Actions in progress for the conservation of *Unio crassus* in Belgium

BNIP

Dr. Motte Grégory *, Cors Ruddy, Etienne Fabrice

[1] Directorate-General for Agriculture, Natural Resources and the Environment (DGARNE), Nature, Agriculture and Environment Studies Department (DEMNA), Directorate of Nature and Water (DNE). Wallonia, Belgium. * Corresponding : Gregory.Motte@spw.wallonie.be

Introduction

Conservation status of *Unio crassus* (art.17 Natura 2000 reporting) are U1 in the continental biogeographical region and U2 in the Atlantic region (Wibail *et al.* 2014). Due to this poor state of conservation, Wallonia has initiated studies and inventories through the Belgian Nature Integrated Project (BNIP).

In order to establish an action plan (2021) for *U.crassus*, we need studies to improve the knowledge in order to establish priority populations and a list of priority actions.
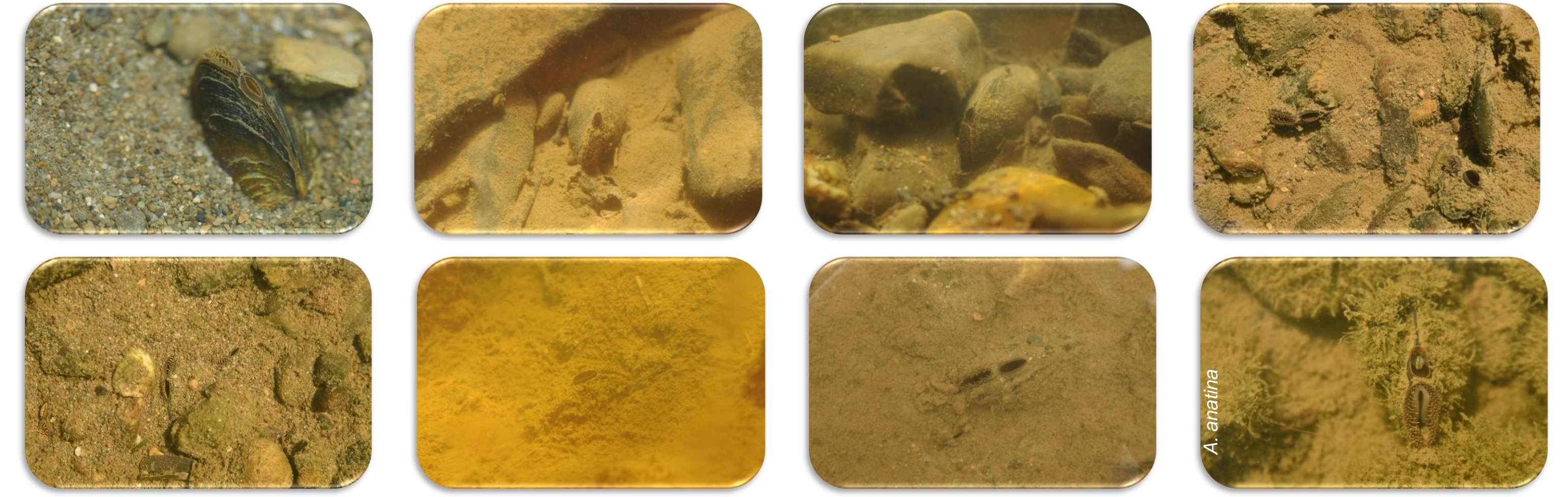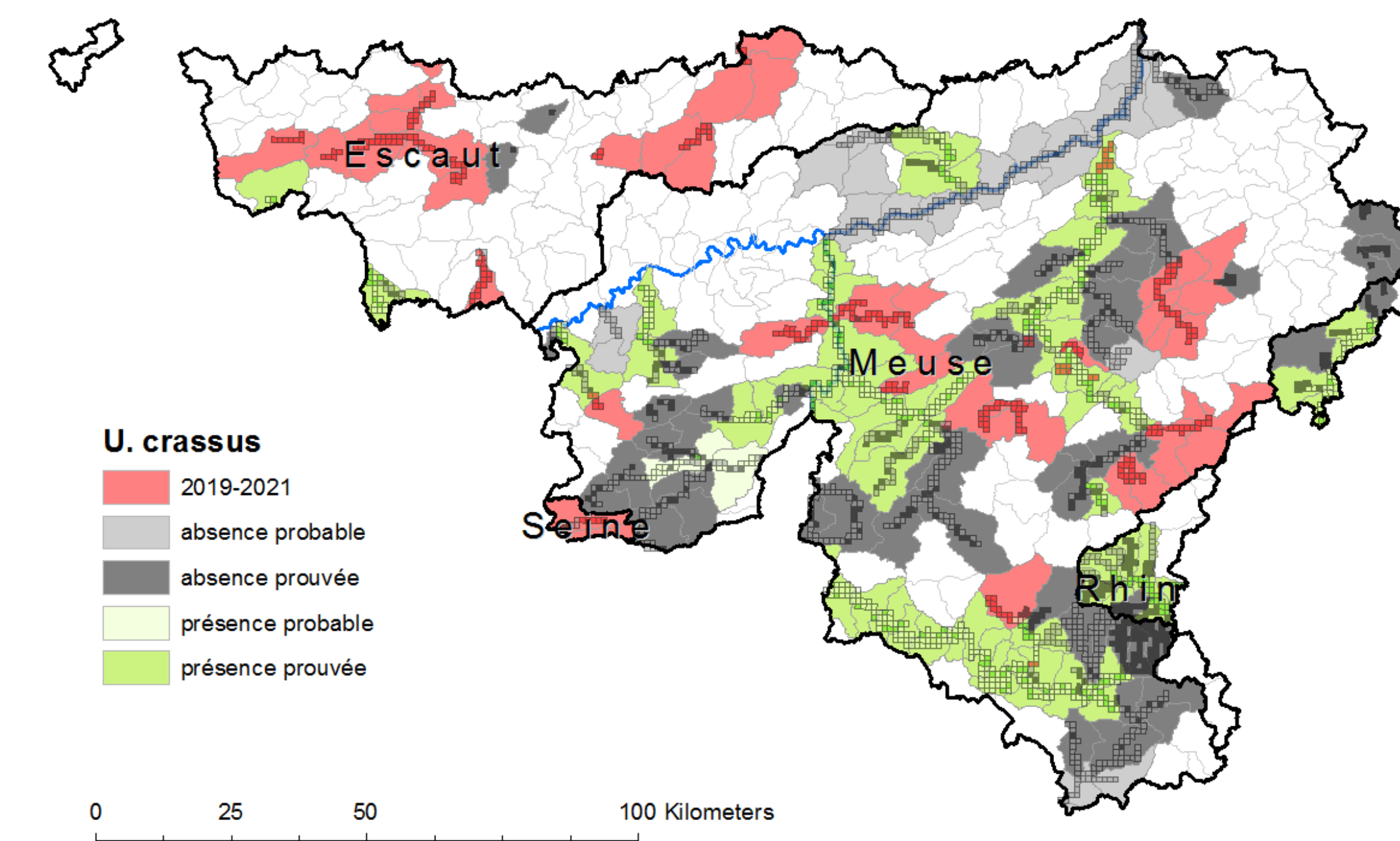

Improving distribution knowledge (Range)

In Belgium, *U. crassus* is currently present, but only in Wallonia. However, the distribution remains poorly documented. Since 2014 (C15 action), prospections are made in all Wallonia.

Surveys are carried from May to September, by a team of 2-4, with an aquascope, feet in the water. Visual searching and "touch with hand" along riverbanks are done. Empty shells are also searched on dewatered areas and next to muskrat burrows. When individuals or shells are discovered in a river, its main tributaries are prospected as well. Localization of the inferior and superior limit of the distribution area in a river is then realized. In each square of 1x1km UTM, 300-600m are prospected.

The selection of the river to prospect is based on historical data (Adam, 1960) and recent data (DEMNA databases). Rivers without known population but with good or very good ecological status, according to the WFD, are also prospected.

Data (presence and absence) are encoded in a database (DEMNA) and will be available in the open database GBIF.

U. crassus
- 2019-2021
- absence probable
- absence prouvée
- présence probable
- présence prouvée

0   25   50   100 Kilometers

Monitoring (work in progress)

**Structure and size of the population (every 6 years, art.17 N2000)**

Location of the sections with the highest densities (C15 action)

1. 20m/20min strips (4-10 strip/site, 1-6 sites/river) : visual and tactile search
2. Count + measure of living individuals (length, width, number of growth streak)
3. Collection and counting empty shells
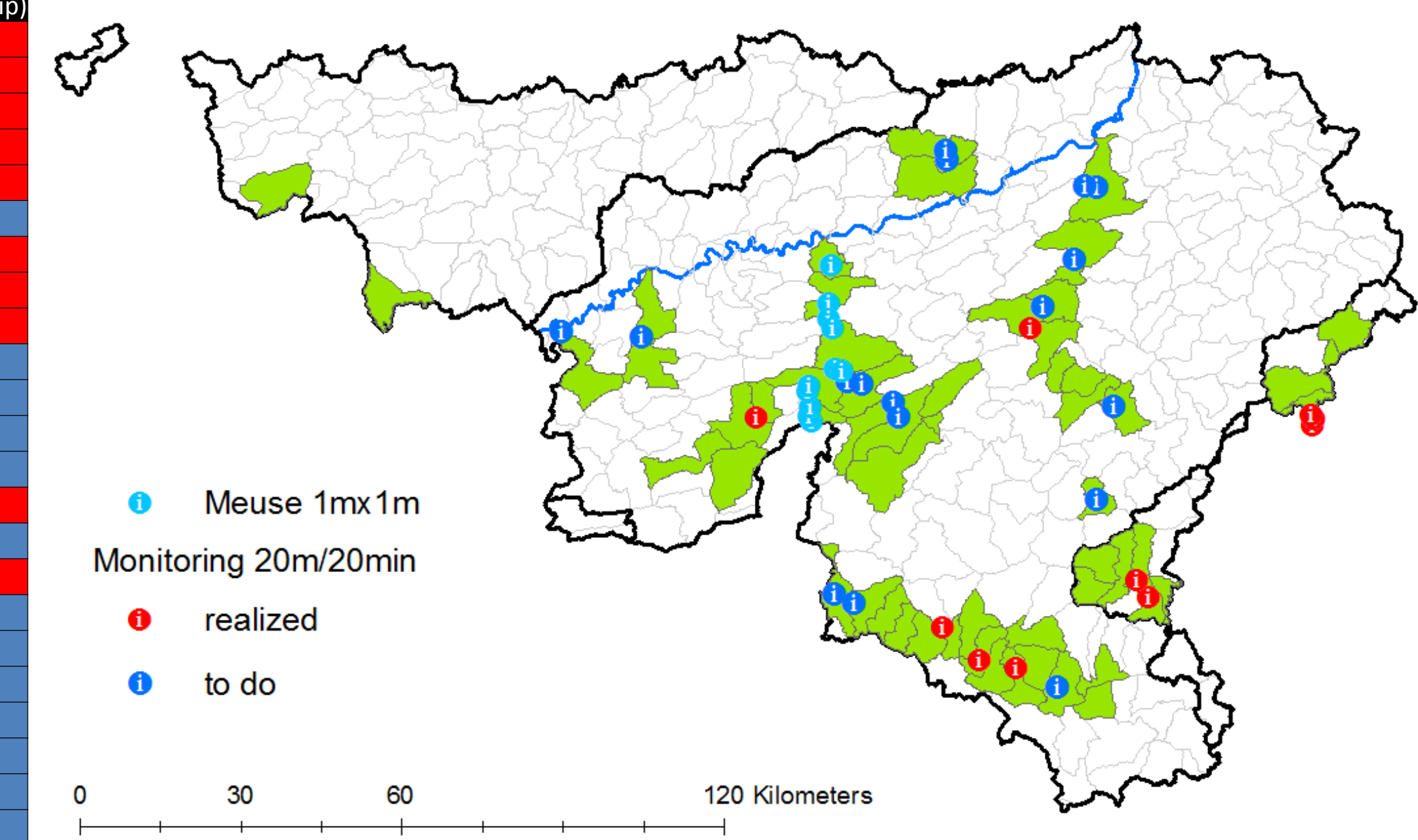4. Encoding in a database

Statistical treatment : number and length of individuals
(Bates & al. 2014) *Linear mixed-effects models using Eigen and S4. R package*

Particular case : Meuse (navigation). Periodic assecation for maintenance
12 sites, 115 1mx1m square, using a rake (Libois 1983)

Distribution : unit = 1kmx1km UTM square
Priority = monitoring of the uper and inferior limit (presence /absence)
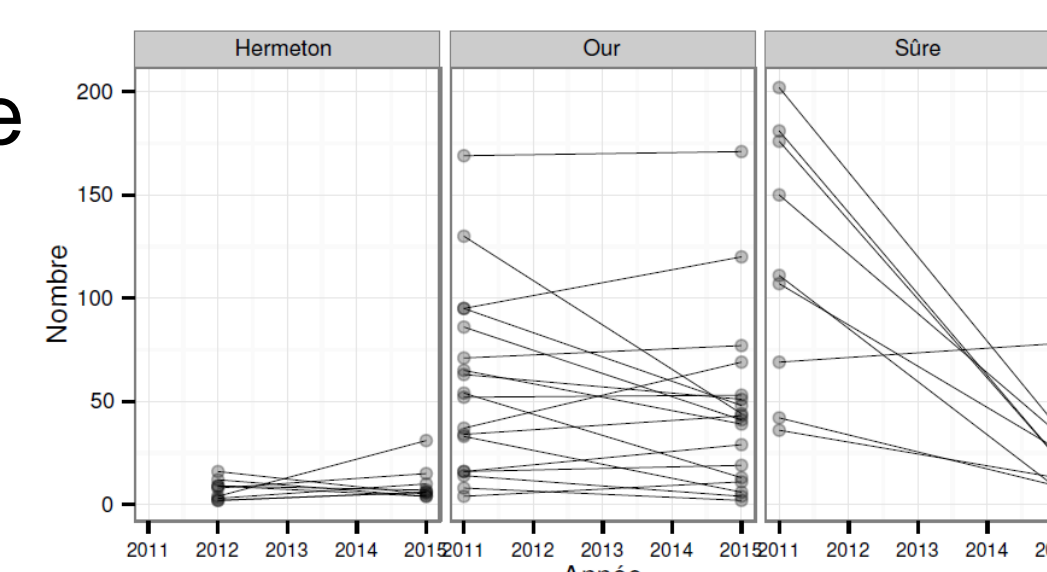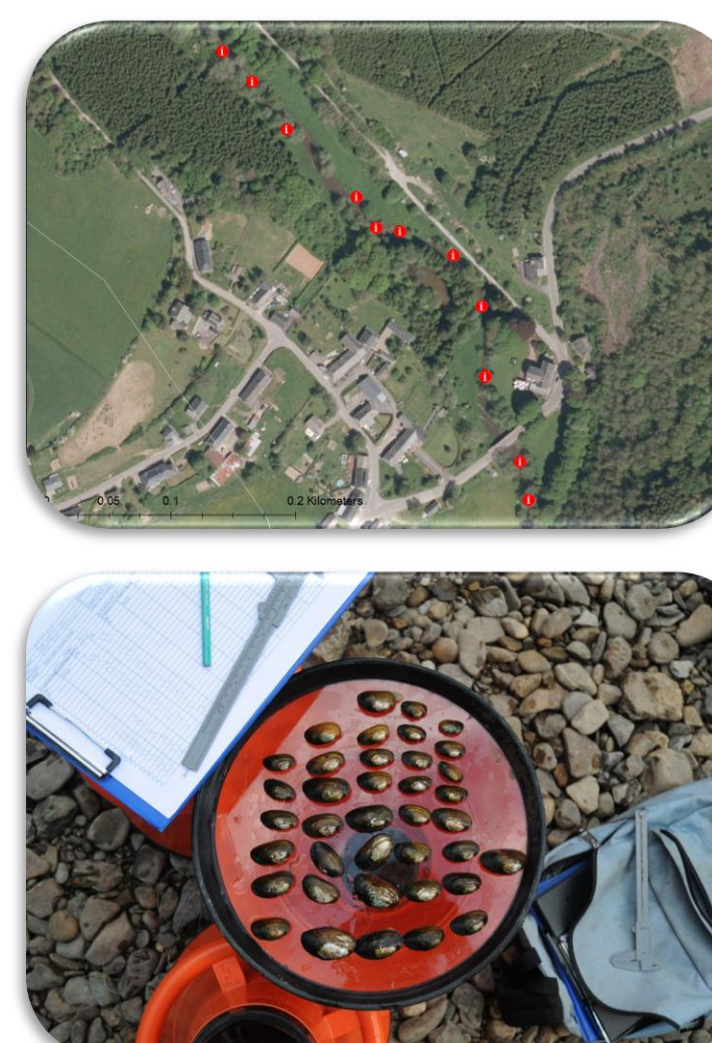
District	River	Toponym	Width (m)	Nb 20m (strip)
Rhin	Sûre	Strainchamps	8	5
	Sûre	Bodange	15	11
	Our	Ouren	22	8
	Our	Rittersprung	22	6
	Our	Oberhausen	20	4
Meuse	Semois	Termes	15	10
	Semois	Chiny	35	10
	Semois	Herbeumont	35	10
	Semois	Hayons	45	10
	Semois	La Forêt	40	10
	Semois	Bohan	50	10
	Eau d'heure	Cour-sur-Heure	12	10
	Hantes	Hantes-Wihéries	8	10
	Hermeton	Romedenne	3	10
	Ourthe	Maboge	30	10
	Ourthe	Deulin	20	5
	Ourthe	Petit-Han	30	5
	Ourthe	Lassus	33	5
	Ourthe	Ham	45	5
	Ourthe	Hony	50	5
	Laval	Rechimont	5	10
	Lesse	Wanlin	25	10
	Lesse	Lissoir	25	10
	Lesse	Gendron	25	10
	Lesse	Walzin	50	10
	Mehaigne	Pitet	8	10
	Mehaigne	Fumal	8	10
	Meuse	12 stations	115	115 (1mx1m)

- Meuse 1mx1m
Monitoring 20m/20min
- realized
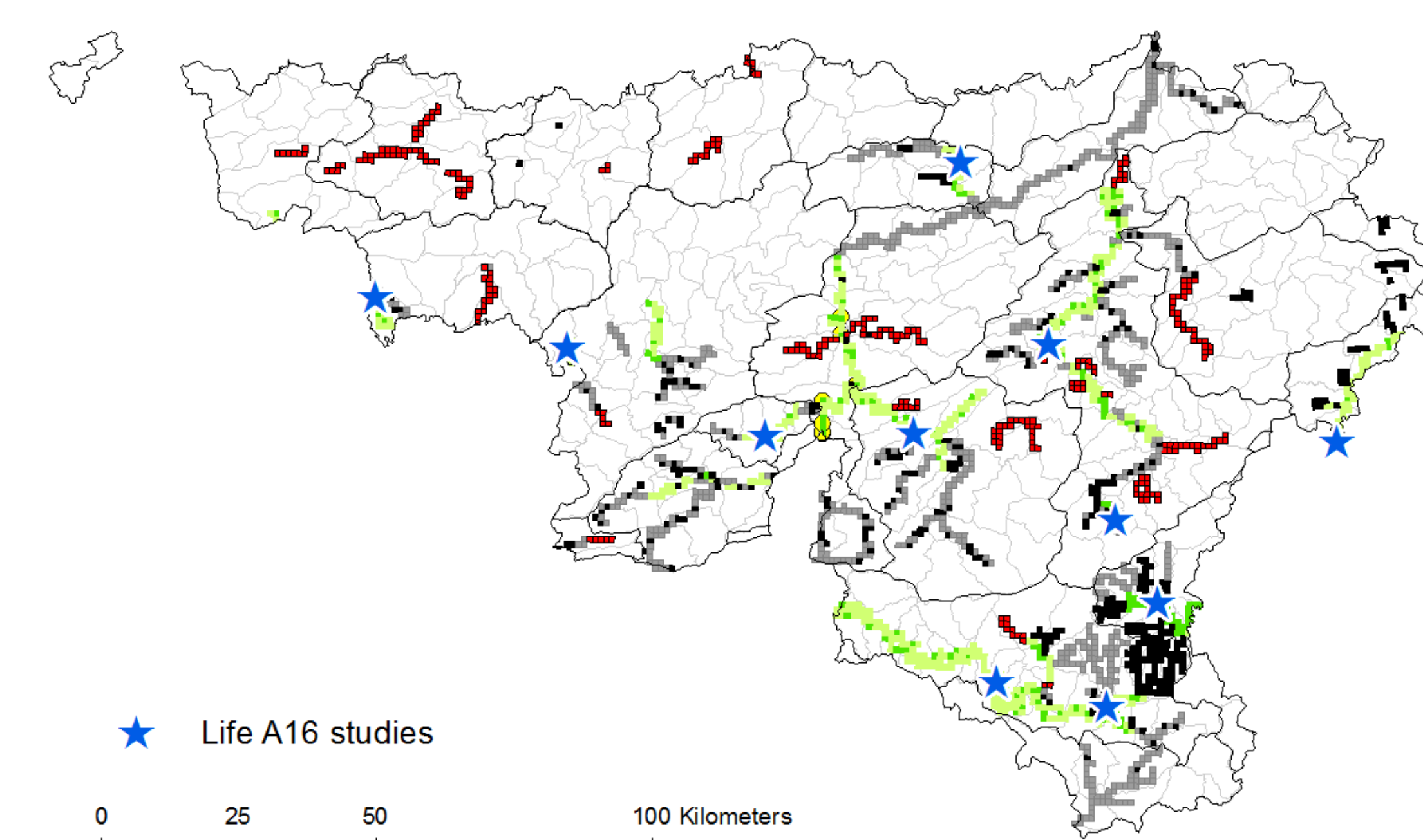- to do

0   30   60   120 Kilometers

Genetic, host fish, habitat

The following studies (A16 action) are carried out with B. Stoeckle, S. Feind, H. Bayerl & J. Geist (Universität München). Market number N° O3.02.03 -16H45. Results are expected in spring 2019.

Populations genetics (genotyping) : identify priority populations for conservation by considering their uniqueness in terms of genetic divergence and genetic diversity on Wallonia and European scale (Geist & Kuehn 2005, Sell et al. 2013). About 260 individuals were sampled.

Best host fish species : about 600 fish samples including the head and gills were collected during electrofishing. Infection rate will be documented with photo and glochidia will be determined by fragment length analysis of the ITS-region according to Feind (2015).

Habitat quality analysis : habitat quality was analyzed on the microhabitat scale regarding the variables : redox potential (free-flowing water and at 5 cm depth), composition of grain size fractions (from the top 10 cm at the same location where redox potential was measured), and penetration resistance using a hand-held penetrometer (Geist & Auerswald, 2007 and Stoeckl & Geist 2016).

- Life A16 studies

0   25   50   100 Kilometers

Acknowledgments

Hantes

Ourthe

Semois

Honnelle

Hermeton

Meuse

Vierre

Photos : Ruddy Cors