Издръжливи горски ландшафти – предизвикателство за експертите и обществото

Resilient forest landscapes – a challenge for experts and society

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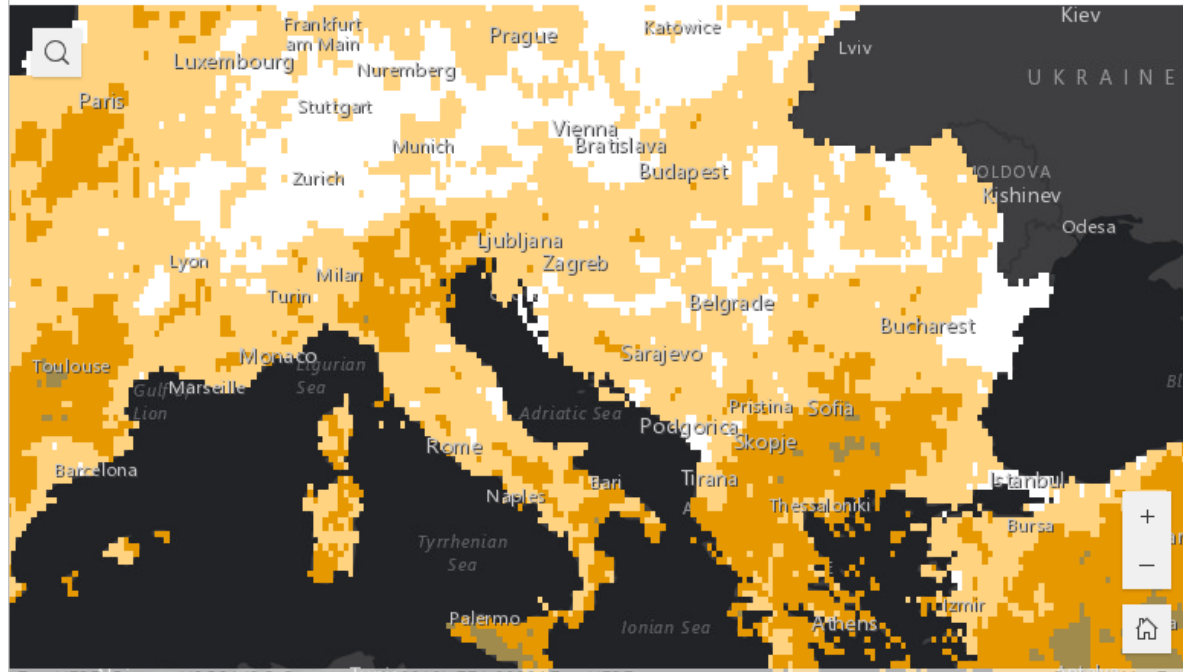
6. Sources

Current crises affecting forests

1. Climate Change
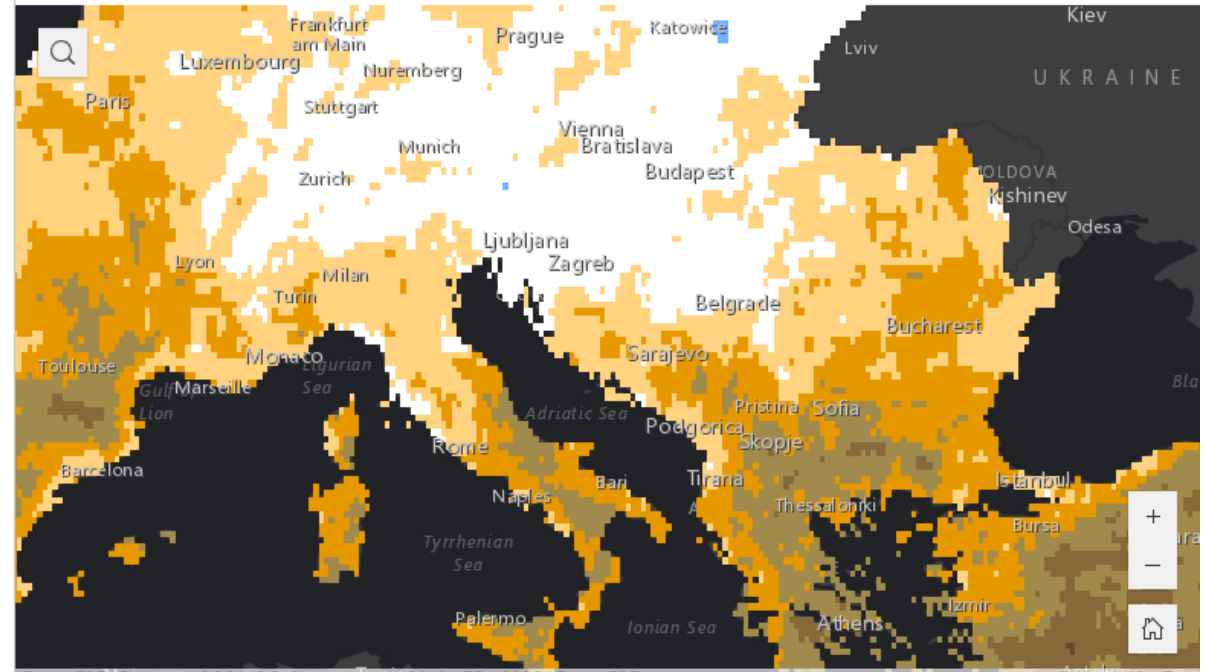
2. Decreasing Biodiversity

CLIMATE CHANGE- Droughts

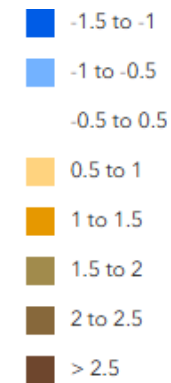Projected change in meteorological droughts for a medium emissions scenario (period 2041-2070, compared with 1981-2010)

Projected change in meteorological droughts for a high emissions scenario (period 2041-2070, compared with 1981-2010)

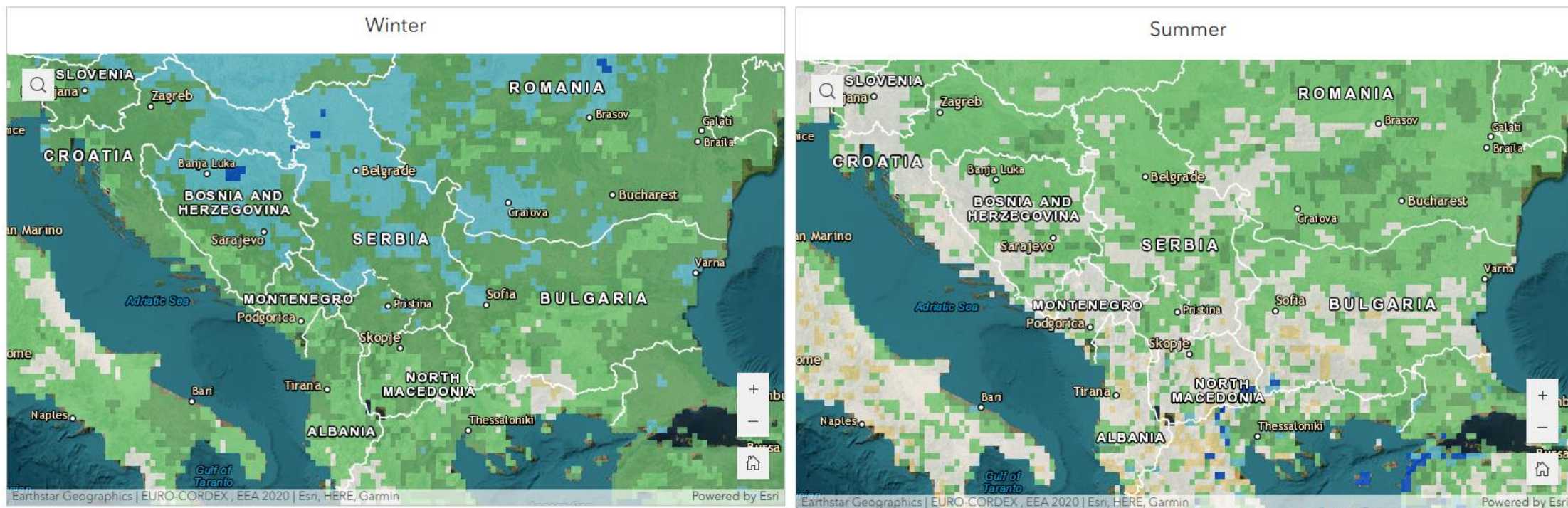Projected changes in the frequency of meteorological droughts for two emissions scenarios
(a drought event is defined when the Standardized Precipitation Index (SPI-3) is below -1)

Legend:
- -1.5 to -1
- -1 to -0.5
- -0.5 to 0.5
- 0.5 to 1
- 1 to 1.5
- 1.5 to 2
- 2 to 2.5
- > 2.5

CLIMATE CHANGE- Heavy rain and flash floods

Projected changes in the magnitude of heavy rain in winter and summer in the period 2071-2100, compared with 1971-2000 for a high emissions scenario (%) Heavy rain is defined as 95th percentile intensity of total rain events
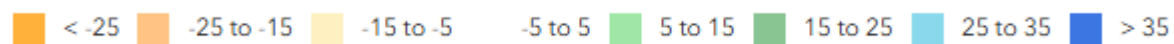
CLIMATE CHANGE- Forest fires

Projected change in meteorological forest fire danger by the late 21st century for two emissions scenarios, compared with the period 1981-2010 (%)

CLIMATE CHANGE- Sea level rise
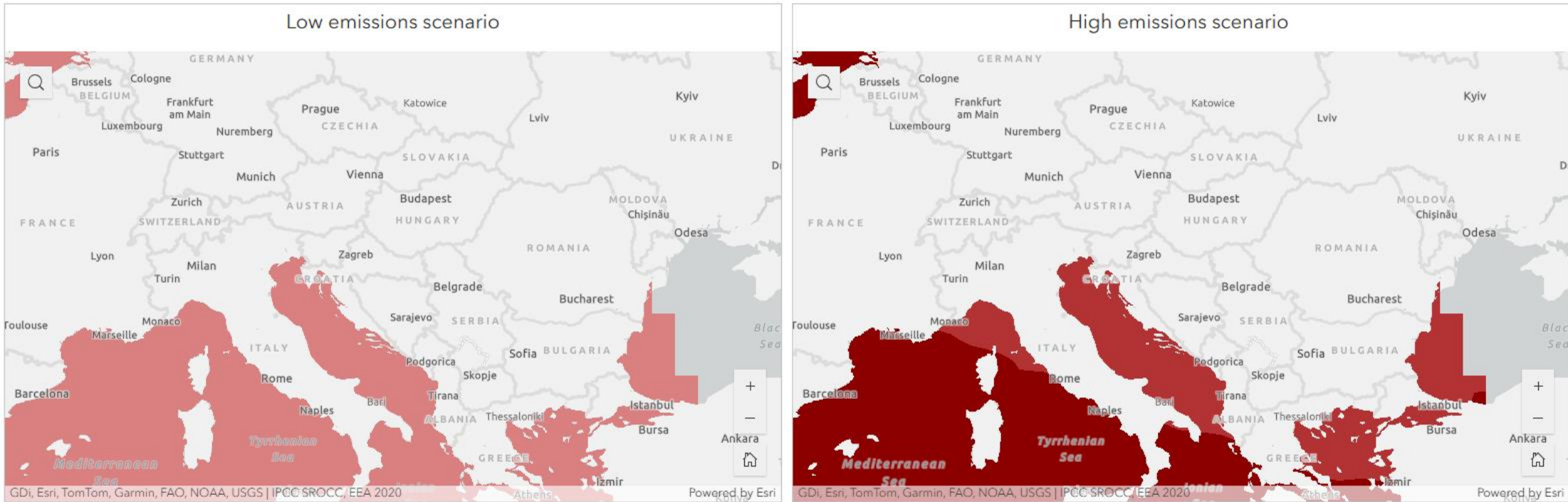
Projected rise in relative sea level by the late 21st century for two emissions scenarios, compared with the period 1981-2010 (m)
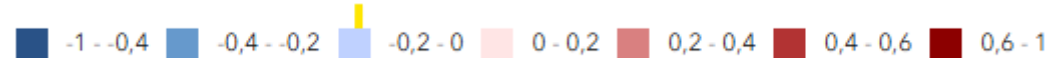
Decreasing biodiversity

- Reduce the functional diversity of forest ecosystems and thereby their ability to respond to the stressors;

- Increasing the risk of new pests and, pathogens, incl. invasive species dangerous to humans;

- Reducing the management capacity of forest ecosystems to mitigate climate change;

The EU Biodiversity Strategy envisages measures at landscape level. This means drawing up the so-called EU Nature Restoration Plan, which „*has to improve the condition of existing and new protected areas and to increase the diversity and sustainability of all landscapes and ecosystems*".

Building a resilient forest landscape - precondions

Forests are a fundamental, long-lasting element of the landscape. Forests and woodlands are important visual elements in the landscape that change over time. They have great potential to enhance and enrich the environment and make a significant contribution to landscape quality.

The ideas of sustainable management and reproduction of forests are embedded in the foundations of forestry theory and practice;

The management of agricultural and urban landscape elements has traditionally been directed towards commercial goals (often short-term);

The functioning of the forest ecosystem is dependent on the regional land use patterns that can affect ecosystem services provided by forests (material, protective, carbon fixation, etc.);

The degradation of any individual element of the landscape affects all others (Need for a collaborative management approach).

WHAT IS RESILIENT FOREST LANDSCAPE

Resilience is the ability of a system to absorb disturbances and reorganize itself while undergoing change, maintaining the same functional structure, identity, and feedback;

Basic resilience enables ecosystems to cope with wildfires or other extreme events and helps communities to manage impacts and to recover from these events;

A landscape capable of offering a minimum of the previous ecosystem services;
Resilience means avoiding system collapse in any dimension;

Sustainable management of landscapes in such a way that they have the capacity to recover faster when Extreme Event occurs;

Ecosystem, socio-economic, natural and societal features must be taken into account when determining sustainability.

Resilient landscapes - definition

- Resilience is the ability of a system to absorb disturbances and reorganize itself while undergoing change, maintaining the same functional structure, identity, and feedback
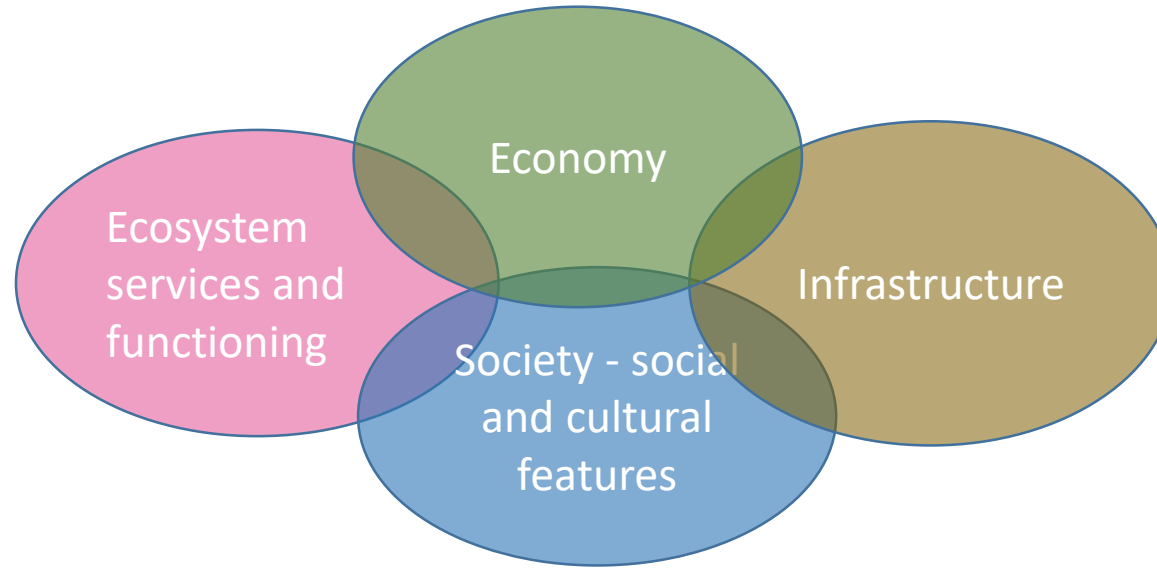
- Resilience is the ability of a socio-ecological system to sustain human well-being in the face of change, both by buffering shocks and by adapting or transforming in response to change

34 Innovation Actions

Based on the four pillars, FIRE-RES will develop **34 Innovation Actions** that will allow the integration of the fire management measures for:

Prevention and Preparedness

Detection and Response

Restoration and Adaptation

The Innovation Actions will be deployed and tested in **11 Living Labs** to assess and foster scalability at larger scale.

Living Labs are open innovation ecosystems dedicated to the demonstration and deployment of innovative solutions, through collaboration with local actors:

Public sector

Scientific communities

Private companies

Citizen associations
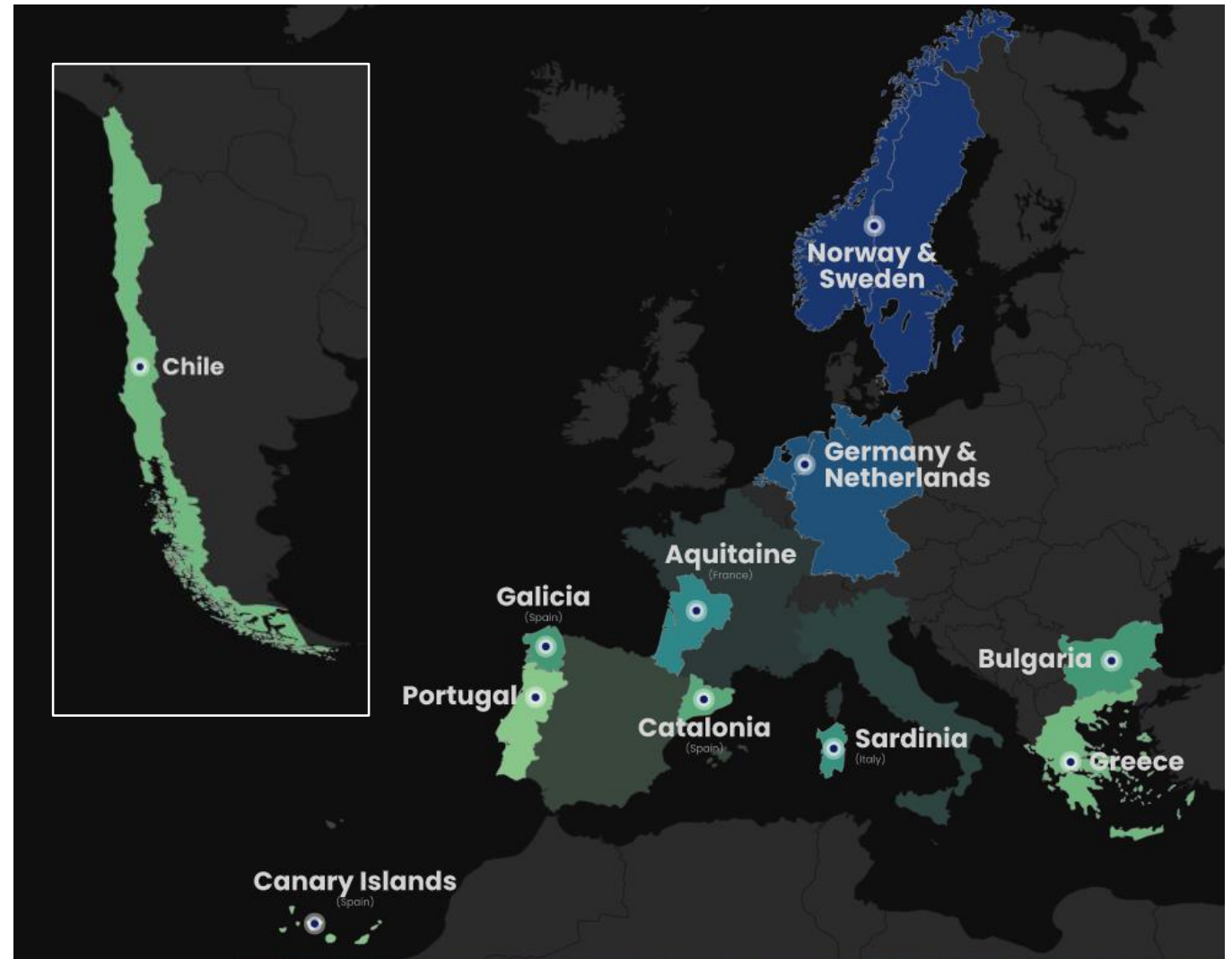
Back to climate impacts

Climate Change Effects on European Countries

Based on the scale from 0 to 100. The higher the score, the more the country has been affected.

Legend: 40, 45, 50, 55, 60, 65, 70, 75
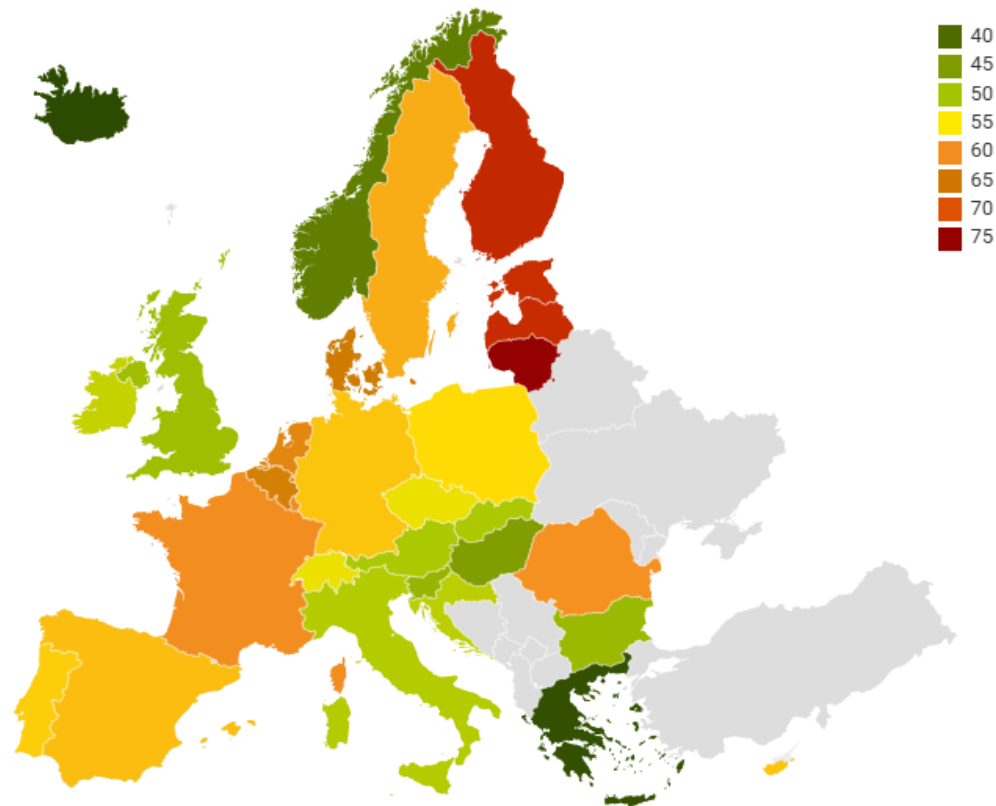
Source: GreenMatch · Get the data · Created with Datawrapper

Extreme Events Between 1960-2019 in Europe

Legend: 0, 20, 40, 60, 80, 100, 120

Source: GreenMatch · Get the data · Created with Datawrapper

Impact of forest fires in the EU for the period 2000-2017:

- Ecological losses: 8.5 million hectares of burned area, approximately 480,000 ha per year;

- Human casualties: 611 firefighters and civilians died, nearly 34 per year;

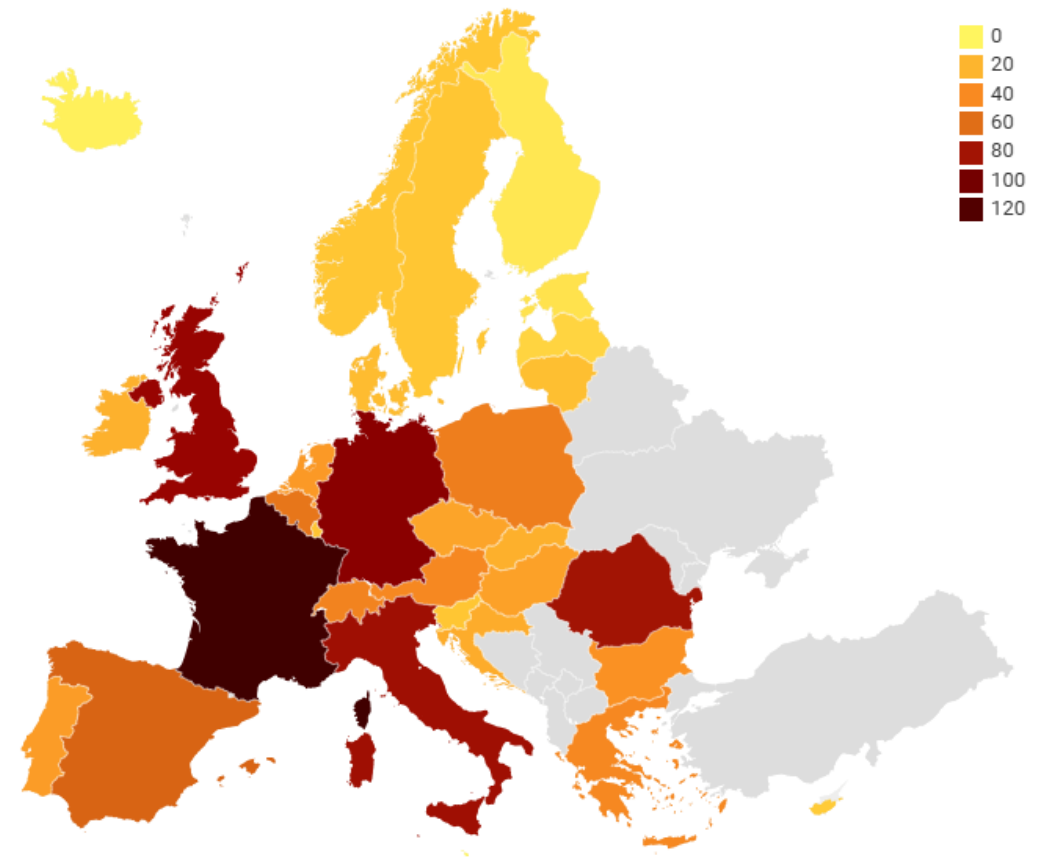- Economic losses: over 54 billion euros, approximately 3 billion euros per year. At fast economic growth and increase in greenhouse gas emissions, the economic impact on Greece, Spain, France, Italy and Portugal could reach over 5 billion euros per year until 2070-2100.

1981-1999
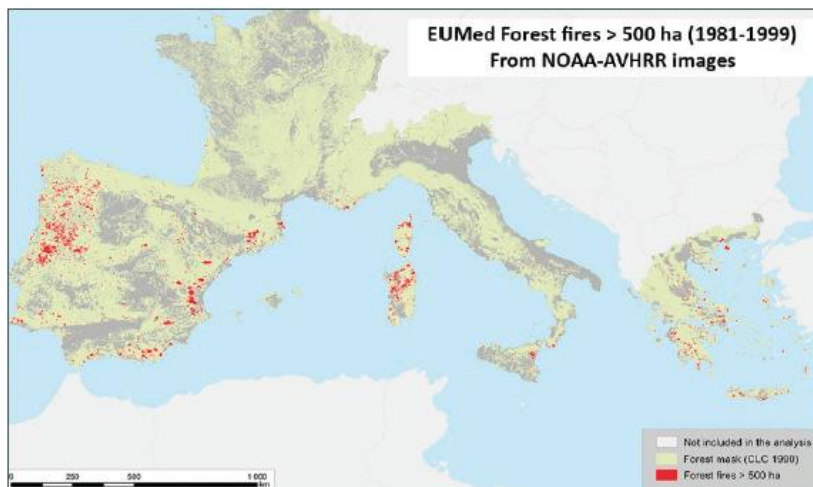
Fires over
500 ha in the EU

2000-2017

EUMed Forest fires > 500 ha (1981-1999)
From NOAA-AVHRR images

Not included in the analysis
Forest mask (CLC 1990)
Forest fires > 500 ha

EUMed Forest fires > 500 ha (2000-2017)
From MODIS images
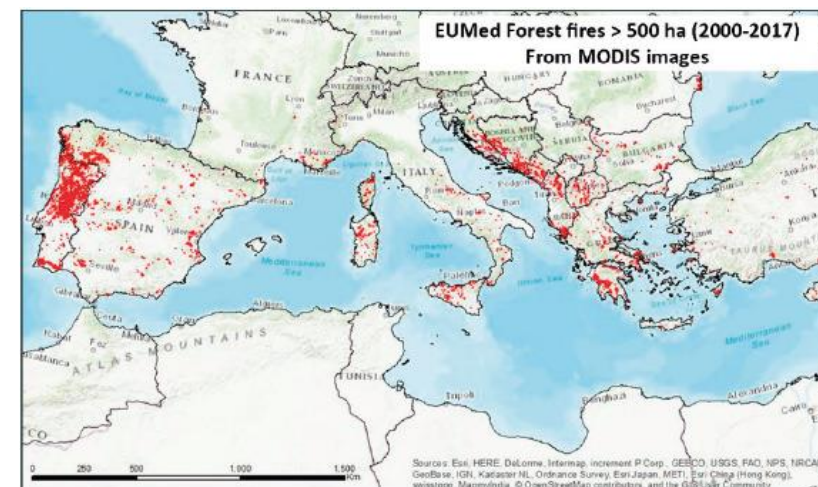
BULGARIAN CONTEXT

- 600 forest fires per year, 10,000 ha, apr. 3 million EUR direct losses (excluding recovery costs and long-term ecological losses);

- Dramatic increase in fires after 1990. Most fires come from agricultural areas;

- There are several large fires every year.

Forest Fires in Bulgaria 1998-2020

Total number by municipality
- 0
- 1 - 10
- 10 - 30
- 30 - 50
- 50 - 100
- > 100
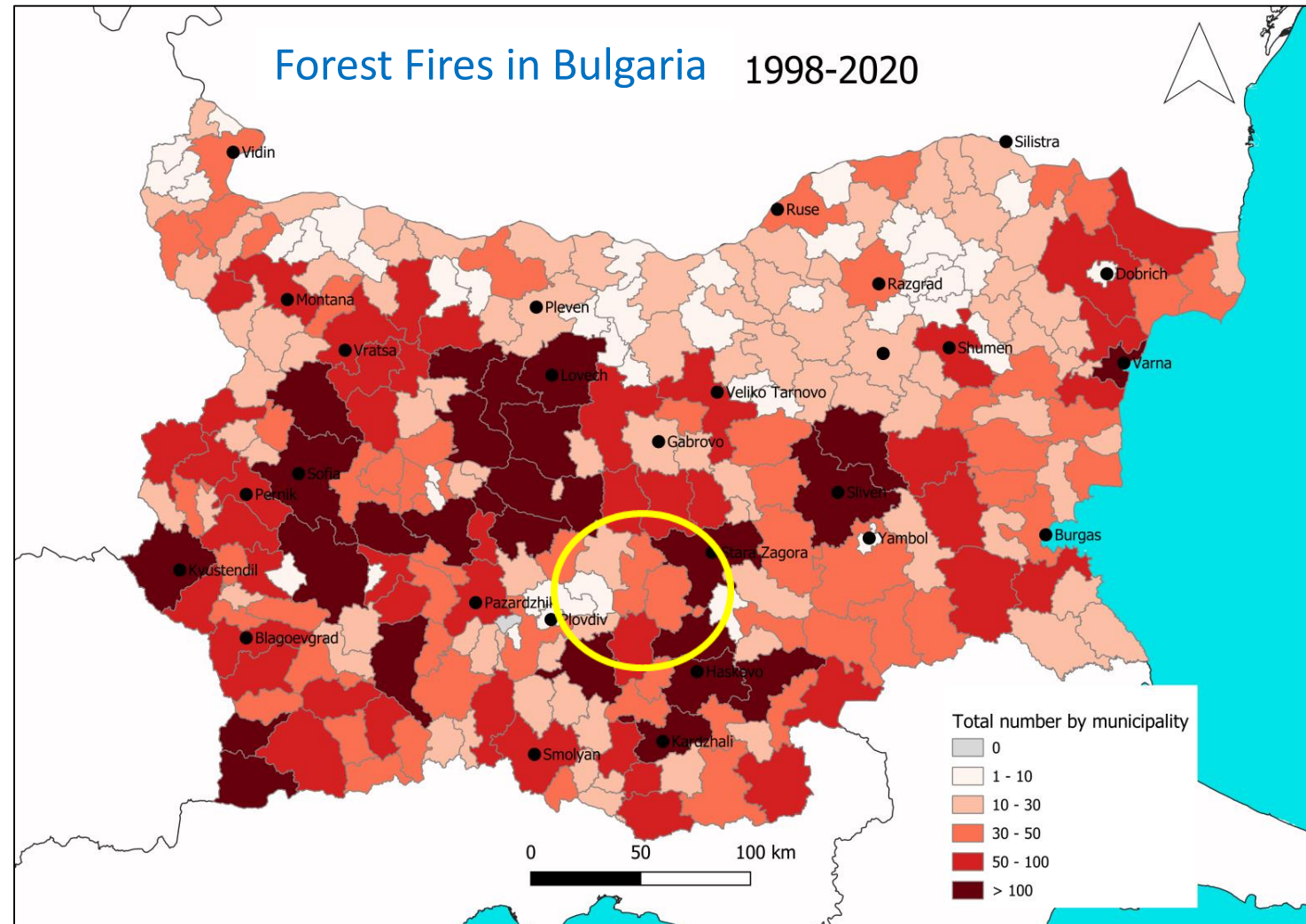
Over 90% of fires start from agricultural areas

BULGARIAN CONTEXT

When there is very dry plant mass around and in the forest (undergrowth and other grasses and shrubs), flames easily reach the crowns and spread quickly

BULGARIAN CONTEXT

Brush clearing in the most vulnerable forest areas requires a lot of manual labor. It is expensive and economically unprofitable. This is actually an **impossible task** due to the size of the needs

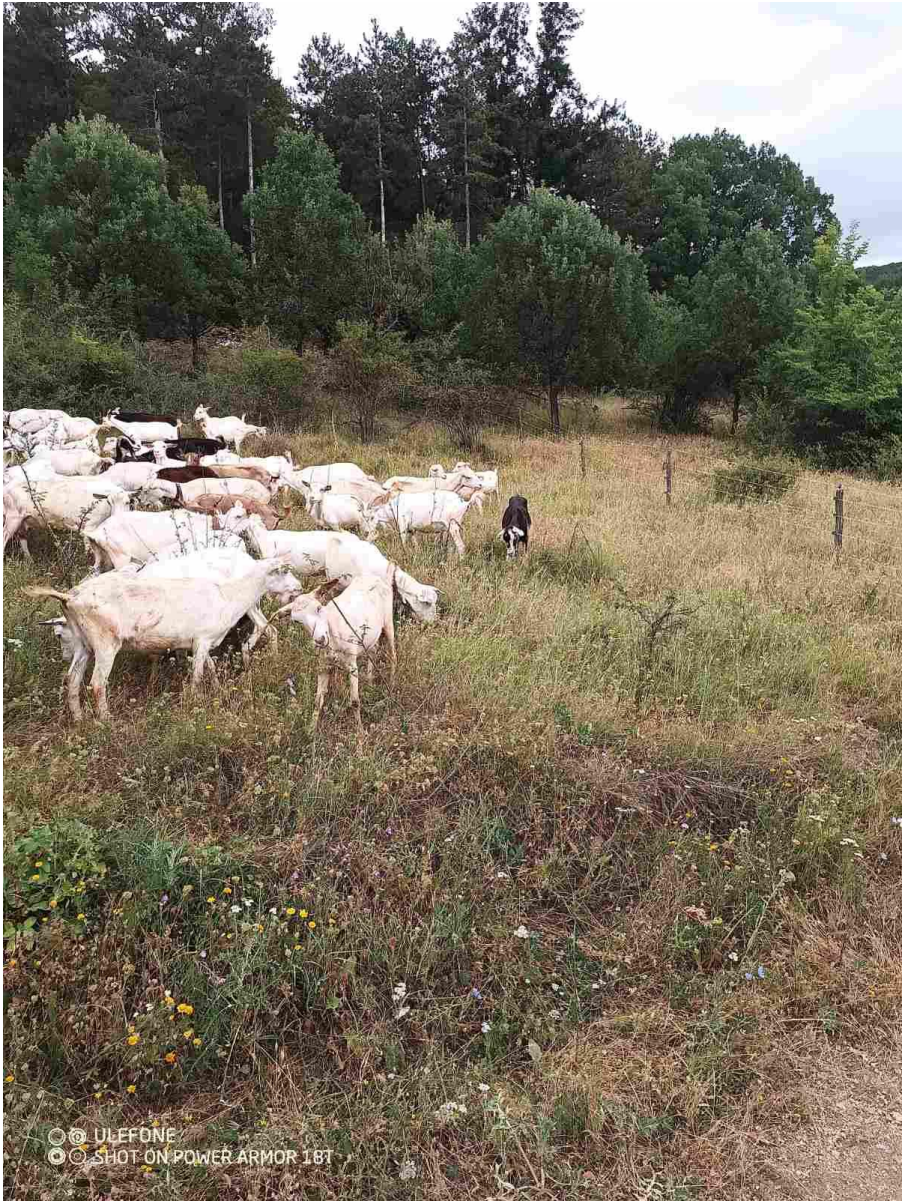Controlled goat grazing in the most fire-vulnerable areas of the forest is a possible adaptive solution

Lessons learned in BG LL
Focus on prevention

A resilient landscape is the best prevention!

(This means that all vulnerable points of the territories have been identified and fire-prevention treated)

Is there real integrated management of forest landscapes?

- Operational Management, incl. planning of individual territories is separate. There is a lack of a common vision for the prevention of individual types of territories from "outside,,;

- It is most clearly seen in the financing and implementation of fire prevention measures;

- A major problem is the lack of requirement and understanding for sharing responsibility and finances between institutions;

- Many unresolved issues with mapping, determining ownership of vulnerable objects, etc.

Характеристики на горивото

Степен на приоритет
- ниска
- средно ниска
- средно висока
- висока

A GIS model of forest fire hazard according to forest parameters, vulnerability of activities and accessibility
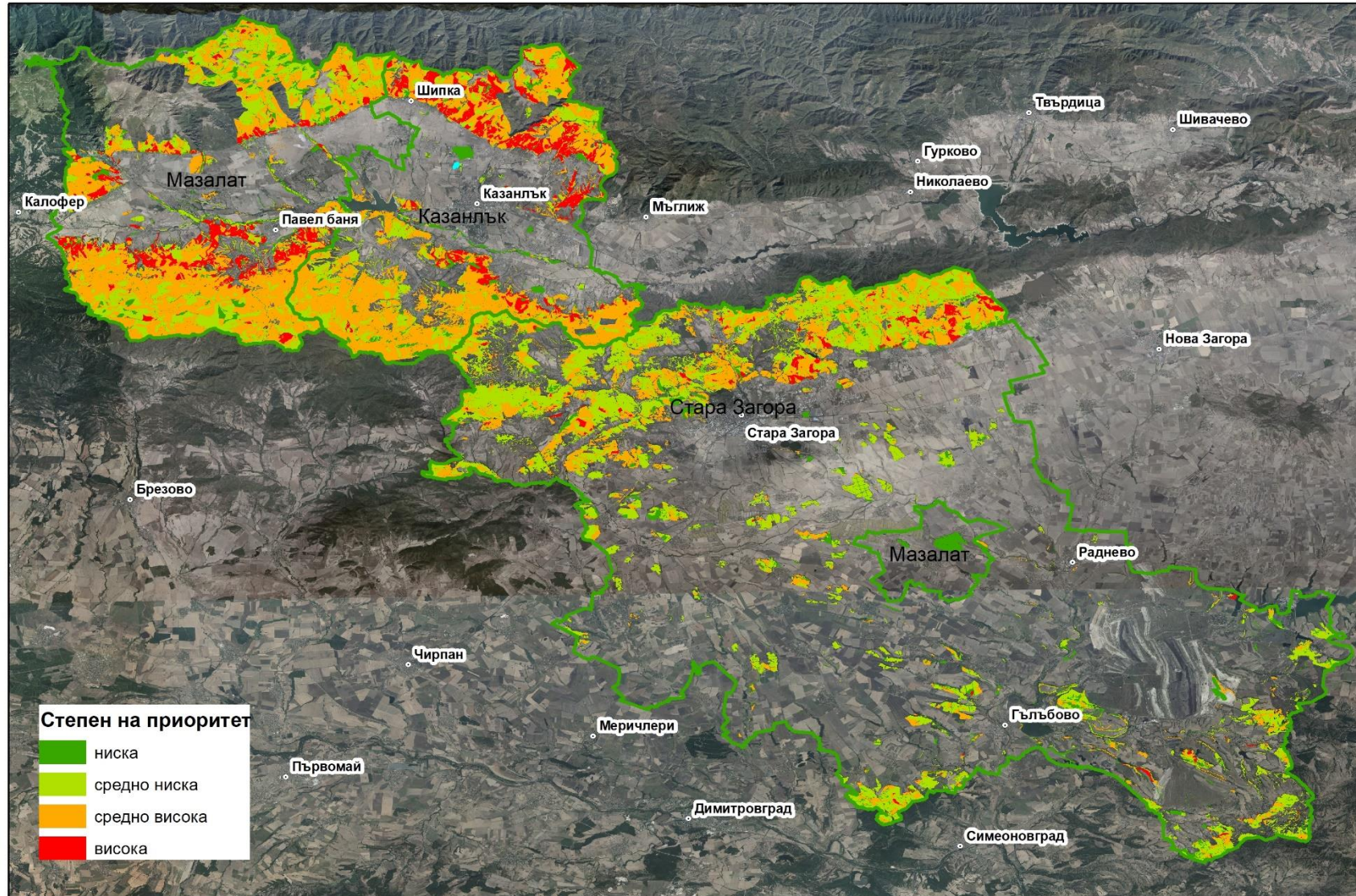
Експозиция/Уязвимост на активи

Building resilient landscapes through integrated management
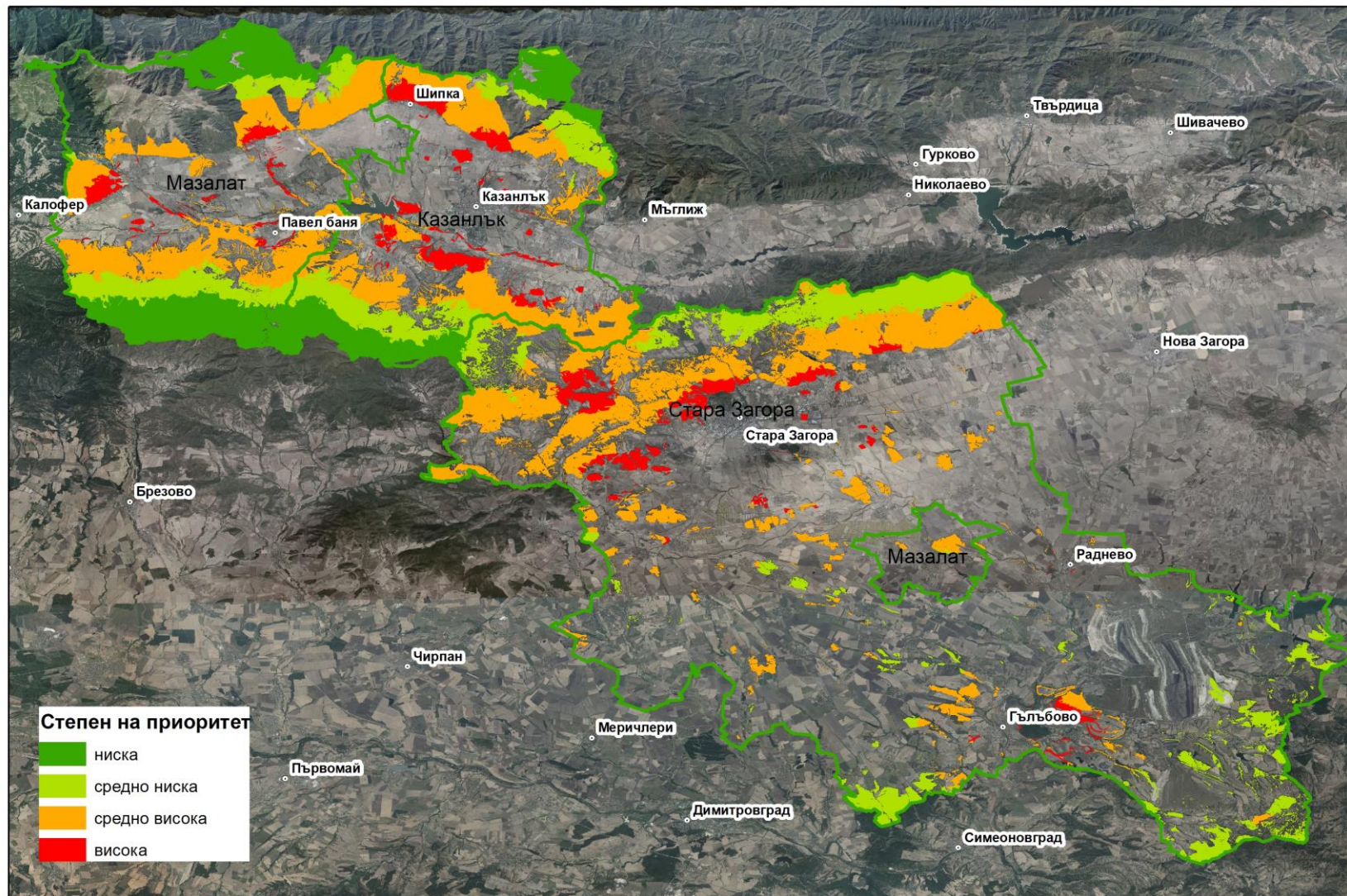
- The leaders should be the local authorities - mayors, municipalities and local institutions;

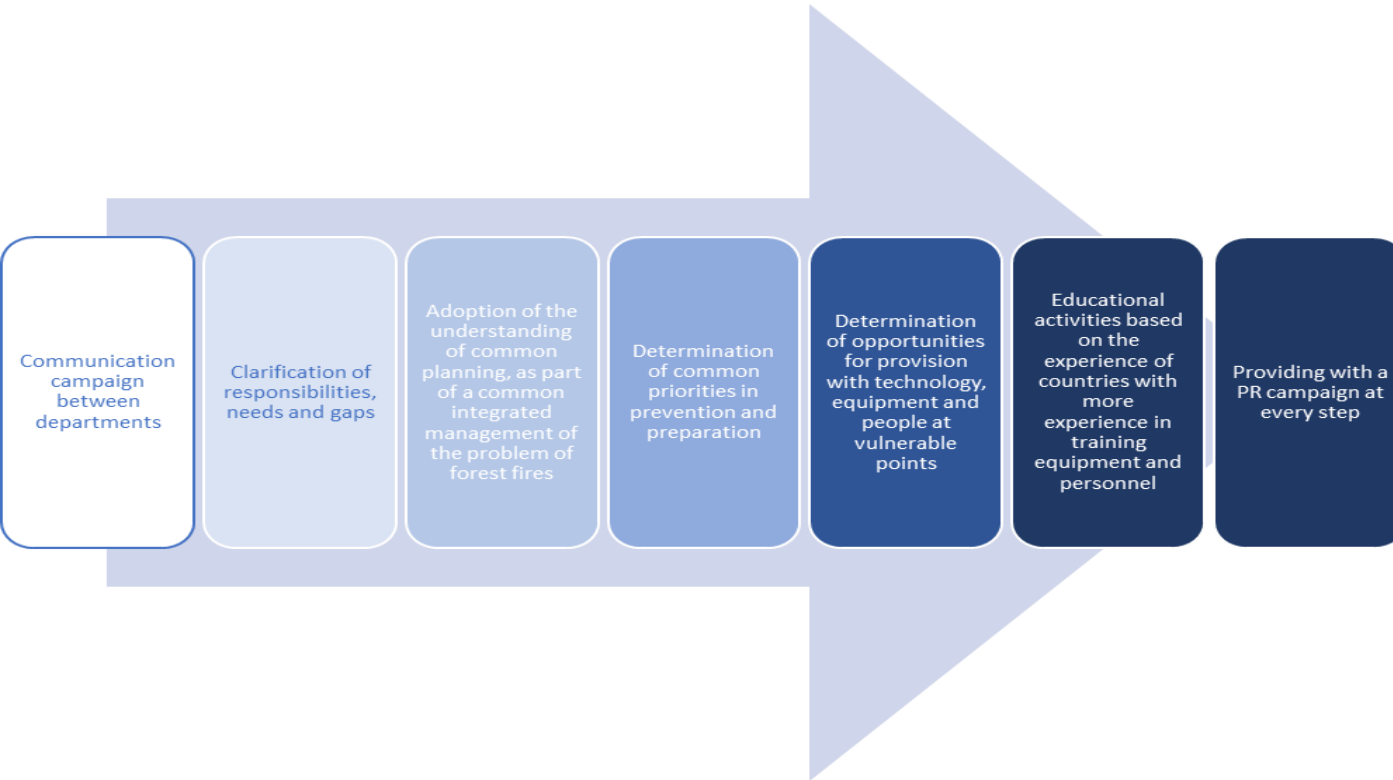- ENGAGEMENT OF LOCAL PEOPLE, incl. Training;

- Funding for activities must be shared and sufficient

Discuss understanding of the territorial scope of the landscape - the boundaries of the lands of the settlements - This is how economic management units are formed, which are not new

Roadmap to integration – realistic version

Communication campaign between departments

Clarification of responsibilities, needs and gaps

Adoption of the understanding of common planning, as part of a common integrated management of the problem of forest fires

Determination of common priorities in prevention and preparation

Determination of opportunities for provision with technology, equipment and people at vulnerable points

Educational activities based on the experience of countries with more experience in training equipment and personnel

Providing with a PR campaign at every step

15.07.2024

Towards forest pedagogy

- Building resilient landscapes requires integrated management;
- Integrated, collaborative landscape management is adaptive management;

Forestry pedagogy should aim to promote the integration of natural resource management at the landscape level and find its way to the practical application of this knowledge and attitude to the environment.

Sources

- https://experience.arcgis.com/experience/5f6596de6c4445a58aec956532b9813d

- https://www.politico.eu/article/how-climate-change-will-widen-european-divide-road-to-cop26/

- https://climate.copernicus.eu/

- https://www.greenmatch.co.uk/blog/2019/04/climate-change-europe

- https://efi.int/forestquestions/climate

- https://fire-res.eu/

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THANK YOU