



Il Piano Paesaggistico Regionale del Friuli Venezia Giulia



Regional Landscape Plan The ecological network

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Networking for ecological connectivity and green infrastructure
Nature reserve Škocjanski zatok, Koper, Slovenia, 19th of september 2017



The **Regional Ecological Network** has been detected inside the Regional Landscape Plan by a working group of the regional administration

University of Udine and
Friulian Museum of Natural History



researched and studied a working method for the detection of **Local Ecological Networks**.

The research analyzed 4 sample areas: Pordenone's grasslands, Lower Friulian Plain, Julian Prealps, area of Monfalcone

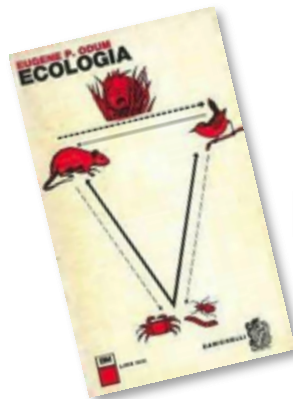


WHAT IS THE ECOLOGICAL NETWORK



The ecological network describes the main ecological processes performing in the territory.

The model of ecological network used by Region FVG takes into account both the biological components: plants and animals.



The Landscape Plan divides the region in 12

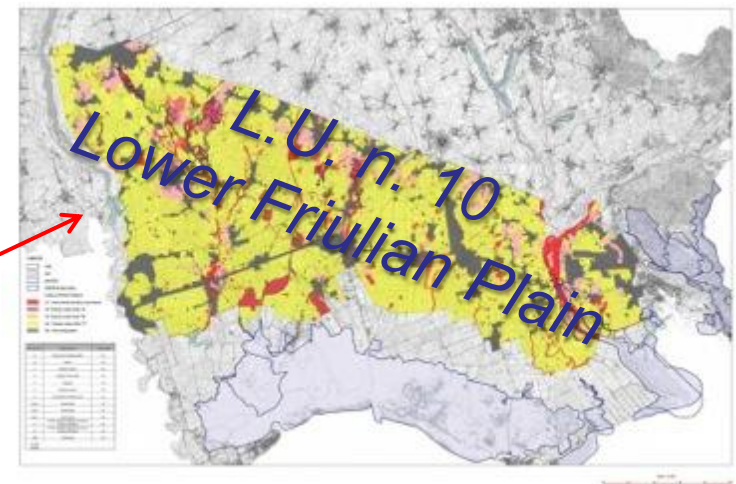
Landscape unit

Every Landscape unit is divided into many **PATCHES**,
playing different ecological roles.

In this model, the spatial unit of the ecological network
is called «**ECOTOPO**» i.e. **PATCH**, meaning an area
differing from its surroundings and representing a
relatively homogeneous and spatially explicit
landscape functional unit.

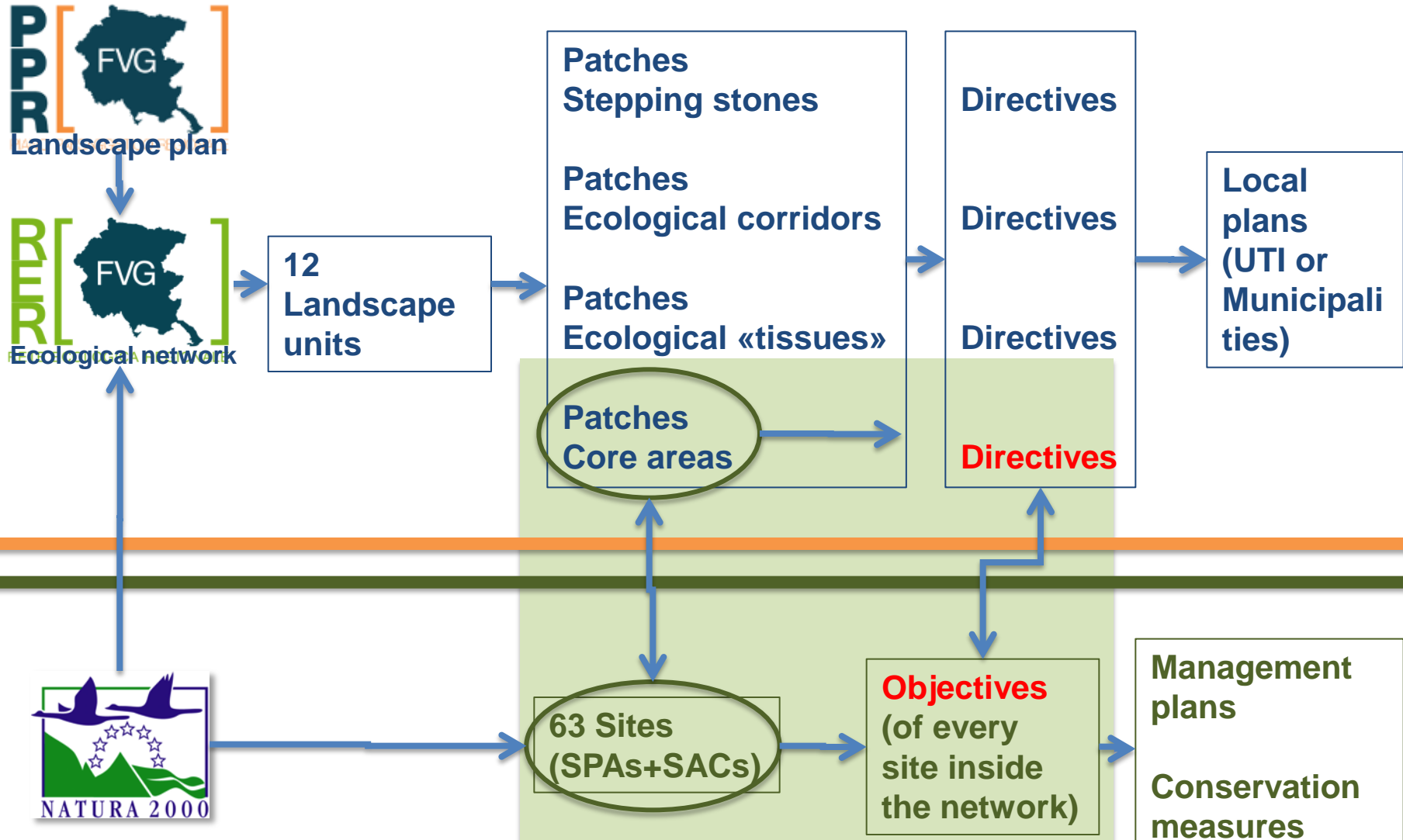
The ecological network is detected and developed for every Landscape Unit to formulate **directives and guidelines** to be transposed in the local plans and rules.

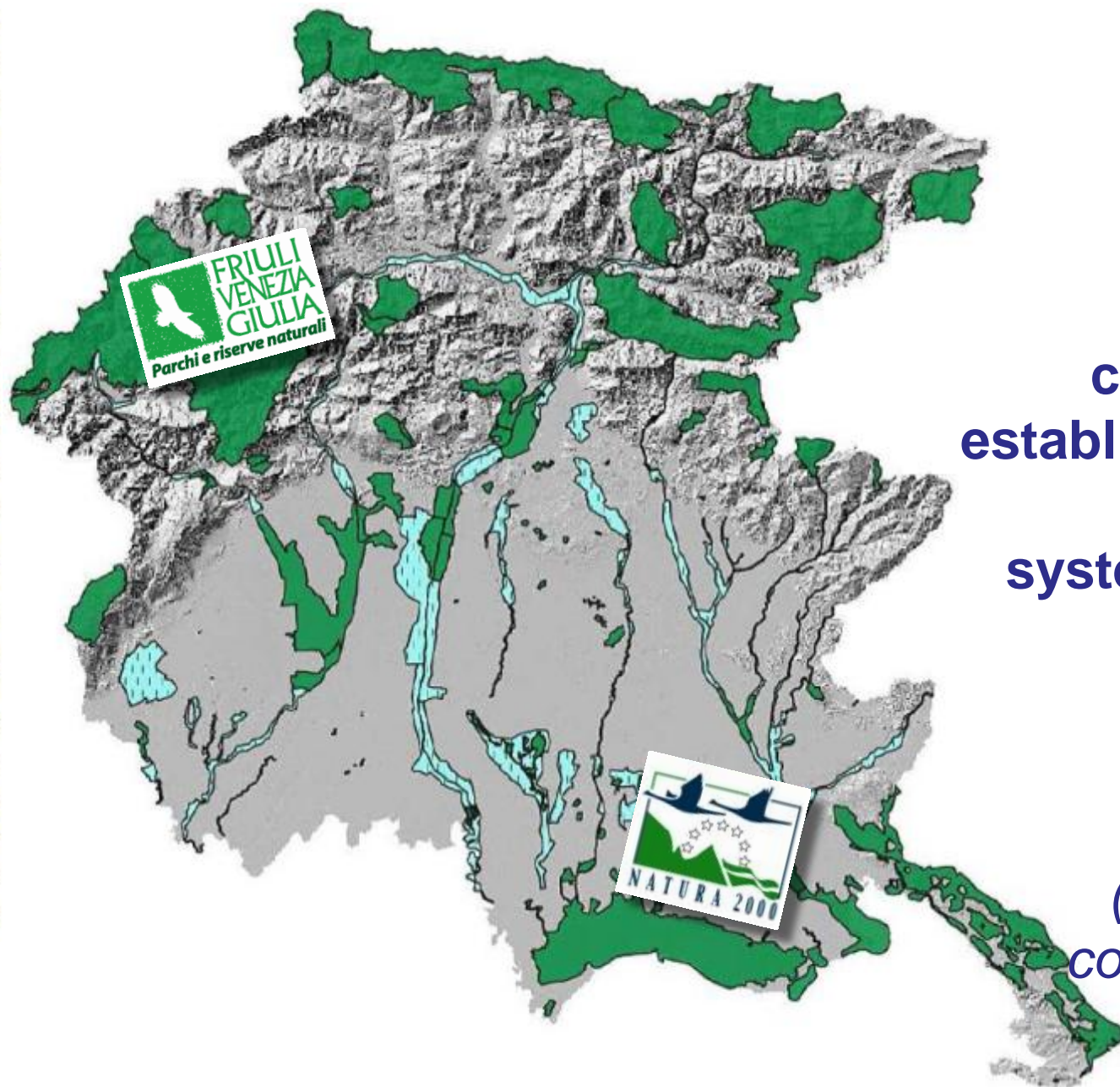
Starting from these directives, «UTI» (Territorial union among municipalities) and municipalities are going to elaborate the **Local Ecological Network** through the method tested by the University of Udine together with the Friulian Museum of Natural History



WHAT IS THE ECOLOGICAL NETWORK

Relationship among the Ecological network and Natura 2000 network in the Landscape plan





Regional scale

Locates main
ecological
connections and
establishes a key role
to the regional
system of protected
areas

for example:

core areas

(protected areas)

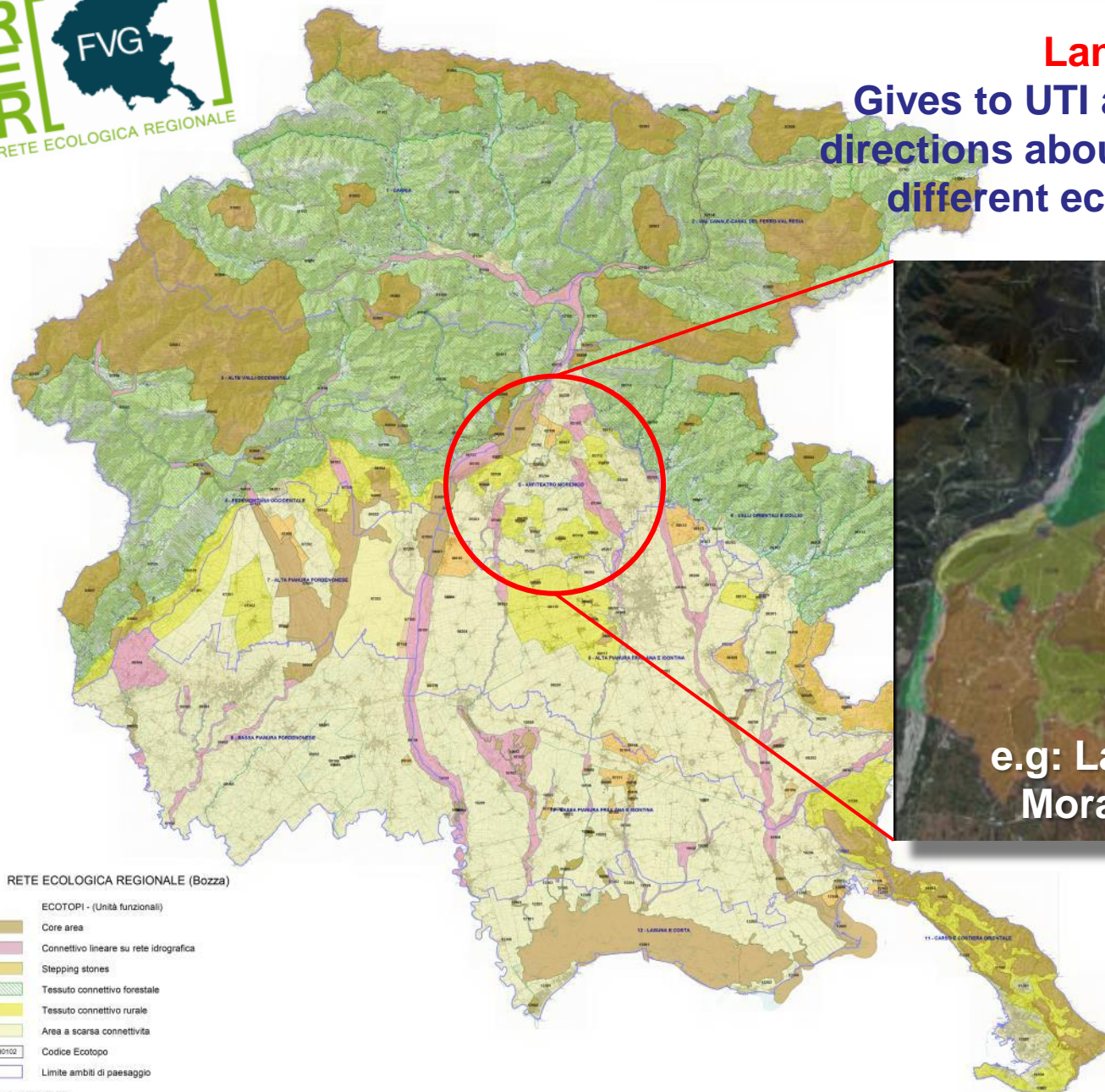
*connected by **river
corridors***



WHAT IS THE ECOLOGICAL NETWORK

Landscape unit scale

Gives to UTI and Municipalities directions about patches playing different ecological functions



**e.g: Landscape unit n. 5
Morainic amphitheater**

PATCHES WITH PREVAILING CONNECTIVE FUNCTION

RIVER CORRIDORS -> 05101 CORRIDOR OF TAGLIAMENTO RIVER

Description of the area: the patch includes the river bed, mount Ragogna and small forest areas close to cultivated fields. It's part of the biggest and most important river corridor that includes the Tagliamento River from source to mouth. (...)

This area provides habitat for many animal species related to the morainic hills but even to Carnic Prealps, e.g. Alpine Shrew *Sorex alpinus* and Pine Marten *Martes martes*.

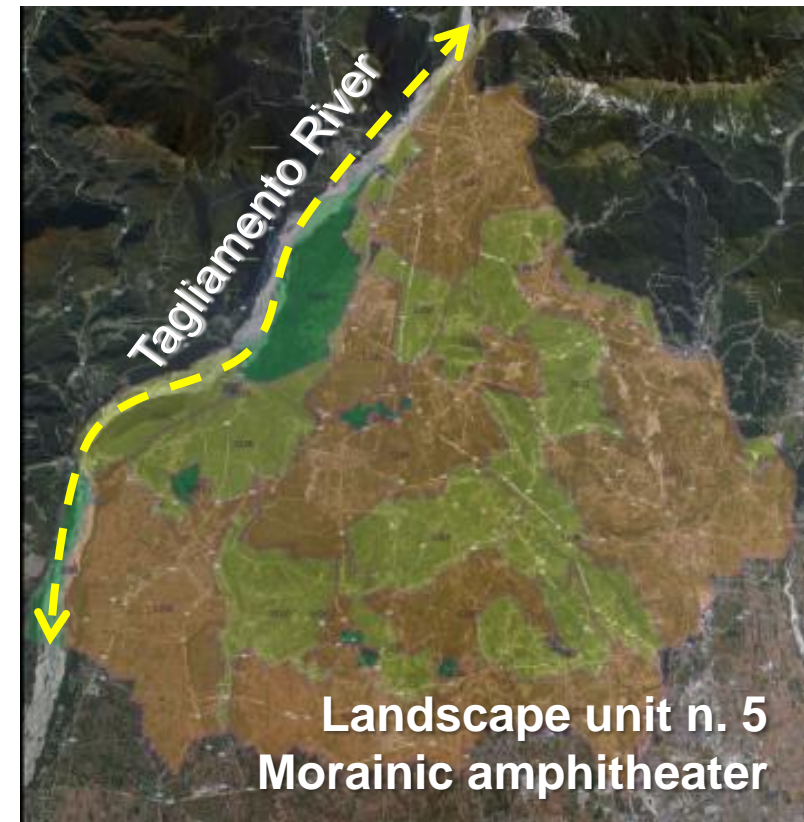
Project category: to be confirmed



DIRECTIVES FOR PATCHES WITH PREVAILING CONNECTIVE FUNCTION

RIVER CORRIDORS

- Ensure **functional integrity** and conservation of natural conditions.
- Conservation and **restoration** of spontaneous riparian vegetation, wet woods and stable meadows.
- Contrast to establishing and diffusion of invasive **alien species** of plants.
- Conservation of **agroecosystem elements** in the neighboring farmlands such as small woods, hedges, rows of trees.
- **Ensure connections** inside the whole Tagliamento's River Corridor and among lesser basins.
- **Ensure permeability** of greater linear infrastructure such as the highway.





WHAT IS THE USE OF THE ECOLOGICAL NETWORK



Bertrando's grasslands near Udine

1. Recognition of **rural connective «tissues»** (spatial relationships) usually corresponding to High Nature Value Farmlands (HNVF)



Tagliamento river

2. Recognition of **river corridors** corresponding to greatest rivers (linear relationship)



Curiedi biotope near Tolmezzo

3. Recognition of the **alpine grasslands as a specific objective** of the network in the alpine and prealpine area



The R.E.N. focuses on those areas that are not included in the protected areas network. The main goal is to protect and increase the territorial quality through the usual instruments for landscape and territorial planning.

Storks on a field

Protected areas, i.e. the **core areas** of the REN, are included in a connection system with the whole territory.

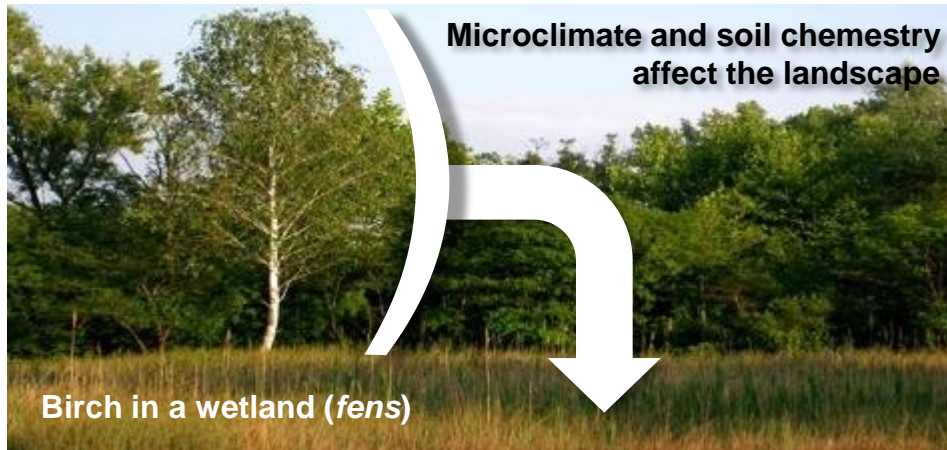
The R.E.N. links to the networks of **cultural heritage** and **slow mobility**



***HOW ECOLOGICAL NETWORK
HAS BEEN DONE***

For every area playing a homogeneous ecological function (patch), the REN defines:

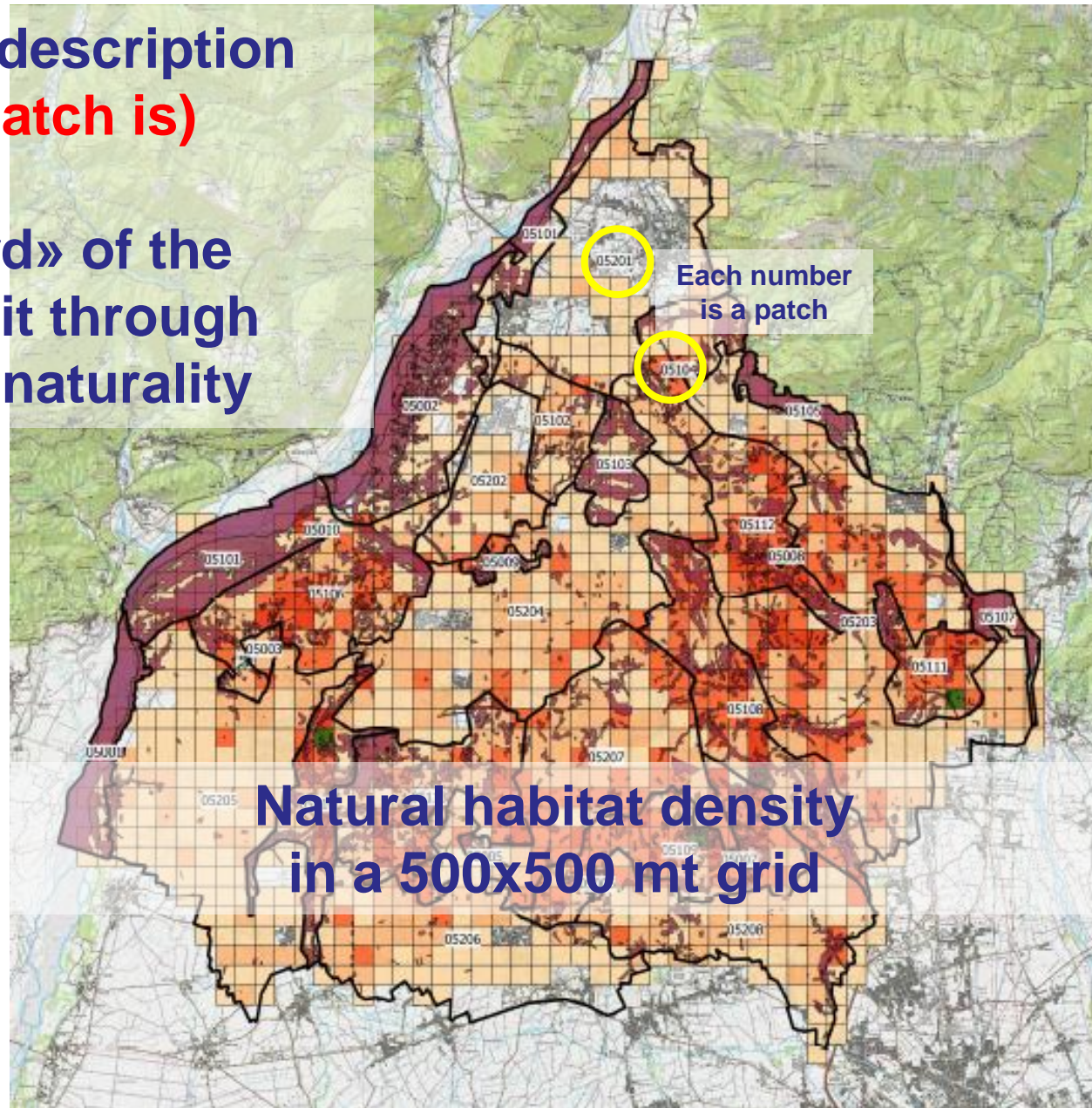
- The structural description (**what the patch is**)
- The functional characteristics (**how the patch works**)
- The project aims (**what is it necessary to do**)





The structural description (what the patch is)

«Identity card» of the
landscape unit through
indicators of naturality





The functional characteristics (how the patch works)

Nodes – identified through ecological data of protected areas (mostly from reports provided for by article 17 of the «Habitat directive»)

1. Core areas

2. Buffer zones

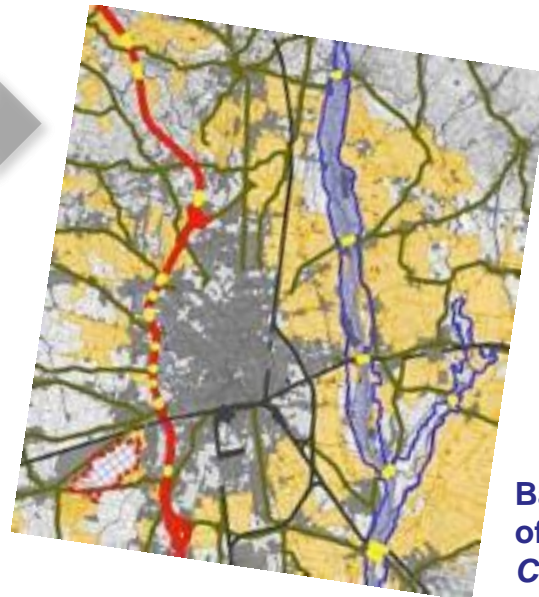
Links – identified through target species (for grasslands, woods and wetlands)

3. Connections

- a. Spatial connective tissue (rural or forestry)
- b. Linear connection (ecological corridors such as river corridors)
- c. Stepping stones or stepping zones

4. Barriers

5. Crossings



Barriers and crossings
of the highway on the
Cormor torrent near Udine



The functional characteristics through target species :

- Species with available distribution data (exhaustive and up to date)
- Ecological features of species: habitat fidelity, mobility, spreading capability
- For plain → grasslands, wetlands, plain woods
- For mountain → secondary grasslands (meadows and pasturelands)



No

Flying animals, nor species with too low or too high mobility



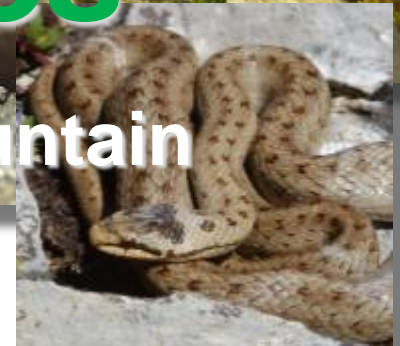
plain

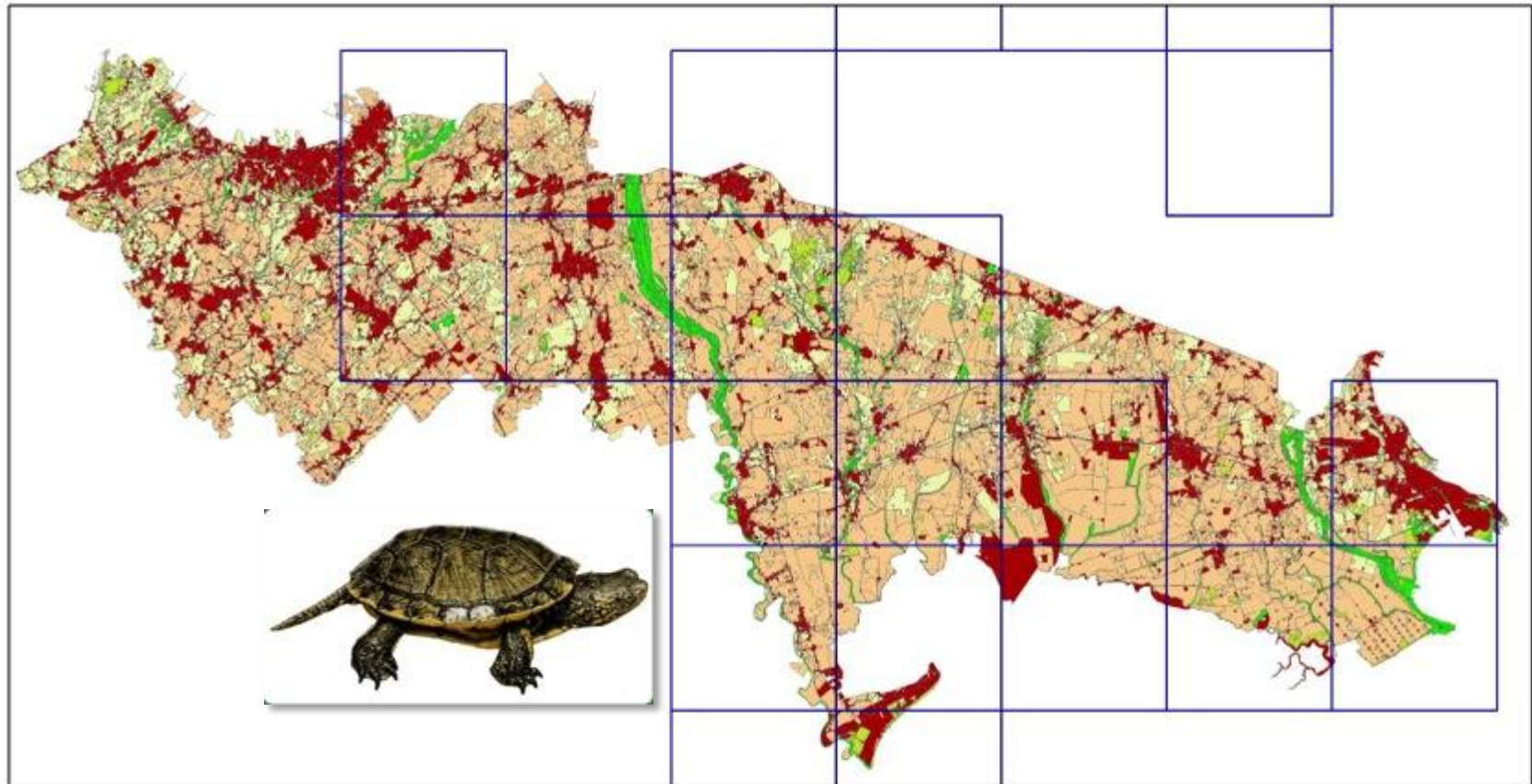


Yes



mountain





Suitability

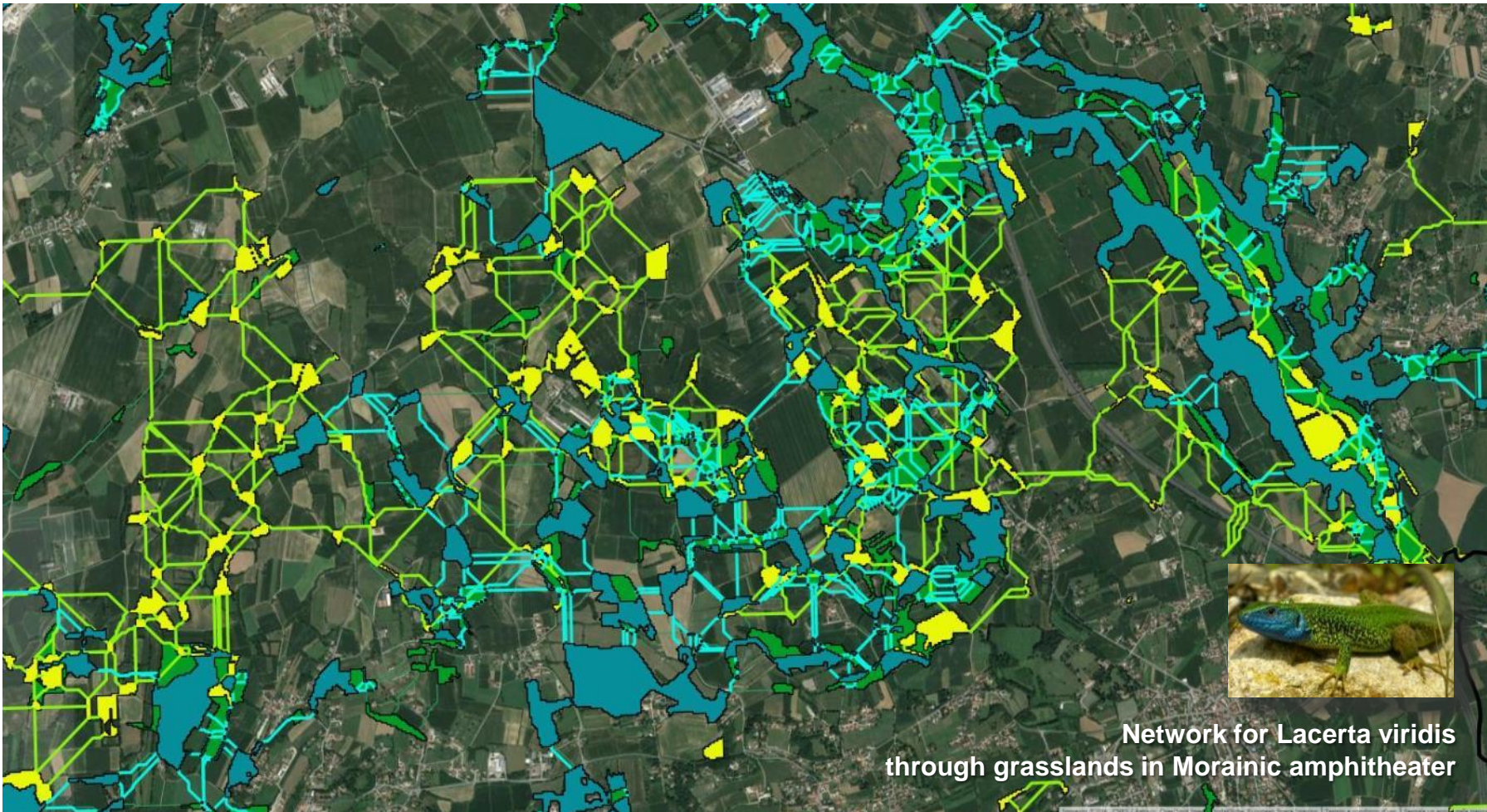


Suitability and real distribution of *Emys orbicularis* in wetland areas

10x10 km squares show the real distribution of this specie.

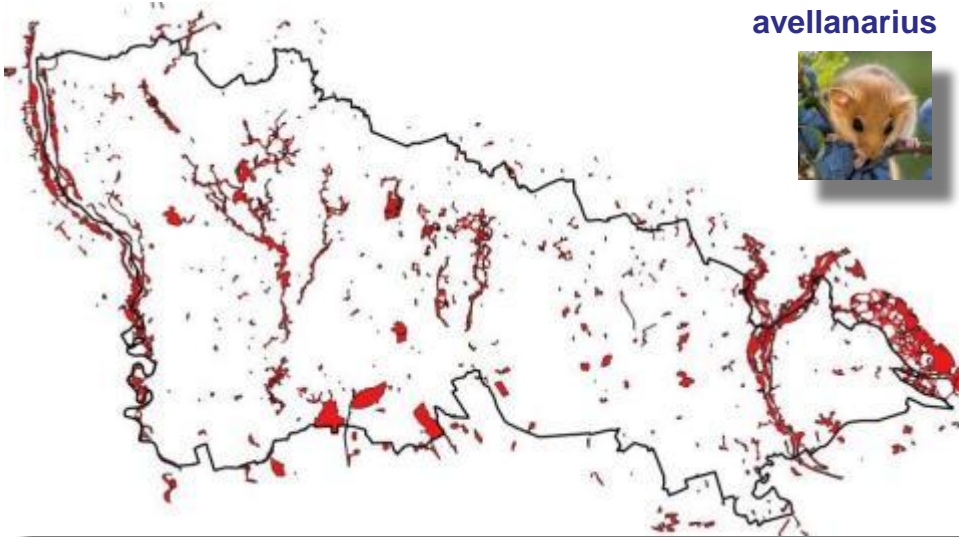
A model of potential mobility was built using an open source software (*Graphab*)

These connectivity lines join the network nodes with less distance and through the most suitability habitats for each specie





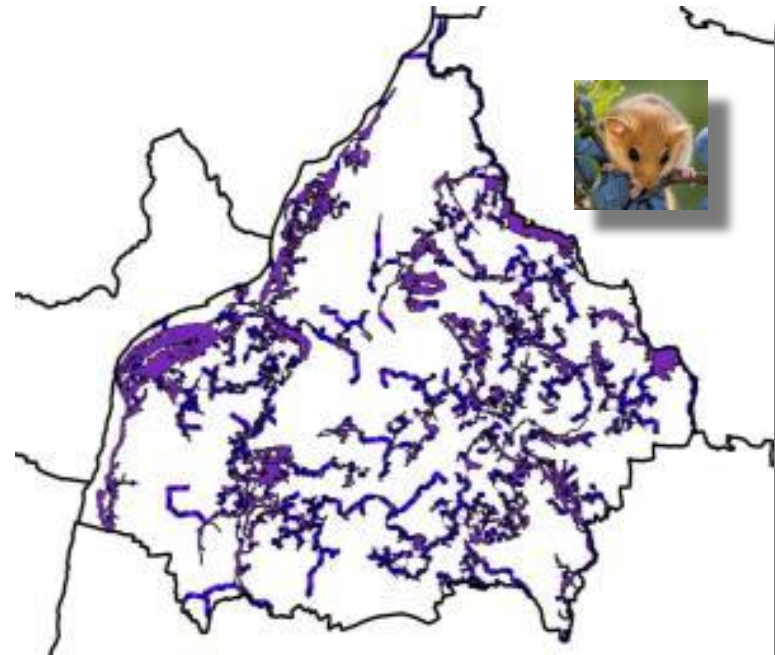
**Muscardinus
avellanarius**



Landscape unit 10 (Lower Friulian Plain) shows an ecological network developed on the surrounding of core areas (wetlands and plain woods).

The rural tissue is not many suitable and connectivity lines are limited

Landscape unit 5 (Morainic amphitheater) shows a better and larger conectivity in several parts of the unit





HOW ECOLOGICAL NETWORK IS



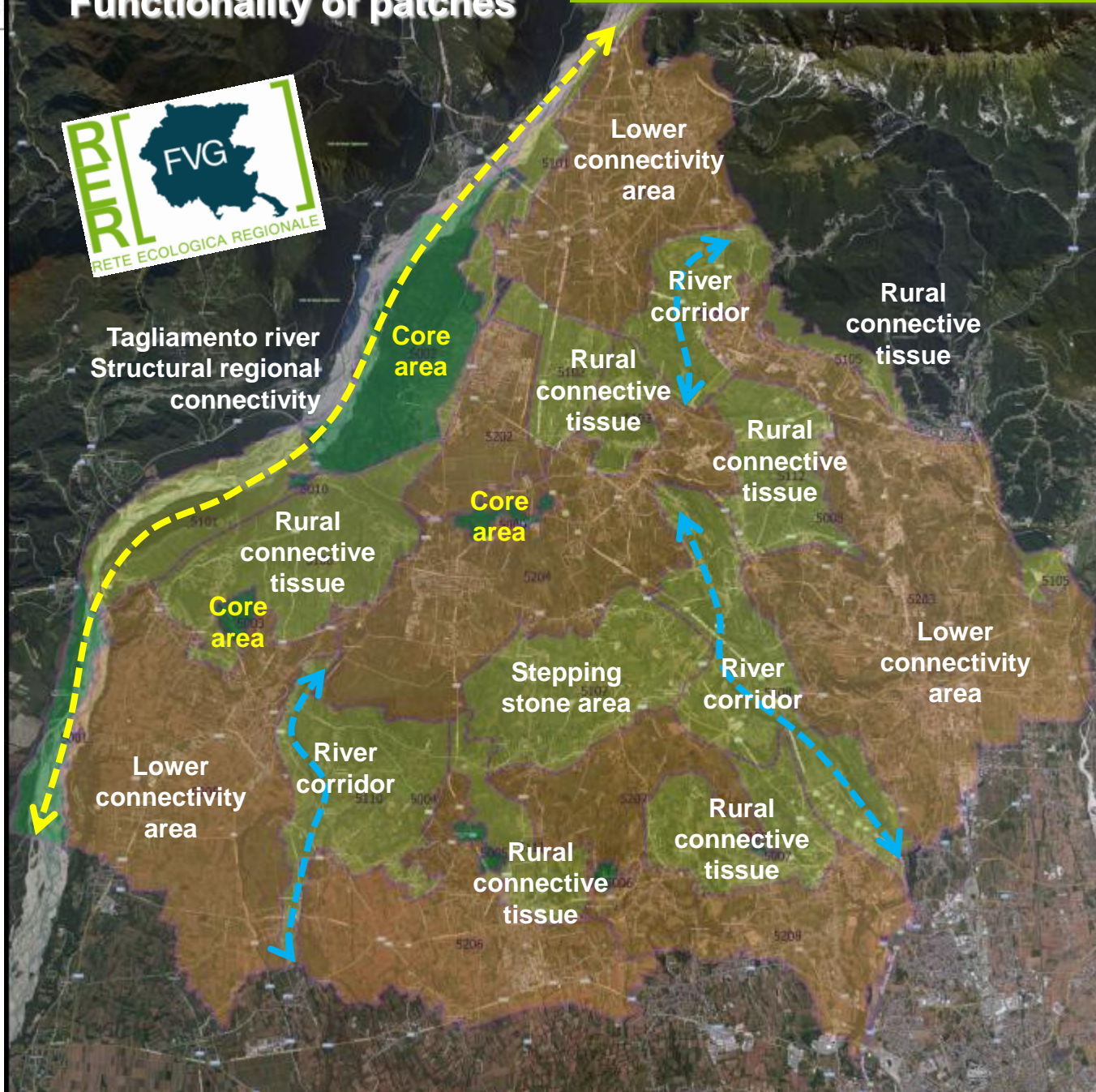
**Structural
description**

**Functional
characteristics**

Connectivity
lines for
Lacerta and
Moscardinus

**Identification and
functionality of
patches**





- Lower connectivity areas: restoring of ecological functionality especially in some strategic points



The goal is not maximum naturalness but maximum of biodiversity

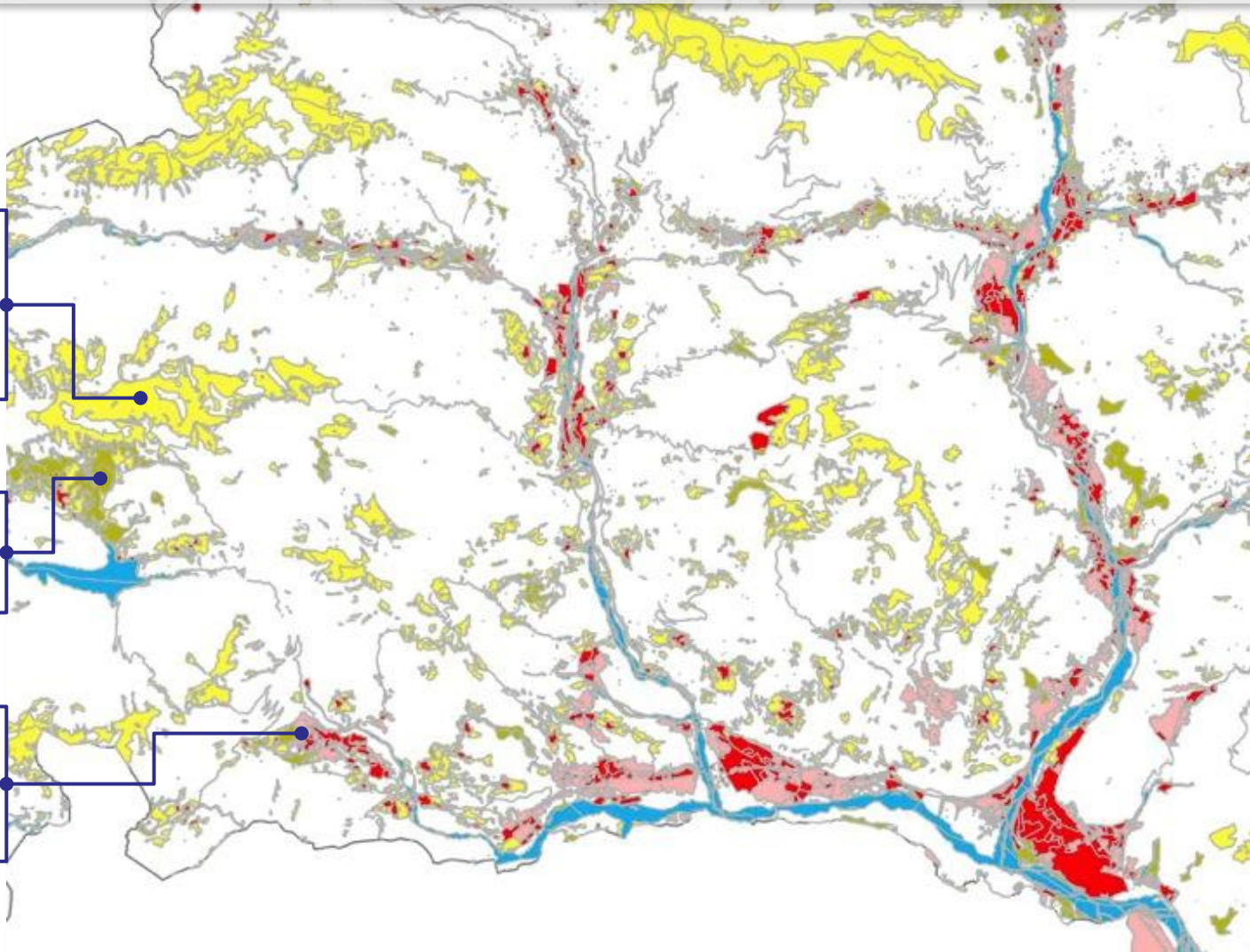
Restoring specific habitats → Secondary grasslands and meadows

Landscape unit 1 (Carnia)

Primary and secondary
grasslands on medium
and high altitude
**CONSERVATION AND
RESTORING**

Bushes vegetation on
grassland
REDUCTION

Meadows
on valley floor
**CONSERVATION AND
RESTORING**



The project aim (**what is it necessary to do**)

Each patch can be:

- **To be confirmed:** when it's completely efficient and effective
- **To be reinforced:** when functionality is partially compromise or threatened by changes of land use
- **To be restored:** the ecological functionality and connectivity is very limited

Each buffer zone of the core areas has the same kind of directive

The REN aim is also to locate the restoration areas and to decide the project priority for mending the «holes» in the network



***WHERE CAN YOU FIND THE
ECOLOGICAL NETWORK PROJECT***



REGIONE AUTONOMA
FRIULI VENEZIA GIULIA

THE LANDSCAPE UNIT CARDS



REGIONE AUTONOMA
FRIULI VENEZIA GIULIA



UNIVERSITÀ
DEGLI STUDI
DI UDINE



PIANO PAESAGGISTICO REGIONALE

DEL FRIULI VENEZIA GIULIA

Scheda

Ambito di Paesaggio

Anfiteatro morenico

5



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DI UDINE



PIANO PAESAGGISTICO REGIONALE

DEL FRIULI VENEZIA GIULIA

Scheda

Ambito di Paesaggio

Bassa pianura friulana e isontina

10





LOCAL ECOLOGICAL NETWORKS



REGIONE AUTONOMA
FRIULI VENEZIA GIULIA

GUIDELINES FOR THE LOCAL ECOLOGICAL NETWORKS



REGIONE AUTONOMA
FRIULI VENEZIA GIULIA

VADEMECUM PER L'INDIVIDUAZIONE DELLA RETE ECOLOGICA ALLA SCALA LOCALE

Linee guida e metodi per la costruzione
della cartografia digitale



MAIN ASPECTS

Model of LEN developed inside **Gis environment**, well known to technicians and experts (*Graphab*)

Biodiversity as target, the focus is on a set of species (both flora and fauna) of conservation **interest and sensitive to fragmentation** (amphibians and reptiles, micromammals, arthropods) and their habitat



Coronella austriaca



Parnassius apollo



Moscarinus avellanarius



Bombina variegata

The propose method is:

- codified step by step;
- general and applicable to the different regional landscapes;
- low demand for specialized knowledge.

Method

Step 1: develop of basic knowledge

MAP OF HABITAT

GIS

Definition of species/habitat target

Step 2: definition of travel costs

MAP OF COST SURFACE

Travel cost for species

Step 3: ecological network for each specie/habitat

Connectivity model

NODES

FUNCTIONAL CONNECTIONS

MAPS OF NODES

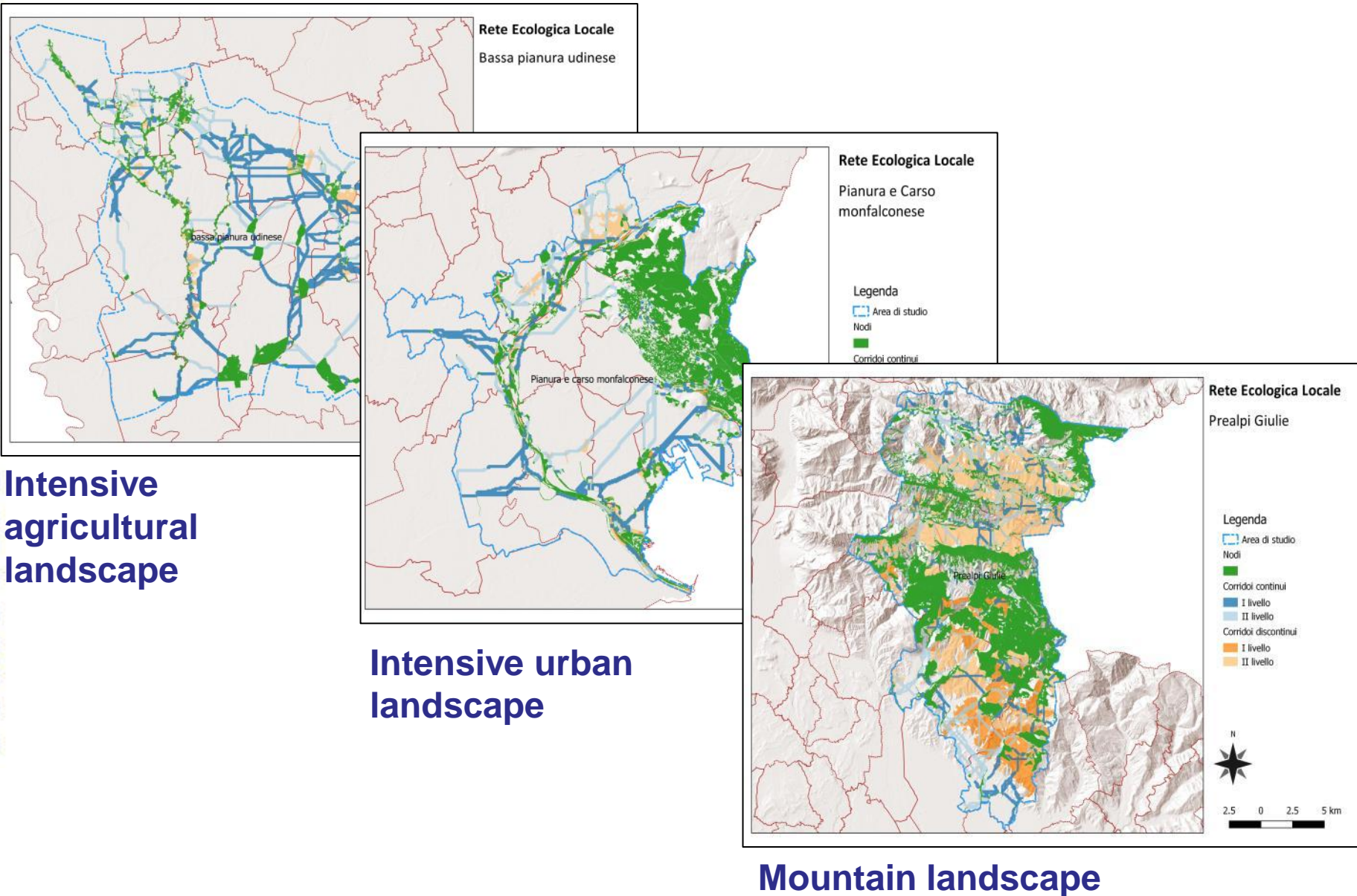
MAP OF CORRIDORS

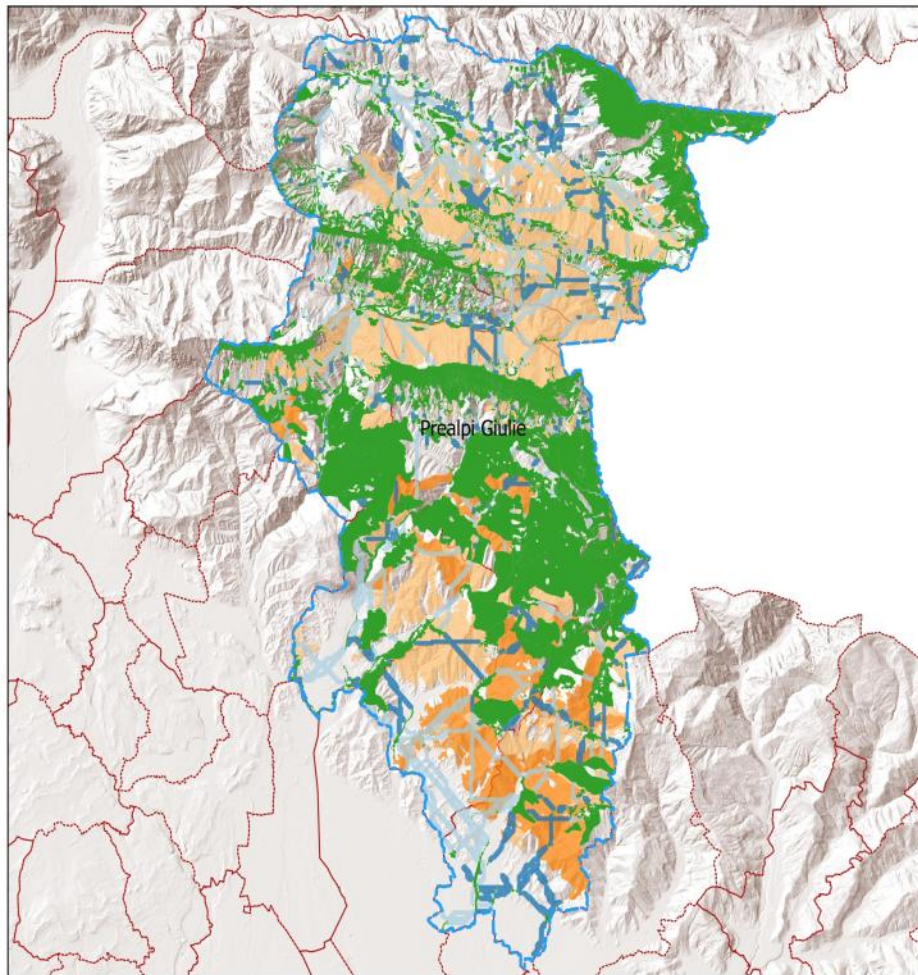
MAP OF STEPPING STONES

Step 4: synthesis

LOCAL ECOLOGICAL NETWORK

THE LANDSCAPE MATRIX IS THE MAIN DRIVER FOR THE MODEL





Rete Ecologica

Prealpi Giulie

Legenda

Area di studio

Nodi



Corridoi continui

I livello

II livello

Corridoi discontinui

I livello

II livello



2.5 0 2.5



The landscape matrix is composed by more or less **natural forest habitats**, rich in biodiversity.

The target for the ecological network are:

- the **open space** (and related habitat) which are most threatened in terms of persistence due to abandonment of agriculture;
- the **most rare habitats** associated with specific physiographic and environmental conditions which are responsible for the diversity of the forest landscape.

Pre-Alpine and Alpine landscape



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FRIULI VENEZIA GIULIA



Ministero
dei beni e delle
attività culturali
e del turismo



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Piano
paesaggistico
regionale



RETE ECOLOGICA REGIONALE

Thank you
Hvala za pozornost

Direzione centrale infrastrutture e territorio
Servizio paesaggio e biodiversità – Gruppo di lavoro RER

anna carpanelli
lucia de colle
roberta petrucco
giuliana renzi
massimo rollo
laura sgambati
lucio taverna
pierpaolo zanchetta



Università degli studi di Udine
Dipartimento di scienze agrarie e ambientali
massimo boscutti
maurizia sigura

Museo friulano di storia naturale



massimo bucheri
luca dorigo
paolo glerean
luca lapini