



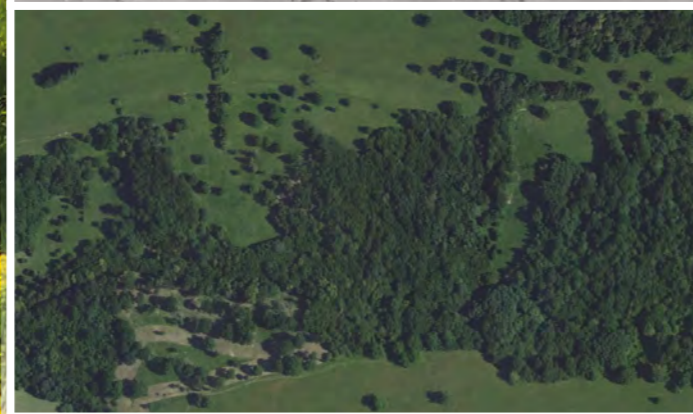
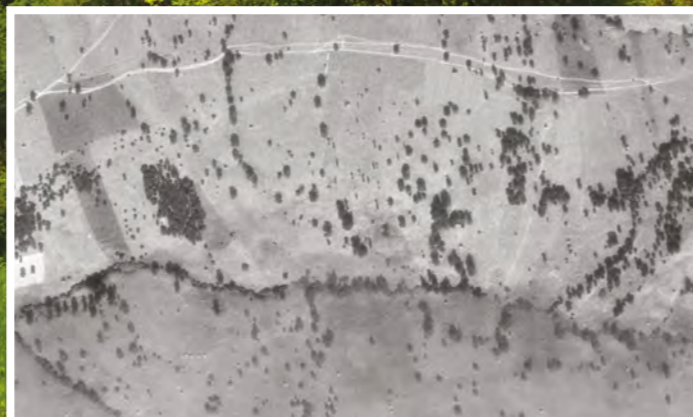
LIFE for insects

Conservation of selected Natura 2000 insect species
in transboundary area (CZ-SK) of Western Carpathian Mts.

What did we do and why?




Meadow, clearing, mountain pasture..., do these terms sound like something from a fairy tale? You are not far from the truth. Such places are becoming more and more rare, not only in our country or in Slovakia, but throughout almost the whole of Europe. Traditional forms of farming used to be common in the past, such as manual mowing, livestock grazing in pastures and forests, and cutting woody plants for heating. Such activities created a colourful mosaic of various habitats, which used to be the home of various types of insects.

And it is these places in the landscape that are rapidly disappearing. Where agricultural machinery cannot get to them, and hands of local farmers are missing, nature works by itself. And it is where we put our efforts, while implementing LIFE for insects project.



A comparison of landscape in the south-western part of the White Carpathians in the 1950s and nowadays, where we can clearly see how former meadows and pastures have disappeared under pressure from self-seeding woody plants.

What were the main activities we did in the project to achieve diversity in the landscape?






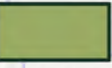
-  To create new homes for targeted insect species, we chose almost 600 hectares of land across the Beskydy Mountains, the White Carpathians in the Czech Republic and the White Carpathians in Slovakia. Here, we did our best to prepare, or rather restore, the most suitable conditions for their lives.
-  We carefully monitored how our target locations change and how not only the target insect species react to these changes, but also the whole range of other representatives of flora and fauna that benefit from our efforts.
-  We also informed local residents, the general public, and even experts about what we do and why we do it, with an emphasis on the importance of biodiversity.

Target insect species: stag beetle, clouded Apollo, large blue, dusky large blue, and scarce large blue; also, Jersey tiger and others.

Main habitat types: open canopy forests, dry pastures, and wet meadows.

Map of sites under restoration



-  State border
-  Settlement
-  Watercourse
-  Site under restoration
-  Site of Community Importance (SCI)
-  Protected Landscape Area (PLA)

Beskydy PLA and SCI

Area: 1,160 km²
 Designated: 1973
 Forest cover: 71 %
 Number of nature reserves: 60
 Reasons for protection:
 Old-growth forest stands with rare occurrences of Carpathian animal and plant species as well as species-rich meadow communities, unique morphology, and underground pseudokarst phenomena.

In Beskydy, 26 sites with a total size of 105 ha were included in the project.

White Carpathians PLA

Area: 747 km²
 Designated: 1980
 UNESCO Biosphere Reserve: since 1996
 Forest cover: 49 %
 Number of nature reserves: 52
 Reasons for protection:
 Extensive species-rich grasslands with scattered trees and shrubs in the southwest, preserved broad-leaved forests in the central and northern part.

In the White Carpathians (CZ), 61 sites with a total size of 216 ha were included in the project.

White Carpathians PLA

Area: 445 km²
 Designated: 1979
 Forest cover: 67 %
 Number of nature reserves: 45
 Reasons for protection:
 Conservation and improvement of typical landscapes of the White Carpathian mountains, their natural conditions and biodiversity, including specific forms of historical settlement.

In the White Carpathians (SK), 8 sites with a total size of 278 ha were included in the project.

White Carpathians SCI

White Carpathians PLA

White Carpathians SCI

White Carpathians PLA

White Carpathians SCI

White Carpathians PLA

White Carpathians SCI

White Carpathians PLA

Open canopy forests

The first of the habitats that were the aim of our efforts is open canopy forests. In the project, we tried to imitate traditional activities (cutting of deciduous trees and shrubs – so called coppicing; livestock grazing) and open up densely overgrown areas. Apart from hundreds of other insect species, two of our target species appreciated this – stag beetle and clouded Apollo.

The stag beetle, Europe's largest beetle, needs old trees with plenty of dead wood to develop. Its larva develops for as long as five years in the rotting roots before it hatches into an adult beetle.

To lay their eggs, the clouded Apollo females look for the fumewort food plant, whose colourful carpets of flowers can be found in the spring months in open canopy forests, on their edges, or in clearings.



Fumeworts



Thinned forest with tall stumps

In the past, people obtained firewood in a rather strange, but very effective way. They cut down the stems of deciduous woody plants that grew from coppice stumps that had been used for many generations. A number of species of deciduous trees have an amazing ability to quickly regenerate with the help of shoots, i.e. to grow again from the original stem or just a stump. In this way, a mosaic of different ages of growth was created and the diversity of the environment was ensured.



Stag beetle (*Lucanus cervus*)



Clouded Apollo (*Parnassius mnemosine*)



Original grazed forest – before and after intervention



Dry pastures

Large blues, beautiful little butterflies, enjoy sunlit sloping pastures; in addition to various flowers full of nectar, they look for fragrant flowers of thymes or oreganos, so that they can lay their eggs on them and give a chance to the new generation.

If the new pastures lacked enough food plants, we had to lend a helping hand and plant out the herbs we had pre-grown.



Thyme



Planting new thyme plants



Large blue (*Phengaris arion*)



One of the Beskydy sites before and after grazing (horses, sheep, and cows)

AN INTERESTING FACT

All three blue butterfly species included in our project have a very complicated life cycle. Shortly after the caterpillar hatches from the egg, it falls from its food plant to the ground, where it waits to be found by ants of the *Myrmica* genus; they adopt it and take it to their anthill, where they care for it as their own, all through the winter. However, the butterfly caterpillar does not return this kind of care to the ants, rather the opposite: it eats the ant pupae in large quantities. And how is it possible that it gets away with this? The blue butterfly caterpillars secrete a specific pheromone that unwaveringly convinces the ants that it is their own pupa. Only at the beginning of summer, when the adult butterfly hatches after pupating, does it lose this advantage and has to quickly flee from the anthill away from the ant's revenge.

Wet meadows

In wet meadows, the great burnet plant thrives with its strange cone-like inflorescence. It plays an extremely important role in the development of two blue butterfly species, the dusky large blue and the scarce large blue, which lay their eggs on its red-violet inflorescence during the summer. Therefore it is necessary to ensure that these meadows are not cut all at once, and there are always enough blossoming plants for the butterflies.



Jersey tiger (*Euplagia quadripunctaria*)



Dusky large blue (*Phengaris nausithous*)



Scarce large blue (*Phengaris teleius*)



Site maintenance by goat grazing in the Beskydy Mountains



Meadow before interventions and after continuous mowing

Clear-cutting and mowing

At the beginning of the project, it was necessary to clear dense growth at many sites. That was because we focused on long-neglected localities. We had to cut and clear, while at some places mowing was sufficient. In the following years, we maintained many sites by mowing, or in combination with livestock grazing.



Horse dragging timber



Clearing self-seeding woody plants



Clearing of cut trees and shrubs



Mowing



Burning of cut trees in hard-to-reach places

How is it possible that we could intervene in a mature forest like this during the project? In commercial forests, in accordance with forest law, all the above mentioned activities are forbidden. However, the LIFE for Insects project focused on areas of original meadows and pastures which are registered in the land registry as 'permanent grassland', although, overgrown with woody plants for decades. Such localities provided us with space for the creation of variously fragmented environments, gradual transitions between mature forest and meadow, open canopy forests, and meadows or pastures with scattered trees.

AN INTERESTING FACT

Grazing

There is no pasture like pasture. In order to ensure really thorough grazing of our valuable sites, a variety of livestock helped us. Thanks to their various taste preferences, they created ideal conditions, even on hard-to-access slopes.

To ensure sufficient nectar and food plants for successful development of insects, grazing can only take place with a limited number of animals and only in certain periods.

Even geese helped us on the edges of rivers and streams.



Since the time of Maria Theresa, i.e. for more than 200 years, forest grazing has been prohibited by law. This is to prevent damage to forest trees and elimination of seedlings in the developing commercial forest. At that time, there was not enough suitable wood for construction, and priorities therefore went in a different direction than had been common before. As a result, rather even-aged and non-native forests are prevalent nowadays. Forest forms such as coppice or grazed groves, which were common in the past, are completely absent now, and with them spatial and species diversity.

AN INTERESTING FACT



Sheep shearing



Monitoring of insects

From the very beginning, we monitored what changes were occurring at the localities and how animal and plant species reacted to them.

Although it is a long-term process, it was possible to observe partial results during the project implementation. For example, we recorded 720 beetle species (of which 200 are endangered) and 330 species of diurnal and nocturnal butterflies in selected areas.



Sweeping with an insects net



Flight intercept trap



Pitfall trap

Covered pitfall trap on site

Monitoring of plants

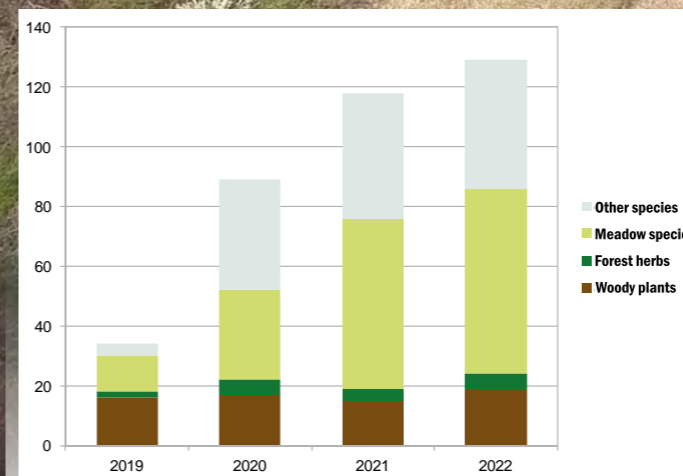
Every year, we monitored the gradual change in vegetation and the return of meadow species in pre-delimited plots. The increase in the number of plant species jumped at an astonishing rate, probably due to the fact that many light-loving species sprouted from seeds long stored in the soil or spread from the surrounding area. As an example, we present a site from the southern part of the White Carpathians, where a meadow is being restored.



Year 2019 - 33 species



Year 2020 - 89 species



Increase in number of plant species in different ecological groups



Year 2021 - 117 species



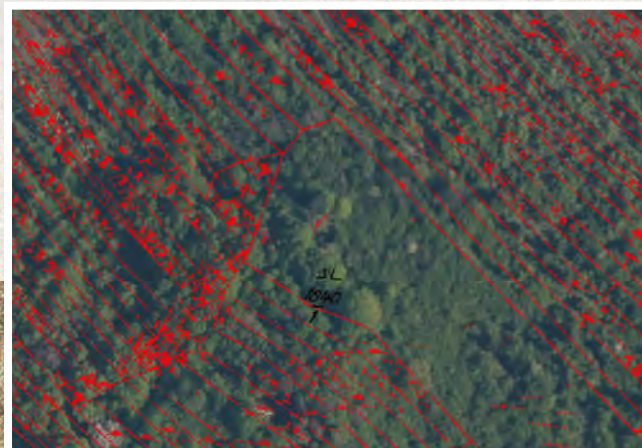
Year 2022 - 129 species

Problems and difficulties

During the five and a half years of project implementation, we had to deal with many complications. Since 2018, the spruce bark beetle outbreak has affected the measures in the landscape as the value of wood from our localities suddenly dropped and the work force in the field also decreased.



From the beginning, when acquiring new areas for the project, we ran into a fragmented land ownership structure, outdated cadastral records, and a large number of untraceable landowners.



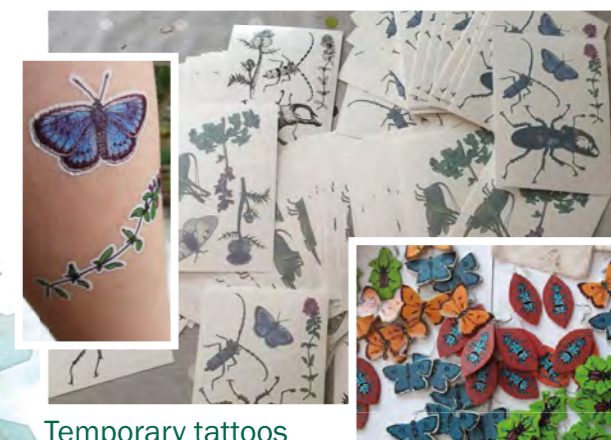
Our efforts were also hit by the coronavirus crisis. It was not possible to meet in person or travel across borders, which did not benefit communication activities. However, we did not hesitate and adapted the creation of promotional items to this complication.



Promotional materials



Coasters



Temporary tattoos and earrings



Posters with motif of a meadow and a coppice forest



Three issues of the Bílé - Biele Karpaty magazine



T-shirts and bags with 'mandala'



Five issues of the Beskydy newsletter



Stag beetle soft toys

Communication with professional and lay public

Communication is very important, so we devoted much effort to it. We organized workshops and field excursions to project locations, organized summer festivals, children's camps, and toured large regional public events. We regularly invited key interest groups to joint meetings – farmers and representatives of the included municipalities. However, we also focused on the professional public, organized seminars, presented our activities at national and international conferences, and exchanged experience with other similar projects across Europe.



Pastoral Day on a farm



Life for Insects Festival



Field excursion at one of the project sites



Participants at an expert seminar on coppice forests



Meeting of mayors



Presentation of the project at a regional event



Monitoring of nocturnal butterflies

Educational programmes

„**LOVE IN THE COPPICE**“ is a characteristic name for the first of two comprehensive educational programmes created in the project. The central role is played by the stag beetle, whose long life cycle is presented to children in a playful way with the help of many original aids, such as animated puppets, a plastic diorama, and an amusing comic strip.

The programme offers a one-day and two-day format, consisting of a theoretical part in the classroom and an outdoor part connected with an excursion to the project site. There, with the help of research aids and tools, the children examine for example the content of the forest soil, or identify what plant and animal species they can encounter in the open canopy forest.



Coppice forest insect life cycle puzzle



Educational elements for natural gardens

As another educational activity, in cooperation with four schools in the region, we created educational elements in school gardens:



A permanent teepee



Interactive dendrophone



Information boards



Tables for working in groups



Learning during outdoor part of the programme



Assembling the life cycle of the stag beetle

1. ROK

TADY JE KRÁSNĚ TEPLO...



2. ROK

...A TAKY VLHKO...



TROUCH STARÝ PÁŘEZ S DUTINOU

Educational programmes

„BEAUTY OF BUTTERFLY WINGS“ is the title of the other educational programme, the main character of which is the large blue butterfly. This insect species also has a very complex development cycle, which is described in the Dry Grasslands section.

Also for this programme, we created a number of original aids, such as an interactive exhibition with various insect species ‚under a magnifying glass‘, plastic templates of butterflies, and complex dominoes with an engaging story of the life cycle of the blue butterfly. The programme includes research in the field, on a meadow, where children explore everything that this specific habitat has to offer.



Part of didactic aid – dominoes



Demonstration of the blue butterfly life cycle



Stacking dominoes



Winning collage from the art competition



Children sweeping with an insect net



Interactive exhibition with insects under a magnifying glass



Ecosystem services or What does nature give us?

During implementation, we observed how our restoration interventions in the landscape influence the benefits that nature provides us. By mowing the meadows, we obtained fodder for our animal helpers for the winter. Of course, they fed themselves well on the pastures. We further managed to produce firewood and wood chips from the cut trees and shrubs.

On the other hand, after harvesting the wood and grass, the carbon stored in it was released. Everything has its pros and cons, but the benefit in the form of increased biodiversity in the area is almost incalculable.



Hay for animals during housing



Logged wood

Impact of the project on lives of local inhabitants

We monitored a large number of so-called socio-economic aspects, too.

We were interested in how people judge our activities, how they view nature conservation in the region, and how their perception of the importance of nature conservation has changed in the meantime. In addition, we investigated whether and to what extent the project impacted business activities and tourism in the project area. To obtain all this information, we conducted an extensive survey among local residents.



Information board
'Stag beetle'



Information board
'blue butterflies'

Project title: **Conservation of Selected Natura 2000 Insect Species in Transboundary area (CZ-SK) of Western Carpathian Mts.**

Acronym: **LIFE for insects**

Project number: **LIFE16 NAT/CZ/000731**

Coordinating beneficiary: **Nature Conservation Agency of the Czech Republic (Prague headquarters, Regional office of White Carpathians PLA, Regional office of Beskydy PLA)**



LIFE for Insects



Associated beneficiaries: **Regional Association for Nature Conservation and Sustainable Development (BROZ), CUNC** - Local Chapter White Carpathians, CUNC** - Local Chapter SALAMANDR, White Carpathians Education and information centre, infinity-progress**



infinity-progress z.s.

Implementation period: **1/7/2017 - 31/12/2022**

Total budget: **€ 4,222,005**

Programme LIFE EU contribution: **€ 2,533,203 (60 %)**

Contribution also provided by **Ministries of the Environment of the Czech and Slovak Republics.**

More about the project: www.lifeforinsects.cz

Ministry of the Environment of the Czech Republic

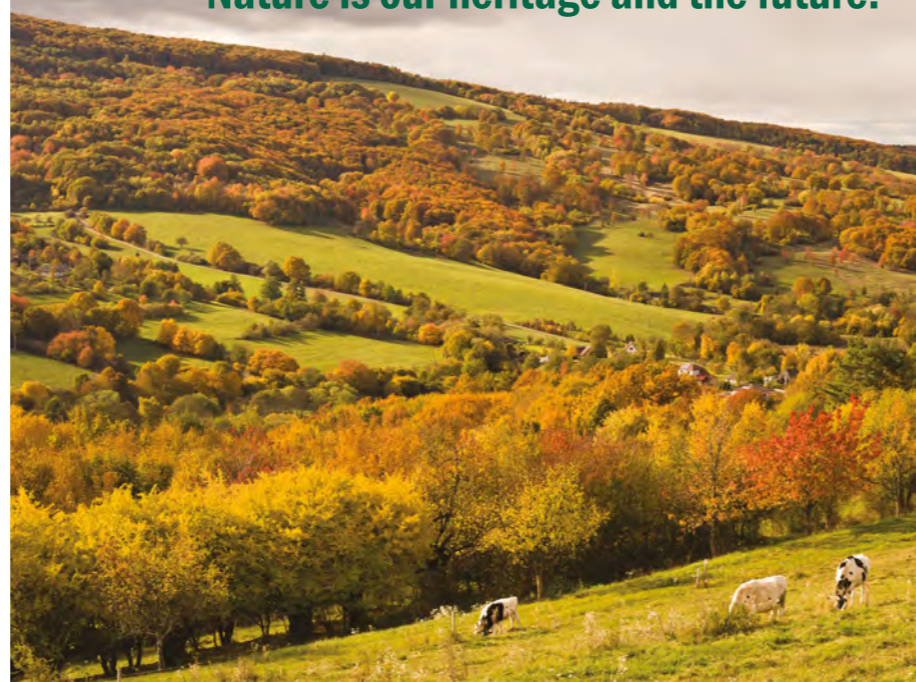


*Czech Union for Nature Conservation

Project objective:

Improving the status of the populations of selected endangered insect species within the Natura 2000 network by restoring their natural habitats in the cross-border area of the Western Carpathians and linking metapopulations of individual species in targeted localities.

Nature is our heritage and the future.



LIFE programme EU

Through the LIFE programme, the European Commission finances a variety of projects aimed at environmental protection and fauna and flora conservation. The objective of projects falling under the theme Nature and Biodiversity is to rescue threatened species and natural habitats, thereby contributing to the European goal of halting biodiversity loss.



NATURA 2000

Natura 2000 is a network of protected areas created by all member states of the European Union. The aim of this network is to secure the conservation of the most valuable, most endangered, rarest and endemic (limited in occurrence to a certain area) animal and plant species as well as types of natural habitat in the European context.

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