



Restoring a Butterfly Meadow Management Plan SVK_004_BUTTERFLIES

Key Details		
Date (from/to)	April 2023	October 2024
Project lead		
Partnership structure	BROZ will implement all activities outlined in the management plan. Mossy Earth will provide the funding for the project.	
Management team	Katarina Tuharska	Project manager
	Lubo Vitaz	Site manager
Legal status	Non-governmental Organisation	

1. Background Information

1.1. Partnership and funding context	
Project partners	BROZ Slovak Nature Conservancy Institute of Zoology Slovak Academy of Sciences
Project funders	LIFE Nature and Biodiversity
Related projects	Restoration activities are carried out in 20 Natura 2000 sites across Slovakia
Relative project position	Project is part of a larger international LIFE Metamorphosis project aimed at protection of 15 butterfly species listed in EU Habitats Directive and restoration of priority habitats

1.2. Project Area	
Location	Beckovske skalice (code: SKUEV0566)
Nearest town	Beckov
Coordinates (long/lat)	N48° 46' 31.1" E17° 53' 36.2"

1.3. Conservation target	
Priority species/habitat	<p>Target species of butterflies and moths:</p> <ol style="list-style-type: none"> 1. Jersey Tiger (<i>Callimorpha quadripunctaria</i>) 2. Danube clouded yellow~ (<i>Colias myrmidone</i>) 3. Orange eggar~ (<i>Eriogaster catax</i>) <p>~The Natura 2000 site Beckovske Skalice (code: SKUEV0566) has been designated for the protection of the above target species. However, based on the latest monitoring both Danube clouded yellow and Orange eggar are listed as missing. Danube clouded yellow last sighting in 2018. Orange eggar last sighting in 2021. Species might still be present but in such low numbers that they have not been detected.</p> <p>Note: Other species of interest are species from the Maculinea family (<i>Maculinea arion</i> and <i>Maculinea alcon</i>). Overall, 67 butterfly species have recently been recorded at the site. Further 9 species are missing and further 5 are most likely extinct. Another 5 migrant butterfly species utilise the site. Proposed intervention will improve conditions for all the present butterfly species and other pollinators including solitary bees, bumblebees, grasshoppers, beetles etc.</p> <p>Target habitats:</p> <ol style="list-style-type: none"> 1. Sub-continental steppe grasslands (code: 6240) 2. Lowland hay meadows (code: 6510) 3. Dry grasslands and scrubland on calcareous substrates with flowering orchids (code: 6210) - this is one of the 2 most threatened habitat types in Europe (out of the 230 characteristic habitat types) 4. Pannonian woods with Oak <i>Quercus pubescens</i> (code: 91H0)
Conservation status of species/habitat	<ul style="list-style-type: none"> ● Jersey Tiger (<i>Callimorpha quadripunctaria</i>) IUCN status: Not evaluated ● Danube clouded yellow (<i>Colias myrmidone</i>) IUCN status: Endangered, shows decline in much of its range. ● Orange eggar (<i>Eriogaster catax</i>) IUCN: Not evaluated
Relevant legislation	Law on Nature Conservation 543/2022, the legal authority permission to carry out the management was obtained already
Threats	<p>It is increasingly recognised, based on pollen analyses and the complex plant and animal assemblages of modern grasslands, that post-glacial Central and Western Europe was a mosaic of closed forests as well as open landscapes - grasslands and open forests maintained by arid conditions and grazing megafauna. Later on, traditional animal husbandry and grazing practices partially compensated for the loss of this megafauna and allowed for the continued survival of grassland species.</p> <p>Many of the biodiverse areas we find in modern-day Europe, especially semi natural grasslands, have been maintained or created by human activity as a side-effect of traditional farming practices. The recent decline of butterfly species in Europe is directly linked to the changes in land use - the abandonment of traditional low intensity (extensive) grazing and mowing for hay on the one hand, and the intensification of agricultural production and the use of insecticides on the other hand. The abandonment of the traditional extensive use of grasslands leads to subsequent encroachment by grasses and woody plants which decreases plant species richness and feed availability for butterflies. In Slovakia, the misdirected subsidies for intensive large-scale mowing and mulching of meadows also led to the decimation of butterfly host plants and butterfly populations.</p> <p>The proposed conservation site has further been negatively affected by past afforestation programmes using pine trees. The Danube Clouded Yellow has historically been present at many localities in the southwest of Slovakia and several sites in eastern Slovakia (see occurrence map 1960 https://lepidoptera.sk/colias_myrmidone). Recent</p>

	<p>extinctions in Germany, Austria, Hungary and Czech Republic make it one of the most endangered butterfly species in Central Europe. At present in Slovakia, the species occurs very sporadically on the limit of observability and seems to be undergoing a process of extinction. However, this is not the only species, whose range and abundance are shrinking. Recent studies indicated severe decline of insect diversity and abundance across major parts of Central Europe. As an important ecological indicator and pollinator taxon, butterflies require human interventions to sustain their populations in cultivated landscapes. This can be achieved by restoration of high nature-conservation value (HNV) grasslands such as extensive meadows and pastures which harbour the highest butterfly diversity.</p>
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2. Project goals, objectives and activities

2.1. What is being done and why
<p>This project aims to address the problems associated with abandonment of grasslands and the associated insect habitat degradation. The prerequisite for the survival of the butterfly species present at the site is maintaining the highest possible habitat quality and increasing habitat availability. Conservation grazing using husbandry animals is an effective method to maintain grassland biodiversity by creating a mosaic of micro habitats for a range of plant and insect species</p> <p>The locality is surrounded by urbanised landscape and agricultural fields, it thus serves as an important wildlife refuge - a “micro-reserve”. Since many of the threatened butterfly species are specialist, either oligophagous - feeding on a few specific host plants or monophagous - feeding exclusively on just one host plant species, to maintain and increase the number of butterflies at the site we need to create suitable conditions for the butterflies' host plants. These plant species often require conditions that are created by grazing (<i>Thymus sp.</i>) and disturbance of the soil by trampling (<i>Gentiana sp.</i>). Grazing herbivores are selective in what they eat so a mixture of grazing animals will be used at the site to utilise the grazing styles. Goats usually prefer shrubs and will be able to access a more rocky terrain while sheep, grazing the ground with the front teeth will create areas with uniform height.</p> <p>The site is currently overgrown with woody vegetation, artificially introduced pines and non native acacia . 11 ha have been cleaned this winter and will be grazed this season. Further 6ha will be cleaned during winter 2024. The overall area to be grazed by spring 2024 is 17 ha. This includes both open dry meadows and open oak woodlands. If no intervention is taken, the suitable habitat for the butterfly and other insect species will continue to shrink as a result of further succession.</p> <p>Both under grazing and overgrazing can result in habitat degradation, therefore the stocking densities will be carefully adapted to local conditions based on previous BROZ experience. The effects on the vegetation and butterfly populations will be monitored to achieve the increase of herbs and the desired conservation outcome.</p> <p>The intervention is expected to have a fast and positive impact - population increase of a number of butterfly species that currently survive at the site in small numbers. The long-term maintenance by grazing will be secured by BROZ in cooperation with local stakeholders.</p> <p>The project aims to restore rare habitat types such as dry orchid grasslands - one of the most threatened habitat types in Europe and oak wood pastures - a rare habitat type in the context of Slovakia and important habitat for woodland butterflies.</p>

2.2. Project objectives: one objective per row	
Objectives	Activities
1. Improve habitat condition and increase habitat availability for threatened butterfly species on 17ha	Clearing 6ha of target habitat - dry grasslands and open oak wood pastures overgrown with shrubs, introduced and non-native trees and introducing management by grazing to 17ha of target habitat.
2. Monitor the effect on plant assemblages and butterfly populations	Monitoring by expert botanists and entomologists will be carried out yearly, with monitoring reports prepared in 2026 and 2029. After that the monitoring will be done every 3 years as a part of regular monitoring of habitats and species of European importance carried out by the State Nature Conservancy.

2.3. Supporting evidence	
Claim	Evidence to support it
Many of the biodiverse areas in Europe, especially grasslands, have been created by human action in the past as a side-effect of traditional farming practices. The decline of butterfly species in Europe is directly linked to the changes in land use including the abandonment of traditional low intensity (extensive) grazing and mowing for hay.	https://www.researchgate.net/publication/225599087_Grassland_butterflies_and_low_intensity_farming_in_Europe
It is increasingly recognised, based on pollen analyses and the complex plant and animal assemblages of modern grasslands, that post-glacial Central and Western Europe was a mosaic of climax forests as well as grasslands and open forests maintained by arid conditions and grazing megafauna.	https://onlinelibrary.wiley.com/doi/abs/10.1111/gfs.12066 https://www.researchgate.net/publication/320182174_Grazing_ecology_and_forest_history https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5433559/
Traditional animal husbandry and grazing practices partially compensated for the loss of this megafauna and allowed for the continued survival of grassland species.	https://conbio.onlinelibrary.wiley.com/doi/epdf/10.1046/j.1523-1739.2000.99119.x
The abandonment of the traditional extensive use of grasslands leads to subsequent grass and forest encroachment which decreases plant species richness	https://www.researchgate.net/publication/233641745_Sheep_versus_donkey_grazing_or_mixed_treatment_Results_from_a_4-year_field_experiment_in_Armerio-Festucetum_trachyphyllae_sand_vegetation
High nature-conservation value (HNV) grasslands such as extensive meadows	https://link.springer.com/article/10.1007/s10531-022-02498-3

and pastures harbour the highest butterfly diversity.	
Conservation grazing is an effective method to maintain grassland biodiversity by creating a mosaic of micro habitats for a range of plant and insect species	https://www.cabdirect.org/cabdirect/abstract/20113056522 https://www.researchgate.net/publication/233641745_Sheep_versus_donkey_grazing_or_mixed_treatment_Results_from_a_4-year_field_experiment_in_Armerio-Festucetum_trachyphyllae_sand_vegetation

2.4. Licences and permissions
All permissions to clear-cut the vegetation and establish the grazing were granted according to Law 543/2002 on Nature Conservation.

2.5. Stakeholder engagement
The principal stakeholders are landowners and users that will benefit from clearing the expansive vegetation and introduction of the grazing, as years abandoned land will be used. The important stakeholder is a nearby restaurant (cottage house type with specialities from sheep cheese produced locally) that will benefit from the grazing of their animals at the locality, increased number of visitors to their restaurant and purchase of products. Local inhabitants are also involved through their tourist club association that organises local events in the area. This association will also cooperate to create new trails in the area to prevent crossing with grazing fences and inform on activities and project species during excursions.

2.6. Cultural considerations
Project site is frequently visited by tourists so the project will have a positive educational impact. Risks are associated with people or dogs entering the enclosures or manipulating the farm animals, however the risks will be reduced by putting up warning signs and frequent monitoring by the staff.

2.7. Wildlife ethics
NA. Standard animal husbandry and welfare will be adhered to.

2.8 Risks, challenges and uncertainties		
Risks/challenges	Probability	Mitigation measures
All permissions have been granted and the project is ready to go ahead		
Ensuring the sustainability of conservation grazing at the site		The management by grazing will be ensured at least until 2059 as part of the LIFE Metamorphosis project and the After Life pledge. Grazing after this period is dependent on the availability of funding and agreement with local stakeholders.

Long term monitoring of species assemblages at the site		Monitoring after year 2029 is dependent on the availability of funding and other resources
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3. Project Calendar

3.1. Short-term work programme:		
Activity	Timeframe	Responsible
Introducing grazing to 11ha of already cleared butterfly habitat	May 2023	BROZ
Clearing additional 6ha of land	Winter 2023	BROZ
Grazing 17ha of butterfly habitat	Spring 2024	BROZ
Plant and butterfly monitoring	throughout until 2029, then each 3 years	BROZ and Slovak Nature Conservancy

4. Project budget

4.1 Budget		
Category	Activity/supply	Cost (relevant currency)
Project specific staff	Site manager Shephard	provided by BROZ
Travel and subsistence	car and fuel	provided by BROZ
Husbandry animals	Purchasing husbandry animals and associated costs with care	provided by BROZ
Grazing infrastructure and materials	Buying materials and building grazing infrastructure	7000 EUR
Clearing	Removing shrubs, non-native and introduced woody plants - subcontracted	21 000 EUR
Total Costs		28 000 EUR

5. Monitoring and Reporting

5.1. Monitoring strategy: outline how the project will monitor whether objectives have been met				
Objectives	Indicators	Method of assessment	Monitoring period	Responsible
Every objective in section 2.2 should have its own row in this table.	What are the relevant indicators that will be monitored to assess whether objectives have been met	How will the project assess whether the objectives have been met?	When will monitoring take place and for how long?	Which organisation is responsible for this monitoring? Please include the

				team members name if known.
Improving habitat quality and availability on 17ha	ha of land cleared and grazed	Field monitoring, using GPS to create a map	Summer 2024	BROZ
Monitoring plant and butterfly assemblages	Changes in species abundance and composition compared to baseline monitoring	targeted butterfly and plant monitoring	Once a year until 2029 with reports in 2026 and 2029.	BROZ





5.2. Reporting strategy		
Type	Date	Content
Progress report(s)	September 2024	Area cleared and grazed, photo documentation, GPS map
Monitoring report	yearly	results from yearly butterfly and plant monitoring shared with Mossy Earth
Spending report	December 2024	Spending report - outline how the budget was spent and include receipts for expenses above (tbd).

5.3. Sharing generated evidence
Know how will be shared during various meetings, networking events, conferences and workshops within Europe with other projects and project beneficiaries.

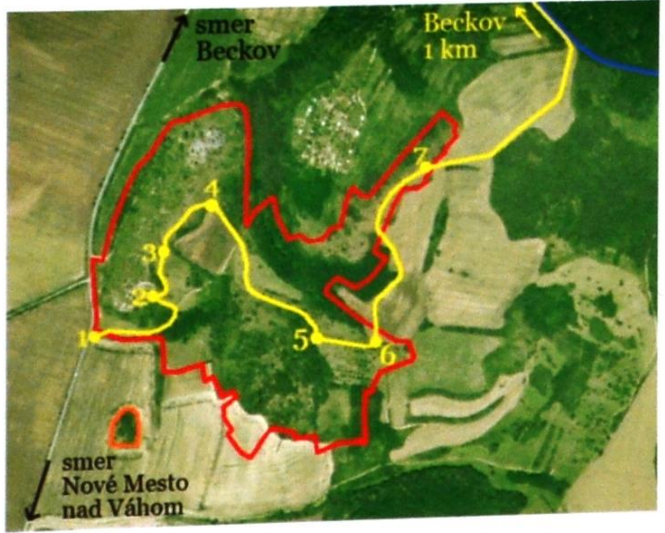
6. Maps

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Include any maps of intervention areas,

-  Hranica PR Beckovské Skalice
-  Trasa a stanovištia náučného chodníka
-  Modrá turistická značka
-  Hranica PP Skalka pri Beckove

- 1 Začiatok + Spraš (Koniec)
- 2 Kameňolom
- 3 Lúky a pasienky
- 4 Orná pôda - úhor
- 5 Lesy
- 6 Ovocný sad
- 7 Koniec (Začiatok + Krajina)



Please also send relevant geospatial files separately.

7. Images

7. Images

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