

BioSpace25 - Biodiversity insight from Space
10 - 14 February 2025 | ESA-ESRIN | Frascati - Italy



Innovative collaborative tools for habitat monitoring and
conflict prevention through SRS technologies.
Insights from the **Nature FIRST Project**

Boris Hinojo
3edata

3edata: Boris Hinojo, Federico Cheda, Yago Alonso, Marco Rubinos
WWF Romania: Alexandra Sallay-Mosoi, Nándor Erős, Cristian Remus
WWF Ukraine: Taras Yamelynets, Roman Cherepanyn, Yuriy Andreichuk
Bulgarian Academy of Sciences: Vladimir Todorov, Ilya Acosta, Nikola Doykin, Nikola Ganchev

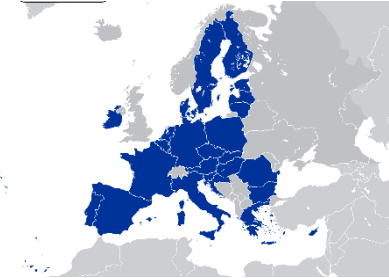
Anna Davison, Koen de Koning: **Wageningen University**
Albin Ahmeti, Robert David, Artem Revenko: **Semantic Web Company**
Linda van Duivenbode: **dotSpace Foundation**
Melanie Arp, Jan-Kees Shakel: **Sensing Clues Foundation**

Biodiversity conservation EU main legal framework

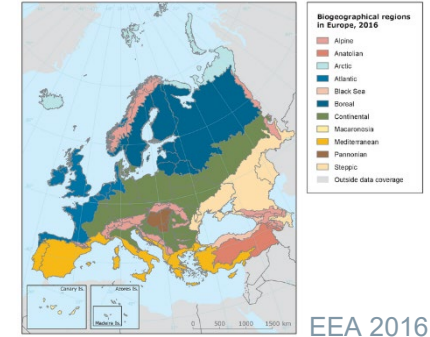


Habitats & Birds Directive

- ❑ Natura 2000 sites and all EU territories
- ❑ Site Specific Conservation Objectives
- ❑ Conservation measures
- ❑ Conservation status assessment (Annex III, Art. 17 & 12)



Wikipedia

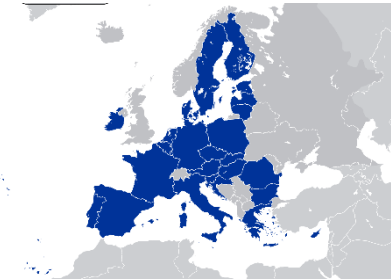


EEA 2016

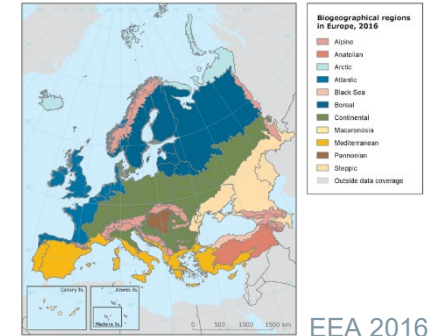


Habitats & Birds Directive

- ❑ Natura 2000 sites and all EU territories
- ❑ Site Specific Conservation Objectives
- ❑ Conservation measures
- ❑ Conservation status assessment (Annex III, Art. 17 & 12)



Wikipedia



EEA 2016

Data Quality is not Good

- ❖ Biodiversity monitoring is complex and difficult
- ❖ Lack of resources
- ❖ Lack of interest

Biodiversity monitoring EU main legal framework

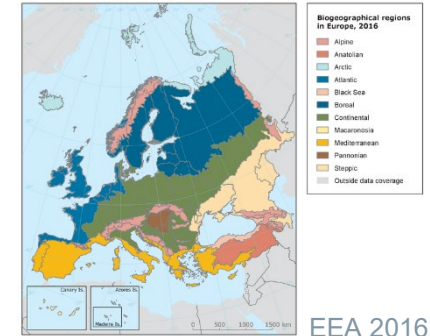


Habitats & Birds Directive

- ❑ Natura 2000 sites and all EU territories
- ❑ Site Specific Conservation Objectives
- ❑ Conservation measures
- ❑ Conservation status assessment (Annex III, Art. 17 & 12)



Wikipedia



EEA 2016

Water Framework Directive

EU Restoration Law [EU Biodiversity Strategy - GBF]



SEEA – Ecosystem Accounts Essential Biodiversity Variables (EBVs)



Biodiversity monitoring EU main legal framework

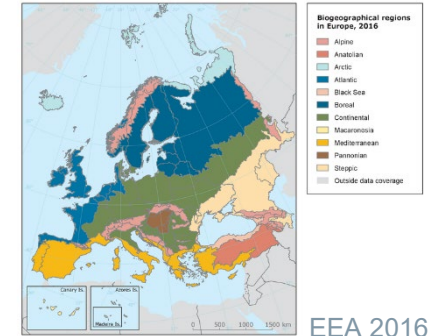


Habitats & Birds Directive

- ❑ Natura 2000 sites and all EU territories
- ❑ Site Specific Conservation Objectives
- ❑ Conservation measures
- ❑ Conservation status assessment (Annex III, Art. 17 & 12)



Wikipedia



EEA 2016

Water Framework Directive

EU Restoration Law [EU Biodiversity Strategy - GBF]



SEEA – Ecosystem Accounts Essential Biodiversity Variables (EBVs)



Habitat Mapping



3edata



Ground truth

Spatial data and information

Local Knowledge

Integration with official data

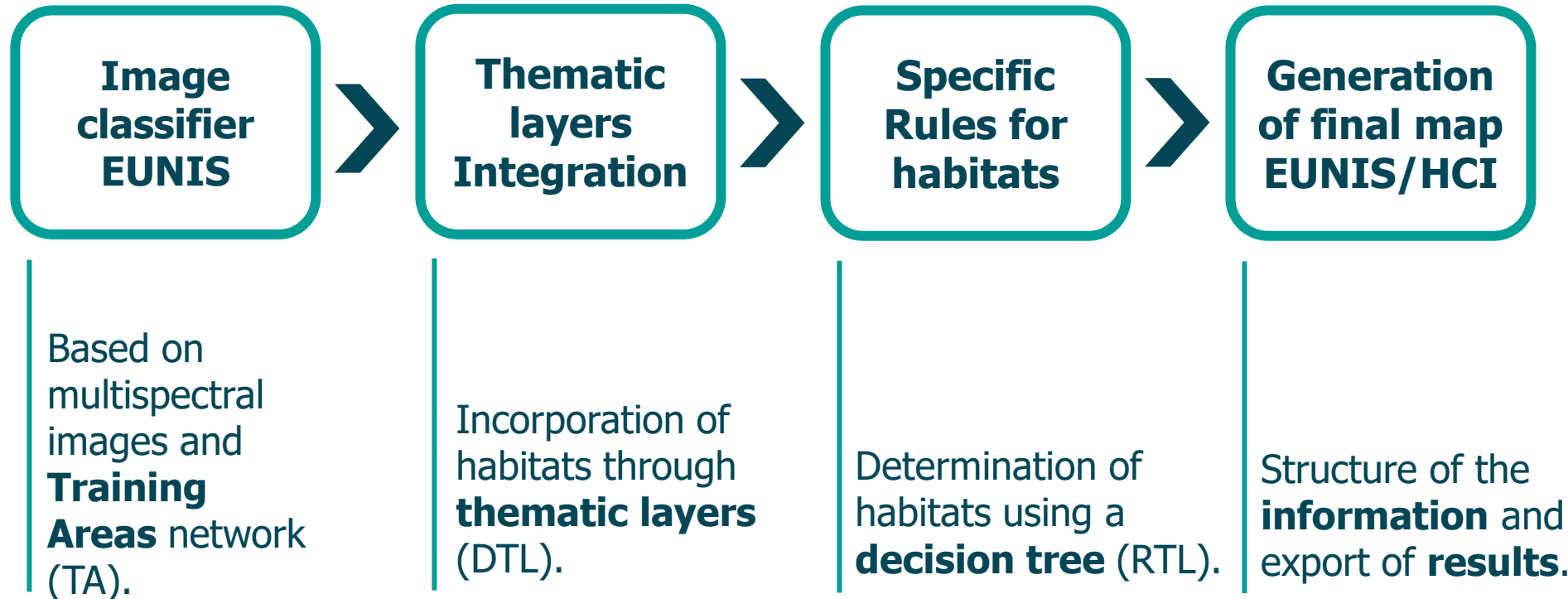


NATUREFIRST



Funded by
the European Union

Habitat Mapping Model – More than a Map



NATUREFIRST



Funded by the European Union 7

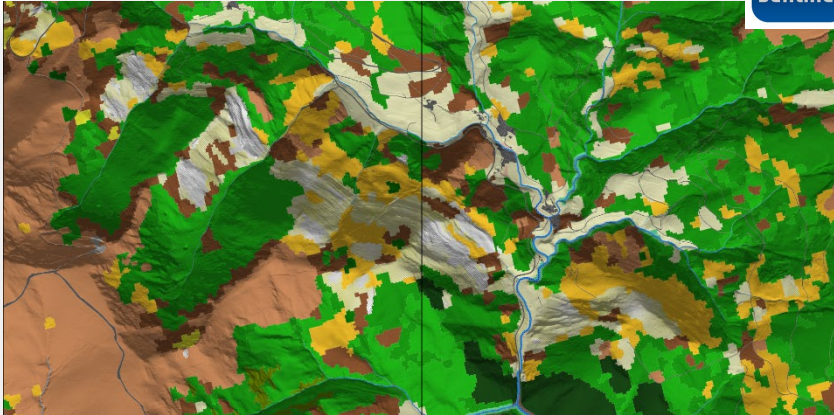
Habitat Mapping Model – More than a Map



3edata



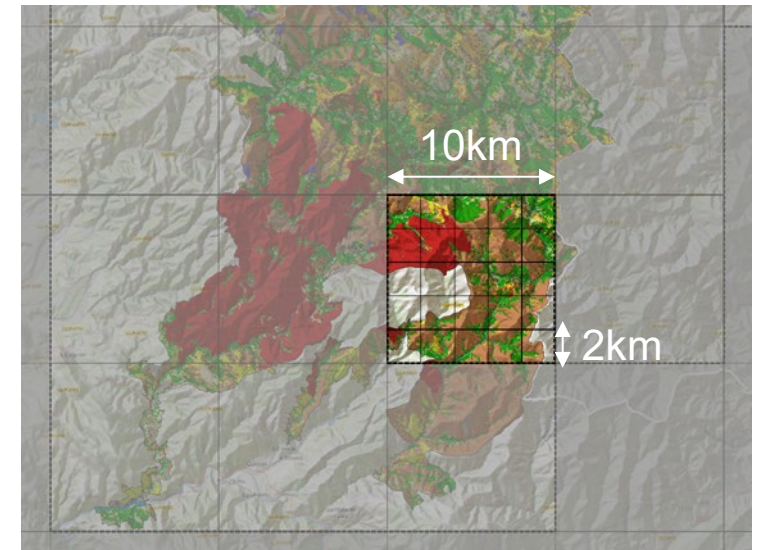
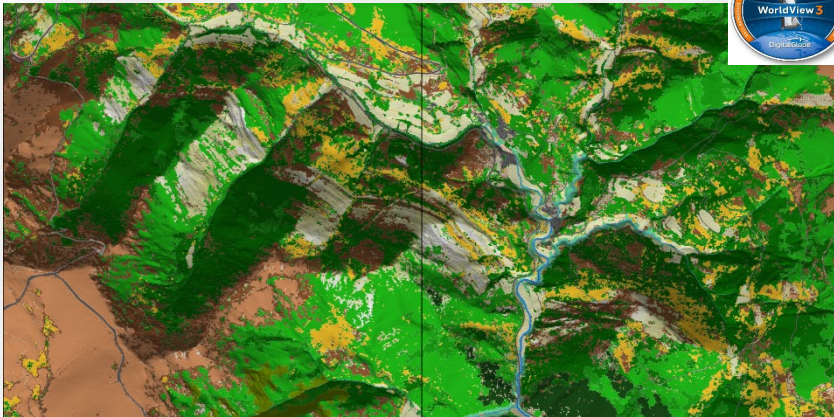
SENTINEL 2



EUNIS 2012 - WorldView3 [26078]

- C2.1 - Springs, spring brooks and geysers [43]
- C2.2 - Permanent non-tidal, fast, turbulent watercourses [9]
- E1.1 - Inland sand and rock with open vegetation [1881]
- E2.234 - Northern Iberian submontane hay meadows [343]
- E4.4 - Calcareous alpine and subalpine grassland [1142]
- E5.1 - Anthropogenic herb stands [324]
- E5.31 - Sub-Atlantic bracken fields [3807]
- F3.25 - Piornales [6381]
- F4.2 - Dry heaths [1176]
- G1.2 - Mixed riparian floodplain and gallery woodland [979]
- G1.7B2 - Cantabrian Pyrenean oak forests [3182]
- G1.7D - Chestnut woodland [1395]
- G1.9151 - Cantabrian [Betula celtiberica] woodlands [3873]
- G1.A44 - Pyreneo-Cantabrian mixed elm - oak forests [7]
- G2.12 - Holm-oak woodland [62]
- G3.F22 - Highly artificial coniferous plantations [7]
- G5.2-Small broadleaved deciduous anthropogenic woodlands [364]
- H3.1 - Acid siliceous inland cliffs [135]
- H3.24 - Western mediterraneo-montane chasmophyte communities [169]
- H3.511 - Limestone pavements [453]
- H3.6 - Weathered rock and outcrop habitats [38]
- H5 - Miscellaneous inland habitats with very sparse or no vegetation [213]
- J4 - TransportsNetworks [13]
- J1 - Buildings of cities, towns and villages [79]
- I - Regularly or recently cultivated agricultural [3]

WORLDVIEW 3



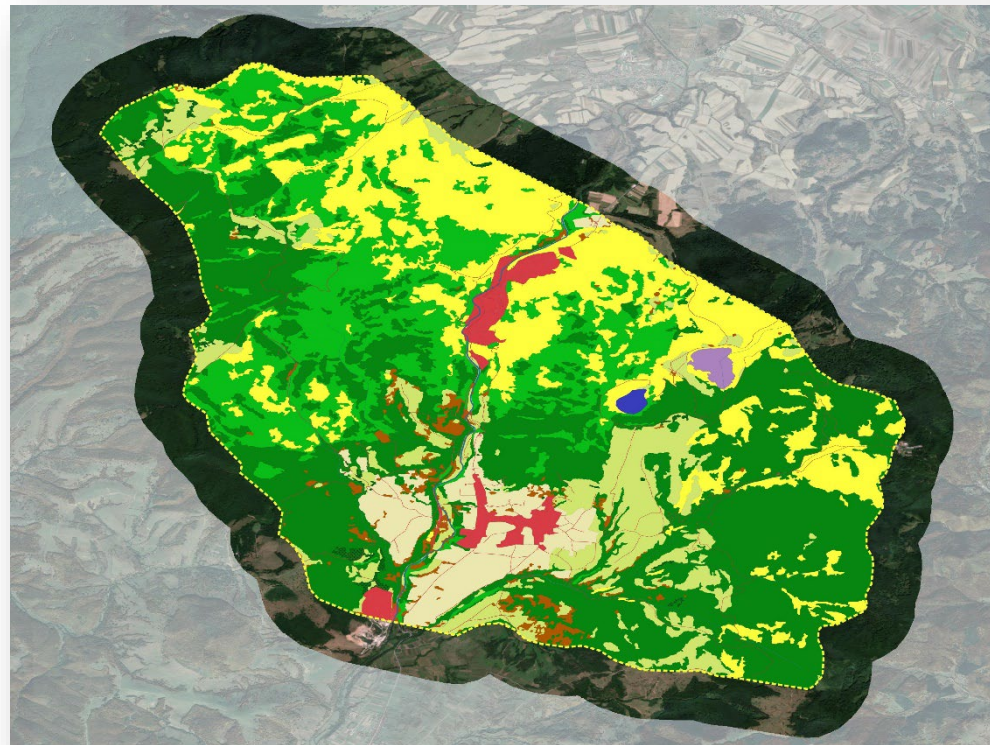
Habitat Mapping Model – More than a Map



Băile Tușnad



UBB



Working flow

Habitat Mapping request
(WWF/TWP/UBB)



Analysis , resources & objectives
(WWF/TWP/UBB & 3EDATA)



Training Areas Network (TAN)
(WWF/TWP/UBB & 3EDATA)



1st iteration of HM-Model
(3EDATA)



Improvements to the TAN and
HM-Model (ALLRO & 3EDATA)



2nd iteration of HM-Model
(3EDATA)



Habitat Map Results.
Habitat Mapping Model



Area of Interest: 108 km²

10Km Cells: 4

EUNIS classes: 15

Habitats of community interest: 8

Training Areas: 224

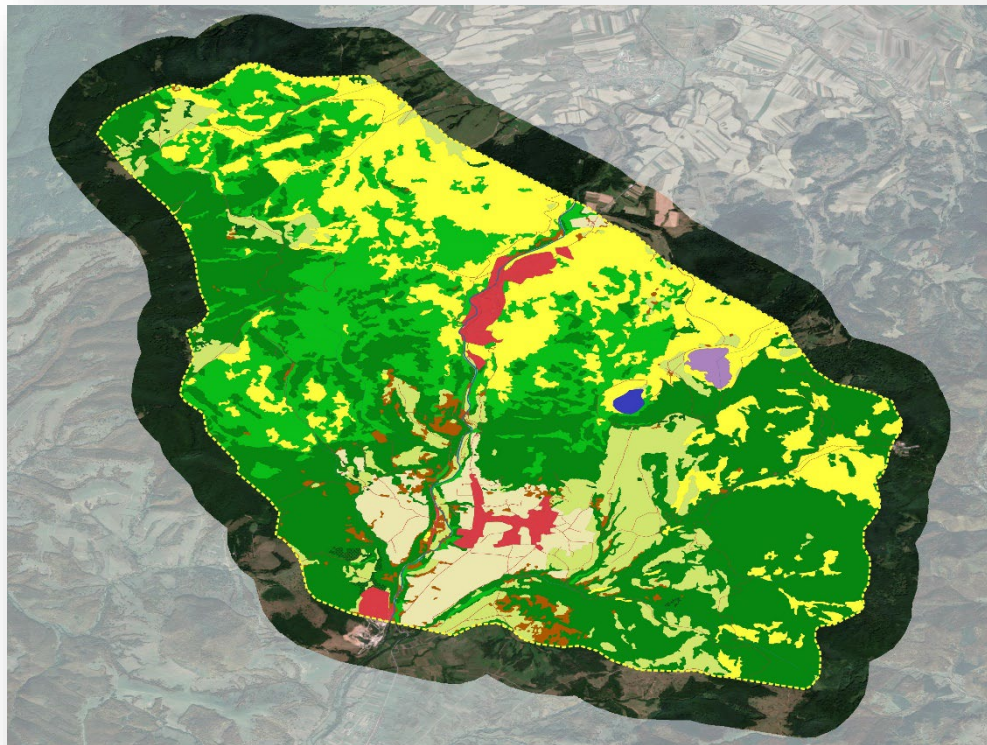
Habitat Mapping Model – More than a Map



Băile Tușnad



UBB



Habitat Mapping request
(WWF/TWP/UBB)



Analysis , resources & objectives
(WWF/TWP/UBB & 3EDATA)



Training Areas Network (TAN)
(WWF/TWP/UBB & 3EDATA)



1st iteration of HM-Model
(3EDATA)



Improvements to the TAN and
HM-Model (ALLRO & 3EDATA)



2nd iteration of HM-Model
(3EDATA)



Habitat Map Results.
Habitat Mapping Model created



Automatic model

Reduce costs of production,
updating

Allowing management:
Objectives, Actions, Measures
and their monitoring

Area of Interest: 108 km²

10Km Cells: 4

EUNIS classes: 15

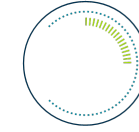
Habitats of community interest: 8

Training Areas: 224

Habitat mapping Demonstration



Habitat Mapping Model – More than a Map



3edata

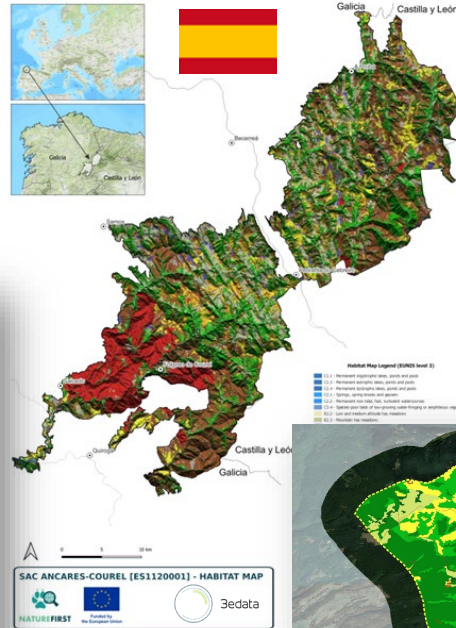


NATUREFIRST

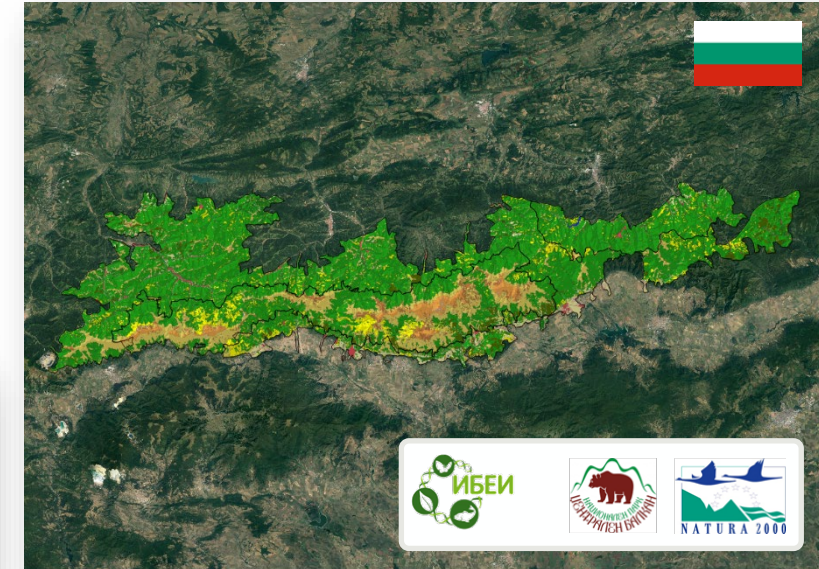
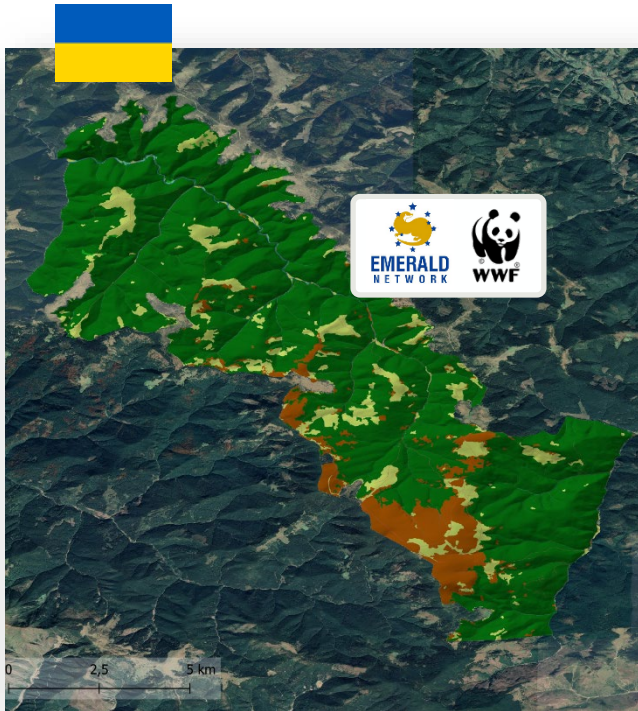


Funded by the European Union

Area of Interest: 119,46 km²
 10Km Cells: 8
 EUNIS classes: 11
 Habitats of community interest: -
 Training Areas: 582



Area of Interest: 1,026 km²
 10Km Cells: 23
 EUNIS classes: 44
 Habitats of community interest: 16
 Training Areas: 5,093



Area of Interest: 2,346 km²
 10Km Cells: 52
 EUNIS classes: 29
 Habitats of community interest: 22
 Training Areas: 2,550

Aol: 108 km²
 10Km Cells: 4
 EUNIS Habs: 15
 Annex I Habs: 8
 TA: 224



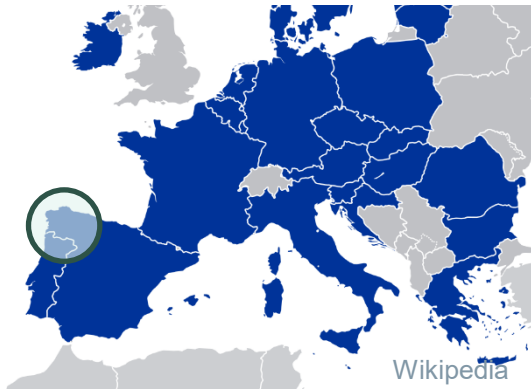
Habitat mapping Real world – Selling services



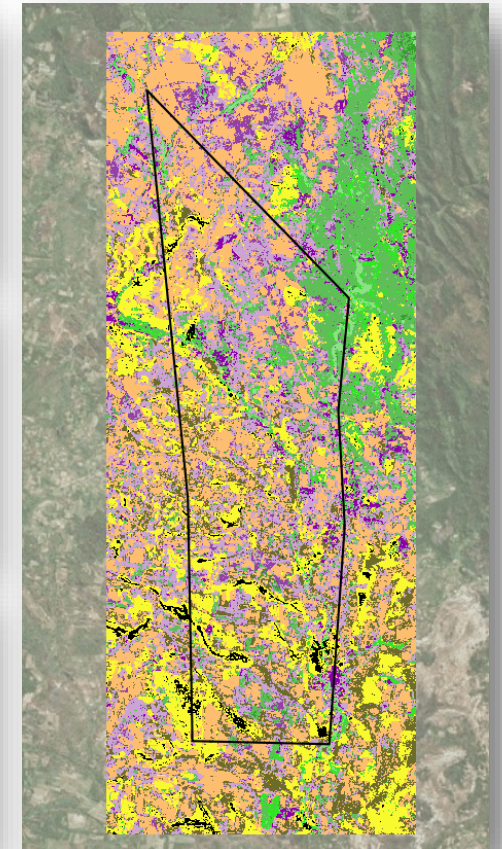
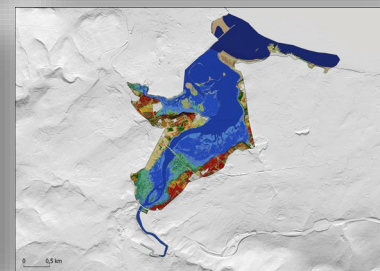
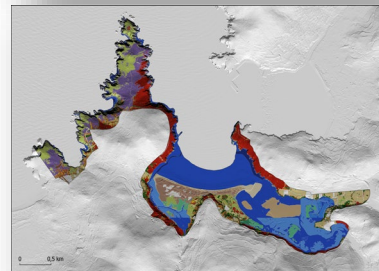
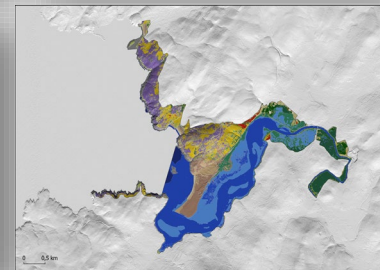
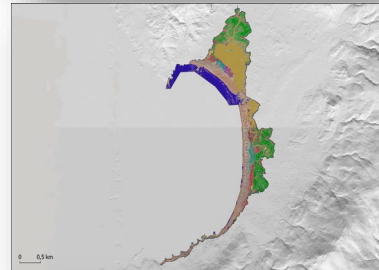
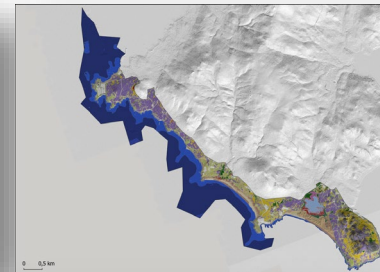
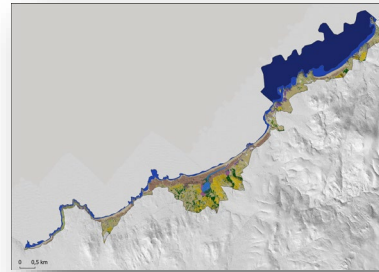
Habitat Mapping Model – More than a Map



3edata



XUNTA
DE GALICIA



BY LIFE
CONNECTED

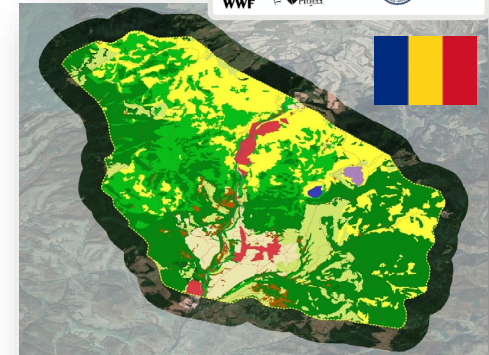


Habitat Change Detection



Băile Tușnad

Detection



2023/08



2024/06

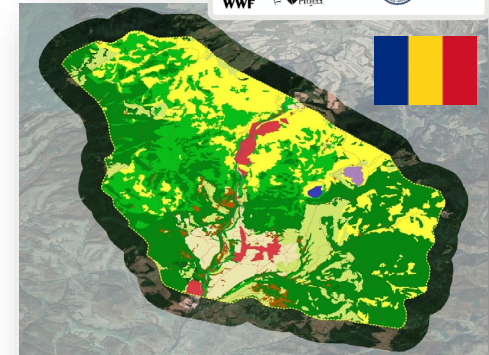
G1.A - Meso- and eutrophic *Quercus*, *Carpinus*, *Fraxinus*, *Acer*, *Tilia*, *Ulmus* and related woodland

Habitat Change Detection



Băile Tușnad

Confirmation



2023/08



2024/07

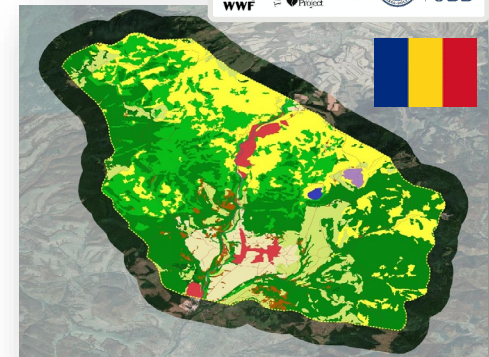
G1.A - Meso- and eutrophic *Quercus*, *Carpinus*, *Fraxinus*, *Acer*, *Tilia*, *Ulmus* and related woodland

Habitat Change Detection



Băile Tușnad

Reconfirmed



2023/08



2024/08

G1.A - Meso- and eutrophic *Quercus*, *Carpinus*, *Fraxinus*, *Acer*, *Tilia*, *Ulmus* and related woodland

Biodiversity monitoring

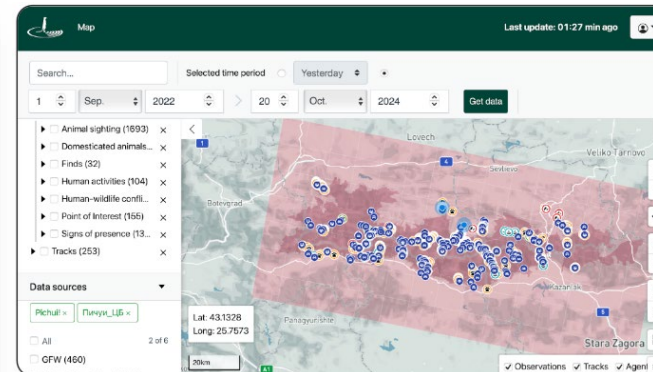
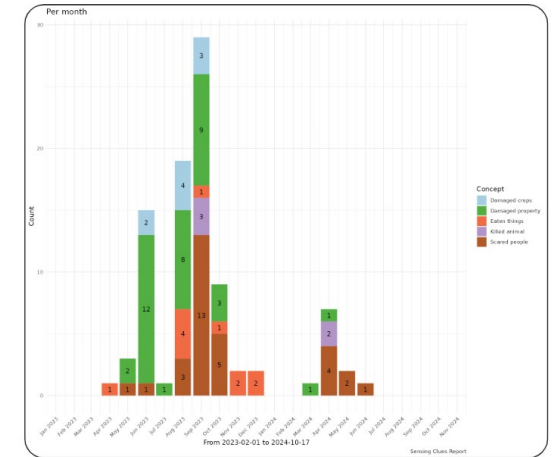
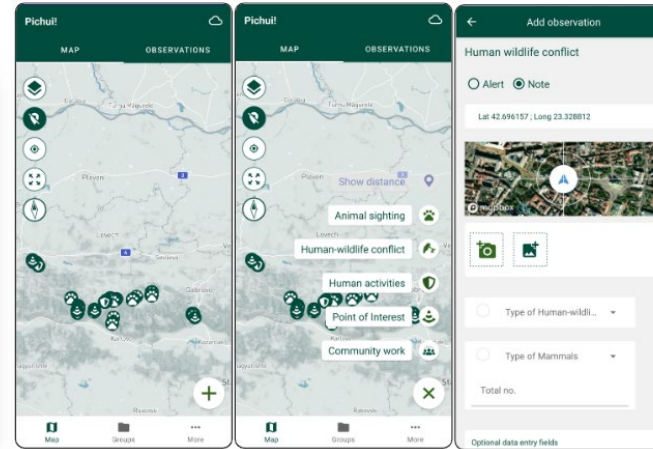
Other products from Nature FIRST



Human Wildlife Conflict Mapping



NATUREFIRST Funded by the European Union



Biodiversity monitoring Other products from Nature FIRST



Bear Radar – Digital twin



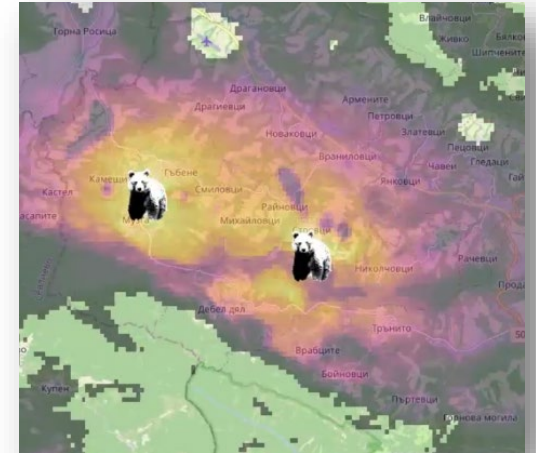
Village
Wildlife Scouts
on the lookout



Recording
wildlife sightings
with the Cluey app
from Sensing Clues



Automated updating
of predictions



Sharing real-time
risk predictions
with the public



NATUREFIRST
Funded by
the European Union

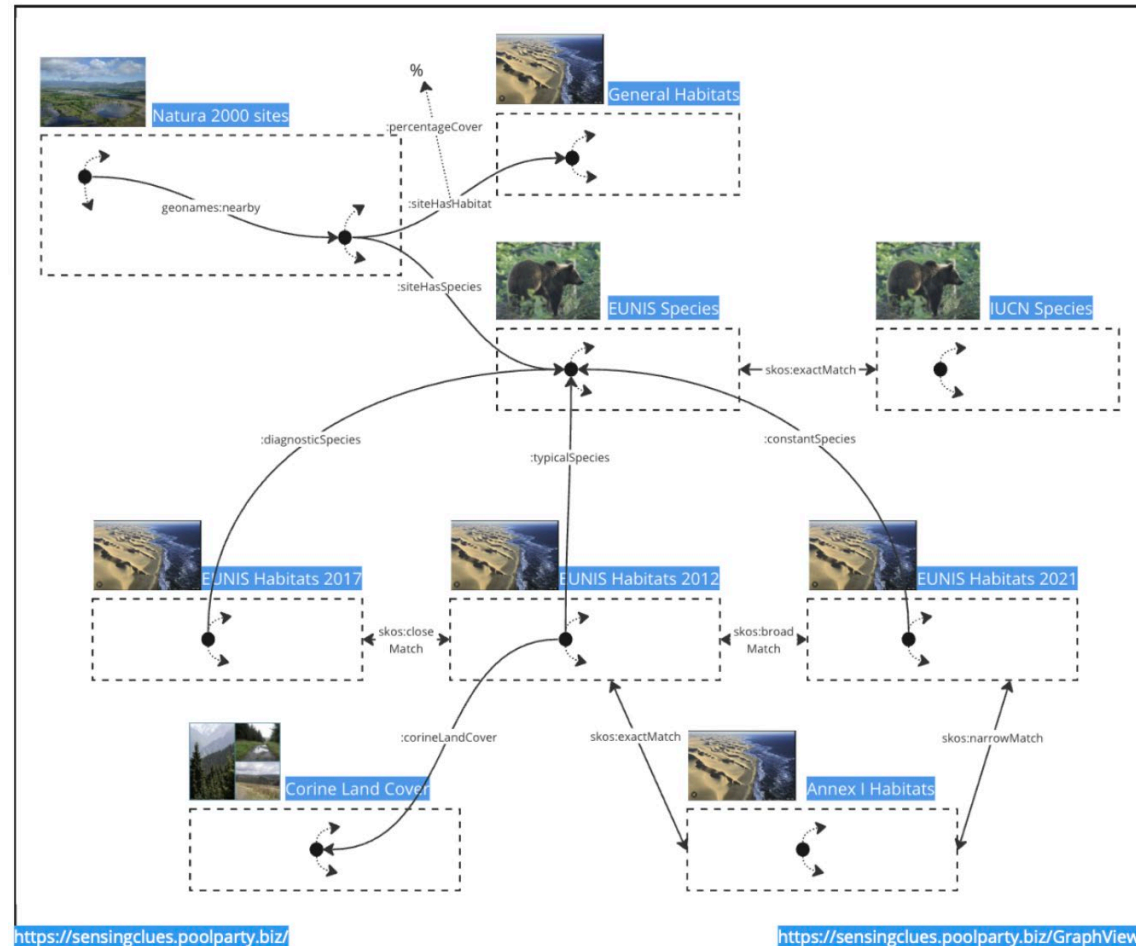


Biodiversity monitoring

Other products from Nature FIRST



Biodiversity Knowledge Graph



<https://sensingclues.poolparty.biz/>

<https://sensingclues.poolparty.biz/GraphViews>



NATUREFIRST

Funded by the European Union



Biodiversity monitoring

Other products from Nature FIRST



GEOBON

CEOS

esa

Next



3edata

- Data integration for automatic assessment of habitats conservation status in the framework of standardised national methodologies
- Delivering services – Convincing potential users to develop more than a map

Recommendations

- When developing SRS solutions, work with the users, with their problems and limitations
- More Technology oriented to real world cases and uses
- EEA/DG ENV. Raise the bar on environmental data quality from Member States. This will encourage a wider adoption of SRS solutions



NATUREFIRST



Funded by
the European Union

19



Biodiversity monitoring Other products from Nature FIRST



THANK YOU

Boris Hinojo Sánchez
boris.hinojo@3edata.es

INNOVATION AND COLLABORATION IN CONSERVATION

NATUREFIRST CONFERENCE 2025

- ✓ HUMAN-WILDLIFE CONFLICT SOLUTIONS
- ✓ BIODIVERSITY MONITORING
- ✓ HABITAT MAPPING
- ✓ KNOWLEDGE GRAPHS

JUNE 25 AND 26, 2025

RHENEN, THE NETHERLANDS

Funded by the European Union



SECURE YOUR SPOT AT THE NATURE FIRST CONFERENCE HERE

