Landscape changes and wildfire behaviour: New fire scenarios in Spain

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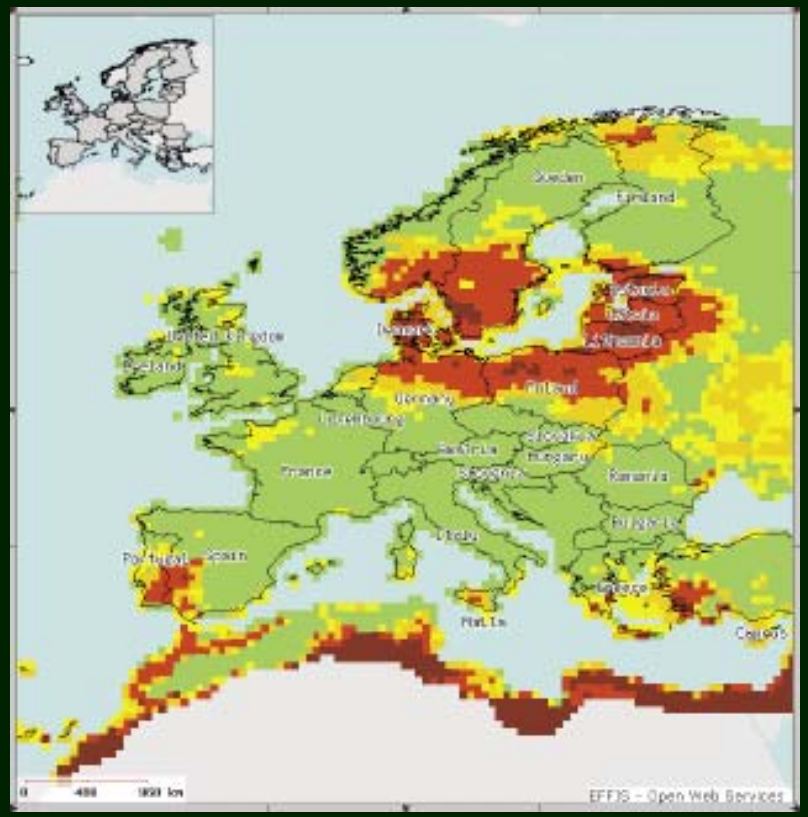
Fire problem in Europe

Recent territorial trends & Global change



Extreme weather situation, June 9, 2008

Increase of the ignition risk

Increase of the propagation risk

Driving forces for landscape changes

Rural depopulation

Poor management

→ Large and continuous areas with fuel models of high risk

Urban spread

→ Wildland-urban interfaces

Landscape changes & fire regime

New Fire Scenarios

Maintained rural landscape

Large and continuous areas with fuel models of high risk

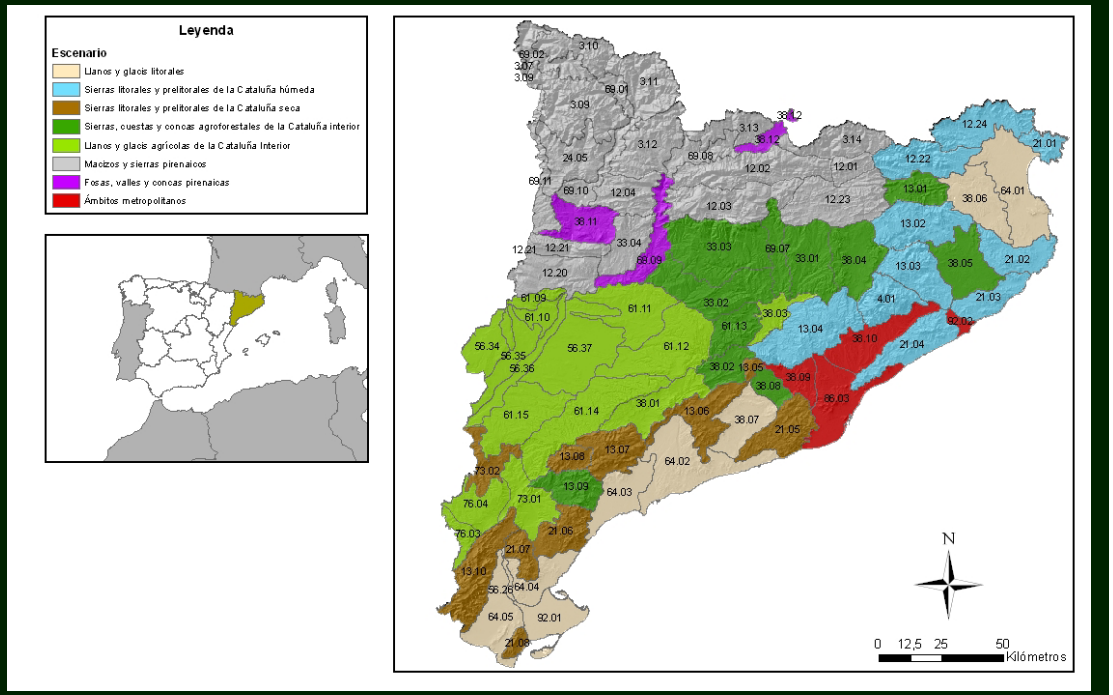
Wildland-urban interfaces

Fire scenario definition

Territorial sphere which features shared characteristics in the initial conditions and possible evolution and impact of wildfire

Instrument for the establishment of homogeneous strategies of wildfire prevention and extinction

Fire scenarios are defined at the national, regional and local scale (different objectives and methods)



National Fire Scenarios

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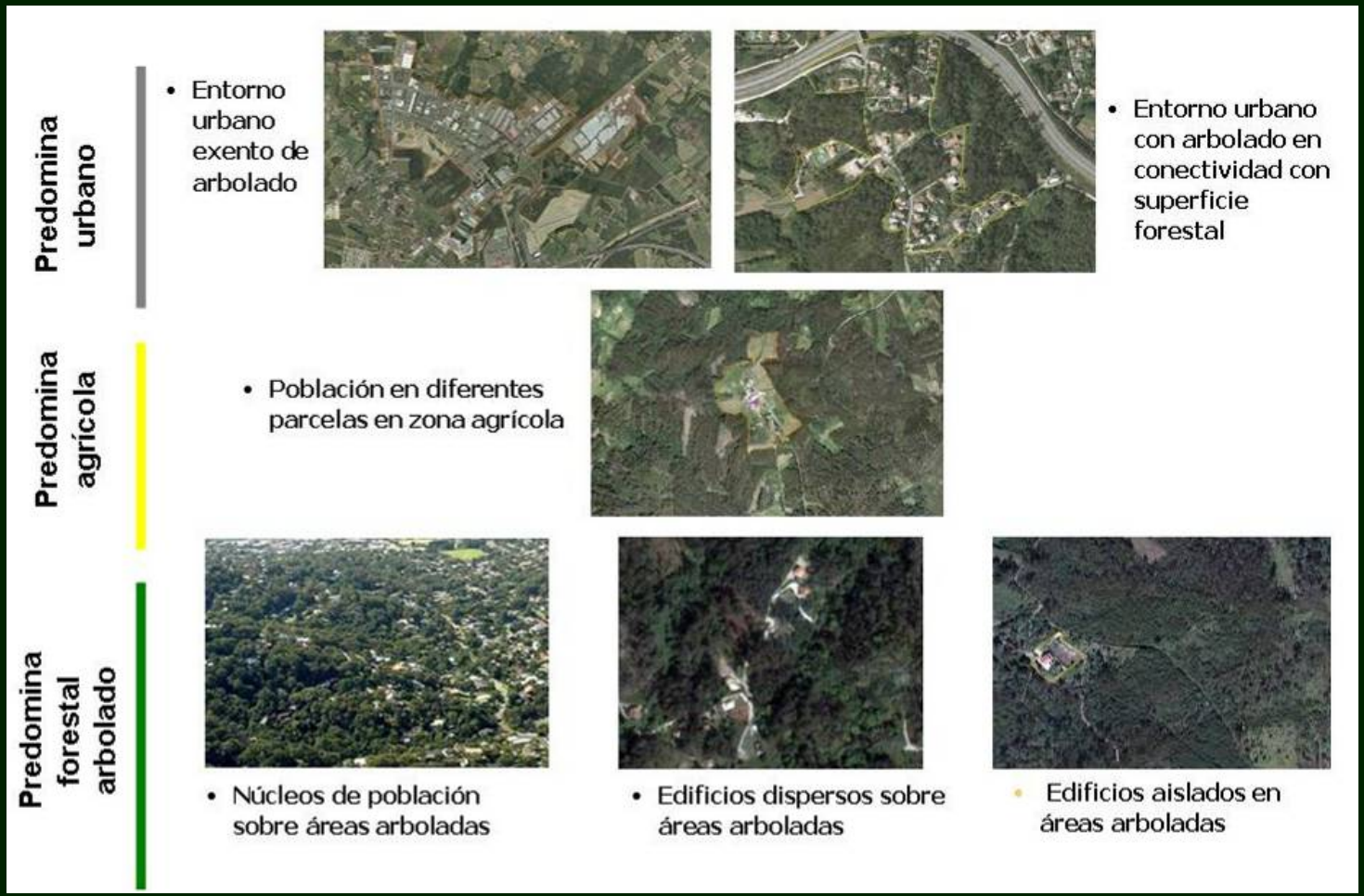
Settlement model



National Fire Scenarios

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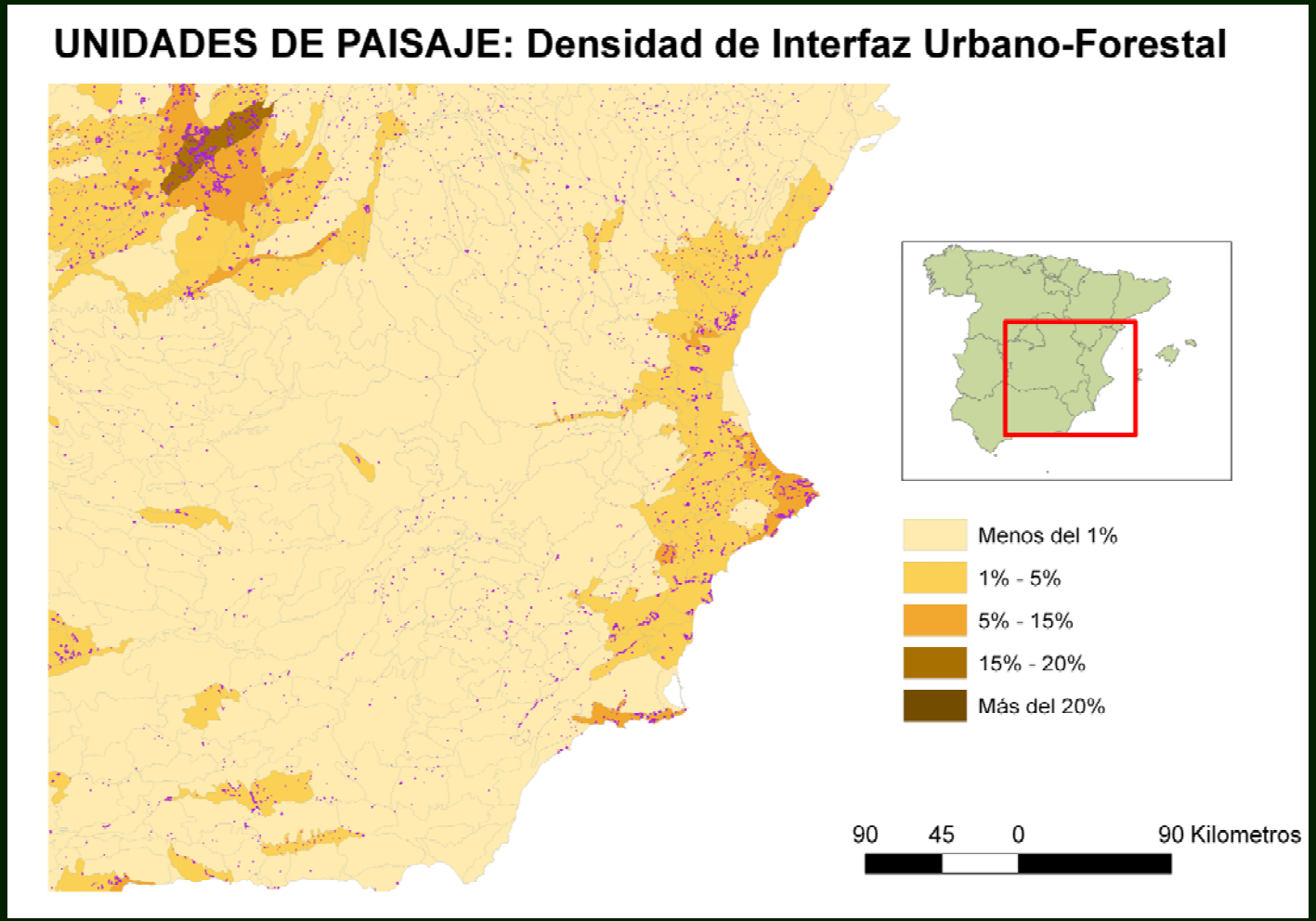

National Fire Scenarios

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Forest ecosystem

Fuel model related hazard + Physiography related hazard = Potential propagation capacity of the physical environment

⇩ Flammability / Combustibility

⇩ Slope range

National Fire Scenarios

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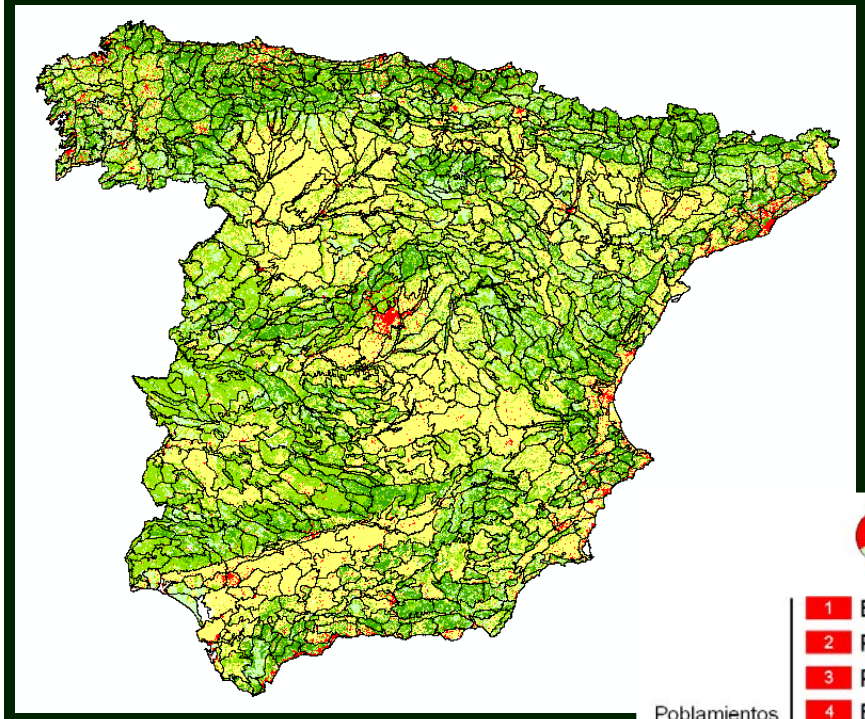
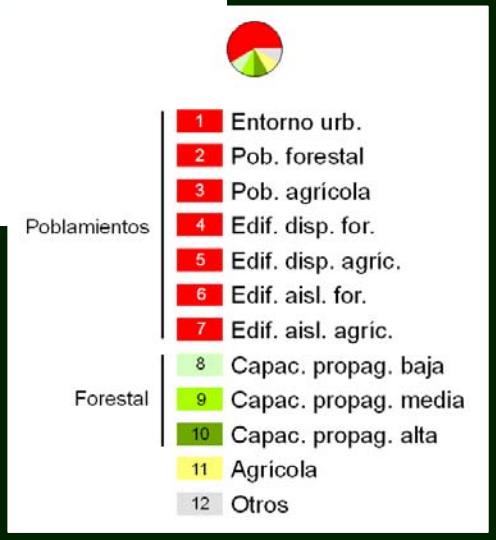
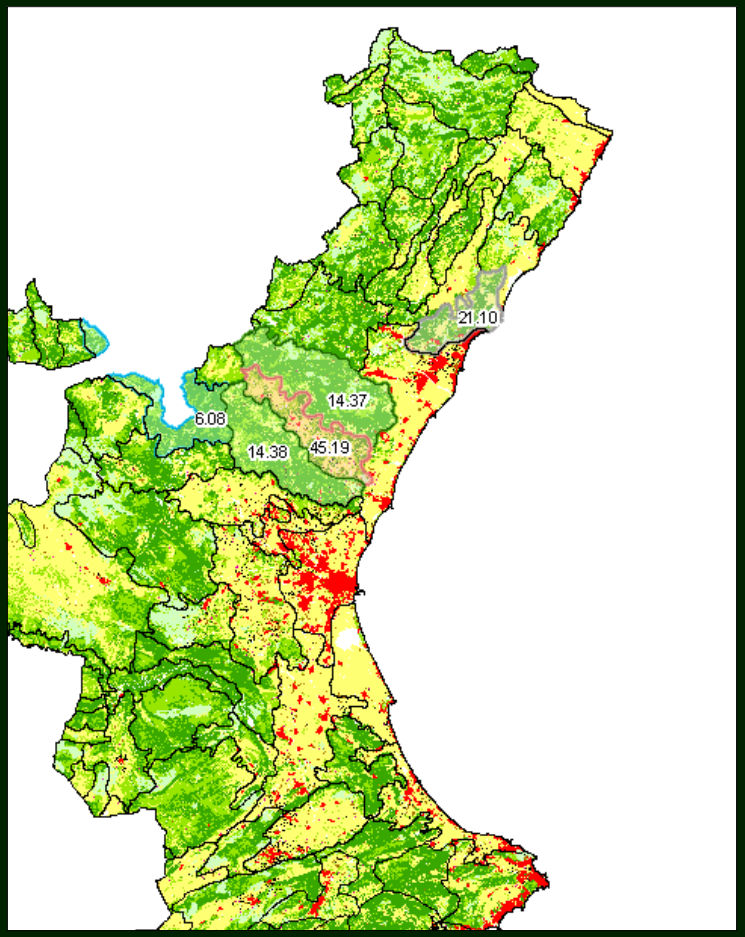


Landscape character assessment units & Fire scenarios





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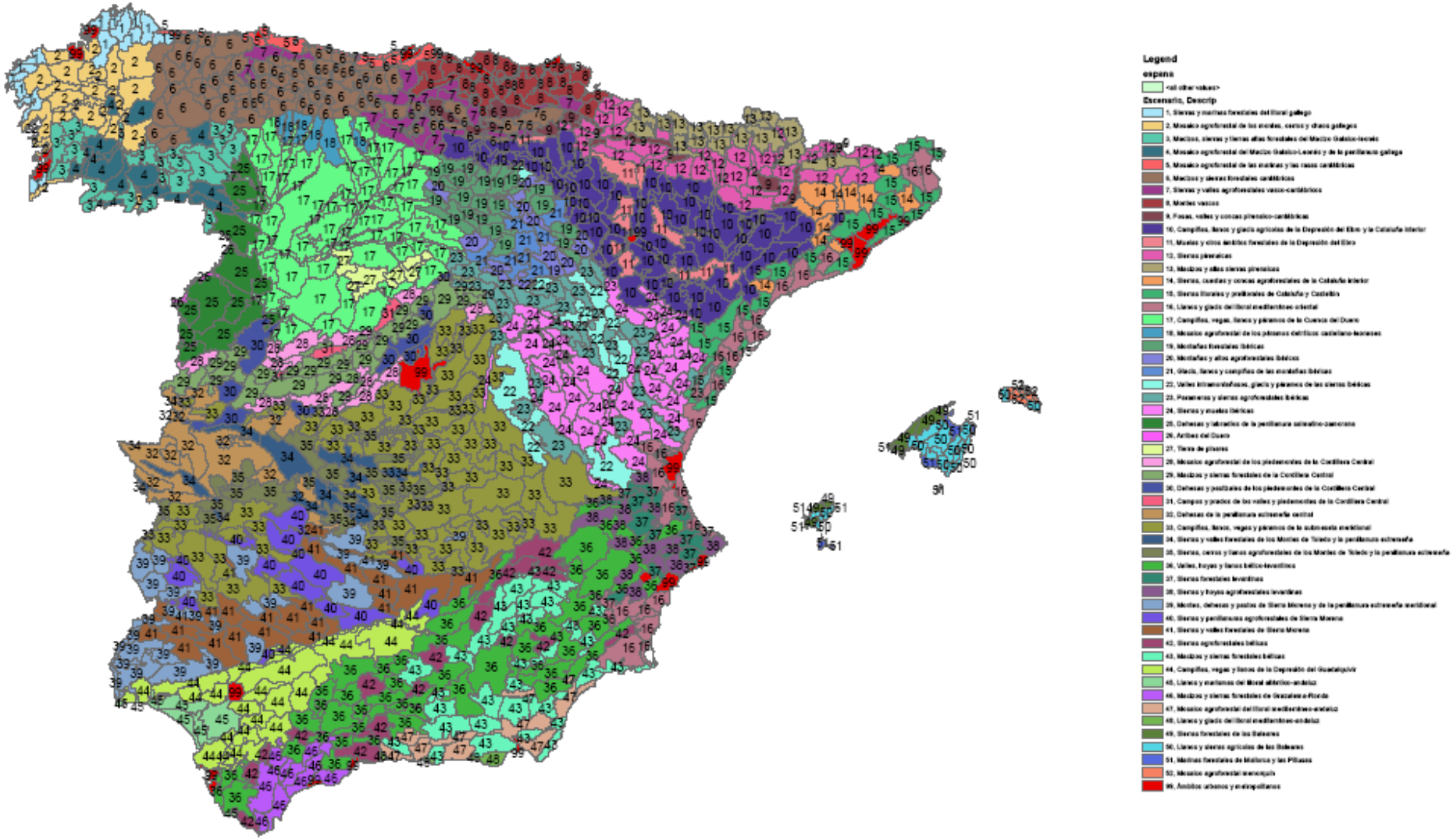

CONCEPTUAL BASIS = WILDFIRE GENERATION

The concept of *wildfire generation* is associated with the different stages of landscape evolution. It relates to a model of wildfire evolution towards a situation of predominance of large wildfires, which show high intensity and overwhelm control capacity. All this related to the variations of available fuel, framed within a determined spatial and temporal context, which prompt changes in action strategies

1st Generation: - Area with continuous fuel load
- Recent abandonment of farmlands

(Quite large wildfire perimeters)

2nd Generation: - 10-15 years of abandonment of agricultural and forest management
- Fuel continuity and homogeneity (shrubland)

(High fire propagation intensity and spread)

3rd Generation: - High fuel density and vertical continuity

(Crown fire out of control)

4rd Generation: - Wildland-urban Interfaces
- Fuel continuity and estates

(Great fire intensity and jumps)

Regional Fire Scenarios

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ATRIBUTE AND DATA SELECTION

DEFINING ELEMENTS	INTERVENING FACTORS	SOURCES OF INFORMATION
PROPAGATION CAPACITY	- Fuel load and continuity - Slop	•Cartography of fuel models (Forest Map) •DTM
WILDFIRE CHARACTERISTICS	- Intensity, propagation speed, simultaneity - Burned area	* Wildfire database * Wildfire perimeters
TERRITORIAL CONTEXT	- Agricultural abandonment - Intensity of forest management - Presence of WUI	* Crops and land use map * National Forest Inventory * Settlement map (TRAGSATEC)

Regional Fire Scenarios

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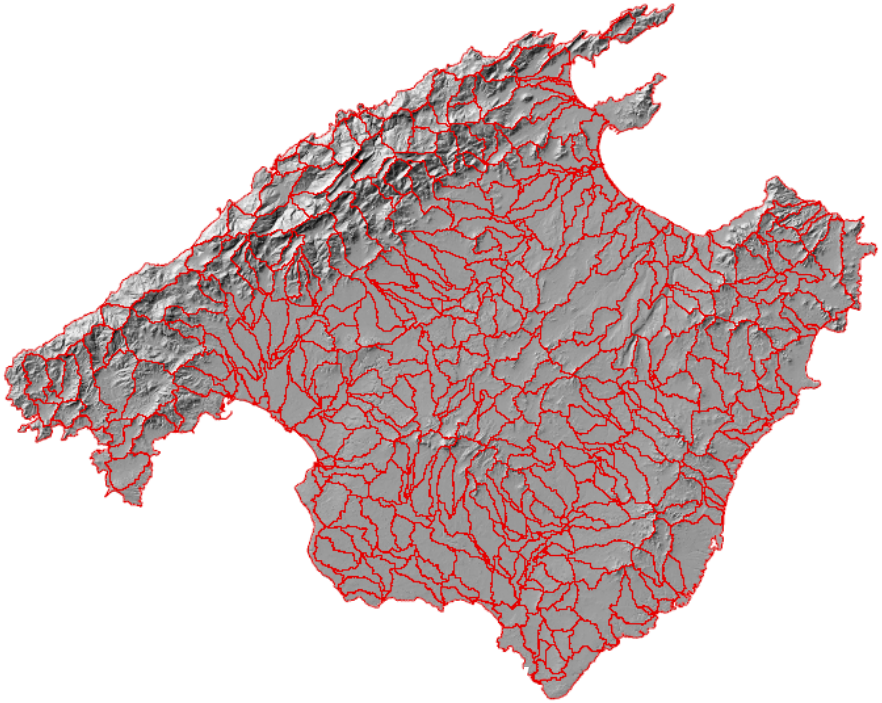
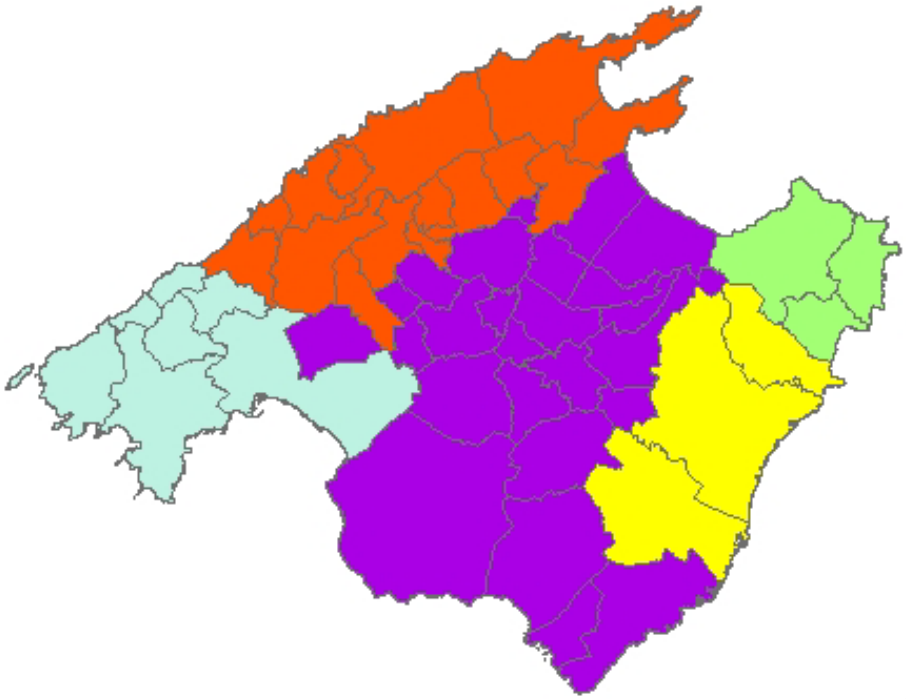
ANALYSIS UNIT = Drainage basin

Automatically calculated: 4.5 km^2, average area

MANAGEMENT UNIT = Forest massif

Homogeneus biogeographic unit which is delimited by natural or agricultural features, and is suitable for carrying out forest management or defence against wildfires actions





Regional Fire Scenarios

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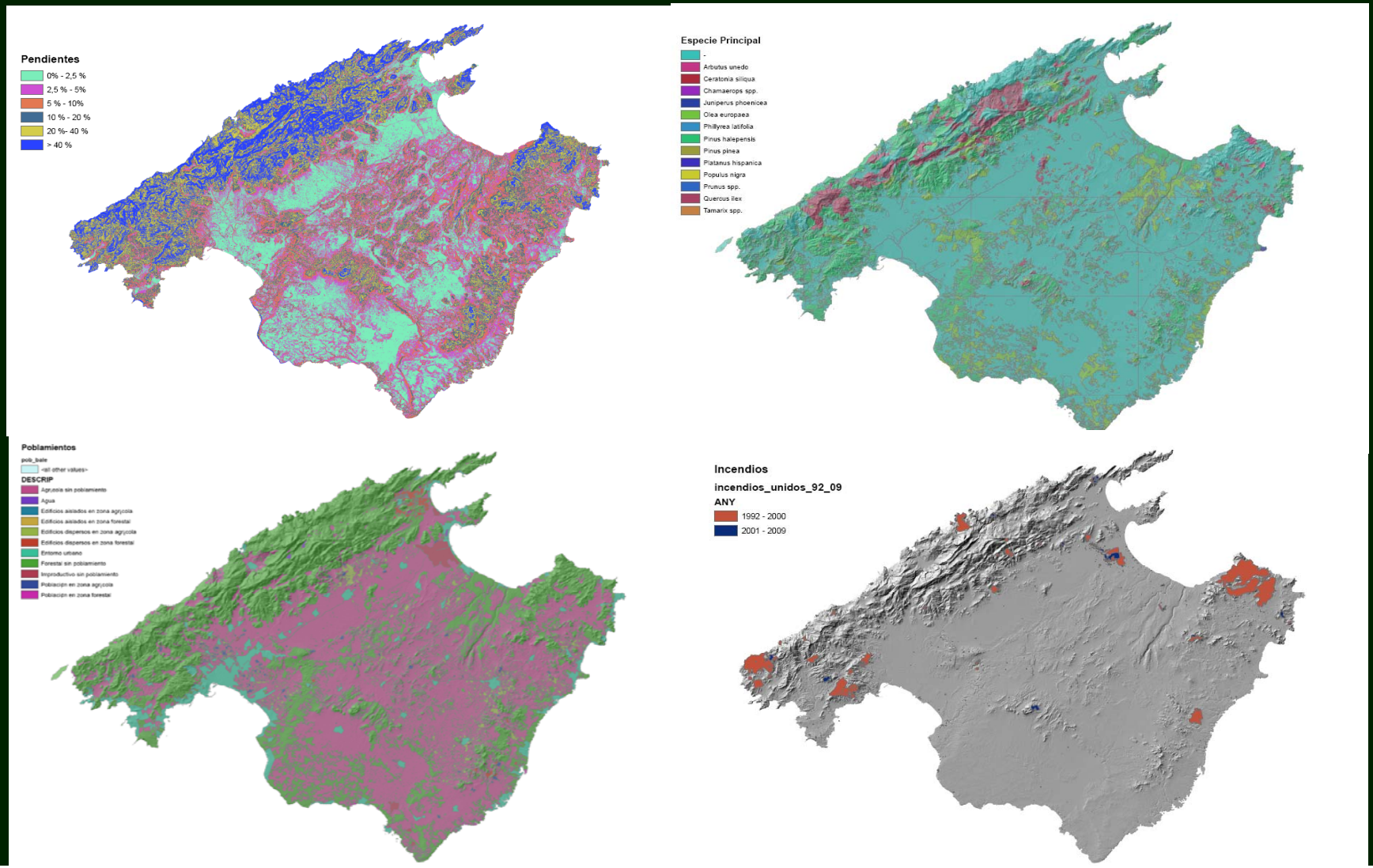
Mapping the components of regional fire scenarios



Regional Fire Scenarios

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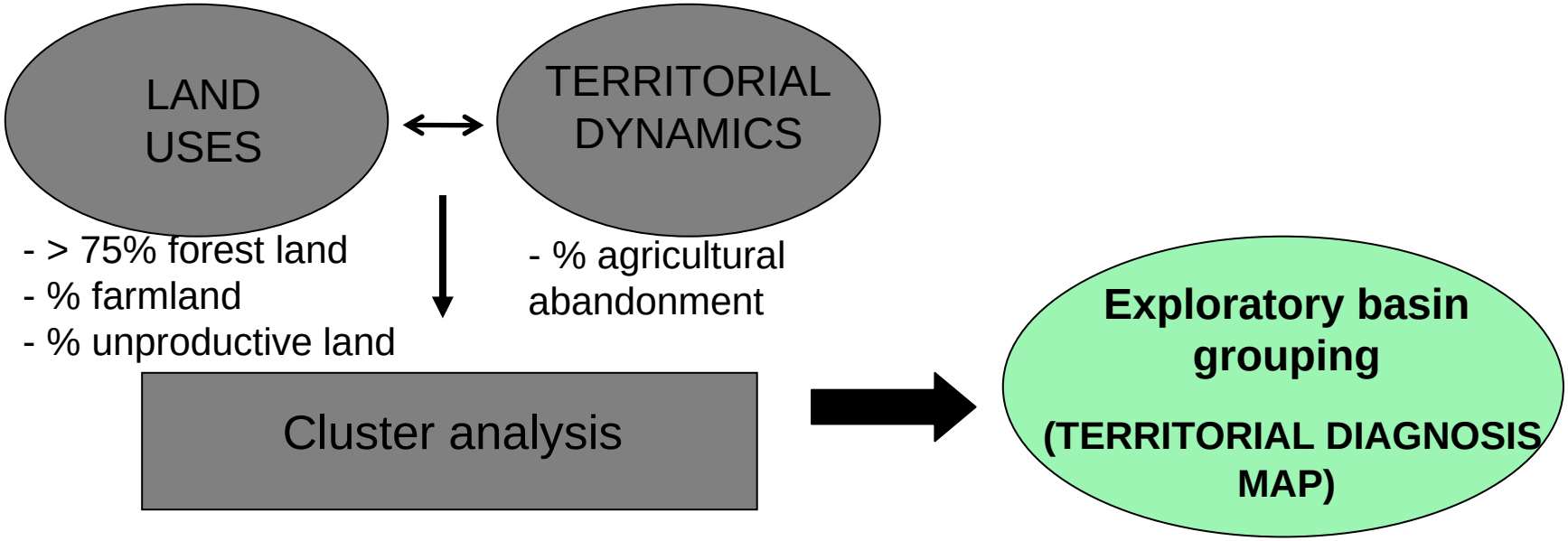

Regional Fire Scenarios

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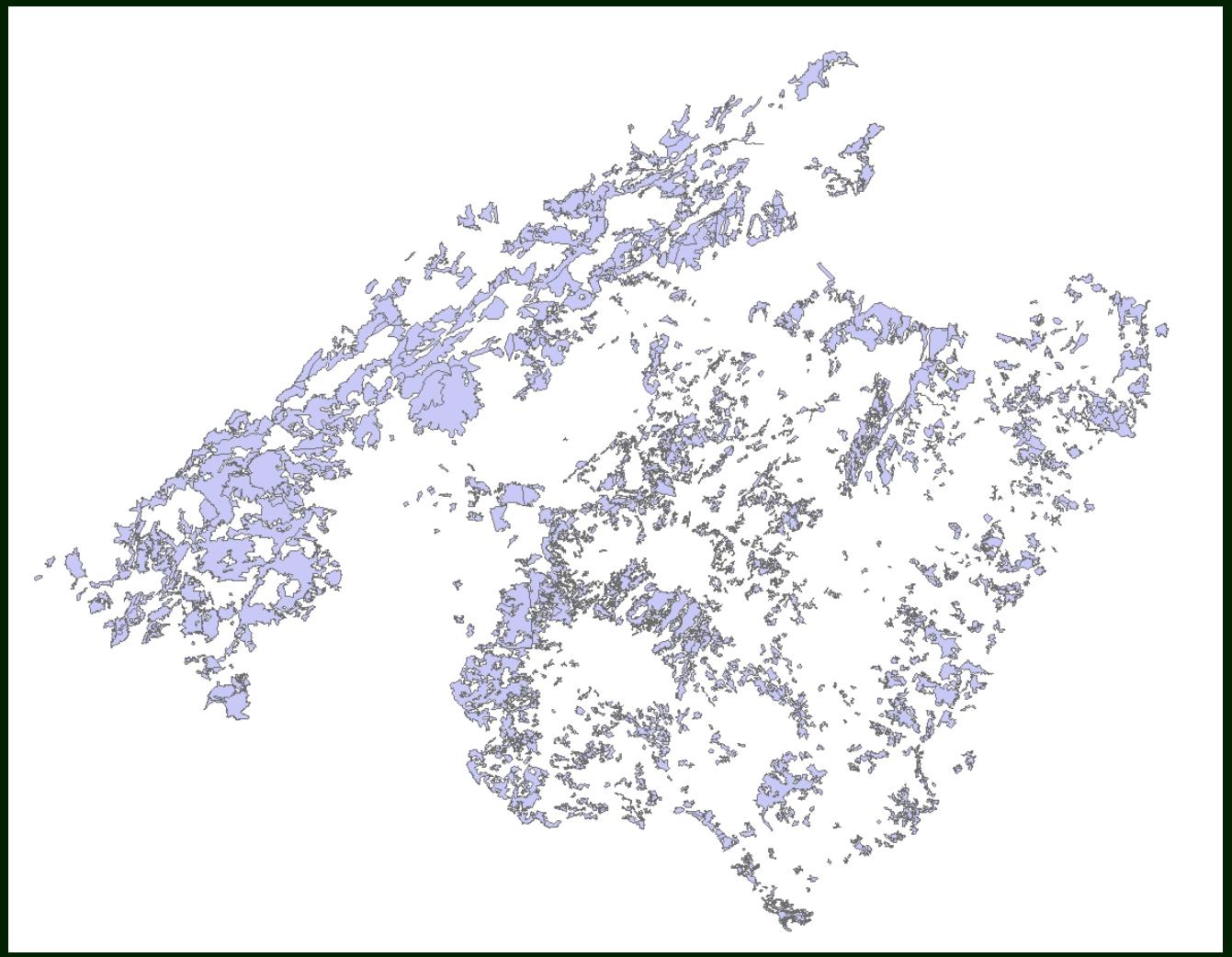
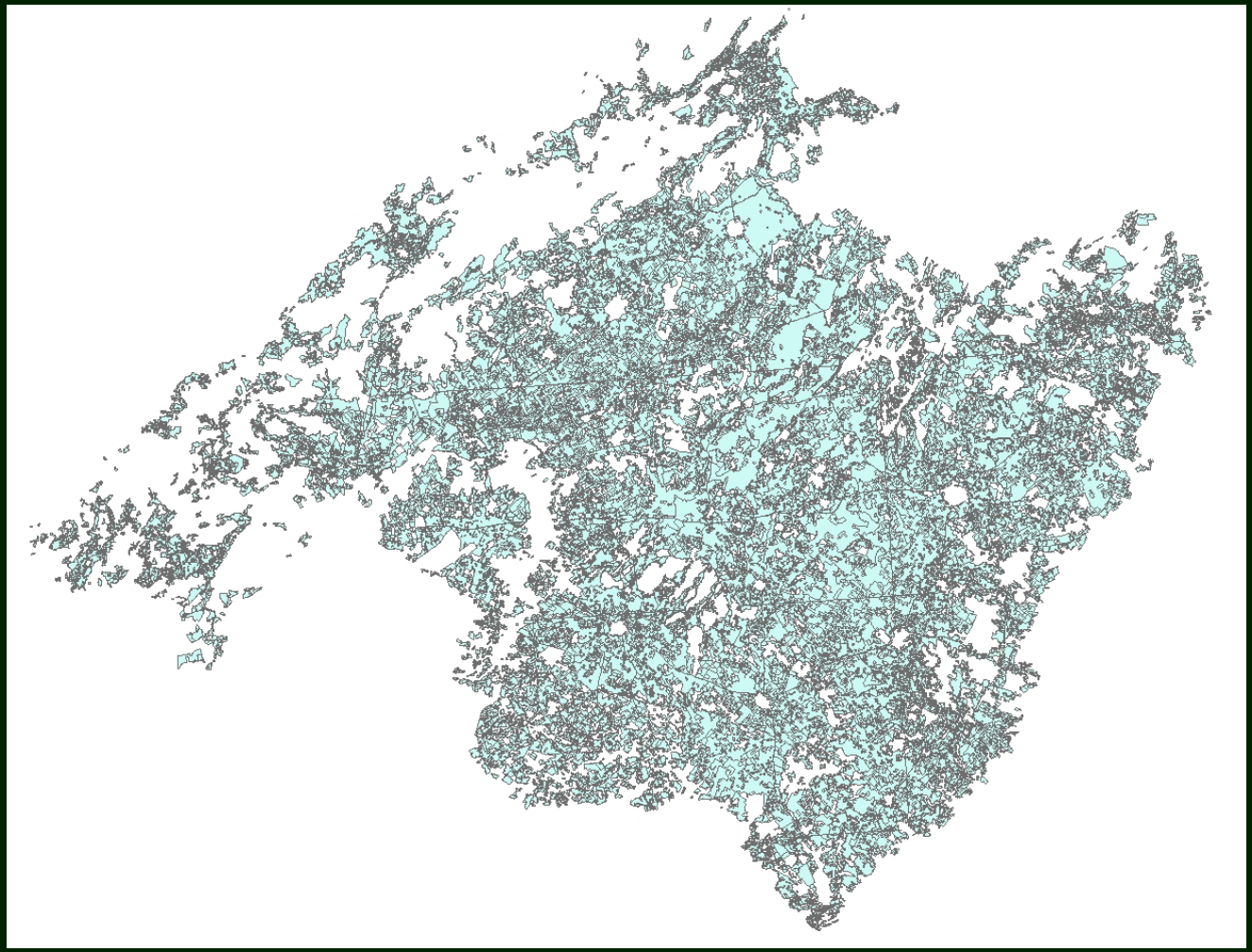
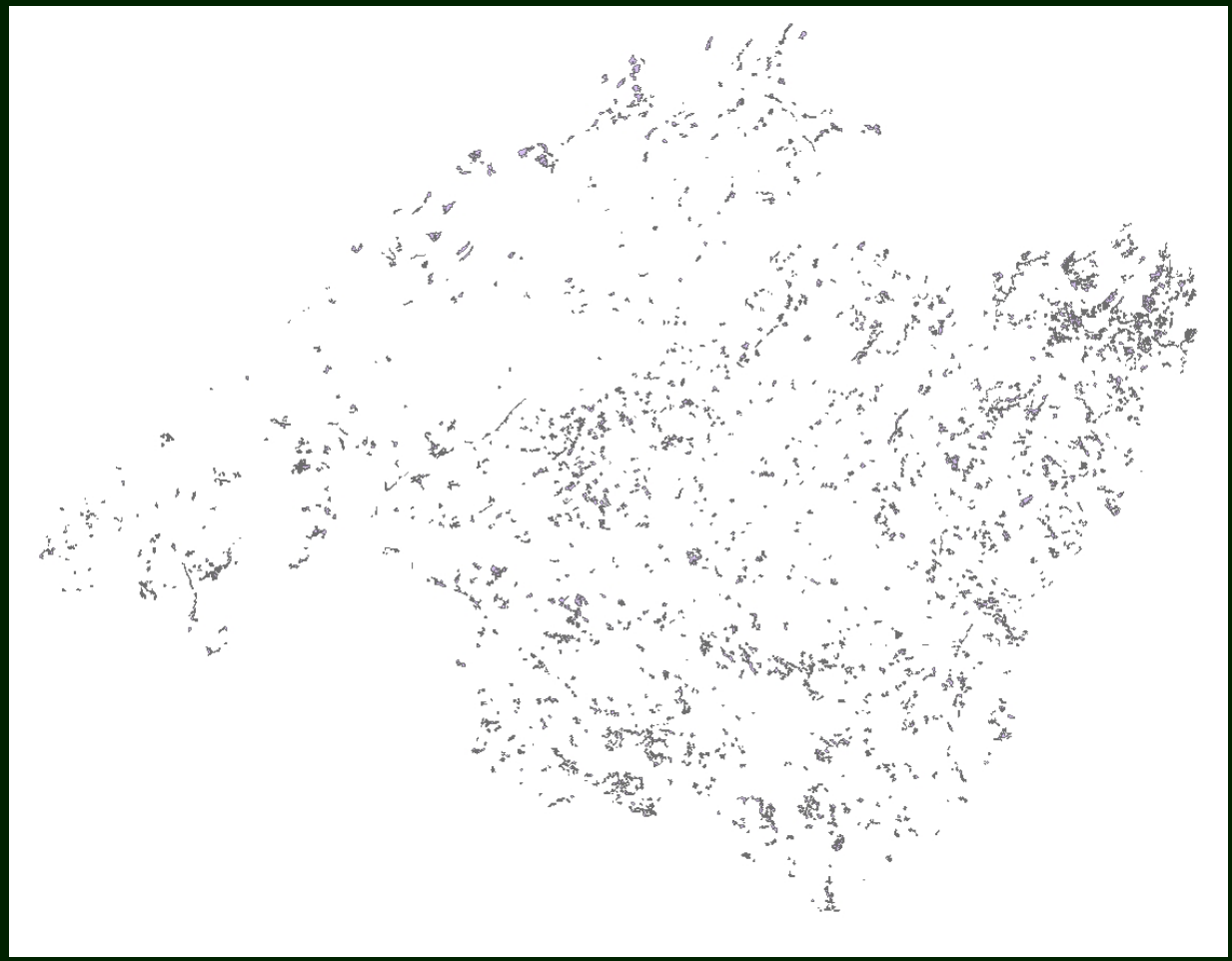
LAND USES: > 75 % forest land



LAND USES: % farmland



TERRITORIAL DYNAMICS: Agricultural abandonment



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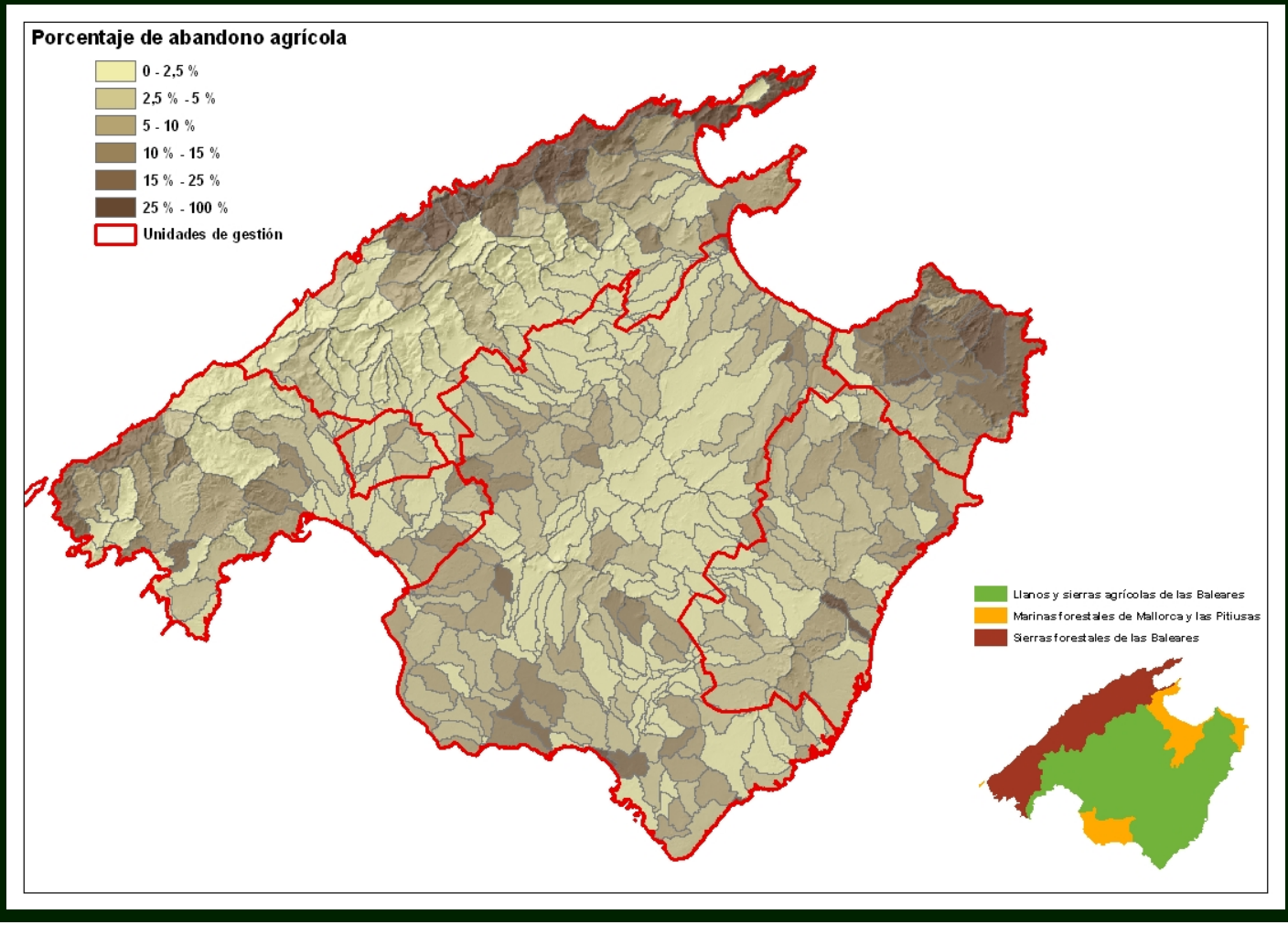
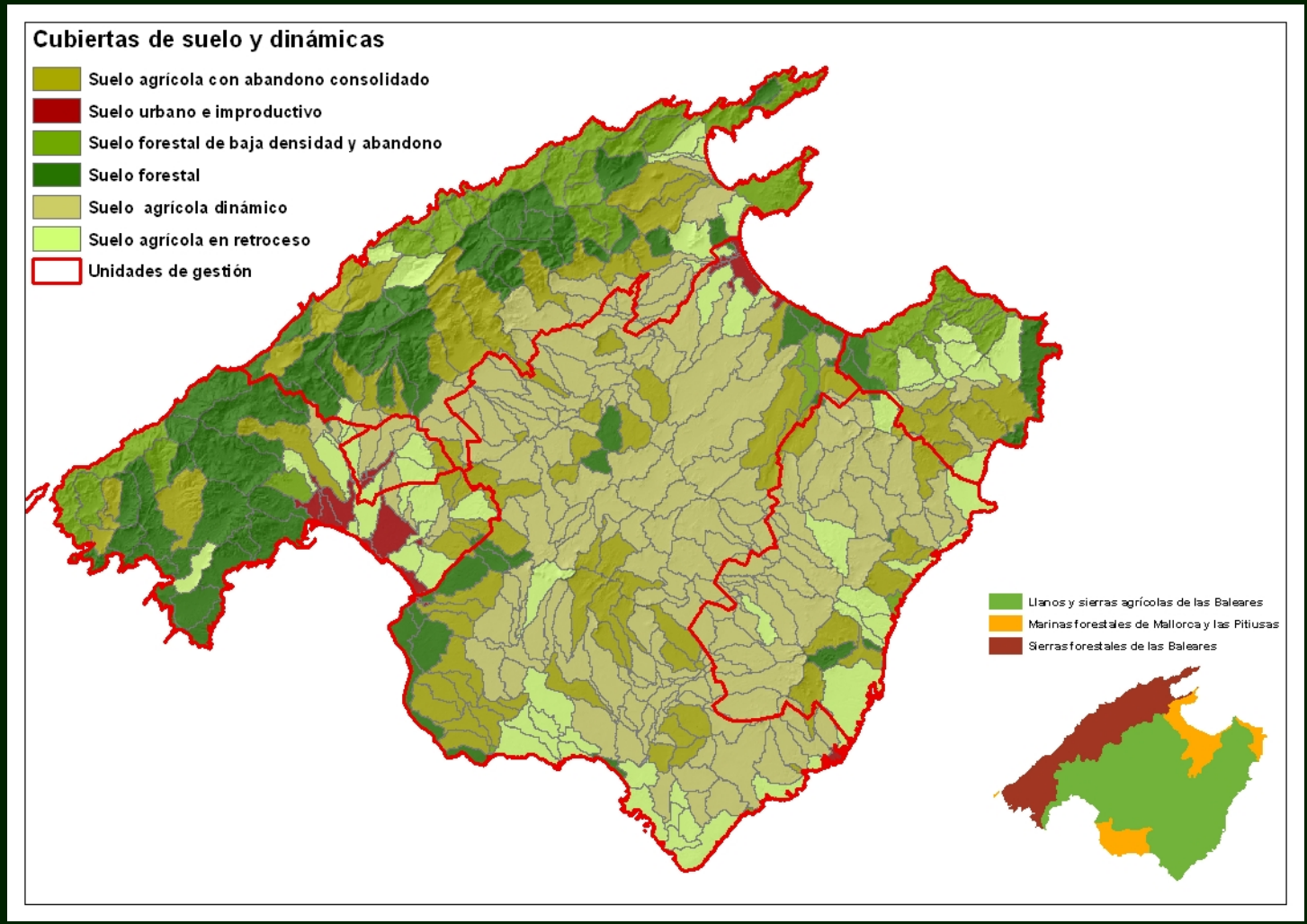


Territorial Diagnosis Map



Regional Fire Scenarios

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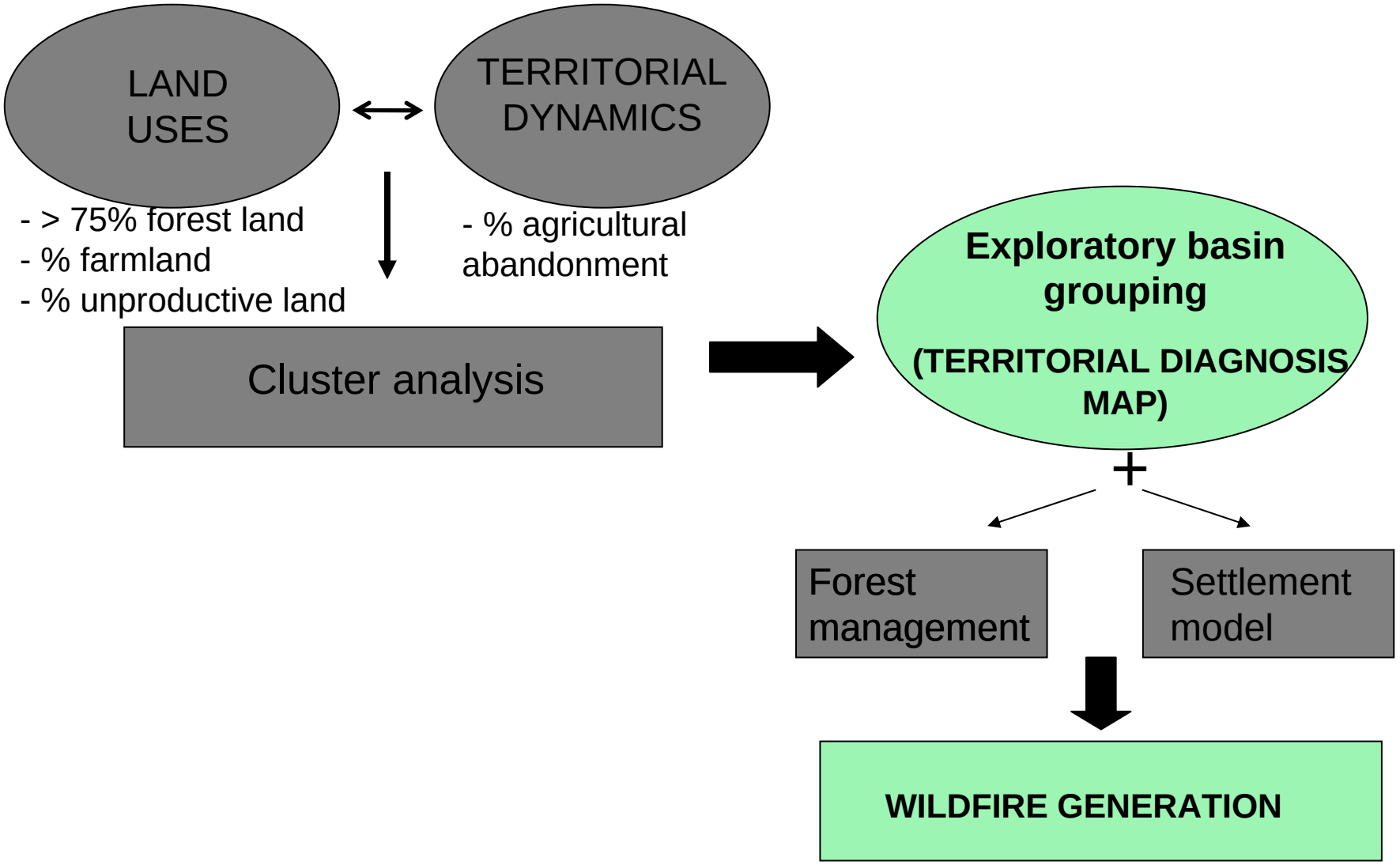

Regional Fire Scenarios

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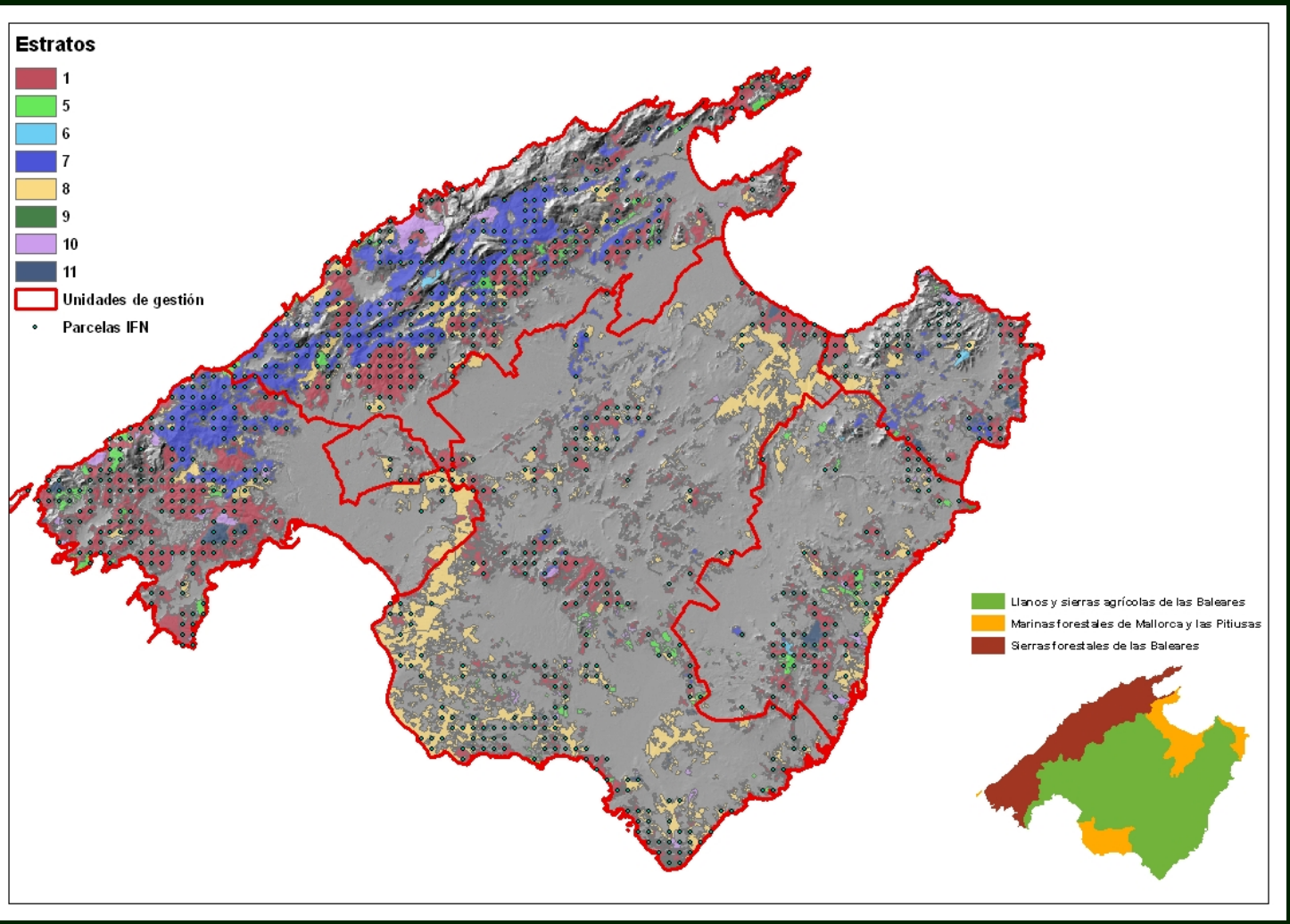
Forest management:



Regional Fire Scenarios

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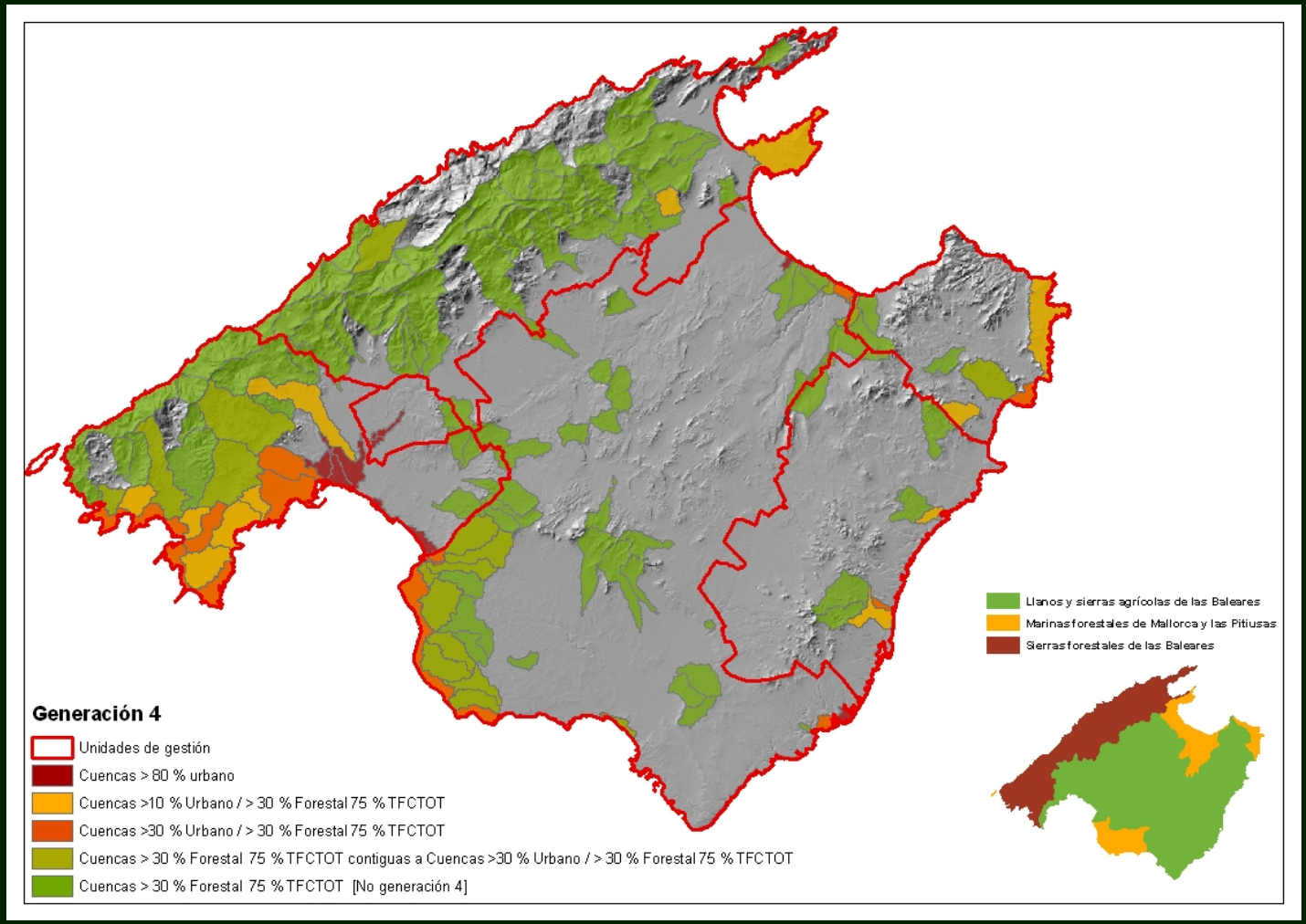
Settlement model:



Identifying wildfire generations:

- 1st and 2nd Generations: Intensity of agricultural abondonment related to % farmland

- 3rd Generation: fuel continuity + forest management

- 4rd Generation: WUI + fuel continuity

Regional Fire Scenarios

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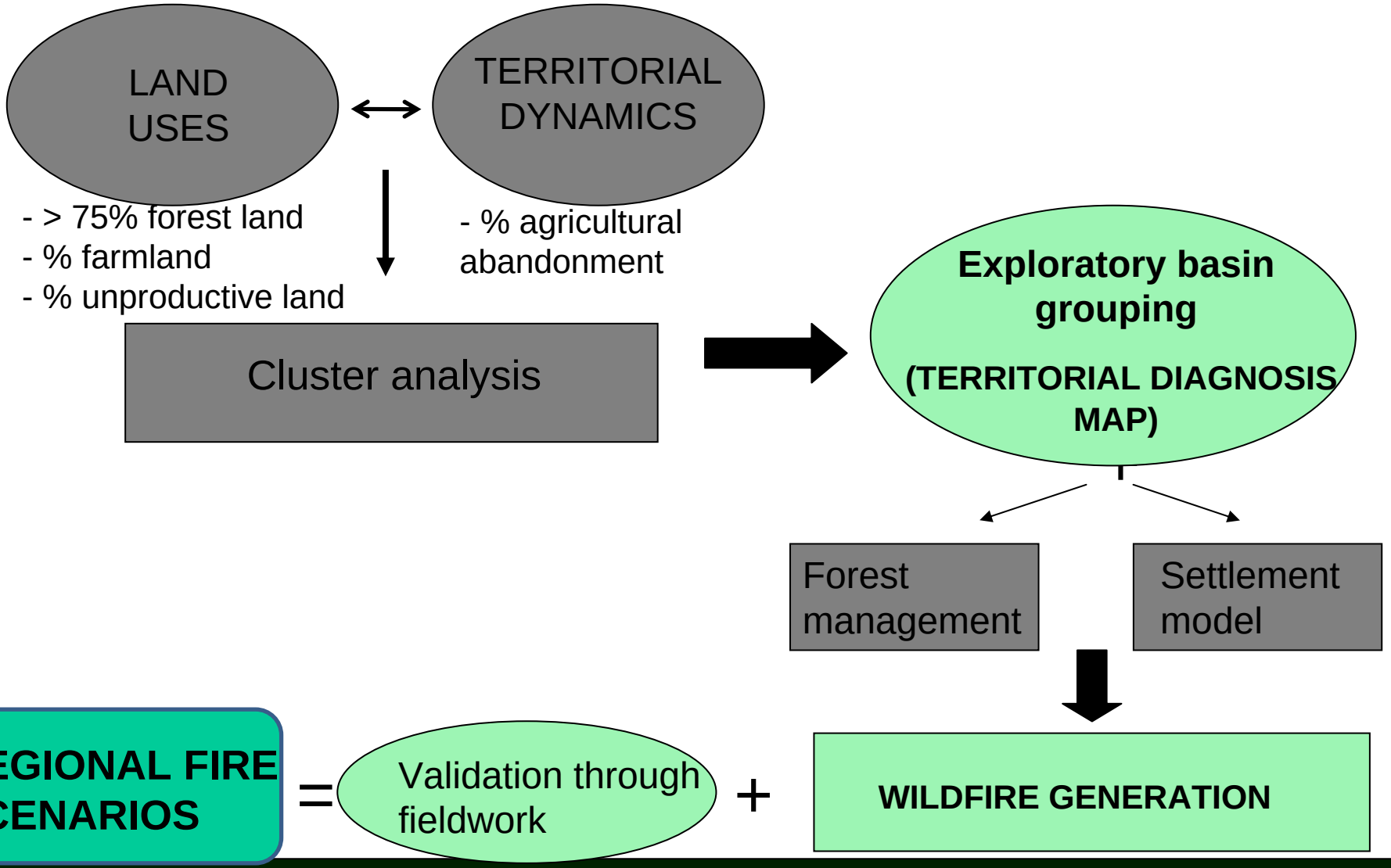

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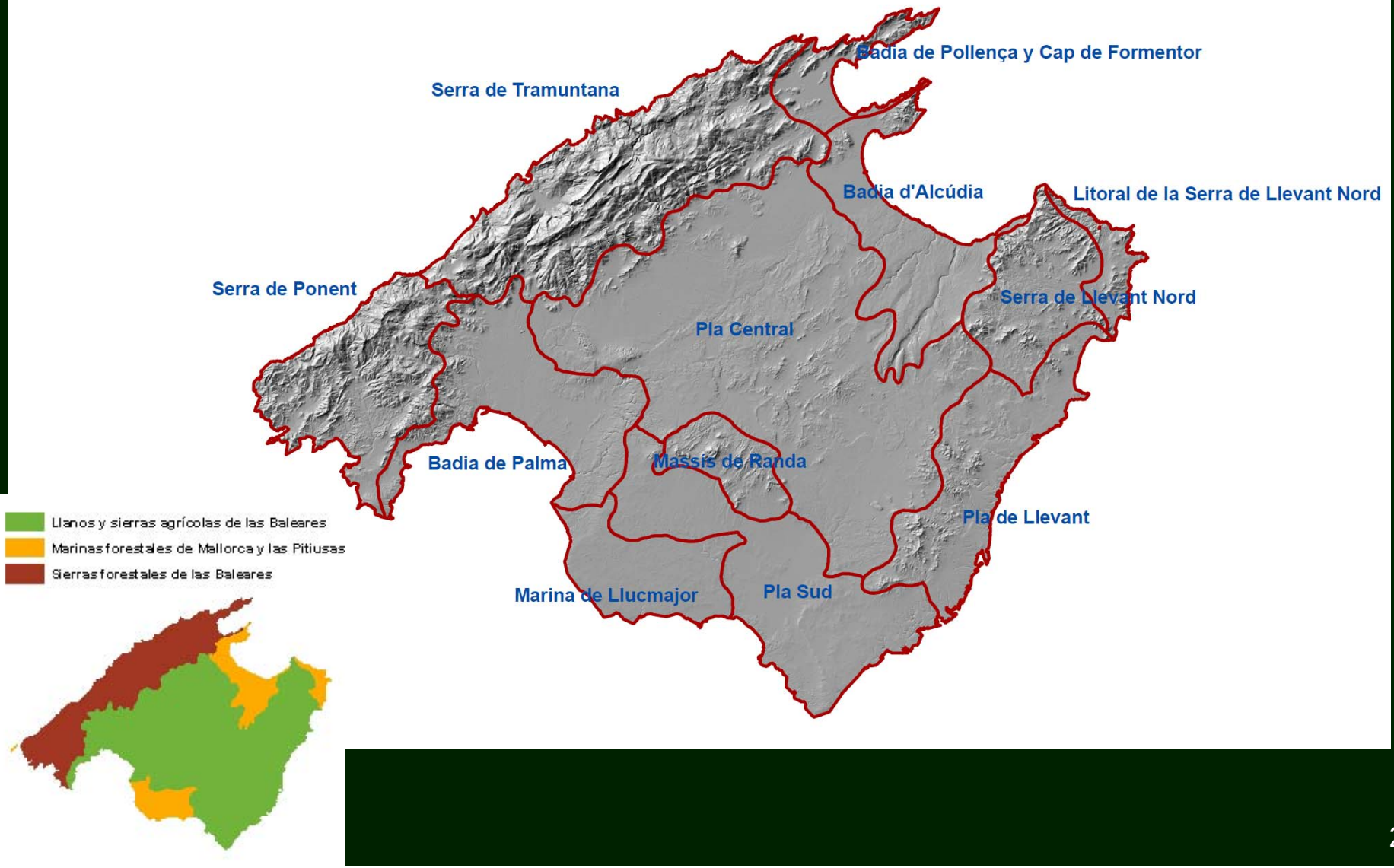

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