



# Large scale network and restoration of peatbogs and wetlands in Southern Belgium

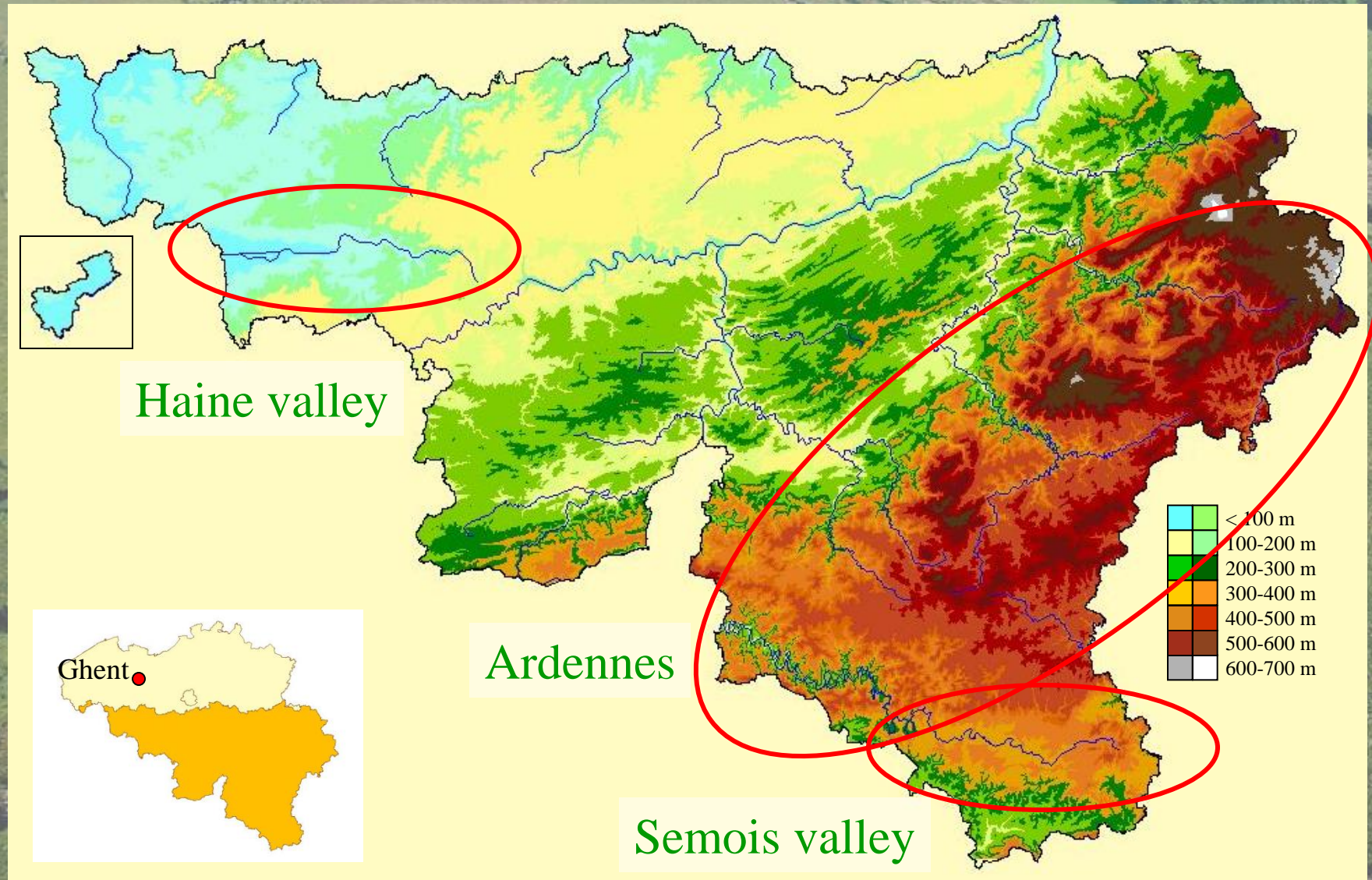
## Planning and first results

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Motte G., Parkinson D., Pirard H. and Pontegnie M.

(SPW/DGO3/DEMNA - UGCSH - NATAGORA)



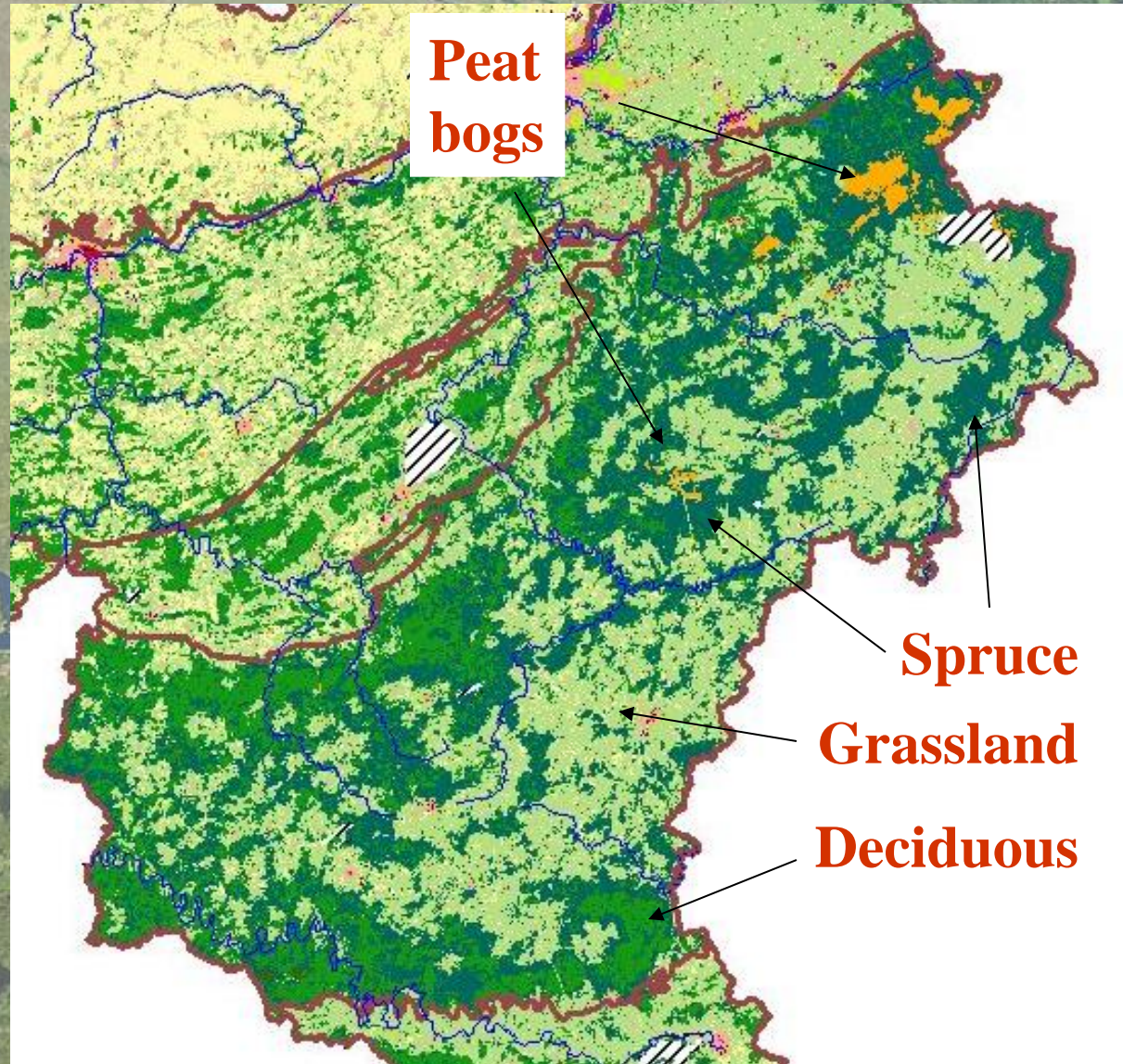
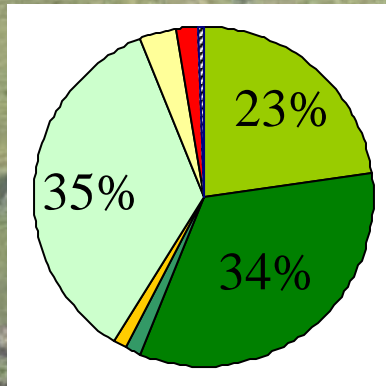
# Peatbogs and wetlands in Southern Belgium





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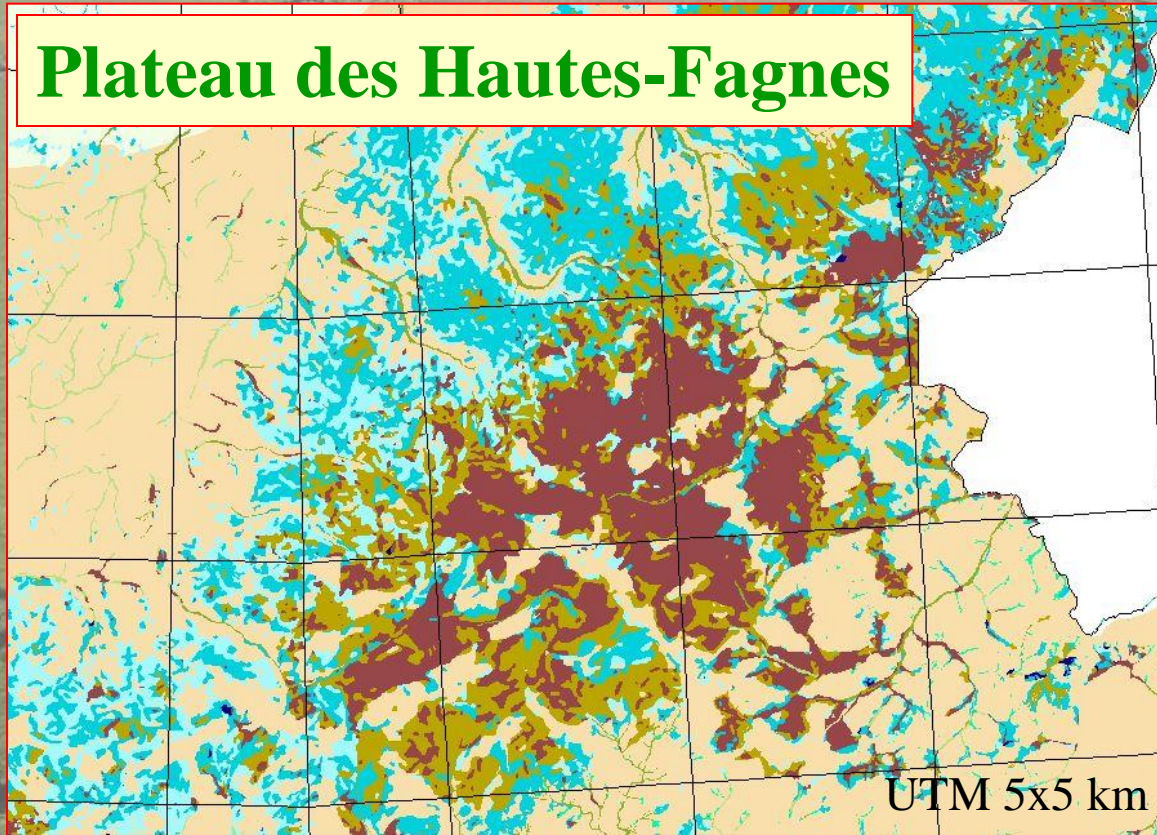
**Ardenne :**











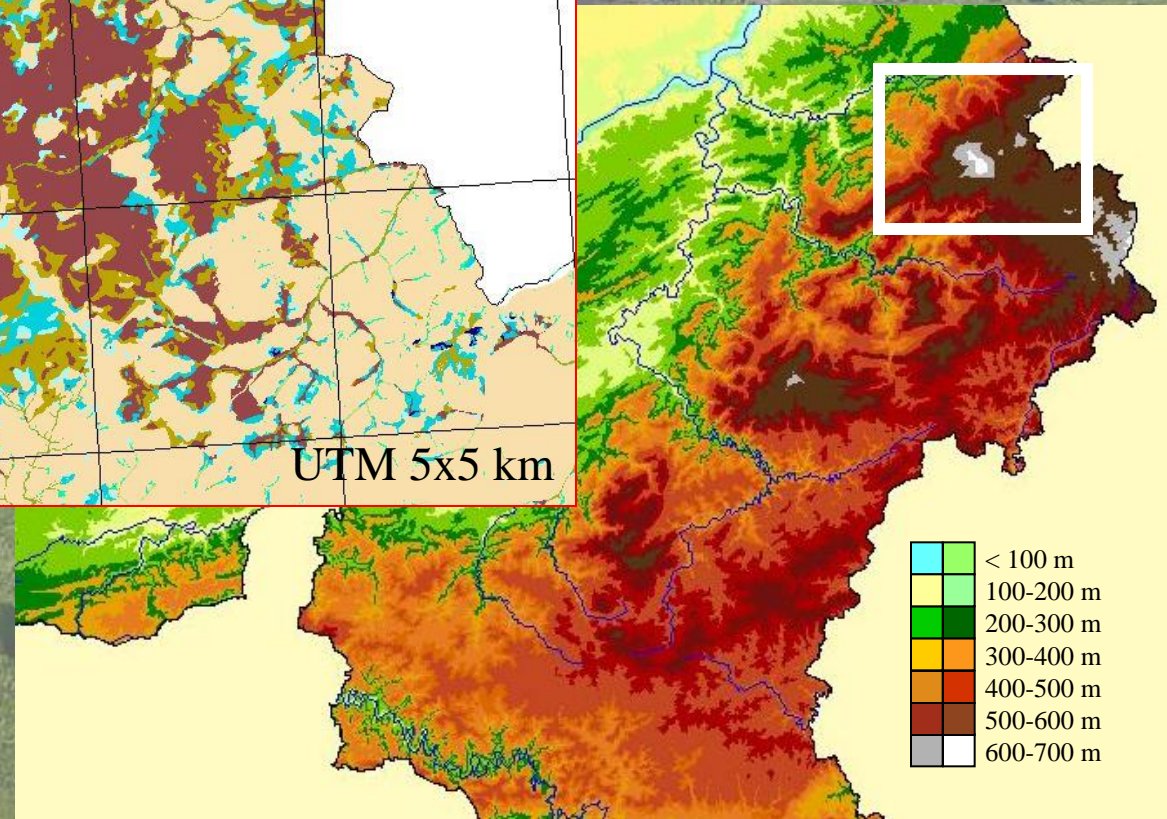
# Peatbogs and wetlands in Southern Belgium








## Plateau des Hautes-Fagnes



UTM 5x5 km

-  Alluvial soils
-   Peat (high, low)
-    Gleyed soils

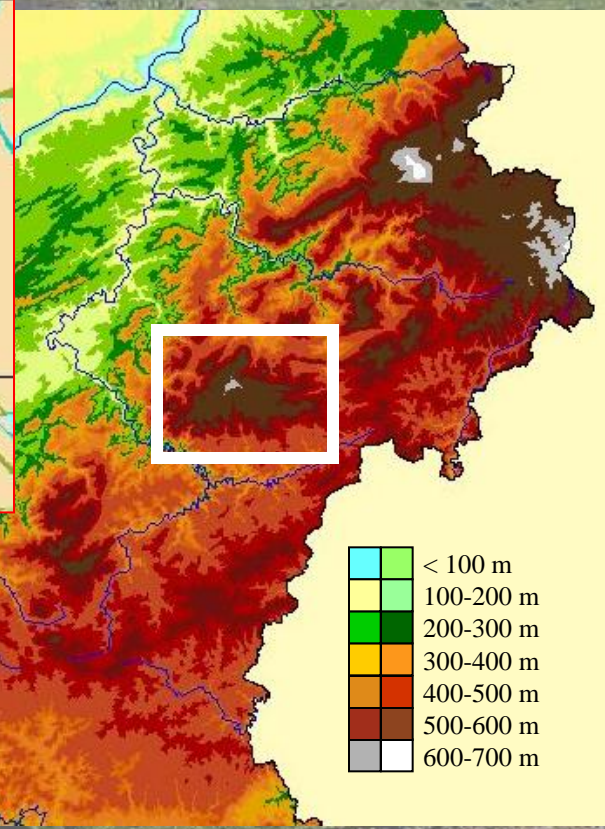
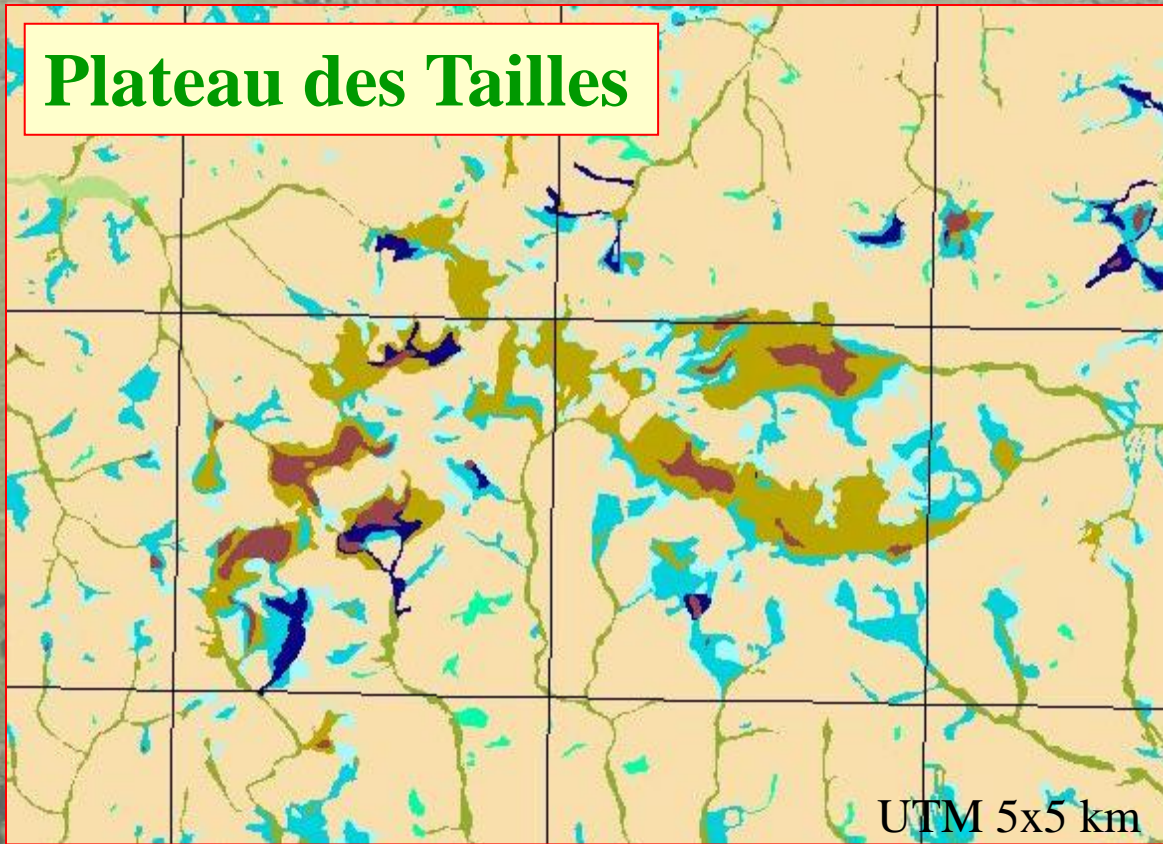


-  < 100 m
-  100-200 m
-  200-300 m
-  300-400 m
-  400-500 m
-  500-600 m
-  600-700 m



# Peatbogs and wetlands in Southern Belgium

## Plateau des Tailles



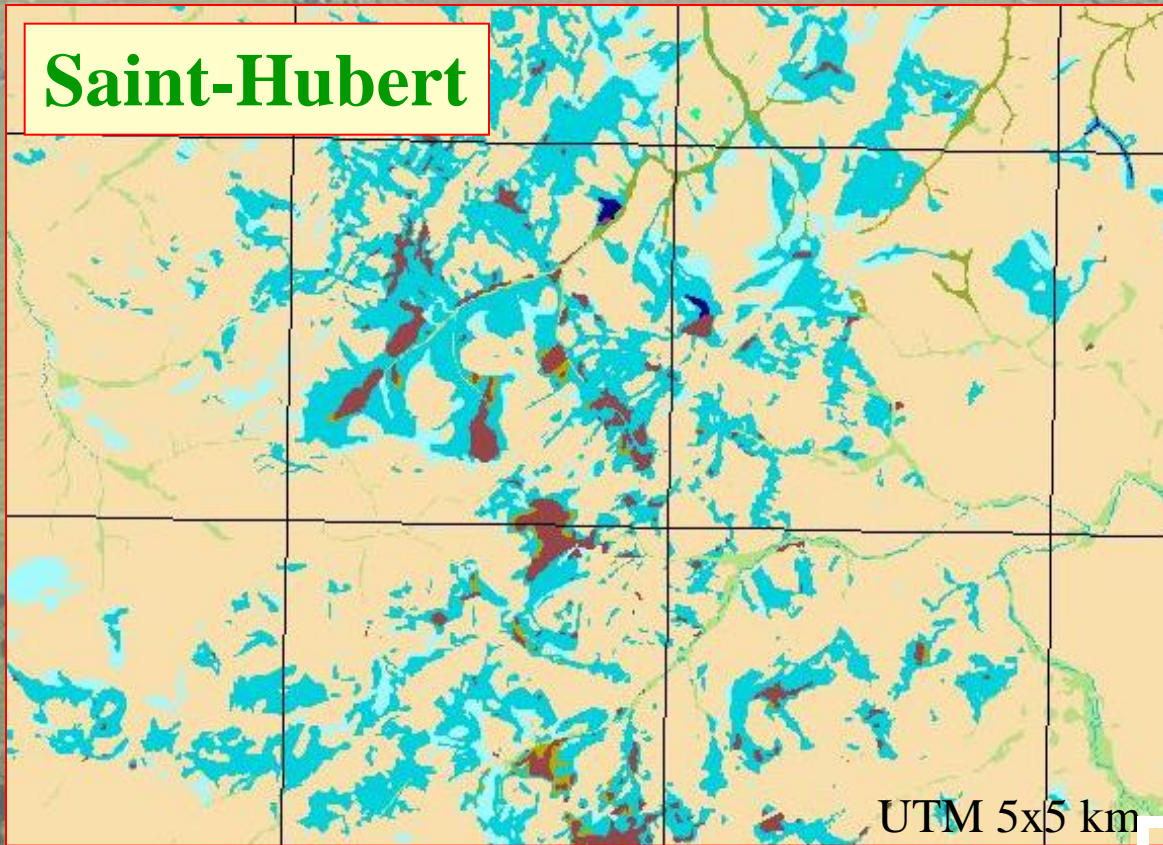
- Alluvial soils
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- < 100 m
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- 600-700 m

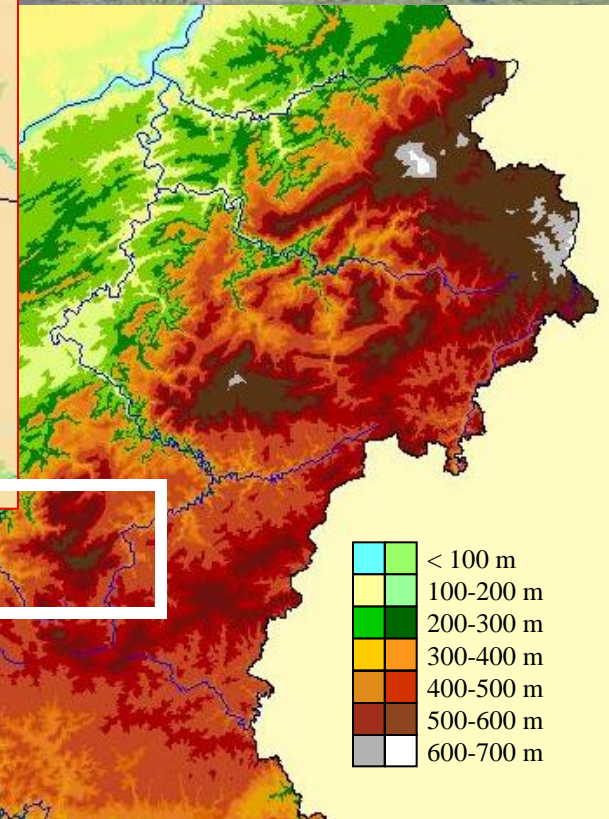


# Peatbogs and wetlands in Southern Belgium

## Saint-Hubert



UTM 5x5 km



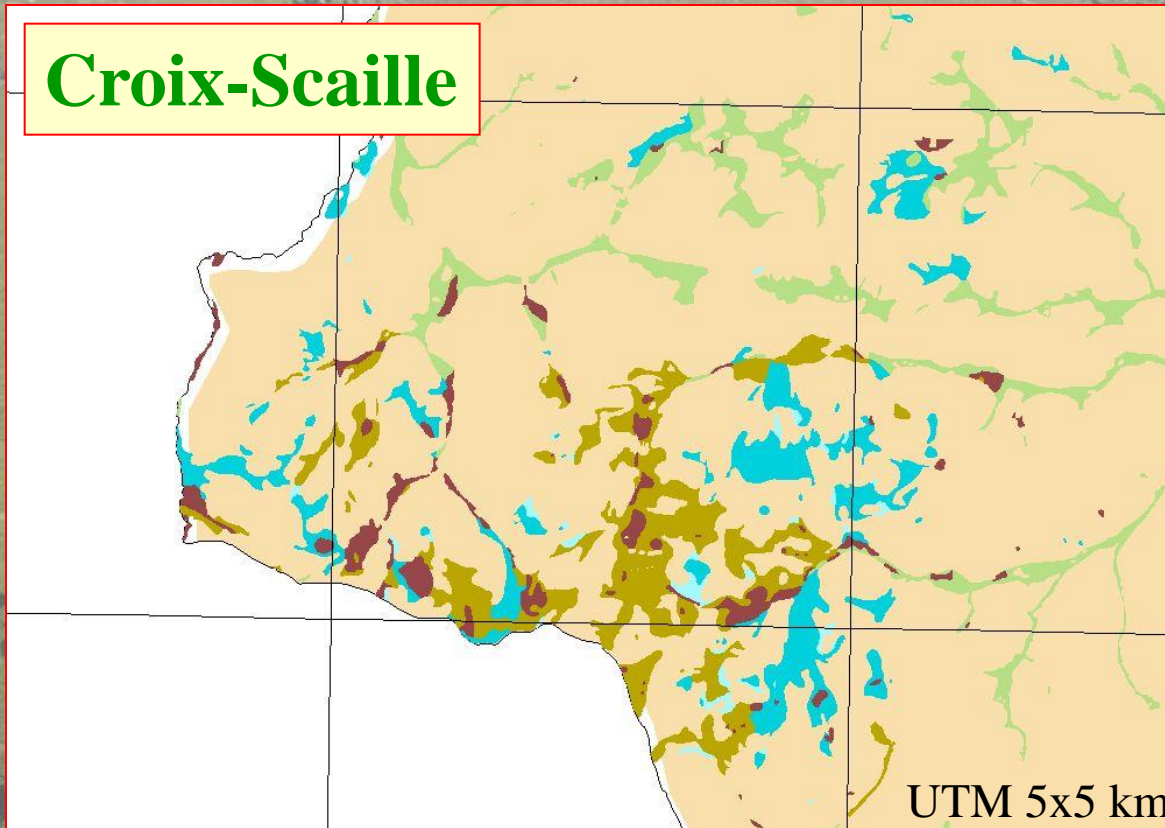
- Alluvial soils
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- < 100 m
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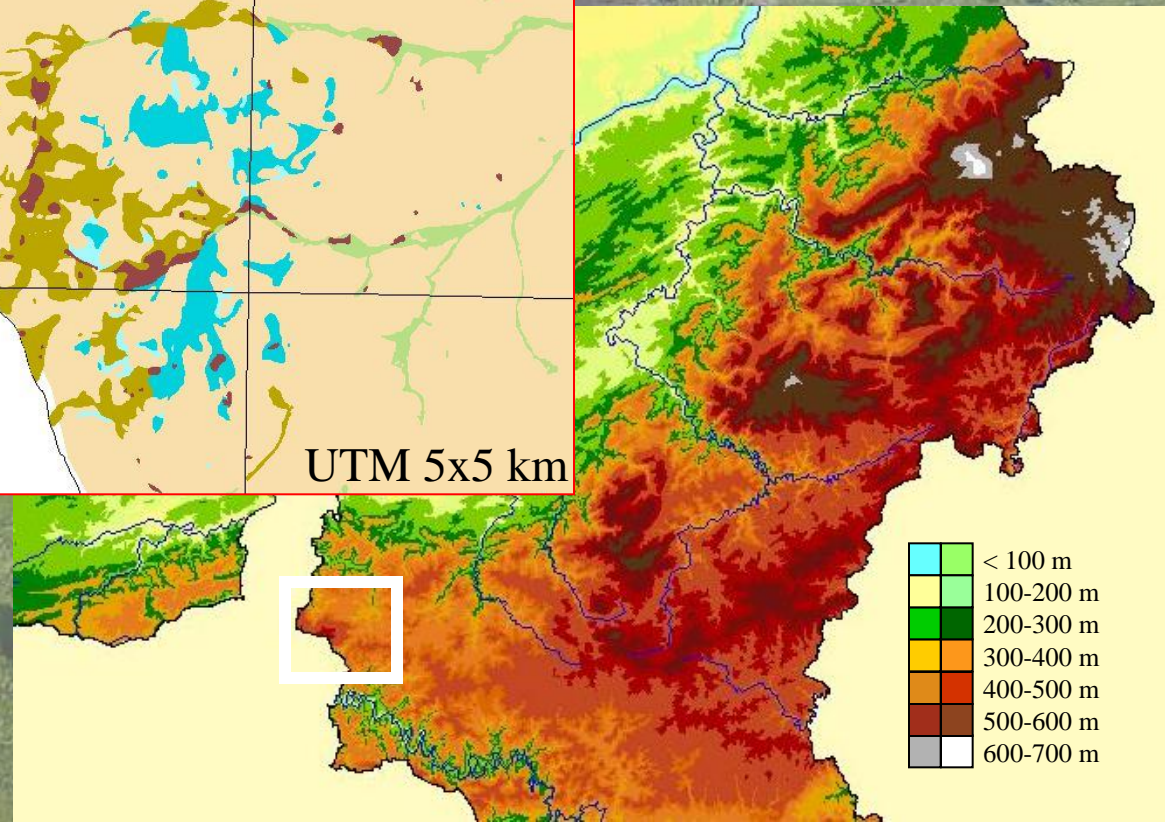
# Peatbogs and wetlands in Southern Belgium

## Croix-Scaille



UTM 5x5 km

- Alluvial soils
- Peat (high, low)
- Gleyed soils





# Conservation state and threats

## Raised bogs :

- **Historical peat extraction (for domestic heating)**
- **Recent drainage for spruce plantations**

**from 2.000 ha => 200 ha**





# Conservation state and threats

## Raised bogs :

- **Historical peat extraction (for domestic heating)**
- **Recent drainage for spruce plantations**

from 2.000 ha => 200 ha

## Other peaty biotopes (wet heaths, mires, wood, ...)

- **Recent drainage for spruce plantations**

from 11.000 ha => 1.000 ha

## Wet grasslands, mires, wet woods, alluvial forests :

- **Drainage for agriculture and spruce plantations**

from >150.000 ha => < 40.000 ha

= 10% of Southern Belgium and 50 % are in

Ardenne



# Conservation state and threats

## Natura2000 biotopes :

Natura2000 Habitats		Range	Area	Structure	Future	Global
4010	Wet heaths					
6410	Molinia meadows					
6430	Wet tall herb grasslands					
7110	Active raised bogs					
7120	Degraded raised bogs					
7140	Transition mires					
7230	Alkaline fens					
91D0	Bog woodlands					
91E0	Alluvial forests					

**Non-Natura2000 biotopes => similar evaluation**

**Only 1% of protected sites in Wallonia**

**(< 10.000 ha - rate of 150 ha/an)**

**Very slow process of protection and restoration !**



# Conservation priorities and actions

## Priorities :

- to stop threats on existing sites
- to restore their quality and to extend area
- to restore new sites to increase connectivity



## How ?

- Quite good N2000 designation for wet biotopes
- Allow the design of several large LIFE projects
  - Administrations (scientists, managers) and/or NGOs
- Key point :
  - concentrate actions on existing major regional nodes to have locally good population systems (sources for surrounding sinks) instead dispersed actions.



# Conservation priorities and actions

## Large LIFE projects (peat and wet biotopes) :

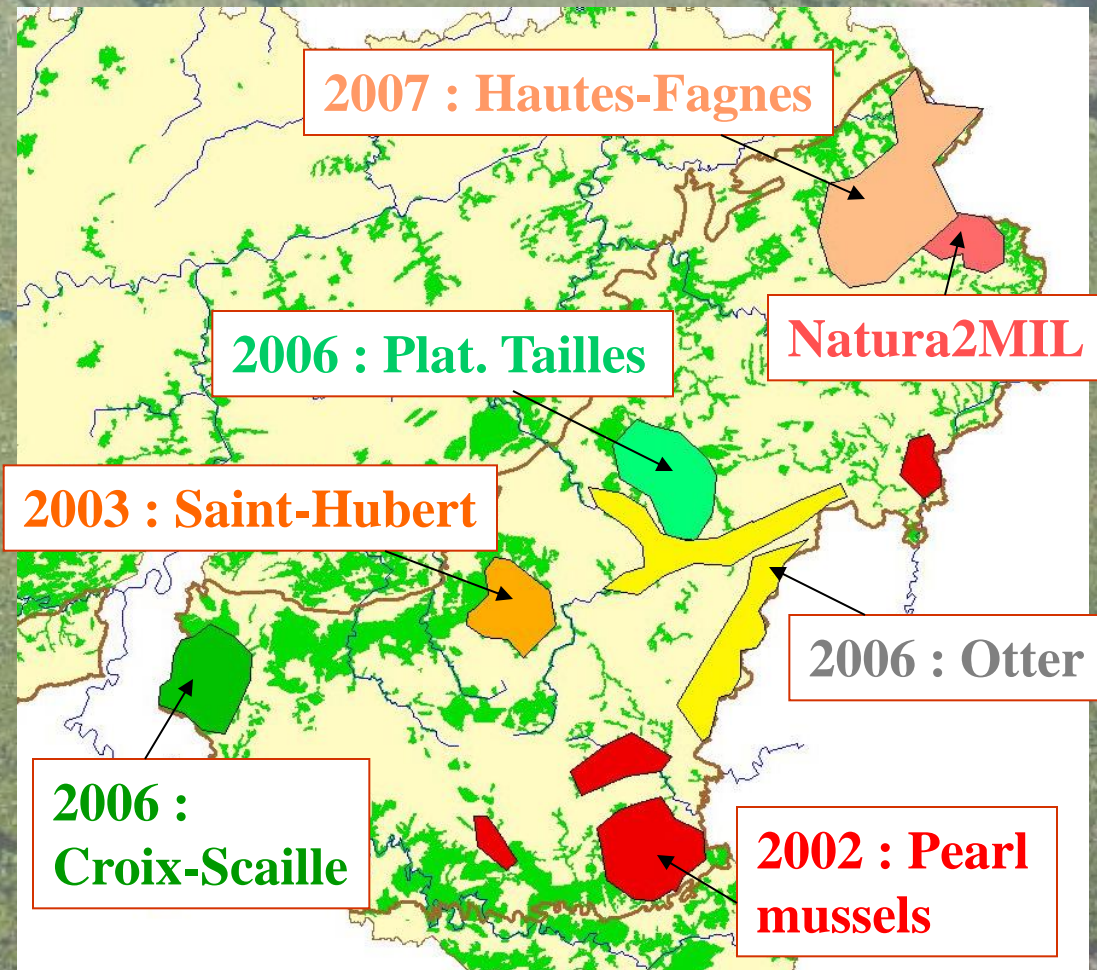
### In Ardenne :

Since 2002 :

- 7 projects
- 19 MEuros

### Expected results :

- > 4.000 ha restored
- > 1.500 ha protected for 2010





# Conservation priorities and actions

## Main restoration actions :



## Spruce cutting or milling





# Conservation priorities and actions

## Main restoration actions :

ditch blocking

Restoration of mires

Large dams

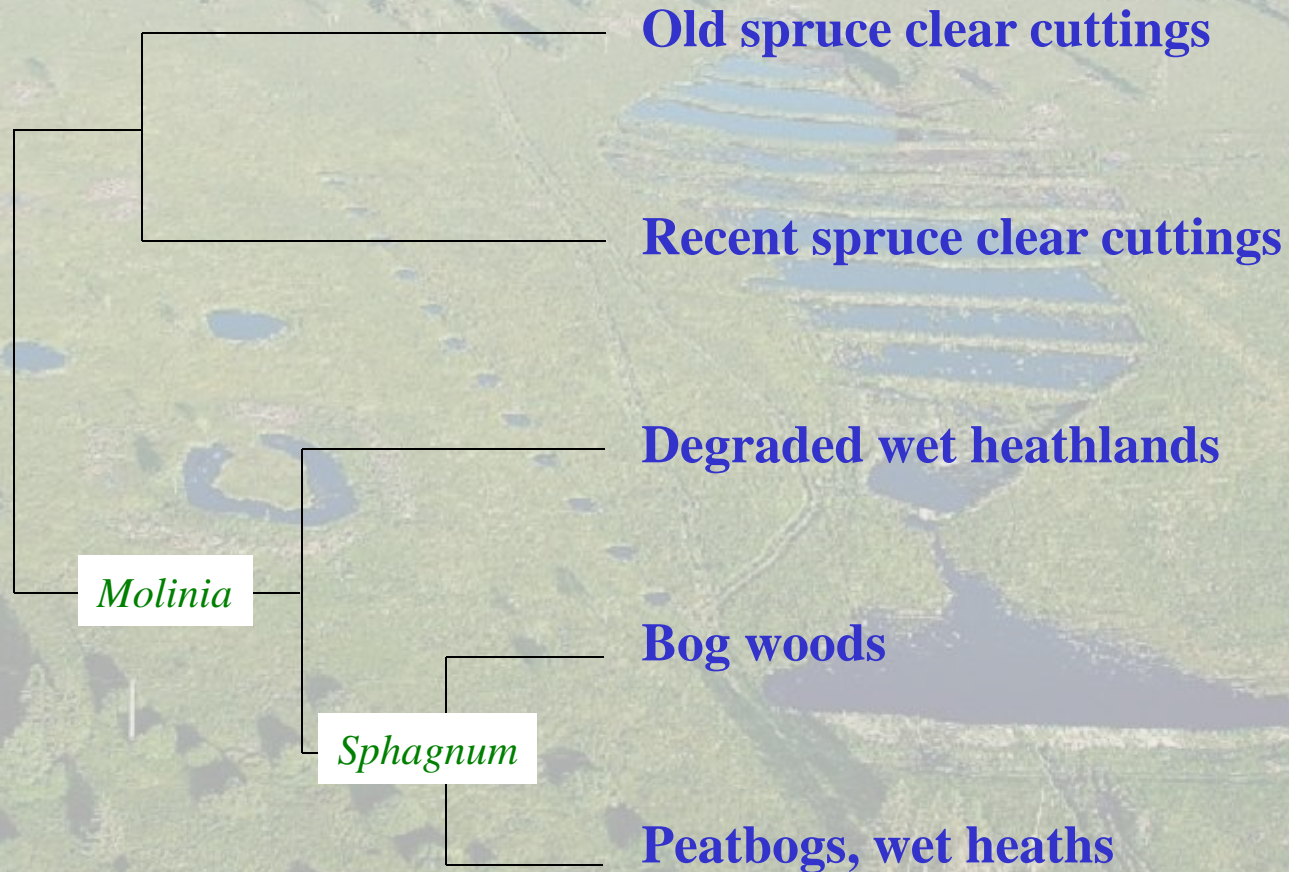
Rotovating  
vegetation  
and subsoil  
with water  
level control  
(heavily cut-  
over bogs with  
only *Molinia*  
vegetation)





# Preliminary results : vegetation trajectories

## Analysis of permanent vegetation plots :

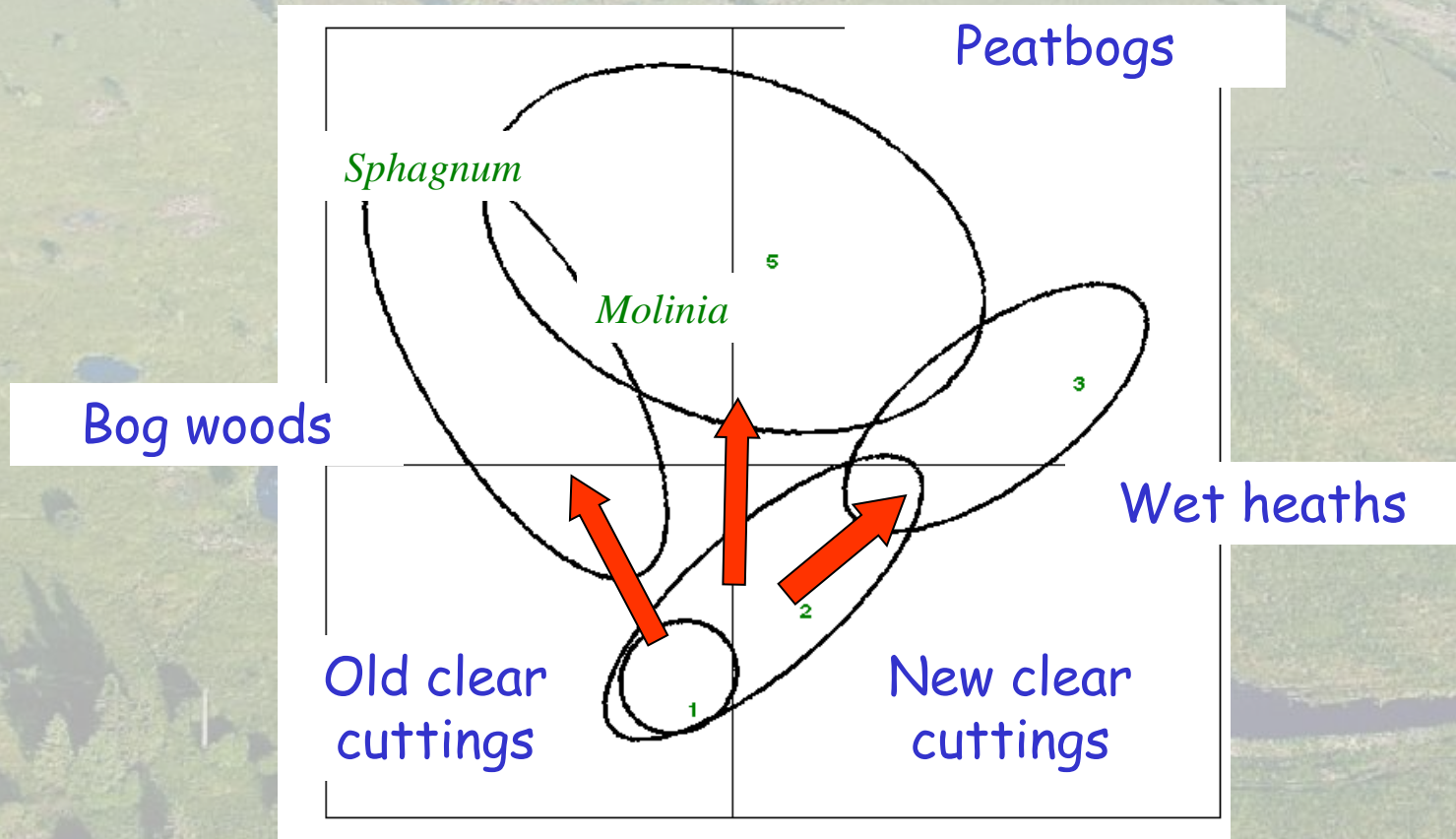


299 stations - 109 species - % - Bray-Curtis index - Ward clustering - IndVal analysis



# Preliminary results : vegetation trajectories

## Analysis of permanent vegetation plots :

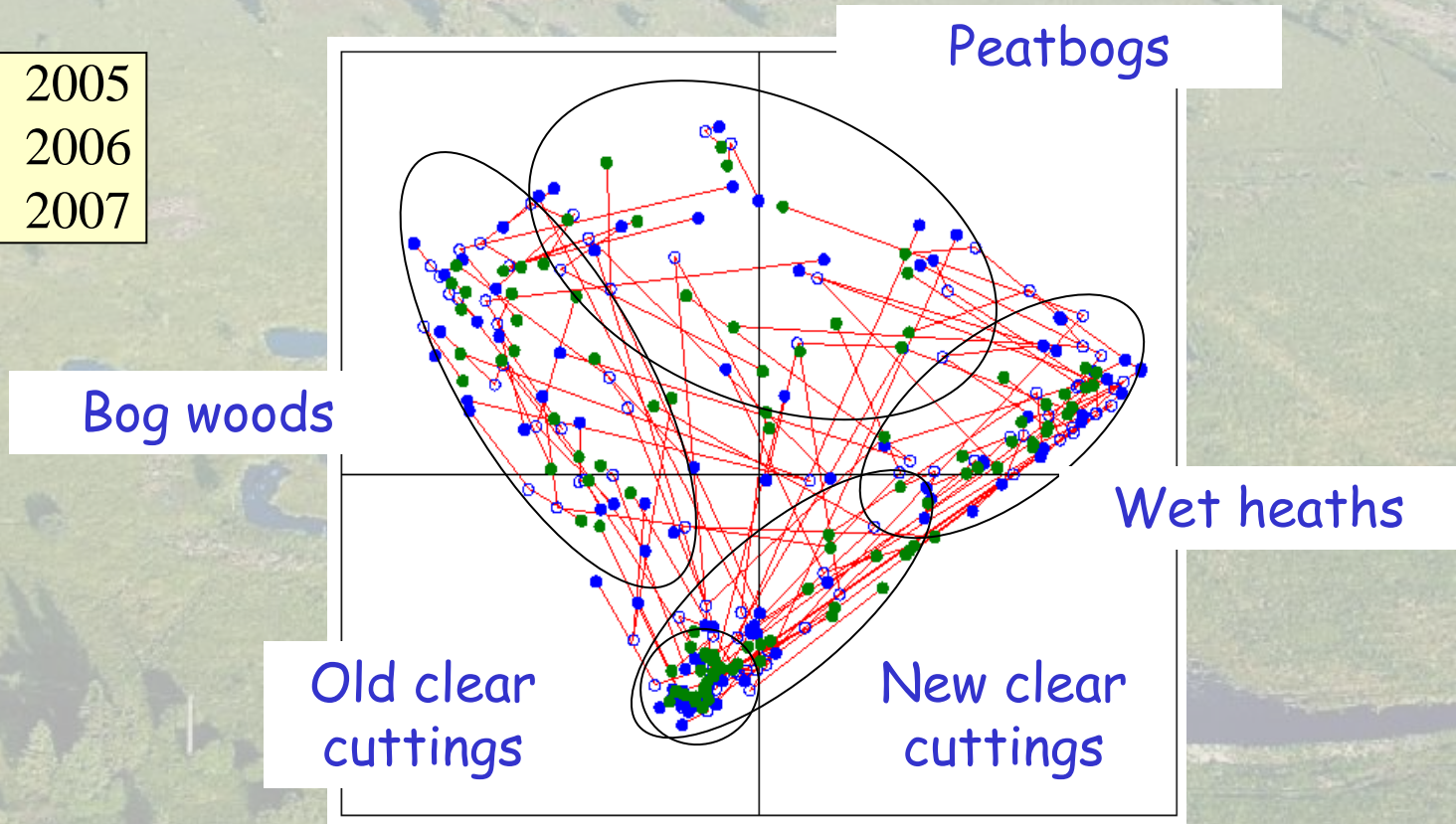
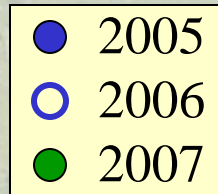


PCOA -  $\% \Delta = 22\%$



# Preliminary results : vegetation trajectories

## Analysis of permanent vegetation plots :

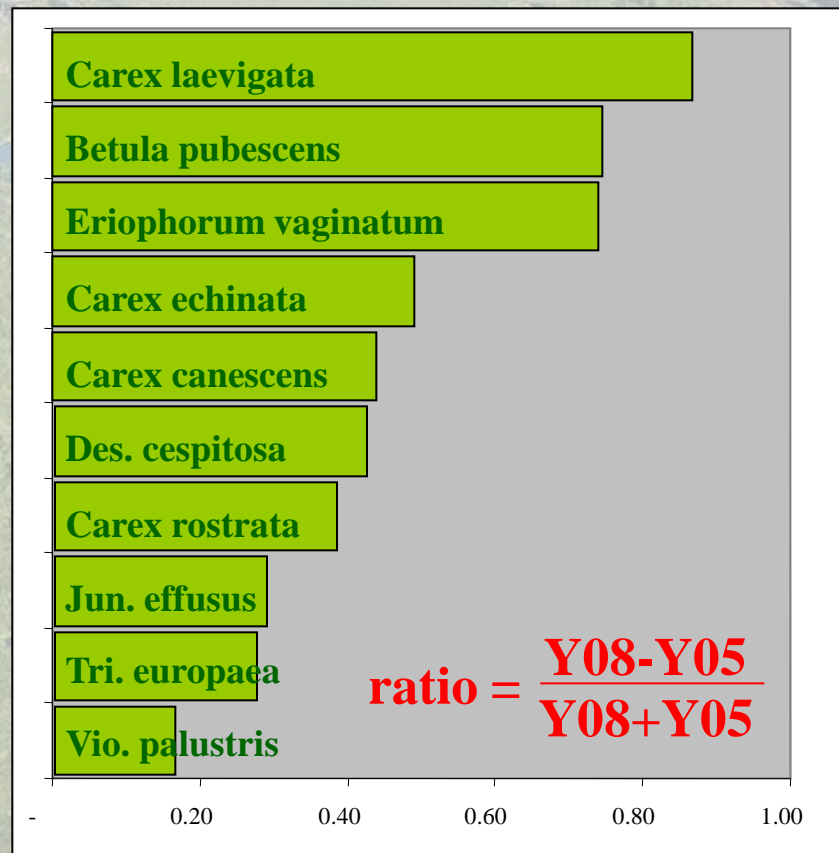
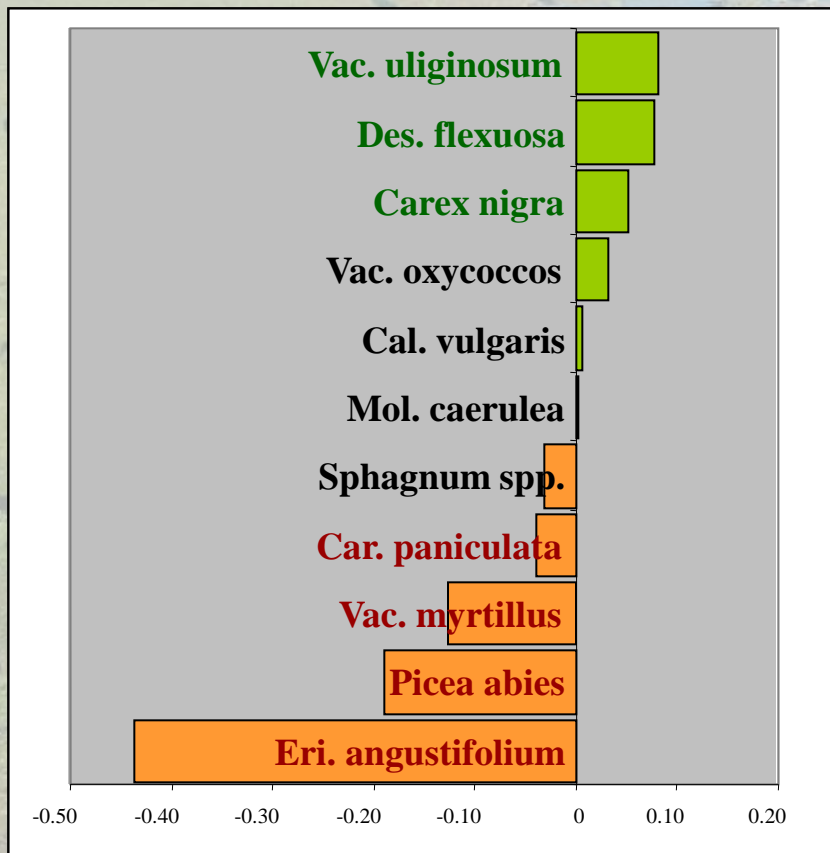


**Strong vegetation change during restoration actions ...**



# Preliminary results : vegetation trajectories

## Analysis of permanent vegetation plots :



$$\text{ratio} = \frac{Y08 - Y05}{Y08 + Y05}$$

Relative index indicates clearly increasing abundances ...



# Preliminary results : vegetation trajectories

Analysis of permanent vegetation plots :

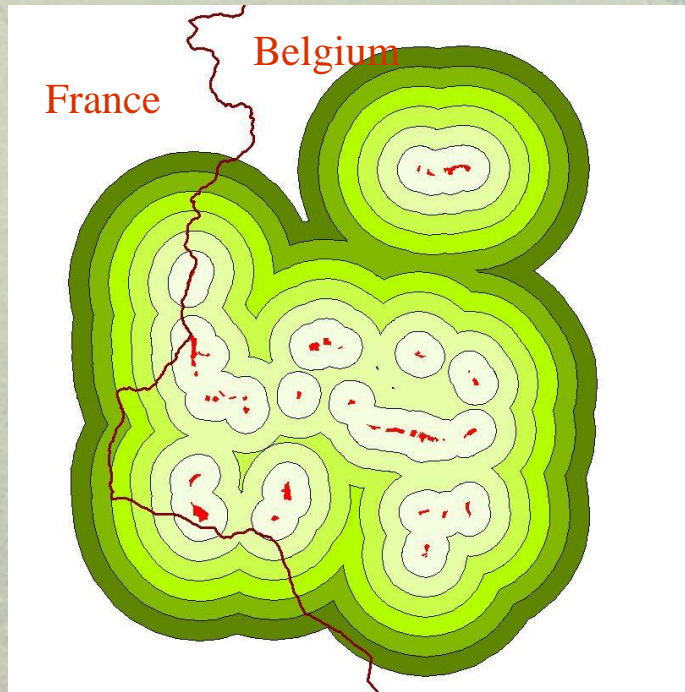
Spruce plantations in 2005 ... (sod cutting)





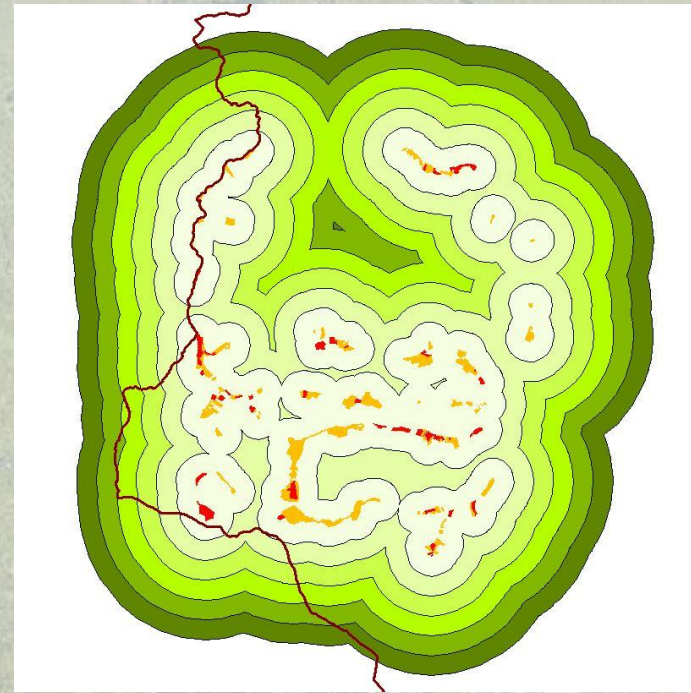
# Preliminary results : connectivity

## Croix-Scaille project Old network



Existing site area = **66 ha**  
All sites connected at **2000 m** level  
Buffer 500 m = **2600 ha**

## New network



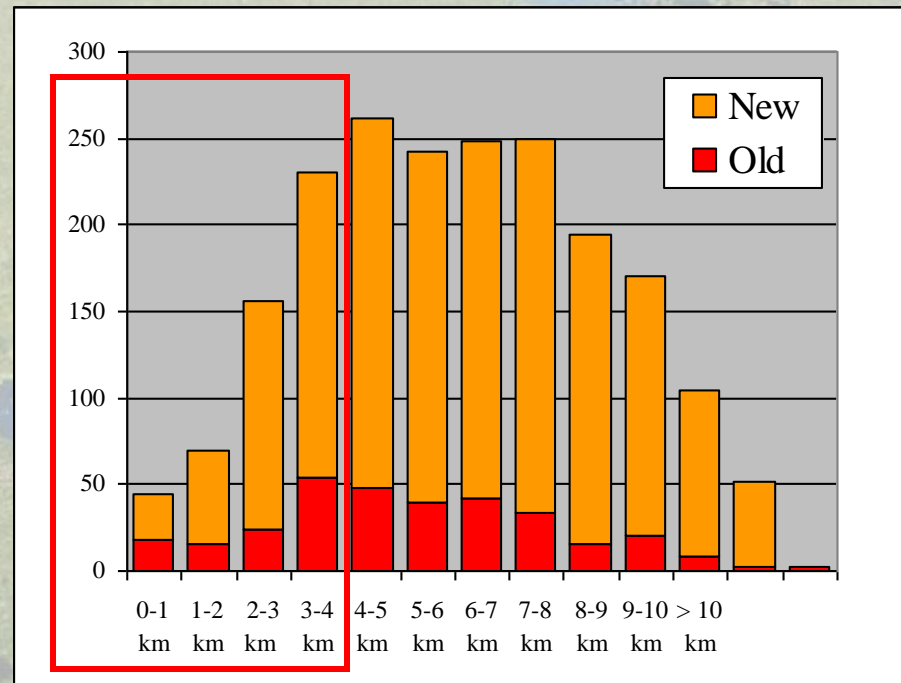
... multiplied by **4.5**  
... at **1000 m** level  
... multiplied by **1.8**



# Preliminary results : connectivity

## Croix-Scaille project

### Number of potential links between sites

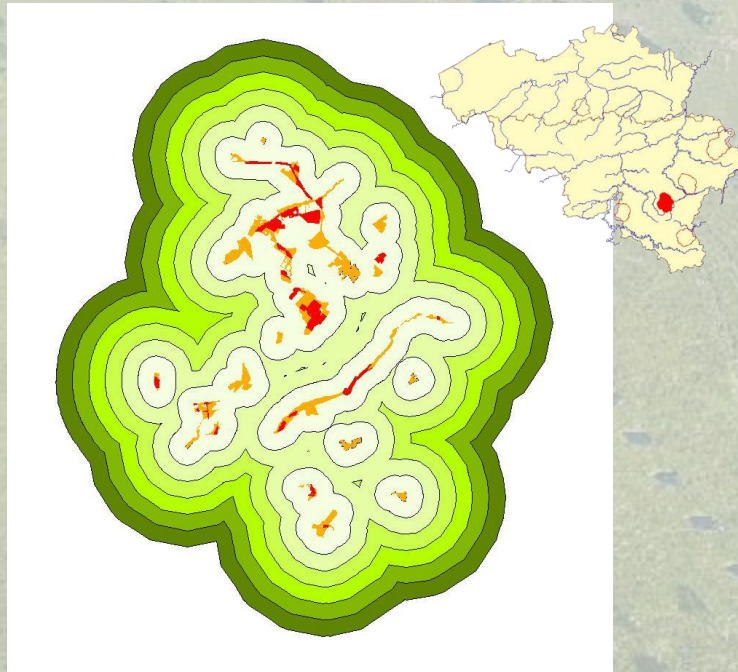


A lot of new links :  
(4.5 times more exchange possibilities below 4 km level)



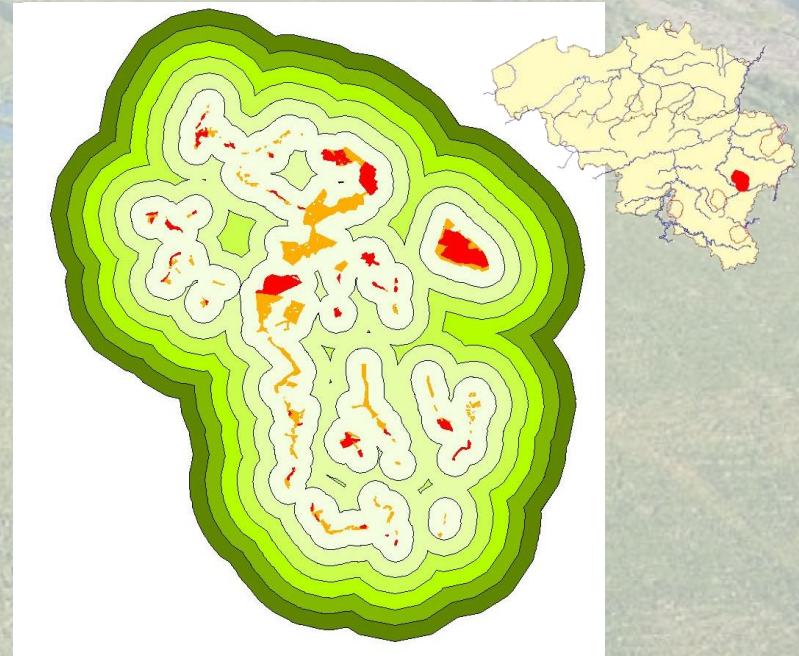
# Preliminary results : connectivity

## Saint-Hubert



**135 ha multiplied by 3.9**  
**1500 m => 1000 m level**  
**2400 ha multiplied by 2.0**  
**< 4 km dist. multiplied by 2.9**

## Plateau des Tailles



**295 ha multiplied by 2.6**  
**2000 m => 1000 m level**  
**3800 ha multiplied by 1.8**  
**< 4 km dist. multiplied by 3.3**

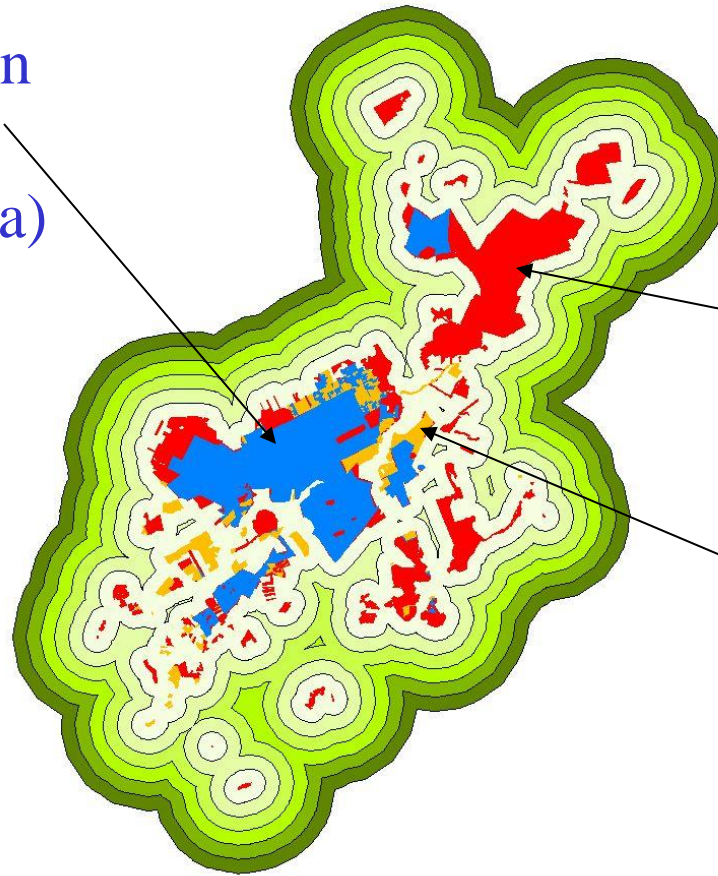


# Preliminary results : connectivity

## Hautes-Fagnes project

Restoration  
works  
(on 3500 ha)

**Very large  
drained  
site,  
priority on  
restoration**



**Existing sites  
(5700 ha  
natural  
reserves)**

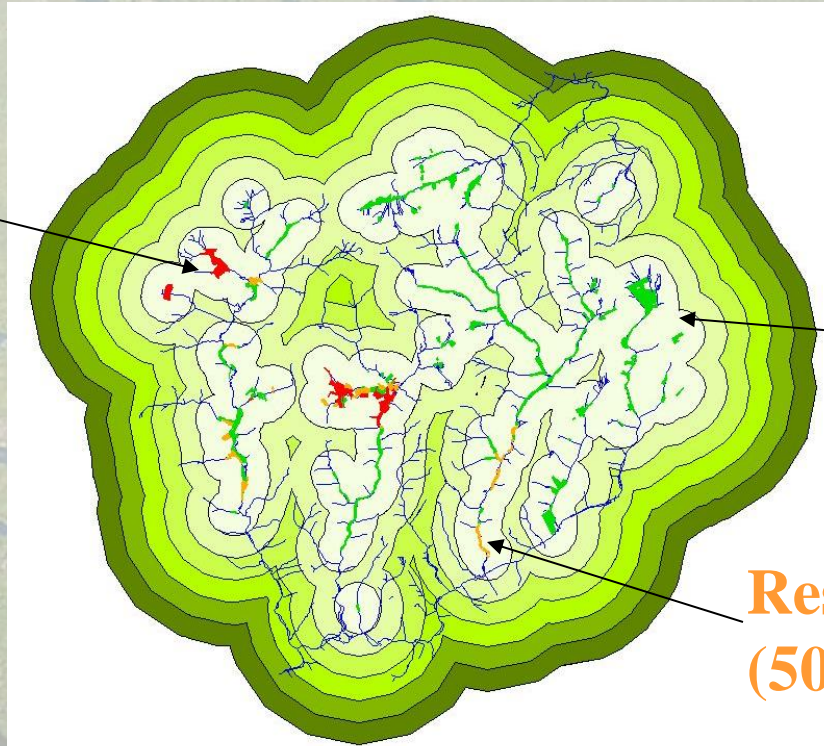
**New sites  
(785 ha)**



# Preliminary results : connectivity

## Pearl mussel project

**Existing  
protected sites  
(48 ha of  
natural  
reserves)**



**New natural  
reserves  
(229 ha)**

**Restored sites  
(50 ha)**



**Priority to obtain a quite complete connectivity  
of major zones for Pearl mussel populations !**



# Preliminary results : connectivity

## Species response to restoration of ecological networks



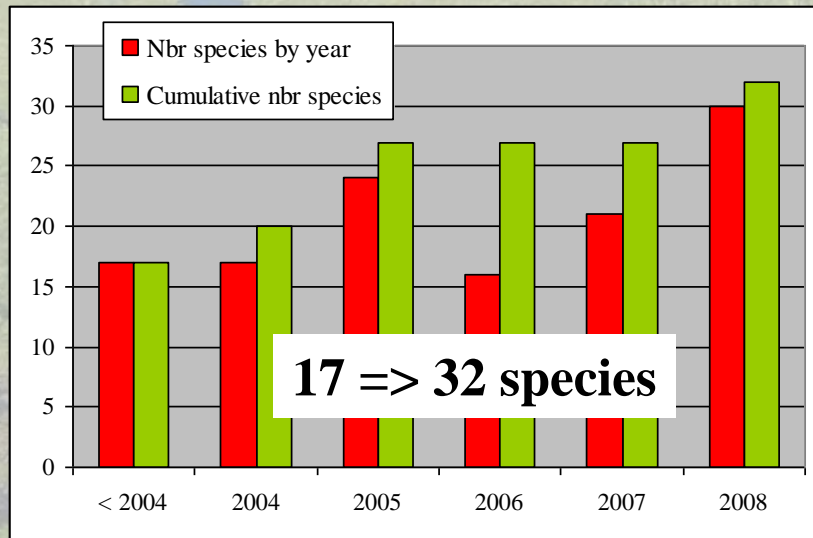
**Saint-Hubert :**

> 250 new ponds (> 20 m<sup>2</sup>)

> 2500 ditch blocking



### Dragonfly species number



#### 2004-5

*Aeshna grandis*, *Gomphus pulchellus*,  
*Cordulia aenea*, *Lestes viridis*, *Orthetrum*  
*brunneum*, *O. cancellatum*, *O.*  
*coerulescens*, *Platycnemis pennipes*,  
*Somatochlora arctica*

#### 2008

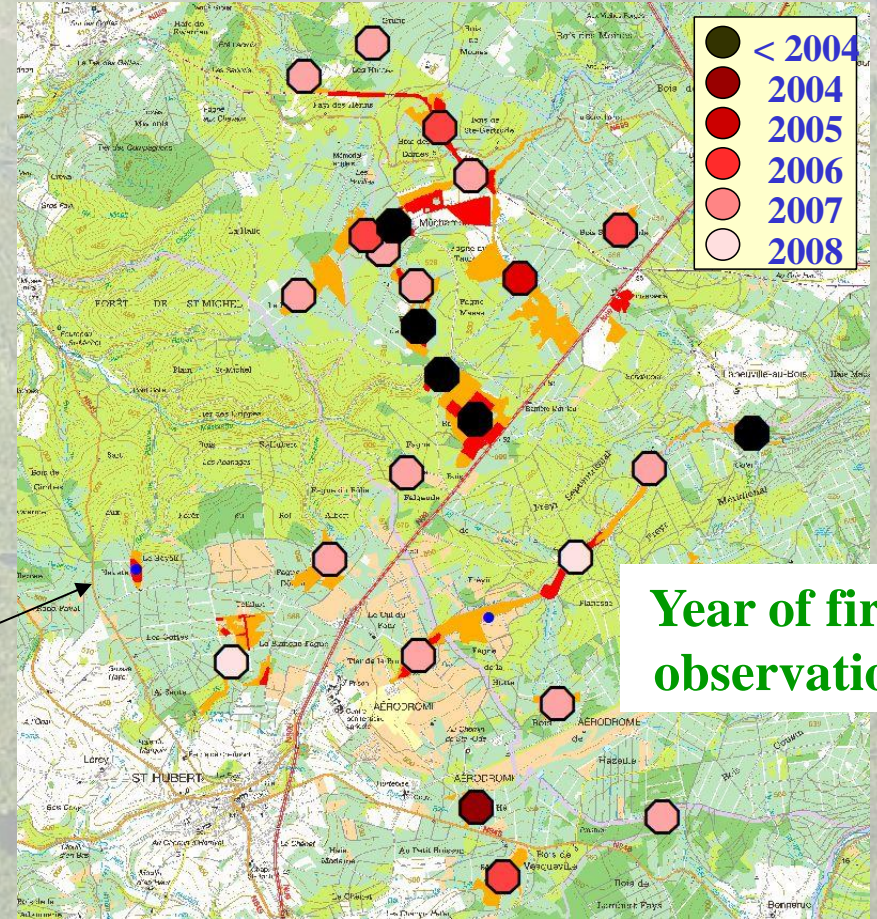
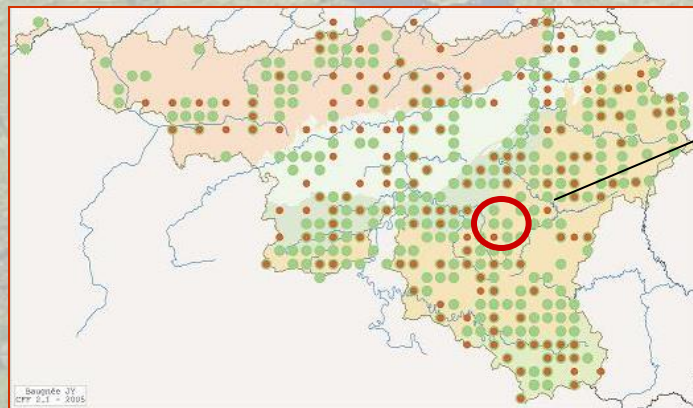
*Coenagrion scitulum*,  
*Ischnura pumilio*, *Lestes dryas*,  
*Sympetrum sanguineum*, *S. striolatum*, ...



# Preliminary results : species response

## Species response to restoration of ecological networks

### *Libellula depressa*

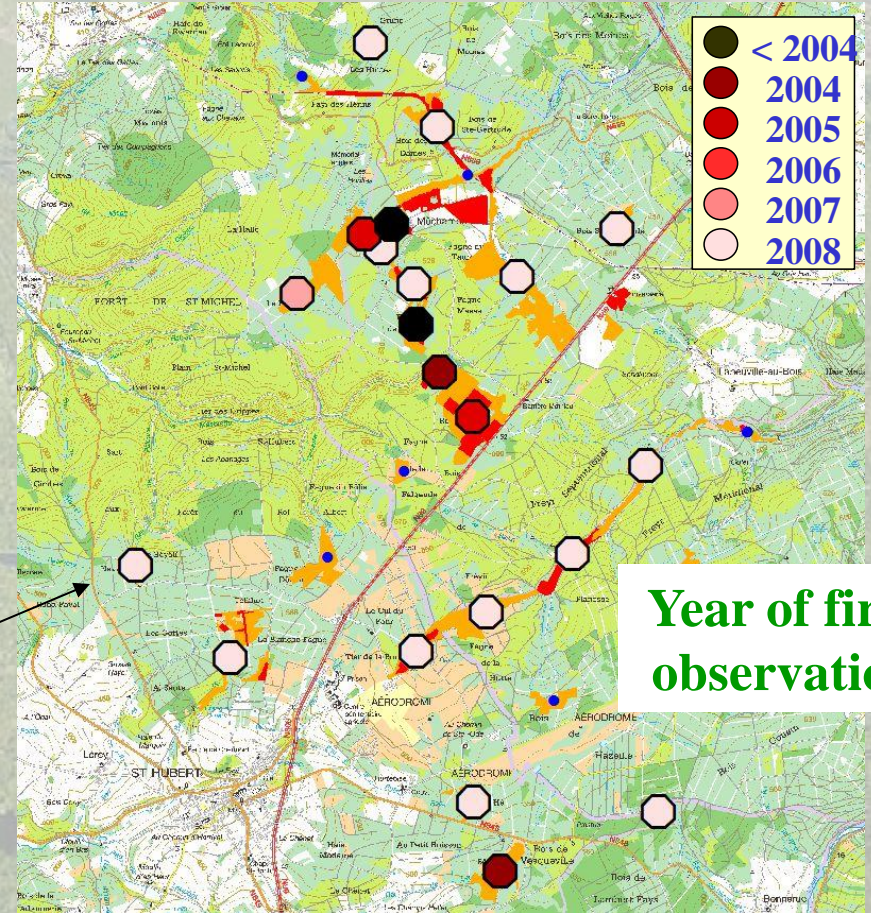
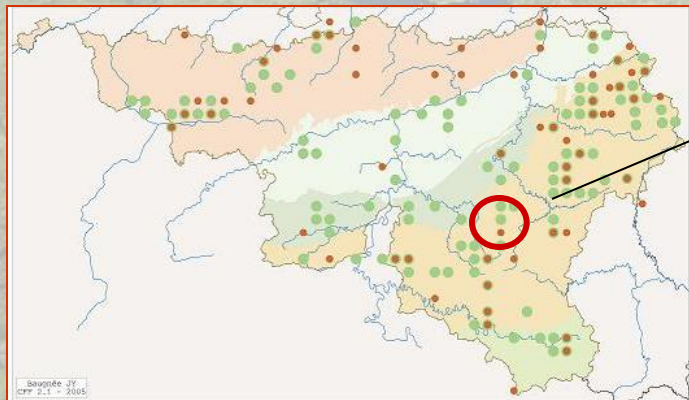




# Preliminary results : species response

## Species response to restoration of ecological networks

### *Sympetrum danae*

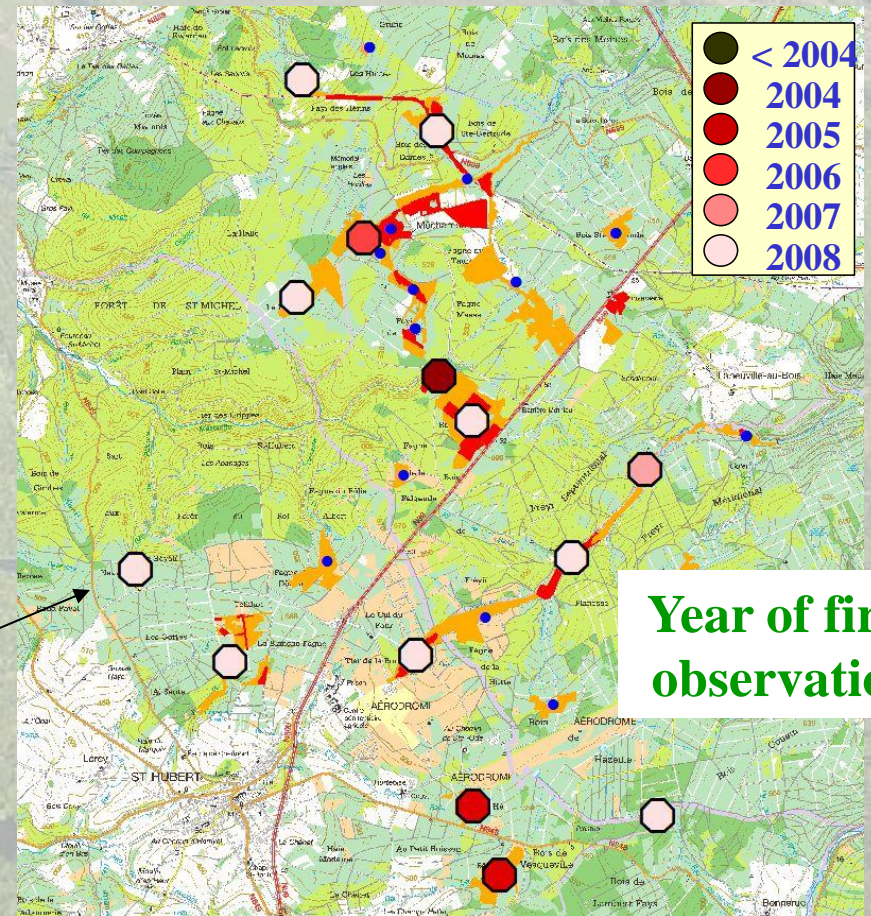
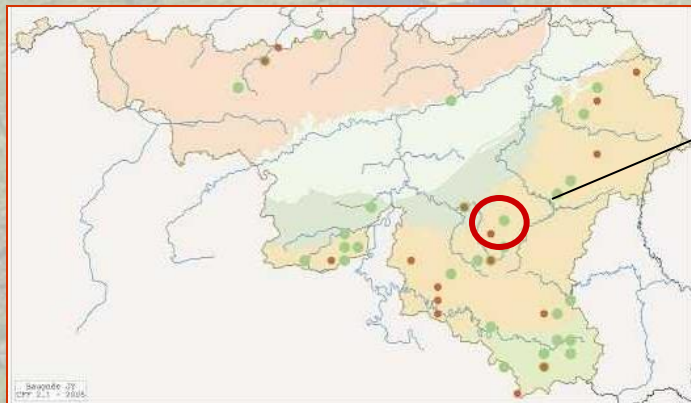




# Preliminary results : species response

## Species response to restoration of ecological networks

### *Orthetrum coerulescens*



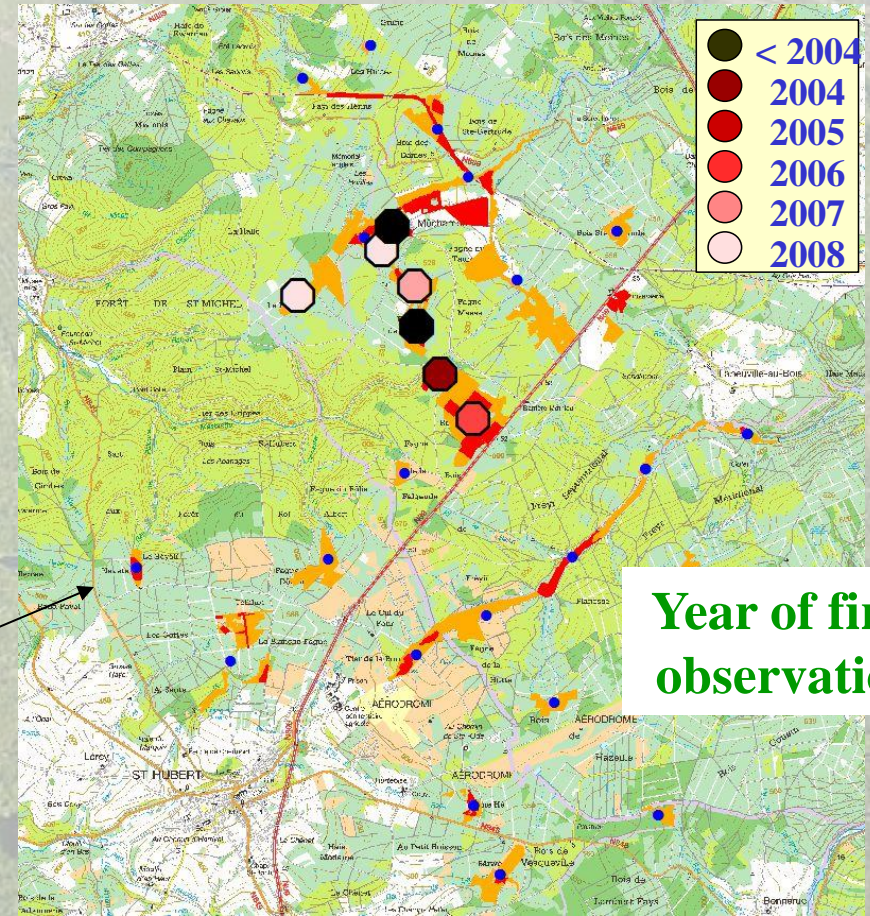
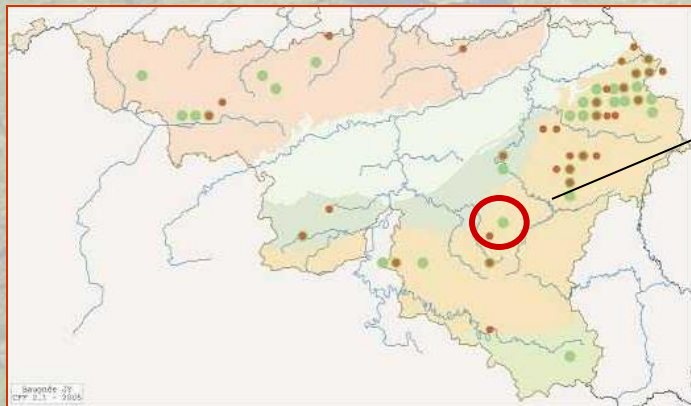
Year of first observation



# Preliminary results : species response

## Species response to restoration of ecological networks

### *Leucorrhinia dubia*



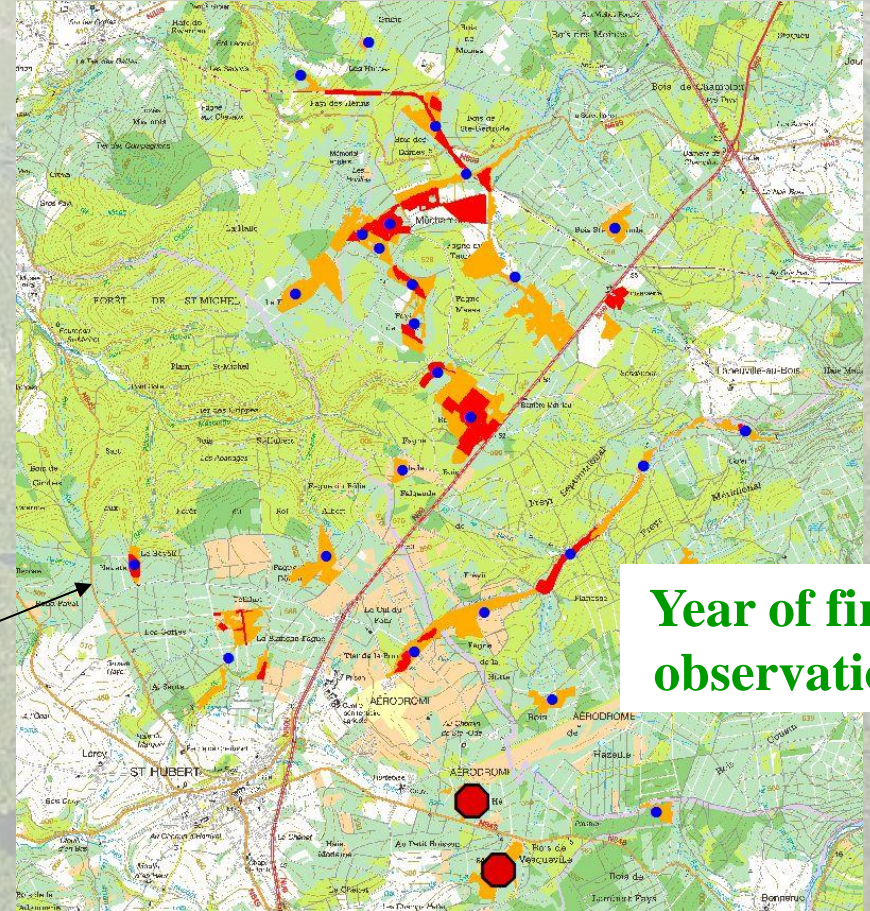
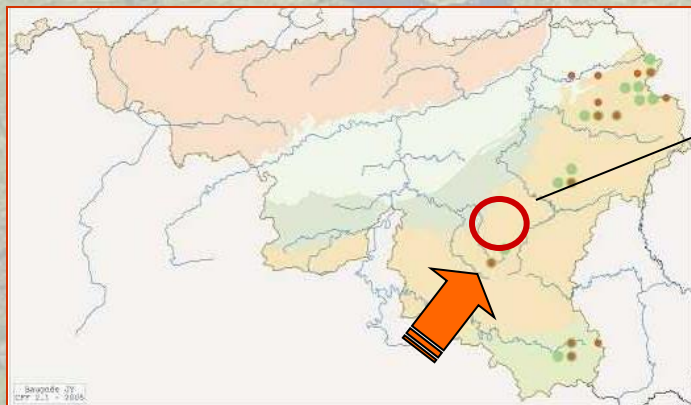
Year of first observation



# Preliminary results : species response

## Species response to restoration of ecological networks

### *Somatochlora arctica*





# Preliminary results : species response

## Species response to restoration of ecological networks

### *Butterflies*



Slower response but *Boloria aquilonaris*, is now recovering at Saint-Hubert (where it was extinct in 2000) and colonizing new sites at Plateau des Tailles.

### *Birds*



Return of migratory of *Grus grus*, increase density of *Lanius excubitor*, *Falco subbuteo*, *Ciconia nigra*, *Aegolius funereus*, *Saxicola torquatus*, *Locustella naevia*, ...



## Taken home messages



- With **> 4.000 ha** restored and **>1.500 ha** of new protected sites, **LIFE projects** will change landscapes in **Belgian Ardenne** !
- **Biodiversity in peat and wet biotopes** should be enhanced in a next future
- **Forester and local people behaviour** against peat biotope is also slowly changing
- But, at least **10.000 ha** of spruce plantations are still waiting similar restoration actions ...

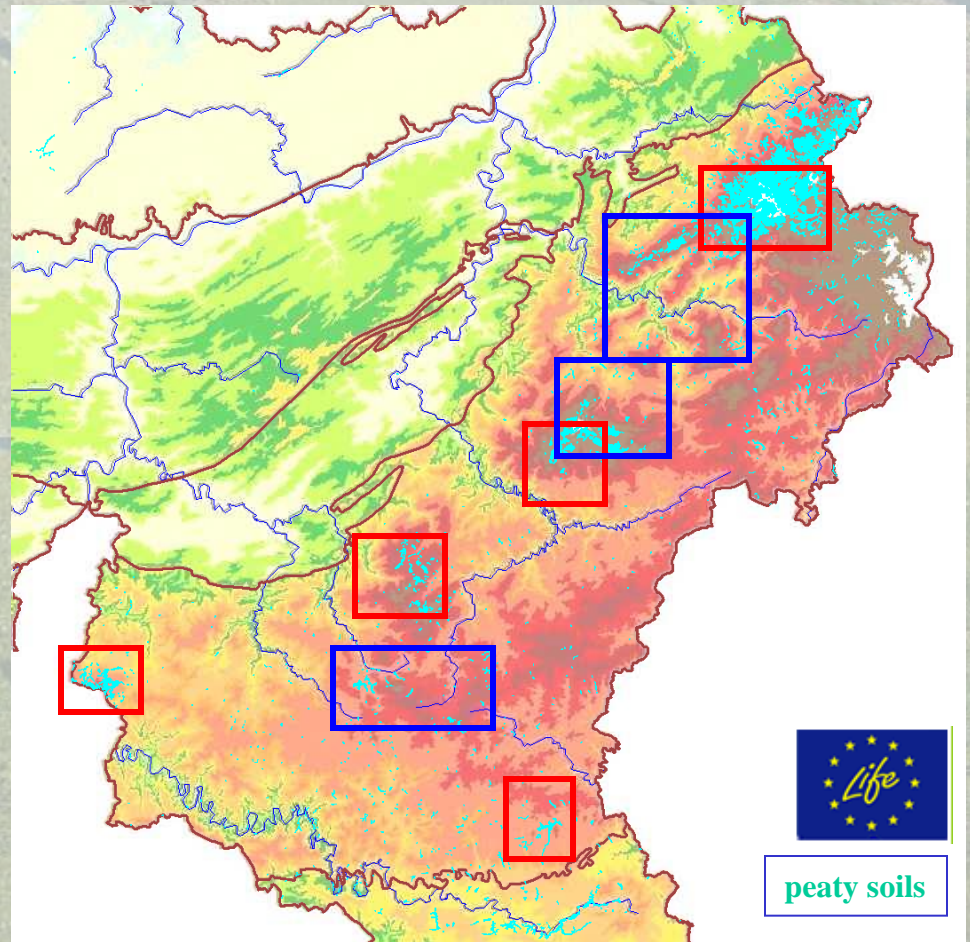


## Taken home messages

We need now to  
make the link  
between main  
restored peaty  
areas

with new  
other LIFE+  
projects

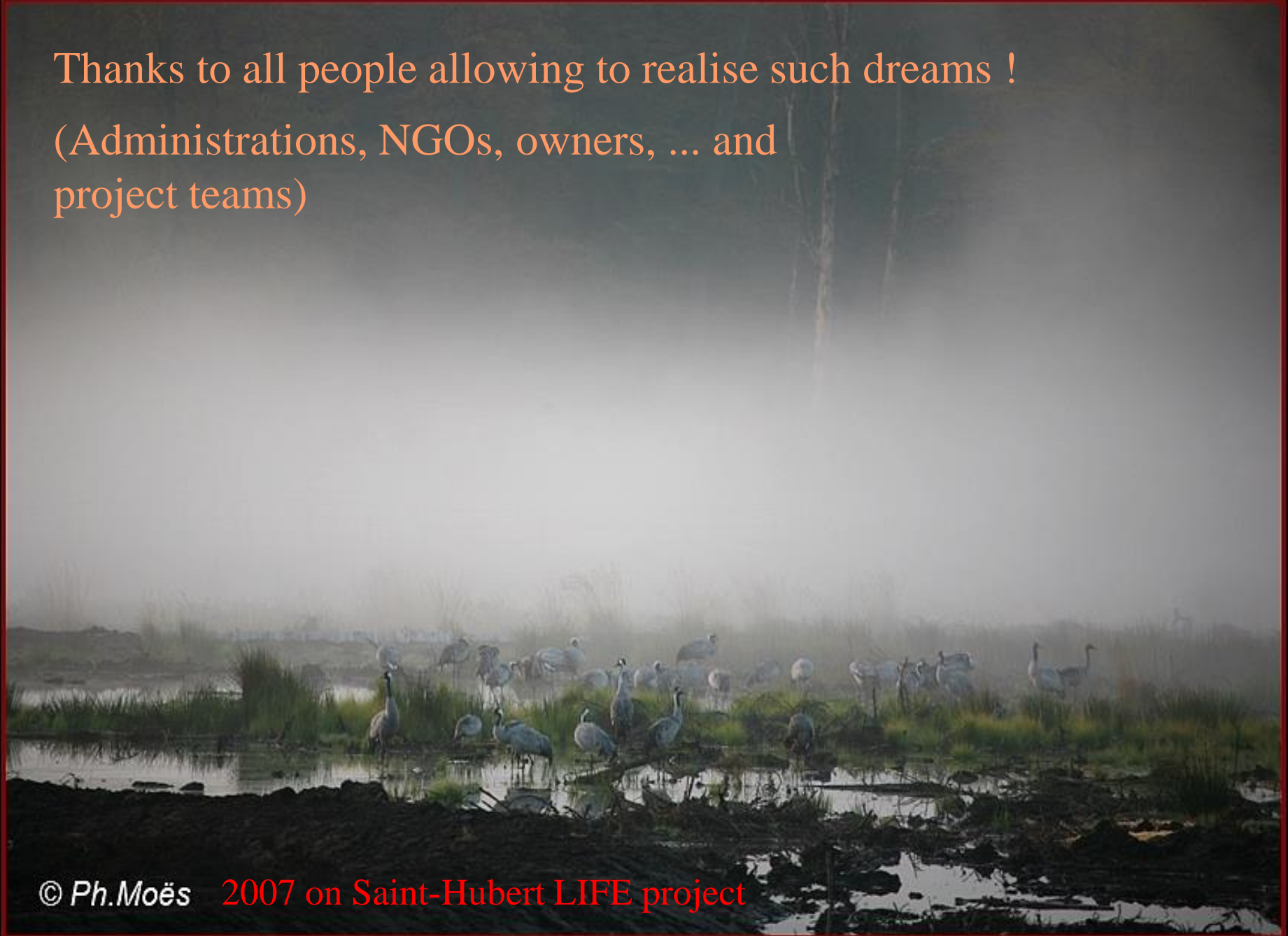
It's not the end ...





Thanks to all people allowing to realise such dreams !

(Administrations, NGOs, owners, ... and  
project teams)



© Ph.Moës 2007 on Saint-Hubert LIFE project



**Thank you for your attention !**



**© G. Jadoul**



**Early morning, yesterday, on Saint-Hubert LIFE project**