



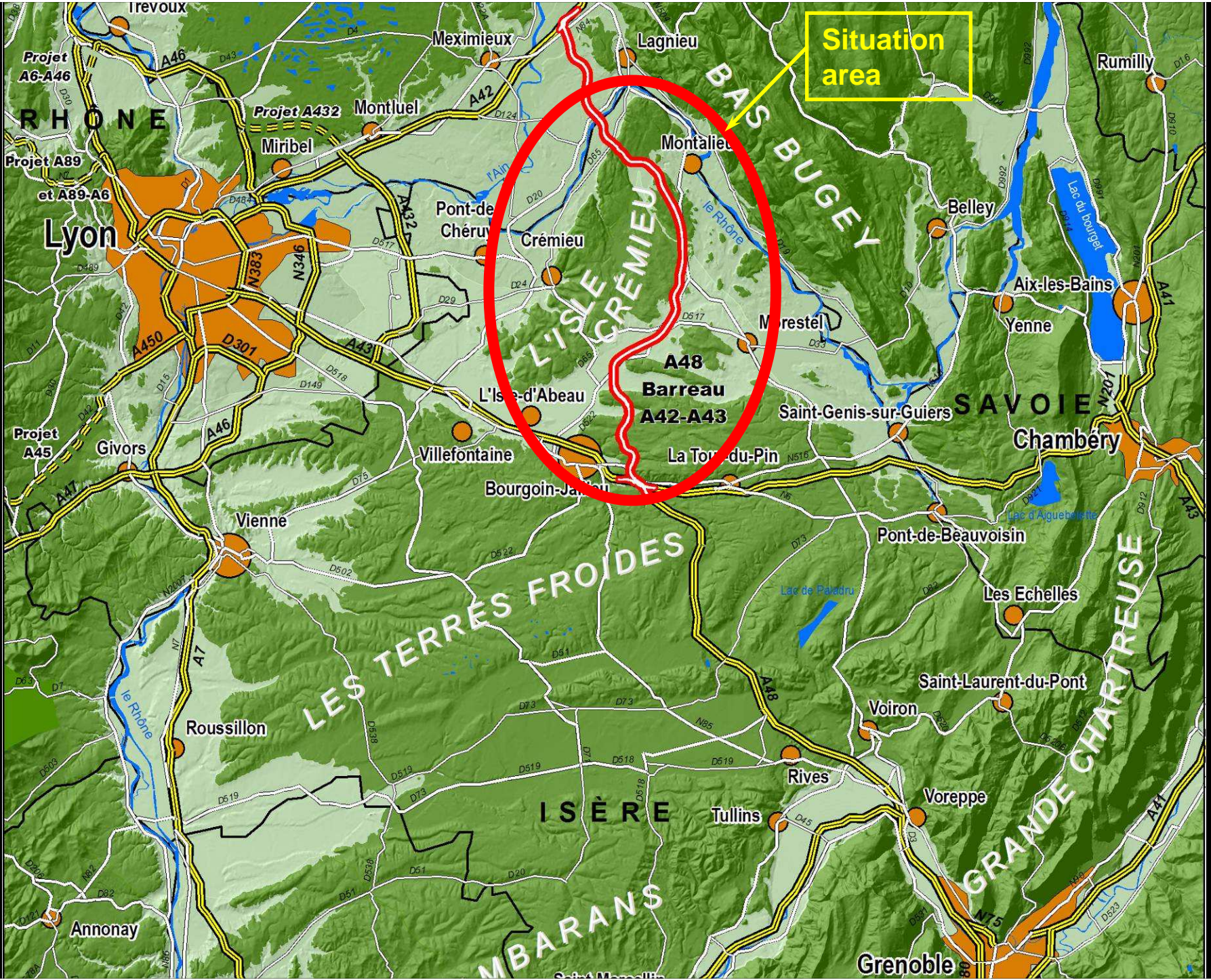
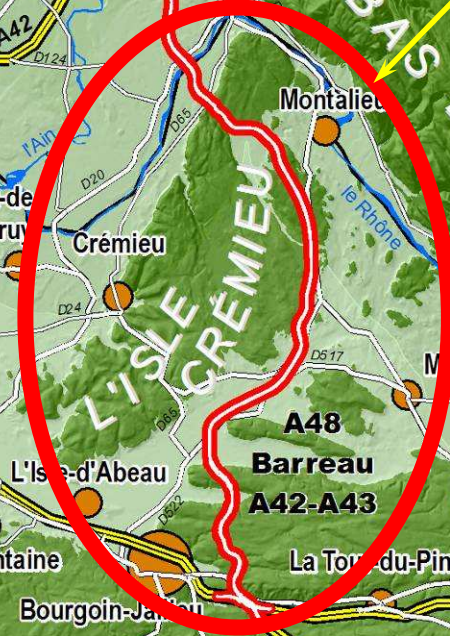
Mapping ecological continuities in Ile Crémieu, North Isère (38)

Workshop, Econnect, november 5th 2009

Vincent Vignon, v.vignon@oge.fr



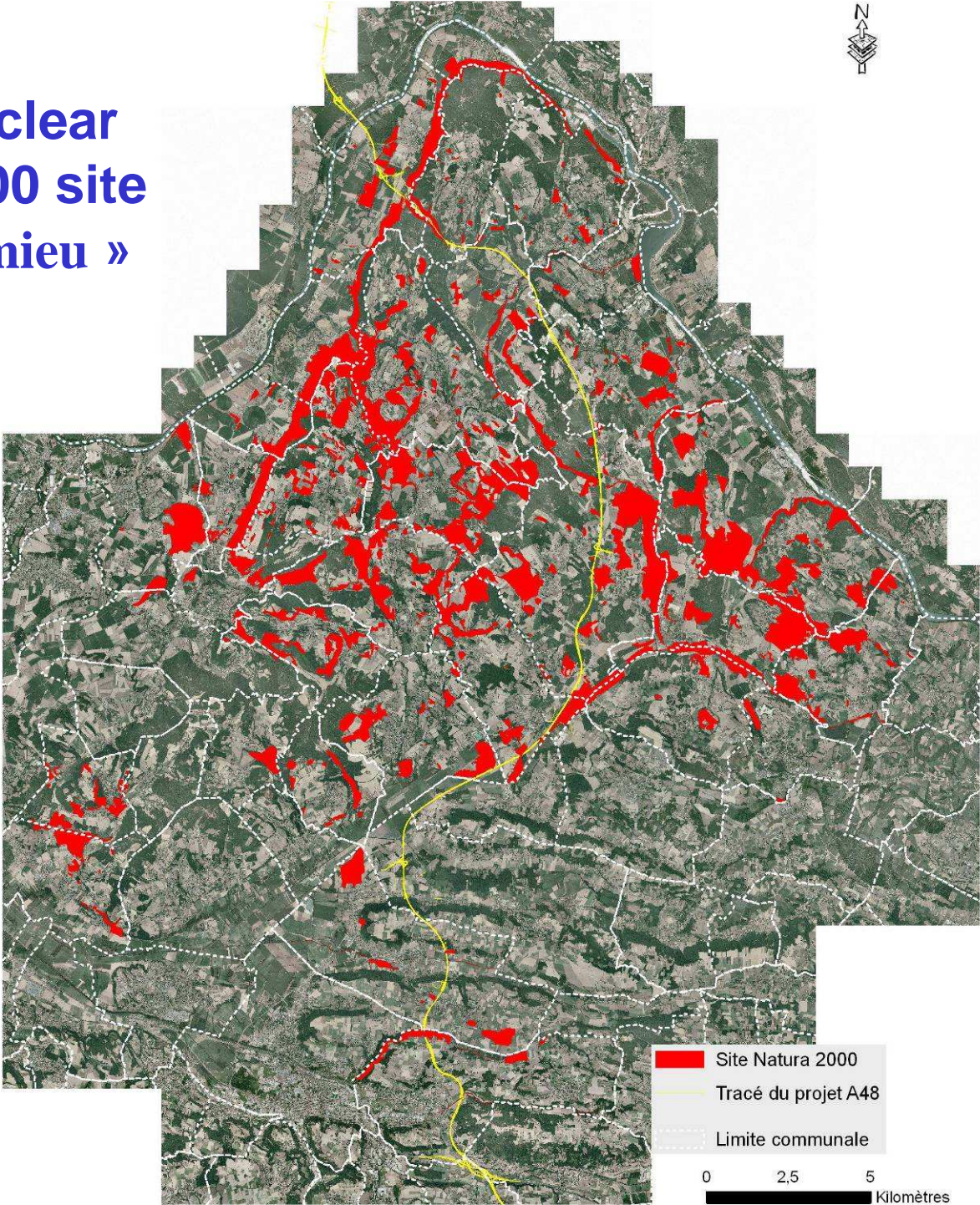
Situation area



Ile Crémieu (north of Isère)

- This work is made in the scope of an environmental impact assessment study concerning a motorway project in a Natura 2000 site (O.G.E., 2008. Autoroute A48 Ambérieu–Bourgoin. Etude des incidences du projet sur le site Natura 2000 FR8201727 des «Etangs, coteaux secs et grottes de l'Isle Crémieu». Office de Génie Ecologique pour le Centre d'Etudes Technique de l'Equipement de Lyon, 152p.).
- The site is a medium altitude plateau of 400 m made of a mosaic of dry grasslands, meadows, cultivated areas, wetlands and forest. The mapped area is about 1000 km². We mapped ecological continuities mostly for low dispersal ability species: forest species (*Lucanus cervus*, *Cerambyx cerdo*, *Rinolophus hipposideros*...), dry grassland insects (*Ephippiger ephippiger* (low dispersal abilities), *Eriogaster catax* (high dispersal abilities)...) and species using terrestrial and wet habitats: *Coenagrion mercuriale*, *Triturus cristatus*, *Emis orbicularis* ...
- The goal is to take into account landscape ecology in town and country planning in particular the land consolidation project as the reallocation of parcels to remove effect of fragmentation due to the motorway project.

**A polynuclear
Natura 2000 site
« Isle Crémieu »**



Datas about land-use

- Aerial photography from IGN in 2003
- Spot picture (april 5th 2003 usefull date to identify oak forest)
- 4 spectral stripes (green, red and two infra-red)
- Forest, hedges and isolated trees mapped from picture analysis: aerial photography and spot picture
- Cartography of the habitats in the Natura 2000 site (AVENIR, 2007)
- Water courses
- Urbanized areas



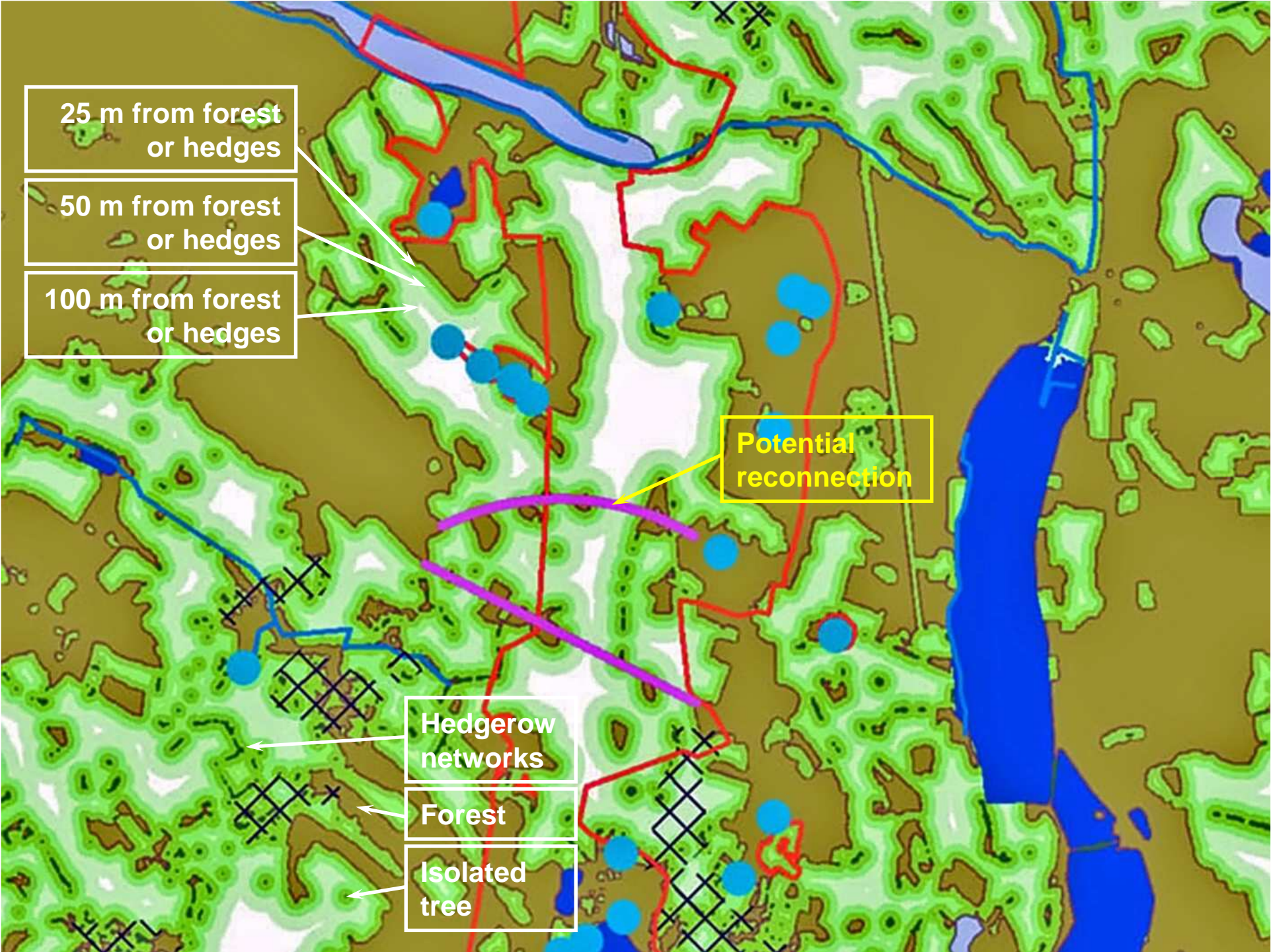
Petit Rhinolophe, *Rhinolophus hipposideros*

Principles of mapping for forest, forest edges and hedgerow networks

Ecological continuities for forest species as:

*Lucanus cervus, Cerambyx cerdo,
Rinolophus hipposideros...*

- Separation between hedges and hedgerow networks
- 3 buffers :
 - 25 m
 - 50 m
 - 100 m





Ephippigère des vignes, *Ephippiger ephippiger*

Principles of mapping for dry grassland networks

- **Scenario 1**
 - Dry grassland < 0,5 ha: dispersal < 2 km
 - Dry grassland 0,5-1,5 ha: dispersal < 4 km
 - Dry grassland > 1,5 ha: dispersal < 5 km
- **Scénario 2**
 - Dry grassland < 0,5 ha: dispersal < 500 m
 - Dry grassland 0,5-1,5 ha: dispersal < 1 km
 - Dry grassland > 1,5 ha: dispersal < 1,5 km
- **Scénario 3**
 - Dry grassland < 0,5 ha: no dispersal
 - Dry grassland 0,5-1,5 ha: dispersal < 100 m
 - Dry grassland 1,5-5 ha: dispersal < 300 m
 - Dry grassland > 5 ha: dispersal < 500 m
- **Complementary datas**
 - Displacement efforts in dry grassland and meadows 1/1
 - Displacement efforts in arable land 1/10
 - Displacement efforts in less than 50 m in forest 1/10, over 50 m in forest 1/1000



Agrion de Mercure, *Coenagrion mercuriale*

Principles of mapping for *Coenagrion mercuriale*

- Dispersal from water courses in the sun (not covered by forest)
- 1 km maximum distance between suitable habitats along water courses
- 100 m maximum distances over terrestrial habitats (scenario 1) 1000 m (scenario 2)
- Does not cross woods or dense hedges.
- No reproduction on the Rhône, but can fly over it. A given dragonfly can reach a population if the flight is no more than 800 m over the Rhône.



Triton crête, *Triturus cristatus*

Principles of mapping for *Triturus cristatus*

- Displacements from ponds
- Maximal distances of 1000 m
- Displacement efforts in arable land 1/50
- Displacement efforts in urbanized area 1/100



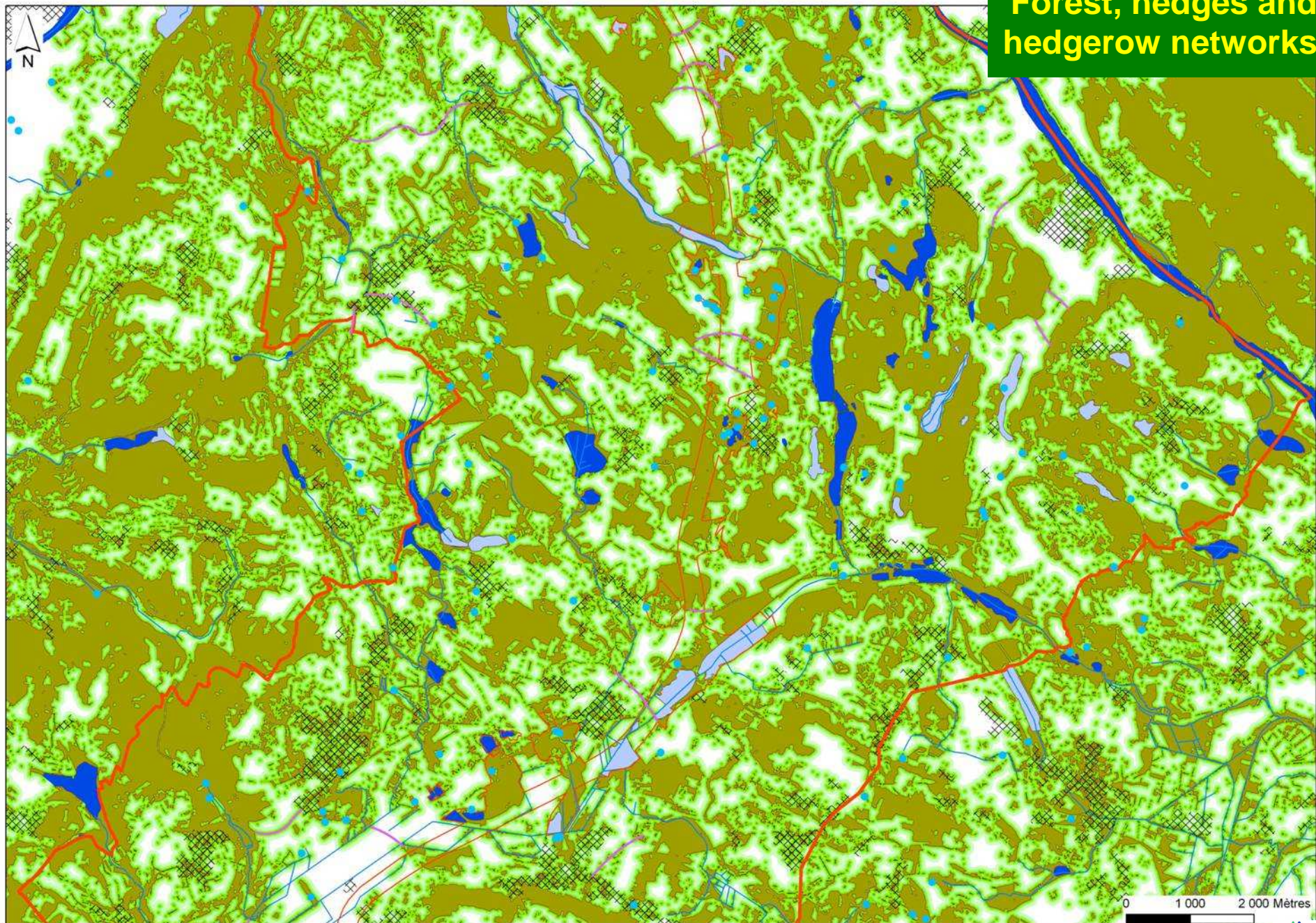
Cistude d'Europe, *Emis orbicularis*

Principles of mapping for *Emis orbicularis*

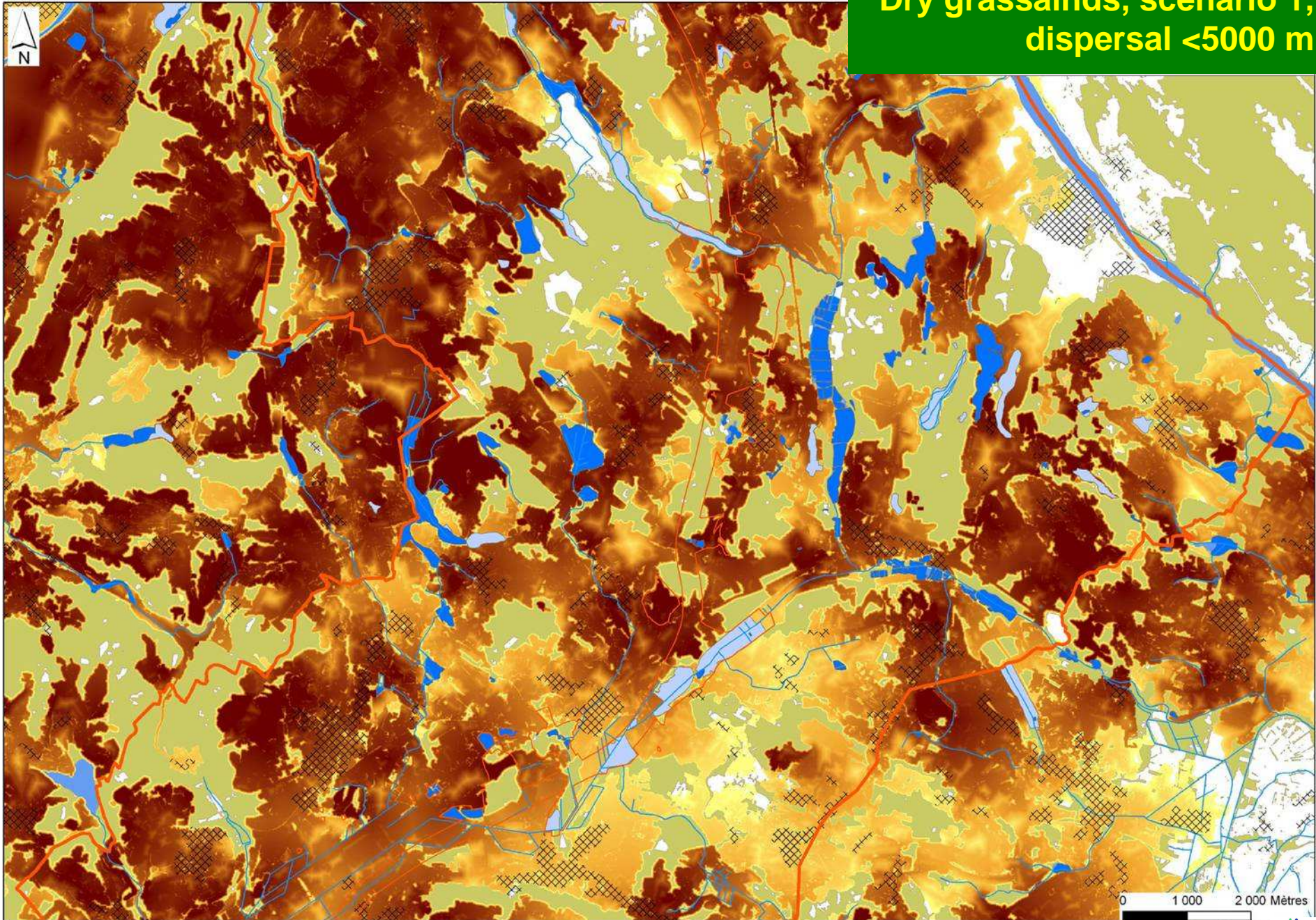
- From aquatic habitats of *Emis orbicularis* identified in the mapping provided by Avenir 2003 (datas from Avenir, LoParvi, Nature et Vie Sociale...).
- Dispersal ability is rendered by the principle of the allocation of energy that would enable the most performant individuals to cross 1000 m in terrestrial environments or ten times more that is 10 km along water courses.
- This potential is hindered by some displacement efforts:
 - 1/5 in forest, that is maximum 200 m ;
 - 1/1,5 in arable land, that is maximum 670 m ;
 - 1/500 in urbanized area, that is maximum 2 m ;
 - If the turtle reaches a pond the remaining allocation of energy is doubled.
 - All theses values are modified by slope and exposure. Warm exposure is 135 to 270 °. Displacement efforts are :

• Slope	5%	15%	30%	
• North exposure	1	1/2	1/6	1/8
• South exposure	1	1	1/3	1/4

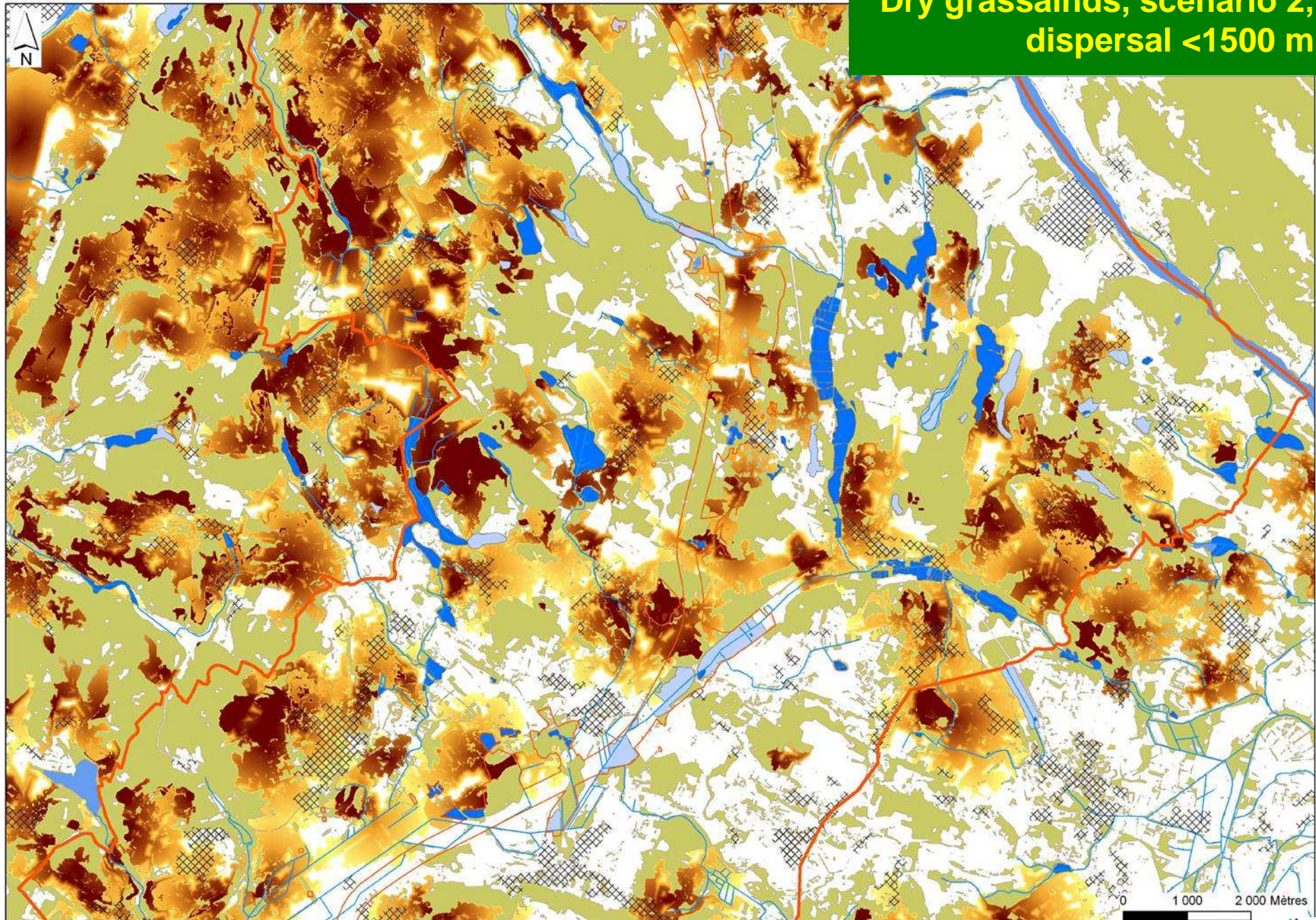
Forest, hedges and hedgerow networks



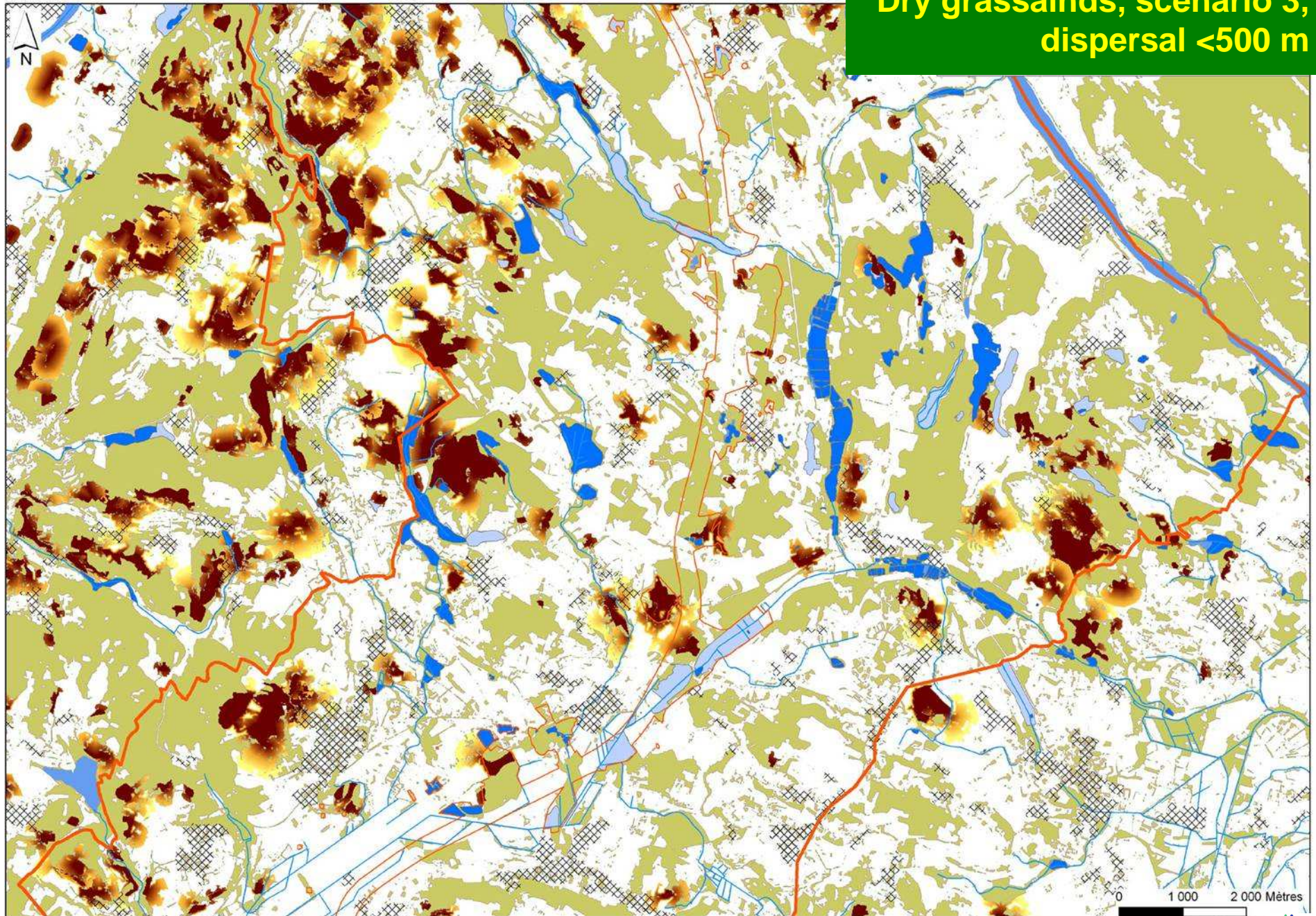
Dry grasslands, scenario 1,
dispersal <5000 m



Dry grasslands, scenario 2,
dispersal <1500 m

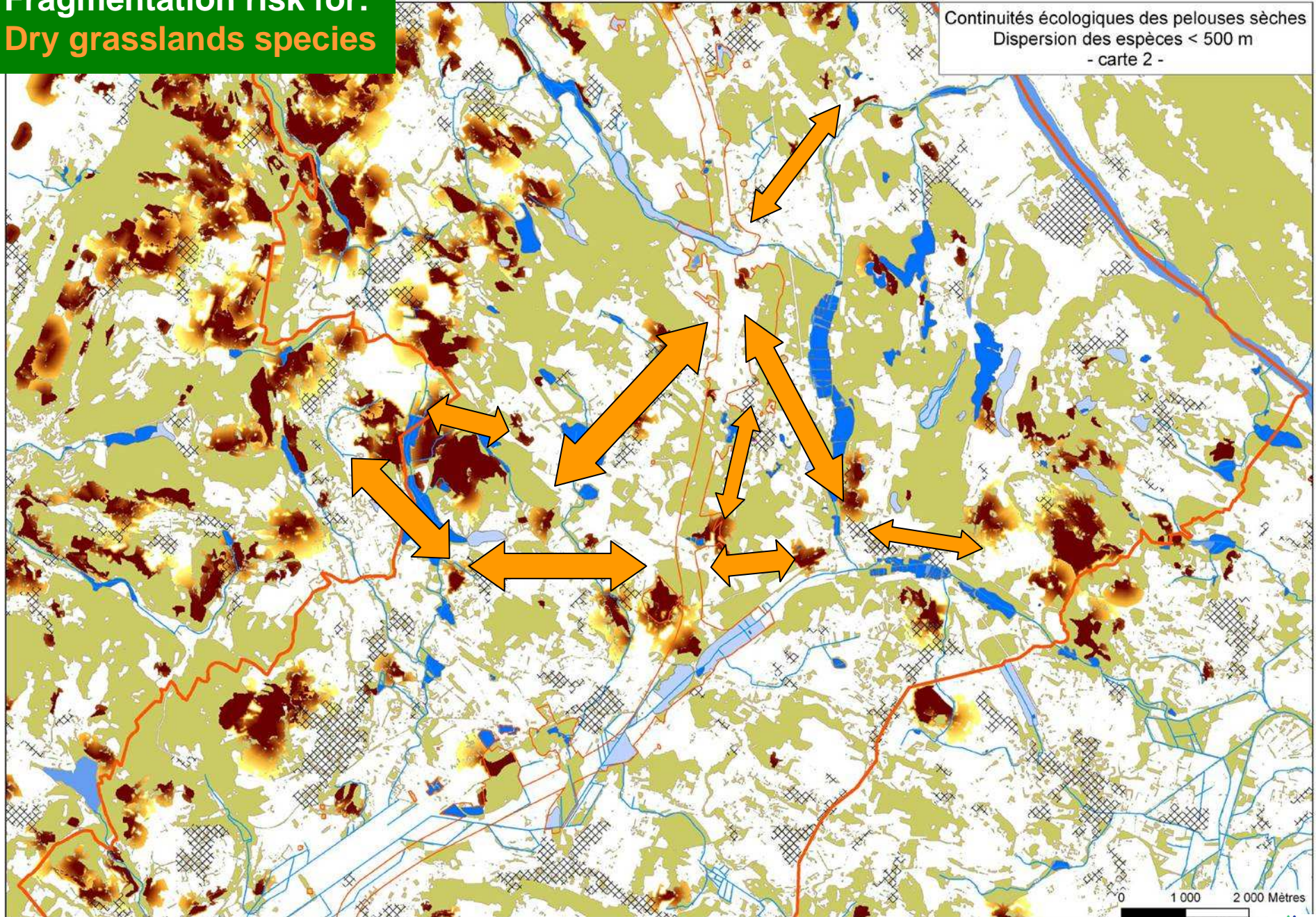


**Dry grasslands, scenario 3,
dispersal <500 m**



**Fragmentation risk for:
Dry grasslands species**

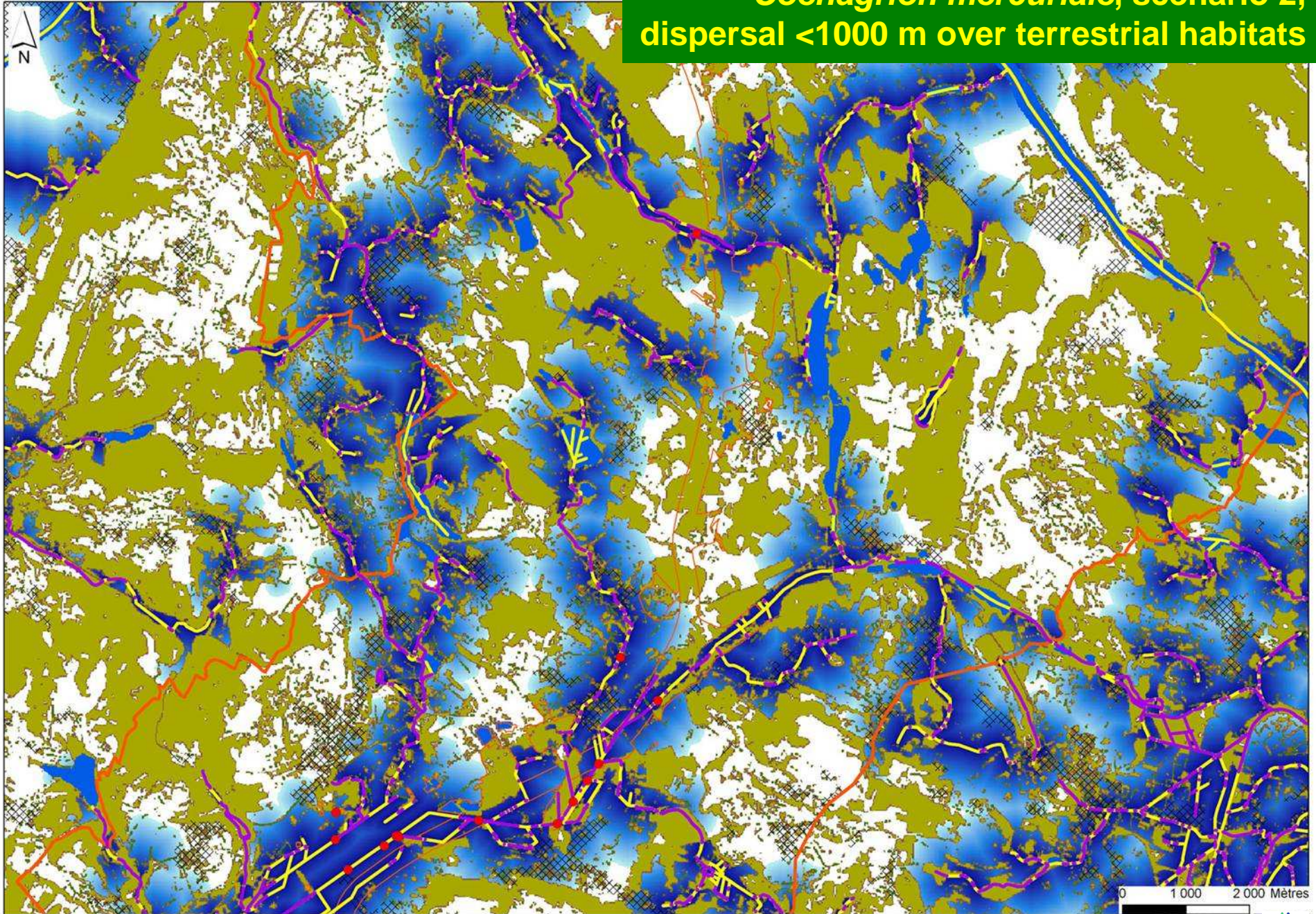
Continuités écologiques des pelouses sèches
Dispersion des espèces < 500 m
- carte 2 -



***Coenagrion mercuriale*, scenario 1,
dispersal <100 m over terrestrial habitats**

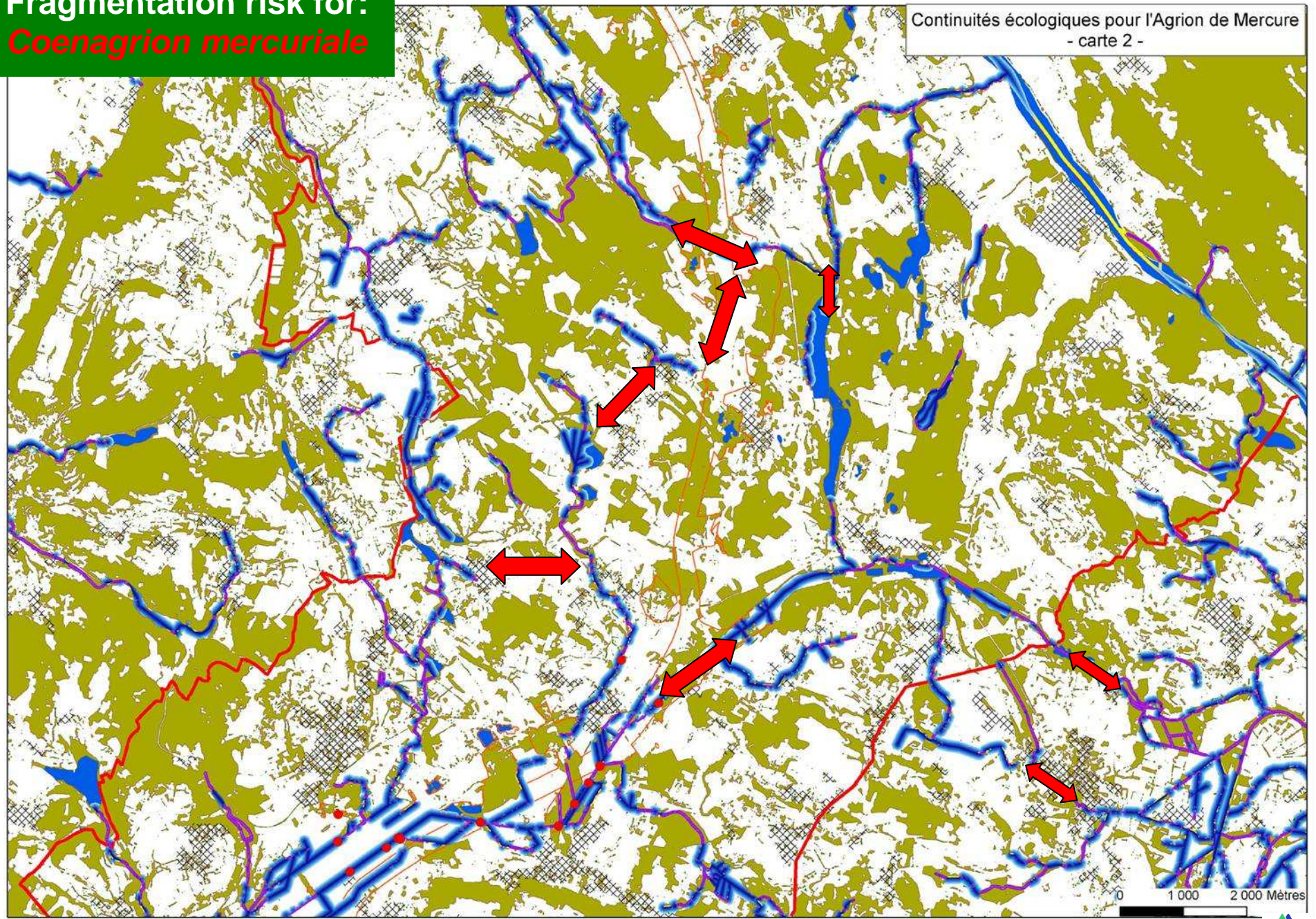


***Coenagrion mercuriale*, scenario 2,
dispersal <1000 m over terrestrial habitats**

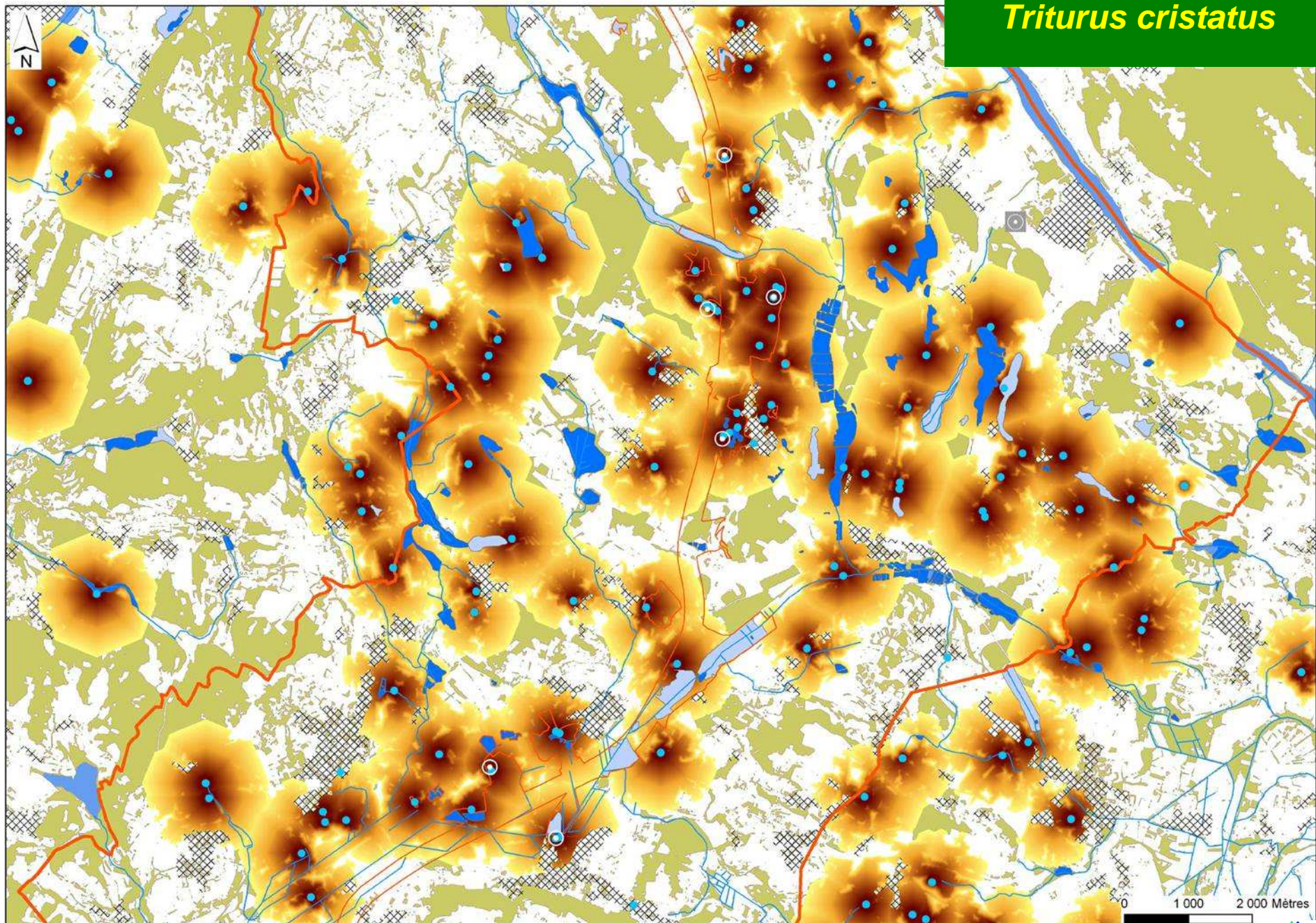


Fragmentation risk for:
Coenagrion mercuriale

Continuités écologiques pour l'Agrion de Mercure
- carte 2 -

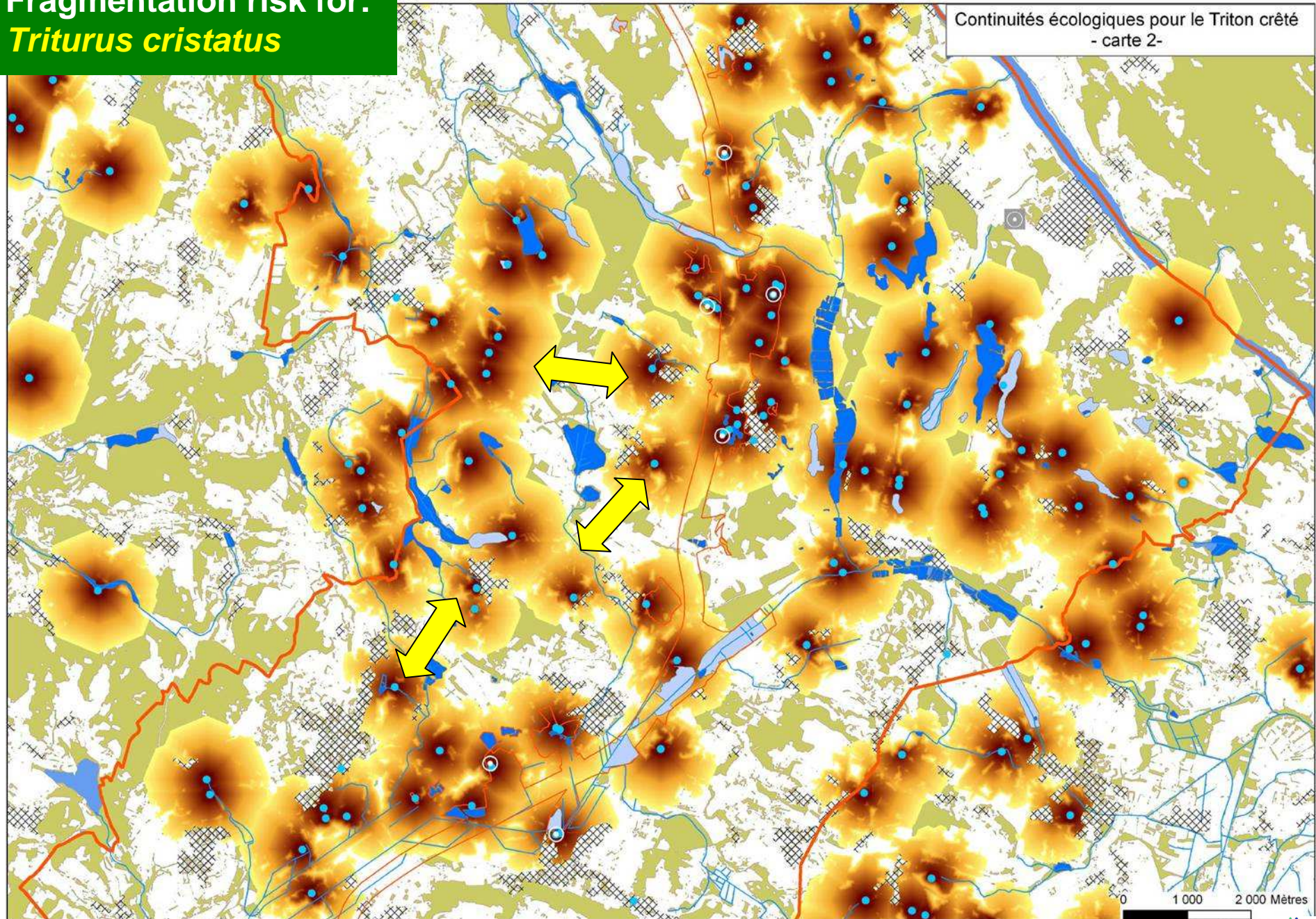


Triturus cristatus



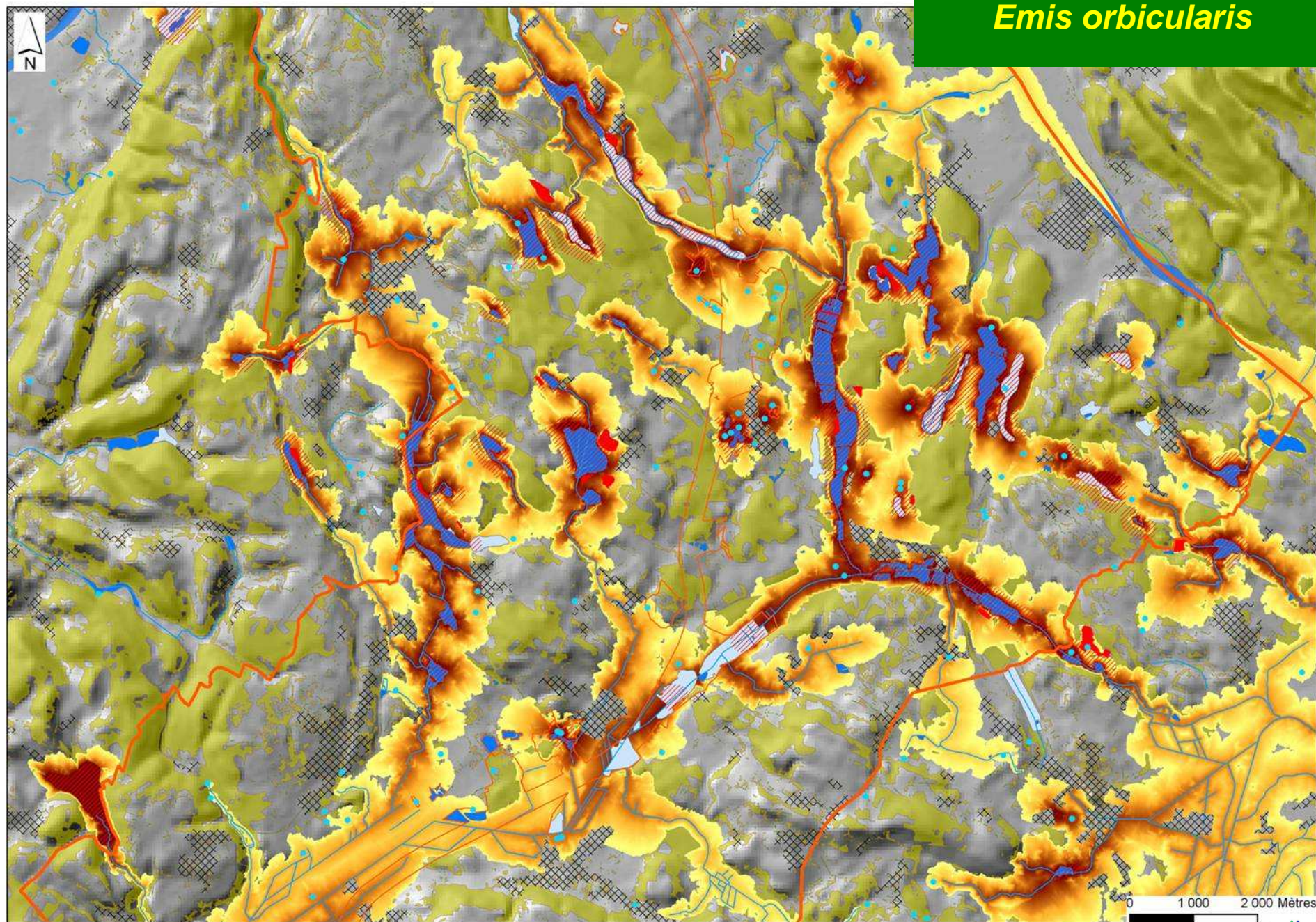
Triturus cristatus has been located in pond circled in white. Inventory not exhaustive.

Fragmentation risk for:
Triturus cristatus



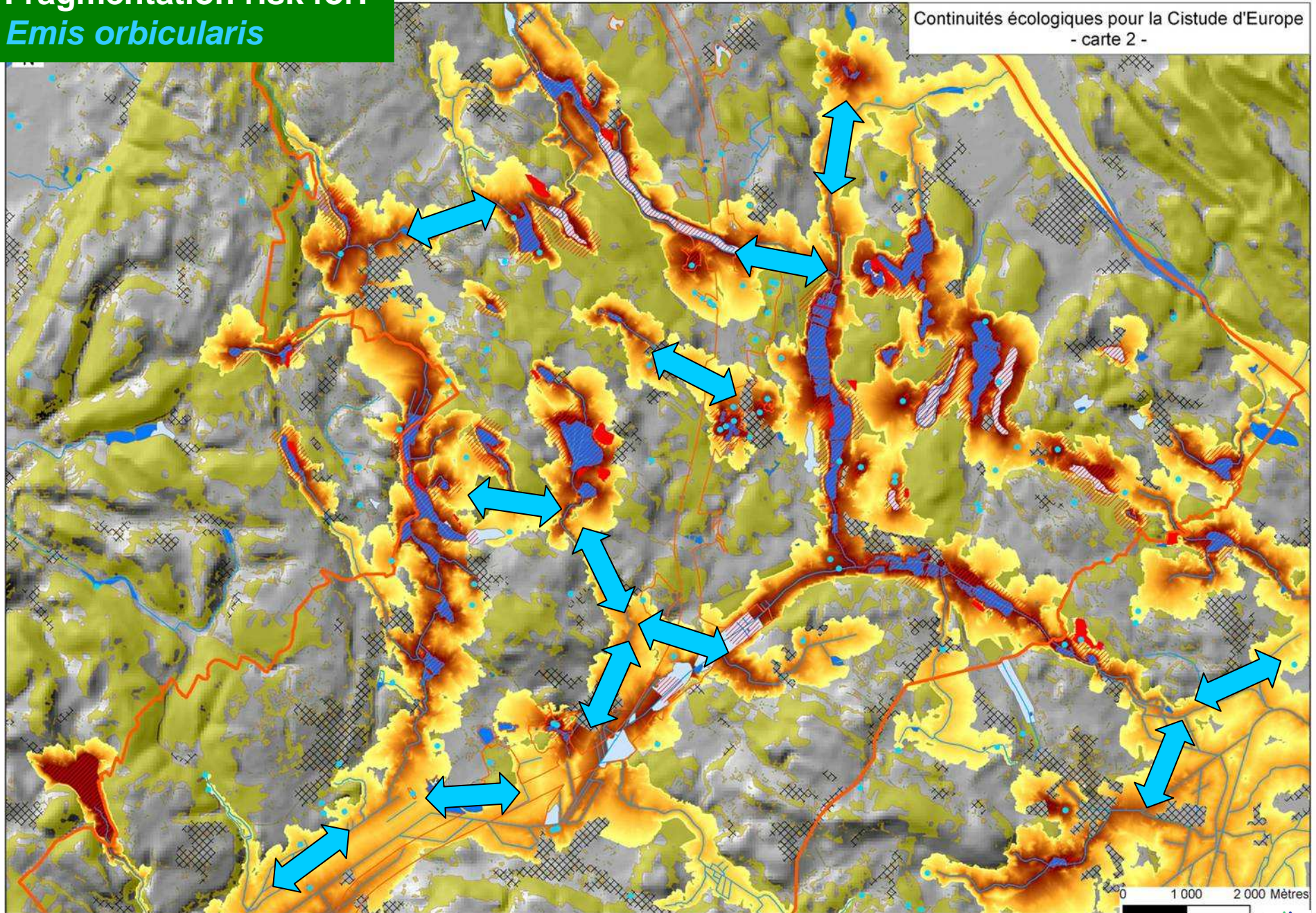
Triturus cristatus has been located in pond circled in white. Inventory not exhaustive.

Emis orbicularis



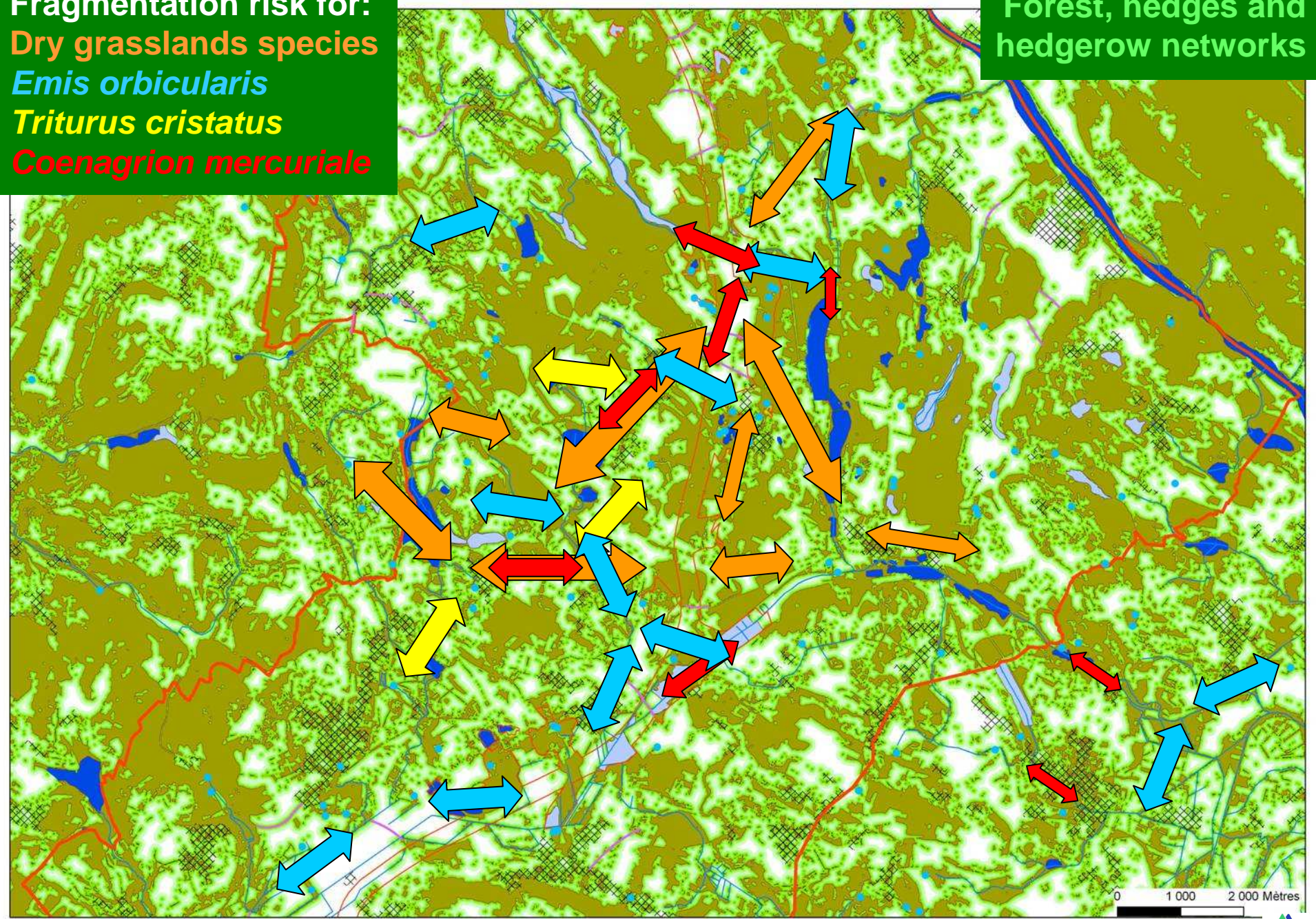
Fragmentation risk for:
Emis orbicularis

Continuités écologiques pour la Cistude d'Europe
- carte 2 -



Fragmentation risk for:
Dry grasslands species
Emis orbicularis
Triturus cristatus
Coenagrion mercuriale

Forest, hedges and
hedgerow networks



Sablonnières, North from RD517
An example of an infranchisable site by *Emis orbicularis*



Emis orbicularis

