

2017- 2025

Aims and result of the EU-LIFE-Project

LIFE Patches & Corridors

A Habitat Network for the Violet Copper

Nature provides us with air, water, food, and quality of life. At the same time, it is home to countless animals and plants. By preserving habitats and species, we safeguard the balance of nature - for today and for future generations.



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Why do we need nature conservation projects – even in the Eifel region?

As in many parts of Germany, intensive land use has caused the landscape in the Eifel region to lose its original character. Although there are many nature reserves here, forestry and agricultural land use have significantly reduced the number of old, unspoilt forests, flower-rich meadows, and marshy floodplains. Not every area covered with grass and trees is of value to native fauna and flora.

An important objective of the LIFE project “Patches & Corridors” was to connect the habitats of the violet copper butterfly. This species is rare throughout Europe, and its survival is considered to be highly endangered, including in the Monschau region. Both existing habitats and those still in development were to be connected with each another. To ensure that butterfly populations remain viable, the distance between suitable biotopes must not be too great. Typical deciduous forests in the valleys, bog forests, species-rich hay meadows, and moist tall-herb communities needed to be preserved, optimised or developed - habitats that are particularly important for the violet copper butterfly.

However, this butterfly can also be regarded as a representative species. It is the prominent part of the community of all animal and plant species that make up the habitat. By conserving the habitat of the violet copper butterfly, we are also protecting the many other species that can only live here.

Project area

The Natura2000 site “Oberlauf der Rur” is the key area in the regional biotope network for the Violet Copper within the StädteRegion Aachen. It is located in the northern Eifel, which is characterised by high precipitation, low temperatures and poor soils.

The river Rur rises in the moors of the Hautes Fagnes and is fed by numerous tributaries on its way through the Eifel. Species-rich meadows and extensive forests line adjacent slopes and meadows.

Area size: 938 ha

Sea level: 550-280 m

Average annual precipitation: 1100 mm

Mean annual temperature: 6.5°C

Facts & Figures

Title: „LIFE Patches & Corridors“ LIFE 15 NAT/DE/000745

Duration: January 2017 to December 2025

Total budget: about 2,45 million euros

Project management: Biological Station StädteRegion Aachen e.V.

Project partner: The State of North Rhine-Westphalia

Co-financer: StädteRegion Aachen

[LIFE - the EU's financial instrument supporting nature conservation](#)

The European financial instrument LIFE (*L'Instrument Financier pour l'Environnement*) exclusively supports environmental protection concerns. The aim is to promote the development and implementation of environmental policy and legislation in the EU. This support implements and develops the Natura 2000 European network of protected areas and promotes and protects species and habitats of Community importance.

The Habitats Directive (FFH Directive) is a legal framework that obliges EU member states to protect nature. It sets out how wild species, their habitats, and the Europe-wide connectivity of these habitats must be secured and protected.

NATURA 2000 is the coherent network of European protected areas consisting of Fauna-Flora-Habitat sites and bird reserves. The aim is to protect typical, special, rare and endangered habitats, animal and plant species in Europe. The member states of the EU have a responsibility to preserve typical natural landscapes and biological diversity. In Germany, for example, approximately 14% of the country's surface area and 31% of its marine area are registered as Natura 2000 sites.

The Biologische Station (Biological Station) based in Stolberg was founded in 1998. As a non-profit organisation, it is funded by its members - nature conservation associations, the district farmers' association, the forest farmers' association and the StädteRegion Aachen. Its task is to implement and support nature conservation, landscape conservation and species protection projects in the StädteRegion Aachen.

Violet copper butterfly

Endangered throughout Europe

The flagship species of the LIFE project "Patches & Corridors", the violet copper butterfly (*Lycaena helle*), is an endangered butterfly throughout Europe. In Germany, it is only found in four regions: the Bavarian Alpine foothills, the Black Forest, the Westerwald and the Eifel.

Particularly worthy of protection

- Scientific name: *Lycaena helle*
- Protection status: Red List Germany: 2 - highly endangered
- Red List NRW: 1S - threatened with extinction, thanks to conservation measures now at the same level, less endangered or no longer endangered
- FFH Annexes II and IV - Animal and plant species of Community interest for which special areas of conservation must be designated. Strict protection regulations apply to these species, including outside the FFH areas. The protection of these species must be taken into account in any intervention in nature and the landscape.

The target species – the violet copper butterfly

Coloration

The violet copper butterfly owes its name to the blue-violet iridescence on the upper side of its wings. In the male, this iridescence appears on the entire wing surface, in the female only on the wing edge. This coloration is not due to stored pigments, but is caused by a microscopically fine ribbed pattern on the wing scales. When sunlight hits it, it is diffracted by

the ribs in such a way that blue-violet colors are reflected. Therefore, the colouring can only be seen clearly when the butterfly is at the right angle to the sun or to the observer.

Habitat on Wet Ground

Species-rich wet meadows, wet fallow land, and highly light-flooded floodplain forests with bistort (*Bistorta officinalis*) are typical habitats of the violet copper butterfly. In the Northern Eifel, wet soils are not uncommon. Here, above the first higher elevation east of the Atlantic, moist air masses often rain down heavily. Headwater swamps on the plateaus, wet riparian zones, and bog meadows in valley bottoms have developed in many places. However, many of these biotopes have disappeared.

Habitat Loss

One reason is the expansion of mechanized grassland farming. In the past, drainage systems were installed to improve the accessibility of meadows, removing water from the soil and releasing it into streams. These streams were then straightened and deepened so that the drainage water could flow away more quickly. The use of tractors on former marshy meadows made it easier to mow, clear, and fertilize the land several times a year.

Another reason is that remote meadows and pastures with poor access were completely taken out of agricultural use and used for forestry. Afforestation with spruce appeared to be the most promising option for generating income in such unfavorable locations. Here too, ditches were dug in wet areas, making the growth of coniferous trees possible in the first place. However, in a drained, dense spruce plantation, nothing grows for decades until timber harvest that would be important for the survival of the violet copper butterfly.

Life cycle

The females lay their eggs on the caterpillar's only food plant - the common bistort (*Bistorta officinalis*). The egg-laying process can be easily observed and always follows a very similar pattern: The butterfly lands on one of the large basal leaves at the base of the plant, not on one of the usually narrower upper stem leaves. The female moves toward the leaf edge, turns so that its abdomen is positioned at the edge, and climbs under the leaf. It usually moves only as far as it can still hold onto the leaf edge with the claws of its forelegs. The egg is then laid,

and, corresponding to the butterfly's body length, it is usually found about 1.0–1.5 cm from the leaf edge on the underside.

The caterpillars hatch on average 10 days after the eggs are laid. They remain on the underside of the leaf, where their green coloration provides good camouflage. With some practice, they can be best found by the window-like feeding patterns they create. After hatching, the caterpillars molt three times within the next 30 days before pupating. The exact pupation site is not well documented. Presumably, the caterpillar attaches itself to a leaf of the bistorta or another nearby plant. When the leaf wilts, it falls to the ground, where the caterpillar overwinters in the litter until the adult butterfly emerges the following year. The adult copper butterflies use various flowering plants as a nectar source and are no longer as picky as they were during their larval stage.

Project successes - What has LIFE achieved?

- 120 plots of land, totaling 45 hectares, purchased
- 22 ha of deciduous forest development initiated after the felling of spruce plantations
- 7,000 trees planted, including 540 wych elms
- 9 ha of fallow meadows mown or grazed
- 7.5 ha of mountain hay meadows secured, put into extensive use and newly created
- 5.6 ha of wet meadows optimised for the violet copper butterfly
- 1,300 m of riverbank strips created and optimised for the violet copper butterfly
- 7,500 bistort cuttings planted
- 17 km of stream valleys cleared of Himalayan balsam

International Expert Exchange

Nature conservation and the associated challenges and solutions are discussed internationally. Knowledge was shared and gained through presentations at various events in England, Scotland, Finland, Estonia, and Italy. A highlight of the project was the specially organised hybrid international conference in Monschau with speakers from Germany, Belgium, Spain, and the Czech Republic.

Public Relations

Information about the project was continuously provided via a dedicated website, at various events through a travelling exhibition, and through brochures. Special leaflets and flyers were distributed to draw attention to the problem of invasive plants. Particular emphasis should be given to the hiking guide: it enables nature lovers, in four languages (German, English, French, and Dutch), to explore the project area in search of the violet copper butterfly and other animal and plant species.

Environmental Education

The Himalayan balsam (*Impatiens glandulifera*) was removed in publicly promoted community actions - "Monschau rupft" has now become a well-known term. Trees were planted in collaboration with a school class and residents of the local community of Imgenbroich. Two courses on using the scythe were held in Höfen and Kalterherberg. Guided excursions to observe the violet copper butterfly were conducted annually.

Ecological monitoring

Comprehensive accompanying studies on butterflies, moths, ground beetles, spiders and vegetation were carried out. This expanded knowledge of species diversity and some surprising new discoveries were made. For example, the moorland ground beetle (*Epaphius rivularis*), a ground beetle measuring just under 4 mm, was discovered, which is extremely rare in North Rhine-Westphalia. Its only known locations in North Rhine-Westphalia appear to coincide with those of the purple-edged copper butterfly (*Lycaena helle*). Both species occur only in the northern Eifel region and in the district of Siegen-Wittgenstein.

The capture-recapture studies with the violet copper butterfly were also very interesting: more than 1,500 individuals were individually marked and released. The record that one specimen of the species had travelled a distance of at least 1,400 metres is potentially record-breaking.

Which habitats were the focus?

Moist tall herbaceous meadows

Along creeks, nearby rivulets and moist ditches, the nutrient-rich, moist tall herbaceous meadows extend in spring and summer as a colourful band of flowers. With common bistort (*Bistorta officinalis*), meadowsweet (*Filipendula ulmaria*), valerian (*Valeriana officinalis*), wild angelica (*Angelica sylvestris*) and broad-leaved marsh orchid (*Orchis majalis*), they provide a habitat for numerous insects with their lush growth. They represent an elongated buffet of various nectar sources, along which butterflies and other flower-visiting insects fly from one habitat to another. Not or only sporadically mown, animals and plants can develop undisturbed.

Typical plants are:

bistort, meadowsweet, valerian and wild angelica, whose lush growth provides a habitat for numerous insects.

Damp meadows and pastures

When soils are wet and marshy due to high groundwater levels, meadows are difficult to manage. In addition, fertilization is prohibited here for reasons of drinking water protection, meaning that yields for farmers are low. Typical plants growing here include rushes - marsh grasses with little nutritional value for livestock. They often form large stands. Due to their dark green colour, wet meadows stand out clearly from the surrounding vegetation.

A whole range of other plant species specially adapted to wet soils make these meadows particularly valuable for nature conservation. These include marsh marigold (*Caltha palustris*), marsh bedstraw (*Galium palustre*), marsh violet (*Viola palustris*), bog bedstraw (*Galium uliginosum*), and many other herbs that are, in turn, essential for the survival of certain animal species.

In the past, many such wet meadows have been lost due to drainage measures. Even if formerly extensively managed grassland becomes fallow, the typical vegetation disappears over time.

Mowed mountain meadows

The nutrient-poor, sparsely growing mowed mountain meadows have a high proportion of herbaceous plants. This makes them an important habitat for a large number of animal species, and their colourful variety of flowers enriches the landscape. Formerly a result of little intensive agriculture, they are still only mowed once or at most twice. The already from afar with its purple flower carpet recognizable wood cranesbill (*Geranium sylvaticum*) and the spicy smelling baldmoney (*Meum athamanticum*) are characteristic species. The “daffodil meadows” are widely known. These are mountain hay meadows in the Monschau region that attract many visitors from far and wide in April due to the mass flowering of the yellow daffodil (*Narcissus pseudonarcissus*). In Germany, this flowering spectacle is unique!

Plants that are constantly found here include:

tormentil, yellow rattle, bitter vetch, harebells and black knapweed.

Forest of slopes, screes and ravines

High humidity and a coarse, rocky subsoil on steep slopes and in gorges are the determining characteristics of this particularly rare habitat. In addition to sycamore maple (*Acer pseudoplatanus*), ash (*Fraxinus excelsior*) and honesty (*Lunaria rediviva*), the wych elm (*Ulmus glabra*), which has become rare due to elm disease, is characteristic here. The herbaceous layer on the ground is impressive due to the presence of a whole range of early bloomers. Plants such as lesser celandine (*Ranunculus ficaria*), wood anemone (*Anemone nemorosa*), bird-in-a-bush (*Corydalis solida*) and yellow star of Bethlehem (*Gagea lutea*) use the time of year when the trees are still leafless to develop and flower.

Bog woodland

This near-natural forest community grows on very acid soils under high water levels and nutrient deprivation. Downy birch (*Betula pubescens*), alder buckthorn (*Frangula alnus*), blueberry (*Vaccinium myrtillus*) and various types of peat moss (*Sphagnum spec.*) can be found regularly. In the project area, bog woodlands occur sporadically at higher elevations along the upper reaches of the streams.

Alluvial forests with common alder and ash

Alluvial forests are special types of woodland that grow directly along streams. The soil there is very moist and is often flooded. As a result, these habitats are dominated by tree species that tolerate large amounts of water and can grow quickly, such as black alder (*Alnus glutinosa*), ash (*Fraxinus excelsior*), and willows (*Salix cinerea*, *Salix aurita*). Flooding leads to erosion and the deposition of soil and stream sediments. These are regular, natural processes that give these biotopes their distinctive character. Especially when they are open and well-lit, allowing a species-rich herb layer to develop, they contribute significantly to the connectivity of a wide variety of habitats. Bitter cress (*Cardamine amara*), water avens (*Geum rivale*), wood stitchwort (*Stellaria nemorum*), as well as stinging nettle (*Urtica dioica*), are among the typical plant species. These plants are well adapted to the moist soils and fluctuating water levels.

Measures – in the woods and on meadows

In the woods

- removal of fir forests from the alluvial plain
- Initializing the development of bog woodland, alluvial forests and forests of slopes, screes and ravines
- Improvement of alluvial forests by selective forestry and initial planting of bistort rootstocks (*Bistorta officinalis*)
- Reintroduction of Which Elm (*Ulmus glabra*) on sites typically inhabited by forests of slopes, screes and ravines

On meadows and pastures

- Establishment of extensively used meadows on fir forest clearings,
- fencing of existing wet meadows, brooksides and sources,
- Reintroduction of management in wet fallows by either annually alternating mowing or grazing with low stocking rates, both in late summer/early spring
- Control of the invasive neophytic plant Himalayan Balsam through consistent removal by hand over several years.

Measures – Wych elm (*Ulmus glabra*)

A now rare species

Some species in the Eifel have become rarer over recent decades without much notice or have already become extinct. The wych elm is one of them. At the beginning of the project, its population was so small that there was considerable uncertainty within the expert community about the location of remaining individual trees. The aim was to promote this striking and native tree species.

Breeding in the project

As part of the project, elm seeds were collected from old elm trees - some of them were over 200 years old - sown in a tree nursery and then planted out as 1- to 2-year-old plants in protected locations in gorge forests. The aim is to support the occurrence of this beautiful and typical tree species. Wych elms bloom very early in the year—in March. The small, brown flowers are inconspicuous and have exposed stamens and pistils. This is typical for plants that rely on wind pollination. Like the flowers, the fruits of the wych elm develop early and fall to the ground in May. They germinate in the same year, so young elms can already be found in autumn. This also means that elms grown by humans can be planted out in autumn. Under cultivation conditions, they can sometimes already reach over half a metre in height!

Protection of the offspring

The buds and leaves of deciduous trees are a delicacy for deer and red deer. The chances of plants growing successfully are higher if the young trees are protected from the hunger of these animals. In the project, a variety of browsing and rubbing protections were used. In addition to protecting individual trees with small wire or wooden tubes, small forest areas were also fenced in. For this purpose, so-called “Hordengatter“ (“herd gates”) were installed - a network of fence elements made of untreated spruce slats.

Optimisation of the habitat

We removed the naturally regenerating spruce trees from the area surrounding the planting site. This work will continue for many years, as the fast-growing, competitive conifers would eventually displace the native elm trees. Compared to the space that a single, fully grown wych elm will occupy in the future, we initially planted far too many young trees. In doing so, we

are following the example of the wych elm in nature, which produces a huge number of seeds each year, only a few of which germinate and reach maturity.

Measures – Himalayan balsam (*Impatiens glandulifera*)

Facts and figures

- Typical growth height 1.5–2.0 meters, in extreme cases up to 3 meters.
- Depending on the source, a maximum of 800–4,000 seeds are produced.
- Seeds are ejected by the special capsule up to 4–7 meters, in extreme cases up to 10 meters.
- Seed viability is mostly 1–2 years, in exceptional cases 3–5 years.
- The proportion of seeds that actually germinate per plant was over 80% in experiments, but likely lower in the wild.

Globalisation

With the steadily increasing international transport of goods, plants and animals are being exchanged increasingly between continents. When these new species become established in native regions, they are referred to as neobiota (plants = neophytes, animals = neozoans). Problems arise when alien species become invasive, meaning they invade native biotops and cause undesirable impacts. Invasive neobiota are considered a major threat to biodiversity.

Legal Aspects

The plant can enter the wild, for example, when planted as an ornamental plant in gardens followed by improper disposal of green waste. However, the planting and spread of invasive neophytes is prohibited by law (§40 of the Federal Nature Conservation Act, BNatSchG). Property owners are responsible for removing invasive species and/or must allow measures to control them. High fines are possible!

Negative Impacts

Within the project area of Patches & Corridors, Himalayan balsam (*Impatiens glandulifera*), a species native to northern India and introduced to Europe as an ornamental plant in the 19th century, has spread rapidly. It forms dense, large-scale stands, especially along riverbanks and in adjacent fallow meadows. Sunny locations with moist, nutrient-rich soils are ideal for its

growth. The plant grows very quickly and tall, forming dense stands. Other species are suppressed due to heavy shading and strong competition for nutrients and water. Native plants such as meadowsweet, stinging nettle, or bistort may disappear locally. As a result, specialized herbivores that depend on these plants find little or no food available. This may also affect the caterpillar of the violet copper butterfly.

Project Work

The Himalayan balsam was removed from the project area primarily by manually pulling out individual plants, including their roots. In areas with more extensive stands, brush cutters or scythes were used. The removal of Himalayan balsam took place in the valleys and side valleys of the Belgenbach, Kluckbach, Holderbach, and Tiefenbach (the latter only partially) between July and September. Each year, three work phases were required, scheduled at intervals of four to six weeks. All plants were bagged, collected in containers, and disposed of at a waste incineration plant at the end of the season.

Monschau / Roetgen pucks

We received voluntary support from the youth football team of JFV Monschau, hunters from the Monschau hunting association, and young people from the organization Jugendaktiv Simmerath. In cooperation with the City of Monschau and the Lower Nature Conservation Authority of the StädteRegion Aachen, the participatory campaign “Monschau rupft” (Monschau plucks) has also been taking place since 2020, in which volunteers take part in the control efforts. Inspired by this, a similar initiative was launched in the municipality of Roetgen in 2022, which has proven successful to date under the name “Roetgen rupft.”

[Nature guide - hiking through the project area](#)

The compilation of this nature guide was inspired by a small booklet from a series of publications entitled “Butterfly Walks“, which was on display at a conference of butterfly experts in the UK. With little effort, but with loving attention to detail, the book outlines walks that guide butterfly enthusiasts to the places where they can find specific butterfly species.

This addresses a problem that affects every nature lover who finds themselves in an unfamiliar area: you know that there are interesting plants and animals to see. However, it is often unclear exactly where can find them.

The tours described here are designed in such a way that they are also “butterfly walks“. The violet copper (*Lycaena helle*) takes centre stage, as it is the flagship species of our “Patches & Corridors“ LIFE project. It is also the region’s special butterfly attraction. But other, no less beautiful or equally rare butterfly species are also mentioned here.

But this is not just about butterfly walks, as flora and fauna highlights can be found at all levels of the animal and plant world. The nature conservation measures carried out as part of the LIFE project are aimed at many different species in the North Eifel. A butterfly cannot exist independently of its environment, i.e. without the other members of the natural communities in the woodland and meadows. For this reason, we also refer to other special species and to our measures aimed at preserving and restoring their habitats.

Where to obtain the hiking guide

The printed hiking guide is available in four languages. It can be obtained from the tourist offices in Monschau, Simmerath and Roetgen, at the National Park gates in Rurberg and Höfen, and at the National Park information point in Einruhr.

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