

# lifeaislek

RESTORATION OF WETLANDS  
AND ASSOCIATED ENDANGERED SPECIES

2012-2017





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AND ASSOCIATED ENDANGERED SPECIES  
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Natura 2000 is a network of nature reserves in Europe and the largest coordinated network of protected areas in the world. The Habitats and Birds directives list the most valuable species and habitats in the European Union, for which the network was declared. The philosophy behind the networks is the sustainable use of and recreation in nature and not the exclusion of human activity.

In Luxembourg, 706 km<sup>2</sup> were designated as Natura 2000 sites, 37.3% of the surface of Luxembourg is thus protected at the moment.

Life Nature is a financial tool to support innovative projects within Natura 2000 areas. It is a vital conservation tool to preserve biodiversity in the European Union. The Life projects do not only implement practical conservation measures but also elaborate new methods, which are shared among European conservation organisations to facilitate implementation of strategies.

The Life Eislek project is active in 11 Natura 2000 areas in the North of Luxembourg, 2 Bird areas and 9 Habitat areas. The aim of the project is to restore the traditional mosaic of habitats, composed of wet fallow land, extensive pastures and hay meadows with delayed cutting regimes. With this aim in mind, natur&ëmwelt has worked relentlessly for the past 5 years.

*PROJECT ID*

**LIFE11 NAT/LU/858**

*Duration: 2012-2017*

*Location: Luxembourg Ardennes*

*Budget: 1,766,775€*

*Funding: 50% EU, 38% MDDI, 12% contribution of beneficiaries*

*Beneficiaries: natur&ëmwelt Fondation Hëllef fir d'Natur,*

*natur&ëmwelt asbl, CNDS Natuuraarbechten*

*For more information: [www.life-eislek.eu](http://www.life-eislek.eu)*



# A BIT OF HISTORY

## *Why do we need a LIFE Project?*



*Traditional land use :  
collecting hay and animal traction  
(c) ANLux, Erny Schmit*

## Cultural history of the Eislek region

The upper North Region of Luxembourg is called "Eislek" and is part of the Ardenne mountain region, an old transboundary rock massif stretching from France through Belgium and Luxembourg to Germany. It is characterised by a landscape of high plateau culminating at 560 meters of altitude and a network of small rivers, which form wetland-plains on the plateau and typical steep-sided valleys as their distance to the plateau increases.

A soil of poor chemical quality and an impermeable bedrock has limited human activity in this region to small sized subsistence agriculture. In the Middle Ages, human dwellings consisted of small and poor human settlements. In the periphery were orchards, only few fields and manually managed wetlands. Further from the settlements were either vast forests or large surfaces of heathen grazed by itinerating flocks of sheep.

The first massive change came after 1850, as a consequence of the industrial revolution. A network of railways facilitated transport and thus opened the region to other countries. The modernisation of agriculture (metal tools, use of draft horses, liming, pasteurisation, barbed wires..), and the subsidised use of phosphorus fertiliser allowed a progressive extension of crop fields and pastures. Wetlands were still managed manually, though intensification occurred through the multiplication of water channels. The lesser fertile parcels were planted with spruces.

The diversified landscape, which subsisted through agropastoral traditions, maintained a rich diversity of habitats, including marches, pastures, meadows, orchards amidst meadows and fields, up to the Second World War.



*Intensification of agriculture :  
Massive manure spreading close to the wetland,  
and absence of a buffer zone*

## Reasons for a Life project

In the post-industrial period after the Second World War, the generalised use of tractors and heavy machines, chemical fertilizers and pesticides progressively brought important transformations to the region, essentially in the last decades of the 20th century.

Most semi-natural habitats have been abandoned or were transformed, wetlands have been drained, rivers have been channelled, agricultural use of wetlands has been intensified or wetlands were transformed into spruce plantations and the structural elements of the landscapes have disappeared due to the consolidation of farmland.

These radical transformations resulted in a uniform and banal landscape and entailed a dramatic loss of wetlands and its associated species.

Thus, the main aim of the LIFE EISLEK project is the restoration of a mosaic of wetland habitats, consisting of alternating patches of extensive pastures, lately managed wet meadows with a large diversity of species and abandoned grasslands with a large number of structural elements, like small patches of shrubs and hedges. In an ideal environment, these habitats will cover each a third of the surface (1/3 meadows, 1/3 pastures, 1/3 abandoned land).

## TARGET SPECIES

*provide a measure for the project's impact on biodiversity*



### *Lycaena helle* Violet copper

Like most glacial relict species, the violet copper has a montane range. In Luxembourg, it occurs only in the Eislek, the Luxembourgish Ardennes in the North of the country.

Although, the butterfly is of very small size, its violet shimmering wings are rather conspicuous.

The occurrence of the butterfly species is tightly linked to its only larval

food plant, the common bistort, which occurs in extensively managed wetlands. The adults additionally require protection from wind, usually through structures such as hedges and trees.

The violet copper is considered to be an umbrella species of the Eislek's wetlands. While protecting the violet copper, we simultaneously protect other typical species of this habitat.

Photo © Mario Cordella



### *Lanius collurio* Red-backed shrike

This bird of the shrike family breeds in Europe and winters in tropical Africa. In the Eislek region, it sets up its territories close to fallow land or recent clear-cuttings rich in insects and other prey species (including small birds, frogs and rodents). It requires elevated perches from where it can spy and hunt its prey. It impales its prey on

barbed wire, thus its nickname "butcher bird".

The typical habitat consists of extensive meadows rich in hedges and shrubs. Thus it is a typical species of our targeted landscape of extensive pastures, late mown meadows and fallow areas.

### *Saxicola rubetra* Whinchat

Even though no longer breeding in Luxembourg, the whinchat is still present in neighbouring countries at a reachable distance. The migratory bird passes through Luxembourg on its way from Europe to Africa and we're still hoping it will settle again in the Eislek region. We manage the last breeding spots of the whinchat according to its requirements.

It is a ground breeding bird and therefore vulnerable to modern agricultural

practices. It favours open habitats with low vegetation and some perching points. Therefore it is dependent on cultivated land but with early mowing dates, it cannot breed successfully.



Photo © Raymond Gloden



# Implementation of restorative management

for biodiversity in  
the project area



# Initial care on fallow land



## Natural succession seizes abandoned land

One of the most prominent reasons for the decline of wetlands is urbanisation and the change in agricultural practices since the industrialisation. However, access to the valleys in the Luxembourgish Ardennes is often difficult and management of wetlands is not profitable as modern agricultural machinery cannot be employed. Wet parcels often lie fallow as a consequence and

habitat of the target species is lost due to natural succession processes. In the beginning of these processes, abandoned land might be beneficial for the target species but with advancement of the scrubs, the loss of light will hinder the less competitive plant species to get established and open habitat is lost.

## Management is adapted to the site's initial state

Small sites with deteriorated plant communities were mown manually while large areas were mown with specialised low ground pressure-machinery. The hay was exported from the sites to remove nutrients that were either leached from surrounding agricultural land or have accumulated from rotting vegetation over the years. Sites that were in a more progressed succession state were milled, usually followed by mowing in the successional year to extract the additional nutrients.



Each year, only a third of a site was treated. Even though the sites were mown late in the season, preferentially in september, insects hiding in the undergrowth can still be affected. By treating only a third of a site, two thirds are left as a refuge for the caterpillars of the violet copper as well as other species.

Monitoring showed that treated sites were readily accepted by our target species as well as other rare plants, insects and birds. Shorebirds and meadow pipit profited from wetlands that were recently milled as open water spaces appeared and the peewit was breeding in the Luxembourgish Ardennes for the first time since 20 years at a site that was recently mown with the converted Pistenbully.



## Creation of access to nature reserves for adapted management

Another, more unusual measure in nature conservation, was implemented in the Life Eislek project: the creation of accesses to nature reserves. At some sites, mowing was only possible in very dry years as trenches or small temporary streams had to be crossed. To al-

low facilitated management of nature reserves, accesses were improved by creating fords or by using gravel to stabilise the underground.





# Hydrological restoration of drained areas

## The aquatic landscape was modified to maximise profits on agricultural land

In Luxembourg, wetlands have regressed by 80% between 1962 and 1999. As a consequence, 45% of species linked to this habitat are threatened. We chose our three target species to represent those species. As a

consequence to the mechanisation of agriculture in the 20th century, the landscape was modified to meet the requirements of the new machinery. In this context, wetlands have been drained and/or backfilled to allow facilitated

management. Floodplains got disconnected from the rivers as water courses were straightened for a fast evacuation of the water. The deepened river bed furthermore acted as a draining mechanism on the surrounding area.



## Remeandration recreates aquatic habitats

Several actions of the Life project were meant to counteract the landscape modifications carried out on water-related ecosystems. The remeandration of a watercourse can be induced by

simple measures such as the introduction of dead wood into the river bed. However, if the river bed erosion is too pronounced, simple measures are not able to raise the water level sufficient-

ly to reconnect the floodplain to the waterbody. In that case a pre-profiling of the new elongated and meandering water course is necessary.

## The theory was put into practice on the Trëtterbaach

The team of the Life project was able to purchase a large complex of land in the valley of the Trëtterbaach. Here, the stream has been straightened prior to the first land register, so before 1824. The profiling of the new meanders was carefully planned and inspired by a section upstream that is still in its natural

state. Even though the new river bed was predetermined by a digger, it is not supposed to remain static. The river will restore its own dynamic and form its course accordingly.

Besides the improvement of the natural processes with reduced velocity,

reactivation of the floodplain and diversification of habitats (=increased biodiversity), remeandration projects also deliver several services such as improved water quality through filtration processes and retention of water having an impact on flooding downstream.

## Backfilling of drainage systems recreates wetlands with open water surfaces

Restoration of wetlands was also induced by backfilling of a drainage system. A wet pasture was drained by a herringbone drainage system in order

to plant spruce trees in the late 50ies. To recover enough soil to fill up the trenches at their deepest points and to cut their connection to the stream, ponds

were laid out onsite. The ponds and the open water surfaces that formed at the filled trenches provide additional habitats to dragonflies and amphibians.

# Restoration of valleys planted with coniferous woods

## Planting spruces was a commercial measure

Spruce plantations have been introduced in the 19th century for commercial purposes. The valleys of the Luxembourgish Ardennes, often difficult to access and exploit efficiently, were planted with coniferous woods to generate profit from the land. The choice was generally on spruces as they grow fast and do not have many require-

ments, though they were not adapted to the humid locations in the valleys. The trees did not grow well in the waterlogged soils and turned out to be a costly investment. The roots do not extend very deep, even more so in the gleyed soils; the consequence is windthrow. Most plantations are not well maintained nowadays.



## Spruce plantations were a major reason for biodiversity decline

The plantations were costly to the environment as well and are considered as one of the main reasons for the disappearance of species adapted to the valleys of the Eislek region. Spruces have an impact on several parameters of their environment, they acidify the soils and change the microclimate,

thus they provide a habitat to hardly any species. They are generally planted densely, hardly any light reaches the ground and only little undergrowth can develop. Streams with reduced light penetration do not harbour phytoplankton, the primary producer in aquatic habitats. The trees provide no

food either as needles are not a suitable food source to most aquatic larvae. Plantations form a barrier for wetland species such as butterflies and dragonflies. The impact on tourism in an area with many walking trails should not be neglected either.

## Coniferous forests were removed and an extensive management established

In the Life project coniferous woods in wet stations were reconverted into the historically known open habitats. These were added to the existing grazing scheme of the itinerant shepherd or other farmers who collaborate in nature conservation. After the felling of the trees (the wood was sold to foresters), the remaining dead wood was exported from the sites to prevent eutrophication of the soils. In most cases, the stumps were milled to provide the possibility to mow the sites every few years to prevent scrub encroachment.



In the first year, clear-felled and/or milled sites can have an adverse effect on the public. Revisiting the site only one year later exhibits the growth of new plants, in the years to follow the number of specialised species is steadily growing. Sites that were cleared at the beginning of the project impress now with a diversity of highly adapted species.

# Restoration of bistort and other species-rich meadows



## Rhizome transplantation is an effective method to restore bistort meadows

To get a fast response to restoration measures, the colonisation by desired plant species can be accelerated. As one of our target species, the violet copper, is highly dependent on its host plant, the common bistort, this species was the primary target for recolonisation in this project. Spring (March, April) is the best time for rhizome

transplantations. An experimental set-up provided additional information on the density and requirements concerning moisture level of the soil. A density of about 7 pieces of rhizomes of the size of a fist/m<sup>2</sup> at a distance from the stream where the soil is not waterlogged provided the best results.



## The bistort does not seem to rely much on its seeds for propagation

Since rhizome transplantation is a method that is rather labour intensive, experiments were conducted to elaborate a method of collection and sowing of seeds. Despite many efforts including analysis of the soil quality of target sites, genetic

analysis of source populations, germination tests in petri dishes with different overwintering conditions, a successful method could not be elaborated. It seems that bistort spreads primarily by rhizome propagation rather than seeding.



## Hay from species-rich meadows is used to inoculate restoration sites

The process of the reconversion of an acre into grassland was accelerated with hay from a species-rich meadow. The donor parcel, at a distance of only 300m to the acre, was mown with a cutter bar, the hay was loaded and transported to the acre where it was spread manually. A tedder turned the hay three times before it was pressed to round bales and evacuated.

Monitoring of the site in subsequent years revealed positive results, almost all the species present in the donor parcel were found on the restored acre if only in small numbers. However, restoration is a slow process and it will take longer than the duration of the project for the parcel to become a species-rich meadow.

## Hedges provide a habitat and refuge for many species

Hedges were planted on the perimeters of the restored meadows to provide wind protection (especially for the violet copper) and perching sites (primarily for the red-backed shrike). Furthermore, hedges build a barrier to surround-

ing intensive agricultural fields and they may act as migration corridors and refuges for a whole variety of species.

# Construction of infrastructure and supervision of grazing management



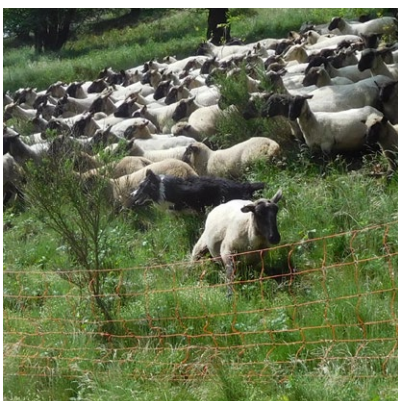
*A barn was constructed on the winter pasture of the Galloway herd grazing on 10 hectares of nature reserves. To improve the mobility of the herd, a new livestock carrier was purchased.*

*13 kilometers of new pasture fences were set up during the project to create fallow strips along the waterways and to limit the impact of grazing.*



*On the site of Léresmillen, the Trërterbaach river was fenced off on a length of 250 meters of an intensively used pasture, a solar-powered drinking trough was installed to provide the cattle with water.*

*2 flocks of sheep itinerate on 80 hectares of nature reserves, their impact is closely monitored and consequently adapted throughout the season.*



*LIFE EISLEK worked in collaboration with the last remaining itinerant shepherd to re-adapt his grazing itinerary to the aims of the project.*

*The lease-contracts to farmers were re-adapted to the target species specifications.*



# Sensibilisation of farmers and general public

People can only judge the utility, necessity and impacts of different management practices when they are provided with the necessary information without being inflicted with a certain way of thinking.

## Farmers were informed about alternate management options

A workshop with the Bourguignons, the famous founding couple of the “Laboratoire d’analyse microbiologique des sols” informed local farmers about soil quality and the role of microorganisms in maintaining healthy soils. They analysed the soil structure of two parcels managed by an organic and a conventional farmer respectively to visualise their theories. Other themes treated at information events were the use

of pesticides and how to reduce their negative effects, erosion risk zones and erosion avoiding techniques, as well as the benefits of biodiversity contracts. Two potential national protection areas “Am Dall” and “Sporbaach” were presented at meetings and on field visits in collaboration with the ministry, administrations, farmers, hunters and the community.



## Sharing information with the general public increases acceptance

The public was not only informed about the project with articles, flyers, signs and a web site. People were able to experience nature protection measures up close at “chantiers natures” where they worked manually in a nature reserves to clear scrubs, plant trees or evacuate hay. The sheep walking tours, that were accompanied

by the project’s staff to inform about the role of sheep in the project, were a special experience that evoked great excitement. The butterfly determination course was met with great enthusiasm as well and will hopefully provide volunteers that help track the state of the Luxembourgish butterfly populations.



## A walking trail is installed at Léresmillen to inform about the measures implemented in the Life project

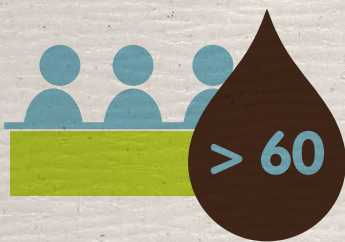
“Léresmillen” is the only site in the project area with habitats and presence of all three target species (the whinchat only during migration so far) where almost all the measures are represented. Therefore the project can be well represented on this trail with several information boards.



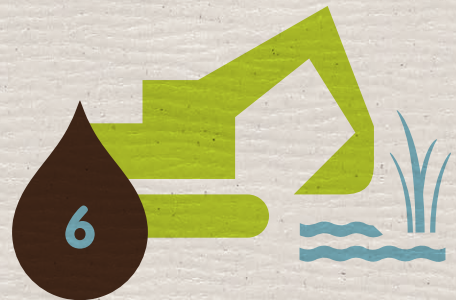
# Life Eislek in Numbers



Pasture fences were set up



Participations at seminars/ exchanges with experts



Ponds excavated



Meadows were planted with bistort



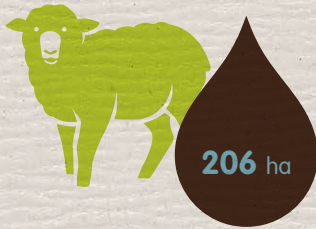
Hedges and trees were planted



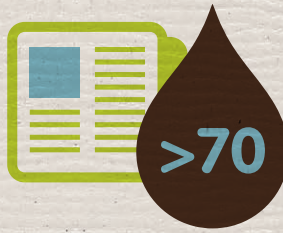
Land was purchased or leased (secured on the long term)



Sheep walks and other guided tours accompanied



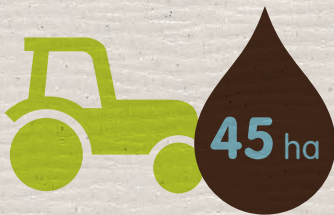
Leased to  
38 managers



Articles  
published



Land have  
been  
ecologically  
restored



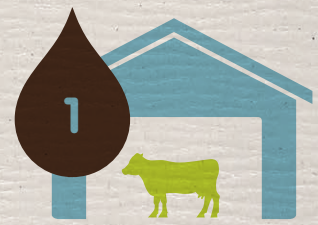
Maintenance  
of fallow land



Shrub removal



Coniferous forests near  
rivers were reconverted  
into meadows



Cattle shed build



Walking  
trail installed

Budget:  
€ 1.7m

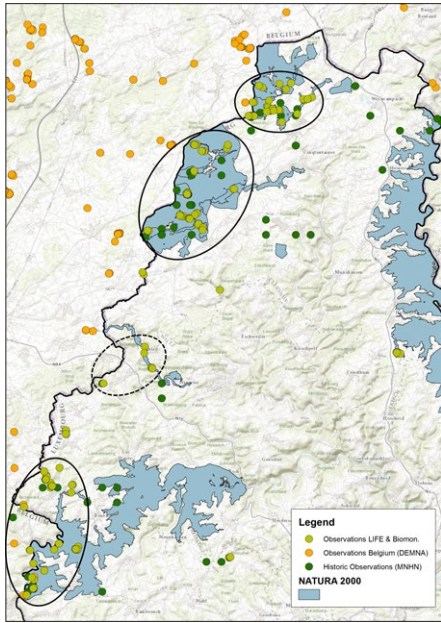


Drains were closed



Additional  
financial  
mobilisation

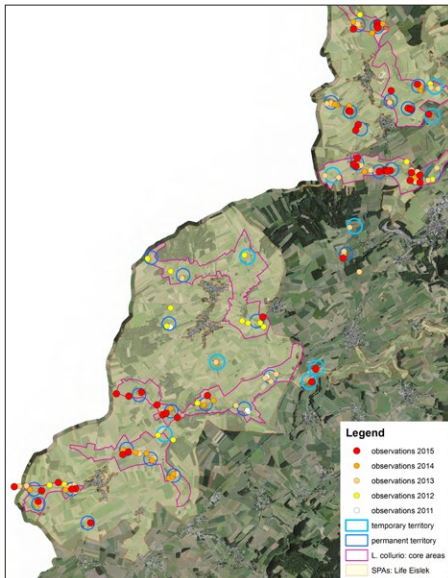
# MONITORING



## *Lycaena helle* Violet copper

Despite scientific research that was conducted since the 1980's, a systematic monitoring of this highly endangered species only started with the beginning of the Life project. Many new sites were discovered within the three hotspots Troisvierges, Wincrange and Sure, that were known from an analysis of historical data. A comparison between the historic data and the new observations shows the regression of the most eastern and isolated populations, suggesting a decline on the national level. Additionally, only very few individuals were recorded per

site, many sites are small, in bad shape and lack corridors for migration. The knowledge gained from these observations allowed to develop a protection plan for this species.

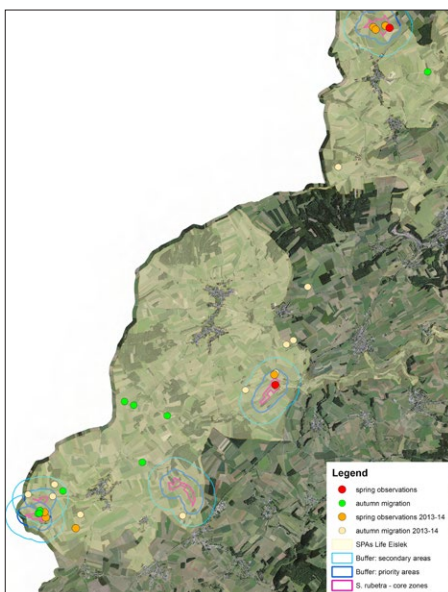


## *Lanius collurio* Red-backed shrike

The two bird directive areas Wincrange and Troisvierges were monitored systematically between mid-May and mid-June for the presence and behaviour of red-backed shrikes.

conditions each year. Many measures of the Life project proved successful by the presence of new territories of this target species, so that we are confident that the project contributed to an increase in the number of shrike territories.

In the project area, the territories are limited to the more extensively used valleys and slopes of rivers and streams rather than the intensively managed arable land on the plateaus. In the two bird protection areas, 30 - 40 territories are occupied, fluctuating with



## *Saxicola rubetra* Whinchat

Sites with observations of whinchats between the 15th May and 30th June were monitored on a regular basis to determine whether or not they were used as breeding sites. As there have been no recorded breedings or occupied territories, despite extensive efforts during the 5 year project, the whinchat is still considered as extinct as a breeding bird in Luxembourg since 2010. Many of the birds that were observed during either the spring or autumn migration were recorded in areas that are known to be former strongholds of the species, and have been ear-

marked for substantial restoration work in order to improve their suitability for whinchats specifically, particularly so in the context of recent population recovery and expansion of whinchat populations in eastern Belgium.



# PARTNERS helped us to achieve the desired results

Project coordinator:

**natur&ëmwelt Fondation Hëllef fir d’Natur**  
[www.naturemwelt.lu](http://www.naturemwelt.lu)

The foundation purchases and manages nature reserves. natur&ëmwelt Fondation Hëllef fir d’Natur is the most important NGO advocating for nature protection in Luxembourg. Its main missions are the purchase, maintenance and restoration of areas worthy of protection as well as the information and sensibilisation of the public on nature protection and biodiversity. The foundation executes numerous measures of the objectives of the “Plan National pour la Protection de la Nature”. Its team also participates at the elaboration of scientific studies concerning the protection of fauna and flo-



ra and works on several national, interregional and european projects.

The foundation coordinated the implementation of the project’s objectives.

The foundation provides the manpower for the administrative tasks as well as the coordination of the practical implementation of the objectives formulated in the project’s grant agreement.

Associated beneficiary:

**natur&ëmwelt asbl**  
[www.naturemwelt.lu](http://www.naturemwelt.lu)

The centrale ornithologique of natur&ëmwelt asbl is responsible for the survey and conservation of bird populations in Luxembourg.

The Centrale ornithologique is part of natur&ëmwelt asbl, founded in 1920 as the “Lëtzebuenger Natur- a Vulleschutzliga” primarily to protect the birds and their habitats. It is bound to the “Ministère du Développement Durable et des Infrastructures” by a convention. Its main mission is to preside the two working groups field ornithology and bird ringing. By these means, it coordinates several national programs including the Common Bird Monitoring, the Rare Bird



Breeding Survey and the International Waterbird Census or area-specific research.

The main role of natur&ëmwelt asbl in the project was the coordination of the monitoring of the target species.

Considering its competences in monitoring programs, the Centrale ornithologique was responsible to set up and accompany the monitoring efforts of the three target species as well as a more general monitoring of bird species on restored sites. Another important task was the assistance in public relations.

Associated beneficiary:

**CNDS Naturaarbechten**  
[www.cnds.lu/naturaarbechten](http://www.cnds.lu/naturaarbechten)

CNDS Naturaarbechten supports disadvantaged people suffering from long-term unemployment.

The “Comité National de Défense Sociale asbl” was founded in 1967 to support the reintegration of disadvantaged people through wide-range assistance such as support for family, professional, psychological or physical problems as well as advice in terms of accommodation, work, education and employment. The structure “Naturaarbechten” of CNDS aims to provide work through management of nature reserves. It combines social engagement with Luxembourg’s obligations



in relation to the conservation of biodiversity. The main goal is to re-integrate the target group into the private sector by providing the means to acquire skills that are transferable to other domains. CNDS was responsible for the practical implementation of many of the concrete actions. CNDS Naturaarbechten employed two foremen to supervise a group of disadvantaged people in the implementation of the objectives of the Life project. CNDS was involved in mowing and clearing fallow land, planting hedges and trees, restoring bistort meadows and building fences. Their autonomous way of working and knowledge of the area was an invaluable asset to the project.

## Team natur&ëmwelt



Mikis Bastian



Michelle Clemens



Patricia Heinen



Mireille Molitor



Claude Schiltz

## Team CNDS Naturaarbechten



### Beneficiaries:



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### Financial support by:



Gemeinde Wintrange



### Methodological partners:



**Phillippe Luty,**

*Administration de la Gestion de l'Eau, Division de l'hydrologie – Service régional Nord*

"Even if the Life project comes to an end, it is surely the beginning of many more river restoration projects such as that at Léresmillen."

**Sebastien Den Doncker,**

*Stream and River Consult*

"A stream needs freedom to assure its functions and provide ecosystem services."

**Xavier Mestdagh,**

*Luxembourg Institute of Science and Technology*

"Thanks to the many surveys conducted during the Life Eislek project, the knowledge on the distribution of the violet copper in Luxembourg is now more complete than ever before. This permits to adapt the restoration actions objectively to reinforce the core populations as well as ameliorate their connectivity. The management methods that were adapted during the project are a key element concerning the violet copper's, as well as associated species', future in Luxembourg. Even after the project comes to an end, the network of observers that was formed will continue to evaluate the success of the actions, and this in collaboration with the national monitoring of biodiversity."

**Florian Weber,**

*nomadic shepherd*

"As nomadic shepherds, it was a pleasure to be part of the Life Eislek project. With the implementation of numerous measures in difficultly accessible sites, the working conditions for man and animal were greatly improved, a circumstance that will not least benefit nature conservation."

**Joe Hosinger,**

*local farmer*

"I experienced a good collaboration with the project's team and am impressed with the many actions that were implemented in a short time."

**Pit Bertemes,**

*teacher and part-time farmer*

"Life projects have contributed to build up trust on the small scale between conservationists and me as a farmer. The copper project is now a new challenge we face. We don't know many things, we need to learn and make mistakes, but in a dialog and with compromises, hopefully everyone involved will benefit."



During 5 years Life Eislek, **a total of 150 ha wetlands were managed** in the Eislek region.