



Restoration of the heathlands and mires of the High Fens plateau 2007-2012

LIFE Nature Project



Wallonie



NATURA 2000



SPW
Service public de Wallonie



Parc naturel Hautes Fagnes - Eifel



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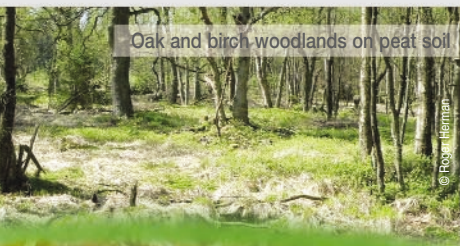
Agriculture exploitation of the High Fens : centuries old human practices

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HISTORY

The notion that the High Fens is an environment at its natural state is completely wrong. Just like almost all European landscapes, the High Fens have been modelled throughout the ages by various forms of human exploitation.

Originally, natural woods occupied the vast majority of the High Fens plateau surface (except for 2.000 ha of mires). These woods were gradually transformed into a heath landscape due to agricultural and pastoral practices: **grazing, peat extraction, harvesting mulch for the stables, cultivation, tree cutting, ...**



From the Middle Ages up to the beginning of the 19th century: exploitation through agricultural and pastoral practices



Grazing at the High Fens dates back at least to the end of the Middle Ages. Herds came from the villages located near the high plateau and grazed here all together, for better or for worse. In spite of the vast area, the High Fens heathlands space was disputed between herds. **Grazing** had a considerable impact on the landscape: it prevented regeneration of woods (as the animals trampled the soil and fed on small plants). In this way, grazing contributed to maintaining the heath landscape all the way up to

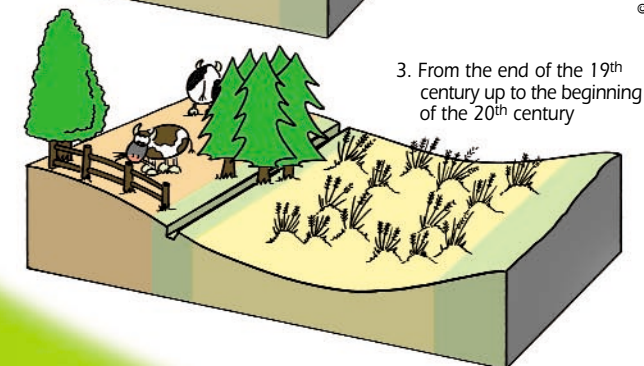
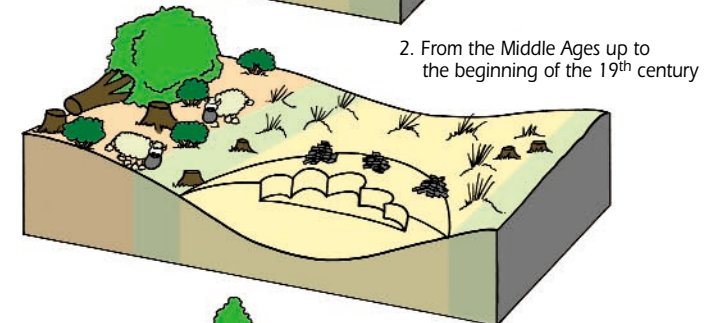
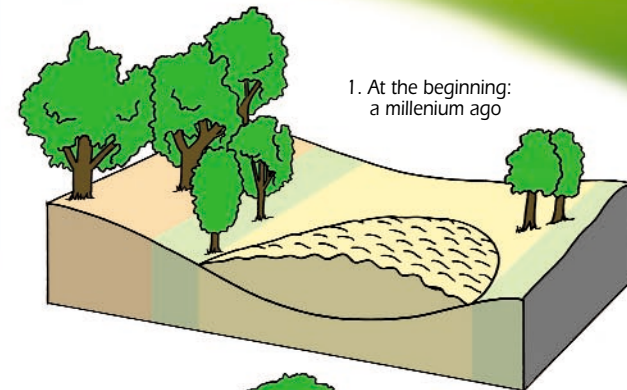


the beginning of the 20th century. **Mowing** certain plants, such as ling, was practiced in order to have mulch reserve for the livestock. Finally, we should not forget the numerous other forms of exploitation illustrating the inventiveness of man in extracting some of his needed resources from his direct environment: fire agriculture, wood coaling, bilberry picking, apiculture, ...

But how come people exploited this environment?

We know that most of the High Fens villages existed at the end of the Middle Ages. Their population exploited these difficult lands with poor yield, so the balance between needs and resources was fragile. Hence, in former days, the fen was needed to support the survival of village communities.

If there is one form of former exploitation that is still well known today, this definitely is the peat exploitation as a means for heating. Testimonies of this activity date back as far as the end of the Middle Ages. This malodorous combustible, causing lots of smoke and with a calorific value much lower than coal, was probably adapted by the local population as a result of the lack of wooded areas.



Agriculture exploitation of the High Fens : centuries old human practices

From the end of the 19th century until the beginning of the 20th century: the introduction of spruce changes the landscape once more

The 19th century introduced another way to exploit the High Fens: a massive spruce plantation was started. However, these conifer forests, that have become common place today, did not grow naturally in Belgium! These woods lay at the origin of the last important landscape modification caused by man.

In the Ardennes, on soils suitable to its growth (dry ground), spruces are still an important economical resource for the region today.

On the other hand, on peat soils, which are very wet and acidic, its growth is far less fruitful. On these soils, systematic cultivation required digging a vast **network of drains**, needed to dry the parcels and in this way create more favourable conditions for growing these trees. Unfortunately, these drains contributed to degrading the mires by cutting off the water necessary for their development, without even resulting in a sufficiently lucrative forestry production.

Today, even though the spruce has gradually been eradicated from the nature reserve, the future of these peatbogs still remains compromised.

Compared to the initial 2,000 hectares of peatbogs, about 125 hectares are still considered to be active. The rest of the area is very often completely invaded by a graminaceous plant, the purple moor-grass (*Molinia caerulea*). Its development is favoured by draining and burning, as well as atmospheric nitrogen pollution.

Exploitation of the High Fens waters

During the 19th and 20th centuries the exploitation of the High Fens waters took on industrial proportions. **Dams** capable of holding millions of cubic meters of water were built. From the middle of the 19th century onwards, the textile industry in Verviers demanded and obtained the construction of the dam on the Gileppe River, built between 1867 and 1875.

During the same period, the **development of tourism**, the latest form of High Fens exploitation, began; today this activity has more importance than ever before.



Spruce plantation



Digging of drains



Boloria Aquilonaris

Why is the protection and restoration of the High Fens environment important today?

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TARGETS

1. A rare natural heritage, a threatened biodiversity

With its highest point at 694 meters, the High Fens plateau has a much tougher climate compared to anywhere else in Belgium. The cold and rainy conditions allowed the development of rare threatened environments that are protected at the European level.

Numerous species directly depend on these restored poor habitats.

The High Fens, for instance, hosts the last population of **black grouse** living in Belgium, a population that is actually significantly reduced and threatened.

Other species strictly linked to mire and heathland plants life conditions are also threatened: the cowberry fritillary (*Boloria aquilonaris*), the European stonechat (*Saxicola rubicola*), the nightjar (*Caprimulgus Europaeus*), etc.



2. Global climatic importance (carbon sinks)

In natural functioning conditions, peatbogs are considered to be great carbon sinks. As a matter of fact, they can store up to ten times more CO₂ compared to mineral soils. On the other hand, exploitation and draining of peatbogs modify the carbon balance and the degraded peatbogs release more CO₂ in the atmosphere. In the long-term rewetting of degraded peatbogs implies the reduction of greenhouse gas emissions, such as CO₂



Why is the protection and restoration of the High Fens environnement important today?

TARGETS

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3. Landscapes that testify former human activities

The High Fens landscapes represent an open-air testimony and an education source for future generations. First of all, there is the heritage of small monuments. Numerous boundary markers remind of the past frontier zone of the High Fens; crosses testify to tragic traffic accidents or murders. Last but not least, there are also the three High Fens pillars, rare reminders of road signs from our ancestors. Other traces, less evident but yet present all over the area, testify of human activity: tracks of former roads, old peat exploitation pits, drain networks, etc. As illustrated before, the heathland landscape is the result of the century's old extensive agricultural and pastoral practices.

The peatbogs also have an archive function. This wet, acidic environment with few microorganisms does not completely decompose organic materials (plants, animals). Sampling in the thick peat layers reveals the remains of dead plants (especially: pollens). They are the remains of the various High Fens landscapes that successively emerged during the last 12,000 years. In the same way, due to the typical characteristics of mires of inhibiting decomposition, one of the most remarkable road remains of Belgium is preserved buried underneath the peat layers: the cobbled pavement of Charlemagne (Road of Charles the Great).

4. An educational tourist attraction

Today tourism has become one of the most important factors for economical development in the area surrounding the High Fens plateau. Every year, approximately 200,000 tourists visit this area! They all have various motivations: relaxing, special interest in nature, sports,... The challenge for the tourist sector is double. On the one hand, they need to welcome this substantial number of visitors, making sure that the impact on the High Fens ecosystem is minimized. And on the other hand, they must take advantage of this exceptional

framework to prove the importance of preserving our environment, both locally as well as on a global scale.



The cobbled pavement of Charlemagne

Restoring the mires and heathlands



Aware of the threats weighing on the fens, several protagonists, amongst others the scientists from the Walloon Public Service, the Liège University scientific Station, the DNF or volunteers (Amis de la Fagne, Sonnentau, Patrimoine Nature...), have been carrying out restoration actions on the high plateau for many decades.

In 2007, a new European project was launched: the "LIFE-Nature: High Fens" Project. The LIFE-Nature projects aim at restoring **natural habitats at the European level**. These projects are developed within the NATURA 2000 network. All over Europe, the NATURA 2000 zones were mapped out according to criteria of rarity and threatened biological importance, with the objective of providing them with improved protection. The various environments present in the High Fens comply with these criteria: **mires, heathlands, natural birch and oak woods, sphagnum birch woods and juniper bushes**.

The High Fens LIFE project is basically aimed at **restoring** the heathlands and mires (minimum 1400 hectares) within an action area of 10,000 ha. How? By reconvertng mainly peaty, degraded and drained soils, surfaces covered with purple moor-grass, or areas planted with spruces that are not economically rentable, into:

- peatbogs where peat is generated again,
- heathlands maintained by grazing or mowing,
- broadleaf forests (birch woods, oak woods, beech woods...) adapted to the ecological conditions of the environments.

The restoration will contribute to **enhance the appeal** to remarkable animal and plant species.

Grazing in the High Fens

Multiple skills at the service of nature

ACTORS

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During its 6 year term, 50 % of the High Fens LIFE project has been funded by the European Union, 49.9 % by the Walloon Public Service and 0.1% by the Nature Park High Fens-Eifel non-profit organisation. Its budget: 4.5 million Euros, which means approximately 1 Euro per taxpaying Walloon.

A team of four people is coordinating the project: planning, budget management, working site monitoring, sensitisation, scientific monitoring,... The team has been assisted through every-day close collaboration by 35 people from the **Walloon Region** (foresters, engineers, biologists) whose terrain knowledge and experience contributed to a smooth progression of the restoration works. Five forestry cantonments (**DNF**) were involved (and will be further involved, within the framework of the After-LIFE): Elsenborn, Eupen, Malmedy, Verviers and Spa. The works as such were carried out through qualified local **entrepreneurs** (85 local companies participated in the project).

Moreover, **private owners** largely participated in the project. For certain owners, this was an opportunity to capitalise on terrains with little economic rentability (less suitable for spruce cultivation) but with an ecological importance. The project gave them

the opportunity to prematurely deforest and/or to sell their parcels. All in all 95 families positively replied to our call, which represents a total of 296 hectares. On top of the revenues from their sale, an allowance was granted to compensate for the loss due to premature cutting. For areas with natural growth, a flat-rate allowance was also granted for their cutting. After being cut, these parcels were bought by the project and will become public nature reserves, or preserved by the owner and protected by a convention. In this way, it is possible to carry out restoration works as well as to elaborate a long term management plan in concert with the owner. As an example, we mention the following:

- **Fences** installed to protect natural regeneration of indigenous broadleaf trees;
- **Small groups of spruce trees** that will be left untouched to leave some refuge for the wild game;
- **Pools** and certain clogged drain ditches were created in order to diversify the landscape and the natural habitats;
- **Some zones were sod lifted** in order to free up space for heather, ling and bilberry.

These actions allowed the environment to partially regain its original ecological richness. Through this project, 144 hectares were purchased that will become nature reserves.

The four **municipalities** directly involved in the project, namely: Bütgenbach, Jalhay, Malmedy and Waimes, as well as two Church Councils (Hockai and Malmedy), all accepted to participate in the project by means of allowances. In total, 99 hectares of municipal plantations or natural spruce regenerations were cut and over 350 hectares of municipal fens were restored within the framework of the LIFE project. The money from the allowances has been reinvested in actions in favour of nature: building paths and installing educational information boards, planting trees fit for these soils, ... : back to nature!

We should also mention the actions taken in collaboration with the **nature preservation associations**

("Amis de la Fagnes", "Sonnentau", "Patrimoine Nature", "Haute Ardenne"), the trainees, the visiting schools, ...!

On various occasions, we received precious help from volunteers on several works. Cotton grass was replanted and Sphagnum-species were sown by the "Amis de la Fagnes" and "Sonnentau", in basins where the top layer was removed in much degraded peatbogs.

Cut cleaning tests were made by means of manual cutting

executed by a secondary school from Soignies.

Numerous volunteers also helped us with the scientific monitoring, assisted by a total of about twenty trainees: dragonflies, butterflies, amphibians, birds, plants, ants and mammals were inventoried during the right seasons.

Their help was essential in order to monitor the evolution of all restored areas.



Measures for restoring the heathlands and mires

1. Deforestation of spruce plantations that are not economically rentable

The major spruce blocks, especially in or near the public nature reserve of the High Fens, form **impenetrable barriers** for a large number of species. One of the main actions of the project was to cut these spruces on the peat soils that are less adapted for forestry and therefore provide low earnings. This way, the economically non profitable soils were given ecological value, and now, once again, host natural habitats and rare species. Forestry production has been preserved on good soils.

Some trees were preserved as perches and shelter for birds.

More than **960 hectares were deforested during the project** (cutting plantations and natural regeneration areas, meaning zones that were not planted), this represents 0.1% of the woods surface in Wallonia. A large part of these surfaces will reforest and become thinly sown natural broadleaved forest with a rich biodiversity. In this way, the required connections between the various fens can be established.

Hard circumstances

Within the LIFE project, forestry exploitation conditions were rather difficult. In fact, to avoid soil compacting or the creation of grooves in these very wet environments; the machines had to circulate on layers of branches or even on beds with trunks, and had to be equipped with twin wheels.

Another technique was used for all works executed with excavators: the machine used a set of two platforms, each measuring 4 by 5 meters, onto which the machine moved by altering between both, making it possible to reduce the pressure on the soil.



2. Favouring plant germination in the heathlands and mires to the detriment of the purple moor-grass



Underneath the moor-grass tussocks there are seeds of other species that cannot germ under this thick carpet where no light reaches. This is the case for heather and ling, for instance. To give these plants a chance, it is vital to **bring the surface to bare soil**. Several methods were applied: sod lifting (on 64 hectares) or milling (on 200 hectares) of the vegetation and of the surface layer of the soil. Repeated periodic mowing leads to similar results: 50 ha have been restored in this way.

Thanks to these works, typical plants of the heathlands and mires are re-colonizing the area and once again give the landscapes their original colours.

The results are quite impressive!



Measures for restoring the heathlands and mires

3. Favouring the natural forest

Originally, **broadleaved forests** (birch woods, oak woods, beech woods) covered the whole area of the High fens, except for the peatbogs. Today, these environments have become **rare** on the high plateau. However, the biodiversity of these natural broadleaved forests is far more important than the biodiversity in a monotone spruce plantation (except for old spruce plantations, aged 70-80 years, where the biodiversity increases). Redpoll, hazel grouse and wild cat are rare species that will be favoured by the development of these environments. These natural woods guarantee **better transit** between open areas and spruce plantations. For this effect, 125 hectares were temporarily fenced in order to protect young shoots against the great appetite of deer.

In various peat valleys of the "North-East Fens", grey alder (*Alnus incana*) was planted. This non-indigenous species was introduced more than 60 years ago to serve as fire cutting (limiting flame propagation thanks to its fire resistance).

Thanks to its remarkable environmental adaptation and its capacity to grow next to other broadleaf trees, the grey alder expanded far too abundant over the years and covers the space that is normally occupied by alder woods with black alders (*Alnus glutinosa*), rare indigenous habitat of great ecological importance at the Walloon territory scale. The deforestation and milling of 22 ha of grey alder within the LIFE project will prevent this species from growing back.

4. Installing a sustainable, integrated management of the heathlands through grazing

About 1,400 sheep and about thirty cows of rustic races gradually remodel 400 hectares of fens: at Wihonfagne, at Fagne des Deux-Séries, at Grande Fange and at Neuwald.

Today, scientific monitoring points out that grazing diminishes covering by purple moor-grass, favours the development of heathland and mire plants, and increases the floristic richness.



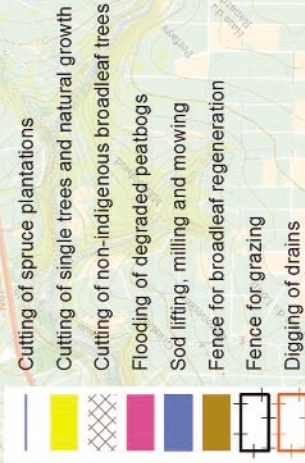
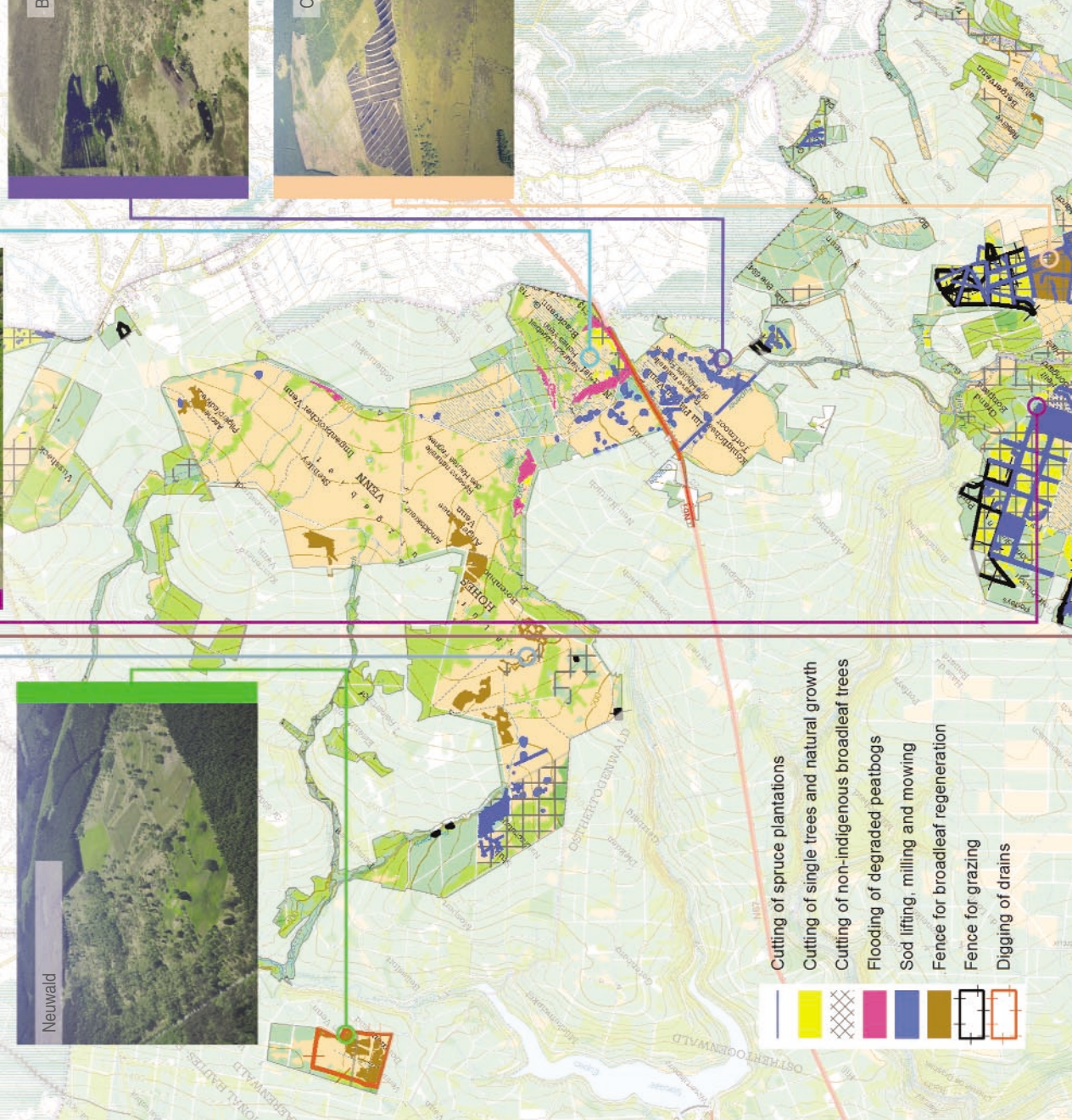
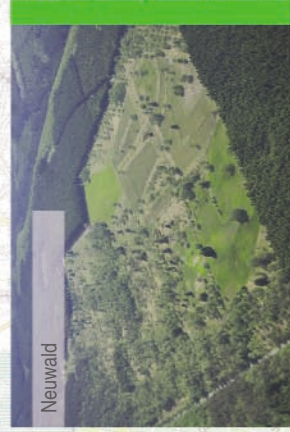
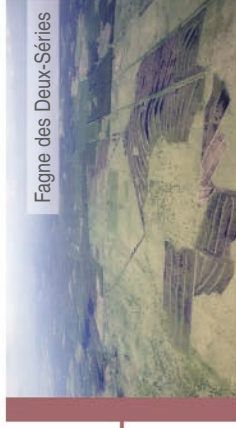
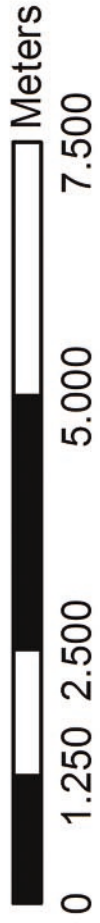
5. Rewetting the peatbogs

Digging drains causes peatbogs to dry out, as a consequence they no longer accumulate peat. In order to find suitable humidity conditions again, it is necessary to fill these drains and recreate flooded areas. Thus dams were built in certain places to hold back the water and further on depressions and basins were excavated accordingly. These generated shallow water areas will be gradually recolonised by Sphagnum-species and other plants of fens, transitional mires and peatbogs. This is a first step towards healthy peatbogs.

During the project, 210 km of drains were clogged. Moreover, according to estimates, more than 95 hectares are now shallow water areas once again (no deeper than 50 cm), more precisely by means of damming, top layer removing and drain filling.



Flooding near the Baraque Michel





Potales



Setal-Fraineu



Hockai



Grand Biseau



Eau rouge



Rour



Fagne Wallonne

Mission accomplished !

12 SOME NUMBERS DEFINING THE LIFE PROJECT

At the end of the project, the initial goals were reached and very often even greatly exceeded!

- **Restoration of 2800 hectares of heathlands and mires**, of which 1,300 ha were subject to "heavy" actions (sod lifting, milling, deforesting, ...) and 1,500 ha were restored in a less drastic way (cutting single trees, maintenance works, ...).
- **Purchase of 144 ha** of land belonging to private owners.
- **Relinquishing forestry speculation** on **289 ha** of private and municipal land (via thirty-year conventions), and on **337 ha** of public land.
- **Cutting spruces with economical importance** on **230 ha** of private and municipal land and on 322 ha of public land.
- **81 ha where spruces without economical importance grew were cut** (mainly by shredding).
- **480 ha of natural spruce growth** were cut.
- **Cleaning and restoration of cuts** on **481 ha**.
- **Cutting single trees** (sawed into pieces and left on the spot or ringed) on **1,546 ha**.
- 21 ha of non-indigenous broadleaf trees cut.
- **210 km** of drains were clogged at regular intervals.
- **Top layer removal** (about 30 cm deep) of degraded peatbogs on **8.5 ha**.
- **Flooding of 34 ha** of degraded peatbogs, through the construction of 8 km of dams.
- Restoration of **98 lithalsas** by closing breaches carried out at the dykes or through top layer removing
- **Sod lifting** (about 10 cm deep) of heathlands and mires on **64 ha**.
- **Milling** (about 5 cm deep) of heathlands and mires on **156 ha**.
- **Milling** around sub-intact peatbogs on **22 ha**.
- **371 ha** fenced for sheep and rustic breed cattle **grazing**.
- **125 ha** fenced off to facilitate **broadleaf regeneration** and to protect young shoots against the great appetite of deer.
- **Mowing** purple moor-grass and bracken to achieve growth control on **50 ha**.

In flooded areas Sphagnum-species grows back

Landscape of "Fagne wallonne" and "Fagne des Deux-Séries"



Dragonfly (*Aeschna juncea*)

Scientific monitoring, for what purpose?

During the LIFE project, numerous restoration techniques were applied to very large surfaces. The major part of these techniques had already been tested before the project, but on a far smaller scale, and the actions undertaken seemed to produce good results everywhere, in terms of restoration of the targeted habitats and extension of the plant and animal species population.

However, within the scope of the surfaces treated by the LIFE project, it is primordial to evaluate the biological impact of the various actions on vegetation and on very indicative animal groups (like avifauna, odonata, lepidopterans). Moreover, this scientific monitoring should be repeated on a long-term time schedule, in order to:

- validate the appropriateness of the actions undertaken in terms of habitat restoration,
- monitor the dynamics of the typical species in the various restored habitats,
- determine the impact of the restoration in terms of connectivity,
- identify the most performing management techniques.

And the outcome of all this?

botanic monitoring

vegetation surveys carried out in a standardised way and at regular time intervals, led to the conclusion that the actions undertaken have clearly had positive impact. Regression of the purple moor-grass is drastic in the restored environments; these areas are now gradually colonised by plant species that are typical for the targeted habitats, sometimes even in a spectacular way: Sphagnum-species (mosses typical in wet and peat environments), rushes,

sedges, deer-grass, cotton grass, heather, ling, bilberry and cowberry, depending on substrate wetness and peat layer thickness. The environments restored in this way evolved towards a natural peatbog vegetation type of fens, transitional mires, peaty heathlands or dry heathlands. Regeneration of rare species, such as round-leaved sundew (a small carnivore plant), as well as the reappearance of plants that had disappeared for many decades, such as marsh clubmoss (*Lycopodiella inundata*), which has been spotted in

certain areas: this is an encouraging conclusion anyhow!

Also, former poor, abandoned grasslands, managed by mowing, are no longer neglected! The mowed grasslands reveal a typical development of the flowering species: bistort and daffodil, and also various interesting herbaceous species (spignel, devil's bit scabious, ...).

Over all the **results** obtained are **very positive**, regardless of the applied restoration technique. Thanks to the reappearance of a large number of typical species in the various restored habitats, the increase in plant-

diversity is undeniable. At the same time, the various works carried out allowed establishing **connections** between sites that initially were reduced and isolated, thus creating a mosaic of different habitats that interact with each other on the whole plateau.

This allows optimal dissemination of plant species on the one hand and an exchange of animal population on the other hand.

Over all, these vital connections for the survival and preservation of habitats represent one of the key achievements of the LIFE project.



Cranberry bush



Heather



Border line of Sod and lifted area

Clubmoss

Dragonflies (*Aeschna subarctica*)

14 RÉSULTS

Avifauna and insects

During the project, **numerous shallow water areas** were dug.

The creation of these water areas was carried out to the detriment of the purple moor-grass that generally occupies the degraded habitats. Today all these areas have become new biotopes that are favourable to birds, dragonflies and butterflies.

The flooded areas are **very well suited for the avifauna** and particularly attractive for waders and anatidae (ducks, geese and swans). In

migratory periods, numerous species were spotted.

During springtime 2012, two migrating species rather common in Wallonia, but rarely and very rarely nesting here, were breeding at the High Fens: the little ringed plover (*Charadrius dubius*) and the common teal (*Anas crecca*).

The little winged plover nests on bare soils or soils with scarcely developed vegetation, normally near slow water-courses or shallow stagnant water. At the High Fens, this species was breeding in a peaty area where the vegetation was shredded and the remains swathed. These swaths, installed

perpendicularly on the slope, allowed the formation of many shallow water areas with varying surfaces.

In the very same section, more precisely next to one of these water areas, the common teal was nesting.

Due to the multiplication of aquatic areas where he can catch odonates (dragonflies and damselflies), its favourite preys, the High Fens hobby (*Falco subbuteo*) population has increased.

Close to the water areas, the avifauna has also taken advantage of the very important deforesting of conifer forests due to the Life project. The

clear-cuts have been colonised by the stonechat (*Saxicola torquata*), the tree pipit (*Anthus trivialis*) and the meadow pipit (*Anthus pratensis*).

As for insects (**dragonflies** and damselflies), some pioneering species reacted immediately to the creation of water areas. This led to a demographic explosion of the black darter (*Sympetrum danae*) and the four-spotted chaser (*Libellula quadrimaculata*).

Very rare and very local species also took advantage of these new habitats: the ruby whiteface (*Leucorrhinia rubicunda*), the spearhead bluethroat (*Coenagrion hastulatum*) and the bog hawk (*Aeshna subarctica*).

When the shallow waters will be filled with thick Sphagnum-species covering, they will undoubtedly be able to host the very rare northern emerald (*Somatochlora arctica*).

The **butterflies** also reacted very rapidly on the works, more specifically the cowberry fritillary (*Boloria aquilonaris*) has once again colonised a large part of the High Fens plateau.

Little Ringed Plover

A special case : the black grouse



Chickweed Wintergreen

Hope for the black grouse

In Belgium, the fluctuation and also the **decrease of the black grouse population** is hard to deny. On European scale, the tendencies are identical, and in spite of some increases here and there, populations are decreasing over all.

An important factor of influence on the black grouse population fluctuation is **climatic change**. However, just this one factor is nowadays no longer sufficient to explain the evolution of the population. Other factors to be taken into account are: **predation, collisions** of animals with the "barriers" in the open landscape (fences, for instance), **human disturbance, habitat modifications and perturbations**, and also a possible genetic depression.

Within this scope, several studies were completed and various resulting data was collected, data dealing with the black grouses on the one hand (observations, migrations, excrements, igloos, nests, perch trees, seasonable feeding areas, ...) and data about potential predators (fox, crow, ...) and users of the same resources on the other hand.

Based on the results obtained, a **preservation plan** was set up, and immediate and medium term measures were taken to guarantee the preservation of the species of the High Fens.

Amongst these measures, there is the extension of the circulation prohibition in C zones during nesting and breeding; limitation of opportunist predators (foxes, ...); mowing the lek flora; marking of enclosure and exclosure fencing; etc.

Finally, the various habitat developments that have been generated through the High Fens Life project can be favourable for the species, but their real influence can only be evaluated through long term studies. At this very moment, in spite of these efforts, the black grouse population continues its decrease. It is now up to all actors involved to hold on to the efforts made and to find a useful solution to safeguard this icon of the High Fens.



Black grouse

Unforeseen danger

16 FIRE

On the 25th of April, 2011, an important fire devastated approximately 1,385 hectares of heathlands and mires on the High Fens plateau. In this vast burnt down zone, basically only the areas restored due to the LIFE project, as well as the areas mowed according to the RND management measures, were saved.

As a matter of fact, in the restored zones (heathlands and mires where the top layer was removed, sod lifted, milled or mowed), the pioneering vegetation as well as the high humidity blocked the flames and prevented the complete devastation of the plant covering. Moreover, the flooded areas formed upstream of the swaths served as a fire-break, thus limiting fire propagation in this way.

We can point out, to conclude, that the consequences of this fire for habitats outside the areas restored by the LIFE project are less disastrous than could be feared. If the fire had reached the active peatbogs, it would have been a completely different story.

As for the species, it is mainly the heathlands avifauna that was affected by the fire. Apart from the fact that the fire took place in full nesting period, it will take several years for the heathlands, much more affected by the fire, to become favourable to nesting again. More precisely, we need to monitor how the black grouse population will develop during the coming years.



The LIFE project High Fens: restoring nature, but at what price?

The High Fens Plateau is economically renowned for its wood production, for hunting and for ecotourism.

Within this context, the LIFE project actors were regularly confronted with questions made by the hunters, foresters or inhabitants of the region: « *Isn't it all just an enormous waste of money? Is it pertinent, in these days of economic crisis, to spend money on restoring natural habitats and biodiversity? What will our children live off in future if there is nothing left but fens?* »

In this view, a **preliminary study** was made in 2010. The target of this study was formulating qualitative and quantitative arguments to support the most pertinent socio-economic interests that are most representative for the geographical context of the High Fens.

Study areas:

In order to study the impact at the **local level**, the study area was broadened to the 7 municipalities involved in the project, namely Eupen, Baelen, Raeren, Jalhay, Malmédy, Waimes and Bütgenbach.

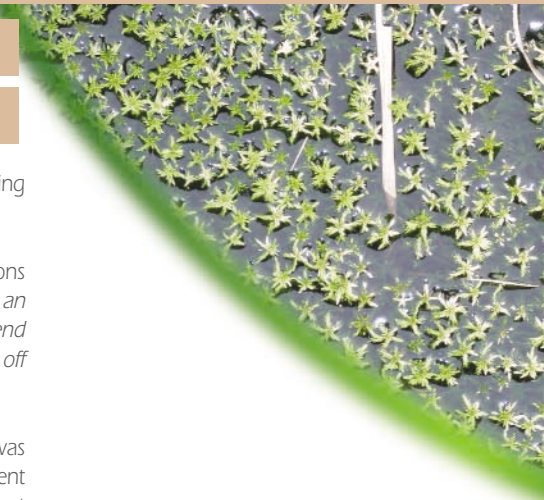
Two larger geographical entities were also taken into account: the Walloon Region (at the **regional level**) and the European Union (at the **global level**).

Methodology:

The study wanted to formulate an answer to the following question: "What tangible benefits can the lambda citizen obtain from the High Fens LIFE project?". For this purpose, the effects evaluated are the impact on the citizens' well-being. The well-being as such is expressed in Euros and has to be interpreted as follows:

1 euro of well-being = well-being increase which can be benefited by 1 euro extra revenue (for a Belgian with an average income).

The results are presented according to the annual cost/benefit of the impact. However, some of these results occur every year, but others only occur once. Therefore, non recurring impacts were distributed over 20 years, in order to obtain an annual average.



Economy and ecology for everyone

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SOCIO-ECONOMICAL STUDY

Results :

The diagram presents the significant impacts of the High Fens LIFE project at the local, regional and global level.

It is very obvious that investing in nature yields about 10 million euro per year.

Moreover, the impact of the LIFE project basically has a global dimension and is non financial. It concerns biodiversity, recreational use of the High Fens and storage/emissions of greenhouse gases.

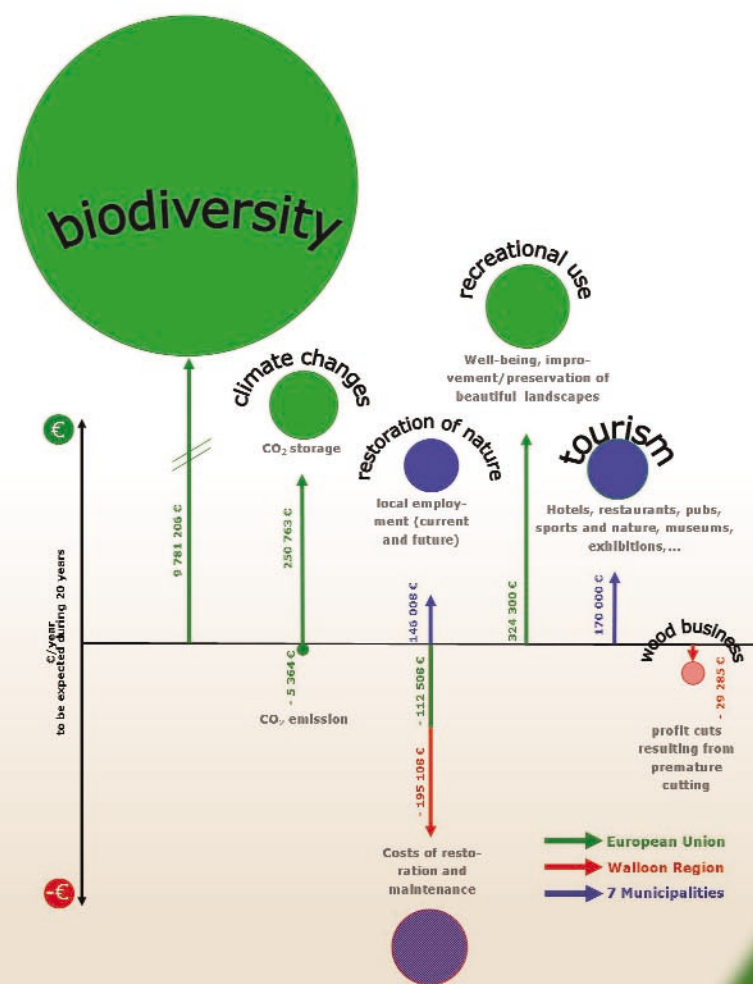
Furthermore, the project impact on the well being of the 7 municipalities is positive. On the one hand, it is linked to the creation of nature restoring activities, which are directly profitable to local companies and entrepreneurs. On the other hand, the larger attractiveness of the sites, a consequence of the works carried out, causes an increase in tourism, generating a benefit that translates into an increase of local benefits favouring tourist infrastructures and other related sectors.

Finally, the impact at the Walloon Region level is negative, since it finances the project at a rate of 50%. This result should be nuanced as Walloon Region citizens also benefit

from the positive impact granted to the European Union within its full context!

The full report can be downloaded from our website:

www.lifehautesfagnes.be



And what is the

hunters' interest?

The study shown before also clearly pointed out a positive effect of clear-cutting spruce woods on theoretical game quantity. The population regulation through hunting preserves all of its sense in this view. If in spite of all, shelter decrease is really effective the first years after cutting as a consequence of opening up these areas, very soon, however, herbaceous species appear, forming an interesting feeding provision. Consequently, the regeneration of dense, varied vegetation (especially broadleaf species) allows recreating places of shelter, which were reduced in a former stage, and which are also necessary for the development of the deer population.

Besides, the restored areas, and more particularly the milled areas colonised by ling, also form interesting feeding

areas, especially since they are situated in areas very seldom frequented by tourists. In this case, it is possible that the multiplication of these zones could also be seen as a factor favouring the increase in game populations or at least an element limiting game pressure in the woods. Moreover, the numerous openings created offer attractive areas for hunters practicing their sport from hidden blinds.

Finally, if positive impacts on hunting linked to works by the LIFE project are still to be confirmed and put into their context, it is in any case confirmed that the project had no negative effect whatsoever on this activity.

Sustainability of the project

And after the project?

In order to guarantee the continuity of the actions taken, and the sustainability of their positive effects, the LIFE project set up a management plan in concert with DNF and DEMNA.

The parcels bought within the framework of the project have been reassigned to the Walloon Region to become Public Nature Reserves, the management of which is taken care of by DNF.

The management measures, which will be executed by the DNF as well, consist mainly of grazing, mowing and periodic cutting of the natural spruce regeneration.

Extensive **grazing** will be applied on about 400 ha by means of sheep and rustic cattle breeds, allowing heathlands maintenance in a more gentle way.

In a first stage, **mowing** will be necessary, to control bracken growth (mowing 2 to 3 times a year to weaken the plant) as well as that of the purple moor-grass. Moreover, at a middle term, the sod lifted and milled areas will have to be mowed as well, in order to preserve the heathland vegetation.

The most important action will be the periodical **elimination** (every 5-10 years) of the **spruce germs** on the restored areas as well as inside the fencing intended to protect the natural regeneration of indigenous broadleaf species.

The 8 km of dams as well as the 50 km fencing for protecting broadleaf species and the fences for grazing will be inspected every year in order to assure their state and to perform possible repairs if necessary.

Furthermore, for lands belonging to private owners having signed a deforesting convention, the DNF will see to it that the restrictions linked to this convention are correctly respected, more precisely that no exotic species are replanted for a period of 30 years.

The scientific monitoring started will be continued. A study by the Liège University will be done to quantify the impact of restoration measures on the hydrological regime of a basin.

The sensitisation and information of a large general public, as well as the specialised public, is a very important target developed during the project, but also for after LIFE, by means of various supports and instruments:

→ A **film**:

Shot during a full year, the film shooting brought together a sample of know-how in the field of restoration of heathlands and mires. The film is available in 2 versions – one for the public, the other one more specialised – and is also translated into 4 languages for a better propagation throughout Europe.

The film is also displayed on the internet site of the project, as well as inside the permanent exhibition of the Botrange Nature Centre or at the Malmundarium.

An **educational edition "Water and peatbogs"**:

- It was prepared by the LIFE team and animators from the Botrange Nature Centre, in order to animate visits by schools groups to the Nature Centre, educating them regarding the theme of the heathlands and peatbogs, and the necessity of their restoration and protection. Edited in three languages (FR, D and NL), the film makes it possible to sensitise on this subject starting from a very young age!

- A **website**: www.lifehautesfagnes.be in French and German.

→ **Educational information boards**:

These are installed at the starting points of long walking tours at the High Fens, as well as at the borders of impressive works visible along certain paths.

Trained nature guides, well informed throughout the project, will be the key contact point to inform the general public about the works carried out.



Top layer removing, sod lifting and milling :	techniques to clear cut soil in view of reactivating germination of seeds present underneath the purple moor-grass layer: removing the upper layer (5 to 10 cm deep for sod lifting, 30 cm deep for complete removing and stock piling the plant material. A slight slope is made in the treated areas in order to partially flood the area. In case of milling, the vegetation is shredded (up to 10 cm deep) before being placed in piles.
DNF :	Département de la Nature et des Forêts (Nature and Woods Department), department of the Walloon Public Service.
DEMNA :	Département de l'Etude du Milieu Naturel et Agricole (Nature and Agriculture Environment Study Department), department of the Walloon Public Service.
Ecosystem :	An ecosystem includes an environment, the living beings of which it is composed and all relations that can exist and develop inside this system.
Heathlands :	environment characterised by low vegetation, mainly heath species (heather, ling, bilberry ...), shrubs that can survive on very poor and acid soils thanks to symbiosis with certain mushrooms.
Natura 2000 :	programme worked out at the European level according to the standards of each member state of the Union. The goal is preserving certain species as well as the natural environments where these species live. Consequently, the areas have been outlined according to precise criteria and will be subject to particularly attentive care and monitoring.
Nature Park :	rural territory of high biological and geographical importance, subject to measures intended to protect the environment, in harmony with the aspirations of the population and the economical and social development of the interested territory.
Nature reserve :	an area protected by an appropriate management system set up to preserve this area at its basic state. For this purpose, measures can be taken in view of preserving, monitoring or reintroducing plant or animal species, to maintain certain plant layers or to restore modified environments.
Public nature reserve :	protected area managed by the Executive founded on parcels belonging to the Walloon Public Service, rented or made available for this purpose.
Sphagnum :	typical plant of peatbog areas. It is a kind of moss that is actively taking part in peat formation.
SPW :	Service Public de Wallonie (Walloon Public Service)
Peatbogs or mires :	flooded areas with shallow water, an ideal ecosystem for Sphagnum-species to gradually decompose, accumulate and form peat layers.

Visit the project website for any additional information: www.lifehautesfagnes.be

Managing editor: "Commission de gestion du Parc naturel Hautes-Fagnes Eifel" non-profit organisation

In collaboration with the European Commission and the Walloon Region (SPW – DEMNA and DNF)