Protected Landscape Area Has Been in Existence for 70 years

Lukáš Bílek

Our predecessors—naturalists, local historians, and members of ornamental societies/ beautification associations and tourism clubs—took an interest in the landscape among the towns of Turnov, Jičín, and Mnichovo Hradiště, nowadays located on the border of Central Bohemia, northern Bohemia and eastern Bohemia, as early as the 19th century. But when did the name “Český

ráj/Bohemian Paradise” first appear in connection with the landscape around the Trosky/Ruins Castle? For decades, it has been claimed that the name was coined by 19th-century Prague writers, led by Jan Neruda and Eliška Krásnohorská. They used to go to the spa of Sedmihorky for recreation, and it was there that the name “Český ráj/Bohemian Paradise” was born.



Figure 1. The Český ráj/Bohemian Paradise landscape with the Trosky/Ruins Castle and the Kozákov Ridge. © Jiří Klápště



Figure 2. The Prachovské skály/Prachov Rocks. © Vladimír Šoltys

That is not the case; it did not originate there, and neither Neruda nor other Prague writers were its authors. Nor was it Václav Durych the town of Turnov, to whom the National Revival-era relocation of the name “Český ráj/Bohemian Paradise” from the then-German region of Litoměřice (northern Bohemia) to the purely Czech region of Turnov is often attributed. In 2007, architect Karel Čermák published the results of his study on the origin of the name. The oldest evidence of the name’s use is the 1843 poem titled “Kde děvka má/Where is My Girl?” by Václav Jaromír Pick, a native of the village of Svijanský Újezd (Čermák 2007). In it, he writes about “a rose in the Český ráj/Bohemian Paradise” in his home region of Turnov, and the text clearly shows great inspiration from Tyl’s song “Kde domov můj/Where is my home?”, later becoming anthem of Czechoslovakia and the Czech Republic. Eighteen years later, Václav Sedláček published the poem “U Jizery/Near the Jizera River,” in which the author refers to Pick and explicitly names the region around the Jizera River, Turnov, Trosky/Ruins Castle, and Kozákov Ridge as the Český ráj/Bohemian Paradise—later the territory of a Protected Landscape Area (PLA, Čermák 2007). It had been not until 1886 that the above Václav Durych published his travel sketchbook “From

the Český ráj/Bohemian Paradise” with a map and illustrations by A. Nejedlý, and “Český ráj/Bohemian Paradise” as a designation for the Turnov region entered the broader public consciousness (Čermák 2007)

Nature Conservation in the Bohemian Paradise for Nearly a Century

The year 2025 marks the 70th anniversary of the designation of the Český ráj/Bohemian Paradise PLA. Moreover, the first protected areas in the region were established even before the PLA’s official designation. The Prachovské skály/Prachov Rocks Nature Reserve has been in existence since 1933, and twenty years later, the Na Hranicích/At the Border Nature Reserve was designated near the town of Turnov. Discussions about the need to protect the entire landscape began as early as the First Republic, i.e. in Czechoslovakia 1918-1938. Shortly after World War II, the Mnichovo Hradiště District National Committee approached the then Ministry of Education and National Enlightenment with a request to ensure the protection of the wider area around the village of Mužský with a number of archaeological sites. In 1947, the

renowned physician Jiří Šolc was appointed as the District of Turnov Nature Conservationist, a person in charge of nature conservation in the respective district (Pelc 2025). It was he who advocated for the then Ministry of Culture to designate the Český ráj/Bohemian PLA in 1955. Tgus, the Český ráj/Bohemian Paradise became the first PLA in Czechoslovakia. This occurred a year before the adoption of the Nature Conservation Act. Covering an area of 92 km², the rock towns of Hruboskalsko, Příhrazské skály/Příhrazy Rocks, and Apolena, the valleys of Žehrovka Rivulet and Jordánka Brook below the village of Trosky/Ruins, Trosky/Ruins Castle itself, the Plakánek Valley, the Žehrovské lesy/Žehrov Forests, and the largest fishpond in the region, Žabakor, came under joint protection. In addition to these natural monuments, cultural monuments also became part of the PLA – the castles of Kost/Bone, Valečov and Trosky/Ruins, the chateau of Hrubá Skála and later Vesec u Sobotky and Mužský Village Heritage Reserves.

Nevertheless, the PLA’s protection regime was weak (Pelc 2025). Despite the declared protection, the floodplain of the Libuňka Brook—the main watercourse of the area between the Trosky/Ruins Castle and the Kozákov Ridge—was drained in the



HOW THE ČESKÝ RÁJ/BOHEMIAN PARADISE PROTECTED LANDSCAPE AREA LOGO WAS CREATED

The idea to create a logo for the Český ráj Protected Landscape Area originated in the mid-1970s at the Regional Centre for State Monument Preservation and Nature Conservation in the city of Pardubice. The project was undertaken by forester Jaroslav Macák, botanist Vlastizdar Vágenknecht, zoologist Petr Rybář from the Department of Nature Conservation, and Miroslav Pojkar—at the time the only employee of the Protected Landscape Area Administration—together with heritage conservation advocate Hana Raková-Kočová. It was clear that it had to feature the familiar silhouette of the Trosky/Ruins Castle (Proceedings: 50 Years of the Český ráj/Bohemian Paradise Protected Landscape Area, 2005). There were several options for what to add to Trosky—the outlines of rocks and summit pines, the silhouette of an eagle owl, an antlion pit, fern leaves, or orchids. The Peregrine falcon (*Falco peregrinus*), which would have seemed ideal, had already gone extinct in

the Český ráj/Bohemian Paradise at that time. Rybář therefore proposed a universal falcon-like bird instead of the peregrine, and there was consensus on this.

The emblem was designed by the academic painter Jan Hlína from the town of Heřmanův Městec. The simple design and professional execution ruled out any potential reproduction issues later on (Proceedings: 50 Years of the Český ráj/Bohemian Paradise Protected Landscape Area, 2005). It can be easily enlarged or reduced, and options include full colour, single-colour outline, grayscale, and negative versions. The emblem was approved and commended by the Committee of the Czech Fine Arts Fund based in the city of Hradec Králové. Half a century of existence has proven the logos quality, and fortunately, it has not suffered the later graphic devaluation that has befallen other original emblems of large-size Specially Protected Areas, i.e. PLAs and National Parks. In recent years, the universal falcon-like bird can be declared a true falcon, and Petr Rybář's idea can be described as visionary. The Peregrine falcon has returned back and has been once again nesting at the castle of Trosky/Ruins.

1960s. By straightening and regulating its course, the Libuňka Brook was shortened by up to a quarter in some sections, and e.g. in the vicinity of the village of Ktová, it has since flowed over a cascade of concrete weirs. As elsewhere, meadows were ploughed and drained, waterlogged habitats were destroyed, and the cultivation of Norway spruce and pine monocultures continued in the forests. The Český ráj/Bohemian Paradise PLA Administration was not established as an institution until 1969 and had no authority. Its voice was merely advisory to the National Committees within the PLA's territory at that time (Pelc 2025) and was often ignored. What was successfully protected back then may not be entirely obvious today. Virtually nothing is known anymore about the grand plan to build a large-scale recreational centre on the meadows near the Věžák Fishpond. At the time, the PLA Administration managed to prevent the construction and preserve the most picturesque of the Český ráj/Bohemian Paradise valleys beneath the Trosky/Ruins Castle.

Practical nature conservation often relied on volunteer activities. The PLA Administration built two nature trails/educational paths—one in the Hruboskalsko area and another along the fishponds in the Podtrosecké údolí/Bellow Trosky Castle Valley. Following the example of the Krkonoše/Giant Mountains information centres, two were established in the Český ráj/Bohemian Paradise in the 1980s—one by adapting a historic gazebo in the arboretum at Bukovina near the village of Hrubá Skála, and the other in a newly built structure near the Věžák Fishpond. The information centre at Věžák Fishpond was a significant venue where exhibitions and meetings were held in collaboration with the editorial staff of the popular Mladý svět/Young World magazine. On the other hand, the design of the Věžák Information Centre is typical of the prefabricated structures of that era and, even at the time of its construction, contradicted what we now refer to as landscape scenery/character protection. The third location designated for communication with, education of and raising awareness among the general public was an exhibition space with a lecture hall in the PLA Administration building in the town of Turnov.

It was not until after 1989, with the introduction of new legislation, that a fundamental change took place—not only for the Český ráj/Bohemian Paradise. Thanks to Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection the administrations of PLAs and National Parks gained decision-making authority performing Public/State Administration within their

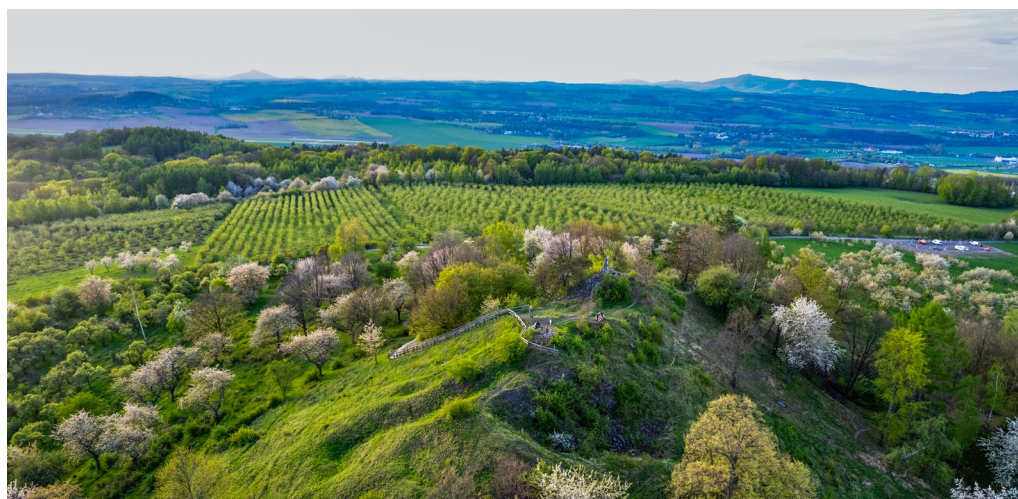


Figure 3. On Mužský Hill black locust (*Robinia pseudoacacia*) self-seedlings were successfully eradicated and non-forest habitat has been maintained by goat grazing. © Jiří Šťastný

The Green-winged orchid (*Acamptis morio*) used to be a relatively common orchid in the Czech Republic's countryside, but today it is rarely seen there. In the Český ráj/Bohemian Paradise, it is known from two sites only. At one site, the number of plants has increased from seven to twenty-six over the course of seven years showing that even small populations can gradually grow and become more stable.

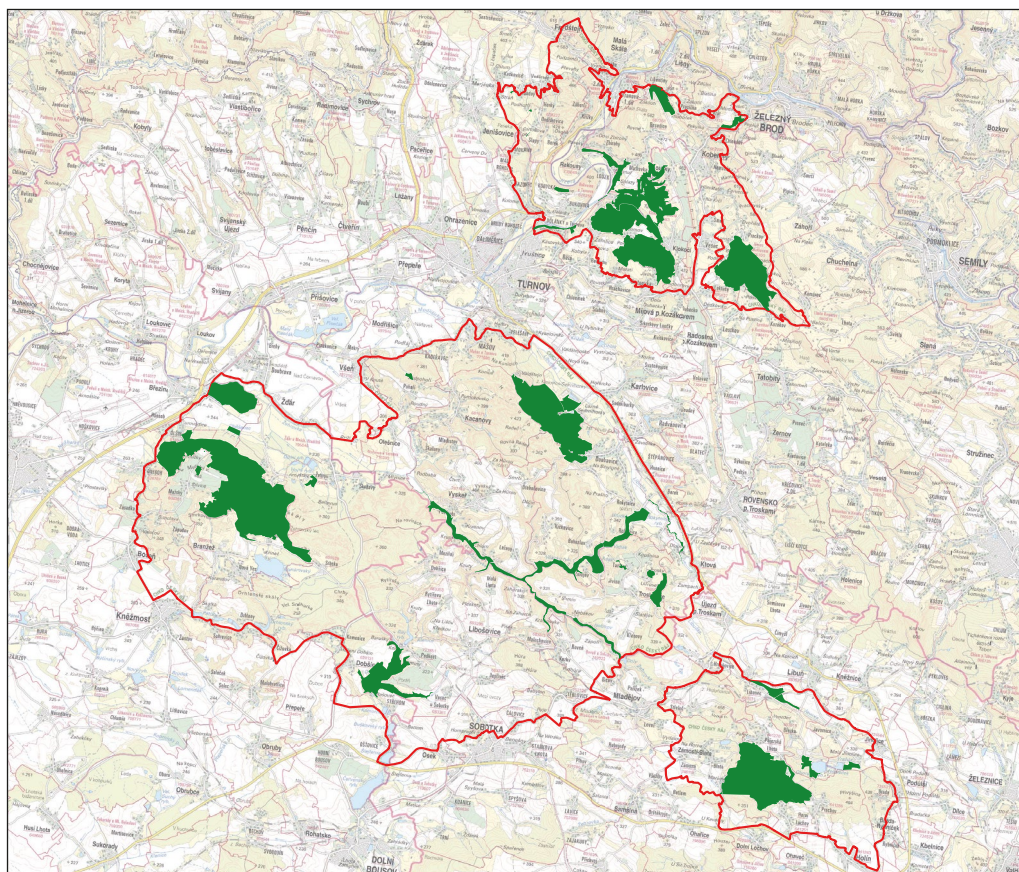
The Autumn dwarf gentian (*Gentianella amarella*) is a biennial plant that blooms in late summer and autumn. In unfavourable years, it can survive in the soil as a seed bank and reappear when conditions are right. In the Český ráj/Bohemian Paradise, it is known from only a single site, where over 14,000 individuals have been recorded.

The Early coralroot (*Corallorhiza trifida*) is an inconspicuous, leafless orchid whose non-green stems grow from forest litter. It obtains nutrients through symbiotic fungi connected to tree roots. In the Český ráj/Bohemian Paradise, it was found after thirteen years in the Bučiny/ Beech Forest u Rakous Nature Reserve, where botanists counted 85 individuals. Its presence indicates the well-preserved habitat of the local forests.

The European yellow lady's slipper (*Cypripedium calceolus*) is an orchid with a strikingly shaped flower. The lower labellum resembles a hollow pouch that acts as a trap for insects. The insect can only exit the flower through a narrow slit, thereby transferring pollen on its body. In the Český ráj/Bohemian Paradise, the orchid grows at only a single site in the Maloskalsko region.

Jan Višínský

territories; management plans began to emerge as conceptual documents for the Specially Protected Areas including PLAs; and, last but not least, subvention programmes/subsidiary schemes were introduced, along with the funding needed to implement measures for nature conservation and landscape protection. As a result, more targeted and effective management

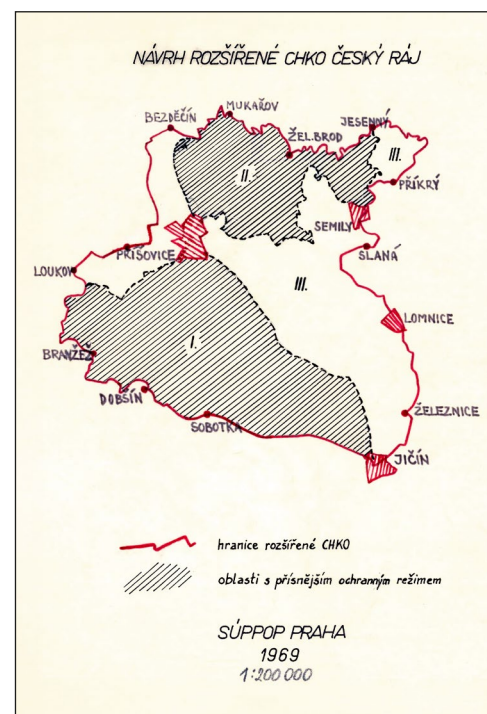


Map 1. The Český ráj/Bohemian Paradise Protected Landscape Area in 2025 and its 25 small-size Specially Protected Areas. Map © Ondřej Tomášek

could begin in the 1990s, and a number of Natural Monuments and Nature Reserves were designated.

Enlargement of the Protected Landscape Area

Discussions about enlarging the PLA began shortly after its designation. The plan was to extend protection to the entire landscape from the town of Železný Brod to the town of Jičín. The proposed new boundaries from the 1960s were ambitious; the area was several times larger than the existing PLA and included other natural and landscape features of the Český ráj/Bohemian Paradise. The proposal was revised over the course of a decade, with interest in the expansion declining and then increasing intermittently. It was not until after 2000 that a scaled-down version consisting of two separate parts was submitted for discussion. It seemed acceptable because it excluded the entire wide valley between the Kozákov Ridge and the Trosky/Ruins Castle, through which



Map 2. Proposed enlargement of the Český ráj/Bohemian Paradise Protected Landscape Area from 1969. © NCA CR Archive



Figure 4. A new path lined with fruit trees leading from the village of Rytířova Lhota to the village of Libošovice. © Lukáš Bílek

the transport link between the towns of Jičín and Turnov, and the cities of Hradec Králové and Liberec, runs. Even the proposal was drastically reduced during the deliberations. The main reasons were objections from the municipalities of Mírová pod Kozákovem and Mladějov, as well as difficulties to incorporate the Hrdoňovice sandpit into the PLA. The final agreed-upon form divided the PLA into three separate parts. The historic section from 1955 is supplemented to the south by the Sobotka area, featuring picturesque villages, Humprecht Castle, and the Kostec forests, extending all the way to Komárovský rybník Fishpond near the village of Branžež. A separate eastern segment encompasses the landscape of the Prachovské skály/Prachov Rocks and wetland meadows in the Javorka River basin. The northern segment consists of part of the Maloskalsko region with the southern slopes of the Kozákov Ridge. Therefore, the PLA nowadays includes the monumental Suché skály/Dry Rocks and Vranovský hřeben/Vranov Ridge rock formations, Frýdštejn Castle, the massive Jizera River Canyon between the towns of Turnov and Malá Skála—along with the Bučiny/Beech Forest u Rakous and Na hranicích/At the Border Nature Reserves—as well as the Klokočské skály/Klokoč Rocks and Betlémské skály/Nativity Scene Rocks, the Besedické skály/Besedice Rocks, and the Měsíční údolí/Moon Valley on the Kozákov Ridge. In this form, in October 2002, the then-Czech government declared

the expanded Český ráj/Bohemian Paradise Protected Landscape Area covering just under 182 km². The lack of territorial integrity, and in particular the highly fragmented border in the northern section, has soon proved to be a weakness in protecting the landscape as a whole, and this remains the case to this day.

(Not Only) the Successes and Challenges of Nature Conservation and Landscape Protection in the Český ráj/Bohemian Paradise

As stated in 2002 Regulation of the Government of the Czech Republic, the area designated for protection is “a vast area with a harmoniously shaped landscape, sandstone relief, and rock formations, featuring a significant proportion of natural forest and permanent grassland ecosystems, numerous fishponds, streams, and cultural monuments that contribute to the characteristic landscape scenery.” The PLA’s mission is “to preserve and restore its natural environment, particularly ecosystems, wild animals and wild plants, and to maintain the typical landscape scenery/character while developing an ecologically optimal system for the use of the landscape and its natural resources.” Fulfilling this mission is the task of the Český ráj/Bohemian Paradise Protected Landscape Area Administration.



Figure 5. A system of new pools in farmland near the village of Záměstí Blata. © Jiří Klápště

Over the past 70 years, 25 small-size Specially Protected Areas have been designated in the categories of Nature Reserves, Nature Monuments, and National Nature Monuments. Some of them were “inherited” through the PLA enlargement.

In connection with landscape restoration in recent years, a large part of the effort has been directed toward Zone III in the open countryside. Field paths and tree-lined avenues are being restored. Since 2019, the number of trees in the avenues has increased by nearly 2,500. Volcanic peaks are undergoing another significant transformation. Their appearance is changing, returning to the historic deforested form seen in period postcards. The Trosky/Ruins, the village of Vyskeř, and Mužský Hill, once overgrown with black locust (*Robinia pseudoacacia*) self-seedlings, have gradually been cleared and are now used for grazing. This creates patches of distinct conditions amidst the sandstone landscape, serving as “stepping stones” that enable the wild plant and animal dispersal between isolated sites. In recent years, some forty wetland areas have also been restored or newly established in the Český ráj/Bohemian Paradise. A major task for the coming years is to attempt to restore the Libuňka Brook, which was canalised sixty years ago. A significant challenge in PLA staff’s nearly daily activities is the pressure caused by urbanization on the open landscape



Figure 6. Many historic cottages have been preserved thanks to the of their owners using them as weekend-houses, such as this one in Záborčí, a quarter of the village of Malá Skála. © Lukáš Bílek

and construction in general. Fortunately, nearly all municipalities within the PLA already have approved land-use/territorial/physical plans, so landscape protection can be addressed conceptually, and some requirements for its protection can largely be incorporated into the plans. A major asset is the existence of a high-quality “preventive assessment of the PLA’s landscape scenery/character.” The degree of success in protecting the landscape scenery/character is similar to that in other PLAs. The open landscape is more or less being successfully protected, but the situation is not as successful when it comes to the appearance of human settlements. The mantra of the gabled roof is not all-powerful. And so, high-quality architecture that is both contemporary and reflective of the rural architecture of the Český ráj/Bohemian Paradise (as opposed to the nearby Jizerské hory/Jizeraa Mountains) is few and far between.

The former threat to the Český ráj/Bohemian Paradise posed by the high-capacity four-lane I/35 highway has been moved almost entirely outside the PLA. This may seem like good news for Libuňka Brook; just twenty years ago, there were plans for a corridor that would have completely destroyed it. Unfortunately, the current proposed highway’s route, despite all efforts to find a more environmentally friendly solution, will impact the Český ráj/Bohemian Paradise landscape just as severely. It is uncertain whether a more generous solution for the Český ráj/Bohemian Paradise can be found. Time will tell if our society is mature enough to protect and cherish its “paradise” regardless of the PLA’s administrative boundaries. There is no substitute for the Český ráj/Bohemian Paradise waiting elsewhere.



Figure 7. A commemoration of Karel Čapek’s century-old column, featuring the planting of his maple tree in the arboretum at Bukovina near the village of Hrubá Skála, took place on Arbor Day. Among the participants were Zdeněk Vacek, Director of the Karel Čapek Memorial; Ondřej Pecháček, Forest Manager for the Forests of the Czech Republic, State Enterprise in the town of Hořice, along with Jan Drahotský, the Hruboskalsko District Forester; Alena Pospíšilová, the retired librarian from Sobotka; Ondřej Havrda, Mayor of the home village of Karlovice, and Jaroslav Černý, Mayor of the neighbouring village of Dobšín; and Jiří Hušek, Director of the Nature Conservation Agency of the Czech Republic’s Liberec Regional Office. © Lukáš Bílek

The Český ráj/Bohemian Paradise Cannot Be Protected Without People

Contributing to communication with, education of and raising awareness of nature conservation and landscape protection among the general public is part of the PLA Administration’s activities. Caring for visitors is an important task that has been fulfilled with varying degrees of success throughout the PLA’s existence. The original two nature trails/educational paths have been renovated over time. In 2005, a sensory forest nature trail/educational path at Sedmihorky Spa—pioneering for its time—was added; in the same year, the historic gazebo at Bukovina was sensitively restored. Although a number of other nature trails/educational paths were added ten years in 2015, it seems that the time has come to reconsider the overloading of the landscape with signs, even if placed in good faith. Their moral

obsolescence is progressing just as quickly as the aging of the material. The unattractive information centre building near the Věžák Fishpond has been still awaiting a new design. In recent years, CEPA (communication, education and public awareness) in the Český ráj/Bohemian Paradise has been provided by the Český ráj/Bohemian Paradise House of Nature at the village of Dolánky near Turnov and the Bukovina Information Centre through their operators. The PLA Administration closely cooperates with them. The Český ráj/Bohemian Paradise has developed a Concept for Working with the Visiting Public, and it is up to all tourism stakeholders in the region to decide whether they will cooperate in its implementation. The Český ráj/Bohemian Paradise is not merely a backdrop of rock formations for vacations, day trips, races, and entertainment. Helping both local residents and visitors understand the fragility and uniqueness of the local landscape is no easy task, but it is one of the ways to protect it.



Figure 8. The October 2025 opening of the exhibition in the town of Sobotka was inaugurated by (from left) Mayor Lubor Jenček and Kostec estate manager Francesco Kinský dal Borgo, together with Lukáš Bílek, Head of the Český ráj/Bohemian Paradise Protected Landscape Area Administration. © NCA CR Archive



Figure 9. The opening of the exhibition in the town of Turnov was attended by František Pelc, Director of the Nature Conservation agency of the Czech Republic and Lukáš Bílek, Head of the Český ráj/Bohemian Paradise Protected Landscape Area Administration (both center), along with Deputy Governor of the Liberec Region Jiří Klápště (left) and Turnov Deputy Mayor Jan Lochman. © NCA CR Archive

The 2025 Year's Český ráj/Bohemian Paradise Anniversary

To mark the 70th anniversary of the Český ráj/Bohemian Paradise Protected Landscape Area, the Administration has organized an exhibition on its history and present. It does not showcase the beauty of Český ráj, but rather highlights the work that has been done. It highlights what has been achieved in nature conservation and landscape protection among the towns of Jičín, Sobotka, Mnichovo Hradiště, Turnov, and Železný Brod. It also shows what has not gone as planned. The exhibition began its journey through the Český ráj/Bohemian Paradise in late spring 2025 in the town of Jičín at the Valdická brána/Valdice Gate, continued in Turnov, moved to the Mnichovo Hradiště Castle after the summer holidays, and made its autumn stop at the town of Sobotka. Each opening was a remarkable gathering of people who have a close connection to the Český ráj/Bohemian Paradise.

The celebrations continue through the fall 2025, and the 70th anniversary of the Český ráj/Bohemian Paradise PLA is not the only anniversary in 2025. One of the original nature trails/educational paths, the one in the Podtrosecké údolí/ Bellow Trosky Castle Valley, is turning 45 in 2025, and so it received a new look on St. Wenceslas Day. Also in 2025, a sad anniversary marks 25 years since the fall of the Semtín Linden Memorial/Veteran Tree, which did not survive the May storm of 2000. Famous Czech writer Karel Čapek had already written about this most significant tree in the Český ráj/Bohemian Paradise of all time. With it, a series of anniversaries comes to an end. In his text "A Piece of Land," he professes his love for the Český ráj/Bohemian Paradise. He wrote it in 1925—exactly a hundred years ago. The Nature Conservation Agency of the Czech Republic, Forest of the Czech Republic, State Enterprise, and the Karel Čapek Memorial commemorated this on an October afternoon 2025 at the Bukovina Arboretum by planting a sapling from Čapek's Tatarian maple (*Acer tataricum*), which has been growing for nearly 90 years in the garden of Čapek's Strž summer villa in Central Bohemia. ■

The list of references is attached to the online version of the article at www.casopis.ochranaprirody.cz

Sika Deer – a Key Nature Conservation Issue in the Slavkovský les/Slavkov Forest Protected Landscape Area

Přemysl Tájek, Vladimír Melichar & Zdeněk Janovský

The presence of non-native Sika deer (*Cervus nippon nippon*) in the wild in the Czech Republic has been tolerated for several decades. Sika deer are attractive game animals, and therefore, the hunters have no interest in reducing their numbers. The undemanding and adaptable Sika deer has taken full advantage of this. In some areas in

the Czech Republic, the invasion of Sika deer has reached such proportions that it is almost impossible to find a natural habitat without having been significantly damaged by them. The fact can be well illustrated by examples of long-term monitoring plant species and communities in the Slavkovský les/Slavkov Forest (western Bohemia).



Figure 1. One of the experimental plots for monitoring the impact of grazing in the Křížky National Nature Reserve. In the fenced area, the Winter heather (*Erica carnea*) is blooming profusely, whereas in the adjacent part of the heathland, it suffered from excessive winter grazing by sika deer. Photographed in April 2011. © Přemysl Tájek



Figure 2. A drone view of the Úpolínová louka/Globeflower Meadow near Křížky documenting high ungulate game population density. The image is from the northernmost, wettest part of the site, where human visitors do not pass through. Photographed in May 2024. © Přemysl Tájek.

The Sika Deer Population Abundance in the Slavkovský les/ Slavkov Forest

The first sika deer was shot in the Slavkovský les/Slavkov Forest in 1963. In the 1990s, the population grew rapidly, and it has been continuing to increase. In the 2024 hunting season only, more than 2,600 sika deer were reported to have been harvested in the hunting grounds within the Slavkovský les/Slavkov Forest Protected Landscape Area (PLA) covering 611 km².

We can illustrate what this means in practice using the example of the Prameny hunting ground (18.5 km²), which encompasses most of the main serpentine ridge of the Slavkovský les/Slavkov Forest (Zone I of the Protected Landscape Area, Sites of Community Importance of the European Union's Natura 2000 network). The hunting ground includes several Specially Protected Areas

(Pluhův bor/Pluh's Pine Grove National Nature Reserve, Planý vrch/Wild Hill Nature Reserve, Křížky National Nature Monument, Dominova Skalka/Domin's Little Rock Nature Monument), and others are located in its immediate vicinity (Upolínová louka/Globeflower Meadow pod Křížky National Nature Monument, Údolí Teplé/Teplá River Valley Nature Reserve). According to Decree No. 491/2002 Gazette on the Method for Determining Minimum and Standard Game Populations, the total natural population density of all deer species should be around 60 individuals there—that is, 3.24 individuals per 1 km². However, thermal imaging revealed 478 sika deer alone, or nearly 26 individuals per 1 km² (Macháček *et al.* 2020). Added to this are another 301 European red deer (*Cervus elaphus*), or over 16 individuals per 1 km². Although an alternative method of collecting droppings identified slightly fewer individuals (648 sika deer and European red deer combined), the number is still many times higher than what would correspond to the population level prescribed by the Decree. To provide a more complete picture of the game population and its

reproductive potential, it should be noted that 69 sika deer and 115 red deer were reported as culled in the Prameny/Spring hunting ground in 2020.

Křížky – A Very Last-Minute Rescue

The Křížky National Natural Monument is arguably the most famous natural site in the Slavkovský Les/Slavkov Forest. It consists of a 400-meter-long rocky serpentine ridge, on which, over the past centuries, sheep grazing has helped stabilize a species-rich heathland with rare plants and lichens. The area's flagship species is the Winter heather (*Erica carnea*), also known as the Spring heat whose blooming carpets attract visitors from far and wide even before the last snow has melted.

Sometime after 2000, however, the sea of reddish-pink flowers began to gradually disappear from Křížky, and after 2014, the last flowering clumps could only be found on hard-to-reach rocky ledges. The causes of the heathland's degradation



Figure 3. A seventeen-year-old fenced enclosure in the Pluhův bor/Pluh Pine Grove National Nature Reserve built to protect pine regeneration. In the fenced section (left), herbaceous undergrowth with winter heather has fully developed, while in the unfenced section, both the herbaceous and moss layers are almost absent. However, no pine trees have grown within the enclosure to this day—occasional damage to the fencing from blown downs/windfall trees or stem breaks has allowed overpopulated ungulate game to repeatedly destroy the regenerating trees entirely. Photographed in April 2021. © Přemysl Tájek.

were not entirely clear at first. Initially, suspicion fell on the poor timing of summer sheep grazing, which the PLA Administration has been managing there since the late 1990s, so the PLA Administration launched an experiment to verify this. However, it turned out that the decisive driver in the destruction of the heath population and the entire heathland was winter overgrazing by an extremely overpopulated forest game populations, particularly the non-native Sika deer. The game concentrated at Křížky primarily in late winter grazing on the south-facing slopes, where the snow melts earlier, on sprouting heather and other shrubs (Tájek & Janovský 2016).

In response to the findings, the PLA Administration took drastic measures in 2017 by fencing off the entire Křížky National Nature Reserve (4.5 ha). The very next year, the heathland once again turned red with a beautiful carpet of blooming heather, clearly demonstrating how significant a factor forest overgrazing can

be in the conservation of plant communities (Tájek 2024). Access to the site for visitors has been maintained, but they must squeeze through a narrow opening in the fencing. Undesirable, highly competitive grass species continue to be successfully suppressed by summer sheep grazing. A disadvantage of fencing the ridge is that it becomes overgrown with woody plants more quickly, a difficulty that must be addressed from time to time by cutting them back. The massive fencing also does not look natural in the landscape and reduces the site's aesthetic value.

The Surprising Reason Behind the Disappearance of Globeflowers at Upolínová louka/Globeflower Meadow

The next chapter of our story takes place just across the road, and the plot reaches its climax

roughly two months later each year. At that time, a population of more than a thousand globeflowers (*Trollius altissimus*) blooms in the wetland meadows of the Upolínová louka/Globeflower Meadow National Natural Monument near Křížky. Its popularity is evidenced by the well-trodden paths left by visitors willing to endure wet shoes for a photo featuring as many of the large, spherical, and bright yellow globeflower blooms as possible. Today's patches of blooming globeflowers, however, are apparently only a faint echo of times long past, as described by eyewitnesses. They often attributed the decline of the globeflowers to improper management of the site, specifically the mowing of the wetland meadows, which was resumed there with the arrival of the 21st century. In fact, globeflowers thrive even in unmown meadows, and the Upolínová louka/Globeflower Meadow near Křížky was left fallow for the entire second half of the 20th century. Mowing at the site has been still

carried out on a rotational basis, with roughly one-third of the meadows mowed each year.

Therefore, in 2014 the PLA Administration launched an experiment across 20 plots measuring 7×7 meters to determine which management method would be optimal for both the meadow and for minimizing maintenance costs. A quarter of the plots are left fallow, a quarter are mowed once every four years, a quarter are mowed every other year, and a quarter are mowed annually. Over the past ten years, the globeflower population has unfortunately been slowly declining across all plots—most rapidly in the unmown sites, and most slowly in those mowed annually or every other year. However, when monitoring the globeflowers, the authors did not focus solely on the number of individuals but also on their condition/fitness, and this provided an explanation for the declining population numbers. In some years, up to 90% of all globeflower blooms were grazed. Moreover, overgrazing pressure (measured by the proportion of grazed stems) has intensified over the years. The inevitable consequence has been a long-term, noticeable shortage of globeflower seedlings throughout the population, despite the seeds' good germination rate, and the impact of grazing has thus completely overshadowed the potential effects of mowing (Janovský 2023, Tájek & Janovský 2024). The culprits are obvious—Sika deer have been observed there more than once in the act. Until the time of the research, however, it had not occurred to anyone that overgrazing by forest game could have such fatal consequences specifically for the globeflower. Wild animals prefer to graze on the flowers after they have bloomed, during the seed-ripening stage, when the stems gradually dry out. It can be assumed that this is due, on the one hand, to the higher nutritional value of the seed-bearing stems and, on the other hand, to their lower or negligible alkaloid content. Globeflowers (like other species in the family Ranunculaceae) are known for its high content of toxic alkaloids, which can cause poisoning even in much larger livestock, but only when fresh. Grazing after flowering is significantly less noticeable, and therefore its consequences had eluded the authors for a long time until the results of a long-term experiment were evaluated.

Disappearing Serpentine Pine Forests

One of the most significant natural phenomena in the Slavkovský les/Slavkov Forest is the

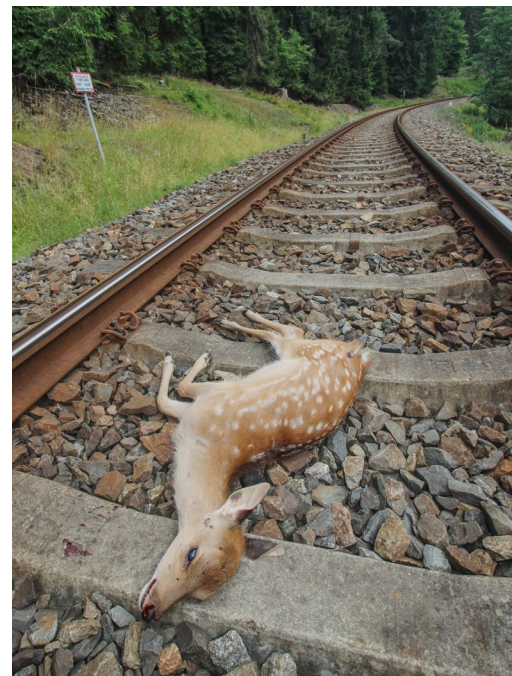


Figure 4. The critically endangered Bristly bellflower (*Campanula cervicaria*) in the Údolí Teplé/Teplá River Valley Nature Reserve, with the upper part of the stem missing. Most plants are at least partially damaged each year by selective grazing by sika deer. Sika deer populations are so high that animals are regularly killed by trains there. © Přemysl Tájek.

relict pine forests on serpentinite, which are protected in the Mnichovské Hadce serpentine area within four Nature Reserves and two Sites of Community Importance. This is the largest serpentinite area in the Czech Republic. Were it not for old photographs in the earliest descriptions of the local vegetation dating from the early 20th century (Domin 1924), it would be difficult for us today to imagine how different and fascinating the habitats there once were. The local sparse serpentine pine forests—or rather heathlands with scattered pines—have, in fact, transformed over the past century into a denser forest with a significant proportion of the Norway spruce (*Picea abies*).

There are several causes for the changes. One of them is the abandonment of traditional forest management practices—grazing by domestic livestock, litter raking, and controlled burning. Fire likely had kept the forests open (and with a higher proportion of fire-resistant pines) even before human arrival, as evidenced by carbon analyses in soil profiles. The forest there apparently burned periodically at intervals of approximately 170 years (Bobek 2015). In contrast, modern forestry practices and the absence of natural fire events have led to the dominance of spruce and the suppression of herbaceous understory diversity. In recent decades, atmospheric nitrogen deposition and overgrazing pressure from

overpopulated forest game have compounded the changes in forest management. Initially, this was evident only in the absence of pine regeneration. Gradually, however, the overpopulated game, namely ungulates, began to significantly reduce the herbaceous layer in the forests there. In some parts of the serpentine ridge, only moss was growing in the undergrowth as early as twenty years ago; today, the situation is even more critical—vegetation is completely absent, leaving only trampled soil and pinecones.

The impact of forest game overgrazing on the herbaceous layer of serpentine pine forests was monitored in the Mnichovské hadce serpentine area in 2007, 2009, 2011, and 2014 as part of small-scale pilot experiments involving pairs of fenced and unfenced vegetation plots. In the fenced plots, the coverage of all shrubs increased significantly, particularly that of the Common heather (*Calluna vulgaris*) and the Weather heather (Tájek, unpublished data). Due to the growing importance of the topic, a large-scale experiment was established in 2024 on the main ridge of the Mnichovské hadce serpentine area, comprising 6 pairs of 200 m² study plots, with one plot in each pair fenced. Given the enormous pressure from game, the first results were observable just one year after fencing. The average herbaceous layer cover increased in the fenced plots from 29% to 46%.

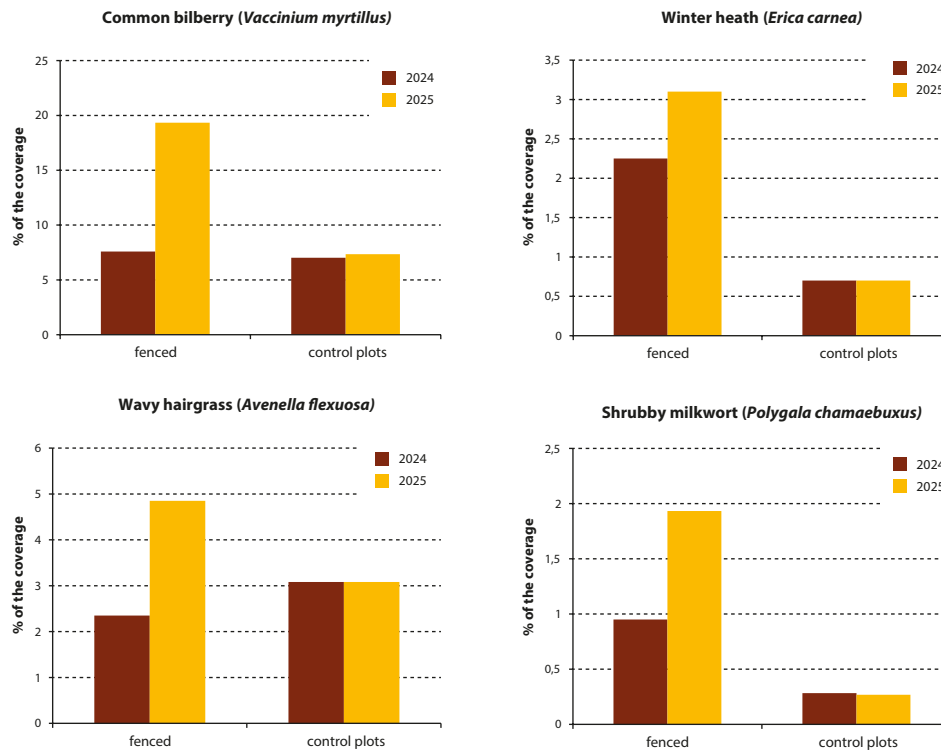


Figure 5. Changes in average cover of the selected herbaceous layer species in fenced and control plots in the Mnichovské hadce serpentine area pine stands

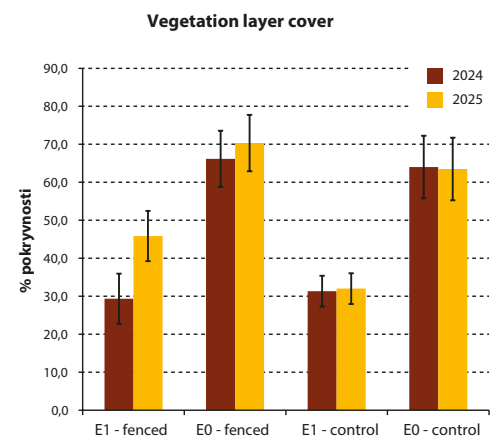


Figure 7. Changes in average cover of the herbaceous and moss layers in fenced and control plots in the Mnichovské hadce serpentine area pine stands

The greatest increase was observed in shrub cover (Common bilberry – *Vaccinium myrtillus* – relative increase of 155%; Shrubby milkwort – *Polygala chamaebuxus* – relative increase of 104%) and some grass species (Wavy hairgrass – *Avenella flexuosa* – relative increase of 106%; reed grass – *Calamagrostis arundinacea* – relative increase of 82%). In contrast, there were virtually no changes in areas further accessible to ungulate game, which proves that the suppression of the herbaceous layer was indeed caused by overgrazing by forest game, particularly big herbivores, dominated by Sika deer (Melichar 2025) – see Graf1, Grafy_druhy.

A similar situation to that in the serpentine pine forests near Mnichov can also be found in the natural pine forests around the town of Bečov nad Teplou and on the Kozí hřbety/Goat Ridge Hills between the towns of Horní Slavkov and of Doubí near the city of Karlovy Vary/Carlsbad Spa. Just ten years ago, carpets of heaths bloomed there in the spring; today, only pitiful remnants have been remaining.

Orchids as a Sought-After Delicacy

Anyone who has ever had the opportunity to watch sika deer or red deer overgrazing up close in the wild knows how selective they are when feeding. Very often, they specifically choose plants that are scarce but to their liking. Therefore, even a small herd can become a disaster for rare plant species such as



Figure 6. The impact of forest game grazing on clearing vegetation in the Javorná hunting ground (842 ha). The area has long been known for its high sika deer numbers (in 2024, 99 sika deer, 3 red deer, and 19 roe deer were reported as having been harvested there). Photographed in May 2008. © Přemysl Tájek.

the Burnt orchid (*Orchis ustulata*), the Marsh Fragnant-orchid (*Gymnadenia densiflora*), and the Early purple orchid (*Orchis mascula*). Long-term monitoring of the Early purple orchid population in the Prameny/Spring hunting ground has shown that the vast majority of orchids are unable to produce seeds due to the grazing on their flowering stems. Thus, part of the population has been protected from overgrazing since 2024 having been using special portable cages. However, closer observation has shown that in this case, the more frequent culprit is the native European red deer, though the Sika deer also occasionally likes to “munch” on them.

A rare bellflower and lichens beneath the hooves of the herds

Another rare species directly threatened by the overpopulation of Japanese knotweed is the Bristly bellflower (*Campanula cervicaria*)—a sturdy, hairy, and visually appealing biennial. The Údolí Teplé/Teplá River Valley Nature Reserve is likely the last known site of the critically endangered species in western Bohemia, where it grows in a sunny herbaceous strip above the railroad tracks. The local Bristly bellflower population has been monitored annually since 2011, and the location of all found plants is precisely recorded (Tájek 2025). More than half of the flowering bellflowers are bitten off each year. Damaged plants then either produce no seeds at all or only a small number from replacement inflorescences. While globe-flowers are long-lived perennials, for this biennial, any significant decline or lack drop in seed production poses a serious threat (bellflowers die after producing seeds in their second year). The impact of forest game ungulates on the Bristly bellflower is not limited to grazing but also includes excessive trampling of the slope and subsequent soil erosion associated with habitat drying. In 2025, the site was therefore fenced off from forest game with the aim of stabilizing the Bristle bellflower population.

The grazing intensity in the Teplá River Valley is also well illustrated by a lichen survey (Peksa 2025). Game overgrazing and movement are key limiting factors for the occurrence of most terrestrial lichen species in the area's sloping terrain (Fig. 9). In addition to the usual Sika deer, the European mouflon

(*Ovis aries musimon*) also joins the ranks of the culprits there; the latter mammal species is the most significant animal threat to nature conservation in other areas (e.g. the České středohoří/Central Bohemian Uplands or the Křivoklátsko/Křivoklát region, Central Bohemia).

Not all of the sika deer's impact is negative, but the downsides clearly outweigh the benefits

The extreme overgrazing pressure exerted by sika deer not only decimates specially protected wild plants but also damages tree plantings. There is also considerable damage to unsuitable Norway spruce plantations, which paradoxically results at some sites into the natural enrichment of the forest species composition with the Silver birch (*Betula pendula*), Rowan (*Sorbus aucuparia*), Sycamore maple (*Acer platanoides*), and in some areas even the European beech (*Fagus sylvatica*). Mature spruce plantings aged 30–50 years are often so damaged by earlier bark stripping and browsing by game that they undergo premature decay, providing an opportunity for the faster regeneration of more species-diverse and stable stands. Disturbance of the soil surface significantly supports populations of certain rare wild plant species—in the Slavkovský les/Slavkov Forest, this is particularly noticeable with the Round-leaved sundew (*Drosera rotundifolia*) in the Paterák and Smraďoch peat-bogs. Old or only occasionally used deer wallows in the fens are often the last refuges of the highly endangered Common butterwort (*Pinguicula vulgaris*). On the serpentine ridge, spring areas with old wallows are the sites with the highest coverage of the endemic Mouse-ear chickweed (*Cerastium alsinifolium*). Intensive grazing and browsing by deer also slow the overgrowth of some valuable wetlands in open areas and forest clearings. Such clearings then provide better refuge for rare heliophilous species—for example, the highly endangered Pyramid bugle (*Ajuga pyramidalis*) in the Bečov region – see Fig. 10.

The positive effects of deer overgrazing and browsing are a byproduct of their overpopulation and cannot be relied upon massively, as grazing and browsing pressure varies

significantly from one site to another. Given current deer populations, it is indisputable that the negative effects far outweigh the positive ones, and the state has been rapidly deteriorating. Furthermore, the decline in traditional landscape management (particularly livestock grazing) exacerbates the problem with deer. This is because deer are left with food sources that would otherwise be utilized by livestock, thereby mitigating the dramatic increase in deer populations. It remains a question for further research why earlier landscape management with widespread grazing was generally positive for species of conservation value, while the current increase in deer grazing and browsing has a clearly negative effect. To answer this question, it will be necessary to study deeper deer grazing and browsing preferences and their spatial behaviour. This differs significantly from that of livestock, in part due to the need to avoid hunters as well as wild predators.

Without increasing the number of culls, a solution is not possible

All studies on the impact of overgrazing and browsing by sika deer on plant communities have reached the same clear conclusion: it is necessary to radically reduce deer numbers. Although the most valuable fragments of ecosystems can be protected by fencing, currently the only real solution for restoring natural phenomena at the landscape level is to increase culling.

Research on forest game grazing on the serpentine ridge in 2024–2025 was supported by the LIFE Integrated Project for the Natura 2000 network in the Czech Republic – LIFE17 IPE/CZ/000005 LIFE-IP: N2K Revisited. We would like to thank the staff of the relevant municipalities with extended powers for providing data on hunting bag sizes: Pavel Nečas, Miroslav Kučera, Hubert Jeřábek, Lukáš Kovář, and Petra Stará. The article utilized results from the ongoing monitoring the effectiveness of management measures, which is conducted by the Nature Conservation Agency of the Czech Republic as part of the management of the Křížky National Nature Reserve and the Upolíňová louka/Globeflower Meadow near Křížky National Nature Reserve (Tájek, unpublished data; Janovský 2023). ■

Restoration of the Structure and Water Regime the Valley Floodplains at the Confluence of the Morava and Dyje/Thaya Rivers

Tomáš Havlíček & Barbara Stachoňová

Water management interventions/modifications carried out in South Moravia during the 1970s and 1980s provided some benefits, but they also resulted into drastic changes in the area's original conditions

and character. They caused extensive environmental damage, either by the direct destruction of valuable habitats or by alterations to the hydrological regime there.



Figure 1. An oxbow lake of the Dyje/Thaya River below the Janohrad Castle (South Moravia). © Tomáš Havlíček

The designation of the Soutok/Confluence Protected Landscape Area (PLA) increases the chances of remedying the damage. What exactly happened in the past, and what kind of damage occurred? What might structural and hydrological measures look like, and what benefits could they bring? Drawing on the results of a water management study commissioned by the Nature Conservation Agency of the Czech Republic (NCA CR) as the basis for preparing the management plan, we offer at least brief answers to these questions.

The study is dedicated to the memory of Antonín Buček, a forester and biogeographer who devoted himself intensively to the conservation of floodplain ecosystems and who also defined the concepts of the complete dynamic fluvial successional series of floodplain habitats and the water management paradigm.

Hydromorphology of the Morava and Dyje/Thaya Rivers

Depending on local conditions, dynamic fluvial processes in river floodplains give rise to different hydromorphological river types (channel patterns), which in turn determine the associated ecosystem types. The main factors/drivers influencing hydromorphological type are discharge, gradient and the amount of transported sediment. In essence, this is an energy-related process, although varying in space and time. Each type of river pattern occurs under characteristic natural conditions, which also determine the basic spatial and morphological parameters e.g. the width of the meander belt, sinuosity coefficient, centre-to-centre distance/wavelength of successive meanders, their “radius”, etc.

Within the Soutok/Confluence PLA, the principal hydromorphological type of the Morava River and the Dyje/Thaya River is anastomosing: the branching of a meandering (Morava) or sinuous (Dyje/Thaya) channel into multiple arms within a wide floodplain subject to frequent inundation. This is a river pattern in which the river has one or more main channels while also forming numerous periodically flowing side arms that emerge and disappear over space and time.

These dynamically evolving habitats are typically associated with specially protected wild plant and animal species. The river arms also ensure

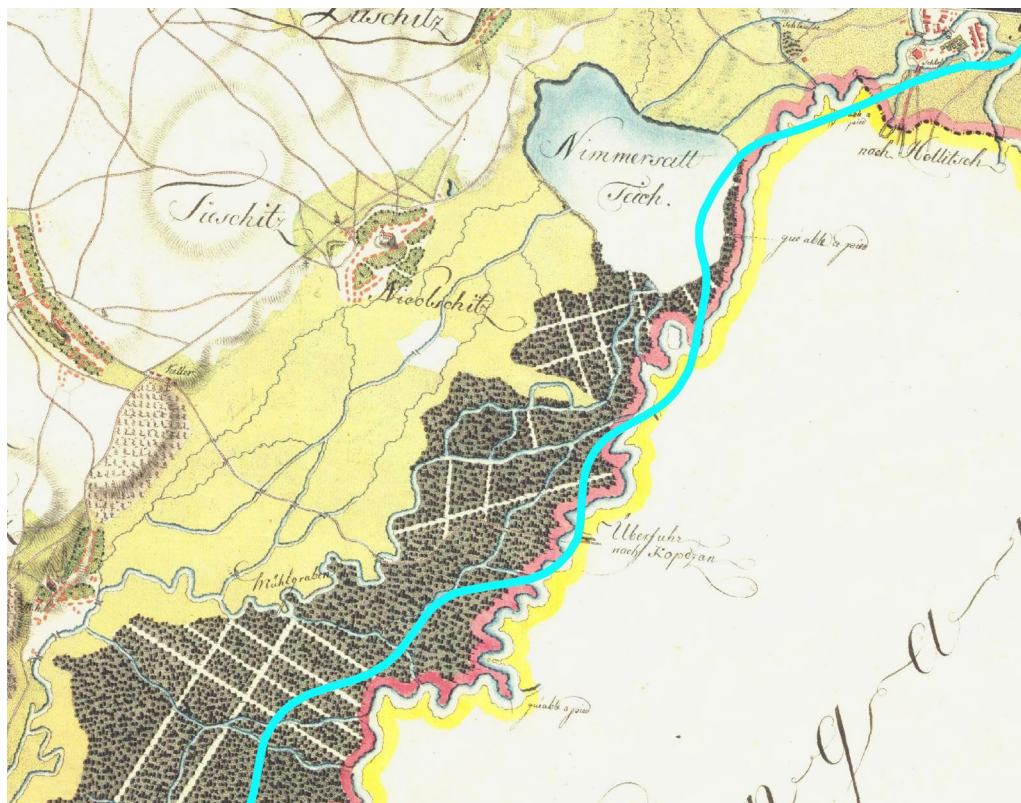


Figure 2. The Podluží ethnographic region (literally Beneath the Floodplain Forests) between the town of Hodonín and the village of Tvrdonice (South Moravia) shown on an extract from the First Military Survey. An example of the originally relatively natural type of the river system. The main meandering channel of the Morava River forms the historical border with the Kingdom of Hungary. Floodplain forests and meadows are interwoven with branches of an anastomosing system, fed both directly from the main channel of the Morava River and from the fishpond below the town of Hodonín, Nimmersatt Teich (Nesyt). Some of the meadow channels had already been straightened. The turquoise line indicates the present-day course of the Morava River. Source: www.geolab.cz, Barbara Stachoňová

the transport of water and sediment (including nutrients). Floodplain forests are crucial to the formation, development, and functioning of the side arms within this branching river pattern. In the Czech Republic, river channel branching occurs primarily within floodplain forest stands. Trees uprooted into channels, barriers formed by trunks and branches, and similar obstacles act as triggers for channel-forming processes. When floodplains are deforested and converted into meadows, anastomosing side arms may persist for some time; however, they gradually disappear over the long term.

The anastomosing system was functionally destroyed by the regulation of the Morava and the Dyje/Thaya rivers; however, the floodplain has still been preserving an entire range of gradually disappearing remnants of river arms. The mechanisms described above are abiotic factors/drivers underlying the formation of the ecosystems that constitute the subjects of protection within the Soutok/Confluence PLA.

The complete dynamic fluvial successional series of floodplain habitats

The diversity and interconnectedness of floodplain ecosystems linked by complex developmental processes are best captured by the geoecological concept of the dynamic fluvial successional series of floodplain habitats. This represents a continuum of aquatic, wetland and terrestrial biocoenoses at different stages of successional development, continuously evolving in response to fluvial landscape-forming processes. Therefore, it may be considered as a system of different habitats, ranging from flowing and standing waters, through the early stages of colonisation of freshly exposed, eroded, and sedimented surfaces on river deposits, to climax forest stages.

The completeness of the series of floodplain habitats depends on the continuous action of fluvial processes. In particular, these include

disturbances associated with channel migration driven by lateral bank erosion, as well

as sedimentation and erosion processes occurring within the channel and floodplain

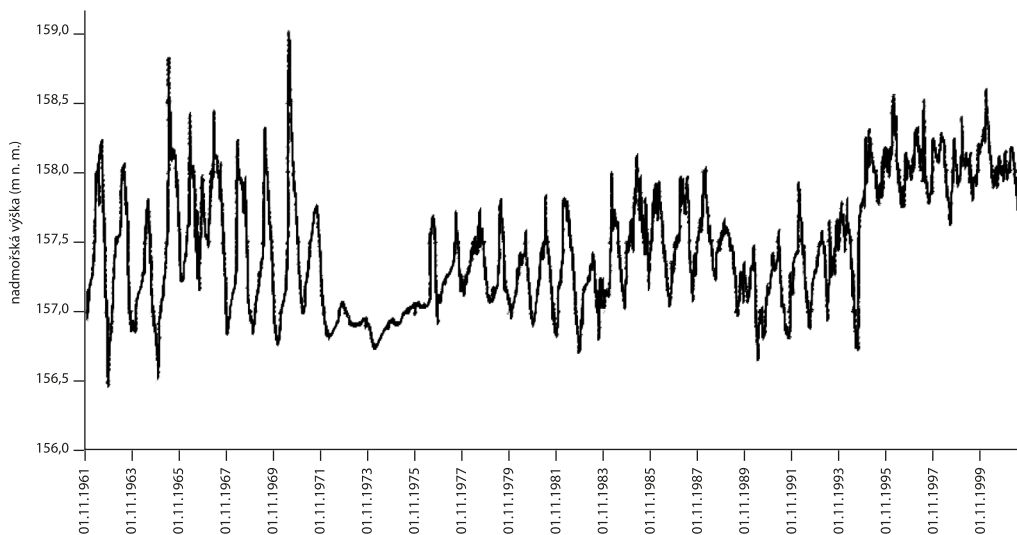


Figure 3. Kančí obora/Wild Boar Game Preserve – weekly groundwater level records from borehole KBO 710 (based on monitoring by the Czech Hydrometeorological Institute Brno) for 1961–2000. The graph shows three distinct phases of the hydrological regime: (1) the original state prior to water management interventions (*i.e.* regulation of the Dyje River); (2) the period following these interventions (1972); and (3) the period after the implementation of restoration measures (1995). Compiled by Alois Prax



Figure 4. Pohansko weir, 22 September 2024, the day the flood peak subsided. © Adam Koukal
During the September 2024 floods, Pohansko weir (at the lower edge of the image) was not used to inundate the alluvial forest. Floodwaters are largely confined outside the polder, and the embankment paradoxically prevents Dyje/Thaya River floodwaters from spreading into the polder.

during floods. The complete dynamic fluvial successional series of floodplain habitats can be maintained only by restoring natural fluvial processes in at least some parts of the floodplain landscape, thereby ensuring the spatial connectivity of biocoenoses and the continuity of their development.

The concept presents both the values and the rationale for nature conservation and landscape protection, while also defining the framework for the water management solutions required within the Soutok/Confluence PLA.

Water management interventions in the 1970s and 1980s

The system of natural watercourses and their minor modifications described above had persisted until the 1970s and 1980s, when the so-called water management interventions in South Moravia were carried out. These included radical modifications to the channels of the Morava and the Dyje/Thaya rivers, building the Soutok/Confluence polder, construction of the Nové Mlýny Waterworks reservoirs system, including modifications to the outlet reaches of the Svratka River and the Jihlava River and several smaller watercourses, as well as related infrastructure such as irrigation systems.

The measures were implemented primarily with the aim of flood protection (including the protection of agricultural land), accelerating the conveyance of flood flows through the Morava channel, and reducing peak flows in the Dyje/Thaya River through retention in the Nové Mlýny Waterworks reservoirs and the Soutok/Confluence polder. This was followed by the irrigation of agricultural land. As regards the river channels themselves, the measures mainly involved straightening, embanking, deepening, and widening, together with bank reinforcement.

The interventions brought some benefits, but they also led to drastic changes in the area's original conditions and characteristics, a radical simplification of its morphology, and the loss of habitats used for shelter, feeding, and reproduction. They caused extensive environmental damage, whether through the direct destruction of valuable habitats or through alterations to

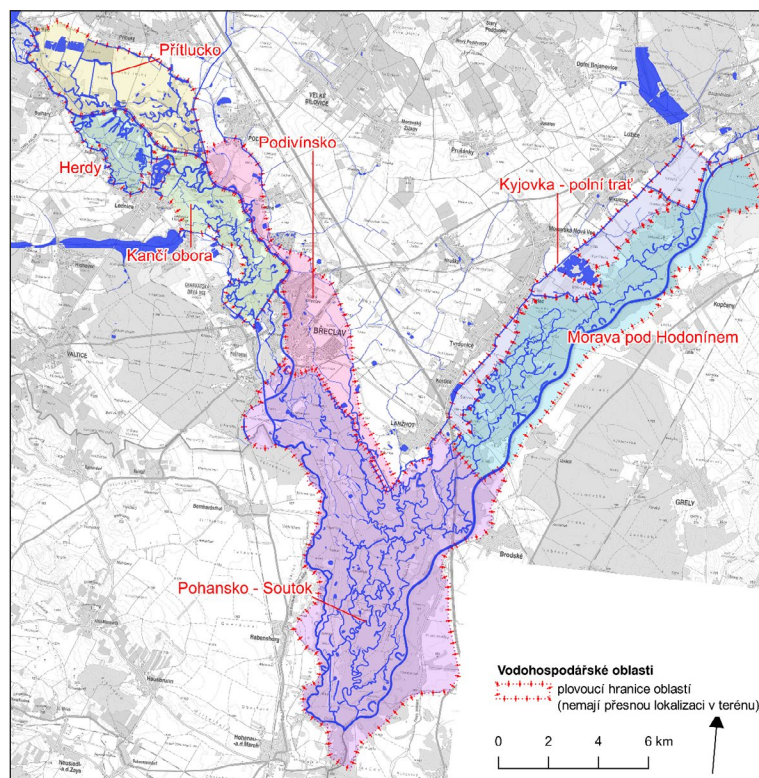


Figure 5. Delineation of water management areas. Source: Tomáš Havlíček, Barbara Stachoňová

the hydrological regime. Along the Rohatec–Soutok/Confluence stretch, the Morava River was shortened to 53% of its original length. The interventions caused drainage of the landscape through deepened river channels and disconnected the floodplain from the main channels. As a result, regular natural floods and smaller-scale inundation ceased, and both longitudinal and transverse migration barriers were created there.

Full restoration of the original anastomosing system and its associated hydrological regime has no longer been possible given existing built-up areas, current land use, and resulting constraints. The proposed measures, therefore, focus on mitigating the negative impacts described above.

Principles and objectives of the proposed measures

The Soutok/Confluence PLA is a floodplain landscape. Thus, an appropriate river system and hydrological regime are fundamental prerequisites not only for achieving nature conservation objectives, but also for sustainable forest management and other water management

functions, primarily the provision of drinking water and flood protection, as well as additional benefits such as recreation.

The proposed changes are based on a critical analysis of the current system created by past water management interventions. Some water management structures have still been serving a purpose today and should be preserved and properly maintained. Other structures, however, should be reassessed for their function and design and either modified or fully removed. This approach is based on the principle that, in some cases, adapting to natural processes is more effective and less costly than attempting to control them through expensive technological measures. Therefore, the proposed measures are differentiated, *inter alia*, according to where and how this principle can be applied.

At the same time, the approach to the functioning and management of basic water management structures (the water management paradigm itself) is being reconsidered. Humans neither need nor can control and manage every process. Instead, natural processes should be allowed to operate freely wherever possible.

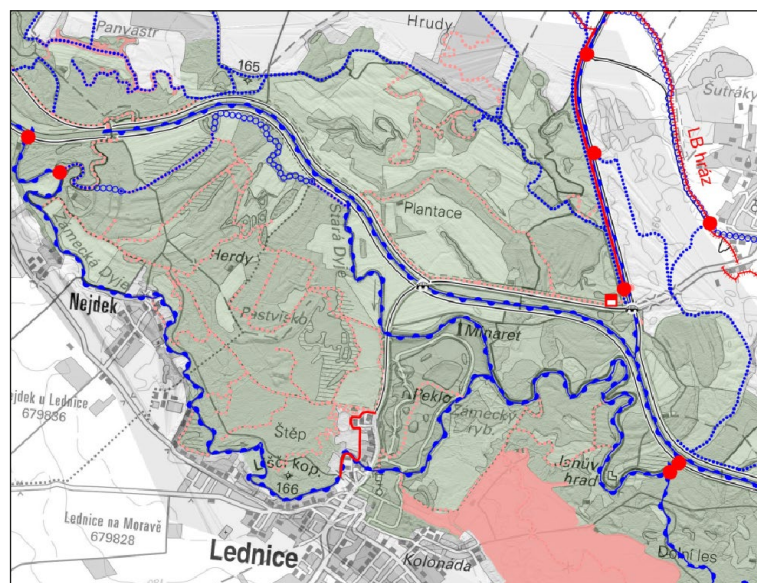


Figure 6. Extract from a map of proposed structural measures for the Herdy area. The core of the proposal is restoration of the flowing the Stará Dyje/Old Thaya River stream. A substantial part of it has still been there, but only as disconnected standing waters. Other proposals are also shown: the clearance of Zámecká Dyje/Castle Thaya River stream, the restoration of the main Dyje/Thaya River channel, the reconstruction or proposed new water control structures, and sections of the embankment system to be restored or supplemented. Also indicated are canal systems for rewetting and an area with a proposed restoration intervention by the municipality of Lednice. Source: Tomáš Havlíček, Barbara Stachoňová

The proposed measures approach the modification or retention of the existing functioning of key water management features as follows:

1. Flood protection of the town of Břeclav and downstream settlements through the retention areas of the Přítluky and Lednice polders and the levee systems is to be maintained, with the existing model further developed and inflows to water abstraction areas increased.
2. The existence of the Nové Mlýny Waterworks reservoirs system is respected, even though their construction caused extensive ecological/environmental damage and significantly altered water management conditions. However, it will be necessary to redefine the allocation of storage capacity for different purposes (irrigation, support of minimum flows, flood protection, etc.).
3. The principle of using the right-bank floodplain of the Morava River and the Soutok/Confluence complex for flood protection only during extreme discharges is to be abandoned and replaced by a principle of allowing floods to spread across the entire undeveloped floodplain much more frequently and at lower discharges. This would make it possible to remove or relocate levees, fully restore the Morava River channel, and significantly

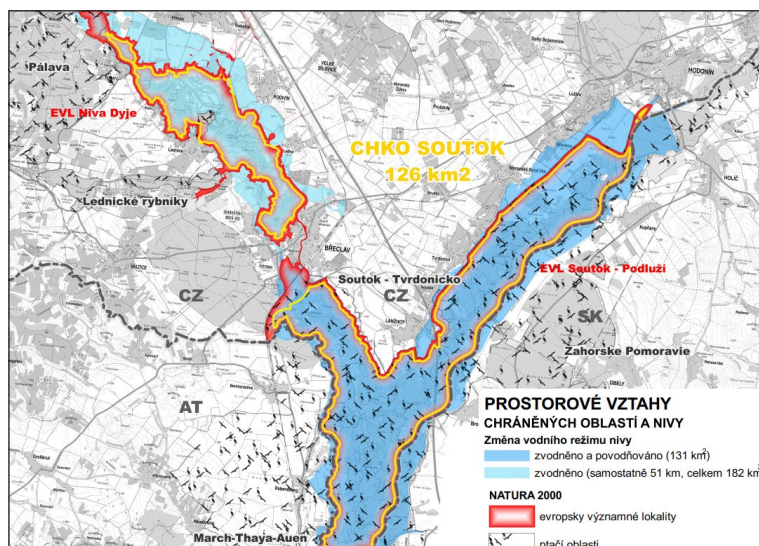


Figure 7. Effects of the proposed measures in relation to changes in the hydrological regime in the Soutok/Confluence Protected Landscape Area. Darker blue indicates flooding (high-flow conditions with overbank inundation of the floodplain, including disturbance effects). This is explicitly distinguished from rewetting, shown in lighter blue (redistribution of normal flows in favour of the floodplain). Source: Tomáš Havlíček, Barbara Stachoňová

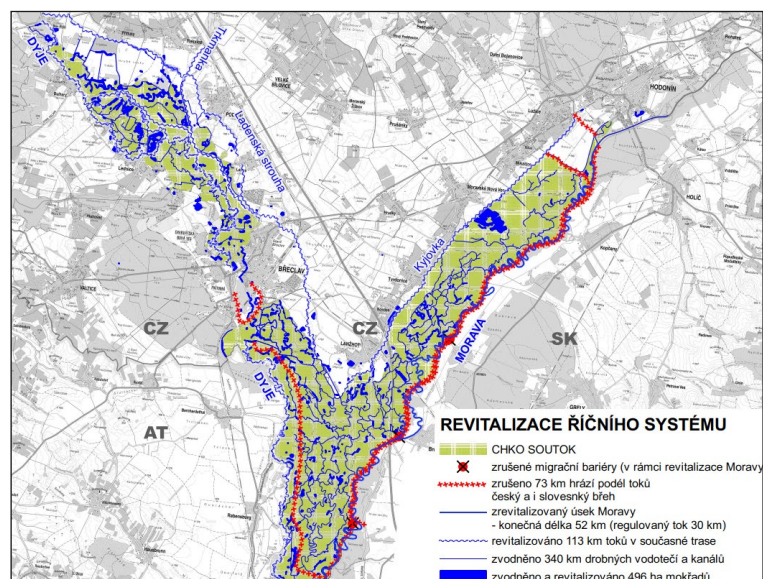


Figure 8. The effects of the proposed measures on standing and running waters consist primarily of restoring a more natural character to running waters and in reinstating smaller watercourses within the floodplain, enabling the distribution of water across the area. Source: Tomáš Havlíček, Barbara Stachoňová

alter the hydrological regime of the Morava and Dyje/Thaya river floodplains within the Soutok/Confluence polder area. Although this would mean losing the (problematic) possibility of “controlling” major floods, other functions would thereby be strengthened.

The long-term objectives of the proposed measures from the perspective of nature conservation may be defined as follows:

- Restoration of a natural, or at least close-to-natural, river system as the fundamental landscape structure (structural objective). Therefore, the main means of achieving the objective will consist of interventions to remedy the impacts of past water management modifications. This objective may be further specified through seven specific requirements.
- Restoration of a natural, or at least close-to-natural, hydrological regime of river floodplains as the fundamental water-management process (regime objective). The regime is characterised by discharge and the movement of surface water and ground-water. Its manifestations include floodplain inundation during high flows and more extensive floodplain rewetting during normal usual flows. Thus, the main means of achieving the objective will involve adjusting hydraulic features (channel capacity, hydraulic structures, etc.) and, in some cases, artificial

water regulation. The regime objective may be further specified through four specific requirements.

- Restoration of natural processes. The two objectives are linked by their mutual interdependence and dynamic variability in space and time. Therefore, the processes themselves provide the desired natural values. Landscape disturbances, as one of the principal manifestations of the processes, are not only acceptable but directly necessary for the preservation of the natural values for which the Soutok/Confluence PLA is being established.

The nature conservation objectives cannot be achieved across the entirety of the Soutok/Confluence PLA or to their full extent. The proposed measures are differentiated according to local conditions and possibilities. Nor can the proposed solutions be separated from cross-border connections, which will need to be addressed at the very beginning of further planning and implementation.

Proposed target conditions and measures for individual areas

The proposals are set up for individual water management areas (relatively self-contained

water management units), each structured in the following sequence: target condition → structural measures → regime measures. Taken together, the proposed measures are a coherent overall water management concept that serves as a framework for more detailed solutions for individual structures and water management regimes. These are addressed in greater detail through proposed approaches to water management under six typical hydrological situations, ranging from low flows to flood conditions.

In the Přítluky and Podivín area, the current land use of the left-bank floodplain of the Dyje/Thaya River, together with its envisaged flood-protection (retention) function, does not fully achieve the above-mentioned nature conservation objectives. Therefore, the proposed measures aim at for at least partial fulfilment of the objectives, corresponding to the category of “halting degradation”. The main measures focus on revitalisation of the Dyje/Thaya River channel within its current course, improved rewetting of the left-bank floodplain through the restoration of small watercourses and channels, and modifications to the levee system that protects settlements. Attention is also paid to measures to improve the quality of water discharged from the Nové Mlýny Waterworks reservoirs system and to prevent fish mortality.

In the right-bank floodplain of the Dyje/Thaya River (Herdy and Kančí obora/Wild Boar Game Preserve), increased flows and spatial modifications strengthen both water management and ecological functions. However, full-scale restoration has no longer been possible. The area will continue to serve as a polder. The “minimalist” category is implemented there. The role of the Stará Dyje/Old Thaya River stream is significantly strengthened, with the continuity of its channel restored/reconnected and flow re-established from the water intake into the Zámecká Dyje/Castle Thaya stream all the way to its confluence with the Dyje/Thaya River below the Janohrad Castle. The measures also aim to enhance ground-water recharge.

The Kyjovka River was previously relocated to the foot of the Podluží river terrace and is now an artificial channel that does not allow for substantial interventions (the “minimalist” category). The proposed measures are limited to previously proposed revitalisation/restoration measures along the Kyjovka River channel and changes to the flow distribution regime at the diversion structure below Lužice. The question of whether the historic earthen field levees at the boundary between forest and agricultural land should be fully restored is left open for further decision-making.

The Morava River downstream of the town of Hodonín requires radical changes to achieve the stated objectives. The “comprehensive” category is considered feasible, whereas less extensive alternatives would not allow fulfilment of the declared objectives. The proposals envisage the removal of levees on the Czech side and, in part, on the Slovak side, together with substantial restoration of the original river system, including meanders and floodplain side arms. One of the background studies already discussed also envisages relocating levees on the Slovak side. The measures must not worsen flood conditions in the town of Hodonín, and the more detailed solutions will be adapted accordingly. Of all the main watercourses considered, this section of the Morava River is in the worst ecological condition, but surprisingly it also offers the greatest realistic possibility for restoration.

For the Soutok/Confluence PLA itself, the proposals in the “comprehensive” category envisage continuing the restoration of the natural meandering channel and side arms of the

Morava River in this section as well. At the same time, they also propose the complete removal of the levee system along the Dyje/Thaya River downstream as far as the town of Břeclav, while respecting the need for flood protection. Some restoration/revitalisation measures have already been carried out on the Dyje/Thaya River (the restoration of several boundary meanders), and their completion is anticipated. The flap weir currently under construction on the Dyje/Thaya River will be completed, enabling significant changes to the flow regime and substantially improved rewetting and flood inundation of the floodplain, with beneficial effects on ecosystems and the condition of forest stands.

Conclusions

Most of the issues outlined above have already been known and have been described in various background documents. Several studies and projects have already been elaborated to address them, but they are fragmented. As part of the study, the authors taken them on board, critically evaluated, incorporated and coordinated them with other proposals. Most of the proposals included in the study have thus already been included into both the river basin management plans and the Territorial Development Principles of the South Moravian Region. The Austrian and Slovakian partners are preparing joint restoration measures on the Morava River border stretch downstream the Soutok/Confluence. Thus, the agreements with Slovakia and Austria need to be updated as soon as possible and a coordinated approach is needed. In the next phases, it will be necessary to establish the phasing schedule of the activities and to define individual investment or administrative actions as a basis for the systematic implementation of the proposed measures. The principal task is to ensure that these plans do not remain on paper. Virtual water is neither drinkable nor does it meet the needs of ecosystems.

Several studies and projects have already addressed possible solutions, but these remain fragmented. In preparing the present study, these materials were incorporated, critically evaluated and coordinated with the other proposed measures. Most of the proposals contained in the study have therefore already been incorporated into river basin management plans and regional spatial development principles.

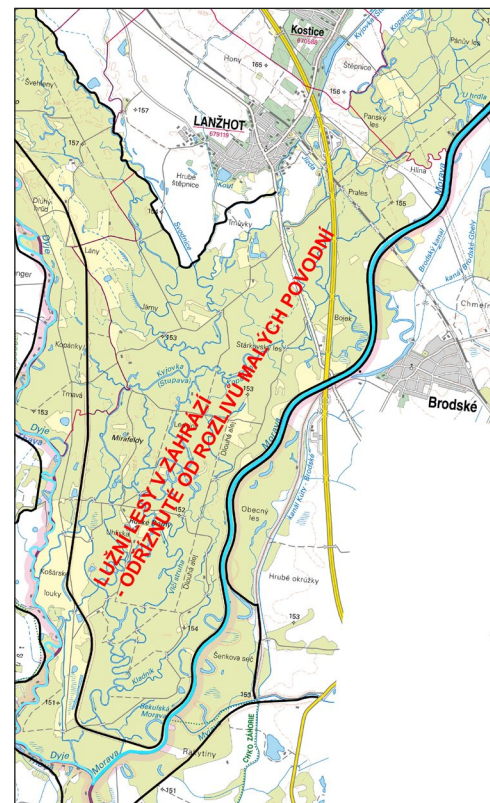


Figure 9. The embankment on the right bank of the Morava River and the set-back embankment on the left bank of the Dyje/Thaya River form the Soutok/Confluence polder. Significant flooding of the floodplain forests rarely occurs. A more natural regime would be enabled by removing the polder embankments and the embankment on the right bank towards the town of Hodonín, setting back embankments on the Slovak side, and restoring a meandering channel of the Morava River. This would enhance water retention and rewetting of the floodplain even during much smaller floods. Source: Tomáš Havlíček, Barbara Stachoňová

The Austrian and Slovak partners are preparing joint revitalisation measures for the border stretch of the Morava River downstream of Soutok/Confluence. It will be necessary to update agreements with Slovakia and Austria as soon as possible and to proceed in a coordinated manner. In subsequent phases, it will be necessary to establish a phased implementation schedule and define specific investment and administrative actions to support the systematic implementation of the proposed measures.

It is society's responsibility to ensure that these plans do not remain merely on paper. Virtual water cannot be drunk, nor can it meet the needs of ecosystems ■

How to Ensure the Maintenance of Populations of Species Associated with Old-growth Trees at the Soutok/ Confluence

Vladan Riedl & Pavel Dedek

The area above the confluence of the Morava River and the Dyje/Thaya River (South Moravia) is unique in many respects. By Central European (indeed European) standards, it is an area exceptionally rich in biodiversity. The species diversity stands out all the more when one

considers that the area in question is, in terms of habitats, relatively uniform compared with other national biodiversity hotspots such as the Pálava Hills, Podyjí/Thaya River Basin, or the Český kras/Bohemian Karst.



Figure 1. The elegant Great capricorn beetle (*Cerambyx cerdo*) is one of the insect symbols of Soutok/Confluence Protected Landscape Area. © Jan Miklín



Figure 2. The flattened bodies of both larvae and adults of the Cinnabar flat bark beetle (*Cucujus cinnaberinus*) facilitate movement beneath the bark of dead branches and trunks of broadleaved deciduous trees. © Pavel Dedek



Figure 3. One of the rarest insect inhabitants of old trees is the Oak jewel beetle (*Eurythyrea quercus*). The Soutok/Confluence Protected Landscape Area supports by far the largest population of this species, which is threatened with extinction. © Jiří Klváček

In this article, the authors focus on a specific group of organisms – invertebrates associated with wood. These include saproxylic species (dependent on dead wood, including mycophagous species) and xylophagous species (associated with living trees). For practical reasons, both groups are hereafter referred to collectively as xylobiont species. This is a highly species-rich group, with knowledge levels varying considerably among taxa. Beetles are by far the best studied, which is why we focus primarily on them. They include species with such a wide range of habitat selection and life strategies that they effectively cover the needs of representatives of other taxa as well (Hymenoptera, Araneae, Diptera, and many others).

Moreover, what most endangered xylobiont insect species have in common, is a preference for wood that is fully or at least partially sun-exposed. The microclimate within the wood plays an important role in larval development. The presence or absence of light largely determines whether trees are suitable for xylobiont species or not. Even an abundant supply of dead or dying wood will remain unused by many rare species if there is a lack of sunlight.

Open-canopy groves/forests are among the most threatened habitats in Europe. Therefore, plant, insect, and other wild animal species associated with this habitat type are likewise under pressure. In the Morava–Dyje/Thaya Rivers confluence area (South Moravia), the extent of open-canopy forests declined from more than

3,000 ha to less than 500 ha between 1938 and 2009 (Miklín & Čížek 2014). Even in the 1930s, their proportion was undoubtedly significantly lower compared with previous centuries.

A brief history of forest management

Most of the land in the Morava–Dyje/Thaya Rivers confluence area had been owned by the House of Liechtenstein. At that time, there were no sharp boundaries between open land and forest as there are today. Meadows and pastures without trees gradually transitioned through very open, park-like wood pastures into more closed forest stands.

With the modernisation of forestry machinery, forest managers were able to focus much more on cultivating large, branch-free trees with straight trunks, suitable not only for beams, sleepers and boards but also for veneer production. To prevent excessive crown/canopy branching, trees were maintained in close spacing through silvicultural practices. As a result, forests became much shadier than they had been in previous centuries.

To reduce the costs of timber harvesting and subsequent forest management, extensive clear-cuts were established there. In many places, uniform blocks of even-aged forest were established, with stand density prescribed according to management tables.

In recent decades, abiotic conditions have also changed profoundly, resulting in a deterioration in forest health and changes in the species composition of natural regeneration. Beneath today's centuries-old stands, natural regeneration of oak (*Quercus* spp.) is absent, with the Field maple (*Acer campestre*) now dominating the understorey regeneration.

The initial conditions for the active conservation of forest communities are highly complex due to changes in forest management and altered hydrological conditions. Nor are matters helped by the relatively high proportion of older stands or by rapidly spreading diseases that are devastating certain tree species on a large scale. Another factor/driver to consider is the shift in forest tree communities driven by climate change. In many cases, the conservation of diverse forest communities and the multitude of species associated with them is therefore at a disadvantage.

Reserved trees

One of the measures implemented to mitigate negative impacts on species associated with sun-exposed trunks is the use of reserved trees¹ on clear-cuts. Since 2007, reserved trees have been left on regenerated areas at a density of 100 trees per 10 ha. Under the Forest Management Plan for 2020–2029, and on the

¹ reserved tree: a tree intentionally left standing on a clear-cut after harvesting until it undergoes natural physical decay.



Figure 4. Restoration in biologically valuable stands is carried out through their gradual opening. However, to allow light to reach the understorey, dense regrowth of the Field maple must be removed. © Vladan Riedl



Figure 5. One of the many rare inhabitants of hole in sunlit broadleaved deciduous trees is the Hermit beetle (*Osmoderma eremita*). © Pavel Dedek

basis of an agreement between the Nature Conservation Agency of the Czech Republic (NCA CR) and Forests of the Czech Republic, State Enterprise (FCR), the number of reserved

trees was increased to 20-30 trees per hectare. Over the course of 18 years, more than 12,000 trees have been reserved in the alluvial forests.

As a result of past forest management practices, however, it is often difficult to find trees with sufficiently developed crowns to cope with the stress of sudden exposure to sunlight. Thus, their lifespan frequently ends sooner than it would have if they had remained within the adjacent stand. Over time, the primary crown often dies back and is replaced by the growth of a secondary crown. Elms (*Ulmus* spp.) cope particularly poorly with this stress, whereas oaks and lime trees, in North America known as lindens (*Tilia* spp.), are much better able to withstand it.

Therefore, priority is given to retaining trees with low-set crowns, *i.e.* essentially trees growing along the edges of stand groups in dense forests. Where edge trees are absent from harvested areas, selected trees are arranged in larger or smaller groups so that they can provide at least partial shade for one another.

As reserved trees gradually die, they become heavily colonised by species favouring

sun-exposed trunks and that simultaneously contributing to the accelerated decline of the trees themselves. Although the slower growth of planted trees beneath reserved trees and the fall of reserved trees into young stands may be viewed negatively from a forestry perspective, these small-scale disturbances increase stand heterogeneity.

Releasing trees along stand edges

Solitary trees in meadows are either very young or nearing the end of their life span. Only along the edges of stands adjoining meadows can we still find older, vigorous trees relatively well adapted to sun exposure. The open space on one side results in an asymmetrical crown structure, with branches extending out over the meadow.

As a consequence, mowing machinery cannot reach the forest edge, and shrubs and self-seeding woody plants spread beneath the trees, shading the trunks and gradually expanding the forest at the expense of the meadows. By clearing vegetation around edge trees, it is possible to quickly establish a generation of

solitary trees that are adapted to sun exposure, vigorous, and structurally valuable.

Light conditions within forest stands

As described above, the recurring cycle of managed forest with dense regeneration, maturing stands, and mature forest provides no space for heliophilous organisms. Given the current age structure of the forests in the Soutok/Morava-Dyje/Thaya Rivers Confluence, conventional forest management would in many cases result in the replacement of the existing centuries-old oak stands with new clear-cuts.

For this reason, a framework agreement on forest management was concluded between FCR and NCA CR for the EU Natura 2000 network sites Dyje/Thaya Floodplain and the Soutok/Morava and Dyje/Thaya Rivers Confluence—Podluží Region, establishing criteria for the regeneration of stands with an oak proportion exceeding 50%. Under this agreement, regeneration is carried out over 60 years, during which four successive harvesting interventions are conducted. The first intervention should remove approximately 30-40% of the trees.

This should result in a more substantial increase in light availability, to which viable trees are expected to respond not only through increased radial growth, but also through expansion of their crowns. An increase in subordinate tree species is expected in the newly opened areas. Following the first intervention, the greatest risk is considered to be the trees' response to sudden release. There also is a risk of shock from increased sun exposure, particularly in older individuals, especially when moisture is insufficient. For this reason, interventions should be designed so that both more- and less-open sections remain within the stand.

In the first phase, the regeneration approach was applied primarily to the oldest stands, which, in many cases, are already naturally more open and possess a well-developed lower layer, dominated in particular by field maples. Thus, in many cases, the proportion of removed trees is lower than 40%. Experience to date shows that the first interventions primarily target ash (*Fraxinus* spp.) trees that have already exceeded the optimal felling age, with subordinate tree species targeted subsequently. At the same time, oaks are harvested only at later stages.



Figure 6. A wide range of wild animals depend on habitats created by natural processes. For this reason, snapped and windthrown trees are not removed in Lanžhotské pralesy/Lanžhot Primary Forests National Nature Reserve. © Vladan Riedl

Economic considerations are also taken into account during selection, meaning that sparsely branched oaks with straight, high-quality stems are preferentially felled before trees already exhibiting valuable biological features, e.g. large, low-set crowns, cavities, exposed wood patches, and emergence holes. Where younger oaks are present within the stand, they are retained to diversify the age structure. By the end of 2023, the first phase of regeneration had been completed on approximately 70 ha, representing one-tenth of the area planned for canopy opening over the decade. The average age of the opened stands is 140 years.

The first phase of regeneration should be followed after 15 years by a second phase with an intensity of 30%, and subsequently by a third phase with an intensity of 20%. During all these interventions, the lower storey should also be removed to give the parent oak stand an opportunity to regenerate. Nevertheless, at present, oak natural regeneration is more wishful thinking than reality, mainly because of the disrupted hydrological regime throughout the area, which favours the expansion of the Field maple. Therefore, even now, it is possible to establish advanced regeneration elements with artificial oak planting in areas

with substantially reduced canopy cover following removal of the lower storey.

Old trees surrounded by young stands

Measures aimed at increasing light availability within forest stands also include the release of old trees growing within stands. Between 2006 and 2015, a team from the Institute of Entomology of the Academy of Sciences of the Czech Republic identified nearly 12,000 such trees in the alluvial forests of the two Natura 2000 sites. It assessed both their health condition and biological potential.² Among the veteran trees, oaks were the most common (64%), followed by ash (9.8%), willow (9.2%), and elm (5.6%). More than 54% were assessed as almost or completely healthy, 22% showed signs of dieback, and nearly 24% were dying or already dead.

During canopy-opening interventions, particular attention has been paid to releasing heavily branched trees that are at least one generation

2 Miklín, J., Hauck, D., Konvička, O. & Čížek, L. (2017): Veteran trees and saproxylic insects in the floodplains of lower Morava and Dyje rivers, Czech Republic. *Journal of Maps*, 13(2), 291–299



Figure 7. Trees newly exposed on the edges of stands are adapted to full sunlight. Many of them were formerly solitary trees in meadows before being engulfed by forest.
© Vladan Riedl

older than the surrounding stand. The pace of canopy opening, however, remains relatively slow, and by the time all deserving trees are reached, it would already be too late. Therefore, it is necessary to actively release the old veterans even in stands where no intervention is currently planned. The removal of younger trees surrounding an oak both increases its competitive ability and allows much-needed light to reach the tree.

Trees suitable for release must be carefully selected to avoid accelerating their decline following intervention. Priority should be given to the release of vigorous vital trees.

Moreover, the key to developing trees with large crowns can be found in younger stands, which need to be managed accordingly. The ability of young trees to respond to interventions differs fundamentally from that of old individuals, which can no longer flexibly develop their root systems. A major challenge for both foresters and nature conservationists will therefore be to prepare young trees for their future role as carriers of biodiversity through targeted tending interventions in stands younger than 80 years.

Solitary trees in meadows

The trees, living witnesses of times gone by, support a substantial proportion of xylobiont diversity. A single massive ancient oak may host populations of dozens of threatened species, ranging from lichens and fungi to hole-nesting birds and roosting bats. The decline in groundwater levels resulting from water management interventions over the last century has caused most of these trees to deteriorate. Old trees have been unable to adapt to the new conditions, and their root systems often no longer reach the groundwater. As a result, many of them are dying or declining rapidly. Yet a fully sun-exposed ancient oak that has been still alive is irreplaceable in the short term.

Thanks to the wide range of microhabitats they provide, these trees support species with exceptionally diverse life strategies. Such microhabitats include holes in different parts of the trunk and larger branches, fractures and broken stubs, dead bark-free sections of trunks and branches, as well as still-living parts of the trunk and crown.

The loss of each remaining ancient oak in meadows or along levees already poses a real threat

to many more specialised species. As the density of still at least partially living solitary trees declines, the distance that individuals of threatened species must disperse in search of suitable trees increases. Populations may collapse if the number of viable solitary trees falls below a certain threshold – determined individually for each species and influenced, among other factors/drivers, by dispersal ability. After many years during which populations appeared more or less stable, albeit small, a very rapid collapse may occur. Therefore, one of the key measures must also be the management of ageing trees. Their life span can be prolonged through appropriate arboricultural interventions.

The decline of existing solitary trees in meadows must be compensated for by planting new ones. At the same time, it is necessary to take into account the long gap between the death of the last solitary ancient oak and the moment when newly planted trees begin to attract insects associated primarily with senescent stages of trees. Thus, planting oaks in meadows is one of the essential measures, but insufficient on its own if the collapse of the most demanding saproxylic and xylophagous insect species populations is to be prevented.

Areas shaped by natural succession

Most of the newly designated Soutok(Confluence Protected Landscape Area (PLA) is covered by forest stands, providing ample scope for applying different management approaches there. Part of the forests is intended to remain under a non-intervention regime, *i.e.* left to natural development/succession, primarily within the existing Lanžhotské pralesy/Lanžhot Primeval Forests National Nature Reserve covering almost 440 ha.

Forest stands left without active management are attractive to saproxylic insects primarily because of the abundance of dead wood in various decomposition stages. Not all rare species require sun exposure, and non-intervention management particularly benefits xylobionts that are indifferent to light conditions or even prefer shade.

One beetle species particularly well adapted to exploiting dead wood resources in partial shade is the *Rosalia longicorn*, also known as the Alpine longhorn beetle (*Rosalia alpina*). The species, more commonly associated with beech forests, feeds in the Soutok/Confluence area on a much wider range of tree species, with an apparent preference for maples (*Acer* spp.), including the shade-tolerant field maples.

In non-intervention stands, large-scale natural regeneration of oak cannot be expected, and therefore, the species composition of forests left to spontaneous development will gradually change. The significantly lower future proportion of oak is, however, offset by other benefits for xylobionts and for other groups of organisms associated with old-growth forest habitats.

Lednice Castle Park

Parks are one specific habitat that has gained exceptional importance for xylobionts following changes in forest management. Although entirely artificial and intensively shaped by humans to match the romantic ideals of their creators, they now represent local/sub-national biodiversity hotspots for species associated with sun-exposed senescent trees.

In this respect, the Lednice Castle Park has a particularly prominent privileged position. The proximity of source populations in the surrounding forest stands, together with the high



Figure 8. Reserved trees in clearings are one way of maintaining the habitat continuity for species associated with sun-exposed trunks. © www.cuzk.cz.

proportion of mature, old and sun-exposed oaks, has made it a unique refuge for “refugees” from the increasingly dense surrounding forests.

In parks, and more generally in urban greenery/ green spaces, the numerous inhabitants of trees are threatened not by changes in management practices, but by entirely legitimate requirements concerning tree safety management. In the Lednice Castle Park, representatives of the NCA CR, the National Heritage Institute, and the park administration have found a functional compromise between visitor safety requirements and the need to maintain habitat continuity for rare invertebrate species.

The solution to this seemingly insoluble problem is brought in a differentiated approach to trees assessed as potentially hazardous. The trees are professionally checked and evaluated and, depending on the degree of risk posed by the

possible fall of the entire tree or its parts, measures are adopted ranging from relatively “soft” arboricultural interventions, *e.g.* pruning dangerous branches within the crown, to pollarding the entire crown to create standing trunks, and only in exceptional cases the felling of the whole tree with the woody material left in place for gradual decay and decomposition.

Although the massive tree trunks were initially received with some hesitation, years of practical experience with this approach have led to public acceptance, and they have now become an almost inseparable part of the local castle park’s *genius loci*. ■

The list of references is attached to the online version of the article at www.casopis.ochranaprirody.cz

Nemanický potok/Nemanice Brook Floodplain Site of European Importance/Special Area of Conservation – Cooperation between the Owner, Farmers, and Nature Conservationists Is a Prerequisite for Maintaining High Diversity in Wildlife Communities

Tomáš Peckert, Václav Bystřický & Zuzana Blažková

In May 2024, a public-law agreement was formally signed between the Nature Conservation Agency of the Czech Republic (NCA CR) and the majority landowner Štěpán Bečvář on cooperation in the management of one of the most valuable areas within Český les Mts. Protected Landscape Area, namely Nemanický potok/Nemanice Brook Floodplain Site of European Importance

(SEI, western Bohemia). Pursuant to Act No. 114/1992 on Nature Conservation and Landscape Protection, as amended later, SEI is the term for Site of Community Importance, SCI, later Special Area of Conservation, SAC, under the European Union's Habitats Directive). The Niva Nemanický potok/Nemanice Brook Floodplain SEI has official label as CZ0324026.

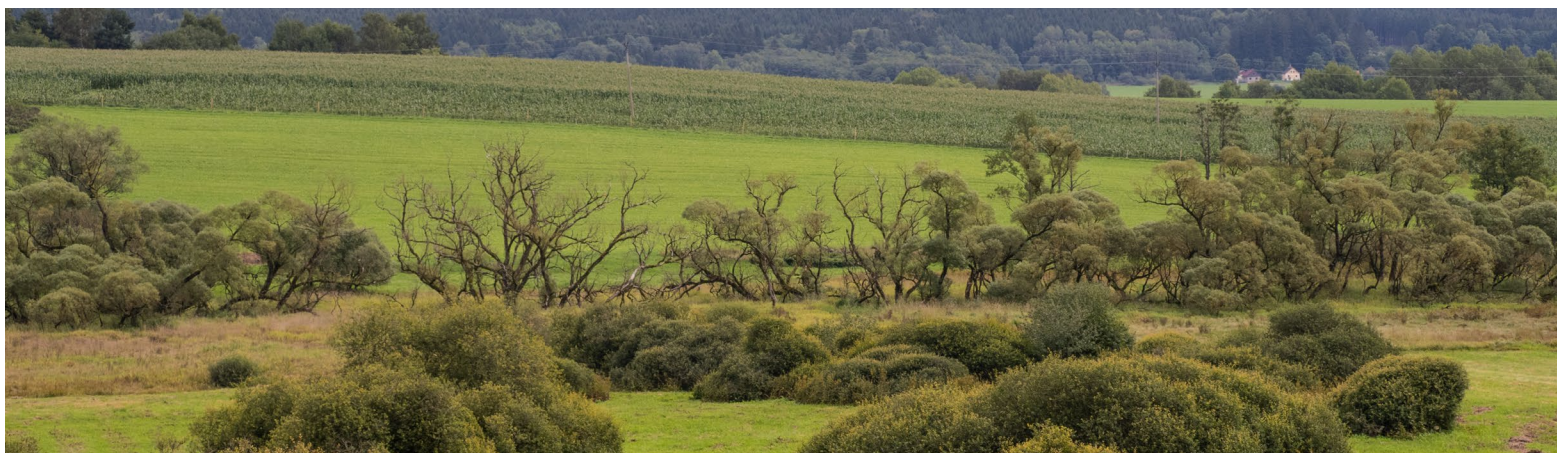


Figure 1. A typical view of the Nemanický potok/Nemanice Brook Floodplain. The landscape mosaic is essential for a range of bird species. © Václav Bystřický



Figure 2. Male common rosefinch (*Carpodacus erythrurus*), the flagship species of Nemanický potok/Nemanice Brook Floodplain. © Václav Bystřický

This extensive area, covering nearly 700 hectares, is exceptional both in its size and its biological diversity. The diverse mosaic of predominantly wetland ecosystems also includes the remains of abandoned human settlements. The area has been preserved largely due to its location near the Austrian border during the time of the Iron Curtain. A high groundwater table and poor accessibility have made it unattractive for modern forms of agriculture.

These challenging conditions also make it difficult to establish appropriate management today. Initial tentative efforts on the most valuable areas have developed into extensive cooperation with the landowner, culminating in the signing of a comprehensive public-law agreement between him and the NCA CR.

A jewel of the Český les Mts.

The Nemanický potok/Nemanice Brook Floodplain is located in the southern part of the Český les Mts. Protected Landscape Area (PLA), in the border region around the village of Nemanice. The backbone of the area is the Nemanický potok/Nemanice Brook, which rises near the village of Závist and drains into the Danube. The area comprises nearly 700 ha of well-preserved wetlands.

This type of habitat, combined with a mosaic of diverse meadow ecosystems and scattered solitary shrubby willows and alder stands, creates ideal conditions for a wide range of wild animal and plant species. The area is particularly well known for certain bird species, for which the Nemanický potok/

Nemanice Brook Floodplain provides ideal nesting conditions due to the presence of habitats at different successional stages. Birds find not only a variety of nesting opportunities there, but also a diverse food supply. The presence of the Nemanický potok/Nemanice Brook also ensures year-round access to water, even during dry periods.

The species-rich avifauna, therefore, attracts considerable attention from birdwatchers. During 2025 bird survey, 58 species were recorded within the area. In addition to common species, several conservation-significant species were recorded (see Tab. 1), attesting to the importance of this site. Regular breeding species include the Common rosefinch (*Carpodacus erythrurus*), Barred warbler (*Sylvia*

Table 1. Overview of conservation-significant bird species recorded in Nemanický potok/Nemanice Brook Floodplain in 2025. They include Specially Protected Species pursuant to Decree No. 395/1992 Gazette, those listed in annexes to Council Directive 2009/147/EC on the conservation of wild birds (EU Birds Directive) as well as the Czech Republic’s Red List of Threatened Vertebrates based on the IUCN Red List criteria and categories

Ochranařský významný ptačí druh	Červený seznamu ptáků podle IUCN	Vyhláška 395/1992 Sb.	Směrnice Rady č. 2009/147/ES
Common snipe (<i>Gallinago gallinago</i>)	EN	EN	BD IIA, IIIB
Common stonechat (<i>Saxicola torquata</i>)	VU	EN	
Whinchat (<i>Saxicola rubetra</i>)		EN	
Black woodpecker (<i>Dryocopus martius</i>)			BD I
Common rosefinch (<i>Carpodacus erythrinus</i>)	VU	EN	BD I
Corncrake (<i>Crex crex</i>)	VU	SEN	BD I
Common crane (<i>Grus grus</i>)	CR	CR	
Sparrowhawk (<i>Accipiter nisus</i>)	VU	SEN	
Common raven (<i>Corvus corax</i>)		EN	
Barred warbler (<i>Sylvia nisoria</i>)	VU	SEN	BD I
Eurasian skylark (<i>Alauda arvensis</i>)			BD IIB
White-spotted bluethroat (<i>Luscinia svecica cyaneacula</i>)	EN	SEN	BD I
Corn bunting (<i>Emberiza calandra</i>)	VU	CR	
Common starling (<i>Sturnus vulgaris</i>)			BD IIB
Red-backed shrike (<i>Lanius collurio</i>)	NT	EN	BD I
Barn swallow (<i>Hirundo rustica</i>)	NT	EN	
Grey heron (<i>Ardea cinerea</i>)	NT		
Carrion crow (<i>Corvus corone</i>)	NT		
Grey-headed woodpecker (<i>Picus canus</i>)	VU		BD I

CR – Critically Endangered, EN – Endangered, VU – Vulnerable, NT – Near Threatened, SEN – Severely Endangered, BD I – Annex I to the Birds Directive, BD II – Annex to the Birds Directive, BD III – Annex to the Birds Directive

nisoria), White-spotted bluethroat (*Luscinia svecica cyaneacula*), Common crane (*Grus grus*), Corncrake (*Crex crex*), and the Common snipe (*Gallinago gallinago*).

The floodplain also provides a long-term, stable and promising habitat for the Eurasian beaver (*Castor fiber*). Given the extent of the area, con-

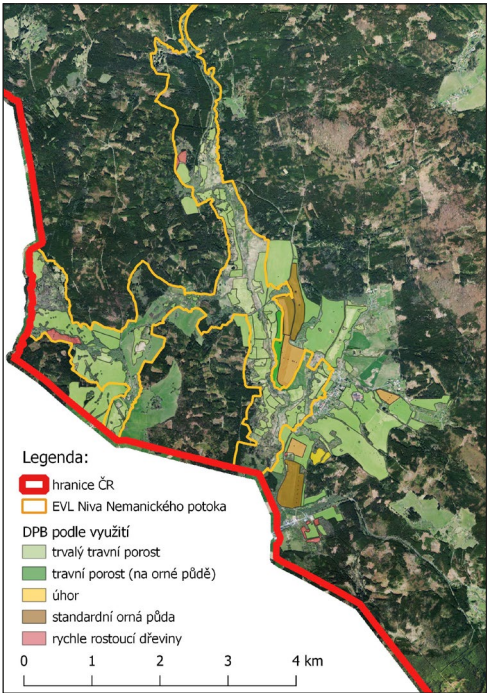


Figure 3. Map of the delineated study area showing the relevant agricultural land blocks. Base map: orthophoto © Czech Office for Surveying, Mapping and Cadastre, layer “Land Parcel Units” © Ministry of Agriculture of the Czech Republic, Nature Conservation Agency of the Czech Republic 2023

flicts with human activities are minimal; however, there remains a potential risk of adverse impacts on valuable plant communities.

The Nemanický potok/Nemanice Brook Floodplain is also highly valuable from a botanical perspective. The most valuable are the communities of aquatic macrophytes in the Nemanický potok/Nemanice Brook. The occurrence of the Alternate water-milfoil (*Myriophyllum alterniflorum*) and Alpine pondweed (*Potamogeton alpinus*) is noteworthy. Other species are also abundant, such as water-starworts (*Callitriche* spp.).

Equally valuable are the numerous non-calcareous moss-rich fens, Cirsium meadows, and oligotrophic tall-sedge beds, with species such

as the Bogbean (*Menyanthes trifoliata*), Marsh cinquefoil (*Comarum palustre*), Broad-leaved marsh orchid (*Dactylorhiza majalis*), and Early marsh orchid (*Dactylorhiza incarnata*). Extensive stands of meadowsweet-dominated tall-herb vegetation are also present, complemented by several reedbeds.

Relatively little is known about the occurrence of invertebrates in this area. The first systematic survey, focused on day-active Lepidoptera, was carried out in 2019 and 2020 (Fric 2019). A total of 36 species were recorded, of which the most notable is the Six-spot burnet (*Zygaena trifolii*). This moisture-dependent burnet moth was once distributed in scattered populations across the Czech Republic, before undergoing a dramatic decline over most of its distribution range. Today, it survives only at a few isolated sites in Bohemia, Moravia, and parts of the Beskydy/ Beskids Mountains. Therefore, the wet meadow areas of the Český les Mts. are some of the last sites in the Czech Republic where there has still been hope for a more substantial occurrence of this species.

Another notable inhabitant of the area is the ant species *Formica picea*. This rare member of the Czech myrmecofauna is considered to be highly resistant to low winter temperatures and at the same time tolerant of nest inundation, both of which are key traits for the successful colonisation of new (including climatically unfavourable) sites.

A look into the past

The entire non-forest area in the vicinity of the village of Nemanice covers just under 1,000 ha (Fig. 2). This region receives very high precipitation, with an annual total of around 800 mm. A substantial amount of water drains through the area, originating in the higher parts of the Český les Mts., including the entire western, windward side of the Haltrava Ridge.

Most of the currently farmed land was previously drained as part of so-called “compensatory reclamation” and converted into arable land. Following the fall of the Communist regime in 1989, the area was largely converted back to grassland; however, the altered hydrological regime has persisted there.

Despite its higher elevation (500–667 m a. s. l.), the area remains agriculturally attractive due to the year-round abundance of precipitation.



Figure 4. Example of a specialised small tractor with low-pressure tyres. © Václav Bystřický



Figure 5. Official signing of a public-law contract between the Nature Conservation Agency of the Czech Republic, represented by František Pelc, and the landowner Štěpán Bečvář. © Daniela Hlinková

Intensive biomass production, including maize cultivation, is particularly attractive. Thus, there is ongoing pressure to expand arable land and to increase soil fertility through the application of farmyard manure and digestate. Over the long term, this is likely to lead to nutrient accumulation/eutrophication in the Nemanický potok/Nemanice Brook Floodplain, through which all water from the area drains.

The Nemanický potok/Nemanice Brook Floodplain itself was fortunately spared the agricultural experiments of the second half of the 20th century. A high degree of waterlogging, the presence of a strictly guarded state border, and difficult accessibility had instead led to a complete absence of management. This situation persisted for a long time, even after the political changes of 1989. By the time the Český les Mts. PLA was established, the area was already beginning to be affected by advancing succession.

Given the size of the area, its difficult accessibility and the high groundwater table, initial management efforts were very tentative. There were even proposals to fence the entire area and allow it to be grazed by large herbivores. At the time, however, such approaches were still too innovative and could not be implemented.

Gradually, the most valuable areas began to be mown using traditional conservation methods, i.e. brushcutting and the removal of biomass onto tarpaulins to firm ground, followed by its transport off-site. This made it possible to safeguard some valuable habitats; however, managing the area as a whole remained technically and financially unfeasible. A turning point came only with the transfer of formerly state-owned land into the hands of a private farmer.

In 2016, restoration management was carried out over an area of 14.01 ha under the Landscape Management Restoration Programme, consisting of the reintroduction of mowing on long-abandoned land combined with the partial removal of encroaching self-seeded woody plant vegetation. To ensure long-term sustainability, agricultural land blocks were subsequently delineated on these areas, and appropriate agri-environment-climate scheme (AECS) options were applied – specifically, the wet and peat meadow option.

The landowner also invested in suitable light-weight machinery, enabling low-impact mowing

of wet meadows (Fig. 3). Raking and removal of the biomass remain manual. Given the extent of the mown areas – approximately 70 ha managed in this way – the process is organisationally demanding.

Differentiated management supports biodiversity

The natural value of the Nemanický potok/Nemanice Brook Floodplain lies in the diversity of its habitats. A high degree of habitat heterogeneity, combined with the presence of habitats at various successional stages, supports a rich species diversity (Fig. 4). Maintaining the diversity depends on the careful design of management measures that consider the requirements of individual conservation-significant species. These include e.g. appropriately timed removal of encroaching self-seeded woody vegetation, mosaic mowing, restrictions on agricultural activities in selected areas, and the protection of dense scrub and reedbeds.

Close cooperation between the farmer and State Nature Conservancy authorities is essential to ensure the successful breeding of meadow bird species. A typical example is the protection of the corncrake's (*Crex crex*) nesting sites, whose nests are most often destroyed by early mowing and heavy machinery. For this reason, annual monitoring is carried out in the Nemanický potok/Nemanice Brook Floodplain to determine the precise locations of all territorial individuals and to implement appropriate agri-environment measures to protect them. Most commonly, this involves enrolling selected agricultural land parcels in the “Corncrake Protection” scheme, which requires that the first cut is carried out no earlier than 15 August.

A positive outcome is not only the protection of the corncrake itself, but also of other conservation-significant bird species nesting on the ground and in grasslands. These measures thus also benefit species such as the Common quail (*Coturnix coturnix*), Corn bunting (*Emberiza calandra*), and Whinchat (*Saxicola rubetra*). Several other conservation-significant bird species also breed regularly on the relevant land blocks, including the Common rosefinch, Barred warbler, White-spotted bluethroat, Common crane and the Common snipe. All these species benefit from appropriately implemented management.

Nature conservation does not end at the reserve boundary

Cooperation with the farmer does not end with the management of the Nemanický potok/Nemanice Brook Floodplain SCI/SAC. The site does not exist in isolation, and surrounding land uses exert a secondary influence on the floodplain. Based on long-term discussions, the distribution of arable land has been optimised, with grassland established on plots adjoining the floodplain and on the steeper parts of fields. In exchange, the landowner was allowed to plough new areas in locations of low conservation value.

Grass buffer strips were established at interfaces/ecotons with arable land. Their purpose is to reduce the impacts of eutrophication: they are not fertilised; instead, biomass is intensively harvested to remove nutrients. Maize cultivation has been reduced and partly replaced by other crops.

At the same time, a study funded by the Landscape Management Programme was conducted in 2021–2023 to assess the extent to which the floodplain is affected by surrounding agricultural management and to evaluate the effectiveness of the proposed measures. For this purpose, several soil sampling pits were established in the field, where changes in selected soil indicators and water quality are being monitored (e.g. mineral nitrogen content, total nitrogen content, and soil pH).

However, cooperation with the landowner does not end with these steps. Two orchards of local fruit tree varieties have been established under the Landscape Management Programme, and several small ponds/pools for amphibians have been created there. Project documentation is currently being prepared for the restoration of the hydrological regime in a drained area within the wider site. Encroaching self-seeded woody vegetation has already been partially reduced, and regular mowing has been introduced again under the AECS “Wet and peat meadows” option.

The long-term, extensive cooperation between the NCA CR and Štěpán Bečvář was formally sealed in the spring of 2025 by the signing of a comprehensive public-law contract (Fig. 5). ■

The list of references is attached to the online version of the article at www.casopis.ochranaprirody.cz

Fire Prevention in the České Švýcarsko/Bohemian Switzerland National Park: Avoiding Throwing the Baby out with the Bathwater

Tomáš Salov

The fire that struck České Švýcarsko/Bohemian Switzerland National Park (northern Bohemia) in the summer of 2022 had spread across an area of approximately ten square kilometres. In the aftermath of the

fire, a wide range of societal and professional questions emerged concerning the extent to which similar events can be prevented in the future without compromising the fundamental purpose and mission of National Parks.



Figure 1. České Švýcarsko/Bohemian Switzerland National Park Administration has significantly improved its firefighting capacity; however, operating the equipment places high demands on staff. © Tomáš Salov

Public debate on this issue in the Czech Republic was highly emotional and often polarised. Looking back at statements made by some respondents interviewed by various mass media outlets, viewers, listeners and readers frequently received the message that the problem is caused by the very nature of National Parks as areas where, across most of their territory, nature is allowed to develop through its own processes with minimal human interference. This interpretation was often accompanied by broader calls for changes in the way such areas should be managed.

A wide range of opinions could therefore be heard in public discourse, some of them rather extreme. Broadly interpreted, the demands put forward included e.g. calls for National Park forests to be brought into a condition in which they would be essentially non-flammable across their entire area, for drastic reductions in the amount of decaying wood, and for forest complexes to be fragmented by a dense network of roads suitable for heavy fire-fighting equipment.

As of the editorial deadline for this issue of the journal, many of these ideas have still been reflected in proposed amendments to Act on Nature Conservation and Landscape Protection being debated in the Chamber of Deputies of the Parliament of the Czech Republic. The proposed changes concerned even the country's most strictly Specially Protected Areas.

Fire prevention legislation does not distinguish between ordinary commercial/production forests and Specially Protected Areas such as National Parks. However, the experience of a large-scale fire under extreme weather conditions and in exceptionally challenging rocky terrain inevitably led the České Švýcarsko/Bohemian Switzerland National Park Administration (NPA) to seek solutions that would significantly reduce the risk of a similar event recurring while preserving the fundamental purpose of the National Park.

Over the course of three years, the NPA developed a comprehensive set of measures which, as an integrated system, combine practical interventions within the National Park, monitoring its territory, preparedness and technological equipment of field staff, cooperation with third parties, and public outreach.

One of the first preventive measures implemented by the NPA after the fire involved the felling of

standing dead trees and the removal of the woody material from the vicinity of human settlements and other important infrastructure. To ensure that these interventions remained proportionate, the NPA commissioned the Institute of Forest Ecosystem Research (IFER) to prepare a study defining the minimum intervention parameters required for specific sites so that the measures would effectively reduce fire risk while remaining as sensitive as possible to the natural habitats.

Although the areas involved were not unusually large in terms of their extent, the number of sites was considerable and, given often difficult terrain and weather conditions during the year, some of the logging operations initiated in 2023 could only be completed in 2024. The next step involves planting woody plant species in the cleared areas that are expected to help suppress the spread of fire in the future. These are primarily beeches and oaks. Such artificial forest regeneration is now relatively exceptional within the National Park and is carried out mainly in the immediate vicinity of human settlements and buildings.

An important milestone in the development of the broader system of measures was the establishment of a Fire Prevention Officer position within the NPA. The establishing the new post was made possible through an increase in officially allocated staff positions approved by the Ministry of the Environment of the Czech Republic, and the position was filled in the second half of 2023. The responsibilities of the Fire Prevention Officer include identifying potential sources of fire risk, proposing and implementing measures to reduce those risks, and coordinating cooperation with other partners, particularly the Fire Rescue Service of the Czech Republic (FRS CR) and volunteer fire brigades.

The newly appointed Fire Prevention Officer was then able to build upon the measures already adopted by the NPA. Alongside the above-mentioned IFER study, which had already been underway at the time, efforts also focused on improving access to water for fire-fighting in terrain naturally poor in water resources. The most feasible solution appeared to be the placement of smaller water reservoirs at locations selected in consultation with the FRS CR. Such reservoirs cannot be used to combat large-scale fires, but they may prove highly useful during the initial stages of a fire.

At present, the National Park includes 13 smaller reservoirs with a capacity of 1,000 litres each,

three large-capacity water tanks holding 50,000 litres each, and, since 2025, two additional large-capacity tanks with volumes of 70,000 and 100,000 litres, respectively. One permanent reservoir with a capacity of 70,000 litres has also been restored: a former swimming pool carved into the sandstone massif near the Na Tokáni Hunting Lodges in the second half of the 19th century.

Large-capacity water tanks also deserve attention because they were developed by a local company based in the city of Děčín according to specifications provided by fire fighters. This represents a relatively uncommon solution that is now available to forest owners at an acceptable cost. The technology also inspired the municipality of Hřensko, which purchased its own 50,000-litre tank and installed it in the settlement of Mezná. During the major fire in 2022, fire fighters had been forced to withdraw from the area partly because of a lack of water for fire-fighting.

The České Švýcarsko/Bohemian Switzerland National Park has experienced a relatively long history of fires. Since its establishment in 2000, more than 80 fires have occurred there, with the vast majority caused by human negligence, namely failure to comply with the rules governing visits to the National Park. Even when a fire was reported by others rather than detected directly by National Park staff, park employees were usually among the first to reach the scene thanks to their detailed knowledge of the area. Even during fire suppression operations, National Park staff consistently provided indispensable support to the responding fire brigades.

For this reason, the NPA considers it important that field staff in particular are equipped at least with basic gear enabling them to contain newly detected fires or even extinguish them using their own resources. During the summer season, their service vehicles are routinely equipped with backpack water tanks holding 25 litres of water, together with canisters for refilling.

The capabilities of field staff were further significantly enhanced by the addition to the vehicle fleet of an all-terrain vehicle equipped with a fire-fighting unit. In addition to a 300-litre water tank, pumps and hoses, it is equipped with a range of specialised attachments suitable for extinguishing different types of fires, as well as other equipment, including protective gear. Its compact dimensions, which allow it to reach fires even in difficult terrain, is the greatest



Figure 2. Visitor access to the České Švýcarsko/Bohemian Switzerland National Park is restricted depending on the declared level of fire risk. The vast majority of fires in the National Park are caused by failure to comply with the rules for visiting protected areas. © Tomáš Salov

advantage. It has already been deployed successfully on several occasions, including during a fire affecting approximately two hectares on Koliště Hill in September 2023.

In the following year, field staff were also equipped with a drone fitted with a thermal imaging camera to facilitate the identification of hot spots in difficult terrain. The drone is used primarily to provide operational support for responding fire brigades.

Operating the newly acquired equipment definitely places far greater demands on staff; they must be trained and acquire practical skills in the use of fire-fighting equipment. In the case of drones, it is not sufficient merely to know how to fly them; numerous additional requirements must also be met, including passing pilot certification

examinations. Therefore, maintaining proficiency in operating the equipment therefore causes a considerable increase in workload.

Once a fire has started, early detection and accurate localisation are absolutely crucial. Questions as to whether the 2022 fire could have been detected and reported earlier were widely debated in the region. The incident was reported at around 07.00 a.m. Subsequent analysis of infrared satellite imagery later showed that the forest had already been burning around midnight, giving the blaze several hours to spread. This finding may unintentionally have fuelled assumptions that the fire had already been known about and that reporting it had for some reason been delayed. In reality, however, continuous real-time monitoring of the area from orbit has not been yet possible.

Ensuring rapid and reliable fire detection in terrain as complex and rocky as that of České Švýcarsko/Bohemian Switzerland National Park is far from straightforward. During periods of elevated fire risk, the NPA regularly addresses this challenge through monitoring patrols, usually composed of carefully instructed staff members. The task of these patrols is to climb designated vantage points at dawn and dusk and check whether smoke is rising from any part of the forest. If smoke is detected, the patrols attempt to determine its location and source in cooperation with one another. If there is any suspicion of a fire, they alert the fire brigades. This highly staff-intensive activity has, at times, also been outsourced by the NPA to external contractors.

In 2025, the NPA has been operating a genuinely powerful tool for the early detection of



Figure 3. Cooperation with fire brigades is a key component of preventing large-scale fires. In the landscape naturally poor in water resources, creative solutions are often required. The image shows a custom-designed flow-retention barrier for small watercourses. © Tomáš Salov

potential fires: two drone stations installed in the field. These consist of “drone ports” equipped with independent power systems and high-capacity internet connections, from which drones can take off and land autonomously. Operators control them remotely from a computer workstation and, once airborne, can switch between images from a standard camera and infrared footage. Unlike human patrols, drone operators can bring the aircraft closer to the locations where smoke is rising and assess the situation more accurately. The systems are highly sophisticated and require considerable expertise to operate, while also placing substantial demands on work organisation, including the need for on-call duty arrangements. In addition to routine monitoring flights, operators must also be capable of deploying the drones rapidly whenever suspicion of an emergency arises outside scheduled monitoring periods.

National Park staff themselves do not actually extinguish fires. The response to the large-scale fire brought large numbers of fire fighters to the area from various parts of the Czech Republic and, to a lesser extent, from neighbouring Saxony, aside from the aerial fire-fighting operations carried out with international assistance. For fire fighters operating in the field, the greatest challenge was the difficulty of navigating the terrain and their unfamiliarity with the area – almost literally a stumbling block. As a result, National Park staff had to guide fire fighters to specific locations within the affected area. The extraordinary and virtually continuous involvement of the National Park staff during the fire received only limited public recognition.

Preparedness for emergency situation in the extremely rugged natural environment of the National Park can only be achieved through

gradually becoming familiar with the terrain. Therefore, the NPA provides maximum support for the organisation of fire brigade exercises. Nevertheless, it is important that such exercises are planned for periods less sensitive for nature conservation; the tourist season and days on which exceptionally high visitor numbers can be expected must also be taken into account.

Volunteer fire brigades from municipalities surrounding the National Park are actively encouraged to carry out familiarisation drives using their vehicles and equipment. Using their specific equipment, this allows them to verify in practice the passability of roads and the accessibility of particular sites within the Specially Protected Area.

Debate over whether the road network had been sufficiently passable during the large-scale fire resulted in several practical measures.

Following consultations with the FRS CR, the network of roads designated for emergency response units was slightly expanded. Consultations with fire fighters are conducted on an ongoing basis. Cooperation with the FRS CR now also takes place within the Council of the České Švýcarsko/Bohemian Switzerland National Park, to which a representative of the Service has been appointed.

For the entire road network, including roads not primarily intended for emergency response units, internal guidelines established inspection/checking intervals within which fallen trees, or trees posing an immediate risk of falling, are removed where necessary. Finally, the roads were categorised according to the types of vehicles capable of using them. The categorisation is available both to the FRS CR and to volunteer fire brigades, including through a specially developed application for smartphones, tablets and computers. The application includes a wide range of practical information for managing operations within the České Švýcarsko/Bohemian Switzerland National Park. In addition to road categories, fire fighters can view water sources, recommended routes intended to prevent delays where vehicles cannot pass one another, locations suitable for parking equipment, turning points for large vehicles, and similar operational information.

Preparedness for the outbreak of fire and for fire suppression is very important in the landscape prone to drying out. The ideal situation, however, is one in which no fire occurs at all. Natural causes of fire are very rare in the České Švýcarsko/Bohemian Switzerland National Park. In practice, lightning is almost the only possible natural cause; all others can be linked to human activity. Statistics show that, where the origin could be identified, the most common sources of fires were campfires, smoking, and the use of fireworks. For this reason, preventive measures must also be directed towards visitors. Since January 1, 2024, the NPA has also been acting as the State/Public Administration Authority in Forestry for the National Park. It has therefore introduced, through a general administrative measure, a dynamic system regulating visitor access to forests according to the level of fire-risk warning issued by the Czech Hydrometeorological Institute (CHMI).

In practice, this means that if no warning is issued by the CHMI, visitors to the České Švýcarsko/Bohemian Switzerland National Park are subject only to the standard rules, including

the generally known prohibitions on smoking and the use of open flames. They may move freely wherever access is permitted. If the CHMI issues a warning due to a low level of fire risk, night-time access to the National Park is automatically restricted. The NPA's experience shows that many fires were caused in connection with illegal overnight stays in the National Park, during which visitors also lit campfires. When a warning is issued because of a high level of fire risk, the night-time access restriction is supplemented by limiting movement within the National Park exclusively to marked hiking trails/visitor paths. The purpose of this measure is to reduce to the absolute minimum the area within which a fire could potentially start.

Visitors are informed about the applicable rules via fire-risk indicators installed at 48 entry points to the National Park. The rules currently in force are also communicated through social media, the media, and the Park's website.

The public is informed throughout the year about the need to comply with the rules, including those concerning the lighting of fires and smoking, through a variety of media channels and information platforms, regardless of the season or the current severity of drought conditions. Media communication is typically prompted by information about newly acquired equipment, reports on fire brigade exercises, discoveries of illegal fire sites by National Park rangers – which are particularly frequent in forests outside the National Park within the Labské pískovce/Elbe Sandstones Protected Landscape Area (PLA) – or summaries of the results of joint patrols carried out by rangers and the police.

Joint patrols by police officers and National Park rangers are carried out several times during the year. They are organised in response to peak visitor periods, during which breaches of the rules governing visits to protected areas also occur more frequently. Naturally, illegal behaviour by some visitors is addressed on an ongoing basis. The activities of the National Park ranger service was further strengthened in 2023, when the number of professional rangers increased from seven to ten. In supervising the area, they are also significantly assisted by volunteer rangers, of whom approximately ten are active in the region. The area under supervision includes not only the 80 km² of the České Švýcarsko/Bohemian Switzerland National Park itself, but also a further 240 km² of the Labské pískovce/Elbe Sandstones PLA.

Following the fire in the summer of 2022, the introduction of preventive measures had been initially based on preliminary analyses of the causes of the fire and its spread, and later also on assessments and comments provided by the FRS CR and municipalities in the České Švýcarsko/Bohemian Switzerland region. Over time, it proved possible to approach the issue more systematically. Fire prevention and measures aimed at maintaining the accessibility of the National Park for emergency response services are now incorporated into the Principles of Management for the České Švýcarsko/Bohemian Switzerland National Park for 2025–2041. These entered into force on January 1, 2025 through a decision of the Ministry of the Environment of the Czech Republic. Importantly, this took place based on broad consensus within the Council of the České Švýcarsko/Bohemian Switzerland National Park, which adopted the document unanimously, with the support of all members present, including more than half of the municipal representatives and a representative of the FRS CR.

The Principles of Management for the České Švýcarsko/Bohemian Switzerland National Park also include a proposal to prepare a Fire Suppression Study for the Park. During June 2025, the study was gradually presented to representatives of municipalities, fire brigades, and members of the National Park Council. It provides a solid foundation for the further development of fire prevention measures in a broader context, as it includes recommendations not only for the National Park Administration, but also for third parties, including surrounding municipalities and property owners in the vicinity of forests. Effective protection against the outbreak and possible spread of fire requires coordinated cooperation among all stakeholders.

Preventive measures against the outbreak and spread of fire in natural habitats are now implemented within the České Švýcarsko/Bohemian Switzerland National Park at an unprecedented level, far exceeding any legal requirements. It is important to recognise, however, that these are locally focused measures implemented by only a single forest owner. Fire risks should not be viewed as affecting only Specially Protected Areas. If the risks associated with fires in natural environments are to be minimised, effective prevention depends on broad cooperation and on all parties being adequately prepared and equipped, within the scope of their respective responsibilities and competences, to respond should a fire occur. ■

Rearing Ukrainian Brook Lamprey/ Vladykov's Lamprey Larvae for Restocking its Population in the Račinka Brook

Lukáš Merta & Jiří Křesina

The Ukrainian brook lamprey (*Eudontomyzon mariae*) is a non-parasitic potamodromous lamprey species. Together with the more common European brook lamprey (*Lampetra planeri*), it is one of only two lamprey species currently found in the Czech Republic. Since its discovery in 1968 it is known from a single site, Račí potok/Crayfish Brook (also called Račinka) near the town of Velké Losiny in the Šumperk region, northern Moravia (Kux 1969). Ukrainian

brook lamprey is classified as a critically endangered species in the Czech Republic's fauna and protected at both the national and EU levels. Račinka SCI (CZ0713004) was specifically included in the national list of Natura 2000 sites to protect the rare lamprey there. Since 2017 the Nature Conservation Agency of the Czech Republic (NCA CR) has also been implementing a regional action plan (RAP) for the Ukrainian brook lamprey.



Figure 1. Preparation of a floating tank for rearing this year's lamprey larvae. The larvae had been released into the tanks in mid-June and kept there until mid-September. Nearly half of them survived and tripled their body length. © Jiří Křesina

The Račinka population had not been particularly large even at the time of its discovery, but survived many years of neglect, and was reconfirmed at the site in 1995. Since then, the population is regularly monitored, although with rather discouraging conclusions. Over time, the river section inhabited by lamprey larvae has become shorter, and the population has been declining. In 2013, when not a single larva was captured, it was even considered to be “below detection limit” (Hanel et Lusk 2013). Fortunately, fears of extinction proved unfounded, and the same year, lampreys were rediscovered in the lowermost section of the Račinka stream (km 0.0–0.8), which had so far been overlooked by ichthyologists. Despite targeted measures implemented in the following years (partial restoration efforts, supporting sediment deposition, transfers for recovery), the situation has remained critical. The lamprey population is affected by a wide range of negative factors/drivers, including inappropriate riverbed modifications, watercourse fragmentation with transverse structures, water pollution, and an assumed high predation level by both aquatic and terrestrial predators (Merta et Křesina 2017). In recent years, also changes in the river’s hydrological regime caused by climate change have played a role. The frequency of flash floods and periods of very low flow rates are increasing, which both have a devastating impact on sediment deposits, which are an essential habitat for lamprey larvae.

Taxonomic Classification and Geographic Origin of the Račinka Population

The taxonomic position of the species is complicated and has not yet been fully clarified. Most authors today, however, tend to believe that the Ukrainian brook lamprey (*Eudontomyzon mariae*) and the Vladyskov’s lamprey (*E. vladyskovi*) are two distinct species with different distribution ranges. The range of the Ukrainian brook lamprey is quite extensive, including rivers in the basins of the Baltic Sea, the Caspian Sea, and the northern part of the Black Sea, whereas the range of Vladyskov’s lamprey is relatively small and compact, including watercourses in the upper and middle Danube Basin (Kottelat et Freyhof 2007). Genetic analyses conducted on a large sample of lampreys, among which one individual from Račinka, have clearly demonstrated that the only population inhabiting the Czech Republic does not belong to the species *E. mariae* (Levin et al. 2016). On the contrary,



Figure 2. Portrait of one of the captured adult lampreys from the Račinka Brook. Unlike the European brook lamprey, the Vladyskov’s lamprey has significantly smaller eyes. © Lukáš Merta

unpublished recent analyses show a close genetic relationship between the Račinka population and Slovak populations (particularly those from the Rudava, Hron, and Váh rivers), and thus their affiliation with the species *E. vladyskovi* (Šanda *in litt.*). It is therefore time to start using the name Vladyskov’s lamprey when referring to Račinka. Incidentally, renowned ichthyologist Prof. Vadim Vladyskov (1898–1986), after whom the lamprey is named, was Ukrainian. He was born and studied in Kharkiv. In his youth, he actively fought against the Bolsheviks, from whom he fled to Prague, where he was employed at Charles University for some time.

Particularly conservationists periodically claim to question the autochthonous nature of the Račinka lamprey population, due to its high degree of isolation. Besides the existence of many similar cases in our fauna and flora, it should be noted once more that Račinka is located within the range of Vladyskov’s lamprey, albeit at its margin. There is one other site of this species in the Morava River basin, Rudava Brook in the Slovak Záhorie region. Historically (in the 19th century), two lamprey species were known to inhabit the Morava River system, European brook lamprey and then a species referred to as *Petromyzon fluviatilis*. However, since the presence of European brook lamprey in the Morava River basin is ruled out, the other species was probably Vladyskov’s lamprey, which at that time was found in the middle and lower sections of the Morava River, between the village of Bludov and the town of Hodonín, and apparently also in many of its tributaries (Lusk et al. 2014). As

a result of increasing pollution and widespread regulations, the species disappeared from most waterways, leaving Račinka as its last refuge. Incidentally, the extinction of Vladyskov’s lamprey from entire streams and basins due to river regulation and pollution is also known from neighbouring Austria (Ratschan et al. 2021). We therefore propose adhering to the presumption of native origin of Czech Republic’s population until proven otherwise. The burden of proof should rest with the sceptics. This is the only way to avoid endless debates, whose sole result is an undermining of efforts to preserve the species for the Czech Republic’s fauna.

Artificial Spawning and Rearing of Lamprey Larvae from the Račinka Brook

In 2023, the authors, in another conservation project (Křesina et al. 2024), managed to artificially produce spawn of European brook lamprey followed by rearing of the youngest larvae. At a workshop on the conservation of Vladyskov’s lamprey in the city of Olomouc, organised by the NCA CR in January 2024, participants agreed that artificial spawning and rearing larvae is one of the last options to save the Račín population from extinction. This measure is also fully in line with the recommendations of the mentioned regional action plan (Merta et Křesina 2016). In early March 2024, the Regional Office issued a decision pursuant to Sections 54 and 56 of the Act on Nature Conservation and Landscape Protection, authorising the capture of up to five adult fish from the Račinka Brook,



Figure 3. The last morphologically preserved stretch of the Račinka Brook, the only site of the Vladykov’s lamprey in the Czech Republic, is not longer than 300 m. © Lukáš Merta

Table 1. Basic data on artificial spawning and larva rearing of Vladykov’s lamprey from the Račinka Brook, 2024

Female no.	Body length (mm)	Number of eggs collected (pcs)	Number of hatched eggs (pcs)	Hatching rate (%)	Number of reared larvae (pcs)	Larval survival rate (%)
1	171	1,933	671	34.7	638	95.1
2	174	3,215	748	23.3	692	92.5
3	161	1,564	620	39.6	568	91.6
		Σ = 6,712	Σ = 2,039	Ø = 30.4	Σ = 1,898	Ø = 93.1

followed by rearing of the fry and their release into the stream to restock the remaining population. In April 2024, four adults – three females and one male – were caught in the stream, all from a relative short stretch (approx. 200 m) in order to keep natural reproduction possible in the remaining stretches of the stream. The adults were transported to Olomouc and kept there in a 60-litre aquarium with continuous aeration in an unheated room. At the end of April, the adults began to display typical pre-reproductive restlessness. In early May 2024, artificial spawning of the lampreys was therefore carried out using the so-called dry method, *i.e.* without water. First, the eggs were squeezed out of the females by gently pressing their abdomens, and were then fertilised with the males’ milt. Each female was spawned separately so that their fertility and egg hatchability could be quantified. A total of 6,712 eggs were collected from the three females,

with the number of eggs gathered from each female varying considerably (1,564, 1,933, and 3,215, respectively). The eggs were transferred from the spawning tray to larger ones with a water depth of 4.5 cm, where hatching took place. For both rearing of the adults and development of the eggs, water from the Račinka Brook was used, refreshing it regularly. The water in the trays was aerated using standard aquarium equipment, but without filtering. The water was neither treated with chemicals; instead, a few alder cones were added to each tray to serve as a natural fungicide. The eggs were checked twice a day and unfertilised or mouldy eggs were removed mechanically. The first embryonic changes in the eggs had been found a few days after fertilisation, and the larvae had fully hatched within 3 weeks after fertilisation. The hatching rates of the eggs were 23.3%, 34.7%, and 39.6% for the three females, respectively. A total of

2,039 larvae successfully hatched. The mortality rate of developing larvae from hatching until the depletion of their yolk reserves was very low, with an average survival rate of 93.1%. The water temperature during hatching and the early larval stage ranged from 11 to 19 °C (gradually increasing), with day-night differences typically ranging from 2 to 3 °C. Rearing the youngest larvae yielded some interesting ethological observations. For example, they tended to hide en masse in the holes of half-opened alder cones. This would be understandable given their initiated photophobia, but all the larvae in the cones hid only their torsos and tails while their heads stuck out.

Release of Larvae into the Račinka Brook and their Subsequent Rearing in Oncubation tanks

Most of the hatched larvae (1,618 individuals) were released into the Račinka Brook just before their yolk reserves were depleted, at the turn of May and June 2024, when they reached 8–9 mm in length. After the necessary acclimatisation (temperature adjustment), the larvae were released into four different stretches of the brook, mostly into the upper parts. Immediately after release, the larvae tried to burrow quickly into the sediment.

A remaining 280 larvae were transferred to four special floating tanks, originally designed for the incubation of salmonid eggs. The LOSOSA GAMA tanks are made of stainless steel and have perforated sides allowing for inflow of fresh water. The outer section of the tank, which keeps it floating on the water surface, is supported by connected PVC pipes. A 2–3 cm layer of muddy-sandy sediment from the existing deposits was spread over the tanks’ bottom, to which coarse detritus in various decomposition stages was added. Into each tank, 70 larvae were released; the tanks were placed in calmer sections of the streambank and tied to a tree trunk with strong wire. Two incubation tanks were installed in the Račinka Brook, and two more in the nearby Papírenský náhon/ Paper-making Water Race, selected as a potentially suitable site for establishing a new lamprey population. Presence of the tanks was checked every 2 to 3 weeks. During the checks, coarse organic material – primarily tree leaves – was added to the tanks. The original plan was to leave the tanks in both streams until late October, but the weather decided otherwise...

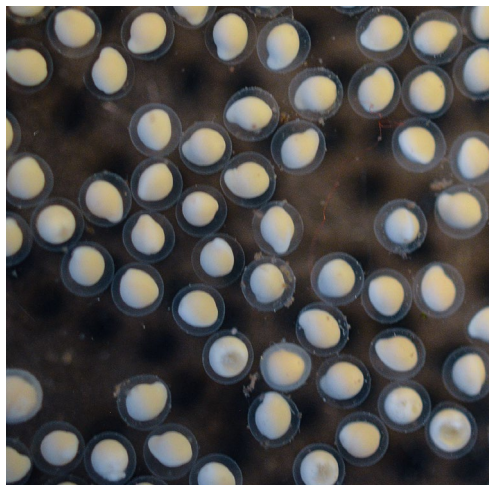


Figure 4. Developing lamprey embryo. The development from fertilisation to hatching did not last more than 3 weeks. © Lukáš Merta



Figure 5. Lamprey hatchlings 8–9 mm in size before release into the Račinka Brook. The elongated yellow structures are undigested yolk reserves, while the red dots behind the gill slits are the heart. © Lukáš Merta



Figure 6. In 2024, a total of 1,898 reared larvae were released into the Račinka stream, most of them already in the spring. They were released into streambank sediments where the water flows slowly. © Jiří Křesina

September Flash Flood on the Račinka Brook and its Impact on Lampreys

Already in the second week of September, it was forecast that the Jeseníky Mountains region would be affected by floods of exceptional intensity. Because of the threat of losing the floating tanks (each costing €1,000) along with the larvae inside, it was decided to remove the tanks, which took place just one day before the flood started. After being counted, the larvae from the tanks were transferred to aquariums, where they were kept until the highwater flow in the Račinka Brook subsided, after which they were released into the river. A total of 123 larvae (39, 41, 34, and 9 individuals, respectively) were reared in the rearing tanks, counting for a survival rate of 43.9%. One tank had clearly been manipulated with (it was found open), which is probably why the number of larvae found there was significantly lower than in the other ones. The larval survival rate was assessed as very good, indicating that the tanks are well-suited for rearing young lamprey in a relatively safe and controlled environment. The larvae in the tanks also showed very good growth, reaching a size of 24–30 mm at the time of release.

The flood hit the Račinka Brook with full force on 14 and 15 September 2024. It is estimated to have reached a level corresponding to a 20- to 50-year flood (exact data are unavailable). The damage to local property was low, but the impact on the lampreys was undoubtedly high.

Most of the fine-grained sediments were washed away, particularly from the high-capacity, straight stretches (predominating there), and naturally, the lamprey larvae present were carried away as well. The flow took the material away to unknown places, locally outside the bed on the Račinka Brook banks. A significant decline in the lamprey larva population was confirmed by subsequent monitoring in October 2024, during which only 7 larvae were captured, whereas in April a total of 38 had been caught with a similar fishing effort in the same section. Not surprisingly, the population after the flood lacked particularly younger larval stages (none was caught in the size range up to 10 cm), which are least able to withstand the force of the current. As research has shown, the number of drifting lamprey larvae increases by an order of magnitude even during regular floods, with this year's individuals strongly predominating (Kirillova *et al.* 2011). Thus, it is likely that the vast majority of larvae released in spring had not survived the extreme flood, and efforts to restock the population in the Račinka Brook have thus gone to waste. However, the coming years will tell if this is really the case, since this year's lamprey larvae are caught very rarely during electrofishing operations.

Conclusions

The year 2024 ended with mixed feelings in terms of efforts to save the declining population being close to extinction. Artificial spawning and subsequent larval rearing proved feasible, even without sophisticated technological equipment and

facilities. In the case of the Vladykov's lamprey, this is the first documented successful attempt ever. However, strengthening collapsing populations by introducing reared individuals can only be of real benefit at sites with restored natural conditions suitable for the species. This is unfortunately not the case for the Račinka Brook, which has still been affected by a number of negative factors/drivers. Some of them can be influenced by tailored management interventions, while others, e.g. the changing hydrological regime in the streams, can hardly be reduced. However, if saving the unique Vladykov's lamprey population in the Račinka Brook is worth the effort, there is no time to waste. Quickly, in particular, the comprehensive morphological restoration of the Račinka Brook riverbed should be urgently initiated wherever it has been still possible. Artificial rearing of lamprey larvae and their introduction for restocking can then be a very effective tool towards the ultimate recovery of the viable population of these remarkable animals.

Acknowledgements

We would like to thank our colleagues for their help and valuable advice (in alphabetical order): Ondřej Dočkal, Alexandr Jeništa, Radek Málek, Clemens Ratschan, Vít Slezák, and Radek Šanda. ■

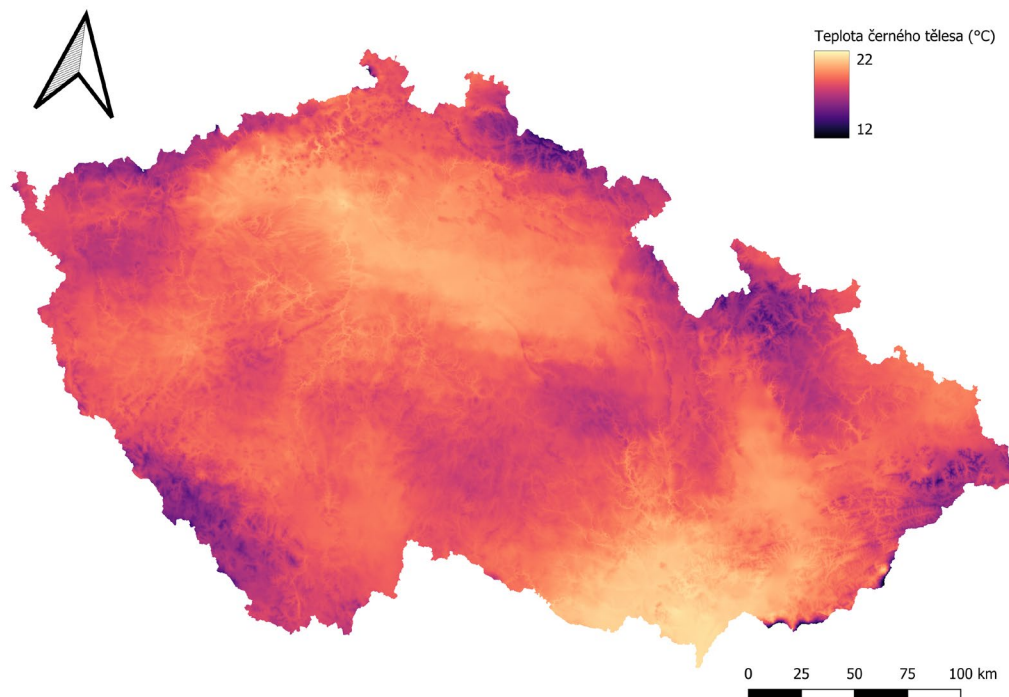
The list of references is attached to the online version of the article at www.casopis.ochranaprirody.cz

Ecosystem Accounting: Services by Pollinators

Pavel Moskaljuk

Our everyday life is fundamentally influenced by ecosystems surrounding us. If these are healthy, they provide us in return with a wide range of services, such as fertile soil, clean air, clean water, and more. However,

ecosystems have unfortunately too often been used for economic benefits, which has led and still leads to habitat destruction, extensive damage to the biosphere and to natural richness (United Nations, 2021).



Map 3. Refined layer of blackbody temperature. The raster was refined using linear regression with a digital elevation model (DEM). To smooth out residual errors, the ordinary Kriging method was used. Due to computational complexity, the process was divided into blocks, parallelised, and a training model with 10,000 samples was used for the regression. Compiled by Pavel Moskaljuk.

One of these services, treated in this study, is that of pollinators, *i.e.* the benefit of wild pollinators for the production of food crops. Even though we use controlled pollination provided by beekeepers today, wild pollinators have still been doing most of the pollination work. In the past decades, the abundance and diversity of insect pollinators (bees, butterflies, hoverflies, and moths) have declined dramatically. One of the main causes is agricultural intensification, landscape fragmentation, and other changes

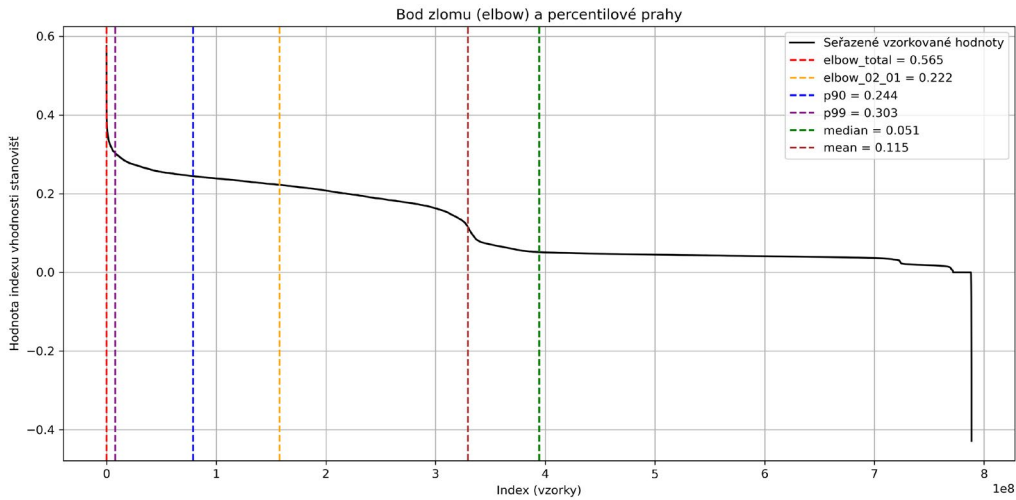
to the landscape, which deprive pollinators of their natural habitats and food sources (Potts *et al.*, 2021).

For this reason, the need for a detailed statistical assessment has arisen (known as ecosystem accounting), based on the requirements of Eurostat (United Nations, version 2024-12-12), the statistical office of the European Union playing a key role in this field, particularly in the coordination of environmental data collection

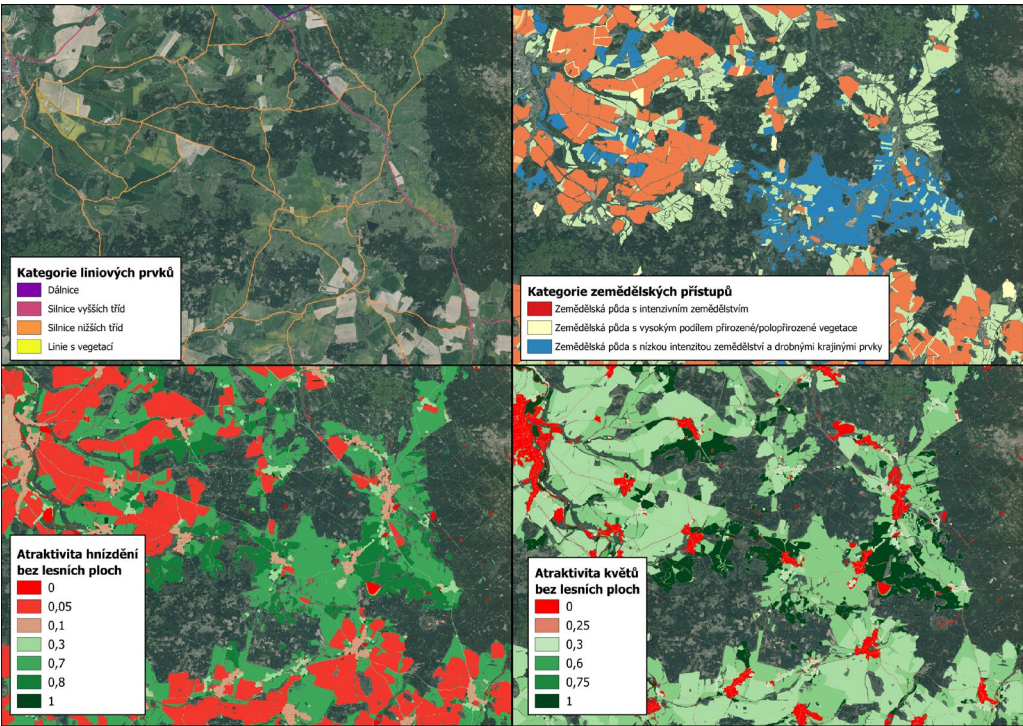
methods (currently in a testing phase). As of 2026, the results of this analysis will be reported every year. In this case, the best option would be in-situ monitoring, but this method is not available in the Czech Republic. Thus, insect populations need to be predicted based on assessment of the condition and extent of the ecosystems and other variables significantly influencing the lives of pollinators.

Methodological approach

The analysis is inspired by the methodological framework developed by Eurostat dealing with the identification of suitable habitats for pollinators and subsequent identification of ecosystems which contribute most to this ecosystem service. In our case, the general approach was significantly expanded to include more detailed data and more sophisticated analytical methods, enabling a highly accurate localisation of areas important for pollinators. Therefore, the main objective was to identify suitable habitats, predict areas with insufficient pollination, and forecast agricultural yields attributable to the wild pollinator activity. As the evaluation is conducted annually, the analysis was transcribed



Graph 1. Finding a threshold value using several statistical methods. The model includes approx. 788,700,000 samples. Compiled by Pavel Moskaljuk.



Map 1. Map display of raster data with the following variables: 1. linear element category (top left), 2. agricultural approach category (top right), 3. nesting attractiveness excl. forest areas (bottom left), 4. flower attractiveness excl. forest areas (bottom right). Southern Brdy Higlands region, vicinity of the town of Blovice (western Bohemia). Compiled by Pavel Moskaljuk.

and automated using the Python programming language.

Factors/drivers affecting pollination services

- Habitat characteristics;
- Distance between food source and habitat;
- Activity of pollinating insects

To visualise the factors/drivers, the following map layers were created (described in more detail in the following chapters):

- Maps of ecosystems, Significant Landscape Elements and agricultural practices;
- Maps with correction factors assessing flower attractiveness and habitats;
- Maps of air temperature and solar radiation;

- Maps eliminating unsuitable areas according to landscape fragmentation;
- Maps showing high probability of pollinator occurrence, adjusted with threshold values;
- Maps of crops dependent on pollinators;
- Maps distinguishing pollinated and non-pollinated crops;
- Maps of the most beneficial ecosystems for pollination services.

The analysis is based on spatial data from 2023 (see Tab. 1) and uses a combination of tools of the QGIS geospatial software, the Python programming language, and the Google Earth Engine Code web environment (JavaScript). All spatial calculations were performed at a grid resolution of 10 × 10 m, ensuring a high level of detail for spatial interpretation of the results.

Identifying landscape elements with positive and negative impacts on pollinators

In the first step, the analysis classified and indexed narrow linear elements in the landscape. These include particularly alleys, hedges, and baulks, as well as roads and streets. The nature of these elements is essential when identifying suitable habitats for pollinators, as it affects their movement and presence. For this reason, the layers of roads (State Administration of Land Surveying and Cadastre, SALSC) and non-agricultural linear elements was merged with the layer of ecologically significant elements (Land Parcel Identification System, LPIS). The linear elements are represented by highly detailed vectors (see Map 1). Correction factors were set as follows:

- 0 to < 1 – negative impact;
- 1 – neutral impact;
- 2 – positive impact.

Another significant factor with a major impact on pollinators is agricultural practices on cultivated land. The approach applied takes into account farming intensity and quality. For these purposes, the LPIS layer was used, which distinguishes farmland types in detail and also identifies whether organic farming is practised on a parcel. Selected areas from the ecologically significant areas (LPIS) layer were added to the layer. In the case of overlays in the raster display, the values were averaged. Similar to the

linear elements, agricultural practices were rated with an index from 0 to 2 (see Tab. 2), with an additional index of 0.2 for farming. The resulting data (see Map 1) can be interpreted as follows:

1. Land farmed intensively;
2. Farmland with a high rate of (semi-)natural vegetation;
3. Low-intensity farmland with small landscape elements.

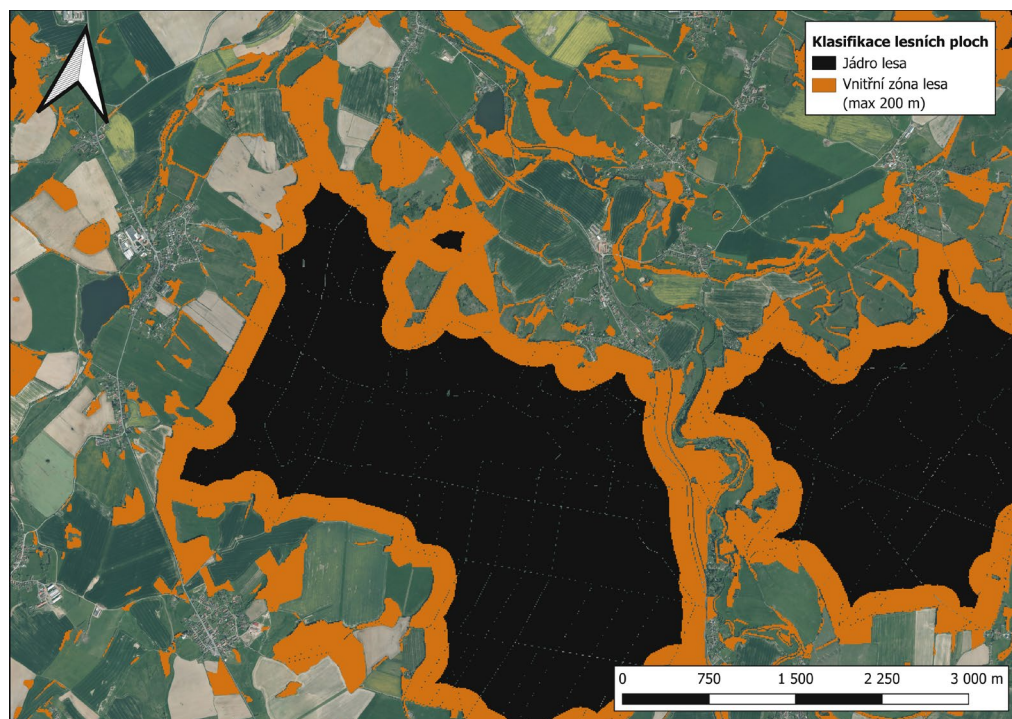
For a better idea, in 2023, in the Czech Republic farmland with intensive agriculture covered an area of 24,066.3 km² (68%), while low-intensity farmland with landscape elements or natural vegetation 11,079.1 km² (31%).

In the following step, the impact of various ecosystem types on the presence and activity of pollinators was assessed. For this purpose, the Consolidated Layer of Ecosystems (CLES) layer was used (Nature Conservation Agency of the Czech Republic, NCA CR), which classifies the territory into 40 different ecosystem categories based on their ecological characteristics. Similar to the previous steps, correction factors were assigned to the ecosystems (see Tab. 3) according to two key criteria.

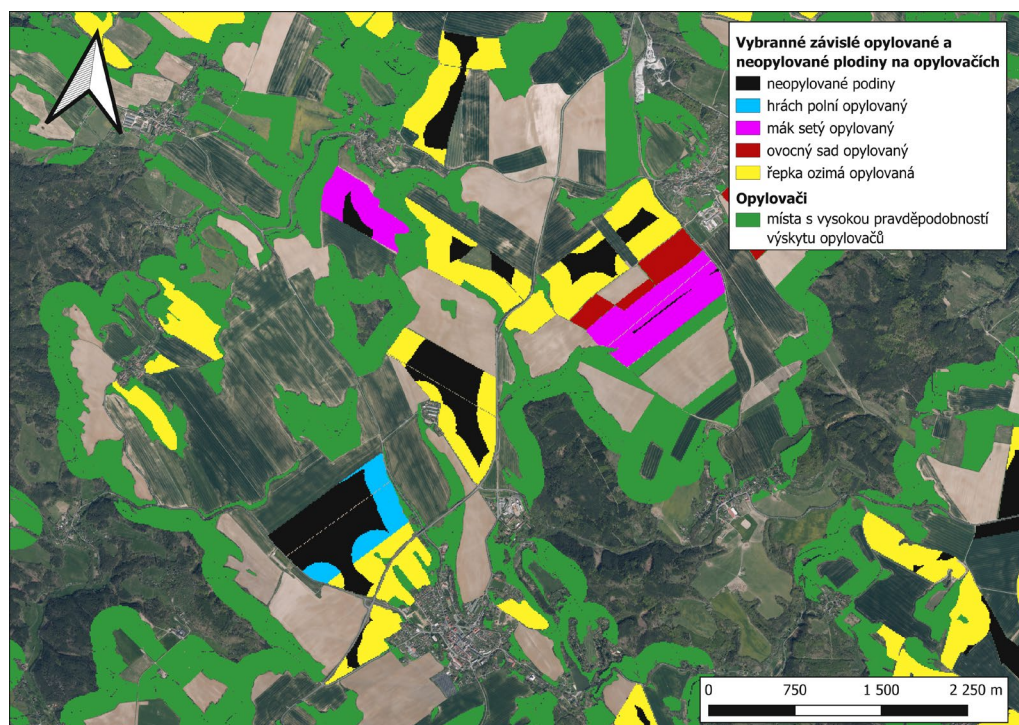
1. Flower attractiveness, *i.e.* the degree to which a particular ecosystem provides a source of food for pollinators (see Map 1).
2. Nesting attractiveness, *i.e.* suitability of a habitat for the nesting and shelter of pollinators (see Map 1).
3. It should be noted that forest areas have not yet been included in this step. These will be addressed in the analysis below.

Pollinator flight ranges

Another important input variable is the flight range of pollinators, which is a key factor in identifying suitable habitats. Simply, pollinators choose their habitats in a way that food is within easy reach. For this reason, forest ecosystems, which were excluded from assessment in the previous steps, were provided with inner mantle zones. These are used to identify forest areas which are located too far from potential food sources and are at the same time unattractive to pollinators. In this case, a flight range of 200 m was chosen, corresponding to the operation range of many wild pollinator species. In the first step, small isolated forest patches (1–2 pixels 10 × 10 m in size) were eliminated, as they could distort the analysis disproportionately. Subsequently, using Euclidean distance, the distance between



Map 2. Classification of forest areas according to 200 m flight range. Southern Brdy Highlands region, vicinity of the town of Blovice (western Bohemia). Compiled by Pavel Moskaljuk.



Map 5. Identifying pollinated and non-pollinated crops dependent on pollination. For identification of these areas, a 200 m flight range around sites with a high probability of pollinator occurrence was used. Compiled by Pavel Moskaljuk.

each pixel representing a forest ecosystem and the nearest pixel which could represent a food source was calculated. After several adjustments and based on the previous calculation, an inner

mantle zone was created, enabling the distinction of forest areas located in the immediate vicinity of suitable habitats from isolated ones and those less accessible for pollinators (Map 2).

After completing the spatial classification, the forest areas were assessed according to the criteria shown in Tab. 4. Finally, they were merged with the resulting layers from the previous step.

Connection of variables to pollinator activity

Based on a detailed description of several key variables, which significantly influence the potential occurrence of pollinators, an expert index was created combining all previous indices. For this calculation, the following equation was derived using raster calculations:

where:
ek = pixel representing an ecosystem
AK = flower attractiveness 0–1
AH = nesting attractiveness 0–1
 KL_{ek} = correction factor for linear elements
 KZ_{ek} = correction factor for agricultural elements
 KE_{vp} = correction factor for ecologically significant areas
 El_{ek} = pollinator expert index

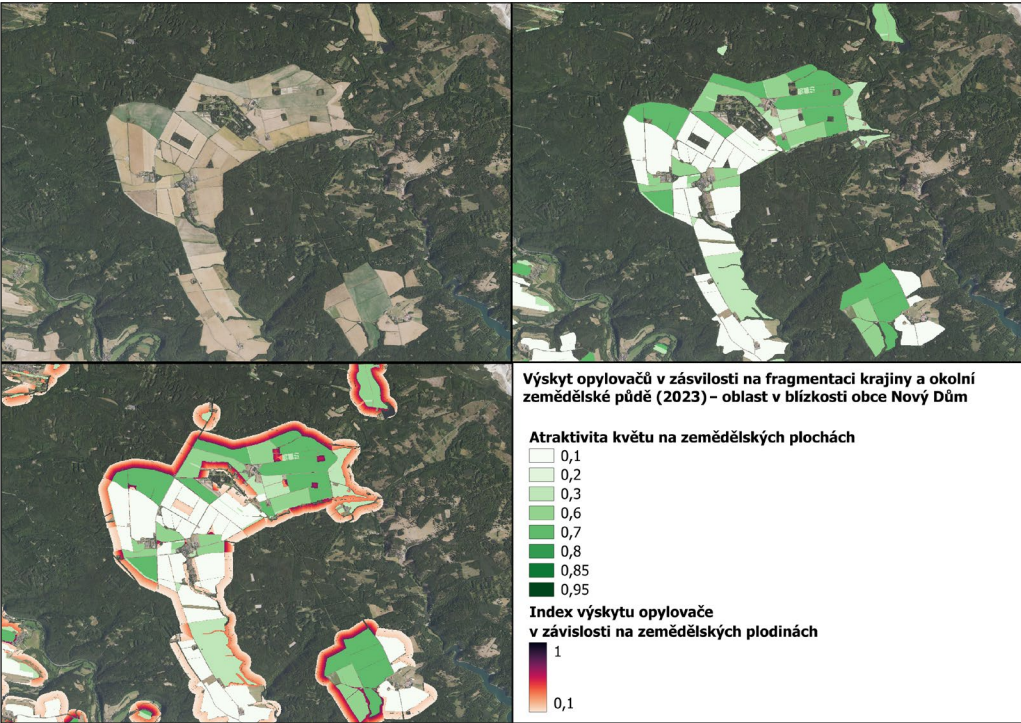
The occurrence and behaviour of insects are significantly influenced by temperature and solar radiation intensity. Insect activity generally correlates positively with these factors, with each pollinator species becoming active only when the so-called blackbody temperature (*i.e.* the radiant temperature perceived by the insect's body) exceeds a certain threshold (Corbet *et al.* 1993). The approach allows us to simulate the temperature conditions under which insects are capable of active movement at a specific time and location.

For the calculation of blackbody temperature, two input layers from the ECMWF/ERA5 LAND/ HOURLY dataset provided by the Copernicus service were used.

1. Air temperature at 2 m above the ground (1,000 × 1,000 m)
2. Short-wave solar radiation (1,000 × 1,000 m)

The data were averaged for the period April to September 2023 and only during daytime hours from 6 am to 8 pm, when we expect insect activity to be the highest. Data from cloudy days were also included.

Calculation of the blackbody temperature is based on coefficients from a British study (Corbet *et al.* 1993). Given the large volume of



Map 4. Illustration of the impact of landscape fragmentation and flower attractiveness on agricultural land. Map sections show an area near the village of Nový Dům (Central Bohemia). Compiled by Pavel Moskaljuk.

data, the calculation was performed for each day within the time interval, and finally the average for the entire observation period was calculated.

where:
T = average temperature from April to September 2023
R = average radiation from April to September 2023 (6:00–20:00)
Tčt = blackbody temperature

Since the input data are available only at a resolution of 1,000 × 1,000 m, one of the spatial downsampling regression methods was used to improve the accuracy. Specifically, the Kriging regression method was chosen, combining a linear regression model with spatial interpolation. Elevation data from the digital elevation model (SALSC) was used as a predictor, as elevation significantly influences temperature conditions. The result was a prediction of Tčt values at a finer resolution of 100 × 100 m, which better captures local topographic conditions (see Map 3).

Based on the calculated Tčt, the insect activity index (IA_{ek}) was then derived using the following equation:

For a comprehensive assessment of the habitat suitability for pollinators, the final indicator combined the pollinator expert index (EL_{ek}) with the insect activity index (IA_{ek}), which provides a more accurate view of the real occurrence of pollinators based on a combination of biotic and abiotic factors:

Table 1. List of input datasets used, including their providers. The datasets cover various topics, ranging from geographic and environmental information to meteorological and agricultural data.

Dataset	Provider
Linear infrastructure (ZABAGED)	SALSC
Ecosystems (KVES 2023)	NCA CR
Ecologically important areas	LPIS
Land parcels	LPIS
Agricultural crops	LPIS
Air temperature	Copernicus ERAS
Solar radiation	Copernicus ERAS
Digital elevation model	SALSC

SALSC – State Administration of Land Surveying and Cadastre, NCA CR – Nature Conservation Agency of the Czech Republic, LPIS – Land Parcel Identification System

Impact of landscape fragmentation and search for a threshold value

The result from the previous step (habitat suitability index) already provides a fairly comprehensive description of the sites/areas where pollinators are highly likely to occur. However, this leaves the issue of landscape fragmentation and the determination of a threshold value which clearly distinguishes areas with and without pollinators.

Landscape fragmentation is a key factor affecting the lives of pollinators. To assess its impact, it is first necessary to identify areas which are too far from food sources, while also taking into account the attractiveness of those sources. The basic analysis already takes into account food sources in meadows and other natural ecosystems, but a significant role is also played by agricultural crops, particularly those which are rotated in seeding practices. Therefore, all crops in the 2023 crop layer (LPIS) were assessed using attractiveness coefficients reflecting the quality and quantity of food available to pollinators. A total of 327 crops were assessed, with each assigned a coefficient based on the following rule: the larger the food supply, the higher the coefficient. For example, spring barley received a low coefficient of 0.1, while sage was assigned a high coefficient of 0.85.

After suitable crops were identified, areas too far from available food sources were excluded from the analysis. Also, the flight distance of pollinators to nesting sites was taken into account: the attractiveness of the habitat gradually decreases with every 10 metres from a food source. The approach made it possible to effectively filter out unsuitable sites, while also providing a more detailed assessment of the food spatial availability for pollinators (see [Map 3](#)). If we allow for agricultural crops and field size, only about 30% of the land surrounding the fields can be considered attractive to pollinators. The remaining area is either too far from an accessible food source or lacks quality flowering crops in its vicinity. This fact underscores the importance of an effective distribution of high-quality food sources, but above all, the need to increase landscape diversity/heterogeneity in intensively farmed areas.

For a final identification of areas with pollinators, a threshold value distinguishing suitable from unsuitable sites needed to be established. Several statistical methods were selected to determine this, including percentiles, inflection points, means, and medians. Based on an analysis of the

Table 2. Categories of farmland linked via two input layers consisting of ecologically significant areas and parts of blocks. Correction factors serve as a basis for filling the expert model equation (described below)

Farmland category	Correction factor
Landscape orchard (Streuobstwiese)	1.3
Orchard	1.3
Permanent grassland	1.3
Thalweg grassland	1.2
Other permanent field crop	1.2
Grassland (on arable land)	1.2
Fallow land	1.2
Baulk	1
Wetland	0.75
Ditch	0.75
Group of trees and scrubs	1
Solitary tree	1
Alley	1
Terrace	1
Afforested land	0.75
Area of fast-growing trees cultivated in coppices	0.75
Other plantation	1
Nonproductive land	1
Fast-growing trees	0.75
Afforested land	0.75
Hop garden	1
Common arable land	0.75
Vineyard	1
Fishpond	0
Area with perennial production crops	0.75
Area with containers	0
Area with truffles	1
Tree nursery	1
Rock garden	0.75
if locally farmed organically + 0.2	

data distribution, the inflection point method with a value of 0.222 was selected as the most appropriate, as it best captures the natural threshold of the decline in value distribution (see [Graph 1](#)). The method allows for a more precise identification of the transition between areas with low and high probabilities of pollinator occurrence. Based on the threshold, it was found that 7.6% of the Czech Republic's territory can be considered to have a high probability of pollinator occurrence.

Table 3. Ecosystem assessment according to flower and nesting attractiveness.

Ecosystem	E1 Flower attractiveness	E2 Nesting attractiveness
Alpine meadows	1	0.8
Alluvial and wet meadows	1	0.8
Swamp, marsh	0.55	0.1
Degraded grassland	0.5	0.7
Road network	0.25	0.3
Hop garden	0.6	1
Macrophyte vegetation of stagnant water	0	0
Urban greenery, ornamental garden, park, cemetery	0.5	0.7
Mesic meadows	1	0.8
Wetlands and riparian vegetation	0.55	0.1
Scattered built-up area	0.3	0.3
Arable land	0.4	0.05
Orchard, garden	0.9	1
Industrial and business units	0.05	0.1
Peatbogs and springs	0.5	0.1
Fishponds, lakes, reservoirs	0	0
Rocks, (artificial) quarries	0.05	0.7
Rocks, scree	0	0
Waste dumps and building sites	0	0.05
Contiguously built-up area	0.05	0.1
Sports and recreation areas	0.05	0.3
Dry grasslands	0.75	1
Vineyard	0.6	1
Streams	0	0
Heaths	1	0.7

Impact of pollinators on agricultural yields

In the final phase, pollinator-dependent crops and their spatial distribution were identified in the analysis. Before finding pollinated and non-pollinated areas, first the dependence of different crops on pollinators and their yield in tonnes/hectare had to be determined. For this purpose, the 2023 crop layer (LPIS) was used once more. A total of

Table 4. Correction factors for different types of forest ecosystems classified according to pollinator flight range. The table further shows the proportional distribution of categories relative to the total area of each forest ecosystem type.

Forest category	Position	Nesting attractiveness	Flower attractiveness	km ²
Broad-leaved	200-m edge	1	1	4,268.8
	core	0.3	0.2	2,927.4
Coniferous	200-m edge	1	1	8,000
	core	0.2	0.2	7,259.5
Mixed	200-m edge	1	1	3,737
	core	0.3	0.2	1,517

Table 5. Selected crop types divided according to dependence on pollination and yield in t/ha over the year 2023.

Crop type	Pollination dependence (%)	Productivity (t/ha)	Total yield (t)
Aromatic plants	5	15	2.2
Protein crop (chickpea, soy)	5	2	2,451.0
Courgettes	95	30	529.2
Strawberries	25	15	1,165.8
Culinary plants	5	3.5	984.1
Medicinal plants	5	6.6	1,720.6
Eggplants	25	10	7.2
Legumes	5	4.5	8,220.7
Watermelons	95	32.5	1,369.8
Grains (buckwheat)	25	2	856.0
Gherkins	65	37.5	2,076.9
Oilseed plants	25	3	226,830.9
Other vegetables (Chinese rhubarb <i>Rheum palmatum</i>)	5	17	0.1
Orchards	95	15	167,081.7
Peppers	5	30	232.6
Tomatoes	5	50	169.3
Squashes/marrows	95	16	13,602.5

Table 6. Proportional distribution of ecosystems identified at sites with pollinator occurrence.

Ecosystem	Area (km ²)	Proportion (%)
Coniferous production forests	3,197.94	31.12
Beech forests	2,233.77	21.74
Broad-leaved production forests	1,588.09	15.45
Shrubbery, brush, thickets	1,039.50	10.12
Alluvial and wet meadows	918.41	8.94
Degraded grassland	823.44	8.01
Orchard, garden	265.52	2.58
Arable land	209.55	2.04
Heaths	0.29	0.00
Urban greenery, ornamental garden, park, cemetery	0.10	0.00
Total area	10,276.60	100.00

168 crop species exhibiting varying degrees of dependence on pollinators were identified. Each of them was assigned a dependency percentage according to the methodology by Klein *et al.* (2006). Subsequently, the average yield in t/ha was added (values for individual crops taken from and adjusted according to official statistics of the Czech Statistical Office). The results are summarised in [Table 5](#).

Based on these data, pollinated and non-pollinated areas can be distinguished spatially. Once again, a flight range of 200 m from areas with a high probability of pollinator presence was set for this purpose. Farmland located within this zone was classified as pollinated, while the rest was indicated as non-pollinated (see [Map 4](#)). The results show that 71% of dependent crops were pollinated, while 29% were out of reach of pollinators. The total production of pollinator-dependent crops attributable to pollinators amounted to approx. 427,300 tonnes in 2023.

Final assessment of the contribution of ecosystems

As mentioned at the beginning of the article, the aim of the entire analysis is to identify and distinguish ecosystems based on their contribution to the provision of the ecosystem service. Using an overlay analysis, all ecosystems from the 2023 KVES layer (NCA CR), after adjustment according to Eurostat requirements, were identified. The results show that forest and grassland ecosystems provide the greatest benefit to pollinators (see [Table 6](#)).

To conclude this analysis, it needs to be stressed that the method has still been in the testing phase. The advantage of the proposed method is that it is fully programmable, which allows for easy adjustment of all variables, such as the pollinator flight ranges. Before the mandatory reporting, minor changes or improvements to the methodology may still be made. Particular emphasis will be placed on improving the accuracy of meteorological input data and, where available, incorporating records of pollinator species occurrence. In this regard, it would be sufficient to choose a few test areas and use the data from them to train machine-learning models, which would then enable the prediction of pollinator occurrence throughout the Czech Republic. ■

The list of references is attached to the online version of the article at www.casopis.ochranaprirody.cz

Changes in the Sites of Community Importance in the Czech Republic

Tereza Kušnířová, Martin Šíkola & Pavla Klabanová

In December 2024, the Government of the Czech Republic approved the 8th amendment to the national list of Sites of Community Importance/Special Areas of Conservation (SCI/SAC) sites, the expert preparation of which had been entrusted by the Ministry of the Environment of the Czech Republic (MoE) in 2021 to

the Nature Conservation Agency of the Czech Republic (NCA CR). The amendment responds to requirements of the European Commission (EC) arising from the assessment of the sufficiency of SCI/SAC sites in the Czech Republic to ensure the protection of species and habitats, as reflected in ongoing infringement proceedings.



Figure 1. Newly designated Strážkovice SCI/SAC in South Bohemia for the conservation of the Dusky large blue butterfly (*Phengaris nausithous*). © Jonáš Gaigr



Figure 2. Paseky /Clearings SCI/SAC was designated primarily for the protection of the Lady's slipper orchid (*Cypripedium calceolus*). It currently supports the species' largest known population in the Pannonian biogeographical region within the Czech Republic. Abundantly flowering clumps are visible at the site. © Petr Slavík

It should be recalled that the proposal included not only the designation of new sites and the addition of conservation features to existing ones, but also expert/technical changes, i.e. boundary refinements and complementing conservation features or entire SCI/SAC sites that met the criteria set by the EC for possible de-designation. With this update to the national list of SCI/SAC sites, the network has moved closer to its final stage in terms of sufficiency. In the future, mainly “operational” adjustments to the Czech Republic's national list are planned, reflecting the need to maintain the functionality of the network (i.e. changes that will reflect developments in natural conditions at sites and the response of the conservation

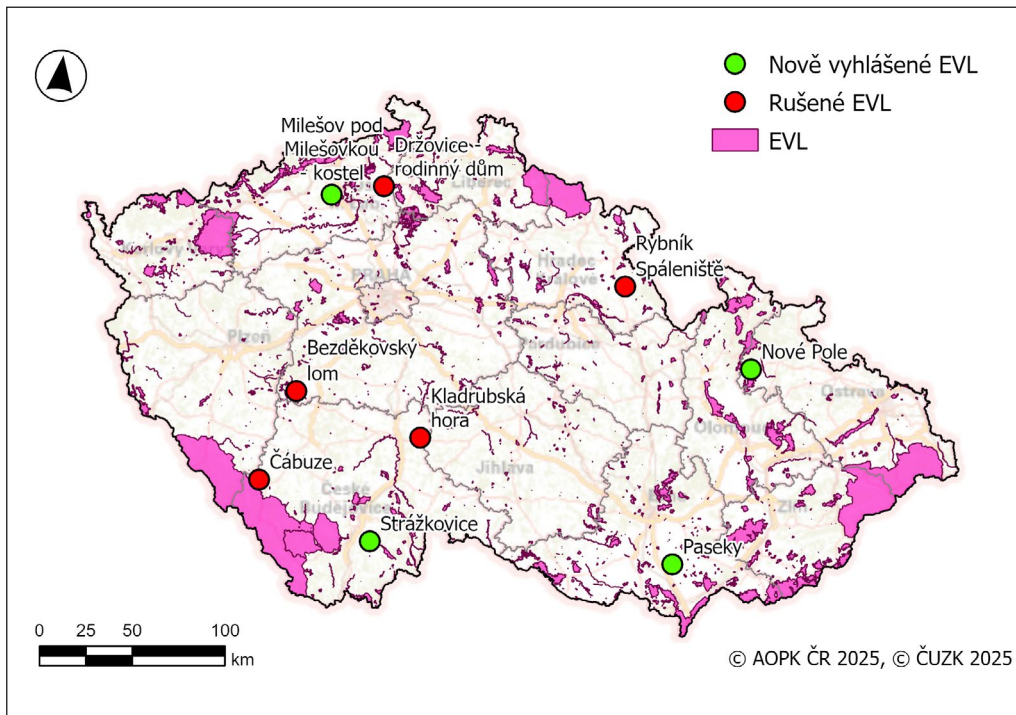
features to these, as well as other changes such as boundary revisions).

Consultation at the national level

The expert proposal, pre-negotiated by the NCA CR with the relevant stakeholders (landowners, land managers and local authorities), had been submitted to the MoE in June 2022 in accordance with the established timetable. It still included several outstanding disagreements that the NCA CR was unable to resolve at its level. Many of these comments were based on concerns about restrictions on land management.

Although the NCA CR had prepared so-called supporting sheets for the consultation, containing basic information on the sites, the additional conservation features, and their management requirements, this did not provide sufficient assurance for some stakeholders.

However, unlike the designation of national Specially Protected Areas, summaries of recommended measures (SRMs), which describe the optimal management of EU Natura 2000 network sites and their conservation features, are prepared only after the legislative changes have been adopted. The reason is that the European Union's Habitat Directive requires SCI/SAC sites to be designated



Map 1. Delineation of SCI/SAC (pink colour) in the Czech Republic following the amendment of the national list, highlighting newly designated (green) and abolished (red) sites. Compiled by Martin Šíkola

Change	SCI/SAC code and name
New SCI/SAC	4 CZ0317017 Strážkovice CZ0427014 Milešov pod Milešovkou - kostel CZ0627016 Paseky CZ0717012 Nové Pole
De-designated SCI/SAC	5 CZ0213008 Bezděkovský lom/Bezděkov Quarry CZ0312035 Kladrubská hora/Kladruhy Hill CZ0313096 Čábuze CZ0423651 Držovice - rodinný dům/family house CZ0523287 Rybník Spáleníště/Burn.site Fishpond
Addition of conservation feature	34
Removal of conservation feature	7
Boundary refinement	129

Table 1. Overview of changes to the national list of SCI/SAC. Source: Nature Conservation Agency of the Czech Republic

solely on the basis of scientific data, while other interests in the area, including economic ones, are to be taken into account only when setting conservation measures, *i.e.*, *inter alia*, in the preparation of SRMs. An advantage of preparing SRMs only after the amendment is that more time is subsequently

available to agree on their form with the relevant stakeholders.

Following submission of the proposal, the MoE promptly initiated the preparation of legislative documents; however, due to the Czech Republic's Presidency of the EU, discussions on

the remaining disagreements could only begin in 2023. In that year, all outstanding objections were addressed by the MoE with expert support from the NCA CR. Meetings with landowners and land managers were followed by discussions with the relevant ministries – the Ministry of Transport of the Czech Republic (MoT), the Ministry of Defence of the Czech Republic (MoD) and the Ministry of Agriculture of the Czech Republic (MoA). The proposal had also been preliminarily discussed with the Ministry of Industry and Trade of the Czech Republic (MIT) and the Ministry of Regional Development of the Czech Republic (MRD). The MoE noted the remaining disagreements regarding the proposed amendment to the legislative regulation. In January 2024, the inter-ministerial consultation process was launched, during which some ministries carried forward their previous objections.

The disagreement with the MoA was subsequently resolved through a compromise delineation of the boundaries of the expanded Kozlov–Tábor SCI/SAC. The objection of the MoD to the addition of the habitat type Euro-Siberian steppic woods with *Quercus* spp. (91I0) to the Doupovské hory/Doupov Hills SCI/SAC was resolved through mutual agreement on the future establishment of a contractual protected area.

A different situation ultimately arose in addressing the objection to the inclusion of the Yellow-bellied toad (*Bombina variegata*) among the conservation features of the Boletice SCI/SAC, which is also a military training area. In this case, the MoE accommodated the request of the MoD not to increase nature conservation requirements within the military training area in the current geopolitical situation, which requires intensive use of such areas for their primary purpose; the specific proposal was therefore withdrawn following agreement at the ministerial level. At the same time, the NCA CR was tasked by the MoE with investigating amphibian species' alternative sites in 2025.

Within the inter-ministerial consultation process, no solution was ultimately found to a single outstanding issue, namely the MoT's objection to the addition of the habitat type Alluvial forests with *Fraxinus excelsior* and *Alnus glutinosa* (91E0) to the Porta Bohemica SCI/SAC. In the end, this single issue alone was submitted to the Government for a decision. This concerns a long-standing, site-specific requirement of the EC. The MoT expressed

concerns about the impact on the preparation of the Děčín navigation weir project, specifically regarding the appropriate assessment under Section 45i of Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection, as amended later.

The disagreement was ultimately resolved during the Government meeting through the addition of a condition to the Government resolution concern-

The changes included boundary refinements to SCI/SAC sites (in some cases leading to the exclusion of parts of the sites) and the removal of conservation features. Such removal of a conservation feature is possible only in exceptional cases, where the long-term absence of the given feature has been confirmed due to causes that could not have been prevented (natural development), and where there has been no human influence or neglect of management. At the same

Replacement of Čábuzé with Strážkovice for the Dusky large blue butterfly in the South Bohemian Region

One of the expert/technical adjustments involved the de-designation of the Čábuzé SCI/SAC, which had been designated for a single conservation feature – the Dusky large blue (*Phengaris nausithous*) – and its replacement by the new Strážkovice SCI/SAC (CZ0317017).

The species had long been absent from the Čábuzé site, despite the presence of its host plant, the Great burnet (*Sanguisorba officinalis*), the implementation of appropriate management (including support from agricultural subsidies), and occasional records of the species in the surrounding area.

This site had already been proposed for de-designation as part of the amendment approved in 2016; however, the proposed replacement SCI/SAC site of Nová Ves nad Lužnicí-Lanopás was contested by several

stakeholders during the interministerial consultation process due to the close proximity of its boundary to a planned road transport corridor. As the proposal could not be advanced, it was withdrawn together with the proposal to de-designate Čábuzé SCI/SAC, since the European Commission had agreed to the de-designation only in exchange for a replacement site.

As part of the amendment presented there, the regional office of the Nature Conservation Agency of the Czech Republic identified a new, promising replacement site, Strážkovice, located near the city of České Budějovice; it had a long-term occurrence of the dusky large blue and other common butterflies. The proposal covered the most important and long-term monitored meadows with occurrences of the species in the area between the villages of Strážkovice and Trocnov. The site attracted no objections.

ing the riparian vegetation management, and the habitat type was consequently added to the list of conservation features of the SCI/SAC site.

Consultation with the EC regarding the proposed changes

In addition to updating the national list in response to the sufficiency assessment, the amendment also included the so-called expert/technical changes. These had to be discussed in advance with the EC to ensure that no changes were made that would subsequently be rejected at the EU level, thereby avoiding inconsistencies between national and EU legislation.

time, it is desirable to propose a replacement site. Such a case is described in the box below.

Boundary refinements enhance legal certainty in delineating SCI/SAC sites, as the original boundaries of many sites were delineated using source data that no longer meet current accuracy standards. The refinements were aligned to existing boundaries in the field, namely (in order of priority) small-size Specially Protected Areas, contractual protected areas, cadastral parcel boundaries, forest stand units, etc. Similar adjustments are also envisaged in the future.

In both cases, extensive sheets with detailed justifications had to be prepared for the EC, followed by several rounds of queries from its side.

In the end, the proposed boundary alignment was withdrawn for only three SCI/SAC sites.

Outcomes

The proposed amendment to the Czech Republic's national list of SCI/SAC sites was approved by the Government of the Czech Republic on December 18, 2024 (i.e. three years after the start of preparations), and on January 9, 2025 it was promulgated as Government Regulation No. 2/2025 in the Collection of Laws/Gazette, entering into force on January 24m, 2025. This marked a major step towards achieving the sufficiency of the Czech Republic's Natura 2000 network and, at the same time, increased legal certainty across a wide range of sites. In addition, the updated data were successfully submitted to the EC in January 2025 through the Standard Data Form – the official format (available via the Natura 2000 Viewer) used to transmit information on the Natura 2000 network (including site boundaries, protection, conservation and management and conservation features) in individual Member States. The amended national list will thus be incorporated into the European Union's list at the beginning of 2026.

Summary of changes to the Czech Republic's national list of SCI/SAC sites

Four new SCI/SAC sites were designated (mostly as replacements for removed conservation features), and new conservation features were added to 34 sites. Particular attention should be paid to Nové Pole/New Field SCI/SAC, which is the first site in the Czech Republic designated for the protection of the bryophyte species Round notothylas (*Notothylas orbicularis*). At seven SCI/SAC sites, one or more conservation features were removed, and five sites were de-designated entirely. There are currently 1,111 SCI/SAC sites in the Czech Republic, covering an area of 796,182 ha (i.e. 10.1% of the country). In addition, the boundaries of 129 sites were refined. An overview of the changes is provided in the table. The revised delineation of SCI/SAC sites, highlighting newly designated and de-designated sites, is illustrated on the map and is also available as a data layer on the NCA CR data portal (data.aopk.gov.cz) or in the MapoMat application (<https://webgis.nature.cz/>), which is also available in a desktop version. ■

Amendment to the Forest Act – Freedom of Choice at Last

Tomáš Vrška

On June 26, 2025, the President of the Czech Republic signed an amendment to Forest Act No. 289/1995 Gazette, 30 years after adoption of the current act. The drafting and discussion of the amendment had evoked much debate and concern about the future of forests in the Czech Republic, particularly in the Chamber of Deputies of the Parliament of the Czech

Republic, and had also been accompanied by quite some misinformation. This contribution does not aim to provide an exhaustive list of all changes or comments on them. Instead, we will focus critically on those that were frequently discussed even within circles close to nature conservation community.



Figure 1. This is also what an even-aged European beech (*Fagus sylvatica*) monoculture created by multi-stage shelterwood cutting may look like. Differentiation in both thickness and height is caused by the forester's intelligent work with the trees' response to clearing as part of a transfer to the model of value incremental beech management. Terms like age, stocking density, or rotation gradually lose their meaning there. Instead, total current increment, tree diameter class distribution, and target diameter for felling are key terms. © Tomáš Vrška.

Urgent need for change

Across society and the political spectrum, the need to amend the Act was basically undoubted, for several reasons.

- I) The current Act was written and adopted in a time of concern about the future of forests returned by the State to various owners, both private and public, as part of the restitution process. For this reason, it included stricter rules which were moreover (and this is the second reason) ...
- II) ... strictly based on the age-class model, because in the era of communism and central planning, we did not know or apply anything else. This meant an 80-year rotation period, a minimum stocking of 7 (or 0.7) years, reforestation within 2 years, securing stands for another 5 years, *etc.* Those are all regulations for an age-class forest: a uniform, homogeneous forest, typically regenerated artificially. In such growths/stands, the criteria can be measured easily and fairly accurately. However, when dealing working with a more diverse forest (both in terms of species and spatial variation), the criteria for age-class forests cease to apply, and one finds oneself in a legislative vacuum, which was another important reason for the amendment.
- III) The previous point relates to the clear need to relax the strict regulations due to the climate change effects, which does not distinguish between forms of ownership. If we want forests to be species-rich, gently mixed, varied in tree height and diameter, with a subtle spatial distribution of growth stages, and where natural regeneration plays a dominant role – *i.e.* forests where a higher proportion of growth processes is driven by natural forces rather than by humans – we cannot confine them to uniform criteria. That was why practical foresters having experience with non-clear-cutting management models making more use of selective harvesting principles, promoted liberalisation through their organisation, Pro Silva Bohemica.
- IV) There are also two social reasons. Over the past three decades, we have seen a rapid change in society in the Czech Republic regarding the expected benefits of forests. Today's mostly urban population spends more and more time staring at blue-glowing screens, and when they go to the woods to relax, noise from forestry



Figure 2. Establishing a habitat tree network in the Bavarian way (trees with a blue wave sign). The forester selects trees of various sizes (*e.g.* large, medium-sized, and even crooked, substandard trees) at an average of 5 trees per hectare. The trees are not harvested but left to complete their natural life time and then to fully decompose. When a tree dies and its trunk falls to the ground, a new habitat tree is selected from the set of living standing trees there. This ensures a continuous supply of new habitat trees scattered across the property. The forester enters the coordinates, species, and average diameter into a mobile phone app – simple and easy to verify. In return, he/she receives a payment of €100 per hectare per year for providing ecosystem services in the forest. The photo shows Baron Rotenhan's estate. © Tomáš Vrška.

operations, rutted roads (primarily serving the foresters, who built them), and hunting suddenly bother them – and usually the foresters are to be blamed. Forests need to be transformed to stands differing both locally and regionally (=subnationally) in terms of ecology, productivity, and immaterial benefits.

- V) Another social reason for amending the Act is, as the author hopes, a shift in thinking regarding the functioning of society. The current Act is written in a way that anyone who deviates from its strict rules can be punished, because we regard them as forest destroyers. This is a legacy of communist thinking, in which everyone was constantly under suspicion. To a certain extent, the Act has been turned to a point where fewer regulations give forest owners or their managers greater creative freedom – and of course greater responsibility. The objective of achieving long-term goals will no longer be just restriction, but greater voluntary motivation – after all, this is a sign of a more advanced society.

Forest regeneration

A clearly positive moderation of the Act is the longer period for regeneration of stands/growths from the current 2 years to 5 years, and for reaching the state of established plantation from the current 7 years (2+5) to 10 years (5+5) (Section 31, paragraph 6). NGOs had proposed even longer extensions, and there had also been calls to keep the existing regulations. The current shift is undoubtedly positive, as a 10-year period will allow everyone to regenerate a stand in a fully natural way, even after an initial invasion of pioneer trees. It is of course a political compromise, but it will contribute to a better use of natural forces/drivers in forest regeneration.

However, a more widely discussed regulation was abolishing the obligation to use proportions of ameliorating and stabilising woody plant species (ASWPS) in stand regeneration as prescribed for forests in all forms of non-state ownership. We have heard manipulative statements like: “Now monocultures will be allowed to be grown in forests” (press release Friends

of the Earth of the Czech Republic, June 11, 2025). Although we had been legally forced to use the decree-defined ASWPS rate for thirty years, for which seedlings were subsidised, anyone wanting to have a monoculture could have it anyway, because the presence of AWPS is verified at the stage of an established plantation. To make this clear: if an ASWPS proportion of e.g. 25% is mandatory at a certain site, you plant three rows of Norway spruce (*Picea abies*) and one row of ASWPS (e.g. European beech *Fagus sylvatica*) and in the first cleaning (after securing the plantation) you cut out the beech rows and thus get a monoculture again. This is done by foresters who do not understand the impact of climate change, and as we can see, not even today's Act can stop them from doing so(!) and moreover, the State paid the owner money which was actually misused. Such foresters and owners have still been across all types of ownership, but they are really few. The majority of foresters and owners have understood that there is no other way but to shift towards spatially more differentiated mixed stands/growths, including ASWPS in their plantations even without regard to the liberalisation of the Act, i.e. even without the legal obligation, regardless of the increasing trend of applying natural regeneration and pioneer trees. According to the Green Reports of the Ministry of Agriculture of the Czech Republic, between 1950 and 1998 (i.e. over a period of 48 years) the proportion of broad-leaved deciduous trees increased from 12.5 to 22.4% and between 1998 (when Act No. 289/1995 Gazette started to work) and 2023 (over a period of 25 years) the proportion increased from 22.4 to 30.1 %. The acceleration of change in forest species composition is clearly positive and could be even higher, although not because of the law, but thanks to the positive (financial) motivation of foresters, who have learned from the 2016–2020 disaster.

Another frequently applied solution in the application of ASWPS is in the planting method. Simplified, out of a hectare of clearing, 0.75 ha is planted with continuous Norway spruce and 0.25 ha with European beech, i.e. two monocultures are established next to each other. That is of course better than 1.00 ha of spruce, but from a future perspective, beech monocultures at mid- and lower elevations are also wrong, although in accordance with the current Act. Therefore, it was possible to plant monocultures and they have even been planted under the present Act.



Figure 3. Advanced version of the Dauerswald model for mid-elevations. Tree crown cover (canopy) is nearly 100%, but due to height variation and an irregular patchwork of different growth stages, the light conditions within the stand are highly variable, thus supporting regeneration of oak (*Quercus* spp.) and biodiversity in general). Yet measuring stock density in such a stand is irrelevant, given the way the criterion is defined. The amendment to the Forest Act paves the way for adoption of non-clear-cutting management models. © Tomáš Vrška.

Ecosystem services and decaying wood

The amendment to the Act introduces the institution of payments for ecosystem services (newly in Section 46b), with conditions for providing payments set by government regulation. This is a new and important provision, although the introduction of a government regulation is not time-limited and will certainly be non-entitled like previous Government Regulation No. 30/2014 Gazette, according to which management contributions are provided. If payments for ecosystem services are well defined, this can significantly motivate owners to gradually convert their forests to mixed, structurally and texturally differentiated forests. Experience abroad where these services are already paid for (Ireland, Luxembourg, Switzerland) shows that finding relatively simple criteria is essential.

The long-discussed and undeniable need to leave a relatively large amount of decaying wood in forests remains a task for the Ministry of Agriculture of the Czech Republic by preparing a decree setting a minimum amount of (parts of) logging residues and trees intended for decay (Section 33, paragraph 8). It is true that

no consensus on this issue was reached during the negotiations on the amendment. Therefore, implementing a decree prevailed as a solution. Proposals like an obligation to leave a certain number of trunks after the final felling for decay were not included into the Act. In close-to-natural forest management, where we do not distinguish between improvement and regeneration felling, this is an unmeasurable criterion, as we always harvest very different trunk diameters at the same time. For practical use in the Czech Republic, the simple and practical Bavarian model is available, which operates by means of a simple mobile phone application also used by the State/Public Administration providing financial contributions to owners during inspections.

For nature conservation and providing ecosystem services, enabling forest grazing is an undeniable benefit. This is criticised for the loss of production, but it should again be the owner's free decision – does he want to graze and have a destroyed or limited production of quality wood? That is his/her choice. On the other hand, grazing can contribute to a local increase in biodiversity, but will always be a minority issue, supported more by the State Nature Conservancy authorities and NGOs/non-profit organizations.



Figure 4. Transition to a selection forest, 50 years after the original stand consisting mainly of Norway spruce. In some stands (the smallest permanent forest unit to which of ameliorating and stabilising woody plant species (ASWPS) rate assessment applies, the ASSWPS rate in natural regeneration does not meet the required proportion mentioned in the regulation. Neither the forces/drivers of nature nor the forester using them acted in accordance with the law there (!). The shift of financial support for ASWPS rates to incentive tools will make these funds being used sensibly rather than at any cost. Photo by Tomáš Vrška.

A clear benefit is the possibility of creating pools up to 1,000 m² in size in forests without the need for a building permit. This way we can very quickly – with well-set motivational support – shift more toward retaining water in the forest or the landscape as well as in supporting biodiversity, which is good for everyone – the forest owner and society.

Economic and management parameters

The departure from the narrow concept of forest age classes, as set in the current Act, includes abandoning the stocking density criterion for assessing the rate of stand thinning before regeneration. To date, an over 80-year-old stand/growth below a stocking density of 0.7 could not be thinned, whereas now stocking density is replaced with the term canopy (tree crowns of the stand) which should not fall below 6, or

0.6 of the full canopies. This will no longer legally prevent a more significant diversification in tree diameter and height of a stand, because with a greater evenness of growth stages within one stand group, stand size measurements are biased. Canopy assessment is simpler and more objective for forests homogeneous in age classes as well as for diversified stands. In a diversified stand, stocking density may fluctuate, but its canopy may remain more stable, which is more important from the perspective of ecological (and therewith production) forest criteria.

The issue of reducing the rotation period for forest stands of different age classes from the current 80 years to 60 years (Section 33, paragraph 6) have also been discussed. The reason for that is clear: an effort to save at least part of the production from existing Norway spruce and Scots pine (*Pinus sylvestris*) stands, which will continue to face climate extremes and disasters to come – which is just a question of time.

But this is not only a financial issue but makes communicating vessels with the future form of forests. If we regenerate formerly even-aged stands with clearcutting or structuring interventions, or a combination of both, we will get better conditions for conversion without large disaster/calamity clearings – also thanks to the sale of non-calamity wood at a higher price, finances for including absent broad-leaved deciduous trees, whose seedlings are more expensive and whose stands require more demanding management than the usual conifers, Norway spruce and Scots pine.

More diverse forests and their management cannot be imposed generally

Why do countries most advanced in forestry, which are an example in openness of thought and new approaches, have had the simplest forest laws? It is because they had given up on uniform age-class forests earlier than we did, and know that a monotonous uniform forest cannot be transformed into a forest with an irregular structure and a delicate mixture of tree/woody plant species with criteria for an age-class forest. If we use more natural drivers/forces in the process of forest cultivation/silviculture, we cannot expect them to behave “as the law dictates”, according to uniform rules. Therefore, the Czech branch of the Pro Silva initiative, bringing together practical foresters who practise close-to-natural management (no clear-cutting), has been actively involved in elaborating the amendment from the beginning and supports it. It is important to realise that foresters who have been managing the forest without clear-cutting for thirty years are in conflict with the current Act in many aspects, e.g. concerning the use of ASWPS (Fig. 2).

We are certainly all aware that a diverse forest = fewer regulations = greater responsibility of the practising forester. However, for the desired forestry transformation, three conditions must be met: (i) the forester has to want it, (ii) the forest owner allows or even requires the forester to do so (i.e. he “may” do so), and (iii) the forester has to be able to do it. Condition (iii) means he has to learn it somewhere, but he can only learn it from someone who has already been doing it and has tangible results. Thus, theory is not sufficient. But try to convince a more cautious person of a change which is strongly blocked by existing legislation! We therefore need a liberal forest act. ■

Network of Houses of Nature in the Czech Republic

Pavel Pešout, Lenka Šoltysová & Tomáš Růžička

In the Czech Republic, communication with, education of and raising awareness among the general public and the target groups (CEPA) has long been one of the main priorities of the State Nature Conservancy. One of the effective CEPA's forms is the provision of information directly in the field using the visitor infrastructure. Visitor centres are the most expensive facilities to build and operate when it comes to providing information in specific areas. The demand for building visitor centres has been constantly growing. The State Nature Conservancy authorities want to welcome visitors to

the area and promote environmentally friendly forms of tourism, but at the same time they must manage to control individual recreational activities so that excessive visitor numbers do not damage the most valuable parts of Specially Protected Areas. The goal of the Houses of Nature Programme is to establish a network of visitor centres (Houses of Nature) supplemented by smaller Information Centres in tourist-attractive locations within Protected Landscape Areas (PLAs) and significant National Nature Reserves (NNR) and National Nature Monuments (NNM) with high visitor traffic.



Figure 1. Visitor centres are successfully being developed as unique facilities of civic/public amenities with a specific character, as evidenced by the awards received by some of them. For example, the renovation of a historic building into the Žďárské vrchy Hills House of Nature in a Village Heritage Reserve won the 2020 Vysočina Region Governor's Award and the Public Choice Award in the Vysočina Region Building of the Year competition. © Ota Nepilý

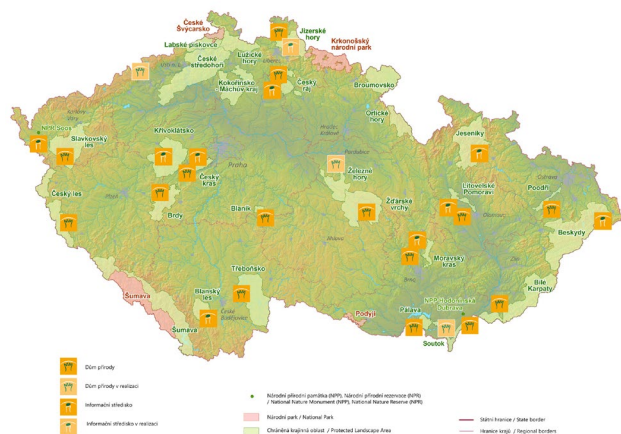


Figure 2. Visitor centres—Houses of Nature —supplemented by smaller Protected Landscape Area (PLA) Information Centres the latter having been incorporated into the Nature Conservation Agency of the Czech Republic's (NCA CR's) Houses of Nature Programme. Map © Jana Tomcová

Twenty years ago, while drafting the first Operational Program Environment (OPE), funded by the European Union, the Agency for Nature Conservation of the Czech Republic (NCA CR) had proposed including building appropriate visitor infrastructure—including visitor centres—among the programme's funding priorities. The proposal was approved, thereby opening up the possibility of securing investment funds. In 2009, the NCA CR adopted the House of Nature Programme with a target to establish a visitor centre in selected PLAs (Pešout *et al.* 2009, 2010). The concept was approved by the Ministry of the Environment of the Czech Republic in the same year.

A Successful PPP Project

From the very beginning, its status as a Public-Private Partnership (PPP) project was crucial for the further Programme's development. Therefore, the "Unified Architectural Concept, Manual for the Design of NCA CR's Visitor Centres" (David & Velková 2009, updated by Velková *et al.* 2019) was developed, and a system for reviewing individual Houses of Nature at the national level was established. With minor additions and modifications, the system remains in use today. The initial inspiration for using the PPP model was primarily capacity- and cost-related. Such an extensive and investment-intensive visitor infrastructure could not be built and subsequently operated by the State Nature Conservancy only. The operation of the facilities must be based primarily on local resources (Pešout *et al.* 2012). It gradually became clear that another major benefit of the approach to implementing the programme is the long-term involvement of local and regional partners in public engagement and in shaping the entire Houses of Nature Programme.

Location and Design of Houses of Nature

The planning of these facilities is primarily based on a visitor management concept (Obermajer & Růžička 2021), which is developed by the NCA CR in collaboration with municipalities and other local partners and serves as an annex to the Management Plan for the respective Specially Protected Area. The location of Houses of Nature is assessed with regard to the area's limitations, the accessibility of the structure to visitors, and, above all, the interest of a potential investor in establishing and operating a House of Nature at the given location. In terms of architecture and materials used, buildings must adhere to the above unified concept, whereby the structure must meet the criteria of contemporary architecture using local materials and comply with the criteria for energy-efficient buildings and the use of renewable energy sources. In the case of renovations of historic buildings, the principles of heritage conservation and preservation must be fully respected.

Building most of the Houses of Nature was funded primarily by the OPE, Interreg programme/scheme, and, to a significant extent, by the Houses of Nature Programme partners' own resources.

Current Status of the Houses of Nature Programme

The NCA CR's Houses of Nature Programme has been continuing to expand; only in 2024, five new Houses of Nature were added to the

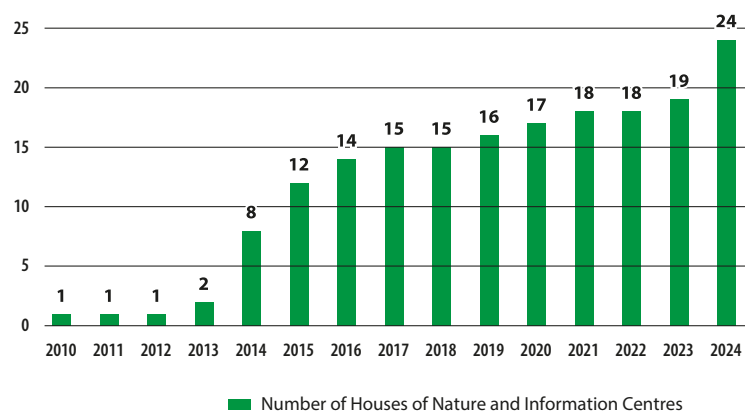


Figure 3. Growth in the number of facilities incorporated into the NCA CR's Houses of Nature Programme in the individual years. Graph © Tomáš Růžička

network: the Jizerské hory/Jizera Mountains House of Nature (northern Bohemia), the Bílé Karpaty/White Carpathians Mountains House of Nature (South Moravia, Jongepierová & Říhová 2024), the Český kras/Bohemian Karst House of Nature (Central Bohemia, Hofmeisterová *et al.* 2024), the Pálava/Pavlov Hills House of Nature (South Moravia, Miklín & Kmet 2024), and the Hodonínské Dúbravy/Hodonín Oak Grove House of Nature (South Moravia, Ambrozek *et al.* 2024). Thus, the Houses of Nature Programme includes 24 facilities (15 visitor centres, i.e. Houses of Nature and 9 Information Centres) providing services to visitors in 18 PLAs, one NNR, and one NNM (see Figs. 1, 2). The Houses of Nature Programme involves 26 partners acting as investors or operators of visitor centres; most of these are local governments or non-governmental non-profit organizations.

Visitor numbers are on the rise, reaching nearly 0.5 million in 2024 (see Fig. 3). Approx. 2,500 public events were held in 2024, most of which were educational and outreach programmes or guided tours of the permanent exhibits. Each year, 30–50 temporary exhibitions on nature conservation are also installed in the visitor centres, and over 150 field trips are organized.

The visitor centres share a common website to showcase the individual Houses of Nature and Information Centres – www.dumprirody.cz. The site provides comprehensive information about the Houses of Nature Programme and the individual visitor centres, including details on events and programmes. Virtual tours of the exhibits are available online for six of the Houses of Nature.

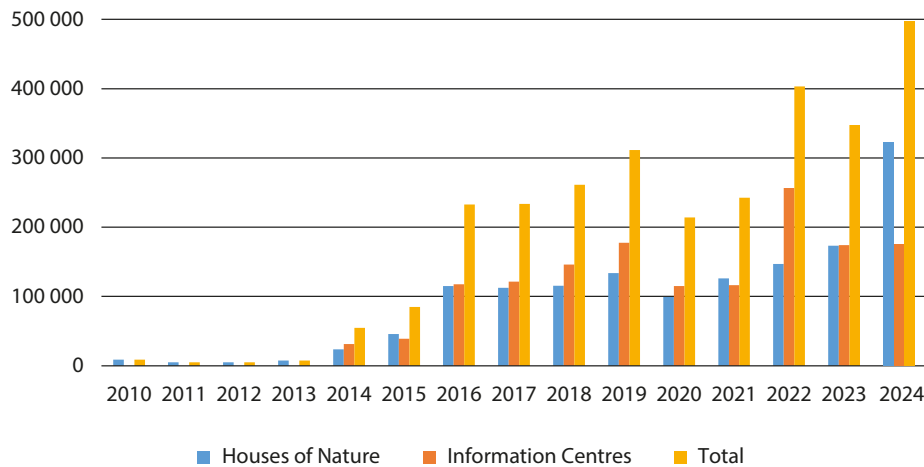


Figure 4. Visitor numbers at Houses of Nature and Information Centres from 2010 to 2024. Graph © Lenka Šoltysová

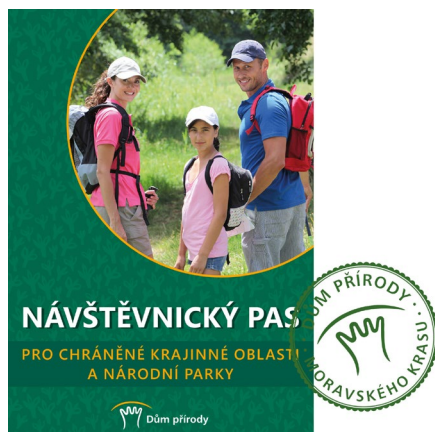


Figure 5. The visitor passport links facilities included in the NCA CR's Houses of Nature Programme with visitor centres and Information Centres in National Parks in the Czech Republic.

To promote the centres, each visitor centre has its own informational brochure, a set of postcards, a memory game for children (where applicable), and other small promotional items. The NCA CR also publishes a brochure providing information about the entire network of Houses of Nature in the Czech Republic. A specific guide (mascot) for each House of Nature, which is unique to that centre, is used in promotional activities. In cooperation with National Park administrations, a visitor passport was developed to promote the visitor centres (see Fig. 4).

Each visitor centre collaborates with regional destination management organizations to promote the region effectively. At the national level, there has been a successful partnership with the CzechTourism agency developed to

promote guidelines for visitor behaviour in nature and to market Houses of Nature as gateways to Specially Protected Areas.

Each year, the NCA CR organizes meetings with visitor centres operators focused on sharing experiences and providing training in nature conservation and landscape protection and management. The NCA CR evaluates the activities of Houses of Nature and Information Centres annually, including an overview of visitor numbers, programme content, and the operating costs of individual operators. In 2024, the certification of visitor centres began according to parameters agreed upon among the partners of the Houses of Nature Programme. As part of the certification process, criteria are assessed in four areas: compliance with the conditions of the unified architectural concept and operations; staff competence, skills and approach; the quality of programming; and media image. Certification is approved by the House of Nature Programme Steering Committee for four years at a time.

Further Development of the Houses of Nature Programme

The long-term goal of the Houses of Nature Programme is to establish a visitor centre in each of the PLA managed by the NCA CR, as well as in selected NNRs and NNMs with high visitor attendance/visitorship.

In March 2025, the Ministry of the Environment of the Czech Republic's Board approved the development plan for the NCA CR's House of Nature Programme for 2025–2030. According to

Box 1 The House of Nature is a modern visitor centre that:

- welcomes visitors in a high visitor attendance/visitorship,
- informs the public through various means about the features of the appropriate Specially Protected Area, with the main attraction being an interactive exhibition about the area, both indoors and outdoors,
- raises awareness of the reasons for nature conservation and landscape protection, raises interest, and fosters a positive relationship between visitors and the site they are visiting, as well as toward nature conservation and landscape protection in general,
- assists in educating visitors and guiding their movements within the Specially Protected Area (including organizing field programmes with certified guides, etc.),
- provides educational and instructional programmes for visitors and schools,
- provides basic tourism information (accommodation, transportation, cultural events in the region, etc.) in cooperation with local destination management,
- facilitates gatherings of local residents in a pleasant environment,
- and sells publications, regional/local products, high-quality souvenirs, promotional items, maps, and educational materials.

The House of Nature is a dynamic project built on regional partnerships and resources. It is not only an engaging attractive exhibition that appeals to visitors, but also a venue and a means of actively involving the local community in the conservation, protection and management of the region's natural and cultural heritage.

the plan, five additional facilities are expected to be added during the period. The Jizerské hory/Jizera Mountains PLA Information Centre–Mariánskohorské boudy/Maria Hills Cabins (northern Bohemia), which is currently under construction and funded by the NCA CR, will be completed later in 2025. The NCA CR also plans to build the Jeseníky Mountains House of Nature at the village of Karlova Studánka Spa (Silesia). A full-size architectural competition has already



Figure 6. Information Centres are smaller facilities that complement Houses of Nature in attractive sites within Protected Landscape Areas or in small-size Specially Protected Areas. The information centre at the Soos National Nature Reserve (western Bohemia) serves as the gateway to the reserve, featuring a well-known nature trail/educational path, and also as a starting point for further excursions within the Cheb region's natural heritage. Photo © Archive of the Municipal Museum in town of Františkovy Lázně Spa



Figure 7. Every House of Nature features a permanent exhibition that introduces visitors to the area's natural richness and the story of the landscape. At the Bílé Karpaty/White Carpathians Mountains House of Nature (South Moravia), the exhibit (sculptural element) "Caress the Landscape" serves as the central feature in the introductory section at the indoor exhibition. © Jitka Říhová



Figure 8. Building the Jizerské hory/Jizera Mountains Protected Landscape Area Information Centre – Mariánskohorské Boudy/Maria Hills Cabins (northern Bohemia) is co-financed by the National Recovery Plan and will open to the public in the spring of 2026. © Daniel Kopecký



Figure 9. At visitor and information centres, educational programmes specially designed not only for schools are a key part of the main activities. At the Žďárské vrchy Hills House of Nature, visitors can participate in the "Landscape of the Žďárské vrchy" programme. Photo © Archive of the Žďárské vrchy Hills House of Nature.

taken place there. The winner is currently developing the project documentation. The Soutok/Confluence House of Nature, funded by the town of Břeclav (South Moravia), is in the final design phase, including the exhibition. The town of Chrudim (eastern Bohemia, the Pardubice region) has also been preparing to build the Železné hory/Iron Mountains House of Nature.

The final facility under the approved plan is the Krušné hory/Ore Mountains House of Nature, currently being developed by the town of Horní Jiřetín (northern Bohemia), which will also provide information on the recently designated National

Nature Monument, the Czechoslovak Army Mine/ČSA Quarry (Pešout & Porteš 2024). In other PLAs where there is currently no House of Nature or Information Centre (Broumovsko/Broumov Region, České středohoří/Central Bohemian Uplands, Kokořínsko – Máchův kraj/Kokořín Region-Mácha's Country, Lužické hory/Lusatian Mountains, and Orlické hory/Eagle Mountains), new partners and financial resources will be sought.

In addition to the annual meeting and exchange of experience among operators of Houses of Nature houses and Information Centres, training opportunities for visitor centre staff will be

developed, and providing products from the above network will be supported. By 2030, all Houses of Nature and Information Centres included in the Houses of Nature Programme will undergo evaluation and certification. Starting in 2025, the NCA CR is also preparing to introduce a visitor satisfaction survey, which can be completed anonymously online.

The approved programme's development plan also includes securing funding for the renovation and maintenance of existing Houses of Nature (especially permanent exhibits) and providing support to their operators.

A Sustainable Project

The many years of operation of the Houses of Nature Programme have confirmed that the decision to use a PPP model was the right one. The operator is always a local partner (local government, nonprofit organization, state-owned enterprise, etc.), which also serves as the primary investor. This allows a significant portion of the investment costs and most of the operating costs to be generated from the partners' own resources

and through the operation of the visitor centres. Thus, the impact on the Czech Republic's State Budget is significantly lower than if the visitor and Information Centres were invested in and operated by the NCA CR. The NCA CR contributes an average of 20–25% to the operating costs annually. In 2024, the operation of all Houses of Nature was supported by a total of CZK 7.821 million (EUR 312 840), and the operation of Information Centres by CZK 1.856 million (EUR 74 240).



Figure 10. The Český kras/Bohemian Karst Protected Landscape Area Visitor Centre was built in cooperation with the Caves Administration of the Czech Republic near the Koněprusy Caves (Central Bohemia). The freestanding House of Nature of the Český kras/Bohemian Karst, including its exhibits and show caves, was opened to the public in 2024. The building itself meets the standards for very low-energy buildings and fully respects the landscape character/scenery there. © Magdaléna Medková – Aktuálně.cz



Figure 11. The House of Nature Programme is based on partnerships, as in this case, where the Hodonínská Doubrava/Hodonín Oak Grove House of Nature (South Moravia) is operated by a public institution established by the town of Hodonín, which is also its investor. © Archive of the Hodonínská Doubrava/Hodonín Oak Grove House of Nature in Hodonínské Důbravy



Figure 12. The Houses of Nature also harbour original works of art. The artworks along the visitor trail at the Litovelské Pomoraví/Litovel Morava River Basin House of Nature serve as places to connect with nature and are open to all experiences. In 2023, artist Miloslav Fekar created the Lookout Above the Fishpond, a unique observation tower used for observing wildlife there. © Miloslav Fekar

In addition to their contribution to education and the interpretation of the area, visitor centres are appreciated as a resource for local communities and institutions, as a promoter of sustainable tourism, and also as a local employer. The Houses of Nature Programme has contributed to the creation of 41 permanent jobs and 116 part-time (seasonal) positions.

Let us hope that the development plan for the Houses of Nature Programme for the next five years will be implemented at least as successfully as the Programme itself has been so far. In this regard, the authors would like to express their sincere gratitude to the investors and operators of the Houses of Nature and Information Centres—for their annual efforts to provide services to visitors and for their efforts to secure funding for operations. ■

75 Years Have Passed since the Discovery of the Koněprusy Caves

Jaroslav Hromas

“It wasn’t until we were inspecting the quarry on September 14, 1950—Director Pastora, Foreman Frič, Duha, and me, Karel Mareš—that I was walking above the quarry when I reached a spot where the quarryman Frant. Štěpán called out to me, ‘Foreman, I just found a hole in the quarry wall after the blast. There was

a hole 10 meters long, 4 meters wide, and 3 meters high. A 13-meter-long passage leads from this cave...” recalled Karel Mareš, foreman of the Houba’s Quarry at Zlatý kůň/Golden Horse Hill near the village of Koněprusy (Central Bohemia), in his memoirs in 1997.



Figure 1. The Zlatý kůň/Golden Horse Hill National Natural Monument, which includes the Koněprusy Caves, is now surrounded by the Čertovy schody/Devil's Stairs Quarry open-pit mine (Central Bohemia). © Josef Mottl

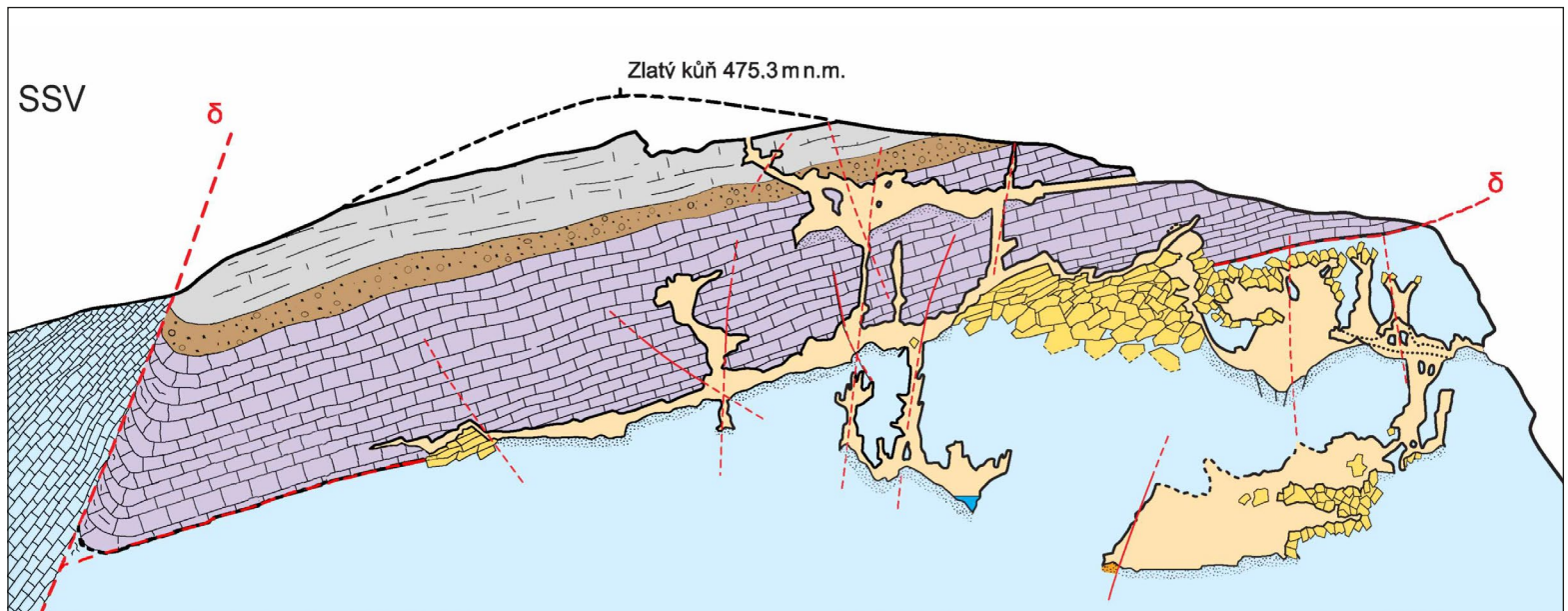


Figure 2. North-south cross-section of the Zlatý kůň/Golden Horse Hill showing the geological structure of Devonian limestones and the three levels of the Koněprusy Caves. © Josef Mottl

The First Major Discoveries

The “hole” in question was explored by quarrymen (stone breakers) Foreman Karel Mareš, František Štěpán, Jiří Jiránek, and Karel Chvojka. It was located in the quarry wall just a few dozen meters from the entrance to the long-known Ztracená sluj/Lost Cave (also called Bábina/Grandma), a hide-out for shepherds, vagabonds, and perhaps even various unsavory characters. By coincidence, at that very time, Petrbok’s boys—Radvan Horný (18), Ivo Chlupáč (19), and Jiří Kovanda (15)—were digging test pits there for Jaroslav Petrbok (69), a researcher of the Český kras/Bohemian Karst. And as was customary there, the quarrymen reported their discovery to Petrbok himself. Within a few days, his boys connected Bábinka/Grandma to the newly discovered passage via a tunnel, and quarryman Štěpán even dug his way through it to long-forgotten chambers with a small lake.

On October 15, 1950, quarrymen Karel Mareš, František Štěpán, Jiří Jiránek, Karel Chvojka (and, according to some witnesses, also Duha) penetrated the first large part of the Koněprusy Caves within a limestone quarry – today’s Stará chodba/Old Passage with Letošník’s Abyss, Kukla’s Dome, and, on their way back, and on the way back, they also stopped by Mareš’ Hall, which features beautiful cave speleothem decoration. Beneath the



Figure 3. The slope beneath the chimney in Prošek’s Dome, the site of major archaeological finds. © Alexandr Komaško

chimney near the abyss, they found rotten wood, glass and bone beads, shards of medieval pottery, animal bones, coals and cinders, and a piece of a hollowed-out log with remnants of copper shavings. Someone had been there before them.

The cave was explored by Jaroslav Petrbok and members of the Karst Section of the Natural Science Club of Charles University (later the Karst Section of the National Museum Society) led by Jiří Kukla. The finds



Figure 4. The stalactite Varhany/Organ, a traditional promotional image of the Koněprusy Caves. © Alexandr Komaško

were sent to the National Museum, and the caves began to be called Petrbok's Caves.

A period of great discoveries had begun.

On October 18, 1950 Kukla descended into the abyss and found human footprints at a depth

of about 30 meters. Two days later, however, Vlastimil Letošník, Assistant Professor at the Institute of Geography at Charles University Prague, fell while rappelling the last few meters, and the footprints were destroyed during the rescue operation. The abyss retained the name Letošník's Abyss. After the accident, the quarry administration restricted access to the caves to experts only.

On November 5 (according to Stárka, November 6), near Letošníková Chasm, Kukla, Jan Budák, and Petr Batík widened a small opening with a draft, but only twelve-year-old Petr managed to squeeze through the narrow passage. He discovered the domes of the New Cave (a name no longer in use)—U strážce/Neat the Ranger Dome (now Petrbok's Dome) and Petr's Dome. He could have gone further, but since he was alone, he disciplined himself and returned. It was not until a week later that Jiří Kukla's group managed to widen the crawlway to accommodate bigger speleologists, penetrate the subsequent Pustý dóm/Empty Dome and Hlavní dóm/Main Dome (now Prošek's Cave), and make the first archaeological discoveries there.

As was customary in quarries, the caves exposed by mining were always a welcome target for collectors of natural specimens before their subsequent destruction (this time, part of the cave speleothem decoration in Mareš Hall fell victim to them). The quarrymen always hid the stalactites, crystals, fossils, any skeletal remains, or other curiosities they found for "Professor" Petrbok (usually in exchange for a pack of tobacco), who frequently visited the quarries. This time, too, mining proceeded relentlessly, and the same fate threatened the new caves. While the cavers continued to uncover and make initial maps of the new areas, Petrbok called on the quarrymen and Kovanda and his mother to salvage whatever they could from the caves. This mainly concerned the numerous bones lying on the surface of the debris cone beneath the chimney in the Hlavní dóm/Main Dome. On November 15, Foreman Mareš found a woolly rhino skull there, which Kovanda carried to the surface through narrow crawlways. Two days later, along with a number of other bones, Mareš carefully brought up Kovanda's Basque beret with his discovery of the crushed rear portion of a human skull.

On December 4, Kukla and Miss Zárubová climbed a 14-meter chimney from the Staré chodby/Old Passage to the top floor and discovered the remains of a Middle Ages mint there.

It was high time to take action to save the caves. Therefore, on December 6, under Kukla's leadership, the Karst Committee of the Czechoslovak National Research Council met, and it was agreed not to continue mining in the wall with the entrance to the cave. The State Archaeological Institute was tasked with establishing a commission of experts and relevant agencies to determine the next steps. The Commission, led by the Director of the State



Figure 5. Scraps of copper sheet from the Mint at Zlatý kůň/Golden Horse Hill, remnants from the production of counterfeit coins. © Alexandr Komaško



Figure 6. The discoverers of the Koněprusy Caves—quarrymen Štěpán, Mareš, Jiránek, and Chvojka in front of the Koněprusy Caves building in 1960. Photo: © Cave Administration of the Czech Republic—copy

Archaeological Institute, Academician Jaroslav Böhm, met on December 18 at Zlatý kůň/Golden Horse Hill and entrusted the research of the caves to the State Archaeological Institute, the Central Geological Institute, and the Karst Section of the National Museum Society.

Petrbok was no longer invited to participate. He had to hand over the finds he had been bringing to the National Museum to his student, the archaeologist František Prošek. He took it hard, but the new researchers were no longer willing to tolerate his research methods. When one of the chimneys was broken through to the surface from the Hlavní dóm/Main Dome in December 1950, making the cave more accessible for research, Petrbok and his colleagues descended into the cave for the last time.

Archaeological Research and Its Findings

František Prošek began the archaeological research in late 1950 and completed it in 1952. The main contributors were palaeontologist Zdeněk Hokr, geologist Jiří Kukla, palaeontologist Oldřich Fejfar, and anthropologist Emanuel Viček. Following the initial findings from the course of the discoveries, Prošek focused primarily on the Hlavní dóm/Main Dome, while the palaeontologists also examined all skeletal remains from other, predominantly central parts of the cave system. Remains of the following

species were found in varying numbers—woolly rhinoceros, horse, red deer, grey wolf, chamois, goat, cave hyena, bear, hare, marmot, bat, vole, dormouse, and other rodents, as well as molluscs dating from 10,000 to 1.5 million years ago.

Nevertheless, the most significant find was human remains—a lower jaw, fragments of the supraorbital and occipital regions of the skull, fragments of the right and left zygomatic bones, a rib fragment, a cervical vertebra, and three thoracic vertebrae. Initially, the prevailing opinion was that these belonged to multiple individuals; later, it was proven that they are parts of a single woman. Her grave goods likely included three stone tools (a quartz flake with traces of retouching and two flakes of metamorphosed Liteň slate), a drilled sea mussel shell (from a necklace), and a flake of thick hollow bone with a notch. The woman's grave was likely located in the sediments in the subsurface part of the chimney, from where it gradually collapsed into the cave. Despite the skull's striking archaic features, its age remained undetermined for a long time. It was not until 2023, thanks to the work of anthropologists Petr Velemínský and Jaroslav Brůžek, that the Max Planck Institute in Jena succeeded in proving through DNA analysis that the woman lived at Zlatý kůň/Golden Horse Hill at least 45,000 years ago, her ancestors interbred with Neanderthals another 2–3 thousand years later, and she belonged to an extinct branch of anatomically modern humans. She is one of the oldest Eurasian inhabitants

following the expansion from Africa. The find is the only preserved, nearly complete skull from that period, having really been a global sensation.

Rebeka Rmoutilová and the French researcher É. Daynés carried out the reconstruction of the skull and, subsequently, the entire appearance of the prehistoric woman. Based on the published data, Brazilian 3D designer Cicero Moraes repeated the procedure.

Further Discoveries

In January 1951, while loading limestone at the base of the Houbá's Quarry wall, an excavator uncovered an 11-meter-deep shaft leading to the third, lowest level of the caves. The mostly straight, high passages in the Koněprusy limestone are accompanied there by a series of small chambers with unique decorations of glassy, eccentric speleothems. To prevent the valuable speleothem decorations from being destroyed, the shaft was covered again after the cave was explored and mapped, and was intentionally forgotten for a long time.

On February 17–18, 1951, Zdeněk Březina discovered the Březina Chambers, a very difficult-to-access area on the middle level.

On August 10, 1951, the original counterfeiters' entrance to the Mint was finally found and opened. It is just a small rock window in the

remains of a medieval quarry on the Zlatý kůň/ Golden Horse Hill. It was covered with a stone just a few decimetres below the grassy surface.

On September 8, 1951, while cleaning the wall of the Houba's Quarry in areas where mining was still ongoing, quarryman Bartoníček discovered an opening, which he and Mareš and Štěpán widened; through a spacious passage-way, they made their way past the "Věčná touha/Eternal Longing" stalactites to a formation called "Varhany/The Organ." The speleologists then continued through a narrow crawlway from Varhany/The Organ to the U labutě/Swan Hall and named the entire cave Zářijová jeskyně/ September Cave after the date of its discovery.

On December 22–23, Stárka, Kukla, and Batík dug a long, narrow squeeze from Varhany/The Organ to a chamber, which they logically named Vánoční/Christmas Hall.

When Zářijová jeskyně/September Cave was subsequently connected to Mareš' Hall by a short passage, the major discoveries in the Koněprusy Caves were completed for a long time.

Research at the Mint

Between 1953 and 1956, Pavel Radoměský and Antonín Hejna conducted an archaeological survey of the caves' upper level and confirmed the existence of a medieval counterfeit coin workshop there. The cave's layout, along with the discovery of hearths, furnaces, ceramic vessels, and oil lamps, remnants of a coin die, scraps of copper sheet (cissures), uncut discs (blanks), rejects of counterfeit coins, a stamp (or punch?), and other items demonstrated that around 1469, during the reign of George of Poděbrady, King of Bohemia, counterfeit small coins, also known as Hussite halers, were secretly minted in the cave. The blanks were cut from copper roofing sheet, silver-plated by dipping in silver amalgam and annealing in fire, and subsequently stamped once with a double-tailed Czech lion surrounded by a pearl astragal. Total production is estimated at 5,000–10,000 pieces.

The first use of a punch in the 15th century in the Kingdom of Bohemia (the state mint had been still cutting out the pieces by hand), the high quality of the steel used for the punch (or die?), which was previously unknown from that period, and the first discovery of a complete eight-piece set of small weights made from talc

balls highlights the extraordinary significance of the find.

Opening the Caves to the Public

It had been decided to open the middle and upper levels of the caves to the public, thus making show caves there. In 1958, all preparatory activities were completed, and the Road and Railway Construction National Enterprise (formerly Baraba) began work on making the caves accessible. On August 2, 1959, the caves were opened to the public on a shortened tour; the following season, starting May 2, 1961, the visitor route was a closed loop. The investor, the District National Committee in Beroun, established the Stalactite Caves Centre at Zlatý Kůň/ Golden Horse Hill near the village of Koněprusy. Exploration and research of the caves did not continue; speleologists were only allowed to visit them as tourists.

Over the next few years, the cave administration, acting on its own initiative and always during the off-season, continued with further modifications to the caves, including the concreting of walkways and surfaces and the extension of the visitor route to the Stará chodba/Old Passage and the U labutě/Swan Hall.

Last Major Discoveries

It was not until 1962, following personnel changes in the cave administration, that speleological exploration could resume in the Koněprusy Caves. Under the cave administration (later as part of the Local History Club of the Beroun District Museum), the Český kras/Bohemian Karst Speleological Club, led by the author of this article, began its activities; together with members of the Karst Section, they resumed extension work at Zlatý kůň/Golden Horse Hil.

In February 1962, speleologists rediscovered and opened a forgotten chimney leading to the Spodní patro/Lower Level and dug through a previously silted-up crawlway into its main chambers. Although they managed to find an impassable connection to the nearby Sláva's Abyss in Houba's Quarry, no part of the Spodní patro/Lower Level offered any hope of continuing the exploration. Therefore, during the 1st speleological camp at Zlatý kůň/ Golden Horse Hill, Pavel Nosek focused on the fissures and chimneys in the high ceilings

of the chambers. On July 23, 1965, he dislodged several wedged stones high up in the ceiling of the Hlavní chodba/Main Corridor and opened access to an unknown chimney. A day later, he and the author of this article climbed through it to the level of the middle floor, discovered what is now known as the Nová jeskyně/New Cave with the "By the Mosque Stalagmite" passage, and, guided by a beam of light, dug their way to the surface through the quarry wall. On September 1 of that same year, guided by a draft, Nosek dug through a narrow passage into the Síň trosek/ Hall of Ruins, Peklo/Hell, and the largest dome of the Noví jeskyně/New Cave—the Kavárna/Café. It was certain that these spaces were already located near the Březina's Halls, but they were separated by an extensive collapse of massive boulders and rock blocks from the collapsed ceilings.

On February 20, 1966, members of the club, led by Březina, Nosek, and the author of this article, cleared narrow passages between the blocks of cave-in and established a connection between the Kavárna/Café in the Nová jeskyně/ New Cave and Březina's Halls on the Prostřední patro/Middle Level. Two groups, moving toward each other, searched for and gradually cleared the connecting "path." This historic moment marked the culmination of the discoveries in the Koněprusy Caves. All three levels were connected into a system with a total length of 2,050 m and a depth of 70 m.

What's next?

The global significance of the discovery of human remains clearly calls for the resumption of archaeological research in the Koněprusy Caves. Greater attention to the mineral content of the caves, its succession and genesis—particularly in connection with the documentation and exploration of cavities gradually being uncovered in the Velkolom *Čertovy schody/ Devil's Stairs Quarry*—also offers new insights into the development of the Český kras/ Bohemian Karst. For speleologists, there have still been plenty of unexplored sites at Zlatý kůň/Golden Horse Hill and its surroundings. There are several topics that could pose a challenge for relevant specialized institutions and their researchers. The Cave Administration of the Czech Republic itself could serve as the initiator and subsequently as the entity that communicates new findings to the public as part of its educational mission. ■

The Czechoslovak First Land Reform and Nature Conservation

Pavel Pešout

One of the significant milestones in nature conservation in the Czech Republic was the land reform of the First Czechoslovak Republic (the term used for the former Czechoslovakia in 1918 – 1938), which took place a century ago. Its aim was to establish a more socially just system of land ownership, expand the middle class

among the agricultural population, and create self-sufficient medium-sized farms that would drive the agriculture modernization. The relevant authorities of the First Republic sought, as part of the reform, to ensure the conservation, protection and management of the natural and cultural heritage of what was then Czechoslovakia.



Figure 1. A monument near the village of Zálší in the Soběslavská Blata/Soběslav Marshes region (South Bohemia) bearing the inscription “In memory of the transfer of manorial land to the people of Blata region through the 1924 land reform” illustrates support for the First Republic’s land reform—an intervention in the private rights of landowners that would be unimaginable today. © Pavel Pešout



Figure 2. In 1903, Prince John II of Liechtenstein established the first nature reserve in Moravia, covering an area of 172 hectares, known as the Liechtenstein Virgin/Primeval Forest, in the summit parts of Mt. Vozka and Mt. Keprník, northern Moravia (photograph of the local peat bog from 1923). Reserves established before the founding of the Czechoslovakia in 1918 were largely nationalized as part of the land reform. © Rudolf Maximovič

The implementation of a large-scale land reform was included in the very foundations of the First Republic (the term used for the former Czechoslovakia in 1918 – 1938). The principle that “large estates shall be expropriated for domestic colonisation” had already been included in Masaryk’s Washington Declaration of October 18, 1918. The reasons for such broad political support for the reform can be found primarily in the negative perception of the aristocracy and the anticlerical sentiments of that time.¹⁾ Despite the release of half of the confiscated land, the Czechoslovak land reform was one of the largest in Europe. In relative terms—that is, in terms of the proportion of land confiscated—the Czechoslovak land reform ranks third, just behind Latvia and Estonia (Maslov 1929, Peichlová 2011). Of the total area of 4,068,370 hectares, of which 1,312,721

hectares was agricultural land, 1,831,920 hectares was left to owners under various titles, of which 418,858 hectares was agricultural land; the remainder was allocated or sold to new owners or “nationalized for the public good” (Pavel 1938). Land reform had a positive impact on the social structure of rural areas/countryside and their development, leading to an increase in medium-sized farms, a rise in livestock production, etc. (SPÚ 1925).

The land reform had the support of society,²⁾ but also its critics (e.g. Jeřábek 1919). The most prominent among them was one of the leading historians of that time, Josef Pekař. He warned very strongly against the consequences of such an ambitious land reform and proposed a much more gradual pace and a differentiated approach to the reform in the

Czech lands and Slovakia (Pekař 1923). He described in detail the reasons for his concerns, particularly regarding the economic impact on public budgets and the threat to cultural and natural monuments. He considered the centuries-old parks surrounding manor houses, the old tree-lined avenues on large estates, and in some places or sites even “true nature reserves” to be seriously endangered as a result of the reform (Pekař 1919).

Legislative Framework for the Reform

Constitutional support for the reform legislation came somewhat belatedly in 1920³⁾. In fact, the 1918 Act on the Seizure of Large Estates had already foreshadowed the upcoming

land reform⁴⁾: it was intended to ensure that the size of the plots of land subject to land reform would not be reduced. Even the basic law governing the entire land reform, the so-called “Expropriation Act,” was enacted before the Constitution in 1919⁵⁾. The purpose of the framework legislation was to expropriate “large landholdings” located within the Czechoslovak Republic territory⁶⁾. At the same time, this law established the State Land Office (SLO).

One of the most important implementing laws for the Expropriation Act was the “Land Allocation Act”⁷⁾. The law, enacted in 1920, established to whom expropriated land was to be allocated if the state did not use it for public benefit purposes. The second important regulation issued in the same year, which clarified the basic provisions of the Expropriation Act, was the so-called “Compensation Act”⁸⁾, which established the principles for determining the amount of compensation (purchase price) for the acquisition of expropriated property.

As part of the land reform, representatives of the Ministry of Education and National Enlightenment (MENE) sought to secure territorial protection for significant areas—which had been often already considered nature reserves—by transferring them to the ownership of the Czechoslovak Republic. Examples include the Rokytská, Mlynářská, and Buková in the Knížecí Pláně peat-bogs, Černé jezero/Black Lake and Čertovo jezero/Devil’s Lake (all of them located in the Šumava/Bohemian Forest Mountains), the primeval forest on Žákova hora/Pupils’ Hill, the Českomoravská vysočina/Bohemian-Moravian Highlands), the Milešovka and Říp Hills (Central Bohemia), the Lanžhot old-growth forests (South Moravia), the caves in the Moravský kras/Moravian Karst (South Moravia), the Lednice fishponds (South Moravia), and the park in Průhonice near Prague (Voženílek 1930). The use of agreements with landowners—similar to today’s public-law agreements—became a significant tool for ensuring the protection, conservation and management of valuable natural sites.

Exemption from Expropriation for Nature Conservation Purposes

The Expropriation Act⁹⁾ set forth two exceptions allowing for the exclusion of land from

expropriation based on the nature of the property and certain types of ownership (municipal, district, and provincial property was excluded from expropriation). However, a third exception, enacted later in the Land Allocation Act⁷⁾, is important for regional nature conservation. The provision required the State Land Office to ensure “that the allocation does not disrupt natural beauty and the character of the landscape and that natural, historical, and artistic monuments are not harmed.”⁹⁾ While the inclusion of the provision was appreciated—“Were it not for this, instead of beautiful trees and flowers, beets would be growing around the castles today!” (Batěk 1925)—it did not silence the critical voices represented by J. Pekař (see above) and many other prominent figures. Experts and journalists pointed out the impossibility of maintaining castle parks with valuable dendrological collections using the income from the remaining estates, especially when such a park became freely accessible to the public. They cited, for example, the fate of the Průhonice or Buchlovice parks, or “how the once-beautiful Konopiště parks have been plundered since being opened to the public.” Land reform was also criticized for failing to adequately protect monuments, tree-lined avenues, and orchards—as well as the natural environment and landscape—after the land was allocated to new owners. The failure to account for the higher costs associated with the maintenance of natural and cultural heritage was seen as the greatest shortcoming of the legislation. The disadvantaged landowners found no support even from the Supreme Administrative Court, which stated that “there is no justification for allocating more land to the maintenance of these unproductive estates” (Batěk 1925).

As noted above, the State Land Office had the option, pursuant to an exception in the Land Allocation Act, to allow the owner—at his request—to retain above the limit for an extensive property⁶⁾ additional land and structures containing “natural, historical, and artistic monuments”⁹⁾ and to set conditions for their use that were binding on the owner’s heirs or other successors and were to be recorded in the land registers as “public law encumbrances.” The SLO assessed each individual request on a case-by-case basis and did not always grant them. For example, it did not grant Jan II of Liechtenstein’s request to release the so-called “Předměstský les/Suburban Forest” near the town of Uherský Ostroh, as it found that the

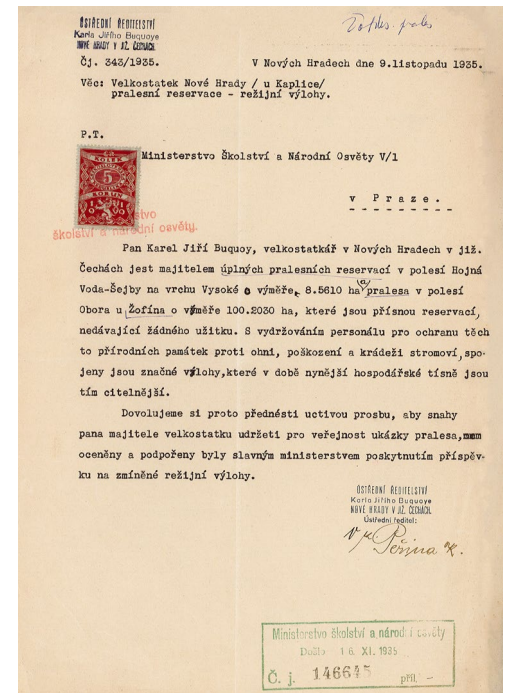


Figure 3. Following the land reform, some landowners had lacked the finances to maintain the natural and cultural monuments that had been released from confiscation. They therefore turned to the State for financial support; in this case, the Central Directorate of K. J. Buquoy is requesting support from the Czechoslovak Ministry of Education and National Enlightenment. Source: Nature Conservancy Central Register, Nature Conservation Agency of the Czech Republic Prague, photo reproduction © Josef Votrubec

forest was of a standard commercial nature¹⁰⁾. In some situations, the office also utilized other forms of agreement with the owner. For example, in 1933, it had concluded an agreement with the Forest Directorate of Karel Jiří Buquoy to retain the “Prales/Virgin Forest” reserve (part of today’s Žofín Forest National Nature Reserve) “for free management until 1955,” and it was not released from expropriation. This did not happen until a year later (see below).

Ensuring the conservation, protection and management of natural and cultural heritage during the implementation of land reform was complicated by a jurisdictional dispute between the State Land Office and the State Heritage Authority, which was ultimately decided by the Supreme Administrative Court¹⁰⁾, which ruled in favour of the Ministry of Education and National Enlightenment. The SLO continued to decide on exemptions from expropriation; owners submitted their applications to the SLO, listing the natural and cultural monuments they wished to retain, along with a request for additional land

to cover their maintenance costs. The SLO was required to seek the opinion of the Ministry of Education and National Enlightenment. At the Ministry, the agenda was handled by the Department of Public Enlightenment under the leadership of Zdeněk Wirth. Rudolf Maximovič prepared the statements regarding the release of natural monuments, which constituted the largest part of the agenda (Stejskal 2006). The expert opinion was drafted based on an on-site inspection and discussion with the owner and, in addition to an assessment of the monument's significance, also included conditions for its continued use. The SLO incorporated these conditions into its decision, which usually included a warning that in the event of non-compliance, the State Land Office would have the right to "continue to consider the released land and structures as confiscated and to immediately take them over and allocate them." Because the use of the exception under the Allocation Act—that is, for the purpose of ensuring the conservation, protection and management of natural and cultural heritage—allowed for a significant increase in the area of property released from requisition, and the owner was entitled to retain the properties in question provided the conditions were met, this exception was widely requested¹² This placed a heavy burden on the Ministry of Education and National Enlightenment, leading to situations where the SLO decided on the release but the specific terms were not determined until later. An example is the decision to release land from requisition in the case of the Nové Hradky and Rožmberk estates dated December 18, 1934, by which the NLO in Prague subsequently released the land from requisition based on a request from the owner – Karel Jiří Buqoy – 4,033.3 hectares of predominantly forested land, provided that "the owner complies with the conditions" to be subsequently added by the Ministry¹³.

Conditions for Release

The primary aim of the conditions was to ensure the preservation of the natural and cultural heritage. The areas were not to be reduced in size, built upon, used for quarrying, or utilized for other purposes. Forest stands were to be managed sustainably, using selective cutting, and only native woody plant species were to be used for reforestation.

For example, in the aforementioned case of the Nové Hradky and Rožmberk estates, the Ministry of Education and National

Enlightenment supplemented the conditions with a protocol in 1935, following a local investigation conducted on behalf of the Ministry by Chief State Conservation Officer Rudolf Maximovič¹⁴. According to the amended conditions, the owner was required to ensure "strict /complete/ preservation as a primeval forest in the Hojná Voda–Šejby forest district on an area of 8,561 hectares, in which any activity would be permanently prohibited. Fallen trunks were not to be utilized, except in the event of an imminent bark beetle threat or where a forest road ran through the reserve" (this refers to the current Hojná Voda National Nature Reserve), as well as in the Obora/Game Preserve forest district, to continue maintaining the "complete reserve" established as early as 1838 and permanently exclude it from commercial use (this is the core of the current Žofínský prales/Žofín Virgin Forest National Nature Reserve).

In the case of castle grounds frequently released from expropriation, the owner was required to preserve their integrity and ensure adequate maintenance. Significant changes and renovations were subject to prior approval by the heritage authority or, in the case of natural sites, by the MENE. Trees in parks were to be protected, maintained, and replaced in a timely manner in the event of death; e.g. specific protective conditions were established for non-forest trees in Babiččino údolí/Grandmother's Valley (today's National Nature Reserve) owned by the Náchod Estate: "All trees, unless they are part of forests, that form avenues, tree-lined paths, or stand individually or in groups in the meadows of the Babiččino údolí/Grandmother's Valley, especially trees distinguished by their size, age, or historical significance, shall be spared in every way possible and shall not be felled or pruned without prior permission from the State Heritage Authority."¹⁵

The terms and conditions for releasing some sites/areas placed great emphasis on making the relevant sites and buildings accessible to researchers and, in some cases, to the general public. For example, in the above case of the Náchod Estate, the State Land Office, in agreement with the Ministry of Education, Ministry of Education and National Enlightenment, stipulated to the owner, Bedřich of Schaumburg-Lippe, *inter alia*,

that all roads and trails¹⁶ would be accessible to pedestrians visiting the Babiččino údolí/Grandmother's Valley and that no motorized or other vehicles would be permitted there. It was further stipulated that "free camping, lighting fires, and walking off the trails and paths, as well as swimming in areas not designated for that purpose, shall not be permitted on the retained properties, particularly in the Babiččino údolí/Grandmother's Valley. Furthermore, the owner was required to "allow the installation, placement, and maintenance of tourist signs and directional signs," and conversely, not to permit the placement of advertising signs of any kind¹⁵. From these few selected conditions, it is clear that the SLO sought to regulate the activities of third parties through the owners.

Areas Released from Expropriation

Areas that could be released from expropriation included, *inter alia*, those designated as parks, nature parks, or areas that otherwise serve to enhance the landscape, or whose purpose is to preserve an example of the landscape's original scenery/character⁹. The criteria were general, and therefore depended on the assessment made during specific proceedings. The release of natural beauties and monuments from requisition was closely watched by the public and widely covered by the media. The scientific community proposed many sites for conservation/protection, while the public criticized the release from requisition of objects that were allegedly of no value (e.g. the garden in Červené Pečky [Pšeničková 2000]).

In total, more than two hundred sites were left in the hands of their original owners for the purpose of protecting natural monuments (as of 1930, this included 205 sites of natural beauty [Voženílek 1930]). Today, less than a third of them are protected within the Specially Protected Areas network, *i.e.* within the nationally designated protected areas. Below is a selection of only a few that are currently protected by the State Nature Conservancy.

The most common type of released sites/areas are castle parks, such as Kačina, Letovice, Paskov, Petrohrad, Veltrusy, Vinoř, and Vlašim, which today serve as refuges for a wide range of endangered species and are mostly specially protected as Nature Monuments.

Landscape units have also been protected; today, they often are the cores of National Nature Monuments, Nature Reserves, National Nature Reserves, or Protected Landscape Areas, e.g. as the Prachovské skály/Prachov Rocks, Hruboskalsko, the Adršpašské skály/Adršpach Rocks, Babičino Valley/Grandmother's Valley, Terčino údolí/Terka Valley, and the Žehuňská obora/Žehuň Game Preserve, *inter alia*. (However, some sites/areas met a different fate, e.g., the Vltava River Valley with the Svatojánské proudy/St. John's Flows rapids, which was released from confiscation on the grounds of protecting natural beauty.) Many of the virgin/primeval forest reserves were provided with protection by conditional retention with the original owner, e.g., Javorina, Kokšín, or Vrapač. Natural monuments whose protection, conservation and management justified their exclusion from confiscated property also included karst phenomena (e.g. the Mladečské jeskyně/Mladeč Caves), distinctive rock formations (e.g., Mrhatina or Mnichova skála/Monk's Rock near the town of Telč, Výrova skála/Eagle Owl's Rock near the village of Tavíkovice, etc.), veteran/memorable trees (e.g. Oldřichův dub/Oldřich's Oak in the village of

Peruc, Napoleonův dub/Napoleon's Oak near the town of Znojmo), and arboreta (e.g. the Americká zahrada/American Garden, Bukovina in the Český ráj/Bohemian Paradise).

The Benefits of Land Reform for Nature Conservation

Even already while the reform was underway, its benefits were viewed with mixed contradictory opinions. Both the SLO and the MENE highlighted the benefits (cf. SPÚ 1925), including establishing state reserves and the securing of additional ones through agreements with landowners. Moreover, a significant part of the professional community and journalists, assessed the situation much more critically¹⁷.

The World War II and post-war developments, nationalisation, the expulsion of the German population, collectivisation and socialisation of the countryside caused the breaking the owners' relationships to the land and almost wiped out the results of the First Republic land reform. All this was completed after 1989 by

the state land privatisation, which did not even attempt to take into account the objectives of the First Republican land reform. The positive impact of the reform on the agricultural landscape - the establishment of medium-sized farms and family farms and the increase in rural employment - has thus largely disappeared. The benefits of the now unimaginable interference with property rights are difficult to assess even after a century. In any case, however, the persistent efforts of the completely understaffed Department of Enlightenment at the then Czechoslovak Ministry of Education and National Enlightenment to ensure the protection of areas of natural importance as part of the land reform should be highlighted (Pešout 2019). During the First Republic, when several attempts to pass a nature conservation law failed (Pešout 2022), these efforts were the only real form of territorial protection. It can be stated that without the efforts of the above MENE's Department of Enlightenment, many sites/areas would not have been preserved, areas that today rank among the most significant Nature Reserves or Nature Monuments from a nature science perspective (Pešout 2013). ■

Notes:

¹ See, e.g. the excerpt from a speech by T.G. Masaryk: "Our homeland was a land of large estates; as a result of the forced re-Catholicization of this Hussite country by the Habsburg dynasty, nearly three-quarters of the land was confiscated and divided between the Crown and its Catholic administrators; the republic abolished the aristocracy, the owners of the large estates, took over their land, paid them a fair price for it (the enemies of our republic speak of 'land confiscation'), and distributed the land among the landless; in this way, around half a million new landowners were created. I am presenting you with only a very brief outline of our land reform, which is the greatest and most difficult undertaking of the new republican administration; it was, in fact, a great economic and social revolution—mistakes may have been and are being made, but all in all, the activity deserves the attention of thoughtful statesmen in all countries." (Masaryk & Fejlek 2003)

² "Land reform brought Czechoslovakia quite far from Eastern conditions, and was one of the forces that brought the state closer to and made it more like the West." (Peroutka 1934)

³ Section 109 of the Constitutional Charter No. 121/1920 Gazette of Laws and Regulations, dated February 29, 1920; Act No. 121 of February 29, 1920, enacting the Constitutional Charter of the Czechoslovak Republic.

⁴ No. 32/1918 Gazette on the Seizure of Large Estates, dated November 9, 1918.

⁵ No. 215/1919 Gazette on the Confiscation of Large Landholdings, dated April 16, 1919.

⁶ "Large landholdings are defined as groups of real estate properties, together with the rights associated with their

ownership, where the total area located within the territory of the Czechoslovak Republic and owned by a single person or by the same co-owners exceeds 150 hectares of agricultural land (fields, meadows, gardens, vineyards, hop fields) or 250 hectares of land in total. Unmarried spouses are considered a single person" (Section 2 of Act No. 215/1919 Gazette., as amended⁹).

⁷ Act No. 81 of January 30, 1920, which, pursuant to Section 10 of Act No. 215 of April 16, 1919, as amended, establishes provisions regarding the allocation of confiscated land and regulates the legal relationship with respect to the allocated land (the Land Allocation Act).

⁸ Act No. 329 of April 8, 1920, on the Acquisition and Compensation for Confiscated Real Property (Compensation Act).

⁹ According to Section 20 of the Land Allocation Act⁷: "When drawing up the plan, the State Land Office shall ensure that the allocation does not impair the natural beauty or scenery/character of the landscape and that it does not damage natural, historical, or artistic monuments. To this end, the State Land Office may authorize that areas designated as parks, nature parks, or areas otherwise serving to enhance the landscape, or whose purpose is to preserve an example of the original scenery/character of the landscape, or to secure and protect historical monuments and their closely related surroundings, be left to the owner in addition to the area of land which, pursuant to Section 11 of the Act of April 16, 1919, No. 215 Gazette of Laws and Regulations, may be released from expropriation to the current owner if the owner complies with the conditions set by the State Land Office in agreement with the relevant ministries regarding the accessibility of those sites to the public, to scientist and artists, or their use for philanthropic purposes."

¹⁰ Judgment No. 22763 of the Supreme Administrative Court, dated December 23, 1924.

¹¹ State Land Office in Prague, Decision No. 33532/28-II/3 dated March 22, 1928.

¹² By 1933, under the Land Allocation Act (Section 20⁹), 803,072 hectares of land had been released from requisition to 600 landowners (Pšeničková 2000). A total of 1,178,758 hectares were released from requisition, of which 67,989 hectares were agricultural land (Peichlová 2011).

¹³ State Land Office in Prague, Decision No. 67649/34-II/1 dated December 18, 1934.

¹⁴ Report of June 28, 1935. Reservation Book of the Žofínský prales/Žofín Primeval Forest National Nature Reserve, Box No. I, Nature Conservancy Central Register, Nature Conservation Agency of the Czech Republic Prague.

¹⁵ State Land Office in Prague, Addendum Ref. No. 158006/31-II/1 dated September 11, 1931, to Decision Ref. No. 146025/26-II/2 dated February 17, 1927.

¹⁶ Excluding the path leading past the gazebo to Bažantnice/Pheasantry, see ¹⁵

¹⁷ "...the State Land Office should not even mention its own contribution to establishing nature reserves in the Šumava/Bohemian Forest Mountains virgin/primeval forests, the national parks near Karlův Týn/Karlstein, and the Adersbachské skály/Adersbach Rocks. — Or should the virgin/primeval forests, which foreign nobles have preserved for generations, for centuries, be cut down, and should quarries be opened in the Adersbachské skály/Adersbach Rocks...?" (Batěk 1925).

About the Soutok with Pavel Pešout

The designation of a protected area at the confluence of the Morava and Dyje/Thaya rivers took nearly fifty years to discuss. Why did it last so long?

During communism, most of the area was part of an inaccessible border zone. Moreover, as of the 1950s, the construction of “great socialist projects” was considered, for which nature conservation would have been an obstacle. Unfortunately, some of them were implemented. The strongest negative impact on the Dolnomoravské luhy/Lower Morava River Floodplains are caused by water management adjustments, involving straightening, deepening, and embanking of the Dyje/Thaya and Morava rivers. And the Nové Mlýny waterworks put an end to periodic flooding of the floodplain forest. That is fortunately definitely an issue of the past – *inter alia*, for the doubtful economic benefit of the megalomaniacal plan to connect the Dunaj/Danube, Odra/Oder and Labe/Elbe rivers, including harbours and related infrastructure, which would also have meant direct land deprivation.

Another reason why the unique Dolnomoravské luhy/Lower Morava River Floodplains were not designated a protected area was the perceived conflict with hunting interests and differing views of conservationists and foresters on land management. The last attempt at area conservation 15 years ago was thwarted by spreading false information about the negative impact of a Protected Landscape Area on the lives of the local people. For example, rumours went round that access to the forests would be totally prohibited. Even during the process of PLA designation, various false claims were spread, for example that designation would jeopardise the drinking water supply for 70,000 residents.

When did things start to change, and what was the impulse in your opinion?

Over five years ago, several important events took place. There were protests of local inhabitants against intensive clear-cutting in floodplain forests, which culminated in a petition to save the so-called “Moravian Amazon”. Gradually, also national scientific societies followed. Even the European Commission pointed to the inadequate protection of the area, which is part of the European Union’s Natura 2000 network.

In 2019, the Nature Conservation Agency of the Czech Republic (NCA CR) further decided

to publish all information, documents, and decisions concerning the protection of the area at the confluence of the Morava and Dyje/Thaya rivers on a special website. In that time also the dispute between conservationists and foresters culminated with the rejection of forest management plans. That conflict was later solved, and an agreement was reached on management practices for the conservation of Specially Protected Species.



Pavel Pešout

All previous events, often commented on in the public media, had an impact on politics as well, and several political parties included protection of this unique area in their election programmes. Subsequently, the protection of the “Moravian Amazon” was incorporated into the Government of the Czech Republic’s policy statement.

As the Minister’s representative for Protected Landscape Area (PLA) designation, which strategy did you choose in the negotiations?

In my opinion, the most crucial decision had been to discuss the proposal in detail with representatives of municipalities, farmers, associations, and other stakeholders even before the official designation process started. We had about three hundred meetings and met with

everyone interested. Their goal was to include into the PLA’s delineation and specific protection measures all possible comments, so that the final proposal would reflect the broadest possible consensus within the region. I think such an approach contributed to the very small number of objections: only five to the zonation, and just nine to the delineation and specific protection measures. Many other ones were identical and sent on behalf of the same lawyer, and their contents and form of submission indicated an attempt at obstruction and making the designation process difficult and troubled.

During the negotiations, many questions and doubts arose. We were able to explain all of them and also to record and publish them with responses on websites. The web included an interactive map of the area, where each landowner, farmer, and stakeholder could gather detailed information about e.g. PLA boundaries and proposed zonation.

Will the change affect the residents of the new PLA in any way?

The Soutok/Confluence PLA has been delineated in a way excluding human settlements. Nevertheless, most of the area is situated in a flood zone, so the designation does not restrict building activities. This eliminates the most common source of disputes and debates in the PLA. The PLA regulations do not restrict leisure and recreation activities in the landscape, nor do they restrict access, collection of wild berries, etc. Restrictions may apply to forestry and agricultural activities on meadows and in forests in stricter protection zones. In such a case, however, the owner is entitled to be compensated. Where possible, we have tried to satisfy farmers, we have made agreements on management issues with the largest enterprise in the area, Forest of the Czech Republic, State Enterprise, we have lowered the protection level e.g. of the premises of Lednice Castle in consultation with the National Heritage Institute, we have taken into account the demands of the Obelisk Gamekeeping Forest owner, and as recommended by the South Moravian Regional Authority, major roads have received the lowest protection level. Based on suggestions from farmers and hunting and fishing associations, also specific protection measures have been amended.

What was a pleasant surprise for you?

Certainly, the commitment of everyone willing to protect, conserve and manage our natural and cultural heritage was the most positive aspect. We did not have to convince anyone about the extraordinary values of the area. The responses from most local governments were positive, just as the ongoing support for the PLA designation by the South Moravian Region and both municipalities with extended competence. The petition supporting the designation, signed by more than 15,000 people, including several thousand local residents, was another boost.

What, on the other hand, was unpleasant?

The group of real opponents of the area's protection consists of just a few individuals with partial private or development interests in the area, but even the discussions with them were constructive.

However, I regret that we have not been able, despite repeated negotiations, to reach greater consensus with the hunters, with whom we collaborate in many other areas on the implementation of various measures benefiting endangered species or improvement of the landscape.

If we try to compare, when the Kokořínsko/Kokořín Region PLA had expanded to include the Mácha's Country nearly ten years before the Soutok/Confluence PLA and Brdy Highlands PLA were designated, were the negotiations fundamentally different? Has the attitude of local governments and the public changed?

The attitude of local governments is comparable. Their representatives are interested in informing the residents and finding the best solution for their territory, ensuring a good place to live, and in developing the community sustainably. Of course, we live in a time of fast spreading information, including misinformation, and it is important that officials can form their own opinion and maintain, defend, and explain that opinion persistently and consistently.

What recommendations regarding communication can be drawn for the designation of any further areas?

We will definitely make an evaluation, but not just now – it has still been too fresh. However, we can already draw some conclusions. It is necessary to involve the locals as early as possible. That is, during the drafting of a proposal to designate a protected area, even before the official designation process begins. It is also important to keep local residents and organisations supporting the

protection of an area informed. Both approaches clearly proved to be effective in the case of the Soutok/Confluence PLA.

I must also mention one internal recommendation. Next time, we will need to consider if the internal capacity of the State Nature Conservancy is sufficient before we initiate the process of designating another large-size Specially Protected Area. For the designation of Soutok/Confluence PLA, nobody at the NCA CR was specifically assigned, so everyone at the headquarters and at our South Moravian Regional Branch, handled this matter beyond their regular duties. Our sincere thanks go out to all colleagues who spent their free time on designating the Soutok/Confluence PLA two years long. I realise that such commitment cannot be taken for granted.

As of July 1, 2025, the PLA Administration will be fully operational. What should it concentrate on?

The first task is to develop a management plan for Soutok/Confluence PLA, including all the outcomes and commitments from the discussions. Advisory board should be established, in which many local governments have expressed interest. We would further like to develop projects for restoring hydrological conditions in floodplain forests, on improving meadow management for biodiversity support (including pollinators), on the treatment of ancient oak trees and support of promising trees which could eventually replace them, etc.

Are there any other areas in the Czech Republic which deserve large-size special protection?

There have still been plenty of such valuable areas in our country - besides the Krušné hory/Ore Mts. also the Novohradské hory/Gratzen Mts. and Rychlebské hory/Golden Mts., and the Středomoravské Karpaty/Central Moravian Carpathians. The decision on which area will be designated depends primarily on support from local governments, as was already the case with the recently designated PLAs. Of course, an area must meet the necessary quality criteria, but expert/technical criteria will probably always come in second place after support from local residents, when it comes to the decision which one to designate.

In any case, in the current "post-fact" era with people generally having little trust in public institutions, the media, and even the scientific community, and where a lack of critical thinking

makes them susceptible to misinformation, it will be difficult to designate any new large-size Specially Protected Areas. Plans for designating often become a battleground for various groups of people with contradictory demands, and nature unfortunately often comes in last place. ■

Pavel Pešout graduated from the Czech University of Life Sciences, Prague in 1993. In 1991–2004 he was with the Mt. Blaník Protected Landscape Area (PLA) Administration (Central Bohemia). At the Ministry of the Environment of the Czech Republic, he later served as Advisor to the Minister (2003–2007) and was member of the Scientific Council (2002–2007). From 2003 to 2007 he was member of the Government Council for Sustainable Development. In 2004–2005 he was Deputy Director for Expert/Technical Affairs at the Nature Conservation Administration. Since 2006 he has been heading the Nature Conservation and Landscape Protection Section and is Deputy Director of the Nature Conservation Agency of the Czech Republic (NCA CR). He prefers dealing with landowners and farmers in nature protection, conservation and management and landscape management. Pavel Pešout has promoted the use of management agreements in the form of public-law contracts and has also designed and now manages a standardisation system in nature conservation. He also is a co-author of the "House of Nature" Programme.

Pavel Pešout has been a member of the Minister of Justice Advisory Board on Water Management, Nature Conservation, and the Environment since 2017. As of 2020 he is also involved in the Czech Commission for UNESCO's activities.

He has also long been involved in nature conservation as a volunteer. In 1990 he founded the Vlašim Chapter of the Czech Union for Nature Conservation, and served as its chairman for thirty years. From 1994 to 2006, he served on the National Board of the Czech Union for Nature Conservation (from 2003 to 2006 as President). He was one of the founders of Union programmes such as Space for Nature, National Wild Animal Rescue Station Network, and Biodiversity Conservation, and stood at the rebirth of the Krása našeho domova/Our Homeland's Beauties magazine.

Summary of 2025 Issues

On Nature in the Czech Republic

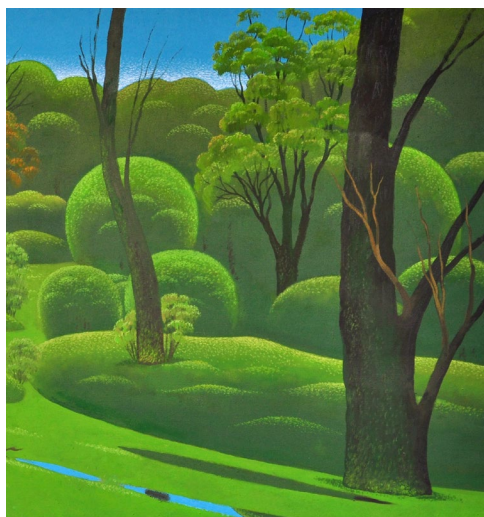
Mikuláš I., Volf V., Volf O. & Tejrovský V.: New Special Protection Area – the Western Krušné hory/Ore Mountains

As of 1 January, 2025, the 42nd Bird Area (pursuant to Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection, as amended later, the term for Special Protection Area, SPA under the European Union's Birds Directive) in the Czech Republic has been declared in the extremely valuable Krušné hory/Ore Mountains western edge, which has long been neglected in terms of bird conservation. The Western Krušné hory/Ore Mountains Bird Area focuses on the protection and conservation of two bird species, namely the Black grouse (*Lyrurus tetrix*) and the Boreal Owl (*Aegolius funereus*), also known as the Tengmalm's owl. The inclusion of the site in the EU Natura 2000 network aims to substantially strengthen the protection of their habitats and ensure the long-term stability of their populations. The new Bird Area is naturally linked to two existing ones in the Krušné hory/Ore Mts.: the Eastern Krušné hory/Ore Mts. and the Novodomské Peatbog - Kovářská. These were also designated primarily to protect the Black grouse, one of the most endangered bird species in Central

contribute to the conservation of the unique Krušné hory/Ore Mts. nature.

Pešout P. & Koukal S.: The Soutok/Morava and Dyje/Thaya Rivers Confluence Protected Landscape Area Declared

By Decree of the Government of the Czech Republic approved 15 January 2025, the Soutok/ Morava and Dyje/Thaya Rivers Confluence Protected Landscape Area (PLA) located in South Moravia was declared the



Displaying 676 documented saproxylic beetle species, the Soutok/Morava and Dyje/Thaya Rivers Confluence PLA is one of the most important areas in the whole of Central Europe in this respect. Almost half of the butterfly species (1,670) known from the whole Czech Republic's territory have been recorded there. The rich spider fauna is mainly related to the hrúdy (native tops of sand dunes the vicinity of which was step-by-step infilled with deposits made by floods). The area is also a hotspot for dragonflies (52 species). Unique fish communities have developed there, and the area is extremely valuable also for amphibians. In total, 249 bird species are known from the floodplain landscape. Therefore, the Soutok/Morava and Dyje/Thaya Rivers Confluence PLA protects a unique floodplain landscape with an unusually high biodiversity.

Horál D.: Birds of Prey of the Floodplain Landscape at the Soutok/Morava and Dyje/Thaya Rivers Confluence

The Soutok/Morava and Dyje/Thaya Rivers Confluence Protected Landscape Area (PLA) situated in South Moravia is one of the Czech Republic's most important areas for birds of prey at least in Central Europe. The nesting sites and the place of large numerical con-

27th Protected Landscape Area in the Czech Republic. The floodplain landscape in the area of the confluence of the Morava and Dyje/Thaya Rivers has been proposed for protection since the middle of the last century. Since then, the area has been negatively affected by intensive farming and dramatic changes in the water regime due to water management. In spite of this, it has still been harbouring a unique landscape with a concentrated extraordinary natural and cultural heritage, which has led to its inclusion on many prestigious European and world lists in recent decades. The Soutok/Morava and Dyje/Thaya Rivers Confluence PLA consists of a complex of floodplain forests, meadows and a dense network of watercourses, dead and disused, permanent and periodically flowing channels, canals and pools. The confluence is a valuable example of wild animal communities associated with the large river floodplain.



centrations of two eagle species and both of kite species (*Milvus* spp.) occurring in the Czech Republic have attracted the attention



Europe. Extending the territorial protection in this direction is a significant step towards the Black Grouse's preservation and will also

of ornithologists, birdwatchers and raptor fans for almost a hundred years. The first findings about birds of prey in this area were published by the founding fathers of South Moravian ornithology as early as in the 1940s. At least ten species of birds of prey regularly nest in the Soutok/ Morava and Dyje/Thaya Rivers Confluence PLA, three more species reproduce in its immediate surroundings so that they would at least occasionally breed in the PLA itself (the Western marsh harrier *Circus aeruginosus*, the Montagu's harrier *Circus pygargus* and the Saker falcon *Falco cherrug*). Eight species occur regularly on the flyway or during the winter, and four species are either only historically recorded or have occurred recently but literally exceptionally there. From the point of view of raptor protection and conservation, it is important that most of the area is located in the hunting grounds owned and managed by the Forests of the Czech Republic, state enterprise, namely by the Židlochovice Forest Enterprise. The fact reduces the possibility of conflict with game management and hunting because it focuses on the keeping hoofed game, not small game. Thus, there is no direct persecution of raptors (shooting, poisoning), as we know from other, mainly hunting grounds in farmland.

Vébrová D. & Härtel H.: 25 Years of Forest Development in the České Švýcarsko/Bohemian Switzerland National Park (Northern Bohemia)

Sandstone rock areas are generally considered to be very dynamic in natural development. After 25 years of the České Švýcarsko/Bohemian Switzerland National Park's existence, even regular visitors can see the relatively sudden and extensive changes in forest ecosystems. From a natural science perspective, the processes have resulted in a higher proportion of natural forest features, e.g. dead wood, succession and regeneration stages, spatial diversity of the forest, and the decline in mature and compact Norway spruce (*Picea abies*) stands, which were previously so typical of České Švýcarsko/Bohemian Switzerland. Direct human intervention, which was preferred in the National Park's early days, has had only a minor impact on the transformation of the forest. The interventionist approach to forest management in the first 15 years of the National Park's existence was chosen with the aim of locally accelerating the transformation of the species composition in originally cultivated/

commercial spruce stands in secondary habitats, promoting age and spatial diversity, and removing the invasively spreading Eastern white pine (*Pinus strobus*). Since the climatically extreme year of 2017, disturbance events have



become more prevalent, triggering droughts, wind breakages, and increasing European spruce bark beetle (*Ips typographus*) outbreaks, the latter affecting almost the entire National Park's territory between 2018 and 2022 and killing almost all adult spruce trees there. At the same time as the European spruce bark beetle plague came to an end, another disturbance event occurred in July 2022 - a large wildfire damaging an area of 1,060 hectares in the town of Hřensko and its part of Mezní Louky area and intensively altered all forms and stages of the forest through which it passed. The unaffected natural processes, which completely prevailed over human interventions, are a significant approximation and, to a large extent, the meeting the National Park's long-term goal.

Luka V.: Wings above the Rock Towns: The Story of the Eagle Owl and the Peregrine Falcon in the Český ráj/Bohemian Paradise Region

The Eagle owl (*Bubo bubo*) and the Peregrine falcon or Peregrine (*Falco peregrinus*) – two powerful predators that symbolize the wildness and resilience of nature in the Český ráj/Bohemian Paradise region. In the past, both species had faced intense pressure from humans. Legal protection adopted in the 1920s had a positive effect on increasing the number of peregrines in the above region until the early 1950s. Both species

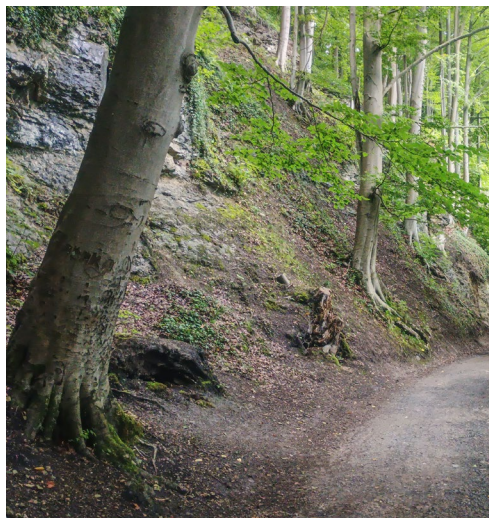
thus found themselves on the brink of extinction, and peregrines did not nest in Český ráj/Bohemian Paradise for several decades. Over time, however, thanks to targeted conservation efforts, the situation has changed.



Strict legislative measures, bans on harmful chemical substances, and targeted conservation programmes have helped both species to recover. Therefore, the first nesting of the Peregrine falcon in recent times was documented in 2001, after more than 35 years. Today, both the Eagle owl and the Peregrine falcon have stable populations in the Český ráj/Bohemian Paradise, numbering in the low tens. The PLA Administration monitors both species annually. Falcons are observed as early as February, when they perform courtship flights, indicating their efforts to occupy nesting sites. Nesting itself is then confirmed when the young are fed, when the flight activity of both parents reaches its peak and the nest is relatively easy to spot. Eagle owl's territories are identified during the winter months, especially in February, when their vocal activity peaks during mating and territorial defense. Unlike falcons, however, we have to rely solely on vocalizations, and due to their nocturnal activity, Eagle owl's nests are not easy to be found even during the spring months and when the young are fledging.

Višínský J.: Scree Forests near the Town of Turnov – a New Nature Reserve in the heart of Český ráj/Bohemian Paradise

In 2025, a new Nature Reserve called Scree Forests near Turnov was declared in



the Český ráj/Bohemian Paradise region. Moreover, protection of the site did not begin with the declaration of the Nature Reserve, but the first significant step was taken in 2002, when it was included in Zone II of the extended Český ráj/Bohemian Paradise Protected Landscape Area. Two years later, it became part of a Site of European Importance (SEI, pursuant to Act No. 114/1992 on Nature Conservation and Landscape Protection, as amended later, the term for Site of Community Importance, SCI, later Special Area of Conservation, SAC, under the European Union's Habitats Directive). The reserve covers an area of approx. 7.3 hectares, with a buffer zone covering an additional 5.6 hectares. It is located on the rugged slopes of the Jizera River Valley in the cadastral areas of Turnov, Bukovina u Turnova, and Bělá u Turnova. The dominant features of the area are scree slopes and rock outcrops formed by calcareous sandstones. The forest stands consist mainly of Sycamore (*Acer pseudoplatanus*), linden (*Tilia* spp.), and European or Common ash (*Fraxinus excelsior*) trees, while the herbaceous layer includes, *inter alia*, the Perennial honesty (*Lunaria rediviva*), Nine-leaved toothwort (*Dentaria enneaphyllos*) and the Martagon lily (*Lilium martagon*). One of the unique geomorphological features found in the area is the Dolánecký vodopád Waterfall, also known as the Myšina Waterfall. It was formed as a suspended waterfall on a rocky defile of sandy marlstone, which was shaped by the lateral erosion of the Jizera River in the valley's lower part. Originally reaching a height of up to 18 meters, today it measures approx. 12 meters, as erosion processes and frost weathering in waterlogged rocks are gradually reducing

its profile. Although the area has been now protected by stricter regulations, it remains open to the public. Visitors can explore diverse habitats ranging from scree slopes to wet springs and rock faces, and experience nature that has retained its natural character.

Mareš J., Bruthans J. & Filippi M.: Bohemian Paradise – a Natural Geological Laboratory of Global Significance

From a geological point of view, the Český ráj/Bohemian Paradise region is an exceptionally interesting and significant area, where

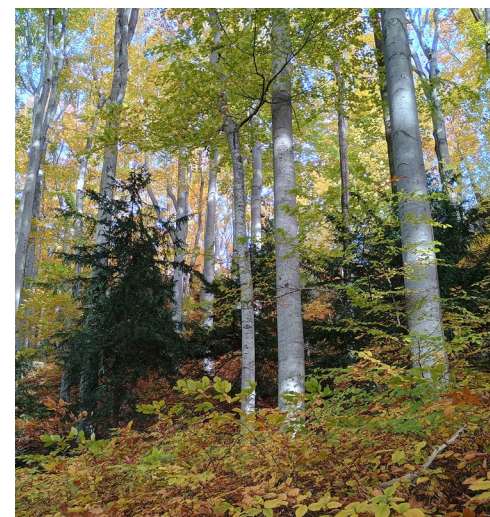


rocks of various origins and compositions are concentrated in a small area. That is why we can see sandstone rock formations, volcanic remnants, and even well-developed karst formations there. In addition, there are many interesting and beautiful minerals to be found there. Thanks to its exceptional geological diversity, Český ráj/Bohemian Paradise was included into the European Geoparks Network in 2005 and has been part of the UNESCO Global Geoparks Network since 2015. More than 200 geological and mineralogical sites can be found there within a relatively small area. The famous explorer and naturalist Alexander von Humboldt even called Trosky Hill with its castle ruins the eighth wonder of the world. A significant part of Český ráj/Bohemian Paradise is made up of Hrubá Skála block sandstone. In the vicinity of the village of Troskovice, there is a special type of this sandstone, known as locked sand, which has no cement between the grains, giving it specific properties. The karst in the Turnov area suggests that karst

channels may also form in other areas of the Bohemian Cretaceous Basin where calcareous sandstones occur, which would make it the largest karst area in the country. The presentation of the discoveries described above has led to a significant shift in knowledge in the field of sandstone area studies, confirming the importance and renown of the Český ráj/Bohemian Paradise.

Šafář J. & Havira M.: Špičák is Not Just about Caves

The landscape north of the town of Jeseník (northern Moravia) offers a large number of low, wooded hills. But only one between the villages of Písečná and Supíkovice hides a number of treasures. Across the Na Špičáku National Nature Monument (NNM), a rocky ridge approximately 260 m long stretches from the north-northeast to the south-southwest, with its highest point, Mt. Velký Špičák, reaching an altitude of 516 m a.s.l. In the gentler terrain below the rocky ridge, flowering beech forests of the *Mercurialis perennis*-Fagetum association predominate, with the main tree species being the European beech (*Fagus sylvatica*), Norway maple (*Acer pseudoplatanus*), Sycamore maple (*Acer platanoides*), and the Small-leaved lime (*Tilia cordata*). The tree layer on the steeper slopes is complemented by tree species typical of scree forests, such



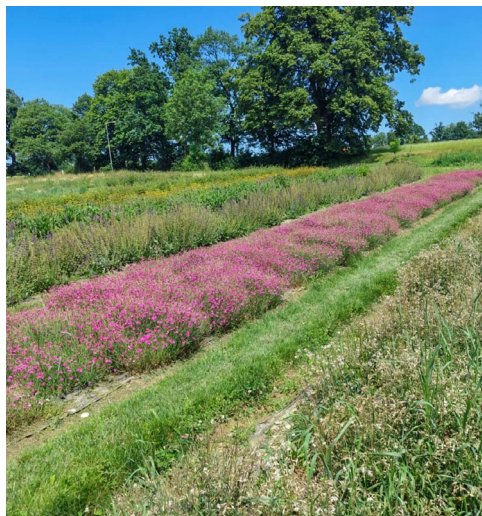
as the Large-leaved lime (*Tilia platyphyllos*) and Wych elm (*Ulmus glabra*). The shrub layer includes the Alpine rose (*Rosa pendulina*) and several specimens of the Common juniper (*Juniperus communis*). The highly endangered European yew (*Taxus baccata*), which

occurs across the described stands, deserves a separate discussion. According to a survey conducted in 2023, 258 specimens taller than one meter were recorded there. If local sources of reproductive material are to be used for its further spread or return to the Jeseníky Mts. forests, this is the optimal option. In 2021, the local stands were therefore recognized as a source of reproductive material. Yew trees of all ages are represented there, from seedlings and young trees to individuals around 200 years old. The most significant wild animal group in the Na Špičáku NNM is bats. The area is also included in the European Union's Natura 2000 network as a Site of European Importance (SEI, pursuant to Act No. 114/1992 on Nature Conservation and Landscape Protection, as amended later, the term for Site of Community Importance, SCI, later Special Area of Conservation, SAC, under the European Union's Habitats Directive) with the Lesser horseshoe bat (*Rhinolophus hipposideros*) as the subject of protection.

Nature & Landscape Management

Straková M., Jongepierová I., Raab S., Musil Z., Gluzová D., Doležalová P., Čížek M., Vítovcová K., Kadaš D. & Bauer P.: Current Availability of Regional and Species-enriched Mixtures in the Czech Republic

The importance of regional mixtures (RM) and species enriched mixtures (SEM) continues to increase as biodiversity in the landscape has been steadily declining in the Czech Republic. Although seed availability remains a problem, not only is the number of areas where RS or DOS can be obtained increasing, but there are also more and more competent enthusiasts striving for the sustainable availability of mixtures. Mixtures are gradually being developed, whether in collaboration with a regionally competent NGO, research institute or seed company. The greatest challenges in obtaining regional or species-enriched mixtures are mainly the lack of knowledge about collecting and growing a diverse range of plants in nurseries, sharing of experience, time and physical demands, registration of seed by the Central Institute for Supervising and Testing in Agriculture (CISTA), ensuring seed purity for registration and machine sowing, and ensuring seed germination, care of the nurseries including machine harvesting,



sufficient number of dedicated staff, economic creation of a mixture composition that is both affordable and of high quality, lack of space for seed drying, storage and handling, high cost of mechanization for seed care, harvesting and cleaning, and lack of native Czech varieties in grass species.

Neuwirthová H.: Evaluation of the Action Plan/Recovery Programme for the Bohemian Early Gentian

The Action Plan/Recovery Programme for the Bohemian Early Gentian (*Gentianella praecox* subsp. *bohemica*) was approved by the Ministry of the Environment of the Czech Republic in 2011. Its implementation has been going on long enough to assess the results achieved



by the joint efforts of the whole implementation team. The number of people involved in the Action Plan/Recovery Programme is

higher compared to most other Action Plans/Recovery Programmes carried out in the country. This is due to the fact that the Bohemian early gentian's distribution range extends over six regions, i.e. sub-national administrative units in the Czech Republic. Habitat management is the basis of the whole Action Plan/Recovery Programme and a number of other measures contributes to ensuring or improving the management at the sites. Most of the proposed measures have been partially or fully implemented. It is already clear that the long-term objectives of maintaining or improving the number and size of populations will not be achieved in their current form. The past period has been significantly affected by several extremely dry years, a relatively new phenomenon that will definitely have to be taken into account in the future. However, it is very likely that, especially without systematic monitoring and follow-up management, the status of the vascular plant's populations in the Czech Republic would be significantly more pessimistic. For the Bohemian early gentian, the Action Plan/Recovery Programme is an appropriate tool, as agreed by the entire implementation team, including the Ministry of the Environment of the Czech Republic.

Vrška T.: Fewer Trees More Trees for Everyone

In connection with the declaration of the Soutok/ Morava and Dyje/Thaya Rivers Confluence Protected Landscape Area (PLA), South Moravia, it will be necessary to define management methods graded according to nature conservation zones, particularly in forests as the most extensive ecosystem occurring there. In Zone III and partly in Zone II, one of the future management models may also be that of value-added increment oak management, which may replace the current clearcutting oak management. The model will not reduce the yield from forest management for the Forests of the Czech Republic, state enterprise (the manager of the majority of the forests in the new PLA). At the same time, it can enhance the diversity of the environment and provide better conditions for supporting the biodiversity for which the Soutok// Morava and Dyje/Thaya Rivers Confluence PLA was designated. The Pedunculate oak or English oak (*Quercus robur*) is the most important commercial/production tree species of the South Moravian floodplains and it also



is a woody plant species supporting a very specific biodiversity, especially if the oaks are solitary or marginal individuals. The model is not a groundbreaking discovery, it has been applied for a long time, most notably in France, and can be used as a model on many estates. The transition to the value increment model is slow, and there is no point in experimenting with it in stands older than 80 years - the trees will invariably produce a lot of excrescences from the tree trunk because, due to their higher density per unit area, they have small, narrow, elongated crowns and cannot overcome the stress caused by opening the canopy. On the other hand, it can be safely implemented in all existing stands under 50 years of age, while a more cautious approach should be taken in stands 50-80 years of age with regard to the production of excrescences by the stem. Today, in the South Moravian floodplains, the oak clear-cut/main felling stands are harvested that were established by the Liechtenstein foresters. None of today's protagonists of the change in forest management will live to see the outcome of the transformation, but it has been known that this model works elsewhere and we need not fear an experiment with an unknown end.

Sychra J., Bojková J. & Janáč M.: Does Building Pools Contribute to Biodiversity Conservation in Farmland?

Solving problems of wetland loss and degradation has currently been almost exclusively limited to the construction of new pools, ponds and reservoirs. This is a specific Czech way of approaching the aquatic habitat restoration. In the neighbouring countries, there has never

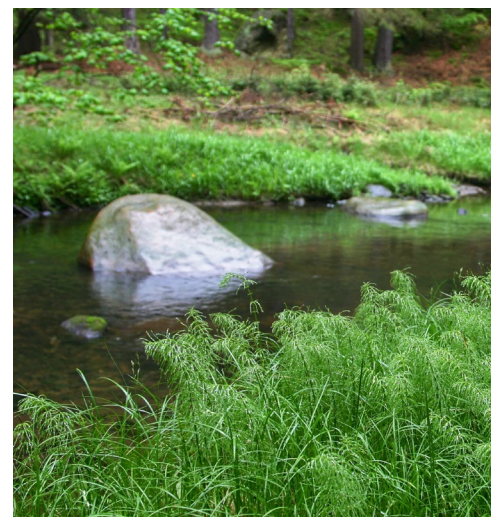
been such a boom in building new pools as in the Czech Republic. According to the standard elaborated by the Nature Conservation Agency of the Czech Republic, man-made/artificial pools are supposed to fulfil the objectives of promoting nature conservation, especially strengthening and enhancing biological diversity. Research on wetlands in the agricultural landscape conducted by the authors is carried out in South Moravia where dredging of pools and reservoirs is a huge phenomenon. Between 2009 and 2023, more than 600 new small water bodies were built there, including more than 490 pools at a total cost of CZK 1.36 billion (EUR 54 million). In terms of investments in aquatic ecosystems, projects for the



construction of pools, *i.e.* water bodies without outlet facilities, were the most common, together with the construction of water reservoirs with outlets (effectively fishponds). The problem arises especially when pools are planned and built on valuable habitats. A survey of more than 120 sites across South Moravia has shown that new pools face a number of difficulties, the most pressing of which are poor, sometimes appalling, water quality, lack of management resulting in rapid reed growth and early colonisation by fish, particularly invasive alien ones. If we want to help bring back water and with it wetland habitats and their biodiversity, change should start with a different set of rules aimed at better practice, in particular taking into account the current character of the sites, allowing the establishing dry habitats and pools with outlets in case of polluted water or overpopulated invasive alien fish, and, above all, clear support for other types of ecosystem restoration fully respecting the needs of the particular site.

Härtel H., Pergl J., Perglová I. & Bauer P.: Non-native and Invasive Alien Species Management Strategy at the Regional Level: An Example from České Švýcarsko/Bohemian Switzerland

Invasive alien species are one of main threats to biodiversity worldwide. While at the global level, efforts to eradicate or at least control some invasive alien species may seem difficult or even impossible, at the regional (= sub-national) to local level, their management can be very effective. A differentiated approach to both the selection of invasive alien species and the space and time in which eradication/control may (or may not) be effective is proving to be a key factor. Just such an approach has been chosen for the new Non-native and Invasive Alien Plant Species Management Strategy in the České Švýcarsko/Bohemian Switzerland National Park and the Labské pískovce/Elbe Sandstones Protected Landscape Area 2025-2041 (hereinafter the Strategy), which can also serve as a methodological inspiration for other Specially Protected Areas in the Czech Republic. The Strategy defines priority objectives, which are to inform and involve the public and other target groups, to improve or maintain the current status of the sites of extraordinary value from a point of view of nature conservation and ensure their permanent monitoring and management, to prevent the 2022 fire site from becoming a centre of plant invasions in the České



Švýcarsko/Bohemian Switzerland National Park (NP) for selected species, to ensure monitoring and management at key sites for further invasive alien species spreading (especially along watercourses). The strategy is a comprehensive matrix combining 4 types of sites in terms of

management objectives, approx. 50 invasive species and a range of 5 levels of management intensity. The most important species concerned are the Tree of heaven, also known as the *Ailanthus* tree (*Ailanthus altissima*), Giant hogweed (*Heracleum mantegazzianum*), poke-weeds (*Phytolacca* spp.), Wild black cherry (*Prunus serotina*), Eastern white pine (*Pinus strobus*) and the Narrow-leaved ragwort (*Senecio inaequidens*). The Strategy should be regarded as a starting point only, which must be followed by the preparation of an action plan specifying the necessary procedures and measures as well as the detailed responsibilities of NP's individual units or staff.

Kosejk J. & Truhlárská P.: The Territorial System of Ecological Stability Plans in Protected Landscape Areas: A Step towards Better Nature Conservation

The Nature Conservation Agency of the Czech Republic (NCA CR) has been updating the Territorial System of Ecological Stability (TSES, a multilevel ecological network) plans for a long time. In 2021-2023, it implemented a project called 'TSES plan in Protected Landscape Areas', the output of which was the preparation of the current TSES plan for 20 Protected Landscape Areas (PLAs) managed by the NCA CR. Currently, the NCA CR is preparing an update of the TSES plan for the remaining 5 PLAs under its man-



agement and for the proposed Krušné hory/Ore Mountains PLA. The basic methodological basis was the updated Methodology for the TSES delineation (Ministry of the Environment of the Czech Republic 2017), with more emphasis on the specific biological aspects of the area under

consideration, namely a greater inclusion of selected natural habitats. The main principle of the TSES delineation was taking into account the current state of the landscape. The biogeographical representativeness principle, i.e. that potential natural ecosystems on more than 95% of the Czech Republic's territory are forest ecosystems, and therefore that representative biocentres (= core areas of the ecological network) must be mostly forest ones, was not applied there. The division into natural and anthropogenic TSES was not used, too. During the procedure, special emphasis was placed on grassland, woodland and aquatic ecosystems. These sites are often more valuable and harbour higher biodiversity than compact forest cover. It is therefore desirable to preserve the diversity and mosaic nature of these TSES components and to favour regular mowing over afforestation. As a result, the TSES plans for individual PLAs are used as a basis for the preparation of territorial/land-use planning documentation, TSES projects, the implementation of comprehensive land management, forest management plans and water management plans.

Dušek M., Bureš P., Hromádka R. & Bogdan V.: Biological Surveillance on Transport Construction Sites

Infrastructure and transport constructions in the countryside (and not only there) usually pose a major impact on nature and the landscape. The negative impacts can be reduced to a large extent by a complex of mitigation and compensation measures. However, all measures must be implemented correctly, including often crucial details, which is unfortunately not a given. A large part of the measures is ordered by State Nature Conservancy authorities under exemptions from the protection conditions for Specially Protected Species, but they may also result from the conditions of the EIA binding opinion and other permits. Fortunately, a condition requiring the developer to carry out biological surveillance has therefore become a standard part of the relevant permits. This is important because it ensures that all conditions are complied with and fulfilled throughout the construction process. Therefore, the primary task of the bio-surveillance is to carry out an environmental risk analysis. In addition, it is necessary to monitor compliance with deadlines (e.g. for tree felling, soil clearance or alteration and relocation of watercourses), the construction and maintenance of temporary

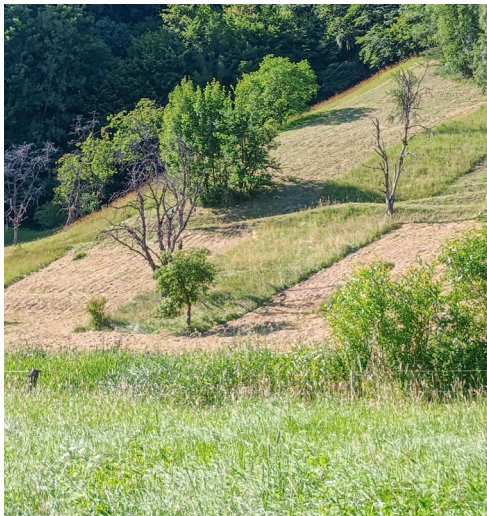
migration barriers, the implementation of certain construction works such as watercourse alterations and, last but not least, the felling of trees and their compensatory planting. In addition, the biological surveillance carries out rescue wild plant and animal transfers and continuously monitors the entire construction. In the future, it is essential that bio-surveillance becomes a standard feature of all large-scale construction projects, both during the design and operational phases. It is necessary to convince all actors, including contractors, through the individual cases in practice that early and preventive treatment of all environmental conditions will simplify and speed up their activities. Such an ap-



proach will reduce serious conflicts during construction and raise the profile of the State Nature Conservancy in the sector.

Višínský J.: The Český ráj/Bohemian Paradise Region and Its Meadows

The Český ráj/Bohemian Paradise is a cultural landscape that has been shaped by human activity over centuries. An integral part of its appearance are diverse meadows that originated as secondary treeless areas and have been maintained for generations by mowing and extensive grazing. It is precisely the continuity of this farming having been given the landscape its distinctive character/scenery. Above the Věžák Fishpond, the Kosin family monument has been still standing today, commemorating more than three centuries of continuous farming by one peasant family on the "Na Budách" farmstead in the village of Krčkovice. Within the Český ráj/Bohemian Paradise Protected Landscape Area,



several Specially Protected Areas can be identified where meadow habitats are most prevalent and at the same time in their most preserved form. Three areas located in PLA's different parts were selected as an example. The Podtrosecká údolí Valleys in the central part represent a complex of wetland and peat meadows. The Oborská luka Meadows in the eastern part are connected to a system of fishponds and represent traditional wet meadows. The Podloučky Meadows in the northern part preserve a mosaic of xerothermic grasslands and flower-rich beech forests. Together, they provide a representative picture of the variability in and ecological value of meadow habitats in the Český ráj/Bohemian Paradise.

Konvička M., Peškařová T., Fric Z., Tájek P. & Konvičková H.: The Violet Copper Butterfly Extinct, Relocated, and Globally Warmed

Two decades ago, the Violet copper butterfly (*Lycanea helle*) – a small, neat diurnal butterfly that became extinct in the Czech Republic in the early 1950s – was reintroduced into the country's fauna. The transfer of part of its population from the Austrian Tünnitz Alps was not a classic reintroduction of an extinct species. Today, the originally Alpine violet copper butterflies inhabit the peat meadows of the Šumava/Bohemian Forest Mts. National Park, in the headwaters of the Teplá Vltava River. They share these habitats with cold-loving butterflies such as the Bog fritillary (*Proclossiana eunomia*), Moorland clouded yellow (*Colias palaeno*), and the Cranberry blue (*Plebejus optilete*). Because the Violet copper butterfly is considered to be a glacial relict, several research teams have attempted to model the development

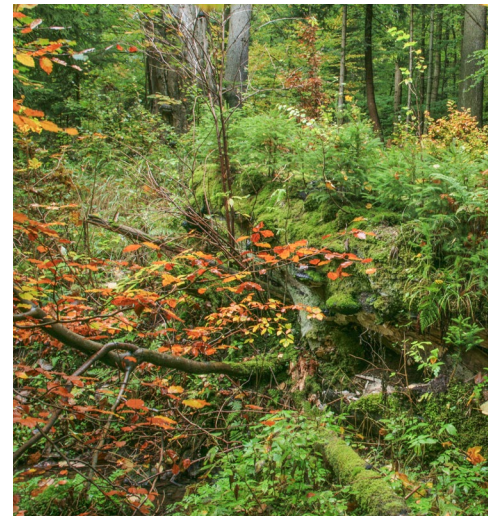
of European populations under conditions of climate change. The results are not surprising. The Central European lowlands, including those where the original populations had lived in the Czech Republic and where the butterfly long ago lost its suitable habitats, will cease to be



habitable for it in a warmer climate. Dry summers lead to the drying up of meadow wetlands and a visible decline in the Common bistort, also known as the Snakeweed (*Bistorta major*). On the contrary, suitable conditions will remain in the Czech Republic's border mountains. The Šumava/Bohemian Forest Mts., Krušné hory/Ore Mountains, Slavkovský les/Slavkov Forest, and Krkonoše/Giant Mountains are all at least 300 m higher than the Westerwald or Ardennes and will remain suitable for the Violet copper butterfly even in radical global warming scenarios. The fact led authors to a heretical idea: to transfer population samples of the Violet copper butterfly from Western European genetic lines, which are unlikely to survive the current warming, to other mountain ranges in the Czech Republic, thus creating a genetic reserve for them. The first candidates for such a transfer are butterflies from the Westerwald and Ardennes mountain ranges.

Kadlecová G., Kounek F., Voslářová E. & Večerek V.: Eurasian Beaver (*Castor fiber*) in the Wild Animal Rescue and Rehabilitation Centres in the Czech Republic

Wild animal rescue and rehabilitation centres help endangered Eurasian beavers (*Castor fiber*) by caring for injured individuals. Between 2010 and 2024, the number of beavers



admitted to the centres in the Czech Republic increased, with the highest number recorded in the Plzeň/Pilsen Region. The most common reasons for admission were beavers falling into holes in the ground or being hit by vehicles. Nearly half of the beavers were successfully returned into the wild after treatment. However, 37 out of the 120 beavers admitted either died or had to be euthanized, mainly due to collisions with vehicles or injuries from being bitten by other beavers or animals. Data from wild animal rescue and rehabilitation centres can help identify risk factors affecting beavers in the wild and may also be used to improve welfare during treatment in these facilities.

Research, Surveys and Data Management

Blättler L. & Daněk J.: From Landscape Functions through Ecosystem Service to Nature's Contribution to People

In the State Nature Conservation and Landscape Protection Programme of the Czech Republic for 2020-2025 ecosystem services (ES) are considered as one of the cross-cutting objectives and tools. Specifically, ES assessment and its integration into decision-making in ecosystem management including their use should be carried out. Not only in the Czech Republic, but also abroad, the ES concept is part of key strategic documents. In the Czech Republic, a national-wide ES mapping and assessment have been conducted (see Ochraňa přírody/Nature Conservation Journal 4/2014). In order to use the ES assessment in nature conservation practice, the IP LIFE One Nature and the follow-up project Prospective LIFE are working



on the development and testing of a methodology for this purpose. At the academic level, ES are a dynamically developing field. In recent years, more than 6,000 scientific papers have been published on ES per year. The main objective of the ES concept has therefore been to 'green economics'. In the IP LIFE One Nature project, the IPBES classification of ES is used; the authors focus on the positive contributions of nature to people there, which to this end they called „nature's contribution's to people“.

Peksa O. & Pecháčková S.: Are Power Lines the Hope for Heathland?

One of the traditional and biologically very valuable habitats - heathland – has been disappearing from the Czech Republic's landscape. Recent research has shown, in line with pan-European one, the nature of the changes that these oligotrophic habitats are undergoing. Heather and lichens are virtually disappearing everywhere and shrubs, herbs and grasses, or tree seedlings, are coming in. Heliophytes (mainly heather, herbs and lichens) are declining and the species composition in mosses is also changing. Non-woodland heaths are rapidly turning into grassland, while changes in woodland heaths are generally smaller in scale. The total number of species from the Red List of Threatened Species of the Czech Republic found in heaths is declining significantly. Degradation of heathland is very rapid and is not primarily caused by global change, but primarily by lack of management. Most of the sites that have survived display a very small area, which, together with their unfavourable location, prevents the use of traditional

management methods such as grazing, burning or large-scale turfing. Areas under power lines could offer hope for heathland, but only if they are managed in an appropriate way. The current often applied massive milling is more of a threat to them.



Zejdová L., Musil Z., Patočka Z., Klimánek M., Hustáková K., Koutecký B., Rožnovský J. & Litschmann T.: Monitoring Population Dynamics in the Endemic Moravian Alpine Bells and Microclimate in the Macocha/Stepmother Abyss

The Moravian Alpine Bells (*Cortusa matthioli* subsp. *moravica*) is a glacial relict occurring at only one site in the Czech Republic, namely on the northeastern wall of the Macocha/Stepmother Abyss in the Moravský kras/ Moravian Karst Protected Landscape Area in the Vývěry Punkvy/Punkva River Springs National Nature Reserve (South Moravia). The long-term existence of the mountain species is made possible by the cool and moist microclimate within the abyss connected to the cave system on the Punkva River. The site itself is only accessible by climbing equipment in extremely difficult terrain, so for a long time no accurate data were available to enable repeated monitoring and tracking of the population dynamics in the plant species. When comparing the data from the census of Moravian Alpine bells clumps, a general trend of decrease in the total number of plants can be seen. In the last monitoring from the rope in 2024, only 48 Moravian Alpine bells' individuals were found there. The Moravian Alpine bells' population is only stable in the optimal conditions of the upper level and one group from the middle level, where any decline in clumps is



compensated by vegetative reproduction; very rarely there also is reproduction by seeds. In the lower level, there is a steady, slightly decreasing trend. Plants are surviving at their limits there, which is reflected in reduced fitness, low growth and low flowering frequency; some of which are attacked by fungal pathogens. Habitat limiting factors at the lower levels are mainly the amount of light, the lack of suitable terraces with deeper topsoil and drought, which in this case is probably related to increasing average temperature and decreasing humidity rather than the amount of rainfall there.

Antonín V., Lepšová A., Matějka K. & Zíbarová L.: Fungi - Macromycetes of Floodplain Forests at the Confluence of the Morava and Dyje/Thaya Rivers

The floodplain forests at the confluence of the Morava and Dyje/Thaya Rivers (South Moravia) are one of the most important complexes of semi-natural floodplain forests and floodplain meadows in the Czech Republic. The area is known for occurrence of very rare fungi species, which are often found only there across the whole Czech Republic. The species composition of fungi communities in the floodplain forests provides a certain standard against which findings from other areas of floodplain forests along lowland rivers are compared: the Litovelské Pomoraví/Litovel Morava River Basin, remnants of floodplain forests in the Polabí/Elbe River Basin and the Poodří/Odra River Basin. In the context of the efforts to declare the area of the confluence of the Dyje/Thaya and Morava Rivers as a Protected Landscape Area, project entitled "Monitoring of biodiversity and ecological changes of floodplain forests and meadows in the area of the confluence of the Dyje/Thaya and

Morava Rovers” was implemented in 2021-2023, financially supported by the Forests of the Czech Republic, state enterprise. The current list of all fungi (macromycetes) historically found there includes a total of 952 taxa. Of these, 179 taxa are ectomycorrhizal and 225 saprotrophic, which are associated with dead vegetation, soil humus or small woody debris. The most common species are lignicolous, preferring decaying wood and wounded trees, with 541 species. Lignicolous species account for 56.8% of all the recorded species. In terms of fungal conservation, 152 of the species found there are included in the Red List of Threatened Species of the Czech Republic, thus reaching 14% of the total number. Of the indicator species for the softwood



floodplain forests, 26 fungal species (83.9%) were found at the Confluence and 46 species (95.8%) were recorded in the hardwood floodplain forests there. All the results confirm the high quality of the local vegetation and the fact that the floodplain forests in particular are extremely valuable sites from a mycological point of view.

Marešová E., Halačka K., Vetešník L. & Mendel J.: Genetic analysis of the Brown Trout in the Brdy Highlands Protected Landscape Area or Are the Brdy Highlands All Very Much the Same?

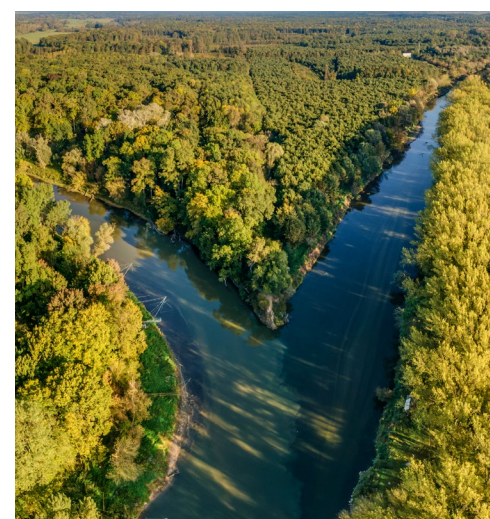
The aim of the study was to assess the genetic status of the Brown Trout (*Salmo trutta morpha fario*) populations in the Brdy Highlands Protected Landscape Area (Central Bohemia) and to identify fragments of its original or otherwise unique populations. The population parameters found demonstrated their successful genetic status and did not confirm either the

historical population declines or the dangerous level of inbreeding. Statistical analyses divided the 13 populations into six groups, which correspond to the history of fishery management at the Brdy Highlands sites. The unique position of three populations in the Pílský, Pstruhový and Obecnický Brooks, which are genetically homogeneous and represent three unique sources of Brown trout's genetic variability in the Brdy PLA, was clearly demonstrated. At the same time, they enhance the unique gene pool of the Brown trout in the Czech Republic. Their homogeneity is probably due to population isolation and the historical and current absence of intensive fisheries management. The different genetic profile of the populations should be taken into account in future manipulations and intended fish stock transfers.

Salašová A., Dohnalová B., Lacina D. & Kohoutková K.: Landscape Character/Scenery Values in the Soutok/ Morava and Dyje/Thaya Rivers Confluence and Recommendations for Their Conservation

The landscape at the confluence of the Morava and Dyje/Thaya Rivers (South Moravia) is unique in many respects. In 1996, it was inscribed on the UNESCO World Heritage List under the name of the Lednice-Valtice Cultural Landscape. The area is characterised by a high concentration of natural, cultural, historical and aesthetic values, many of which are of European or global importance. The natural values of the Soutok/ Morava and Dyje/Thaya Rivers Confluence Protected Landscape Area have been largely caused by the interaction of natural processes and human activities. Historical types of forest, pasture and

meadow management and Liechtenstein water management and landscaping have created a number of rare habitats there. If they are to be preserved in the future, it will be necessary to strengthen close cooperation between the State Nature Conservancy authorities and the landowners and resource managers and to seek for management measures that are sustainable from an environmental and economic point of view. The protection of the cultural and historical characteristics of the unique area and its cultural and aesthetic values will need to be harmonised with the development of the municipalities there. The protection of the area's landscape character/scenery has not yet been fully incorporated into the land-use/territorial plans



of all municipalities, and is notably absent from some documentation. With regard to the expected changes and development plans of the municipalities (e.g. development of renewable energy sources) it shall be necessary to update the land-use/territorial plans in this respect. In the case of the Lednice-Valtice Landscape Monument Zone, there is a noticeable lack of a conservation plan, which would further specify the protection of the cultural and historical features and values of the area.

Jakubínský J., Donoval J., Štěrbová L. & Pechanec V.: Assessment of Ecostabilizing Floodplain Function in the Czech Republic

The article provides an overview of the key outputs of the “Functional floodplain” project, focused on the assessment of the floodplain ecosystem functions. The main result of the project is a methodological procedure, based on which it is

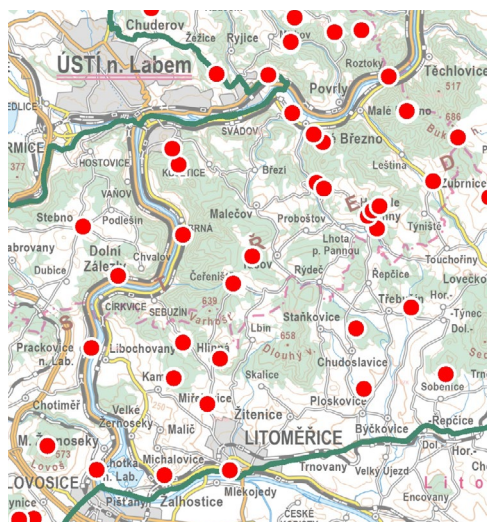
possible to express the magnitude of the human activities impacts in the landscape, which directly or indirectly affect the performance of the basic functions in a specific selected floodplain ecosystem. In the case of intensive land utilization, it is therefore possible to determine whether the given floodplain ecosystem has been still performing certain functions supporting the ecological stability of the area. In practice, the result is useful especially in nature conservation and landscape protection, when making decisions (planning) on the development of areas within floodplains (as Significant Landscape Elements pursuant to Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection, as amended later), or when designing ecosystem restoration actions at



degraded sites. The application of the methodology into practice is facilitated by a supporting tool - a web map application displaying the degree of performance of selected ecosystem functions in floodplains at the national level, including the resulting eco-stabilization function and the extended layer of the currently defined floodplains along the main rivers in the Czech Republic.

Müllerová J. & Forejt M.: New Assessment of Memorial/Veteran Trees in the České středohoří/Central Bohemian Uplands Protected Landscape Area

In 2023-2024, a dendrological assessment of 125 declared Memorial/Veteran Trees (162 individuals) in the České středohoří/Central Bohemian Uplands Protected Landscape Area (northern Bohemia) was carried out. The current documentation was revised and a management plan for the next 10 years was developed. The

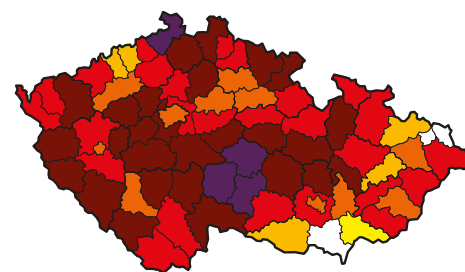


project outputs also include a possible software for planning and structure of tree inspections. Trees were visually assessed from the ground between July 2023 and April 2024. Each individual was visited twice in the field: once in leafed and once in leafless condition. For each tree, 63 parameters were evaluated and recorded. Some trees are outstanding in landscape terms and shape the character of the site, others provide cultural messages at vanished human settlement sites. The Memorial/Veteran Trees often are trees of exceptional size and of high dendrological value, or they may be trees of significant habitat value. The characteristic should be taken into account when setting the planting target. The trees are divided into five categories, which are further refined by sub-categories. The level of significance is then further qualitatively rated on a five-point scale. Of the 162 trees evaluated, 122 are deciduous (75%) and 40 are coniferous (25%). The representation of rowans or mountain-ashes (*Sorbus* spp.) among the Memorial/Veteran trees (1 wild service tree *Sorbus torminalis*, 7 service trees *Sorbus domestica* evaluated) can be considered exceptional in the Czech Republic. The famous common medlar (*Mespilus germanica*) tree at the village of Mířejovice is the only Memorial/Veteran Tree of this species in the Czech Republic and probably also the smallest one in the country.

Vrba P, Čížek L., Faltýnek Fric Z., Filippov P., Spitzer L. & Konvička M.: Has the European Spruce Bark Beetle Outbreak Revived the Czech Commercial Forests?

In the Czech Republic, as well as in the whole of Central Europe, there have been

unprecedented outbreaks of the European spruce bark beetle (*Ips typographus*) in the last 20 years, followed by widespread die-back of Norway spruce (*Picea abies*) plantations (especially) in low elevation areas. The outbreak development has changed the vegetation cover of large sections in the landscape. Thanks to the saving of other tree species during salvage cutting, formations remotely resembling a “savannah” with scattered trees and shrubs have appeared there. Richly flowering herbs, typical of forest clearings, have dramatically increased the nectar supply. Dead wood, which is a scarce resource in commercial forests, was found in unprecedented quantities at some sites. In 2021, the research was conducted in



three areas located in different stages of the outbreak, namely in the Nízký Jeseník/Low Jeseník Mts. (northern Moravia/southern Silesia), Křižanovská vrchovina/Křižanov Highlands (the Českomoravská vrchovina/Bohemian-Moravina Highlands) and Lišovský práh Hilly Area (South Bohemia). Four groups of organisms were monitored in all areas - vascular plants, diurnal butterflies, moths and saproxylic beetles. Surprisingly rich communities were found in all monitored groups. The total number of species found is approx. one third of the diurnal butterflies and moths, one eighth of the saproxylic beetles and one tenth of the vascular plants known from the whole Czech Republic. Red-listed species were also found in all the groups. It turns out that the outbreak has spectacularly returned to the Czech Republic's landscape two phenomena that were historically and prehistorically quite common there – groves/open forests and the associated abundant supply of sun-exposed dead wood. Moreover, the grove or open forest regeneration is only temporary. Most of the areas disturbed by the outbreak will be reforested sooner or later. Nevertheless, some lessons can be learnt from the European spruce bark beetle

outbreak that may contribute to the recovery of subsequent stands.

Hošek J., Kebřle D., Hošková J., Kodet V., Karlík P. & Tenčík A.: Biodiversity in a Commercial Forest: Easy and Quickly?

The article deals with the structure of commercial forests in the Czech Republic and its relationship to biodiversity. The introductory section describes the specific conditions of the temperate forest biome in Central Europe in its geohistorical developmental context. It then analyses the diversity of factors/drivers and complexity of interactions that contribute to the final state of forest biota (living part of an ecosystem), em-

phasizing the importance of including various spatial and temporal scales in which individual phenomena are studied and interpreted. The significance of various stages in forest development, in the process of natural or economically moderated development, for different biota groups is consequently discussed. The main topic is the presentation of the possibilities of using forest structure indices, which summarize the state of a larger number of structural variables in a single quantitative characteristic. One such index is the FSI (Forest Structure Index, sensu Storch *et al.* 2018), which has been tested in a modified form on data from the authors' own multitaxon survey as well as on data from the National Forest Inventory to assess forest structure in Specially Protected Areas in the Czech Republic. In summary, such tools are well suited for assessing the forest habitat quality from the perspective of diverse taxa, comparing different

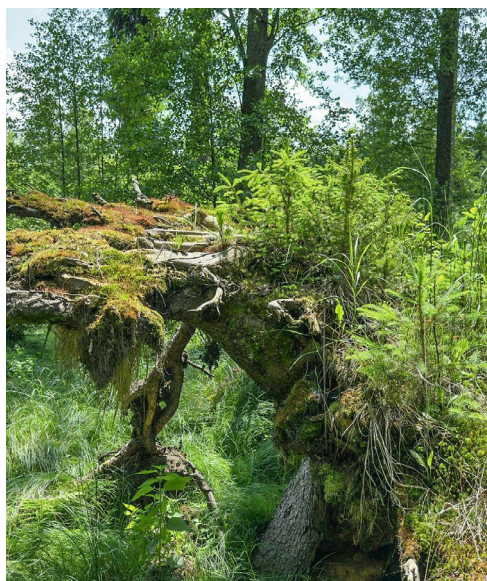
Večerík Z., Kizek K., Vašíček M., Líznařová E., Kotasová & Adámková M.: Slováké lúky/Moravian Slovakia Meadows as a Model Site for Invertebrate Diversity Protection and Conservation

Slováké lúky/Moravian Slovakia Meadows, part of the Soutok/Confluence, namely Morava and Dyje/Thaya Rivers Confluence newly designated Protected Landscape Area

areas, monitoring developments over time, and informing nature-friendly forest management policies and the formulation of instruments to support them.

Pech P., Spitzer L., Konvičková H. & Konvička M.: Why Does the Dusky Large Blue Avoid Large Meadows?

The Dusky large blue (*Phengaris nausithous*), a species protected by the European Union's legislation (Annex II of the EU Habitats Directive) and obligate myrmecophilous inhabitant of wet meadows, is one of the most widespread blue butterflies in the Czech Republic, despite its specialized lifestyle. It can be found everywhere except in the warmest lowlands and highest mountain areas, with wetland



phasizing the importance of including various spatial and temporal scales in which individual phenomena are studied and interpreted. The significance of various stages in forest development, in the process of natural or economically moderated development, for different biota groups is consequently discussed. The main topic is the presentation of the possibilities of using forest structure indices, which summarize the state of a larger number of structural variables in a single quantitative characteristic. One such index is the FSI (Forest Structure Index, sensu Storch *et al.* 2018), which has been tested in a modified form on data from the authors' own multitaxon survey as well as on data from the National Forest Inventory to assess forest structure in Specially Protected Areas in the Czech Republic. In summary, such tools are well suited for assessing the forest habitat quality from the perspective of diverse taxa, comparing different

in South Moravia, represents an exceptionally valuable site for the conservation of terrestrial invertebrates in lowland Central Europe. A full-season entomological monitoring, conducted in 2024, recorded 821 species in total, including many threatened, stenotopic, and ecologically specialized taxa associated with a wide range of habitats. The findings evidence the presence of wetland, halophilous, and steppe-associated species co-occurring at a single locality, reflecting extraordinary habitat heterogeneity, microclimatic variation, and long-term ecological continuity. Particularly important is the presence of species dependent on open, early-successional and transitional habitats, which are increasingly rare in modern landscapes. Thus, the entomofauna of Slováké lúky/Moravian Slovakia Meadows confirms the site's conservation value and provides

meadows harbouring the characteristic herb Great burnet (*Sanguisorba officinalis*) being a necessary but not sufficient condition for its occurrence. Entomologists have long believed that any species of the widespread ant genus *Myrmica* is sufficient for the development of blue butterflies of the genus *Phengaris*. Later, while searching for the causes of the mysterious extinction of the Large blue butterfly (*P. arion*) in Britain, a close link was found between individual blue butterfly species and individual ant species, which in turn were linked to specific microclimates. Blue butterflies are usually linked to the most abundant species or species of the genus *Myrmica*, which are predominantly found in their preferred habitat. The Dusky large blue, which is classified as near threatened (NT) on the Czech Republic's Red List, shares its association with the Great burnet with another species of the same genus, the

Scarce large blue butterfly (*P. teleius*), which is considered to be endangered (EN) in the Czech Republic. The differences in their preferences stem from their requirements for the quality of their host plant. The Scarce large blue butterfly prefers lower, younger great burnet plants growing in loose grassland, while the Dusky large blue prefers taller, more robust plants that have already flowered in denser vegetation. The two species also differ in their host ants – for the Dusky large blue, it is predominantly the Common red ant (*M. rubra*), and to a lesser extent the Common elbowed red ant and Woodland red ant (*M. scabrinodis*, *M. ruginodis*). The Scarce large blue butterfly, on the other hand, uses a wide range of ants (including species used by the Dusky large blue), in proportion to their occurrence in a particular location.

Boháč O.: How is the Eurasian Sparrowhawk Doing in Central Moravia and the Nížký Jeseník/ Low Jeseník Mountains?

Eurasian sparrowhawk (*Accipiter nisus*) monitoring takes place throughout the year, beginning with the search for its nests from September to March, followed by checking occupied nesting sites from the end of April, which ends in early August with the last young fledged. The aim of the monitoring is to observe nesting site fidelity, habitat requirements/selection, nesting site protection, and to study food sources at sites where the raptor processes its prey. Thanks to ringing, which identifies adult birds and the subsequent dispersal of young birds, the exact number of



young birds in the nest, the sex ratio, and the possible presence of trichomoniasis during ringing have been found. Monitoring and local research show how a seemingly common and widespread species of bird of prey in the Czech Republic can become a rare nesting species in parts of the country, with considerable problems affecting its nesting success. Sparrowhawks have lost more than 90% of their nesting habitat in the Hornomoravský úval/Upper Morava River Valley (central Moravia) and Nížký Jeseník/Low Jeseník Mts. (northern Moravia and Silesia). Some pairs are adapting to the reduced size of suitable nesting habitats, while others are attempting to nest in more “risky” pine or deciduous tree stands, where predation is significantly higher. The Eurasian sparrowhawk continues to be threatened by ongoing logging during the nesting season and consequently, by continued loss of suitable nesting habitats.

Kupka J.: The Importance of Agricultural Structures in Velký Roudný Hill for the Survival of an Endemic Snail

Cochlodina cerata opaviensis is a critically endangered endemic subspecies of the Odra and Moravice River basins. Until recently, it was considered a strictly forest species bound to natural scree forests. However, the latest research in Velký Roudný Hill has revealed viable populations on agricultural as barks (stone walls) created by the historical farming practices of the German-speaking population, which was displaced after 1945. The finding expands existing knowledge about the ecology of the species and



demonstrates the importance of historical landscape structures for the conservation of critically endangered endemics. The protection of *Cochlodina cerata opaviensis* should now also include targeted management of these historical structures.

Nature Conservation Legislation

Jelínková J.: Rights of Environmental Associations during Issuing a Unified Environmental Statement Procedure

The Unified Environmental Statement (hereinafter referred to as UES) is not issued as a binding opinion under Article 149 of the Administrative Procedure Code in administrative proceedings. However, an environmental association has the right pursuant to Article 70, paragraph 2 of the Act on Nature



Conservation and Landscape Protection (ANCLP) to be informed in advance of the issuance of a UES if the association has requested it, instead of taking action under the ANCLP. The association may have other procedural rights in the “proceedings” for the issuance of an UES as a “party concerned” under the Administrative Code. Both the Act on the Unified Environmental Statement and the Administrative Procedure Code explicitly regulate only the interaction between the applicant for the issuance of the UES (binding opinion) and the administrative authority competent to issue it. The other parties/persons concerned are generally only aware of the binding opinion after it has been issued, as parties to the procedure for issuing the decision for which

the binding opinion is the basis. There is no right of appeal against a binding opinion. The basic remedy for imperfection is a review of the legality and substantive correctness of the binding opinion under the appeal procedure (Article 149, paragraph 7 of the Administrative Procedure Code), which is supplemented by a supervisory remedy in the case of unlawful binding opinions - a review procedure in the narrower sense (Article 94 and Article 149, paragraph 8 of the Administrative Procedure Code). If an environmental association requests, pursuant to Article 70, paragraph 2 of the Environmental Protection Act, to be informed about the intended interventions - requests for the issuance of a UES (with the

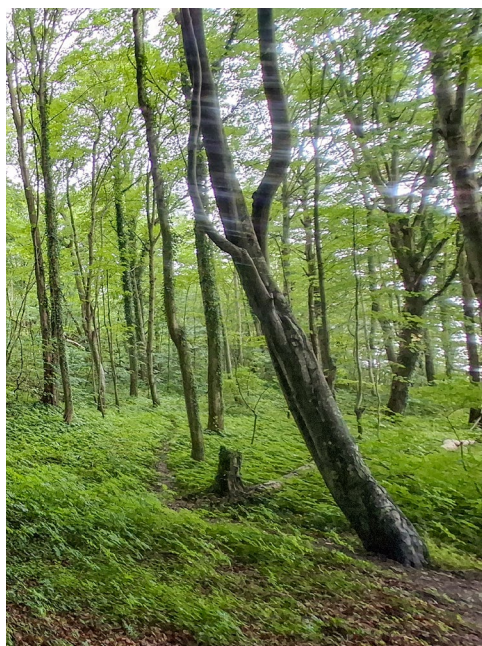


possibility of narrowing the subject matter and local specifications), the competent administrative authority is obliged to inform it about the initiation of the “proceedings” for the issuance of a UES if the UES will be issued instead of (one of) the actions under the ANCLP.

Jelínková J.: Amendment to Act on Compensating Damages Approved

Act No. 115/2000 Gazette on Providing Compensation for Damage Caused by Selected Specially Protected Animals, will be amended as of 1 January 2026. The Ministry of the Environment of the Czech Republic together with the Nature Conservation Agency of the Czech Republic had prepared the basis for this amendment already in 2021, but failed to make it a priority in the legislative process.

The key shortcomings of the current law include, in particular, the demanding method of damage administration, the deadlines for submitting applications (the same for reporting single and continuous damage), the range of beneficiaries of damage compensation (many of them are paid by the State itself from the State Budget), the insufficient range of compensation provided (e.g. for damage caused by the Gray wolf *Canis lupus*, it is not possible to compensate game farm owners), conditions for obtaining the right to compensation (there is no condition for minimum security of livestock against attacks by the Gray wolf) and the law does not stipulate a condition for breeding livestock according to the Breeding Act. The newly approved amendments include, in particular, the list of domesticated animals for which damages are payable (it is extended to all types of livestock species and damages will be payable for all dogs), the establishment of a decree to set the minimum parameters for securing selected livestock species (mainly sheep and goats) against attacks by the Gray wolf, the establishment of the basic principle of liability and prevention, the demonstration of the legality of breeding in terms of Act No. 154/2000 Gazette on Breeding and Documentation of Farmed Animals and Amending of Some Relating Acts and Regulations for selected livestock species in case of damage caused by wolves and other changes. Decrees are currently being drafted to amend the law so that it can be effectively implemented by January 2026.



Jelínková J.: The Question of the Specificity of the Act on Nature Conservation and Landscape Protection in Relation to Other Legal Regulations in the (Most) Recent Case Law

The key provision of Article 90, paragraph 4 of the Act on Nature Conservation and Landscape Protection (ANCLP), which established its specificity in relation to forestry, water, construction/building, and other specified laws, had been repealed many years ago. After that, the relationship between conflicting provisions had to be assessed on an *ad hoc* basis. According to jurisprudence/legal science and case law, a legal norm that has a narrower definition, whether personal or material, can be considered special. Nevertheless, in a specific case, a legal norm may be more general in substance but at the same time having a narrower personal scope. If the relationship between conflicting legal norms cannot be described as a relationship between special and general legal regulations, it is necessary to apply them simultaneously wherever possible. Moreover, regional courts have recently stated that, in relation to the Water Act, the ANCLP is a special legal regulation, arguing that nature conservation and landscape protection is in the public interest, based on the precautionary principle and, of course, the wording of the relevant provisions of both laws. The issue concerned the extension of the validity of water management for a small hydroelectric power plant in a Protected Landscape area and, in the other case, the obligation to ensure a final decision on exemptions under Article 43 and 56 of the ANCLP as a basis for a water management permit. This implies the correct procedure for administrative authorities and courts, which must consider all relevant provisions of the legislation concerned, not limit themselves to a linguistic interpretation of isolated provisions, but strive to find the meaning and purpose of the legislation using other methods of interpretation.

Rudolf V.: Drone Flights in Specially Protected Areas in the Czech Republic

Unmanned aerial systems (UAS) and their operation in the Czech Republic do not avoid Specially Protected Areas. Until recently, the operation of UAS in Specially Protected Areas was governed by comprehensive measures of a general nature



regulating the restricted (flight) area LKR10 – UAS over the entire territory of the Czech Republic. On August 15, 2025, the Civil Aviation Authority issued a set of new general measures, which, as of September 1, 2025, split the original restricted space LKR10 – UAS into several separate restricted spaces. The purpose of the legal regulation is to preventively establish a stricter regime for UAS operations in Specially Protected Areas due to well-founded concerns about possible disturbance, in particular to birds, by noise or the mere presence of a foreign object. The conditions for UAS operations within the Specially Protected Areas, preliminary information (or preliminary information and a follow-up administrative measure) and the obligation to enter information about the planned flight into a public digital map apply to flights falling within the “open” category of operations. For flights with UAS falling within the “specific” category of operation, different conditions may be specified within the scope of the operating authorization. No specific regulations (in the sense of restrictions) have yet been laid down in general measures for UAS operations within Natura 2000 sites where UAS flights may be particularly problematic in Bird Areas (pursuant to Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection, as amended later, the term for Special Protection Area, SPA under the European Union’s Birds Directive).

Focusing on the Public

Zajiček P.: Floodings in Show Caves in the Czech Republic

In September 2024, during prolonged heavy rains, extensive flooding occurred

throughout the Czech Republic, reaching millennial water levels in some areas. In many places, they had devastating effects. Flood naturally also affect cave systems with water regimes. Therefore, water levels in caves are closely monitored during floods. References to floods in connection with caves were in earlier times linked to the Moravský kras/Moravian Karst area (South Moravia). In other parts of the Czech Republic, caves with a water regime had been previously unknown. Floodings in the Moravský kras/Moravian Karst caves have been occurring at irregular intervals continuously. They occur either during progressive spring snowmelt, during prolonged rainfall or during local storms with extreme precipitation. In recent decades, ex-



treme water levels in karst areas have been recorded and documented in detail. A very dynamic atmospheric phenomenon occurred in April 1985, when a prolonged intense frontal storm swept across Central Europe. During this overnight storm, for example, sinkholes in the Moravský kras/Moravian Karst filled with water and the Punkva River overflowed over the visitor plateau at the bottom of the Macocha/Stepmother Abyss. Perhaps the most significant flood event of the last decades was the 1997 flood in Moravia during very intense and prolonged rainfall in July. The water flooded the bottom of Macocha/Stepmother Abyss, some parts of the dry part of the Punkva Caves, the surroundings of the area and the entrance to the Sloupské jeskyně/Column Caves. The flood also affected other show caves there.

Hlinková D.: Nature Conservation in Dialogue: 20 Years of the Český les Mts. Protected Landscape Area

The Český les Mts. Protected Landscape Area (western Bohemia) was established on August 1, 2005. It covers an area that for forty years was non-go zone or a zone with limited access due to the Iron Curtain there and therefore, was purposely neglected not only from the perspective of tourism development but also nature conservation. From the outset, the new Protected Landscape Area (PLA) has been making efforts to meet the expectations of the region and has worked systematically to develop partnerships. In the early years of the PLA’s existence, the



first interpretive tools began to be developed. Information boards were placed on hiking trails and trailheads, but often without a clear concept. The turning point came in 2006, when the first issue of the magazine Český les was published. Three years later, the calendar of events “Come with us to nature” was launched, offering a regular overview of outdoor excursions, lectures and thematic events in the region. Other important milestones include establishing several nature trails/educational paths. Since 2009, hikers have been able to follow the Podkovák, Vodní svět/Water World and Capartice Meadows trails, and later the Sklářství/Glas Industry and Chodovské skály Rocks trails were added. A key step in the CEPA implementation was building the Český les House of Nature. The visitor centre was

opened in the historical post office building in the municipality of Klenčí pod Čerchovem in 2016. An important event in partnership cooperation is the Český les Day, where the natural and cultural values of the area are jointly presented. Each year it is held in a different place and on a different theme. An indispensable partner in transboundary cooperation is the Centre Bavaria Bohemia (CeBB) in Schönsee, a cultural institution serving to strengthen Czech-Bavarian cultural and partnership cooperation.

Nagel R.: What is the Voice of the Inhabitants of České Švýcarsko/Bohemian Switzerland?

Communication with the public is an essential part of current nature conservation in national parks. It is absolutely crucial to engage in dialogue with local people, not only about the benefits of having a national park, but also about issues that may be perceived as difficulties by locals, e.g. restrictions on access to certain areas, changes in game control,



and forest management. During the quarter-century of the České Švýcarsko/Bohemian Switzerland National Park's existence, the coexistence of locals with the National Park (NP) has gradually evolved. After an initial phase of mistrust, but also high expectations, the relationship more or less stabilized relatively quickly. Unfortunately, however, after two significant natural events, public trust was undermined, even though neither the European spruce bark beetle (*Ips typographus*) outbreak nor the extensive forest fire

was primarily caused by poor decisions by the NP's Administration. Fortunately, the trend has been reversed, mainly due to systematic and fact-based communication, supported by a long-term communication strategy. This is also why the National Park Administration decided to conduct a representative public opinion poll. In order for it to be representative, it was necessary to adhere to several basic rules, namely anonymity, a correct and representative sample of the population surveyed, and verification of responses. The results showed that most residents of České Švýcarsko/Bohemian Switzerland perceive the National Park as a "good neighbour." 80% of respondents expressed overall satisfaction with the National Park's existence, and more than three-quarters of those surveyed also appreciated the contribution of the NP Administration to the protection, conservation and management of local nature. Tourism and the economic opportunities associated with it are cited as the key contribution of the České Švýcarsko/Bohemian Switzerland National Park. At the same time, however, 77% of respondents believe that nature conservation should take precedence. On the other hand, locals have still been very sensitive to events related to the European spruce bark beetle plague and the fire in 2022. According to almost 75% of respondents, the NP Administration should prioritize ensuring safety on tourist trails/visitor paths, and almost 70% consider fire prevention as a priority.

Moravec J.: Ecology Olympiad Thirty Years Old

In 2025, the Ecology Olympiad has celebrated its 30th anniversary. Over the years, it has come a long way from a local event to a respected national competition. Two issues remain unchanged, distinguishing it from probably all other high school Olympiads – it is a team competition (involving teams of three students) and at the same time, a competition with a strong emphasis on practical skills. From the very beginning, the Ecology Olympiad has been closely linked to the Czech Union for Nature Conservation (CUNC), important NGO dealing with nature and landscape heritage across the country. The competition is based on regional rounds, the winners of which then advance to the national round. These are usually multi-day events consisting of a test, nature component determination task, a practical task followed

by a "defence" of the results achieved before a professional jury, and thematic non-competitive activities (lectures, excursions, etc.). The theme of the 30th edition was water. Therefore, the practical tasks in the regional rounds often focused on water retention in the landscape, the quality of water elements, or the water regime of a particular area in general. A total of 484 competitors participated in the Olympiad in 2025. The national round took place in the town of Vlašim (Central Bohemia) on June 5-7, 2025. The winner of the 30th annual Ecology Olympics was a team from the Gymnasium and Vocational School of Pedagogy Liberec, consisting of Eliška Krausová, Jan Činčera, and Jan Beránek. The topics are set several years in advance. Thus, the 31st edition of the competition will focus on climate change mitigation and renewable energy sources, the 32nd edition on invasive alien species, the 33rd edition on forests, and the 34th edition on environmental chemicalization.



Šoltysová L.: The Český ráj/Bohemian Paradise among the Most Visited Places in the Czech Republic

It is a well-known fact that the Český ráj/Bohemian Paradise region is one of the most popular tourist destinations in the Czech Republic. The wildness and picturesqueness of the landscape have attracted pilgrims, romantics, and artists since time immemorial. The answer to the question of why Český ráj/Bohemian Paradise is one of the most visited places in the Czech Republic can be found not only in its distinctive morphology, but also in the landscape modifications carried out by humans since the beginning of the 17th century. The Český ráj/Bohemian Paradise's landscape

enchanted Albrecht von Wallenstein (1583–1634). His Italian architects had created the first early Baroque composition in the landscape around the town of Jičín, connecting the residence with farmyards with linear plantings of lime trees. Wallenstein's targeted landscaping continued by architect Jan Baptista Mathey, who designed sacred buildings connected by sightlines and paths on the southern edge of Český ráj/Bohemian Paradise for Count Franz Joseph Schlik (1656–1740). In the 19th century, the western and northern parts of Český ráj/Bohemian Paradise were significantly influenced by the House of Rohan, who built a country residence in Sychrov. The central part of Český ráj/Bohemian Paradise, dominated by Hrubá Skála Castle and Trosky Castle, began to be developed by the Aehrenthal family in 1821. During this period, most of the churches were restored and rebuilt, chapels were built on the volcanic peaks – the domi-



nant features of Český ráj/Bohemian Paradise – and some even had Stations of the Cross added. The interests of public administration, the business sector, and non-governmental non-profit organizations intertwine in Český ráj/Bohemian Paradise. Systematic communication and cooperation using the Concept and the current Management Plan are prerequisites for preserving the region's natural values. An example of good practice is saving the Sedmihory wetlands, where the excellent communication between the non-profit organization, namely Bukovina Czech Union for Nature Conservation Local Chapter and dozens of landowners and the Nature Conservation Agency of the Czech Republic,

including interpretation, led to the implementation of a large and successful ecosystem restoration project.

Jehlička J., Mácová K., Melichar J., Farkač B., Škopková H. & Hanson E. J.: Public Perception of Traditional Forest Management

Traditional approaches in forest management, e.g. coppicing (pollarding) or forest grazing, have been a common feature of the Central European landscape for centuries. In the Czech Republic, however, they have now been almost forgotten. Recently, the alternative, nature-friendly forestry management approaches have been reintroduced – to a limited extent and under specific conditions. While the ecological benefits of these interventions are well documented (which is why we are returning to



them), their perception by the public remains poorly researched. The results of research on how people perceive forests are not uniform. In fact, many of them seem to contradict each other. This is because scientists study forests from various point of view and focus on different aspects of forest perception. A pilot survey was conducted online by the authors in the spring of 2025. A total of 142 students from various faculties of Charles University Prague took part in the survey. This will be followed by a survey focusing on the general population of the Czech Republic (the general public). The authors plan to publish the conclusions in 2026 in *Ochrana přírody/Nature Conservation Journal* as a follow-up article to this pilot study.

From the History of Nature Conservation

Zajíček P.: The First Making the Na Špičáku Cave a Show Cave 140 Years Ago

The Na Špičáku Cave is one of the most important natural and cultural monuments in Silesia. Several natural phenomena contributed to its creation and unique shaping. It has been accessible since time immemorial, as evidenced by hundreds of inscriptions, signatures, drawings and paintings on the walls. In 1885, it was officially open to the public for the first time, thus making it a show cave, although for one year only. Nevertheless, a tourist lodge with a dance floor was built there. A number of valuable documents have been preserved from this period. The caves were professionally explored and documented, and the first-floor plan map of the cave was elaborated. After 1885, the official tourist visits



at the Na Špičáku Cave ended, but the tourist hut built near the cave continued in its operation. During World War II, the underground spaces beneath Mt. Velký Špičák became a hiding place, and just after the war, members of the Wehrwolf movement also hid there. The modern history of the caves begins in the 1950s. In 1954-1955 the caves were electrically illuminated. A tunnel was built from the outermost part to the new exit. Since the cave tour is on one level and there are no stairs inside the cave, the access route to the exit was modified in 1995 and the tour became wheelchair accessible. The Na Špičáku Cave has a total length of 430 metres with a height range of 10 metres. The visiting route is 220 metres long and the tour takes approx. 35 minutes. The



underground spaces are an important wintering ground/hibernaculum for bats and therefore, the cave is closed to visitors in November and December.

Zajíček P.: The Na Pomezí Cave Became a Show Cave 75 Years Ago

The Na Pomezí Caves is the longest cave karst system in the Czech Republic formed in crystalline limestone. The first parts had been discovered in 1937 under circumstances that are not entirely clear. A substantial part of the cave system was then discovered during quarrying activities in 1949. A year later, some sections were modified, electrically lighted up, and made accessible for the public. Currently, the three largest caves – Na Pomezí, Liščí díra/Fox Hole, and Rasovna – form a continuous and interconnected cave system. Speleologically, the connection has

only been verified between the Na Pomezí Cave and Liščí díra/Fox Hole Cave. The connection between the Rasovna Cave and Na Pomezí Cave is formed by an impassable system of fissures approximately 25 meters long. However, there is no doubt about the mutual connection between these caves. All of these caves are now important wintering grounds/hibernacula for bats. The Na Pomezí Cave has a total length of 1,320 meters with an elevation of 47 meters (including the Liščí díra/Fox Hole Cave). The cave is part of the Na Pomezí National Natural Monument, declared in 1965. In September 2024, the entire cave system was hit by extensive flooding. A substantial part of the cave was under water. Pumping, removing mud deposits and repairing electrical installations then took several months.

Zajíček P.: Zdeněk Burian was Born 120 Years Ago

120 years ago, the world-famous painter of prehistory and adventure, cartoonist, and illustrator Zdeněk Burian was born in Kopřivnice (northern Moravia). His work is associated with the lives of the Earth's indigenous peoples and the lives of animals and humans in various prehistoric eras. He illustrated hundreds of popular and specialist books and magazines and created scientific reconstructions of the development of life on Earth. Zdeněk Burian's comprehensive work went far beyond the scope of standard artistic profession. He spent the first years of his life in the town of Štramberk, where he often visited Kotouč Hill with the Šipka/Arrow Cave, where the skeletal remains of Neanderthal man had been found. He was also influenced by the art exhibitions

he saw there. Based on photographs taken by travellers and explorers Enrique Stanko Vráza and Josef Kořenský, he drew and painted animals and inhabitants of world's various parts. Burian's role model was the famous artist Walter Paget. Ethnography and portraiture therefore became lifelong interests of the artist.

International Nature Conservation

Plesník J., Rolfová E. & Miko L.: IPBES Published Two Important Reports

Nature conservation is not and cannot be a scientific discipline, although it is sometimes considered to be. Traditionally, conservation biology has been. Nevertheless, both nature conservation and biodiversity conservation, management and sustainable use should be based on the proven evidence provided by science. The Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) has been trying to do just that for more than a decade. In 2013, IPBES published a conceptual framework for further action. It emphasises the strong interdisciplinary nature of its assessments, with increasing involvement of economic and social sciences. Thus, in many cases, the authors of IPBES assessment reports do not analyse ecosystems but straight socio-economic systems. On 10-16 December, 2024, the 11th Session of the Plenary of IPBES was held in Windhoek, Namibia, and approved two more important assessments. The first assesses the interlinkages between declining water and food availability, deteriorating human health and ongoing climate change, all in the context of biological diversity. The second assessment report looks at the necessary transformative change, consisting, *inter alia*, of changes in worldviews and in the structures of human society towards real sustainability.

Hachmöller A., Sudau M., Lauterbach D. & Ruffer J.: Sustainability and Development of Natural Dry Grasslands in Brandenburg in the Framework of LIFE Projects

The Stiftung NaturSchutzFonds Brandenburg (Brandenburg Fund for Nature Conservation) is implementing two LIFE projects for the management of dry grasslands co-funded by the European Union. Within the LIFE project Sand Grasslands carried out in cooperation with the Brandenburg State Environmental Authority,





measures for the conservation, development and restoration of calcareous grasslands on dry sands were implemented on an area of 77 hectares between July 2013 and June 2019. In addition to these measures, other natural habitat types listed in Annex I to the EU Habitats Directive, such as European dry heaths and dry sandy heaths with *Calluna* and *Genista* (inland dunes, old and decalcified), have been stabilised or improved on about 151 hectares. These measures were carried out in 20 project sites in the Dahme-Heideseen Nature Park south of Berlin. The project's budget was EUR 2.4 million (CZK 60 million). In the other LIFE project, entitled Continental Dry Grasslands, the Brandenburg Fund for Nature Conservation, together with the Botanical Garden of the University of Potsdam and the Naturschutzbund Deutschland (German Association for Nature Conservation and Biodiversity, NABU), is implementing

measures to protect and develop dry grasslands between 2019 and 2026. Dry habitats associated with dry grasslands, such as the above European dry heaths, inland dunes with open *Carynephorus* and *Agrostris* grasslands and dry sandy heaths with *Calluna* and *Genista*, will also benefit from the project measures. The project also aims to extend the distribution range of the Sand juninea (*Jurinea cyanoides*) in Brandenburg to five hectares. In total, it covers 29 sub-areas throughout the province and has a budget of EUR 6.3 million (CZK 157 million). The authors' experience including methods applied there is described in the article.

Härtel H.: European Transboundary Protected Areas: Håldi (Norway/Finland)

The Håldi Transboundary Area is part of the network of European transboundary parks certified by the EUROPARC Federation (since 2021). The park covers a total area of 3,099 km², comprising the Käsivarsi Wilderness Area in Finland and Reisa National Park along with the Ráisdottarháldi Protected Landscape in Norway. The transboundary conservation efforts aim at preserving and maintaining the area's unique natural and cultural values. There are three main landscape types in the Håldi Transboundary Area: (i) mountains (fells), with the highest point, Håldi, at 1,361 meters above sea level on the Norwegian side, (ii) plateaus, and (iii) river valleys, including the deep canyon of the Reisaelva River. The area is part of the Sámi homeland and is closely tied to extensive reindeer husbandry.

Plesník J.: The IUCN Red List Also Assesses Threats to Ecosystems on a Global Scale

Red Lists of globally threatened species have been regularly issued by the International Union for Conservation of Nature (IUCN) since the early 1960s. But the idea of presenting threatened components of biological diversity has long been about more than just species and other taxa. At the IUCN, the multifaceted issue of ecosystems is dealt with mainly by the Commission on Ecosystem Management (CEM). Delineating what an ecosystem is and establishing benchmarks for their assessment and classification is extremely complex. The first draft of the criteria was published after three years of intensive discussions. Five criteria were proposed for determining the degree of threat to ecosystems, namely: (i) Reduction in geographical distribution of the ecosystem (quantitative loss of the ecosystem); (ii) Restricted geographical distribution of the ecosystem; (iii) Degradation of the non-living (abiotic) component in the ecosystem as environmental degradation; (iv) Disruption in biotic processes and interactions reflecting deterioration of the living component of the ecosystem; and (v) Quantitative risk analysis, i.e. analysis of the possible collapse of the ecosystem. In 2024, the IUCN published the first ever Red List of Threatened Ecosystems. For this purpose, experts have chosen specific but relatively well-defined ecosystems that have been known for some time to be in a generally unfavourable state - mangroves. We will therefore deal with this topic in more detail in a future issue of our journal.

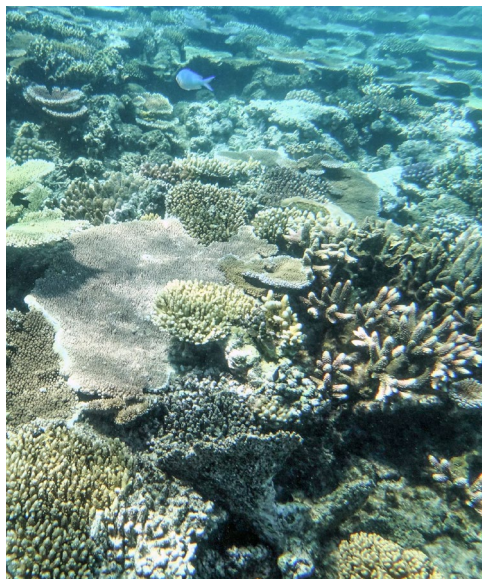


Plesník J.: IUCN Published First Global Red List of Ecosystems – Mangroves

The International Union for Conservation of Nature (IUCN) recently published the first ever global Red List of Ecosystems. Experts chose specific ecosystems for the list that have been for some time known to be in poor condition overall – mangroves. To undertake a comprehensive global assessment of mangrove ecosystems, it had been essential to establish a manageable number of assessment units that are both meaningful and reflective of the variation in the geographical, abiotic and biotic diversity associated with mangrove ecosystems around the world which were then classified using criteria for classifying ecosystems into Red List categories. Thus, experts clustered the world's mangrove forests into 36 biogeographical units. The world's mangrove ecosystems cover currently about 150,000 km² along mainly tropical, sub-tropical and some warm temperate coasts of the world. About 15% of the world's coastlines are covered by mangroves. In the past, this unique type of ecosystem was mainly degraded by wood exploitation and the acquisition of new land for agriculture, including shrimp farming. Later, it was the establishment of oil palm plantations and rice fields as main driver of decline in mangroves. The construction of dams altering freshwater and sediment fluxes also contributes to their loss. At present, they are also being affected by climate change, including sea-level rise and an increased frequency and severity of cyclonic storms. The IUCN analysis has confirmed that more than half of the mangroves remaining on Earth have already been at risk of collapse. Mangrove forests are one of the most productive types of ecosystems on Earth, where 90% of all marine organisms spend at least part of their lives. In addition, from an anthropogenic point of view they support the lives of 2.4 billion people living within 100 km of the coast through ecosystem services they provide.

Plesník J. & Hanel L.: Coral Reefs in Various Parts of the World Are Again Experiencing Global Bleaching Event

Coral bleaching, i.e. the noticeable transformation of originally yellow-brown corals into pale, transparent organisms, has been known for more than a century. When corals are stressed by changes in conditions such



as temperature, light, or nutrients, they expel the symbiotic algae living in their tissues and providing them with nutrients, oxygen and vibrant colours, thus causing corals to turn completely white. The first extensive study of coral bleaching, caused by increased water temperatures in large sections of the Great Barrier Reef, dates back to 1929. Since then, the process has been recorded regularly in various parts of the world. Between 1998 and 2017, bleaching was reported from 3,351 sites in 81 countries. The first global coral bleaching event in 1998 affected reefs throughout the tropical and subtropical climate zones and claimed the lives of 16% of all corals living on Earth at the time, with as many as half of those in the Indian Ocean perishing. What triggers local coral bleaching? First, and foremost, changes in seawater temperature, high solar radiation intensity, heavy metals (especially copper and cadmium), changes in water salinity, pesticide pollution, excessive nutrient concentrations (eutrophication), fishing, cyanides, ocean acidification, and pathogenic organisms such as bacteria. Local meteorological conditions that warm the sea surface, such as clear skies, high humidity, and high air temperatures, also contribute to coral bleaching. El Niño causes global coral bleaching events by triggering marine heatwaves, which lead to elevated sea surface temperatures that stress corals starving to death. A serious problem remains the fact that corals live in symbiosis with algae, usually in habitats where the water temperature is only 1–2 °C lower than the temperature at which bleaching begins. Coral bleaching is more intense the longer the coral reef is



exposed to higher temperatures. However, if corals that have resisted bleaching are able to produce new larvae, the seawater is of good quality, and suitable substrate is available, even severely damaged reefs can recover on.

Holer T.: Cave Salamanders of Sardinia

Sardinia is one of the major European biodiversity hotspots and a part of the global one. A number of endemic plant and animal species can be found there, among which the cave salamanders of the genus *Speleomantes* stand out for their uniqueness. Thanks to the diverse geology of the island and the isolation of individual mountain ranges interlinked with karst caves, a total of five species of cave salamanders occur there, which, together with three other species in mainland Italy, are among the only European representatives of the family of the lungless salamanders (Plethodontidae). As is evident from the name of this otherwise most numerous family of tailed amphibians, cave salamanders do not have lungs and breathe only through their skin. In addition, they reproduce by direct development without an aquatic larval stage and therefore need specific environmental conditions for their life, especially high air humidity and relatively low temperature. It is therefore not surprising that cave salamanders are currently threatened, mainly by climate change affecting the microclimate in caves, but also on the surface in their surroundings, where salamanders under suitable conditions forage for food. ■

NATURE IS OUR HERITAGE AND THE FUTURE



The Nature Conservation Agency of the Czech Republic (NCA CR) is a governmental body established in 1995. The NCA CR's main aim is to protect, conserve and manage nature and the landscape on the whole territory of the Czech Republic. The NCA CR directly manages 25 Protected Landscape Areas (PLAs, IUCN Category V) and 132 National Nature Reserves and National Nature Monuments (small-size Specially Protected Areas of at least national importance) outside National Parks and PLAs (IUCN categories Ia, III, IV) across the country.

The NCA CR's range of activities includes inter alia:

- Performing State/Public Administration in nature conservation and landscape protection in the particular areas, namely the Protected Landscape Areas, as the Public Authority;
- Monitoring the status of, changes and trends in the selected natural habitats and their types and populations of specially protected wild plant and animal species;
- Technical and expert support to other State/Public Administration authorities including methodological and expert activities;
- Carrying out inventories, surveys, monitoring and research for nature conservation and landscape protection;
- Running the Nature Conservancy Central Register and the central governmental documentation on nature conservation and landscape protection;
- Managing the Nature Conservancy Species Occurrence Database (in July 2026, there are more than 41 million records, thus being the most comprehensive database on species occurrence in the country);
- Implementation of practical conservation measures in the field to conserve nature and to protect landscape in the 25 Protected Landscape Areas and 132 National Nature Reserves and National Nature Monuments on the whole Czech Republic's territory;
- Developing & implementing specially protected species action plans & recovery programmes;
- Administration of national subvention programmes/subsidy schemes as well as of some European Union funds serving to conserve nature, protect the landscape and to mitigate climate change or to adapt to it;
- Payment of financial compensations for loss of property in agriculture, forestry and fishpond management;
- State property management in the Czech Republic's Specially Protected Areas including purchasing and exchanging new land;
- Communication with, education of and public awareness among the general public and the target groups;
- International cooperation in nature conservation and landscape protection: the NCA CR is the Czech Republic CITES Scientific Authority, IUCN, EUROPARC Federation and ENCA member and National Focal Point of the CBD SBSTTA and Clearing-House Mechanism (CHM) and of the IPBES.

The NCA CR consists of Headquarters based in Prague and of 13 Regional Branches. As of May 1, 2026, it has 711 staff members, of them 615 with university degree and 54 with Ph.D. degree.



2026 Czech Nature Conservation

