

# Ochrana přírody

2023 Czech Nature Conservation

Children and Nature Conservation  
Fire in a National Park

Hundred-year of Nature Conservation Legislation  
EU Nature Restoration Law and Czech Republic

Natura 2000 Will Again Expand  
Protected Areas in the World



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Dear readers,

You have got a special English issue of Ochrana přírody/Nature Conservation Journal published by the Nature Conservation Agency of the Czech Republic. The Agency traditionally submits each year a selection of articles from the previous year translated into English and publishes it as a supplement aiming at sharing the experience with colleagues from abroad, thus at least partially overcoming language barrier which can be fully removed neither by automatic translators.

You can read on possible Czech approach to the EU Nature Restoration Law implementation, specifically what the obligation implies for protected area network and for forests. It is a piece of legislation having a good chance, after having been passed, of becoming groundbreaking in the

field just as the EU Habitats Directive in 1992. From a point of view of implementation, the latter has been however after all living evidenced by the article on further expansion of the Natura 2000 network in the Czech Republic in 2022.

Information on revising the legislation on threatened species is no less interesting. This is an agenda the individual countries to a large extent deal themselves with. Therefore, every such approach is original and can inspire others.

An extensive forest fire in Bohemian Switzerland National Park should be mentioned among the serious issues of 2022. A combination of spatial impact of the European spruce bark beetle plague in non-native Norway spruce growths, a long period of the drought and human carelessness changed a tenth of the National Park in a burn-out area and jeopardized municipalities and local people there. The fire also reminded us of that such affair can repeat itself and shall repeat itself more often, *inter alia*, because of climate change gaining power despite if there is a protected area or the non-protected landscape. The fire became an affair moving the political world and mass media for a major part of the year. Finally it hopefully succeed in explaining that the National Park's target, *i.e.* preservation of natural processes across the majority of its territory will help to change the burn-out area soon into green spaces more resistant against similar events. In addition, they will allow to sufficiently in detail monitor succession within the area and therefore, to learn more about the power of and the limit in natural processes for the future. As well as that the fire did not emerge *a priori* as a consequence of the National Park's existence.

This year the EUROPARC Federation celebrates the 50<sup>th</sup> anniversary. During the half-century, the Federation grew into an organisation with approx. 400 members in 40 countries being the greatest professional body of protected area managers not only in Europe, but probably also globally. In then Europe, the idea was clear – to build a platform for communication and cooperation in the region with a large number of relatively small countries, significant language barriers and bipolarity into the two worlds. Relevancy of the mission has been unchanged and identically strong also today. Neither in the European Union, nor in the wider region there is a legal or other enough strong framework for an active cooperation among protected areas. Thus, the EUROPARC Federation has been filling the gap which may be in the current globalized world hardly understandable. That makes all the more important that on 24 February 2022 “the European world” again divided, namely by Russian aggression in Ukraine. We can only hope that the conflict will soon finish and Ukraine will have possibility of again developing itself without threats. The EUROPARC Federation has been and will be offering its support.

Internationally shared values and active communication are among tools to be confronted with disinformation and direct threats to democracy. Issuing this compilation contributes to the above as well as yourselves by reading it.

Wishing you enriching reading

**Michael Hošek**  
EUROPARC Federation President

**Ochrana přírody/The Nature Conservation Journal**  
**State Nature Conservancy of the Czech Republic Journal**  
**Volume 78**  
Special issue: Anthology of Articles from Vol. 78 (2023)  
**Price: CZK 60 (EUR 2.5)**

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**ISSN 1210-258X**

Registered by the Ministry of Culture of the Czech Republic Prague (Register No. E 6001)

**Published by** the Nature Conservation Agency of the Czech Republic, Kaplanova 1931/1, CZ – 148 00 Praha 4 - Chodov, Czech Republic and the Cave Administration of the Czech Republic, Kvetnove nam. 3, CZ – 252 43 Pruhonice, Czech Republic, supported by the Krkonose/ Giant Mts. National Park Administration, the Sumava/

Bohemian Forest Mts. National Park Administration, the Podyjí/Thaya River Basin National Park Administration and the Ceske Sycarsko/Bohemian Switzerland National Park Administration

**Translation into English:** Mark Sixsmith, Jan W. Jongepier, Jan Plesník

**Suggested citation of the individual articles:** Miko L. (2022): Soil as a biodiversity hotspot, namely that of small soil arthropods. Ochrana přírody/Nature Conserv. J. 77, suppl.: 24–29

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[www.nature.cz](http://www.nature.cz)

On behalf of the publisher, distribution for subscribers in the Czech Republic is carried out by the Send Ltd. Prague, Czech Republic, Ve Zlibku 1800/77, A3 Hall, CZ-93 00 Praha 9, Czech Republic; phone +420 225 985 235, cellular phone +420 777 728 757  
[send@send.cz](mailto:send@send.cz), [www.send.cz](http://www.send.cz)

**Orders from abroad** are disposed by the Nature Conservation Agency of the Czech Republic, phone +420 283 069127, [predplatne@nature.cz](mailto:predplatne@nature.cz)

**Layout and typesetting:**  
Atelier Mgr. Václav Hřaba ([atelier-hraba@volny.cz](mailto:atelier-hraba@volny.cz))  
**Printed by** Tiskárna Unipress, Ltd.

This issue was published 24 May, 2023  
Whole issues including references to the articles are available in open access on [www.casopis.ochranaprirody.cz](http://www.casopis.ochranaprirody.cz)



# Fragments of Successes from the Landscape of Changes and Stability: the Český kras/ Bohemian Karst under Protection of the Protected Landscape Area for a Half a Century

Jindřich Prach, Josef Mottl, Vojen Ložek, Lucie Hružová,  
Jaroslav Veselý, Tomáš Urban & František Pojer



In 2022, half a century has passed since the colourful limestone landscape nor far from Prague was declared as Protected Landscape Area (PLA). The Český kras/Bohemian Karst is a textbook of changes in nature from the sea with trilobites almost half a billion years ago, to the current overgrowing the landscape and decline in rare species. In contrast to mountainous and remote protected areas, the nature and the landscape have been co-created and shaped by humans over many thousands

of years there, and it would be incorrect to consider nature conservation without humans, land managers, and visitors. The article presents half a century of rapid social changes as well as changes in the landscape and nature in this picturesque, dynamic and at the same time in some aspects stable area. Stable with respect to the fact which phenomena have been preserved under the title of the PLA, particularly by recovery and replacement of traditional management.



Decades after the end of mining, the Alkazar quarry in the Berounka River Valley has become a habitat for steppe and rock species, as well as sought-after landscape scenery/character.

© Jindřich Prach

## Geology and geomorphology – basis of the landscape

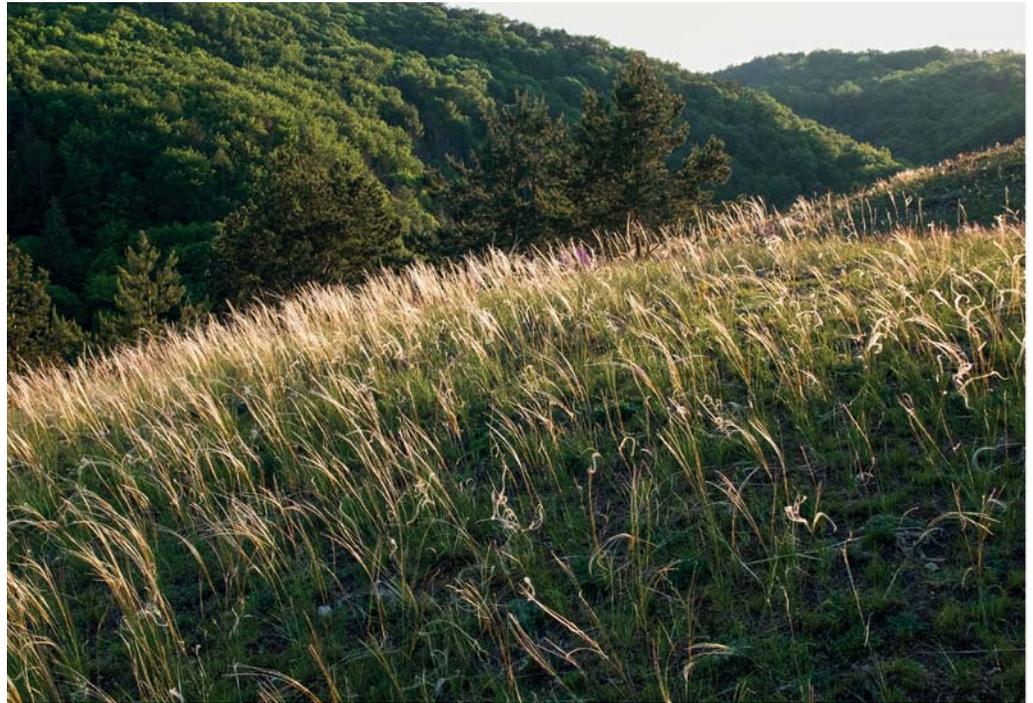
The gorges of the Berounka River and its tributaries have been furrowed over the last million years; these are mainly Palaeolithic limestones with complex and complete succession of beds and famous fossils. The landscape of ravines and plains was created, which has no equivalent elsewhere in Bohemia. Rocks with caves and rock steppe vegetation are the most important and typical element for the PLA (those interested in the details of how the Český kras/Bohemian Karst is the "Key to the Czech Landscape" are referred to the book of the same title ŽÁK *et al.* 2014).

Rocks are also changing; the numerous quarries are an often discussed nature conservation issue and, at the same time, a key phenomenon for geological research. It was possible to concentrate mining in areas approved before establishing the PLA, where valuable phenomena had already been destroyed. Mining continues at depth, which has less impact on distant views of the landscape, and quarries move towards relatively less-valuable areas (fields and ordinary forests). Simultaneously, it was possible to protect the valuable edges of the mining areas with the help of newly declared nature reserves. Nevertheless, continued mining is a source of controversy. Hundreds of former quarries are no longer mined; quarries and landfill, sometimes overgrown and sometimes managed by targeted grazing and clearing woody plants, are integrated into the landscape and become important habitats for rare species.

## Steppes and forest-steppes

From the point of view of living nature, forest-free steppe fragments are the most valuable. The rugged karst landscape, with permeable limestones and south-facing slopes, has always been perfect for the survival of xerophytes and heliophytes and their communities. The European feather grass (*Stipa pennata*), pasqueflowers, yellow sunroses (*Helianthemum* spp.) – they are part of the westernmost islands of Eurasian continental steppes and relicts of the forest-free Ice Age (*i.e.*, in principle, a similar phenomenon to the well-known cloudberry, also now as the Nordic berry (*Rubus chamaemorus*), and tundra in the Krkonoše/Giant Mts.). Numerous southern European species have joined the continental species which, on the other hand, have their northern-most occurrences on warm karst rocks.

There are several types of steppes in the Český kras/Bohemian Karst – from rock steppes to broad-leaved grasslands on deeper soils, which have been disappearing the fastest, to forest-



Feather grass steppes – forest-free islands on southern slopes and rock tops (Radotínské údolí/Radotín Valley Nature Reserve and Special Area of Conservation under the EU Habitats Directive). © Jindřich Prach

steppes. All in an unprecedentedly fine and colourful mosaic intermingling with thermophilic oak forests. The blurred boundary between forest and forest-free areas is important; it is becoming increasingly evident that quite a few of the rare and declining species need some ecotone type to live there.

To understand the dynamics of communities and to plan management, it is important to realize that we cannot explain the diversity and richness of the Český kras/Bohemian Karst by natural conditions alone. We find the answer in history and archaeology, as with all sites/areas at lower altitudes within reach of core, warm, and intensively populated areas. It is half a day's walk from the Polabí/Elbe River Basin, Hořovická kotlina/Hořovice Basin, and the territory of Prague to the karst – not only for today's tourists, but also for prehistoric hunters and herders. As evidenced by numerous archaeological findings, in caves, on surface settlements, and in the mounds of gords on the hills, there has never been a shortage of people in the area, even though the karst plains are barren. From the research so far, we can still only see hints of what the landscape looked like in agricultural prehistory. It must have been significantly influenced by humans, to a large extent open, grazed and mosaic-like, resembling a park (we infer from snail communities from the correspondingly old scree layers under the slopes and from mammal communities documented in bones from cave fillings).

Steppe heliophytes have lived there for seven millennia together with humans, and humans have preserved their habitats through landscape management. This implies the necessity of an active approach to nature conservation; targeted forest-free area management.

## Grazing management

Steppe grasslands in the Český kras/Bohemian Karst, as well as forest-steppes on the forest soils, had been used as pastures in the past and thus prevented overgrowing by woody plants. However, grazing was gradually reduced from the 1930s until it finished completely in the 1950s. The steppes were overgrowing, their area was shrinking. Since the 1980s, management mainly consisting of clearing invasive and expansive trees (acacia, ash, shrubs) and occasional mowing could not by itself prevent the accumulation of old grass and turf thickening, *i.e.* gradual degradation.

Goat and sheep grazing has therefore been recommended in management plans since the 1990s. Regular grazing of steppe vegetation, initially only on former pastures outside the forest, had started in the Český kras/Bohemian Karst on Zlatý kůň/Golden Horse Hill and Pání hora Hill in 2004, covering an area of about 15 ha. Between 2008 and 2010, it was also possible to start grazing management on forest-steppe sites in the Karlštejn National Nature Monument (NNM), located on the forest land fund, on the basis of permission for a deviating procedure in special



Landscape changes in the Český kras/Bohemian Karst in the last half century on aerial photographs of the same area in the 1950s and now. The upper right corner is outside the Protected Landscape Area, and without territorial protection; satellite development has become very widespread there (the municipality of Bubovice). In the lower left corner and in the middle of the photos, overgrown forest steppes are visible, where the last remaining unvegetated areas are managed by conservation grazing and host rich populations of the Pyramidal orchid. In the bottom right of the photos, part of the landscape altered by the quarry and landfill is shown.

purpose forests to fulfil the management plan (grazing in the forest and stocking reduction below 0.7 is allowed); this was issued by the Cadastral Office of the Central Bohemian Region after agreement with Lesy České republiky/Forests of the Czech Republic State Enterprise and the municipality of Srbsko. Since 2010, grazing management has been gradually extended to other areas in the Karlštejn NNM, Koda NNM, Kotýz NNM, Kobyla Nature Reserve, and other areas in the zone I of the Český kras/Bohemian Karst PLA. Thanks to the activities of the Pražská pastvina/Prague Pasture association, since 2017 grazing has also been implemented at sites in the Radotínské údolí/Radotín Valley (Nature Reserve and surroundings), Zmrzlík Natural Monument, and the Cikánka I. NNM on the outskirts of Prague. Other significant areas in the PLA are leased and grazed by herders, who otherwise provide management at core sites in the neighbourhood, with the support of agricultural subsidies/subsidary schemes.

Grazing brings numerous organizational problems, e.g. the need to move fences and herds in

a timely manner according to the most important target species, whether it is plants and their flowering and reproduction, or ensuring the development of insects on specific plots during a given season. There has been still much to learn there. In recent years in particular, the problem is that weather fluctuations cannot be guaranteed in a contract, while natural science needs and the economic-legal framework are not in unison.

Currently, over 70 ha of steppe grasslands are regularly grazed every year in the Český kras/Bohemian Karst. In addition to sheep and goat grazing, pony and cattle grazing has recently started at selected sites. Grazing contributes to the improvement of the steppe site condition, which is manifested, e.g. in the increase in the Small pasque flower (*Pulsatilla pratensis*) and Pyramidal orchid (*Anacamptis pyramidalis*) populations.

### Butterflies and beetles preserved through grazing

On carefully grazed areas (especially under the management of the Třesina conservation associ-

ation) it has been possible to preserve a thriving population of the otherwise disappearing or already locally extinct Grayling (*Hipparchia semele*). For its development, the butterfly needs short-grazed fescue stands adjacent to plots with insulated tree trunks and plots with nectar. In other words, a previously common intricate landscape mosaic which is not possible to be created with modern management and whose absence is the reason for the disappearance of many other, less explored organisms. Less fortunate were the Hermit (*Chazara briseis*) and the dusky meadow brown (*Hyponephele lycaon*) butterflies, which have widely become extinct in the decades since declaring the PLA there. Grazing also supports important species of dung beetles (*Onthophagus lemur*, *Onthophagus illyricus*, *Sigorus porcus*, *Planolinus fasciatus*, and *Euoniticellus fulvus* having been confirmed in the area recently, the latter after more than 50 years). The thermophilous *Sisyphus schaefferi* is very abundant. However, the restoration of grazing is not a panacea; for example, the iconic Horned dug beetle (*Copris lunaris*) and *Gymnopleurus geoffroyi* disappeared from the Český kras/Bohemian Karst not long after declaration of the PLA.

### Forests

Open thermophilic forest-steppe oak forests are another fundamental phenomenon of the Český kras/Bohemian Karst. In a delicate mosaic, it changes into the above-mentioned steppes and shadier forests, especially oak-hornbeam forests, islands of calcareous beech forests, and ravine forests. Positive changes have also taken place in Český kras/Bohemian Karst forests since declaration of the PLA. In the 1970s, species composition of forests was marked by the long-term intensification of forest management. Coniferous trees, of which only the European silver fir (*Abies alba*) and Scots pine (*Pinus sylvestris*) can be considered native, represented 35% when the PLA was established. Of deciduous trees, oak (*Quercus* spp.) dominated with 38.2% and the European hornbeam (*Carpinus betulus*) with 14.4%. The transformation of the species composition in forest stands was one of the priority nature conservation goals. Not only thanks to long-term efforts, but also in recently due to extremely dry years, the Norway spruce (*Picea abies*) and the European larch (*Larix decidua*) have almost completely disappeared from the Český kras/Bohemian Karst forests. The non-native Austrian pine (*Pinus nigra*) still grows on about 5% of the forest area, and the total proportion of conifers has decreased to the current level of about 11%.



Changes in the forest in the Karlštejn National Nature Reserve – aerial photographs of the same area of forest stands (about 0.5 x 0.5 km) in the 1950s and now. In the sparse thermophilic oak forest in the lower half of the pictures, there used to be a rich population of the Elder-flowered orchid (*Dactylorhiza sambucina*); today, individual plants occasionally appear. In the upper half of the photos, strips of former often-cleared coppice forests with standard trees are shown; today, it is a continuous stand. Given that the plot is owned by the Nature Conservation agency of the Czech Republic, active forms of management are being renewed there. Aerial photographs © The Czech Office for Surveying, Mapping and Cadastre, <https://ags.cuzk.cz/archiv>

The Český kras/Bohemian Karst holds national primacy in the delimitation of non-intervention forest areas. The very first agreement with Lesy České republiky/Forests of the Czech Republic State Enterprise on leaving the forests to spontaneous development was signed in 2004. Part of the Karlštejn NNR – Doutnáč Hill, covering an area of 65 ha, has been a model non-intervention site since then. Regular monitoring and evaluation of changes in the forest habitat takes place there, and data obtained are used to understand natural processes in lowland forests.

It is not only conservative nature conservation that makes sense. In previously intensively managed forests in particular, imitating former management methods is a way of effective active nature conservation. Returning to coppice forest with a short rotation period helps to preserve the previously abundant wild animal and plant species of open canopy middle forests. Through gradual negotiations with owners of State and private forests, the current area with the aim of reintroducing coppice management has reached 43 ha, with interventions currently being implemented on 7.6 ha.

### Iconic plants show change, problems, and relative stability

The rarest and, at the same time, the most monitored plant is the Austrian dragonhead (*Dracocephalum austriacum*), a rare and disappearing species at a pan-European level. In the PLA, it occurs at eight sites, where we count hundreds of plants in total. We have sufficient information about the plant from detailed monitoring (T. Dostálek, Institute of Botany, Academy of Sciences of the Czech Republic Průhonice near Prague), and we can generalize the findings and use them for planning the management of other similar long-lived plants limited in the seedling stage. Between 2003 and 2013, the number of individuals increased and the situation appeared promising. In the dry years since 2015, however, there has been a decrease, and the decrease became critical after the extremely dry year of 2018, when the populations reached roughly a quarter of their original number, from hundreds to tens of plants per site. For nature conservation, the confluence of impacts – the well-intentioned opening of sites and drought – is instructive and a warning. Previously, it was clear that they thrive, bloom profusely, and produce clumps in the sunny

parts of the sites, and wither away in the shaded ones. Therefore, conservationists started to clear bushes locally. Unexpectedly dry years followed, when old clumps generally did not survive in sunny, extremely dry places. Plants in the marginal, more shaded parts of the sites were preserved. So clearly, in the longer term, this is a species bound to a mosaic of habitats, and its needs and management needs cannot be simplified if we do not understand processes on a scale of decades or centuries. A regional action plan/recovery programme was developed for the species, which includes, *inter alia*, establishing replacement populations in botanical gardens that separately keep the gene pool from individual populations. Sowing and planting are carried out on replacement sites, where management is ensured, and they are not as extremely dry as the original sites.

Despite the apparent decline in the Austrian dragonhead to roughly a third over almost 20 years of monitoring, it can be stated that conservation under the Nature Conservation Agency of the Czech Republic (NCA CR) – Český kras/Bohemian Karst PLA Administration is relatively successful; occurrences in the Český kras/Bohemian Karst PLA are still among the richest within the species'

European distribution ranges, while on the other two sites in the Czech Republic it has become extinct.

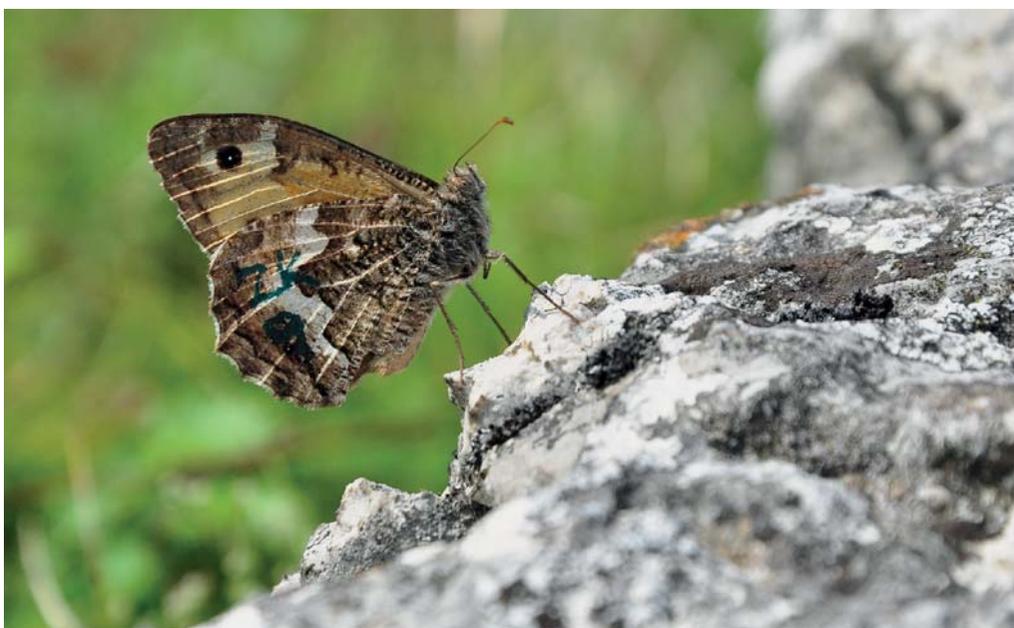
It is more complicated with open forest species. Specialized insects, such as butterflies, had become extinct immediately after management changes, the decline in long-lived plants is only considered under the heading of PLA, and the trend is clearly not going to be reversed anytime soon. Orchids, the ones we know from meadows

in other areas, grew in the Český kras/Bohemian Karst on grassy patches in open oak forests. In recent decades, the Common fragrant orchid (*Gymnadenia conopsea*) has become extinct at both sites, the Elder-flowered orchid (*Dactylorhiza sambucina*) has been declining, with a few individuals remaining at a few micro-sites. Everything is an obvious consequence of forest stratification, forest undergrowth, and litter. So far, the preservation of the Early purple orchid (*Orchis mascula*) has been successful; the respective areas in ther-

mophilic oak forest are mowed, raked, and the plants are monitored in detail. The numbers of the flowering pyramidal orchids has increased at sites with management grazing. In the turf of a forest-steppe, which had been thinned out by the dry years, several specimens of the Burnt orchid (*Neotinea ustulata*) have appeared again. We are unsure about the decline in sites of the Ladybells (*Adenophora liliifolia*), which was previously apparently associated with a mosaic of low forest cycling on a landscape spatial scale, although its abundance is increasing at sites that are purposefully fenced and specially managed.



Goat grazing is the main management tool for preserving the varied mosaic of steppes and forest-steppes in the Český kras/Bohemian Karst Protected Landscape Area. © Jindřich Prach



The grayling (*Hipparchia semele*), a declining or extinct butterfly elsewhere, remains in the Český kras/Bohemian Karst thanks to management interventions, especially grazing. © Lucie Hřůzová

## Vertebrates

Vertebrates mainly "read" the landscape on a larger spatial scale; therefore, a relatively small PLA in the populated landscape is not so special in terms of vertebrates. In recent decades, the Fire salamander (*Salamandra salamandra*) populations have been relatively prosperous, as well as the Dice snake (*Natrix tessellata*) in the Berounka River Valley, and the number of the steppe Smooth snake (*Coronella austriaca*) habitats has been increasing. It is worth mentioning the confirmation of the appearance of three new species of bats, namely the Soprano pipistrelle (*Pipistrellus pygmaeus*), Alcaholic bat (*Myotis alcaholic*), and the Savi's pipistrelle (*Hypsugo savii*), apparently related to more detailed research and genetic analysis as well as climate change.

During the existence of the PLA, the occurrence of 123 bird species has been confirmed: there is new nesting of the Black stork (*Ciconia nigra*), European bee-eater (*Merops apiaster*), Montagu's harrier (*Circus pygargus*), and Savi's warbler (*Locustella luscinioides*). On the other hand, the European roller (*Coracias garrulous*) and two species of shrikes, the Lesser grey shrike (*Lanius minor*) and the Woodchat shrike (*Lanius senator*), can be considered completely extinct species. Among the mammals, the European beaver (*Castor fiber*) and the Eurasian otter (*Lutra lutra*) are increasing, and there is a problem with the European mouflon (*Ovis orientalis musimon*) destroying unique vascular plants, the botanical subjects of protection. All this corresponds to general trends in the surrounding countryside and in the Czech Republic as a whole.

## Urbanism – development and the landscape

Due to the proximity of the capital city and the growing interest of urban residents in "living in nature", the PLA is exposed to very strong interest in new construction. In terms of the landscape, "keeping construction under control" is relatively

successful, and the traditional appearance of the landscape, including settlements, has still been visible in the PLA compared to other parts of Central Bohemia, which are quickly becoming a suburb of Prague. Weekend house cottage development had occurred there even before the declaration of the PLA; in the first years of the PLA's existence, weekend house cottages were still being built, but over the past 20 years further permission has almost stopped and the extent of weekend house cottage development has remained stable for many years. Although the scope of development in total has increased significantly over the 50 years of the PLA's existence, the trend is significantly lower compared to the rest of the Central Bohemian Region, mainly thanks to the active participation of the NCA CR (PLA Administration) in the municipal planning process.

### Cradle and laboratory of natural science research

The PLA is essential from the point of view of natural science research; the variety of abiotic and living nature as well as the proximity of Prague make the area a destination for generations of scientists, university excursions, and all types of enthusiasts. The common name Český kras/Bohemian Karst itself was introduced 100 years ago by the quirky naturalist Jaroslav Petrbok. The Český kras/Bohemian Karst serving as a model area for the study of broader scientific questions can be found on the pages of leading scientific journals. Cooperation with the scientific community is welcomed by nature conservation; formalities such as placing devices or taking samples in the NNR are negligible due to the widely applicable results that scientific research of all types brings to subsequent better understanding and planning of nature conservation.

### Preserving for future generations

Today, human reshaping of the planet (co-creation or destruction) has been faster and faster. It manifests itself in the local landscape, as we have shown in the examples, while local phenomena contribute to the whole like a fragment in a mosaic. So how to summarize 50 years of nature conservation in the Český kras/Bohemian Karst PLA? An old timer can complain that much has disappeared and is disappearing, in both within the PLA and outside of it. The conservationist can be happy that much is being preserved and that under the NCA CR – PLA management the decline has been slower, as we showed in the positive examples. Quite a few rare species only survive in somewhat sustainable populations within the PLA. This is to



The Pyramidal orchid (*Anacamptis pyramidalis*); the only sites of occurrence of this orchid in Bohemia are managed on the Český kras/Bohemian Karst pastures. © Jindřich Prach



The gorge of the Berounka River with limestone rocks is the core of the Český kras/Bohemian Karst Protected Landscape Area. © Jindřich Prach

some extent due to the varied and extreme natural conditions (they would be there even without conservation), but many directly depend on traditional management and its restoration, or its imitation and implementation. As for the traditional landscape scenery/character, the PLA clearly does better than the surrounding landscape, *i.e.* other parts of the periphery of Prague. Even a non-expert can see the persistent qualities of nature and the landscape within the PLA, as evidenced

by the increase in interest in the area among tourists. Due to the thousands of years of shaping of the landscape and nature by people, visitors generally do not disturb the protected phenomena there. Let us believe that the Český kras/Bohemian Karst will continue to prosper in cooperation among conservationists, land managers, scientists, and many others, and that the basic phenomena will be preserved for future generations. ■

# What Does the European Union's Nature Restoration Law Mean for Nature Restoration in the Czech Republic?

**Pavel Pešout & Jan Šíma**

On 22 June 2022, the European Commission published a draft Nature Restoration Regulation of the European Parliament and the Council. It brings a legislative instrument to fulfil the EU Biodiversity Strategy 2030 adopted two years ago, which includes a plan for nature restoration and is one of the pillars of the European Green Deal. The European Commission thereby fulfils its task arising from the strategy, to submit a legally binding proposal for

objectives in the field of nature restoration (restoration of disturbed ecosystems). The dramatic increase in extreme weather events, risks and threats in the area of living standards, security and social peace significantly increases the urgency of implementing measures aimed at restoring ecosystems, as a prerequisite for ensuring long-term food and energy self-sufficiency as well as human well-being.



The nature restoration plan included in the EU Biodiversity Strategy 2030 (hereinafter the EU Strategy) may appear ambitious and difficult to implement (PEŠOUT 2020); however, its immediate implementation is necessary for our continued survival (HERMOSO *et al.* 2022). We are fully dependent on intact nature – for food, in terms of the availability of clean water and air, and of course also for health. In many parts of the world, we can observe a dramatic decline in insects, including pollinators, without which three-quarters of food crops cannot be produced (IPBES 2019). The summary of scientific evidence included in 6<sup>th</sup> Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), taking into account the interdependence of climate, ecosystems, biodiversity, and human society, is unequivocal: climate change directly threatens the human well-being and the health of the entire planet. With each additional delay in mitigating the climate change negative impacts and adapting to it, we miss a short and rapidly closing opportunity to secure a viable and sustainable future for all (IPCC 2022). A recent study completed as part of the evaluation of the EU Strategy 2020 (EC 2022) shows that the EU failed to halt the loss of biodiversity in 2011 - 2020. The outlook for biodiversity including ecosystems is bleak and shows that the current approach has not been working. Therefore, the European Parliament and the Council insist on intensifying efforts to restore ecosystems. In a resolution of January 2020 (EP 2020), the European Parliament called on the European Commission to move from voluntary commitments to the design of an ambitious and inclusive strategy that would establish legally binding (and therefore enforceable) quantified targets for the EU and its Member States.

## Comprehensive standard

The draft Nature Restoration Regulation of the European Parliament and the Council – the Nature Restoration Law (hereinafter the Regulation) is built as a comprehensive standard following the existing EU legislation in nature conservation (Birds Directive, Habitats Directive, Regulation on Invasive Alien Species), as well as in protection of rivers and other water ecosystems (Water Framework Directive) and other EU documents (e.g. EU Forest Strategy until 2030 and EU Pollinator Initiative). The Regulation fulfils not only the European Green Deal, but also other European Union's policies and concepts in sustainable management and use of natural resources. Its legislative point of view (*i.e.* the form, character, and structure) is presented in more detail by STEJSKAL (2022) in the previous issue of this journal.



The Nature Restoration Regulation also focuses on urbanized areas aiming at increasing and enhancing public green spaces. With the help of national subsidy/subvention programmes and those with the participation of the EU, green and blue infrastructure has been built in human settlements for many years. Pictured is a project to improve rainwater management and restore a reservoir in the centre of the municipality of Bratčice (South Moravia). © Pavel Pešout

The Regulation is not only focused on the restoration of ecological functions in natural habitats, as defined by the existing, above-mentioned legislation, but in the landscape as a whole, on broadly defined groups of ecosystems of agricultural landscapes, cities, forests, watercourses, and on habitats important for pollinators, *etc.* If we are to live up to the obligation of comprehensive nature restoration arising from the Regulation, it shall be necessary to abandon the existing isolated, sectoral approach, where conservation and management of Specially Protected Areas, watercourse administration, landscape management, management of the green infrastructure in urbanized areas, and land-use/territorial planning are dealt with separately.

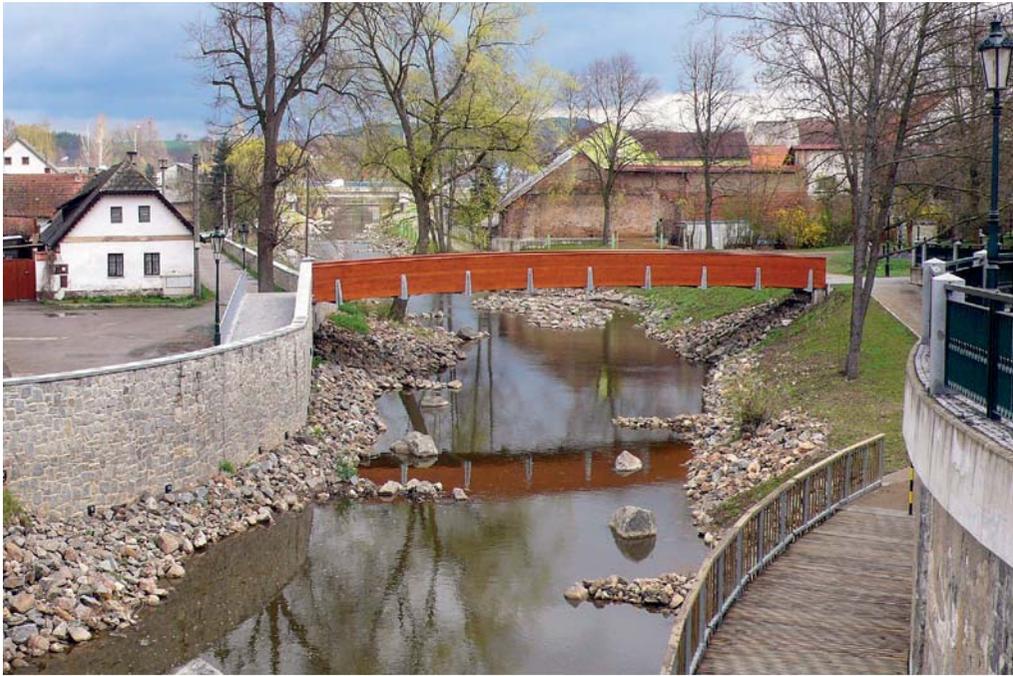
## Amendment to the Act on Nature Conservation and Landscape Protection (?)

In connection with implementation of the Regulation in the Czech Republic, there are considerations about the need for a comprehensive amendment or even a new law on nature conservation and landscape protection. The Act on Nature Conservation and Landscape Protection is certainly outdated in some parts, for example in the special protection of species (PEŠOUT *et al.* 2022); however, thanks to its structure when it was adopted, we can still build on it and the necessary quick changes can be made by partial amendment. The fact that the draft

Regulation is in the form of an actual regulation also testifies to the mentioned approach – it is a directly applicable EU regulation that is not further transposed and it is "only" necessary to ensure its connection with national legislation, *i.e.* so-called adaptation.

It will be necessary to determine the competences for implementation of the Regulation, in particular the responsibility for the preparation of the National Nature Restoration Programme (NNRP), which will be a very demanding process with extensive participation of stakeholders, municipalities, land managers, and the general public. Furthermore, it will be necessary to anchor the responsibilities for reporting and data collection for the EU authorities. The necessity of legislative amendments in relation to the Regulation's provisions concerning the right to NNRP's judicial review in relation to a potentially large circle of authorized persons cannot be ruled out (to expand public participation, *cf.* STEJSKAL 2022).

A partial amendment will probably be required for general nature conservation, where it will be most appropriate to include substantive links and implementation details related to fulfilment of the Regulation. In particular, it will create the conditions for sufficient improvement in the quality and quantity of natural habitats for EU requirements, including their restoration and connection, while taking into account the ecological requirements of



Restorations within a built-up area are being successfully implemented in an increasing number of municipalities in the Czech Republic. An example is the Blanice River, which has been restored along the entire length of its flow through the town of Vlašim (Central Bohemia). At the same time, all four local weirs were made permeable for biota on this section. © Pavel Pešout



The commitment to protect nature on 30% of the country can also be fulfilled by including private reserves established by the Czech Union for Nature Conservation, Czech Society for Ornithology, and other associations, such as the Jehliště Primeval Forest near the town of Sedlec – Prácheň (Central Bohemia). © Pavel Pešout

the species that are bound to these habitats. For this, it would be appropriate to use the existing establishment of Significant Landscape Elements (SLEs), especially those "by law", and specify the method for defining their individual segments (where it is not obvious), conservation objectives and management, etc. Another tool, which should be the basis for fulfilling the requirement to ensure

landscape connectivity, is the Territorial System of Ecological Stability (TSES), a national multilateral ecological network *sensu stricto*, or its modernized form (see below).

Adjustment of established general territorial protection, especially SLEs and TSES, in the legislative and methodological areas is also

a prerequisite for fulfilling another obligation arising from the EU Strategy, namely to protect at least 30% of the EU's land area by 2030. At the EU level, this means increasing the protected land area by 4% compared to the present. In the case of the Czech Republic, the extent of all protected areas (after removing territorial overlaps) is 17,249.1 km<sup>2</sup>, i.e. 22.1% of the country's territory. If we were to fulfil the objectives of the Strategy at an unreduced level, an additional 8% of the Czech Republic's territory will need to be protected, i.e. approximately 6,310 km<sup>2</sup>. There is an opportunity to complete the network of large-size Specially Protected Areas, i.e. to declare the new Morava and Dyje/Thaya Rivers Confluence Protected Landscape Area, Krušné hory/Ore Mountains PLA, Doupovské hory PLA, Středomoravské Karpaty/Central Moravian Carpathians Mts. PLA, and Rychlebské hory/Rychleby Mts. PLA (PEŠOUT 2015, PEŠOUT & DORT 2022), but even this will not be sufficient, and including at least selected TSES and SLE components is necessary (KNÍŽÁTKOVÁ & HAVEL 2022 – see pages 14 - 19 in this issue).

## Changes to regulations in the area of landscape design and use (?)

The Regulation comprehensively addresses the overall state of the landscape. The majority of measures are therefore not aimed at Specially Protected Areas, but rather at cultivated and inhabited landscape without distinction. Settings, competences, and opportunities for current nature conservation are not enough to preserve biodiversity; they alone cannot ensure that nature fully returns to our lives. It is precisely "bringing nature back into our lives" that is the main motto of the EU Strategy, and the ecosystem restoration plan, which the Regulation is supposed to help fulfil, is one of the main tools. Let us remind ourselves that the Regulation brings binding goals in restoration of disturbed and damaged ecosystems. Among the most essential is ensuring an improvement in at least a third of the species and natural habitats protected by the relevant EU legislation which are not currently in a favourable condition. It is obvious that without an overall improvement in the state of the agricultural landscape/farmland, forests and water ecosystems, without a change in approaches in land-use/territorial planning, we will not be able to achieve this goal, as well as others related to, for example, the state of pollinators.

In the case of freshwater ecosystems, the Commission notes only slow implementation of the Water Framework Directive and formulates a key commitment – to restore at least

25,000 km of negatively affected watercourses to free-flowing rivers by 2030. This is to be achieved by removing or modifying obstacles that prevent fish migration and the natural movement of sediments, primarily those that are not used for energy production, inland navigation, water supply, etc. The Czech Republic has significant issues in this area. Although there is a concept of making the river network passable/permeable, it has only been fulfilled in a fragmentary way (VOGL 2019). The sub-basin plans include dozens of proposals for measures, yet the morphological status and continuity of the watercourses is slowly being restored, despite a favourably financial support. In order to change the status more quickly, it will be necessary to ensure greater motivation of watercourse managers. In this context, an extension of the main subject of state basin enterprise activities in the Basin Act is proposed. In the Water Act, it would be appropriate to make partial changes simplifying the discussion and preparation of restoration buildings, changes enabling the restoration of watercourses to be used on a large scale, and dealing with water abstraction for fish crossings at hydropower facilities (KUJANOVÁ 2022).

The Regulation also focuses on forests. The objective is to increase the species diversity, age and spatial structure of forests with the aim of increasing their quality and resilience, strengthening their biological diversity and carbon storage capacity, while taking into account their production function. In addition to changes in forest management (e.g. preference for non-age-class forestry, improvement of the quality of natural habitats of EU importance), partial changes to forestry legislation will probably be necessary, especially to enable monitoring the prescribed set of indicators, e.g. introduction of an indicator in forestry planning for monitoring the volume of standing and lying dead wood (HOFMEISTER & SVOBODA 2022 - see pages 20 - 23 in this issue). Within the obligations arising from the Regulation, it will also be necessary to look at the currently ongoing preparation of legislation changes in hunting because the current overpopulation of ungulates, namely cloven-hoofed game, significantly limits the forest ecosystem restoration.

Furthermore, it will probably be necessary to amend legislation in construction and land-use/territorial planning, e.g. to ensure the fulfilment of an increase in urban green spaces (by 3% by 2040 and 5% by 2050 compared to 2021), or an increase in green spaces that are incorporated into existing and new buildings and infrastructure, including their renovation and restoration.



Damage to spruce monocultures by the European spruce bark beetle outbreak is an opportunity to change the forest management method and to restore species- and age-varied stands – pictured the Lužické hory/Lusatia Mts. Protected Landscape Area (northern Bohemia). © Pavel Pešout



The Regulation emphasizes green infrastructure and connectivity. There should be an increase in the representation of landscape elements on agricultural land – pictured an avenue of fruit trees in the Polabská nížina/Labe/Elbe River Lowland between municipalities of Velim and Sokolč (Central Bohemia). © Pavel Pešout

## Completion of green infrastructure

In the urban environment, the Regulation focuses on increasing green spaces (especially the proportion of trees, but also greenery as part of buildings and infrastructure), which also fully corresponds to one of the points of the Government's current programme statement *We will advocate improving*

*the climate in cities and municipalities with their significant greening. We will legislatively anchor so-called blue-green infrastructure.* Overall, the Regulation can be understood, with its emphasis on strengthening the connectivity of habitats, forests, free-flowing rivers and ensuring the proportion of landscape elements in the agricultural landscape, as a significant impetus to support the green infrastructure of the landscape and the



If the Czech Republic is to fulfil the goal of restoring the morphological state of 250-300 km of rivers by 2030, it will be necessary to ensure an increased allocation of funds in subvention programmes/subsidy schemes for this type of measure. Restoration of the 10 km long section of the Vltava River Vraňany – Hořín (Central Bohemia) implemented by Povodí Vltavy/Vltava River Basin Management Authority, State Enterprise thanks to the Operational Programme Environment's support of EUR 7.6 million. © Povodí Vltavy/ Vltava River Basin Management Authority, State Enterprise archive

application of nature-based solutions, *i.e.* solutions based on natural processes.

The backbone of green (and blue) infrastructure in the Czech Republic is an ecological network – a system of interconnected natural and semi-natural areas, where we evaluate and protect the level of resistance and resilience, and which we manage differently according to priorities. Its foundation is represented by the Territorial System of Ecological Stability (TSES) and the Specially Protected Area network, but also most of the Significant Landscape Elements (SLEs) and some nature parks. The segments of the ecological network today cover 56% of the Czech Republic (PEŠOUT & HOŠEK 2012). Functional superstructure consists of defined habitats of wild animals, including their movement corridors having been defined and provided for land-use/territorial planning since 2020 (PEŠOUT *et al.* 2018 a, 2018b). We can say that the Czech Republic has already had a sufficiently robust ecological network, but it is necessary to specify the definition of some segments, to start consistently applying existing legislative and economic tools for its conservation and management in broad cooperation with managers and municipalities. In addition, in the case of TSES, a fundamental paradigm shift is needed. It is necessary to further consider the conservation, restoration, and connection of current natural habitats and their characteristic species (HLAVÁČ & PEŠOUT 2017).

## National Nature Restoration Programme (NNRP)

The pillar of the Regulation is the processing of NPOP. Many goals, tasks and measures resulting from the Regulation have already been part of existing national policies, concepts and strategies, most of them approved by the government after inter-ministerial discussions (Strategic Framework of the Czech Republic 2030, National Plan for Adaptation to Climate Change, National Biodiversity Strategy, State Nature Conservation Programme, Concept for Protection against the Consequences of drought, National Forestry Programme, river basin plans, *etc.*) and, as already indicated above, many of the Regulation goals also resonate with the Government's current programme statement. Links and complementarities will need to be established, especially in measures fulfilling existing legislation, such as the priority action framework for the EU Natura 2000 network. NPOP will more specifically quantify and prioritize both territorial and qualitative commitments in the field of nature restoration, taking into account national specifics. Coordination of NNTP with the RePower EU initiative is also required, particularly with the delineation of zones suitable for the installation of renewable energy sources. The new legislative framework will also need to be considered when updating the National Biodiversity Strategy, which awaits us in 2025 (and possibly the State Nature Conservation Programme, if it still exists); considering the ambi-

tions of the Regulation and NNRP, its fundamental revision will be necessary.

## Changes in setting support

According to the position of the Czech Republic on the draft Regulation discussed in the Parliament of the Czech Republic (HAVEL *et al.* 2022), to fulfil its goals it will be necessary to ensure adequate financial support, or adaptation of both EU and national financial mechanisms. Within their national budgets, the Member States (including the Czech Republic) will have to take into account the need to direct expenses towards goals in nature restoration, conservation, and support for increasing biological diversity. However, the goals of the support are not entirely new, they result from the existing legal framework of EU legislation in nature conservation and from national policies, concepts, and strategies in biodiversity, landscape, and climate change impact management.

The subvention programmes/subsidy schemes within the Ministry of the Environment of the Czech Republic is set up in an appropriate way for the implementation of restoration measures. It includes support for small non-investment measures (primarily the Landscape Management Programme), smaller investments (primarily the Landscape Natural Function Restoration Programme, currently strengthened from the National Recovery Plan and Project Scheme of the National Conservation Agency of the Czech Republic financed by the Operational Programme Environment (OPE)), as well as larger investment activities (OPE). It is certain, however, that without significant financial support from the OPE and the Ministry of the Environment of the Czech Republic national programmes, the Czech Republic will not be able to fulfil the Regulation goals by 2030. For example, we should restore the good condition of at least 30% of the coverage of natural habitats or significantly accelerate (at least five times compared to OPE 2014-2020) the improvement of the morphological status of watercourses (including the removal or opening of migration/movement barriers) and the natural functions of related floodplains. The underfunding of OPE will be partly improved by the currently discussed reallocation from the Integrated Regional Operational Programme (IROP), but it is certain that it is only a partial solution and further changes in the setting of the programmes will have to be adopted, while as the time for their fulfilment progresses, this will represent an increasingly difficult task.

For the strengthening of blue and green infrastructure in cities and the planning public green spaces, significant support is set, especially in the IROP, to

a lesser extent also within the OPE and the National Recovery Plan.

Agriculture is of absolutely fundamental importance for the state of biological diversity, including the landscape. The basic tool for implementing and monitoring the implementation of the Regulation as well as the goals of the Farm to Fork Strategy (EC 2020b) is the new Common Agricultural Policy (hereinafter the CAP). The currently finalized setting of the CAP in the Czech Republic has managed to move more in the desired direction compared to previous periods (ČÁMSKÁ 2018), yet when watching the protests of some large farmers, one cannot avoid the feeling that the premise on which the European Commission was based when formulating the Strategy and Regulation was not understood: *Farmers are among the first to feel the effects of biodiversity loss and are also among the first to reap the benefits of its conservation and restoration, as biodiversity helps them secure safe, sustainable and affordable food and provides them with income.*

## Supplementing the monitoring system

The Regulation establishes the scope of mandatory long-term monitoring of the state of biodiversity and inventories and reporting to the European Commission. This is partly already implemented monitoring (e.g. Common Bird Index, habitat mapping), but in a number of other cases, these are indices on the state of biodiversity and the landscape that have not yet been anchored (e.g. the dead wood volume left in forests, the abundance and diversity in pollinators, canopy stratification of greenery in cities, etc.).

In addition to what follows from the Regulation, the key commitment of the EU Strategy is also ensuring effective management of all protected areas, defining clear conservation goals, and monitoring of their fulfilment. The ongoing integrated project of the EU LIFE Programme *One Nature* of the Ministry of the Environment, NCA CR and academic institutions, together with the NCA CR project entitled Information System for Nature Conservation II" should contribute significantly to achieving this goal in Specially Protected Areas (ZÁRYBNICKÝ *et al.* 2020). However, in general nature conservation, the Landscape Register module will need to be completed in connection to the Regulation within the Nature Conservancy Information System (NCIS). It is a long-planned project, which, however, has not yet been fully implemented, and so far only a few parts have been developed (e.g. Memorial/Veteran Tree Database, TSES in Protected Landscape Areas).

The Landscape Register will be necessary to monitor the fulfilment of obligations in general territorial nature conservation (area coverage and management provisions/measures).

## The regulation is subject to amendments

The draft Regulation is currently being discussed by the relevant group within the Council of the EU (Working Party on the Environment) – currently led by the Presidency of the Czech Republic in the Council of the European Union (CZ PRES) – and simultaneously in the European Parliament. Within all EU Member States, national parliaments have also been at various stages of discussion on and negotiations of the position towards the proposal. The Czech position was discussed between ministries and presented to the Parliament of the Czech Republic in July 2022 (HAVEĽ *et al.* 2022). The Committee for European Affairs of the Chamber of Deputies approved the proposed position of the Czech Republic on 5 October 2022 (Committee Resolution No. 96), and so did the Senate on 12 October 2022 (Senate Resolution No. 578).

It can be assumed that, based on the progress and conclusions of negotiations at all levels, the text of the Regulation will be modified. The main part of the discussion in the European Parliament (draft

report, amendments, voting) will probably take place in the first half of 2023, when Sweden will follow up on the CZ PRES in discussions within the EU Council and there will be discussions on revisions of the text, *etc.* The next phase, *i.e.* a tri-logue and the overall finalization of the process can be expected in the second half of 2023 at the earliest.

With regard to the Czech Republic's current role as a Member State country holding the Presidency, when (especially in this initial phase) the main role is primarily to chair the discussion on the legislative proposal, the upcoming period and negotiations on the proposal will be crucial. It will be important for the Czech Republic to apply its priorities (as formulated in the Position of the Czech Republic) and at the same time "be there" so that we have sufficient insight into the principles stipulated in the Regulation and are able to fulfil it. If the Regulation is passed at the end of 2023 (with effect from 2024), we will have to work hard on the preparation of the necessary legislative steps and above all the Regulation implementation, preparation of NPOP, *etc.* The result should be more resilient ecosystems and a healthy landscape for us and our descendants. ■

*The list of references is attached to the online version of the article at [www.casopis.ochranaprirody.cz](http://www.casopis.ochranaprirody.cz)*



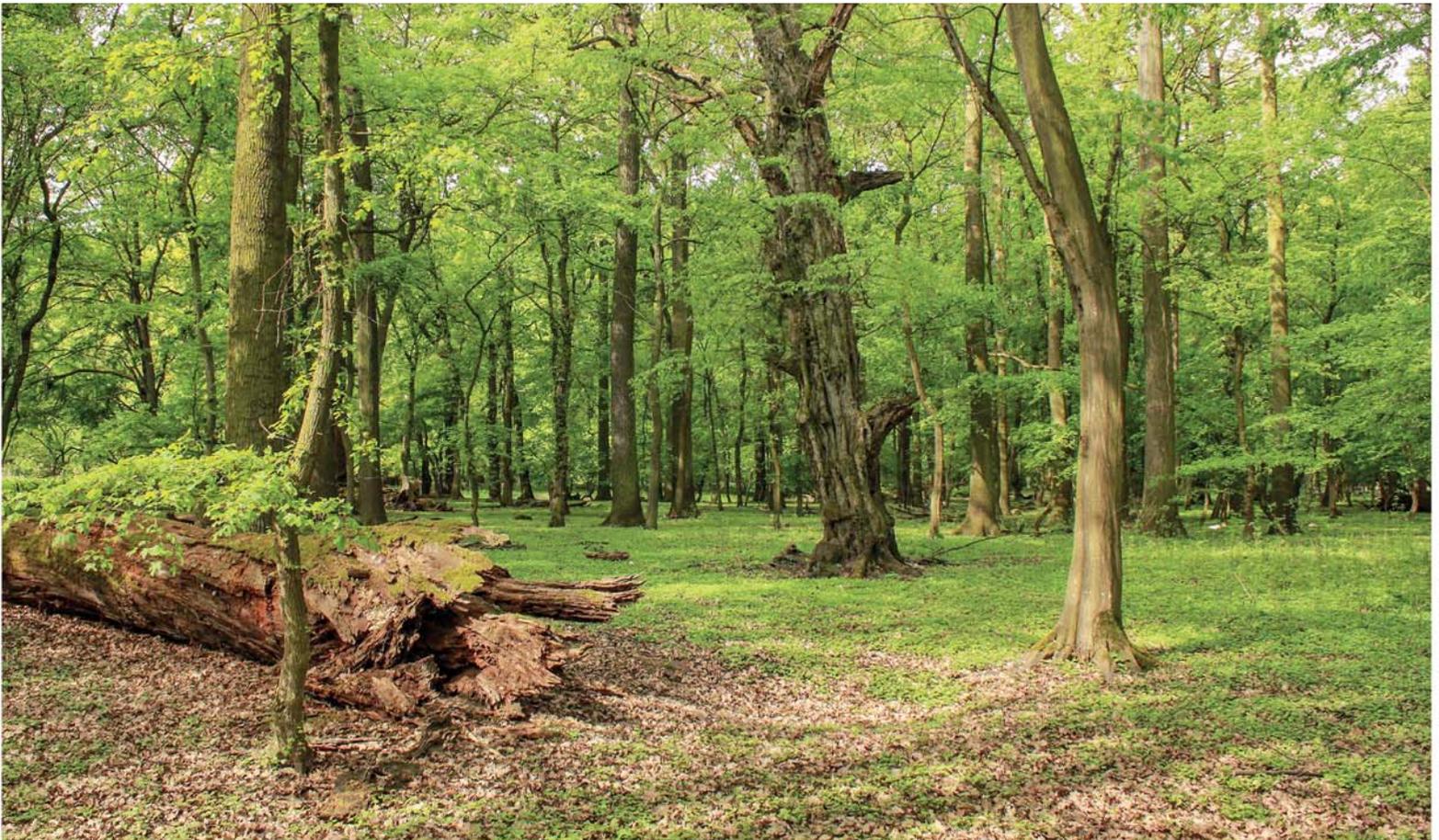
Quarry after renaturalization. © Zdeněk Patzelt

# The National Commitment to Increase the Coverage and to Improve the State of Protected Areas in the Czech Republic

**Eva Knižátková & Petr Havel**

The Czech Republic, like other EU Member States, should produce a specific proposal to increase the coverage and protection, conservation and management intensity in protected areas by the end of 2022. This follows from the EU Biodiversity Strategy for 2030 (hereinafter, the 2030 Strategy), which considers effectively managed protected areas to be one of the key tools to halt the loss of biodiversity and, *inter alia*, expects to protect 30% of the land,

of which one third strictly. The contributions of individual Member States should take into account different conditions and reflect their real importance for the biodiversity conservation. What can we realistically offer in the given time horizon? This is still a subject of professional debate. This article aims to summarize the starting points, the current state, quantify the possible liabilities and, thus, contribute to this discussion.



The area on the confluence of Morava and Dyje Rivers (Soutok/Confluence) is one of the most important in the Czech Republic from the point of view of biodiversity protection; it is protected pursuant to the EU nature directives as a Special Protection Area and a Special Area of Conservation. However, only a negligible part has still been under strict protection (Cahnov – Soutok National Nature Reserve, Ranšpurk NNR). The designation of the Soutok PLA, with the zone I covering the most valuable sites, would make a significant contribution to the 10% target. © Eva Knižátková

## About the 2030 Strategy

Increasing the extent of area-based nature conservation is one of the partial components of the Green Deal, *i.e.* a set of strategic initiatives of the European Commission, whose basic goal is to achieve carbon neutrality in the EU by 2050. The methods for fulfilling the biodiversity pillar are elaborated in the 2030 Strategy adopted by the European Commission in May 2020 (EC 2020).

Simultaneously, the key objective of the 2030 Strategy is a "Cohesive network of protected areas", to which three key commitments are to contribute by 2030:

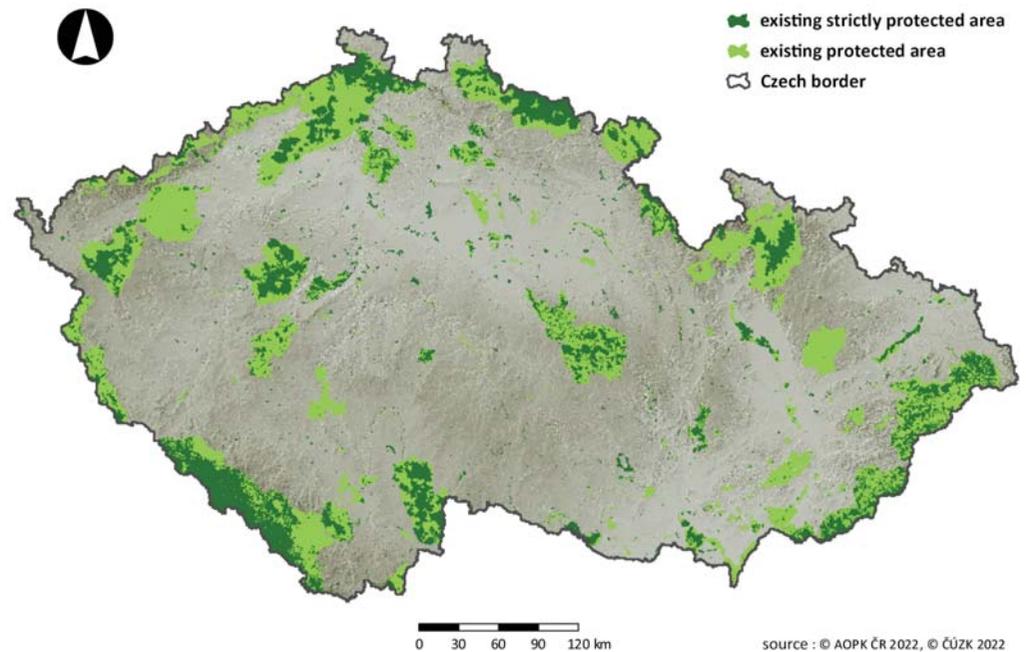
1. Legally protect a minimum of 30% of the EU's land and 30% of the EU's sea and integrate ecological corridors, as part of a true Trans-European Nature Network (hereinafter, the 30% target).
2. Strictly protect at least a third of the EU's protected areas, including all remaining EU primary and old-growth forests (hereinafter, the 10% target).
3. Effectively manage all protected areas, define clear conservation objectives and measures, and monitor them appropriately (hereinafter, the goal of effectiveness).

Regarding the 2030 Strategy, the European Parliament adopted a resolution by which it welcomed the policy document and, *inter alia*, emphasized the need to fulfil all of its goals in view of the failure of the two previous strategies in this topic. It also expressed strong support for the goals in increasing the share of area-based nature conservation, including the so-called strict regime, and pointed out the necessity of their consistent implementation (EP 2021).

The Council of the EU also commented on the 2030 Strategy in its conclusions, which supported it and called for its rapid and ambitious implementation. It particularly welcomed the goals in the field of area-based protection and nature restoration and emphasized the need for collective efforts of the Member States to achieve them (COUNCIL OF THE EU 2020).

It is therefore evident that significant political support was expressed at the level of the EU institutions, formed by representatives of the Member States, for the implementation of the 2030 Strategy, often with an emphasis on the objectives in strengthening area-based nature conservation. This fact can be an important argument in promoting and defending its fulfilment.

Both the 2030 Strategy itself and its sub-objectives and their fulfilment are an important starting



Existing protected areas in the Czech Republic with the most strictly protected parts highlighted. In dark green, all existing small-size Specially Protected Areas, Protected Landscape Areas zones I and II and all National Park zones with the exception of the cultural landscape zone – *i.e.* a category with the potential for strict protection. © Zdeněk Kučera & Mária Bárđyová

point for the upcoming international negotiations on the global framework for biodiversity after 2020.

### Criteria for selecting protected areas

In order for Member States to proceed uniformly when defining their obligations, the European Commission published guidelines in January 2022 (EC 2022), which summarize the criteria and methodology for the selection of protected areas, which should contribute to the fulfilment of the above-mentioned goals. Subsequently, in June 2022, a detailed format was published for the uniform for providing the information by individual Member States, both about sites that have already met the criteria (and can therefore be included in the initial state) and about areas through which it is proposed to achieve the 30% and 10% targets.

The content of the guidelines is the result of relatively long negotiations and four rounds of written consultations with representatives of Member States within the Nature Directives Expert Group (NADEG). The discussion within NADEG focused mainly on the realism of the goals and the considerations that led the European Commission to set them, the timetable for their implementation, financing, the necessary human capacity or the transparency of the process and, last but not least, on the so-called strict protection (see below).

From the point of view of the definitions important for the 30% target, it is worth noting that this target does not have to be fulfilled only by protected areas in the usual sense of the word, but also by means of the so-called other effective area-based conservation measures (OECM). For more information on what this relatively new concept means, see Box 1. In the Czech Republic, no territories have yet been designated as OECM. When looking at the Protected Planet database (UNEP-WCMC & IUCN 2022), it is clear that the whole of Europe is still struggling to identify OECM.

However, not every potentially identified OECM will meet the criteria that the European Commission further states in the guidelines as conditions for counting towards the 30% target. These criteria are essentially the same for both protected areas and OECM and mainly include the following principles:

- The territory is covered by some legal form of protection (legislative, administrative, or contractual);
- Its natural values and conservation objectives are defined in the territory;
- The territory has an administrator (*i.e.* the institution that manages it);
- The territory is managed efficiently, with established management measures ideally embodied in planning documentation;
- Monitoring of biodiversity is carried out in it.

These criteria must already be met, or the commitment of the Member State must consist in the promise of their fulfilment by 2030.

## Default status – protected areas

According to current data, 1,725,672 ha (21.88%) of the Czech Republic are protected by protected areas – in the sense of Specially Protected Areas, contractually protected areas, and the EU's Natura 2000 network sites – after deducting mutual overlaps (see Tab. 1). For the Continental Biogeographic Region the current coverage is 22.15%; in the Pannonian Biogeographical Region it is 16.02%.

We consider it undisputed that all the above categories already meet the criteria for counting towards the 30% target. Only some Natural Monuments designated primarily only for the protection of abiotic nature could be a theoretical question. However, since in the vast majority of cases typical fauna and flora inhabit the protected formation (e.g. caves, rock outcrops), which is taken into account in management plans and measures taken within the area, it would be unjustified to ignore the importance of these areas from the point of view of the 2030 Strategy's goals, even though they are usually very small in size. A separate question remains as to whether there is room for improvement in the state of all protected areas in the Czech Republic – see below.

## Possible commitments to the 30% target

In order to achieve the 30% target, we therefore need a little over 8% of the Czech Republic's territory, about 631,000 ha. Strategic considerations should be directed both towards the designation of new or expansion of existing protected areas, and towards the identification of sites outside the existing categories that fulfil the requirements for OECM and which have already been contributing significantly to the biodiversity conservation. As the 2030 Strategy also strongly emphasizes the importance of ecological corridors and the creation of a truly coherent trans-European nature network, the aspect of improving the insufficient connectivity of existing areas should play a significant role. However, it should be borne in mind that not all ecological corridors are themselves large enough and scientifically valuable enough to meet the criteria for the OECM to count towards the 30% target (HILTY *et al.* 2020). When choosing sites for the promise of fulfilling the 30% target, one must also pay attention to overlaps – we are looking for areas that have not yet been included among protected areas in any of the categories listed in Table 1. Let us briefly discuss the options:

Natura 2000 – the definition of the EU's Natura 2000 network has a firm basis in European

Union's law, and its definition is a legislative obligation; it is not a voluntary strategic commitment. This process has been practically completed in the Czech Republic. In 2023, a government regulation is expected to be issued which will take into account the last outstanding requirements of the European Commission in terms of the adequacy of the system for the protection of the target species and habitats in the Czech Republic. This amendment will address, *inter alia*, the clarification of the borders of existing areas, and seven SACs are proposed for new designation or more significant expansion (Strážkovice, Milešov pod Milešovkou – church, Lichkov, Paseky, Nové Pole, Kozlov – Tábor, and the Východní Krušnohoří/Eastern Ore Mountains). In the advanced stage of preparations, there is also a proposal to designate a Special Protection Area in the Západovní Krušné hory/Western Ore Mountains, which should primarily serve to protect one of the last populations of the Black grouse (*Lyrurus tetrix*) in the Czech Republic. After deduction of overlaps, these planned changes will cover 0.05% of the Czech Republic's territory.

**Large-size Specially Protected Areas** – considering the designation of new Protected Landscape Areas and National Parks is certainly more than appropriate in this context. The identification of suitable sites from an expert point of view has taken place many times in the past (PEŠOUT 2015). The process of designating large-size protected areas is usually long-term, requiring close cooperation with local governments and a wide range of stakeholders. In terms of progress, the preparation of documents for the start of the discussion of the Křivoklátsko National Park, Soutok Moravy a Dyje/Morava and Dyje/Thaya Rivers Confluence Protected Landscape Area, and the Krušné hory/Ore Mountains Protected Landscape Area are now the furthest along. After deducting overlaps with existing protected areas (which are considerable in the case of Křivoklátsko and Soutok in particular), the designation of the above-mentioned areas could increase the protection in the Czech Republic's territory by 0.8% (PEŠOUT & DORT 2022).

**Small-size Specially Protected Areas** – the small-size Specially Protected Areas network in the Czech Republic is extensive in terms of number, but the problem is often the very small size of individual areas (in the Czech Republic there are an incredible 2,649 small-size Specially Protected Areas with an average size of 43.8 ha, but half of them is smaller than 9 ha). In this context, the emphasis on network connectivity is particularly important. Designating new small-size Specially Protected Areas together with the expansion of existing ones will continue to be an important

## OECM: OTHER PROTECTED AREAS?

Other effective area-based conservation measures (OECM) is a new concept that identifies areas *other than protected areas* as defined by the IUCN (DUDLEY 2008), in which conservation objectives are nevertheless effectively and long-term achieved, often as a side effect of conservation for another primary reason.

The definition of OECM was approved at the 14<sup>th</sup> meeting of the Conference of the Parties to the Convention on Biological Diversity in 2018 (CBD 2018): "A geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in situ conservation of biodiversity with associated ecosystem functions and services and where applicable, cultural, spiritual, socio-economic, and other locally relevant values." Frequently cited examples include closed areas for military purposes, protection zones for vulnerable water resources, regulated fishing areas, etc.

In 2019, the IUCN issued guidelines (IUCN 2019) to unify the approach of countries to identifying OECM and their reporting. A follow-up methodology for the evaluation of individual sites is being prepared, which defines obtaining the consent of the area manager as a key step after the pre-selection of potential OECMs (MARNEWICK *et al.*, *in prep.*).

Several countries have already started OECM reporting – more than 800 are now identified in Protected Planet's global database (mainly Canada, Algeria, Colombia, Morocco, the Philippines, and South Africa). Europe is now in the phase of analysing the possible use of these elements to increase connectivity between protected areas and harmonization with other instruments used, e.g. within the framework of fulfilling the Water Framework Directive (LÁZARO *et al.* 2021). Unequivocal instructions and dispelling some doubts (e.g. regarding the real added value of identification as an OECM given the current state, or the devaluation of the importance of traditional protected areas) when applying this tool are a necessary prerequisite for its wider use not only in the Czech context (DUDLEY *et al.* 2018).

## DEFINITION OF STRICT PROTECTION

In the guidelines of the European Commission (EC 2022), strict protection for the fulfilment of 10% target of the 2030 Strategy is defined as follows: “Strictly protected areas are fully and legally protected areas designated to conserve and/or restore the integrity of biodiversity-rich natural areas with their underlying ecological structure and supporting natural environmental processes. Natural processes are therefore left essentially undisturbed from human pressures and threats to the area’s overall ecological structure and functioning, independently of whether those pressures and threats are located inside or outside the strictly protected area”. The guidelines further state that this definition is clearly met by non-intervention areas in which only a few strictly assessed activities are allowed (e.g. invasive alien species control, scientific research or natural disaster prevention).

Furthermore, it is explicitly states that “strictly protected areas may also be areas in which active management sustains or enhances natural processes”, with semi-natural grasslands and some peatlands given as examples, with the condition that active interventions are limited only to those necessary for the restoration and/or conservation of the habitats and species for whose protection the area has been designated. As a specific example, mowing/grazing of grasslands at an intensity chosen to optimize their natural value is given, as well as game control in areas where natural predation is insufficient. Also, activities necessary for the restoration and small-scale use of resources by local communities, provided that these activities do not conflict with the objectives of area-based protection, should be allowed.

Particular emphasis is placed on the mapping and subsequent strict protection of the last remaining original and natural forest stands in the EU. The New EU Forest Strategy (EC 2021) also takes this into account.

nature conservation tool to protect the most valuable sites. Among the sites of national importance, whose proposals have already been announced, e.g. Lanžhotské pralesy/Lanžhot Primary Forests National Nature Reserve, Soutok/Confluence National Nature Monument, Obírka – Peklo NNR, and Zlatý potok/Gold Brook NNM should be mentioned. For a number of others, documents are being prepared or negotiations are being

Table 1: Protected areas in the Czech Republic – current status

Category	Number	Area (ha)	Proportion of CR (%)
National Park	4	119 019	1.51
nature zone		29 876	0.38
close-to-nature zone		27 858	0.35
focused nature management zone		60 254	0.76
Protected Landscape Area	26	1 138 177	14.43
zone I		93 679	1.19
zone II		332 186	4.21
National Nature Reserve	110	30 427	0.39
National Nature Monument	126	8 273	0.10
Nature Reserve	819	43 530	0.55
Nature Monument	1594	33 768	0.43
Special Area of Conservation	1112	795 640	10.09
Special Protection Area	41	703 437	8.92
Contractually protected area	53	47 410	0.60
<b>TOTAL (without overlays)</b>	<b>3 885</b>	<b>1 725 672</b>	<b>21.88</b>

Note: data taken from the Central List of Nature Conservation (Ústřední seznam ochrany přírody) and valid as of 1/10/2022

conducted at various levels, e.g. the considered national category for part of the Czechoslovak Army mine, Tok Hill NNM, Jordán Fishpond NNM, Bečva River NNR, and others. After deducting the overlaps, the number of sites of national importance currently planned for designation is at about 0.02% of the country’s territory; this does not include plans to designate Nature Monuments and Nature Reserves by regional authorities in hitherto unprotected landscapes.

**Contractual protection** – this relatively new instrument of nature conservation (Article 39 of Act No. 114/92 Gazette on Nature Conservation and Landscape Protection, as amended later, hereinafter ANCLP) has been still used almost exclusively for the protection of Natura 2000 sites; however, there is essentially nothing preventing its wider use even in the non-protected landscape – except for the absence of practical experience with its use.

**Significant Landscape Elements (SLEs)** – perhaps a somewhat neglected, but legislatively relatively powerful tool for area-based protection. By their very nature, registered SLEs are sites that often meet the OECM definition, which also meet the criteria for inclusion in the 30% target – they have a designation document that defines natural values and protection objectives, the law designates an authority responsible for their management, which also provides management according to its financial possibilities. Targeted biodiversity monitoring does not take place in most of them; however, regular habitat mapping can provide valuable data on the development of

ecosystems there over time. In addition to the absence of dedicated planning documentation, a significant problem is that there has currently been no central registration of VKP (ŠTEFANOVÁ 2015), so we can only estimate (based on extrapolation of data from two regions where the Nature Conservation Agency of the Czech Republic (NCA CR) data were systematically collected, checked and digitized) that registered SLEs in the Czech Republic occupy approx. 10,000 ha (about 0.13% of the country’s territory). The legal obligation to store designation documentation together with spatial data in a central database could be part of the changes in area-based protection in connection with the adoption of obligations according to the 2030 Strategy. In such a case, it would also be necessary to deal with the issue of systematic management planning in these areas.

In this context, it is also possible to consider the so called SLEs protected by law, which often protects valuable areas (fishponds, lakes, water-courses, peatlands, valley floodplains, and forests) from the biodiversity point of view and ensuring the connectivity of the landscape. However, they are not precisely spatially defined and targeted management in the sense of the criteria for the 30% target is not so clearly defined by the designation regulation. An effective solution would be to set up a record of the most valuable SLE segments, which are the bearer of the main values of the given SLEs protected by law, to give them priority attention in terms of finances for management and monitoring. SLEs protected by law, without overlap with existing protected areas, represent about another 23% of the country’s



On the left, the natural zone of the Šumava/Bohemian Forest Mts. National Park, on the right, the natural zone (Naturzone) of the German Bayerischer Wald/Bavarian Forest National Park. On both sides of the state border, the areas are intended to be left undisturbed by natural processes in the future. However, they clearly differ in the time of the last intervention. © Eva Knižátková



Mowing meadows in the Lopenik area in the zone II of the Bílé Karpaty/White Carpathians Mts. Protected Landscape Area. In accordance with the methodological instructions of the European Commission, it is possible to include areas where the necessary active management supports biological diversity into the so-called strict protection as well, including grazing and mowing meadows at an intensity and frequency corresponding to the ecological demands of the subject of protection. © Ivana Jongepierová

area<sup>1</sup>, however, this is the maximum proportion and realistically it would make sense to include only registered SLEs and registered segments of the SLEs protected by law according to the differentiated approach proposed above.

#### Territorial System of Ecological Stability (TSES)

– even these elements (especially biocentres/core areas, probably of all levels) have the potential to be included in OECM, aimed to a certain extent at ensuring the protected area system connectivity; see also PEŠOUT & HOŠEK 2012. They partially overlap with VKP protected by law (especially forests) but there is also a problem with the

absence of central records on the current TSES for the purposes of reporting or planning targeted management.

Another element of area-based protection, which significantly contributes to the biodiversity conservation and which is worth paying attention to, are **private protected areas**. The term is not enshrined in Czech legislation and the 2030 Strategy does not explicitly include it either; however, these areas can probably be included among the OECMs that meet the criteria for the 30% target. They include, e.g. Bird Parks established by the Czech Society for Ornithology, or sites purchased and managed by land trusts/land associations (PEŠOUT 2015). If the administrators agree, these areas could be included in the system.

Some other elements of area-based protection can also be considered among the potential OECMs, e.g. temporarily protected areas, nature parks, or military districts, protection zones for vulnerable water resources, and protective forests, although some of the established criteria are not always met. However, a detailed analysis of the OECM issue is beyond the scope of this article.

#### Strict 10% protection

As the sites that also protect biodiversity secondarily contribute to the 30% target, it is important to emphasize the importance and increase the coverage of those that were directly established for the purpose of biodiversity conservation and where all activities are strictly regulated so that this target is achieved. The 2030 Strategy thus quite rightly places emphasis on increasing the share of EU territory that is strictly protected.

Although it might seem that strict protection is emphasized in the 2030 Strategy exclusively in the sense of protecting natural processes and minimizing human influences, in the European Commission's instructions, targeted interventions to support biodiversity are ultimately taken into account (see Box 2 for more details). It is the result of discussions with Member States within the NADEG, where the definition of strict protection and, in its context, the role of management of areas and permissible anthropogenic activities (hunting rights, forest management, etc.) finally crystallized as a fundamental topic. As a result, the definition is looser compared to the original proposal and allows for a certain range of interventions, which must be compatible with the objectives of the protection of the given area, or they are necessary for its restoration. This topic was also discussed in this journal in 2022 (HOFMEISTER 2022, HOŠEK & STORCH 2022).

<sup>1</sup> when counting all forest, wetland and water ecosystems from the Consolidated Layer of Ecosystems

## How many strictly protected areas do we already have?

If we look at the legal protection conditions and objectives of individual Specially Protected Area categories, then in general we can say that in particular the natural zones, the close-to- nature zones and the focused nature management zones in National Parks, the zones I a II of Protected Landscape Areas, (National) Nature Reserves, and to a large extent also (National) Natural Monuments have sufficiently strong (albeit differently worded) instruments for all threatening activities to be regulated to the extent that they do not compromise the achievement of the area-based protection objectives. These sites without mutual overlaps now represent 7.78% of the Czech Republic (see Map); for data on the proportion of individual categories in the Czech Republic, see Table 1.

It is obvious that not all specific areas falling into these categories fulfil the minimization of interventions to only those that are needed to manage or restore habitats and species. Areas and their parts mainly differ in terms of the quality of preserved natural values, and optimal management or acceptable level of use depends on the ecological requirements of individual subjects of protection and the conditions of the site. All these facts are taken into account in regularly updated management plans or principles. In reality, land ownership probably remains the most important factor for the success of implementing optimal management. The actual proportion of strictly protected areas in the sense of the ranking of the claims of subjects of protection to other uses is therefore difficult to quantify more precisely at the national level; it is probably around 3%.

## Is it possible to get closer to 10%?

It is certainly possible to gradually increase the proportion of strictly protected areas from those categories that have the prerequisites for it. It is also worth considering whether the conditions of protection of the small-size Specially Protected Areas, or Protected Landscape Areas in the ANCLP would not deserve evaluation from the point of view of their adequacy, *i.e.* whether they are able to respond effectively enough to new pressures and threats acting in the today's landscape.

Designation of new protected areas has already been discussed above; the gradual re-designation of existing areas also plays a role in this context, including *e.g.* the revision of PLA zoning. In the Czech Republic, increasing the proportion of strict

protection understood in this way is also in line with efforts to ensure the protection of Special Areas of Conservation (SACs under the EU Habitats Directive) in the form of the Specially Protected Area selected categories, which still have not been designated to the necessary extent. In the following period, it will be appropriate to focus on the evaluation of the effectiveness of the so-called basic protection (Article 45, letter c, Para 2, ANCLP) to maintain or improve the condition of specific SACs and, in the event of its insufficiency, to proceed with the designation of other Nature Monuments or Nature Reserves.

However, the fact that the definition of strict protection is broader does not mean that increased emphasis should not be placed on the protection of sites where we primarily protect natural processes and leave them to spontaneous development. Size is essential for this approach; small-size Specially Protected Areas and zones of large-size Specially Protected Areas that have this objective should always be defined in such a way that they are large enough for the processes to actually be applied at sufficient scales. A summary evaluation of the existing system of protected areas in terms of suitability and expediency of leaving selected ecosystems primarily exposed to natural forces (including areas affected by the extraction of mineral resources) has not yet been carried out.

Achieving the application of strict protection on 10% of the Czech Republic's territory is an ambitious goal, which in any case will be difficult to achieve in the conditions of the Czech landscape with a tradition of use (PEŠOUT 2020), but we should at least try to get as close to it as possible.

## Are our protected areas effective?

It is not sufficient just to have protected areas; protected areas need to be in good condition. They must succeed in effectively achieving the goals for which they were designated, which is very closely related, *inter alia*, to the above-discussed real application of strict protection. Many articles have dealt with the evaluation of the protected area effectiveness in general; for an overview at the global level, we refer to a text in one of the previous issues (PLESNÍK & PELC 2022 – see pages 77 - 81 in this issue).

And what do we actually know about the effectiveness of protected areas in the Czech Republic? So far, surprisingly little at the national level. At the level of individual sites, information can be found in the relevant assessment chapters of management plans and summaries of recommended

measures. We have a very good level of planning documentation, regularly updated for most sites. It defines everything necessary – subjects of protection, goals, measures to be taken to achieve them, and often also indicators for evaluating the achievement of the favourable status.

However, what is noticeably missing is the targeting of monitoring on the effectiveness of the implemented measures. It is important to realize that, according to the 2030 Strategy, in terms of achieving the protection goals of individual protected areas, biodiversity monitoring should take place on 30% of the area. This requires significant financial and human resources. The basis should continue to be extensive and regular habitat mapping, which, however, must be supplemented with a series of the targeted monitoring as needed. Only monitoring can provide managers with information for adapting management and making decisions about the use of the site within the adaptive management cycle.

## Conclusion

The 2030 Strategy provides us with a mandate, a guide, and a starting point for expanding one of the most effective tools for nature conservation. Area-based protection is a very important part of efforts to preserve biodiversity, which allows us to plan the management of certain relatively geographically integral natural units, has its pan-European tradition and, to a large extent, the support of the public. However, it is becoming more and more clear that we cannot solve the problem of declining biodiversity in protected areas, and we must also focus our efforts on the landscape outside them and towards its restoration, so that it is more resistant to climate change impacts, and is therefore able to adequately respond to the needs of society (in terms of food production, economy, local communities, *etc.*), even though the role of protected areas is traditional and irreplaceable in this as well. Both of these efforts should therefore complement each other appropriately, for which at least European Union initiatives and the legislative environment provide us with a good basis. ■

**Acknowledgments** – The authors thank Zdeněk Kučera and Mária Bárdyová for performing the analyses and elaborating the map, and Pavel Pešout for checking the text and providing valuable comments.

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*The list of references is attached to the online version of the article at*  
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# What Does the European Union's Nature Restoration Law Mean for Forests in the Czech Republic?

Jeňýk Hofmeister & Miroslav Svoboda

The Nature Restoration Law sets a challenging (and if fulfilled, probably effective) goal of implementing measures to improve the state of natural habitats by 2050 wherever it is needed, and by 2030 on at least 20% of EU land and sea areas. Formal implementation of established (technological) procedures for the restoration of forest habitats, only applied within the prescribed territorial scope, is not sufficient for truly improving the

condition of forest habitats and the populations of wildlife bound to them. If we are to achieve real restoration of nature, how the Nature Restoration Law is implemented, will be very important. Not only in the case of forests (but especially with them), we should significantly employ the creative forces of nature itself and, simultaneously, sensibly use an active management approach.



Trees of little economic value often provide valuable habitats for forest species in otherwise structurally poor economic stands (eastern slope of Nad Liskovcem hill, the Český les Mts.). ©Jeňýk Hofmeister

## Nature restoration of forest ecosystems in general

Forests cover almost 44% of the European Union and thus form a significant part of the environment which is less affected by human activity. In the Czech Republic, forest makes up 34% of the country's territory, and almost a quarter of the forest area (8% of the Czech Republic as a whole) is occupied by natural forest habitats defined according to the Habitats Catalogue (see Tab. 1). A large part of natural forest habitats, including those with the largest size, are in a condition that does not allow the establishment of viable populations in a significant part of the species bound to the given habitats (RYBICKI *et al.* 2020). This is evidenced by long lists of extinct and endangered species in the so-called Black and Red Lists or Books of various taxa/groups (e.g. HOLEC & BERAN 2006, LIŠKA *et al.* 2008, HEJDA *et al.* 2017). The Nature Restoration Law aims at changing this situation.

The basis for the restoration of nature in individual EU Member States is to be the so-called national restoration plans for nature, which, based on the results of research and preparatory monitoring, will determine the areas that need to be restored in order to determine the halting of the decline in biodiversity and other Nature Restoration Law objectives. The selection of specific areas is to take into account "the sufficient quality and quantity of the habitats of the species required for achieving their favourable conservation status, taking into account the areas most suitable for re-



Drainage canal in the Pivonické skály/Oivonice Rocks Nature Reserve immediately adjacent to the Žofínský prales/Žofín Primeval/Virgin Forest National Nature Reserve. © Jeňýk Hofmeister

establishment of those habitats, and the connectivity needed between habitats in order for the species populations to thrive, as well as ongoing and projected changes to environmental conditions due to climate change" (Article 11, paragraph 2b of the Nature Restoration Law). In the text of the Nature Restoration Regulation, emphasis is consistently placed on national restoration plans being the result of a process open to the general public and assessment based on the latest scientific knowledge.

The Nature Restoration Regulation closely follows the EU Biodiversity Strategy for 2030, as it envisages a significant contribution from protected areas to nature restoration. The EU Biodiversity Strategy obliges Member States to extend protected areas to 30% of their total area, and to strictly protect 10% of the area. Strict protection means support of natural restoration of natural habitats and effect of natural processes by maximally limiting the influence of human activity. Strict protection is an effective tool, especially for such habitats and areas whose restoration will occur spontaneously through their unprompted development after stopping or limiting the human activity impacts. For a number of widespread forest habitats (e.g. acidophilous and herb-rich beech forests, montane *Calamagrostis* and waterlogged spruce forests), strict protection can be a sufficient (even ideal) measure leading to the restoration of their natural value and the recovery of biodiversity within a short time (paragraph 10 of the justification of

the Nature Restoration Law). It has already been clear from the above that one of the basic pillars

of nature restoration in forest habitats should be a breakthrough change in the intensity, methods, and scope of forest management, which in the Czech Republic still have been dominantly represented by age-class forestry in even-aged stands. It is obvious that such a change will not be easily enforced in circumstances where an (un)certain part of traditionally minded foresters do not imagine forest habitat restoration as anything other than "restoration of the stand" (in the sense of the forestry definition) after clearing the previous stand.

A fundamental change in forest management does not mean that we should completely give up on the economic use of forest stands. Only a small part of forest habitats, roughly corresponding to 10% of the forest area in the Czech Republic, should remain strictly protected. This strict protection includes both the exclusion of forest management as the main tool and active management to support biodiversity at selected sites (VAN MEERBEEK *et al.* 2019). In most other economic forest stands, the fundamental change in forestry approach should consist precisely of the protection of so-called biological heritage (structures of old forests) and the variability of natural conditions. Within nature

**Table 1:** Extent of the most important forest habitats in the Czech Republic and their proportion of forest area (in %); specifically, all habitats with a share higher than 1% are listed, excluding the area of natural forest habitats in mosaics (data source: Updated habitat mapping layer, Nature Conservation Agency of the Czech Republic 2022).

Code	Habitat name (in Czech Rep.)	Area (km <sup>2</sup> )	Forest area of the Czech Republic (%)
L5.4	acidophilous beech forests	1177.31	4.50
L5.1	herb-rich beech forests	1124.17	4.30
L3.1	Hercynian oak-hornbeam forests	982.37	3.76
L2.2	ash-alder alluvial forests	647.78	2.48
L9.1	montane <i>Calamagrostis</i> spruce forests	406.13	1.55
L3.3B	West Carpathian oak-hornbeam forests	363.60	1.39
L7.1	dry acidophilous oak forests	333.39	1.28
L9.2B	waterlogged spruce forests	239.91	0.92
L2.3	hardwood forests of lowland rivers	200.66	0.77
L7.3	subcontinental pine-oak forests	120.74	0.46
L4	ravine forests	117.04	0.45
L3.2	Polonian oak-hornbeam forests	109.56	0.42
L8.1	boreo-continental pine forests	92.44	0.35
L7.2	wet acidophilous oak forests	84.07	0.32
L6.5	acidophilous thermophilous oak forests	55.80	0.21
L3.4	Pannonian oak-hornbeam forests	51.78	0.20
L3.3A	Pannonian-Carpathian oak-hornbeam forests	44.20	0.17
L9.2A	bog spruce forests	42.99	0.16
L10.2	pine mire forests with <i>Vaccinium</i>	40.36	0.15
L6.4	Central European basiphilous thermophilous oak forests	33.10	0.13
	other 24 forest habitats	203.97	0.7



A fragment of a 240-year-old beech forest in the Východní Krušnohoří/Eastern Ore Mts. Special Area of Conservation pursuant to the EU Habitats Directive, logged by the Lesy ČR/Forest of the Czech Republic, State Enterprise in spring 2022. © Jeňýk Hofmeister



Extensive clearings as a consequence of the European spruce bark beetle (*Ips typographus*) outbreak/plague, almost entirely lacking biological heritage of the previous forest generation, have emerged in recent years in the Brdy Highlands Protected Landscape Area (northern slope of Březový vrch/Birch Hill, September 2022). © Jeňýk Hofmeister

restoration of forest habitats, biological heritage protection should become a natural part of management in a significant part of ordinary commercial forests, and not just a prerogative of commercial forests in protected areas (see Box on page 23).

### The importance of protected areas

Let us go back to the importance of protected areas for nature restoration of forest habitats. The fulfilment of the Nature Restoration Law objectives cannot be imagined without a truly significant

increase in the area of strictly protected forest habitats. Strict protection means the exclusion of forest management and other direct human intervention on a significant part of strictly protected habitats. However, in order to support biodiversity in habitats significantly affected by specific management methods in the past (forest pasture or middle forest in various types of lowland forests), strict protection allows the implementation of measures replacing the beneficial influence of historical management. At the same time, these active steps to support biodiversity may include, for example, active support for the creation of habitat trees and dead wood, or "breaking" the homogeneous structure of dense young forest stands created by intensive artificial regeneration after large-scale random logging. All these measures are aimed at improving habitat condition and they are not in any way ordinary management interventions as applied in commercial forests. These active measures are therefore very different from current forestry practice. In the Czech Republic, there are very few sites where these measures have been applied in a qualified manner, even though the knowhow has existed for a long time (GÖTMARK 2013, THORN et al, 2020). In some cases, these measures are financially unprofitable, so that, at least initially, their practical application depends on requirements and financial subsidies from the State Nature Conservancy.

Another important measure is the restoration of the forest water regime. This is a fundamental measure that should include wetlands, peatbogs, water features, and streams of all levels, and should be applied at a landscape scale (LÖHMUS et al. 2015). These measures will probably lead to (at least temporary) waterlogging of larger forest areas, which may lead to restrictions in their economic use. On the other hand, they can very effectively help to improve the hydrological balance of restored habitats and their surroundings, if there is a sufficient area of forests with a restored water regime at the landscape level.

Forestry management cannot avoid significant changes even in forests outside protected areas. The Nature Restoration Law requires that all ecosystems in the landscape, including forest ones, are used in such a way that they are in a condition that enables effective capture and accumulation of carbon (point 18 of the Nature Restoration Law justification). It is based on the fact, that, on the one hand, forest ecosystems (and the organisms living in them) are sensitive to climate change, but, on the other hand, they can be an effective tool for mitigating the adverse effects of climate change (point 56 of the justification).

## RESTORATION OF OLD FORESTS AS A BAD EXAMPLE

According to the 2020 Forest State Report of the Ministry of Agriculture, forest stands older than 120 years account for almost 9% of forests in the Czech Republic. On the one hand, this causes very suitable conditions for using the potential of these forests to restore the nature of forest habitats and strengthen the role of forests in carbon accumulation. On the other hand, however, there is increasing pressure to restore these stands, usually justified by an effort to save forest stands from decay, which, paradoxically, is often mistaken for the protection of the habitat natural state. In particular, in the case of Norway spruce stand restoration at lower altitudes, another reason is precisely the restoration of the natural character and woody composition of the habitat itself, i.e. actually fulfilling the Nature Restoration Law. However, this restoration is also carried out in habitats where the Norway spruce is a natural, albeit minor, part of the tree composition (for example, in stands managed by Vojenské lesy a statky in Brdy Highlands Protected Landscape Area; see Příbramský deník daily, 24 October 2022). In addition, this restoration takes place through traditional procedures involving clear-cutting of up to 200-year-old stands and artificial planting of the presumed natural tree species composition. The beginning of the restored natural habitat thus represents a clearing lacking any substantial part of the previous stand's biological heritage. Mature trees of mixed tree species are supposed to be excluded from clear-cutting; their contribution is, however, negligible in most stands.

If, out of fear of the uncontrollable decay of old spruce stands and European spruce bark beetle (*Ips typographus*) outbreak/plague, we proceed to clear these stands, and, at the same time, strive for nature restoration, we should preserve as much as possible of the biological heritage, that has already been created, which we can assume is inherent to the given habitat, or at least not completely strange. In most Norway spruce stands in the uplands, a certain proportion of old spruce should be left to die naturally. Only in this way will statements about nature restoration be more than a mere imperfect excuse for another management and nature-damaging intervention, which the complete harvesting of the old spruce represents.

According to current estimates, temperate zone forests contribute a (significant) quarter of the global sequestration of CO<sub>2</sub> by forest ecosystems (PAN 2011). Accumulation capacity generally increases with the age of a tree; a single healthy large old tree can capture and accumulate a comparable amount of CO<sub>2</sub> as a young stand in the same period (e.g. one year) or a tree several decades old in its entire lifetime (STEPHENSON *et al.* 2014). Even in naturally developing forests, large old trees usually make up only a fraction of the total number of trees, but their share in the total production of the ecosystem (thus also sequestering carbon) remains significant (LUTZ *et al.* 2018). Excluding selected trees and entire stands from logging and leaving them to naturally age, die, and decay can be a very effective measure to support the carbon storage capacity of the forest habitats. Even extending the rotation period has a positive, albeit relatively short-lived, effect on the amount of carbon accumulated in the wood.

## Restoration of forest ecosystems – Article 10

Article 10 of the Nature Restoration Regulation, which is relatively brief, is specifically devoted to the restoration of forest ecosystems. The article contains only two points. The first states that the restoration of forest ecosystems has to be aimed at supporting the biodiversity of forest organisms. The second point specifies that Member States shall achieve an increasing trend at national level of each of the following indicators in forest ecosystems measured in the period from the date of entry into force of the Regulation until the end of 2030, and every three years thereafter, until the satisfactory levels identified are reached: (a) volume of standing dead wood; (b) volume of lying deadwood; (c) share of forests with uneven age structure; (d) forest connectivity; (e) common forest bird index (based on a list created specifically for each EU country; and (f) stock of organic carbon (in litter and mineral soil at a depth of 0 to 30 cm).

The selection of indicators can be considered a good compromise based on the latest scientific literature, which, on the one hand, ensures sufficient information about the quality of forest habitats from the point of view of various groups of forest organisms and carbon accumulation. On the other hand, it does not prevent the acquisition of this information due to excessive input, and technical and financial complexity of carrying out repeated surveys. Based on current knowledge, it can be assumed, that the increasing trend of selected indicators (or the



A standing dead Norway spruce becomes a valuable habitat for many lichen species not finding suitable conditions on living spruce trunks (top part of the Boubínský prales/Boubín/Kubany Primeval/Virgin Forest National Nature Reserve). © Jeřík Hofmeister

crossing of certain quantitative limits) can reliably serve to assess the increase in forest habitat potential for the forest species richness. In order to achieve an increasing trend in indicators, it is necessary to use natural processes as much as possible and human interventions only to a properly justified extent. To a certain extent, this can also be applied to management measures carried out in order to support photophilous species in various types of oak forests, which are currently considered by some experts to be indispensable for the survival of species or entire communities from the relevant taxonomic groups (most often insects).

If we manage to create a functional network of forest habitats at the landscape (or even better, regional) level, open to the action of natural disturbances and more complete food chains (including large herbivores and their predators), we may be surprised at how much in protecting specific open forest habitats from overgrowth is done by nature itself. Nature conservation efforts could then be more concentrated on small sites isolated in the cultural landscape, which would remain outside the reach of the beneficial effects of restored forest ecosystems. ■

The list of references is attached to the online version of the article at [www.casopis.ochranaprirody.cz](http://www.casopis.ochranaprirody.cz)

# Restoration of a meadow wetland and its effect on aquatic invertebrates

Dana Klímová Hřívová, Jana Petruželová & Marie Kotasová Adámková

Lowland wetland meadows are among the most endangered habitats in the Czech Republic. The main drivers of their decline and loss include particularly decline in traditional management measures, targeted draining, consequent overgrowing by natural self-seeding as well as spreading aggressive plant species the latter excluding wild plant and animal species there. Thus, suitable meadow wetland management should aim namely at maintaining an open character of the above habitat

effectively provided by grazing and mowing.. Although it may not be apparent at first glance, these measures can also significantly affect small water bodies in the immediate vicinity of the managed area. The article presents the project entitled Management measures and assessment of their impact on meadow wetland biodiversity and it introduces the pilot results of water body hydrobiological monitoring in a meadow wetland near the village of Krumvíř (South Moravia).



Juvenile marsh frog (*Pelophylax ridibundus*) in the newly created pool. © Marie Kotasová Adámková



Figure 1: Aerial photograph of the project site taken using a drone, registration number OK-X071A. © Lubomír Tichý.

## Characteristics and development of the project site

The meadow wetland project site in the Spálený potok Brook Valley floodplain, located in the village of Krumvíř cadastral area (South Moravian Region, District of Břeclav), is a typical example of disturbed wetland habitats highly threatened by degradation. The wetland is characterized by numerous more or less waterlogged areas located on both banks of the Spálený potok/Burnt Brook. In the 20<sup>th</sup> century it was used as a communal

pasture where cattle and poultry grazed; hay was also harvested on many plots. These management methods were beneficial for many rare wetland wild plant and animal species, including rare halophilic species recorded there in the 19<sup>th</sup> and 20<sup>th</sup> centuries (e.g. FORMÁNEK 1887-1897). However, due to the reduction of small-scale farming in the South Moravian countryside, together with landscape drainage, the use of waterlogged meadows soon began to decline. The Spálený potok/Burnt Brook bed was also modified, deepened and straightened. A funda-

mental milestone had been the construction of an agricultural drainage system in the 1970s, which significantly changed the rainfall-runoff conditions in a large part of the Czech Republic. In addition, inappropriate agricultural management has led to the so-called cultural eutrophication associated with the excessive use of fertilizers and the subsequent nutrient runoffs into streams and wetlands, in which the runoffs further increase the trophy of entire wetland ecosystems. Despite the drainage and intensive agricultural management in the surrounding landscape, however, the wetland in the Spálený potok/Burnt Brook Valley floodplain has been preserved, including its periodic flooding.

The wetland is located on an area of approximately 11 ha along a short section of the brook, which is shallow there and floods the wetland annually with varying periodicity and frequency within the year. As part of municipality restoration efforts, a water reservoir with an area of 0.9 ha was built at the site in 2003; its purpose was to stabilize and expand suitable conditions for the occurrence of wetland wild animal populations. Unfortunately, the project was just a one-off action with a plan to leave the site to natural development and to exclude use. Further development of the site was therefore quite predictable: landfilling of small terrain depressions, eutrophication of the water reservoir, overgrowth with reeds, and spread of invasive alien plant species. Species diversity of the monitored wild animal groups (namely amphibians, reptiles, and birds) has begun to significantly decline since 2012 (KOTASOVÁ ADÁMKOVÁ, unpublished data). Due to the advanced level of degradation over the entire site and its potential for the occurrence of a large number of rare and endangered species, a total restoration was proposed



Figure 2: Development of one of the pools built on the pasture. The upper row presents the state of the pools (from left) in the period (i) September 2020 shortly after excavation; (ii) the October 2020 floods; (iii) February 2021; and (iv) March 2021. The lower row in the period (v) April 2021; (vi) May 2021; (vii) July 2021; and (viii) August 2021. © Marie Kotasová Adámková

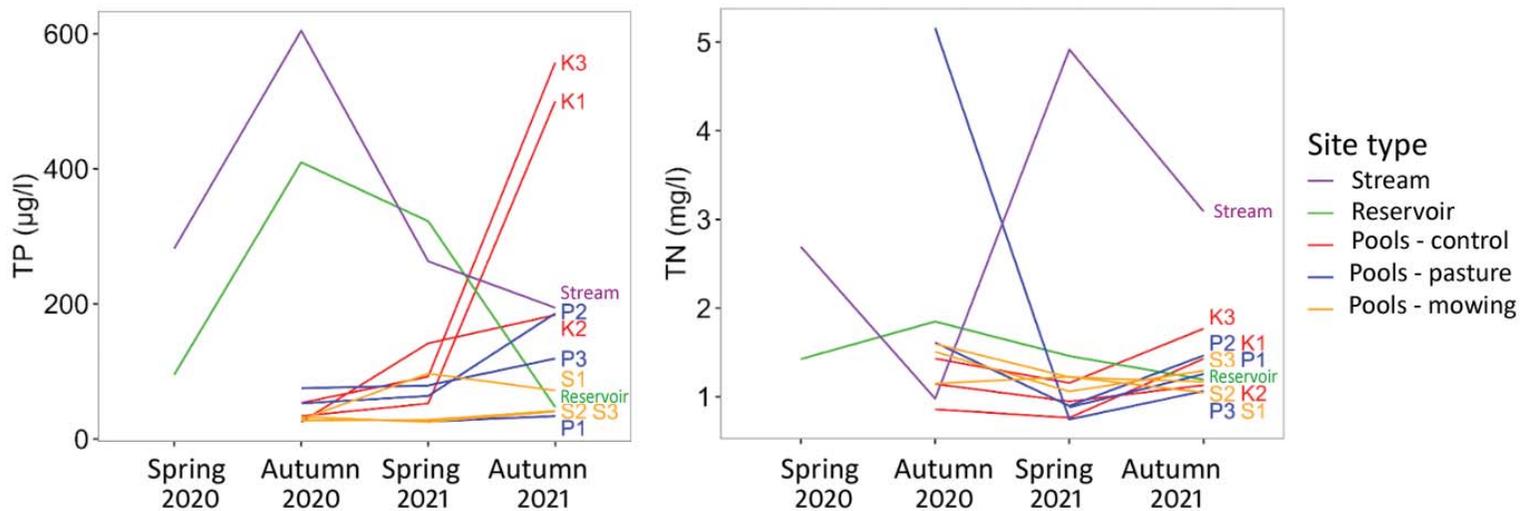


Figure 3: Changes in the total phosphorus (TP) and nitrogen (TN) level in water during the spring and autumn seasons of 2020 and 2021. Values from a stream, a reservoir, and nine ponds are presented, which are coded with the letters K (no intervention area), P (pasture), and S (mowing). © Jana Petruželová

using the construction of new pools, mosaic mowing, and cattle grazing. These activities, together with thorough monitoring of the overall wetland biodiversity implemented on both experimental and control non-intervention plots, are carried out within the framework of the above-mentioned project supported by the Technology Agency of the Czech Republic (project no. TJ04000145).

### Building/creating pools: why and how?

In the undisturbed landscape, pools were naturally formed in the floodplains of lowland brooks and rivers by their spilling into terrain depressions or by the formation of cut-off meanders. However, disruption of the flood regime through stream canalization led to the disappearance of natural floodplain pools. In the Czech Republic's landscape, standing/stagnant water is therefore mainly represented by fishponds, while small shallow pools without predation pressure from fish are desperately missing in the current landscape (SYCHRA *et al.* 2021). The aim of building new pools on the meadow wetland near the village of Krumvíř was the creation of a new, suitable habitat type, thereby supporting local biodiversity.

The parameters of pools and their location were selected with regard to their use as experimental plots for monitoring the progress of colonization and further development of aquatic invertebrate communities, taking into account the specific management of plots in the immediate vicinity of the pools. In total, nine pools were built using light machinery during September 2020: three in the grazed area, three in the mowed area, and three in the control non-intervention plots with reeds

(Fig. 1). Each pool had a diameter of five metres and sloping banks with a maximum central depth of up to 100 cm. A relatively deeper excavation was selected with regard to the expected silting of the ponds during numerous floods (Fig. 2).

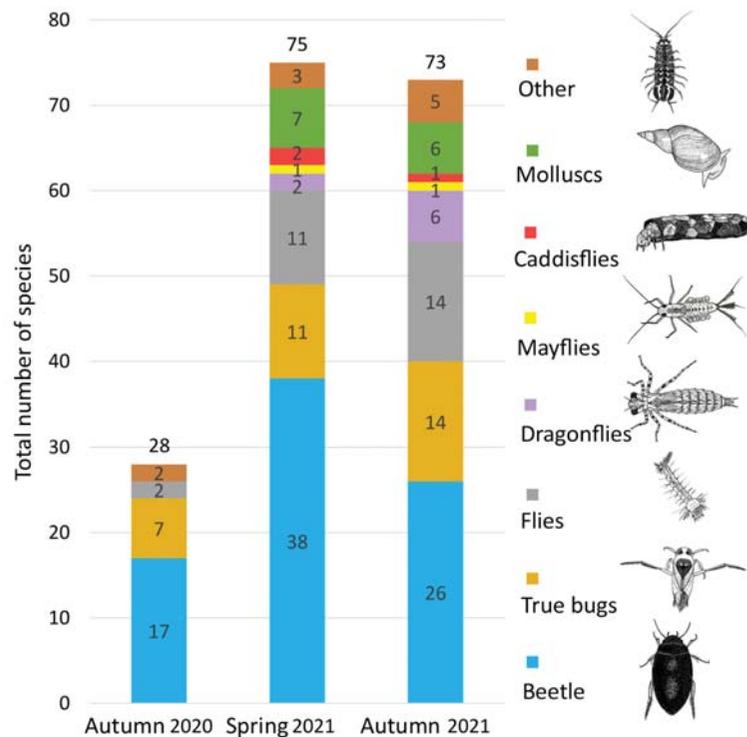
### First results of aquatic invertebrate monitoring

Monitoring the aquatic invertebrate community started in the existing reservoir and the Spálený potok/Burnt Brook in May 2020. It was repeated in September 2020, this time also in the newly built pools. Subsequent sampling took place in May and September 2021, while a similar timing of monitoring was also planned for 2022. Although a relatively short time has passed to evaluate the development of the communities in the pools, the pilot data has already brought some interesting information.

At the start of monitoring, after almost twenty years of existence, the reservoir was heavily overgrown with aquatic plants, especially hornwort (*Ceratophyllum* sp.). The environment was very homogeneous and the steep banks were overgrown with impenetrable reeds. The water had low transparency, high conductivity, and contained high nutrient level: 1.43 mg/l nitrogen and 0.095 mg/l phosphorus, which fluctuated significantly during subsequent samplings (Fig. 3). The detected concentrations thus correspond to eutrophic to hypertrophic water trophy (ADÁMEK *et al.* 2010), which is manifested by vegetation overgrowth, subsequent excessive decomposition of organic matter, and higher oxygen consumption. These accompanying eutrophication processes have a negative effect on the aquatic invertebrate community composition.

A total of 129 macroscopic aquatic invertebrate species and 29 zooplankton species were recorded in the water reservoir. All species found are characterized by the ability to tolerate pollution and lack of oxygen. However, the low numbers of individuals in most species indicated that the reservoir is not an optimal habitat for their life due to its homogeneity. In contrast, a few of the most adaptable species occurred in large numbers; for example, the Small red-eyed damselfly (*Erythromma viridulum*) adapted to life in the submerged vegetation of densely overgrown water reservoirs (WALDHAUSER & ČERNÝ 2015). The most species-rich order of insects in the reservoir were beetles (45 species); however, two-thirds of them were recorded only in the spring season. Several less-common species specialized in densely overgrown waters were also recorded in the reservoir; for example, the beetle species *Cybister lateralmarginalis*, the Dainty damselfly (*Coenagrion scitulum*), and the only spider species permanently inhabiting the aquatic environment, the water spider (*Argyroneta aquatica*), also known as the Diving bell spider. The zooplankton composition was seasonally very variable, with the dominance of water fleas *Chydorus sphaericus* and *Daphnia curvirostris*. These species are also typical for eutrophic habitats with an increased nutrient supply.

Only a week after their building, several species of aquatic insects and zooplankton were found in the pools. These were mainly beetles and true bugs that actively fly and therefore have the ability to quickly colonize new water bodies. We attribute the rare occurrence of common copepod (Cyclopoida and Harpacticoida) species either to their previous presence in the substrate



**Figure 4:** Total number of macroscopic aquatic invertebrate species found in the newly built pools within three samplings. The numbers in the columns express the number of species in the given invertebrate group (or higher taxa, genera or families, especially with flies). The "Other" group includes crustaceans, leeches, arachnids, and cnidarians. © Jana Petruželová

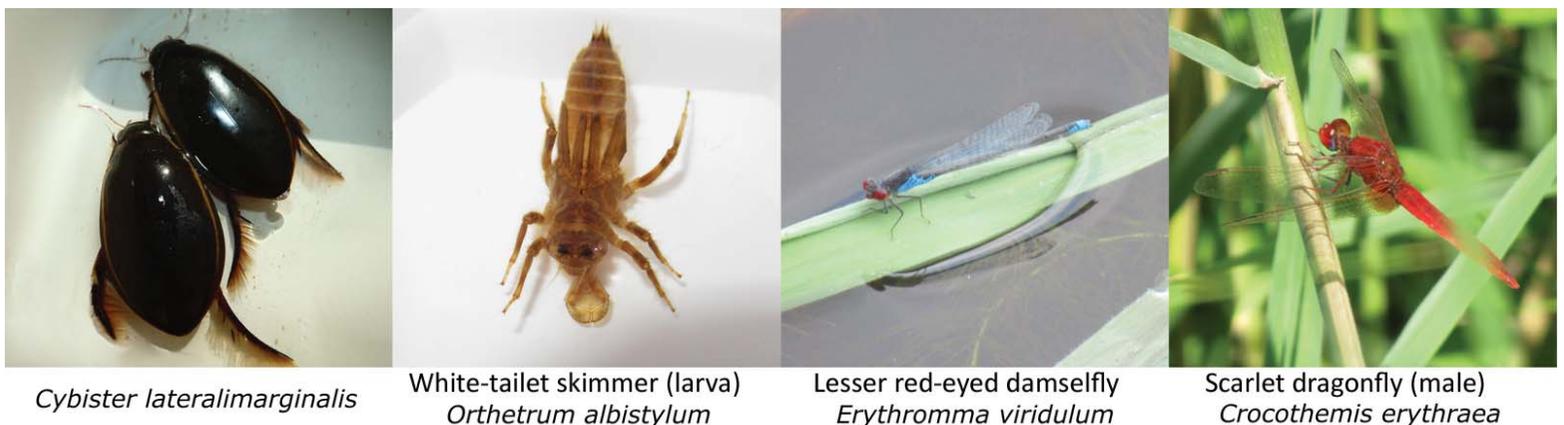
**Figure 5:** Ponds overgrown with charophyte green algae of the *Chara* genus. The common *Chara vulgaris* was recorded, but also the rarer *Chara hispida*. © Marie Kotasová Adámková.

at the excavation site, or to passive transmission by other animals. In the following year, representatives of most invertebrate groups inhabiting standing/stagnant waters appeared in the pools (Fig. 4). Many of them are the so-called pioneer species preferring newly established water bodies.

Among the beetles, eurytopian species (e.g. diving beetles, namely the Supertramp beetle *Rhantus suturalis* and *Hydroglyphus geminus*) first had appeared in the ponds, and among the true bugs, these had been typical pioneer species that

are good flyers (water boatmans *Sigara lateralis* and *S. nigrolineata*). The following year beetles preferring a sandy or muddy substrate overgrown with algae occurred there (crawling water beetles *Haliplus fluviatilis* and *H. ruficollis*) and some rarer species from the Red List of the Czech Republic preferring smaller warm water bodies (e.g. crawling water beetles *Bidessus nasutus* and *Laccophilus poecilus*; BOUKAL *et al.* 2007). As the algal vegetation grew (Fig. 5), species of true bugs associated to it appeared, such as pygmy backswimmer *Plea minutissima* and the Saucer bug (*Ilyocoris cimicoides*).

The first dragonfly larvae appeared in the ponds only in 2021. Some of the pioneer species of this group, e.g. the Common broad-bodied chaser (*Libellula depressa*), the Emperor dragonfly (*Anax imperator*), but also the rarer White-tailed skimmer (*Orthetrum albistylum*), were not recorded in the reservoir at all, or they occurred very rarely (the Scarlet dragonfly *Crocothemis erythraea*). At the same time, representatives of other insect orders, mayflies and caddisflies, appeared in the pools, and the number of flies increased. Furthermore, representatives of molluscs and crustaceans of the permanent



*Cybister lateralmarginalis*

White-tailed skimmer (larva)  
*Orthetrum albistylum*

Lesser red-eyed damselfly  
*Erythromma viridulum*

Scarlet dragonfly (male)  
*Crocothemis erythraea*

**Figure 6:** Selected species recorded as part of monitoring. © Marie Kotasová Adámková & Jana Petruželová.

aquatic fauna were recorded in the pools, e.g. the Water louse *Asellus aquaticus* and water fleas, which probably colonized the pools during the linking of water bodies by spilling of the stream into the wetland area, or by transfer on vertebrates. In total, 110 aquatic invertebrate species have been found in the pools during monitoring so far, although the average species richness in the individual pools was 50 species. A large part of the species was therefore only found in some pools, which confirms the importance of building a large number of small water bodies in different places on a given site. Selected captured species are presented in Figure 6.

The nutrient input into the pools from the surrounding agricultural landscape causes an ever-increasing measurable nutrient concentration in the water. Phosphorus values increased year-on-year; for example, in pool K3 from 0.034 mg/l to 0.499 mg/l, similarly also in pool K2. The nutrient level in the ponds, and the related further development, is dependent on the quality of the water flowing into the wetland from the brook (Fig. 8), which brings many times more nitrogen and phosphorus to the site under study. The further development of the pools is thus unclear. However, it can be assumed that there will be an increase in species associated to vegetation and dead organic matter, and, on the other hand, pioneer species will decrease. However, more detailed information will only be provided by data from subsequent years of monitoring.

## Influence of management on pool development

The pilot results show that the implemented management of wetland habitats demonstrably affects the characteristics of pools which are generally considered to be favourable for the occurrence of a number of invertebrate species. Grazing and mowing reduces the growth of reeds on the banks of pools and thereby increases the amount of sunlight falling on the water, which directly supports the growth of algae as well as increases the temperature and accessibility of water from the surrounding area. In the pasture, livestock trampling increases the heterogeneity of pools and the proportion of shallows (Fig. 2), which are essential for a rich diversity in aquatic invertebrates (JIRKŮ & DOSTÁL 2015).



Figure 8: Water from the brook flows into the wetland mainly after higher rainfall, after which the brook leaves its bed in many places (left) and then flows into temporary channels through which it flows directly to the pasture (right). © Marie Kotasová Adámková.

The differences in species richness recorded between the individual trios of ponds shortly after their creation probably only reflect the different course of colonization depending on as yet unknown variables. The pools built on the grazed and control plots in further periods hosted a similar number of species, regardless of the management type (Fig. 7). Only the communities of the two pools located in the no-intervention control plot were significantly poorer in terms of species in the autumn of 2021, which we attribute to the location in the overgrown and often flooded part of the wetland, where decaying organic matter accumulates, causing frequent occurrence of anoxic conditions. In general, newly built pools in a eutrophic environment overgrow quickly without proper management, and are therefore often unattractive to a large part of the biota (including aquatic invertebrates) very quickly after their building.

## Conclusion: the only certainty is change

Of the total number of 158 aquatic invertebrate species reported from the site so far, 18% were

found only in pools. Initial results show that early-stage pools serve as refuges for many species, including species completely new to the wetland. We believe that the combined effect of flooding and ongoing management will result in the continued development of the pools in a varied mosaic of suitable habitats for a large number of species. However, management measures, namely adequate mowing and extensive grazing, will play a fundamental role there. Removing vegetation around pools should lead to a reduction in nutrient concentration, but it has not been known whether these local measures can effectively compensate for the constant nutrient supply from the surroundings. Eutrophication is a problem that goes far beyond the management of a single site, and which can only be significantly mitigated by large-scale

measures at a region level. However, new knowledge on impact of properly set wetland habitat management would contribute to elaborating measures to be applied in degraded meadow wetland restoration on a wider scale and thus to important agriculture landscape improvement. ■

## Acknowledgement

The project is co-financed from the State Budget through the Technology Agency of the Czech Republic with the ZÉTA Programme. [www.tacr.cz](http://www.tacr.cz) Research useful for the society

The list of references is attached to the online version of the article at

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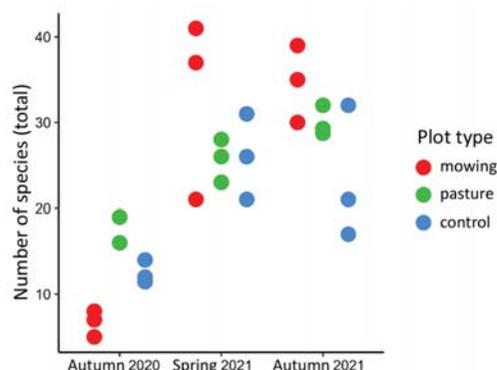


Figure 7: Comparison of number of species in pools at the mowed, grazed, and control project site, recorded during the three sampling events to date. Missing data from one pool on the grazed area is due to the pool drying up in the autumn of 2020. © Jana Petruželová.

# A Prehistoric Bear Cub from the Javoříčko Karst

Ivan Balák, Vlastislav Káňa, Martin Koudelka, Olga Suldovská & Ivo Světlík

Every cave represents a unique natural phenomenon, preserving the complex links between living and non-living nature. They often contain paleontological findings as well as archaeological monuments connected with the development of the humans. The remains of

animals get into the caves through the sinking of debris and alluvium. Some animals use caves for hibernation, others as shelters, dens, and food stores. And some find death underground after being caught in a natural trap...



Detail of hind limb bones, scapula, pelvis, and part of spine/backbone. A brown bear cub from the Late Pleistocene, the Javoříčko Karst (Central Bohemia) © Ivan Balák



Cranial view of the skull. © Ivan Balák

## Discovery after a hundred years

In 1918 a subtle entrance into a small cave was discovered in a small limestone islet in the Javoříčko Karst (Central Moravia) during stone quarrying. The entrance caught the attention of a group of speleologists from the Ludmírov-Štýmbek Czech Speleological Society Local Chapter, which, almost a hundred years after the discovery of the entrance (sometime around 2017), gradually dug through the amount of deposited cave sediments with the aim of discovering a way forward. Their efforts were rewarded at the end of July 2019, when they advanced to a small dome with a length of about 9 m, a width of about 1.5 m, and an average height of about 8 m. The small dome contains a relatively rich stalactite decoration represented mainly by stalactites and corallite forms, which also cover the walls of the chimney. Its base is covered with sharp-edged debris, probably of frost origin; clay cave sediments are essentially missing there. The debris is strengthened by sinter flow with the accompanying formation of small lake forms, cave pearls, and similar shapes.

In addition to the cave decoration, however, the newly discovered area also contained skeletal remains, of which the skeleton of a larger vertebrate caught attention at first glance. It was clear from the first photographs that it was the preserved skeleton of an as yet unspecified carnivore lying in a natural position on the debris floor. At the end of August 2019, palaeontologists with experience of studying caves were intro-

duced to the find. They determined the bones of the larger mammal to be a juvenile Brown bear (*Ursus arctos* ssp.) about one year old. The original assumption that it was one of the species inhabiting the caves – the Cave hyena (*Crocota spelaea*) or some form of the Cave bear (*Ursus* ex group *spelaeus*) – was not confirmed, but the finding did not lose its significance.

## The question of age

Identification of the finding as a brown bear cub raised the question of the time of its origin. In the Czech Republic, the species *Ursus arctos* was found in various forms (subspecies) from the Pleistocene to historical times; the original estimate of the age of the finding ranged from hundreds of years to thousands of years. A rib sample (the only free fragment of about 3 cm long that was not covered or cemented with sinter) was taken from the skeleton for age determination using the radiocarbon method. This sample was handed over to the Czech Radiocarbon Laboratory at the Nuclear Physics Institute of the Czech Academy of Sciences, public research institution., with whom the Cave Administration of the Czech Republic has been cooperating for a long time.

Collagen was isolated from the sample, which was subsequently graphitized. Measurement was then carried out on the MICADAS compact tandem accelerator in HEKAL ATOMKI HAS laboratory in Debrecen (DeA). The resulting  $^{14}\text{C}$  activity and its combined uncertainty were

expressed in years BP (Before Present) according to the Stuiver Polach Convention for reporting radiocarbon determinations. The IntCal20 calibration curve designed for dating terrestrial samples of the Northern Hemisphere was used to calibrate the activity. The resulting calibrated age interval (dating result) was expressed in years BC (Before Christ) together with the absolute probability  $P$  (%) of this interval.

Conventional radiocarbon age (years BP) - result of $^{14}\text{C}$ analysis	Resulting calibrated age interval (years BC)	P (%)
12 084 ± 37	12115 – 11860	95

The dating results show that the age of the skeleton falls into the Upper Pleistocene period, also now as the Late Pleistocene, *i.e.* the very end of the Last Ice Age (Last Glacial Period). This is also evidenced by the sharp-edged frost debris at the bottom of the cave space on which the skeleton lies. The subsequent covering of the skeleton and floor debris with sinter material resulted from younger climatically warmer periods with abundant rainfall.

A survey of sediments, the cave topography, knowledge of the age of the deceased animal, and position of the skeleton all allows to idea of how and why the bear got into the cave and why it has been preserved as it is. The place with the described finding is located approximately 6 m below the level of today's entrance. The skeleton is on the surface of sharp-edged debris, partly covered by debris. The animal lies on its right side in a crouched position. Both the skeleton and the debris are completely cemented together with sinter coating, just like the entire invert level of the dome. The bones show no visible signs of injury or damage.

At the end of the Pleistocene, the Brown bear was the only member of the bear family in what is now the Czech Republic; cave bears no longer existed there. Even "non-cave" bears are currently looking for underground spaces including karst caves to spend the winter there, but unlike cave bears, their preferred wintering grounds are smaller cavities. Their fossil and recent dens are usually found closer to the entrance; bones or skeletons are not found there in large numbers.

Young individuals (born during the first winter season) usually spend the second winter season with or near their mother, but this is not always

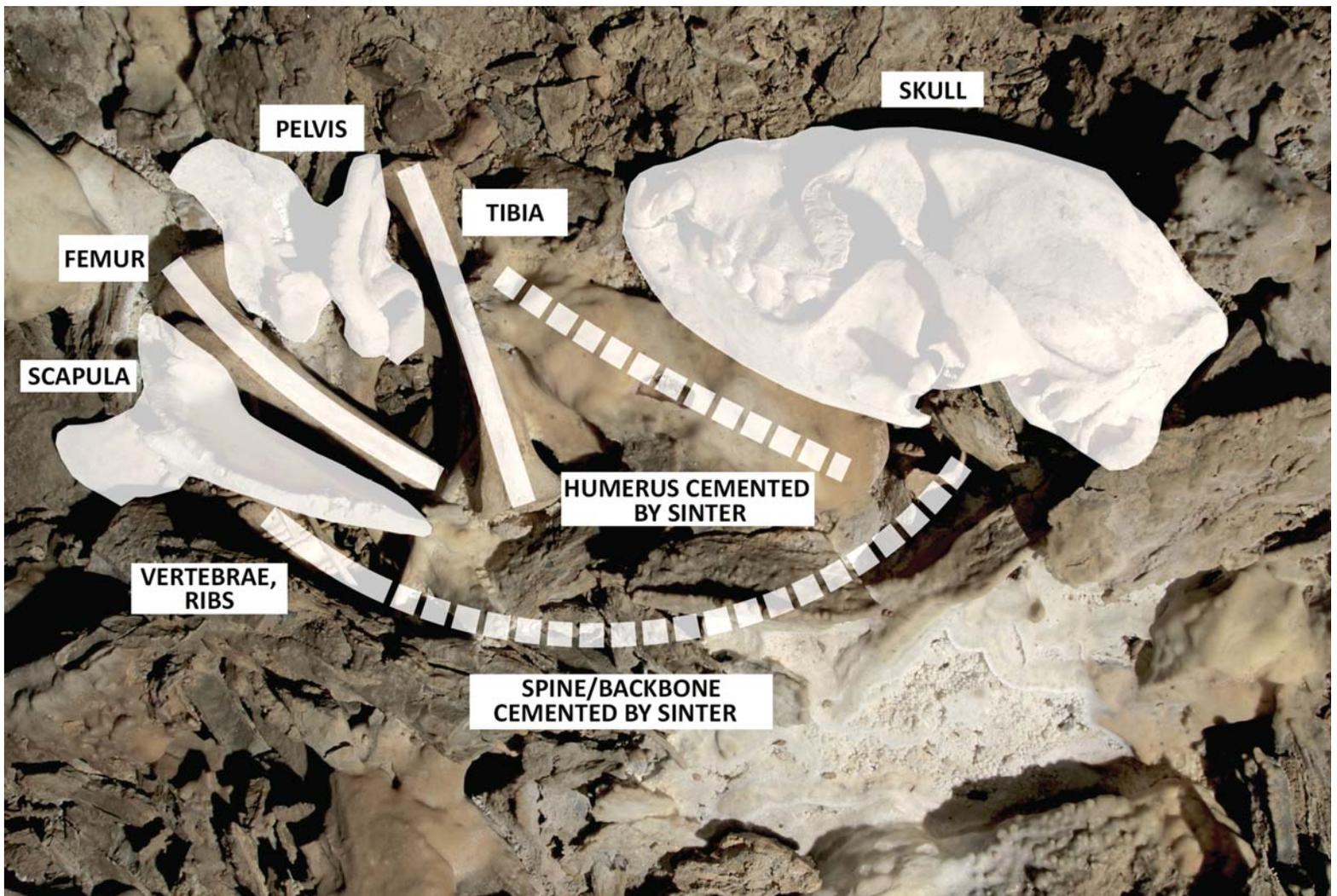


Diagram of the bones of a bear cub. © Ivan Balák

the case. The age of the animal found corresponds to the second winter. It is not possible today to determine whether the cub entered the cave with its mother and separated inside, but the authors consider it improbable. Rather, it was looking for a separate wintering place, wandering away from the mother, or simply the curiosity of the young. The cave could have been a natural trap (falling into a chasm from which the bear could not get out and died of hunger and thirst, sudden closing of the entrance, not finding a way back, it could have crawled into the cave through a narrow corridor that was not passable in the back direction, or perhaps a combination of several factors mentioned). It is equally probable that the death could have occurred simply from hunger, cold or disease, so the cave would not have been a real trap at all, it would have been a simple shelter. After the death of the cub, it remained in its original position, the visible bones do not display traces of serious injury (for example, a fracture), the bones were not dragged

by another animal and they are not bitten. This fact supports the hypothesis that there may have been a sudden closure of the entrance, for example by a sediment slide, which prevented the presence of other predators and scavengers.

As part of the documentation, the immediate surroundings of the cave were also explored in detail. Several other fallen and collapsed cave entrances and the probable place where the karst chimney exited to the surface were recorded. The original natural entrance to the cave with the finding is unknown and has probably been filled with sediment.

### A valuable finding

Speleological activities were immediately interrupted after the initial evaluation of the finding, the cave was closed with a lockable grate and other interventions aimed at protecting and recognizing the exceptional finding were made.

The finding of the sinter cemented skeleton remains in place; it is protected from mechanical damage. The entrance to the cave is locked (the cave and its immediate surroundings are protected according to the Act on Nature Conservation and Landscape Protection) and entry is allowed only to speleologists who are conducting further speleological research there, and to relevant experts. It is possible that other interesting findings will be made in the debris filling. ■

*The list of references is attached to the online version of the article at [www.casopis.ochranaprirody.cz](http://www.casopis.ochranaprirody.cz)*

# The Species Concept in Nature Conservation Theory and Practice

Jan Plesník

*To Václav Petříček (1944 – 2022) who told me dragons did not exist, then led me to their lairs*

It is no secret that there hardly is any other issue in biology which has been full of contradiction as the species, whether as a concept, category or taxon in systematics. The continuing debate which set of individuals could be considered the species resulted in at least 35 various concepts: although most species concepts have strong implicit similarities and they in some extent overlap each other, some of them exclude others (ZACHOS 2015,

2018b). It is necessary to mention that many of them in the fact do not define what species are or should be but rather provide differently complicated approach how to delimitate them (MAYDEN 1997, QUEIROZ 1998, 2007, STEWART 2018, REYDON & KUNZ 2019). Taking into account the extent of the debate the following reflection offers only a glimpse of the topic from a point of view of nature conservation, not an exhaustive analysis.



In addition to the well-known Rowan (*Sorbus aucuparia*) also called Mountain-ash there are other 28 species of the genus *Sorbus* in the Czech Republic. Ten of them are endemics or rather microendemics: they grow only at a few small sites and they developed themselves through hybridization or asexual reproduction. © Jan Plesník

## Species is if...

Most biologists seem to agree that species are separately evolving (meta-)population lineages (QUEIROZ 2005a, 2005b, 2007, ZACHOS 2018a, 2018b). We can in a simplified way say that species is the smallest distinctive group of individual organisms. Moreover, there has been a question about differences we prefer and how we delimitate them. Of various species concepts, we present three most often applied in practice.

Species can be the smallest groups that are constantly and determinedly distinctive and distinguishable by average means, e.g. by external traits. Thus, species are the smallest natural populations permanently separated from each other by a distinct discontinuity in the series of biotype. Therefore, we speak about the Morphological Species Concept (MSC, RAY 1686, CRONQUIST 1978). The MSC considering species to be constant, unchanging and well separated entities has been the most widely spread species concept in taxonomic practice, having had a monopoly in biology for a long time and despite its great subjectivity it dominates also in present (ZACHOS 2016). Problems raised when a certain group of individuals displayed a huge variability in some trait or traits, e.g. coloration, and it was necessary to decide whether this has been the single species yet. Description of species was becoming difficult also in cases if the species shows in external appearance different stages in the course of an individual development (ontogeny) or if single sex can appear in two or more morphological forms. In addition, it was found that the species called cryptic are morphologically indistinguishable: moreover, they differ, often sharply, in genetics, ecology and in animal also in behaviour. Therefore, although they were believed to be a single species they in reality comprise more than one evolutionary distinct lineage or species. It must also be added that external morphological similarity does not necessary reflect the true phylogenesis (evolutionary development of a species).

Due to continuing development in evolutionary biology and population genetics in the 1930s and 1940s biologists had turned their attention in seeking for suitable species concept to knowledge of these scientific disciplines. Thus, at the time revolutionary approach rather generally called the Biological Species Concept (BSC) appeared. It means an interbreeding natural population reproductively isolated from other such groups; all individuals produce actually or potentially fertile offspring (MAYR 1942, 1963). BSC's clear weakness is that it cannot be, of course, applied onto asexual organisms as well as onto



Based on morphological traits and more recently genetic analysis there are eight subspecies in the Tiger (*Panthera tigris*): three of them have to be considered extinct. On the contrary the opinion that according to the Phylogenetic Species Concept (PSC) there are two and even three species has not been broadly accepted. © Jan Plesnik

fossils. The question raised directly from the above definition is how to determine that individuals from a certain group can interbreed among themselves in the wild, e.g. if populations are spatially separated each other, live at different times or their biology or bionomics has been little, if anyhow known. Simply said it is difficult or impractical to determine whether populations are reproductive isolated: the direct testing of the reproductive compatibility by e.g. mating experiments in most groups of sexual organisms is logistically infeasible. When applying the BSC every clonal organism should be the separate species. From a broader point of view the BSC ignores evolutionary and ecological processes forming reproductive isolation mechanisms among groups of organisms.

Since the 1990s a variety of the Phylogenetic Species Concepts (PSC) has been more and more advanced. It is the smallest diagnosable cluster of individual organisms within which there is a parental pattern of ancestry and descent. The individuals within PSC share in both sexes a certain absolutely unique trait which occurs neither in their ancestors nor in other group. The given trait is characteristic of the particular independent evolutionary lineage maintaining its identity across space and time: these are groups of organisms with unique defined and measurable genetic similarity. The PSC and its variants define species either as the smallest cluster sharing genetically transmitted characters, such that all individuals are unequivocally diagnosable on the basis of those diagnostic characters, or as mono-

phyletic assemblages. In these, all individuals sharing a common ancestor belong to one species, with common ancestry inferred on the basis of shared derived characters (CRACRAFT 1983, NIXON & WHEELER 1990, DAVIS & NIXON 1992, BAUM & DONOGHUE 1995). The fact that the PSC, i.e. two populations are listed as distinct species if they have a common ancestor but differ physically or genetically, has been more and more used in practice is significantly supported by rapid development in phylogenetics (the study of the evolutionary history and relationships among or within groups of organisms trying to reveal evolutionary relationships among biological entities – often species, individuals or genes) related to a boom in molecular genetics including genomics (an interdisciplinary field of biology focusing on the structure, function, evolution, mapping, and editing of genomes: the latter are organism's complete sets of DNA, including all of its genes as well as its hierarchical, three-dimensional structural configuration). Not all by now proposed species concepts can be applied in all species, but the PSC considering species as the results of evolution, thus according to some opinions providing the best balance of theoretical consistency with an evolutionary framework and necessary operationalism of all existing concepts, can do it (RUSSELLO & AMATO 2014). Moreover also the PSC has – after all, like anyone – its quirks. Which criteria allow to determine some organisms as diagnosable different from others? It is rarely possible to reconstruct with certainty the past evolutionary pathway; and if so, it is hardly possible to devise a satisfactory method of designation a branching pattern by



A new insight into phylogenesis and consequently classification of giraffes (*Giraffa* spp.) was supported particularly by applying molecular genetic techniques and phylogenetic methods. A recent analysis of the genome (all the genetic information of an organism) confirmed there are four species of these popular big herbivores. © Jan Plesník

Applying the Phylogenetic Species Concept increased the number of bovids from commonly referred 143 to 279 species. Instead of the original single species of the African buffalo some zoologists distinguish four. The West African buffalo (*Syncerus brachyceros*), also known as the North-western or Lake Chad buffalo, inhabits African savannas from Senegal where the photo was taken to Ethiopia and Sudan. © Jan Plesník

means of a single linear sequence. Which genetic and morphological traits and how many of them we need to delineate various species if they are reproductively isolated? In addition, it has been found that various parts of genome can display different genetic history? Therefore, opinions on whether the particular group of organisms is the true species can differ according to markers (DNA sequences with a known location associated with a particular gene or trait) is used during genetic relatedness analysis. The PSC highly depends in the variability of the chosen DNA marker and in the chosen threshold of genetic divergence between two species.

## Does nature conservation need its own species concept?

Together with protection, conservation and management of the selected sites/areas species conservation has been traditional approach in nature conservation. Species are one of three generally respected biological diversity levels (UN 1992, WRI/IUCN/UNEP 1992). How the persisting ambiguity of what species is impact nature conservation?

Changes in taxonomic classification of a certain groups of organisms caused by applying the particular species concept can enhance its protection, conservation and management, do not impact its conservation status or on the contrary to reduce programmes or project aiming at its conservation (MORRISON *et al.* 2009). According to the PSC particularly the populations originally considered to be subspecies (once named geographical races) often become new species. Sometimes there is a dramatic increase in the

number of species not because of extensive description of new ones: the process is aptly called taxonomic inflation (ISSAC *et al.* 2004). It is the rapid accumulation of scientific names due to processes other than new discoveries of taxa. According to moderate estimation there was overall an increase in species numbers of 48.7% when a PSC replaced other concepts, although there were significant difference among various groups of animals, plants and fungi: *e.g.* there was a 50% decrease in mollusc species (AGAPOW *et al.* 2004). In this respect the record holder is the diatom *Pinnularia borealis*: it was found that in the fact there are 200 to 600 species instead the single one (PINSEEL *et al.* 2020, KOLLÁR 2022).

Multiplying number of species changes the species richness (the number of species within a defined region in a defined time), one of the most common proxy of and insight into biological diversity, and related approaches, *e.g.* identifying biodiversity hotspots. Newly delineated species usually show both smaller population sizes, and narrower distribution range so they are at increased risk of extinction: nature conservation should add new species to threatened ones and provide them with appropriate protection, conservation and management. Different distribution range of a subspecies or a local population (demotop) elevated to the rank of species influences also protected area designation. In practice the process also involves necessary changes in legislation, both national and international as well as an urgency to allocate for new species the relevant capacities including financial. Therefore, species splits may amplify the number and proportion of endangered species thus reshuffling conservation priority and policy for each new split (COLLAR

1997, ISSAC *et al. l.c.*, ZACHOS *et al.* 2013a, 2013b, ZACHOS & LOVARI 2013, ZACHOS 2015, 2016, GALINDO-CRUZ *et al.* 2022). FRANKHAM *et al.* (2012) suggest that the PSC is not appropriate for nature conservation because it considers small isolated populations suffering inbreeding as the distinct species. If the BSC is consistently applied such populations can be enhanced by individuals from related populations belonging to the same species and interbreeding with individuals from the population to be rescued. According to the PSC it would be interspecies hybridization, *i.e.* crosses between species, with consequent legal and regulatory ramifications that could preclude actions to prevent extinction. Moreover, neither in birds nor in primates the increase in the number of species was followed with elevated risks of extinction within the taxa (SIMKINS *et al.* 2020, CREIGHTON *et al.* 2022, *cf.* LESLIE 2014).

On the contrary, other authors see the taxonomic inflation as the much-needed incorporation of phylogenetics into taxonomy (KNAPP *et al.* 2005). Supporters of PSC also argue that splitting the original species into more species can reveal from a point of view of nature conservation significant populations having been overlooked or ignored, and thus providing them with appropriate protection, conservation and management: those often are (micro)endemics (GUTIÉRREZ & HELGEN 2013, GROVES *et al.* 2017, GIPPOLITI 2020).

The BSC immediately implies that there should be no hybrid species, *i.e.* the stabilized species caused by hybridization between various species. Quite the opposite is true and some hybrid species, *e.g.* the European bison or Wisent (*Bison bonasus*) and Père David's deer (*Elaphurus david-*

## NATURE CONSERVATION AND WITHIN-SPECIES UNITS

Formally named subspecies or other intraspecific categories which can significantly differ in extinction risk have often been described based upon rather superficial and broadly changing characters, e.g. coloration or body size. In some cases because of lack of finances, staff, knowledge or time it is not feasible to protect, conserve or manage the species as a whole. Therefore, conservation biologists have independently on the debate on the species concept introduced some proposals how to delineate within a certain species priority non-taxonomic units to be specially managed.

The most important of these approaches is the Evolutionarily Significant Unit (ESU) proposed in the mid-1980s (RYDER 1986). In short, it is a population, or group of closely connected populations considered due to its or their genetic, ecological or evolutionary extraordinariness worthy of particular conservation and the targeted management.

For purposes of the United States Endangered Species Act of 1973 WAPLES (1991) defined ESU as a population that is substantially reproductively isolated from other conspecific population units, and represents an important component in the evolutionary legacy of the species. MORITZ (1994) recommended specific methods to delineate ESUs. Since that time, the ESU concept has been debated, criticised, worshiped and specified (e.g. CRANDALL *et al.* 2000, FRASER & BERTNATCHEZ 2001, HEY *et al.* 2003, WINKER *et al.* 2007, CASACCI *et al.* 2014, BURBRINK *et al.* 2022). Moreover, an ESU meets at least one of three criteria: (i) current geographic and thus reproductive separation; (ii) past restriction of gene flow; or (iii) locally adapted phenotypic traits caused by differences in selection.

While BARROWCLOUGH & FLESNESS (1996) considered species delineated according to the PSC to be ESU, RIDDLE & HAFNER (1999) recommended to use ESUs directly just instead of species. If proposing new ESU concepts resembles the reader an early stage of the way the species concepts itself has been trudging for two centuries he is not too far from the truth.

*ianus*) are among the indisputable nature conservation icons (ROBOVSKÝ 2007, ZRZAVÝ 2019).

Responding to troubles in seeking for a consensus what should be considered the species, nature conservation has been, *inter alia*, aiming at the level below the species, i.e. at intraspecific conservation units – see Box on page xx.

## Species mirrored by time

Ideally, species should be well delineated and captured, naturally perceived entities the result of two processes: (1) the evolutionary processes that have caused biological diversity; and (2) the human mental apparatus that recognizes and gives names to patterns of recurrence, in this case efforts to classify living elements of the world – and just the fact causes their splendours and miseries (HEY 2001, HAUSDORF 2011, KOLLÁR *et al.* 2022).

It was Charles Darwin who highlighted that no one definition of species has as yet satisfied all naturalists; yet every naturalist knows vaguely what he means when he speaks of a species (DARWIN 1859). None of the successively proposed approach has been currently generally accepted and it does not fully satisfy nature conservation needs. In addition it does not seem that the issue shall change in the future (MISHLER 2021, PYRON & MOOERS 2022, WILKINS *et al.* 2022). Therefore, not only national nature conservation legislation except Australia but also multilateral biodiversity-related agreements except the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) carefully avoid defining “species” in any way that takes sides in the scientific debate (GARNETT & CHRISTIDIS 2007). Just as biology, either nature conservation simply does without species. After all, more attention is generally paid to species protection, conservation and management, e.g. reintroductions, restocking or releasing recovered animals into the wild than to the ecosystem approach or enhancing the landscape connectivity. Although the main unit of field species protection has been a population, both decision-makers as well as lawmakers and the general public consider the species as a key nature conservation term. Moreover, there are two possibilities for nature conservation how to respond to the above facts.

In practice a very simple solution has currently been applied that species are whatever a component taxonomist chooses to call a species. The approach is called the Taxonomic Species Concept or rather ironically the Cynical Species Concept (KIRSCHER 1984, MAYDEN *l.c.*, WILKINS 2018). Nevertheless it implies the necessity, based

on the current taxonomic knowledge, to regularly reassess priorities in species protection, conservation and management (ROBUCHON *et al.* 2019). It is worth mentioning that nature conservation legislation fails to keep pace with changes to how organisms are classified, in some cases it even does not try to do it (MACE 2004, GARNETT & CHRISTIDIS 2017).

Given that biologists have spent decades trying to find a universal definition of species and have not achieved it, it has become obvious that there is no single correct universal definition. The idea that due to a huge diversity in biota it is not quite well possible for all organisms, from viruses to humans to make do only with the single species concept and that in different groups of organisms different species conceptions that are most adequate to their biological properties responsible for their diversity should be applied has not been in any way totally new. Proposals for pluralism are motivated also by the fact that particular criteria for identifying species are not applicable in all situations and the observation that multiple concepts can give conflicting results when they are applied ((MISHLER & DONOGHUE 1982, KITCHER *l.c.*, ERESHEFSKY 1992, DUPRÉ 1999, HEY 2006). Such pluralism could terminate endless fruitless debates about appropriateness of one or another particular species concept to all groups of living beings (PAVLINOV 2021). In that case nature conservation could commonly said has an axe to grind. From a pragmatic point of view of nature conservation, a species is a group of individuals varying in numbers which is important from natural heritage management: therefore it should be reasonably protected, conserved or managed. Because the individuals share an evolutionary and ecological history they display common trait(s).

The longstanding disagreement should not become an impediment to responsible conservation and wildlife management. Moreover it has been repeatedly confirmed that populations valued by humans, for whatever reason – charisma, beauty, rarity, or economic worth – are protected regardless of their taxonomic rank (MORRISON *et al. l.c.*). Really, whether the Mountain gorilla (*Gorilla gorilla beringe*) is classified as a species, subspecies, evolutionary significant unit or local population makes little difference for its conservation in the field (UCHIDA 1996). Nevertheless we should consider also others, particularly endangered biota. This is species protection, conservation and management is or should be about. ■

*The list of references is attached to the online version of the article at*  
[www.casopis.ochranaprirody.cz](http://www.casopis.ochranaprirody.cz)

# The Natura 2000 Network Will Again Expand in the Czech Republic

Tereza Kušnířová & Martin Šikola

Although the first national list of Special Areas of Conservation (SAC) was adopted by the Government of the Czech Republic following the country's accession to the European Union in 2005, the question of its representativeness for species and habitats of European importance, and therefore the sufficiency of the EU Natura 2000 network of protected areas in the Czech Republic, has not yet been closed by the European

Commission. Over the course of the Natura 2000 network's existence, the Czech Republic has tried to deal with the identified shortcomings in particular with three major additions, most recently in 2016. Nevertheless, we are now awaiting another more extensive update of the national SAC list. The proposed amendment and the reasons for its development are explained on the following pages.



The proposal deals with, *inter alia*, the expansion in size of the Kozlov SAC – a site for the protection of herb-rich beech forests. © Zdeněk Patzelt

## Sufficiency reassessment after six years

In 2017, the European Commission commissioned a new analysis on the sufficiency of SACs in the Czech Republic, whose task was to evaluate whether sufficient and representative SACs had been declared, providing protection for individual species and habitats that are the subject of their protection. Only phenomena considered under-represented in the most recent sufficiency assessment from 2011 were reassessed.

In general, reports on the status of species and habitats that EU Member States submit to the European Commission at six-year intervals are used for evaluation, as well as other available literature and publicly accessible documents.

In the conclusions of the assessment for the Czech Republic, 36 insufficiently represented species and habitats, or phenomena, were identified, for which there is insufficient evidence to declare the site and are thus kept as a "scientific reserve". For most phenomena, specific existing SACs or supplementary sites have been identified. There were more than 170 requests. The European Commission was led to a new assessment, *inter alia*, by the fact that, despite the amendment to the national list in 2016, not all of the then-historical requirements, supported by the expert data, were fulfilled.

## Supplementing the national SACs list failed

By Government Regulation No. 73/2016 Gazette which amends Government Regulation No. 318/2013 Gazette on establishing a national list of Special Areas of Conservation, 50 new SACs were announced and subjects of protection were added to 70 existing SACs. In the same month as the European Commission was informed about supplementing the national list, the so-called infringement procedure were initiated against the Czech Republic regarding violation of the Treaty, or of Union law. This call did not yet take into account the supplements made; however, the European Commission had information that some sites that met the expert/technical criteria for inclusion in the Natura 2000 network would not be declared due to other interests in the area; this was Porta Bohemica (extension of the Labské údolí/Elbe River Valley SAC) and Louky u Přelouče/Meadows near the town of Přelouč SAC (originally listed as Slavíkovy ostrovy/Slavík's Islands and Labišťata/Elbe River Pools sites). The Czech Republic responded to the call by including the Porta Bohemica SAC in the



The species for which a geographical gap was identified in the Czech Republic was the Green club-tailed dragonfly (*Ophiogomphus cecilia*). © Jiří Neudert

national list with amendment No. 207/2016 Gazette, but as you will learn further in this article, even this proposal did not fully meet the requirement for this site.

## Several years of negotiations with the European Commission

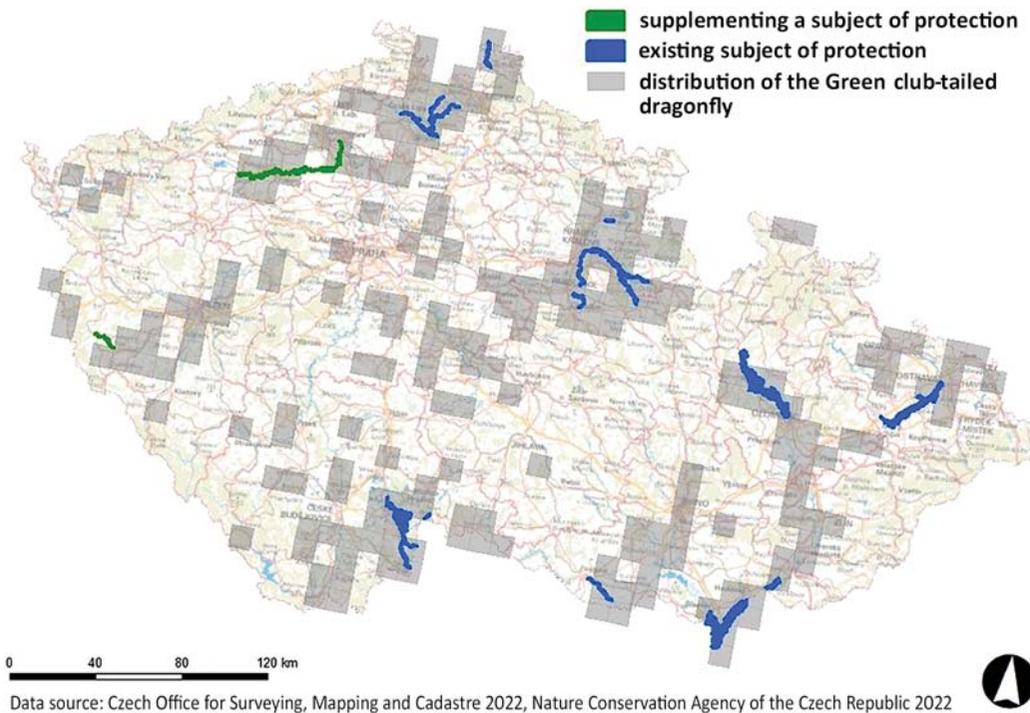
The conclusions of the 2017 assessment, which the Ministry of the Environment of the Czech Republic had received in 2018, were discussed at bilateral meetings with the European Commission as part of the "Nature Dialogue" process. Such negotiations would take place in all Member States in accordance with the then three-year Action Plan for Nature, People and the Economy from 2017, which included specific actions aimed at strengthening the practical implementation of the Directives and their contribution to the goals of the then EU Biodiversity Strategy until 2020.

The initial two-day meeting took place in the Czech Republic in September 2018. In addition to the topic of sufficiency and ensuring the protection of sites, issues above the network itself were also discussed with the European Commission, e.g. forest management, intensive fish farming in the landscape, and the process of permitting small hydroelectric power stations in the context of the need to preserve the ecological functions of watercourses.

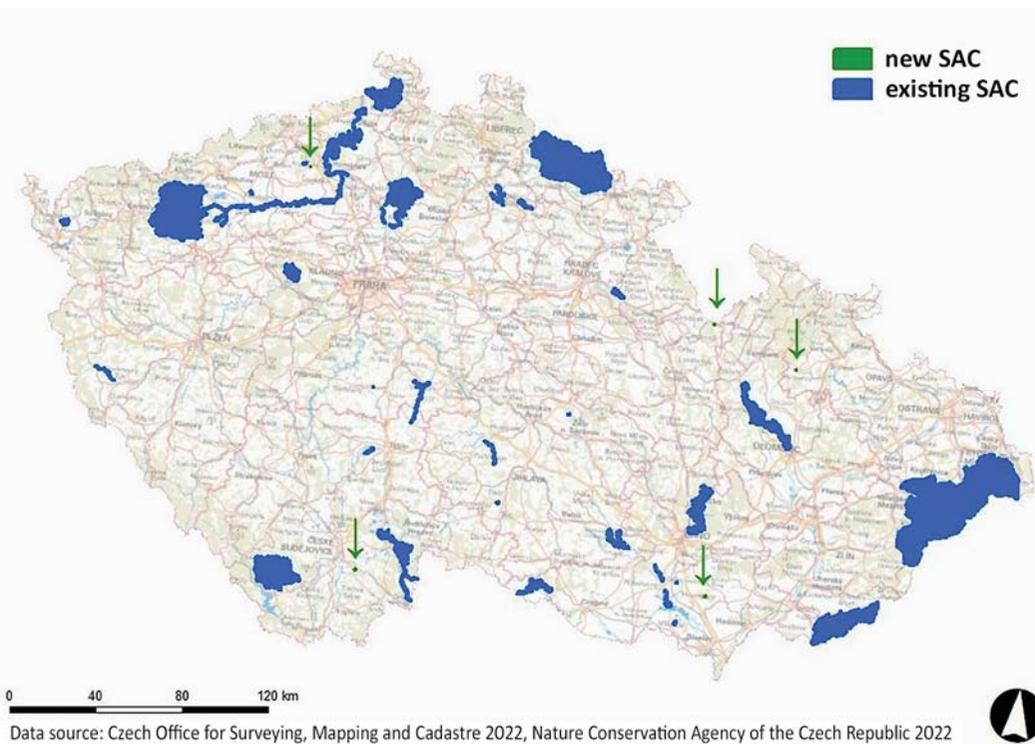
Due to the extensiveness of the supplement requirements, negotiations on sufficiency continued for another round in February 2019, within which, on the basis of existing data, it was possible to confirm unambiguous cases in which the phenomenon did not meet the criteria for inclusion at the given site. The number of sites that the Commission requested to add to the network was thus reduced to approximately half. The Czech Republic also promised to start the process of supplementing Louky u Přelouče/Meadows near the town of Přelouč SAC.

## Review of the Commission's requests' justification

It was also agreed at the meeting that the relevance of the remaining requirements will be verified in 2019 and 2020, as in some cases it was necessary to carry out verification in the field or to wait for the completion of the habitat mapping update at the given site. The verification, as well as the documents for all previous meetings, was provided by the Nature Conservation Agency of the Czech Republic (NCA CR). The evaluation mainly included information on the quality and size of the habitat, population size of the species, nature of occurrence (dispersed/concentrated occurrence), importance on a regional, i.e. within the respective biogeographical region, and potential for the future, including the possibility of implementing management.



**Figure 1:** Distribution of the Green club-tailed dragonfly reported in Conservation Status Assessment (2019). SACs in which the species is the subject of protection (blue) and the proposed supplementing of the species as a subject of protection to the existing SAC in the Continental Biogeographic Region (green). The sites are enlarged for better visibility. © Tereza Kušnířová.



**Figure 2:** Map of SACs that are proposed for declaration (5 SACs) or supplementing the subject of protection (35 SACs) as part of the amendment preparation. Due to their small size, new sites are shown with an arrow (new sites amount to almost 31 ha). For some sites, where the subject of protection was added, the boundaries were also revised. In the map, SACs are already shown with the newly proposed boundaries. The sites are enlarged for better visibility. © Tereza Kušnířová.

NCA CR commissioned several studies, e.g. for the Green club-tailed dragonfly (*Ophiogomphus cecilia*), in which a geographical gap in western and central Bohemia was identified as part of the sufficiency assessment for the Continental Biogeographical Region. Based on detailed monitoring from 2019, two existing SACs with a stable population were selected from the five monitored areas to supplement the species as a subject of protection: the Radbuza River SAC and Ohře River SAC. These sites will thus ensure a geographically representative sample of the species in the network corresponding to its distribution range.

## The Commission continues to conduct negotiations at two levels

A month before submission of the partial verification of the results in accordance with the schedule, at the end of 2019, the infringement procedure was moved to the next stage, which explicitly mentioned the following shortcomings: failure to declare the Louky u Přelouče/Meadows near the town of Přelouč SAC, failure to include the subject of protection of gravel-sand banks at the Porta Bohemica SAC, and failure to declare the Svatá and Prostřední vrch/Holy and Middle Hills SAC to a sufficient extent. The first two of these requirements were corrected by amending the national SAC list under No. 29/2020 Gazette. In 2020, preparations began for the expansion of the Svatá and Prostřední vrch/Holy and Middle Hills SAC, which were only accepted in 2021 by amendment No. 440/2021 Gazette; the site has a new name that better corresponds to the new geographical definition – Dambořický les/Dambořice Forest.

## How extensive will the supplementing be?

The results of the review were submitted to the European Commission at the end of 2019 and in 2020. According to the evaluation from 2017, only about a quarter of the original requirements were evaluated by the NCA CR as relevant. The results were discussed at two bilateral meetings with the European Commission during 2021, at which the scope of completion was agreed upon – a total of 45 subjects of protection will be added to 32 SACs.

In October 2021, the NCA CR was commissioned by the Ministry of the Environment of the Czech Republic to prepare a proposal to amend the SAC national list. On the occasion of the "opening" of the national list, long-term deficits should also have been resolved, such as the alignment of boundaries or problematic sites in which the absence of the subject of protection has been recorded.



The Porta Bohemica SAC enhancing the Labské údolí/Elbe River Valley SAC was declared in 2006. © Ondřej Nitsch

## How accurate are the SAC boundaries?

Historically, SACs were declared over maps that did not reach today's quality and accuracy. They were defined with the prospect of future refinement. This was governed by the then wording of the Act on Nature Conservation and Landscape Protection assuming that all Natura 2000 sites will become Specially Protected Area. The latter have currently been declared with precision on the individual plots or are directly delineated in the field, which would unify the boundaries of SACs and Specially Protected Areas. However, in 2013, basic site protection was introduced into the Act on Nature Conservation and Landscape Protection, and this assumption no longer applies to a significant number of sites.

The first large-scale review of the boundaries was undertaken as part of the SAC national list update in 2016 on the occasion of its supplementing, when it was possible to adjust the boundaries of almost 300 SACs. The primary basis for specifying the boundaries are still the declared Specially Protected Areas (especially the recent ones) and the Cadastre of Real Estate (thanks to advancing digitization); other layers are used according to the

individual considerations. The prepared amendment envisages a more precise definition of the boundaries of more than 130 SACs. Mostly, it is a matter of unifying the boundaries with small-size Specially Protected Areas that were declared with the aim of protecting SACs.

## Where do our subjects of protection disappear?

The NCA CR also records information on problematic sites where the subject of protection has not been recorded for a long time. However, the only argument that the European Commission accepts for the exclusion of a subject of protection is its long-term absence confirmed by monitoring, whose cause is either a scientific error (the phenomenon was included in the SAC based on insufficient or incorrect technical/expert information) or natural development (caused in particular by natural conditions), provided that measures have been implemented to prevent adverse development and it is no longer possible to restore the subject of protection at the site. Where it is possible and feasible, especially in cases where elimination could affect the sufficiency of the phenomenon, or could lead to a geographical

gap in the coverage in the distribution range, it is desirable to propose a replacement SAC, otherwise the proposal for exclusion may be rejected by the European Commission.

The current amendment prepared by the NCA CR deals with the exclusion of species subjects of protection from 13 existing SACs, while six sites would see their total cancellation. Compensation is expected for some of them; it is proposed to declare three new SACs and supplement the subject of protection to two existing SACs. Problematic habitat subjects of protection will only be dealt with in the following years. The certainty of their loss is more difficult to prove; the subjective opinion of the mapper plays, *inter alia*, a significant role in their determination, or the observation depends on the mapping period and the climatic conditions of the given year. In this regard, ephemeral and dynamic habitats are especially problematic.

## What else would be good to supplement and change?

In addition to the above-mentioned changes, the NCA CR also proposed declaring two SACs for the



The Louky u Přelouče/Meadows near the town of Přelouč SAC was adopted by the Government in 2020. © Zuzana Růžičková

hornwort species, the Round notothylas (*Notothylas orbicularis*). The species has not been yet subject of protection at any SACs and was designated as a "scientific reserve" as part of the latest efficiency assessment. The species had been considered missing in the Czech Republic for a long time until its rediscovery (after more than 90 years) in 2010. In the following years, several specific surveys have been carried out with positive results, and the first high-quality and prospective sites could now be proposed for declaration.

Last but not least, it is proposed to expand the Kozlov–Tábor SAC for the protection of the local herb-rich beech forests, while simultaneously adding a new subject of protection of Hercynian oak-hornbeam forests with a significant occurrence in the newly supplemented parts.

On the initiative of the Regional Office of the Ústí nad Labem Region, a proposal to expand the Východní Krušnohoří/Eastern Ore Mountains SAC near the town of Horní Jiřetín was also included in the update, thanks to which the protection of acidophilous beech forests will be expanded by more than 200 ha.

### Who was the proposal discussed with?

The NCA CR and the relevant National Park Administrations have ensured that the technical/expert proposal was pre-negotiated in the first half of 2022. This is a process that is not required by legislation, but it makes it possible to inform regional authorities, municipalities, owners, and important land managers in the area about upcoming changes, to use their local knowledge to improve the quality of the proposal, and to meet their reasonable and acceptable requirements. The scope of outreach is proportional to the significance of the change in the given site: e.g. in the case of the declaration of a new site, all the mentioned entities are contacted; in the case of the alignment of the boundaries to a Specially Protected Area, only the regional authorities are informed, and the municipalities are asked to post the information on their official board.

### What is the prospect of the amendment proposal?

The proposal was submitted by the NCA CR to the Ministry of the Environment of the Czech Republic

at the beginning of July 2022, which will further ensure the preparation of legislative document and preliminary negotiations with other key stakeholders. An inter-sectoral comment procedure will follow and certainly long negotiations; in any case, the amendment should be completed in 2023 in order to comply with the schedule agreed with the European Commission.

If the proposal to amend the SAC national list as prepared by the NCA CR is accepted, the coverage of SACs in the Czech Republic will be expanded by almost 550 ha, which will have a minimal impact on the percentage proportion to the whole country's territory, but the protection of species and habitats will be significantly strengthened due to the increase in their representation in the Natura 2000 network as subjects of protection. Thanks to this status, targets and protection measures will be set for them.

### What next for SACs?

If the Czech Republic fulfils its promise to enhance the Natura 2000 network, it could be possible to close the question of the sufficiency of the Czech



In 2020, the protection of natural habitat type 3270 was extended from the Labské údolí/Elbe river Valley SAC (pictured) to the Porta Bohemica SAC. © Zdeněk Patzelt

Natura 2000 network once and for all. However, as part of the bilateral negotiations, the topic of selecting subjects of SACs' protection in the Czech Republic emerged. For the sufficiency analysis, available data on the occurrence of the subject phenomena in question from the then official Czech website for the Natura 2000 network were used, which included information on the occurrence of habitats for individual SAC, based on data from the first mapping of habitats, delineating those which are subject of protection. This caused a great discussion; according to the European Commission, everything that occurs "significantly" at a given site should be subject of protection. However, this approach is different

from the Czech Republic procedure, which, in accordance with the criteria established by the Habitats Directive, selected the best sites for the given phenomena, which are meaningful to protect at the site, and which subsequently became the subject of protection and are targeted for protection and management. Nevertheless, thanks to extensive mapping and monitoring, it was not a problem for the Czech Republic to apply this approach. The second option, *i.e.* selecting sites and protecting phenomena listed in annexes to the Habitats Directive within them, is a suitable way in cases of insufficient data on the occurrence of phenomena in the country.

For the time being, everyone has to answer the question of whether it is worth protecting (and if to protect at all) each species and habitat of European importance at the site for themselves. The issue of significance and subjects of protection has now been transferred to other EU Member States as part of the currently ongoing revision of the Standard Data Form format, in which the Member States provide information on individual sites (available via the Natura 2000 Network Viewer <https://natura2000.eea.europa.eu/>) and within which the definition of significance and the content of reporting are now being addressed. Therefore, the activities on completing the Natura 2000 network has been ongoing yet. ■

# A Proposal for Revising Threatened Species Protection in the Czech Republic

**Pavel Pešout, Jan Šíma, Eliška Blažejová, Lenka Tomášková, Paula Filipová, Jana Fuglíková, Radek Hejda, Karel Chobot, Jindřiška Jelínková, Lenka Jeřábková, David Lacina, Ivan Mikuláš, Aleš Tenčík & Petr Vít**

In the Czech Republic, principles of current special species protection come from the second half of the 1980s. They entered into practice by Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection, as amended later, and since that time they – except small adjustments due to transposing and implementing the European Union legislation before joining the EU- have not been changed. Moreover, knowledge has been significantly improved during the thirty past years and the state of nature and the landscape has also significantly shifted across the whole country's territory. Long-term negative effects are currently amplified and multiplied by climate change impacts. It is clear that

species protection tools have been in many aspects outdated and their effectivity has been insufficient. We are not able to halt species richness/diversity decline and loss and to effectively protect, conserve or manage habitats of the individual species as a basic precondition of their survival. A lot of necessary changes can be reach only by those in methodologies and approaches in performing State/Public Administration and setting out economic/financial tools without changes in legislation. Nevertheless effective protection and providing the most threatened species with management need new legislation dealing with Special Species Protection, conservation and management



The Common frog (*Rana temporaria*) currently the fastest disappearing frog in the Czech landscape, not included in the current decree, newly proposed between Specially Protected Species in the 3<sup>rd</sup> level of protection. © Martin Waldhauser



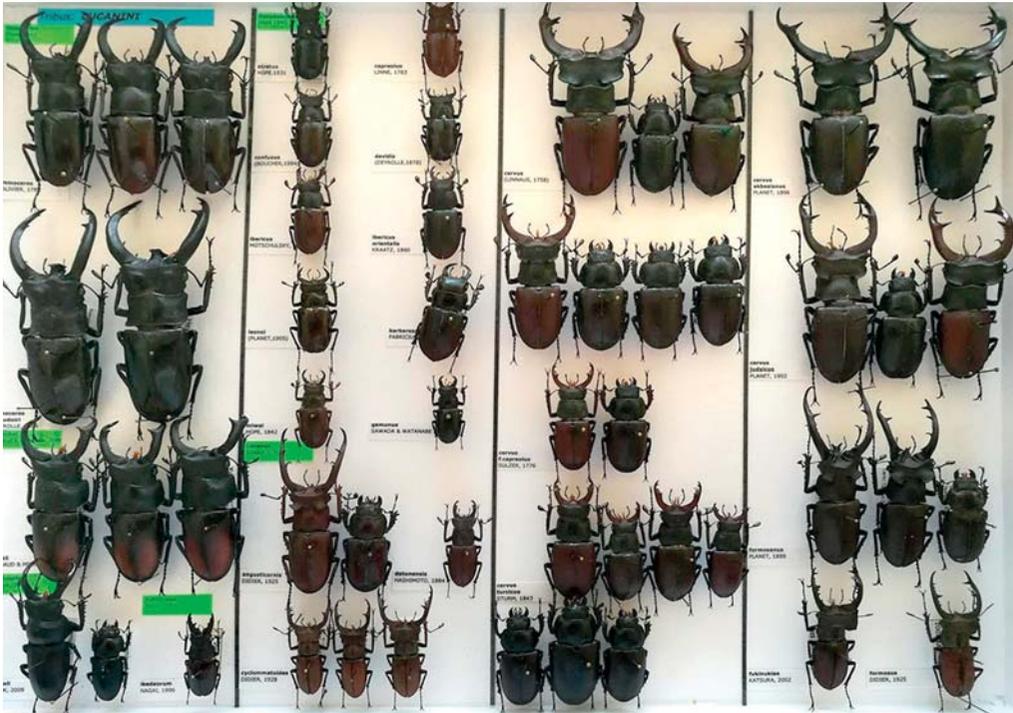
The Marsh fritillary (*Euphydryas aurinia*), an endangered butterfly according to the Red List of Threatened Species of the Czech Republic, which is among the most endangered diurnal butterflies in Europe (in the Czech Republic, it occurs only in western Bohemia), is not included in the current decree, and therefore the Nature Conservation Agency of the Czech Republic cannot prepare and implement an Action Plan/Recovery Programme for it. © Václav John

Act No. 114/1992 Gazette on Nature and Landscape Protection, as amended later (hereinafter the ANCLP) combines the so-called General Species Protection of species, ensuring all populations of wild species protection from destruction or damage, with Special Species Protection, which ensures protection of selected rare and endangered species. The list of these species is given by the implementing legislation, Decree No. 395/1992 Gazette (hereinafter the Decree). Simultaneously, through Special Species Protection and the so-called General Protection of Wild Birds, the transposition of the Habitats Directive (92/43/EEC) and the Birds Directive (2009/147/EC) is ensured in the ANCLP, which both include requirements relating to the protection of individual species. Wild vertebrates are further protected by the provisions of Act No. 246/1992 Gazette on the Protection of Animals against Cruelty, as amended, which also includes provisions relating to wild animals and reflects, *inter alia*, the requirements of the above-mentioned Directives in prohibited hunting methods or wild animal trapping. The protection

of some so-called conflict wild animal species is further strengthened by Act No. 115/2000 Gazette on Compensation for Damage Caused by Selected Specially Protected Animals. The prevention and remediation of environmental damage to protected species or natural habitats is part (along with other areas) of Act No. 167/2008 Gazette on Prevention and Remedying Environmental Damage – however, due to a number of conceptual and procedural ambiguities, the latter has not yet been applied in practice.

In the Czech Republic, the current landscape is mostly made up of a mosaic of intensively cultivated areas, abandoned or variously degraded areas, and built-up areas. At the same time, building-up and impassability of the landscape has been increasing, inappropriate agricultural, forestry, and pond management persists, and the negative process of landscape homogenization has been continuing. It is obvious that both the species bound to the last fragments of original natural habitats and the traditionally managed and used landscape until the first half of the 20<sup>th</sup> century are on

the verge of extinction. We are therefore witnessing the mass extinction of entire guilds of species (e.g. ČÍŽEK *et al.* 2009, VERMOUZEK *et al.* 2018). A necessary step to the overall improvement of the state of the landscape and its use is not a legislative change, but better use of the existing legislative instruments of general nature conservation and landscape protection (LACINA & PEŠOUT 2018); for example, changing the paradigm of the Territorial System of Ecological Sustainability (TSES), a national multilevel ecological network (HLAVÁČ & PEŠOUT 2017), more consistent application of Significant Landscape Element (SLE) protection and other tools of general nature conservation (PEŠOUT & HOŠEK 2012), and the use of land-use/territorial planning tools both for the protection of valuable areas and of species (PEŠOUT *et al.* 2018 a, 2018b) and better targeting of subvention programmes/subsidy schemes for landscape management (e.g. ČÁMSKÁ 2018). The acute need for change in our approach to the use of nature and the landscape is also reflected in new European Union's legislation on nature restoration (Nature Restoration Law), which is



The current Special Species Protection in insects leads to penalties and criminalization of entomologists keeping Specially Protected Species individuals in collections, while not ensuring effective habitat conservation, protection and management. © Nature Conservation Agency of the Czech Republic Archive

currently being discussed, and should be reflected in the Czech Republic in the near future (HAVEL 2022, STEJSKAL 2022).

Landscape protection as a whole is complemented by area-based/territorial nature conservation – Specially Protected Areas and Natura 2000 sites create islands or stepping stones for part of the natural values and populations of the individual endangered species. In Specially Protected Areas, the planning and implementation of management, as well as its evaluation are ensured, also with regard to endangered species, if they are the subject of protection of the respective protected areas, or are a quality indicator of a protected habitat. However, Specially Protected Areas can only ensure the long-term survival of a small group of organisms; they can only partially affect the condition of most endangered species even with the best management.

Although essential, the Special Species Protection is therefore just one part and not the be-all and end-all in the mosaic of the above nature conservation tools, prioritizing the management and protection of the most endangered species. However, the thirty-year-old concept of the Special Species Protection based primarily on the protection of individuals has already been outdated and does not fulfil this function. For a number of years, there have been discussions among the professional/expert public

about the necessity of changes in the relevant part of the ANCLO (see e.g. HOŠEK & DUŠEK 2015) and the shortcomings of the existing legislation have been repeatedly identified. The Ministry of the Environment of the Czech Republic (MoE) commissioned an analysis of legal instruments in, *inter alia*, species protection (TUHÁČEK 2008) and a comparative analysis of legal regulations in nature conservation in selected European countries and their parts (Bavaria, Upper Austria, Poland, Slovenia, Sweden, Slovakia). The first proposal for the recategorization of Specially Protected Species (hereinafter SPS) was developed in 2008, and the first complete revision of SPS based on the MoE assignment was prepared by the Nature Conservation Agency of the Czech Republic (NCA CR) and discussed with the professional/expert public in 2010 - 2011 (HORODYSKÁ *et al.* 2011). The evaluation of the Special Species Protection application and the formulation of terms of reference for its revision are included in two basic conceptual documents: National Biodiversity Strategy of the Czech Republic (MACH *et al.* 2016) and State Nature Conservation and Landscape Protection Programme (SNCLP) 2020-2025 (MACH *et al.* 2020). Specifically, the SNCLP formulates the main goal as follows: "*it is necessary to revise the existing system based on the protection of all individuals and to focus more on the protection of habitats and local populations and to differentiate the protection of individuals according to the degree and way of individual species endangerment*".

## Shortcomings of current legislation

Special species protection in the current ANCLP setting is not effective. The list of SPS is, on the basis of the authorization established by the ANCLP, listed in the Decree, but it has not been changed, except for partial amendments in 2006, when it had been supplemented with "European" species (modified following the transposition of the requirements for the strict protection of selected species according to Directive 92/43/EEC) and in 2013, when the Great cormorant (*Phalacrocorax carbo*) was delisted. During the 30 years of its validity, however, there have been significant changes in the occurrence of and abundance in of a number of species and a significant expansion of knowledge; the list is therefore severely outdated (ŠÍMA & ZMEŠKALOVÁ 2018). Although it includes a large number of species, many of them are missing from the list or are classified in the wrong category. As a rule, the permitted exceptions repeatedly concern only a small range of species. The fossilization of the protected species list thus limits not only the legal protection of species that have become threatened with extinction over time, but also the possibilities of the State Nature Conservancy authorities to use active tools for the management of these species (e.g. Action Plans/Recovery Programmes).

The current names of the SPS categories are inappropriate; they do not and cannot reflect the threat to the species. Tools supposed to rationalize the strict protection of species in selected cases have hardly been used (e.g., agreements on management of land with the occurrence of critically and highly endangered plant species; or opinions on certain interventions in the natural development, *i.e.* ontogenesis, of endangered animal species). The protection of Highly Endangered Species and Critically Endangered Species is formulated identically in the ANCLP, the degree of protection is only used to a limited extent (or, due to the lists being out-of-date, it cannot even be used) when assessing the seriousness of the offence. In the case of many SPS, it is not essential to protect each individual, as it is currently set up, but to preserve the populations and habitats of these species. In the case of many species, current regulation is therefore unnecessarily strict and leads to widespread violations of legal prohibitions in a common landscape use and management, legal uncertainty for landowners and landscape users, as well as to the limitation of some beneficial professional/expert activities, and necessarily to the actual resignation to enforcing the prohibitions provided by law. There is also a proliferation

of speculative use of damages for the difficulty of agricultural and forestry management and management of fishponds as a result of legal restrictions. Moreover, in most current cases of granting exemptions, it is not possible to estimate in advance the specific number of individuals that will be affected by the permitted intention, so in fact the decision is made to affect the given local population.

A fundamental shortcoming is the practically unenforceable setting of the SPS habitat protection, where proof of its violation is conditional on proof that a harmful intervention caused the death, injury, or disruption of a SPS natural development (in practice, usually proven by the presence of dead individuals).

## Principles of the proposed revision

Proposal for a new adjustment, or revision of the Special Species Protection in the Czech Republic is based on the following five main principles, which try to eliminate the fundamental shortcomings of the current legislation:

### 1. Prioritization in threatened species management separated from that in their legal protection

Priorities for active threatened species management will be determined exclusively by the degree of threat according to continuously updated Red Lists. National Red Lists have always been published by NCA CR in cooperation with academic institutions and scientific societies; this professional activity should now be anchored directly in the ANCLP. The result of this change is the possibility to use active tools of species protection (e.g. Action Plans/Recovery Programmes) for any species threatened with extinction in the Czech Republic that meets the relevant criteria (ZMEŠKALOVÁ 2017, KOSTIUKOVÁ & ČEPELOVÁ 2017), even if it is not included in the SPS list. Furthermore, it is proposed to add a new tool for the species management at a regional, *i.e.* sub-national level – a regional Action Plan/Recovery Programme and formal supplementing of national ones.

### 2. Introducing prioritization in natural habitat management

The Czech Republic has high-quality, regularly updated data on the distribution of natural habitats and is one of the first European countries to issue a Red List of Threatened Habitats (CHYTRÝ *et al.* 2020). The aim of the amendment is to include natural habitats in the prioritization of management and to direct nature conservation resources primarily to habitats threatened with extinction. In



The Water caltrop (*Trapa natans*) can establish large viable populations locally. Among the main causes of threat are degradation or loss of its habitats due to intensive fishpond management. It is not important to protect individuals, but local populations; that is why the species is newly proposed to the 3<sup>rd</sup> level of protection. © Barbora Čepelová

this context, the possibility of using the Action Plans/Recovery Programmes also for threatened natural habitats will be newly introduced.

### 3. Special Species Protection based on their habitat conservation

The primary goal of the proposed regulation for all SPS categories is the enforceable protection and conservation of their habitats, even when a specific specially protected species does not occur in a given habitat (e.g. regular reproduction sites for amphibians, bat hibernation shelters/wintering grounds). Protection conditions (prohibition) regarding the destruction or damage of a habitat will be introduced directly, and it will no longer be necessary to prove "intervention into the habitat" through contravening the ban on harmful interference in the natural development of specific individuals. At the same time, it will be possible to introduce the restriction of such activity and the timely implementation of corrective measures when damage to the habitat begins.

### 4. Introducing classification of Specially Protected Species reflecting the level of the species protection

Endangered species or groups of species require a different intensity and type of protection, conservation and management. In some Critically Endangered Species, it is necessary to protect literally every individual, in other species, the protection of habitats and species at the level of their local populations is sufficient (see Box 1). It is not easy to establish cross-sectional legal protection conditions for different groups of organisms with different life strategies (fungi, vascular plants, insects, vertebrates). It is necessary to know the degree of species endangerment, but also their characteristics and habitat requirements (different approach for species with high population dynamics and species with more conservative life strategies and naturally low numbers, *etc.*) and the reasons for endangerment (different approach for species directly pursued and species threatened by environmental changes, *etc.*). If we want to avoid unreasonably strict set-up, all that remains is to differentiate the protection conditions in more detail. It will still be necessary to reflect the requirements of the EU legislation and ensure adequate transposition of provisions in species protection, which will also be reflected in the form of protection conditions within the categories.

## NEWLY PROPOSED SPECIALLY PROTECTED SPECIES CATEGORIES

### 1<sup>st</sup> protection level

All habitats (natural and modified) of species of this level are protected. All individuals of these species are protected from capture, picking, removal, killing, keeping, disturbance, *etc.* All activities that may cause harm to individuals of these species can only be carried out on the basis of an authorized exception. An agreement for common management can be concluded with the owner or tenant of the land plot.

### 2<sup>nd</sup> protection level

All habitats (natural and modified) of species of this level are protected. All individuals of these species are protected from capture, picking, removal, killing, keeping, disturbance, *etc.* Interventions in the natural development of these species that occurred unintentionally, as part of common agricultural and forest management, road transport, and passage through the landscape are not prohibited, but only if the habitat is not damaged and if the activity does not threaten the species' local population (such interventions are prohibited and can only be carried out on the basis of an exception). These are activities that result in the unintentional killing or damage of organisms (typically the negligent killing of an animal on the road or damage to protected plants during agricultural land management), which cannot be eliminated even if the precautionary principle is respected; on the contrary, their implementation is often as a condition for

preserving the existence of the species at the site (*e.g.* mowing meadows). However, if the manager becomes aware of the occurrence of a SPS, they must not kill, damage, or disturb it without exception (*e.g.* nesting harriers (*Circus* spp.) during work on fields), because such an action could no longer be considered an unintentional interference with the natural development of a plant, animal, or fungus.

### 3<sup>rd</sup> protection level

All habitats of species of this level are protected. For selected species, the implementing decree could specify, within the framework of more detailed protection conditions, that protection is narrowed only to the protection of the natural habitat, which is the habitat of the respective species. The aim is to avoid cases where protection would be applied to Specially Protected Species that also occur in a habitat heavily altered by humans, for example a selected halophilous species in a roadside ditch. Species included in this category are not protected at the level of each individual, but their local population must not be threatened or their habitat damaged. These are therefore species not threatened by the direct destruction of individuals, but are threatened by the destruction of or damage to habitats, or systematic activity threatening the local population (*e.g.* repeated management intervention at an inappropriate time).

## 5. Using the Specially Protected Species category only in species where it is meaningful

This principle is for including a species in the Specially Protected Species list which will be applied during developing the implementing decree. A high level of threat is a basic prerequisite for the selection of a species, but not the only one. It is essential to evaluate the meaningfulness of introducing legal prohibitions for the protection of each individual endangered species. For example, it is clear that weeds that are limited by seed cleaning do not primarily belong to the SPS (in this context, it should be emphasized that the active management of these species is not limited by not including them in the SPS). Similarly, it makes no sense to include species that only a very limited number of specialists can determine among SPS (in selected cases, the inclusion of the entire genus may be a solution). For some groups of species commonly found together in the same habitat, it may be sufficient to include only the selected so-called flagship species (see Box 2 for details).

In addition to the above principles, the objective of the proposed legislative change is also to clarify the adjustment and eliminate partial shortcomings of the transposition of the mentioned EU legislation for species protection. This concerns, for example, the determination of the procedure in cases where species protected at the level of the EU as a whole are involved, which are not commonly found in the Czech Republic and are imported into the Czech Republic. The proposal also uses the development of the Nature Conservancy Information System (NCIS) and introduces procedures that reduce the administrative burden and support the computerisation of the State/Public Administration.

## Introducing new terms

The ANCLP's draft revision envisages introduction of some new terms or supplementation/modification of existing terminology. Above all, it earmarks protected species of fungi, which until now have been classified as Specially Protected Species of plants. Although it is legislation that may not

necessarily reflect biological knowledge, the including fungi among plants has no longer been defensible at present.

The ANCLP's current wording uses the term "population", but it is not defined for legal purposes and is thus based on the scientific definition of the term. Due to the fact that this definition is very broad and variable, especially when it comes to the determination of spatial, *i.e.* territorial parameters, it is difficult to use when applying it within legal framework. For the ANCLP purposes, it is therefore newly proposed to define the term "population" and "local population" for a group of individuals of the same species living in the area defined by the boundaries of the continuous habitat of the species at a given site, or confined by the continuous occurrence of a species at a given site. The aim is to differentiate a part of the population/separate subpopulation for the evaluation of prohibitions in Special Species Protection, where the level of the whole population is too broad (with exceptions *e.g.* endemic species). The level of population will continue to be used in General Species Protection.

The proposal includes supplementation to the definition of the term "habitat", which should now also apply to local population; also, in response to the previous interpretation difficulties, areas necessary for migration and other natural movements of the species are also explicitly marked as part of habitat.

The ANCLP uses the term "regular management"; for revision purposes, it is made more precise by adding some forestry and agricultural activities.

As part of the amendment, with regard to the introduction of new terminology, it will be necessary to amend other ANCLP provisions and other legal regulations including the terminology, for example Act No. 40/2009 Gazette., the Criminal Code.

## FAQ

The NCA CR processed the proposal on the basis of the MoE assignment using previous documents in the past six months. There was an effort to involve the science community in the preparation of the initial proposal. Therefore, the proposal was continuously discussed with specialists and scientific societies for individual groups of organisms. Below, we present responses to the most frequently asked questions that could help with overall understanding of the proposal.

### 1. Is it possible to direct the landscape use by means of a proposal for Special Species Protection?

## CRITERIA FOR INCLUDING SPECIES IN THE NEWLY PROPOSED SPECIALLY PROTECTED SPECIES CATEGORIES

**Cross-sectional criteria:**

- The species is taxonomically established, evaluated in the Red List as threatened (i.e. Critically Endangered CR, Endangered EN or Vulnerable VU), or Near Threatened (NT). An extinct (EX) or data-deficient (DD) species can only be included if new knowledge leading to a change in categorization is available.
- In the case of numerous taxonomic groups or lower threat categories, it is a flagship or attractive species, threatened by collecting or gathering for non-scientific purposes.
- It is a species that can be protected through legal prohibitions and restrictions.
- Species from Annex IV of the Habitats Directive requiring strict protection, including the protection of individuals, must be included in the 1<sup>st</sup> or 2<sup>nd</sup> protection level, even if they are not threatened in the Czech Republic.

**Specific criteria for 1<sup>st</sup> protection level:**

- Species from the CR or EN category, in justified cases also VU.
- The species requires the protection of each individual.

**Specific criteria for 2<sup>nd</sup> protection level:**

- Species from the CR or EN category, in justified cases also from lower categories.
- A species requiring the protection of individuals, with the exception of common management and landscape use, if it does not mean a threat to the local population or damage to the habitat.
- A species requiring common management for its survival.

**Specific criteria for 3<sup>rd</sup> protection level:**

- A species not requiring the protection of individuals, and the protection of habitats and local populations is sufficient.

According to the criteria above, the first indicative Specially Protected Species list has been prepared.

More detailed information on individual species can be found at <https://portal.nature.cz/karty-druhu/> including reason for their protection. It will also be possible to follow the updates of the list, which will be continuously updated based on comments.

group	current Decree No. 395/1992 Gazette				new (indicative) list				Red List
	Critically Endangered	Highly Endangered	Endangered	Total	1 <sup>st</sup> protection degree	2 <sup>nd</sup> protection degree	3 <sup>rd</sup> protection degree	Total	Total
Vascular plants	267	182	145	594	175	308	171	654	1 608
Fungi	27	15	6	48	25	12	50	87	840
Lichens	0	0	0	0	0	16	13	29	1 317
Bryophytes	0	0	0	0	0	13	54	67	411
Invertebrates	45	43	137	225	13	43	247	303	5 703
Vertebrates	67	129	47	243	82	102	19	203	302
<b>TOTAL</b>	406	369	335	<b>1 110</b>	295	494	383	<b>1 343</b>	<b>10 181</b>

Comparison of the numbers of newly proposed Specially Protected Species with the current status and with the total number of species included in the Red Lists of the Czech Republic (as of 1 October 2022, the indicative list is continuously adjusted according to received comments and current knowledge).

Biodiversity protection outside Specially Protected Areas should be ensured primarily by General Nature Protection, the correct setting of economic tools, and the method of management on land owned by the State (especially in forests). Special Species Protection cannot replace deficiencies in the setting legislative, administrative, and economic tools determining general approaches to the use of nature of the landscape. However, the proposed protection conditions of the SPS will in all cases impose requirements to ensure that SPS habitats are not damaged and, depending on the characteristics of individual species (according to the newly categories), only allows in some cases the possibility of unintentional

killing of individuals, which, however, must not reach such an intensity that there is a threat to the local population. Simultaneously, the obligation to apply preventive measures will be included there

**2. The term "local population" is newly introduced; will the State Nature Conservancy authority be able to identify it in specific cases?**

Since 1992, the State Nature Conservancy authorities have been dealing with the term "population" when applying the ANCLP. Identifying "local population" will be easier for the State Nature Conservancy authorities than "population", parti-

cularly when both terms and thus the difference between them will be defined by the law.

**3. In the second protection level, unintentional damage and disruption of the Specially Protected Species during common management is allowed, while the current so-called common management is the main cause of the decline in many species (?).**

Legal prohibitions will still apply to management that damages the habitat or threatens the local population of the SPS, even though it might be understood as "common". In the same way, if the manager is alerted to the occurrence of the species, it can no longer be an "uninten-



The Scare swallowtail (*Iphiclides podalirius*), an attractive species of diurnal butterfly classified as Endangered in the current decree. It has been currently spreading in the Czech Republic, and that is why it is not newly proposed among the Specially Protected Species. © Václav John

tional" intervention in the natural development of the SPS, which is not covered by the legal prohibition.

#### 4. It is necessary to maintain three levels of protection – would it not be possible to simplify them to two?

The proposal tries to establish a system enabling an adequate intensity of protection. In principle, two categories would be sufficient for differentiated protection: A. protection at the level of individuals and habitats, and B. protection at the level of populations and habitats. However, some species from group B. are priority species from the point of view of the European Communities/European Union, for which we have an obligation to protect them from intentional killing or damage, or they are species that are not threatened by common management, but it is necessary to limit the intentional damage

to individuals (e.g. illegal hunting/poaching). Therefore, it is necessary to maintain three-level protection. For example, in the case of two-level categorization of the SPS, the Stag beetle would have to be included in the strictest protection category.

#### Does the amendment have a chance of being discussed?

The proposal is currently being finalized by NCA CR under the leadership of the MoE in cooperation with specialists and scientific societies. The MoE will then discuss the proposal with regional authorities and other State Nature Conservancy authorities, the Ministry of Agriculture of the Czech Republic, representatives of landscape users, Czech-Moravian Hunting Association, Czech Anglers Union, and other institutions and organizations. After incorporating comments, the

official discussion on the ANCLP amendment should begin in 2023, with the assumption that the legislative process will be completed in 2024.

The task of revising Special Species Protection was included among the Czech Government's Programme priorities for its current term and is also included in the Government's legislative plan. Therefore, there is now a great chance to review the species protection, which has been discussed for more than a decade. ■

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*The list of references is attached to the online version of the article at [www.casopis.ochranaprirody.cz](http://www.casopis.ochranaprirody.cz)*

# Thirty Years of the Act on Nature Conservation and Landscape Protection in the Czech Republic

**Svatomír Mlčoch, Eva Mazancová**

Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection came into force on 1 June 1992, so in 2022 30 years have passed since this most important legal regulation in nature conservation was adopted. Let us, from the position of co-legislator of

the Act's original version and current legislative lawyer at the Ministry of the Environment of the Czech Republic, recall some of the context regarding the creation of this legislation and evaluate its current state.



The Hungarian iris (*Iris variegata*) in the Podyjí/Thaya River Basin National Park (South Moravia). © Zdeněk Patzelt.



Křivoklátsko Protected Landscape Area (Central Bohemia). © Zdeněk Patzelt.

## Circumstances of passing the new law

Not long after the Ministry of the Environment of the Czech Republic had been established (early 1990), it was charged with the preparation of a draft law on nature conservation and landscape protection as one of the main tasks in the emerging Czech environmental legislation. Ministers Bedřich Moldan and Ivan Dejmál decided to establish a working group led by Svatomír Mlčoch, with core members František Urban, Milan Rivola, Igor Míchal, Milan Damohorský and several external collaborators, in particular Jan Květ.

## Legal environment at the time of the law's development

At the time when the preparation of the law was decided on, Act No. 40/1956 Gazette on State Nature Conservancy applied to the Czech territory (this was the time of the unitary Czechoslovak state). In just a few articles, it basically declaratively defined not more than the tasks of the State Nature Conservancy and entrusted its performance to the Ministry of Education and Culture (Ministry of Culture of the Czech Republic after federalisation in 1968 and 1969). It included a number of terms currently

used in special nature conservation like National Park, Nature Reserve and Protected Landscape Area, but without a definition or effective forms of conservation.

The need of a new, significantly better law was thus evident in the early 1990s. On the other hand, society and the state were in a turbulent period of development. Economy and legislation had not been settled yet, and a period of economic and administrative transformation was on the way. Some voices warned against preparation on the law and advised to wait for greater legal stability. We regard it a small miracle that in this atmosphere an essentially codex-type law was created and subsequently passed. The Act had 92 articles, which was considerable for that time and expressed the effort to develop comprehensive legal regulation of nature and landscape conservation issues. The year 1991 was decisive in the preparations. The law was submitted to the Czech National Council on 20 December 1991 and in the first quarter of 1992 it was discussed in relevant committees, particularly the Committee for Environmental Affairs and the Constitutional and Legal Committee. The Act itself was then passed by an incredible majority of 105 out of 111 Czech National Council Members present on 19 February 1992 there.

## Main benefits of Act No. 114 in brief:

- Introduction of general territorial as well as species conservation;
- Regulation of legal protection of landscape scenery/character and Significant Landscape Elements (SLEs);
- New status of State Nature Conservancy authorities equipped with decision-making powers;
- Introduction of new categories of small-size Specially Protected Areas;
- Legal guarantee of public access to the landscape;
- Establishment of Special State Nature Conservancy authorities, *i.e.* National Park Administrations, Protected Landscape Area Administrations (the latter today united under the Nature Conservation Agency of the Czech Republic) and the Czech Environmental Inspectorate;
- Setting possibilities of citizen participation in legal proceedings regarding nature conservation matters,
- Introduction of basic legal protection conditions for Specially Protected Areas and Specially Protected Species.

## The Act – a burden?

Not long after its adoption, Act. No. 114 was subjected to attacks or criticism from several sides, most of all attempting to delete – under various pretexts – provisions which certain interest groups or politician regarded as too ‘green’ or ‘environmental’. The first attempt at an overall revision of the Act was made at the Ministry of Economy and Regional Development led by Minister Karel Dyba in the second half of the 1990s. At the height of economic neoliberalism, the Act appeared too interventionist and allegedly hindered economic growth in some regions. In the first twenty years, the Act survived these attacks more or less unharmed. It lost nevertheless some relatively valuable provisions, especially the collision norm. This was the original Article 90, paragraph 4, which explicitly defined a special feature of Act. No. 114 Sb. relating to the legislation on forests and waters, the Building Code and other ‘competing’ regulations.

## European amendments to the Act

The Act on Nature Conservation and Landscape Protection (ANCLP) has undergone a large number of amendments during its existence. This is understandable with regard to the dynamic and sometimes turbulent development of society and law in the Czech Republic. The so-called Euro-amendment, *i.e.* the amendment made by Act No. 218/2004 gazette, primarily prepared by Ladislav

Miko, Alena Vopálková, Petr Roth, František Pelc, Pavel Pešout, Jana Prchalová and others, can be considered the most significant change. The essence of the amendment was to introduce into Czech Republic's legislation the European Union's nature conservation legislation, particularly the Habitats Directive and Birds Directive. Amendment No. 218/2004 also led to a completely different wording of Article 58, so as to include the obligation to compensate for economic damage caused by implementing nature conservation interests complicating agriculture and forestry. Before this amendment, hardly any compensation was paid (except for those based on Act No. 115/2000 Gazette on Providing Compensation for Damages Caused by Selected Specially Protected Animals. Not much later also the institutional basis of the State Nature Conservancy was solved by the Nature Conservation Agency of the Czech Republic becoming a legal authority.

## Which direction has the Act gone in the past decade?

Changes to the ANCLP have also appeared in the past decade: we have counted a total of 16 amendments since 2012. A common denominator of fundamental changes would first of all be extraordinary pressure to facilitate construction works (resulting in a comprehensive recodification of construction law in 2021, including a fundamental change in competences in Act No. 114). Other issues were the widely discussed topic of the scope of protection and use of National Parks (Act No. 123/2017) and, last but not least, requirements of recent European Union's regulations, particularly legislation on the prevention and control of introducing and spreading of invasive alien plant and animal species (Act No. 364/2021).

The new legislation on National Parks has improved their legal status by including their delimitation in appendices to the ANCLP. It has also introduced a better concept of National Park zonation and, *inter alia*, considerably silenced disputes on the basic protection conditions and zonation in the Šumava/Bohemian Forest Mts. National Park.

## Nature conservation vs construction works

Requirements to facilitate construction works, consisting in a weakening of some established nature conservation tools, can be traced to several recent amendments to the Act. Despite the absence of a proof-of-concept study and other evidences, lobby groups regard the (so far separate) administrative decisions issued by the State Nature Conservancy authorities for procedures

under the Building Code as the main difficulty in locating and permitting constructions. The often insufficient quality of the documentation submitted by constructors, which is the real brake on fast and trouble-free procedures, is unfortunately less emphasised.

Partial changes limiting the competences of the State Nature Conservancy authorities concerning the location and permission of constructions have already been made in 2012 (by Act No. 350/2012 Gazette), when the consent of nature conservation authorities for constructions located in protected landscape areas was limited. Following an extensive amendment to the Building Code (Act No. 225/2017), the ways of some previous inputs of the State Nature Conservancy authorities into procedures according to the Building Code were changed. The Act newly included a binding regulation on tree felling instead of a permission and a binding regulation on interventions in the protective conditions of Specially Protected Species instead of granting an exception (for situations when the occurrence of a Specially Protected Species is found before the start of the procedure according to the Building Code). In Act No. 225/2017 also public participation in procedures affecting the interests of nature conservation was very disputably limited. Restrictions on participation for proceedings according to the ANCLP prevented regular participation of ecological associations in permitting procedures of constructions which are not subject to an Environmental Impact Assessment procedure, but may despite have an effect on nature and the landscape at a particular site for their location, design or operation. This restriction was subsequently confirmed (although with a narrow majority) by the Constitutional Court.

An amendment to the Act on Line Constructions (Act No. 403/2020) added a completely new type of administrative act of the State Nature Conservancy authorities to the ANCLP. In order to simplify complex permitting processes for transport constructions and water or energy infrastructure, a unified binding regulation on interventions in nature and the landscape according to the Act on Line Constructions was created, replacing individual permissions and approvals of the State Nature Conservancy authorities, including exceptions for species, which had hitherto been granted by separate decisions of the State Nature Conservancy authorities.

Recodification of public construction law, *i.e.* adoption of the new Building Code, Act No. 283/2021, and accompanying Act No. 284/2021 has led to a fundamental conceptual change in the State/Public Administration in nature conservation. A range of previous competences of the State

Nature Conservancy authorities, particularly concerning general nature conservation, is – based on a direct change to the ANCLP – integrated in the competences of building authorities (thus becoming the State Nature Conservancy authorities). In Specially Protected Areas and at Natura 2000 sites, integration should only be partial, *i.e.* some competences would remain in the hands of the Special State Nature Conservancy authorities.

The construction law recodification has not been a fully effective legal regulation and (not only) postponing its effective date, originally proposed to be 1 July 2023, is being considered. At the same time, the newly appointed Government of the Czech Republic not only has amending the Building Code on its agenda, mainly consisting in a return of building authorities under the Public Administration at municipalities with extended powers, but also in the regulation of the so-called Unified Environmental Permission, *i.e.* a separate administrative measure issued by an environmental authority in which all environmental protection requirements need to approve a construction plan would be integrated. Let us hope that such legislation will not only be prepared properly, but also implemented. Besides correction of basic shortcomings of construction law recodification, the Government's Programme Statement also aims at expanding the large-size Specially Protected Area coverage and designating the Křivoklátsko National Park (Central Bohemia) and the Soutok/ Morava and Dyje/Thaya Rivers Confluence National Park (South Moravia). The Government further intends to amend the ANCLP concerning species protection, aimed at increasing its effectivity primarily based on the conservation of habitats and local populations of Specially Protected Species of wild plants and animals, thus establishing more appropriate legal conditions for the enforceability of the issue.

## Conclusion

We are living in an extraordinarily turbulent world which does not benefit the values of nature and the landscape. Biodiversity has been decreasing. The ecological stability of the cultural landscape has been declining. Only a little space is allocated for wilderness. Nature conservation is in a difficult situation trying to preserve these values at least in part. The ANCLP is not sufficient, but may help significantly. Its further development is in the hands of the new Members of the Parliament and Government of the Czech Republic. We wish them courage and wisdom in making decisions in favour of nature. We also wish the ANCLP to remain in a good shape. It has been conceived like that and that obliges. ■

# Patronages of the Scout Institute – Involvement of Scouts (and not only them) in Nature Conservation

**Jarmila Kostiuková**

With its patronages, the Scout Institute helps scout troops and school classes engage in landscape restoration and nature conservation. In collaboration with expert guides and stewards, participants learn not only about natural values but also about the importance of building relationships with all stakeholders. In this way they develop two basic civic competences:

responsibility for the condition of public space and awareness of the opportunity which everyone has to positively influence their environment. At present, patronages are running in the capital city of Prague and in eight regions of the Czech Republic. To date, more than 55 troops and school classes have been engaged in them.



Scouts from the municipality of Přimda monitoring Oblong-leaved sundew (*Drosera intermedia*) plants. © Věra Končická

The patronage project, focusing on landscape management, was set up out of the awareness that nature in the Czech Republic faces a range of difficulties, e.g. decreasing species richness and threatened natural habitats. Even though we generally know what to do, the condition of many sites has not been improving. In many cases, small regular interventions would be sufficient. Examples are cleaning pools, scrub cutting, litter raking, sod cutting and other activities which can easily be done by groups of children.

## History of the project

The idea of patronages emerged five years ago. One of the primary impulses was a discussion at the meeting of the Working Group for Nature Protection of the Czech Botanical Society (CBS), where it appeared up how important, necessary and difficult it is to also secure small-scale management of less significant sites. Anna Šlechtová (CBS member and long-time active Junák functionary) realised that scout troops offer a great potential of people with natural interest in wildlife who are not indifferent to what is happening around them and put great effort into changing things for the better. Thanks to her contacts and activity, she managed to connect key persons and start a one-year pilot project named *Troops for Nature* in the Capital City of Prague, generously supported by the Capital City of Prague Municipal Office and staff of the Department of Environmental Protection in 2018. Within two years, around 20 troops had engaged in the project in Prague and the project (with the later name *Patronages*) naturally started to spread to other regions in the Czech Republic. In addition to scout troops we have also begun targeting other organised youth groups and school classes. In 2020–2021, supported by a grant from the State Environmental Fund, the project scope was expanded to the South Bohemian, South Moravian, Liberec and Plzeň/Pilsen Regions, and since 2022 another four have been added (Central Bohemia, Ústí, Vysočina/Highlands and Zlín Regions).

## Method employed

The patronages show children and youth groups how to actively participate in nature conservation. A troop registers for the programme with the intention to take manage a site with natural values in their surroundings. We help them find a site, bring them into connect with the area's steward and also with an expert guide. The guide helps the participants to understand what the activities are for and which values it creates or preserves. (S)he visits the site with the troop, consults the chosen management with the steward and his/her pres-



Patronage at the Tichá říčka/Silent Rivulet Nature Monument. Introductory talk or “What are we going to do here and why?”. © Olga Hušková



Cut branches need to be dragged away from the peatbog, shortened and piled up. © Olga Hušková

ence guarantees the suitability of the planned interventions and the quality of their implementation. Collaboration with the steward or the site owner (Nature Conservation Agency of the Czech Republic, National Park, Regional Office, Municipal Office or Land Trust) allows implementing the project in accordance with management plans and conservation objectives of the sites.

A troop should go and check a site at least twice a year (in spring and autumn), but there are groups which have ‘their’ site almost literally at hand and spend willingly much more time there. In this way, they deepen their knowledge of nature conservation and build a relationship to the site in question. The programme further includes simple monitoring and space for making records and photo-



Scouts from the municipality of Přimda raking up cut small-reed to make way for sundew plants. © Věra Končická

graphic documentation. Each Region has a coordinator who is responsible for smooth cooperation.

## Cooperation with the Nature Conservation Agency of the Czech Republic

On the Capital City of Prague's territory, cooperation with its Department of Environmental Protection has proven to be effective, whereas the Nature Conservation Agency of the Czech Republic (NCA) is becoming an important partner besides National Park Administrations and Regional Offices in the different Regions. The selection of sites suitable for interventions takes already place in collaboration with NCA Regional Branches, and if a site is adopted by a particular troop, NCA experts often also take on the role of guides. To cover the cooperation formally, a general memorandum between the NCA and Junák will be signed, and also a more specific memorandum between the NCA and the Scout Institute for the needs of the Patronage programme.

## Patronages in practice – examples of troop activities

Scouts from the town of Jablonec nad Nisou have taken patronage of the Tichá říčka/Silent Rivulet Nature Monument near the municipality of Hrabětice, professionally led by Ondřej Šnytr (NCA, RB Liberecko). The site consists of a

peatbog and fields partly encroached by unwanted trees and shrubs at the margin of the Tichá říčka/Silent Rivulet stream. At the site it is important to prune willows and cut self-seeding shrubs, maintain wet parts, and to create and maintain pools. In October 2021, scouts felled willows between two peatbogs to create there, as required, a coherent treeless field with a future wetland. The youngsters dragged the felled branches to the margin of the reserve (into a mature spruce forest), where they cut them into smaller pieces and made a pile of the larger sticks and twigs. The scouts obviously enjoyed working with saws and shears, and the cut biomass was made into surprisingly small piles which are also useful for the wintering of animals. Thanks to the intervention, the open peatland area was increased.

In the Plzeň/Pilsen Region, the 7<sup>th</sup> Troop from the town of Přimda has joined the project, guided by Lucie Koryťáková Nováková (NCA, RB Český les Protected Landscape Area Administration) and taken patronage of Kolowratův rybník/Kolowat's Fishpond Nature Monument situated west of Přimda. The littoral zone of the western bank of the fishpond has a rich population of the critically endangered Oblong-leaved sundew (*Drosera intermedia*), which is however suppressed by the expanding Purple small-reed (*Calamagrostis canescens*). In 2021, the scouts visited the site several times and regularly cut and raked up the small-reed and then removed the cut biomass. At the same time, they prepared another spot suit-

able for the sundew by disturbing the turf with axes and by trampling. They also carried out monitoring under the professional supervision of the guide, thanks to which it was documented that, after two years of regular site management, the small-reed sward had become smaller and sparser and the sundew had demonstrably spread to new sites.

The 1<sup>st</sup> Troop from the municipality of Holubov in the South Bohemian Region with their guide Jana Janáková (NCA, RB Jižní Čechy) have begun to manage a site not far from their campsite, a wet meadow southwest of the municipality of Tichá near the municipality of Dolní Dvořiště, adjacent to Horní Malše/Upper Malše River Nature Monument. The site is home to the critically endangered Crested wood fern (*Dryopteris cristata*), the Broad-leaved marsh orchid (*Dactylorhiza majalis*) and a huge range of other rare species which are threatened by encroachment and overgrowing. The site has no legal territorial protection. Since the site is close to the campsite which the scouts use in the summer holidays, the interventions take place in July. Boy and girl scouts cut away young aspen and willow scrub at the site, so that the grassland can then be mown regularly, thus maintaining it. They make a pile of the cut branches and in the following year they burn the wood, which the site conditions provide for.

## COVID-19 time

The course of the project was unfortunately negatively affected by the SARS-CoV-2 virus epidemic and the related anti-pandemic measures. In the spring of 2020, scouting activities were suspended for many weeks and a number of planned interventions had to be cancelled. The situation repeated itself again in autumn, after the vegetation season for which most interventions had been planned. At that time, however, restrictions were tightened again and mass activities were not allowed. In that year the site could thus mainly be visited to do research and carry out monitoring from May to September. In this regard, the year 2021 was only slightly better, but considerably more field activities were undertaken.

For this reason, we searched for other possible collaboration between guides and troops, ideally by building relationships to sites. The guides prepared online meetings for the troops, so that the youngsters could then go out into the field individually or with their parents to do work or enjoy a theme game. In order to motivate them to make field trips, we recorded several video invitations to sites where patronages run for the troops in Prague. Also three video excursions to inter-

esting natural sites in Prague (St. Prokop Valley, Čihadla and Divoká Šárka) including ideas for games and activities for children were developed. Further, several online networking meetings of troop leaders and guides across the Czech Republic were held, where they exchanged their experience with interventions at the sites, providing valuable feedback.

Translating the youngster's enthusiasm into figures, a total of 30 troops took part in the project in 2020, realising 35 site interventions, *i.e.* more than 500 youngsters performing over 2,000 hours of work. In 2021, a total of 42 troops implemented 45 site interventions, *i.e.* more than 700 youngsters and 2,500 hours of work.

## Expert board

The professional part of the project is supervised by the so-called Expert Board, which meets twice a year. Its members are representatives of scientific institutions and NGOs with long-term experience in nature conservation and environmental education, namely Eva Chvojková (Ametyst), Michal Medek (Kaprálův mlýn), Martin Střelec (Juniperia), Zdeněk Vermouzek and Břeněk Michálek (Czech Society for Ornithology), Zuzana Münzbergová (Charles University - Faculty of Science and Institute of Botany, Academy of Sciences of the Czech Republic), Libor Ambrozek (Czech Union for Nature Conservation) and Jiří Rom (Capital City of Prague Municipal Office). These experts help setting the project concept across various disciplines and organisations and provide the regional coordinators insight into the current problems and trends in nature conservation.

## Other environmentally oriented projects of the Scout Institute

The Scout Institute realises how important the topics of climate change, nature conservation and environmental communication, education and public awareness are and implements many other projects mainly focusing on youngsters. We have made a visual programme in four parts titled *The Landscape in our Hands*, presenting the greatest problems of the Czech Republic's landscape and how to solve them. It gives individuals and groups guidance on how to choose a type of landscape management to tackle. Linked to this programme the so-called Climate Weekends, aimed at treating the landscape with respect, are organised at farms in the countryside. The programme of these weekends includes troop members devising adaptation measures which they could implement in their clubs. Also a series of lectures on climate change, including environmental, economic, sociological



Children having a lot of fun disturbing turf. Nature conservation need not be boring! © Lucie Koryťková Nováková



Enjoyment of a job well done. Scout troop from the municipality of Holubov. © Tereza Křivánková

as well as pedagogical aspects of climate change, is organised at the Scout Institute. These lectures were streamed live in the COVID-19 time. For details of all 'green' projects of the Scout Institute, see <https://www.skautskyinstitut.cz/patronaty>.

## Inspiration for others

The Patronages project of the Scout Institute has shown hundreds of youngsters what nature conservation looks like in practice. We believe that

knowing a particular phenomenon under protection coupled to having the opportunity to contribute to its survival is a strong motivation for youngsters. The entire project can only be implemented thanks to the involvement of a number of willing entities, stewards and expert guides who pass their enthusiasm for nature conservation on to youngsters. Thanks to the patronages, youngsters create a relationship to a site, they learn a lot of interesting issues about nature, and inspire others with their activities. ■

# Golden Leaf Competition a Half a Century Old

Jan Moravec & Lenka Žaitliková

On 20–25 June 2022, the jubilee 50<sup>th</sup> National Round of the Golden Leaf natural history competition took place. Not many youth competitions can boast of such

a respectable age, so it is a good opportunity to have a look at its past and present.



## What is the Golden Leaf?

Golden Leaf is a competition for teams of primary school children with interest in nature and its protection, conservation and management. The organiser is the Czech Union for Nature Conservation (CUNC). It is co-organised by the Ministry of Education, Youth and Sports, which means that schools are recommended to include the competition into their activities.

Golden Leaf is however more than a competition. It is not only about comparing each other's knowledge and competences but it also wants to be a gathering with an experience. The goals, as mentioned in the Golden Leaf competition rules, therefore not only include *offering children the opportunity to test their knowledge and motivate them for further development or enabling children to present their activities in public and formulate acquired knowledge*, but e.g. also *arranging gatherings of teams of children and youngsters with similar interests and orientation, inspiring children and team leaders to develop other types of activities in and for nature and offering children an interesting and meaningful accompanying programme in addition to the actual competition*. As for schools, the goal of *involving schools into systematic activities beyond normal lessons in natural history with an overlap in ecology and nature conservation* is important.

The competition consists of primary rounds, regional rounds, a national round and voluntary tasks.

Primary rounds usually start in April. They are mostly organised by schools, Children and Youth Centres and CUNC Local Chapters (Ecocentres), but do not take place in all regions. Their content is not bound by strict rules, so they differ in content and form depending on local customs and the possibilities the organisers have. Traditionally, most primary rounds are held in the Olomouc Region (11 in the year 2022).

Regional rounds take predominantly place during the month of May. They are mostly organised by Children and Youth Centres and the CUNC, exceptionally by other entities. In nine regions, the organisers have been organising Golden Leaf regional rounds for many years or even decades, in the remaining ones they permute. The only region where no regional round has been organised in the past few years is the Karlovy Vary/Carlsbad Region. In the Olomouc Region, only winners of the primary rounds can participate in the regional ones, whereas contestants in the other regions can take part in regional rounds directly despite the existence of several primary rounds.



On the competition trail, contestants demonstrate their knowledge of various natural science disciplines, e.g. invertebrate identification (national round 2022). © Jan Moravec

Regional rounds usually last two days. Its contest part consists of the so-called nature trail, a route set out in the field with at least seven stops at which experts test the contestants' knowledge in various fields of natural sciences or practical nature conservation. At one stop, the contestants must present their year-round work for nature. It is desirable (not mandatory) to support the talk with some documentation, e.g. a chronicle or photographs. The accompanying programme of regional rounds is very diverse, ranging from scientific lectures and field excursions or small exhibitions to 'social' activities to deepen mutual contacts, e.g. various games or a campfire.

The real culmination of each year's competition is, not only formally but also factually, the national round. It is a five-day long gathering of regional round winners and the winner of the voluntary tasks (see below), held each year at another site in the Czech Republic at late June. The programme is full of special activities (in 2022 e.g. various methods of trapping invertebrates, veterinary autopsy, identifying mammalian skulls, catching and ringing birds, geological excursion, bryology, etc.) organised by a team of dozens of experts and volunteers, often former Golden Leaf contestants. The contest part is similar to the one at the regional rounds with the difference that the national trail has at least ten stops and that the presentation of activities for nature takes place separately, off the trail. Year-round activities are

presented in front of a professional jury and PowerPoint presentations have become a matter of course.

There are four voluntary tasks during the year, which are announced at two-month intervals from September to March at the competition's website ([www.zlatylist.cz](http://www.zlatylist.cz)). The tasks aim at observing nature (e.g. tracing ants, elaborating sound maps, observing the night sky, monitoring animals in a particular habitat) or encourage to do interesting experiments (soil infiltration rate, germination of seed in saline soils, obtaining dyes from autumn leaves, etc.). Current and former tasks, which may be of inspiration for activities with children in the field, can be found at the competition's website.

The different tasks are performed by the entire team and also the poster presentation is developed by them collectively. The research results (all four tasks of a year) must fit on an A1 poster. The jury selects the best of the delivered posters in two categories. This provides the team of the winning work the so-called wildcard allowing them to pass on to the national round without winning a regional round, however on condition that they participated in a primary or regional round that year. The voluntary task is not reflected in the competition in any other way.

All children teams can compete in Golden Leaf, from groups, clubs of Children and Youth Centres



The Golden Leaf national round is a five-day event with a rich technical/expert programme. A group of participants dealing with spiders. © Jan Moravec



The competition trail of the national round of the 50<sup>th</sup> year of Golden Leaf had ten stops, at each the participants could get a maximum of ten points. © Jan Moravec

and other entities to schools. Teams consisting of two patrols of three children compete with each other. In the primary and regional rounds, a team may include more patrols, but it must be clear in advance which (triple) patrols make up which team.

Golden Leaf currently distinguishes three age categories: the youngest (primary school years 1–3), the young (years 4–6) and the older (years 7–9). The youngest category only has primary and regional rounds, there is no national round. If a team consists of children of different age categories, they compete in the category of the oldest member.

Around 3,000 children take part in the competition every year.

## Historic retrospective

The idea for the competition came up among the editors of a magazine named ABC of Young Technicians and Natural Scientists in the early 1970s. This followed on its efforts to involve youth into nature conservation, just like science-oriented book reader clubs (Nature Conservation Patrols) or the Nature Detectives readers contest, but particularly on a correspondence competition of children's teams named Know and Protect Nature, which took place in 1972. A first proposal of the competition, then named For the Golden Leaf, came out as a supplement of the ABC magazine in 1972. Its deputy chief editor at the time, Karel Dunda, is considered the spiritual father of the competition.

Golden Leaf used to have three parts: an 'entry task' documenting voluntary work, a 'specific job', and 'natural history quizzes'. The entry task was strongly determined by the time, as the official ideas of what to do 'for nature' rather resembled socialist commitments (including pest control, help with harvesting agricultural crops and collecting medicinal herbs). Working hour reports with stamps of relevant institutions were important, but from the beginning, clubs also engaged in real nature conservation activities e.g. protected area management. The specific job was a year-round scientific task documented with a written report. Very interesting activities appeared there, such as making nature trails and monitoring sites of natural value. The natural history quiz took place on a route in the field and was initially a real quiz where the correct option out of three had to be ticked. Many attributes of the competition were however basically the same as today: two categories (formerly defined by age: the 'younger' (8–12 years) and the 'older' (12–15 years) and proceeding rounds culminating in a national round lasting several days. The very first national round was held at the end of June 1973 on the bank of Kamencové jezero Lake near the town of Chomutov (northern Bohemia) and was won by the Tuláci/Rovers team from the township of Budišov in the 'younger' category and by the Stopaři/Scouts team from the town of Osečná in the 'older' category.

In the course of time the quiz changed into a nature trail as we know it today, and the word 'for' was left out of the name of the competition. Organiser of the competition was the Pioneer Organisation, but it was practically mostly organ-

ised by natural history divisions of regional Centres for Pioneers and Youth. In the 1980s, the CUNC Local Chapters became more and more involved in the Golden Leaf competition as experts, sometimes also as co-organisers, especially at the local and district level.

The Pioneer Organisation had fallen apart in 1990 and Golden Leaf lost its official organiser. However, it continued, practically on its own, thanks to the enthusiasm of many people from all over the country who had helped organising the competition in the previous years. Naturally, this caused many problems. It was clear that this situation would be unsustainable in the long run and that the competition needed some umbrella. In June 1992, the national round was held at the seat of the Nezmaři/Tries club in the municipality of Vrané nad Vltavou, one of most active clubs at the time. On that occasion, people from all over the Czech Republic worried about the fate of the competition had a meeting at which they agreed to ask the CUNC to take the competition over.

And so the Association of Young Conservationists of the CUNC became organiser of Golden Leaf, renamed to Green Trail - Golden Leaf, in the school year 1992–1993. District rounds were cancelled and the year-round 'specific job' left out. The activities for nature did not have to be documented and emphasis was now mainly placed on its meaningfulness (the contestants knew why they had done these activities – not because somebody had said "rake it up just here"). As a whole, the core of the competition was shifted from year-round activity to the actual competition trail.

Probably the most essential change was opening up the competition for schools, after it had been exclusively designed for clubs and specialized groups. The inclusion of schools was probably also influenced by putting Golden Leaf among competitions co-organised by the Ministry, as mentioned above. Within a few years, schools started to prevail in the competition. The most successful team of the past decades is the Gymnázium Jírovceva/Jírovec Grammar School from the city of České Budějovice/Budweis. Out of 26 participants in 2022 national round, 18 were school teams. However, winners in both categories were no school teams. Lid Medvědího potoka/The People of the Bear Brook, a classic club under the banner of the Olomouc Children and Youth Centre won in the 'younger' category, while Šípy biologickým tempem/Arrows by Biological Rate, a group of children quite untraditionally falling under a start-up named Bene Meat Technologies, was the winner of the 'older' category.

The latest changes to the competition were made ten years ago, when the Association of Young Conservationists staff was complete altered. The new members brought new ideas and new energy into the competition, which had been running rather routinely in the previous years. The competition got its historic name back (most people had called it 'Goldie' for twenty years anyway), 'voluntary tasks' were devised to support the year-round activities, more emphasis was put on the communal dimension of Golden Leaf (the broadly conceived goals of the competition were included in the rules), and the 'youngest' category was added.

One of the hardest times Golden Leaf went through was the COVID-19 pandemic. Epidemiological measures made it impossible to run the competition in its classic format, and so it had to be moved to virtual space two times (2019–2020 and 2020–2021) except for some primary and regional rounds organised randomly when measures were eased or released. In the spring months, Golden Leaf took place in quarantine, which included ten online natural history tests compiled by experts cooperating on the national round every year. The aim of the tests was not so much to verify how much someone knows, but to maintain the contestants' favour. Everyone who completed all ten tests received a small reward.

## Conclusion

The competition could not have taken place without the financial help of a number of entities. Special thanks go out to NET4GAS, which has been supporting Golden Leaf for many years at all



Competition trails are also held in regional rounds. 'Medical herb stop' on trail in the St. Prokop Valley, Prague round 2005. © Jan Moravec

levels, the Ministry of Education, Youth and Sports, the Ministry of the Environment, Lesy České republiky/Forests of the Czech Republic State Enterprise, but also to many Regions and some municipalities.

No less thanks go out to those who help organise Golden List every year, many of them as volunteers or for just a symbolic reward. Thanks to them, the competition has lived to the age of 50 years. ■



A specific element of competition trails in regional rounds is the 'activities for nature' stop. Contestants present their activities supporting nature during a year (Prague round 2006). © Jan Moravec

# The National Platform on Ecosystem Services in the international context of nature conservation and restoration

Davina Vačkářová

A founding meeting of the National Platform on Ecosystem Services (NPES) was held within the framework of the integrated LIFE project One Nature in Prague in October 2022. The establishment of the Platform reflects a long-term development in ecosystem service assessment both in the Czech Republic and abroad. We are at present witnessing a shift in nature conservation goals and ways which have been increas-

ingly including ecosystem services, nature's contributions to people and in a broader context nature's values. The aim of this article is to take a closer look at the present NPES context and objectives especially from the perspective of plural natural values and ecosystem service assessment in relation to ecosystem conservation and restoration following the international context.

Value focus	Value types	Examples
Nature	Internal (biocentric)	Rights of animals and nature Gaia, Mother Earth Evolutionary and ecological processes Biodiversity
Contributions of nature to people / ecosystem services	Utilitarian (instrumental)	Habitat maintenance and creation, pollination, climate regulation Food and fodder, materials, energy Physical and mental experiences in nature, symbolic meaning, inspiration
Well-being	Relational	Physical and mental emotional health Way of life Cultural identity, connection to the site/place/area Social cohesion

Fig. 1. Different values related to nature, to contributions of nature to people, and well-being. Adapted from IPBES (2019).

## International context

At present, the issue of ecosystem services is treated at many levels, so the NPES has not arisen in a vacuum. The concept of ecosystem services (ES), *i.e.* benefits provided to human society by nature, was introduced as a central principle of the Millennium Ecosystem Assessment megascientific project (MA 2005). Since then, scientific research on ecosystem services has exploded. One of the results was the establishment of international platforms, *e.g.* the Ecosystem Services Partnership,

and the initiation of several other processes like The Economics of Ecosystems and Biodiversity (TEEB). The effort of international nature conservation conventions, international organisations and individual governments led in 2012 to establishment of the Intergovernmental Panel for Biodiversity and Ecosystem Services (IPBES – see PLESNÍK 2016). The IPBES is now the main science-policy platform, developing an agenda including thematic assessment reports (IPBES 2019).

At the pan-European level, in the EU, Mapping and Assessment of Ecosystems and their Services (MAES) is taking place. The technical report summarises the hitherto knowledge of the state of ecosystems and ecosystem services on the EU territory and supports the assessment of targets to be reached in biological diversity until 2020 (MAES *et al.* 2020). It also provides a database for future assessment and development of policies, particularly with regard to an ecosystem restoration programme for the next decade (2030). Assessments of ecosystem services are also being carried out in individual countries (UK NEA 2011, SCHRÖTER *et al.* 2016). It is further important to mention the newly developing ecosystem accounting SEEA EA (UN 2021). SEEA EA is an integrated and comprehensive statistical framework for organising ecosystem data, measuring ecosystem services, monitoring changes in ecosystem activities and connecting the information with economic and other human activities. In 2021, a basis for accounting the size/coverage and state of ecosystems as well as biophysical flows in ecosystem services was adopted as an international statistical standard.

The concept of ecosystem services has also seen several shifts. One of them is that from a focus on instrumental benefits of ecosystems for society to an emphasis on different natural values. Whereas the main ecosystem service studies formerly stressed the economic contribution to human well-being (COSTANZA *et al.* 2014), they now – following the IPBES conceptual

framework – emphasise diverse value and knowledge frameworks, including the intrinsic value of nature and relations of different communities to the natural environment. The complexity of the problems to be solved requires a diversity of views, knowledge and experience. We are moving from univariate assessments, such as the mentioned monetary expression of the value of nature, to a more integrated approach taking into account diverse values and attitudes, combining different methodologies and involving the relevant actors.

Another shift can be observed in the generally broad gap between scientific knowledge and common nature conservation practice. Although the scientific and methodological basis of ecosystem service assessment and its benefits is presently rather extensive and established, the concept of the benefits of nature has not been fully integrated and applied in the nature conservation and restoration practice. Part of this exchange at the interface of science, policy and practice is the co-production of knowledge (BALVANERA *et al.* 2020), often as part of a more or less formalised dialogue or participatory and transdisciplinary approaches. The NPES is thus established in the context of international development, also responding to the present requirements having been emerged in the Czech Republic.

## Plurality of natural values

Natural values not only influence the attitude of the public to nature conservation and environmental behaviour of people, but also the approach to ecosystem management and governance and their benefits following existing or prepared strategic and legislative instruments. The NPES, representing a science-policy interface process supporting nature conservation and restoration, must necessarily be based on a pluralistic framework of the values and benefits of nature. An appropriate conceptual framework is provided by the IPBES (2019), which attempts to include a wide range of perspectives and natural values as well as different voices from the scientific community, governmental institutions and civil society. Therefore, the conceptual framework of the One Nature project was developed on the basis of the IPBES conceptual framework.

Natural values are broader than just a benefit for people (Fig. 1). Its intrinsic value expresses the significance and meaning of nature itself, regardless of human use. We can view the intrinsic value of nature from a biocentric perspective but also in the context of various cultures, expressed by the IPBES as Gaia or Mother Earth. It reflects ethical



Fig. 2. Participatory approaches allow a discussion of values in various contexts. Participatory seminar in the Třeboňsko/Třeboň basin Protected Landscape Area and Biosphere Reserve. © David Stella / One Nature.

aspects of life on Earth, evolutionary relationships, genetic diversity and animal rights and finally also the right of nature as such. Connected concepts in the anthropocentric framework include the existential value of nature and of the value of its legacy for future generations expressing economic preferences for the preservation of nature without direct utilisation.

The utilitarian (instrumental) value of nature focuses on human use of nature and mostly overlaps with the concept of ecosystem services. It includes material and regulatory benefits which may be used by people directly as products, recreation and protection against natural disasters or

indirectly as climate change regulation, water quality security and pollination. These utilitarian types of benefit are also the most frequent subject of ecosystem service economic assessment.

Immaterial benefits of nature partly overlap with cultural services provided by ecosystems, but are increasingly incorporated into the framework of relational values. Relational values are linked to fulfilling relationships and that what people find meaningful on nature, *e.g.* identity, responsibility, commitment or care. They include relationships between people and nature as well as mutual relationships between people through nature (CHAN *et al.* 2016). Relational values can also be linked to



Fig. 3. Prioritising the benefits of nature for assessment in the Křivoklátsko Protected Landscape Area and Biosphere Reserve. © Jitka Kozubková / One Nature.

relations to nature in order to achieve a well-being. They are very closely linked to the benefits of nature for social cohesion and for maintaining identity.

## Towards participatory assessments

To a certain extent, natural values co-determine the approach to assessing ecosystem services. Different types of values are not always mutually commensurate. For example, the intrinsic value of nature or maintaining identity cannot, on principle, be converted to money, or at least it does not make sense to do so. By contrast, utilitarian benefits can be expressed as an economic value which allows, *inter alia*, a comparison of their benefits with the costs of restoring ecosystems. Ecosystem service flows can similarly be measured in biophysical units or their significance expressed in a socio-cultural assessment. With regard to this diversity, the NPES will necessarily represent different views of and orientations at natural values depending on the priorities in ecosystem assessment.

There is a huge range of approaches to assessing the benefits of nature but there is not one 'right' approach. The choice of approach reflects the goals and purpose of the assessment as well as the overall decision-making context. Approaches to ecosystem service assessment are usually divided into biophysical, economic and sociocultural ones. In the same way, ecosystem services can be assessed qualitatively, quantitatively or in monetary units. Many approaches, however, combine and integrate various methods at different levels of complexity, e.g. an analysis of synergies and trade-offs or ecosystem accounting. Regarding the requirements to integrate different views and values, the importance of participatory methods, which structurally involve stakeholders into the assessment process, grows just like their application in nature conservation.

It is the participation of involved actors, including local knowledge and easier communication, are among key factors in selecting the method of ecosystem service assessment (HARRISON *et al.* 2018). More advanced approaches use deliberative methods where participants seek agreement or share their views on the benefits of nature. In protected areas, for example, we have applied participatory development of life value scenarios (HARMÁČKOVÁ *et al.* 2021). Similar approaches have also been developed in case studies under the One Nature project in the selected Natura 2000 sites (Figs. 2 and 3), allowing for the mentioned process of knowledge co-production (NORSTRÖM *et al.* 2021).

## NATIONAL PLATFORM ON ECOSYSTEM SERVICES (NPES)

The NPES was established as part of the One Nature project as a science-policy interface to help to respond to the international development and include ecosystem services into decision-making.

The NPES should gradually become a permanent advisory body to the Ministry of the Environment of the Czech Republic. The organisation of NPES activities is, in addition to the Ministry, supported by the Global Change Research Institute of the Czech Academy of Sciences (CzechGlobe) and other partners of the One Nature project (Charles University Environment Centre, Nature Conservation Agency of the Czech Republic, SoWa Research Infrastructure).

The NPES was developed in a two-year consultation process as part of the One Nature project.

To date, 60 representatives of governmental institutions and agencies, the academic sector, associations and NGOs have been nominated for membership of the NPES.

NPES objectives include:

- Exchange of information and sharing experience
- Supporting decision-making and making policies and strategies
- Coordinating involvement in international processes related to ecosystem services
- Supporting research and applied programmes.

The NPES should support the development of a national network of institutions collaborating on ecosystem service issue and developing particular topics in this field further ('Community of Practice').

## Role of the National Platform

The Convention on Biological Diversity's Strategic Vision speaks on living in harmony with nature by 2050, the EU Biodiversity Strategy for 2030 on bringing nature back into our lives. All these appeals are part of a broader awareness of the need for a transformation change towards sustainability in which a satisfactory well-being is not in conflict with the health and integrity of the biosphere. The strategic objectives of nature conservation and restoration cannot be fulfilled without

dialogue and cooperation of multiple actors/stakeholders who influence the state of nature and its services, participate in its restoration and benefit from various services that nature provides to people. Different values and attitudes are not mutually exclusive and do not have to lead to different results in nature conservation and restoration. At the same time, they support for inclusive nature conservation (TALLIS & LUBCHENCO 2014).

The aim of the National Platform on Ecosystem Services is to support a science-policy dialogue on ecosystem services in the Czech Republic (Box 1). Assessment of ecosystems and their services they provide is defined as a social process through which scientific knowledge of the causes of changes in ecosystems, their consequences for human well-being and management and policy options are assessed, and which links various fields of knowledge in a useful way to support decision-making (ALLISON & BROWN 2017). This requires a structured discussion between the scientists, politicians and other key actors. All the above-mentioned processes and strategic goals demand a coordinated approach and involvement of relevant actors/stakeholders.

The NPES was established under the One Nature project and should gradually become an advisory body to the Ministry of the Environment of the Czech Republic. The vision and objectives of the Platform will undoubtedly develop further according to the needs and requirements in ecosystem service assessment. Thanks to its composition, including representatives of different sectors, academia and NGOs, it provides a suitable basis for the development of an informational and science-policy interface for ecosystem service issues. We must not ignore possible pitfalls turning the NPES into a static body without sufficient inclusion and diversity. In addition to its main objectives, the NPES should further find ways to take into account, share and communicate a wide range of natural values related to benefits for people. All this may also contribute to a higher integration of ecosystem services and values into the conservation and restoration of ecosystems. ■

## Acknowledgement

This article was written as an output of the One Nature project (LIFE-IP:N2K: Revisited, LIFE17/IPE/CZ/000005).

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*The list of references is attached to the online version of the article at [www.casopis.ochranaprirody.cz](http://www.casopis.ochranaprirody.cz)*

# Hundred-year History of Nature Conservation Legislation in the Czech Republic

**Pavel Pešout**

Thirty-year anniversary of the current Act on Nature Conservation and Landscape Protection is enhanced by an even older anniversary. In 2022, a century has passed since submitting the very first proposal for nature conservation act by the Member of the National Assembly of

Czechoslovakia Jaroslav V. Stejskal. Therefore, let us briefly remember efforts by nature conservationists and naturalists to obtain legislative nature conservation and landscape protection in former Czechoslovakia, then the Czech Republic.



Leading nature conservationists after passing Act No. 40/1956 Gazette on State Nature Conservancy on the stairs of the National Assembly Prague. From left to right: Ludvík Kuba, Marta Jarošová, Otakar John, Karel Vlach, Jaroslav Veselý, Marie Maršáková, Pavel Neuman, Ladislav Kamarád, Zdeněk Vulterin, Karel Vlach, Otakar Leiský, Viktor Pleva, Rudolf Maximovič and Valentin Pospíšil.

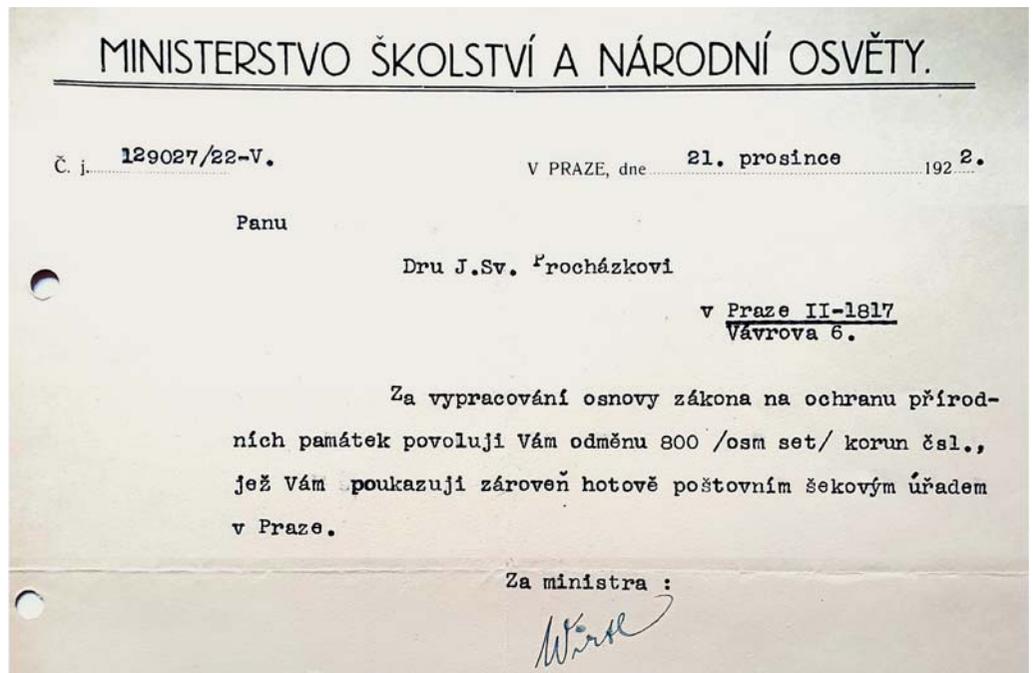
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## Efforts in the early 20<sup>th</sup> century

After previous individual efforts carried out by enlightened educated land owners to protect and conserve valuable natural monuments (PROCHÁZKA 1917, 1926, MAXIMOVIČ 1934, etc.) first attempts for systematic legislative nature conservation appeared at the turn of the 19<sup>th</sup> and 20<sup>th</sup> century. In 1894, in proposal of an act on art and historical monument/sight protection in the Austro-Hungarian Empire, there was a willingness to consider also natural monuments as the public interest.

In 1901, G. Nowak had submitted at House of Deputies in Vienna a proposal for an act on protection and conservation of natural monuments (MAXIMOVIČ 1956). The regulation of the Royal Hungarian Minister of Agriculture Daranyi of 1900 on veteran/memorial tree census and on mandatory protection of natural monuments of scientific and artistic importance issued in 1902 was probably an incentive for activity of the Vienna Ministry of Culture to begin elaboration of natural monument census and protection (MAXIMOVIČ 1942). In the same year, the Imperial-Royal Bohemian Stateholder's Chancellery in Prague issued a circular assigning elaboration of a natural monument census. In the activity, also schools were involved. In 1902 Dr Bachmann MP submitted to the Bohemian Land Diet a proposal for preservation of natural and historical monuments in the Kingdom of Bohemia. As an example, two threatened natural monuments, namely Kamenická Hůrka near the town of Františkovy Lázně and Vysoký kámen/High Stone near the town of Kraslice, were presented by the MP. Consequently in 1903 the Vienna Ministry of Worship and Education had issued a regulation on natural monument protection for scientific and aesthetic reasons assigning to make a list of them and recommending to establish nature reserves there (MAXIMOVIČ 1956). The regulation was implemented by individual territorial authorities; moreover, elaborating more comprehensive list was interrupted by World War II. In 1907, forester Dimitz drafted relatively comprehensive principles of nature conservation legislation: he had been inspired by the definition of natural monument included in the then new law of Hesse and that of Hugo Conwentz (MAXIMOVIČ 1942).

Member of the Bohemian Land Diet Luboš Jeřábek had advocated nature conservation and landscape protection legislation: later he established and directed the State Heritage Office. Just during the first year of his election, i.e. in 1908, he submitted an outline of natural and landscape monument protection law



Official letter made by Z. Wirth from the Ministry of Education and National Enlightenment (MENE) in 1922 ordering a financial bonus to Jan Sv. Procházka for developing a proposal of the act on monuments, namely a part dealing with natural monuments.  
© National Museum Archive Prague, copied by Pavel Pešout

(PEŠOUT 2014). When Commission for Preserving Monuments was established thanks to impetus from the Association for Embellishment on 21 December 1910 aiming, *inter alia*, at advocating their protection, L. Jeřábek became its leading person (PROCHÁZKA 1927). On 20 September 1911 he again submitted a proposal for nature conservation legislation (PROCHÁZKA 1917). During the last session of the Bohemian Land Diet in 1911, he submitted the very first proposal to establish protected areas within the Kingdom of Bohemia with the following resolution: *the Bohemian Land Diet is assigned to ... as soon as possible and funded by the Land to establish National Parks or protected areas for wildlife at suitable sites in typical landscapes in the vicinity of the Royal Capital of Prague (Šárka, Strahov quarries) as well at suitable sites in landscapes in mountains of the Kingdom (the Šumava/Bohemian Forest Mts., Pláně pod Roklanem/Plains under Mt. Roklan, Mt. Boubín, the Rudohoří/Ore Mts., the Krkonoše/Giant Mts., the Středohoří/Central Bohemia Uplands, Mt. Milešovka, Sutomská hora Hill, in the Brdy Highlands, in the vicinity of Padrť Fishponds, Mt. Blaník, Zelená Hora/Green Hill), through agreements with land owners according to the appropriate Land regulations: written after careful discussion with authorities and experts from both nations in the Land..* (PROCHÁZKA 1927). The proposal was based on activities of the Union of Czech Associations for Embellishment in the Kingdom of Bohemia (MAXIMOVIČ 1934).

## Period of the First Czechoslovak Republic

After 1918 intensive efforts to pass nature conservation legislation were continuing. With engagement of Jiří Janda, ornithologist and then the first Director of Prague Zoo, a proposal of a law on conservation of birds, particularly the Common nightingale, and on establishment of bird rescue centres was developed (PEŠOUT 2015). Moreover, it was only drafted. In 1919, the Ministry of Education and National Enlightenment (MENE) gathered background information for nature conservation legislation. Rudolf Korb, Jiří Janda, Jan Roubal and Karel Zimmermann sent their suggestions (MAXIMOVIČ 1956, PEŠOUT 2015, PEŠOUT 2021a).

In 1922, the very first comprehensive proposal for nature monument protection act was submitted by Jaroslav V. Stejskal, the Member of the National Assembly of Czechoslovakia, and 22 other MPs. Unfortunately, the proposal was finally brushed aside. It was also because the MENE itself intended to develop a draft dealing with protection of both cultural and natural monuments together (KLIKA 1946). The MENE did not recommend to separate natural monument protection and historical and art monument protection and criticised also terminology used there. In addition, neither the Union of Czech Associations for Embellishment supported the proposal as evidenced by a speech of Z. Wirth on the congress of Czechoslovak botanists in 1921 when he stated that such an important piece of legisla-



Nature conservationists who watched passing Act No. 40/1956 Gazette on State Nature Conservancy were snapped in a corridor of the National Assembly Prague. From left to right: Ludvík Kuba, Karel Vlach, Otakar Leiský,?, Pavel Neuman, Jan Trška, Marie Maršáková, Rudolf Maximovič, Viktor Pleva, Marta Jarošová, Ladislav Kamarád, Jaroslav Veselý, Miroslav Burian, Věra Vildová, Zdeněk Vulterin and Valentin Pospíšil. © Nature Conservation Agency of the Czech Republic Archive

tion cannot be produced in a hurry if “we were not able to manage it during the Austro-Hungarian Monarchy... we can some years to wait for it in the best interest of its quality.” He planned to elaborate a monumental very detailed law which cannot be found in any neighbouring countries (ANONYMUS 1921).



Rudolf Maximovič watching from a balcony a debate on the act on State Nature Conservancy at the National Assembly Prague, 1 August 1956. © Jan Trška

In 1922, the MENE (Z. Wirth) officially asked historiographer J. Emler and Jan S. Procházka, the first university teacher on nature conservation in Czechoslovakia for developing a proposal for an act on monuments. The proposal partially respected then a new holistic approach to nature conservation and took into account experience from abroad, e.g. nature conservation legislation in the U. S. A. A part of the act dealing with nature conservation Procházka consulted with many other experts. For instance, 8 March 1922 he organised a meeting of the Committee for Scientific and Agricultural Nature Conservation aiming at developing a nature monument conservation act and related issues and where also representatives of the Czech Botanical Society and Natural History Club of the Czechoslovak Tourists participated in (PEŠOUT 2021b). At the same time, they submitted a proposal for statutes allowing declaration and management of national parks and nature reserves as well as a proposal for statutes of the State Heritage Office, Natural Science Section aiming exclusively at nature conservation (VESELÝ 1954). The timeless draft of

the law became a background for further legislative proposals, e.g. that by Jan Dvořák, Ministerial Executive Administrator in 1924: although some of them had been debated within the inter-sectoral procedure but their debate by MPS was permanently postponed.

In 1926 Jan S. Procházka criticized permanent postponing the law and stated that it would have better to debate Stejskal's proposal *despite of its gaps, loopholes and shortcomings if the official draft has been postponed for such a long time* (PROCHÁZKA 1926). In 1931, there was a proposal of an act on natural, historical and art monument protection made by J. Wirth, in 1937 – 1938 a proposal of outline of an act submitted by V. Paleček of 1934 was even debated within the inter-sectoral procedure. Moreover, by the beginning of World War II none of the proposals was passed and implemented. *Officials participating in the respective meetings admitted necessity to protect monuments and nature by a piece of legislation, but they were afraid of declaring nature conservation as a public interest and of impacting private rights of individuals, because this, monument protection and nature conservation should become unpopular among the general public; therefore, they should be kept or shifted to private activities* (MAXIMOVIČ 1956). All efforts to pass the act were terminated by breakup of Czechoslovakia and by German occupation.

Thus, during the First Czechoslovak Republic only partial legislative measures on natural monument protection were adopted, e.g. Article 8 of Act No. 438/1919 Gazette on State Subsidy to Systematic Electrification stating *powerlines should respect the beauty of natural, landscape and historic monuments and art building and reducing trees is acceptable only in extent which is needed to build and manage distribution network*. Or in Article 3 of Act No. 100/1921 Gazette on Building stated that for building purposes mature orchards should not be appropriated. Act No. 127/1927 Gazette on Political Administration Structure authorized political authorities to issue specific regulations on protecting public interests: when applying them, many municipality offices (e.g. Jilemnice, Kolín, Louny, Mladá Boleslav, Praha, etc.) issued local regulations to protect rare wild plants and animals. Furthermore, Act No. 177/1927 Gazette on Cadastral Register and its Administration ordered to list any natural or other monument if it is located on the respective plot and when carrying out the procedure for establishing or renewing the cadastral register, an expert from the relevant department of monuments should be invited (KLIKA 1946).

Because of lack of a nature conservation act, during the First Czechoslovak Republic protected

#### IMPORTANT DATA IN DEVELOPMENT OF NATURE CONSERVATION LEGISLATION IN THE CZECH REPUBLIC UNTIL 1992

- 1908** - Member of the Bohemian Land Diet Luboš Jeřábek unsuccessfully submits the first proposal of natural and landscape monument protection law
- 1911** - Member of the Bohemian Land Diet Luboš Jeřábek unsuccessfully submits the second proposal of natural and landscape monument protection law
- 1919** – Jiří Janda proposes an outline of a law on conservation of birds, particularly the Common nightingale, and on establishment of bird rescue centres
- 1919 – 1920** – Passing the first Land Distribution Reform legislation, which established the first protected areas confirmed by the State/Government
- 1922** – The first proposal of natural monument protection act in Czechoslovakia submitted by J.V. Stejskal and other 22 MPs.
- 1922** – A proposal of the act on monuments assigned by the Ministry of Education National Enlightenment developed by J. S. Procházka in co-operation with J. Emler and other experts
- 1924** – A proposal of natural monument protection law submitted by J. Dvořák
- 1931** – A proposal of an act on natural, historical and art monument protection by J. Wirth
- 1933** – Issuing the MENE Decree No. 143. 547 V on Natural Monument Protection, the so-called the New Year's Eve Decree
- 1934** – A proposal of natural monument protection law by J. Paleček
- 1945** – Three proposals of an act on nature conservation by R. Maximovič
- 1946** – A proposal on an act on nature conservation by J. Klika and S. Prát
- 1956** – Passing Act No. 40/1956 Gazette on State Nature Conservancy
- 1958** – Passing Act No. 22/1958 Gazette on Cultural Monuments establishing the State Institute for Protection of Monuments and Conservation of Nature
- 1987** – Passing the sanction amendment to Act No. 40/1956 Gazette as Act No. 65/1986 Gazette
- 1992** – Passing current Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection

areas could be declared only after they had been agreed the respective land owner, particularly when implementing the land distribution reform. Within the land distribution reform implemented particularly through three laws, namely the so-called Appropriation Act of 1919, Allocation Act and Redress Act of 1920, it was possible to order to current or new landowner specific conditions for management at the given property to preserve and protect a natural monument. Specifically Article 20 of the Allotment Act explicitly states as follows: *When planning, the Land Office should avoid to disturb natural beauties and landscape character/scenery as well as natural, historical and art monuments. The Land Office can agree that sites/areas dedicated to parks, nature parks enhancing the beauty of the landscape or those aiming at preserving an example of the original landscape character/scenery or at preservation and protection of historical monument and their vicinity close related to them will be left to the current owner if the land owner accepts the conditions set by the Land Office after agreement with*

*the ministries involved, if the land plots will be accessible to the general public, scientists, artists or will be used for charitable or philanthropic purposes.*

The then nature conservation community realized that the Land Office had been very powerful. For instance, the above L. Jeřábek called the legislation rare and welcome opportunity for establishing protected area network by activities of the State also not only by efforts of enlightened educated land owners as it had been until then common in Czech lands. According to his opinion, the network should be established by declaring a certain number of national parks and larger nature reserves extensive enough to support undisturbed development and life cycle independent of the current one, by establishing as many as possible less strictly protected forest reserves following the U. S. experience and by as many as possible lesser protected areas for habitats of important flora, fauna and remarkable geological formations. As early as in 1920 he

proposed and published a protected area network concept based on the previous draft from 1911 (JEŘÁBEK 1920, PEŠOUT 2014). Rudolf Maximovič the then General Conservator (Head of the State Nature Conservancy) considered the Land Distribution Reform legislation as *the first generous nature conservation measure* in the Czechoslovak legislation. As a result, there was a disappointment because the Land Distribution Reform implementation itself *became a subject of interest of many political parties and was carried out through various deals* (MAXIMOVIČ 1956, STEJSKAL 2006).

In connection with territorial protection, it is necessary to mention the MENE Decree of 31 December 1933, the so-called New Year's Eve Decree prepared by R. Maximovič. Although the New Year's Eve Decree was "only" an official list of protected areas existing at the time of its issuing and aiming at informing teacher community for teaching the topic, it is an important step in territorial protection on the Czech Republic's territory. In the single act all protected areas which had been until then declared were listed: in addition, clearly a few more which were *under preparation* at that time were included there. Because the list was issued by the highest State Nature conservancy authority in the country, *i.e.* the MENE, thus confirming the existence of the protected areas (the individual decrees establishing the respective protected areas had been only uneasily retrievable), the New Year's Eve Decree has been consequently quoted as a declaration decree (*cf. e.g.* MARŠÁKOVÁ-NĚMEJCOVÁ 1956, KOS & MARŠÁKOVÁ 1997). All up to now preserved areas listed on the New Year's Eve Decree have been re-gazetted or are protected in other ways. The



A boundary table of a State Nature Reserve used in the middle of the 20<sup>th</sup> century. Picture was taken in the then Tobiašův vrch/Tobias' Hill State Nature Reserve, now Nature Monument of the same name, in 1969. © Jan Tříška

New Year's Eve Decree had for decades contributed to protection, conservation and management of a significant part of the from a point of view of natural sciences most valuable areas in the Czech Republic and we have it to thank for their preservation (PEŠOUT 2013).

### Period of the Second Czechoslovak Republic and Protectorate of Bohemia and Moravia

Procedures related to an act on monuments had convinced staff of the central authorities of necessity to separate nature conservation and monument/heritage preservation but everything was changed by occupation by Nazis and breaking away the borderlands. All measures adopted in the Protectorate of Bohemia and Moravia were checked and approved by occupiers, they had to be developed according to the Third Reich's rules and was in accordance with Nazi ideology. Although even in this period attempts to develop nature conservation legislation were continuing and particularly due to efforts by R. Maximovič, some proposals of governmental decrees on nature conservation and landscape protection appeared in 1940 - 1943: thus, nature conservation legislation outline was developed in 1943 (MAXIMOVIČ 1956). For the Sudetenland after its annexation to the Third Reich till the Liberation and restoration of Czechoslovakia the Reich's Nature Conservation Act of 1935 was in force (MAXIMOVIČ 1939a, 1939b, 1939c).

### Period of the Third Czechoslovak Republic

Just in 1945, R. Maximovič as the elected revolutionary leader of Department of Forest Policy at the Ministry of Agriculture had submitted an outline of act on nature conservation in Czechoslovakia and after moving nature conservation to the Ministry of Education he submitted the act's amended draft again. At the turn of 1945 and 1946, the Commission for Nature Conservation (from 1946 the Institute for Nature Conservation and Landscape Protection) at the First Section of Medical and Natural Science of the Masaryk Academy of Labour led by Jaromír Klika had elaborated a detailed proposal of a new nature conservation act, for the first time with differentiation between *protective* and *creative (naturalization of the landscape)* nature conservation and landscape protection (KLIKA 1947, PEŠOUT 2019b). Nevertheless, due to its complexity it was recommended to remake the proposal and to divide it to the act itself and implementation rules (MAXIMOVIČ 1947, VESELÝ 1954).

The Act on National Cultural Commissions for State Cultural Property Management of 1946 should also be mentioned: pursuant to it, plots having natural monument or natural reserve character had to be considered as the State Cultural Property (MAXIMOVIČ 1956).

### Period of the Communist Regime

Neither after World War II nature conservation legislation was passed. Therefore, the main legislative pillars were the Constitution of 1950 highlighting cultural monument protection, the Administrative Criminal Code of the same year, which included also nature conservation and landscape protection, particularly natural monuments and natural reserves, as well as the act on afforestation/reforestation of 1948 explicitly setting down that natural beauties and monuments should be taken into account during its implementation.

Czech professional and non-governmental nature conservationists had to wait to 1 August 1956 when the National Assembly unanimously passed Act No. 40/1956 Gazette on State Nature Conservancy. Passing the act had been preceded by drafting a proposal and persistent efforts carried out by Jaroslav Veselý, the first Director of the State Institute for Protection of Monuments and Conservation of Nature based in Prague (TOMAN & TOMANOVÁ 1976, TRÍŠKA 1986). Czech conservationists were inspired not only by various earlier proposals but also by the Polish law that had been then in force. The Act was in force until 1 June 1992 when was replaced by current Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection. Thus, the former was in force 36 years; there were surprisingly made only five amendments to it. The most significant change was the so-called sanction amendment, namely Act No. 65/1986 adding two articles on offences and possibility to impose sanctions/penalties and remedial actions (FRIEDL & DAMOHORSKÝ 1987). The Act was definitely a great factual and legal moment because it created a strong legal framework playing a key role in forming the modern nature conservation on the Czech Republic's territory (DAMOHORSKÝ 2006).

In the 1980s, activities on amendments to the Act on State Nature Conservancy had begun. After November 1989, when great political, economic and social changes in former Czechoslovakia started, the State Nature Conservancy could prepare quickly a proposal of a new up-to-date legislation in nature conservation and landscape protection, *i.e.* Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection. ■

# An Off-the-scale and Turning Fire in the České Švýcarsko/Bohemian Switzerland National Park

Zdeněk Patzelt

On Sunday 24 July, a fire broke out in the České Švýcarsko/Bohemian Switzerland National Park (northern Bohemia) which due to its extent will go down in the history of not only this National Park. Mainly dry Norway spruce (*Picea abies*) monocultures having been damaged by a European spruce bark beetle (*Ips typographus*) outbreak burned down, but also valuable ecosystems and a part of the village of Mezná were affected.

The fire was preceded by dry and warm weather with record temperatures of up to 36 °C. At the time of writing this contribution, more than a thousand firefighters had been extinguishing seats of fire for 16 days, which is too early for an evaluation of various aspects. It has however already been obvious that the event will become a turning point in the attitude to forests in the Czech Republic.



Below Křídelní stěna/Wing Wall Hill. The first vegetation has appeared a week after the fire there. Beech seeds and fruits are visible at the surface. © Zdeněk Patzelt

## How and why did the fire start – the most important question?

It is agreed that the fire started in the morning of Sunday 24 July 2022. There is also agreement that it started in Malinový důl/Raspberry Gorge, which is situated east of the town of Hřensko and leads to a road with a tourist trail from where large crowds of tourists head towards the Pravčice/Prenischtor Rock Gate. The question is whether the fire started, as is assumed in the media, in Malinový důl/Raspberry Gorge where entry is prohibited, or if it was caused by e.g. a butt thrown on a hiking trail. NASA satellite images show initial outbreaks even by the road with the tourist trail. It will therefore be interesting to know what conclusion the investigators reach about the cause of the fire.

The dynamics of the fire are obvious: it travelled 10 km in 4 days. Outbreaks were isolated and the fire skipped over by air over hundreds of metres. Sunday's information spoke of an area of up to 3 hectares in Malinův důl/Raspberry Gorge and rapid localisation was assumed. Unfortunately, that did not work out and by Monday the fire had already got out of possible control. However, its extent was still optimistically estimated at 3 to 10 ha, on Tuesday morning still only about 30 ha (incident commander: "The fire is about 30 hectares in size. If the weather does not get worse, especially if the wind does not increase, firefighters could bring the flames under control today." – source: <https://globe24.cz/>, 26–7–2022). However, at that moment already hundreds of hectares between the town of Hřensko and the village of Mezná and in parts of Saxony and Kamenice Gorge have been affected. Thus, in the early stages of the fire, rele-



Progress of fire outbreaks day by day according to NASA satellite tracking (source: <https://firms.modaps.eosdis.nasa.gov/>)

vant information about its true extent and spread may have been missing.

The area of the fire largely coincides with that of extensive clearings. These were created in the National Park before 2019 resulting from interventions against the European spruce bark beetle. It is obvious that the clearings did not prevent the fire from spreading but rather helped it, however illogical that may seem. The area is based on extremely desiccating sandy soils where the temperature of the soil surface of south-facing clearings and exposed rocks rises to 60 °C in summer. The main causes of the fire date however hundreds of years back. Due to human activity, the forests have a very

unnatural composition there. Out of the main tree species, the European beech (*Fagus sylvatica*) is only represented for 9.29% compared to a natural 56.95%, the silver fir (*Abies alba*) for 0.38% vs 19.58%, and the Norway spruce, on the other hand, is represented for 59.57%, while 5.29% would be natural (source: [www.npcs.cz/lesy](http://www.npcs.cz/lesy)). It is a natural pattern that unnatural expansion or overpopulation of species leads sooner, or later to decay. In this case it was particularly the record drought and heat in 2018, with a precipitation of only 69% of the mean and a temperature of 1.5 °C higher than normal in the Ústí Region (source: Czech Hydrometeorological Institute) which accelerated the European spruce bark beetle outbreak. Today's fire is thus to a great extent also the result of extreme climate fluctuations. The bottom line is that if the trend continues, nothing good awaits the forests as we know them now: a significant part of them will most likely burn down.

## Unwanted publicity

The hitherto unknown extent of the fire also evoked a corresponding media response. A number of comments rate the fire as an opportunity to restore the ecosystems (e.g. ADÁMEK 2022, HRUŠKA 2022, SEDLÁČEK 2022), while other ones deal with the causes of the fire. They often criticise that deadwood from bark beetle outbreaks had not been removed, and reflect a low awareness of the correctness of this practice in National Parks. This was partly caused by the fact that, conversely, the Park Administration intensively intervened until 2019, as is evident from the large clearings well visible in aerial photographs



Pravčice/Prenisch Gorge, 11 August 2022. © Zdeněk Patzelt

of this part of the National Park. After finding out that not even extreme clear-cutting can stop the bark beetle, interventions were left out. In the adjacent German Sächsische Schweiz/Saxon Switzerland National Park no interventions took place, which meant a fundamental management mismatch. Leaving stands attacked by bark beetle without intervention must be accompanied by fire prevention measures, especially around settlements. If such measures are not taken or are insufficient, this may lead to lower tolerance of the non-intervention principles by the general public and municipalities, and – as will probably soon be shown – also to e.g. a decrease in the willingness to designate Křivoklátsko or another suitable area in the Czech Republic a National Park.

## Damage or not?

Controlled burning is certainly a useful management tool, but only when many necessary conditions are met. In No. 6/2021 of this journal an article appeared on a new methodology regulating this issue (PEŠOUT 2021). Flattering ourselves that the fire did not cause the National Park wildlife any damage is problematic, to say the least. Frankly said, we would be lying to ourselves. The fire will undoubtedly have a favourable effect on sites with dead spruce monocultures and nature will manage to restore. The fire also suitably covered the clearings made by interventions against the bark beetle. However, also little tiny shrub communities on rock edges and forest stands with a natural species composition have been affected to a large extent. Examples are relic Scots pine (*Pinus sylvestris*) forests on rock spurs and beech forests on the slopes near the Gabriela's Trail, but the true extent of this damage remains to be recognised. That is really a pity, since these ecosystems are among the most valuable ones and are the subject of protection in the National Park ([www.npcs.cz/predmet-ochrany](http://www.npcs.cz/predmet-ochrany)). The fire will also have a strong impact on the twenty-year long efforts to restore the representation of the Silver fir. It is therefore definitely out of place to talk about the fire as almost the best thing that could have happened to the National Park.

The efforts and costs connected with firefighter intervention are a chapter apart. As stated by General Vladimír Vlček, commanding the fire brigade, the deployment of firefighter units cost up to 20 million CZK (EUR 850,000.00) a day. A single fire is then comparable in costs to the 20-year National Park's existence. However, we can certainly not agree with General Vlček in everything. His statements about the inappropriate litter layer and disappointment and frustration with the state of the non-intervention zone (Novinky.cz, 6 August 2022) must be rejected, as the National

Park forests will never be an ideal environment for fire prevention. It is neither evident on the basis of which fire brigade powers prevailed over those of the National Park to the extent that heavy machinery created non-forest strips throughout the National Park still after localising the fire. This is an unprecedented situation which will have far-reaching impact on the NP. Its justification is questionable because the spread of the fire was not even stopped by large clearings. With regard to the situation at Mezná, where three houses burned down, we must agree with General Vlček's statement that "in a situation when we do not have fire partitions and access roads, and we have no water for extinguishing, it cannot look good" (Novinky.cz, 6 August 2022). Environment minister Anna Hubáčková made a similar comment about leaving dead vegetation around settlements.

## And what next?

To evaluate the causes and consequences of the fire, it is first necessary to assess all the aspects unbiasedly. They should not be overstated nor understated. Only then can the right starting points for the future be found and will the same mistakes not be repeated. Fires of such an extraordinary extent should definitely not become a common part of forest development in České Švýcarsko/Bohemian Switzerland. The development after the 2006 fire at Havraní skála/Rook Rock, where a new forest has emerged, is favourable. The present fire, however, closely followed up on bark beetle decay of the forest, destroying the undergrowth of saplings which had already formed, whereas in large areas very few fruiting seed trees have remained. One can only hope that no more disturbances such as torrential rains accompanied by erosion will take place, but climate models/scenarios assume them to happen to an increasing extent. Despite all possible unfavourable factors, it is however clear that forests will restore spontaneously. Under the natural conditions in the Czech Republic this would happen practically anywhere and fire sites add particularly suitable conditions to that. It is only a question of how quickly and in what form it will proceed. Already now, grasses and ferns can be observed rising from the ashes.

No one can be left in doubt anymore that yesterday was already too late for a quick start of a massive conversion of the Czech forests to stands with prevailing broad-leafed deciduous trees. Typology maps corrected by a climate change factor must become a binding document in forest planning, and further planting of locally inappropriate trees must become an issue of the past. Forest managers who do not understand this need to be replaced. Absolute priority must be

given to restoration of water retention in forests, cancelling of land reclamation, restoration of peat-bogs and other wetlands, and a return to the tradition of building fire tanks can be doubly useful. In České Švýcarsko/Bohemian Switzerland it will also be important to cope with the adverse effect of high game numbers on forest development, as a new seat of fire will not be so easy to fence off as at Havraní skála/Rook Rock in 2006. At least in the case of the silver fir, spontaneous restoration is not expected to take place, unless we want to wait perhaps thousands of years.

The intention to strictly refrain from intervening in the spontaneous restoration of the burnt site in the České Švýcarsko/Bohemian Switzerland National Park may therefore not be completely optimal, even if it looks tempting. Intervention is not only a logger with a chainsaw or artificial planting. Today, the global effects of a disturbed climate, accompanied by for example invasions of non-native species, are more significant interventions we also have to face in National Parks. In the České Švýcarsko/Bohemian Switzerland National Park more fires will inevitably occur in the future, although probably not on such a scale – humidity and terrain conditions in the eastern part of the NP are more favourable. The resounding demands for removal of all deadwood from the whole NP must definitely be rejected, as this would not help anything. However, the reasons for this need to be explained clearly. A complete ban on interventions is also not possible. Especially measures around settlements and infrastructure are necessary. After all, complete non-interference has never been intended there. Non-intervention should therefore not be a bogeyman, as it certainly does not mean doing nothing in places where intervention is necessary.

### After the deadline:

The latest sources indicate that the fire had already started on 23 July 2022 at around midnight, near a car park above the town of Hřensko (HAVRÁNEK 2022).

The police have requalified the fire in České Švýcarsko/Bohemian Switzerland and now treat it as a deliberate public safety threat ([ct24.ceskatelevize.cz](http://ct24.ceskatelevize.cz), 16 August 2022).

General Vlček: "The Minister of the Interior and I are even ready to prepare a kind of strategic document for the State Security Council, in order to discuss whether ecology has priority over security or vice versa." (<http://www.facebook.com/radiozurnal/videos/43869711607736>, 16 August 2022). ■

*The list of references is attached to the online version of the article at [www.casopis.ochranaprirody.cz](http://www.casopis.ochranaprirody.cz)*

Fire site below Lovecká trubka/Hunter's Trumpet, 11 August 2022.  
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# International Trade in Endangered Species of Wild Fauna and Flora in the Czech Republic, European Union and in the World

**Jan Plesník, Silvie Ucová, Barbora Kameniecká,  
Jakub Makal & Lenka Čolobentičová**

The trade in wildlife, its parts and products is at least as old as recorded humankind's history. Without wishing to start thoughtful intellectual considerations we would like to stress that it had initially been a swap

or a barter, later accompanied by monetary trade which consequently mostly replaced the former. Wildlife trade has recently been moving increasingly to the Internet.



## Legal v. illegal wildlife trade

To quantify the international wildlife trade volume and value on a global scale has been difficult. The more precise data is available only in taxa protected under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Its Parties report annually the number of export/import permits and certification granted, the number of traded species and derived products and countries of their origin and destination. The data is available within the CITES Trade Database which as of 15 January 2022 included more than 20 million records (UNEP-WCMC 2022a). Moreover even the information source displays certain shortcomings (BEREC *et al.* 2018, 2021, ROBINSON & SINOVAS 2018, SLÁBOVÁ *et al.* 2021). We should particularly take into account that the Parties significantly differ from each other in fulfilling the duty: *e.g.* in 2019 126 Parties provided the data required while there were at that time 183 Parties.

From 1975 to 2014 the volume of reported trade in CITES-listed wildlife species quadrupled and in 214 it included about 100 million whole-organism equivalents (HARTFOOT *et al.* 2018, PLESNÍK & JELÍNKOVÁ 2018). The international legal trade in wild fauna and flora and derived products covering also non-CITES-listed taxa including fish and timber has increased more than five-fold in value in 2005 – 2019 and twenty-fold since the early 1980s (IPBES 2020). According to the United Nations International Trade Statistics Database it was worth USD 107 billion in 2019: the top commercial categories for wildlife trade were seafood (82%), furniture (7%), and fashion (furs and hides) (6%, ANDERSSON *et*



During six years, more than 1.36 billion pet animals were imported only to the United States. Annual import of the Green iguana (*Iguana iguana*) mainly from captive farming operations in Honduras is more than one million specimens. © Jan Plesník

*al.* 2021). Nevertheless, other source give significantly higher number (*cf.* EU 2016). It should be mentioned that legal trade of course does not necessarily mean that commodity was taken from the wild or managed in captivity sustainably.

Even more serious troubles appear in efforts to reasonably estimate the volume of global illegal wildlife trade. It is not only because ambiguities in defining illegal wildlife trade on a global scale

from a point of view of legislation, but also due to its covert nature and an overlap with legal trade (ESMAIL *et al.* 2020, TITTENSOR *et al.* 2020, WYATT 2021). Therefore, there are various international illegal wildlife trade volume estimations, ranging from USD 4 billion to 23 billion per year, most often between USD 7 to 8 billion/year (EU *l.c.*, NELLEMAN *et al.* 2016, SCHEFFERS *et al.* 2019, t'SAS-ROLFES *et al.* 2019). If the number includes also illegal logging and fishing it could reach USD 48 – 216 billion per year (WORLD BANK 2019). The more precise measuring the variable is also complicated by the fact that contrary to other illegal trade, demand in wild fauna and flora changes relatively often and quickly.

It is no secret that illegal wildlife trade can be linked to crime and in some cases, to terrorism (UNEP 2018, FATF 2020, UNODC 2020, WJC 2021). No wonder: it is among five most profitable criminal enterprises and according to some opinions, it is the third most lucrative illegal transnational crime, only behind trafficking arms and narcotics (NELLEMAN *et al. l.c.*, VAN ULM 2016, ESMAIL *et al. l.c.*).

The table on page 74 presents the most often traded taxa/groups protected by CITES in the world (2014 – 2018, UNEP-WCMC 2022b), European Union (2019, UNEP-WCMC 2021) and in the Czech Republic (2015-2019, MoE CR 2022,

### INTERNATIONAL WILD ANIMAL TRADE AND COVID-19

Trade in wild fauna has recently been debated particularly in relation to the COVID-19 zoonosis spillover which according to some opinions could originated at Wuhan wet market in China (LI *et al.* 2020, MIZUMUTO *et al.* 2020, PLESNÍK *et al.* 2020). The more recent analysis of the data available suggests the SAR-CoV-2 coronavirus could be transmitted to humans through raccoon dogs (*Nyctereutes procyonoides*) caged in the western section of the market (WOROBAY 2021).

It seems that due to continuing and increasing the purchase and sale on the Internet wild pet trade did not decrease even during restrictions on COVID-19 (MORCATTY *et al.* 2021). In addi-

tion, in some parts of the world, *e.g.* in Africa or India, after some decline in poaching of commercially interesting species caused by restrictions on movement, *i.e.* lockdown after lifting them, poaching has again increased (MCNAMARA *et al.* 2020, ADITYA *et al.* 2021, PLESNÍK 2021).

Data suggests that up to now the extent of international wildlife trade in the Czech Republic did not significantly declined by the COVID-19 syndemic, just the opposite. In 2020, 54,974 specimens of the wild animal species protected by the CITES was exported from the Czech Republic, thus establishing a record in the number: of them, 40,000 were birds (CENIA 2021).

The most frequently traded CITES-listed wild taxa/groups and derived products in the world, European Union and Czech Republic (UNEP-WCMC 2020, 2022a, 2022b, MŽP 2022)

←export, →import

geographical location period	commodity/the most frequently traded taxon/group
world 2014 – 2018	mammal skins/Collared peccary ( <i>Pecari tajacu</i> ) live primates/Crab-eating macaque ( <i>Macaca fascicularis</i> ) live birds/Grey parrot ( <i>Psittacus erithacus</i> ) reptile skins/American alligator ( <i>Alligator mississippiensis</i> ) live corals (Anthozoa) orchids (Orchidaceae) including hybrids cacti (Cactaceae)
European Union 2019	← →live ornamental plants including snowdrops ( <i>Galanthus</i> spp.), orchids, cacti and cyclamens ( <i>Cyclamen</i> spp.) →reptile skins/American alligator
Czech Republic 2015 – 2019	←birds/Red-rumped parrot ( <i>Psephotus haematonotus</i> ) and Eastern rosella ( <i>Platycercus eximius</i> ), birds of prey of the genus <i>Falco</i> including interspecific hybrids ←primates/Ring-tailed lemur ( <i>Lemur catta</i> ) ←amphibians/dart-poison frogs (Dendrobatidae) →reptiles/freshwater turtles of the genus <i>Graptemys</i> , Green iguana ( <i>I. iguana</i> ), Ball python ( <i>Python regius</i> ), Hermann's tortoise ( <i>Testudo hermanni</i> ) →reptile skins/American alligator →birds/parrots (Psittacidae) →mammal trophies/baribal ( <i>Ursus americanus</i> ) →corals

UNEP-WCMC 2022b). They are commented below.

## Trade in wild fauna and flora on a global scale

International wildlife trade covers surprisingly a broad range of subspecies, species and genera including globally threatened ones: some taxa are traded more often worldwide. Approx. one quarter of all terrestrial vertebrate species has been traded and the proportion shall be most likely increasing. On the other hand, trade in invertebrates, plants and fungi has to a large extent been neglected and poorly documented (SCHEFFERS *et al. l.c.*, FUKUSHIMA *et al.* 2021). In respect of volume and financial value the trade in timber plays first violin on a global scale (WORLD BANK *l.c.*).

Let us look in detail at CITES-taxa. Unlike mammals and reptiles in which 62% and 66% of the global trade are hides, birds are almost exclusively traded as living specimens: of them, 80 % of transactions are individuals reared in captivity. Not without an interest that the Czech Republic is ranked globally the fourth in number of birds exported: in 2014 – 2018 200 000 birds was exported from the country. Among fishes, which

also are sold and purchased as living organisms, the Asian arowana (*Scleropages formosus*) is exported in the highest numbers, being considered to be symbol of good luck and prosperity, especially by Asian cultures: more than 1.25 million specimens reared at the registered breeding facilities were sold yearly.

## The European Union as an important wildlife trade market

In addition to South and East Asia and the U. S. A. the European Union is one of the most significant players in global wild fauna and flora trade. On the one hand it displays huge purchase power allowing it to import high numbers of both living specimens and wildlife products, on the other hand there has been a long-term and successful tradition in wild plant growing, cultivation and planting and wild animal breeding there. Thus, it is no exaggeration the EU Member States can keep in captivity and breed a huge number of specimens which are consequently exported literally across the world. According to the official data, the annual value of trading the above articles in the EU is approx. EUR 100 billion, being according to other sources the financial value of the global legal wildlife trade as a whole (see above).

If aiming at import to 27 EU Member States we find that only in 2019 there were approx. 99,200 transactions representing in total 37.5 million imported specimens. The reader would be surprised that within the total number of imported wildlife individuals live ornamental plants dominated (93%). In the total number of wild plant and animal species imported in the EU (4, 315) plants again dominated with 78%.

As it has been pointed out the EU Member States are important wild plant and animal exporters whereas within these exports captive-produced or artificially propagated specimens dominate. In total, 26.5 million specimens were exported from united Europe in 2019. Also in this case, prominent exports by volume included live artificially propagated plants (96%), exported mostly by the Netherlands, mainly cacti (especially *Schlumbergera truncate*, commonly known as “Christmas cactus”), moth orchid hybrids (*Phalaenopsis* hybrids) and snowdrops (*Galanthus* spp.). Over half of the 2,194 different taxa involved were plants.

## Which species are traded most often in the Czech Republic?

The Czech Republic plays in international wild fauna and flora trade a prominent role. It is not only due to geographical location, but also highly developed and very popular plant growing, cultivation and planting and wild animal breeding: in many cases Czech growers and breeders achieve great results. In addition, they had turned professional themselves after 1989 and used numerous contacts to enter a foreign market. In the Czech Republic, having a population of 10.5 million inhabitants, there are 50,000 – 80,000 persons actively keeping or trading CITES-listed species compared with 3,000 such persons in Hungary and 600 in Portugal (ŘÍHOVÁ *in litt.*).

While globally wildlife product trade in CITES-listed species dominates, in the Czech Republic the wildlife trade mostly consists of live specimens. Since 2008 the number of wild animals exported from the Czech Republic tripled (CENIA 2021). In trading wild birds the country is in addition aquarium fish trade, the latter aiming mostly of course at non-CITES-listed species, among major world trading powers (see above). In addition to exotic avifauna, the often exported bird species include also birds of prey. In 2015 – 2019, 788 interspecific hybrids of the genus *Falco*, 285 Peregrine falcons (*F. peregrinus*) and 240 Saker falcons (*F. cherrug*) were exported from the Czech Republic for falconry, most often to the United Arab Emirates, Kuwait and Qatar.

Wild plant and animal trade in the Czech Republic, being from a global point of view when taking into account the human population size there relatively large, is not always legal. Let us remember only some actions carried out by enforcement authorities, e.g. *Trophy* (solving illegal trade in tiger products, PLESNÍK *et al.* 2019, UCOVÁ *et al.* 2019), *Rhino* (rhino horns on the black market, PLESNÍK 2015), *Osseus* (illegal trade in ivory, rhino horns and tiger bones) or *Lora* (illegal trade in parrots). Unfortunately, above cases cast negative light on growers and breeders in the eyes of the general public not only in the Czech Republic.

In the second half of 2022, the Presidency of the Czech Republic in the Council of the European Union will offer suitable opportunity to present experience of implementing the CITES in the Czech Republic. For November 2022, the 19<sup>th</sup> meeting of the Conference of the Parties to CITES is scheduled to be held in Panama City where the Czech Republic delegates shall be coordinating EU positions and negotiating them with representatives of other governments or regional groups. In addition to traditional topics, such as international trade in ivory, rhino horns, rare timber and marine organisms, the meeting will be dealing also with wildlife trade on the Internet or specimens produced through biotechnology.

### Cross-border wildlife trade outlook

The wildlife trade importance for global nature conservation is confirmed, *inter alia*, by the fact that the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was adopted in 1973 in Washington, D.C. as only the second multilateral treaty aiming at natural and landscape heritage protection, conservation and management. Its mission definitely is not to eliminate international wild plant and animal trade but to control in a reasonable way thus ensuring that international trade in specimens of wild animals and plants does not threaten the survival of the species protected by the Convention by providing a framework to be followed by each Party.

Sometimes we can meet the opinion that unsustainable use of biota for commercial purposes is goal-directly overstated and that for organisms involved is not so dangerous. A quantitative meta-analysis of 31 studies estimating trade-driven declines in mammals, birds and reptiles in habitats used by humans and less affected areas particularly in South American



In 2015 – 2019 6,000 products from skins of American alligators (*Alligator mississippiensis*) killed in the wild in the United States were imported to the Czech Republic, particularly from Switzerland. © Jan Plesník



Among 1,480 cacti species assessed by the IUCN (International Union for Conservation of Nature) 31% is threatened by extinction: almost half of them are endangered due to illegal collection of live specimens and seeds in the wild particularly by European and Asian growers. © Dana Turoňová

and African tropes concluded that the terrestrial vertebrate species declined in abundance by 62 % where wildlife trade occurs: of them, 16.4 % faced local extirpations. The decline was caused more profoundly by international trade than local one and the difference between

protected areas and the unprotected landscape was not significant (MORTON *et al.* 2021). About 15,000 commonly traded medicinal herb species, usually rather wild-collected than propagated and cultivated, are threatened (SCHIPPMANN *et al.* 2006).



In five years 245 ring-tailed lemurs (*Lemur catta*) were sent abroad from the Czech Republic, mostly to China. © Jan Plesník



In April 2020, after almost ten years, when the strictest lockdown restrictions were applied in the Republic of South Africa no Southern white rhino (*Ceratotherium s. simum*) had been killed in the Kruger National Park for a whole month. After lifting them number of poached rhinos again increased in the iconic protected area. © Jan Plesník

Governments in source countries forego up to an estimated USD 12 billion each year in potential fiscal revenues that are not collected due to illegal logging, fishing, and wildlife trade. If we try to quantify how illegal and unsustainable trade in wild fauna and flora influences ability of ecosystems to provide humans with benefits, from anthropogenic point of view called ecosystem services or nature's contribution to people, their reduction or loss is hardly imaginable USD 1 – 2 billion in 12 months only (WORLD BANK *l.c.*).

Legal trade in wildlife and derived products has been an important element of the world economy, particularly in developing countries, and millions of people depend on it with their lives. Illegal and unsustainable use of biota, expressed by bushmeat (PLESNÍK & PELC 2021), can directly or indirectly damage target and non-target species, cause ecosystem service loss, support spreading of invasive alien species, pests, parasites and pathogens including causal agents and vectors of zoonoses and disturb both local and global economy (CARDOSO *et al.* 2021). Of course, the solution is not to absolutely prohibit trade in wildlife and derived products but to support changes in consumption patterns, ensure food security, diversify and stabilize incomes for local communities and indigenous people, control wildlife trade on the internet, enforce law including international one, enhance scientific knowledge of biota, improve protected area effectiveness, certificate sustainable use of biological diversity in a uncorrupted way, carry out legal reasonable wild plant growing, cultivation and planting and wild animal keeping in captivity, use current technologies against illegal wildlife collecting, poaching and smuggling and least but not least to enhance and to improve communication with, education of and awareness among the general public and the target groups (FUKUSHIMA *et al. l.c.*, PLESNÍK & HANEL 2021). ■

*The list of references is attached to the online version of the article at*  
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# Protected Areas in the World: Current State and Prospects

Jan Plesník & František Pelc

*Conservation is a state of harmony between men and land.*

Aldo Leopold: Conservation (1938)

When one says “nature conservation”, many people recall various boards with a notice “protected area”. It is no surprise. Not only in the Czech Republic territorial protection or area-based conservation is among the oldest and at the same time most common approaches in protection, conservation and management of natural and landscape heritage. Moreover, there have been recently appearing various opinions whether protected areas really fulfil their mandate

and whether area-based conservation deserves at least a significant renovation (BHOLA *et al.* 2020, FENG *et al.* 2021, WALSH 2021, JONES *et al.* 2022, RAYMOND *et al.* 2022, ROBSON *et al.* 2022, WAUCHOPE *et al.* 2022, WILLIAMS *et al.* 2022, ZENG *et al.* 2022). This prompts the question about the current state of the art in global protected area network and in particular what we have known on its real effectiveness.



Cloud forest which has been well-preserved in the Chirripó National Park in Costa Rica is the primary habitat there. © František Pelc



Before the COVID-19 syndemics according to respected estimations the global protected area property received 8 billion visits per year. The Redwood National Park in northern California became famous due to highest trees in the world – the Coast redwood (*Sequoia sempervirens*): the woody plant species is unique also to its huge girth. © František Pelc

## What protected areas have experienced yet

At present the most frequently used concept proposed by the IUCN (International Union for Conservation of Nature) defined a protected area as a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values (DUDLEY 2008).

The very first protected area based on the current concept in the world is German islet of Vilm close to the island of Rügen where human interventions were limited for preserving nature as early as in 1812. Moreover, 12,000 years before people did not intentionally use some sites or areas of various size. Nevertheless, the aim was not to maintain their natural and landscape values but because of religious or cult reasons or of the strict protection of natural resources by owners against using them by other people. Of course, general strategic target in protection, conservation and management of natural and landscape heritage has been simply and at the same time expressive itself since its establishment in the first half of the 19<sup>th</sup> century: more protected areas for nature conservation. A real boom in territorial protection, particularly declaring national parks according to the U.S. concept, occurred in the 1950s where estab-

lishing a representative network of protected habitats/ecosystems/land cover types became a main nature conservation paradigm (PLESNIK 2012, 2022). Since that time both number of officially declared protected areas and their total coverage have been exponentially increasing on a global scale.

The current approach considers protected areas as a key strategy for maintaining life-supporting processes in nature, benefits of which we have most often used to call ecosystem services. The role of protected areas in mitigating global change impacts, particularly climate change, and adapting both human civilization and nature to them is also highlighted. Putting it simply, protected areas should be beneficial not only for nature (after all, that is why they are established), but also for citizens, mainly for local people.

Let us take a look at the most recent statistical data. As of July 15, 2022 there were in total 271,140 sites/areas meeting the above most respected concept of a protected area, at the same being included in the World Database on Protected Areas (WDPA) run together by the United Nations Environment Programme (UNEP) and IUCN. Of them, 253,359 protected the selected parts of land area and inland waters. Their total size is impressive 21,295,950 km<sup>2</sup>, i.e. 15.78% of the Earth's terrestrial land, thus being comparable to whole North America. Marine ecosystems are harboured in 17,781 areas

covering in total 29,452,489 km<sup>2</sup> (8.13% of the global ocean). In national waters (Exclusive Economic Zones, EEZ) the proportion is sizeable 18.6%, while in Areas Beyond National Jurisdiction (ABNJ)/deep seas the state of the art is significantly less favourable (1.44 %, IUCN & UNEP 2022, cf. PLESNIK & HANEL 2021). It is hard to believe that still in the early 1960s the global protected area estate was only the size of the United Kingdom, i.e. approx. 250,000 km<sup>2</sup> (DUDLEY *l.c.*). Particularly as consequence of establishing huge marine reserves, since 2010 the total size of protected areas on Earth has increased by more than 21 million km<sup>2</sup>, which is 41 % of the world's protected area system current size and twice as Europe (IUCN & UNEP 2022).

As of July 1, 2022, the global target to protect at least 30% of the planet's land and ocean by 2030 was supported by more than 100 countries including seven most economically developed ones and in accordance with the EU Biodiversity Strategy for 2030 also by the European Union (HAC 2022). In addition, particularly some academicians and NGOs as well as the Head of the Roman Catholic Church urge and promote opinion raised by the recently deceased American scientist Edward Wilson to cover by protected areas a half of the Earth's surface (WILSON 2016) by 2050 at the latest. The targets convinced supporters who stress, *inter alia*, that they can at the same time enhance climate change mitigation and adaptation (TALLIS *et al.* 2018, DINERSTEIN *et al.* 2019, 2020, WALDRON *et al.* 2020, YANG *et al.* 2020, UNEP 2022, ZENG *et al. l.c.*). On the other hand, opponents emphasize that the targets can, *inter alia*, possibly impact on global food production, human health and rights of indigenous people. Indigenous people at present manage at least a quarter of the Earth's terrestrial surface including a third of protected areas (BÜSCHER *et al.* 2017, MEHRABI *et al.* 2018, SCHLEICHER *et al.* 2019, VISCONTI *et al.* 2019, COUNSELL 2022, HENRY *et al.* 2022). The long-awaited decision shall be taken at the 15<sup>th</sup> meeting of the Conference of the Parties to the Convention on Biological Diversity in Montreal, Canada in December 2022.

## Protected area is effective if.....

The above data can easily give impression of that global area-based conservation is O.K. and better than on the right track. Unfortunately, it is not the case. Effectiveness has been for quite some time Achilles heel of protected areas (PLESNIK 2008).



The Ichkeul National Park in northern Tunisia was declared in 1980 as a UNESCO World Heritage Site. In addition to a lake important for migratory birds it harbours the forested mountain landscape © Jan Plesnik

The Mount St Helens National Volcanic Monument covering 450 km<sup>2</sup> within the Cascade Mountains (Washington State, U.S.A) was established after the volcano eruption in 1980. The whole area destroyed by the eruption was left to spontaneous development having resulted in a successful forest ecosystem restoration by nature there. © František Pelc

The increasing number of protected areas in the world as well as their total coverage may not indicate their effectiveness. Although the data on the size of protected areas in relation to the total country's or continent's territory (the percentage protected of the country's or continent's territory, *i.e.* the total area of a country's or continent's protected areas is divided by the total area of the country or continent) is relatively well available, easy to apply and is understandable for the general public, decision-makers and politicians, it is not necessarily an indicator for either effective or efficient conservation because does account for biodiversity, ecosystem services and social equity within and

around protected areas, nor for the connectivity between them. Therefore, management and governance effectiveness need to be considered in the context of conservation target at all times.

Protected area effectiveness *sensu lato* shows the degree to which conservation targets are met by the respective national park, nature reserve or protected area management while management efficiency reflects the ratio between the management result and management effort to reach the result (HOCKINGS *et al.* 2006). Due to plethora of protected area designations, variability in protected area manage-

ment and various nature conservation targets, approx. 70 methods to assess protected area effectiveness have been developed (HOCKINGS 2003, LEVERINGTON *et al.* 2010a, 2010b, RODRIGUES & CAZALIS 2020, IUCN & UNEP *l.c.*).

While some studies concluded that protected areas safeguard the future of biological diversity and reduce impacts of drivers threatening it (JOPPA & PFAFF 2011, BARNES *et al.* 2016, GILL *et al.* 2017, VIMAL *et al.* 2021, FENG *et al. l.c.*, MACKINNON *et al.* 2020, PACIFICI *et al.* 2020, CHEN *et al.* 2022), other authors assert the exact opposite (GASTON *et al.* 2008, CRAIGIE *et al.*



Protected areas cover almost 40 % of the Croatia's territory. In consequence of war in former Yugoslavia the Plitvice Lakes National Park often visited by tourists from the Czech Republic was put on the UNESCO List of World Heritage in Danger in 1993 - 1997. © Jan Plesnik

The Kaziranga National Park in the Indian state of Assam is remarkable for rich flora and fauna in the flooded floodplain of the Brahmaputra River. The most recent data show that the park is inhabited by 2,600 Indian rhinos (*Rhinoceros unicornis*), *i.e.* by two thirds of the global population. © František Pelc



As it proved during the COVID-19 syndemics importance of green areas on the urban outskirts for human health has been underestimated (Daleje nad St Prokop Valleys Nature Park on the south-western margin of Prague). © Jan Plesník

2010, VENTER *et al.* 2014, PIMM *et al.* 2018, WILLIAMS *et al. l.c.*). Many protected areas can effectively protect habitats but not wild animal populations within them (GELDMANN *et al.* 2013). As it can be supposed investments and appropriate management enhance territorial protection effectiveness (GELDMANN *et al.* 2015, WAUCHOPE *et al. l.c.*). Countries with lower agricultural activity, higher economic growth and better governance are most strongly associated with greater country-level protected area effectiveness (SHAH *et al.* 2021).

On a global scale, there has not been from various reasons an analysis of protected area network effectiveness: over 55,000 evaluations of protected area, *i.e.* 18 % of their total coverage, have already been completed through the Global Database on Protected Area Management Effectiveness (RODRUGUES & CAZALIS *l.c.*). Till now the most comprehensive analysis based on data from 12,315 protected areas across 152 countries concluded that many protected areas are able to reduce human pressure and to buffer the wild populations and habitats they contain from human impacts on the environment. Over the past 15 years the sample of protected areas has been on average in this respect not more effective than matched unprotected areas (GELDMANN *et al.* 2019). At the

local extent, biodiversity, precisely speaking species richness (number of species) and numbers of the monitored species can be after all higher inside protected areas than in their surroundings (GRAY *et al.* 2016).

### What makes protected area effectiveness harder on a global scale

There are various reasons why protected areas do not carry out their mission and their detailed debate goes beyond the scope of this article. Approximately one-third of the global protected area estate is already under intense human pressure (JONES *et al.* 2018). Protected areas were mostly established without systematic conservation planning, but *ad hoc* and from aesthetic motives. We should also add that protected areas have been often declared not in areas where it is (urgently) needed but where their establishment do not conflict with other competing land uses, simply said where they never mind that (BALDI *et al.* 2017, VENTER *et al.* 2017). At the same time, many protected areas, particularly those in densely populated economically developed world's regions, maintain and preserve valuable parts of nature, but on small, from a point of view of effective conservation and management often unsatisfactory territory.

In Europe 67% of terrestrial protected areas cover less than one square kilometre (BISE 2022).

It is no secret that protected areas worldwide suffer from lack of finances. Data from 2,167 protected areas (with an area representing 23% of the global terrestrial protected area estate) confirm that less than a quarter of these protected areas have adequate resources in terms of staffing and budget – and this reflects even the state of the art before the COVID-19 syndemics (COAD *et al.* 2019). Let us repeat that the overall benefit:cost ratio of an effective global protected area network is at least 100:1 (BALMFORD *et al.* 2002). At the same time, governments worldwide spend per year in support that is potentially harmful to biodiversity five to six times more than their total spending for biodiversity protection and conservation (OECD 2020).

Unfortunately it does not appear that the state of the art shall in the near future change. Anthropogenic land use is expected to continue in expanding into protected areas due to increasing human demand for resources including land for agriculture and forestry, and to accelerate (GELDMANN *et al.* 2019). Despite huge efforts from some countries for connectivity between protected areas and for functionally integrating them into the surrounding landscape more than 90% of the global protected area estate have been continuing to be islands of the natural or close to nature environment isolated in the landscape heavily transformed by man (WARD *et al.* 2020). Territorial protection has had to deal with invasive alien species impacts literally all over the world (LIU *et al.* 2020). On the other hand well-managed protected areas can remain effective in preserving the target species despite climate change (LEHIKOINEN *et al.* 2019).

### Some thoughts instead of clever-clever conclusions

Let us be clear. We neither assert that territorial protection has fulfil its mission in global biodiversity conservation, nor enthuse about to stop establishment of new protected areas. Just on the contrary for preserving biological diversity in the often unexpectedly changing world deliberately selected, well managed and over a long period viable protected areas have been and shall be absolutely necessary. Moreover, we are profoundly convinced that newly declared protected areas should provide, except the cases when being under time pressure, from the very beginning the relevant protection, conser-



The Hinchinbrook Island National Park in tropical Queensland secures the survival of one of the most threatened ecosystems worldwide – mangroves. Also the area situated on north-eastern Australia was inscribed on the UNESCO World Heritage List.  
© František Pelc

vation and management. Instead to often chase after the highest number of protected areas and their maximal proportion to the whole country's territory, continent, land or sea area, more attention should be paid to high-quality nature and the landscape protection, conservation and management in areas having been formally declared to maintain and preserve natural and landscape heritage (*cf.* MACKINNONN *et al.* 2021). Thus, there is concern that focusing solely on the percent area coverage of the global biodiversity conservation targets could be at the detriment of achieving the quality elements of the target. In other words, we should preferen-

tially try to consistently and wherever possible enhance and improve protection, conservation and management of the existing protected areas, particularly from a point of view of their representativeness, effectiveness and connectivity, as it is explicitly said by the above targets within the Global Biodiversity Framework having been just negotiated within the Convention on Biological Diversity (UNEP 2021, 2022, *cf.* MAXWELL *et al.* 2020, ADAMS *et al.* 2021, GELDMANN *et al.* 2021). We intentionally recall the statement many times repeated that less is sometime more and that it is about time quantity gets quality.



The majority of the Cheetah (*Acinonyx jubatus*) current range (77%) occurs outside protected areas where the species faces multiple threats. © Jan Plesník

## PROTECTED AREAS AND CLIMATE CHANGE

If protected areas of various categories cover more than one-sixth of the Earth's terrestrial land and one-twelfth of the global ocean they cannot avoid current and projected climate change impacts. Climate change impacts may have already affected protected areas to a degree that makes it impossible to achieve their conservation targets (SCHEFFER *et al.* 2015). Many wildlife species, particularly cryophilic taxa, will not anymore find suitable habitats within them. In addition it is projected that increase in global mean temperatures by 2 OC above pre-industrial level will change the environment in 58% land area within protected areas by 2050 (DOBROWSKI *et al.* 2021). The predicted climate-induced redistribution of biodiversity suggests that many protected areas will not retain their current biodiversity: thus further shifts in the distribution range will affect more species enjoying territorial protection than today (HOLSINGER *et al.* 2019). Biodiversity loss within protected areas is rarely compensated for by incoming biota (FUENTES-CASTILLO *et al.* 2019).

Protected areas at both extremes of gradients are most exposed to climate change, namely small protected areas at low elevation, with low geodiversity, high human pressure and low irreplaceability for threatened species; and large protected areas at high elevation, with high geodiversity, low human pressure and high irreplaceability for threatened species (HOFFMANN & BEIERKUHNLIN 2020, HOFFMANN 2022).

Various methods, tools and approaches how to reasonably mitigate climate change impacts on protected areas and/or how to adapt properly them to the serious processes have been proposed (HANNAH *et al.* 2007, HUNTLEY 2007, ARAÚJO 2009, PLESNÍK 2009a, 2009b, RANNOV *et al.* 2014, THOMAS & GILLINGHAM 2015, GROSS *et al.* 2016, MARQUET *et al.* 2019). Moreover, euphemistically said their implementation in practice has been significantly lagging behind although the fact might determine protected area effectiveness just in the near future (ELSEN *et al.* 2020, PARKS *et al.* 2022).

In addition neither well located, adequately financed and effectively, *i.e.* by involving all the stakeholders, managed protected areas are themselves enough. Relevant management of the broader unprotected landscape, particularly ensuring its suitable composition, structure and functioning (“health”) should complement in this respect the irreplaceable role of protected areas. But this another, although in some aspects resembling story. ■



Martagon lily (*Lilium martagon*) in the Triglav National Park.  
© Zdeněk Patzelt



## BioLog

<http://biolog.nature.cz>

Species recording is a crucial source of data for nature conservation. The recording needs to be effective, precise and comfortable. Recent technologies are suitable environment to do so. The BioLog Android application by Czech Nature Conservation Agency, serves as an effective way to collect records in the field or just while hiking in nature. BioLog provides an off-line notepad for your observations of animals, plants or fungi in the nature of Central Europe.

The application enables automated localisation (via Google maps) and recording in structured form, which is possible to be imported into Species Occurrence Database of NCA (<https://portal.nature.cz/nd>) or to be exported.

BioLog could be used as a hint source for species search or species local distribution atlas, from the opposite side. Through filtering of Species Occurrence Database via the Around Me function you can get the records collected near to your position on the screen. Your new records through BioLog can then easily enrich this distribution atlas.

The app is connected to the Species Occurrence Database and therefore collected records could be used in wide spectrum of conservation practice based on species presence: as a ground of administrative issues, for management of the specific areas, for assessments on local and regional levels.

## Species Occurrence Database

<https://portal.nature.cz/nd>



Species Occurrence Database is a valuable information resource for experts and all interested in species in Czechia. It is a central species data repository on the national level.

Database encompasses more than 32 million of localised and dated records of 24 thousand species. Three quarters of data are of plants, animals are making a fourth quarter, fungi and lichens do not reach one percent of the data volume. Most of the data are results of expert research and monitoring, but the involvement of public in the citizen science project shows a growing trend.

Former intention to build a database for expert and official use made the growing public interest and open data policy outdated. The data (except of sensitive records) are today available under the Creative Commons License for any registered user.

Public are grid maps of species distribution (available at <https://portal.nature.cz/kartydruhu>), which are generated on a day-to-day basis on the actual state of database, the published knowledge is very recent. The grid maps enable the comparison with published and digitized species distribution atlases. Data are available also in BioLog, the Android app in Around Me function.

Full records are accessible through Filter (at: <https://portal.nature.cz/nd>), the main gate to the database: just put the species name or other conditions. If you are interested what species you can find in your home municipality (if it is in Czechia), just try to search...

# Summary of 2022 Issues

## On Nature in the Czech Republic

### Drbal K.: Looking Back on the International Year of Caves and Karst

The International Union of Speleology (UIS) has declared 2021 as the International Year of Caves and Karst (IYCK) under the motto Explore, Understand, Protect. The importance of the action can be highlighted by the fact that the karst landscape covers approx. 20 % of Earth's surface, karst gravitation water accumulations/aquifers provide about one tenth of global drinking water supply and caves are visited by approx. 150 million tourists a year, thus supporting national economies. Just these numbers are quite sufficient argument for declaring the International Year of Caves and Karst. In the Czech Republic, many excursions, field trips, exhibitions, explorations, workshops and conferences have been organized as a contribution to the IYCK. Due to ongoing COVID-19 pandemic and measures taken against it the UIS has decided to extend actions under the umbrella of the IYCK through 2022.



### Jindřich Prach, Mottl Josef, Vojen Ložek, Lucie Hružová, Jaroslav Veselý, Tomáš Urban & František Pojer: Fragments of Successes from the Landscape of Changes and Stability: the Český kras/Bohemian Karst under Protection of the Protected Landscape Area for a half a Century

In 2022 half a century has passed since declaration of the rich limestone landscape not far from Prague a Protected Landscape Area (PLA). The Český kras/Bohemian karst (Central Bohemia) is a textbook of changes in nature, from a sea with trilobites almost half a billion of years ago up to

current overgrowing the landscape and decline in rare species. Unlike mountain and remote protected areas nature and the landscape have been shaped also by humans for many thousands of years there and it would be incorrect to consider nature conservation without humans, land managers and visitors. The article presents half a century of rapid social changes as well as changes in the landscape and nature in this picturesque, dynamic and at the same time in some aspects stable area. Stable with respect to the fact which phenomena have been preserved under the title of the PLA, particularly by recovery and replacement of traditional management. The authors believe that the Český kras/Bohemian Karst will continue to be successfully preserved and managed in collaboration among nature conservationists, land managers, naturalists and many others, thus effectively maintaining its basic phenomena for future generations.

### Antonín Krása: Distribution of the Clouded Apollo (*Parnassius mnemosyne*) in the Moravský kras/Moravian Karst



In 2021, the Czech Entomological Society declared The Insect of the Year for the first time: the critically endangered Clouded Apollo (*Parnassius mnemosyne*) was selected for the campaign. There were more reasons to do it: the aim was to popularize entomology as well to draw attention to the elegant and rare umbrella species. At the same time an appeal appeared asking the general public to seek for the butterfly species in the field, thus contributing to present knowledge of the state of its populations across the Czech Republic. Because such a population lived and lives also in the Moravský kras/Moravian Karst (Central Moravia), having been rather ignored for

a long time, the article summarises outputs of its four-year monitoring there. It is encouraging that they are mostly positive. Generally, the current Clouded apollo's state in the Moravský kras/Moravian Karst and its vicinity looks very good, many trees have dried up and other were killed by drought together with wood-destroying insects and fungi. On the majority of the area inhabited by apollo's, relatively natural broad-leaved deciduous or mixed forests grow but tree drying caused by climate drought also occurred there, reserves left to spontaneous development and primary/virgin forests have naturally become less dense thus positively influencing the Clouded apollo's population there.

### Michal Hejna & Olga Suldořská: Caves in the Český kras/Bohemian Karst

Karst and caves – the terms belong inherently together. Moreover, in the Český kras/Bohemian Karst (Central Bohemia) number of discoveries of known caves grew very slowly, much less attention by explorers and researchers was drawn to them there in comparison to the Moravský kras/Moravian Karst. Even the name of the Český kras/Bohemian Karst asserted slowly and strenuously. The contribution very briefly sums up development in knowledge of caves in the karst area. The Český kras/Bohemian Karst is unique neither due to its size nor the length of caves but due to extremely long-term karst development, complicated speleogenetic processes and internationally important palaeontological and archaeological findings in cave sediments. The most recent finding in the caves there is a dating of female skeleton from the Koněprusy Caves. DNA analysis showed that she was a member of very early migration wave of modern humans to Europe more than 45,000 years ago. With a little bit of journalistic exaggeration it can be stated that the oldest modern European woman is known just from the Koněprusy Caves.

### Benda P.: Half a Century of the Labské pískovce/Elbe Sandstones Protected Landscape Area as Seen by the Director

In 2022, the Labské pískovce/Elbe Sandstones Protected Landscape Area (northern Bohemia) has been celebrating 50 years since its establishment. Despite humble beginnings the staff often did great things at that time. After endorsing the Act on Nature Conservation and Landscape Protection in 1992 the PLA Administrations staff



was strengthened, suitable facilities were built and necessary finances were available. The Labské pískovce/Elbe Sandstones PLA Administration staff also increased in number and some excellent personalities have been up to now working there. Particularly Werner Hentschel was appointed as Head of the PLA Administration and began to cooperate with the Sächsische Schweiz/Saxon Switzerland National Park: such a cooperation has been of utmost importance for the PLA. At present the PLA Administration has been fighting efforts to use the open landscape for building, unsuitable forestry and agriculture production, real biodiversity loss and intentions to canalize the Labe/Elbe River there. What to wish for the future? We wish our successor wrote about us with respect and appreciated what has been done for Labské pískovce/Elbe Sandstone nature.

#### **Bauer P., Benda P. & Härtel H.: Looking Back on Fifty Years of the Labské pískovce/Elbe Sandstones Protected Landscape Area**

Fifty years of the Labské pískovce/Elbe Sandstones Protected Landscape Area (northern Bohemia) provide an opportunity to assess how its Administration has been reflected in nature and the landscape within the unique area. Therefore, the article presents an extensive account of main events or milestones in nature conservation within the Labské pískovce/Elbe Sandstones as well as the Českosaské Švýcarsko/Bohemian-Saxon Switzerland. Nature and landscape management in the Labské pískovce/Elbe Sandstones aimed through all measures at maintaining landscape heterogeneity and landscape scenery/character, at management of rare species and their habitats as well as at recovering some species which have become extinct due to human activities there. The Administration step-by-step makes efforts to complete a network of small-size Specially Protected Areas in order to give sufficient atten-

tion to species and their communities/assemblages which need the active management. Such an approach of course requires good partners who are considered by the Administration to be very important players. Without farmers and local authorities it has not been possible to maintain the Labské pískovce/Elbe Sandstones and České Švýcarsko/Bohemian Switzerland's current face.

#### **Cílek V.: The Composed Landscape**

When Piotr Migoń, a Polish geomorphologist published the monography called "Geomorphological landscapes of the World" in Springer Verlag/Publishing in 2010, the Česko-saské Švýcarsko/Bohemian-Saxony Switzerland appeared among landscapes of European importance because of not only its beauty, but also as a place where an important continental branch of European Romanticism was formed being conceived in quite another way than the English one. From a pan-European point of view the area is probably the most distinctive and landscape-rich region in the Czech Republic as a whole although cannot be compared from a botanical point of view with e.g. the Český kras/Bohemian Karst or the Džbán/Jug Plain. The principal determinative element there is the Labe/Elbe River cut by high walls into Cretaceous sandstones. The Českosaské Švýcarsko/Bohemian-Saxon Switzerland landscape consists of three originally very different phenomena: a huge river valley, sandstone formations and volcanic elements highlighting its truly continental importance.

#### **Jurajda P. & Kalous L.: Non-native Fish Species in Waters of the Czech Republic**

In Ochrana přírody/Nature Conservation Journal 6/2021 the issue of plant and animal invasive alien species has been extensively and synoptically analysed including new legislation that had entered in force in the Czech Republic in 2021. The European Union adopted Regulation No 1143/2014 on the prevention and management of the introduction and spread of invasive alien species. The EU's law has been repeatedly complemented by an updated list of invasive alien species of Union concern (the Union list): as of 1 June 2022 it included 66 species requiring stricter measures to be implemented. Among the invasive alien species listed there also are fishes: of them, two, namely the Stone moroko (*Pseudorasbora parva*) and Pumpkinseed, also known as the Common sunfish (*Lepomis gibbosus*) occur also in the Czech Republic. For dealing with fish invasive alien species in the Czech Republic suitable fishery management should be carried out



because non-native species can, but also may not to pose a threat to native species and habitats. Most vulnerable water ecosystems are small backwaters: to avoid negative impacts on native species and ecosystems, they should be a priority.

#### **Nováková A.: The Octopus Stinkhorn – An Exotic Member of Mycobiota in Nature of the Czech Republic**

Walking in nature, we can meet many fungi in the Czech Republic throughout the year. Their fruiting bodies differ in shape, size or colour. Fruiting bodies of the Octopus stinkhorn, also known as the Devil's fingers (*Clathrus archer*) with red arms resemble starfishes and due to their exotic appearance they are highly visible. The conspicuous species of the Czech Republic's mycobiota is native to Australia, Tasmania and New Zealand: moreover, it has spread in Europe and other areas. Although the Octopus stinkhorn has been step by step spreading across the whole country's territory, it has been totally missing in some regions. The fungus is a significant synanthropic species, preferring sparse semi-cultural to ruderal growths in river and brook valleys or in the vicinity of fishponds, i.e. at sites with higher groundwater level. The Octopus stinkhorn is considered to be an inedible mushroom; in the Czech Republic it is classified as non-native fungal species posing no threat for the current ecosystem there.

#### **Hejna M.: Calcareous Tufa at Svatý Jan pod Skalou/St. John under the Rock and its Caves**

Calcareous tufa at Svatý Jan pod Skalou/St. John under the Rock and its caves is the smallest karst group within the traditional karstological classification of the Český kras/Bohemian Karst (Central Bohemia). At the same time these are not only in the Český kras/Bohemian Karst caves created in

the most recent rock. The whole calcareous tufa cascade at Svatý Jan pod Skálou/St. John under the Rock is an internationally significant site for stratigraphy and knowledge of development in climate during the Holocene. In the calcareous tufa shells of molluscs occurring in the vicinity or just on the cascade's surface at the time when the respective calcareous tufa layer were created have been preserved. In addition, there are many woody plant leaf imprints as well as other palaeontological and archaeological material there. According to the stable carbon and oxygen isotope ratio within the calcareous tufa the development of climate and the environment during the latest/current geological epoch – the Holocene can be easily traced. A main article summarizing the knowledge of the site published in Quaternary International journal in 2002 has been cited in international literature approx. fifty times.



#### Zajíček P.: Parts of the Na Špičáku Cave Inaccessible to the Public

The Na Špičáku Cave (northern Moravia) has been known since time immemorial: it is mentioned in historical records as early as in the 15<sup>th</sup> century. In addition, there are many epigraphic inscriptions, engravings and paintings on walls in the underground space. It is the smallest show cave in the Czech Republic: a part accessible to the public is 220 meters long out of the total of 410 meters. Less than 200 meters of corridors deviating from a visitor path are not excessively large. Moreover, there are remarkable evidences of history, particularly inscriptions and paintings on the walls, stalagmite/stalactite decoration is beautiful there as well as at some sites characteristic moldings confirming a long-term history of the whole cave system. In the longest inaccessible to the public branch of the cave system under Špičák Hill, there is an abyss leading to the underground water surface. In another shallow abyss called the Kostnice/Ossuary Pleistocene cave bear bones have been found.

#### Pešout P. & Šíma J.: What Does the European Union's Nature Restoration Law Mean for Nature Restoration in the Czech Republic?

On 22 June 2022, the European Commission published a proposal of the Regulation of the European Parliament and of the Council on nature restoration as a key legislative tool for the EU Biodiversity Strategy for 2030 implementation and as a pillar of the European Green Deal. The Regulation does not aim at restoring ecological functions in natural habitats only, but also in the landscape as a whole, groups of ecosystems of farmland, cities, forests, watercourses or on habitats important for pollinators. Most measures do not focus on specially protected parts of nature, but on the landscape managed and inhabited by humans. It is clear that without total improvement in the state of farmland/agroecosystems, forests and water ecosystems, without changes in approaches in land-use/territorial planning the targets simply cannot be reached. In freshwater ecosystems, there is e.g. a commitment that at least 25,000 km of negatively affected rivers will be restored into free-flowing rivers by 2030 through the removal of primarily obsolete barriers and the restoration of floodplains and wetlands. For forests, the Regulation assigns to EU Member States to enhance diversity/heterogeneity in their species, age and spatial structure aiming at increasing their quality, resilience/resistance and biological diversity. The Regulation's cornerstone is developing the National Nature Restoration Plan of the Czech Republic: to meet its goals and targets, it will be necessary to ensure appropriate financial support through adapting both EU and national financial tools. In addition, monitoring schemes have to be complemented and after it will be debated, changes in the Regulation itself should be expected.

#### Knížátková E. & Havel P.: The National Commitment to Increase the Coverage and to Improve the State of Protected Areas in the Czech Republic

Similarly to the other European Union Member States, the Czech Republic should present the particular proposal how to increase the coverage as well as protection and management intensity in protected areas by the end of 2022. The task is included into the EU Biodiversity Strategy for 2030 which considers effectively managed protected areas as one of the key tools to halt biodiversity decline and loss and which aims at protecting 30 % of the EU's land, a third of them to be strictly protected. Contributions of the individual EU Member States should take into account different conditions and reflect their real importance for

biodiversity conservation. What can be in the above time period offered feasibly by the Czech Republic has been debated by experts. Moreover, it has been more and more becoming clear that biodiversity decline and loss cannot be halted by protected areas only and the efforts should also be targeted on the landscape outside protected areas (the non-reserved landscape) aiming also at its restoration. Both the efforts should reasonably complement each other: for this purpose, the new EU initiative provides a quite good background.

#### Nature & Landscape Management

#### Matrková J., Jurajda P. & Vlach P.: The Eurasian Minnow in the Bohemian-Moravian Highlands

Due to changes in the landscape, the Eurasian minnow (*Phoxinus phoxinus*) has been disappearing also in the Czech Republic over the past decades. Therefore, a sub-national Action Plan for the above fish species was launched in the Bohemian-Moravian Highlands in 2016. During its preparation, mapping the Eurasian minnow had confirmed concern about it: the species had been found only at 14 sites there. The fish survives often in small isolated populations in upper/source stretches of brooks. Moreover, within the dry summer of 2018 a lot of the refuges became fully dry. Thus, a project aiming at finding the sites where the Eurasian minnow has survived and where measures strengthening and enhancing its conservation should be applied was developed. The research revealed that there have been no really viable populations, except probably of the Želivka River, in the Bohemian-Moravian Highlands. At some sites, minnow's numbers have significantly declined. On the other hand, it was found that thanks to small pools in the landscape the Eurasian minnow has surprisingly survived even dry periods when there was no water flow in streams.



### Vojtěch Šťastný & Jan Riegert: Which Wetlands Are the most Suitable for Birds?

In comparison to the past, wetlands have been declined in the Czech Republic's landscape. Those left are very often affected by human activities, particularly by draining. Therefore, wetland ecosystems, or more precisely their habitats have currently been displaying various features and quality. Birds occurring there can significantly help in wetland habitat/environment assessment. The article presents results published by the authors (*Wetlands Ecology and Management*, 29, 81-91, 2021). Based on the research carried out the authors concluded that the wetland minimum size attractive for most bird species is approx. 10 hectares. Factors evidently influencing wetland bird community composition include vegetation wetness level, ration between wetland vegetation cover and open water surface and distance to road. Influence of bush cover, distance to water body and reed cover was also significant. Bush cover and reed cover were positively correlated with diversity index, while distance to water body was negatively correlated with diversity index.



### Radim Jarošek, Daniel Kletenský, Tomáš Galia & Václav Škarpich: Instream Wood Management and Monitoring on the Odra River in the Poodří/Odra River Basin Protected Landscape Area

The article deals with instream wood because in nature conservation practice it is important how pursuant to the current legislation to ensure leaving instream wood in a river thus avoiding its removal as a barrier in a stream pursuant to the Water Act and its implementing provisions. The duty is considered by watercourse managers differently, which is in principle correct since there are various situations in the field in this respect. Within a project instream wood monitoring has been implemented and efforts shall be continuing during the next three years. The project funded by the Czech

Science Foundation and carried out by the University of Ostrava will include monitoring floated wood by GPS sensors, regular photography by unmanned aerial vehicles (drones) or by using time-lapse cameras. The authors believe that such a comprehensive research will result in better understanding patterns in instream wood recruitment, remaining and mobility in meandering rivers. The monitoring's outputs can be used for instream wood management not only in the Poodří/Odra River Basin Protected Landscape Area (Moravian-Silesian Region), but also in other watercourses.

### Elznicová J., Věbrová D., Zacharová J. & Müllerová J.: Changes in the Landscape in the České Švýcarsko/Bohemian Switzerland and Labské pískovce/Elbe Sandstones throughout Time

The Labské pískovce/Elbe Sandstones (northern Bohemia) which also regionally includes the České Švýcarsko/Bohemian Switzerland harbour the landscape having been formed for millions of years. At the same time with geological components also its living part (biota) has been formed. The whole landscape had originally been covered, except for the extreme rock environment, by forests, the form, shape and extent of the latter being directly determined by natural conditions. Moreover, humans were later more and more contributing to forming the landscape and their impacts have been one of the strongest drivers initiating huge changes over time. If the human impacts decline they can be erased by natural processes and nature takes over its former area back. Such changes can be read also in an historical context. If we wish to know more on nature surrounding us and to better understand it, it is necessary to aim at recent history, particularly the last century rich in principal historical events. History of the landscape and human activities within it play a key role in understanding the current state as well as for preserving species diversity, ecosystem functions and landscape values for future generations.

### Šáfránek J.: Unwelcome Works of Art in the České Švýcarsko/Bohemian Switzerland National Park

Unfortunately, vandalism does not avoid National Parks and this is true also for the České Švýcarsko/Bohemian Switzerland National Park (northern Bohemia). Undisciplined visitors engrave various messages and inscriptions on rocks. Vandals also destroy infrastructure or tourist facilities, e.g. signboards and signposts, or paint all possible spaces including rocks. The last particularly apparent example is a series of graffiti



created by an unknown "artist" at some sites in the municipality of Hřensko and also directly in the the České Švýcarsko/Bohemian Switzerland National Park. The most apparent for ordinary visitors was a strange inscription on a rock wall near the tourist path leading through the Kamenice River Gorge/Glen. For erasing the inscriptions steam cleaning was applied because it does not damage a sandstone surface layer and rock surface is almost intact after cleaning. The story has a quite happy-end because the works of arts were despite serious difficulties erased by a specialized company.

### Šťastný V. & Bednářová K.: The Sedmihorky Peatbog Restoration

The article presents the restoration project on the Sedmihorky peatbog nearby the town of Turnov in the Český ráj/Bohemian Paradise Protected Landscape Area, which is nowadays interesting mainly because of bird populations. The project was fully funded by the European Union via the Operational Programme Environment (OPE) 2014-2020 and successfully implemented in 2021-2022. The difficult project preparation had preceded the implementation, e.g. dealing with complicated land ownership including the state property was necessary. Both the historic aerial photos of the site as well as the project documentation of an amelioration system carried out under socialism were available. The drainage site disposal and restoration of the natural water regime of the peatlands and the creation of new habitats as 14 pools were the project's aims. The clay apertures were used to terminate the amelioration system functioning. The first growing season demonstrated achievements of the project. The pools with their surrounding are full of clean water and for instance the Common Crane (*Grus grus*) successfully nested for the first time and one young fledged there.



### **Zeidler M.: Nitrogen Management in Non-forest Communities**

High level of nitrogen deposition has been responsible for ecosystem changes and important losses of plant species diversity in natural non-forest communities. In Central Europe, the natural input of atmospheric nitrogen has increased by an order of magnitude due to anthropogenic activities. From a nature conservation point of view, there are several proven ways to eliminate the impact of nitrogen on vegetation: grazing, mowing, sod cutting and burning. The advantages and disadvantages of each practice in terms of improving habitat suitability, removing N, species richness, and the unintended consequences are summarised for habitats in the Czech Republic. Long-term adaptive management accompanied by long-term monitoring are recommended for reaching the target state of the particular habitat.

### **Čamská K.: Shall It Be Necessary to Enhance a New Common Agricultural Policy?**

The Common Agricultural Policy (CAP) is a key tool for ensuring sustainable landscape and biodiversity managed linked to agricultural land within the European Union. The just completed draft CAP for the period 2023-2027 is confronted with that of the Nature Restoration Law. The latter is based on specific objectives for grassland habitats that fall within the scope of Directive 92/43/EEC on the protection of natural habitats, wild animals and wild plants, commonly known as the Habitats Directive. It requires the introduction of such measures on agro-ecosystems, so that it manifests itself in a change in the trend in the status of insects, birds and soil from negative to positive.

### **Hofmeister J. & Svoboda M.: What Does the European Union's Nature Restoration Law Mean for Forests in the Czech Republic?**

The EU Nature Restoration Law sets an ambitious and highly demanding, but if fully implemented effective target to carry out measures to improve the state in natural habitats by 2050 everywhere where necessary, *i.e.* in all ecosystems in need of restoration, but by 2030 at least on 20% of the European Union's land and sea areas. If nature should be really restored within the EU, a way the Regulation is implemented is of the utmost importance. Not only in forests but particularly there we should employ creative forces of nature when at the same time reasonably applying management approach. If we are able to establish a functioning network of forest habitats on the landscape level or even better on sub-national one open to impacts of natural disturbances and more comprehensive food webs the latter including large herbivores as well as their predators, we will be surprised that huge proportion of workload in specific open forest space management can be done just by nature itself instead of humans. Thus, nature conservation effort could be more focused on spatially small and in the cultural landscape isolated sites having been left out of reach of positive effects of restored forest ecosystems.

### **Kujanová K. & Marek P.: Will the European Union's Regulation on Nature Restoration Match Water Framework Directive Unmatched Ambitions?**

The Water Framework Directive (Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, hereinafter WFD) has been implemented in the Czech Republic more than two decades. Nevertheless, the implementation has been very slow providing only minimal impacts on improving the state of waters as a whole. The proposed Nature Restoration Law published by the European Commission on 22 June 2022 offers a new challenge to really meet the particular targets within free-flowing watercourses. Moreover it has been a question whether the EU Member States are even when making every effort able to honour a joint commitment to restore 25,000 kilometres of free-flowing rivers. Based on the experience raised during improving morphological state of watercourses and removing barriers in the Czech Republic during the past 30 years, it is clear that due to the recent and current rates the Czech Republic will not be able to match its fair commitment, even just formally. If the Czech Republic should be able to match the fair part of the commit-

ment to restore free-flowing rivers, in addition to significantly increased effort to implement the measures more attention has to be paid to prepare an infrastructure for applying the Regulation in the field and to positively motivate the general public. Nevertheless, cooperation among various sectors and responsible involvement of all the institutions and components dealing in practice with water ecosystem management is a fundamental precondition of the Regulation's successful implementation across the country.

### **Just T.: Have We Been Prepared to Use of Benefits of Floods for Improving the State of Watercourses in the Czech Republic?**

Floods occurred in the Czech Republic in 1997 and 2022 made difficulties nobody had been prepared to face and most people involved in their mitigation did their best. Definitely it was possible to do a lot of issues better, *inter alia*, during controlling damages caused on watercourses by the floods. The devastating floodings offered also lessons learnt from involvement of the State Nature Conservancy authorities which can help to avoid doing useless and harmful steps, and on the contrary some positive aspects of floods can be used. Based on knowledge from the past floods *e.g.* it is clear that riparian woody plant growths had been often accused of causing the disaster: therefore, they were consequently cut. Positive functions of the growths, *e.g.* buffering overbank flows or capturing the material brought by flood waves particularly outside built-up areas were ignored. Therefore, a two-step assessment is needed because it allows distinguish what is a real damage and what to some extent accepted changes. Applying reasonable approach, flood damages can be a useful tool for restoring the natural state in the selected watercourses.

## Research, Surveys and Data Management

### **Sedláček O.: The Alcon Blue in the Czech Republic**

The Alcon Blue, sometimes called also the Alcon Large Blue (*Phengaris alcon*) is among a huge range of diurnal butterfly species which have been balancing just on the edge of survival (Hejda *et al.* 2017). Although the butterfly can be very easily detected in the field, our knowledge on its current distribution, population size or state of habitats has been rather incomplete (Uříčář & Laštůfka 2013). In 2020, a comprehensive mapping the species financed by the Landscape Management Programme, *i.e.* from the State/Governmental

Budget, namely its ecological forma *P. alcon* f. *alcon* associated by its development with the Marsh gentian (*Gentiana pneumonanthe*) was carried out by the author. The distribution of the plant species is, however, limited to only a few last sites in southwestern Bohemia: in other parts of the Czech Republic, the gentian has become extinct. The research revealed that if we are going to maintain both the fascinating butterfly species and the splendid gentian in the wild in the Czech Republic it is necessary not only to keep the sites, but also to actively support the occurrence of both species. If there are enough butterfly's host plants the butterfly evidently prospers there. In addition, a re-introduction attempt showed that thought-out, elaborated and well-done transfer can help the threatened invertebrate species.



#### Vlašín M.: A Population of the Aesculapian Snake in the Vlára River Pass and its Protection and Conservation

The Aesculapian snake (*Zamenis longissimus*) is one of the biggest European snakes. Pursuant to Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection, as amended later, and the relevant decrees, the species is Critically Endangered. The Action Plan for the Conservation of the Aesculapian Snake in Europe (Edgar & Bird, 2006) recommends to develop and implement national action plans/recovery programmes in all countries with occurrence of isolated populations. Therefore, the national Action Plan/Recovery Programme was elaborated in the Czech Republic by Zavadil *et al.* (2008), having been later updated (Větrovcová *et al.*, 2010). The document suggests, *inter alia*, to carry out regular monitoring the species in all areas of its occurrence across the country and to implement supporting measures, *e.g.* building dry small walls, semi-natural hatching sites, *etc.* Within the monitoring, a population studied in the Bílé Karpaty/White Carpathians Mts., *i.e.* in Vlára River Pass and in the Žitkov region is

by demotope (the area inhabited by a certain population) the biggest of the three ones living in the Czech Republic. Nevertheless, the population density is quite variable and it seems to be most likely lower than in a population inhabiting the Podýjí/Thaya River Basin. Taking into account that this is a margin of the Aesculapian snake's distribution range it is necessary to carry out intensive efforts to maintain the population in the Bílé Karpaty/White Carpathians Mts. The necessity of close transboundary bilateral co-operation with Slovakia is evident.

#### Pavlíčko A., Heřman P. & Fric F.Z.: Has the Baton Blue Become Extinct in the Czech Republic?

The Baton blue (*Pseudophilotes baton*) is the Atlantic-Mediterranean species declining across Europe and occurring from the Iberian Peninsula to Central Europe: in the latter, there is eastern limit of its distribution range. In most of its distribution range, the species display two-generation development (May – June, August – September), in cold areas or years single-generation one: the latter prevails in South and probably southwestern Bohemia. In the Czech Republic, only a few small Baton blue populations in South and southwestern Bohemia has until recently survived. At most historical sites the species has become or has been becoming extinct. A study commissioned by the Nature Conservation Agency of the Czech Republic aimed at the current state of Baton blue populations at the individual sites and thus, at revealing abundance and level of threat across the whole Czech Republic. After two years of research and surveys, a drastic decline in the whole Czech Republic's population was found. Therefore, it is possible that the butterfly species has gone extinct in the country because the most recent confirmed findings were reported from the Šumava/Bohemian Forest Mts. in 2019. The recovery of the Baton blue in the Czech Republic including direct semi-natural breeding started in 2022 has become very urgent, if it is not too late.

#### Dana Klímová Hřívová, Jana Petruželová & Marie Kotasová Adamová: Meadow Wetland Restoration and its Influence on Water Invertebrates

In the Czech Republic, lowland wetland meadows are one of the most threatened habitats. The main drivers of their decline and loss include particularly decline in traditional management measures, targeted draining, consequent overgrowing by natural self-seeding as well as spreading aggressive plant species the latter excluding wild plant and animal species there. Thus, suitable meadow

wetland management should aim namely at maintaining an open character of the above habitat effectively provided by grazing and mowing. Although it is not at first glance recognisable, the measures can significantly influence also small water bodies if management is implemented in their close vicinity. The article presents the project entitled Management measures and assessment of their impact on meadow wetland biodiversity and it introduces the pilot results of water body hydrobiological monitoring in a meadow wetland near the village of Krumvíř (South Moravia). The first results show that pools in the early stage of their development serve as a refuge for many species including those fully new for the wetland under study. Removing vegetation by mowing and grazing in the vicinity of the pools would result in increase in nutrient level there. Eutrophication is an issue far exceeding management at the single site which can be substantially mitigated only by extensive measures within the region as a whole. New knowledge on impact of the properly set wetland habitat management would contribute to elaborating measures to be applied in degraded meadow wetland restoration on a wider scale and thus to important agriculture landscape improvement.

#### Svoboda J.: The Last Hunters, Fishermen and Food Gatherers. Interdisciplinary Archaeological Survey in the České Švýcarsko/Bohemian Switzerland

During the last 30 years one of the still empty sites on Europe's archaeological map was filled: in the České Švýcarsko/Bohemian Switzerland (northern Bohemia) nobody had expected such a long-ago human settlement. More than twenty years of systematic survey show that the rocky and seemingly bleak region was attractive only for the certain type of prehistorical populations in the early Holocene 11,000 – 7,500 years ago. These



had been exclusively hunters, fishermen and food gatherers in the to date less studied time period from the Last Glacial through the Preboreal and the Boreal up to the early Atlantic: in the subsequent periods almost up to the Middle Age these were occasional visitors. Because the survey has been from the beginning team and interdisciplinary, it has allowed to examine the human settlement in the context of the changing landscape, vegetation and fauna.

#### Čapla M. & Komárek J.: Spectral Displays of the Selected Woody Plants in the Context of Climate Change

In optical remote sensing spectral reflectance is a keystone. Ability of vegetation to reflect or on the other hand to absorb solar radiation depends on many factors: the most important ones include its photosynthetic pigment ratio as well as physiological and morphological structure of leaves. The authors aimed at description and comparison of spectral displays in the selected woody plant species across the vegetation period. The data were gathered by an Unmanned Aerial Vehicle (UAV) or a drone equipped with a multispectral camera during five flight missions. The spectral display of five tree species, namely the Sycamore (*Acer pseudoplatanus*), Common or European oak (*Quercus robur*), Common hornbeam (*Carpinus betulus*), Norway spruce (*Picea abies*) and the Scots pine (*Pinus sylvestris*) were examined. The results suggest noticeably dynamic development and almost all the spectral curves corresponded with typical development of vegetation. The sharpest differences among the woody plants were reported from reflectance in near-infrared radiation (NIR) where together with green light an increase was found by August, while from August there was a decline. Lower values of the reflectance in blue and red part of the spectrum were detected in the middle of the season. Spectral differences between coniferous and broad-leaved deciduous trees were also clearly manifested. The above patterns were captured in the seasonal dynamics in Normalized Difference Vegetation Index (NDVI) which confirmed more dynamic development of the reflectance in broad-leaved deciduous trees.

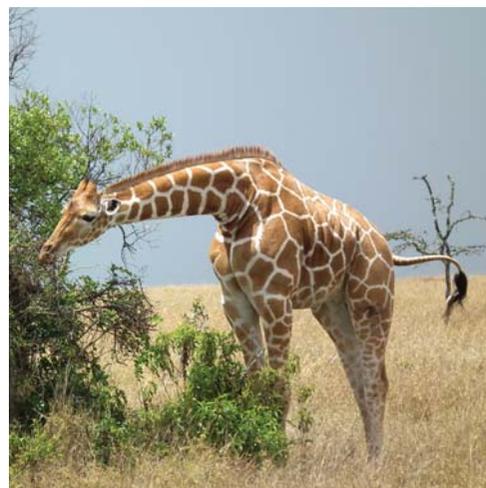
#### Balák I., Káňa V., Koudelka M., Suldoňská O. & Světlík I.: A Bear Cube from the Javoříčko Karst

In 1918 a subtle entrance into a small cave was discovered in a small limestone islet in the Javoříčko Karst (Central Moravia) during quarrying. In late July 2019, a new lesser dome 9 meters long, approx. 1.5 wide and on average approx. 8

meters high was discovered there. It contains relatively rich decoration consisting particularly of stalactites and coralite forms. In addition to cave decoration, bone remnants were found there: among them, there was a smaller vertebrate skeleton. Experts determined it as a juvenile, one-year old brown bear (*Ursus arctos*). The results of dating show that the skeleton is from the period approx. 14,000 years ago, *i.e.* from the Late Pleistocene, the very end of the Last Glacial Period.

#### Plesník J.: The Species Concept in Nature Conservation Theory and Practice

The species problem has been one of the most pressing issues in biology: there currently are at least 35 different concepts, *i.e.* definitions of the species category. Most researchers agree that species are lineages, or, more specifically, separately evolving population-level lineages. In the article, the most commonly used species concepts, namely Morphological, Biological and Phylogenetic ones are debated, paying attention to their impact on nature conservation: *inter alia*, taxonomic inflation or conservation genetic should be mentioned there. One prominent idea has been the concept of the evolutionary significant unit (ESU), a population unit that merits separate management and has a high priority for conservation. Given that biologists have spent decades trying to find a universal definition of species and have not achieved it, it has become obvious that there is no single correct definition. Proposals for pluralism are motivated by the fact that particular criteria for identifying species are not applicable in all situations and the observation that multiple concepts can give conflicting results when they are applied. The author suggests that within the pluralism, there could be an opportunity to apply nature conservation approach that the species is a group of individual varying in numbers and



important from a point of view of nature heritage management; thus it should be protected, conserved or managed: the individuals share an evolutionary and ecological history and are distinct from other groups. The longstanding disagreement should not become an impediment to responsible conservation and wildlife management.

#### Ouhrabka V. & Tásler R.: Mapping and Documenting Karst Phenomena in the Krkonoše/Giant Mts. Region

Although the Krkonoše/Giant Mts. and the region under them are not from a point of view of karst and karst underground space typical areas, dozens of small and a few more extensive caves reaching even more than 100 meters in length have been discovered and documented there. There also are surface flow sinks as well as lot of karst springs. The Krkonoše/Giant Mts. karst phenomena mostly created in crystalline limestone (marble) and calcite crystalline dolomite with significant geomorphological and hydrogeological functions have not been fully realized yet. Many Krkonoše/Giant Mts. caves were also formed in non-karst rocks (quartzites, granites, phyllites, mica-schists, *etc.*). New research carried out within a mapping resulted in key knowledge of the local carbonate age. In a wall in the Jezerní dóm/Lake Dome in the Ponikelská jeskyně/Poniklá Cave remnants of cliff corals aged approx. 285 million years were identified, thus confirming the Devonian (the Givet) age of the Poniklá carbonates.

#### Rozsypálek J., Polochová V., Bábek J., Javorský D., Prouza M., Martinek P. & Klečka J.: Knowledge on Possibilities How to Inhibit Expansive Growths of the European Mistletoe

In the Czech Republic, expansive spreading of the hemiparasite European mistletoe (*Viscum album*) has becoming a huge issue of national importance not only for woody plants growing outside forests, but also for forest stands themselves. The greatest trouble is caused by the fact that the evergreen shrub infests a lot of important broad-leaved deciduous and conifer woody plant species. Although the initial damage caused to a host woody plants is rather negligible (chronic), European mistletoe spreading should not be underestimated. Due to very rapid to expansive spreading, after five to ten years since the appearance of the first little shrubs the mistletoe becomes a pathogenic agent causing acute dying of hundreds to thousands of woody plants. The most effective defence has been proved to be

### Nature Conservation Legislation

#### Filipová P.: Fencing Pastures in the Light of the Building Act and the Act on Nature Conservation and Landscape Protection

In the Czech Republic, livestock grazing is, in addition to its “production-economical” character also an important tool for managing from a point of view of nature conservation valuable habitats. Therefore, it is subsidised from landscape management subvention programmes/subsidy schemes: land owners or tenants implementing grazing are financially supported. Thus, the question of administrative requirements for building a fence is raised. The same issue is also related to preventive measures aiming at terminating large carnivore attacks or making them difficult. In the Czech Republic’s legal system the fencing is regulated by two main pieces of legislation, namely the Building Act and the Act on Nature Conservation and Landscape Protection. Pursuant the former, such a fencing can be processed in simplified authorization procedure, because only location of a fence, not its building is regulated. Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection, as amended later, sets some other public-law limitations for putting a fence into the landscape. They include particularly those arising from territorial protection, species protection, duty to provide permeability of the landscape or from general nature conservation. The article deals with the fact that even if grazing is carried out for managing valuable habitats, it is necessary to take into account also other interests which can be in conflict with the fencing.

#### Vladimír Mana: Unified Environmental Opinion

The Unified Environmental Permission (UEP) concept was for the first time discussed within inter-ministerial comment procedure on the consultation document on recodification of public building law. The Ministry of the Environment of the Czech Republic then proposed it as an alternative to a very broad integration of administrative authorities into a new state/public building administration. The then UEP concept was based on proposing appropriation public interest protection for a special administration procedure which would result in a single administrative decision consisting of assessment of the particular intent on the relevant environmental components. The intention of the new Czech Republic’s Government to change the new Building Act revived the idea to achieve the UEP concept and the Ministry of the Environment was tasked with elaborating a legal document which would

together with amendment to the Building Act allows a real facilitation and acceleration of issuing building permits. Introducing the UEP into the Czech Republic’s legislation provides a huge opportunity to make – after many years – an important step towards a real facilitation of issuing permits for various building and non-building intents.

#### Jitka Jelínková: Controlling Fireworks and Pyrotechnics Use in the Czech Republic - a new Paragraph in the Act on Nature Conservation and Landscape Protection

New paragraph 3 included into Article 66 of Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection as a Members of Parliament’s amendment to the so-called Anti-Invasive Alien Species Amendment to the above Act (Act No. 364/2021 Gazette) sets power for the State Nature Conservancy authorities to restrict or to ban fireworks or pyrotechnics use in the defined areas. Moreover, the well-intentioned legislative initiative raises some questions in relation to more general wording of paragraph 1 Article 66 as well as to competency of the State Nature Conservancy authorities. For nature conservation practice the most important is the conclusion that Article 66 paragraph 3 does not exclude possibility to control fireworks or pyrotechnics use outside the areas defined there, through applying Article 66 paragraph 1 if the condition of the general provision are met. Rich practice of the court highlights a strong preventive feature of Article 66 because restriction or ban on these activities can be justified by possible threatening generally or specially protected parts of nature, not by only the fulfilled threat itself.

#### Mlčoch S. & Mazancová E.: Thirty Years of the Act on Nature Conservation and Landscape Protection in the Czech Republic

On June 1, 1992, Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection (ANCLP) came into force. Since that time it has been many times amended which is understandable due to a dynamic and sometimes turbulent development in the society as well as in legislation in the Czech Republic. The most important amendment transposed the European Union’s nature conservation legislation into the Czech Republic’s legal order. Recently, there has been an extraordinary pressure to make building activities easier resulting in a comprehensive recodification of the building law in 2021 including the principal changes in the ANCLP’s power. We live in extremely turbulent world which is not so much in

prevention against and early treatment of mistletoes, as long as its distribution has not been covered continuously an area but has been localised at a few trees only. Comparing effectiveness of mechanical and chemical eradication of mistletoe is very difficult and their application in the field depends on the current state of the respective woody plant and the intensity of infestation. In medium infested trees, combination of mechanical (periphery and thin branches of a tree) and chemical (where it is not possible to remove the parasite by a cut) treatment should be applied. In medium heavily infested trees with decreased vitality chemical treatment should be preferred while in heavily infested trees, if they are not veteran/memorial or otherwise important trees, it is suitable to remove of the respective woody plant.

#### Zajíček P.: An Unexpected Discovery in the Kateřina Cave

The Old Kateřina Cave (the Moravský kras/Moravian Karst, South Moravia) has been known and visited since the prehistoric times. It is evidenced by recently found and dated carbon drawing traces on walls inside the cave. Results of probes carried out close to the prehistoric drawings revealed a finding which could be expected only by hardly anybody. Artefacts found there show that there was a secret money counterfeiting workshop within the Old Kateřina Cave dated by archaeologists back to the late 14<sup>th</sup> century or the early 15<sup>th</sup> century. A discovery of a few prehistoric shards younger than the late Neolithic drawings documented at some sites in the Old Kateřina Cave should also be mentioned. Due to the fact that another carbon drawing was dated back to the Hallstatt Period it is clear that the Kateřina Cave has been visited regularly and often since the late Neolithic Period, i.e. in the Neolithic period itself, the Bronze Age, the Hallstatt Period and since the early Middle Ages.



favour of nature conservation and landscape protection. Biological diversity has been declining, only a little space is allocated for wild nature/wilderness. Further development is in hands of new politicians: the authors wish them courage and reason to make decisions to the benefit of nature.

### Stejskal V.: Thirty Years of Nature Conservation and Landscape Protection in the Judicature of the Constitutional Court of the Czech Republic



In the last 30 years of force of Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection (ANCLP) the Constitutional Court of the Czech Republic has dealt not once in its judicature on environmental law also with nature conservation and landscape protection. The article summarizes some important topics the Constitutional Court has ruled. The examples given deal with nature conservation as public interest, Specially Protected Areas declaration and nature conservation in National Parks or landscape protection. To sum up, in the last 30 years of ANCLP's effect the Constitutional Court has dealt with nature conservation and landscape protection from a point of view of the regulation based on constitutional law systematically and its opinions were always consistent and often *in favorem* of nature conservation. The exemption is the recent exclusion of civil society organisations from administration procedure if nature conservation and landscape protection can be affected in the procedure.

### Stejskal V.: Proposal for the European Union's Legislation on Nature Restoration

After some postponements, on 22 June 2022 the European Commission presented a package of legislation measures to restore damaged ecosystems within the European Union by 2050 and to

reduce the use and risk of chemical pesticides by 50% by 2030. The article tries to explain the content and targets of the proposal for the EU nature restoration regulation. The proposal is pioneering, being the EU's very first legislation proposal on the topic in nature conservation and landscape protection. Through legally binding targets in the EU Member States it has an ambition to provide damaged terrestrial and water ecosystems with appropriate restoration but also to support urban green areas or to halt decline in pollinators and to increase their population sizes. Thus, the proposed legislation, sometimes also called the European Nature Restoration Law should implement one of the key targets of the European Green Deal, *i.e.* the commitment defined in the EU Biodiversity Strategy for 2030 that in reversing biodiversity loss and nature restoration the EU should lead the world by example and by action. The Strategy makes the commitment that at least 30% of the land including inland waters and 30% of the sea should be legally protected in the EU, of them at least one third should be strictly protected including all the EU's remaining primary and old-growth forests.

### Kušnířová T. & Šikola M.: The Natura 2000 Network Will Again Expand in the Czech Republic

The Czech Natura 2000 network has not yet been declared as sufficient by the European Commission mainly due to the failure to designate several Sites of Community Importance (SCIs) with the justification of other interests in the area. In 2018–2021, bilateral meetings with the European Commission took place and the scope of the completion was agreed upon. It focuses on the addition of target features to 32 existing SCIs. The Ministry of the Environment of the Czech Republic charged the Nature Conservation Agency of the Czech Republic to prepare the proposal. The amendments will also deal with operational changes – accuracy improvement in delineation of more than 130 SCIs and excluding problematic target species due to their absence at the site, or excluding the entire non-functional SCIs. In about 1/3 of the cases, substitute site is considered. Due to the monitoring efforts, it was also possible to propose sites for the Round notothylas (*Notothylas orbicularis*), which has not been yet protected by any SCI across the country. In the first half of 2022, the proposal was pre-negotiated with the affected stakeholders and submitted to the Ministry of the Environment, which will further develop it into a legislative document for the official amendment procedure that should be completed in 2023, taking into account the schedule agreed with the European Commission.

### Pešout P. et al.: A Proposal for Revising Threatened Species Protection in the Czech Republic

In the Czech Republic, principles of current special species protection come from the second half of the 1980s. They entered into practice by Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection, as amended later and since that time they – except small adjustments due to transposing and implementing the European Union legislation before joining the EU- have not been changed. Moreover, knowledge has been significantly improved during the thirty past years and the state of nature and the landscape has also significantly shifted across the whole country's territory. Long-term negative effects are currently amplified and multiplied by climate change impacts. It is clear that species protection tools have been in many aspects outdated and their effectivity has been insufficient. We are not able to halt species richness/diversity decline and loss and to effectively protect, conserve or manage habitats of the individual species as a basic precondition of their survival. A lot of necessary changes can be reach only by those in methodologies and approaches in performing State/Public Administration and setting out economic/financial tools without changes in legislation. Nevertheless effective protection and providing the most threatened species with management need new legislation dealing with special species protection, conservation and management. The proposal of new legislation or revising special species protection is based on the following five key principles: (1) Prioritization in threatened species management separated from that in their legal protection; (2) Introducing prioritization in natural habitat management; (3) Special species protection based on their habitat conservation; (4) Introducing classification of Specially Protected Species reflecting the extent of the species protection; and (5) Using the Specially Protected Species category only in species where it is meaningful.

### Focusing on the Public

### Froněk J. & Šrailová E.: The First Pocket School Forest in the Czech Republic

Although the year 2021 was among the most difficult ones, it favoured outdoor or open-air actions for the public. During the Arbour Day, *i.e.* October 20, 2021, near the Jan Werich Elementary School in Prague, Řepy Quarter one of them was organized to put activities of people involved in good use. In the course of two days, the first "Pocket



School Forest” was planted following the example of the project “Tiny Forest” implemented by Indian engineer Shubhendu Sharma and subsequent experience raised in the Netherlands. TEREZA Education Centre Prague with other partners and participants arranged planting a new grove covering the same area as a tennis court which will present nature to schoolchildren and vice versa. Schoolchildren not only contributed to the planting, but also prepared soil there and helped to select suitable woody plant species. The whole project is based on conviction that relationship with nature is in the best way maintained and enhanced just outdoor, in greenery as well as on confidence that the project shall inspire also other schools.

#### **Hana Hofmeisterová: The Český kras/Bohemian Karst for the General Public**

The Český kras/Bohemian Karst is a very popular tourist destination. Its location in a densely populated area close to Prague with rail connection following the Berounka River simply predetermines such visits. Therefore, with the Karlštejn Castle being of European cultural importance the area has become just a magnet for visitors. In the 1970s and 1980s tramps, ramblers and weekend cottagers dominated among weekend visitors. At present, these are mostly families with children coming by train and hiking, biking and often by car. In addition to bikes, they come also e.g. with roller-skate and climbing gear. During weather-friendly Saturday afternoon where many people go into nature the Protected Landscape Area (PLA) changes literally into a sports ground for the whole region. There are many other future plans from the Český kras/Bohemian Karst PLA Administration on how to raise awareness of nature among the general public in a reasonable way, where to put new signboards, interactive elements or a whole educational path/trail. Using

data gathered by automated visitor counters installed in 2021 it has been known where efforts from the State Nature Conservancy should be targeted.

#### **Jarmila Kostiuková: Patronages of the Scout Institute – Involvement of Scouts (and not only them) in Nature Conservation**

Patronages are a project of the Scout Institute, in which groups of children and youth are involved in active nature conservation and landscape restoration. The scout unit/school class takes care of some naturally valuable site in its surroundings - by the approval of the site’s manager and also under the supervision of an expert/guide. Field interventions take place twice a year and the professional guide helps with planning, implementation and with environmental and experiential education of children. Sites suitable for the field measures are selected in cooperation with the Nature Conservation Agency of the Czech Republic, National Park Administrations and regional authorities. Patronages currently operate in the territory of the Capital City of Prague and in eight other regions of the Czech Republic; so far more than 55 scout units and school classes have participated in them. The children involved in the programme form a lasting relationship with the site, learn a lot of interesting issues about nature and inspire others with their activities.

#### **Judová J.: A Round Trip Game for Visitors at the Occasion of Fifty Years of the Labské pískovce/Elbe Sandstones Protected Landscape Area**

The České Švýcarsko/Bohemian Switzerland National Park (NP) Administration developed for visitors to the Labské pískovce/Elbe Sandstones region (northern Bohemia) at the occasion of the 50<sup>th</sup> anniversary of the Labské pískovce/Elbe Sandstones Protected Landscape Area (PLA) a game presenting some parts of the above Specially Protected Area and to learn about its natural and cultural attractions. The game aims at motivating participants for visiting the area which has been worthily protected as the PLA for fifty years, but at the same time to focus their attention to other sites than the more and more often visited central part of the NP with famous destinations, e.g. Pravčice/Prenischtor Rock Gate, the Kamenice River Gorges/Glens and the Jertřichovice Lookouts. The main output of the project will be a methodology for interested persons for receiving the “České Švýcarsko/Bohemian Switzerland NP School” certificate. For pupils of the above schools, the NP

Administration issued thematic workbooks in 2021 and a new educational programme as well as a worksheet on the České Švýcarsko/Bohemian Switzerland National Park have been under preparation.

#### **Drbal K.: New Visitor Centre in the Chýnov Cave**

After some years of efforts the Chýnov Cave (Tábor region, South Bohemia) has had a new visitor centre significantly complemented the visitor infrastructure there. The first part of the centre displays a copy of a historic industrial locomotive shed from the former Schwarzenberg’s quarry. This is not an accidental caprice. Discovery of the Chýnov Cave was closely related to just limestone mining at Pacova hora Hill and without such mining the unique natural phenomenon has never been discovered. Mining and processing local limestones have been finished and no features, except two buildings and a pit have left there. The second part of the centre is hidden bellow the terrain level at a site of the former rural quarry and it is more extensive than the above building of the industrial locomotive shed. At the same time, at the former site there is an entrance into “underground” space. The investor of the building the centre was the Cave Administration of the Czech Republic using the European Union funds, namely the European Fund for Regional Development and the Operational Programme Environment (OPE).

#### **Moravec J. & Žaitlíková L.: Golden Leaf Competition a Half a Century Old**

On 20 – 25 June 2022, a national round of the anniversary 50<sup>th</sup> year of natural science competition called the Golden Leaf was held. Really only a few contests for youth can show such a respectable age. The Golden Leaf is a competition for child groups from elementary schools interested in nature and its conservation. The activities within the Golden Leaf are organised by the Czech Union for Nature Conservation. The Ministry of Education, Youth and Sports of the Czech Republic is a co-organizer: thus, participation in the competition is recommended to elementary schools across the country. The competition consists of basic, regional and national rounds and voluntary tasks. The national round is a real, not formal grand finale of annual competition. It is a five-day event for winners of the regional rounds and a winner of partial competition, i.e. voluntary tasks, held at various places in the Czech Republic late June. About 3,000 children participate in the competition every year.

### Vítek O.: Monitoring of Visitation in Areas Managed by the Nature Conservation Agency of the Czech Republic

Since 2009 the Nature Conservation Agency of the Czech Republic (NCA CR) has been systematically monitoring visitation of the selected sites in Specially Protected Areas managed by itself. The results can be broadly used not only in nature conservation and landscape protection practice in the field, but they also are interesting for the NCA CR's partners. As length of the time series has been increasing the monitoring outputs become more accurate and more reliable conclusions can be drawn from them. Patterns found in Specially Protected Area visitation are important particularly for assessment of various intentions related to visitor attendance, e.g. various races. Moreover, they are remarkable also for planning Nature Guard activities and provide a valuable background for planning communication, education and public awareness (CEPA) including building and maintenance of visitor infrastructure (foot-bridges, wooden plank paths, banisters, railings, but also e.g. barriers).



### Vačkářová D.: The National Platform on Ecosystem Services in International Context of Nature Conservation and Restoration

A founding meeting of the National Platform on Ecosystem Services was held within the framework of the integrated LIFE project One Nature in Prague in October 2022. Its establishment reflects a long-term development in ecosystem service assessment both in the Czech Republic and abroad. At present we witness shifts in nature conservation goals and ways which has been increasingly including ecosystem services, nature's contributions to people and in a broader context nature's values. The Convention on Biological Diversity's Strategic Vision speaks on living in harmony with nature by 2050, the EU

Biodiversity Strategy for 2030 on bringing nature back into our lives. Therefore, the National Platform on Ecosystem Services' goal is to support science-policy interface dialogue in the field of ecosystem services. Assessment of ecosystems and services they provide is defined as a social process through which the findings of science concerning the causes of ecosystem change, their consequences for human well-being, and the management and policy options are evaluated (Allison & Brown 2017). The approach requires a coordinated discussion among scientists, politicians, decision-makers and other key stakeholders.

### From the History of Nature Conservation

#### Linhart Z. & Patzelt Z.: Twenty Years since Establishing the České Švýcarsko/Bohemian Switzerland, PBC

As a logical step after designating the České Švýcarsko/Bohemian Switzerland a National Park, the České Švýcarsko/Bohemian Switzerland, a public benefit corporation was established in 2001. As it has been confirmed for the past 20 years, the organisation plays one of key roles in České Švýcarsko/Bohemian Switzerland's modern history and its seat, the town of Krásná Lípa due to, *inter alia*, the PBC blossomed out beyond recognition within that period. In many aspects, the organization provides an example for other regions and it has often been followed, e.g. in streamlining and combining activities of both the State Nature Conservancy and non-profit sector in nature conservation and destination management in tourism, building the House of the České Švýcarsko/Bohemian Switzerland with exhibitions and displays serving to visitors to the region and for communication, education and public awareness activities or in establishing the České Švýcarsko/Bohemian Switzerland Destination Fund regularly supplied by stakeholders and financing joint tourism projects within the region.

#### Zajíček P.: 120 Years since the Karel Absolon's First Expedition to the Macocha/Stepmother Abyss

The Macocha/Stepmother Abyss (the Moravský kras/Moravian Karst, central Moravia) has been attracting adventurers, curious guys and researchers for centuries. By 1914, the bottom of the sinkhole was accessible only by ropes or rope ladders. According to historical sources, the first people had roped down to the Macocha/Stepmother Abyss only in the 18<sup>th</sup>



century. During the 19<sup>th</sup> century, there were more and more explorations there. Before making the abyss accessible, the most explorations to the bottom of the abyss had been carried out by Karel Absolon, scientist, explorer and researcher. His expedition in 1901 brought valuable findings and provided further explorations by lessons learnt. Thus, an important phase of research and surveys on the Macocha/Stepmother Abyss, one of the most important karst phenomenon not only in the Czech Republic, begun.

#### Plesník J.: Biological Diversity Lost Both its Godfather and Patron during Two Days

On December 25, 2021, conservation biologist Thomas Lovejoy passed away at the age of 80. In many obituaries he was referred to as "godfather of biodiversity" for all of his work in the field. Moreover Lovejoy actually coined the term "biological diversity" in the early 1980s. In addition he also did a ton of work studying the connections between the climate crisis and biodiversity as well as between the current coronavirus pandemic and the global loss of biological diversity caused by destruction of nature. Thomas Loveloy devoted his life to studying the natural world which led to unprecedented environmental advocacy.

Edward O. Wilson, a US naturalist known to some as the "modern-day" Darwin died on December 26, 2021. Throughout his decades-long career, he established two new scientific disciplines (island biogeography and sociobiology, the study of genetic basis of the social behaviour of all animals, including humans). In 1978, he published *On Human Nature* which discusses the role of biology in the evolution of human culture and won a Pulitzer Prize. Wilson's highly original book *Biophilia* was the first to use the term to mean human empathy for the natural world. In 1988 Wilson edited the *BioDiversity* volume, based on



the proceedings of the first US national conference on the subject, which also introduced the term biodiversity into the language. Another book *Half-Earth* advanced the idea that plummeting biodiversity could be mitigated by reserving a full half of the planet for nonhuman species.

#### **Petr Moucha: On the Establishment of the Český kras/Bohemian Karst Protected Landscape Area**

In April 1972 when the Český kras/Bohemian Karst Protected Landscape Area was established, a some decades lasting way towards protection and conservation of the rare area not far from the western border of the Great Prague, *i.e.* the Prague agglomeration was successfully crowned. The first proposals for protecting the area's most valuable parts had appeared from Jan Svatopluk Procházka as early as in the 1920s. At the same time formal protection of from a point of view botany most valuable parts of the Karlštejn area was introduced and Jaroslav Petrbok promoted the idea to call the area the Český kras/Bohemian Karst. Immediately after World War II, intensive efforts to protect the area were continuing even by a proposal to establish the Karlštejn Region National Park there (Jaromír Klika). The PLA was declared on April 12, 1972. Moreover, some municipalities rejected to respect nature conservation conditions and requirements. Covering less than 130 km<sup>2</sup>, the Český kras/Bohemian Karst is of one the smallest PLAs in the Czech Republic. Nevertheless geological structure and composition of the PLA's is really unique and the PLA is the largest limestone area in the Czech Republic.

#### **Pešout P.: Hundred-year History of Nature Conservation Legislation in the Czech Republic**

Thirty year anniversary of the current Act on Nature Conservation and Landscape Protection is

enhanced by an even older anniversary. In 2022, a century has passed since submitting the very first proposal for nature conservation act by the Member of the National Assembly of Czechoslovakia Jaroslav V. Stejskal. In the article, the author in detail deals with development in nature conservation legislation during the whole period. Even at the turn of the 20<sup>th</sup> century, first efforts to introduce systematic legislation-based nature conservation had appeared in what is now the Czech Republic. They were not interrupted by the World War II and just in 1945, Rudolf Maximovič elected as a revolutionary leader of the Department of Forest Policy at the Ministry of Agriculture submitted an outline of act on nature conservation in Czechoslovakia. Moreover, an act on Czech nature conservation was endorsed as late as on August 1, 1956: the law had been in place up to June 1, 1992 when Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection came into force.

#### **Zajíček P.: One Hundred Years since Connecting the Sloup and Šošůvka Caves**

The Sloup-Šošůvka Caves (the Moravský kras/Moravian Karst, South Moravia) is the longest show cave in the Czech Republic. At the same time, they are a part of the longest cave system in the country. The Sloup Caves and the Šošůvka Caves had been isolated in the past and each of them has totally different history. When by that time two isolated visitor routes in each of them were restored, they were connected each other approx. one hundred years ago. Probably in 1922, a short connection was bored there: thus, the caves were definitively connected. Therefore, after finishing the restoration and connecting the caves visitors could step by step look through the Sloup Caves as well as the Šošůvka Caves during the single one long route. At present, the Sloup-Šošůvka Caves are managed by the Cave



Administration of the Czech Republic that has during the past decades implemented a lot of restorations and innovations there.

#### **Hromas J.: 75 Years since Discovery of the Bozkov Dolomite Caves**

When a cave hole had appeared in front of quarrymen in a small quarry close to the village of Bozkov (northern Bohemia) in 1947, experts did not believe that this a way towards a cave system. In 1957 after successful entering among caving's blocks, the Cave of Surprise with the first stalagmite/stalactite decoration was discovered. After mapping and study on geological structures, geophysical methods were applied there during speleological survey. Through test pits dug at sites with geophysical anomalies, the New Caves with underground lakes were found. The Bozkov Dolomite Caves consist of two separated systems of corridors and halls, namely the Old and New Caves. In total, they are 1,118 meters long and their height range is 43 meters, thus being the oldest dolomite caves in the Czech Republic. They harbour an absolutely unique stalagmite/stalactite decoration as well as wall molding. Caves are penetrated by a quite small body of calcareous dolomite closed in metamorphic rock formation of the Krkonoše/Jizera Mts. bedrock, mostly phyllites and green slates/schists. The Bozkov Dolomite Caves were created by long-term effect of stagnant, considerably aggressive waters which penetrated in tectonically disrupted dolomite from adjacent rocks. Just the position in "acid" rocks allowed dissolving the resistant dolomite, in addition at some sites having been strengthened by insoluble silica. The Jezerní dóm/Lake Dome reaching the dimension of 24 x 12 meters with the largest underground lake in Bohemia dominates the whole system space.

#### **International Nature Conservation**

#### **Plesník J., Ucová S., Kameniecká B., Makal B. & Čolobentičová L.: International Trade in Endangered Species of Wild Fauna and Flora in the Czech Republic, European Union and in the World**

Illegal or unsustainable wildlife trade affects numerous species, ecosystems and human societies. Its scale is immense and has been increasing because exploiting wildlife by selling it, their parts or products, is one of the most profitable activities in the world. Since July 1975, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) has been



aiming at ensuring that the international trade in animals and plants does not threaten their survival in the wild by providing a framework to be followed by each Party. Globally, the top commercial categories for wildlife traded legally under CITES are mammal and reptile skins, live primates, birds and corals, orchids including hybrids and cacti. The European Union continues to be an important market for international wildlife trade. Live ornamental plants are the commodity imported into the EU in the highest quantities, predominantly consisting of snowdrops (*Galanthus* spp.), cacti, cyclamen (*Cyclamen* spp.) and orchids, all of which were predominantly artificially propagated; reptile skins are the animal commodities imported at relatively high levels there. Prominent exports from the EU by volume include live artificially propagated plants, mainly cacti, orchid hybrids and snowdrops. Due to its geographical location and long-term tradition in highly developed planting and breeding particularly exotic wildlife in captivity, the Czech Republic is an important player in international trade in flora and fauna. Live reptiles, corals and parrots, reptile skins and mammal trophies are among the most often imported taxa, while live birds, mainly parrots and falcons, primates and dart-poison frogs (*Dendrobatidae*) are most frequently exported from the country.

#### Jan Plesník: Is „New“ Conservation Really New?

Although discussions about the aims and methods of conservation probably date back as far as conservation itself, the ‘new conservation’ debate as such was sparked by Peter Kareiva and Michelle Marvier in 2012. Central to the ‘new conservation’ position is a shift towards viewing conservation as being about protecting, conserving and managing nature in order to improve human well-being (especially that of the poor, anthropocentric approach), rather than for

biodiversity’s own sake (biocentric approach). ‘New conservationists’ believe that win-win situations in which people benefit from conservation can often be achieved by promoting economic growth and partnering with corporations. New conservation advocates have been criticised for doing away with nature’s intrinsic value. In other words, it claims that conservation needs to emphasise nature’s instrumental value to people because this better promotes support for conservation compared to arguments based solely on the rights of species to exist. Despite the fact “new” conservation putting together various relatively non-standard approaches to specific aspects of nature conservation and management was generally rejected as a concept or paradigm by conservation community, some issues, e.g. stressing relationship between nature conservation and human well-being and health or non-equilibrium paradigm, have been accepted by scientists, conservationists and decision-makers. In any case, the debate on future conservation has been extremely important in respect to transformative change, a fundamental, system-wide reorganization across technological, economic and social factors, including paradigms, goals and values, more and more often proposed as one of the solutions for post-COVID-19 world development.

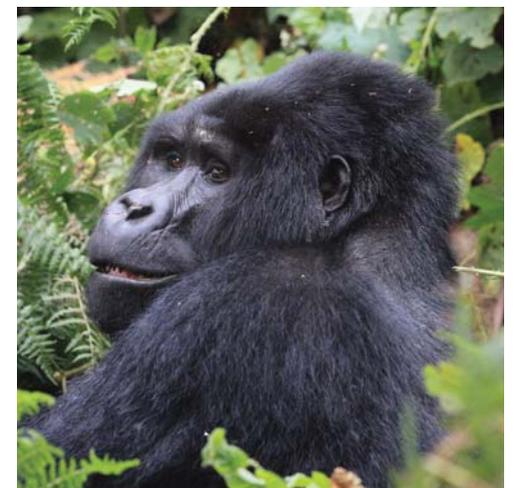
#### Miko L. & Plesník J.: The Presidency of the Czech Republic in the Council of the European Union Has been near at Hand

The Czech Republic will take over its already second presidency in the Council of European Union on July 1, 2022. In the Council of the EU government ministers from each EU country meet to discuss, amend and adopt laws, and coordinate policies. The ministers have the authority to commit their governments to the actions agreed on in the meetings. The country holding the presidency sets the agenda and priorities of the Council and chairs meetings of the different Council configurations and the Council's preparatory bodies, which include, *inter alia*, working parties dealing with very specific subjects. The Working Party on International Environment Issues (WPIEI) prepares EU positions for international negotiations related to environmental and climate change issues. It works in subgroups: for nature conservation, those on biodiversity, *Convention on International Trade in Endangered Species of Wild Fauna and Flora* (CITES) and whaling are important. The Czech Republic's presidency shall have to face the fact that many meetings of Multilateral Environmental Agreements (MEAs) have been postponed due to COVID-19 pandemic, some of them for two years, and both the date and venue of them have not been known yet: this is the case

particularly of the Convention on Biological Diversity (CBD), namely its 15<sup>th</sup> meeting of Conference of Parties to adopt a new global framework on biodiversity conservation.

#### Pelc F., Pešout P. & Ambrozek L.: Nature Conservation in Uganda

Uganda, located in East Africa, is one of the most densely populated countries in the world. The fact has been significantly influencing nature and the landscape there. Moreover, extraordinarily valuable wilderness fragments have been maintained across the country. In addition, the low-income country displays high biological diversity, particularly species richness: e.g., a half African avifauna occurs there. The Uganda Wildlife Authority manages 10 National Parks including the famous Murchinson Falls, Queen Elizabeth, Kidepo Valley, Rwenzori and Bwindi Impenetrable NP and 11 Game Reserves. Biological diversity has been threatened there by land-use changes, *i.e.* natural and semi-natural habitat conversion into farmland and current or planned mineral extraction, particularly oil production: unfortunately deposits of the strategic raw material overlaps with the country's most valuable protected areas. Among Czech naturalists involved in research and nature conservation in Uganda Petr Verner and Jan Jeník dealing with the Uganda kob (*Kobus kob thomasi*) in the Toro-Semliki Game Reserve in the late 1970s and early 1980s and Josef Vágner who was capturing particularly big mammals in Karamoja region for the Zoo/Safari Park Dvůr Králové nad Labem in the early 1970s should be mentioned.



#### Plesník J. & Pelc F.: Protected Areas in the World: Current State and Perspectives

Protected areas (PAs), regarded today as a cornerstone of nature conservation have been established since the early 19<sup>th</sup> century and they

are considered to be a key response to global biodiversity declines and the associated threatening processes. As a result of the exponential growth both in PAs number and total coverage at the global level having been accelerating particularly since the 1960s, as of 15 July 2021, according to the World Database on Protected Areas there are 271,140 PAs covering 15.8 % of land and 8.1% of coastal waters and the ocean on Earth. In view of expanding human land use, increasing climate change and unmet conservation targets, area-based conservation requires efficiency and effectiveness more than ever. Protected area coverage is a measure easy to apply and to understand for policy-makers but does not account for biodiversity, ecosystem services and social equity within and around protected areas, nor for the connectivity between them. Thus, there is concern that focusing solely on the percent area coverage of the global biodiversity conservation targets could be at the detriment of achieving the quality elements of the target. Therefore, management and governance effectiveness needs to be considered in the context of conservation targets at all times. Methods to evaluate management effectiveness are manifold due to the diversity of protected area designations, their management and conservation targets. While many PAs show positive outcomes, strikingly compared with matched unprotected areas, PAs have on average not reduced a biodiversity decline over the past 15 years. Although effectiveness has been assessed only in a small proportion of PA worldwide, most of them seem to be not effective and there have been too many paper parks on the planet. The authors recommend to pay more attention to PA quality, not only quantity and to enhance PA management wherever possible.

#### **Drbal K.: 6<sup>th</sup> October – International Geodiversity Day**

Recognizing the importance of geoscience in solving major challenges that humanity is facing today, UNESCO's General Conference proclaimed 6 October as International Geodiversity Day (IGD) on 22 November 2021. The proposal was supported by 193 Member States and based on an input submitted by the International Union of Geological Sciences (IUGS) and other scientific organisations. The IGD aims at raising awareness of the relationship between abiotic part of nature and all life forms among the general public. It is supposed that not only expert/technical bodies and institutions but also research institutes and universities will be involved in various activities related to the IGD. The Cave Administration of the Czech Republic

has prepared a public awareness campaign presenting caves as a natural part of the abiotic environment. At the same time natural values of the Czech Republic, importance of cave and karst protection and conservation, historical significance of caves for humans, outputs of cave monitoring and surveys and principles of managing the natural phenomena have been highlighted.

#### **Plesník J.: The United States Will Have a New Recovering Wildlife Act**

The Endangered Species Act of 1973 (ESA) is the primary law in the United States for protecting imperiled species and it has been considered to be one of the most comprehensive legislation for the preservation of endangered species enacted by any nation. The purpose of the ESA are two-fold: to prevent extinction and to recover species to the point where the law's protection is not needed. It therefore protects species and through the critical habitats the ecosystems upon which they depend. In addition, a species under the act can be a true taxonomic species, a subspecies, or in the case of vertebrates, a distinct population segment, *i.e.* the evolutionary significant unit. Moreover, the ESA's power can be reduced by administration through cutting the finance allocated for its implementation. Therefore, the Recovering America's Wildlife Act (RAWA) which would create an annual fund of more than USD 1.3 billion, given to states, territories and tribal nations for wildlife conservation was passed by the U.S. House in June 2022. At least 15 % of RAWA funding must be spent on species that are listed under the ESA. The RAWA also addresses climate change by building more resilient ecosystems and boosts the outdoor economy. The bipartisan RAWA will be the most significant investment in wildlife conservation in a generation.



#### **Mantle G.: 60 Years of Nature Conservation and Restoration in Wiltshire, the United Kingdom**

In late July 2022 representatives of the Nature Conservation Agency of the Czech Republic visited the United Kingdom, namely Wiltshire Wildlife Trust (WWT). The WWT was set up in 1962 and many of the founding members were landowners and farmers who were alarmed by the industrialisation of agriculture and the widespread use of pesticides. The first area purchased in 1970 was a small meadow in the upper reaches of the River Thames, where there remained an abundance of the Snake's head fritillaries (*Fritillaria meleagris*), with over half the plants having white flowers rather than the typical purple colour. The WWT has since created 42 nature reserves, covering over 1,200 hectares, representing some of the best wildlife habitat found in the county. Each nature reserve has free public access. Since 2000, knowledge gathered in the Bílé Karpaty/White Carpathians Mts. repeatedly visited by Wildlife Trusts leaders was awe-inspiring for all the Wildlife Trusts in the U.K. In addition to successful meadow restoration, in the past 20 years, the Trust's water team have tackled 110 projects, restoring over 60 kilometres of rivers.

#### **Exceptional Incident**

#### **Patzelt Z.: An Off-the-scale and Turning Fire in the České Švýcarsko/Bohemian Switzerland National Park**

On Sunday 24 July 2022 a fire started in the České Švýcarsko/Bohemian Switzerland National Park (northern Bohemia) which due to its extent has been going down in history of not only the National Park. On an area covering more than 1,000 hectares, the fire was particularly developed at sites with Norway spruce (*Picea abies*) monocultures having been damaged by the European spruce bark beetle (*Ips typographus*). Moreover, valuable little tiny bush communities on rock edges as well as forest growths with natural species composition were also negatively affected. The real extent of the damage will be revealed only in the future. In the village of Mezná three houses were fully burnt. The fire outbreak had been preceded by dry and hot weather with record temperatures reaching up to 360 C. When the article is written, more than one thousand fire-fighters have been pit out fire source just the 16<sup>th</sup> day of their efforts. It has been too early to assess all the issues. Nevertheless, even now it is clear that the event should be a turning point in an approach to forest management in the whole Czech Republic: it is necessary in forests to come back to natural species composition with prevailing broad-leaved deciduous woody plants.

# 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 24 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 May 2021, there are more than 28 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 24 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, European Topic Centre on Biological Diversity (ETC/BD) partner, 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 14 Regional Branches. As of May 1, 2023, it has 621 staff members, of them 577 with university degree and 50 with Ph.D. degree.



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