

# Ochrana přírody

## 2020 Czech Nature Conservation

The unique Elbe Canyon  
Bird Migration Monitoring

Black Grouse in the Krkonoše Mts  
60 Years of State Nature Conservation

Šumava National Park  
Kaziranga National Park





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Dear friends,

Allow us to introduce to you the Ochrana přírody/Nature Conservation Journal, having been issued in the Czech Republic more than three quarters of a century. This is because the first issue appeared during a post-World War II euphoria already in 1946. The journal has experienced a lot of changes both in the formal and factual format since that time and it was issued mostly six or ten times a year. Surprisingly, many principal bases have been maintained

to the present. The journal has always been aiming at professional and voluntary nature conservationists and at the general public interested in natural and landscape heritage conservation and management.

Of course, meantime the world has changed beyond recognition. Nature conservation has become a sophisticated branch of human activities with a strong position in public administration, non-profit sector, science, research and technological development as well as in the human society generally. That all, unfortunately with something of a delay, reflects a human society's response to increasing degradation and destruction of nature and the landscape surrounding us. In addition, the Czech Republic also went through a forty-year experiment to build socialism where individual's freedom and democracy were absent while on the other hand, the landscape was massively damaged and destroyed. Despite all the positive changes in the Czech Republic's nature conservation institutional framework since the Velvet Revolution in 1989, there have been a lot of problems to be solved yet and at the same some difficulties have newly emerged.

Similarly to the whole nature conservation in the Czech Republic, the professional journal is by the content based on four pillars, namely knowledge provided by science, legal provisions, economic tools

and communication with, education of and awareness among the general public and the target groups. Further, the journal regularly provides possibilities to exchange experience from international nature conservation. In this issue in English, we present the selected articles from the 2019 volume, reflecting the current topics in our branch. Special attention has been, is and will be paid to biological diversity conservation and management, protected area management and landscape integrity including water regime in relation to climate change.

For Czech readers, the Ochrana přírody/Nature Conservation Journal is issued six times a year with English summaries of main articles. On the webpage [www.casopis.nature.cz](http://www.casopis.nature.cz), all the articles from this and each issue are available in the digital and pdf format free of charge. In addition to the Nature Conservation Agency of the Czech Republic and the Cave Administration of the Czech Republic, publishing the journal is also supported by all the four Czech National Park Administrations.

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# Albis – White River: The Elbe as a Central European phenomenon

Handrij Härtel

The Romans called the Elbe *Albis*, White River, apparently for its extensive light-coloured sand beaches in which the river could freely change its flow at the time. Since then, a lot of

water has flowed through the Elbe river and it has significantly altered in many places. In the Central European context, however, the Elbe is still considered an exceptional river.



Elbe at Dolní Žleb, one of the most beautiful stretches of the river, combining high natural and scenic values: Kaňon Labe National Nature Reserve on the right bank and extensive gravel-sand alluvium on the left bank. Photo Petr Bauer

## Elbe: 600 km without weirs

From the Czech perspective, we may not appreciate the importance of the Elbe-associated nature, which is yet amplified by the fact that our national emotions are much more linked to the Vltava (Moldau). The uniqueness of the Elbe river will however be recognised if we also know its much longer segment on German territory and see this river as one natural system,

regardless of the state border. It then becomes clear that it is wrong to look at the 40 km long part between the Střekov lock and the state border as the last, still insufficiently canalised section of the Czech Elbe. On the contrary, these 40 kilometres are part of an over 600 km long continuum of the Elbe between Střekov and Geesthacht, which is unique for it has remained completely free of navigation locks. Al-

though the Czech part of this most valuable Elbe section is short in comparison to the German part, it is important: the Elbe valleys in the Bohemian Highlands (České středohoří) and in the Elbe Sandstones (Bohemian-Saxon Switzerland) form a unique scenic coulisse, which is not seen further downstream after the landscape definitively opens up behind the Saxon town of Pirna. It is exactly this landscape that attracted romantic painters in the 19<sup>th</sup> century. Inspiration in the Elbe valley was found by world-class painters, such as Caspar David Friedrich (1774–1840), Johan Christian Dahl (1788–1857) and Adrian Ludwig Richter (1803–1884), whose *Überfahrt am Schreckenstein* (Gemäldegalerie Dresden) is probably the most famous painting from the Elbe valley.

It would be unjust to think that the mentioned 600-km long segment of the Elbe has fully kept its character known from ancient paintings and gravures. Anti-flood dams ('Deiche' in German) have been built since as early as the Middle Ages, first to protect the villages, later also the land. In this segment of the Elbe, also a range of islets were removed in the past, and regulatory measures in the form of stone fortifications or groynes ('Buhnen' in German) have been carried out with the aim of enlarging the navigation depth. A river adjusted this way becomes narrower, deeper, but also faster. This is not without consequences: a narrower and faster river works itself deeper and deeper into its bedrock, so that

the water level falls. In some places, such as between Torgau and Coswig (Anhalt), it has dropped two metres, and this deep erosion is observed further and further downstream. This poses a major threat to the floodplain forests and is also a problem for the agriculture in the German segment.

Despite these adjustments, the greatest natural value of this segment, consisting in the absence of cross barriers in the flow, has been preserved, retaining migration conditions and near-natural river dynamics. This situation is determined, just as in a range of similar cases (e.g. the unique nature of military grounds), by a historical paradox. As a result of the post-war division of Germany and thus also the Elbe river, the transport route saw no fundamental modernisations, so the river was, unlike part of the population, given freedom. Until this day, the Elbe has remained the only(!) large, freely flowing German river, whereas other watercourses, such as the Rhine and its tributaries the Main and Moselle with its tributary the Saar, just as tributaries of the Danube like the Iller, Lech, Isar, Inn, Altmühl, Naab and Regen, are today technically significantly transformed rivers with many weirs or dams, similarly to the Vltava in our country or most of the Czech Elbe river. After the political change in Germany ('Wende'), also here efforts were made to revive plans for building a range of navigation locks in the Elbe. These were however soon deferred ad acta, because it was already then obvious that the expenses would considerably exceed the profits and that realisation of these plans would cause unrepairable damage to the unique natural heritage, eventually protected under the European network of protected areas Natura 2000.

## Protected areas on the Elbe and their exceptional diversity

The entire section between Střekov and Geesthacht is nearly continuously lined with sites of European interest (in Germany also called 'FFH-Gebiete') together with a number of bird areas ('Vogelschutzgebiete'). In the Czech part, these are the České středohoří (Bohemi-



Flusslandschaft Elbe Biosphere Reserve around Dessau. Photo Petr Bauer

an Highlands) and Labské pískovce (Elbe Sandstones) Protected Landscape Areas, while České Švýcarsko (Bohemian Switzerland) National Park marginally extends to the Elbe valley as well. The latter connects to the Sächsische Schweiz National Park and Sächsische Schweiz Protected Landscape Area ('Landschaftsschutzgebiet') on the Saxon side. Further downstream, the 'Flusslandschaft Elbe' is situated, the largest German terrestrial UNESCO Biosphere Reserve (2822 km<sup>2</sup>, since 1997), extending over five Federal States (Saxony-Anhalt, Brandenburg, Lower Saxony, Mecklenburg – Western Pomerania and Schleswig-Holstein). This extensive Biosphere Reserve covers more than 400 kilometres of the river Elbe and includes many protected areas designated under legislation of the different Federal States, the most important of which is a Biosphere Reserve named 'Mittel-elbe' (since 1990). This reserve protects not only the actual river, but also a large complex of floodplain forests.

The biodiversity of the habitats on the Elbe river is of extraordinary importance. If we had to select some so-called flag species for the Elbe, they would be particularly Eurasian beaver and Atlantic salmon, and as for plants e.g. strapwort (*Corrigiola littoralis*). The beavers on the Elbe have played a key role in the natural return of this rodent in Central Europe. Whereas beavers were exterminated on e.g. the

Rhine and Danube already in the mid-19<sup>th</sup> century, and then also in large parts of Central Europe during the 20<sup>th</sup> century, nearly 200 beavers survived on the Elbe between the towns of Lutherstadt Wittenberg and Magdeburg. As early as 1929, a beaver reserve was established here and many conservationists were involved in the rescue of the beaver. From this area, sometimes referred to as a 'beaver ark', beavers could also spread to other sections of the Elbe catchment basin (incl. the Czech Republic since the end of the 20<sup>th</sup> century) and was introduced to other rivers, such as the Oder and, after the change in regime, also to Western European countries (Saarland, Netherlands, Belgium, Denmark).

The story of the return of the salmon to the Elbe river is just as remarkable. In this case, however, no indigenous population was available. The extinction of the salmon on the Elbe is well documented. Until the 19<sup>th</sup> century, it was the most important fish in the fishery business. With the transformation of the Elbe to a waterway, salmon, just like the sturgeon, started to decline. In 1896, a salmon hatchery was established in Porschdorf, aimed at halting salmon decline in the river. However, its operation was stopped after just a few years. As of 1932, salmon was not recorded in the Elbe with the exception of an isolated capture near Pirna in 1947. In the year 1995, under





In Flusslandschaft Elbe BR on the middle Elbe in Germany, historic dikes were intentionally interrupted after the 2013 floods in order to enable overflowing of the river into the landscape. This should increase flood prevention in lower lying river sections and prevent floodplain forests from drying. Photo Handrij Hartel



Old oxbows of the Elbe river are highly valuable habitats in Flusslandschaft Elbe Biosphere Reserve. Photo Petr Bauer

the Salmon 2000 project, salmon from northern Europe were planted in the Lachsbach ('Salmon Stream' in translation), Saxon Switzerland. In the autumn of 1998, the first returning salmon were discovered here.

Not only certain rare and endangered species inhabit the Elbe in abundance, also

a rich mosaic of habitats is found here. Besides the mentioned floodplain forests, also river sediments, otherwise known as gravel sand or Muddy river banks, deserve protection. This type of habitat has seen a strong decline in Central Europe during the 20<sup>th</sup> century, particularly as a result of river canalisation. It is namely dependent on natural or at least near-natural river dy-

namics, i.e. on a periodic alternation of flooding and falling dry, which enables competitively weak species, such as strapwort, to survive. This is a critically threatened species in the Czech Republic, occurring only in the segment from Střekov downstream, and reliably indicates river parts of extraordinary value, i.e. without transverse structures (navigation locks).

### Potential for further renaturalisation of the Elbe

Long periods of low river water levels in the summer months are natural in the Elbe, although we can recently observe a tendency to an even sharper polarisation during the year. In addition, the history and course of floods, including the latest ones in 2002 and 2013, are very instructive. It is quite evident that the basic principle is to provide the river space. In the German segment of the Elbe river, during a large flood in 1845, dikes ('Deiche') broke in more than 100 places. It was shown that the dikes had often been built too close to the river. The old dikes were therefore interrupted in some places and new dikes built at a larger distance from the river. This measure was also meant to help rescue the floodplain forest. In contrast to other large rivers, the German Elbe has large areas of former floodplain, which serve as farmland and are not built up. Thanks to this, a return to natural flooding is principally possible. It namely turns out that many so-called flood control measures, which must prevent the river from overflowing, actually accelerate its flow, worsening the situation in lower lying river sections, i.e. efforts to raise dikes against extreme floods often increase flood risk downstream. The 2013 flood on the German Elbe was, compared to the Czech Republic, worse than the 2002 flood.

Concluding we can state that the collaboration between Czech and German conservationists is important for the protection of the Elbe nature, particularly its 600 km long segments without navigation locks. It is certainly appropriate to intensify cooperation between the different protected areas. For example, the international association of protected areas on the Danube named 'Danube



During low water levels in the summer months, extensive sand beaches significant for biodiversity are created in the Elbe around Dessau in Flusslandschaft Elbe Biosphere Reserve. Photo Petr Bauer



Using historically created groynes ('Buhnen') to improve navigation, banks on the German middle Elbe were corrected to their present form, here covered with willows and oaks, with a sand bottom and pools. Photo Petr Bauer

Parks (<http://www.danubeparks.org/>) may be inspiring, just as the German Integrated Elbe Conception ('Gesamtkonzept Elbe') is. On the one hand, this text (2017) rejects further building up of the Elbe river but also notes that "measures on the Elbe will be accepted if they serve environmental, water management and transport objectives at the same time, connecting these goals in a meaningful manner". I think that the protection of the Elbe in the section downstream of Střekov and the state border should be conceptually based on

similar principles, moreover because the approaches applied on the German part of the Elbe will always limit the transport connection of the Czech Republic with the North Sea. These theses are of essential importance for the further protection of the Elbe, especially in light of the conditions that recently prevail on the Elbe during the summer months. For example in 2018, according to official data of the Federal Ministry of Transport and Digital Infrastructure, a fairway depth of 140 cm was not reached on the German Elbe for



Old oak trees on Elbe dikes are a characteristic feature in Flusslandschaft Elbe Biosphere Reserve. Photo Petr Bauer

240 days, i.e. for two thirds of the year (at least in one of the sections between de state border with the Czech Republic and Geesthacht).

As stressed in the introduction, the fact that in comparison to the German Elbe only a relatively short near-natural river section has remained in the Czech Republic, does not reduce its value in any way. Rather the opposite is the case, and the greater is our responsibility for its protection, ideally in close Czech-German cooperation.



# Dirt roads – biodiversity islets within an agricultural desert on the example of Pálava Protected Landscape Area

Pavel Dedek

The impact of industrialised agriculture on biodiversity and landscape ‘condition’ is presently a frequent topic of discussion with experts from various scientific fields. The media and the public are also very interested in the issue, particularly in connection with the drought and generally the

ability of our landscape to retain the little moisture which our nature currently endows us with. This contribution will however not deal with rapeseed and maize fields, but with that what separates (or at least should separate) blocks of intensively farmed fields, i.e. increasingly rare dirt roads.



Dirt road below Svatý kopeček hill at Mikulov. Photo Pavel Dedek

The dense network of dirt roads, which has intersected our landscape since ancient times, has not only served man and his needs. It has also been a migration corridor and a permanent habitat of many animal and plant species. Particularly insects associated with bare and sparsely vegetated soil have found here exactly what they need for their development. The margins of dirt roads, with transitions to arable land, have thus provided refuge to all sorts of weed

species, many of which we regard (despite negative connotations associated with the word ‘weed’) as rare and disappearing species of our flora today. Bouquets of field flowers, overflowing with colours and shapes, and evoking in people feelings of harmony and unity with nature, used to be a frequent motif in paintings and are a basic motif in ornaments in South Moravian folk art. However, an artist would hardly find inspiration in the present agricultural landscape.

Red poppies, blue cornflowers, pink corncockles and white chamomiles are replaced by uniform verdure, passing into the equally uniform yellow of ripening corn or flowering rapeseed. That dense network of dirt roads has disappeared and also the diversity accompanying it has gone. Despite, or all the more, remaining unpaved dirt roads are important – for the landscape itself as well as for species diversity.

The migration permeability of our landscape is still declining. This is not only due to linear infrastructure like roads and motorways, most often mentioned in this context. Dense, dark forests and vast land blocks are much more involved in the loss of connectivity. With the isolation of plant and animal populations inhabiting the last remnants of suitable environment, also the probability of their extinction is growing.

## Maya the Bee and her relatives

Stacks of paper have been written about the importance of bees to humans. A great majority of these works, however, concentrate on a single species, the honey bee (*Apis mellifera*), while more than 1,300 species of various solitary bees and wasps (included in the group of so-called sting hymenoptera) live in our country. It is a rich group of various shapes, colours and life strategies. A large part of them is bound to bare or just sparsely vegetated soil (not poisoned by pesticides). Their association with bare substrate is often reflected in the vernacular names of bees

and wasps, like mining bee or mason bee. All these species take part in the pollination of plants. Some are specialised in particular plant species or genera; others take all that abounds in the landscape at a particular moment. In the past, varied and richly flowering field margins offered sufficient nectar and pollen and a dirt road provided bare soil to build nests.

Changes in the structure of the agricultural landscape have meant a significant deterioration in the conditions for solitary bees and wasps. Easily accessible food as well as suitable places for nest building have declined. The remaining unpaved dirt roads in Pálava, however, still host interesting hymenopterous species, although there are undoubtedly not so many as in the past. One of the most remarkable ones is sweat bee *Lasioglossum marginatum*, which is not large or colourful, but their nests and the high activity around them can hardly be missed. Although sweat bees (*Halictidae* family) are solitary bees, the developmental cycle of their nests of this species is different from all other members of the family and approaches that of true social insects. The development of a nest takes a full six years and the number of workers in the nest increases year by year. Drones and fertile females appear only in the last year. They then copulate and the fertilised females fly away to found a new nest. Other solitary bees and wasps have a much simpler development. A fertilised female builds a nest (e.g. a long corridor with chambers in the ground), supplies the different chambers with food (mainly pollen for



*Lasioglossum marginatum* workers. Photo Pavel Dedek

bees and e.g. paralysed spiders, caterpillars etc. (for wasps), lays one egg in each chamber, secures the nest against intruders, and dies.

The much larger and colourful *Scolia hirta* can be observed on flowering field eryngo (*Eryngium campestre*). Belonging to the wasps, their larvae demand ‘meaty’ food. It searches for larvae of cockchafers (e.g. scarabs of the genus *Anisoplia*). When it finds a cockchafer grub, it stings just enough much poison into it as to

paralyse but not to kill the larva. It lays a single egg on the paralysed grub, from which a larva hatches that will live from the tissue of the immobilised grub for the whole time until it becomes a pupa.

Members of the spider-hunting wasp family (*Pompilidae*) choose a similar strategy. They like visiting the flat inflorescences of plants of the carrot family and are not rare along well-preserved dirt roads. They build their nests on bare



*Asproparthenis punctiventris*, once a dreaded pest. Photo Filip Trnka



The weevil *Coniocleonus nigrosuturatus* reappeared in the Czech Republic after 40 years. Photo Filip Trnka



Black oil-beetle (*Meloe proscarabaeus*). Photo Pavel Dedek

soil and supply the chambers with paralysed spiders.

Solitary hymenopterous species often 'suffer' from nest parasites. Nearly every thrifty bee or wasp species has some thief wanting to obtain some food without work. They let the honest bee or wasp build a nest, wait until the host species fills it with sufficient food and then, inconspicuously, just as a cuckoo, puts its own egg into the alien nest. The described thief scenario is just one of numerous possibly strategies.

An example of such an unwanted coexistence on one of the Pálava dirt roads is the rare sweat bee *Systropha curvicornis*, whose males have typical curved antenna tips. These bees nest on bare sand or sandy loam and often collect pollen and nectar on field bindweed (*Convolvulus arvensis*). The roughly 1cm large bee digs an up to 50cm deep corridor with a foetal chamber at the end. Its 'personal thief' is the bee *Biastes brevicornis*. It has a 'prying' flight, searching for nests of its victims. Also these bees like the flowers of field bindweed, where host and parasite meet each other. However, they do not want to work and so rather rob the nests of the poor sweat bee. Both species are included the Czech Red list of invertebrates. *Systropha curvicornis* used to be quite common and distributed throughout the Czech Republic, but has disappeared from many sites and is now relatively common only in the south of Moravia. *Biastes brevicornis* is a distinctly thermophilous bee occurring only at South Moravian localities.

Triungulins – larvae of violet oil-beetle (*Meloe violaceus*). Photo Pavel Dedek

### Weevils – easy and fast from dreaded pests to dying species

Weevils of the *Cleonini* tribe are another significant group of inhabitants of dirt roads and other disturbed habitats with sufficient bare soil. These are rather large and particularly attractive beetles with an interesting history. A vast majority of species have undergone a drastic decline in the last half century and some of them have gone extinct.

An interesting case is formed by *Asproparthenis punctiventris*. This used to be a dreaded pest of rapeseed. The fight against it was so successful that this weevil is now a rare species threatened with extinction. Unfortunately, many other weevil species met a similar fate, even though they were not actively controlled. Changes in the landscape structure were sufficient: a decline in grazing, elimination of baulks, disappearance of fallow land, and paving of dirt roads.

The most interesting species of dirt roads in Pálava include *Pseudocleonus cinereus*, *Bothynoderes affinis* and *Mecaspis alternans*. While encountering these beetles in nature reserves of Pálava Protected Landscape Area\* is a rare event, dozens of these beetles can be observed on dirt roads within a few hours. In 2019, the author of this article managed to discover *Coniocleonus nigrosuturatus*, a species which had been unaccounted for in the Czech Republic for more than 40 years (last seen in 1978), on two dirt roads. Unpaved dirt roads are, as it seems,

absolutely essential for this threatened group of beetles.

### Blister beetles

These beetles are a group which has been most affected by extinction over the past century. Out of the total number of blister beetles (24 species) 11 have gone extinct, another six are on the brink of extinction and only three can be regarded to be relatively safe. All the above-mentioned factors have contributed to this terrible decline: intensification of agriculture, decline in landscape variety, the use of chemicals, yet completed by the dependence of blister beetles on solitary bees, in whose nests not only hymenopterous relatives parasitise, but also many other insect species, including blister beetles.

After a blister beetle successfully mates, it lays thousands of eggs in the ground, from which small, slender and very mobile larvae called triungulins hatch. These larvae quickly search for the nearest flowering plant and settle right in the flowers, in great numbers. However, they do not head here for food, but wait for transport. Larvae of blister beetles are parasites in solitary bee nests, which they reach by massively climbing on a pollinator which has landed on the flower and then takes the parasites home. This is however a kind of lottery. The larvae get on any insect which sits on the flower and by far not all taxi rides end there where the larva needs. Also butterflies, flies and other insects visit flowers, so only a small part of the larvae

reach their destination and the remainder dies (hence also the seemingly unnecessary overproduction of eggs). The luckiest in the solitary bee nest undergo a complete reconstruction of their bodies. After the slender larva eliminates the bee foetus and occupies a honey chamber with accumulated food, it transforms into a barrel-shaped immobile larva which further feasts on the food which the bee has collected for its offspring. After it has used up all the honey, the larva transforms into another untypical stage, a pseudopupa, and hibernates this way. In spring, the larva transforms again, from a pseudopupa into a legless larva, which can then turn into a true pupa. This is followed by the last, stormiest stage of development: in the pupa, the larva body dissolves into a pulpous substance which turns into a mature blister beetle, which digs itself out of the underground bee nest to the surface. And the entire cycle can then start again. Blister beetles thus need solitary bees. And the bees in their turn need non-poisoned bare soil and flowering plants. No wonder our blister beetles are not doing well.

### Conclusion

Unpaved dirt roads are habitats and migration corridors, the importance of which is still increasing in the present altered agricultural landscape. This landscape element is essential for at least the biodiversity which has remained. This is not only 'weeds', bees, weevils and blister beetles. A sound dirt road is full of small predatory ground beetles, wolf spiders, darkling beetles, tiger beetles and hundreds of other invertebrates. Insects provide people and ecosystems with a whole range of services for which they request no other 'salary' than living space. Hundreds of species of hymenoptera, butterflies, beetles and other invertebrates are involved in plant pollination, others in decomposition of dead matter or dung, returning nutrients to the soil. Insects also form the food base for countless birds, amphibians, reptiles and mammals.

Nevertheless, we still encounter efforts to pave dirt roads (most often with asphalt). This trend, together with industrialised agriculture, has the potential to become the definitive gravedigger of the diversity and functionality of our landscape.

Fatal mistake by triungulins: instead of solitary bees, the larvae 'board' a chafer (*Tropinota hirta*). Photo Pavel Dedek

Not many remaining landscape structures meet the definition of 'significant landscape element' and the role of 'territorial system of ecological stability' better than exactly unpaved dirt roads do. Despite, many dirt roads only exist on paper (but are in fact sown and farmed as arable land) and the remaining ones are systematically eliminated by paving them with asphalt or other materials.

Long discussions can be held on the effectiveness of this. An asphalt road looks good, at least in the beginning. However, it is evident from asphalt roads built not long ago what these paved roads will look like after a few years of being used by increasingly heavy agricultural machinery. The driveability of broken asphalt roads with ruts and torn roadsides is really far from ideal for cyclists, in-line skaters and even a personal car. A new asphalt road is free of costs thanks to subsidies, but their future maintenance will need finances. And we really have to reach deep into our pockets for securing constant repairs.

In places where paving is truly indispensable, more suitable alternatives to asphalt exist. An example is a double-track dirt road, consisting of two strips (e.g. using prefabricated concrete elements) with a free space between them. This

was realised in the Nymburk region (<https://www.spucr.cz/aktuality-z-kraju/archiv/stredocesky/vystavba-kolejovych-polnich-cest-na-nymbursku.html>) and shows that the National Land Registry (NLR) can also build such roads. On its website, the NLR states among others the following on this topic: "For practical reasons, we utilise track paving in the realisation of some subordinate dirt roads. Its advantage is lower costs, possible application on routes with steep slopes, minimal maintenance, high durability, and better integration in the landscape". However, neither this paving method is ideal. Without regular traversing, the space between the concrete tracks will grow over with vegetation, so that the necessary spots with bare soil disappear.

\* A positive exception in this respect is the recently designated Na cvičišti Nature Monument, which is managed by means of intensive disturbance and thus provides sufficient disturbed habitats with bare and sparsely vegetated soil.

**A list of the most significant species recorded by the author on a single dirt road below Svatý kopeček Nature Reserve is attached to the web version of the article on [www.casopis.ochranaprirody.cz](http://www.casopis.ochranaprirody.cz).**



# Will the black grouse survive in the Krkonoše Mts until 2040?

For the time being, this is realistic! But it is up to us, the people who live and work in the Krkonoše (Giant) Mts, as well as the visitors to our highest mountain range.

Jiří Flousek

The Czech Republic probably does not have a more endangered species than the black grouse. The country hosts many birds which also face great problems and whose numbers are considerably lower than those of the black grouse, e.g. the little owl (*Athene noctua*) and the saker falcon (*Falco cherrug*).

These have, however, a significant advantage as for survival: they manage to fly dozens or hundreds of kilometres and thus have at least a chance of finding suitable nesting grounds or new partners elsewhere, and mainly... they are within flying distance of their relatives in neighbouring countries.

In lek sites over 10 males can be encountered in a quality population (such grounds still existed in Krkonoše in the early 1980s, for example at the Elbe springs). Dominant adult cocks fight for the most important position in the centre of a lek, while the others are waiting at its margin. Also females are hidden here, about 90% of which only mate with the male controlling the centre of the lek (e.g. Alatalo et al. 1996, Lebigre et al. 2007). Photo Ondřej Prošický



The black grouse misses this advantage. The closest substantial populations can be found in the Alps, Scandinavia, eastern Poland and Belarus, i.e. many hundreds of kilometres away. Such a distance is an unsurpassable obstacle. The fact is that most males spend their whole lives within one kilometre of their hatching site, while females move away for up to 5 km on average, flights of over 10 km being an exception. An isolated population, especially when in trouble, is a fundamental problem for every animal, which is particularly true for 'settled' species like the black grouse. If we do not solve this bird's problems ourselves, the surrounding nature will not help us. A strengthening of our populations with black grouse flying in from the Alps or northern Europe is namely impossible. And artificially increasing populations by releasing birds does not help!

## Black grouse on the national level

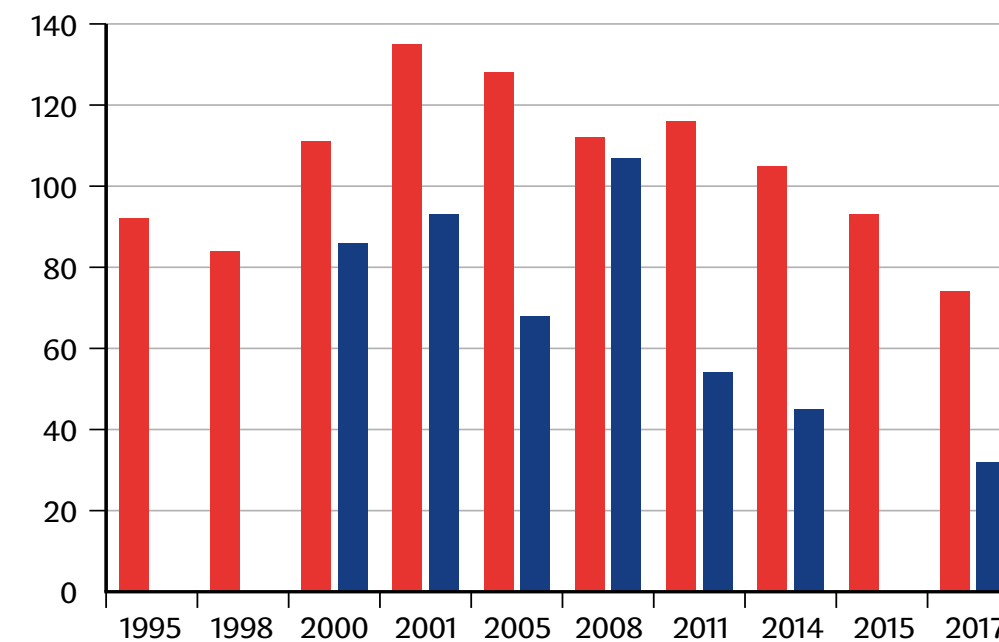
Still in the mid-20<sup>th</sup> century, roughly 70 years ago, black grouse could be observed in most areas of the Czech Republic. During a national bird survey in the years 1973–1977 it was detected in only 15% of the original area, but its numbers were still rather high, estimated at 1,250–2,250 males (Šťastný et al. 1987). Then a dramatic decline followed: 800–1,000 males by the year 2000, less than 600 males counted in 2005 and only 330–380 males by the year 2017

(Šťastný et al. 2000, Hora et al. 2015, J. Flousek unpubl.). **Within 40 years, thus 80% of black grouse have disappeared from our landscape!**

The birds have vanished from all low-lying areas as well as the Vysočina region, the Jeseník Mts and the Bohemian Forest. Only three mountain populations have survived, in the Ore Mts, the Krkonoše and Jizera Mts, and the Šumava Mts and Boletice region. We cannot speak of populations in the Doupov Mts, where not more than 10 males live, nor the Libavá region, where two males only were found in 2018. In all areas, black grouse are still declining, the most dramatically in Šumava and at Boletice, seeing a decline of 95% in 40 years to the present number of about 50 males. The species is slightly better off in the Ore, Jizera and Krkonoše Mts, where it has declined by 40–60% since the year 2000 (see Box).

## Why is it declining so fast?

There are many causes. The main one is the **loss of suitable habitats and landscape fragmentation** (e.g. Patthey et al. 2012, Geary et al. 2015). Black grouse prefer open habitats, especially waterlogged meadows, fens and peat bogs, heaths and clearings, with a rich herb layer, various *Vaccinium* species and scattered stands of *Betula*, *Salix* and *Sorbus* (the fruits of all these plants form an important component



Numbers of lekking black grouse males in the Krkonoše Mts (red) and Jizera Mts (blue) in the years 1995–2017, in both ranges constantly declining since the turn of the century (intervals on the X-axis are not equal). (Hora et al. 2010, 2015 and 2018; Flousek et al. 2015; L. Dostál, J. Flousek and M. Pudil unpubl.)

## Brief 'genetic' intermezzo

Published studies state that a number of *about 100 birds* is considered to be the survival limit of viable populations of the black grouse (e.g. Segelbacher et al. 2014). If they are smaller, more or less related birds inbreed, the genetic quality of their offspring declines and the entire population inevitably faces extinction.

If this limit is realistic, the situation of Czech black grouse is not bright. Šumava is exactly on the brink (if we assume that both sexes are balanced, i.e. the 50 males are matched by the same number of females). In the Ore Mts, with about four times the number of individuals, the situation is more hopeful. Also the joint population in the Krkonoše and Jizera Mts, counting 220 individuals, looks optimistic at first sight, BUT ...

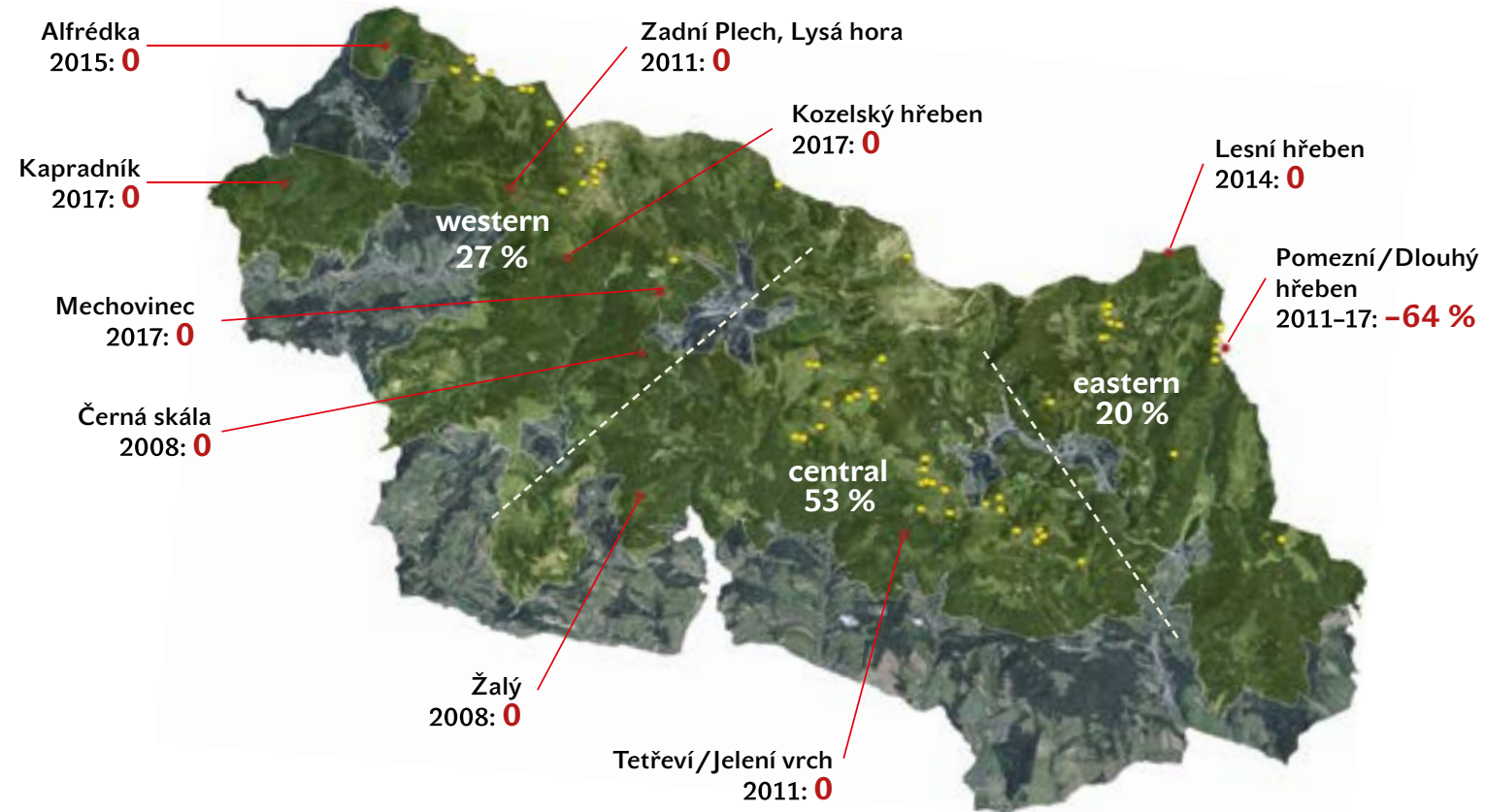
Already 10 years ago, a genetic study indicated that black grouse from the Jizera and Krkonoše Mts differ slightly from each other, just as those from the western, central and eastern parts of the Krkonoše Mts (Svobodová et al. 2011). It may thus be concluded that Jizera and Krkonoše birds crossbreed very little, even though they live close to each other, at sites just six kilometres in a straight line, separated by the Jizera valley and the Novosvětský pass. Similarly, birds from the west, middle and east of the Krkonoše Mts meet each other rarely, if at all (see the map). If we add specific numbers to these four subpopulations (from west to east 70, 40, 80 and 30 individuals, respectively), a purely mathematic conclusion is, unfortunately, evident.

Slight optimism is provided by cases of recovering black grouse populations, although sometimes just temporarily, from relatively low numbers (e.g. Klaus 1994). However, availability of an increased number of suitable habitats was always a fundamental condition.

In any case, it follows that a key step to save the local grouse is *connecting subpopulations* and creating conditions to enable the birds to find each other again in the entire Krkonoše Mts and between these and the Jizera Mts!

of their food) (e.g. Svobodová 2005). Another important condition is the presence of young woodland or shrubland patches in the vicinity, where black grouse hide and females build nests. This diverse mosaic of habitats should





Three black grouse subpopulations on the territory of the Krkonoše Mts in 2017. Roughly a quarter of the birds live in the west, over a half in the central part and only a fifth in the north-east of the range. Abandoned leks on the periphery of the Krkonoše Mts and the year in which no grouse were detected anymore are indicated in red. On the Pomezní and Dlouhý ridges, two thirds of lekking birds disappeared between the years 2011 and 2017. (J. Flousek unpubl.)

also include exposed sites with sparse vegetation or even without, where they dig up and collect small stones (grit), helping their stomachs to process food.

Such habitats have however disappeared from our landscape in a rapid way since the mid-20<sup>th</sup> century, as mentioned. Wet meadows have been drained, just as many lowland wetlands or peatbogs and waterlogged spruce forests in the mountains, and intensive farming has spread over originally unmanaged parts of the landscape. This has caused black grouse to decline more and more, and their formerly continuous population has shattered into small parts, leaving the birds only a few mountainous areas. However, they still do not have peace today. For example, the very valuable extensive bogs and open habitats in the Ore Mts, where currently nearly half of our black grouse population lives, are at the same time attractive sites for hundreds of wind farms planned there.

In the mountains on the border, particularly in the Ore, Jizera and Krkonoše Mts, affected

by industrial air pollution in the late 20<sup>th</sup> century, the black grouse was one of the few bird species benefiting from forest dieback and the formation of large clearings (e.g. Šťastný & Bejček 1983, Flousek 1989). The emissions have fortunately decreased, the clearings are revegetating, and spruce forests are returning to sites where they used to grow – certainly a favourable trend, which however does not benefit the black grouse. The relatively untouched habitats beyond the upper treeline in the Krkonoše Mts are therefore all the more valuable.

A very significant negative factor, probably the most important at least in the present Krkonoše Mts, is **disturbance of black grouse at their lek sites, nesting sites and places where they overwinter** by different, most often sport and recreation activities (e.g. Zeitler 2000, Baines & Richardson 2007, Arlettaz et al. 2013). In the current landscape we will hardly find places where man has not set foot, while the black grouse is very sensitive to any disturbance.

Leks are a key area for the black grouse's entire life and is the most important every spring. From late March to early May, a few hours after daybreak, males come together here, fight for females and the most successful ones mate with them (e.g. Alatalo et al. 1992, 1996). If the birds are disturbed, they fly away and when peace returns, they come back. If they are alarmed repeatedly, they only return the following day. And if such a situation, either disturbance by an early tourist, a supply car or a careless photographer, happens every day, this may cause the birds reproduction problems. In extreme cases, mating does not happen at all, so the female lays unfertilised eggs and the breeding of that year fails. One should realise that around 90% of females mate only once during the entire breeding period (e.g. Lebigre et al. 2007).

Winter is a critical time for the survival of black grouse (e.g. Patthey et al. 2008, Braunisch et al. 2011, Formenti et al. 2015). Most of the time they stay under the snow, into which they dig out burrows and have themselves covered by snow.

Such an igloo protects them from unfavourable weather and from predators. They leave the burrows only in the morning and before the evening falls in order to collect food, thus replenishing their energy supply. Each extra time a black grouse leaves the burrows means a loss of energy, the necessity to spend more time on the snow when looking for additional food, and an increased risk of being predated by a beast or a bird of prey. By disturbing a grouse, also the stress hormone level in its blood rises. Stress is an important defence response of an organism to danger, essential for the survival of animals, including human beings. However, if it lasts long, it undermines the health of the stressed individual. A single disturbance of a black grouse increases the level of its stress hormone by 20–50%, while each other disturbance prolongs the time of its decomposition. Permanent stress causes grouse health problems, increasing the risk of being surprised by bad weather or a predator. Studies from the Alps clearly show that the stress level of black grouse rises with decreasing distance to a ski area or frequented cross-country trails.

The mentioned **predation** is a common feature in nature. If the population of a potential prey (a grouse in our case) is favourable, it can cope with predator attacks. However, if that is not the case, any caught bird or destroyed nest may be a concern. It is obvious that there are enough natural enemies of black grouse all around: the numbers of fox, wild boar and martens (especially beech martens) have long been increasing, and weasels and goshawks predate on black grouse as well (e.g. Summers et al. 2004, Tornberg et al. 2016).

Also **'invisible' obstacles**, like cables of cable cars and ski lifts, electric wires and mesh fences protecting tree plantings, are a danger (e.g. Bevanger 1995, Baines & Andrew 2003, Buffet & Dumont-Dayot 2013). A brusquely flying black grouse cannot avoid them and after the collision it dies or gets wounded with a small chance of survival.

To date, we hardly know anything about the impact of the ongoing **climate change** (e.g. Spidsø et al. 1997, Selås et al. 2011). However, due to rising temperatures in the breeding time, hatching of the chicks will cease to overlap with the time of optimal food supply. Also



Black grouse have accustomed to frequented tourist trails between Výrovka and the chapel in the Modré saddle, used by thousands of visitors. However, the two skiers on the left, selfishly preferring their own experience to vulnerable Krkonoše nature, are heading straight for the site of overwintering black grouse. Three more tracks in the same direction show that they are not the only ones. Grouse buried in the snow do not withstand this.

the amount of natural snow will decrease and so black grouse are expected to get difficulties with building their winter shelters, while birds overwintering outside the snow cover are more vulnerable to weather and predators.

### And what about Krkonoše?

No glory! During the last survey of lekking grouse in 2017, we counted 74 males (the inconspicuously coloured females cannot be counted exactly) on the Czech side of the mountain range. Sixteen years before, 135 males were observed lekking here, which means a decline of 45% (see the graph).

One of the characteristics of a black grouse population is the number of males lekking in a lek (e.g. Höglund & Stöhr 1996, Lebigre et al. 2007). The more birds are lekking together, the higher the chance that the best of them will mate with females and their genetically high quality offspring will maintain the population in a favourable condition. Conversely, in leks with one male only even a young or handicapped individual will assert itself. Also this is apparently a problem in the Kr-

konoše Mts: the last censuses of collectively lekking males ranged from 4 to 25%.

In contrast to the remaining Czech populations, black grouse in the Krkonoše Mts also have many advantages. Clearings created by air pollution revegetate also here but there are many mountain meadow enclaves and particularly habitats above the upper treeline which offer the black grouse living space. Moreover, the entire mountain range is protected as a national park, which is the highest nature conservation category in the country. Black grouse thus have ideal conditions for survival in the Krkonoše Mts with their national park, subalpine and alpine grasslands and peatbogs with scattered mountain pine (*Pinus mugo*) stands on their ridges.

Unfortunately, everything seems to be overshadowed by the area's very high visit rate. The latest census in 2018 showed that nearly six million visitors spent some 12 million days of residence here (CE-Traffic 2018). So even if just a small percentage of them does not follow the rules of the





One of the created black grouse centres in the Krkonoše Mts including an open area for lekking grouse, solitary trees or small tree groups providing shelter to the birds, vegetation offering appropriate food (blueberries, birches, rowans) and also an exposed patch for the collection of grit. Photo Jiří Floušek.

National Park (such as keeping to marked trails), there is probably no help for the grouse.

### Is there anything we can do?

Certainly! Possible ways to solve the problems are given by the abovementioned list of problems with the black grouse. We can probably not return lost habitats to them, but we can preserve and try to connect the still remaining suitable ones. A total of 24 black grouse 'centres' with a total area of 86 hectares have been created in the Jizera and Krkonoše Mts in the last four years (Dostál & Kavková 2015, J. Floušek unpubl.). By cutting woodland, open areas have been formed for completely new or lost lek sites, moreover at flight distance in order to give at least grouse females a chance to fly from the Jizera to

the Krkonoše Mts or back, or gradually 'skip' from the west to the east of the latter mountain range.

The mentioned invisible obstacles can be removed with a simple technical solution: securing cables of cableways and ski lifts with hangers deterring the birds (the FireFly type – [www.hammarprodukter.com](http://www.hammarprodukter.com) seems the most appropriate for the time being), and either building mesh fences no longer or securing them by visual elements (e.g. upper or lateral cross-bars).

Also disturbance of black grouse can be limited to an acceptable level. However, we cannot do here without a responsible attitude of every inhabitant and visitor of our mountain ranges. Black grouse can adapt to human movement along well-

known routes. Any deviation from them is however a problem for the birds. And remember that in winter such a problem can be caused by just a few irresponsible individuals who enter inaccessible places left for a peaceful development of nature and its inhabitants.

**There is no time to lose. We have some ten to twenty years to try and reverse the unfavourable population trend and maintain the black grouse in the Krkonoše and Jizera Mts as well as the rest of the Czech Republic in sufficient numbers, therewith preserving this fascinating and iconic bird species for the next generations!**

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

# Has a feasibility study on the Danube-Oder-Elbe Canal really been performed?

Petr Havel

The preparation of large infrastructural works has long been criticised for being time-demanding and ineffective. Drafts of amendments to construction law have repeatedly been submitted in order to shorten and facilitate the approval process. Recently, a proposal for its integral recodification was submitted. The actual administrative process aimed at realising a construction is however to a great extent the final stage in the prepa-

ration of a construction. Efforts for systematic changes in building permit procedures should therefore be preceded by a comprehensive analysis of shortcomings already in the stage prior to the building permit procedure. It is not an overstatement to say that the stage of project preparation and specification of the project at different levels in spatial planning documentation have much greater margins than the building permit stage.

Morava river in Litovelské Pomoraví Protected Landscape Area. Photo Zdeněk Patzelt





## Why feasibility studies?

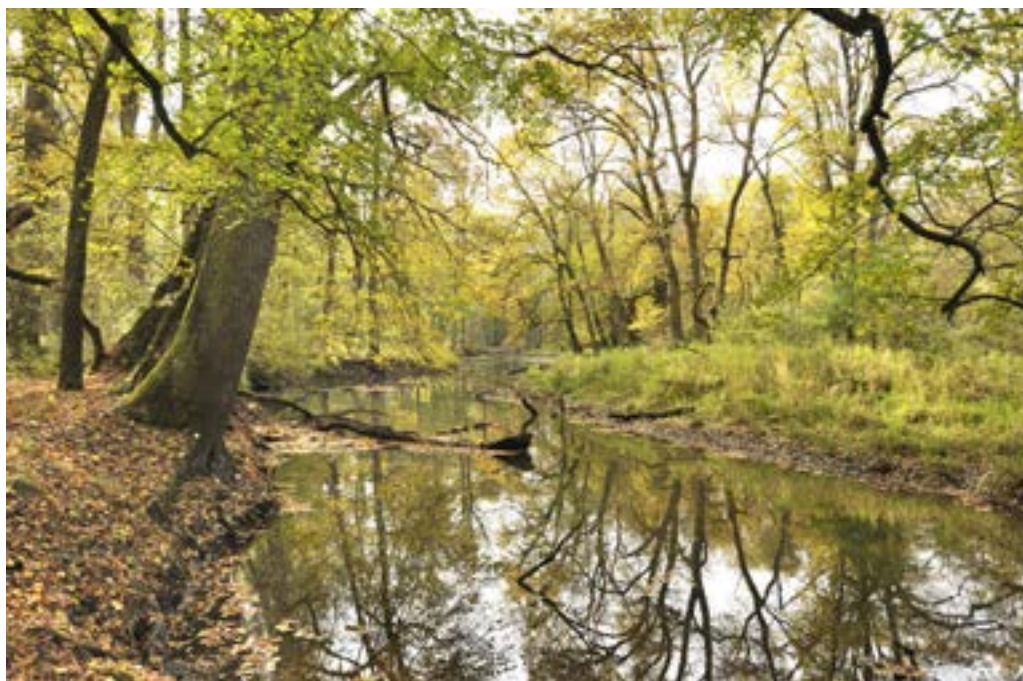
A valuable instrument (especially with large constructions) is also a feasibility study, the objective of which should be – besides assessment of technical aspects of the realisation – a complete examination of the feasibility of a project with regards to all other interests protected by legal regulations and international conventions. Even though the compilation of such a study may be demanding, the resulting study should help prevent the investor from ineffective investments into an inappropriately designed project.

The project of a connection of Danube, Oder and Elbe (D-O-E) for navigation has a truly rich history dating back to the Middle Ages, when Charles IV first came with this plan. In 2016, the Czech government, member state of the European Union (thus, among others, bound to obligations following from its environmental legislation) and party to many environmental conventions, adopted an update of the Spatial Development Policy, i.e. a top priority document of the Czech Republic in the area of spatial development planning. Under Paragraph 180, the Ministry of Transport was assigned the task to “Examine the effectiveness and feasibility of the Danube-Oder-Elbe connection to assess its possible realisation in a complete European context (incl. environmental aspects), its transport efficiency and the demandingness of the different branches” to be completed in 2018. This step should have contributed to an end of the disputes between opponents to the project, not knowing why there is still debate about the project, and its proponents, regarding conservationists as fanatic environmentalists not understanding the ‘environmental benefits’ of water transport.

The study was commissioned to the ‘D-O-E Association’, created for the needs of the tender process realised by the Ministry of Transport, being a conglomerate of the companies Vodní cesty, a.s., Sweco hydroprojekt, a.s. and Aquatis, a.s. The timetable for performing the study (and the interdepartmental comment procedure) aimed at completion by the end of 2017. At the same time, a monitoring committee including Polish and Slovak representatives was established, but Austrian members were not included (expressing Austria’s opin-



View of the Elbe river from Dubeč, České středohoří Protected Landscape Area. Photo Zdeněk Patzelt



Riparian forests in the UNESCO Biosphere Reserve at the confluence of the Thaya and the Morava. Photo Zdeněk Patzelt

ion by their absence). The committee should monitor, guide and provide feedback to the material during its entire compilation. However, the fear of rather biased document compilation by the D-O-E Association turned out to be justified, and members of the monitoring committee not primarily interested in the construction did not have influence on the study to the extent necessary.

## What could be a barrier for its feasibility?

River navigation usually demands large constructions adjusting the flow. These lead among others to changes in the regime of surface- as well as groundwater, in physical-chemical features of the watercourse, to a significant reduction in habitat diversity of rivers and their floodplains, and are a se-



Kaňon Labe National Nature Reserve downstream of Děčín. Photo Zdeněk Patzelt

rious intervention in the natural conditions of a river ecosystem (Rulík et al. 2014). The natural process of drift and sedimentation of river deposits is disturbed, accompanied by a loss of valuable habitats, and it also leads to a reduction in migration permeability of the waterbody and of the landscape for aquatic as well as some terrestrial animals (Krátký, Löw 2005). At the same time, the mentioned effects cannot be removed by technical solutions and can thus de facto not be compensated for. Realisation of the D-O-E connection would cause a change in water regime and have a negative impact on the natural functions of the rivers Morava, Bečva, Oder and Elbe and their floodplains, including adjacent floodplain soils and riparian forest ecosystems, which are unique in terms of extent and naturalness in the European context.

Watercourses and wetlands belong to the world’s most endangered ecosystems, providing many ecosystem services, and their role in the landscape is irreplaceable (MŽP 2015, Mach et al. 2016). Watercourse canalisation leads to a significant loss of their ecological functions and to a considerable disturbance of the natural water regime, due to which lower water retention of the

landscape manifests itself very negatively now that the climate is changing. We should add to this the impact on the actual waterbodies, including the essential influence on groundwater in floodplains and on the connected drinking water resources, which are of life importance, and further on water quality, sedimentation processes, bed-load regime and minimum and maximum flowrates (drought, floods). These ecosystems should on the contrary be in the forefront of interest with regards to the conservation, support and restoration of their functions. In other words, our activity should primarily consist in a reduction in and compensation for the impact of watercourse adjustments already conducted and of navigation already taking place. Aquatic species and species of natural habitats bound to water have been assessed the worst in national monitoring for years (Chobot a kol. 2013). This means that they are the most affected by negative changes and that the Czech Republic should particularly strive to improve this situation. It should not be forgotten that the idea of the D-O-E plan arose in times of different social priorities. Today however, the situation is completely different, whether in terms of economy, the environment or climate change.

Environmental legislation (especially requirements of the Habitat and Bird Directives, the Water Framework Directive, the Nature and Landscape Protection Act, etc.) has a fundamental impact on the feasibility of the project and should be thoroughly evaluated prior to further considerations on how realistic and necessary a D-O-E is. Conflict with the objectives of European nature conservation directives is one of the most important limits of the project, but this is just the tip of the iceberg. There is no need to specify these conflicts or make prognoses (as has been done in parts of the study dealing with expected economic benefits of the project and the development of the demand for shipping, not always based on well-founded assumptions), as they are determined by legislation. Nevertheless, they have not been evaluated in relation to the project’s feasibility.

In this respect, international conventions on environmental protection should not be overlooked either. Although these so-called multilateral environmental agreements may be seen as instruments not reaching the force of legislation, they form a full part of the Czech legal order. An example of an agreement with a direct link to the D-O-E project is the Ramsar Convention, but also the Bern and Bonn Conventions and the Convention on Biological Diversity must be mentioned. The mission of these documents should certainly not be interpreted in a way arguing on the one hand that the Czech Republic as a contracting party has complied to them and on the other hand making steps leading to a realisation of the D-O-E connection.

## Assessment of the feasibility study

The basic prerequisite for meeting the objectives of a feasibility study is quality workmanship and independency in its evaluation. The credibility of the compiled study detracts, among other things, from the fact that separate parts are not interconnected, i.e. in different places often different information on the same subject can be encountered and the contents of some passages is rather surprising when compared to their titles. For example, Part A of the study, which should deal with the possible alternative ways of achieving the project objectives, is rather a



summary of the project's benefits for carriers and declarations of those involved in the realisation of the D-O-E connection, which does not answer the question whether and to what extent objectives in transport policy can be achieved by other means than by realisation of the D-O-E project, which would irreversibly damage many components of the environment. The D-O-E project study promotes mostly ill-founded assumptions on flood prevention, recreation, and even water management and adaptation to climate change. Neither the economic calculations are very persuasive. On the contrary, it prefers documents which contain information on the D-O-E project and create the impression that the Czech Republic has committed itself to realisation of the river connection or has been imposed some kind of legislation or international agreement (European Agreement on Main Inland Waterways of International Importance, AGN). That is however a completely misleading interpretation.



Gravel deposits in the Oder river in Poodří Protected Landscape Area. Photo Zdeněk Patzelt

Another prerequisite for meeting the objectives of a feasibility study is a thorough evaluation of all available information. By the way, we deal with a feasibility study, not a search of available literature, so it is not an exaggerated demand to expect qualified conclusions regarding the feasibility of the project. A part indicated 'B.5' deals, on ca 1400 pages, with the impacts of the D-O-E connection on the environment. These are, although not exhausting (e.g. an assessment of the impact on farmland is missing; the aspect of ecosystem services and the influence on them, neither their inclusion into the economic balance are evaluated in the document; impacts on e.g. Poodří Protected Landscape Area and the UNESCO Biosphere Reserve at the confluence of the Thaya and the Morava are not comprehensively described, only a concluding assessment of the impact on the water regime of the landscape, etc.), in many cases correctly evaluated as serious or even as non-compensable, and are thus a clear proof of the severity of the impacts of the D-O-E project on the environment. Nevertheless, this part is not adequately reflected in the 'Conclusions' chapter or in the risk analysis or SWOT analysis. The D-O-E Association has therewith omitted obvious conclusions which are essential for the realisation of the project.

It is thus the question whether the study can serve as a foundation for a government decision on the meaningfulness and feasibility of the project, now that it mentions the risks which can essentially jeopardise the project on the one hand, but does not find the will to accept and interpret this information in key passages. If these environmental risks had been taken into account, general conclusions in favour of the D-O-E connection would have been practically impossible.

An abstract of the feasibility study was submitted for an interdepartmental comment procedure in January 2019. Even on the significantly reduced number of 167 pages, the material has almost the same shortcomings as the study itself: particular parts are again not interconnected and the environmental impacts are rather mentioned as a minor factor posing a certain risk in the form of difficult enforcement with regard to the professional sector and in permit procedures. In a motion for a resolution, the Ministry of Transport has proposed performing a Strategic Environmental Assessment (SEA) process. Besides the fact that this material is dedicated to a single project and deals with reasons why the project should be realised, and is thus not a strategy but de facto

project documentation, there is hardly any justification for a SEA process also because serious environmental impacts of the D-O-E project are already known today, among others based on the observations in the relevant part of the feasibility study (although not adequately evaluated from the perspective of feasibility). Performing a SEA process at this moment would only be another waste of public funds.

### The most important thing is still to come

The task from the Spatial Development Policy ordering the Ministry of Transport to summarise and assess available documents on the feasibility of the D-O-E project still remains unfulfilled three years after it was formulated. Although compiling a feasibility study was a logical and justified choice, the final study cannot be characterised this way, inter alia because it basically misses environmental risks. It will now be essential which position to the study the Government will take after evaluation of the interdepartmental comment procedure. But that is unknown at this moment.

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

# Update of the Strategy for Unblocking the Czech River Network

Zdeněk Vogl

This year, already a second update of the Strategy for Unblocking the Czech River Network, an important water management planning document, will be completed. At present, the Czech Nature Conservation Agency is working on a proposal delineating watercourses which are primarily determined to be made passable for migration, at the same time respecting territorial and species protection.

For this reason, the length of corridors will generally increase as compared to the present situation. These will be prioritised in the subsidy policy also in future. The objective of the updated version of the document is to implement measures providing free migration to fish and other water animals in an effective and systematic way, especially on watercourses of international and national importance.

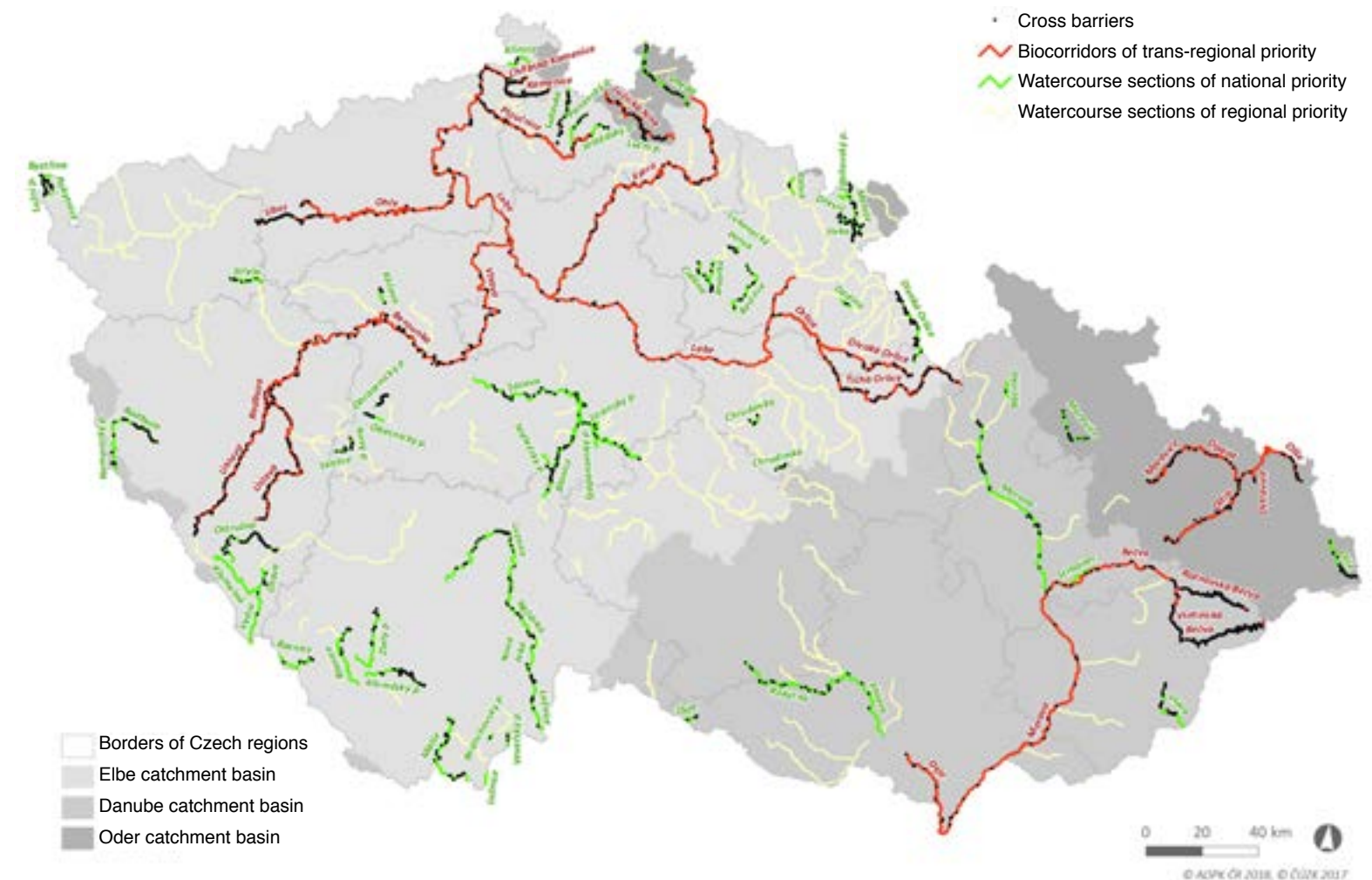


Figure 1. Delineation of corridors of international, national and regional priority in the updated Strategy. Compiled by Jan Vrba



**Current Strategy**

The Strategy is a strategic document of the Ministry of the Environment, aimed at setting priorities which establish options for bidirectional migration of water organisms on Czech watercourses by opening cross barriers. Particularly longitudinal continuity of watercourses is one of the requirements to achieve a good ecological state of a waterbody according to the 'Water Framework Directive' (2000/60/ES) implemented in the 'Water Act' (as amended). It is being realised thanks to, among others, a water planning process.

In the presently valid Strategy, watercourses of international (Category A) and national (Category B) importance are defined (see Fig. 2). The first ones are formed by corridors linked to marine environments intended for diadromous fish migration, in our conditions particularly eel (*Anguilla anguilla*) and salmon (*Salmo salar*). The other ones have been defined according to priorities in territorial and species protection, primarily with regard to threatened bivalve species.

**Why is the Strategy being updated again?**

Before each stage in water management planning, it is necessary to revise all relevant documents, add current knowledge and update them with newly available data. Besides a selection of priority watercourses, especially for distant migrants, the updated version of the Strategy takes territorial and species protection based on national and European legislation into account in a comprehensive way (see Fig. 1). For these reasons, nearly a doubling of national corridors and definition of a completely new category, Category C, for watercourses (or sections of them) of regional importance have been achieved. A numeric comparison of changes in the currently valid and updated version of the Strategy is illustrated in Graphs 1 and 2.

Trans-regional International? corridors were originally selected with regard to their high ecological potential, absence of water reservoirs and the abovementioned link to marine environments. The location of lake systems across these watercourses and the excessive number of migration barriers were omitted. The update aims at taking these factors into account. In Category A, the most significant changes have been made in the Oder catchment basin, particularly given the his-

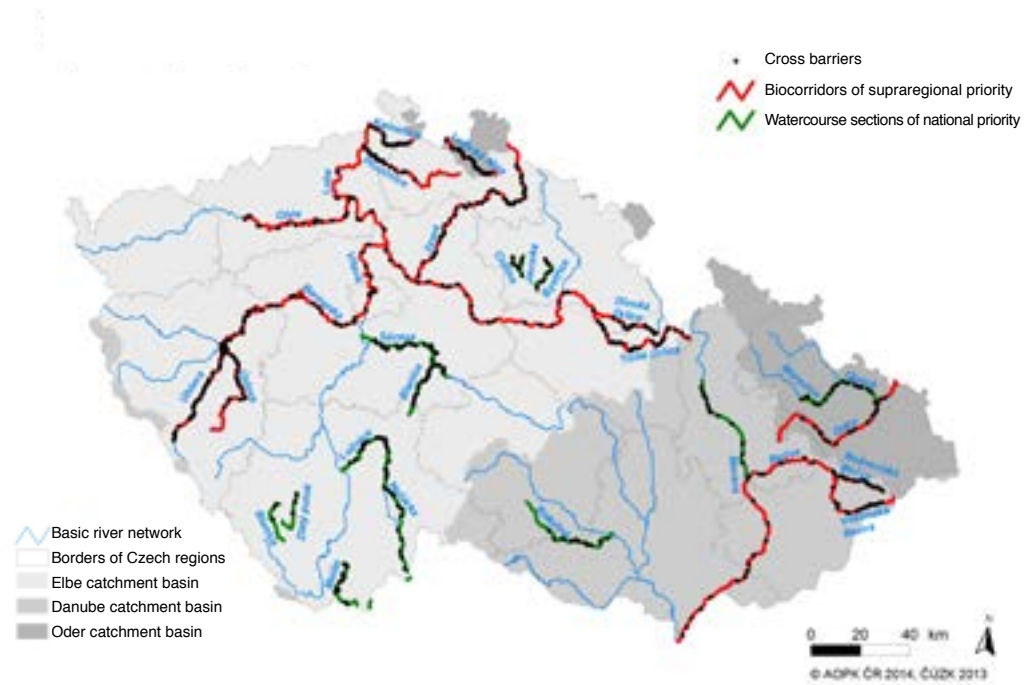


Figure 2. Definition of trans-regional and national corridors in the currently valid version of the Strategy for Unblocking the Czech River Network (Ministry of the Environment, 2014 update). Compiled by Zdeněk Kučera

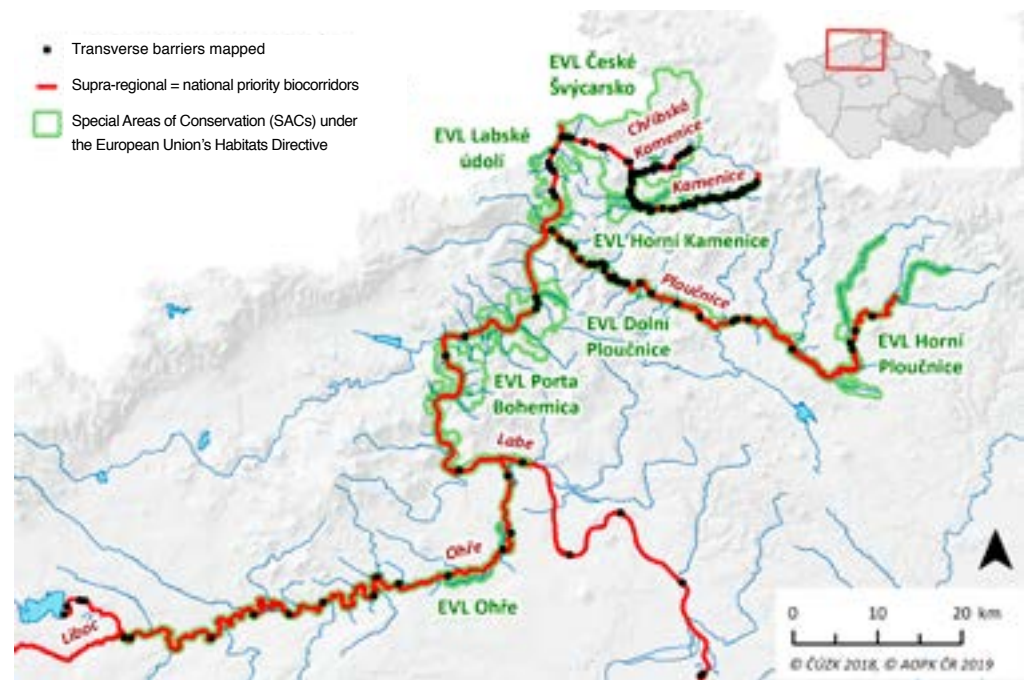
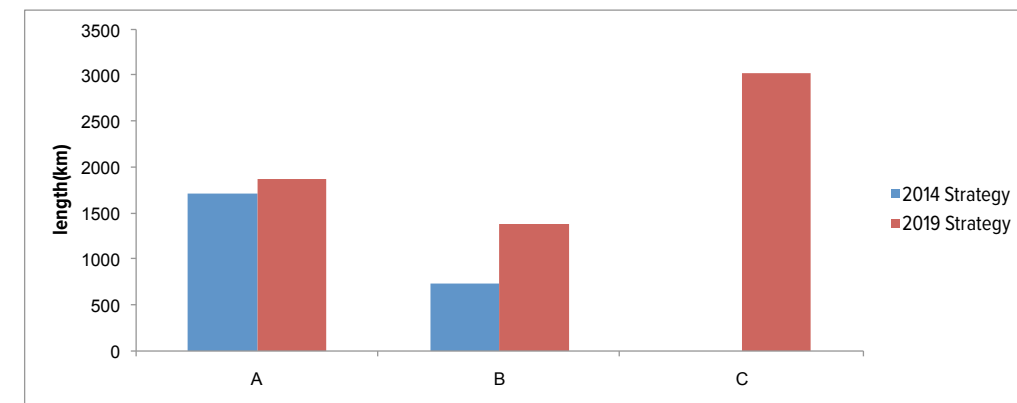


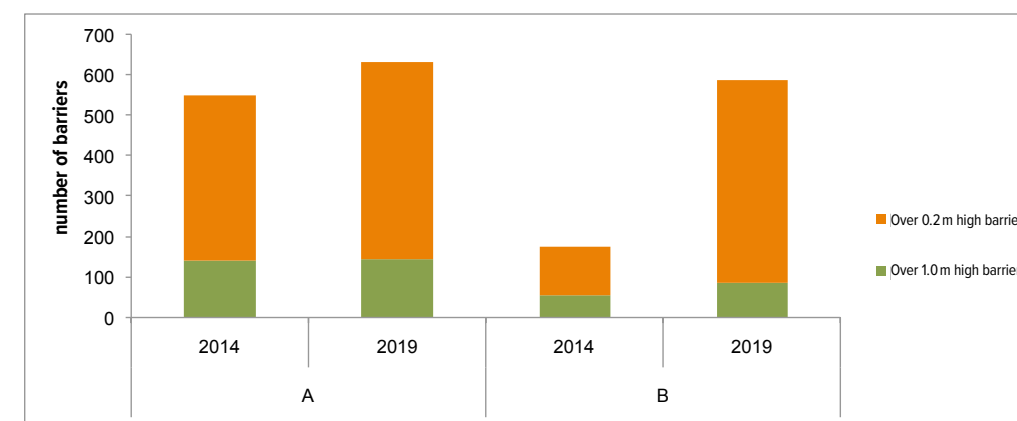
Figure 3. According to the Strategy on Providing Watercourse Network with Permeability, the lower and middle Elbe River stretches with important tributaries are included among the international priority corridors suitable particularly for diadromous migrants, e.g. the Atlantic Salmon. Elaborated by Jan Vrba

torical occurrence of salmon. In order to return this species, the Opava river – in connection to the Moravice river – was delineated up to the water reservoir at Podhradí. In the Elbe catchment basin, moreover, the Chřibská Kamenice river was included up to the village of Chřibská and in the Ohře (Eger) catchment basin, Liboc was included for this flag species. In both these water-

courses, salmon is repatriated by the Czech Anglers Union as part of the long-term programme Losos 2000. To preserve migration permeability, also the Dyje (Thaya) river from its confluence with the Morava river to Nové Mlýny waterworks was included in this category. On the other hand, some river sections were shortened, e.g. the currently delineated Ploučnice river (from its



Graph 1. Comparison of changes in length of the river network in the Strategies of 2014 (currently valid version) and 2019 (updated version). A – Corridors of international priority, B – Corridors of national priority, C – Corridors of regional priority. Compiled by Zdeněk Vogl



Graph 2. Comparison of changes in the number of migration barriers of over 0.2 and over 1m high in the Strategies of 2014 and 2019, using a dataset from the 'Migration Barrier Database' of the Czech Nature Conservation Agency. A – Corridors of international priority, B – Corridors of national priority. Compiled by Zdeněk Vogl

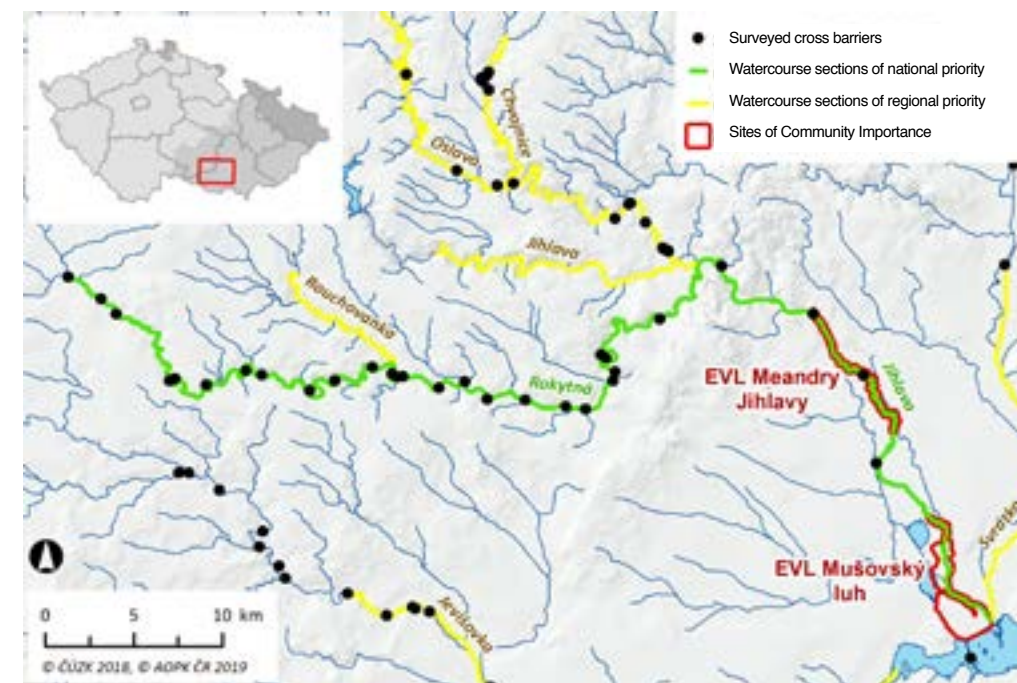


Figure 4. Example of connection of the newly defined national corridor of the Jihlava river to the existing Rokytná corridor. Compiled by Jan Vrba

**Database on Animal Movement/ Migration Barriers in the Czech Republic**

The Database on Animal Movement/Migration Barriers in the Czech Republic is a web portal managed by the Nature Conservation Agency of the Czech Republic gathering data collected in the course of the project No. EHS-CZ02-OV-1-016-2014 entitled Developing a strategy to mitigate river network fragmentation effects in the Czech Republic and funded by the European Economic Area funds. More precisely, migration/movement barriers, facilities to enhance watercourse permeability, e.g. fish ladders, also known as fish passes, fish steps or fishways, as well small hydropower plants, are documented there having been monitored on the selected watercourses across the country. In addition, it also presents other project's outputs, inter alia an analysis on water management in the selected Sites of European Importance (pursuant to Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection, as amended later, the term for Site of Community Importance, SCI under the European Union's Habitats Directive), fish ladder functionality assessment by the extensive method or data gathered during migratory fish monitoring by advanced methods having been a part of the national biological diversity monitoring scheme.

More information on the Database on Animal Movement/Migration Barriers in the Czech Republic is available on the web portal itself ([www.vodnitoky.ochranaprirody.cz](http://www.vodnitoky.ochranaprirody.cz)) or in the article published in this journal entitled River network fragmentation in the Czech Republic. The Database on Animal Movement/Migration Barriers as a tool to minimize their effects (Ochrana přírody/Nature Conserv. J., 72, 6, 13-17, 2017).

confluence with the Elbe to its confluence with the Ještědský potok stream) and the Oder (from the state border to the SW boundary of Poodří Protected Landscape Area). This category may be reduced in the negotiations to be followed by excluding the upper sections of the Rožnovská Bečva and Vsetínská Bečva streams as a result of the relatively high number of cross barriers.

Category B includes watercourses or sections of them inhabited by protected animals or animals of European importance with a high migration demand of the species themselves or of species existentially dependent on these migrants (a list of species is given in Tab. 1). These species are always the protection target of an SCI or nature reserve. Category B watercourses are often short, isolated sections which have been included for the mosaic location of protected areas. An example is the Račinka stream, where Ukrainian brook lamprey (*Eudontomyzon mariae*) is the reason for protection. For European brook lamprey (*Lampetra planeri*), watercourses on the territory of e.g. SCI Olše, SCI Moravice and SCI Údolí Chrudimky have been included. The river Vlára in the Bílé Karpaty (White Carpathians) Protected



Landscape Area is included for the occurrence of chub (*Alburnoides bipunctatus*) and provides at the same time protection to other fish species, particularly the loach *Sabanejewia balcanica*. For pearly mussel *Margaritifera margaritifera*, e.g. Lužní potok stream in the Aš region has newly been included. In some cases, links to currently defined corridors have successfully been made. For example, the Jihlava river, upstream of the Nové Mlýny reservoirs, is connected to the presently defined Rokytka, intersecting SCI Mušovský luh and SCI Meandry Jihlavy, protected for the occurrence of white-finned gudgeon (*Romanogobio albipinnatus*) (see Fig. 3).

The regional corridors have been defined by staff of the regional offices of the Nature Conservation Agency or national park authorities based on certain criteria according to a uniform methodology displayed on [www.vodnitoky.ochranaprirody.cz](http://www.vodnitoky.ochranaprirody.cz). For classification into this category, in contrast to national corridors, only species protection has been taken into account. Other criteria were number of migration barriers, hydromorphological and ecological quality of waterbodies, and connection to corridors of higher priority. This category includes among others the Ohře river with notable tributaries upstream of the Nechranice Dam, which prevents inclusion of the entire watercourse into the category of corridors of international priority (Fig. 4). In the areas concerned, also the occurrence of invasive crayfish species has been taken into account in order to prevent spread of the crayfish plague. For these reasons, the Strategy does not include e.g. the Stroupinský potok stream in the Křivoklátsko Protected Landscape Area, where our native crayfish was affected by this fungal disease last year.

### Financing of the proposed measures

Watercourses delineated as mentioned above will be prioritised in the subsidy policy of the Ministry of the Environment, particularly in the Operational Programme Environment (up to 100% of the expenses). The allocation of finances is still considerable. We expect a substantial increase in submitted projects (or requests), with regard to the demanding preparation of the actual measures as well as to the administration involved in subsidy requests, from a few per year at present to at least dozens next year.

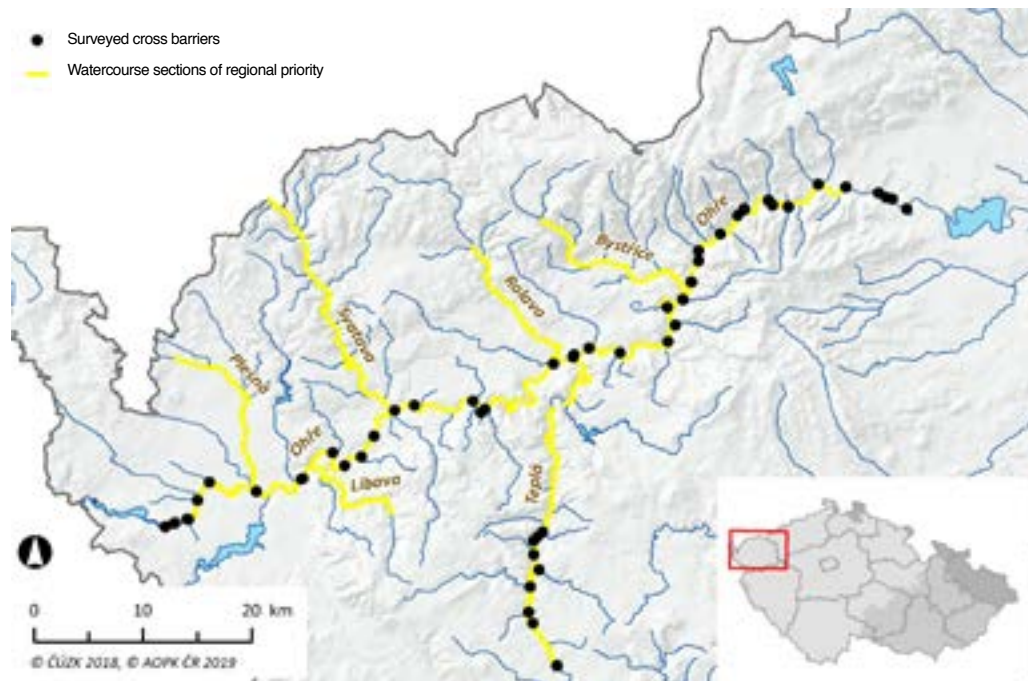


Figure 5. Classification of the Ohře river and selected tributaries upstream of the Nechranice Dam as a regional corridor. Compiled by Jan Vrba.

Table 1. List of fish, lamprey and bivalve species for the delineation of corridors of national and regional importance. Compiled by Zdeněk Vogl.

Class	Species	Protection Category (Act No. 114/92 Coll.)	Habitats Directive
Fish	<i>Leuciscus aspius</i>	–	Annexes II and V
	<i>Gobio albipinnatus</i>	–	Annex II
	<i>Romanogobio kesslerii</i>	Critically threatened	Annex II
	<i>Leuciscus idus</i>	Threatened	–
	<i>Lota lota</i>	Threatened	–
	<i>Alburnoides bipunctatus</i>	Strongly threatened	–
Lampreys	<i>Lampetra planeri</i>	Critically threatened	Annex II
	<i>Eudontomyzon mariae</i>	Critically threatened	Annex II
Bivalves	<i>Margaritifera margaritifera</i>	Critically threatened	Annexes II and V
	<i>Unio crassus</i>	Strongly threatened	Annexes II and IV

### Conclusions and expectations of the updated Strategy

The updated Strategy should serve as a document for the third water management planning period, running from 2022 to 2027. Its objective is to comprehensively define watercourses significant from the perspective of nature and landscape conservation, primarily securing the continuity (migration permeability) of these watercourses, thus implementing, among others, the ‘Water Framework Directive’. This requires, besides securing migration permeability, also the preservation or restoration of other stream functions like the stream load regime and self-purification functions. In accordance with these objectives, appropriate adjustments of the measures

should be chosen in the following order: (1) removal of cross barriers, (2) near-natural solutions such as boulder chutes, (3) fish ladders, optimally accompanied by revitalised watercourse sections linked to them, e.g. in the form of spawning grounds, distributaries, groynes, etc.

The document should further present the current measures and novelties in this particular field in a comprehensive way, including fundamental problems with solving migration permeability, especially on corridors of international and national priorities. The objective of updating the Strategy is not only to delimit these corridors, but also to establish conditions to make them passable in a systematic and effective way.

# Where is Šumava National Park heading?

Pavel Hubený, Martin Starý, Pavla Čížková

I believe in an authentic internationally recognized national park, but the path to it is thorny, slow and cautious...

The hitherto maturing National Park can easily be compared to the life of a human being. Its birth was

full of enthusiasm and great plans developed by fathers, mothers, uncles and aunts, grandmothers and grandfathers – and each person had a different plan. But everybody agreed that it is necessary to put the best into the child's life.

Forest at Medvědice in spring. Photo Zdeněk Patzelt





## Free-flowing youth

And so the National Park Authority got control over forests, minor watercourses, and the Ministry of the Environment even provided competences in land-use planning. But the parents got divorced. Land-use planning went to the Ministry of Regional Development, forestry management to municipalities. And all of a sudden, the child was supposed to grow up in alternating care and adapt to another relative in all aspects. It should conserve nature, implement the forestry act and develop the area sustainably. Then adolescence started and the National Park slowly began to understand its role in society. It distanced itself from parents and relatives, which caused problems. The desire to fulfil the dream of an authentic national park was impeded several times. One moment it looked like its future would be aligned with the life of its mother, Šumava Protected Landscape Area, and that National Park would just be its name, not its function. But now that it has already passed the age of 25, it knows that rebellion does not get you anywhere. At the same time, it has gained a clear idea of its future, at least until its midlife crisis, i.e. until its 45<sup>th</sup> birthday... This clear idea is what we would like to discuss today.

## Wilderness – a nasty word

There were times when the word ‘succession’ (at least in the sense of spontaneous recovery of a forest on abandoned land) was popular with staff of the Šumava National Park Authority. Then there was a short period when ‘wilderness’ was very popular, but also this soon became a forbidden word. Well, everybody has a slightly different idea of wilderness. Some people see it as an untouched tropical virgin forest, others as a long-abandoned garden where people go and have a smoke. In our National Park, the second option rather prevails. We do not have many virgin forests. Although virgin forests still covered 70% of the National Park area in the early 19<sup>th</sup> century, only one century was needed to reduce this number to 15%. But why is it a national park at all? Because after felling of the virgin forests no cultural tree plantations were created, but tree offspring from the original forests grew up and aged here. Historical records speak of legions of young spruce trees growing in old forests. And until the 1960s, artificial restoration, if any, was mainly carried out by sowing



Mt. Blatný vrch. Photo Pavla Čížková

seed from local cones, out of which the seeds were extracted at local seed-extraction plants. Only about 35% of the present forests have its origin in a combination of natural and artificial restoration or have been planted on farmland. Yes, there are hardly any virgin forests in Šumava, but somewhere wilder, elsewhere less wild offspring of the original virgin forests grows here. And since 2007, nearly a quarter (23%) of the National Park area has been left to natural processes. In this area, we have once again released the reins of ‘wilderness’.

## Conservation experiment

Since the National Park was established, it has been a legitimate opinion that leaving a forest to natural processes is an ‘experiment’ which nobody has ever tried out. Yet it was already rather well known that before the arrival of man, forests lived their own life and were uprooted by storms and attacked by bark beetles, and even also burned. From the perspective of historical forest descriptions and results of pollen analyses of lake and peat sediments, forest management rather than natural processes seemed to be an experiment. The way in which (predominantly spruce) forests react to thinning, following from natural processes, has evoked passion – and still does. Quite a number of people probably still believe that if the bark beetle had been fought by foresters, such a massive tree death would never

have occurred, despite what we already know today. Firstly, we know that in the time of the bark beetle outbreak in Šumava NP, forests where we had properly fought against the beetle neither remained protected. Secondly, it was shown that during both massive outbreaks in Šumava NP, the population density of bark beetles in intervention and non-intervention areas changed at the same speed, so that it was not demonstrated that harvesting of infested spruce trees had a real effect on bark beetle reduction. Rather the weather and pests were the reason for its decline. Thirdly, it can be seen in our entire country today that massive outbreaks can occur even despite large and uncompromising interventions. And fourthly, felling a forest is not the ideal start for natural processes. And it is natural processes in most of the National Park area which is our present objective.

## Proposal for new zonation

The new zonation model is fundamentally different from the conventional one: whereas in the zonation delimited in 1992, Zones 1 were automatically open to the public on marked routes, and management interventions were not clearly limited in them, the new zones do not deal with public access, but define management regimes relatively strictly. Public access is not anymore limited by zonation, but by a different measure, the designation of Quiet Zones.



Kamenná hlava. Photo Pavla Čížková



Kamenné moře on Mt. Plechý. Photo Pavla Čížková

The ‘Natural Zone’ will be the wildest zone. We designated to areas where natural processes can be given a free hand already now. In truth, we are not completely revolutionary. This zone is kept in about the same territory as where natural processes have been allowed hitherto. The Natural Zone is proposed for 27.7 % of the National Park area. To this zone, a Near-natural Zone has been attached, including especially forest ecosystems of which we are convinced that they can be transferred to the Natural Zone – in other words, turned

into wilderness – in a rather short term. The natural processes here play a main role already today and we correct them just moderately or take action against the spread of spruce bark beetle to surrounding forests. The expert proposal also represents 27% of the National Park area, but after the hearings we are heading for 24%.

The largest proportion, 45% of the National Park area, is to be included into the Concentrated Management Zone. This is mostly forest-

or farmland where we will take care of nature in the following decades, concentrating on the preservation of unique, protected or threatened species or species of European interest and also habitats of European interest. After hearings with the municipalities, the Concentrated Management Zone could be expanded to almost 48%.

All settlements forming a spatially connectable whole, built-up areas and land intended to be built up in land use plans, have been included into the Cultural Landscape Zone. Although the smallest part of the National Park area (1%, 642 ha), it is important. Really built-up area (with gardens and yards connected to them) represents less than half of this area, so over 320 ha is still available for municipal development in the National Park. Besides, scattered in the other zones throughout the National Park, other buildings (mostly individual houses) are found which cannot be included in the Cultural Landscape Zone for their small size and seclusion. Also cottages are part of some of the remaining three zones, but exempt from zone regulations. They cover roughly another hundred hectares. It is important to note that the majority of legal restrictions in the most of the National Park area do not apply to areas which are or may be built up. One may camp, make fire or even salt roads or pavements here in winter.

## Zones and Natura 2000

Now and then, the idea that zonation should especially secure the conservation of species and habitats of the Natura 2000 network pops up among conservationists. This is indeed one of the main tasks of a national park. It is therefore necessary to set up new zones in a way that natural processes take place mainly there where it does not ‘bother’ Natura 2000, and to include Natura 2000 habitats which demand our care into the Concentrated Management Zone. But also this approach has its shortcomings. For example, the minimum acreage of one Concentrated Management Zone segment is 2 ha, but non-forest Natura 2000 habitats are often just about 0.5 ha large. Natural Natura 2000 woodland habitats and peatbogs should be included into the Natural and Near-natural Zones, grasslands on secondary non-forest land rather into the Concentrated Management Zone. According





Morning at Želnavá. Photo Zdeněk Patzelt



Světlé hory. Photo Pavel Hubený

to degree of naturalness, natural woodland habitats are for 44% situated in the Natural Zone and for 29% in the Near-natural Zone. In the next zonation delimitation (in 15 years) we will thus be able to leave a full 73% of woodland habitats to natural processes. Two-thirds of all forest bogs, raised bogs and transitional bogs are also included in these zones. By contrast, 85% of submontane *Nardus* grasslands are situated in the Concentrated Management Zone and Cultural Landscape Zone, just as 66% of X-coded habitats (strongly influenced or created by man).

### Will Quiet Zones bring peace?

They certainly will, although there will certainly be a lot of fuss around them before their designation. As already stated, Quiet Zones are not regulated by management – that is the task of zonation – but by visit rate. Freedom of movement is one of the basic civil rights, enshrined in the Charter of Fundamental Rights and Freedoms, so it can only be limited in justified cases. Our Quiet Zone proposal tries to get to the core. This means that Quiet Zones, which are according to law accessible only by routes and paths reserved by nature conservation authorities, cover 16.7% of the National Park area and represent only the most sensitive and threatened minimum. We concentrate especially on animal species, exceptionally also plants and peatbogs which are protected and easily disturbed. Conservation of the western capercaillie (*Tetrao urogallus*) will be the highest priority of the National Park in this. The sensitivity and population density of this bird has been dealt

with in No. 1/2019 of this magazine. For its conservation we want to create, in collaboration with Bavarian Forest National Park, a compact joint area on both sides of the border to which the same rules will apply. We aim at maximum protection of the real core of the capercaillie population in the area of the Modrava moors and the border ridge between Prameny Vltavy (Vltava Springs) and Plesná. This area will have time-limited access and the density of access roads will be minimal. At the same time, hunting and forestry interventions will be banned on both sides of the border.

The second largest Quiet Zone area has been dedicated to the protection of the Eurasian black grouse (*Tetrao tetrix*). Its population is markedly smaller than that of the capercaillie and the situation is not yet improving. Grouses are not concentrated in a coherent territory, but inhabit plains in marginal parts of the National Park which are rather remote from each other. This fragmentation of its populations may be a great problem in preserving the species in the long term. At the moment, a DNA analysis of individuals, based on collected dung, is being completed. This year for the first time we will obtain detailed information on the real grouse population numbers, on relatedness of individuals and also on the question how far individual birds fly. Protection of its courting grounds and nesting habitats is today linked to the protection of nesting grounds of common crane (*Grus grus*), whose numbers in Šumava have slightly increased over recent years. We also have a plan to protect three

territories which are permanently inhabited by reproductive lynx females. These areas are sufficiently varied, rocky and inaccessible, and have game concentrations which lynxes use for hunting. The territories include parts of the Vydra and Křemelná canyons and the scree forest at Medvědice. We further want to dedicate some small-scale quiet areas with limited access restricted to the spring months to the protection of peregrine falcon (*Falco peregrinus*). Moreover, the quillwort *Isoëtes echinospora* in lake Plešné jezero will be protected by disallowing entry into the lake, similarly to the protection of some peatbogs and wetlands situated close to paths where visitor numbers are extremely high.

The 2017 amendment to Act No. 114/1992 has brought really revolutionary changes. The separation of management, connected with the system of Nature Conservation Zones, from visitor regulation, which involves a system of Quiet Zones, is still strange and new. This has led to the creation of areas without human intervention which are however free to visit, and on the other hand, managed areas with temporarily limited access to visitors (historical courting grounds of black grouse on meadows). This change in the way nature is managed brings us closer to Western Europe, where this approach is common, and enables us to unify the practical approaches on the Czech and Bavarian side of the state border, making Šumava National Park and Bavarian Forest National Park speak a common language again.

# Tree veteranisation, pollarding and girdling vs tree conservation

## Selected issues of practical protected area management

Pavel Pešout, Jan Šíma, Linda Stuchlíková

We are currently observing changes in the landscape at an unprecedented rate. We do not have in mind here the often mentioned impacts of climate change, but particularly the consequences of changes in land use by man. A century ago, when a third of the inhabitants of the Czech Republic still made a living from agriculture and forestry and the average farm size did not even exceed 5 hectares

(Kučera 1994), the landscape was in many ways exploited more intensively, but at the same time in a much more mosaic way. At present, only a tenth of them participate in land management, while industrialised farming takes place in large, consolidated areas and the management of economically marginal areas and traditional, more labour-intensive forms of farming have been abandoned.

Tree girdling has been maintained until today and is applied in many European countries. This traditional technology is now gradually being applied in the Czech Republic again, not only by nature conservationists in special interventions for the benefit of saproxylic species, but in certain situations also by foresters. Photo Karel Kříž







High stumps were often left in coppices, so coppicing mostly fluently passed into pollarding. Restoration of a formerly trimmed oak. Photo Karel Kříž.



Trimming of pollard willows is best carried out in regular, roughly five-year intervals in a way that the heads do not break apart under the weight of the branches. Pictured: willows in Křivé jezero National Nature Reserve. Photo Vladan Riedl

The result is a progressing homogenisation of the landscape, changes in and loss of many habitats and communities, and an alarming overall decline in and extinction of many species. If we want to face this trend, nature conservation must make an effort to restore historical forms of management or their effects by realising appropriate compensatory measures. By default, efforts to restore grazing at suitable sites, mowing in a mosaic way (grassland cutting differentiated in time and space) attempting to compensate for the diversity that small-scale farming had naturally generated, etc. have already been included into 'conservation management'. Also a wide range of other activities take place in the landscape, including many different forms of utilisation of trees and tree parts. Measures for the support of biodiversity must include the restoration of these historical management methods and compensatory procedures for the initiation and creation of habitats for species (particularly saproxylic insects) specifically bound to such habitats. In this contribution, we will have a look at special treatment of trees growing outside forests.

Before the advent of fossil fuels, wood was a much demanded energy source. It was even obtained at remote sites and hardly accessible places in the easiest possible way. At the same time, forests were exploited as a source of various materials, and all kinds of tree stands were used as a source of complementary biomass. Particularly municipal pastures, somewhere

also mortuary lands and open-canopy forests, were used intensively for grazing. Commonly coppicing was practised here, branches were trimmed, etc. Also use was made of dry twigs and shoots and tree debris. In the case of trees growing along roads, in hedges and on land boundaries, pollarding was often practised. At the same time, trees were exposed to cattle activity and, last but not least, also to fire. These activities, together with more age- and species-differentiated forests and a higher percentage of old-age solitary trees (incl. old fruit trees) in the landscape, guaranteed permanent suitable conditions for the presence of saproxylic insects and other organisms bound to sunlit trunks, cavities, cracks and other microhabitats typical of senescent trees. Today, former municipal pastures, tall standard-tree orchards and coppices densely encroached with trees and shrubs, are often reclassified as woodland and managed as clearings, or are protected woodland left without deliberate felling. Pollarding and other ways of obtaining wood have been abandoned (Szabó 2010).

### Compensatory measures for habitat creation

Many animal and plant species are existentially dependent on habitats through traditional management forms (Šebek et al. 2013). This is apparently related to the fact that at least some of these forms are similar to natural processes which used to have an impact on trees even without man. Tree trimming or pruning may be

similar to the effects of large mammals, while girdling and coppicing create habitats similar to fire. All the more problematic is the fact that trees treated in this way gradually disappear from the landscape. Sites indispensable for the survival of many endangered organisms inevitably decline due to this (Čížek et al. 2016). Modern nature conservation is therefore searching for ways to compensate for traditional management forms with the aim of preserving conditions necessary for a favourable development of populations of various endangered species and communities. Such approaches include controlled veteranisation and other sorts of interventions on trees, which make it possible to accelerate the creation of habitats linked to more advanced tree development stages, i.e. aging and decay (for a detailed description of different methods, see Box). With regard to the degree of threat of different species bound to dying trees (or their parts – cavities), their usually slow development and low population dynamics (e.g. in the beetles *Cerambyx cerdo*, *Osmoderma barnabita* and *Lucanus cervus*, having a development cycle of several years) and also with regard to the uneven representation of trees of the appropriate age and condition, it is necessary to create habitat conditions with a relatively long-term perspective. This cannot be limited to just a preservation of the actual, often residual condition, which would also mean the loss of populations of species bound to it after death and decay of even well-maintained trees. Un-

### BOX: Methods of tree treatment for habitats

#### Coppicing, high-stump felling

Coppicing is one of the oldest methods of restoring tree stands, in which stumps (often relatively high) were left to rejuvenate. Many existing forests on slopes, particularly those formed of oak, hornbeam, but also lime trees and other species, are former, so-called reserved coppices, where coppicing was abandoned mostly after World War II. Stumps, especially the high ones, rapidly became a habitat suitable for saproxylic insects and other organisms. Coppicing is recommended in certified methodologies of the Ministry of the Environment in order to maintain populations of endangered species (Čížek et al. 2015 and 2016).

#### Girdling (ring-barking)

Girdling used to be applied particularly in connection with timber harvesting. The farmer or shepherd removed a band of bark from a tree trunk, interrupting the conductive tissue (phloem) and waited for the tree to dry. After that he cut off the dry part, which he used as fuel. The dry wood was lighter and easier to transport. This method of 'gradual timber harvesting' is practised until today in the Balkans. In the Czech Republic, girdling is especially applied in the elimination of black locust (*Robinia pseudoacacia*) (Pergl 2014). Recently it has locally also been applied in tree (e.g. pine) stands which were being thinned in an effort to prevent the stand from deteriorating, or

which were being restored (Kozel 2010). In other countries it has been applied in oak forests as well as other forest types for many years (Noel 1970, Ford et al. 2012, Percival & Smiley 2015).

#### Dry twigs, branch trimming

In the past, there was often a lack of forage, particularly among small farmers and cottagers. They therefore obtained fodder from all kinds of sources, one of them being dried twigs and trimmed branches including leaves, which were used directly to feed livestock or dried for the winter. Dry twigs include cut vegetation on clearings consisting of brambles, shoots of non-target trees, graminoids, ferns, etc. The harvesting of dry twigs maintained sunlit rejuvenating stumps and branch trimming increased the insolation of tree trunks and caused minor wounds, initiating the creation of drywood habitats.

#### Pollarding

This was the most common management method in combination with coppicing in the past. Top branches or shoots were trimmed or cut, which was physically easy and sustainable. However, not every tree species withstands repeated trimming (Krása 2015). A common type of pollarding is the trimming of willow twigs ('rods'). When trimmed repeatedly, trees react by making a dense head (as in pollard willows) with many cavities. A trimming method

similar to pollarding is applied in the modelling of trees, e.g. lime trees, horse-chestnuts, plane trees, etc., in landscaping and urban areas (Kolařík et al. 2003).

#### Veteranisation

Veteranisation includes a set of measures carried out with the aim of accelerating the formation of microhabitats (cavities, cracks, barkless spots, fractures, etc.) important for the settling of here saproxylic and other groups of organisms bound to such habitats (Krása 2015, Bengtsson, Hedin, Niklasson 2012). Also a combination of the above-mentioned methods, such as pollarding and girdling, is regarded as veteranisation. Since applying these methods may mean a curtailing of the tree's lifespan or at least a deterioration of its condition, veteranisation is used exceptionally at small sites of an endangered species, lacking a tree generation able to replace senescent specimens after they decay, meaning a risk of interruption in the continuity of the habitat. If such a site is isolated from other ones, veteranisation of a required number of trees may be the only way of securing occurrence of the species in the long-term. As isolated spots with species bound to senescent trees are often found in castle parks and other monumental gardens, careful preparation, consultation and compliance with monument care is always necessary.



A small-leaved lime tree can survive for centuries thanks to coppicing. Its stump may reach a diameter of even 10 m and is a suitable habitat for many species. The photo is from Děvín National Nature Reserve. Photo Vladan Riedl.

fortunately, such a threatening scenario can be expected in many cases and will often be difficult to prevent (e.g. species associated with allees and similar groups of trees, some of which fall under the Natura 2000 network). The more important is the implementation of measures in areas which have a potential for maintaining particular species and their habitats in the long term. In many states of southern and western Europe, traditional management forms have partly been maintained to this day, while in other (e.g. northern) countries, restoration of these forms, initiated by nature conservation, has been practised for years (Alexander 2012, Cavalli, Mason 2003, Speight 1989, Read 1996, Unrau et al. 2018, Vignon, Orabi 2003).

### Creating habitats does not mean damaging trees

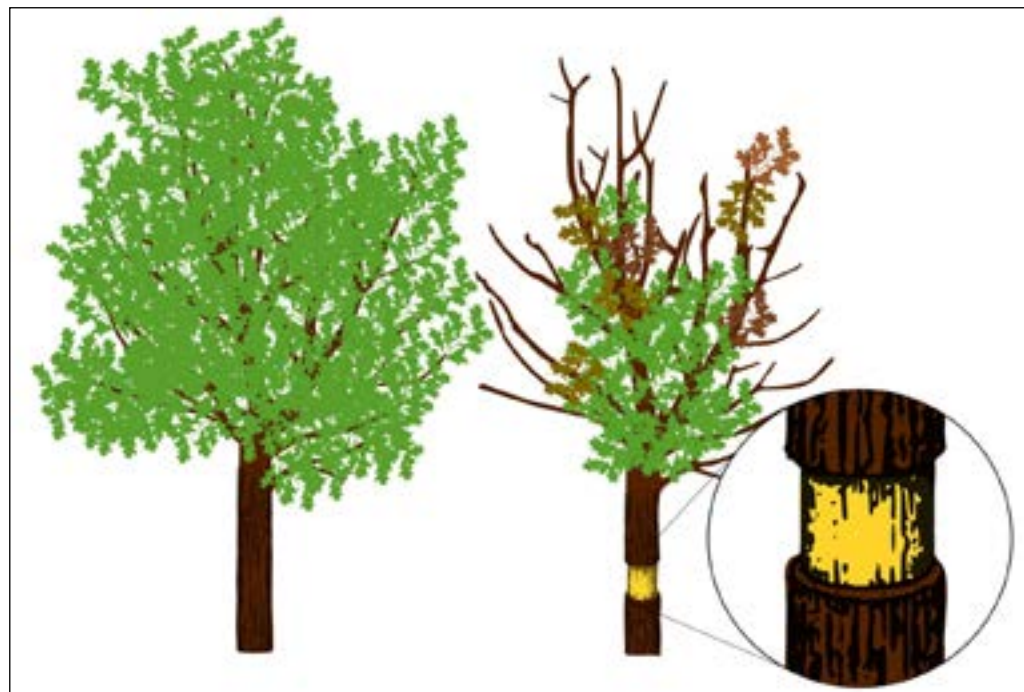
Legal limitations concerning the protection of non-forest greenery in the Czech Republic are based in the embellishment movement of the



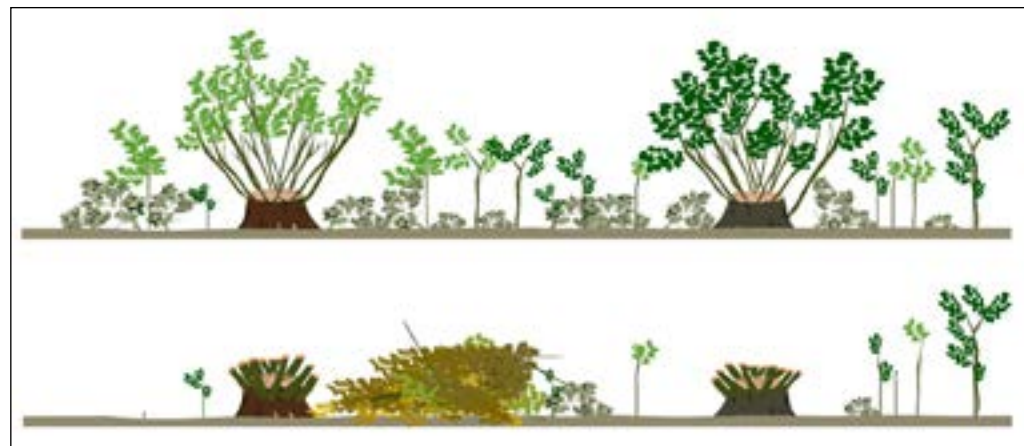
first half of the 20<sup>th</sup> century. It was a reaction to the then overexploited landscape (grazing, but also unregulated tree felling) aimed at maximum enforcement of tree preservation.

Current legislation (Act on Nature and Landscape Protection, since 1992) generally prohibits the ‘damaging and destroying’ of trees. At the same time, it empowers the Ministry of the Environment to define in an implementing legal regulation which interventions are or may be ‘damaging’ or ‘destroying’ and must thus be regarded as ‘illegal’. This empowerment makes it possible to define species or cases of such interventions also ‘negatively’, i.e. to determine in which cases an intervention may be legitimately considered permissible. The Ministry of the Environment has taken into account current expertise and conservation needs of endangered species and, in Act No. 189/2013, on the protection of trees and authorisation of tree felling, constitutes that “an intervention is permitted if it is performed with the aim of preserving or improving particular functions – for the treatment of a protected plant or animal species, as part of protected area management performed in accordance with the management plan or management principles, or as part of the management of a European Site of Community Importance (SCI) or Special Protection Area (SPA) performed in accordance with the set of conservation measures.” Thus, whereas planning documentation, i.e. management plans or sets of conservation measures are the basis of the management of protected areas, SCIs and SPAs, the regulation on the ‘treatment of a protected plant or animal species’ is not bound to any other formal condition (not even that the protected species in question should occur at a site before an intervention).

In the case of protected animal or plant species, procedures must be based on expert documents, which may not only be rescue programmes or regional action plans, but also expert proposals as part of particular projects or measures (see below). Generally, in each individual case it must be assessed whether the legal principle of proportionality is maintained, i.e. whether an intervention is appropriate (if it can create the conditions necessary to enforce the populations of target species at a site), necessary (no alternative measures can achieve comparable objectives with regards to the



Girdling (ring-barking) consists in removing bark all around the tree trunk, thus interrupting the conductive tissue (phloem). Delineated by Vladan Riedl



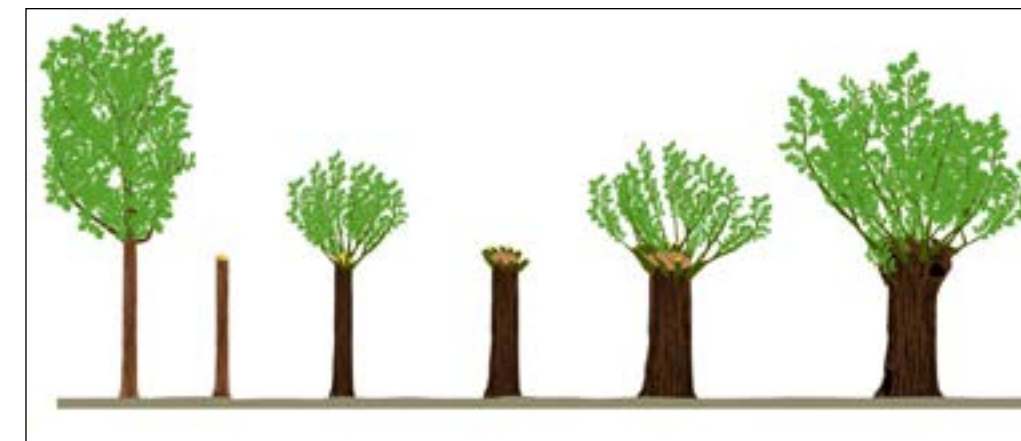
Dry twigs are intended to feed livestock and are obtained by cutting vegetation on clearings consisting of brambles, shoots of non-target trees, graminoids, ferns, etc. Delineated by Vladan Riedl

treatment of a certain species at a site) and proportionate. The expert documents should thus provide information to answer these questions. It is, of course, also necessary to assess the needed measures with regard to the trees in question. In most cases, the benefit of saving a species will be considered greater than the damage caused to common tree species, but opposite situations may occur (extraordinarily robust trees, trees of high cultural value, etc.). If the measure is not initiated by a nature conservation authority, it is appropriate that the need and expertise of the proposal be approved by the relevant nature conservation authority, so that the initiator of the measure is

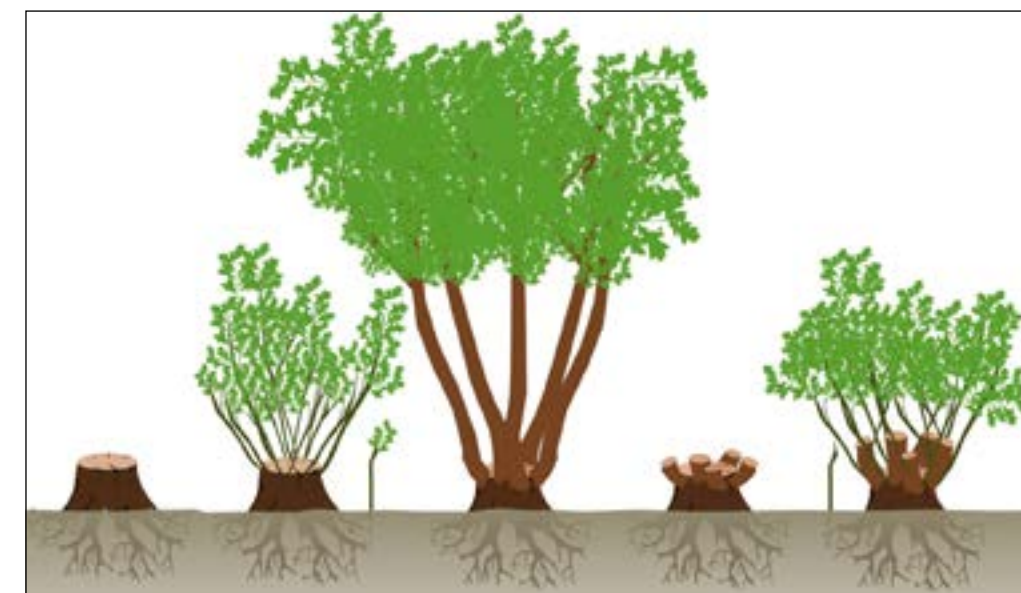
certain that the interventions will not be evaluated as undesirable and disproportionate by supervisory bodies. It can therefore be recommended to pre-discuss a measure with the Czech Nature Conservation Agency, being the official nature conservation authority, and with the relevant regional authority responsible for species conservation outside protected landscape areas and national parks.

### Do not underestimate project preparation

If a measure does not follow from nature conservation planning documentation (management plan, set of conservation measures,



Pollarding in combination with coppicing used to be a common management method in which top branches and shoots were trimmed and cut. Delineated by Vladan Riedl



Coppicing is one of the oldest methods of restoring tree stands. Stumps (often relatively high) were left to rejuvenate. Delineated by Vladan Riedl

rescue programme), it is effective to make a project from which the objective of the measures, the necessity and the way effectiveness will be monitored are evident. It also needs to be assessed if a project requires other appraisals and permissions (e.g. exemptions in protected areas or because of the presence of a protected species) and whether the trees in question are not subject to heritage protection (e.g. in a castle park). As for tree protection, permission to perform particular interventions is not issued in accordance with Act No. 189/2013 (it is not felling). It is however advisable to inform the local municipality and also the wider public of the interventions in an appropriate way, in order to secure the necessary acceptance. In case a tree is located at the site of a protected

monument, agreement must be reached with monument care authorities<sup>1</sup>.

A project may be based on existing professional methodologies, see e.g. ‘Conservation of saproxylic insects and measures for their protection’ (Krása 2015) issued by the Czech Nature Conservation Agency and ‘Methodology for the conservation of selected beetle species and their habitats’ (Konvička et al. 2017), and on methodologies for saproxylic beetle species important in the European context (Čížek et al. 2015), certified by the Ministry of the Environment. At present, a standard titled ‘Treatment of trees as a habitat of rare species’ (Pešout, Štěřba 2013) is being compiled. Also consultations with specialists are advi-

ble because recommended approaches may have to be modified or specified according to the needs of a particular species.

### Necessary change in approach

Just as land use by man changes, also the tools of contemporary nature and landscape conservation must develop. In this particular case it is obvious that the conservative conservation of trees outside forests and a range of woodland conservation instruments from the times of the Austro-Hungarian Empire have become outdated in many aspects. It is necessary to respond to the current state and utilisation of the landscape, the impacts of climate change, new challenges and current knowledge.

It is also clear that for reasons of capacity and economy, planned tree habitat treatments as indicated will always be realised to a very limited extent and especially in protected areas. However, protected areas will not save the existence of many animal species even with the best care. Traditional land use forms, which can be realised economically by farmers and foresters, need to be supported by adjusting subsidy instruments or also by legislation to be applied on a larger area. Further, environmental education can help improve the situation by informing the public on the need of leaving fractures and other tree damage not jeopardising its stability untreated.

**A list of recommended literature is attached to the web version of the article at [www.casopis.ochranaprirody.cz](http://www.casopis.ochranaprirody.cz)**

### Note

<sup>1</sup> Examples of areas where monument care and nature conservation interests are concentrated and where the methods of tree treatment had to be agreed on (incl. treating senescent trees, restoring tree stands, securing continuity of saproxylic insect habitats, etc.) are the horse-breeding farm at Kladruby nad Labem (Beneš et al. 2018) and the castle park in Vlašim (Hejda, Kříž, Pašek 2017).

### Acknowledgements

We are grateful to Lukáš Čížek (Institute of Entomology), David Číp (Czech Union for Nature Conservation), Eva Mazancová (Ministry of the Environment), Radek Hejda and Vladan Riedl (Nature Conservation Agency) for reading the text and comments on the article.



# Influence of Fireworks on Birds

Pavel Jaška, Jiří Sikora, Věra Sychrová

Fireworks evoke mixed feelings across society. Part of the population welcomes fireworks as extraordinary entertainment, whereas another part perceives such entertainment rather negatively, for various individual reasons. This article originated from the cur-

rent need to assess the harmfulness of fireworks to wild birds from the perspective of their biology and the need to place specific cases within the legislative framework of Act No. 114/1992 Coll., on Nature and Landscape Protection ("ANLP"), as amended.

Birds may be exposed to the harmful effects of fireworks at a distance of several kilometres away from the fireworks. Illustrative photo. Photo Petr Lang



## Biological aspect

Because firework displays usually take place in the dark, their immediate impact on wildlife is difficult to observe, as evidenced by the limited number of scientific studies. The effect on birds is well demonstrated by the evaluation of observations from 133 firework displays with 272 documented bird reactions, especially waterfowl, birds of prey, crow family, etc. (Stickroth 2015). Birds respond to both acoustic and visual stimuli, with the sound effect producing a stronger response than the visual effect. Birds probably also perceive the pressure wave of explosions. Physiological reactions include increased heart rates, stress hormone production, increased attention, anxiety, fear, escape reactions and panic. Restlessness, panic and escape reactions can be observed in birds at distances of hundreds of metres to kilometres. Waterfowl seem to be

more sensitive (Stickroth 2015). The negative impact of fireworks on birds is also demonstrated by telemetric research on griffon vultures (*Gypus fulvus*), which experienced a threefold increase in heart rate, indicating strong stress (Bögel et al. 1998). Literally groundbreaking is a Dutch ornithological study (Shamoun-Baranes 2011) which monitored the effects of New Year fireworks on bird movements using radar technology. The results were quite clear as the fireworks caused massive movements of birds in a wide area, incl. surrounding wetlands and water bodies. The most massive movements of birds occurred immediately in the first minutes of the New Year, just as the fireworks were let off. The birds flew much higher (up to hundreds of metres) than in normal local flights (up to 100 metres). The decrease in flight activity occurred up to 90 minutes after midnight. During this time, birds

could fly many kilometres and spend more than 30 minutes in the air, which can be fatal under adverse weather conditions.

Several specific events can be mentioned. The New Year firework display in 2013 in Prague on the Vltava river, when the fireworks fired from a pontoon directly on the water caused injuries and deaths of birds, is well known, as the birds fell directly among the audience (Anonymous 2013). Another case happened around Beeb, Arkansas, in 2010, where about 5,000 birds fell in a square mile at around midnight on New Year's Eve, specifically red-winged blackbirds, common starling, common grackle and brown-headed cowbirds. Birds crashed into cars, trees and buildings. Directly before the event there were strong explosions from the fireworks as part of the New Year celebrations (Choi 2011). The nega-



In cities, the endangered common swift nests in cracks in walls and under roofs. The influence of fireworks on the swift is not sufficiently known. Photo Přemysl Tájek.





Mute swan with a cut wound to the neck after flying into tram lines due to fireworks 2014. Photo Rescue Centre for Wild Animals of the Capital City of Prague



Common buzzard with physical injury after hitting an obstacle. Found in the forest after New Year celebrations 2019. Photo Rescue Centre for Wild Animals of the Capital City of Prague

tive impact of fireworks on nesting least terns was described in New Jersey, when fireworks let off more than 250 m from the nesting colony caused the nests to be abandoned perma-

nently. Temporary abandonment of the nest and stressed behaviour was observed in a colony at 1.2 km from the fireworks (Anonymous 1997). Piping plovers and black skimmers

were also disturbed. A video of the great tit, taken during a firework display, also gives an insight into the impact of fireworks on small birds. The video clearly shows the considerable stress the birds have to face in a firework display (web1).

From the above it is clear that holding fireworks and pyrotechnic entertainment has a major negative impact on birds, which can be felt hundreds of metres to kilometres away. It includes stress reactions, the consequences of which can be even fatal. Due to fireworks, birds can abandon shelters, nests with chicks, collisions with obstacles can occur, and subsequent excessive predation cannot be ruled out. The risks caused by fireworks are usually intensified by the night time, when birds' spatial orientation is less effective. It is practically impossible to define a period when fireworks would not have a negative impact on birds. Over the course of the year, birds are increasingly burdened with their energy-intensive biological needs (nesting, overwintering, migration or moulting). Thus, fireworks always have a negative effect on birds.

### Legal aspect – specially protected bird species

From the legislative point of view, dealing with fireworks we must primarily address the possible impact on species of animals protected pursuant to **§ 50 ANLP** together with the Decree of the Ministry of the Environment (MoE) No. 395/1992 Coll., where the species are listed in Annex III. We are of the opinion that, when knowing of the occurrence of any protected animal species for which the firework display would disturb its natural biological activities, vital functions, manifestations, or existence itself, especially in birds up to several kilometres away from the fireworks, the firework display is undoubtedly a disturbing influence, which is prohibited by the ANLP itself.

In order to carry out harmful activities, in this case firework displays, exemptions from the prohibitions for potentially affected species must be granted, in accordance with the procedure in **§ 56** of ANLP. Whether these species can actually be affected must be assessed by the nature conservation authority

(e.g. the absence of migrants in winter, etc.). In doing so, the applicant may utilise the procedure in **§ 56** para. 1 of ANLP – request for provision of preliminary information on the harmfulness of the intended activity before submitting an application for exemption pursuant to **§ 56** ANLP. The provision of **§ 56** ANLP deals with granting exceptions for protected species (**§ 56** para. 1 of ANLP), and also granting exemptions for species that are further protected in addition to special species protection under European Community law (**§ 56** para. 1 and 2 of ANLP). Especially in birds, all species protected by Czech law are also protected under European Community law (Directive 2009/147/EC of the European Parliament and of the Council of 30<sup>th</sup> November 2009 on the Conservation of Wild Birds, the “Birds Directive”). Thus, when assessing an intention in a procedure for granting a generic exemption, it must first be assessed whether the conditions under **§ 56** para. 1 of ANLP are met. In the case of a firework display, its realisation would have to be *other public interest prevailing over nature conservation interests*. If these conditions are met, further steps must be taken in accordance with **§ 56** para. 2 of ANLP. *An exemption pursuant to the first sentence (§ 56 (1) of ANLP) may be granted only if one of the reasons listed in paragraph 2 (§ 56 ANLP) is given, there is no other satisfactory solution, and the activity authorised will not affect the achievement or maintenance of the species' conservation status* (insurmountable legal conditions that must be met). One of the reasons under **§ 56** para. 2, letter c) is “... for other overriding reasons in the public interest, including those of a social or economic nature...” The nature conservation authority must address the question of whether all the conditions for authorising the firework display are fulfilled and whether the intended event falls under that reason. Other legal grounds in **§ 56** para. 2 of ANLP for the case of fireworks and protected bird species cannot be applied.

Of course, there may be a situation where the presence of protected species at the locality is not known in advance, is subsequently confirmed, and at the same time the harmful impact of fireworks on them becomes known. The absence of knowledge of the occurrence of such species does not relieve the entity which carried out the harmful



Fireworks can also have a negative effect on other, less observable animals. Injured leg of a roe deer after colliding with a car during New Year's fireworks 2019. However, it is difficult to prove the connection with fireworks. Photo Rescue Centre for Wild Animals of the Capital City of Prague

activity, from the responsibility for the offence in the fulfilment of the facts and of all the characteristics of the offence. An obligatory feature of the offence in the case of a legal entity (or a natural person as a business entity) in the vast majority of cases is that there is no fault. A negative effect on the individuals of the protected species present within the above collision distance (several kilometres) is highly likely to be expected.

### General protection of birds

Birds have an exceptional position in law compared to other species. In addition to specific species protection (**§ 50** ANLP) they are, like all animals and plants, protected generally pursuant to **§ 5** ANLP, which mainly addresses protection at the population or species level. Beyond these provisions, birds, as the only group of organisms, enjoy protection according to **§ 5a** and **§ 5b** ANLP, due to the transposition of the Birds Directive (Articles 5, 6, 7 and 9) into national legislation. These provisions deal with the protection of individual birds.

In **§ 5a**, the law addresses the protection of wild birds and clearly defines the deliberate negative interference in their lives. The fulfil-

ment of the ‘intention’ in firework production will probably only be inferred if the organiser had a demonstrable knowledge of the harmful effect of the organised entertainment on the birds and, at the same time, the birds would actually be affected. Indeed, the condition of deliberate conduct may also be satisfied in the case of indirect intention. Indirect intent includes cases where the main purpose of the conduct was other than the killing of the birds or damage to their nests (typically by way of fireworks), but the perpetrator, in his indifference, consciously risked interference with the legally protected interest, even though he was aware of the potential violation. Awareness of risk is thus a decisive factor in assessing intention. Not every disturbance is prohibited by **§ 5a** of ANLP (not within the framework of specific species protection, when it is completely prohibited). The disturbance must be significant in a sense of keeping the species population at an appropriate level. It is also necessary to take into account the abilities of the disturbed individual to deal with the disturbance (compare with **§ 50** and **§ 56** of the Act). It is therefore necessary to consider more strictly the disturbance at the time of mating, nesting or other extreme periods for birds.





White storks nesting on chimneys in cities and villages are often the subject of disputes in connection with fireworks. Photo Petr Lang

Under the conditions for a different procedure for the protection of birds laid down in § 5b, the Act specifically lists the activities for which a different procedure may be established. *A different procedure may be established in the interests of public health or public safety, in the interests of air safety, in order to prevent serious damage to crops, domestic animals, forests, fisheries and water management, or for the purpose of protection of wild fauna and flora, also for the purposes of research and teaching, of re-population of a certain area by a population of the species or re-introduction of the species in its original range, or for the breeding in human care for these purposes.* Since the Act does not offer the possibility of granting an exemption for cultural events such as fireworks, the use of the authorisation process in the framework of bird protection under § 5a of the ANLP is virtually impossible. The use of the exemption procedure under § 5b of ANLP for generally protected bird species in the event of disturbance, which is significant for the conservation of the population of the species under the Birds Directive, is at the least highly questionable. As a result, if § 5a would be applicable to fireworks, it would never be possible to authorise fireworks.

General protection of plants and animals pursuant to § 5 of ANLP in the case of fireworks is also very limited in its applicability, because it mostly

deals with harmful interventions that could endanger the existence of the species as such or its entire population. The application of this provision can be envisaged in the case of endangering a particular breeding colony of water birds, etc. In general practice, however, the general protection of plants and animals pursuant to § 5 of ANLP does not appear to be a suitable tool for legitimate legal restrictions on fireworks.

### A little practical experience from the Czech Republic

The Czech Society for Ornithology (CSO) has been informing on the negative impact of fireworks on birds for years. Ornithologists have practical experience in protecting birds from fireworks, for example on the Vltava River in the centre of Prague. In May 2019, the CSO managed to get the planned fireworks on the Vltava, which was to be part of the Midsummer celebration NAVALIS, cancelled. The ornithologists pointed out the harmfulness of the fireworks to the nesting birds and stressed that there was a risk of the eggs and chicks in the nests cooling off, if their parents left them alone as they escaped from the fireworks. They addressed objections to the Mayor of Prague Zdeněk Hřib and asked him to cancel the planned fireworks. Due to the pressure from the public and the ornithologists, the organisers of the Midsummer Society completely cancelled

the fireworks several hours before the planned event. A great turnaround in the issue of fireworks is the abolition of New Year fireworks in Prague, which should be replaced by videomapping, i.e. light projection on buildings. In August 2018 the Prague councillors decided to do this. The negative effect on animals was given as a reason. Brno's Liberty Square is also scheduled to be without fireworks on New Year's Eve 2019/2020 (web2). The use of fireworks, at varying degrees, is restricted by a number of generally binding decrees of municipalities and cities (e.g. České Budějovice, Česká Lípa, Hodonín, Mikulov, Pardubice).

### Conclusion

Given the apparent negative impact of fireworks on animals, namely birds, a systematic restriction on firework displays at the national level would be most appropriate. One of the first steps may be, for example, a total ban on fireworks that have an acoustic effect. This may be followed by measures to restrict pyrotechnics and fireworks, e.g. limitation of the time period of sale, definition of a narrow time period of possible usage, or replacement by less intrusive alternatives (e.g. videomapping). We see positive examples in many places in the Czech Republic and abroad, when the issue of fireworks is the subject of discussion and there is a gradual increase in awareness of the negative effects of fireworks and in their restriction. It is becoming apparent that politicians and the public are increasingly aware of the dark side of costly firework displays, which are not so essential for citizens, who could quite easily live without them. This is confirmed by the experience of the Czech Society for Ornithology and ANP CR, to whom more and more people are turning with their concerns over fireworks.

### Notes

<sup>1</sup>AOPK ČR, RP Správa CHKO Slavkovský les, Hlavní 504, 353 01 Mariánské Lázně

<sup>2</sup>AOPK ČR, RP Správa CHKO Slavkovský les, Závodu míru 725/16, 360 17 Karlovy Vary

<sup>3</sup>Česká společnost ornitologická, Na Bělidle 252/34, 150 00 Smíchov, Praha 5

**A list of recommended literature is attached to the web version of the article at [www.casopis.ochranaprirody.cz](http://www.casopis.ochranaprirody.cz)**

# Records of Animals Admitted to the National Network of Rescue Stations and What They Can Tell Us

Petr N. Stýblo

The National Network of Rescue Stations project brings, in addition to thousands of saved lives of wild animals and effective information for the education of inhabitants, also interesting statistics. The central register of all animals received not only allows the monitoring of numbers of species and individuals of injured animals and the dates

and locations, but also their fate – reasons why the injury occurred, time when they were admitted, number of days spent at the station, etc. Up to 57 data items can be recorded for each animal received. The long-term uniform methodology of record-keeping also enables the monitoring of these parameters over the years.

Figure 1. Rare species of our fauna also reach the rescue stations. Photo ZS Rozovy





**Data summary**

Overall, the rescue stations received 233,797 animals from the establishment of the National Network in 1998 to the end of 2018. Whereas, in 1998 it was 1,337 individuals, in 2018 already 23,779 individuals (increase of 1,778%) were received. The trend in the number of animals received in individual years is shown in Graph 1.

Since 2007, the National Network has kept a unified register of all animals received. Thanks to this, data on received animals can easily be processed statistically. At the end of 2018, a total of 196,987 individuals were registered in the unified register, including 1,701 reptiles (11 species), 7,301 amphibians (13 species), 114,253 birds (228 species) and 73,732 mammals (74 species). The 15 most frequently received species in the period under review are shown in Table 1. With the exception of the common buzzard, these are all species living in the immediate vicinity of human settlements, whereas the buzzard lives near human transport arteries. The order of the most common species in individual years is virtually unchanged, with the exception of the common pipistrelle and the common noctule. These species are often, but not every year, received in whole, even several-hundred-member colonies, so they are placed in the top ten, but in a very different order from year to year.

**Interesting and rare species**

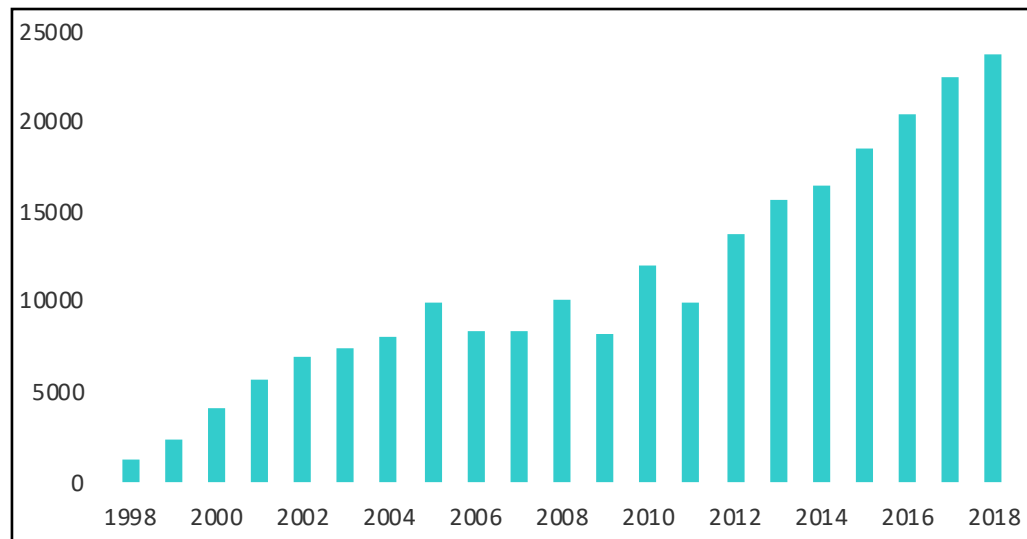
Interestingly, of 18 species only a single individual was in the care of rescue stations in the monitored period 2007–2018:

wheatear, garganey, scarlet rosefinch, pomerine skua, Eurasian curlew, yellow-bellied toad, steppe eagle, greater scaup, red-necked grebe, black-legged kittiwake, lanner falcon, Eurasian water shrew, Alpine shrew, griffon vulture, northern gannet, European grey wolf, common redshank and common greenshank.

In terms of classification of the species into legal categories – Act No. 114/1992 Coll., on Nature and Landscape Protection; No. 449/2001 Coll., on Hunting; No. 100/2004 Coll., ‘CITES’; No. 246/1992 Coll., on the Protection of Animals against Cruelty – rescue stations received the following numbers of animals in 2007–2018, see Table 2.



Figure 2. Reptiles also reach the rescue stations. Photo ZS Bartošovice



Graph 1: National Network of Rescue Stations – numbers of animals received in 1998–2018. Prepared by Petr N. Stýblo

Table 1: National Network of Rescue Stations – 15 most frequently received animal species in the National Network in the period 2007–2018. Prepared by Petr N. Stýblo

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Western European hedgehog	931	1,186	838	1,171	947	922	1,533	1,517	1,876	1,957	2,320	2,269	17,467
Common pipistrelle bat	715	491	1,089	970	1,523	2,582	1,610	644	1,109	2,368	814	1,341	15,256
Eurasian kestrel	906	1,318	763	1,127	919	1,119	1,168	1,209	1,577	1,582	1,604	1,492	14,784
Noctule bat	137	267	337	727	676	821	1,213	1,137	1,351	861	1,211	1,264	10,002
Blackbird	252	327	251	504	324	500	637	887	1,077	1,172	1,310	1,735	8,976
Swift	368	435	341	662	450	605	924	702	1,018	787	796	893	7,981
Eastern European hedgehog	173	291	383	526	532	418	788	594	543	1,034	898	838	7,018
Buzzard	416	476	401	546	373	525	471	539	646	782	691	643	6,509
Mallard duck	146	146	129	325	207	304	691	431	436	767	971	721	5,274
Mute swan	269	331	181	360	221	422	420	435	447	599	500	531	4,716
Red squirrel	155	201	154	267	258	269	375	298	524	509	581	703	4,294
Brown hare	95	176	119	273	234	271	397	362	499	571	558	630	4,185
House martin	249	246	144	190	235	259	323	412	470	394	489	542	3,953
European roe deer	194	164	135	346	223	211	378	328	353	347	381	400	3,460
Collared dove	92	111	88	164	142	179	259	320	398	493	462	582	3,290

Table 2: National Network of Rescue Stations – numbers of animals in particular legal categories, received in the years 2007–2018. Prepared by Petr N. Stýblo

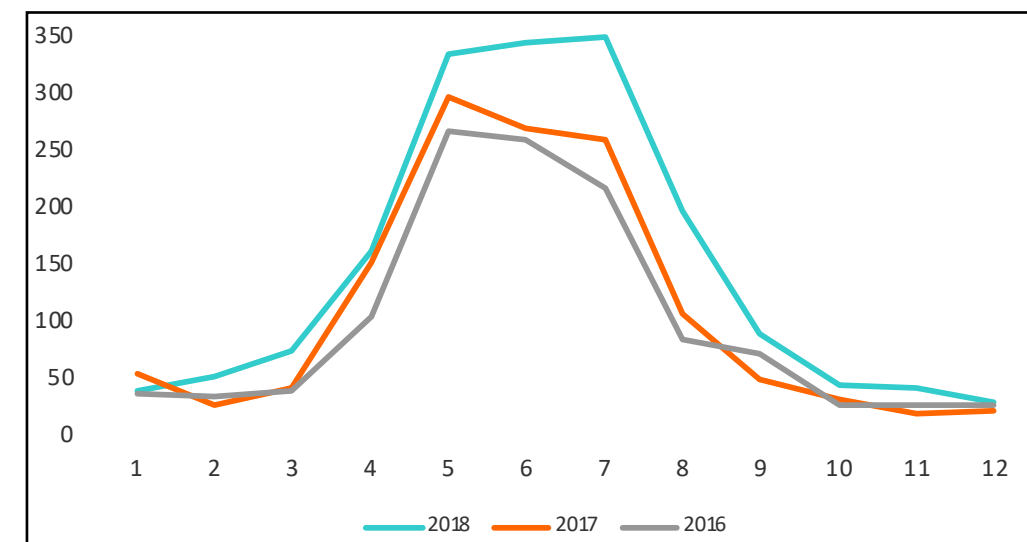
Category of species	Number of animals
Critically endangered	2,379
Severely endangered	42,347
Endangered	38,664
CITES	26,179
Non-huntable game	27,532
Huntable game	23,714
Requiring special care	8,602

**What does the data indicate?**

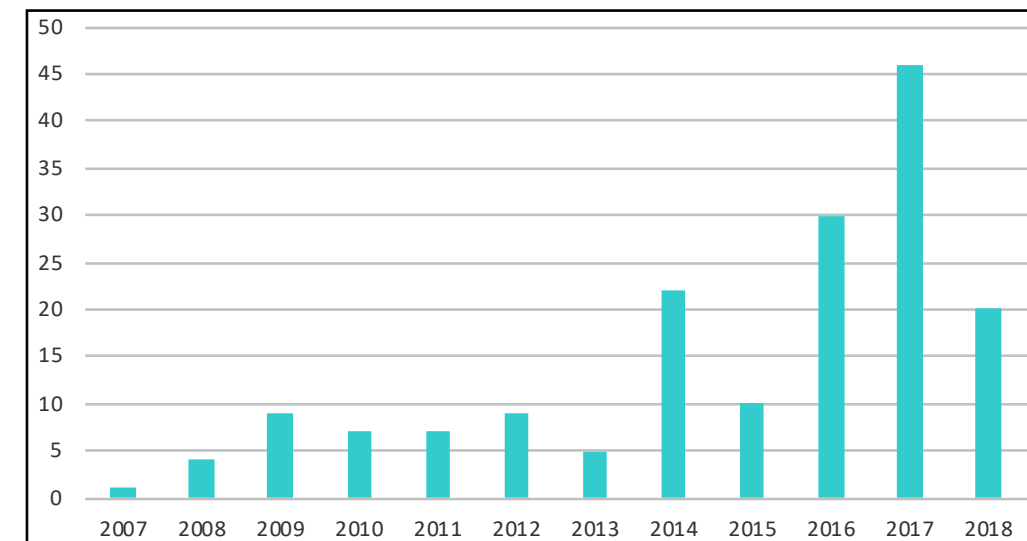
For some of the received species, the long-term statistics of the National Network allow us (with a great deal of caution) to comment on trends in the abundance of their populations in our landscape, their proximity to humans, and the emergence of a new factor that significantly affects their population. For example, Graph 2 shows a shift of maximum admissions of the blackbird in 2018 from the traditional May, when most admissions are of newly-hatched offspring, to July. It can be assumed that this shift was caused by extreme food shortages due to drought in combination with the new USUTU virus, which has primarily decimated the blackbirds since it arrived in Europe.

Using Graph 3, we could document the invasion of the non-native coypu (nutria). In the first half of the period, the average number received by rescue stations reached 6 animals per year. In the second half it was already 26 coypu per year, which is an increase of more than four times. Similarly (a six-fold increase) is also recorded for our native woodpigeon. Its urban population has been expanding significantly in Europe over the last decade, and this ‘migration’ towards people has also been reflected in an increase in admissions at rescue stations. This trend is illustrated in Graph 4.

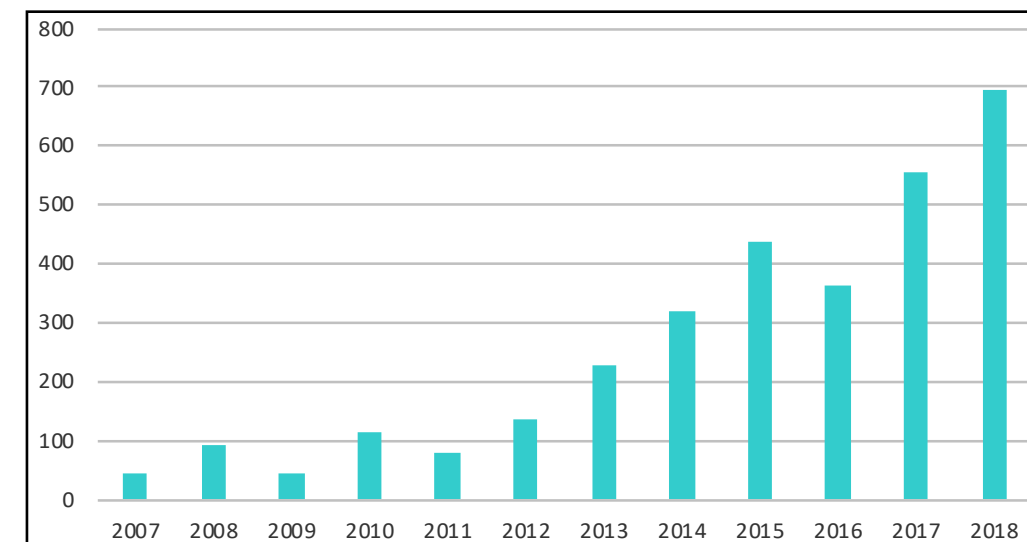
Also, the admissions of the protected species Eurasian otter and European beaver may be indicative of growing populations approaching humans, see Graph 5. However, the above conclusions cannot be adopted solely on the basis of National Network statistics. These can always be taken only as a supplement to the data obtained from the wild. Moreover, it is necessary to compare them with the overall trend of increasing numbers



Graph 2: National Network of Rescue Stations – numbers of admissions of blackbirds in different months in 2016–2018. Prepared by Petr N. Stýblo



Graph 3: National Network of Rescue Stations – admissions of coypu to rescue stations in 2007–2018. Prepared by Petr N. Stýblo



Graph 4: National Network of Rescue Stations – admissions of woodpigeon individuals to rescue stations in 2007–2018. Prepared by Petr N. Stýblo



National Network of Rescue Stations

Thanks to voluntary nature conservation bodies, the Czech Republic has one of the most elaborate systems of care for injured or otherwise handicapped wild animals. The National Network of Rescue Stations has been established gradually since 1998, today associating 33 rescue stations covering the whole Czech Republic. Approximately half of these rescue stations are operated by local chapters of the Czech Union for Nature Conservation, the other half by other entities – other non-profit organisations, but also by contributory organisations of municipalities and regions, or by national park administrations.

Rescue stations associated in the National Network provide comprehensive care for handicapped animals from admitting an injured animal through its examination, treatment and rehabilitation to, ideally, being released back into the wild. Individuals with a permanent handicap, for which release into the wild is not possible, then often serve the needs of environmental education – demonstrating the consequences of various human activities and appropriate or inappropriate behaviour towards wild animals – which is the other major component of rescue station activity.

The Czech Union for Nature Conservation is the coordinator and guarantor of the National Network of Rescue Stations. Summary information on the National Network of Rescue Stations can be found on the website [www.zvirevnouzi.cz](http://www.zvirevnouzi.cz). For quick contact, when the finder does not know how to act or where to call, use the emergency phone line 774 155 155. An application for 'smart phones' can also be downloaded. This gives advice on how to act when an injured animal is found, and depending on the location of the finder calls the appropriate rescue station.

of admissions of all animals – by 300% in the given period.

The frequency of admissions of individual species can also be monitored regionally. Table 3 uses the example of the long-eared owl. This statistic shows that the highest numbers of long-eared owls were received in the Central Bohemian Region, the lowest in the Liberec Region. In terms of the number of inhabitants, however, the highest number of long-eared owls was recorded in the Pardubice Region. On the other hand, in terms of the area of the region, the largest numbers of long-eared owls were from Prague, the lowest in



Map 1. National Network of Rescue Stations. Data source [www.zvirevnouzi.cz](http://www.zvirevnouzi.cz). Prepared by Jan Vrba



Figure 3. An important activity of station workers is the protection of species and their habitats in the field. Photo Zdeňka Nezmeškalová

the Vysočina Region. Combining both of these factors, the Pardubice Region is the richest region in terms of long-eared owls received, followed by the Central Bohemian and Olomouc Regions, and the Vysočina Region at the other end of the scale. However, the Central Register of Admissions of the National Network makes it possible to specify this statistic down to the district level.

Moreover, the admissions of individuals of each species can also be seen in terms of time – during the year. Again, using the example of the

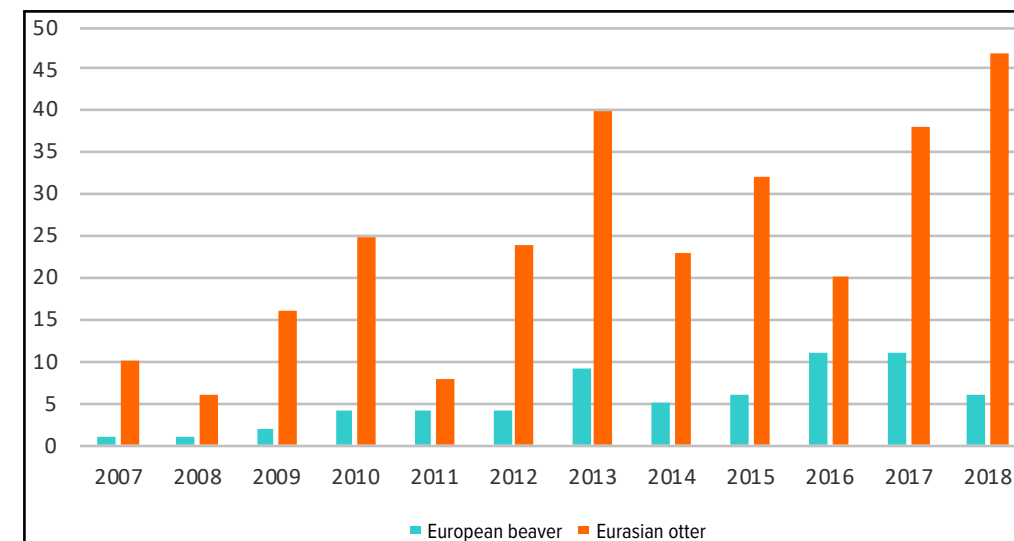
long-eared owl, it can be seen from Table 4 that the maximum of admissions during the year is almost always in the period of May to July, when the long-eared owl raises its young. However, if the winter conditions are extreme, then the peaks of admissions are partially shifted to these months – in the table especially in 2010.

**Causes of admissions to rescue stations**

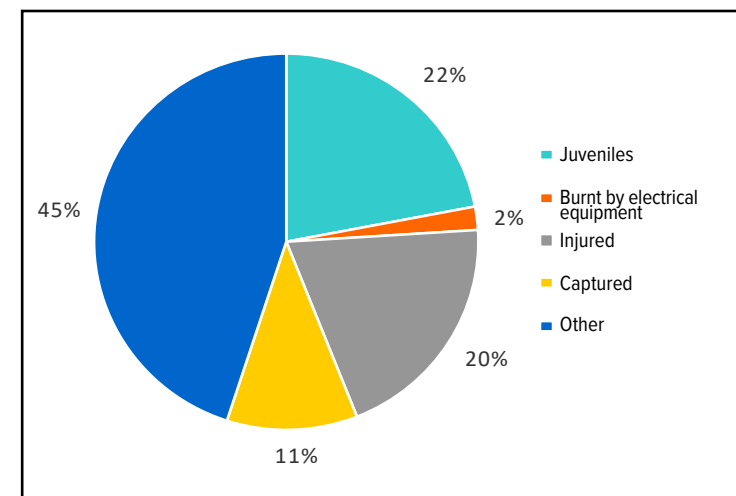
In addition to data on animal admissions, there are also data on the causes of admissions and



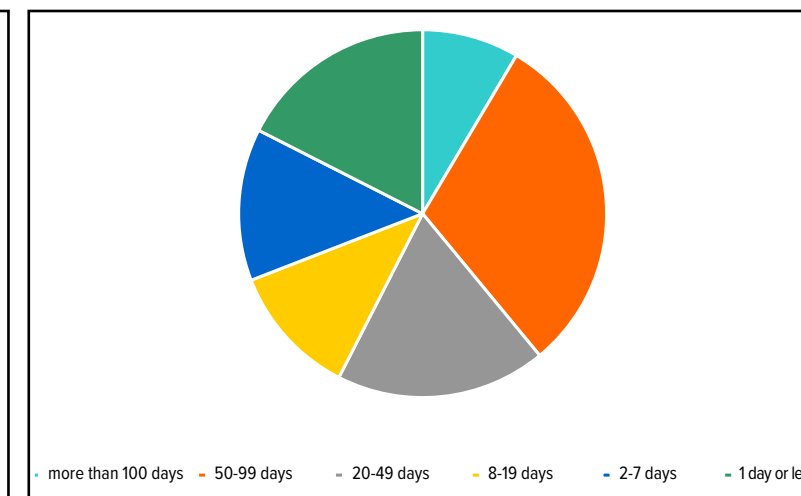
Figure 4. Environmental education DES OP Plzeň 2018. Photo Taťána Typltová



Graph 5: National Network of Rescue Stations – admissions of European beaver and Eurasian otter individuals to rescue stations in 2007–2018. Prepared by Petr N. Stýblo



Graph 6: National Network of Rescue Stations – causes of admissions of animal patients to rescue stations of the national network in 2007–2018. Prepared by Petr N. Stýblo



Graph 7: National Network of Rescue Stations – length of stay of the long-eared owl (n = 1,502) in rescue stations in 2007–2017. Produced by Petr N. Stýblo

the further fate of animal patients in the Central Register of the National Network. The registered causes of admissions are probably the least meaningful value of the central records, because finding the cause is not always easy, as it is often a combination of several causes or one can only guess what the cause was. For example, a bird sitting on the pavement and unable to fly may be shaken by hitting a glass obstacle or exhausted due to climatic conditions or parasites. But it may also suffer from some kind of zoonosis. A bird with a broken wing on the road may not have been hit by a car, etc. Therefore, data on causes, with exceptions, such as scorched birds found near electrical equipment, predators demonstrably poisoned with carbofuran or shot animals, are taken for reference only. The reasons for admission of animals to the rescue stations of the National Network in the monitored period 2007–2018 are shown in Graph 6. In the category of young (22% of admissions), for example, the admissions of juveniles from destroyed nests, admissions of late-born young and juveniles unnecessarily captured by humans (which account for about 40% of all juvenile admissions) are included. In the category of burns by electrical equipment (2%), the admissions of live birds burned on high-voltage distribution networks are included. The category of injured animals received includes all injuries, except for young and burnt birds. Of these, about 30% are injuries caused by traffic, 25% by hitting an obstacle, 20% are animals injured by another animal. Approximately 2% of all injuries are animals injured by agricultural machinery and less than 1% are animals shot or damaged by traps.



Table 3: National Network of Rescue Stations – numbers of long-eared owls (n = 2,539) received in the years 2007–2018 in different regions based on the population and area of the region. Developed by Petr N. Stýblo

Region	Received individuals of long-eared owl	Individuals per 100,000 inhabitants	Individuals per 100 km <sup>2</sup>	Average number of individuals per population and area of region
Capital City of Prague	107	8,3	22,8	15,6
Central Bohemian	559	43,9	5,1	24,5
South Bohemian	119	18,7	1,2	9,9
Pilsen	94	16,4	1,2	8,8
Karlovy Vary	35	11,3	1,1	6,2
Ústí nad Labem	208	25,0	3,9	14,5
Liberec	27	6,1	0,9	3,5
Hradec Králové	155	27,9	3,3	15,6
Pardubice	295	58,4	6,5	32,5
Olomouc	274	42,8	5,2	24,0
Moravian-Silesian	297	24,0	5,5	14,8
South Moravian	186	15,9	2,6	9,2
Zlín	131	22,2	3,3	12,7
Vysočina	52	10,1	0,8	5,5

Table 4: National Network of Rescue Stations – numbers of long-eared owls (n = 2,539) received in the years 2007–2018 in different months. The three largest numbers in a given year are indicated in bold. Produced by Petr N. Stýblo

Month	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	Total	Average
1	15	9	8	14	7	<b>24</b>	5	<b>14</b>	<b>36</b>	9	9	7	142	11,8
2	13	21	19	13	9	14	8	10	<b>50</b>	15	10	7	176	14,7
3	13	13	15	36	15	9	9	10	9	17	16	7	156	13,0
4	14	25	<b>30</b>	<b>45</b>	18	14	<b>35</b>	13	12	14	<b>23</b>	7	236	19,7
5	<b>47</b>	<b>78</b>	<b>53</b>	<b>104</b>	<b>76</b>	<b>53</b>	<b>64</b>	<b>41</b>	<b>62</b>	<b>18</b>	<b>47</b>	<b>67</b>	<b>663</b>	<b>55,3</b>
6	<b>46</b>	<b>48</b>	<b>57</b>	<b>39</b>	<b>42</b>	<b>22</b>	<b>32</b>	<b>22</b>	12	<b>31</b>	<b>54</b>	<b>25</b>	<b>384</b>	<b>32,0</b>
7	<b>19</b>	<b>28</b>	21	31	<b>36</b>	17	29	6	13	<b>20</b>	20	<b>23</b>	<b>244</b>	<b>20,3</b>
8	9	7	13	21	10	11	9	4	7	5	7	13	107	8,9
9	9	7	3	8	7	4	1	1	4	3	3	3	44	3,7
10	5	5	0	6	4	7	6	3	0	2	0	3	36	3,0
11	8	10	3	11	3	8	4	3	6	3	4	1	56	4,7
12	4	9	8	10	9	2	5	8	19	2	5	5	82	6,8

Of course, the structure of the causes of their admission to the station varies from one species to another. The following Table 5 lists the spectrum of causes of long-eared owl admissions.

### Evaluation of success

From the records we can also trace the fate of the animals received – the length of their stay in the rescue station and the way that stay ended. However, since the central register has not been able to transfer the numbers of kept animals from year to year until recently, it is difficult to follow the fate of animals differently than in one calendar year with such a large amount

of data. As many of the animals are kept in the stations through the winter, the recorded data on animals in the stations have only a limited informative value during one calendar year. This can be illustrated on the data from 2018, when 45% of the animals received were released back into the wild the same year. Another 8% overwintered at the stations and most of them were released in spring 2019. A total of 36% of the received animals died or were euthanized. The success of rescue stations in the care of animals – i.e. the ratio of animals released back to nature compared to all animals received is 50–60% in the long term.

Table 5: National Network of Rescue Stations – frequencies of causes of admissions of long-eared owls (n = 2,539) to rescue stations in 2007–2018. Produced by Petr N. Stýblo

Reason for admission	Frequency
Young	1,100
Captured	69
Poisoning	2
Exhausted, hunger	36
Confiscated	1
Injured	727
Other	604

The length of time an animal stays in the rescue station depends on several factors. Of course, it depends mainly on the health and condition of the animal received, the method of treatment and convalescence, but also on the weather or time of year. For the young of many species, the advantage is the knowledge of the station staff and colleagues from the field, because they allow the young to be placed with optimal adoptive parents, which of course shortens their stay in the station. Graph 7 again illustrates, using the example of the long-eared owl, the length of its stay in the National Network's rescue stations. Since this species is admitted to the stations mostly due to complicated injuries or as chicks from destroyed nests, it stays in rescue stations longer, an average of 39 days. In one case, an owl was successfully released after its stay in a rescue station lasting 410 days.

The above, more or less randomly selected information illustrates the vast amount of data found in the records of animals received by the National Network of Rescue Stations. The Czech Union for Nature Conservation (CUNC) as coordinator of the National Network estimates that it keeps more than 10 million records of almost a quarter of a million animals. This unique data lies unused, though it could become the basis of many scientific studies. One cannot expect the activity of rescue station workers in this respect. They are completely overloaded with work taking care of thousands of animals and communicating with tens of thousands of people who pass through the stations every year. In any case, processing the acquired data could reveal insufficiencies, differences in approaches and methodologies for animal care, which could make the actual work of the National Network and individual stations more efficient. Therefore, this article is also a call for cooperation.

# Červenohorské sedlo mountain pass: the History and Present of Watching (not only) Bird Migration in our Mountains

Radek K. Lučan, Anna Lučanová, Martin Vavřík

The west-east oriented main ridge of the Jeseníky Mountains is an important migration barrier for flying animals. The remarkable col of the Červenohorské sedlo mountain pass, visible from afar, allows them to cross this barrier with less effort than if they flew over the Jeseníky ridges, and it is no wonder that especially during the autumn migration a huge number of birds, bats and various groups of migratory insects are funnelled into the relatively narrow corridor of the

saddle. Since 2010, this site has been used for monitoring of migratory birds, to which the monitoring of the passage of bats and selected groups of migratory insects has been added in recent years. Especially in connection with bird migration, this is currently the largest research project in the Czech Republic and is the only locality where birds can be observed under appropriate conditions during both daytime and night-time migrations.

The woodcock (*Scolopax rusticola*) is the emblem of the whole project at Červenohorské sedlo mountain pass, since the vast majority of birds recorded during the whole history of bird ringing in the Czech Republic have been captured and ringed right here. Photo Radek K. Lučan.







With the use of a strong light source in combination with appropriately placed capture nets and voice reproduction, bird migration over Červenohorské sedlo mountain pass is monitored like a live broadcast. Photo by Martin Vavřík



The European robin (*Erithacus rubecula*) is the most frequent species recorded during the nocturnal migration at the Červenohorské sedlo mountain pass. In total, over 34,000 birds were ringed in 2010–2018. Photo Radek K. Lučan

### Brief history

But let's go back a few decades to the beginnings of the study of bird migration in mountain areas in our geographical space. The observation of intensive daytime bird migrations in the Alpine passes, formerly mainly associated with trapping birds for food, led in 1958 to the establishment of a research base in the Swiss Col de Bretolet mountain pass, where regular monitoring, including catching and ringing migratory birds, is performed. Every autumn, around 20,000 birds are ringed on average and night-time catches have gradually been added to the daily catches. In the early 1970s, the large concentration of migrating birds during the autumn migration in the western Krkonoše Mountains, in the area between the peak of Tvarožník and the Trzi Šwiříki massif, was noticed by a Polish team of ornithologists headed by Prof. Andrzej Dyrzc of Wrocław University, who studied this phenomenon for several years. Gradually, in addition to visual observations, birds were also caught and ringed. During 3 seasons (1971–1973), nearly 4,000 birds were captured and over 130,000 individuals of 91 bird species were visually recorded. The results also showed the first laws on the nature of migration, its phenology and, thanks to the later observations of ringed birds, also about the origin or destination of some migrating species.

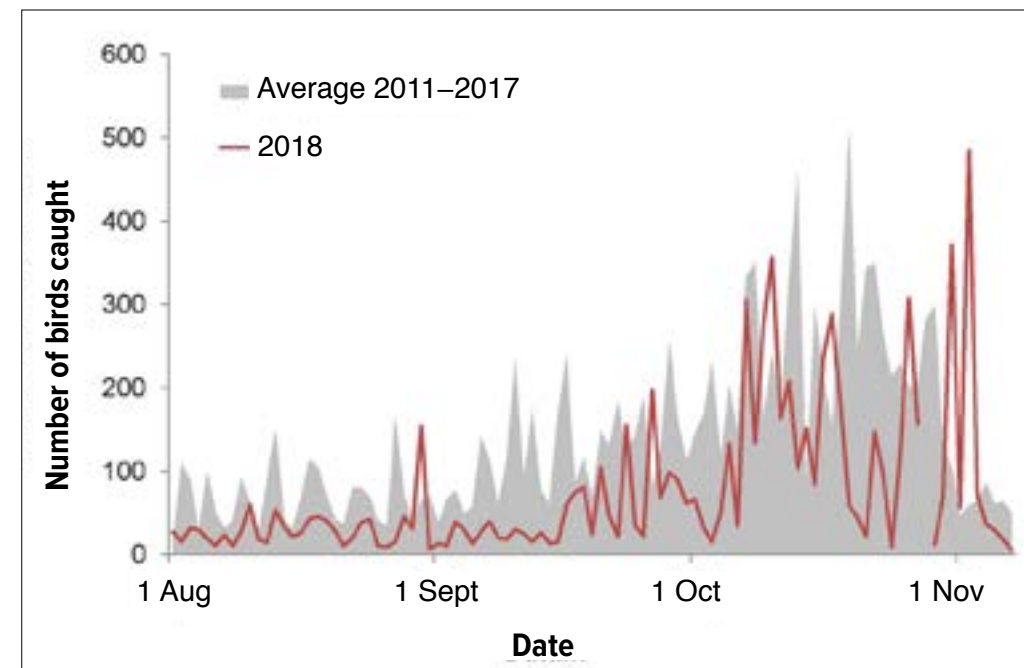
### Who discovered light?

The breakthrough in monitoring bird migration in the mountains came with the discovery of the possibility of observing birds at night using a strong light source. In the early 1980s, inspired by anecdotal reports of watching mass night-time arrivals of birds to lighthouses or ship lights on the seas of northern and western Europe, Czech ornithologists began a series of experiments in the Krkonoše Mountains and later in the Orlické Mountains using this possibility to observe bird migration under the so-called Baltic Action, which was the first coordinated programme to monitor bird migration in central, northern and eastern Europe. Gradually, it was shown that by means of a strong light source, especially during nights with reduced visibility, migrating birds are not only attracted to the vicinity of the light source, but when appropriately positioned capturing devices, most often traditional ornithological nets, are used; they can also be captured for ringing.

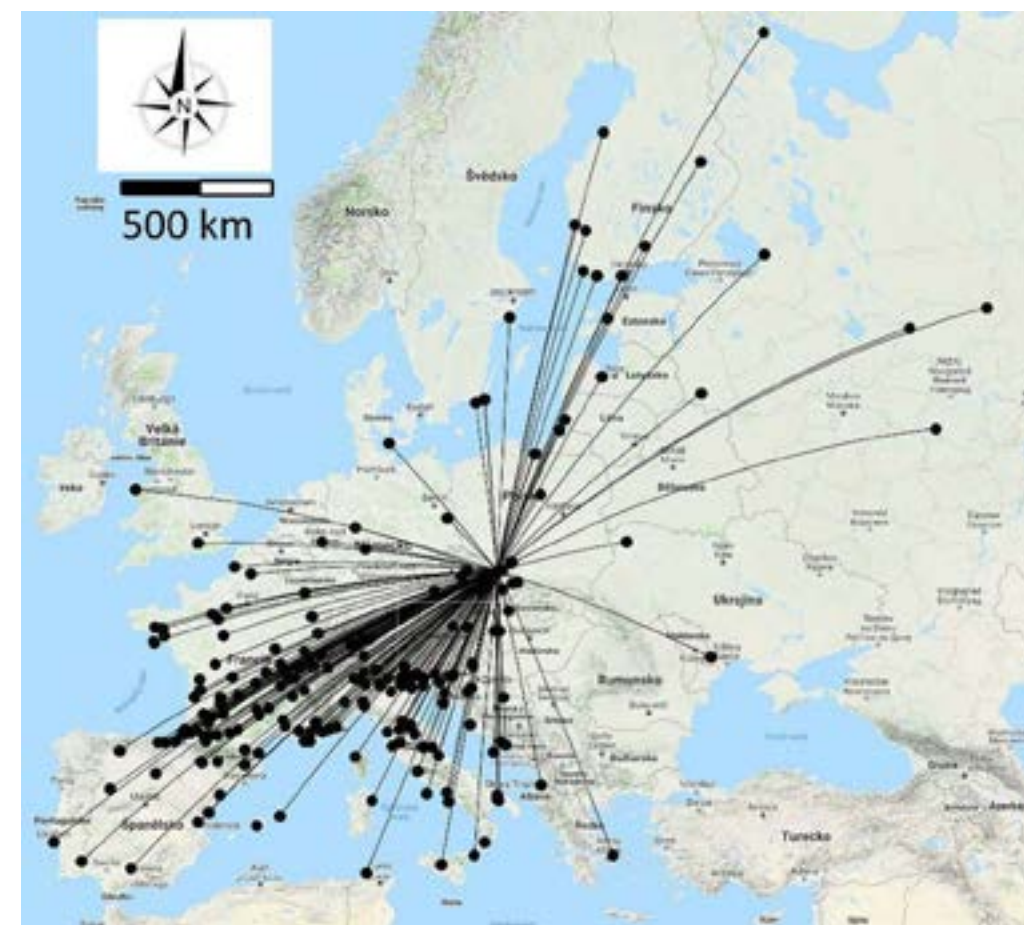
It is interesting to note that this method was discovered and used independently in at least two other, geographically very distant places on our planet. Since 1969 in Kenya, Africa, a large number (about 500,000 birds in 1969–2012) of mostly Palearctic migrants have been regularly captured and individually tagged on foggy nights in November and December at the Ngulia Lodge in Tsavo NP. At the other end of the world, at Dalton Pass on the Philippine island of Luzon, since time immemorial the natives have used fires lit in cave entrances to catch migrating birds. This inspired British ornithologists around 2010, who subsequently managed to prove the existence of the migration routes of a number of very rare bird species. For example, most of the known individuals of the reed warbler *Acrocephalus sorgophilus* have been captured here, although its breeding sites are still unknown and it is probably at the brink of extinction.

### Krkonoše and Orlické Mountains Phase of Research

In the beginnings of the systematic monitoring of night-time migration, which took place mainly at Šerlich in the Orlické Mountains in the 1980s (M. Hromádka, K. Čihák and others) and in the 1990s in the eastern Giant Mountains at Rýchory (P. Miles and others), in the course of autumn migration only a few thousand birds were captured, but the results were also ground-breaking, as many unexpected species such as reed warblers, grasshopper-warblers, flycatchers, nightingales or wheatears were caught as they flew over the mountains. In many cases these were extreme phenological records from a time when the passage of these species was no longer expected. A significant quantitative shift occurred in the late 1990s, when a group of Prague ornithologists (F. Zicha, L. Červa, J. Jelínek, L. Hovorka, J. Rosmus and others) focused on night-time capture in the area of Vosecká bouda in the western Krkonoše Mountains, that is, to a place with the previously known mass daytime migration. By optimizing the combination of the light source used with suitably positioned mist-nets and playback of bird voices, in 1999–2008 nearly 40,000 individuals of 87 bird species were captured and ringed. These captures



Long-term monitoring makes it possible to determine gross year-on-year changes in the abundance and phenology of migrating birds. Here the comparison of the numbers of captured birds in 2018 (red) with the average numbers for individual days in the period 2011–2017. The graph shows that in 2018, significantly fewer birds were caught than the average for previous years and that the main peak of autumn migration was somewhat delayed compared to the average. Prepared by Radek K. Lučan



Concise map summarizing all the data on the origin and destination of birds captured and ringed at Červenohorské sedlo mountain pass. The map shows where the birds passing over the saddle were flying to and from. © Martin Vavřík and Radek K. Lučan





Death's-head hawk-moth (*Acherontia atropos*) and convolvulus hawk-moth (*Agrius convolvuli*) – typical night moth representatives of long-distance migrants; their autumn passage over Červenohorské sedlo mountain pass is regularly monitored. Photo Radek K. Lučan

have already provided a relatively good idea of the composition and phenology of the daytime and night-time migrating bird communities, a lot of interesting information about the origin and destination of the migrating birds and last but not least, records of very rare species which have only been found in our country very sporadically.

### Jeseníky Mountains

After the research in the Krkonoše Mountains was completed, based on previous systematic visual observation of mass daytime migrations, but also several attempts at night-time captures in the mid-1990s (L. Doupal, T. Pospíšil, L. Hajný), Červenohorské sedlo mountain pass in the Jeseníky Mountains appeared to be another suitable, comparative locality. The very first experimental season in 2010 aimed at verifying the suitability of the site and methodological optimization confirmed the correctness of this assumption, as during 30 days of the autumn migration, more than 5000 birds of nearly 70 species were captured and ringed, about half of them during the night. Until 2014, the bird capture and ringing event was carried out between August and November intermittently in the range of 60–70 days and nights of capture, according to the time availability of several ringers. Since 2015, thanks to the cooperation with the Department of Zoology, Faculty of Sciences, Charles University in Prague, we managed to cover the whole season from

mid-August to early November for the first time. Since 2016, monitoring has been running continuously for 3 months from early August to early November. Thanks to this, we have managed to cover the migration period of species, the migration of which peaks at the turn of July and August, such as the nightingale, Eurasian river warbler or marsh warbler.

During the years 2010–2018, almost 100,000 birds of 125 species were caught and ringed at Červenohorské sedlo mountain pass, about half of them during their night-time migration. Such a large amount of data already allows us to postulate a number of partial conclusions, and the heuristic potential of the whole research further increases with the length of the time series. At least since the methodological standardization in 2015, the project has had the character of monitoring; besides the changes in the abundance, structure and phenology of migrating communities, basic biometric data and data on the fitness of migrating birds are also collected. Of course meteorological data is collected as well, because the current state of the weather is directly reflected not only in the intensity of migration, but also in the success of catching at least certain bird species. In addition to the captures themselves, the abundance of migrating birds is monitored visually, as the trapping does not always reflect the abundance of migrating birds,



The common noctule (*Nyctalus noctula*) is a typical example of a long-distance migrant which migrates over Červenohorské sedlo mountain pass in huge numbers, especially in late September and in October. Photo Radek K. Lučan

particularly under specific climatic conditions and for certain groups of species. The observable daytime migration here is particularly spectacular, especially in October, when many tens of thousands of birds, especially finches, often fly over during a single morning. High quality data has been collected on low-flying migratory species that fly through the vegetation and respond well to attraction via the voice recordings (e.g. goldcrest, dunnock, wren, tits), whereas most species of daytime migrants flying through open space at higher altitudes are significantly under-represented. This is illustrated, for example, by the common chaffinch, which represents over 50% of the daytime migrating birds, but only makes up about 3% of the sample from the daily captures. On the contrary, the most frequently caught nocturnal migrant, the European robin (roughly half of all birds ringed here), is very likely to approach the real relative abundance of this species among night-time migrants, which also correlates with data from other bird monitoring localities in Europe.

### Rarities and icons

In addition to species that can commonly be recorded elsewhere during migration, at Červenohorské sedlo mountain pass we also regularly record species of a very rare or hardly detectable nature, mainly due to nocturnal capture. The first type includes several rare species straying from areas far to the

north or east of our country, such as the dusky warbler (*Phylloscopus fuscatus*, 1<sup>st</sup> record for Czechia), Radde's warbler (*Phylloscopus schwarzi*, 2<sup>nd</sup> record for Czechia), Pallas's warbler (*Phylloscopus proregulus*, 3 of 9 records for Czechia), yellow-browed warbler, half of all records for Czechia), booted warbler (*Iduna caligata*, first two records for Czechia), pine bunting (*Emberiza leucocephala*, 3<sup>rd</sup> record for Czechia) and Siberian accentor (*Prunella montanella*, 2<sup>nd</sup> record for Czechia). The second group includes, for example, the emblem species of Červenohorské sedlo mountain pass, the woodcock (*Scolopax rusticola*), of which over 600 have been ringed so far, which is the vast majority of all woodcocks that have ever been ringed in Czechia. Numerous data from the retrospective finds of the ringed woodcock here show, among other things, what great hunting pressure this species is exposed to in its wintering grounds in southern and western Europe.

### Further aspects of bird migration

The data on changes in the intensity of migration, which does not occur all the time with the same intensity but is concentrated in significant migration waves, when after a longer quiet period there are certain days when mass migration of most species typical of the period takes place, and after that again followed by several days to weeks of relative lack of activity. Studying the causes of these fluctuations will certainly yield a number of interesting findings, although many factors have recently been well studied in other regions of the world through the development of the use of radar tracking. Knowledge of the phenology of migration of foreign populations across our territory is also very valuable, as observation in other areas (typically in the lowlands) often does not distinguish members of our populations from members of populations from outside our country. Moreover, in many species the autumn passage is very inconspicuous. This applies for example to the nightjar, nightingale, grasshopper warblers, goldcrests, flycatchers, but also the tits and chaffinches. Equally interesting are cross-species comparisons of circadian migration activity data, where many species migrate exclusively either at different times of the day or at night. However, in many spe-



The booted warbler (*Iduna caligata*) in the Czech Republic is only a very rare vagrant. Both of its previous records come from Červenohorské sedlo mountain pass. Photo Radek K. Lučan

cies, during the season, there is a shift in migration activity from day to night or vice versa.

### Migration of bats and selected groups of insects

Based on the netting activity, the site has proven to be important for another group of flying vertebrates, bats. Since 2015, monitoring of the flight activity of bats, using automatic flight activity recorders (so-called 'batcorders'), has been added to the monitoring of bird migration, because even among bats there are more species of long-distance migrants and many others that carry out shorter-distance seasonal movements. In total, at least 21 bat species were detected by a combination of captures and echolocation records at Červenohorské sedlo mountain pass, including the largest European bat, the greater noctule (*Nyctalus lasiopterus*), the regular presence of which indicates the possibility of its permanent population in a wider area.

In order to complement the spectrum of flying migrants with invertebrates, since the autumn migration of 2015, selected groups of migratory moths (some hawk-moths and others), which are also known for their long-range seasonal flights, have been regularly recorded at

the locality. As a result, the migration of the convolvulus hawk-moth is regularly recorded in large quantities here every year, and the migrations of the very rare death's-head hawk-moth are regularly detected in our country. For example, in 2016 the flight of the Mediterranean striped hawk-moth was recorded. In 2018, monitoring of the daytime migration of hoverflies was also started, which is a very striking phenomenon in the autumn period, but so far described only very inadequately. The preliminary results are very promising.

The whole project is professionally backed by the Department of Zoology, Faculty of Sciences, Charles University in Prague and takes place on a platform of cooperation between the Jeseníky PLA Administration, NCA CR, Ringing Station of the National Museum in Prague, Forests of the Czech Republic and Červenohorské sedlo Ski Area and would not be possible without large numbers of volunteering collaborators such as bird ringers, students and educators at several of our universities and many other interested parties, as well as volunteering contributors, who have played very significant roles in the course of the research. The current activities and results of the project can also be found on the website [www.fkcsso.cz/chs](http://www.fkcsso.cz/chs)



# Monitoring of Alpine Bells in the Macocha Abyss

Karin Hustáková, Bohuslav Koutecký, Zdeněk Musil

Alpine bells (*Cortusa matthioli* subsp. *moravica* Soják) is undoubtedly one of the most famous plants of the Moravian Karst, even though very few people have ever seen it. This is because it grows in the Macocha Abyss, high on the vertical rock walls. Access to the habitat is very difficult and only possible with

the help of ropes and for physically fit people with the necessary experience. Previously, part of the Alpine bells population also occurred on the debris cone at the bottom of the Abyss, from where it was first described. However, only three specimens now survive here.

Alpine bells is a glacial relict which occurs in the Czech Republic in only one place on the northern face of the Macocha Abyss. It is a small, isolated population; the closest localities of this species are in the Strážov Mountains and Malá Fatra Mountains in Slovakia and in the Alps. The long-term existence of this montane species is possible thanks to the cold and humid climate under rocky overhangs. The site is without direct sunlight all year round, and it is under the constant influence of cold air from the caves on the Punkva River, which are located below it. The first reports of the occurrence of Alpine bells at Macocha come from the years 1918–1921, with other authors mentioning this species later. However, data on the size of the local population differ significantly. It is almost certain that the experts who were studying Alpine bells never visited all the sites high on the rock face, but only investigated the localities on the debris cone, and possibly above the upper pool, which can be seen from the floor of the abyss.

Monitoring of Alpine bells was begun by staff of the Czech Nature Conservation Institute (NCA since 1995) in 1992 by counting them with a stationary telescope from the upper rim and floor of the abyss (Řičánek 1994). This method was insufficient for obtaining more detailed data because of the large distance between the observer and the sites, and the acute angle at which the plants were observed. This led to inaccuracies in the surveying and over time it was no longer possible to identify individual clumps.



Alpine bells. Photo Leoš Štefka

Further research was carried out with the participation of specialists from the Institute of Botany at the Academy of Sciences of the Czech Republic (ASCR) and other specialized institutes. Besides botanists, the former NCA branch in Brno also employed an experienced

rock climber, as by combining these specializations, it was also possible for experts who would otherwise not have been able to visit the Alpine bells, to get there. Installation of the climbing route was very difficult as the rock wall is 120 m high and is rugged, with nu-

merous overhangs and is heavily weathered. It was absolutely necessary to select the route to be as close to all localities as possible, but so that the plants could not be damaged by the climber's movements. The route consists of 5 interconnected sections; when climbing and descending it is necessary to switch from one rope to another. Throughout the event, the climber hangs from a rope. Given the difficulty of access, it is imperative that the expert studying Alpine bells is accompanied by an experienced climber on the other rope, who in addition to auxiliary activities (photography, transport of necessary equipment, etc.), ensures the safety of the botanist on the rope. This is a life-threatening activity and without the assistance of a professional climber, a visit to this site is completely out of the question. Any mistake with handling the ropes would result in a long fall with fatal consequences.

## Monitoring methodology

Monitoring of Alpine bells in the years 1992–2012 was focused on visual assessment of the state of the population, and very rarely on sampling for various analyses. Seeds were collected and attempts to grow plants were made. The seeds germinated without problems, but the young Alpine bells soon died without apparent causes. In 2013, in cooperation with Palacký University in Olomouc, a detailed census was carried out, connected with the drawing of plants into photographs of the rock wall. At the same time, leaf samples were taken for the genetic laboratory. The drawings were made by a researcher standing on the floor of Macocha, based on telescope observation, and at the same time a climber who was moving slowly across the wall, using radio communication to report the position of individual plants. The number of plants was easily counted with this method, but an accurate map could not be made, as some parts of the Alpine bells habitat are not clearly visible from the bottom and distortions occurred due to the acute viewing angles. Therefore, in 2017, the monitoring method was modified so that the climber on the wall with the Alpine bells shows all plants gradually with a long orange-tipped pointer, while the other monitor (preferably a pair of climbers) descends the rope along the opposite wall of the abyss to the same height, from where he photographs



Marking Alpine bells plants with dots. Photo Karin Hustáková



Abseiling technique during Alpine bells monitoring. Photo Bohuslav Koutecký

the location of each plant and records the data radioed over by the first climber onto his dictaphone. At the same time, he plots everything in the background photo. After the processing of this data, a very accurate record of all individual Alpine bells was created. Each plant thus received its registration number, was plotted in a photograph of the

whole group, and its fertility or sterility and other additional data were recorded. Monitoring using this method was carried out twice a year in 2017 and 2018, at first at the time of flowering (June) and then at the time of seed ripening. This map of the distribution of all Alpine bells individuals has become a quality basis for monitoring in the coming years.





During abseiling, a careful procedure is necessary to avoid damage to the plants. Photo Karin Hustáková

The disadvantage of this method is its extreme difficulty. It is a dangerous activity and neglecting even seemingly small things could easily end up tragically. The activity must the-

refore be led by an authorised speleological instructor, who ensures that the ropes are tied safely, and takes care of all technical and safety matters. Surveyors must be qualified to work at heights, have the necessary experience to do so, and be able to work independently in this extreme environment, where otherwise ordinary activities (photography, writing, etc.) encounter feasibility limits. Furthermore, a large amount of climbing material is required (3 complete climbing sets, approx. 400 m of climbing ropes and other aids). In spite of all these problems, however, it can be stated that this method has proved its worth and has enabled results to be obtained in a quality that would otherwise not be achievable.

### Description of the Population

Alpine bells occurs only on the permanently shaded part of the northern wall of Macocha in 3 places. The first part of the population of about 14 individuals is located about 70 m above the bottom of Macocha Abyss. These are the most vital specimens of the entire local population, only here ripening seeds were found repeatedly (only 3 times in 1993–2018). A second group of about 13 plants grows on terraces on the rock wall at a height of about 30 m above the bottom. The third group (20 individuals) is located slightly below it, on an inclined rocky plate at a height of about 15 m above the

bottom. This group is then followed by the last, lowest place of occurrence: the edge of the talus cone at the bottom of the abyss above the pool, where there are now 3 plants.

The upper group flowers first, as it has the most light and warmth of all three. It often happens that the Alpine bells has already flowered at the upper level, while the bottom groups are still in bud. The lower part of Macocha Abyss is strongly influenced by the cold and very humid air flowing from the caves, where the year-round temperature is around 8 °C. This is probably the reason why seed ripening has never been recorded at the lower localities. After flowering, the green seedheads are always attacked by mould and die.

The first report on the occurrence of Alpine bells (Podpěra 1921) states that 50 clumps were found. In further reports, the frequency varies considerably: Vaněčková (1973) listed 10 clumps; Kovanda (1992) recorded 35 clumps. It is clear, however, that these researchers only recorded individuals directly at the bottom or clearly visible from the bottom. Řičánek (1994) listed 120 clumps. This information can be considered reliable, since it included the entire population of Alpine bells and was first obtained by means of binoculars, and then the actual condition was verified by two visits to the site, on the wall using ropes. During the monitoring carried out in 2013, a significant decrease in the number of plants was recorded: only 63 specimens were found. In the years 2017 and 2018, detailed monitoring was carried out twice a year, for the first time at the time of flowering (June) and then at the time of seed ripening (September). In 2017, the occurrence of 42 clumps (of which 8 were flowering) was confirmed; in 2018 a total of 51 clumps (of which 17 were flowering) were found.

An interesting finding was that the number of plants found can vary within one year. Some plants were traceable only in the autumn census, so their growth occurred with considerable delay. For example, the photo of the upper group from September 2017 clearly shows large vital plants that were not visible at all during the June monitoring. This phenomenon was probably caused by extreme drought, causing some clumps to start growing later.



Monitoring probe on the Macocha Abyss cliff face. Photo Bohuslav Koutecký



Former microclimate monitoring at the bottom of Macocha. Photo Petr Zajíček, CACR

The Punkva river, which flows across the floor of Macocha, also has a significant impact on the local climate. Under normal conditions, it only dries up exceptionally during the summer peak. However, in 2017 and 2018 it did not flow even in the spring and autumn months. As a result, the air humidity in the abyss decreased significantly and the amount of condensation moisture supplying the plants in the lower parts of the rock walls was reduced. The upper part of the wall is fed by water running down a rocky trough below the upper rim of the abyss. This trough was previously filled with permanently wet mosses, but since 2015 it has been permanently dry and therefore mosses and other plants are massively drying out. All of these phenomena are very likely to affect the local Alpine bells population.

The Moravian Karst PLA Administration, in cooperation with the Czech Hydrometeorological Institute, placed temperature monitoring sensors at the three main Alpine bells sites. Since 2012, we thus have an overview of local climatic conditions. The measurements will continue, as these data are very important for assessing changes in the Alpine bells population.

### Protecting the sites

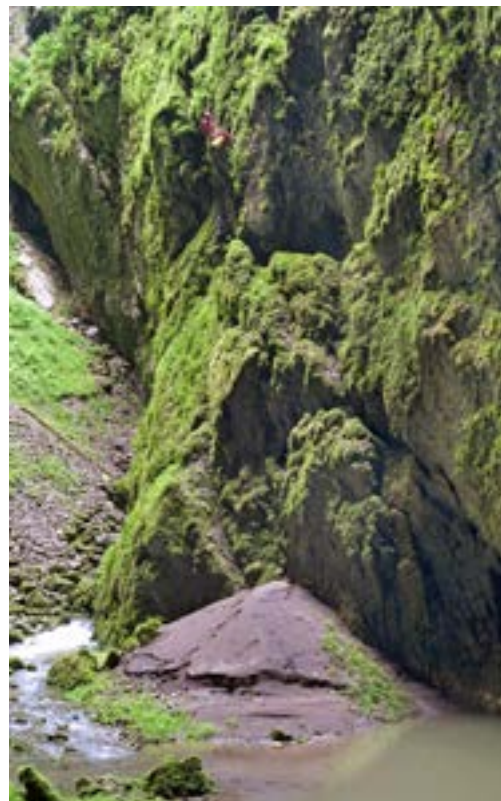
The wall is entered only for the purpose of replacing the recording sensors (3 times a year) and for the population census. Only one person performs this activity. The rope is suspended so that the climber has the rope wrapped in a bag below him, to avoid the risk of damage to the vegetation by swinging the loose rope along the wall. On the climb back up the wall, the rope is immediately packed back into the bag. If the participation of another person is necessary, an optimal procedure is always chosen so that no damage to the locality occurs. At the initiative of the PLA Administration, the climbing route was modified in 2010, and permanent stainless steel anchor points were installed to ensure safe suspension of the ropes. Their location is known only by one climbing instructor who has been accompanying individual research participants since the beginning of monitoring. It is not possible to reach the Alpine bells by simply lowering a rope from the top of Macocha, as the rock overhangs above the Alpine bells prevent access in this way.

Due to total inaccessibility, the Alpine bells are protected from damage by accidental visitors. However, it could be damaged by rock-

falls, which do happen here spontaneously. In March 2010, a single rockfall added about 100 m<sup>3</sup> of rock, released from the unstable parts of the wall above it, into the debris cone. However, it is a natural process that cannot be prevented. In 2017, due to drought and the bark beetle calamity, a group of 30 large spruces dried out on the steep slope above the upper rim of the abyss, directly above the Alpine bells sites. It was obvious that over time these dead trees would collapse into the abyss and would damage the vegetation on the wall in the fall. As some of them weighed around 3 tonnes, there was a risk of major damage, so the Moravian Karst PLA Administration had these spruces expertly felled, to make sure they could not fall into the abyss.

### Monitoring results

Detailed monitoring results (tables, photos) are presented in the final reports for 2013, 2017 and 2018, and kept at the Moravian Karst PLA Administration. Continued monitoring linked to the results of climatic measurements will certainly bring further interesting findings. The data will be used as a basis for expert discussion with the aim of determining activities leading to the conservation of the Alpine bells population at this unique locality.



Biological survey of the wall above the upper pool. Photo Petr Zajíček, Cave Administration of the Czech Republic (CACR).



# Sixty Years of History of State Nature Conservation Organisations in the Czech Republic

Pavel Pešout

The so-called ‘Eight’ year (2018) was significant not only for several anniversaries in Czech statehood (1918, 1938, 1948, 1968), but also for nature protection. The foundation of our oldest forest reserves, Žofín Forest (1838) and Boubín Forest (1858), was commemorated by the Year of Czech Primeval Forests.<sup>1</sup> The anniversary of the founding

of the first national professional state institution for nature conservation in 1958 remained somewhat in their shadow. After 1989, the overall preparedness of nature conservation institutions helped to enforce rapid changes in the environment and to establish modern legislation and nature conservation management in the Czech Republic.

Team of SIMCNP staff in the procession on 19/1/1989. Photo Dana Turoňová



The beginnings of the history of Czechoslovak and later Czech state nature conservation are connected with the establishment of an independent republic in 1918. By a resolution of the Ministerial Council of the newly established Ministry of Education and National Enlightenment (MENE) in Prague on 20<sup>th</sup> November, the competence of this office and subordinate bodies was extended to natural monuments. This important step was taken on the initiative of Zdeněk Wirth<sup>2</sup>, an important art historian, employed by MENE as section director responsible for the organisation and management of monument care. Already in 1919, conservationists were appointed (both for the whole state and for each county) for two years (Procházka 1926). In the same year, Z. Wirth appointed an external expert for nature conservation, Rudolf Maximovič, to MENE, and entrusted him with tasks in the protection of elements deserving protection in land reforms. In 1920, the Allotment Act was passed, which heralded the emergence of a number of specially protected areas<sup>3</sup>. During the First Czechoslovak Republic, intensive efforts were made to adopt special legislation for the protection of nature, but all attempts, often conducted up to interdepartmental discussion, were unsuccessful (Anonymous 1921, Procházka 1926, Klika 1946, Veselý 1954, Pešout 2013). In 1922, R. Maximovič joined the Ministry as officer for the protection of natural monuments (Maximovič 1934), where he worked until 1942, unfortunately until 1935 as the only officer of nature conservation (Anonymous 1941, Čeřovský 2012).

In 1939, the German Reich nature protection regulations were extended to the Sudetenland and at the offices of ‘government presidents’ in Karlovy Vary, Ústí nad Labem and Opava, ‘higher nature conservation authorities’ were established. In 1942, in accordance with the German Reich Nature Conservation Act of 1935 (Maximovič 1939 a, b, c), the nature and homeland protection agenda was transferred to the competence of the ‘chief forester’, i.e. the Ministry of Agriculture and Forestry<sup>4</sup>.

After the liberation, state nature protection returned to MENE, where R. Maximovič again led it until 1948 as the general conservator of nature protection<sup>5</sup> (Stejskal 2006). After his retirement, Maximovič’s pupil and co-worker Jaroslav Veselý became the head of nature



Zdeněk Vulterin (during monitoring at Loužek SNR) led state nature protection in the years 1971–1980. Photo Václav Petříček



Field excursion of Brontosaurus members in Český ráj PLA in 1975. Photo Zdeněk Thoma

conservation at MENE (from 1942, Stockmann 2013). In 1946, the conservators were re-appointed by the Minister, and the state nature and landscape protection gazette ‘Nature Protection’ was first published (Čeřovský & Veselý 1970, Pešout 2012) and in 1951, the Department of Nature Conservation was established at the then State Heritage Office in

Prague, which was led by Jaroslav Veselý until 1958 (Veselý 1954, Čeřovský 1981).

In 1956, Act No. 40 on State Nature Conservation was finally adopted, in 1958 followed by the Act on Cultural Monuments, which constituted the State Institute for Monument Care and Nature Protection (SIMCNP).



### Selected Important Dates in the History of the Czechoslovak or Czech State Nature Conservation Organisations

1918 (20/11)	MENE extends its scope to include natural monuments.
1919	Appointment of the first conservationists in Czechoslovakia.
1920 (30/1)	Approval of the so-called 'Allotment law' No. 81/1920 Coll.
1922	Submission of the first bill on the protection of natural monuments.
1933 (31/12)	Decree of the former MENE (so-called 'New Year's Eve Decree').
1942 (15/1)	Transfer of the nature and homeland protection agenda from MENE to the Protectorate Ministry of Agriculture and Forestry.
1945	Transfer of nature and homeland protection agenda back to MENE.
1946	Start of the publication of the state nature and landscape protection bulletin 'Nature Conservation'.
1955 (1/3)	Designation of the first large-scale protected area, Český Ráj PLA.
1956 (25/8)	Adoption of the first Act on State Nature Protection (No. 40/1956 Coll.).
1958 (17/4)	Enabling of the establishment of a state institute for monument care and nature protection by Act No. 22/1958 Coll. on Cultural Monuments.
1958 (1/7)	Establishment of the State Institute of Monument Care and Nature Protection.
1960 (1/1)	Commitment and obligation of the state to comprehensive nature protection enshrined in the Constitution of the Czechoslovak Socialist Republic.
1963 (17/5)	Establishment of the first Czech national park – Krkonoše NP.
1978	National Nature Protection Concept approved by Government Resolution (No. 243)
1990	Establishment of the Ministry of the Environment.
1990 (1/7)	Establishment of the Czech Institute of Nature Protection from the nature protection sections of SIMCNP and RSCMCNCs (including PLA administrations) under the auspices of the Ministry of the Environment.
1991 (1/7)	Establishment of the Czech Nature and Landscape Protection Inspectorate by Act No. 282/1991 Coll.
1991 (1/1)	Incorporation of all existing administrations of show caves from the abolished District National Committees and Regional National Committees into the Czech Nature Conservation Institute.
1992 (25/3)	Approval of Act on Nature and Landscape Protection No. 114/1992 Coll.
1992 (16/12)	Adoption of the Constitution of the Czech Republic containing a commitment of the state to the sensitive use of resources and natural riches.
1995 (1/3)	Separation of CNCI into Administration of Protected Landscape Areas -APLA CR (from 1/5/2004 Nature Conservation Administration) and NCA CR.
1998	Government approved the first state Nature and Landscape Protection Programme.
2004 (8/4)	Approval of so-called 'Euro-amendment' to the Act on Nature and Landscape Protection (No. 218/2004 Coll.)
2006	Merger of the NCA and NPA into one state nature conservation organisation NCA CR and separation of the cave agenda to the independent Cave Administration of the Czech Republic.
2015 (1/5)	Anchoring of NCA CR as a nature conservation authority with a national competence in the Nature Conservation Act and its incorporation into the civil service authorities.
2017 (1/3)	Designation of all four Czech national parks by law.

### State Institute for Monument Care and Nature Protection

SIMCNP was established by the Ministry of Education and Culture by the Act on Cultural Monuments No. 22/1958 Coll. (§19) from 17/4/1958<sup>6</sup>. Its mission in the field of state nature protection pursuant to the aforementioned Act and the Statute<sup>7</sup> issued in the same year was to assess, elaborate, as appropriate, professional documents for the proceedings and decisions of state nature protection bodies, provide them with professional and methodological assistance, organise and conduct research, exploration, and documentation, in particular as regards nature as a whole and parts thereof, intact or untouched by human activity, the impact of human activity on nature and on countering the adverse effects of human activities, especially research, exploration and documentation of protected parts of nature, the biology of protected organisms, and research into and scientific documentation of large buildings and industrial areas.

It was lucky for nature protection that Jaroslav Veselý, professional nature conservationist (Maršáková-Němejcová 1966, Tříška 1966, 1986, Toman & Tomanová 1976), became the first director of SIMCNP. Although some colleagues blamed him for anxious tolerance of heritage preservation, as a result of which the field of nature protection was not strengthened (Čeřovský 2014). However, he was clearly under pressure from the real demands of that time. Thousands of heritage sites of unquestionable value, which were under the administration of regions and towns, required appropriate procedures, and often immediate solutions to ensure their rescue. The damage to heritage buildings was also more pronounced than the gradual devastation of nature and landscape. Nevertheless, it should be noted that this period was extremely important for state nature conservation, through building the nature protection department in SIMCNP, and also in the creation of nature conservation units in Regional Centres of State Monument Care and Nature Conservation (RSCMCNC). Jaroslav Veselý also contributed to international cooperation, including the IUCN membership of SIMCNP as early as 1958.

All activities in nature conservation at SIMCNP were initially carried out by a depart-

ment of 14 staff. This was led by Jan Tříška (Skřivánek 1982a, 1986), Zdeněk Vulterin (Skřivánek 1982b, Petříček 2017) and later by František Skřivánek (Kučera 1994). In addition to all assessment activities for decision-making by the Ministry of Culture, initial efforts were focused on the proclamation of the Krkonoše National Park, and in cooperation with the RSCMCNCs on the assessment and supplementation of the Protected Landscape Area (PLA) system, as well as small-scale protected areas (nature reserves). Surveys of nature reserves were started, and a system of verification of their condition was set up; gradually the basics of monitoring and documentation were laid out<sup>8</sup>.

In the 1980s, active species protection programmes were launched, in cooperation with regional centres, the Czech Union for Nature Conservation (CUNC) and others<sup>9</sup> and the first rescue facilities for injured wild animals were built. The gene pool conservation strategy was developed, Red Lists of Endangered Species were produced and 5 volumes of Red Books were gradually published.

By engaging in the state electronisation programme, a remote sensing laboratory (RSL) was set up<sup>10</sup>, later becoming the basis for today's Nature Conservation Information System department. In the early 1980s, SIMCNP also began work on the new Nature Conservation Act<sup>11</sup>. In 1986, a partial but substantial amendment to the State Nature Protection Act was adopted (No. 65/1986 Coll.), the so-called 'sanction amendment', regulating sanctions for violations of the law (Friedl & Damohorský 1987).

A certain problem was the lack of clarity of the competences of the independently operating SIMCNP and RSCMCNCs, which the Institute tried to counteract by holding methodical meetings and consultations. Bureaucracy was further increased after 1980, when, in order to improve the care of monuments, the Headquarters of State Monument Care and Nature Protection was established, which only worsened the communication between SIMCNP and the Ministry of Culture.



Jaroslav Hromas (right) and Václav Petříček in 1973 during the delineation of České středohoří PLA. Photo archive of Václav Petříček



Director of SIMCNP Bedřich Tykva and Vojen Ložek on a visit to the Zvířetice castle ruins in 1988. Photo archive of Václav Petříček

In international cooperation, the work of Jan Čeřovský should be mentioned, who in 1969, as a reward for his educational activities, became an employee of the IUCN Secretariat, from where he was withdrawn by our state for political reasons in 1973. In 1988 he was elected a member of the IUCN Council and for one term he was IUCN Vice President (Kučera 1990).

### Regional Centres of State Monument Care and Nature Conservation (RSCMCNCs)

In the regions, the executive state bodies of nature protection were the Departments of Education and Culture of Regional National Committees (DEC RNC). The staff member (usually one in each region) was called a na-



### Directors of central organisations of state nature and landscape protection since 1958

#### State Institute of Monument Care and Nature Protection SIMCNP (1958–1990)

Director of the Institute	Head of Department of Nature Protection*
RNDr. Jaroslav Veselý (1958–1964) PhDr. Vladimír Novotný, DrSc. (1965–1975) JUDr. Otilie Svobodová (1975–1983) PhDr. Bedřich Tykva (1983–1990) Doc. PhDr. Josef Štulc (1990)**	RNDr. Jan Tříška (1958–1971) RTDr. Ing. Jan Vulterin, CSc. (1971–1980) RNDr. František Skřivánek (1981–1990)

#### Czech Nature Conservation Institute CNCI (1990–1995)

RNDr. Jaroslav Hromas (1990–1994)  
Ing. Ivan Dejmal (1994–1995)

#### Agency for Nature Conservation and Landscape Protection of the Czech Republic (1995–2006)

Ing. Josef Novák (1995–1998)  
RNDr. Jan Hošek (1998–1999)  
RNDr. Jaroslav Hromas (1999–2003)  
Ing. Martin Dušek (2003–2006)

#### Administration of Protected Landscape Areas in the Czech Republic (1995–2004) Nature Conservation Administration (2004–2006)

RNDr. František Pelc (1995–2002)  
PhDr. Petr Dolejský (2002–2006)

#### Nature Conservation Agency of the Czech Republic (2006–present)\*\*

Ing. Martin Dušek (2006)  
RNDr. František Pelc (2006–2007)  
RNDr. František Pojer (2007–2010)  
RNDr. František Pelc (2010–present)

\* In the case of SIMCNP, especially after the removal of Jaroslav Veselý from the position of Director, leadership in nature conservation was primarily left to the heads of the nature conservation department, sometimes at the same time holding the position of deputy director; therefore, they are also listed.

\*\* After the Department of Nature Conservation became an independent institute, he was the director of the State Institute for Monument Care (currently National Monument Institute) until 2002.

\*\*\* Director of the Cave Administration of the Czech Republic, separated in 2006 from NCA CR, was from 2006 to 2019 RNDr. Jaroslav Hromas, currently Ing. Lubomír Příbyl.

ture conservation inspector. Similarly, the District National Committees included nature conservation inspectors – often including other agendas, such as the role of ‘church secretaries’). The years 1958–1961 saw the gradually emergence of RCSMCNCs, part of which were the PLA administrations. The Krkonoše National Park was also administered by the Regional National Committee.

Regional centres were methodologically led in their activities by SIMCNP and primarily provided expert support for decision-making by regional and district national committees, conducted natural science surveys and assessments of

the state of nature, cooperated on preparation of new protected areas incl. PLAs (Eberhard 1984, Kuncová 1984, Macák 1985, Podzemný 1985, Polák 1984, Rivola 1985, Strejček 1985). Even though the number of RCSMCNC staff was increasing gradually, a substantial part of the field work was still dependent on voluntary groups of district conservators and nature conservation reporters until the early 1990s (Tříška 1983, Čeřovský 2004).

#### Difficult journey to consolidating state nature protection

In 1990, the Ministry of the Environment came into being and the Nature Prote-

ction Department SIMCNP became the basis of the Czech Nature Conservation Institute (CNCI). CNCI was established on 1<sup>st</sup> July 1990 and on the same date the nature protection departments of the abolished RCSMCNC, including PLA administrations, were integrated into it. From 1<sup>st</sup> January, 1991, the newly constituted structure of state nature conservation was extended to include all existing administrations of show caves, in contradiction with the original idea that, following the example of Slovakia, an independent cave administration would be established in the institute (Hromas 2013). Although the separation of heritage care and nature conservation into different institutions was undoubtedly the right step, it has become clear over time that interdisciplinary cooperation in the care of our common cultural and natural heritage is necessary in many cases (Pešout 2011).

A fundamental change came with the new Act on Nature and Landscape Protection No. 114/1992 Coll., which, from 1<sup>st</sup> June 1992, introduced the institute of special state administration in nature protection, incl. definition of the competencies of PLA and NP administrations. Adoption of a new modern legal standard in nature and landscape protection would not have been possible without the previous decade of preparation and without the overall preparedness of state nature conservation to promote extensive changes in ensuring environmental protection. However, the newly adopted Constitution of the Czech Republic six months later stipulated that administrative authorities can only be established by law. Although the previously established PLA and NP administrations did not cease to exist, their legal status became constitutionally non-conforming and required revision. This should have occurred in a ‘reasonable time’. First, in 1995, the CNCI department managing the PLA administrations was separated into a newly established organisation – Administration of Protected Landscape Areas in the Czech Republic (APLA CR), while the other part of the Institute became the basis for the Agency for Nature Conservation and Landscape Protection of the Czech Republic (ANCLP CR), which provided professional support for the performance of state admi-



Removal of trees and shrubs at Sluneční dvůr NM by SIMCNP staff in 1971. Photo archive of Václav Petříček

nistration. APLA CR had an amendment to the Nature and Landscape Protection Act prepared, but despite two attempts it did not pass through the legislative process. A further effort to remedy this in 2004 did not pass in the Chamber of Deputies by one vote (Pelc 2016)<sup>12</sup>. However, this so-called ‘Euro-amendment’ ensured the transposition of European Natura 2000 directives into Czech law, and, inter alia, shifted the granting of exemptions from prohibitions in the protection of protected species from the Ministry of the Environment to the PLA and NP administrations. In this context, from 2004 APLA CR was renamed to Nature Protection Administration (NPA) (Moucha 2004).

#### Nature Conservation Agency of the Czech Republic (NCA CR)

In 2006, following the changes in nature protection after the establishment of regional self-governing units (1<sup>st</sup> January 2000) and after the accession of the Czech Republic to the EU (1<sup>st</sup> May 2004), steps were initiated to establish a special state administration body in nature conservation with nationwide competence. The aim was to strengthen state nature conservation as an institution containing all the necessary pillars – professional background incl. monitoring and documentation, competence for direct performance

of state administration and providing care incl. financing and, last but not least, public education. In these years, both organisations - ANCLP CR and NPA – faced repeated serious dismantling proposals as part of efforts to develop other forms of environmental governance.

First, in 2006, the Minister of the Environment merged the two state nature protection organisations into one organisational unit of the **NCA CR**. At the same time, operation of publicly accessible caves incl. their research and documentation was entrusted to the newly established contributory organisation Cave Administration of the Czech Republic (Hromas 2008). This clearly separated the performance of the state administration from the operation of visitor circuits, which was appropriate not only from a nature conservation perspective, but mainly for operational and economic reasons.

Even after the constitution of the **NCA CR**, efforts to enforce its establishment by law continued. Unfortunately, the 2009 amendment was again not approved. Only the administration of National Nature Reserves (NNR) and National Nature Monuments (NNM) was transferred from the Ministry of the Environment (MoE) to **NCA CR**, and only a few other

small changes were accepted. In connection with the discussion of the twelve years postponed Civil Service Act (No. 234/2014 Coll.), finally a decision had to be made on the definitive position of special state administration bodies in nature conservation. In the case of national park administrations, economic and economic reasons prevailed and they remained outside the scope of the Civil Service Act, but in the case of **NCA CR** the choice was clear. The management of the organisation sought to establish the **NCA CR** as a civil service office, which, through Act No. 250/2014 Coll. happened. The position of the civil service office brought higher bureaucratization of internal processes, but the benefits of long-term stable anchoring and the inclusion of nature protection on a par with other institutions of special state administration undoubtedly significantly prevail.

#### Efforts to ensure institutional nature conservation

In 2017, we managed to discuss the so-called ‘national park’ amendment to the Nature Protection Act and to designate all four national parks by law. Along with the **NCA CR** legislation, the sustained efforts of many professional and voluntary conservationists and natural scientists to ensure the long-term stabilisation of institutional nature protection in the Czech Republic over a quarter of a century have finally come to fruition. It is good to remember today that in the beginning, sixty years ago, state nature conservation was lucky to have several personalities and nature conservation teams at headquarters and regional centres, who were convinced of the necessity of their work and passionate about it. The readiness of state nature conservation to promote changes after 1989 would not have been possible without the existence of joint professional institutions with monument care. In the period of building socialism, life was not a bed of roses for either of the disciplines, but despite this the staff of SIMCNP and RCSMCNCs managed to protect a significant part of our cultural and natural heritage. This is the right place to thank all professional and volunteer nature conservation workers, both contemporary, and especially our predecessors, without whom we could not have raised the safeguarding of nature and landscape protection to the level of the most advanced countries.





Releasing a young male lynx near Horská Kvilda in November 1985. Photo Ivo Svoboda

## Acknowledgments

I would like to thank my colleagues Bohumil Kučera, Jaroslav Hromas and Václav Petříček for comments on the article.

**A list of documents referred to is attached to the web version of the article at [www.casopis.ochranaprirody.cz](http://www.casopis.ochranaprirody.cz)**

## Notes:

<sup>1</sup> A comprehensive series on annual excursions for the Year of Czech Forests by Tomáš Vrška et al. was published in six issues of Živa magazine in 2018.

<sup>2</sup> PhDr. Zdeněk Wirth remained at MENE until 1939, when on his departure; the President of the Republic thanked him for his merits (Anonymous 1939).

<sup>3</sup> The Act of January 30<sup>th</sup>, 1920, which was issued in accordance with § 10 of the Act of April 16<sup>th</sup>, 1919, No. 215 Coll., the provision on the allocation of seized land and regulating the legal relation to the allocat-

ed land (the so-called 'Allotment Law') in § 20 obliges land authorities "The allotment shall not disturb the beauty of nature or the character of the landscape and not harm the natural, historical and artistic monuments. The Land Office may authorise to this end the areas devoted to parks, nature parks, which otherwise serve to embellish the landscape, or the purpose of which is to preserve an example of the original character of the landscape, or to secure and protect historical monuments and their surroundings closely related to them, may be left in the ownership of its original owners, in addition to the land area, which pursuant to § 11 of the Act of 16<sup>th</sup> April 1919, No. 215 Coll., may be left to its original owners and not confiscated, if the owner complies with the conditions set by the Land Office in agreement with the participating ministries, as regards the accessibility of those places to the general public, scientific and artistic staff, or uses them for humanitarian purposes" and at the same time had the option according to § 50, "to establish a special order on management ... protection of natural and artistic monuments,

preservation of landscape character and landscape specialties in buildings ... and so on."

<sup>4</sup> Under Government Decree No. 14 of 15<sup>th</sup> January 1942 on the new organisation of some central offices, Coll. Protectorate of Bohemia and Moravia 1942, pp. 75–80 and Government Decree No. 208 of 15<sup>th</sup> March 1942 on the new organisation of certain central offices ('reorganisation regulation'), Coll. Protectorate of Bohemia and Moravia 1942, pp. 997–1003.4)

<sup>5</sup> After 1946, the title of his position was changed to "Central Conservator of State Nature Conservation" (Čeřovský 2004).

<sup>6</sup> Originally, two institutes were to be established; one for monument care and one for nature conservation. However, at a meeting of the ministry management, one common institute was eventually promoted (Kučera 1998).

<sup>7</sup> Decree of the Ministry of Education and Culture of 28 August 1958, ref. 38736/1958-E 1, MSK XIV Journal, 277.

<sup>8</sup> As of 1990, 1 NP and 17 PLAs were designated and 13.5% of the territory of the country was covered by protected areas.

<sup>9</sup> In cooperation with the Research Institute of Audio and Video Technology, aerial photography was commenced in 4 bands of the spectrum up to a scale of 1:25,000 and the production of derivatives for use at a scale of 1:5,000. On the example of Jizerské hory PLA, possible evaluation of the degree of damage to spruces by emissions was verified from the produced derivatives. At that time, no other organisation in Czechia was able to do that. In the mid-1990s, other Protected Landscape Areas and the Krkonoše and Šumava National Parks were photographed. In the 1990s, the RSL was transferred to building the GIS system.

<sup>10</sup> Programmes Lynx (gradual repatriation of Eurasian lynx to Šumava) and Haliaeetus (stabilization of white-tailed eagle in Třeboňsko), as well as the programmes Tetrao, Lutra, Otis, Falco and Margaritifera (Trpák 1989). <sup>11</sup> The main activities of SIMCNP in the field of nature protection were described by the Deputy Director for Nature Conservation at that time, František Skřivánek (1983).

<sup>12</sup> The only fully-fledged special nature conservation authority was the Bohemian Switzerland National Park Administration, which was established by a separate Act (No. 161/1999 Coll., declaring the Bohemian Switzerland National Park and amending Act No. 114/1992 Coll., on Nature and Landscape Protection, as amended).

# The Elbe Canyon – Inspiration for Romantic Painters and Cradle of European Tourism

Zdeněk Patzelt

The Elbe Canyon is unique not only for its landscape and natural values, but also represents a huge potential for tourist and recreational use. While the German side realised this long ago, on the Czech side there is still an effort to transform the Elbe into an industrial transport channel. The history of tourist use of this landscape dates back to the 19th century, when one

of the oldest tourist associations in Europe was established, and the Elbe Canyon became the cradle of European and world tourism together with the Alps. The fascinating landscape of Bohemian-Saxon Switzerland inspired renowned romantic artists. Today their works and later old postcards can tell us about the natural appearance of the Elbe.

Tourist restaurant at Großer Winterberg. Anonymous, mid-19<sup>th</sup> century, Hasse-Stiftung Foundation at the Saxon Switzerland NP Administration







Děčín with Chateau. Anonymous, mid-19<sup>th</sup> century: Hasse-Stiftung Foundation at the Saxon Switzerland NP Administration



Vantage point at Bastei. Anonymous, mid-19<sup>th</sup> century: Hasse-Stiftung Foundation at the Saxon Switzerland NP Administration

### Cradle of tourism

The Bohemian Switzerland Mountain Association (Gebirgsverein für die Böhmisches Schweiz) was founded in Děčín as early as 1878. Thanks to the association and the owners of the local Clary-Aldringen and Kinský estates, the most beautiful destinations, such as the Pravčická brána Arch and the Kamenice Gorges, were made accessible in the wild landscape, attracting tourists from all over the world. On the Saxon side, the discovery of the landscape by tourists dates back to an

earlier period, as this historic act is considered to be the moment when the farmer Adalbert Hauff provided accommodation to the first holiday-makers in today's resort of Kurort Göhrisch as early as 1869. Thanks to its proximity to Dresden, Saxon Switzerland became a very popular area for visitors. Already around the year 1800, tourists began to visit Bastei, the most visited destination in Saxony, where a massive stone bridge was built for tourists in 1850–1851. Today, with a visitor rate of about 1.5 million people per year, Bastei is the

most visited place among all national parks in Germany. The Bastei Bridge offers breathtaking views of the surrounding rock labyrinth and the panoramic terrace near the tourist hotel offers spectacular views of the Elbe river. It was this view of the unfettered Elbe and its surroundings that inspired the artists of that time most of all.

### The first conservationists

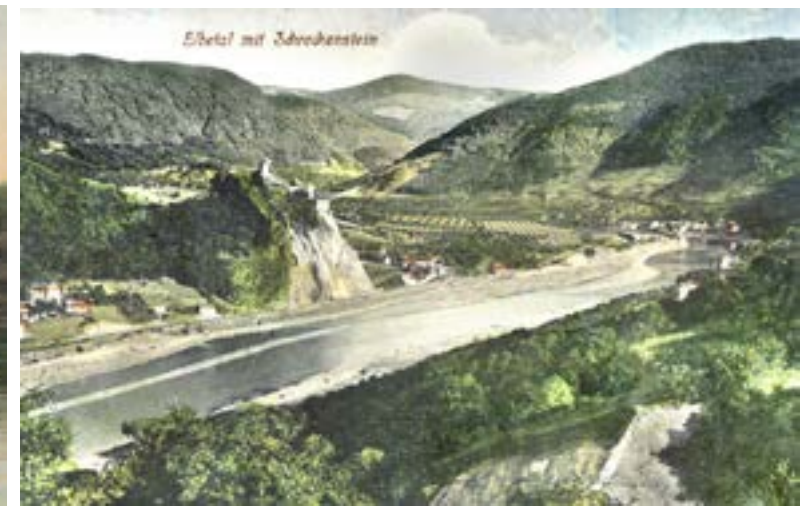
Tourist use of the landscape of Bohemian-Saxon Switzerland increasingly became a source of livelihood. So a century ago, the locals began to realise the need to protect the local nature, where many natural rock formations in the Elbe Canyon were irreversibly destroyed by sandstone quarrying. Therefore, on 31<sup>st</sup> March 1910, the Saxon Switzerland Protection Society (Verein zum Schutz der Sächsischen Schweiz) was established. Its mission was to preserve the unique local nature and above all, to stop the quarrying. By 1917, the association had managed to purchase most of the quarries, preventing further destruction of the landscape. Similarly, tourist associations bought up dilapidated historical monuments and saved them in order to increase the attraction of the area for tourists. For example, the castle above the town of Wehlen was bought in 1882 by the Saxon Switzerland Mountain Association, which set up a vantage point here. Even today, it is clear that the preservation of nature is not only a concern for state nature conservation, but also for the local residents for whom tourism provides livelihoods, and for tourists who come here to admire the unspoiled nature. Therefore, the local history suggests that the potential of tourism income here far exceeds the real income from the Elbe as an industrial transport route.

### Romantic inspiration as a commitment for the future

The mysterious attraction of the landscape of Bohemian-Saxon Switzerland has always tempted man to discover and portray it. It is no coincidence that centuries ago famous artists found inspiration here. The classical composer Carl Maria von Weber set the story of his opera 'Der Freischütz' (The Marksman) here and the territory also captivated Hans Christian Andersen and Johann Wolfgang Goethe. After all, it was the Swiss painters Adrian Zingg and Anton Graff, based at the Saxon Royal Court in Dresden at the end of the 18<sup>th</sup> century, who apparently named the area Saxon, and later, Bohemian Switzerland – they were so enchanted by the area that they named it after their homeland.



Historical postcard according to painting by Ludwig A. Richter, Ferry below Střekov (Überfahrt am Schreckenstein), original from 1837. Archive Zdeněk Patzelt



Historical postcard of the Elbe near Střekov, c. 1910. White-sand beaches lined the river where the locks stand today. Archive Zdeněk Patzelt

Visitors can see the unique collection of many beautiful works of art from the Hasse-Stiftung Foundation's collection at the Saxon Switzerland

National Park Administration in the gallery at Bastei. Many of the depictions of the Elbe Canyon of past centuries show how the river was full of life and

small boats creating dense traffic. The artistic rendering of the landscape of Bohemian-Saxon Switzerland compels us to preserve its values for the future.



Picture from Saxon Switzerland, steel engraving 14 × 18 cm, A. Tromlitz, mid-19<sup>th</sup> century, Hasse-Stiftung Foundation at the Saxon Switzerland NP Administration



# Kaziranga National Park

## – a Little Miracle in Overcrowded India

František Pelc, Vladimír Bejček

As students, we read Zdeněk Veselovský's book 'Voices of the Jungle' describing his stay in Kaziranga National Park. In addition to numerous interesting facts about wildlife bionomics, the reader will find a number of notes on nature conservation half a century ago. A very valuable article on the simplest problems of biodiversity management in this Assam park was published by Douglas Chadwick in National

Geographic (2010). With some worries but also hopes, we visited this area in March 2019. However, the experience exceeded our expectations, despite many problems that persist in the national park. After all, over a hundred of the symbolic Indian rhinoceros (*Rhinoceros unicornis*) have been poached in Kaziranga in the last ten years, and the population around the park has grown by a third.

The population of Bengal tigers in Kaziranga NP reaches about 100 and is therefore one of the highest densities in India, but they are rarely observed by visitors. Photo František Pelc



### India under a magnifying glass

India, covering nearly 3.3 million km<sup>2</sup>, is the 7<sup>th</sup> largest country in the world and, due to its geographical location, is sometimes referred to as the Indian subcontinent. Due to its huge area, a wide variety of environmental conditions can be found there, including tropical coasts and wetlands in the deltas of huge rivers, savannah, semi-deserts, tropical and subtropical dry, rain and monsoon forests, as well as the highest mountains in the world – the Himalayas. However, due to the long-term and extraordinarily high population (with nearly 1.4 billion inhabitants, it is a close second behind China); almost all natural communities have only been preserved in fragments. Indian population density reaches over 430 people per km<sup>2</sup>, i.e. almost four times higher than in the Czech Republic. Although the annual population increase has fallen to 1% in recent years, it still means an annual population increase of 14 million people. Almost 60 cities have more than 1 million residents; the largest are the metropolises of Delhi and Mumbai, both of which have populations close to 20 million. Despite the undeniable economic development observed in recent years, India is still a poor country.

### Kaziranga National Park: Location, Area, History

Kaziranga National Park (KNP) is located in the north-east of India, in the state of Assam, on the border between the tropics and subtropics. Thanks to the local monsoon climate, however, we can find truly tropical nature there. The rainfall is uneven, with most falling in June–September, and the total exceeding 2,200 mm per year. This geomorphologically rather monotonous landscape lies at 40–80 metres above sea level.

KNP has become a UNESCO World Heritage Site. The roots of its protection date back to 1904, when the enlightened Baroness Mary Curzon, after visiting and finding the territory almost devoid of animals due to mass poaching, urged her husband, working in the colonial administration, to enforce the protection of this magical corner of India. At that time the rhinos and other animals had been hunted almost to extinction. And she succeeded. Already in 1905, a reserve of 232 km<sup>2</sup> was designated here, which was gradually extended. However, the latest, sixth expansion of the park to include the riverbed and floodplain of the Brahmaputra was the lar-



Kaziranga NP: Map showing the delimitation of the borders after the sixth and largest extension of the park to include the riverbed of the Brahmaputra, which consists of sandy sediments for part of the year. Compiled by Jan Vrba



Wetlands and lakes make up about a tenth of Kaziranga National Park. Photo František Pelc.



The sandy-muddy floodbanks of varying magnitude and the riverbed of the Brahmaputra, up to 10 kilometres wide, make up more than a third of the area of the park. Photo František Pelc





Red jungle-fowl (*Gallus gallus*), the ancestor of the domestic fowl, is a rather slender and shy bird. Photo František Pelc



Monsoon and semi-deciduous forests can be found in about 15% of Kaziranga National Park. Photo František Pelc

gest: Thanks to the new 350 km<sup>2</sup>, the total area of the national park has reached 860 km<sup>2</sup>, which is above average in Indian terms.

### Landscape and Biodiversity

KNP is part of the Indomalayan (Oriental) zoogeographical region and one of the hot spots of global biodiversity. This term refers to areas with high species richness, a high number of endemic species and a high degree of habitat damage by humans, mainly due to their large-

#### India and Protected Areas

Protected areas make an important contribution to the protection of fragments of the natural environment, including biodiversity, in India. There are currently 104 national parks in India with a total area of 40,500 km<sup>2</sup> (about 1.25% of the country's area) and an average area of 400 km<sup>2</sup>. Not surprisingly, the most common size of national parks tends to be dozens or a few hundreds square kilometres. Only a few of them exceed 1,000 km<sup>2</sup>. The largest is Hemis NP in Ladakh with an area of 4,400 km<sup>2</sup> and one of the largest is the world-famous Corbett NP (1,300 km<sup>2</sup>). These protected areas are also under enormous pressure from surrounding human populations and are subject to frequent conflicts between nature conservation and rural agriculture. National parks are designated by generally binding regulations of individual federal states.

-scale disintegration and destruction. In order to be considered a “hot spot” of world terrestrial biodiversity, at least 1,500 vascular plant species (i.e. more than 0.5% of all known species) must grow there, and at least 70% of the original habitats had to have been lost.

The origin of the Himalayan hot spots is due to several causes. They are points of contact between the foot of the Himalayan ridge and the lowland on the floodplain of the Brahmaputra (translated as the Mother of Rivers), creating extremely varied environmental conditions. In the Tertiary period, the Indian plate crashed into the Eurasian mainland, creating the highest mountains on Earth along the line where the lithospheric plates clashed. A main reason contributing to the high productivity of the local ecosystem is the massive flooding as the Brahmaputra overflows onto its floodplain every year during the rainy season, covering two-thirds of the park, and making the whole park inaccessible to the public, but also bringing a huge amount of nutrients with it. Thanks to this source, we can also find population densities of various wild animals, apparently deviating from ecological assumptions. Last, but not least, long-term protection of the local environment also contributes to the preservation of high biodiversity. In terms of diversity and abundance of fauna, KNP can boldly compete with Africa's most attractive parks on the savannah.

There are six basic landscapes – vegetation formations – in the park. The vast area of the Brahmaputra floodplain is largely covered by flooded grassland communities, including elephant grass growing up to 6 metres high, whereas flooded savannahs, enriched with non-contiguous shrub and tree vegetation, also appear in the adjacent areas. More than a third of the park area is formed by the river-



The red-breasted eagle (*Spilornis cheela*) is a common representative of the Indian avifauna. Photo František Pelc

bed of the giant river with massive alluvia, with only sparse vegetation. Tropical wet and semi-deciduous forests form an important part of the landscape. Finally, we must not forget the permanent wetlands with lakes and pools of different sizes attracting many migratory and nesting birds.

Thanks to the high diversity of habitats, KNP is also very rich in avifauna. A total of 500 nesting and migrating bird species have been recorded here. In addition to dozens of exotic taxa, for example hornbills, parrots, barbets and flocks of Indian geese (*Anser indicus*), we had the opportunity to observe ‘our’ overwintering Eurasian snipe (*Gallinago gallinago*). This is one of the reasons why the park is classified by BirdLife International as an important bird area (IBA). KNP also hosts 56 reptile species, including 17 turtle species and 25 snake species.

Despite other richly represented groups of animals, however, the extraordinary species diversity and abundance of mammals plays an important role. Monkeys are represented by four species, including the western hoolock gibbon (*Hoolock hoolock*), one of the most endangered primates of all. Four species of deer (sambar deer, barasingha, Indian hog deer and muntjac) are important for the functioning of local ecosystems, both as grazers of vegetation and as prey for predators. Similarly to Africa, India also refers to the ‘Big Five’, but with a slightly different composition. Its representatives include the wild water buffalo (*Bubalus arnee*), sloth bear (*Melursus ursinus*), Indian elephant (*Elephas maximus*), Indian rhinoceros and the Bengal tiger (*Panthera tigris tigris*).

Wild water buffalo are threatened not only by habitat destruction and poaching, but also by hybridization with domestic buffalo. Nevertheless, the local buffalo population is thriving and already exceeds 1,800 individuals, representing about two-thirds of the global population. However, the hybridization has some limitations because it appears that while the male wild buffalo is able to mate with the domestic buffalo cow, female wild buffalo can only rarely mate with a male domestic buffalo, due to significantly different body parameters, so the introduction of domestic animal genes into the wild population may not be so dramatic.



The Indian rhinoceros is out of immediate danger due to systematic protection in Kaziranga NP, and unlike its African relatives, it loves to stay in the water. Photo František Pelc



The Indian water buffalo in Kaziranga NP forms one of the last strong populations in the wild. Photo František Pelc

The vital population of Indian elephants in the park reaches about 1,300, and is a frequent cause of conflicts between wildlife and nearby farmers, whose labour-intensive agricultural crops can be significantly damaged by the elephants.

The Indian rhinoceros, along with the white rhinoceros (*Ceratotherium simum*), is one of

the largest terrestrial mammals after the elephant and its weight normally exceeds 2 tonnes. KNP has a unique position in the protection of this archaic-looking species. After all, in the last census at Kaziranga, there were about 2,400 rhinos, or about 80% of the world population. We can say that observation of this species has been practically guaranteed for





The Indian hog deer is the most common deer in the park. It is a frequent prey of the tigers. Photo František Pelc



The development of ecotourism is key to a good level of nature protection. Photo František Pelc

every ecotourist in recent years, which was not always the case.

The Bengal tiger is another treasure of Asian fauna. According to the latest official data, a

total of 2,970 individuals are found in various scattered Indian protected areas, called 'tiger reserve'. Nevertheless, the number of tigers in KNP has increased in recent decades, and now reaches around 100 individuals. Although

it is one of the largest tiger population densities, not only in India, with each tiger occupying 8 km<sup>2</sup> of parkland, ordinary tourists rarely encounter a big cat.

### Dangers from the Surroundings

The densely populated area around the National Park is covered by rice fields and tea plantations. Island-like remnants of declining forest formations only remain on the surrounding slopes. However, in times of flooding, when most of the park disappears underwater, they are a very important refuge allowing many animals to survive for several months. That is why the Assam government is trying to protect them more consistently from further destruction. Wildlife populations must migrate through populated and intensively cultivated areas, and the number of conflicts is increasing. On the road along the northern edge of the park, we saw dozens of signs confirming this fact and urging drivers to significantly reduce their speed to 20 km/h, which nobody adhered to while we were watching.

### Overall Impressions

Kaziranga National Park is faced with many problems related to the surrounding dense population, intensive agriculture and poaching. Despite this, thanks to roughly 600 professional rangers, the park is managing to cope admirably. This is also due to the employment of a further 2,000–3,000 local people in ecotourism. Kaziranga NP is the destination of about 50,000 tourists annually, of which less than a tenth come from abroad, and many spend several days here. Rangers are armed and use an uncompromising approach against poachers.

What message can be found for nature and landscape protection in the Czech Republic? Although each comparison requires some simplification, following the way our hunters and farmers deal with the return of a few dozen wolves to our country, the wilderness co-existence model between Kaziranga NP and the neighborhood in densely populated and poor India can be of inspiration. The existence, care and development of the environment in Kaziranga NP are undoubtedly among the successes of not only Indian nature conservation; which is not such a common thing at present.



## 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 26 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 2019 Issues

## On Nature in the Czech Republic

### Rydlo J.: Contribution to the Knowledge of Water and Wetland Plants in the Lužické hory/Lusatian Mts. Protected Landscape Area Western Part

Water and wetland plants are very important water quality biological indicator. From a point view of water plants, many areas have not been well studied and a lot of water plants have become extinct or have been declining, particularly due to changes in agriculture and in water regime in the landscape. Research



carried out by the author aimed at the above plants in the Lužické hory/Lusatian Mts. Protected Area western part (northern Bohemia). Within a small area, there are a lot of water bodies, namely fishponds and pools. In total, 46 water and wetland plant species were found there, of them 11 being endangered. The area under study provides a good example of effective habitat and species management.

### Hanzal V. & Kříž K.: Discovery of the Largest Hibernaculum of the Common Pipistrelle (*Pipistrellus pipistrellus*) in the Czech Republic.

In 2010, a mass hibernaculum (a bat wintering site) situated on the right bank of the Vltava River approx. 300 meters under

the Slapy water reservoir dam, Central Bohemia (49,82232913N, 14,43661106E) was discovered. The village of Třebeňice can be found across the river, on its opposite bank. During the first check a mass wintering of the Common pipistrelle (*Pipistrellus pipistrellus*) was found, harbouring almost 4,000 individuals. In 2010–2019 number of hibernating common pipistrelles fluctuated between 2,090–4,251 specimens in the individual years. Moreover other eight bat species have been reported wintering at the site: *Myotis myotis*, *M. daubentonii*, *M. nattereri*, *M. mystacinus*, *Barbastella barbastellus*, *Nyctalus noctula*, *Vespertilio murinus* and *Plecotus auritus*. Occurrence of the cryptic Soprano pipistrelle (*Pipistrellus pygmaeus*) has since the discovery been confirmed only by detecting and netting to mistnet in front of the entrance portal during vegetation growing season.

### Härtel H.: The Albis – White River: The Labe/Elbe River as a Central European Phenomenon

The Romans called the Labe/Elbe River the Albis, the White River, probably due to extensive bright sand beaches where it at that time could freely change its flow. Nowadays, the river between Střekov and Geesthacht forms an at the pan-European scale unique continuum more than 600 kilometres long where the Elbe has not been dammed by any weirs.

In the Czech Republic, the stretch is only 40 kilometres: moreover its natural and landscape values are even greater. The Labe/Elbe flows through the České středohoří/Central Bohemian Uplands, also known as the Bohemian Mittelgebirge Hills and the Labské pískovce/

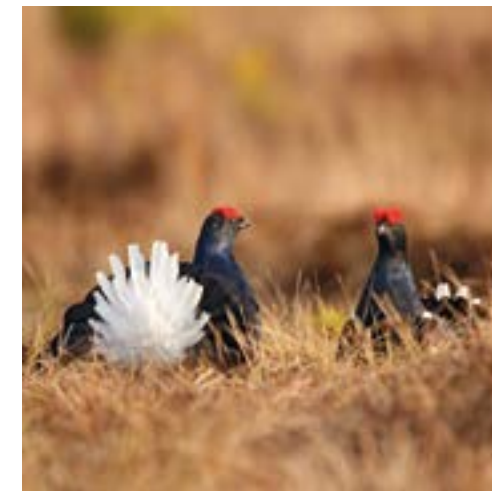


Elbe Sandstones rocks creating a spectacular scene for the canyon-like Labe/Elbe River Valley. The whole stretch between Střekov and Geesthacht is almost continuously covered by Sites of European Importance (pursuant to Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection, as amended later, the term for Site of Community Importance, SCI under the European Union's Habitats Directive). In addition, there are many Bird Areas (pursuant to the above act, the term for Special Protection Areas, SPAs under the EU Birds Directive) and in Germany, floodplain forests are also protected. The fact that on the Czech side there is a relatively short close-to-nature river does not decrease its values. On the contrary, our responsibility for its protection and conservation optimally implemented in close Czech-German cooperation is even greater.

### Flousek J.: Will the Krkonoše/Giant Mts. Black Grouse Survive the year 2040?

In the Czech Republic, there probably is no more threatened species than the Black Grouse (*Tetrao tetrix*). Its populations are small there and the nearest more numer-

ous ones can be found in the Alps, eastern Poland, Scandinavia or Belarus, at least hundreds of kilometres away: the birds are not able to overcome such distances. Based on the outputs of surveys, 80% of black grouse have disappeared from the Czech Republic during the last 40 years. The main driver of the decline is suitable habitat loss and landscape fragmentation (e.g., Patthey *et al.* 2012, Geary *et al.* 2015). Thus, relatively untouched habitats above the treeline in the Krkonoše/Giant Mts. are of the utmost importance. Other



threats to black grouse include disturbance by humans or building invisible barriers, e.g. chairlift or funicular cables or tree seedling fencings. It seems that otherwise favourable conditions for black grouse are beaten by visitors' high numbers in the Krkonoše/Giant Mts. and the Black grouse population has continually been declining there. There are only about ten or twenty years to try to reverse the unfavourable trend in the Black grouse population and to maintain the remarkable birds in sufficient numbers in the Krkonoše/Giant Mts., Jizerské hory/Jizera Mts. or in the Czech Republic as a whole.

### Moravec J.: Spaces for Nature

In the Czech Republic, there are a lot of sites where specially protected wild animal, plant and fungal species occur, valuable natural or semi-natural habitats have been well preserved or are from a point of view of nature conservation in another way remarkable, but from various reasons they have not become a part of the small-size Specially Protected



Areas network, *inter alia*, because the State is not able to officially conserve or protect everything. Thus, there has been a key role of owners, particularly non-profit organizations specialized in seeking for and conserving such sites, most often land trusts. Within the campaign A Place for Nature, from a point of view of nature conservation valuable lands have been purchased to be owned by the Czech Union for Nature Conservation and are managed by local land trusts. During 16 years, almost 150 hectares have been purchased. The article presents some examples of the above activities.

### Štefka L.: The Oldest and the Youngest Protected Landscape Area in Moravia

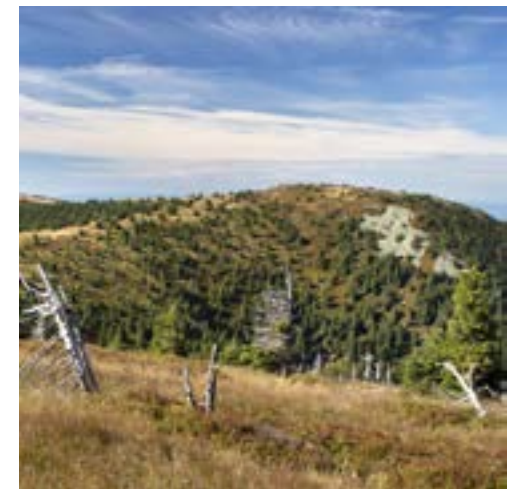
At high midnight on March 31, 2019, the Moravský kras/Moravian Karst changed from the oldest Protected Landscape Area (PLA) in Moravia into the youngest one, according to the date when the respective piece of law was



issued. Just at the above time, Government of the Czech Republic's Order No. 83/2019 Gazette on Re-establishing the Moravský kras/Moravian Karts PLA came into force. There were some reasons for that step. Because the PLA's border had not been unambiguously delineated, it had to be more precise. The previous PLA's delineation into three zones according to their conservation, management respectively shifted into four zones and the Zone I, the strictest one, currently covers 18% of the total PLA's area and includes not only small-size Specially Protected Areas, but also land above caves there. Research has showed that management on the surface above caves significantly influences the environment in the caves, particularly water quality. As a result of the procedure, the Moravský Kras/Moravia Karts has been better conserved and the legislation reflects the current knowledge.

### Slezák V., Štencel R. & Havira M.: A Half of Century for the Jeseníky Mts. Protected Landscape Area or the Jeseníky Mts. Metamorphoses

In 2019, the Jeseníky Mts. Protected Landscape Area (PLA) situated in northern Moravia has been celebrating 50 years since its establishment. During that time, its nature and the landscape as well as human's attitude to both



of them has been changed. In the subalpine zone, there have been a lot of changes, not all of them being positive. On Mt. Praděd summit, a broadcast transmitter tower and a wide asphalt road were built, the area without trees on Mt. Dlouhé stráně/Long Slopes peak was de-



stroyed by building a pumped-storage plant. Even in the early 1970s, the Dwarf mountain pine (*Pinus mugo*) was planted there, most of species-rich grasslands had been replaced by uniform growths with a few prevailing grass species only, having been overgrown by the expanding European blueberry (*Vaccinium myrtillus*). At present, active management has again been applied in the PLA aiming at returning the demised species: some areas are grazed and mown and dwarf mountain pines are eradicated there.

By the 1990s, forests had been managed in a planting, management and cutover cycle. Later more attention was paid to coppice management, stressing maximum use of natural regeneration. Thus, the high proportion of extensive Norway spruce (*Picea abies*) plantations has currently been displaying a mixture of the European beech (*Fagus sylvatica*) and the Norway spruce in understorey. Nature in the Jeseníky Mts. has also been changing due to climate and humans have to reasonably respond to the processes there.

#### Koudelka M.: Seventy years since the Hlinité jeskyně/Clayish Caves Discovery

The Hlinité jeskyně/Clayish Caves are the most continuous part of the lower, so-called medium level of the Javoříčko Caves (Central Moravia). Contrary to the upper corridor level, i.e. the Javoříčko Caves themselves and later discovered Jeskyně míru/Peace Caves, less attention has been paid to them. The horizontal corridor level is located about 25 meters below the extensive spaces ornamented by



stalagmites and stalactites, partially being a show cave. The Hlinité jeskyně/Clayish Caves were discovered just 70 years ago and they have rather been overlooked, namely because their difficult accessibility. Probably that is why they have providing some wild animals with suitable habitats. The Javoříčko Caves is a significant bat wintering site (hibernaculum), hosting the most numerous population of the Lesser horseshoe bat (*Rhinolophus hipposideros*) in the Czech Republic. In the Hlinité jeskyně/Clayish Caves the wintering bats have regularly been monitored since 1994. During that time, ten bat species have in total been found there and their numbers have been increasing.

#### Zajíček P.: The Sloup-Šošůvka Caves, a unique natural and cultural phenomenon

Parts of an underground karst labyrinth near the Sloup pilgrimage site in the Moravský Kras/Moravian Karst (South Moravia) have been known since time immemorial. They were a refuge for Pleistocene animals and a



site inhabited by the prehistoric man. Since the 17<sup>th</sup> century, the caves created by an underground stream of the Sloup Brook have become a subject of interests of scientists and researchers. At present, they are the longest show cave in the Czech Republic, the longest visitor path reaching 1,760 meters. At the same time, they are a part of the most extensive cave system in the country. The Sloup-Šošůvka Caves are open to the public year-round except Mondays outside the main season and some selected days. Short and

long visitor paths are accessible from March to November. In December to February, only the Šošůvka part can be visited by tourists because the Sloup part is closed due to bat hibernating there: the tour is possible only with torches. Moreover, the adventure path is open all year round in relation to the water level.

#### Dedek P.: Field Roads – Biodiversity Enclaves within an Agricultural Desert as Demonstrated by the Pálava/Pavlov Hills Protected Landscape Area

Industrialized agriculture impacts on biological diversity and landscape health has at present been debated, particularly in relation to droughts and generally to ability of the landscape to retain such a little moisture that has recently been provided by nature. Un-



paved dirt field roads are a habitat as well a movement corridor and their importance has permanently been increasing in current transformed farmland. The role of the landscape element in maintaining at least remnants of biological diversity is crucial, not only for “weeds”, bees, weevils (*Curculionidae*) and blister beetles (*Meloidae*). A healthy field road is full of small predatory ground beetles (*Carabidae*), wolf spiders (*Lycosidae*), darkling beetles (*Tenebrionidae*), tiger beetles (*Cicindelidae*) and hundreds of other invertebrate species. Moreover, there have been efforts to change field roads into paved ones, most often by asphaltting the former, usually due to various perverse subsidies. Because the subsidies, a new asphalt is seemingly free of charge, but its future maintenance shall definitely not be

free of charge. In addition to industrialized agriculture, such a trend can become an undertaker of heterogeneity, diversity and health in the landscape in the Czech Republic.

#### Kaděra M.: Ground Beetles of the Genus Calosoma in Woody Plant Protection

Finding a local butterfly pest plague in a woody plant growth within a specially protected area, nature conservationists are sometimes quite surprised. They often consider that there is no possibility to save the trees damaged. Moreover, nature is not so powerless. In addition to many hymenopterans and dipterans, there also are beautiful carabid beetles – ground beetles of the genus *Calosoma*, being also referred to as caterpillar hunters.



Although ground beetles of the genus *Calosoma* do not eradicate a significant proportion of biological defoliants, these are biological controllers importantly contributing to pest population density decline. Unfortunately, they dramatically suffer from old-fashioned insecticide applications. This is probably why that even if some butterfly pest appears somewhere in enormous numbers, there are no calosoman ground beetles, although they inhabited the respective area in huge numbers a short time ago – they have become extinct due to insecticides.

#### Červenková Z., Vejrová H. & Fišer B.: Occurrence of Species Important for Nature Conservation in the Brdy Hills Protected Landscape Area. Outputs of Recent Monitoring within the Area

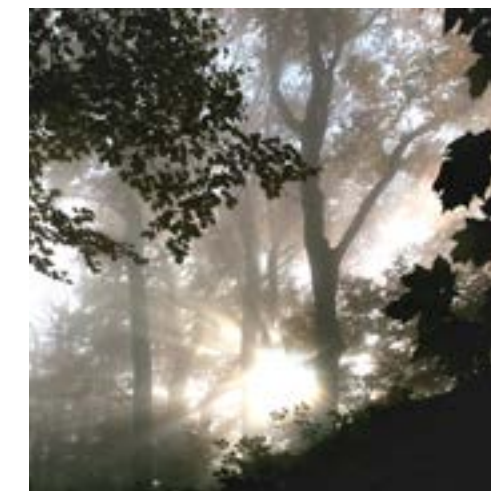


The mysterious, inhospitable and prohibited landscape – these are attributes to the most recent Protected Landscape Area in the Czech Republic – the Brdy Hills. The area neither become a biodiversity hot-spot due to species richness there. At the same time, comparison between the current and past state is often impossible because there has been a lack of inventories, surveys and research, particularly on animals. Thus, considering changes and trends occurring there might be reasonable in plants. Resulting from man-made drainage and transformation of original forests into Norway spruce monocultures/plantations, the former marshes have disappeared from most of the area and lichens communities significantly declined in species numbers have only slowly been becoming back. Thus, species preferring peat waterlogged forests, e.g. the Lesser twayblade (*Listera cordata*), Early coralroot (*Corallorhiza trifida*), Creeping lady's-tresses (*Goodyera repens*) or others reported from the beginning of the 20<sup>th</sup> century, have disappeared. Moreover, a real nature treasure can be found there, e.g. the One-flowered wintergreen (*Moneses uniflora*), Slender St. John's-wort (*Hypericum pulchrum*) or the Narrow-leaved helleborine (*Cephalanthera longifolia*). Recent breeding of the Eurasian three-toed woodpecker (*Picoides tridactylus*) as well as high numbers in the Eurasian pygmy owl (*Glaucidium passerinum*) and Tengmalm's Owl (*Aegolius funereus*), also known as the Boreal Owl, also provide reasons for optimism. Non-forested habitats within the military training area support occurrence of crustaceans, namely the *Branchipus schaefferi* and the Tadpole shrimp (*Triops cancriformis*); the Yellow-bellied toad (*Bombina variegata*) lives there, too.

#### Nature & Landscape Management

#### Jetenská E., Kopecký A. & Lustyk P.: The Rohová Site – a New National Nature Reserve on the Bohemian-Moravian Boundary

The Rohová National Nature Reserve (NNR) located in the District of Svitavy (the Pardubice Region) was declared on January 1, 2019. It is a part of the Hřebečovský hřbet Range Site of European Importance (pursuant to Act No. 114/1992 Gazette on the Nature Conservation and Landscape Protection, as amended later, the term for Site of Community Importance, SCI under the European Union's Habitats Directive). Unique conditions formed by geomorphological, geological and climatic processes support the occurrence of



rare and remarkable organisms with highly different habitat requirements there. A cyclic open treeless vegetation area on the steepest slopes really is an extraordinary habitat: the fact has been evidenced by a joint occurrence of the critically endangered False baneberry (*Cimicifuga europaea*) together with the Rock ragwort (*Senecio rupestris*), the latter was until recently considered as vanished in the Czech Republic. The NNR is dominated by species-rich beech forest vegetation and virgin-like scree forests. Continual forest development is supported by occurrence of many important invertebrate as well as vertebrate indicator species. The management in the Rohová NNR aims at leaving natural ecosystems left to spontaneous development and at maintaining their natural state.



### Růžička M.: The Louky u Přelouče Site of European Importance

The Louky u Přelouče site (eastern Bohemia) has not been included into the National List of Sites of European Importance (pursuant to Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection, as amended later, the term for Site of Community Importance, SCI



under the European Union's Habitats Directive), but it displays a long and possibly hopeful history. Among nature conservationists, there is an expert/technical agreement that the site should be listed in the above document, but up to now it was blocked by an interest to make the adjacent Labe/Elbe River stretch navigable. Moreover, there has been a development and thanks to rational co-operation among all the stakeholders, the solution has been found. Nature conservation targets are the Dusky large blue (*Phengaris nausithous*, formerly *Maculinea nausithous*) and the Scarce large blue (*Phengaris teleius*, formerly *Maculinea teleius*) there. A newly elaborated proposal consists of 19 individual sites and at present conservation of some of them by declaring a Specially Protected Area, namely Natural Monument there, has been considered. Only such a broad proposal can guarantee a long-term survival of both the butterfly species in the landscape there.

### Havel P.: Has a Feasibility Study on the Dunaj/Danube-Odra/Oder-Labe/Elbe Water Canal Really Been Elaborated?

Preparation of big infrastructure buildings has for a long time been criticized as being

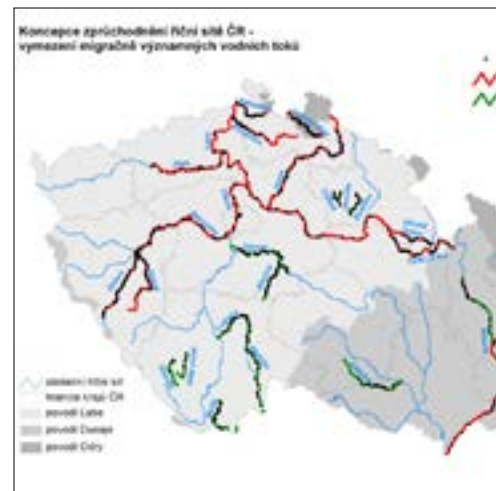
time-consuming and non-effective. For large buildings, a feasibility study is a valuable tool aiming at in addition to evaluating technological aspects of building the infrastructure also at complete assessing a project's feasibility taking into account all other interests pro-



tected by legal regulations and international conventions. It unfortunately has not happened when elaborating a feasibility study on intention to build the Dunaj/Danube-Oder/Odra-Labe/Elbe Canal *inter alia* because it fundamentally leaves out environmental risks. Although the risks were found to be serious, without possibility to be compensated, they have not been taken into account in the study's outputs. After analysing the outputs of inter-ministerial comment procedure, the opinion of the Government of the Czech Republic on the study will be crucial. Nevertheless, it has at present been unknown yet.

### Vogl Z.: Updating the Strategy on Providing Watercourse Network with Permeability in the Czech Republic

In 2019, the second updating the Strategy on Providing Watercourse Network with Permeability in the Czech Republic, an important background document in water planning, shall be finished. At present, the Nature Conservation Agency of the Czech Republic has been developing a proposal delineating watercourses primarily intended for providing them with permeability for wildlife migration and at the same time taking into account species and territorial protection. That is why the total length of corridors will increase



compared to the current state: they will be preferred during subvention/subsidy distribution. The updated strategy aims at effective and systematic implementation of measures for maintaining watercourses permeable for fish and other water animals, particularly on watercourses of national and international importance.

### Hubený P., Starý M. & Čížková P.: Where Is the Šumava/Bohemian Forest Mts. National Park Going?

The 2017 amendment to Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection provided the Šumava/Bohemian Forest Mts. National Park (NP) with



real revolutionary changes. Separating nature management carried out according to the respective nature conservation zones from attendance control followed by establishing areas of tranquillity has been quite

unusual and new. Areas without human interventions which can be freely visited are being established as well as managed areas with the limited time period for visiting by tourists, e.g. historical Black Grouse (*Tetrao tetrix*) leks (common display areas) on mown meadows. The changes in nature conservation measures are moving the NP to West Europe where such approach has been quite common. In practice, the approach to nature has been streamlining both on the Czech and Bavarian side of the mountains and both national parks in the Šumava/Bohemian Forest Mts. and the Bayerischer Wald/Bavarian Forest Mts. have begun to speak a common language.

### Křivan V.: The Chaloupky Land Trust – More than Ten Years of Nature Protection, Conservation and Management

The Chaloupky Land Trust similarly to many other land trusts across the whole Czech Republic has been involved in natural heritage protection, conservation and management. In south-eastern part of the Českomoravská vysočina/Bohemian-Moravian Highlands, it ma-



nages dozens of from a point of view of nature conservation valuable sites. The land trust's activity combines traditional landscape management techniques, e.g. grazing or mowing meadows, with current nature conservation principles. The Chaloupky Land Trust operates on the border among three regions (Vysočina, South Bohemia, South Moravia) and it particularly aims at management of old pastures and preserved meadows. The article deals

with the association's activities from a point of view of its financing as well as of nature conservation, research and data gathering in the field.

### Chlapek J. & Servus M.: The Rejvíz National Nature Reserve in the Heat of the European Spruce Bark Beetle Outbreak – Training for Advanced in Nature Conservation

Nature in the Rejvíz National Nature Reserve (the Jeseníky Mts. Protected Landscape Area, northern Moravia) consists of a broad range of peat-bog habitats related to water, water-logged spruce growths and spring alder stands; rare bird species nest there. In addition, remarkable plant species occur at the site, e.g. only recently described Averyanov's



heath spotted orchid (*Dactylorhiza maculata* subsp. *averyanovii*). Moreover, cultural spruce stands penetrated from the vicinity there. In relation to the recent European spruce bark beetle (*Ips typographus*) outbreaks affecting a large part of the Czech Republic's territory, uprooted and broken tree stand management has been a serious issue there. Possible application of the Vaztak biocide has been debated, because the chemical substance had until recently been applied there and its use was blocked by environmental NGOs. For the further development, it is crucial whether the beetle spreading will be prevented by forest owner in the Rejvíz's vicinity as well as whether overpopulated deer will be controlled because the hoofed game affects forest habitats even more than the European spruce bark beetle.



### Lisal K. & Čížmár M.: Kozmice Bird Meadows – A Private Nature Conservation Initiative

The Kozmice meadows are located in the Moravian-Silesian region: they are one of the last extensive floodplain meadow remnants which contrary to other part of the originally important floodplain ecosystem in the Opava River floodplain have not become arable land. Moreover, the unique area had been reclaimed in the 1960s to 1980s and it was damaged by unfriendly agriculture. Thus, the watercourse was straightened out and a dense network of reclamation canals and conduit pipelines was built. In addition, herbicides were applied there. The article describes an initiative implemented by persons who have not resigned to the unfavourable state. Under the auspices of the Semic private company and with its financial support, they purchase lands to establish an area owned by them as large as possible. The project's first two phases was supported also by the State Environmental Fund of the Czech Republic and the third one has been under preparation. A wetland complex has step by step been establishing at the site harbouring a huge range of wildlife species, particularly birds.

### Mayerová H.: The Brdy Hills Protected Landscape Area – Wilderness Management

Each Protected Landscape Area (PLA) displays its specific features, determining management there. The Brdy Hills PLA, declared almost four years ago, is located by its two-thirds on a former military training area. The PLA is totally situated in the central and southern Brdy Hills, i.e. on an island of mountain character in the middle of Bohemia. The above factors have to be



taken into account when identifying priorities in landscape management there. The Brdy Hills are almost entirely covered by forests, there are only islands without forest growths and with farmland on their margins. On the other hand, due to its geological substrate and elevation, they are nutrient-poor, cold and wet. The



whole PLA's area is only minimally inhabited by humans, at least in comparison with the other common landscape. Thus, nature conservation aims particularly at habitats without forests, forests and water sites/areas there. The above approach is usual also in other areas where management of many specially protected wild species populations is a key priority. Nevertheless, nature conservation measures are targeted particularly at landscape as a whole and various habitats occurring in the Brdy Hills PLA.

#### **Jarošek R.: The Comprehensive Land Replotting/Land Consolidation Schemes from a point of view of Nature Conservation and Landscape Protection – Experience from some Nature Conservation Agency of the Czech Republic's Regional Branches**

The comprehensive land replotting/land consolidation schemes, also called reparcelling, is an ambitious project of the Czech Republic: moreover, it has recently not been providing expected benefits for improving landscape functions from a point of view of the hydrological cycle, soil erosion and biological diversity. A key factor in farmland is its heterogeneity necessary for its general health and providing long-term economic contribution, expressed by wild animal and plant species abundance



and richness, ability to manage water and its aesthetical values the latter having been overlooked due to its subjectivity. At present, there are enormous agricultural land units in the Czech Republic, but a thumb miniature sketch of various landscape structures should be a real value to be further maintained and restored. Unfortunately, the comprehensive land replotting/land consolidation schemes have not been very successful in this respect.

#### **Ohryzek J.: Saving Mat-grass Grasslands or Shall We Overgraze the Beskydy/Beskids Mts. without Sheep?**

The LIFE project helped to manage 50 hectares of meadows covered by the EU Habitats Directive habitat type No. T2.3B, being one of the reasons to establish the Beskydy/Beskids Mts. Site of European Importance (pursuant to Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection, as amended later, the term for Site of Community Importance, SCI under the European Union's Habitats Directive). The priority habitats No. 6230 often occur in mountain areas on oligotrophic soils: therefore, they are among the first communities abandoned by owners. The LIFE project aimed reviewing the state of the priority habitat, but also at seeking for the most suitable management measure to be implemented within five years. In the course of the project, the target management has improved the habitat type at many sites and has maintained biodiversity centres in the landscape important as stepping stones for many rare butterfly species. After four years of the management, the critically endangered Large blue (*Phengaris ario*) appeared at the

sites. Reviewing the habitat type No. T2.3B in the Beskydy/Beskids Mts. concluded that



50% of the T2.3B natural habitat type in the highest quality disappeared while its area in the category "degraded" to "severely degraded", increased by 90% during the 8 to 17 last years. Due to high forest coverage in the Beskydy/Beskids Mts. more attention should also be paid to non-forested habitats there. The project would result in elaborating a management plan for mat-grass grasslands including a more detailed analysis of difficulties and their solutions, also proposing optimal and alternative management measures applicable within the natural habitat type.

#### **Komárek J. & Martin V.: Unmanned Aerial Vehicles in Environmental Practice: Undoubtedly Effective Tools for Gathering Data on Nature, but Are Their Users Realistic in their Demands?**

Unmanned aerial vehicles (UAVs), commonly known as drones, have becoming more and more popular in monitoring and assessing the landscape, both in environmental research and among commercial subjects. They display high flexibility, better availability and decreasing price. Both UAVs with more top sensors with weight more than 10 kilograms and those able to take off from a hand cam be used. It depends on the respective aim of the flight and the target application. Moreover, even the tools of weight only a few hundreds of grams are able to gather full-fledged data to be applied in real practice. In addition, since flight time becoming significantly longer, data



can be gathered across dozens or hundreds of hectares. Despite many pros, use of UAVs in environmental practice is often influenced by inadvertent decisions made by their users, submitters of the respective tasks respectively. UAVs are undoubtedly a step forward, particularly regarding their time resolution - flexible usage, possibility to repeat imaging according to the need and additive generating height models outside the mosaic. Nevertheless, it is necessary to critically assess which details has been still reasonable for our application and whether it would be more advantageous to use an airplane or to buy a satellite image.

#### **Pešout P., Šíma J. & Stuchlíková L.: Veteranization, Pollarding and Girdling of Trees vs. their Protection. On the Selected Issues on Protected Area Management in Practice II.**

In addition to climate changes impacts, there have been rapid land-use changes caused by humans. Even a hundred years ago, when



a third of population living in what is now the Czech Republic was employed in agriculture and forestry and the average size of an agriculture farm did not reach 5 hectares, the landscape was used in many ways more intensive, but such an approach was implemented in the more patchy landscape. At present, the landscape is managed by ten times less people, industrialized agricultural production is carried out on extensive unified land plots, both management of economically marginal sites/area and traditional agricultural human-labour consuming management ways have been abandoned. Thus, the article deals with necessity to specially manage woody plants growing outside forests, because of other species and ecosystem conservation. The authors conclude that it is necessary to respond to the current state of the landscape and land use, climate change impacts, new challenges and fresh knowledge. Veteranization, pollarding and girdling of trees or tree ring-barking are discussed as the appropriate manners. Communication and education on necessity to leave breakings and other defects not threatening woody plant health without a care.

### **Nature Conservation Legislation**

#### **Havelková S.: Two Notes on the Offence Act**

After a year and a half when the Offence Act had come into force, the piece of legislation was amended aiming at simplifying regulations on dealing with offences on the spot pursuant to Article 91 of the Act. Pursuant to the Act's original text, Public Administration authority could impose a penalty of admonishment or a fine on the spot during the offence procedure itself. The fine is imposed by the ticket, but the Act did not set the rules of imposing the admonishment: thus, the procedure was inferred only by interpretation of the text. Writing an order on imposing the admonishment on the spot was too demanding from a point of view of bureaucracy. The Act's application in practice also required legal setting a possibility to deal with less serious offences on the spot by informal reproof. After changing the Act, it is possible only to impose a fine using the ticket if the offence cannot be handled by the informal reproof. The amendment particularly facilitates work of the Nature Guard



members. The article also highlights that Public Administration authorities are obliged to prepare and to submit to the Ministry of the Environment of the Czech Republic (MoE CR) data which are consequently included into compulsorily publicly accessible list of offences. The respective authorities shall follow guidelines available on the MoE CR's web pages.

#### **Jelínková J.: New Building Act Draft Law or Revocation of the State Nature Conservancy Authority Competence or Power**

In early February 2019, an act draft or white paper of the Building Act developed *de facto* by the Czech Chamber of Commerce was submitted to inter-ministerial comment procedure. In the fact this is not "only" intention to change public building legislation, but it aims at preferring "quick" issuing permits for building to protection of all public interests which can be influenced during building activities, including interest on nature conservation and landscape protection. It is no exaggeration to say that the attempt intends to reduce competence or power of the State Nature Conservancy authorities. The Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection, as amended later, would be invalid in building intentions.

#### **Svoboda P., Pašek O. & Kříž K.: The Truth on Participation of the Public in Administrative Procedures**

In the Czech Republic's legislation, there has been a trend to reduce rights of civil society associations to participate in admi-

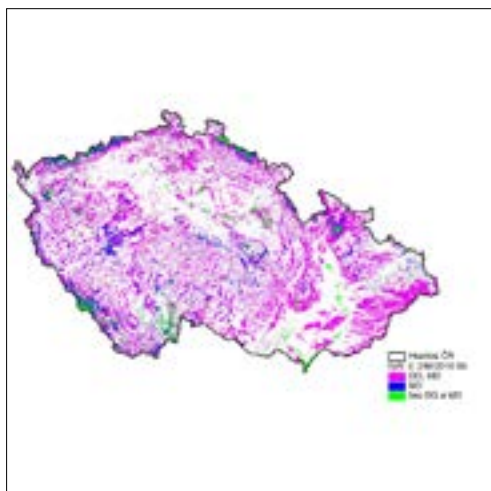




nistrative procedures dealing with nature conservation or with environmental protection. The trend aims at acceleration of development but it is not well elaborated and its target is to possessive the legislation process by business. The trend has four phases. The two have passed and two have been under preparation. At the end of the process associations shall be allowed to participate only in a low number of the biggest building intentions under the Environmental Impact Assessment (EIA) procedure, in addition under very strict conditions. The article presents the most important aspects of the issue, showing what has happened and what is intended and what is no doubt a dismantling of democratic public administration decision-making in environmental issues after 1989.

#### **Dort M. & Kolibáč P.: New Decree on Forests**

On January 1, 2019 new Decree No. 298/2018 Gazette on Elaborating Regional Forest De-



velopment Plans (RFDP) and on Delineation of Management Sets of Forest Types came into force, replacing Decree No. 83/1996 Gazette. There are no substantial changes in the articulated version arranged according to sections. In Article 3, the RFDP context is made more precise. In the framework of Management Types (MT) also a selective MT is again given, but no other recommendations on it are available now there. In Article 4, a typology system is mentioned and in Articles 5, Articles 6 respectively ways of and updating land parcel classification into the system are presented. Article 7 aims at delineation of Management Sets of Forest Types (MSFT) while Paragraph 4 newly provides possibility to delineate MSFT characterized by different habitat/stand conditions or different growth types during development of Forest Management Plans and Forest Management Guidelines. Pursuant to Paragraph 5, for the National Park's territory, MSFT delineation is based on National Park management principles. The article reviews the new decree and concludes that it can significantly contribute to improving tree species composition under current climate change and to forming diversified and long-term sustainable tree species composition in the Czech Republic. Regrettably, expectations of the State Nature Conservancy have been only partially met.

#### **Jelínková J.: Permitting Woody Plant Felling in Relation to the Purpose of Dispossession Set out by a Special Law**

On April 1, 2019, an amendment to Decree No. 189/2013 Gazette on Woody Plant Protection and Permitting Felling came into force. The amendment responds to amendment to Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection, carried out by the so-called Great Amendment to Act No. 183/2006 Gazette on Urban and Territorial Planning and Building Code (the Building Act) on January 1, 2018. It set out that an application for issuing a binding opinion of the State Nature Conservation authority on felling woody plants for building purposes located by planning permission permitted in the planning permission proceedings has to have the same properties as those required into an application for issuing a permit to fell woody plants in the administration procedure.

Further, the Decree enhanced that for the both application types, *i.e.* for issuing a decision on woody plant permitting as well as for issuing a binding opinion for woody plant felling pursuant to Article 8, paragraph 6 of the above act, it is not necessary for an applicant to substantiate the property right on a parcel/plot or other user relation or an agreement from the parcel/plot owner, if woody plant felling has to be implemented in relation to the purpose of dispossession set out by a special law.

The article also deals with the issue which legal regulations the purpose of dispossession is defined in and it proposes a practical procedure for the State Nature Conservancy authorities, if the property right on a parcel/plot with woody plants or the agreement from the parcel/plot owner is not substantiated. In the end, the author highlights that felling woody plants can be carried out only after the applicant (the investor) has got private-law relation (particularly ownership) on the respective parcel/plot.

#### **Havelková S.: Restriction and Prohibition of Some Activities by Measures of General Nature**

Preventing damages caused to some parts of nature by humans is suitable. Therefore, Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection, as amended later, gives capacity to State Nature Conservancy authorities to control human activities possibly threatening nature by setting conditions or to prohibit them. In addition to general restriction or prohibition of such activities included in Article 66 of the Act, the legislator set out some specific provisions, *e.g.* possibility to set out conditions for activities towards wild plant and animal species and their populations during their general protection (Article 5, paragraph 1), possibility to limit or to prohibit public access to Specially Protected Areas (Article 64) or possibility to limit use a site/area declared a temporarily protected area (Article 13, paragraph 1).

#### **Jačka P., Sikora J. & Sychrová V.: Effects of Fireworks on Birds**

Fireworks give mixed feelings among the society in the Czech Republic. A part of the population considers fireworks to be a strik-



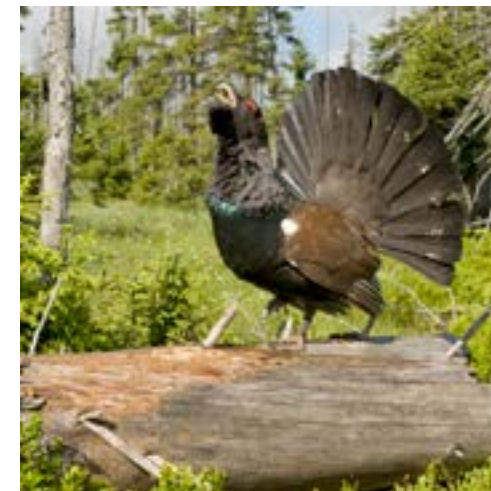
ing entertainment, the other from various individual reasons see them as a negative issue. The article is a result of urgent necessity to assess impacts of fireworks on wild birds from a point of view of their bionomics and to put the issue into the legislative framework of Act No. 114/Gazette on Nature Conservation and Landscape Protection, as amended later. The authors conclude that due to evident negative effects of fireworks on animals, namely birds, it is suitable to reduce fireworks displays at the national level. One of the first steps to be taken would be total prohibition of fireworks pyrotechnics having an acoustic effect followed by measures to reduce fireworks, *e.g.* reducing time for sales of the pyrotechnics, setting a short period where it can be used or replacement of fireworks by less disturbing alternatives, *e.g.* by videomapping.

#### **Research, Surveys and Data Management**

#### **Bečka P. & Rösner S.: The Western Capercaillie without Borders**

In the interwar years (1918-1938) the Western capercaillies (*Tetrao urogallus*) had inhabited most of forests in the Czech mountains along the borders. Then its numbers began to decline mainly due to the suitable habitat loss and increased stress caused by various human activities. The last population in the Czech Republic has survived in the Šumava/Bohemian Forest Mts. The administrations of the Šumava/Bohemian Forest and Bavarian Forest National Parks cooperate in research on and conservation of the shared capercaillie population. Joint monitoring with DNA analysis from

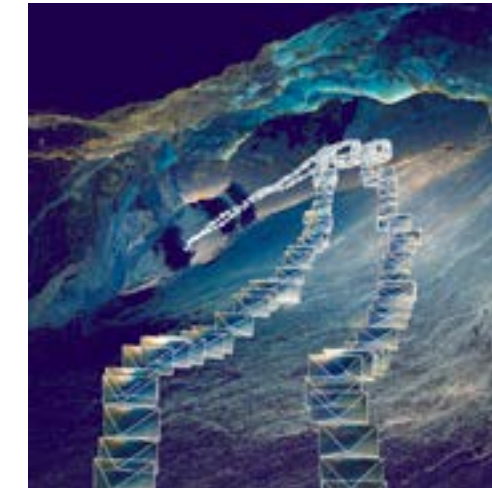
droppings showed that in the past ten years the population has slightly increased, from 556 individuals in 2009-2011 to 605 in 2016-2017: out of them, approx. a third lives outside both the National Parks. The Hurricane Kyrill and the subsequent European spruce bark



beetle (*Ips typographus*) outbreak did not have a negative effect on capercaillies. Studies evaluating disturbing influences show that capercaillies are pushed away from suitable habitats by tourism and intensive forestry activities. For effective conservation of the above iconic bird the administrations have to find a compromise between nature conservation, park forests management and tourism.

#### **Šindelář J. & Krejča F.: A New Method on Mapping Permanently Flooded Space in the Chýnov Cave National Nature Monument**

The Chýnov Cave (South Bohemia) is a morphologically very comprehensive cave system. At present, there have been 1.5 kilometres of corridors known there: approx. a quarter of them is permanently flooded. In 2017, a new method on mapping permanently flooded space had for the first time been tested there. In partnership of the Cave Administration of the Czech Republic, Czech Speleological Society and GEO-cz private company 3D scanning the flooded part of the cave using videogrammetry was successful. Even the first results confirmed the assumption of high quality of the above method how for documenting the underground space. Modesty and particularly the time needed in the field are method's strong positive patterns. During



two dives a couple of divers succeeded in mapping more than 220 meters of branched corridors with superelevation of 43 meters. Activities on detailed assessment and developing maximally accurate and precise virtual model of permanently flooded space in the Chýnov Cave have been continuing.

#### **Bejček V. & Volfová E.: Mud deposits in the Czech Republic and on the Labe/Elbe River**

In the Czech Republic, mud deposits protected as a natural habitat type under the EU Habitats Directive occur particularly on the Labe/Elbe River between the city of Ústí nad Labem and the town of Hřensko, the latter being close to the Czech-German border. Although it is a phenomenon which is the subject of nature protection, it is also threatened by planned building a weir with navigation lock, a long-term intention of the Waterways Directorate of the Czech Republic. Therefore, mud deposits have repeatedly been studied by many experts. In 2018,





the Czech University of Life Sciences Prague elaborated a comprehensive study summarizing up-to-date knowledge of muddy deposits and of the Strapwort (*Corrigiola litoralis*). It also dealt with patterns within the river continuum and evaluation of possible compensation measures. The study concluded that unfavourable impacts caused by the Děčín Weir with Navigation Lock (DWNL) cannot be compensated on the Czech Republic's territory.

**Hradecký J., Škarpich V., Galia T., Gurkovský V. & Vaverka L.: Gravel, Gravel, Gravel... (non)Rolling Stones on the Labe/Elbe River**

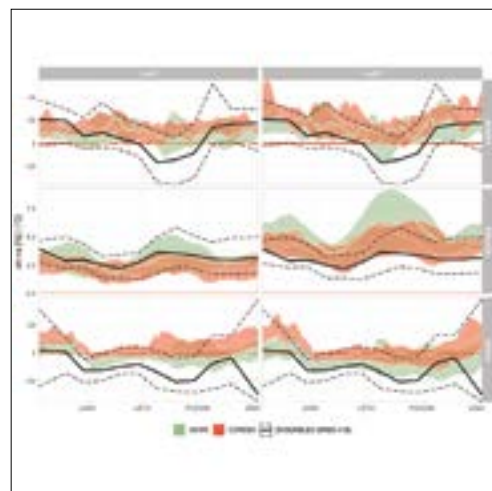
The Labe/Elbe River stretch between Střekov – the Czech-German border displays sediment deficit and their grain quality has also been affected by humans. Moreover, sediments are a key component in the fluvial system. Long-term reduction in sediment movement results in negative balance and principal influence on their distribution in a horizontal profile, thus limiting deposit creating and their dynamics. The deposits are a significant and extremely valuable habitat for many critically endangered fauna and flora species or other taxa, being a landscape phenomenon of the Labe/Elbe River Valley. The study made by the authors analysed grain size structure in Labe/Elbe River sedimentary riverbank types, their state was interpreted with respect to water management and water transport activities and their possible future development was outlined. It is clear that the existence of deposits as a significant and very specific habitat has been strongly influenced and threatened. Another driver of their loss is building new barriers, e.g. the Děčín Weir with



Navigation Lock (DWNL) which would increase further degradation in river deposits as well as risks of being lost. Therefore, on the contrary, it is necessary to deal with measures to restore sediment natural movement and distribution and to consider a comprehensive restoration also in bigger rivers.

**Hanel M., Havlíček V., Heřmanovský M. & Máca P.: Climate Change Impacts on Balance in the Labe/Elbe River Basin up to Dresden**

Climate change impacts on water regime are a key background for planning water management infrastructure as well as for water resource management itself. The article summarises results of a broader study dealing with climate change impacts on long-term water balance and minimal runoffs in some Labe/Elbe River sub-basins up to Dresden. Despite large uncertainty, it is suggested that there will possibly be stagnation or slight increase in the total runoff, decrease in minimal runoffs



and sharp decline in soil water resources. Thus, implementing climate change adaptation measures will push for water resource use intensification with the river basin. Despite projected higher precipitation the Labe/Elbe River navigability for big boats can be negatively influenced, particularly due to decrease in minimal runoffs by approx. 20%.

**Uhlíková J.: The Eurasian Beaver on the Labe/Elbe River after 23 Years**

On the Labe/Elbe River, there are two Natura 2000 sites where the Eurasian beaver

(*Castor fiber*) is the subject of protection and where negative effects of the Děčín Weir with Navigation Lock (DWNL) can be expected when it shall be built. Namely, these are Labské údolí/Elbe River Valley Site of European Importance (SEI, pursuant to Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection, as amended later, the term for Site of Community Importance, SCI under



the European Union's Habitats Directive) as well as the Porta Bohemica SEI. In connection to assessing the Water Transport Policy of the Czech Republic under Article 6 of the Habitats Directive which also includes the above DWNL, the possibility to compensate negative impacts of the planned hydraulic structure on a beaver population occurring there was also assessed. In total, building the DWNL would negatively influence six beaver territories. The negative effects were found to be compensable. The suggested compensation measures target at creating a new habitat for one beaver territory in the Porta Bohemica SEI and listing the Eurasian Beaver among the subjects of protection for the Orlice and Labe/Elbe Rivers SEI.

**Milka D.: The Bozkov Dolomite Caves— Fifty Years from making them Show Caves**

Fifty years ago, on May 2, 1969, the Bozkov Dolomite Caves were made accessible for the public. Up to now, they are the only show caves in northern part of Bohemia and the only dolomite ones in the whole Czech Republic: at the same time, they are the only caves in the country characterized by abundant silica



netted, filiform and ledge structures on walls and ceilings created by selective corrosion. The lower floor is waterlogged and water-bearing: thus, visitors can meet not only the Swan Pools, but also the most extensive underground lake in Bohemia. Although the Bozkov Dolomite caves are not big and some parts had to be enhanced by bricks or significantly deepened they perfectly fulfil their key mission: to present to visitors history, beauty and patterns of unique and vulnerable underground world there.

**Podhorný J.: Conservation Botany in the Hořepník Czech Union for Nature Conservation Local Chapter**

The Hořepník Czech Union for Nature Conservation (CUNC) Local Chapter based in the town of Prostějov deals, *inter alia*, with wildlife mapping in the field, particularly of wild plants mainly in Central and South Moravia. During fifteen years, the Hořepník Lo-



cal Chapter carried out six-year monitoring in the course of research on the Greater pasque flower (*Pulsatilla grandis*) near the town of Plumov in 2008–2013 also including grassland growth burning. In 2008–2012, volunteers also aimed at the Bee orchid (*Ophrys apifera*) populations in the vicinity of the town of Ždánice and in the Zouvalka Nature Monument where impacts of various management measures on generative reproduction in the wild vascular plant species were studied. Most of the projects were financed or co-financed by the CUNC programme entitled Biodiversity Conservation, supported by the Ministry of the Environment of the Czech Republic and the Forests of the Czech Republic, State Enterprise.

**Šaj P.: The Peregrine in the Jeseníky Mts. and Current Technologies to Protect It**

The Peregrine (*Falco peregrinus*) is among the most attractive species in the Jeseníky Mts. (northern Moravia). But it was not always the case. In the second half of the 20<sup>th</sup> century, due to then use of DDT as an insecticide in agriculture and direct persecution by pigeon



fanciers, falconers and hunters, the Peregrine had disappeared not only from the Jeseníky Mts., but also from almost all nesting sites in the Czech Republic. In the Jeseníky Mts. the Peregrine's recent breeding dated back to 2001 and since its population has been increasing both in the mountains and their vicinity. In the Jeseníky Mts. humans have been strengthening the raptor population by regularly monitoring it, reasonable enhancing nesting

sites and by protection. The Peregrine's recovery is also caused by present high nest-site and food availability. Thus, the Jeseníky Mts. and their vicinity are among the most important nesting areas for the falcon species in the Czech Republic.

**Stýblo P.N.: Registration of Wild Animals Taken into Care by the National Network of Rescue Centres and What Can Be Implied from That Statistics**

The National Network of Rescue Centres provides, in addition to thousands of saved injured, sick, exhausted or orphaned wild animals and to effective communication, education and public awareness also interesting statistical data. The central registration of all animals taken into care allows not only to monitor species and individual numbers and re-



cognize dates and sites of their findings, but also to follow their fate – causes why they had been injured or otherwise handicapped/disadvantaged, season of their taking into care, number of days spent at a rescue centre, etc. For each animal, there can be up to 57 data available. Long-term unified registration methods can be used for seeking for the trend in the issue. As the network co-ordinator, the Czech Union for Nature Conservation has gathered more than 10 million records on almost 250,000 individual animals. Moreover, the unique information source has not adequately been used for further processing. Thus, the author highlights that the National network of Rescue Centres would be a remarkable data provider for a lot of scientific studies.



### Křížek M., Uxa T. & Krause D.: Periglacial Phenomenon and its Conservation

Periglacial landforms above the alpine timberline in the High Sudetes are unique because they have been well preserved there due to the specific climatic conditions in the mountains. Some periglacial landforms (earth and peat hummocks, sorted circles, some non-sor-



ted stripes, small nivation hollows, solifluction lobes and ploughing blocks) are active, which is reflected in morphology or internal structure changes, and they represent equivalents of landforms occurring in Scandinavia or in the incomparably higher Alps. Many types of periglacial landforms in the High Sudetes are critically endangered. Thus, the State Nature Conservancy should pay more attention to them, including communication to, education of and awareness among the general public and the target groups to prevent destroying the unique and vulnerable landforms by tourists.

### Lučan R.K., Lučanová A. & Vavřík M.: The Červenohorské sedlo Mountain Pass: Historical and Recent Research Projects Focused (not only) on Bird Migration in Mountain Areas in the Czech Republic

East-west orientated mountain ranges are barriers to migrating birds and wherever possible, birds use suitable corridors, such as mountain passes, to cross them. At such sites, migrating birds are streamlined to narrow space and, consequently, high concentrations of individuals could be recorded there. It is not surprising that such sites have attracted the focus of



researchers since the beginnings of modern research. In the 1980s, the discovery of using a strong light beam to attract birds migrating at night had resulted in an elaboration of techniques enabling effective sampling of night migration using a combination of light beam and mist netting. The method was first applied in the Krkonoše/Giant Mts. and the Orlické hory/Eagle Mts. at the northern borders of the Czech Republic. After the cease of a pioneer work in both the mountain areas, a monitoring project has been launched at the Červenohorské sedlo Mountain Pass in the Jeseníky Mts. (northern Morava) in 2010, including standardization of capture techniques and elaboration of regular sampling schedule (continual day and night mist-netting lasting for three months from August 1 to the beginning of November), visual counts of daily migration and meteorological data recording. Further, the monitoring programme was supplemented by recording migration of bats and several invertebrate groups (migratory moths and howerflies Syrphidae) in later years. Since then, almost 100,000 birds of 125 species have been captured and ringed, gathering a huge amount of valuable data on origin and/or destination of captured birds, phenology and migration intensity, seasonal dynamics in bird assemblage composition, variability in biometric parameters and circadian rhythm of migratory activity in various species. Rare vagrants, including some first records for the country were recorded there, some of them even repeatedly. At least 21 bat species have been recorded, of which rare but regular occurrence of the Greater noctule (*Nyctalus lasiopterus*) suggests a possible presence of its permanent population in a broader region of the site. The project provides a unique opportunity

to study autumn migration in various wild animal groups and the value of the data gathered has been increasing each research season.

### Hustáková K., Koutecký B. & Musil Z.: Monitoring the Moravian Alpine Bells in the Macecha/Stepmother Abyss

The Moravian Alpine bells (*Cortusa matthioli* subsp. *moravica* (Podp.) Soják) is admittedly among the best known plants of the Moravský kras/Moravian Karst (South Moravia), although only few people have seen the plant with their own eyes. It occurs only in the Macocha/Stepmother Abyss, at great heights on vertical rock walls. Access to the sites of its occurrence is very difficult, even for experienced persons displaying perfect physical condition: the only way is to use a rope. In the past, a part of the Moravian Alpine bells population grew also on a talus cone on the abyss' bottom where the subspecies was for the first time described from. Nowadays, only three individuals occur there. The cave microclimate may be significantly influenced by the Punkva River flowing in rapids on the Macocha/Stepmother Abyss bottom.



Due to drought, the river was not flowing even in spring and autumn months in 2017–2018, causing a mass dieback of mosses and other plants. The fact possibly affects also the Moravian Alpine bells population. In addition to microclimate measurements, continuing monitoring will definitely provide further interesting knowledge. The data gathered will be a background for expert discussion aiming at setting activities to maintain the remarkable subspecies population at the unique site.

### Chvátal P.: 25 Years of Winter Bat Censuses in the Loupežnická jeskyně/Robbers' Cave within the České středohoří/Bohemian Mittelgebirge Protected Landscape Area

There are some dozens of neovolcanites, mostly not extensive, being long to 10 meters in the České středohoří/Bohemian Mittelgebirge Protected Landscape Area. Therefore, the Loupežnická jeskyně/Robbers' Cave near the town of Velké Březno (northern Bohemia) displaying a main corridor reaching almost 100 meters in length is extraordinary among them: the cave's total length including branches is about 130 meters: therefore, it is the longest cave in neovolcanites in the Czech Republic. Because the cave is one of the most important bat wintering



sites/hibernaculum in the České středohoří/Bohemian Mittelgebirge, it was declared as the Nature Monument (NM) in 2001. The bat monitoring has shown that bats, particularly horseshoe bats prosper in the NM and their number have been increasing there.

### Koudelka M. & Šafář J.: Bat Monitoring in the Javoříčko Karst Has Been Carried Out for 30 years

The Javoříčko Caves is one of the longest monitored chiropterological sites in the Czech Republic. The first notice on bats from "a cave near Bouzov" is dated back to the half of the 19<sup>th</sup> century. Since 1989, wintering bats have been monitored there, now along the whole underground corridor system being almost six kilometres long as well as in all known caves in the near vicinity. During the last 30 years, a lot of data on bat community species composition



and dynamics have been gathered. For knowing the real bat species richness at the site the winter census is completed by capturing the flying mammals in front of entrances into underground spaces outside the winter period.

### Nováková T., Navrátil T., Žák K. & Elznicová E.: The Litavka River Floodplain: a Unwanted Toxic Legacy

The Litavka River rises in the most recent Protected Landscape Area (PLA) in the Czech Republic, *i.e.* the Brdy Hills, flows through the Příbram region known for rich mining and industrial history, and at the town of Beroun, it runs into Berounka River. Of 56 kilometres of its total length, the stretch up to village of Lochovice displays a submontane character, while from that site the river's longitudinal gradient is reducing and the Litavka River entries into mostly canalized river bed stabilized and reinforced by concrete or big stones. In the case of the Litavka River, a floodplain, a space



created and regularly flooded by a river has been significantly influenced by human activities, particularly by contamination by lead (Pb), zinc (Zn) or cadmium (Cd). The authors propose to maintain the river bed's natural character and do not implement extensive technological interventions to avoid further contaminated sediment releases. The banks should be reinforced by big blocks of rocks complemented by stabilizing woody plants aiming at keeping as much as possible the Litavka River in the current bed. At the same time, it is important to communicate with owners and users of land plots in the floodplain.

### Chumanová E., Černý K., Havrdová L., Haňáčková Z., Strnadová V. & Zýka V.: Important Alien Invasive Pathogens of Forest Woody Plants in the Czech Republic

In their secondary distribution range, non-native pathogens of forest woody plants can cause significant damages or massive dieback of host woody plants and decline in the populations of the latter. Consequently, the process can change structure and species composition in the invaded ecosystems, disturbing their functions and generally threatening biological diversity there. The article aims at presenting to nature conservationists the most important organisms from this group living in the Czech Republic, diseases they cause on woody plants, a threat they pose on nature and the landscape



across the country and tools having been elaborated to be applied for threatened forest ecosystem management. A special attention is paid to *Hymenoscyphus fraxineus* causing ash



dieback, *Phytophthora* xalni responsible for lethal root and collar rot in alders, *Eutypella parasitica* producing a large, distinguishable canker in maple trees and *Phytophthora cinnamomi* causing root rot and collar necrosis in many host plants.

### The Nature Conservation history

#### Pešout P.: Sixty Years of the State Nature Conservancy Institution in the Czech Republic

In 2018, the events important for the Czechoslovakia/Czech Republic were celebrated. In addition, it also was the year of significant anniversaries for the State Nature Conservancy in the Czech Republic. Declaration of the oldest protected areas in the country, namely the Žofín Primeval Forest (1838) and the Boubín/Kubany Primeval Forest (1858) was reminded during The Year of Czech Primeval Forests. Moreover, the anniversary of establishing the very first expert/technical governmental nature conservation institution in 1958 has been rather neglected. Nevertheless, the event should be remembered not only because of its dedicated activities during the communist regime. At that time national heritage and nature conservati-



on had to work under difficult circumstances. Moreover, the State Institute of Care of Cultural Monuments and Nature Conservation and Care of Cultural Monuments and Nature Conservation Regional Centres staff was able to maintain a huge part of the national cultural and natural heritage. Since 1989, when significant political, economic and social changes began, readiness of the above nature conservation institutions

has significantly helped, *inter alia*, to promote robust changes in the environment and to develop current nature conservation legislation and governance in the Czech Republic.

#### Hrdinka T.: The T. G. Masaryk Water Research Institute Celebrates 100 Years

In 1919, the State Institute of Hydrology, a predecessor of the current T. G. Masaryk Water Research Institute (TGM WRI) was established by decision of the Ministerial Council. During the century, water management passed a dynamic development, big water reservoirs were built, lands were ameliorated and water management infrastructure has been improved. At present, special attention is paid to water retention in the landscape, effective water resource management and strengthening water resources not only by building water reservoirs, but also e.g. by artificial water filtration. In the last 100



years of the TGM WRI's existence, experienced experts had to many times face up to complicated decision-making in water management planning procedure. Currently, the mission and duty of this crucial institution having been in charge of directing research in water management is even much more important for promoting rationale solutions than in the past.

#### Pešout P.: Professor Jaromír Klika, a Leading Person in Nature Conservation after World War II

Professor Jaromír Klika was one of the scientists who had realized needs to protect and to conserve nature. Thus in addition to his academician, scientific and research activities, he

was personally involved in natural and landscape heritage conservation in former Czechoslovakia. Although he was among influential persons in Czechoslovak nature conservation after World War, his important contribution to the above branch of human activities has not been assessed in the Ochrana přírody/Nature Conservation Journal yet. Taking the possibility when celebrating 130 anniversary of his birth, the author wants to redress a long-term wrong. In his rich professional life, Professor



Klika was an excellent mycologist, Czechoslovak geobotany organiser, nature conservationist, landscape protectionist and a pioneer in nature conservation application in land-use/territorial planning. Therefore, Professor Klika should for many reasons be remembered.

### Focusing on the Public

#### Petáková Z.: The Czech Geological Survey in 2019 – One Hundred Year Anniversary

The article describes the Czechoslovak/Czech state geological service history and its most successful activities. The institution was established in July 1919 and since April 2002 it has been called the Czech Geological Survey (CGS). In 2012, the CGS merged other service – Geofund of the Czech Republic. The Czech Geological Survey aims at research on structure and development in the Earth's crust, biodiversity and global changes in the past, geosphere-biosphere-atmosphere interactions and on geological risks and at developing various geochemical and mineralogical techniques. Recent analysis showed that the CGS is the most successful sta-



te-funded body as well as the most successful research institution in geological sciences in the Czech Republic. In 1995, a set of geological maps 1:50,000 had been completed: thus, the Czech Republic became the first country in the world having its territory geologically and hydrologically mapped at that scale. The CGS staff has developed more than 10,000 expert opinions on various technical issues including land-use/territorial planning background documents or EIA studies. The institution has been involved in assessing mineral raw materials across the whole country. The GEOMON network consisting of 14 terrestrial monitoring plots provides valuable biogeochemistry data. As a part of the Czech Republic's ODA, the service has been supporting countries in South and Central America as well as in Africa (e.g. Ethiopia or Namibia) or Asia (Afghanistan, Iran, Mongolia). In the article, the state geological survey development in Czechoslovakia, the Czech Republic respectively is also outlined against the backdrop of the political history.

#### Ucová S., Říhová P., Šafář J. & Plesník J.: Tigers and the Czech Republic

Despite an increase in numbers officially reported by some range countries, the Tiger (*Panthera tigris*) is classified as globally Endangered (EN) by International Union for Conservation of Nature (IUCN), the main threats being poaching stimulated by illegal trade as well as habitat fragmentation, degradation and loss. Recent findings gathered during a long term investigation has showed that there is a link between the private facilities breeding tigers in captivity in the Czech Republic and illegal trade in tigers and tiger products to be exported further to southeast Asia by Vietnamese community members living in the country. The

fact has been confirmed by the increasing number of recorded seizures of tiger specimen incl. whole skeletons, teeth, claws and other tiger products in last years and also by quite low average survival age of tigers kept by private breeders (approx. 5 years) in the Czech Republic. Currently, there are 174 tigers bred in the Czech Republic, but only 44 can be found in the registered zoological gardens. Thus, the majority of tigers are kept by private breeders, circuses etc. In July 2018, customs officials, policemen and inspec-



tors from the Czech Environmental Inspectorate assisted by the State Veterinary Administration staff had seized a body of a killed tiger, four skins, tiger claws and further tiger products (bouillon cubes and tiger wine) and equipment used in the production of traditional Asian medicine made from tiger parts. Consequently a private breeder of tigers, a taxidermist and a Vietnamese trader living in the Czech Republic have been under indictment. The Czech Republic authorities have suspended issuing CITES permits for (re-)export of live captive bred tigers from the Czech Republic to third countries (outside of the EU) for commercial purposes and the rules for keeping large cats in captivity by private persons are debated by key stakeholders.

#### Zajíček P.: Neglected Set of Graphic Artworks from the Moravský kras/Moravian Karst

The Moravský kras/Moravian Karst first images had begun to be created in the 1850s. During next decades, particularly in the Romantic era, there were more and more paintings, drawings and graphic artworks. Among artists, the Mачocha/Stepmother Abyss as well as Býččí skála/



Bull Rock, Kostelík/Little Chapel and others became the most popular themes. In the late 19<sup>th</sup> century, artwork of painters and graphic artists began to be replaced by photographs. Moreover, also since that time beautiful artworks have been made in the Moravský kras/Moravian Karst, both from the surface and underground space. In 1922, a set of seven graphic artworks from the Moravský kras/Moravian Karst was produced, but it gradually sank into oblivion. The artworks were made by František Süsser (1890–1956), a painter, draftsman and graphic artist. His set of lithographs became a part of the less known quite slight publication entitled simply The Moravský kras/Moravian Karst and the article reminds readers of it.

#### Patzelt Z.: The Labe/Elbe River Canyon – An Inspiration of Romantic Painters and a European Tourism Cradle

The Labe/Elbe River Canyon is unique not only because of its natural and landscape values. At





the same time, it provides great possibilities for tourism and recreation. Although the fact has been realised a long time ago on the German side, on the Czech Republic there have been efforts to change the Labe/Elbe River into an industrial transport waterway. Moreover, history of using the landscape by tourists came back into the 19<sup>th</sup> century where one of the first European tourist associations had been established there and the area became together with the Alps a European and world tourism cradle. The fascinating landscape in the Českosaské Švýcarsko/Bohemian-Saxon Switzerland region inspired famous romantic artists. Their works and later also old postcards have currently been presenting a then natural shape of the Labe/Elbe River.

#### Adámková K.: NET4GAS Closer to Nature – a Corporate Social Responsibility for Nature

The 12-year partnership between the Czech Union for Nature Conservation and NET4GAS Company can be considered as unique. It had been launched in 2007 when the first sites were introduced within the Closer to Nature Programme aiming at awareness of from a point of view of nature conservation valuable sites among the general public. Educational trails, lookout sites, springs or wells, sites for resting, etc. These



are only a few examples of visitor infrastructure that have been built now at 92 sites across the whole Czech Republic's territory. Nevertheless, the NET4GAS Closer to Nature Programme has been becoming more diverse. During the last three years, the individual ecosystem restoration measures have also been supported by the Programme, providing remarkable outputs, too.

Therefore, the NET4GAS Closer to Nature Programme is a very good example of co-operation between a NGO and a corporation and the efforts of the NET4GAS in this field should be very much appreciated.

#### Kučera J.: Young Nature Conservationists Groups

Activities aiming at children and youth have been an important part of the Czech Union for Nature Conservation's portfolio. Its members and particularly hobby classes, organizations and schools can participate in national contests,



namely the Gold Leaf (for elementary schools) or the Environmental Olympics for high schools. Long-term permanent activities in nature conservation and landscape protection are carried out by Young Nature Conservationists Groups (YNGC). The Czech Union for Nature Conservation's local chapters have established about 65 YNGC across the whole country involving more than 1,600 children. Thus, the Union is one of the most important organisations encouraging children in nature conservation approved by the Ministry of Education, Youth and Sports of the Czech Republic.

#### Havlíček J.: The European Turtle-dove – The Bird of the Year in 2019

The Czech Society for Ornithology (CSO) has been declaring carefully selected bird species as The Bird of the Year since 1992. In 2019, the symbolic but neglected European turtle-dove (*Streptopelia turtur*) has been awarded. Some can be surprised to recognize that in addition



to the well-known Eurasian collared dove (*S. decaocto*) there is another dove species, in Czech called "wild". But it is the former which was verified by Karel Hynek Mácha, a famous poet of Czech Romanticism and which has for centuries been considered as a symbol of love. Moreover, the European turtle-dove displays other symbols that are rather sad. It is one of the birds species most rapidly disappearing from the European landscape evidencing that current landscape "management" causes an unprecedented decline in biological diversity. In addition, the bird species has been massively hunted: therefore, the turtle-dove became a face of the 2019 campaign on stopping migratory bird killing. As a response to the dramatic decline in the European turtle-dove numbers in Europe, the European Action Plan for the species has been elaborated and the Czech Republic has joined it through the Ministry of the Environment of the Czech Republic and the Nature Conservation Agency of the Czech Republic.

#### Ouhřabka V.: Karts Phenomena in the Morava River Valley in the Králický Sněžník Mts.

The Králický Sněžník Mts. is a mountain range on the border among Bohemia, Moravia and Polish Kladsko. The highest peak of the same name reaches 1,424 m a.s.l. Parts of the mountain range along both the border sides are included into Specially Protected Areas and the EU Natura 2000 network, namely the Králický Sněžník Mts. National Nature Reserve, Site of European Importance (pursuant to Act No. 114/1992 Gazette on Nature Conservation and Landscape Protection, as amended later, the term for Site of Community Importance, SCI under the European Union's Habitats Directive)

and Bird Area (pursuant to the above act, the term for Special Protection Area, SPA under the EU Birds Directive) on the Czech side, Śnieżnicki Park Krajobrazowy, rezerwat przyrody Śnieżnik Kłodzki and Jaskinia Niedźwiedzia on the Polish one respectively. In the Morava River valley eight caves were discovered, totalling length of approx. 400 metres, the Tvarožné díry Caves (245 metres) and the Patzelt's Cave being of the greatest importance. On the Polish side in the Klešnice River valley, there is the Medvědí jeskyně/Bear Cave show cave, reaching more than 4.5 kilometres in length. In addition, there are a lot of active swallows of karst waters and more than 20 karst water springs: the most important



among the latter, the Mléčný pramen/Milk Spring can reach maximum yield of 100 litres of water per second. Long-term hydrological monitoring and international speleological surveys have confirmed, that the Králický Sněžník Mts. geological structure and related karst phenomena allow not only communication between karst water swallows and springs within the individual karst bodies, but also water exchange between Klešnica River in the Baltic Sea drainage basin and the Morava River belonging to the Black Sea drainage basin.

#### Plesník J.: Two Reports on the State of the Single Planet

The sixth Global Environment Outlook (GEO-6) produced by the United Nations Environment (formerly UNEP) and launched in March 2019 in Nairobi provides a clear prognosis of what will happen if people continue with business as usual and a set of recommended actions to put



things right. The theme, *Healthy Planet, Healthy People*, highlights the inextricable link between the environment and human health and well-being. The data gathered and analysed are crystal clear on the multitude of challenges humans face, but also the small window of opportunity having been still there to turn things around.

The Nature Conservation Agency of the Czech Republic was involved in preparing both the reports.

#### Zajíček P.: Prehistoric Carbon Drawing Traces, the Oldest in the Czech Republic, Were Found in the Kateřina Cave

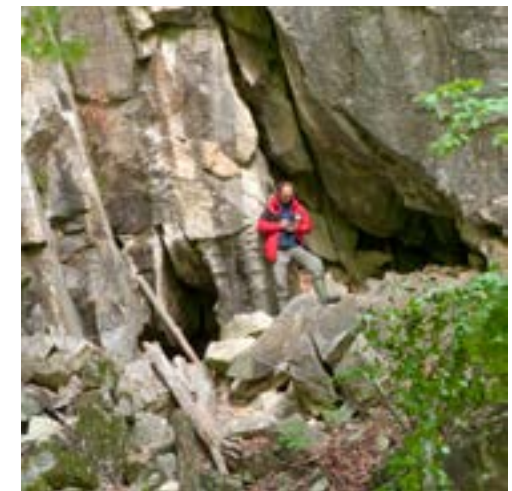
In the Pleistocene Epoch, many caves were inhabited by the prehistoric man, both by *Homo neanderthalensis* and *Homo sapiens* populations as evidenced by a lot of archaeological findings at cave portals. Contrary to similar caves in the world, prehistoric cave drawings in the proper sense of the term have not been



found across the country. Moreover, there are carbon traces apparently resembling abstract drawings on walls in some caves. A prehistoric origin of one of them found in the Býčí skála/Bull's Rock Cave was confirmed in 2005: its age is approx. 5,200 years. In 2019, when applying radiocarbon dating, lines older by 1,000 years were identified in the Kateřina Cave (the Moravský kras/Moravian Karst, South Moravia). The age of approx. 6,300 years fully corresponds to human settlement having been evidenced from the Late Neolithic Period at the cave's entrance.

#### Zajíček P.: The Behind the Crumbled Portal Cave, a New Cave in the Supíkovice Highlands Karst

In karst areas in northern Moravia and Silesia new caves are not so often discovered as e.g. in the Moravský kras/Moravian Karst. In addition, most of karst phenomena had been revealed during limestone mining there and a lot of them disappeared because of that continuing activity. Nevertheless, new karst spaces, both new caves and extensions of the existing ones, can be found there. The



article presents outputs of the surveys on a new cave in the Supíkovice Karst. Erosion holes of various size caused by whirlpool water processes, little erosion channels and facets on walls are typically present but stalagmites and stalactites are totally missing there. Walls and ceilings of spaces have significantly been damaged by crumbling, a bottom is formed usually by stone scree/talus. The total length of all space accessible within the cave called



the Behind the Crumbled Portal Cave is 55 meters, a vertical range being 7 meters. It is supposed that space of the similar character can be extended there.

### International Nature Conservation

#### Mach J. & Plesník J.: International Biological Diversity Conservation again at a Crossroads

There are currently 196 Parties to the Convention on Biological Diversity: the multilateral agreement aims to promote the conservation of biodiversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from the use of genetic resources. The UN Biodiversity Conference was held from 13–29 November 2018, in Sharm El-Sheikh, Egypt and was attended by 3,800 delegates. The event adopted a number of decisions on a series of strategic, administrative, financial, and ecosystem-related issues of relevance to the implementation of the Convention and its Protocols, namely the Cartagena Protocol on Biosafety and the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits arising



from their Utilization. Moreover, participants did not agree the format and topic of the post-2020 global biodiversity framework which should set priorities for biological diversity conservation and sustainable use of its components across the planet. Therefore, an intersessional open-ended working group was established to deal with the significant strategic issue. At the same time, no consensus

has been reached on digital sequence information (DSI) on genetic resources under the Convention and the Nagoya Protocol: so the intersessional process on the topic shall be continuing as well as that on synthetic biology (SynBio). In a rapidly changing world, flexibility will be key, not only to adapt to the dynamic nature of the global environment, but also to be able to take on board emerging opportunities. Therefore, the future global biodiversity conservation directions shall be in detail debated and negotiated at the next Meeting of the Conference of the Parties to the CBD to be held in Beijing, China in 2020.

#### Brunar I.: The Myth of the Děčín Weir with Navigation Lock

Due to dividing Germany after World War II, the Labe/Elbe River escaped the fate of many West German rivers: particularly, it has not been canalised and dammed. Nowadays, on the stretch of 550 kilometres the Elbe naturally flows through the unique river landscape, at



many sites protected, also internationally. The article critically assesses the Czech approach to communicating and to developing the intention to build the Děčín Weir with Navigation Lock (DWNL) as permanently non-transparent. The parameters proposed are not compatible with the German Elbe stretch and the claim that building the DWNL is sufficient to provide the Elbe with navigation is ill-founded. In the Overall Concept/Master Plan of the Elbe, German federal and state authorities have clearly excluded building weirs and weirs with navigation lock there. In Germany, navigation route

depth of 19 meters planned by the Czech side has not been reached in more than 65% of days throughout the year in the last five years (2014–2018). Also after building the DWNL the Elbe would be unnavigable during a great part of the year and the parameters planned by the Czech side would not be reached. It is clear that expectable impacts on nature and the landscape are serious and the so-called “robust credible evidence of overriding public interest” is not provable in connection with the project on the DWNL. Thus, the question is who shall benefit from costs of building the facility and thus spending billions there. The public shall do definitely not.

#### Kišelová M.: The ELCN Workcamp for Volunteers in Portugal

Purchasing land to be privately owned by non-profit organisations is one of the current



nature conservation approaches. The Czech Union for Nature Conservation (CUNC) has been some years coordinating the land trust movement in the country and manages sites of significant importance for nature conservation in its ownership. Land trusts manage land either having been purchased by them or having been rented out to them by the owner aiming at maintaining or creating suitable natural conditions by the tailored measures or keeping cultural traditions alive there. Because of those activities the CUNC is interested in the LIFE ELCN (European Private Land Conservation Network) putting together organisations dealing with the issue. Therefore, the CUNC had been invited to participate

in a workcamp for volunteers held in Portugal in April 2019 as the first step for possible involving in future LIFE ELCN project. At the site, the organizers presented to participants controlled burning management and other related activities, e.g. soil erosion prevention measures or invasive species eradication and control.

#### Kráska A.: Vietnam – A Country of Nature Conservation Paradoxes

Vietnam is a beautiful country enjoying all travellers. It is a tropical and thus colourful



state, offering a lot of remarkable cultural heritage monuments, high mountains, the ocean as well as remnants of magnificent nature. Moreover, there are many nature conservation challenges there. Species richness is really very high in Vietnam: from this point of view, the country is ranked the 16<sup>th</sup> in the world. The fact is caused by a lot of factors, particularly high variability in natural conditions, topography and landform diversity and distinct shape of the country's territory from North to South. In addition, there are deltas of two big rivers, namely those of Red River in north and Mekong in south. Therefore, Vietnam harbours both extensive lowlands and high mountains, the latter reaching 3,144 metres a.s.l. Natural conditions sharply differ at small spatial scale and some species have small distribution areas. Number of endemics is very high in various taxa or ecological/functional groups, e.g. in plants, it is one tenth of species occurring in the country and known to science.

#### Pelc F. & Bejček V.: The Kaziranga National Park – A Little Miracle in Overpopulated India

India, covering almost 3.3 million square kilometres is the 7<sup>th</sup> largest country in the world and also due to its geographical location, it sometimes is called the Indian subcontinent.

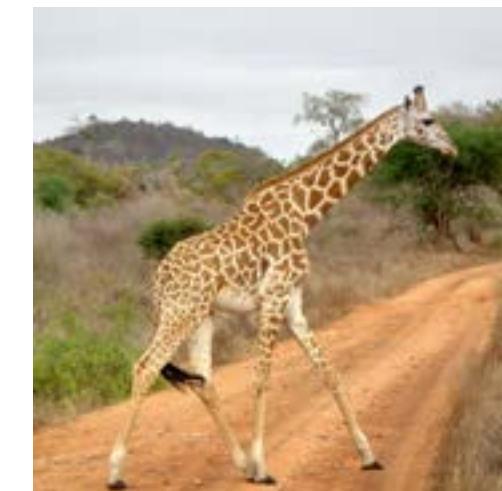


As a result of extreme high human population density (India has with its 1.4 billion people been becoming very close to the Chinese population size), almost all natural ecosystems have been preserved as fragments there. The Kaziranga National Park has been facing a lot of difficulties caused by intensive agriculture and poaching. Nevertheless, they are admirably overcome by about 600 professional rangers. The NP is, inter alia, the global stronghold of the Greater one-horned rhinoceros, also called the Indian rhino (*Rhinoceros unicornis*). Ecotourism generates other 2,000 – 3,000 jobs for local people. The Kaziranga National Park is annually visited by approx. 50,000 tourists, of them one-tenth comes from abroad: many of them spend some days there. Rangers are armed and they are tough on poachers. Also in other ways, a model of co-existence of wilderness in the Kaziranga National Park and its vicinity in densely populated and poor India can inspire nature conservation in the Czech Republic.

#### Plesník J., Makal J. & Klouček O.: The Global CITES Conference Tightened up Conditions for International Trade in Endangered Species of Wild Fauna and Flora

The 18<sup>th</sup> meeting of the Conference of the Parties to CITES (Convention on International

Trade in Endangered Species of Wild Fauna and Flora, CoP18) took place from 17–28 August 2019, in Geneva, Switzerland and was attended by approximately 1700 participants. Delegates considered 57 proposals (relating to more than 500 species) to increase or decrease controls on international trade in wildlife and wildlife products, as well as 140 documents proposing new measures and policies relating to international wildlife trade. The CoP18 adopted a proposal to exempt finished musical instruments (and finished musical instrument parts and accessories) containing Appendix II Dalbergia and Gibourtia rosewood species from CITES permit requirements. The conference also agreed to include giraffes in Appendix II, meaning that permits will be required for international trade in giraffes for the first time. Increased protections were given to Asian small-clawed and smooth-coated otters, with these two species being included in Ap-



pendix I due to threats from the international pet trade. A number of reptile species, including rare lizard and tortoises, were also provided with additional protections. The meeting did not accept proposals to permit some limited trade in ivory from African elephants and in southern white rhino horns, live animals and hunting trophies, which means that the existing trade bans remain in place. Samples from inspected tigers in captivity, wild tigers, suspicious seized products, etc. will be analysed within the TigrisID project in the Czech Republic. Amendments to the CITES Appendices, including new listings, entered into force for all Parties including the European Union 90 days after the meeting.



