

Balkan-Mediterranean Wetlands Mapping & Connectivity Assessment

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Scientific Coordinator of the Balkan Mediterranean Wetland Mapping & Assessment

WEBINAR: Monitoring and reporting on the health of wetlands in the eastern Mediterranean

17th February 2021, organized by Centre for Ecology & Hydrology – (CEH), RIS-Ký project

Project co-funded by the European Union and National Funds of the participating countries



THE GOULANDRIS NATURAL HISTORY MUSEUM
GREEK BIOTOPE/WETLAND CENTRE



HELLENIC REPUBLIC
REGION OF THESSALY
DEVELOPMENT PLANNING



MINISTRY OF
ENVIRONMENT
& ENERGY



- ▶ *The ecosystems' continuity and integration are recognized by EU Regional Policy as challenges for the safeguard of biodiversity of the Balkan Mediterranean territory, in support of sustainable development and improvement of citizens' quality of life.*



Improving the conservation effectiveness of Balkan Mediterranean Wetlands



Target:

Improve scientific knowledge on wetland spatial distribution
to help authorities, planners, and developers, to take informed decisions and to cooperate towards ecosystem integration and sustainability.

Joint Activity: Wetland Mapping & Connectivity Assessment



Methodological approaches

- *Satellite Technology*
- *HORIZON 2020 research project Satellite-based Wetland Observation Service-SWOS*
- *MedWet Inventory Standards*

Joint Activity Mapping & Assessment

1 Intermediate GIS wetland polygon layers

Gathering of
existing
geographical
wetland datasets

+

Satellite
Image
Processing

+

External
validation

2 Final validated GIS wetland layers per country

- ▼ Photointerpretation
- ▼ Inventory data storage: *Ramsar type, Water Permanency, Protection Status*
- ▼ GIS data harmonization



Technical Workshop/Training: Territorial connectivity

4 C O M M O N Storage, Access, Visualization IT Services

**GEOPORTAL Interactive
Map & Database**
of BalkanMed wetlands &
protected areas

**SATTELITE - based
MONITORING of water
surface dynamics**
within BalkanMed wetlands

3 Connectivity Assessment

Spatial analysis &
assessment of wetlands'
role in connectivity of
protected areas of
BalkanMed territory



Dissemination

**Support in
policy**

Joint Activity Mapping & Assessment

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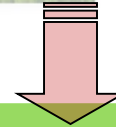
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Technical Workshop/Training: Territorial connectivity

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Dissemination

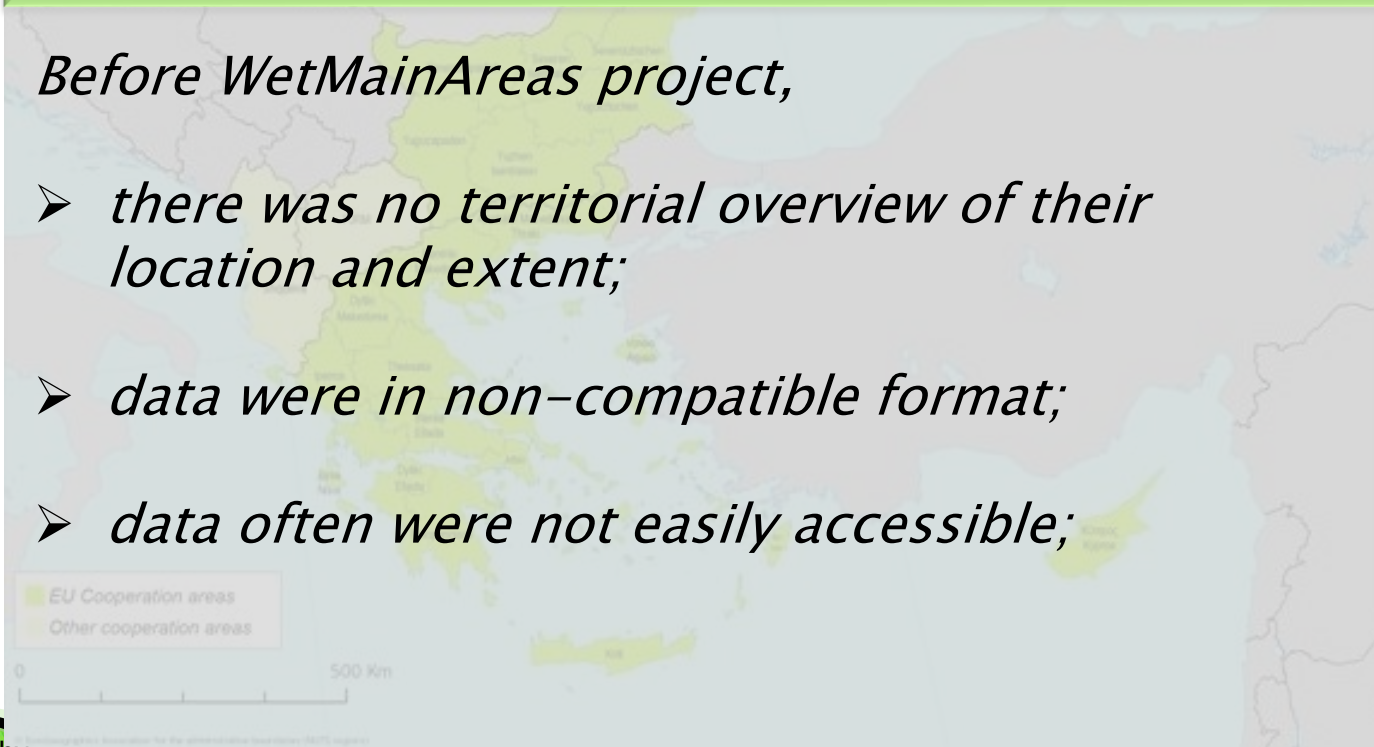
**Support in
policy**

#1 Why mapping Balkan Mediterranean wetlands?

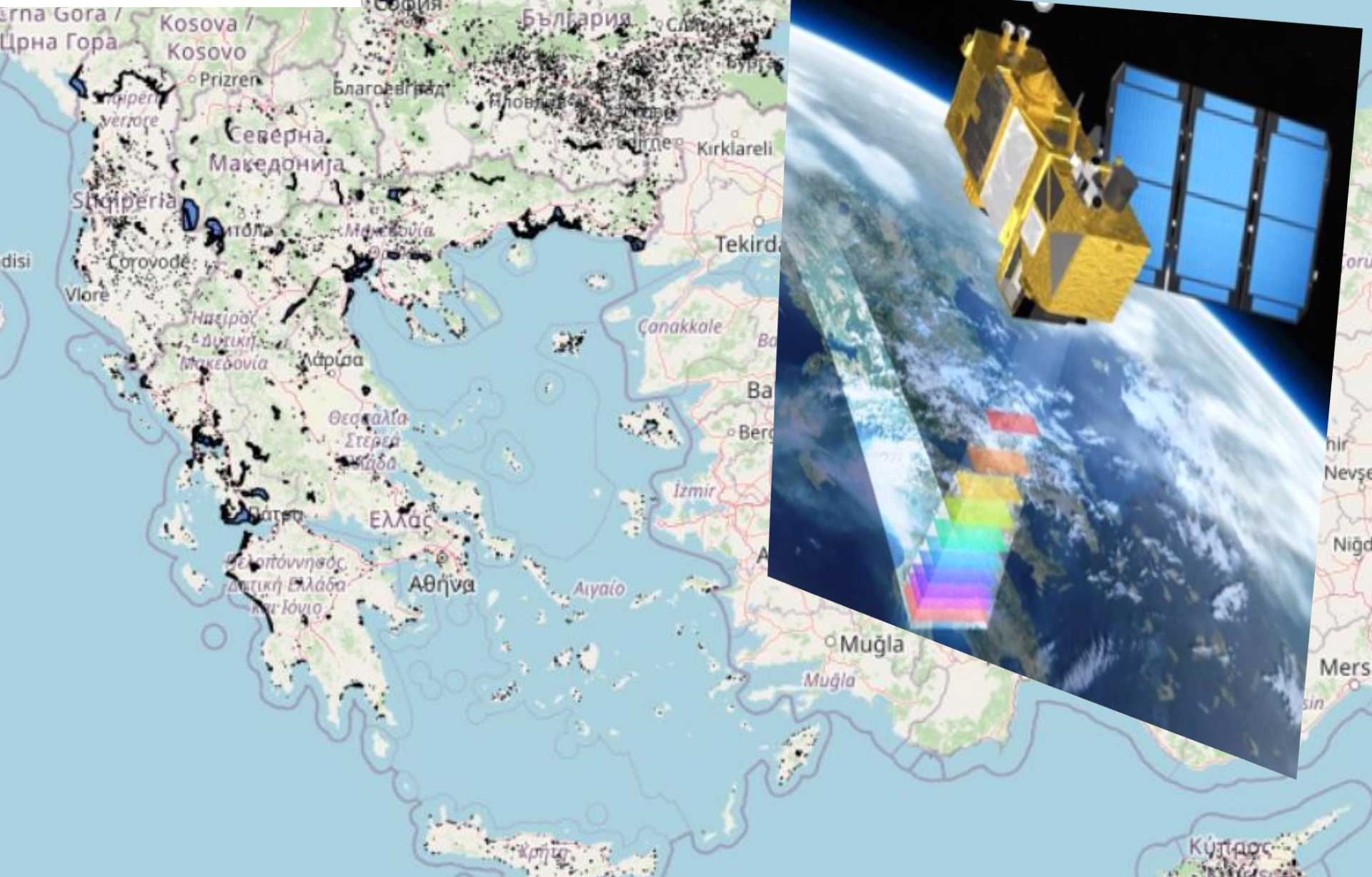
Lack of knowledge and of informed decisions can lead to inadequate conservation & protection measures

Before WetMainAreas project,

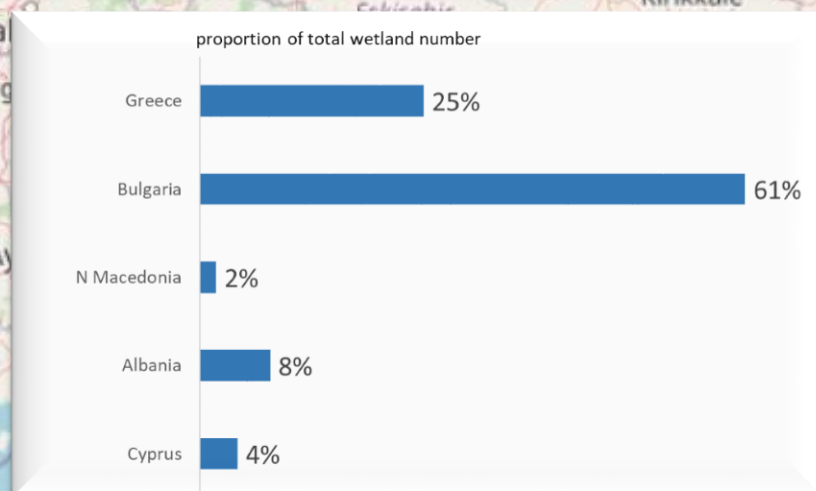
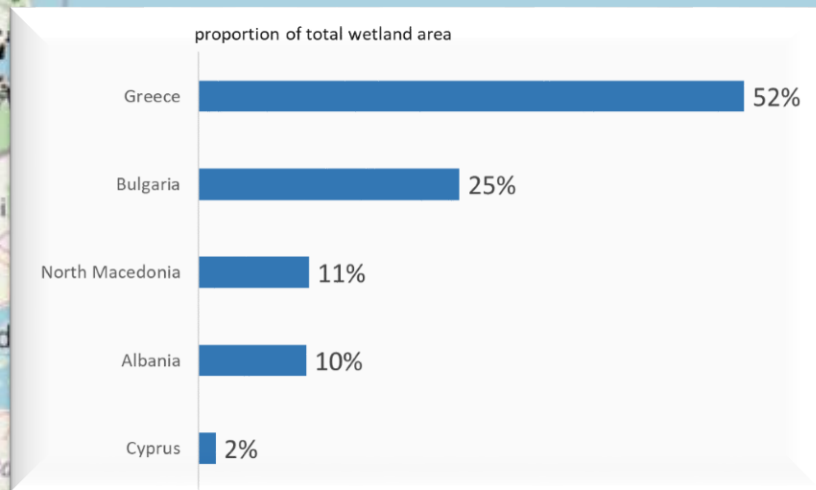
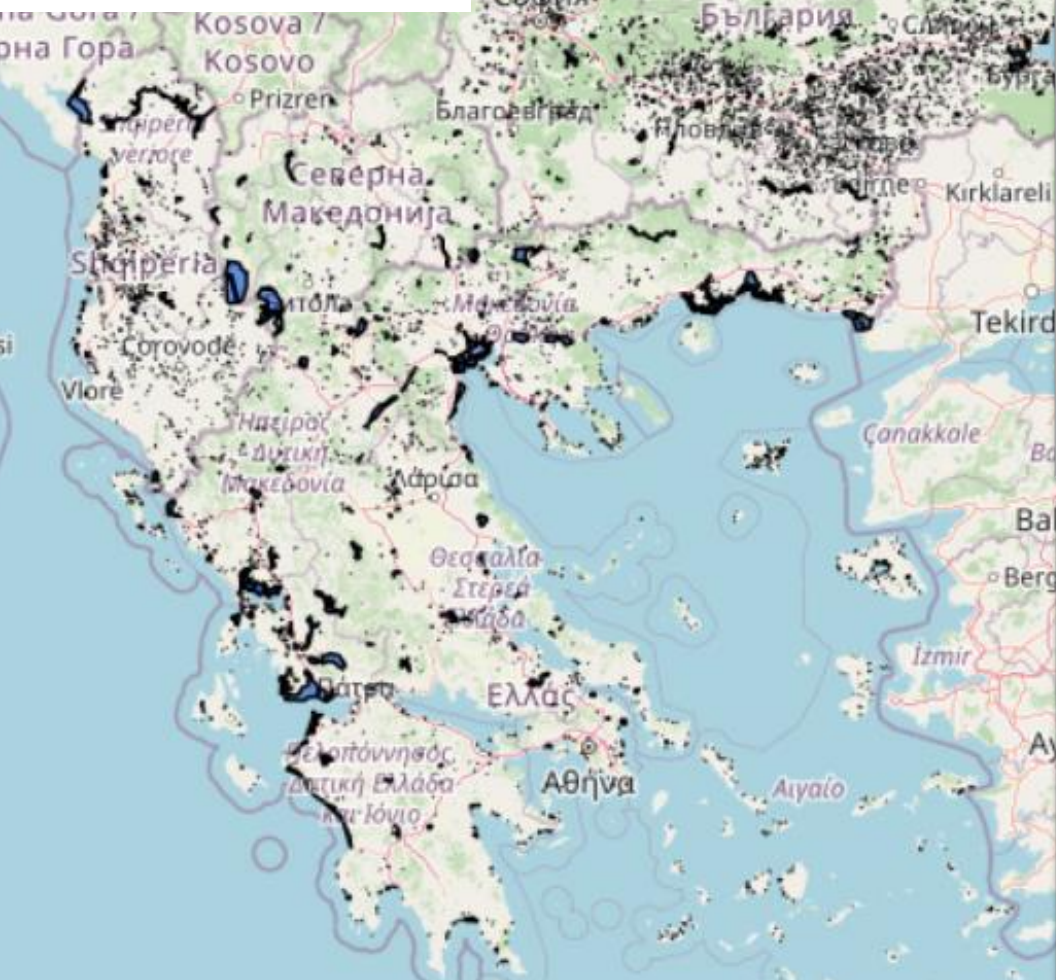
- *there was no territorial overview of their location and extent;*
- *data were in non-compatible format;*
- *data often were not easily accessible;*



Balkan-Mediterranean Wetland MAPPING



Balkan-Mediterranean Wetland MAPPING



Data for Cyprus were provided by Terra Cypria,
and for Greek Islands by WWF-Greece

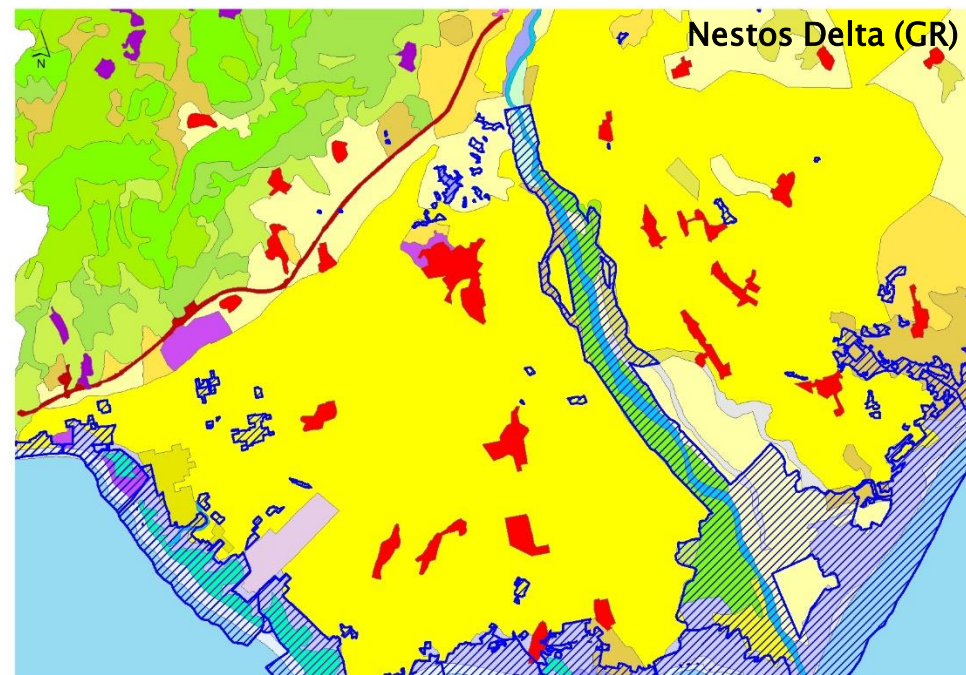
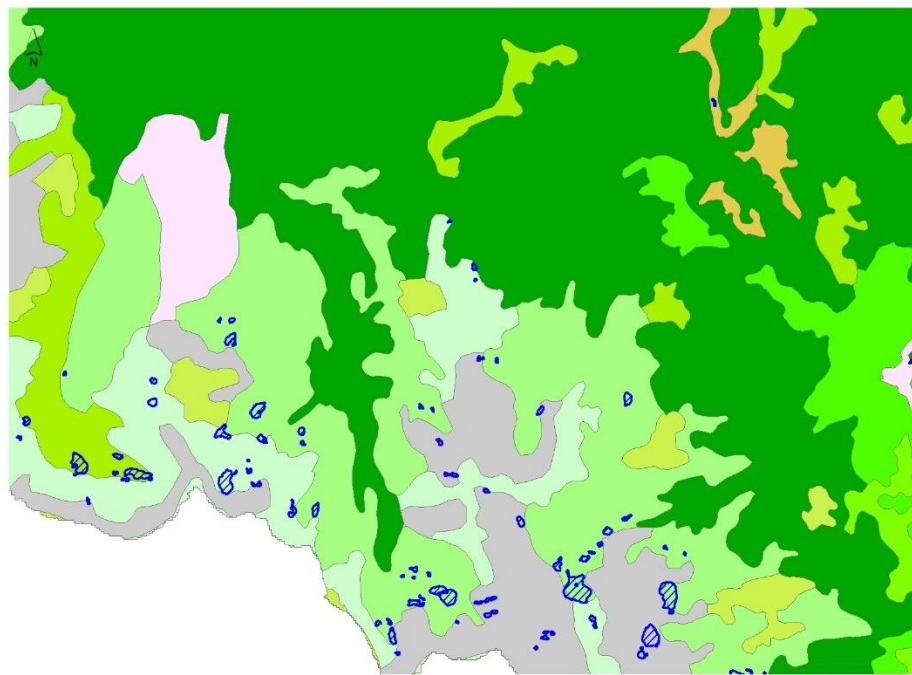
(visit <https://wetmainareas.com/>)

Improved Knowledge

On wetland location and extent

- Detailed wetland layer based on remote sensing technologies, existing geospatial datasets, in situ data & photointerpretation.

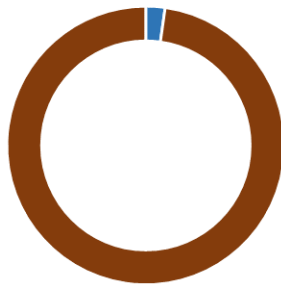
Examples of how the WetMainAreas Wetland layer (blue dashed polygons) improves the CORINE Land Cover datasets



- ▶ Balkan Mediterranean territory shares wetland ecosystems of high biodiversity and cultural value.

occupy only 2% of the territory area

Balkan - Mediterranean Territory



■ Wetlands ■ Other



Number of Wetlands versus Area of Wetlands

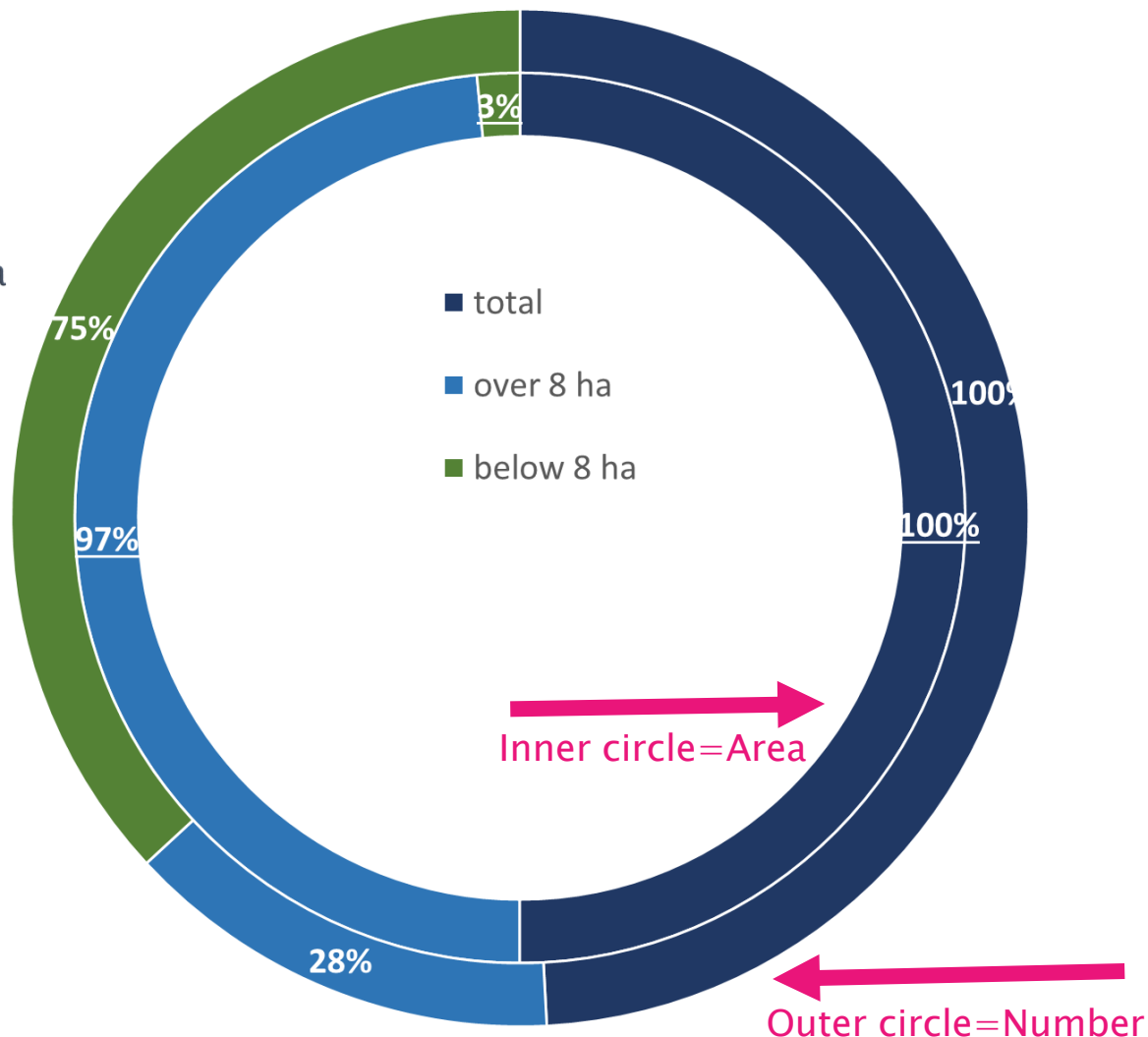
Total Number

➤ **8,800 sites**

with a minimum size of 0.05 ha
(excluding rivers and streams)

Total Area

➤ **531,790 ha**



- ▶ 1 / 3 of their surface area of international importance



- ▶ Numerous SMALL WETLANDS (below 8 ha) create a valuable network of corridors and stepping stones.

3 / 4 of total wetland sites
3% of total wetland area

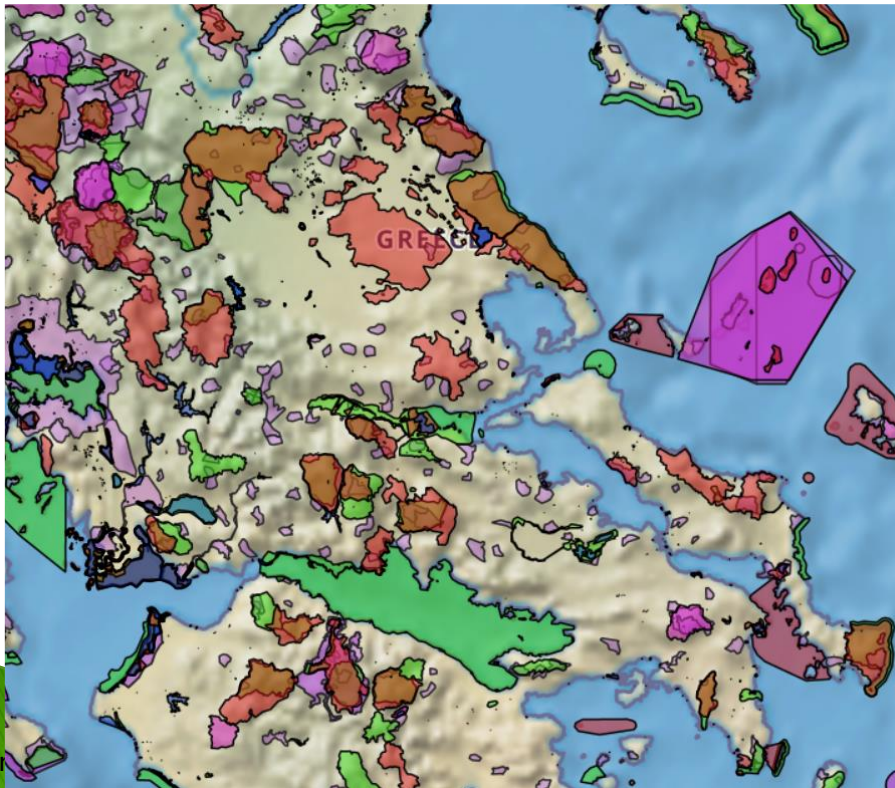


#2 Why assessing connectivity?

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Protected areas can respond to threats if their coherence, connectivity and resilience is ensured!

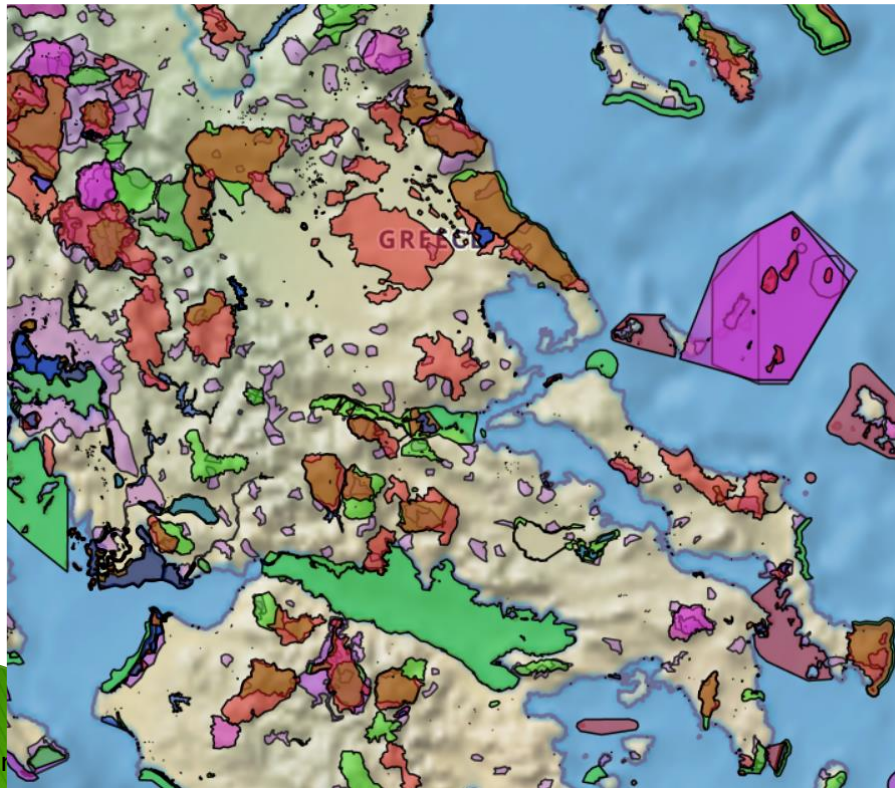
   Protected Areas(PAs)



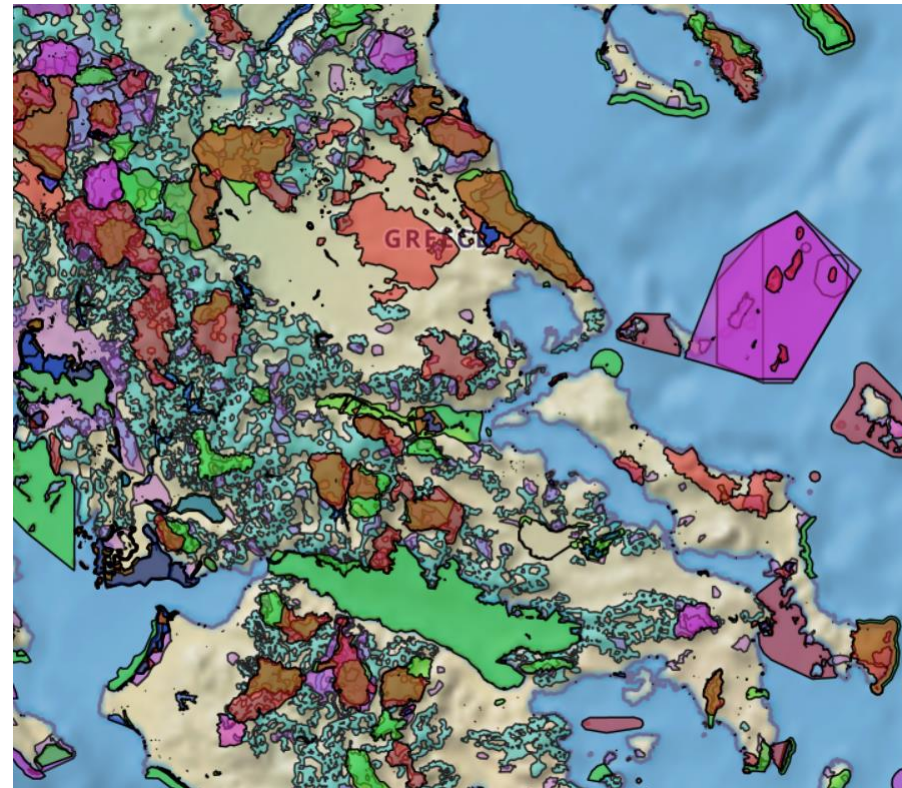
#2 Why assessing connectivity?

Protected areas can respond to threats if their coherence, connectivity and resilience is ensured!

Protected Areas(PAs)



Connected land favourable for biodiversity



#2 Why assessing connectivity?

In line with Aichi Target 11

“By 2020, at least 17 % of terrestrial and inland water areas and 10 % of coastal and marine areas, **especially areas of importance for biodiversity and ecosystem services, are conserved through** effectively and equitably managed, ecologically representative and **well-connected systems of protected areas (PAs)** and other effective area-based conservation measures, and integrated into the wider landscape and seascape”.

According to EU Biodiversity Strategy

WETLAND Ecosystems are
stepping stones & key landscape features that improve the coherence, connectivity and resilience of the Protected Areas (PAs) networks.



Pappa Lagoon. EKBY photo archive/L.Logothesis

How connectivity was assessed?

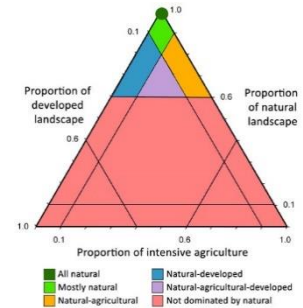
spatial analysis at national level & at pilot level

- ✓ Nature domination patterns based on reclassified land cover maps in:

natural & semi-natural (favourable)

intensive agriculture (hostile)

urban areas (hostile)



How connectivity was assessed?

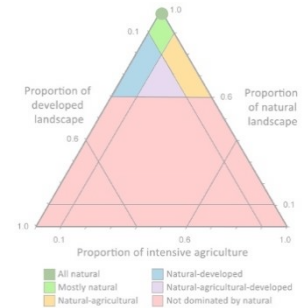
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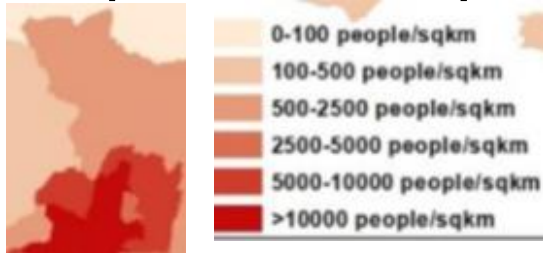
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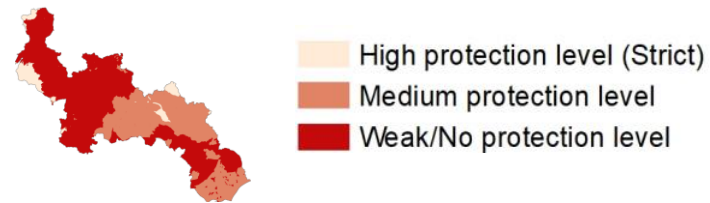
urban areas (hostile)



- ✓ Population density



- ✓ Level of Protection (IUCN categories)



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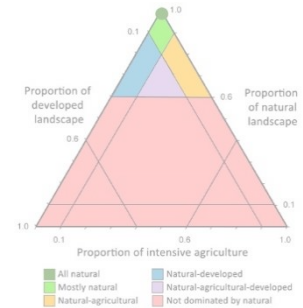
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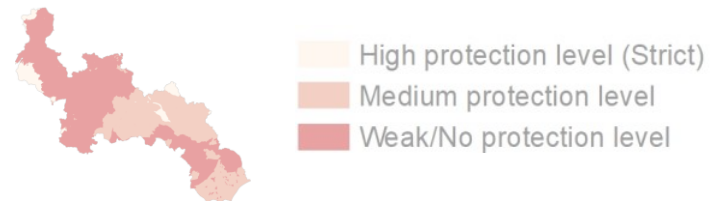
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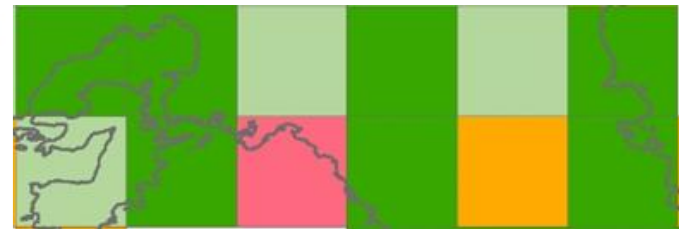


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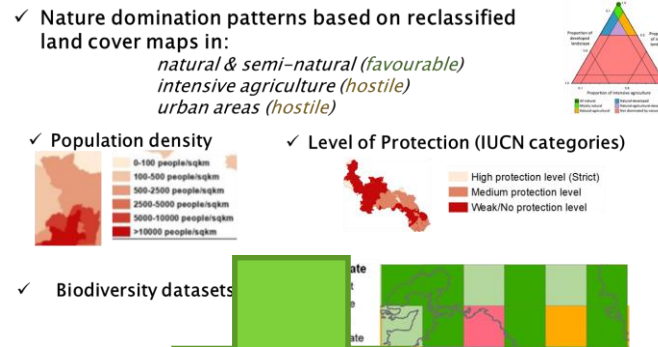
- ✓ Biodiversity datasets

Biodiversity State



How connectivity was assessed?

spatial analysis at national level & at pilot level



Connected areas favourable for biodiversity

- ❑ are dominated by natural & semi-natural habitats
- ❑ population density is low
- ❑ are protected
- ❑ have value for biodiversity

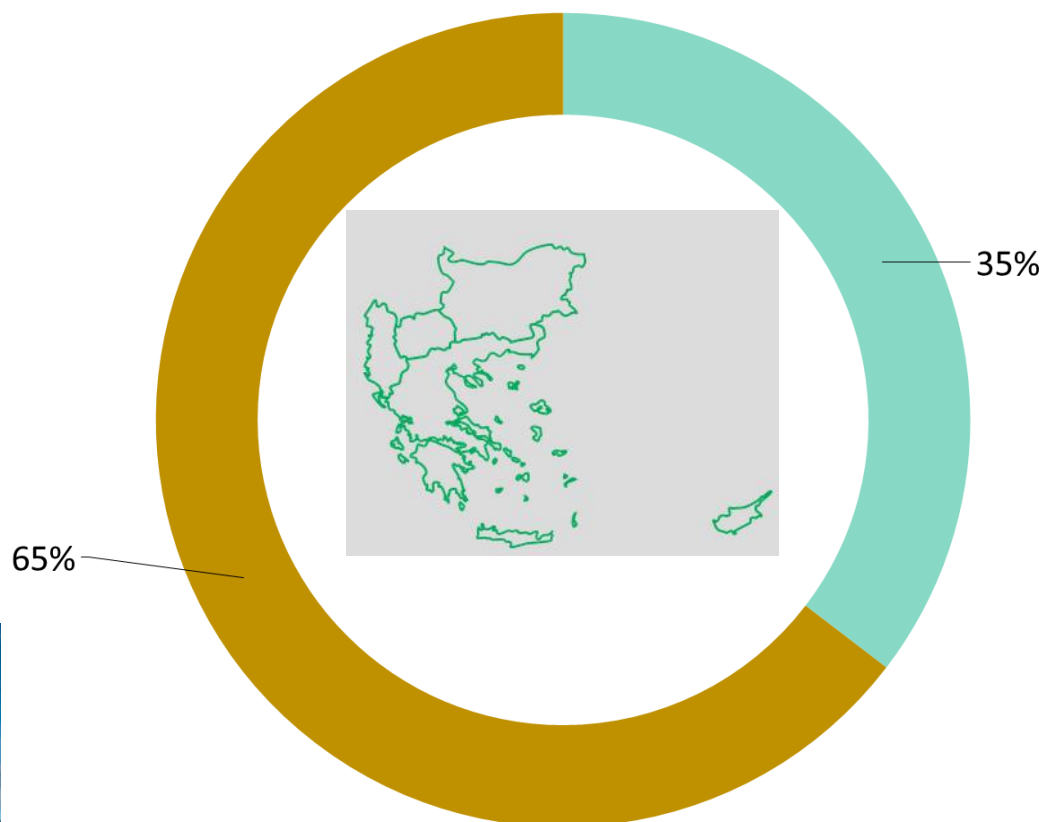
Balkan - Mediterranean **TERRITORY**

WetMainAreas addressed the transnational challenge

for ecosystem connectivity

&

integration of the Balkan
Mediterranean wetlands within
protected networks



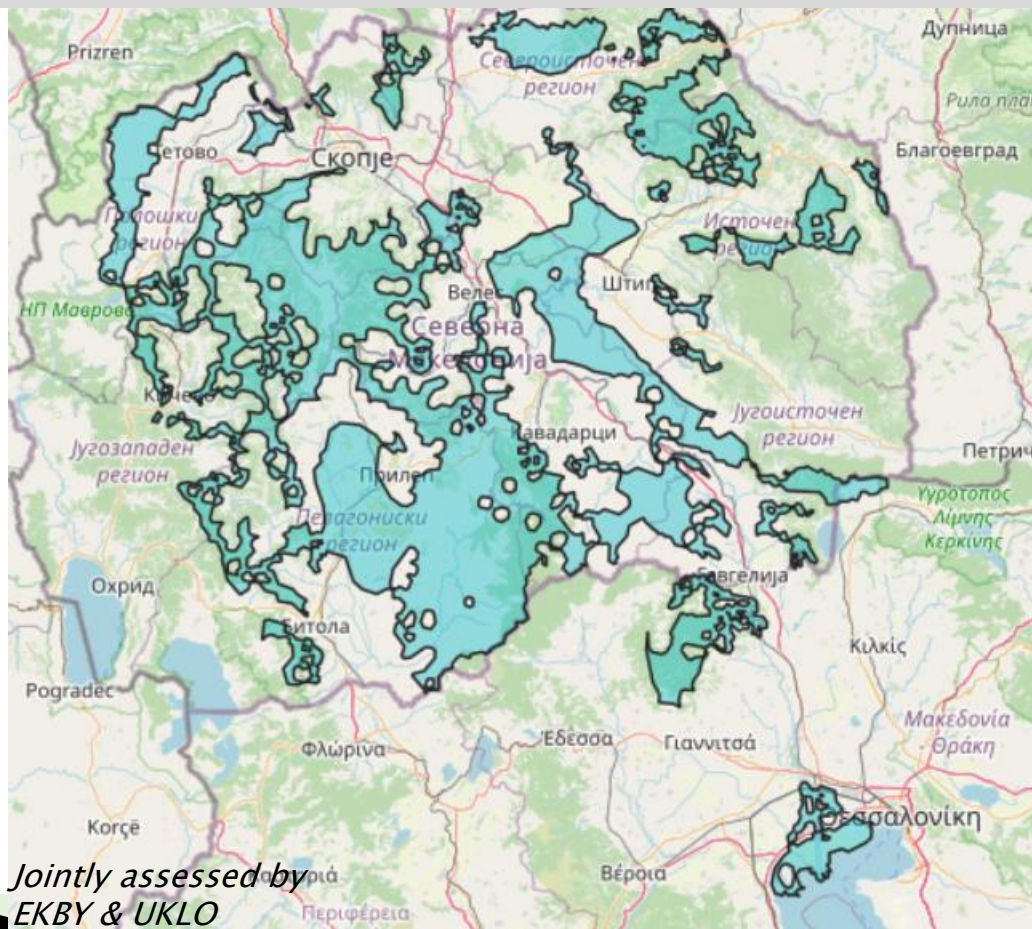
■ Connected land favourable for biodiversity

■ Non-connected / Hostile

Project co-funded by the European Union and
National Funds of the participating countries

Connected areas vs Hostile or Unconnected areas

Connected Areas favourable for biodiversity in transboundary Axios/Vardar river basin



Jointly assessed by
EKBY & UKLO

Wetlands' role in ecosystem connectivity

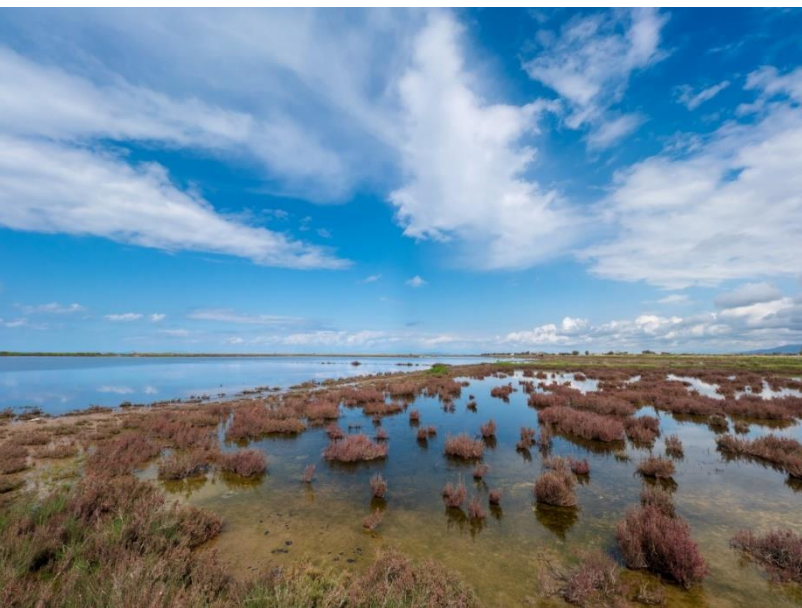
Wetlands which are located in:

(a) **Connected land favourable for biodiversity**

They are part of corridors.

They are important especially for movement and dispersal of aquatic life.

In case they are located **outside protected areas**, conservation and protection measures need to be set in priority.



Wetlands which are located in:

(b) **Non-connected land / Hostile**

They represent biodiversity islands and stepping stones.
They are essential habitats that help aquatic species survival in fragmented and degraded landscapes.

In case they are located **outside protected areas**, priority measures should focus in conservation and protection.

In case they are found **within protected areas**, priority measures may needed for restoration and rehabilitation.

Their conservation, protection, and rehabilitation is the top priority, because **they are the most threatened ones.**



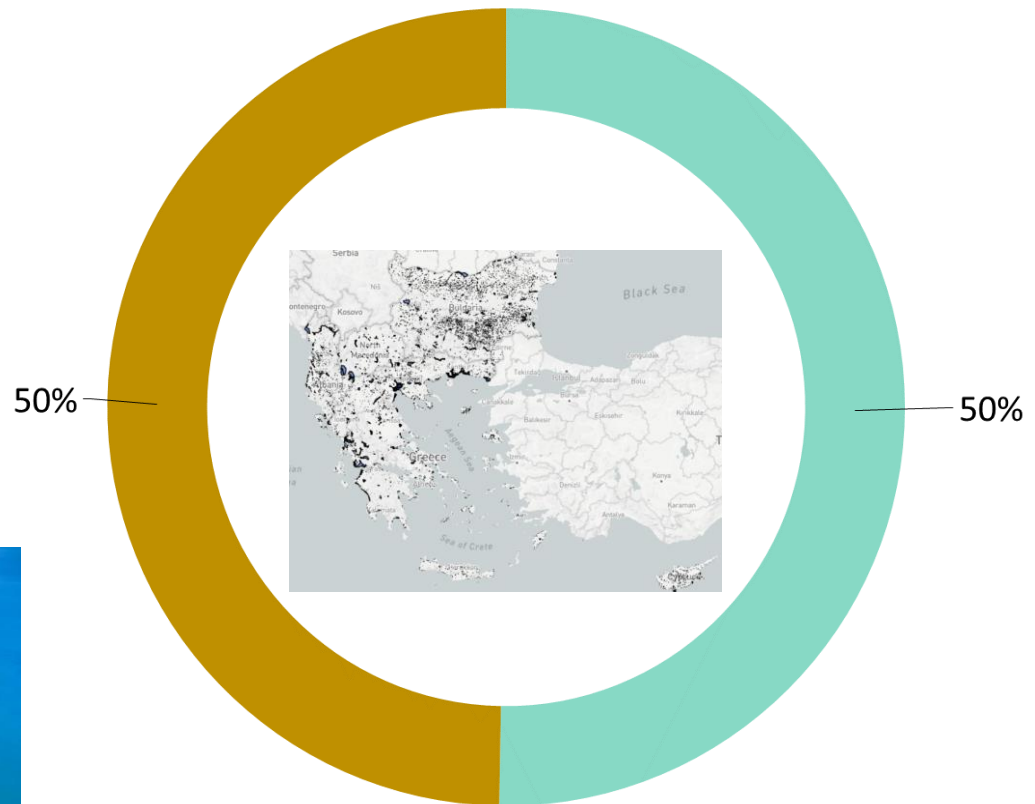
Balkan - Mediterranean WETLAND AREA

WetMainAreas addressed the transnational challenge

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**integration of the Balkan
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protected networks**



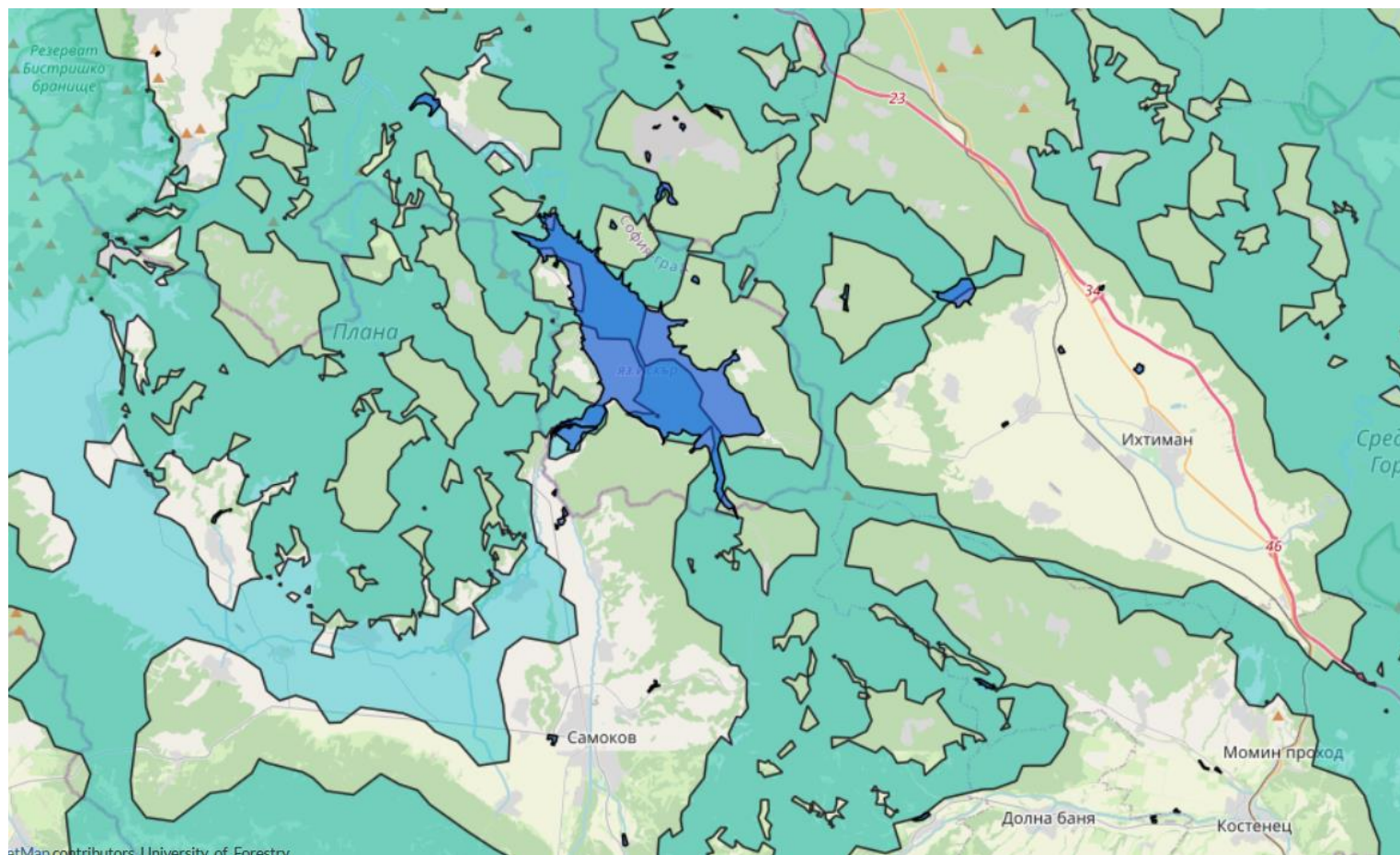
■ in Connected land favourable for biodiversity

■ in Non-connected / Hostile

Wetlands in Connected land

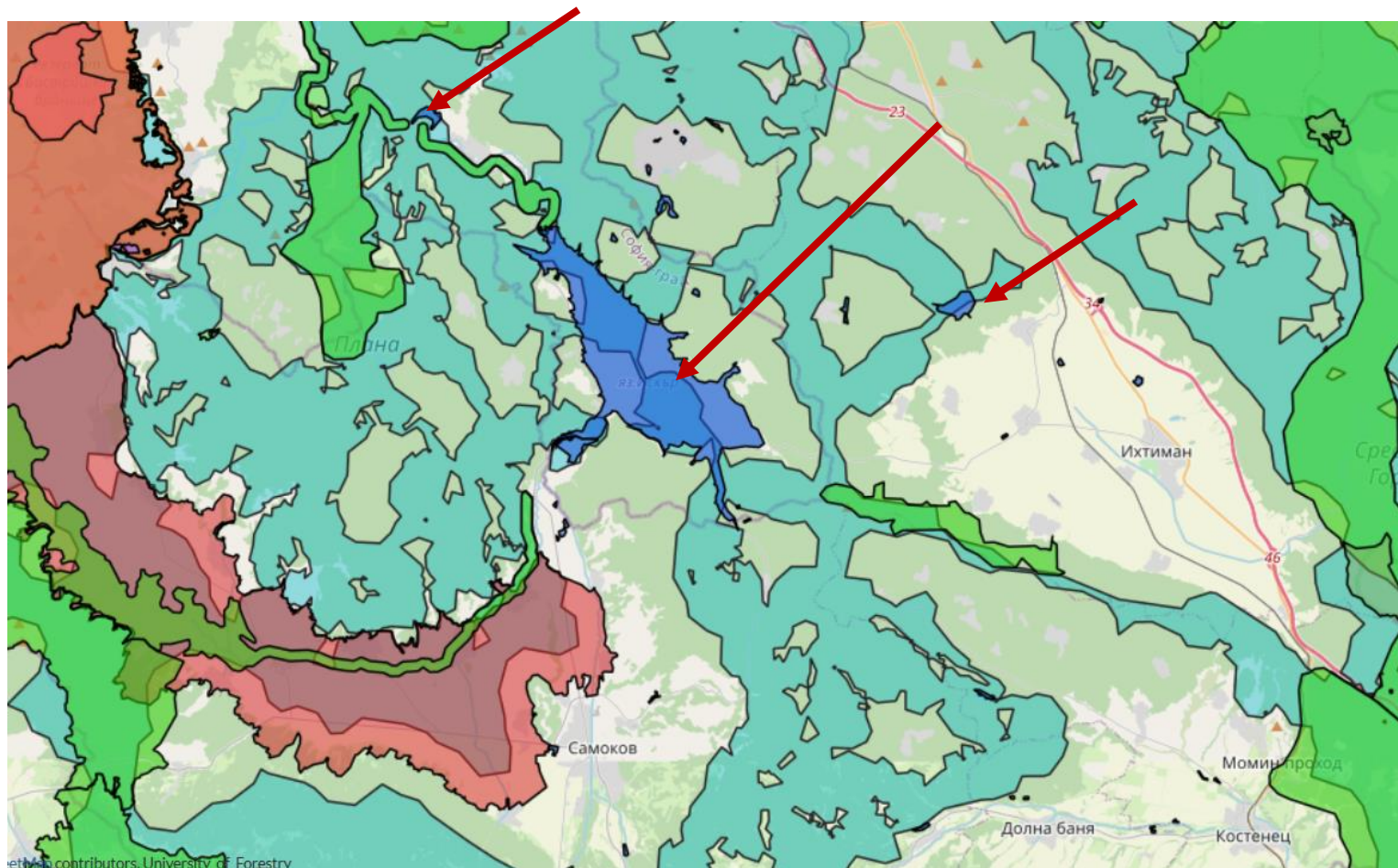
Connected land favourable for biodiversity

Wetland



Wetlands in Connected land outside PAs – to be conserved as corridors

 Connected land favourable for biodiversity  Wetland    PAs

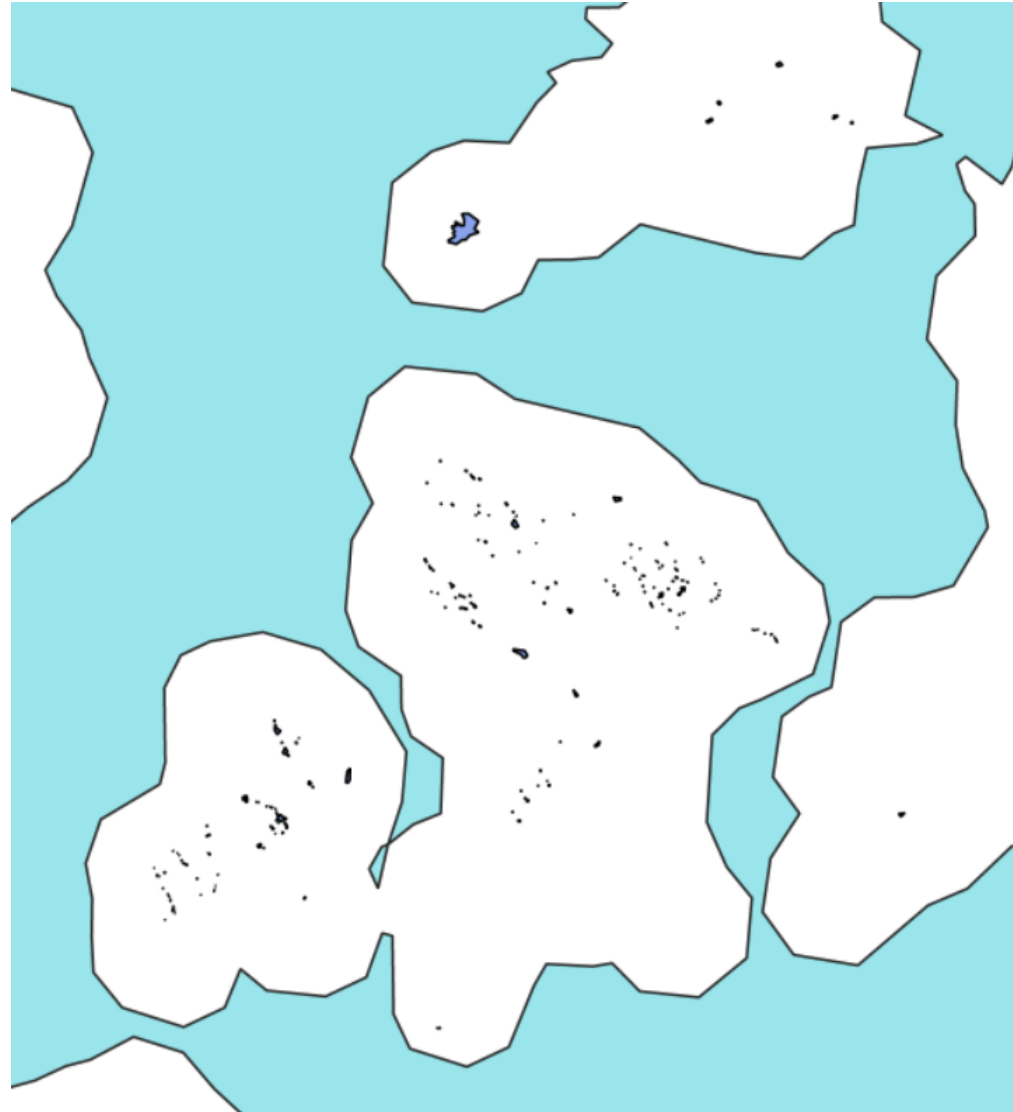


Wetlands in Non connected / Hostile land



 Connected land favourable
for biodiversity

 Wetlands

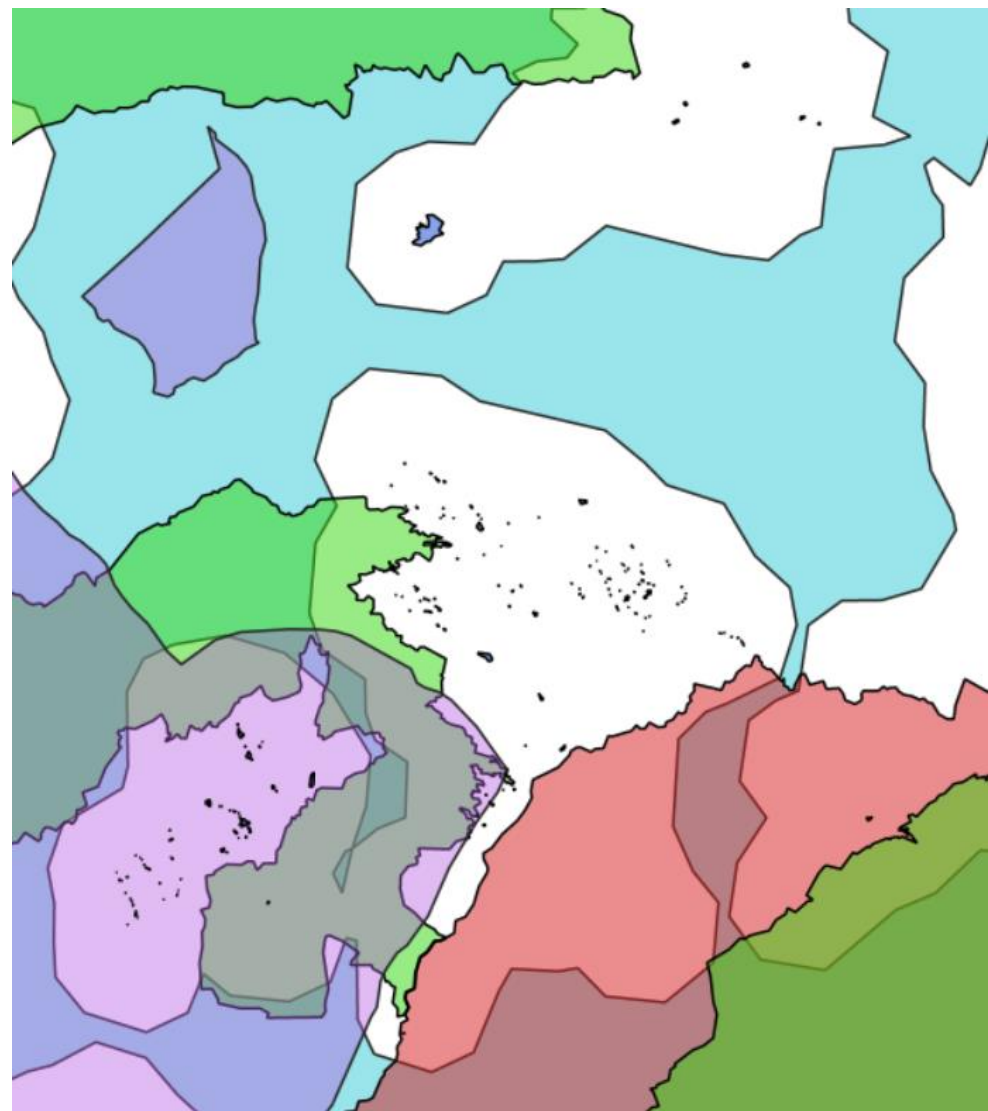


Wetlands in Non connected / Hostile land

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 Wetlands

 Protected Areas(PAs)



Wetlands in Non connected / Hostile land

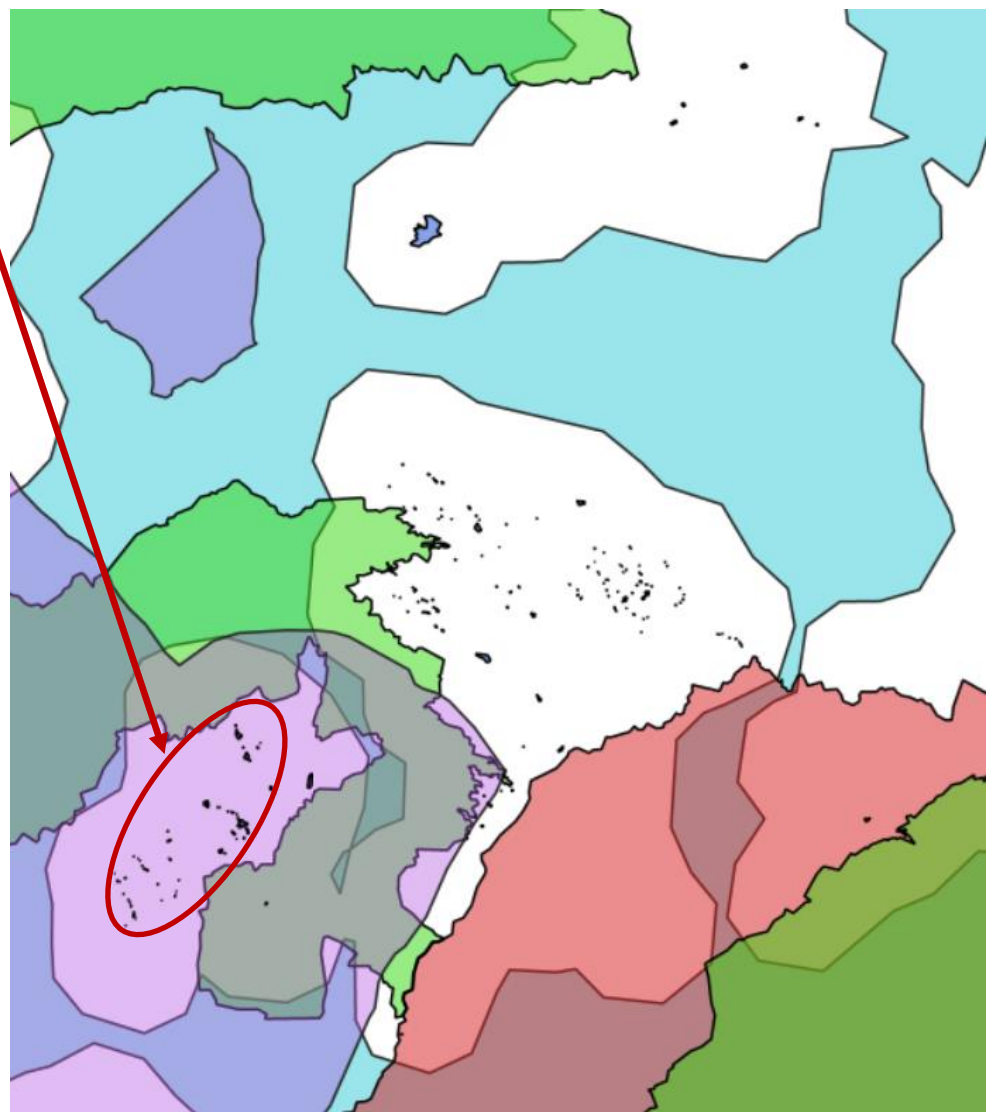
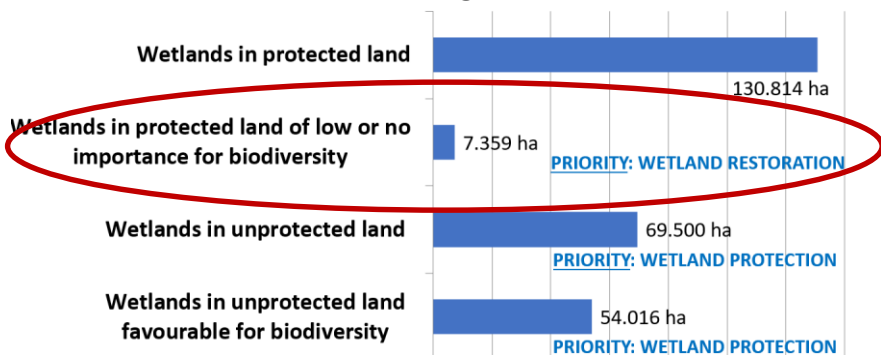
within PAs – priorities for restoration

 Connected land favourable for biodiversity

 Wetlands

   Protected Areas(PAs)


Example of graph



Wetlands in Non connected / Hostile land

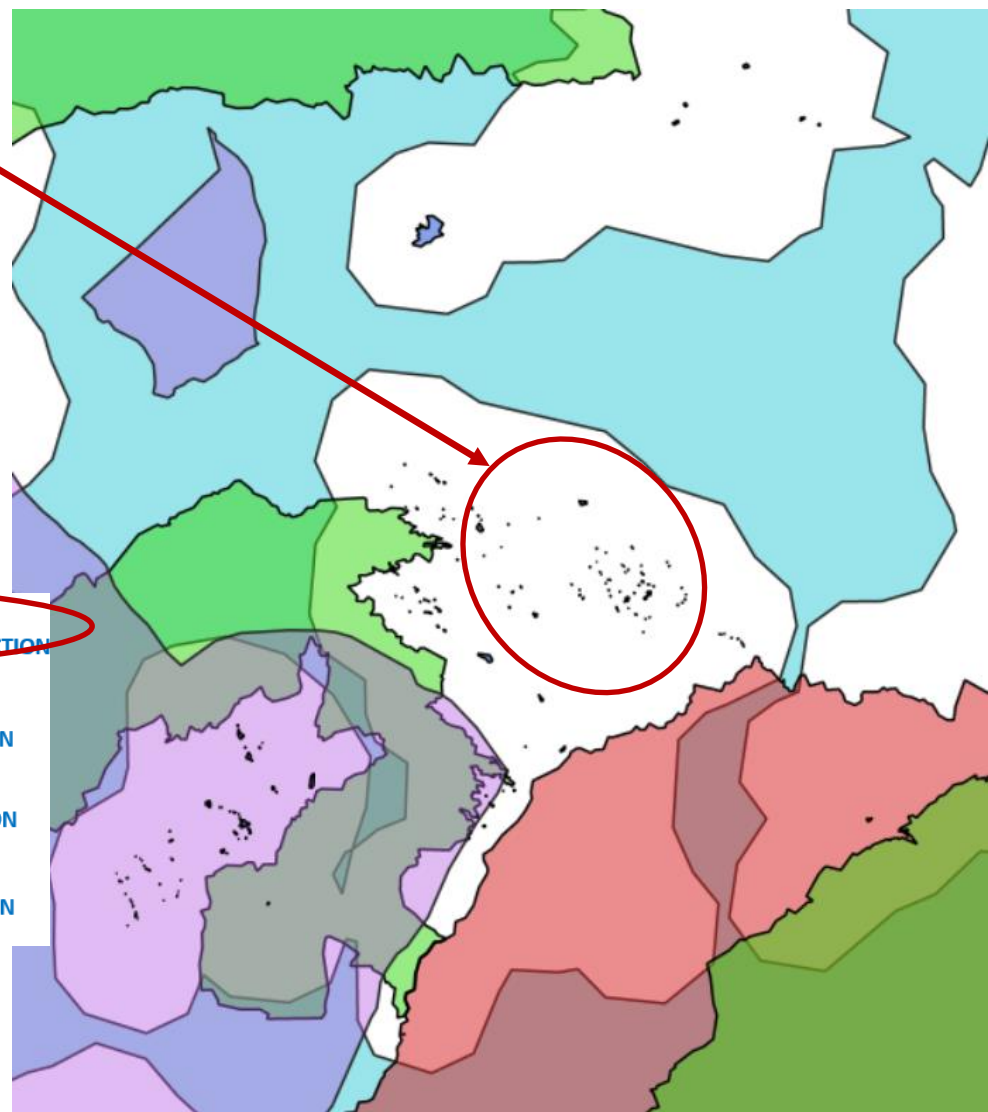
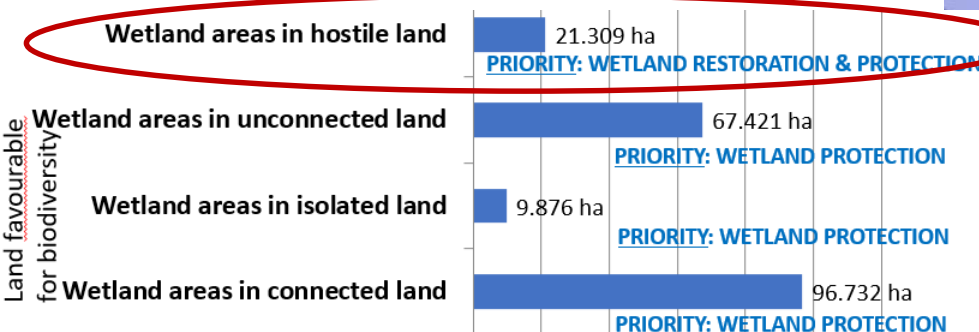
outside PAs – to be conserved as islands for biodiversity

 Connected land favourable for biodiversity

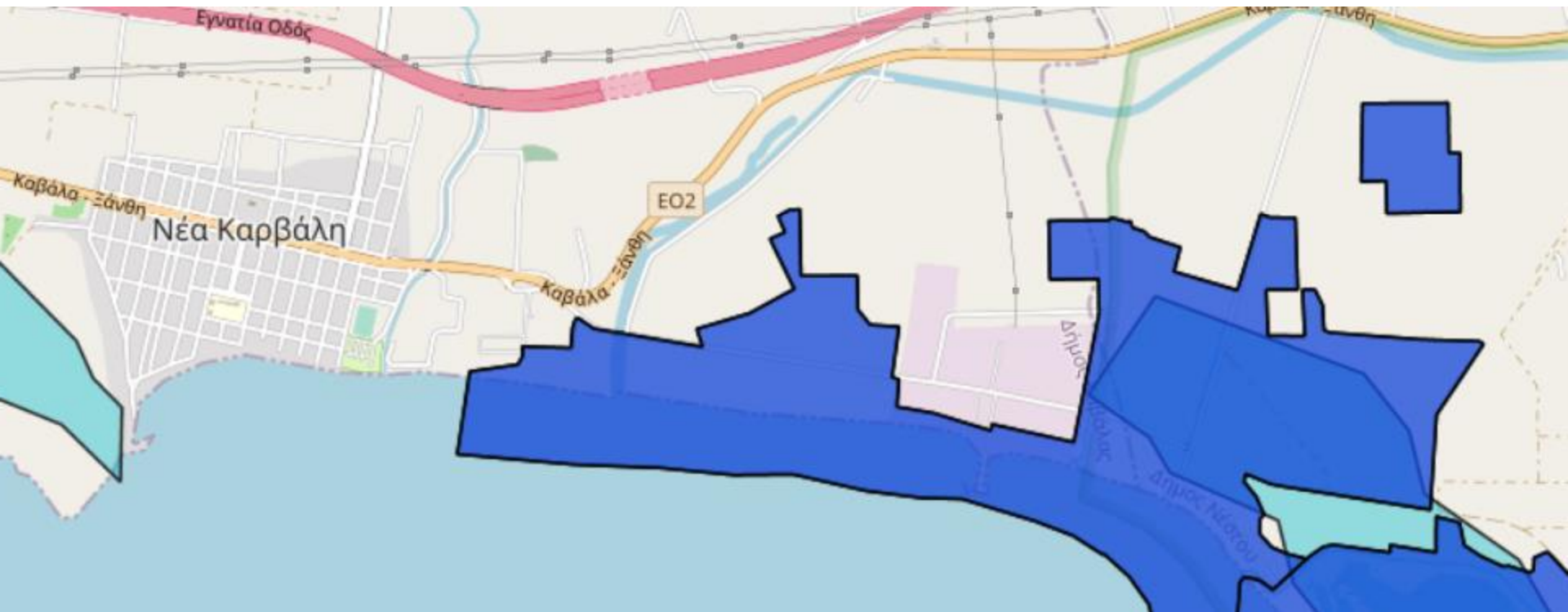
 Wetlands

 Protected Areas (PAs)

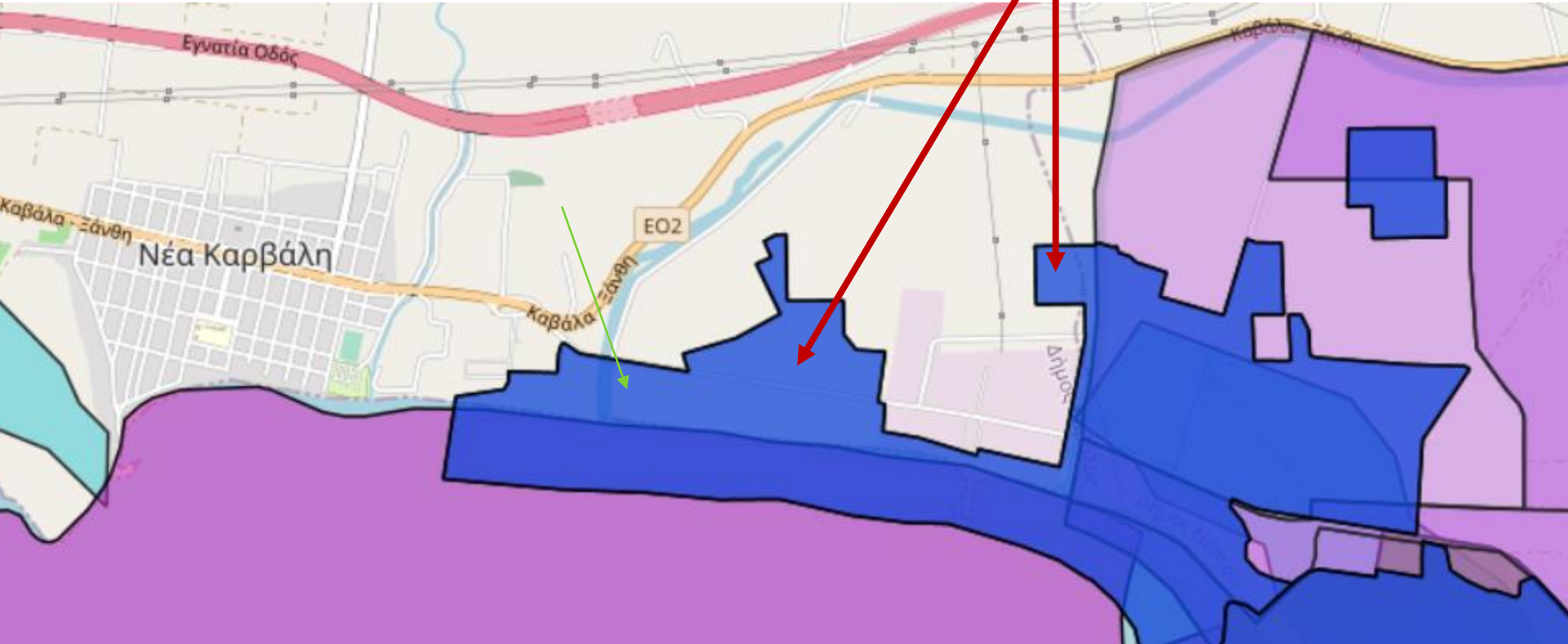
Example of graph



Wetlands partially within PAs to be integrated in conservation & management

 **Wetland**

Wetlands partially within PAs to be integrated in conservation & management



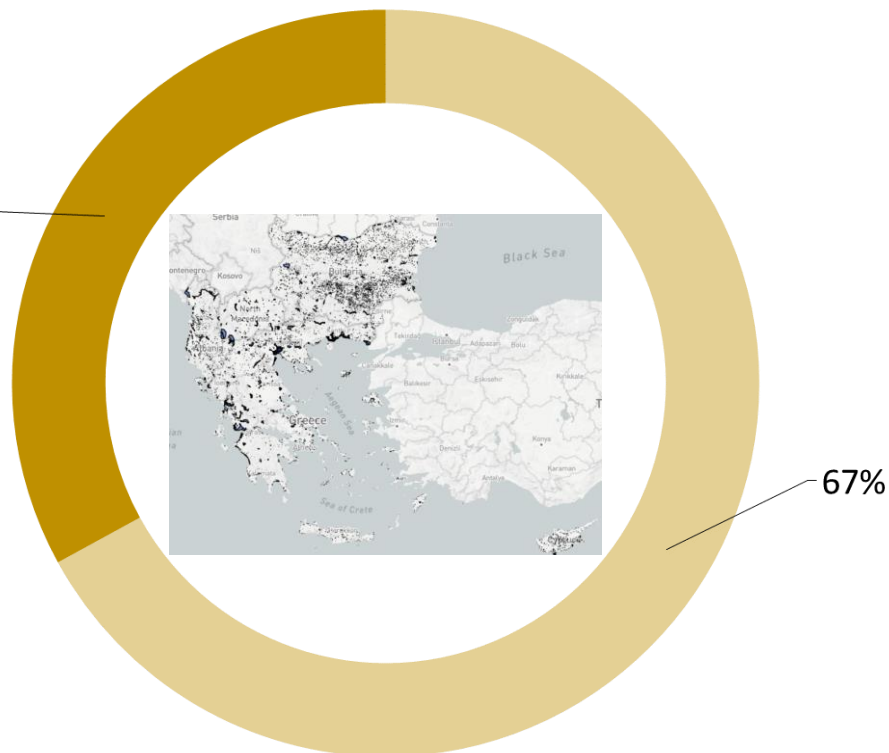
Balkan - Mediterranean **WETLAND AREA** in **Non-connected / Hostile land**

Ecosystem-based approach

**integration of wetland ecosystems
within conservation action plans of
Natura 2000 and the Emerald networks**



33%



■ **inside NATURA 2000 & EMERALD**

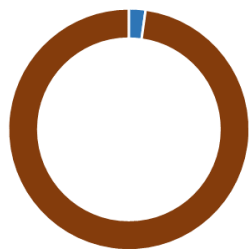
■ **outside NATURA 2000 & EMERALD**

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A positive overall conclusion not much conservation work left to do

occupy only 2% of the territory area

Balkan - Mediterranean Territory



■ Wetlands ■ Other

Balkan Mediterranean Territory

Greece

Bulgaria

North Macedonia

Albania

Cyprus

■ total wetland area

■ wetland area outside national designated areas, Natura 2000 sites, Emerald sites (21,5%)



ACCESS to IMPROVED KNOWLEDGE

For policy makers, authorities, services, researchers of the Balkan Mediterranean territory to support wetland protection, conservation, restoration action plans.

The Balkan Mediterranean Wetland Geoportal
(<https://wetmainareas.com/>)

The Satellite based monitoring service of monitoring the surface water dynamics
(<https://extrema.space/WetMainAreas/dashboard.html>)

The Balkan Mediterranean Wetland Geoportal

<http://185.17.146.157/>

Or via project page: <https://wetmainareas.com/>

Developer: IT external expert: Nikola Kalaydzhiev, nikolakalaydzhiev@gmail.com
under the coordination of WetMainAreas Leader Partner:

University of Forestry, Sofia: Prof. Petar Petrov, wetmainareas@gmail.com

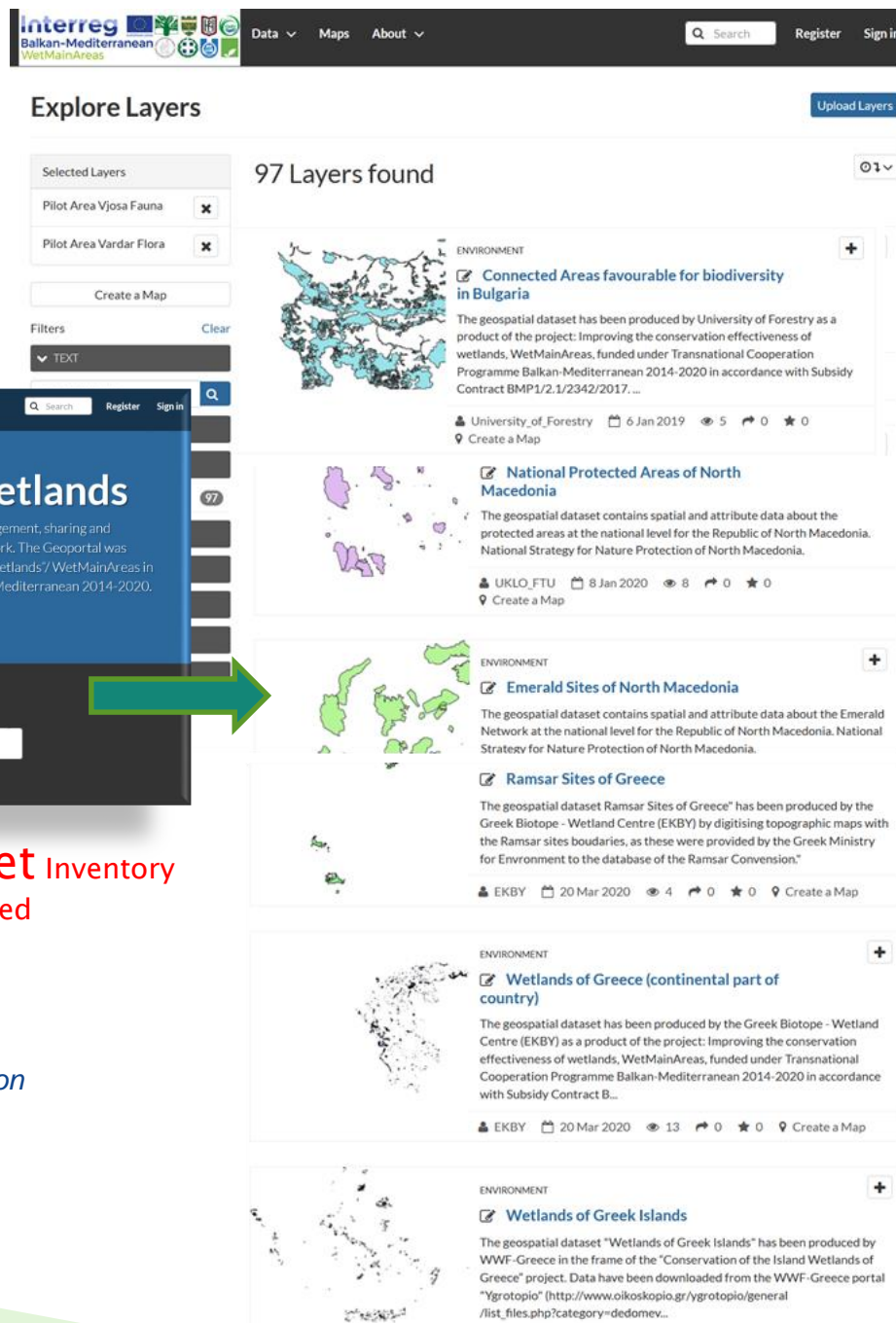
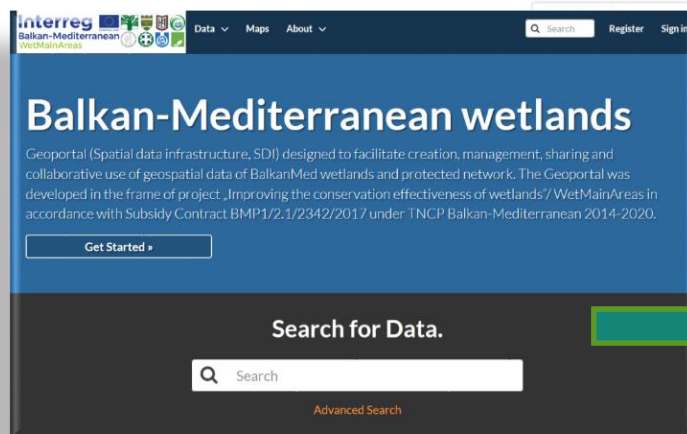
97 harmonized geospatial layers for the 5 Balkan-Med countries:

- ✓ National Protected Areas
- ✓ Natura 2000 sites
- ✓ Emerald sites

- NEW PRODUCTS**
- ✓ Wetland polygons & inventory data*
 - ✓ Connected Areas favourable for biodiversity

- ✓ Auxiliary time series data on temperature, soil moisture, precipitation

*The **MedWet** Inventory standards followed



Project co-funded by European Union and the National Funds of participating countries

The Satellite based monitoring service of monitoring the surface water dynamics

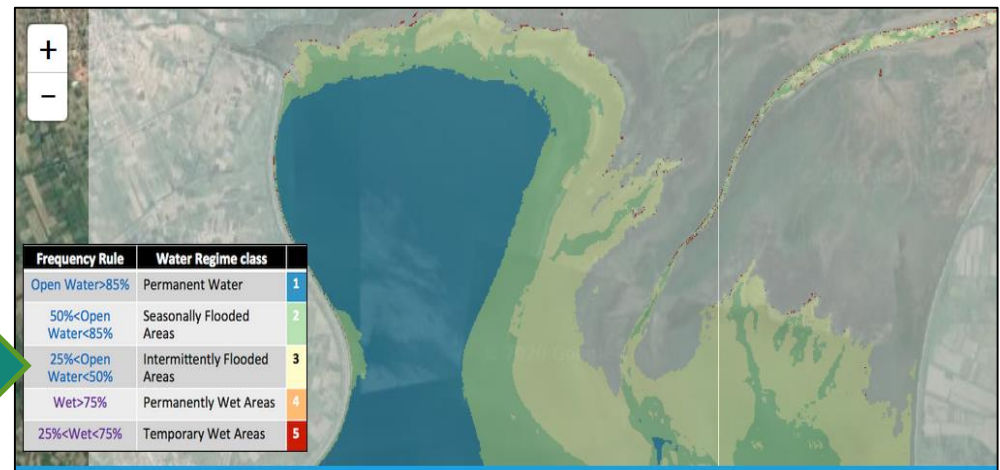
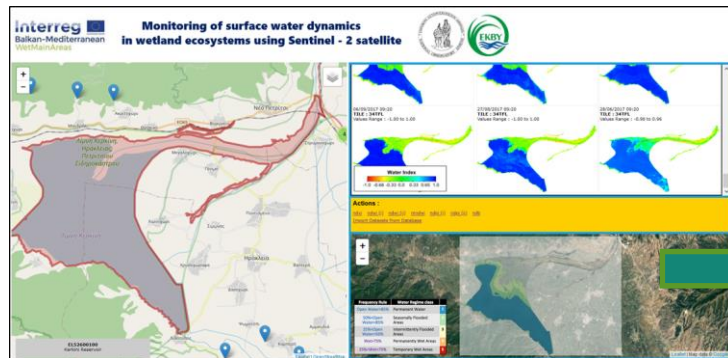
<https://extrema.space/WetMainAreas/dashboard.html>

Developers: National Observatory of Athens, Dr. Iphigenia Keramitsoglou: ik@noa.gr
Greek Biotope Wetland Centre, Dr. Eleni Fitoka helenf@ekby.gr

- ✓ provides access in a 3-year time series of satellite-derived water indices

currently includes 450,800 cloud-free matches of Sentinel-2 images i.e. an average of 52 images per wetland site

- ✓ generates maps of the water regime classes for some 8.000 wetland sites



The frequency rules and water regime classes developed in SWOS HORIZON 2020 research project "Satellite based Wetland Observation Service"

Conclusions

- ❑ WetMainAreas created **New knowledge and tools**, to document where and in which state wetlands in the Balkan region are. **To be used as a decision-making tool**

(i) 1/3 of their size is designated as internationally important according to the Ramsar Convention, and is included in the Natura 2000 and Emerald networks as well as in nationally designated sites;
(ii) 3/4 of wetland sites are small (below 8 ha); they occupy only 3% of total wetland area and create a valuable network of corridors and stepping stones, islands of biodiversity and GIs;
(iii) 1/2 of the wetland size is found in hostile or degraded landscapes;

- ❑ The satellite monitoring service of water regimes continues to be updated, while Sentinel 2 is passing over the Balkan Med region. **Great potential for monitoring of wetland condition!**

- ❑ The project has achieved attracting the interest of national authorities to use these results / tools to support their decisions. **Long term capitalization of the new Knowledge requires additional effort.**

From Joint assessments to Joint action plans

Unprotected lands
where human presence occurs at some level
may have high value for biodiversity



Even if a protected network is well-connected
conservation objectives may not be assured in the long term
without joined action plans & the commitment of stakeholders for
promoting the integration of protected areas in vast regions

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MINISTRY OF
ENVIRONMENT
& ENERGY





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Thank you for your attention!!!



For further information please contact:

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[Lena Hatziordanou, lenahatziord@ekby.gr](mailto:lenahatziord@ekby.gr) / Connectivity Assessment