RECIPE

Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change

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Risk planning the complexity by connecting from response to prevention, the case of wildfire risk at local level

20/10/2021, Lisbon

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Wildfire risk planning at local level

3 phases approach from different topics:

- Integrated risk assessment and planning
- Promoting risk culture

Catalonia, Spain

- Prioritizing fuel management

Mafra, Portugal

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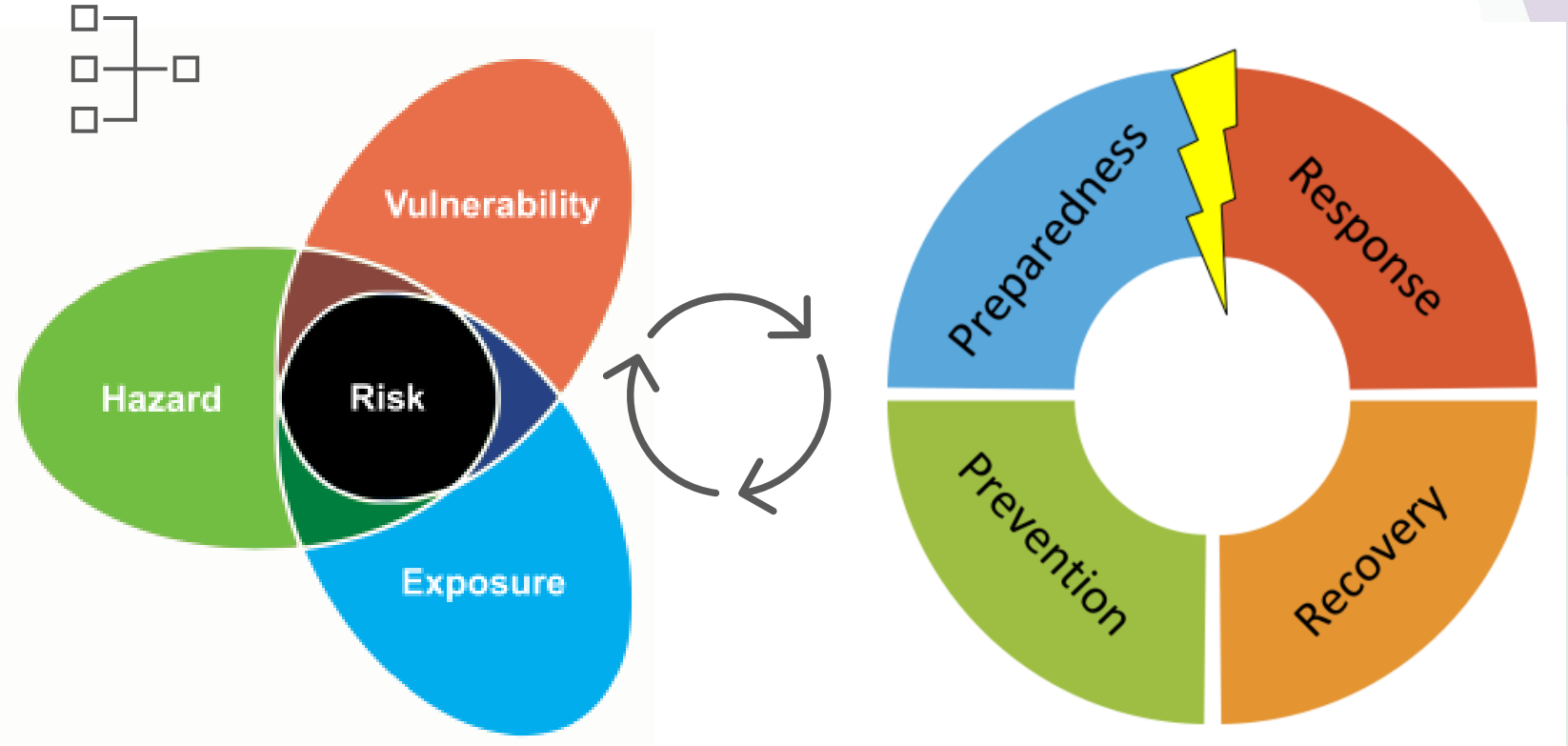
Integrated wildfire risk assessment and planning

What is it?

- A methodology



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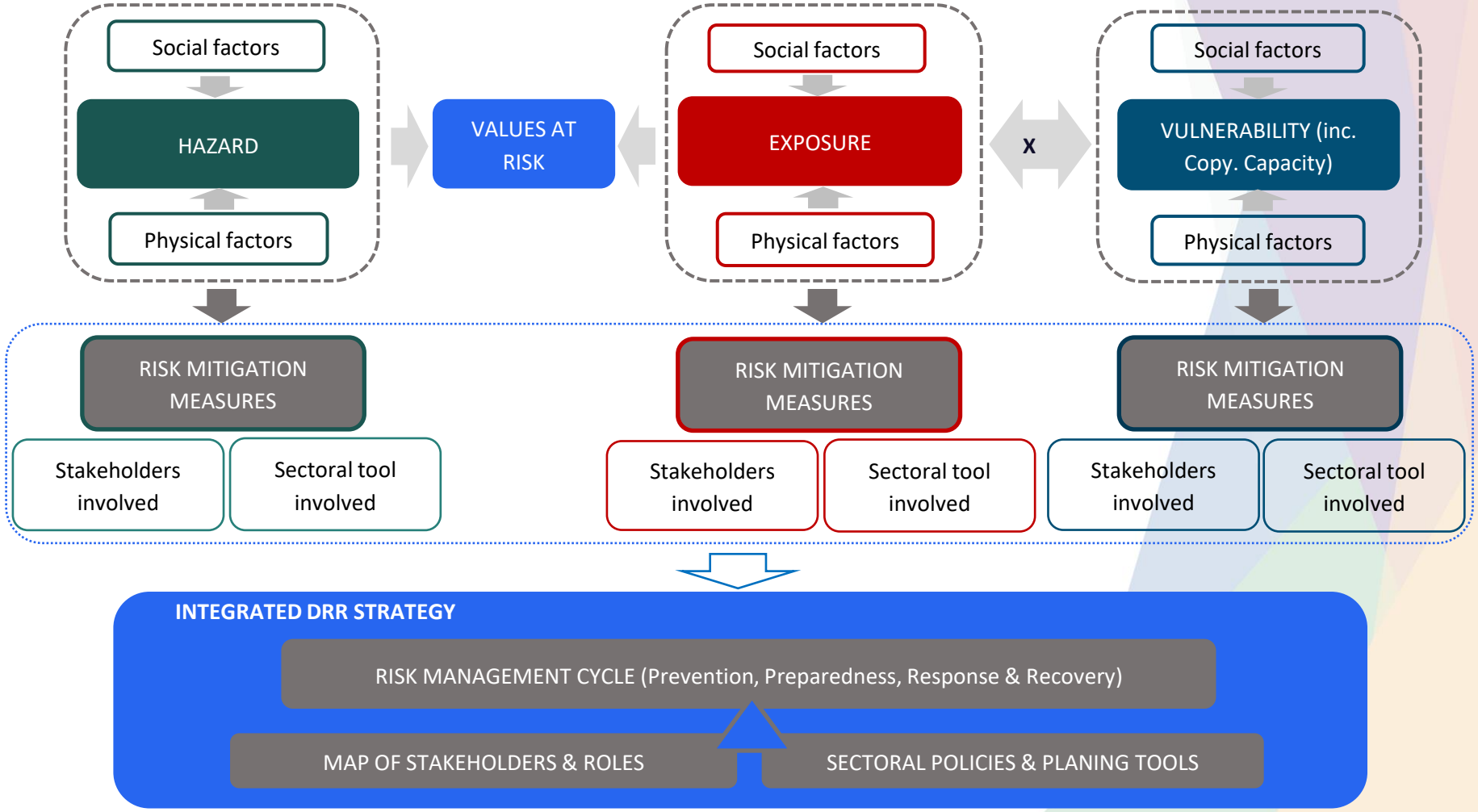
Integrated wildfire risk assessment and planning

How is it?

- A sequential approach to reinforce integrated risk assessment and planning



Plana et al. 2021

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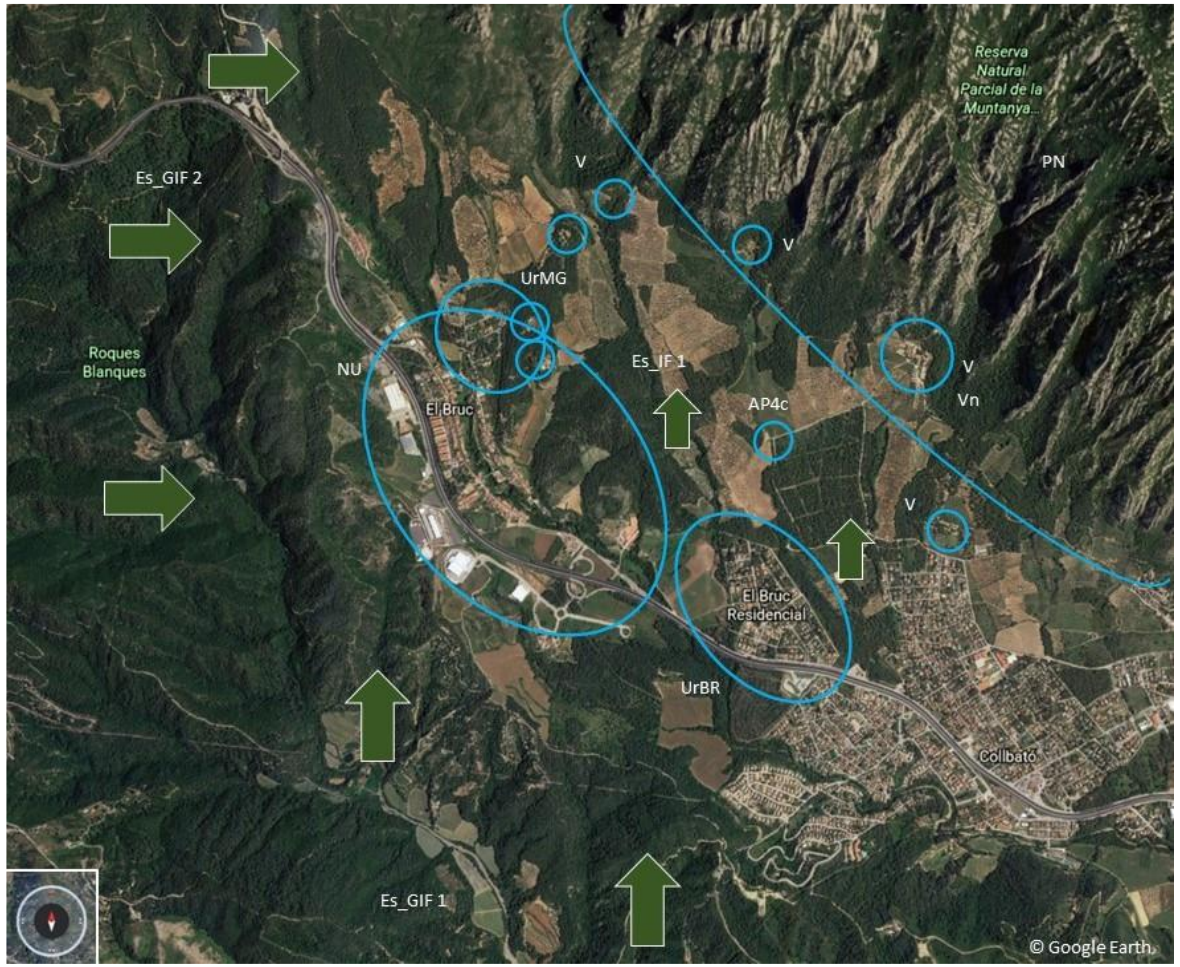
Integrated wildfire risk assessment and planning

1



Where could a wildfire come from? Based on **wildfire pattern** regimes

What territorial **elements** are **exposed** to wildfires? And which ones are not exposed?

What could be the **measures to protect** the identified exposed elements? Are they also **vulnerable**?

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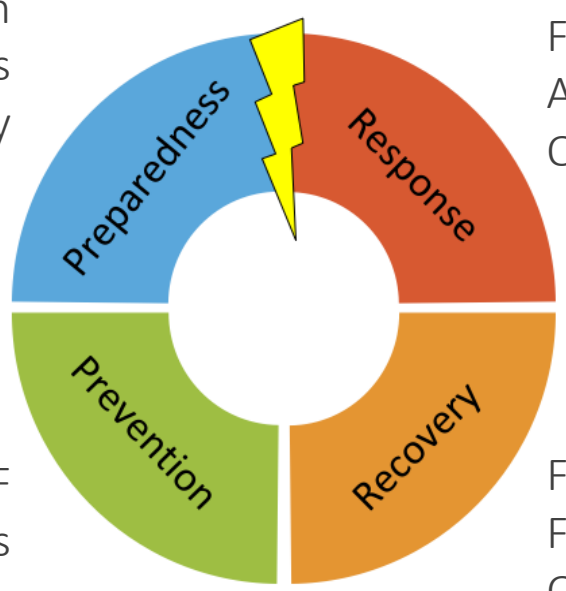
Integrated wildfire risk assessment and planning

2

Civil protection
Rural Agents
Municipality



Civil protection
Firefighters
ADF
Others

ADF
Forest owners
Forest administration
Local producers
Shepherds/Farmers

Forest administration
Forest owners
Others

Who maintains the agroforestry mosaic?

Who is planning urban and land development?

Who is planning possible emergency situations?

Are they organised?

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Integrated wildfire risk assessment and planning

3

What are the prev-prep-resp-recov measures?

Will they work efficiently in a climate change context?

At what level of risk are they efficient?

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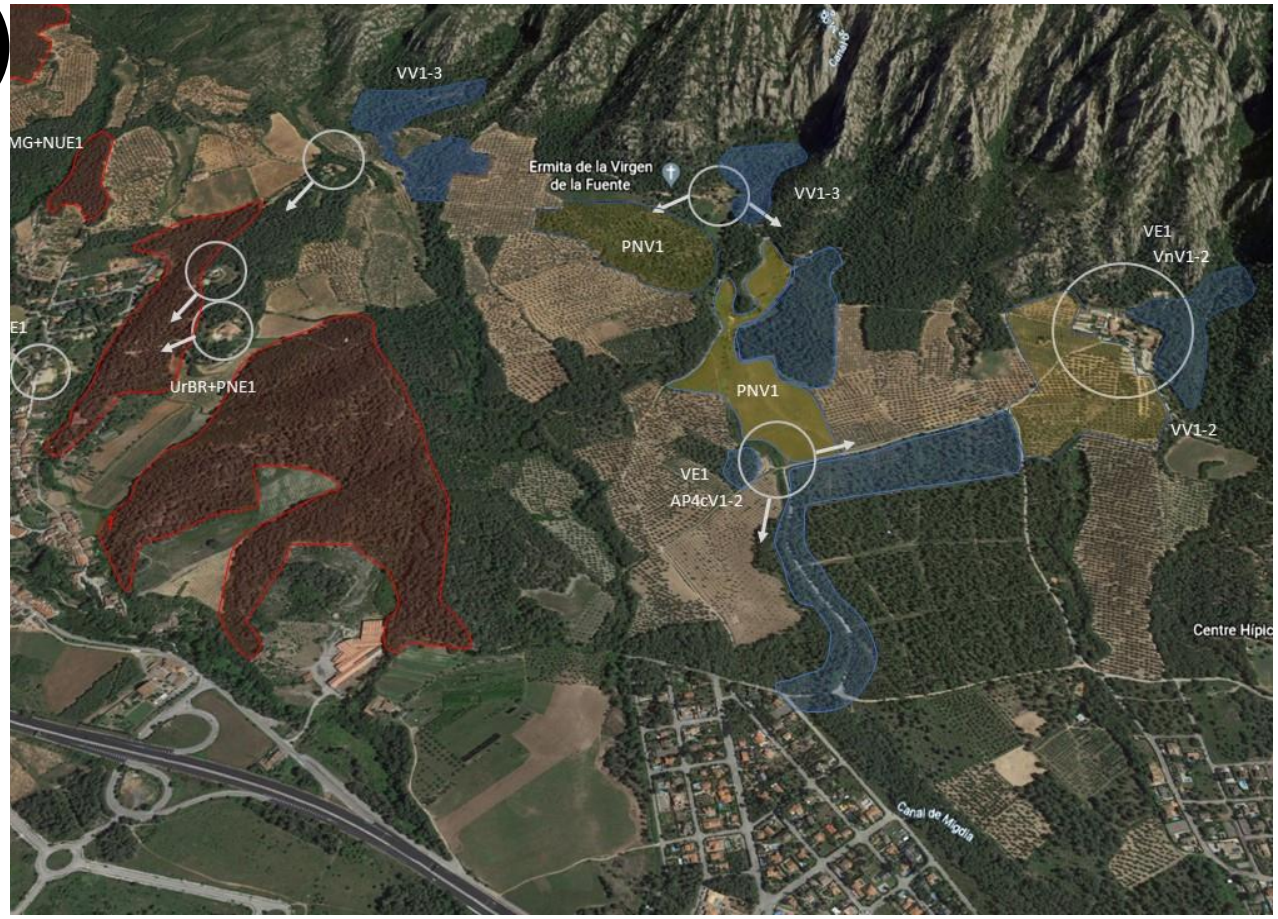
Integrated wildfire risk assessment and planning

4



Who will do it?

Where to protect what?

Useful for different RMC phases?

Is this currently predicted?

Is necessary to create new instruments? Or not?

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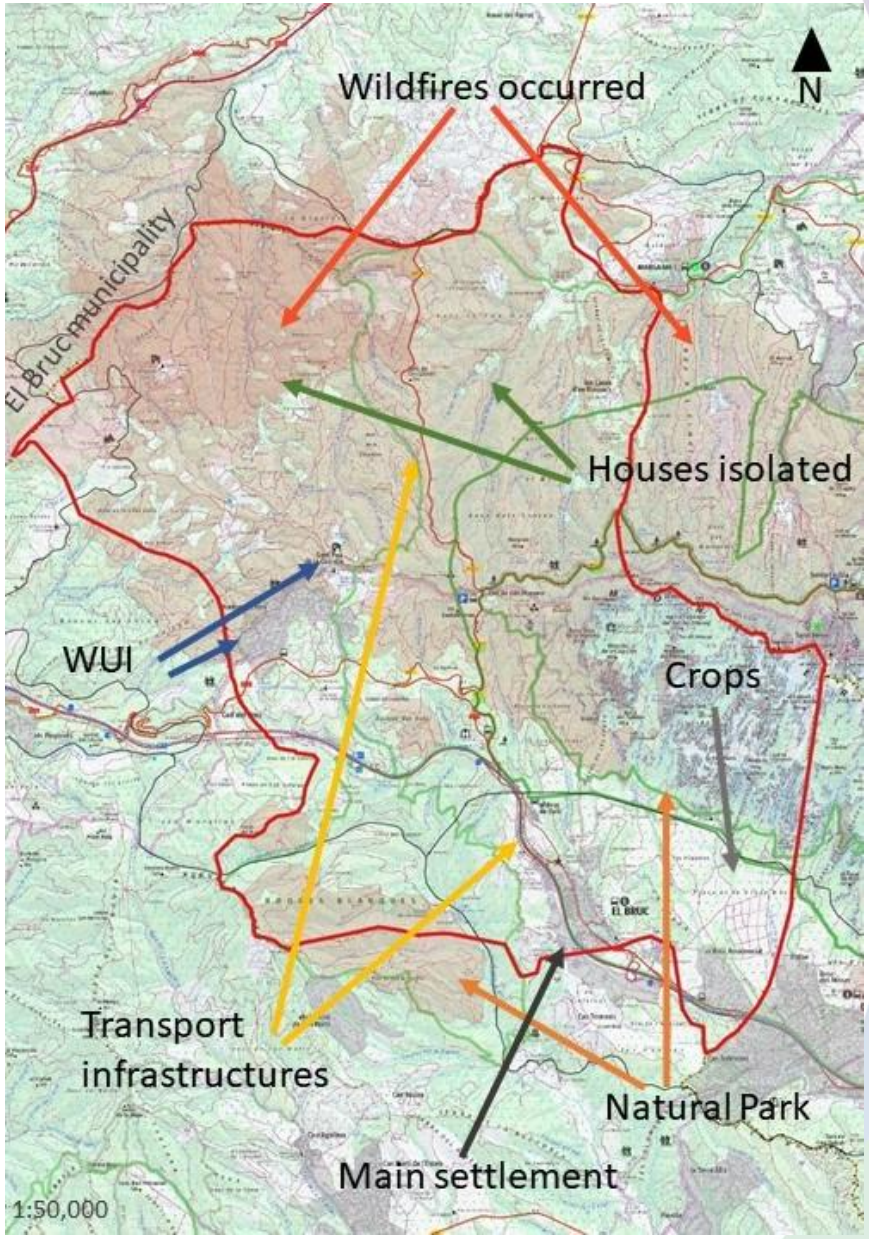
Integrated wildfire risk assessment and planning

Where?

- Pilot case in Catalonia
- Local scale applicability: el Bruc municipality
- Complex territorial diversity



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Integrated wildfire risk assessment and planning

Why?

- Optimise synergies between prevention, preparedness, response and recovery
- Addressing physical and social vulnerability
- Reference framework
- Activities in the territory are part of the Risk Management Cycle
- Wildfire resilient communities and landscapes adapted to impacts posed by climate change

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Promoting a wildfire risk culture

- Two actions under RECIPE framework
  - Educational program at primary school
  - Preparedness Day for citizens exposed to wildfire risk (WUI)

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Promoting a wildfire risk culture

- Two actions under RECIPE framework
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MeFiTu – Objectives

- Appropriate and sufficient skills to see forest fires from a critical point of view.
- Fire as an essential tool for the humankind
- From fire to wildfire
- Forest management as a tool for the prevention of large forest fires

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MeFiTu – The program

- **Me**diterranean forests, **Fi**re **and You**
  - Activity in the classroom
  - Forest fire workshop
  - Field visit

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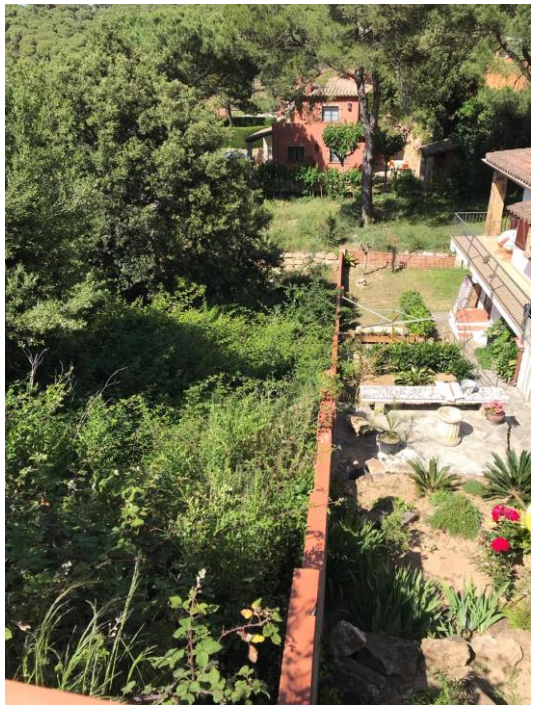
Preparedness Day

- What is it?
  - Transnational activity that takes place every year the first Saturday of May.
  - Developed by NFPA (USA) and transferred to other countries.
  - The objective is to engage exposed communities to undertake risk reduction actions.
  - A lot of different activities can be done:
    - Door-by-door for risk communication
    - Site visits to make a risk analysis
    - Co-creation meetings to find solutions
    - Etc



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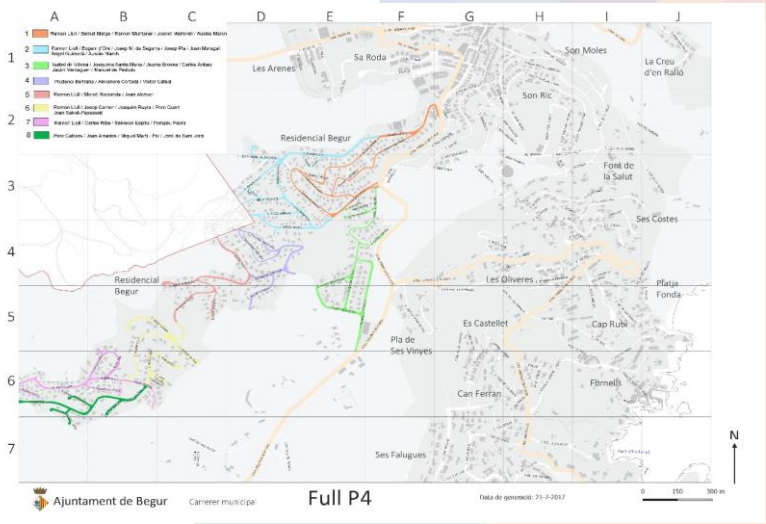
Preparedness Day

- 27th October 2021
  - Wildfire Preparedness Day in El Bruc Montserrat Park
  - Door-by-door activity: PCF, CTFC, El Bruc City Council, Civil Protection, Fire Service, Forest Defence Volunteers, Police
  - Mixed groups to carry out the activity: each group is assigned to different streets
  - In each house:
    - Risk communication
    - Risk reduction measures
    - Brochure with information



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Beyond the Preparedness Day

- A further step is to consolidate the community as a Firewise:

RECIPE

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PRIORITIZING FUEL MANAGEMENT AT WILDLAND URBAN INTERFACES IN PORTUGAL

20/10/2021, Lisbon

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WILDFIRE MANAGEMENT IN PORTUGAL

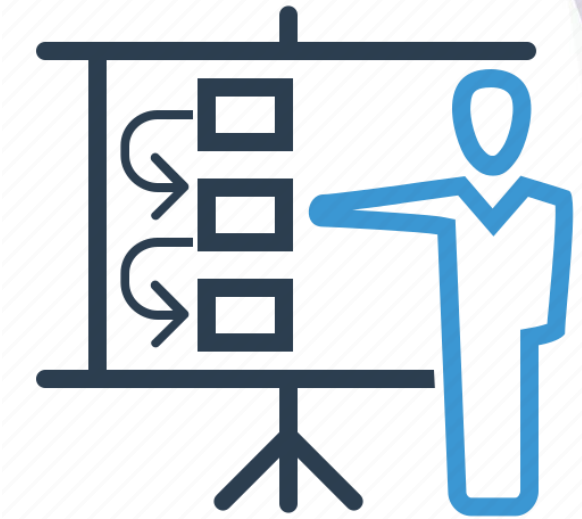
- Fuel management legislation

National

Regional

District

Municipal



Description of legal obligations	Band width (m)
Constructions within rural areas (buildings, construction sites, warehouses, other construction buildings)	50
WUI areas (10 or more buildings spaced not more than 50 meters)	100
Camping sites and picnic sites	100
Forest road network	10
Gas transmission network	10
Very high voltage energy transmission network	10
Fuel management plot mosaics (agricultural land, inland water, rock outcrops, golf courses, wind farms)	-
Water points	30
High voltage energy transmission network	10

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PRIORITIZING FUEL MANAGEMENT AT WUI – Objectives

- Phased intervention
- Ensure the adequate implementation of current fuel management legislation
- Increase the effectiveness of operations in the prevention phase of the disaster risk management cycle

Database of plots to be inspected annually according to fuel management priorities for fire prevention

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DSS FOR PRIORITIZING FUEL MANAGEMENT AT WUI

Hazard
Spatial assessment

Potential damage
Socioecological assessment

Escape routes

Time of first intervention

Fuel treatments performed

NEED for fuel management

Land register

Fuel management bands
(legal obligations)

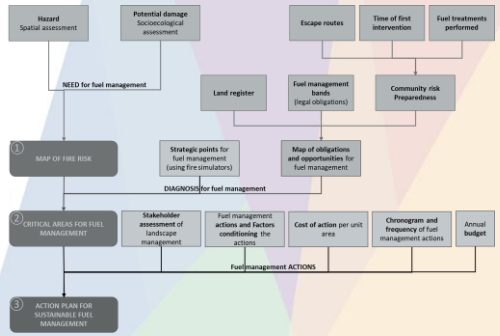
Community risk Preparedness

MAP OF FIRE RISK

Map of obligations and opportunities for fuel management

DIAGNOSIS for fuel management

CRITICAL AREAS FOR FUEL MANAGEMENT
FOR LANDOWNERS AND INSPECTION



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MATRIX FOR THE DSS

Objective	Topic		Value = 1	Value = 0
Map of obligations and opportunities for fuel management	Legal obligations for fuel management		If the fuel management band if of 1st, 2nd, or 3rd order	If the fuel management band is not of 1st, 2nd, or 3rd order
	Community risk preparedness	Time of first intervention	If the distance from fire station is ≥ 20 minutes	If the distance from fire station is < 20 minutes
		Fuel treatments performed	If no fuel treatments were performed in the past 4 years	If at least 1 fuel treatment was performed in the past 4 years
		Escape routes	If it is a no-exit road or If it is a one-way road or If the road in bad conditions	If it is, at least, a two-way road or If there are 2 roads in opposite directions
Map of fire risk	Hazard		In a classification 1 to 5: If hazard is 4 or 5	In a classification 1 to 5: If hazard is not 4 or 5
	Potential damage	Ecological	If there are ecological features	If there no ecological features
		Social	If there are social features in a 100 meters buffer	If there are no social features in a 100 meters buffer

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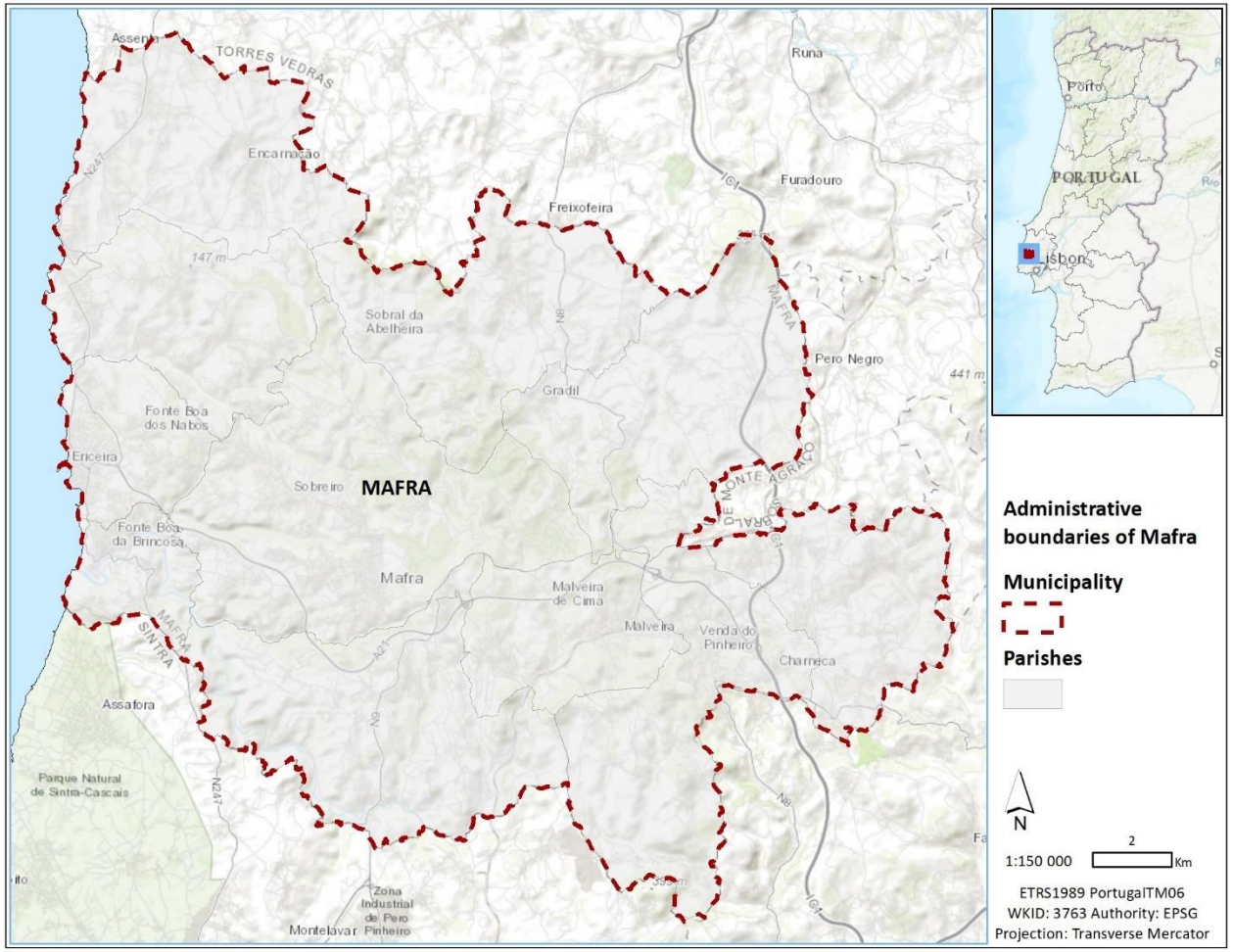
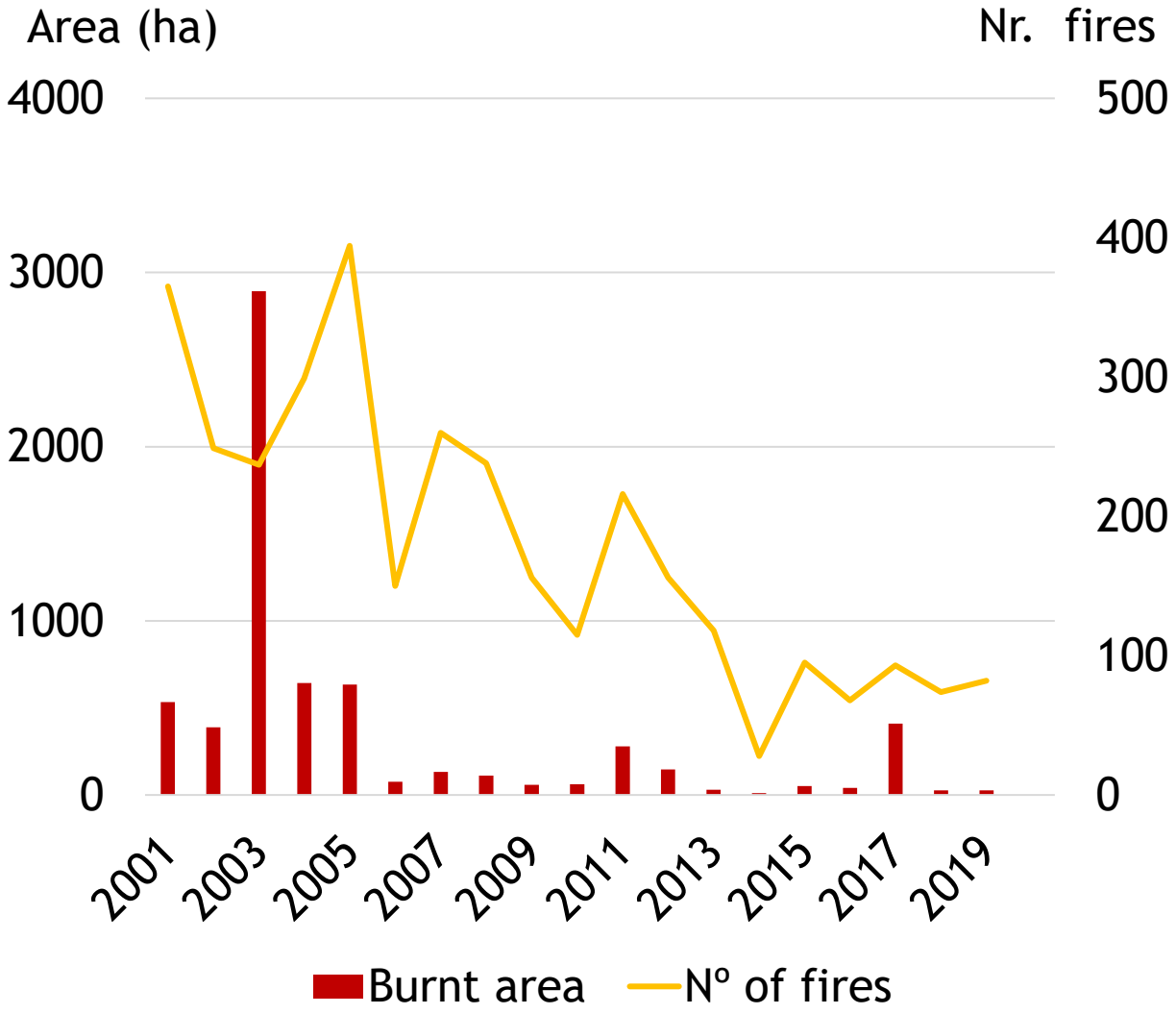
Mafra case study





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Materials

	Topic	Sapefile	Format	Source
1	Administrative boundaries	Carta Administrativa Oficial de Portugal (CAOP)	Vector (polygon)	DGT
2	Fuel management bands	Faixas de gestão de combustível com classificação Rede_DFCI	Vector (polygon)	Municipality
3	Land register	Cadastro	Vector (polygon)	Municipality
4	Forest road network	Rede Viária Florestal com identificação da classificação DFCI	Vector (line)	Municipality
5	Land register with information on clearings	Data das limpezas de terrenos efectuadas nos últimos anos	Vector (polygon)	Municipality
6	First intervention	Distância, em minutos, ao quartel de bombeiros	Vector (polygon)	Municipality
7	Potential ecological damage	Habitats, RedeNatura2000, Fauna	Vector (polygon)	Municipality
8	Potential social damage	Infraestruturas criticas	Vector (point)	Municipality
9	Hazard	Perigosidade, elaborada no âmbito do PMDFCI	Raster (pixel 10)	Municipality

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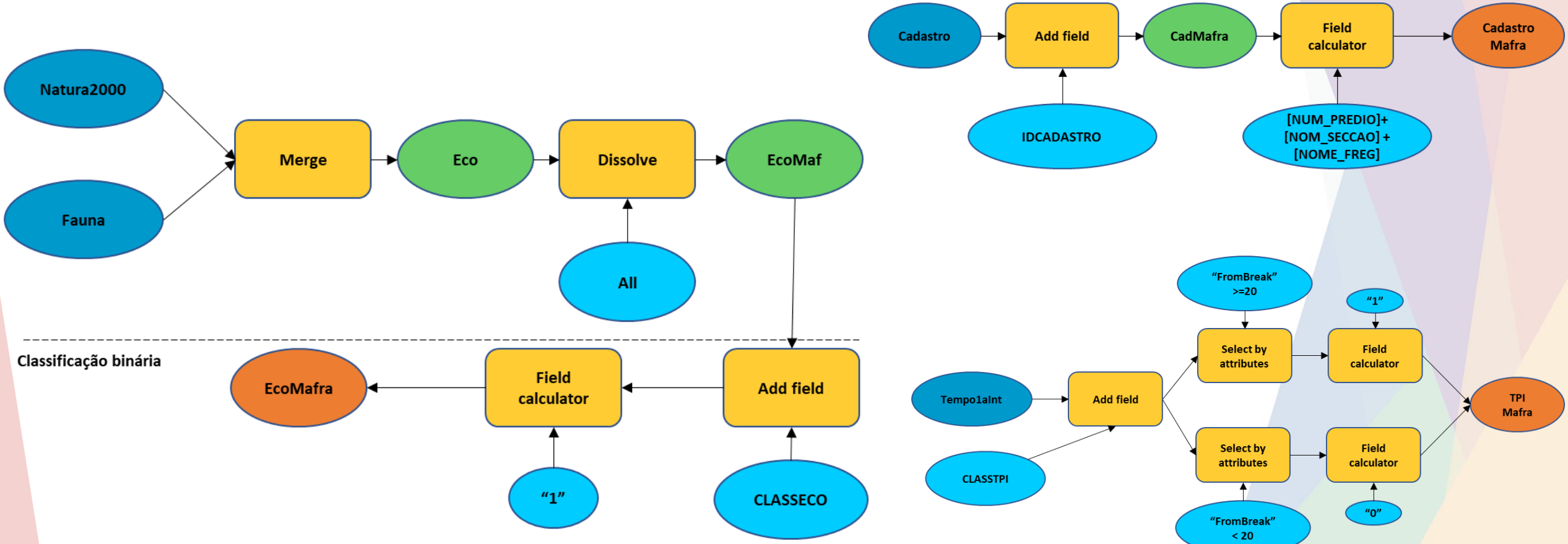
Methodology - Step by step



Results

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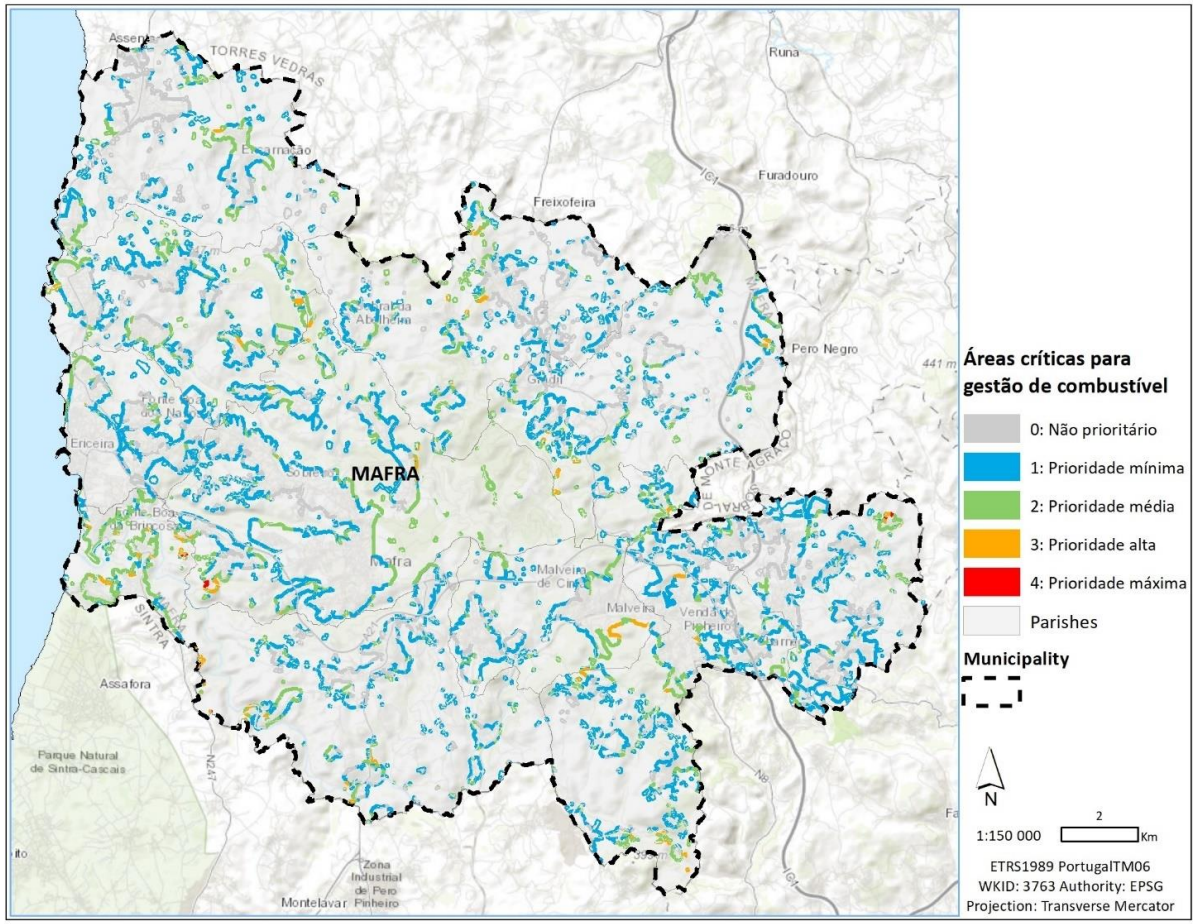

	A	B	C	D	E
1	IDCADASTRO	PRIORIDADE DE LIMPEZA (sem limite de área)	AREA (M2)	LIMITE LIMPEZA (100M2)	PRIORIDADE DE LIMPEZ (com limite de área)
2	1-A-AZUEIRA	1	3359,13	Superior	1
3	1-A-CARVOEIRA	1	17548,05	Superior	1
4	1-A-GRADIL	1	2785,11	Superior	1
5	1-A-MALVEIRA	1	6700,62	Superior	1
6	1-A-SOBRAL DA ABELHEIRA	0	15089,54	Superior	0
7	1-B-AZUEIRA	2	5536,63	Superior	2
8	1-B-CARVOEIRA	2	11537,99	Superior	2
9	1-B-MILHARADO	2	5381,06	Superior	2
10	1-B-SANTO ISIDORO	2	9290,34	Superior	2
11	1-C-CARVOEIRA	1	666,74	Superior	1
12	1-C-GRADIL	1	658,20	Superior	1
13	1-C-MALVEIRA	1	1158,39	Superior	1
14	1-C-SANTO ISIDORO	2	1718,70	Superior	2
15	1-D-AZUEIRA	0	4186,70	Superior	0
16	1-D-CARVOEIRA	2	24761,44	Superior	2
17	1-D-CHELEIROS	1	3050,23	Superior	1
18	1-D-ENXARA DO BISPO	2	34449,48	Superior	2
19	1-D-GRADIL	1	301,47	Superior	1
20	1-D-MALVEIRA	2	126,23	Superior	2
21	1-D-SANTO ESTEVBO DAS GALOS	1	1123,85	Superior	1
22	1-D-VILA FRANCA DO ROSGRIO	1	3307,05	Superior	1
23	1-E-CARVOEIRA	2	3806,75	Superior	2
24	1-E-ENCARNA	1	4826,64	Superior	1
25	1-E-ENXARA DO BISPO	1	6404,52	Superior	1
26	1-E-SANTO ISIDORO	1	14061,11	Superior	1

PrioridadesGestãoCombMafra

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Case study - Final remarks

30.974 properties in register in Mafra

44% of the total plots (5559 ha) are located in fuel management bands

Approx. 1279 ha, corresponding to 5070 plots, are classified as “non-priority for fuel management for fire prevention”

Optimization of inspection resources and community awareness

NEXT STEPS for Mafra:

- (1) must always be fuel managed
- (2) must be treated 3 times every 10 years
- (3) must be treated 1 to 2 times in 10 years

RECIPE

REINFORCING CIVIL PROTECTION CAPABILITIES INTO MULTI-HAZARD RISK ASSESSMENT UNDER CLIMATE CHANGE

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Thanks for your attention

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