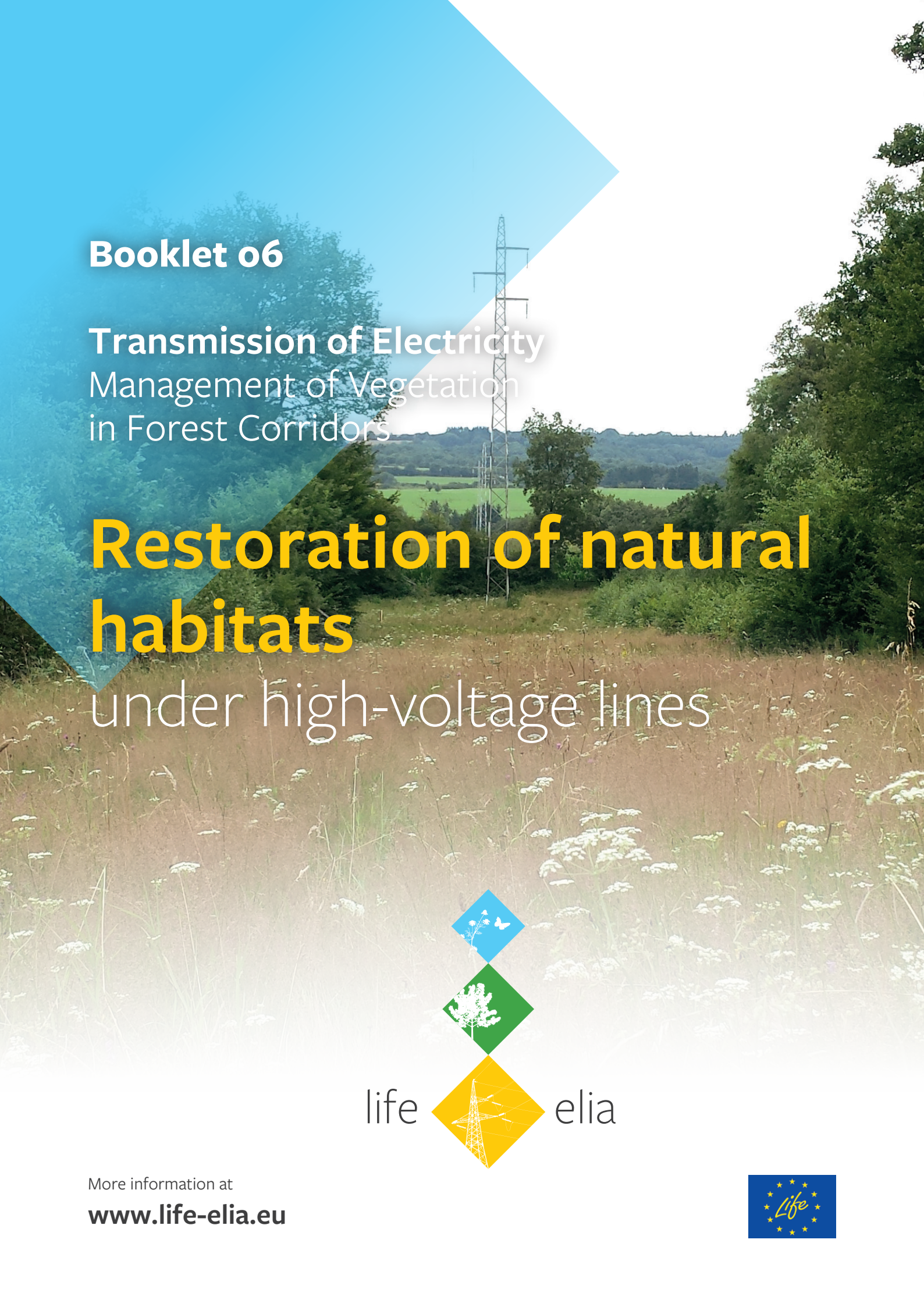

Booklet 06

Transmission of Electricity
Management of Vegetation
in Forest Corridors

Restoration of natural habitats
under high-voltage lines

life elia

More information at
www.life-elia.eu

Contents

LIFE Elia
Enhancement of the electricity transmission network's easements as active vectors for biodiversity

CE Reference
LIFE10 NAT/BE/709

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Partners

Powering a world in progress

Le réseau de transport d'électricité

Wallonie

Service public de Wallonie

The LIFE Elia project benefits from the co-financing of the L+ tool of the European Union

1

Introduction

This booklet was written by the staff of LIFE Elia-RTE (2011-2017), a project financed by the LIFE+ programme of the European Union, by the Walloon government, by Elia and RTE, the latter two being electricity Transmission System Operators (TSO) in Belgium and France, respectively.

The main goal of the project is the transformation of forest easements of high-voltage transmission line routes into ecological corridors in Belgium and France. Restoration activities aim at implementing innovative practices for management of vegetation in these green corridors in the forest, and raising the awareness of various audiences about the importance of biodiversity in these linear anthropic habitats.

This booklet addresses the restoration of natural habitats and builds on the lessons learned from 6 years of experience of this LIFE project.

2

Management of vegetation under electricity power lines

When high-voltage lines cross through a forest range, the issue of safety becomes paramount. No tree can touch or get too close to the electricity wires. This challenge is detailed in the other booklets published by LIFE Elia-RTE.

As alternatives to conventional management of vegetation by mulching, the LIFE Elia-RTE project has implemented various actions such as planting of stepped edges, planting of orchards, installation of fences for grazing, or management by mowing. These innovative management methods, detailed in the preceding booklets (booklets 3, 4 and 5), guarantee electrical safety but also promote biodiversity. These alternatives have also been found to be economically beneficial (booklet 2).

Effects of management by mulching

Example of alternative management: grazing

This booklet details another type of alternative management: **the restoration of natural habitats**.

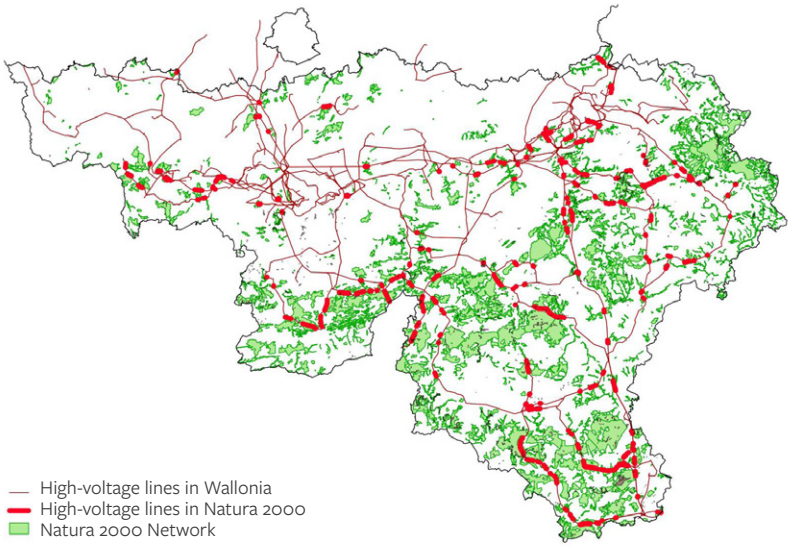
3 Natural habitats

3.1. Description

A natural habitat is a homogeneous space from the point of view of ecological conditions (especially soil and climate) and its vegetation (herbaceous, shrub and tree). It hosts a certain fauna, with species having all or part of their various vital activities in this space[1].

The main natural habitats covered by the LIFE Elia-RTE project are: peatlands, moors, chalky grasslands and lean meadows. These environments, by their scarcity and the diversity of species they host, require special protection.

3.2. Protection via the Natura 2000 network



Peatlands, moors, chalky grasslands and lean meadows are classified as "of community interest" by the European Commission. It has compiled a complete list of these endangered natural habitats. This means that at the European scale it is necessary to protect them or, better, restore them to improve their state of conservation or increase their areas.

The Natura 2000 network, established by Europe, encompasses a large part of these natural habitats. This network includes a group of sites located in each Member State. The sites have been selected because they host species of community interest and/or habitats of community interest. Any actions likely to destroy them (draining peatlands, use of phytopharmaceutical products or fertilisers on lean meadows, overgrazing...) are prohibited! In Belgium, the Natura 2000 network covers 13% of the territory. This figure is similar in France if referring solely to territorial lands.

The actions of the LIFE Elia-RTE therefore contributes to restoration of these natural habitats, since the high-voltage lines of the project cross 31 Natura 2000 sites in Wallonia and 4 in France.

3.3. The interest of natural habitats for the TSO

The natural habitats dealt with in this booklet are of maximum biological interest when the management applied to them obtains a stable plant community. Natural habitats restored as part of this LIFE project have been selected because the height of the vegetation growing there remains low, which is compatible with the issue of electrical safety. For a dry moor, for example, the plant community dominated by the Common Heath (*Calluna vulgaris*) will expand to the point where other woody species will have difficulty germinating and thus growing.

There is therefore a real interest for the electricity Transmission System Operator. In terms of future management, the efforts to be provided by the TSO to prevent any electrical accidents are greatly reduced.

[1] Definition European Fauna-Flora-Habitats Directive

4 Peatlands

4.1. Description

Peatlands are wetlands that have productive vegetation that accumulates peat (sphagnum, cottongrass...). They permit establishment of specialised vegetation and ensure the life of animal species associated with these particular environments.

Permanently saturated with stagnant or barely moving water, peatlands are very poor in oxygen. Asphyxiation of the soil then severely limits the development of woody species and favours others of small dimensions (mosses, heath family...).

Peatlands have an exceptional heritage value. They host rare species such as sundew (*Drosera spp.*), tiny carnivorous plants.

Peat bog under a high-voltage line (punctuated with bog asphodel in the foreground and cottongrass)

Sundew (*Drosera spp.*), *a carnivorous plant typical of peat bogs*

Many actions favouring restoration of peatlands have been undertaken in Wallonia in recent years! For more details: http://biodiversite.wallonie.be/fr/meta-projet-life-de-restauration-des-tourbieres-de-haute-ardenne.html?IDC=5778.

4.2. Restoration actions

Blocking of drainage

Under the forest electrical grid, one of the first actions to implement to restore peaty environments is blocking of old drainage ditches. The purpose of this operation is to ensure a rise in the water level of the peatland by removing the old flow.

When this is possible, blocking must be total, by filling the drainage completely with peat or white clay.

Tillage

Degraded peatlands gradually dry out and constitute terrain increasingly favourable for the establishment of moorgrass, a grass that forms dense monospecific carpets then allows establishment of woods.

When this drying out is confirmed, restoration of the peatland can involve tillage, which is a scraping of the superficial layer of the soil. This operation consists of baring the soil and reactivating the dormant seed bank. This technique makes it possible to retrieve the original natural habitat fairly quickly.

Tillage work

4.3. The work

Driving machinery over peaty environments must be done with caution. The use of caterpillar tracks is mandatory to reduce soil pressure, and in the most extreme cases, metal plates can be used as a raft to limit the pressure on the soil by the machines.

The work must be carried out outside the vegetation and nesting period, between mid-October and mid-March. Ideally, a freezing period is optimal for traffic to have little impact on the present environment.

4.4. Long-term management

Example of tillage of a wide area; note the presence of water on the surface

Peaty habitats are therefore mainly open habitats, with no or few trees and shrubs. Management of these environments must be carried out manually, or by grazing using hardy breeds of livestock. Restoration of these environments allows them to be stabilised over the long term and save on interventions that are costly and disruptive of the environment.

5 Moors

5.1. Description

Heather (in the foreground), a typical moor plant

Moors can develop on dry to very moist environments. The dominant vegetation consists of shrubs, bushes or dwarf bushes. These dwarf bushes include heather (*Calluna vulgaris*), also called false heather, as well as bilberry (*Vaccinium myrtillus*) or lingonberry (*Vaccinium vitis-idaea*).

5.2. Restoration actions

Moors are temporary habitats, even more so when they are dry, since the establishment of trees and shrubs is then facilitated and they can quickly smother the typical small species of the moor.

Before undertaking the work of restoring a moor, it may be necessary to ensure the site's potential for regeneration. This potential is reflected in the nutrient-poor soil and by the presence of seed plants in the immediate vicinity of the work area.

Seedling heather at the base of the pylon

As with peatlands, an effective method for restoring a moor is tillage. The presence of trees and shrubs of less than 4 metres height and a diameter of about fifteen centimetres does not hinder tillage, provided that the specification has provided for this and that the operator has therefore been able to take equipment appropriate for this work.

5.3. The work

In any restoration work, it will be necessary to mark off the "seed" zones which have to preserved. The work should be carried out outside the period for vegetation and nesting, from October to March.

This work allows the excavated materials to be swathed (earth, stumps, shrubs...). They will be placed along the edge of the corridor, parallel to the electricity lines and along the edge that receives the most sunlight. Well exposed, a windrow can be a habitat of choice for reptiles (lizards and snakes). Ensure that they do not exceed a height of 2m.

1. Before tilling in an overgrown area

2. Restoration of a dry moor by tillage

3. Formation of the windrow

4. Four months after tilling

5.4. Long-term management

The main threat for restored moors is their spontaneous recolonisation by trees and shrubs, especially if the following conditions come together: dry soil and presence of seed trees near the corridor. Note that some plants present in the moors may prevent germination of other woody species.

Manual brush clearing and mulching

Felling at one metre and notching the slice

Growth of bracken fern and bramblebush will be prevented by brush clearing or by rolling over for several years for fern. To control woody colonisation, rotary cutting above the heather (at least 10 cm above the ground) or brush clearing of problematic woody species can be done. If the woody plants are larger, girdling will be practised or felling at height with a notch in the trunk.

Grazing

Maintenance can also be provided by grazing. Associated with isolated brush clearing of areas neglected by livestock, it allows the open environment to be maintained and ensures establishment of the moor over the long term.

Mowing

If no breeder is interested in grazing on restored moors, mowing can also be carried out at the end of the summer, which will promote production of seeds and the possibility of saturating the environment to the detriment of woody plants. This mowing can be done about once every 5 years (frequency to be set according to the condition of the vegetation) and must be carried out about 10 cm from the ground.

6 Chalky grasslands

6.1. Description

Chalky grasslands are grassed formations on dry soils, located on soils that are not favourable for agriculture.

Fly orchid (*Ophrys insectifera*)

They are environments resulting from human activity. They have been shaped by ancestral agro-pastoral activities, including clearing and pastoralism. They often shelter some remarkable and rare species, especially botanicals such as orchids.

6.2. Restoration actions

Chalky grasslands are transient environments which, without human intervention, will progressively evolve towards bushy stages and then to forest.

Restoration of chalky habitats therefore requires the elimination of most of the shrubs in place.

It can be done either by brush clearing if there are few shrubs or if the terrain is inaccessible by a machine, or with the help of a rotary cutter. In this case, it is advisable to carry out mulching above ground in order to preserve the herbaceous flora already in place.

6.3. Long term management and interest for the TSO

Grazing with sheep will be most effective in this type of environment.

Very occasional brush clearing can also take place after the grazing season ends, in order to eliminate "grazing holidays", that is, any areas not consumed by the livestock.

Clearing by brush cutting on steep and rocky terrain

Sheep on a chalky grassland

For the technical details relating to grazing, see booklet n°3 "Grazing and mowing under electricity power lines" (available on the www.life-elia.eu website).

7

Lean meadows

7.1. Description

Lean meadows are plant formations which host a wide variety of tall grasses and flowering plants, some of which are protected. This wealth is mainly associated with the absence of tillage and limited supply of fertiliser. The altitude and composition of the soil can affect plant composition as well. As mowing progresses, the grasslands become impoverished (which generates biodiversity) if the fodder is exported, and woody plants struggle to become established.

7.2. Restoration/sowing actions

The Transmission System Operator's maintenance activities have created open environments in the forest. If soil conditions permit, recreating lean meadows can be envisaged, especially if their future exploitation can be ensured through partnership with a farmer or hunter.

The 4 major phases of grassland establishment are:

- mulching of remnants from forest exploitation
- mulching at depth/soil refining
- sowing (in spring or fall) and rolling the soil immediately after
- mowing and ideally exporting of production

The origin of the seeds

The seeds used for such sowing may have two different origins: they can come from a local harvest, or they can be purchased from speciality suppliers, some of whom may also offer local sources.

Harvesting seeds in a lean meadow

Local source of seeds

Seeds from a local harvest

For the greatest promotion of biodiversity, it is ideal to use locally sourced seeds.

In Belgium, the ECOSEM company (www.ecosem.be) specialises in harvesting, processing and marketing of these seeds.

In France, the "Végétal local et Vraies messicoles" programme (www.fcbn.fr/vegetal-local-vraies-messicoles) has set up two quality signs relating to the geographical source of marketed plants, seeds, plants and whole plants.

7.3. Long-term management

The sustainability of a lean meadow is related to respect of the conditions listed above: no fertiliser inputs as well as establishment of a mowing regime with exporting (at least for the first few years during the restoration phase), taking into account the biological cycle of the species present, that is, mowing carried out on July 15th at the earliest in low-lying areas.

Mowing can be carried out by a local farmer or a hunter for whom the lean meadow could represent an interest as a feeding area for big game. Management guidelines should be included in an agreement that binds the TSO and the site manager.

For other details on mowing, see Booklet n°3 "Grazing and mowing under electricity power lines" (available on the www.life-elia.eu website).

Areas of implementation of natural space restoration under high-voltage lines

In Belgium (Walloon region):

- 155 km of electrical corridors

In France:

7 sites in the different biogeographic regions

- Atlantic: Finistère, Seine-et-Marne
- Continental: Aube, Ardennes, Doubs
- Mediterranean: Drôme
- Alpine: Hautes-Alpes

Follow the project at:

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