Integrated Protection of Rare Butterfly Species of Non-forest Habitats in the Czech Republic and Slovakia

LIFE09/NAT/CZ/000364
Natura 2000

Natura 2000 is a network of protected areas created by all states of the European Union according to uniform principles. 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.

LIFE programme

Through the LIFE programme, the European Commission finances a variety of projects aimed at environmental protection and fauna and flora conservation. The programme was established in 1992. The objective of projects falling under the theme Nature and Biodiversity is to rescue threatened species and natural habitats, therewith contributing to the European goal of halting biodiversity loss.
The White Carpathian grasslands

The meadows and pastures of the White Carpathian Mts. are a heritage passed on by our ancestors, who managed them for hundreds to thousands of years. The latest investigations even show that in the SW part of the area, man has been active since the late Stone Age, i.e. at least 7 thousand years. Woodland has therefore never fully controlled the landscape here, but always allowed for grassy openings. This has created very species-rich grassland communities, where in small plots of 16 m² in size over 100 vascular plant species can be found. Besides typical grassland plants, the grassland complexes also host forest fringe species (around solitary trees) and marsh species (in spring fens). Many of these plant species, incl. more than thirty orchids, are protected. The plant richness is associated with a high diversity of invertebrates, especially insects. Butterflies alone are represented by more than 2,000 species, which is 60% of the species recorded in the Czech Republic.

In the past, the grasslands were mowed once a year, not fertilised, and the aftermath was grazed. A small number of farmers used them as extensive pastures. In areas of scattered habitation (kôpanky), however, mowing and grazing was alternated, so that grasslands often form transitions between meadow and pasture. These habitats can also be found in orchards, which are an essential part of the landscape here.

Another unique natural habitat is formed by the Slovakian kľúčené (kľúčo), whose slopes host many plant and animal species which do not grow elsewhere in the White Carpathians.
Basic data

Project objective

The project contributes to halting biodiversity loss and strengthening the Natura 2000 network in the project area through active conservation of non-forest habitats and species of Community and national importance by applying suitable management and by improving the conservation status of these species.

Expected results

- Creation of conditions for the conservation and further development of populations of nine butterfly species of European importance.
- Improvement of the conditions in non-forest habitats regarding the target species.
- Increase in target species abundance and overall biological diversity as a result of the performed management and restoration activities.
- Creation of material, technical and institutional prerequisites for sustainable management of the target species populations in relation to traditional forms of management.
- Increase in public awareness concerning the protection of butterflies, valuable non-forest habitats and their sustainable exploitation.
- Improvement of cooperation between governmental and non-governmental nature conservation authorities and organisations, landowners and land-tenants concerning the conservation of non-forest communities.

Name of the project: LIFE09/NAT/CZ/000364 “Integrated Protection of Rare Butterfly Species of Non-forest Habitats in the Czech Republic and Slovakia” (Butterflies CZ-SK)

Coordinating beneficiary: Nature Conservation Agency of the Czech Republic

Associated beneficiaries:
- Czech Union for Nature Conservation, Local Chapter Bílé Karpaty (ZO ČSOP Bílé Karpaty)
- Czech Union for Nature Conservation, Local Chapter Jadernička (ZO ČSOP Jadernička)
- State Nature Conservancy of the Slovak Republic Regional Association for Nature Conservation and Sustainable Development (BROZ)

Co-financing institutions: Ministry of the Environment of the Czech Republic
- Ministry of the Environment of the Slovak Republic

Implementation period: 1 January 2011 – 31 December 2016

Total costs: € 6,447,799 (174 mil. CZK), of which 50% financed by the European Commission
The White Carpathian mountain range is situated in the western part of the Carpathian arc and is 80 km long. It is predominantly formed of Tertiary sandstone and claystone sediments, which make up the so-called flysch belt. On eastern and south-eastern slopes of the range, Mesozoic limestones of the kieppen belt rise up. The highest top is Velká Javorina (670 m a.s.l.).

**Bílé Karpaty PLA**

- **Area**: 747 km²
- **Proclaimed**: 1979
- **UNESCO Biosphere Reserve**: since 1996
- **Forest cover**: 49%
- **Number of nature reserves**: 52
- **Area of nature reserves**: 1,428 ha; area of their buffer zones: 1,123 ha

**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 Bílé Karpaty PLA, 95 sites at a total size of 1,370 ha have been included into the project.

**Bílé Karpaty PLA**

- **Area**: 445 km²
- **Proclaimed**: 1979
- **Forest cover**: 67%
- **Number of nature reserves**: 45
- **Area of nature reserves**: 611 ha

**Reasons for protection:**
Conservation and improvement of typical landscapes of the Bílé Karpaty Mts., their natural conditions and biodiversity, ind. specific forms of historical habitation.

In Slovakia, 26 sites (+ 41 functional areas) at a total size of 983 ha have been included into the project. Of these, 14 are situated in the Bílé Karpaty PLA, 9 outside of it but under the auspices of the Bílé Karpaty PLA Authority, and 3 sites in the Malé Karpaty PLA.
Threat to meadows and pastures

Uniform mowing of large meadows
Technological development has enabled farmers to cut dozens of hectares of meadow within one or several days, which has a negative impact on their biodiversity. Animals, particularly invertebrates, are affected the most drastically, as they massively die in the cutting itself but also due to a sudden loss of food resources and shelter.

Intensive farming
In the second half of the 20th century, agriculture was markedly intensified. Large areas of meadows were consolidated and fortified with mineral fertilisers. Hundreds of hectares of meadows were even ploughed up.

Expansion of hedges
If meadow margins are not mown, forest fringes and hedges gradually expand. This way many light-demanding and forest-fringe plant and animal species retreat. Especially in the case of small meadows, this leads to a decrease in biodiversity and eventually threatens their existence as such.

Lack of management
Steep slopes have been abandoned and gradually encroached by shrubs and trees. Similarly, a range of pastures have been abandoned, especially in Slovakia. Still today, a large number of sites are endangered by lack of management, especially remote and badly accessible sites and meadows which cannot be managed with heavy machines.

In order to preserve the unique biodiversity of the local meadows and pastures, it is necessary to maintain and restore traditional farming methods.

Landownership

Another problem with the maintenance and restoration of grasslands is the extreme fragmentation of landownership. All project partners have therefore invested much time and energy into communication with landowners and land-tenants. These have been informed on the natural values of their plots and the necessary farming methods. Collaboration has been set up with many landowners, who have started to manage their plots themselves, have farmed out other plots to a firm which manages them (275 ha), or have at least given consent to necessary interventions (1535 consents).
Shrub removal and hedge pruning

Large areas of thermophile pastures encroached by shrubs (Crataegus monogyna, Prunus spinosa, Rosa canina, Corylus avellana) or trees (e.g. Populus tremula, Betula pendula, Carpinus betulus, Tilia cordata) had to be cleared. Some trees (mostly fruit trees and solitary broad-leaved trees) have, however, been saved not only to avoid spoiling the landscape, but also to provide many organisms with shelter and food.

Long abandoned meadows and pastures which have been encroached by shrubs (Crataegus monogyna, Prunus spinosa, Rosa canina, Corylus avellana) or trees (e.g. Populus tremula, Betula pendula, Carpinus betulus, Tilia cordata) had to be cleared. Some trees (mostly fruit trees and solitary broad-leaved trees) have, however, been saved not only to avoid spoiling the landscape, but also to provide many organisms with shelter and food.

In the Biel Karpaty PLA, an area of 100 hectares has been cleared, whereas in Slovakia a total of 285 hectares have been treated. In the year after the intervention, sprout shoots were eliminated and in the following years these sites have already been mown or grazed.

To prevent expanding tree hedges from decreasing the grassland area and also to create a lee zone for butterflies, 25 km of hedges and forest fringes have been pruned, mainly in the SW part of the White Carpathians.

Clearing of forest fringes creates favourable conditions for Parnassius mnemosyne.
Mosaic mowing

Cutting large areas of grassland in a short time, and moreover in the flowering time of food plants, leads to a decline of many rare insect species. Therefore a considerable part of the project in the Czech Republic has focused on so-called mosaic mowing. This means that the cut is diversified in time (into two or three terms during one year) and space. The mosaic may have the form of belts or a chessboard, but can also be irregular.

Since the mowing of hillsides cannot be carried out with tractors, Local Chapters Bílé Karpaty and Jablonec of the Czech Union for Nature Conservation have bought mountain tractors with accessories. This technology is now used not only for the maintenance of plots managed by these organisations, but also on hillsides belonging to other land-tenants.

The Bílé Karpaty PLA Authority has acquired mountain technology as well and has built a management centre.

Mowing in Čertoryje Nature Reserve is carried out in three terms at monthly intervals.

In 2016, Calias myrmidon was rediscovered at several sites on the Slovak territory of the White Carpathians, although in small numbers. Since also other sites have been expanded and managed for it, there is hope that it will spread in the future.
Grazing

Large-scale intensively grazed grasslands are unsuitable habitats for butterflies. We have therefore concentrated on introducing extensive grazing under the project, employing smaller numbers of animals on grazing the aftermath in autumn, and on alternating grazed and temporarily non-grazed plots. Grazing has also been introduced at badly accessible sites, on rocky cliffs, in forest fringes, orchards and baulks, by which a diverse mosaic of suitable habitats has been created. Moreover, thanks to grazing, some food plants for butterflies rejuvenate, e.g. Chamomile for Colias myrmidon. In contrast to large-scale mowing and intensive grazing, extensive grazing does not destroy anthills, important for the development of some Blue species.

During the project, 415 ha of habitats suitable for the target butterfly species have been grazed at Slovak Sites of Community Importance (SCI) and also at sites connecting them, so-called stepping stones. These are sites with a lower degree of protection, at which the project butterfly species live or used to live until recently.

In the Czech White Carpathians, sheep grazing has been resumed on an area of 90 ha.

The Slovak population of Parnassius opillo has its centre in the area of Vrtčianska brada and is stable. If the current site management consisting of extensive grazing by goats and elimination of shrubs is retained, further improvement and expansion of the population is made possible.

At several sites, pasture infrastructure (electric fences, hay sheds, shelters, watering places, etc.) have been built after shrubs and trees were removed. These sites are grazed by animals purchased under the project (106 sheep, 45 goats and 67 cows) or by herds of local farmers with whom collaboration has been set up during the project. BROZ has bought 13 ha of plots for the overwintering of the purchased domestic animals.
Butterfly monitoring

Some conspicuous organism species are used to assess the quality and biological stability of communities. They are called umbrella species, as their presence signals the occurrence of many other organisms.

For the project, nine butterfly species of European importance were selected. Two of them, *Parnassius apollo* and since recently also *Colias myrmidon*, occur only in Slovakia.

Butterflies were inventoried in the entire Bílé Karpaty PLA by 20 specialists in 2011, 2013 and 2015. They collected a total of 28,413 occurrence records of butterfly species.

In Slovakia, 14 specialists and workers of the Bílé Karpaty and Mliečné Karpaty PLA Authorities monitored butterflies in 2013, 2014 and 2016, resulting in 30,362 records.

The monitoring was a success, since a range of new localities of rare species, e.g. *Eulogaster catex*, were discovered. For several species, e.g. *Maculinea teleius* and *Parnassius mnemosyne*, an increase in the number of sites was recorded. The formerly rare *Lycaena dispar* was found to have spread all over the area (with the exception of forest areas) from the lowest altitudes in the SW part since 2000.

Based on the monitoring of selected butterflies, a system of management and grassland restoration has been proposed in order to create a diverse mosaic. This also enables the survival and development of populations of other organisms in the future.

On the Czech territory, *Maculinea arion* has only remained in the NE tip of the area, in open short swards with thyme cushions and nests of symbiotic ants. Thanks to the project, other potential sites suitable for their occurrence have been created. In the past three years, single specimens along the border with Slovakia down to Stáry Hronenkov in the southwest have been newly recorded.

In Slovakia it occurs in the klippen belt in the northern part of the area, sporadically also in its central part, the Malé Karpaty and the Tematinke vrchy area. Despite the measures taken under the project, it is still very rare and endangered in the area.
Excursions and seminars

Under the project, many events have been organised across the region, aimed at promoting the necessity of conserving the White Carpathian grasslands. The events included annual meetings of workers of the Bílé Karpaty FLA Authority with mayors of towns and villages in the area, farmers, land-tenants and landowners, and contractors. Under the joint title “Open Days on the Meadows”, 15 field excursions for the public have been organised, at which participants were introduced to various sites on both sides of the White Carpathians. In this way, a total of 834 people in the region have witnessed the species richness of the meadows, their management and man’s activity in the landscape. Most promotional activities in the White Carpathians were carried out by the Bílé Karpaty Education and Information Centre (VIS BK).

In Slovakia we have mostly concentrated on working with landowners, land-tenants, municipal representatives, schools and nature rangers. Mainly these groups have received more than 4,000 copies of five project brochures. The activities and objectives of the project have also been promoted during many field excursions and at traditional events in the region, e.g. the Pohode festival, the Bio-fair in Trebišov, the Czech-Slovak Brotherhood Festival on Mt. Velká Javorina, spring excursions, etc.

The project has also been presented at public events in the region, such as the Earth Day Eco-fair in Veseľé nad Moravou, the Horňácko Mowing Festival at Malá Vrbka, the Bio Harvest Festival in Velká nad Veliškou, and the T SSTT festival in Uherské Hradiště. These events were attended by a total of 6,100 people.

Promotion materials issued

Excursion for children to a project site in the Holubyho kopanice SCI

Excursion of science students to project sites in the Holubyho kopanice SCI
One of the most important information activities was the compilation of the Meadow Mysteries training programme for pre-school, primary school and secondary school children.

Its objective is to introduce children and youngsters to the meadow as a fascinating living ecosystem hiding many secrets. The programme has a two-hour variant and a two-day variant in which children experience meadows in the open air.

A total of 2,837 Slovak and Czech schoolchildren attended the programme at an average tuition length of four hours per pupil (11,320 pupil-hours in total).
Thanks to this project we have managed at least part of the White Carpathian landscape in a way that supports the former diversity and restores open vegetation at many neglected sites. Shrubs have been cleared from 385 ha of abandoned meadows and pastures, and 25 km of hedges have been pruned. On more than 1000 hectares mosaic mowing has been applied and grazing has been restored at an area of over 500 hectares. In this way not only populations of European protected butterfly species but also other rare plants and animals are consolidated. Involving the local people into the management and restoration of sites has been very important. Thanks to 45 field excursions for over 1,300 people, a new training programme (attended by 2,837 pupils) and presentation of the project at other events, a public of all ages has acquired higher awareness of the values of the White Carpathians.

Coordinating beneficiary:
Nature Conservation Agency of the Czech Republic
Its main task is performance of the State Administration in nature conservation and landscape protection in Protected Landscape Areas, and technical and expert support of State Administration performance elsewhere in the Czech Republic. It has 14 regional offices. This project has been carried out by the Regional Office of the Bílé Karpaty PLA Authority, Luhačovice (Nádražní 318, 763 26 Luhačovice, e-mail: bilekarpa@nature.cz, www.nature.cz).

Associated beneficiaries:
**Czech Union for Nature Conservation, Local Chapter Bílé Karpaty**
This organisation has worked in the Bílé Karpaty PLA since the early 1980s. It manages 200 ha of grassland, organises botanical and zoological research, educates and informs by means of lectures, information boards, the Bílé – Biele Karpaty magazine and excursions (nám. Bartolomějské 47, 698 01 Veselí nad Moravou, e-mail: csop@bilekarpaty.cz, www.bilekarpaty.cz/csop).

**Czech Union for Nature Conservation, Local Chapter Jadernička**
Manages valuable sites, mainly in the Moravské Kopanice area (687 67 Lopeník 115, e-mail: jadernicky@centrum.cz).

**State Nature Conservancy of the Slovak Republic**
Specialist organisation of the Ministry of Environment of the Slovak Republic with a national scope. The project has been realised by two of its 26 organisational branches, the Biele Karpaty PLA Authority (Trenčianska ul. 31, 914 41 Nemšová, www.bielekarpaty.sk) and the Malé Karpaty PLA Authority (Štiárovej 115, 900 01 Modra, www.soprs.sk).

**Regional Association for Nature Conservation and Sustainable Development**
This organisation is specialised in practical nature conservation in western Slovakia. Under the project it particularly worked on the introduction of grazing at sites in the Biele Karpaty PLA (Na Rivière 7/A, 841 04 Bratislava, e-mail: broz@broz.sk, www.broz.sk).

Co-financing institutions:
**Ministry of the Environment of the Czech Republic**
**Ministry of the Environment of the Slovak Republic**