

## Sustainable Forest Management in the Carpathians: Status and progress of the ETC/ULS supporting activities

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# The Background

Carpathian Convention Implementation Committee  
Vienna, 17-19 December 2018



The Carpathian Mountains are one of the most important forest ecosystems in Europe due to their *high concentration of virgin forests*

The “**protocol for sustainable forest management**”, signed by the Carpathian Convention Parties is formalising the *need to preserve the richness and ensure sustainable use of the Carpathian forests*

In this framework, EEA signed a partnership agreement with the Carpathian Convention Secretariat in July 2012 and included a work plan that is being implemented by one of its European Topic Centres (actually ETC/ULS) represented by the University of Malaga (UMA)



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→ identification and protection of natural forests, with a special focus on virgin forests

Since 2014, EEA and ETC/ULS support the Forest WG of the Carpathian Convention in setting the basis to locate, monitor, and prioritise virgin and HNV forest areas:

- Developing Carpathian-wide indicators supporting sustainable management efforts
- Support in the virgin forest inventory for better conservation
- Develop an Integrated Data platform to host data

# Timeline

EEA and SCC signed a cooperation agreement (WG on Forest for the implementation of the protocol on sustainable forest management)

2012

2014

Definition and delimitation of a study area (KEO), collection of available datasets to populate a virgin forest inventory

2015

Gathering relevant available datasets, indicators from the Parties to support the identification of virgin forests

2016

Development of regional indicators based on the EEA HNV forest indicator

2017

Creation and publication of a first Inventory of Carpathians Virgin Forest (Member Parties data)

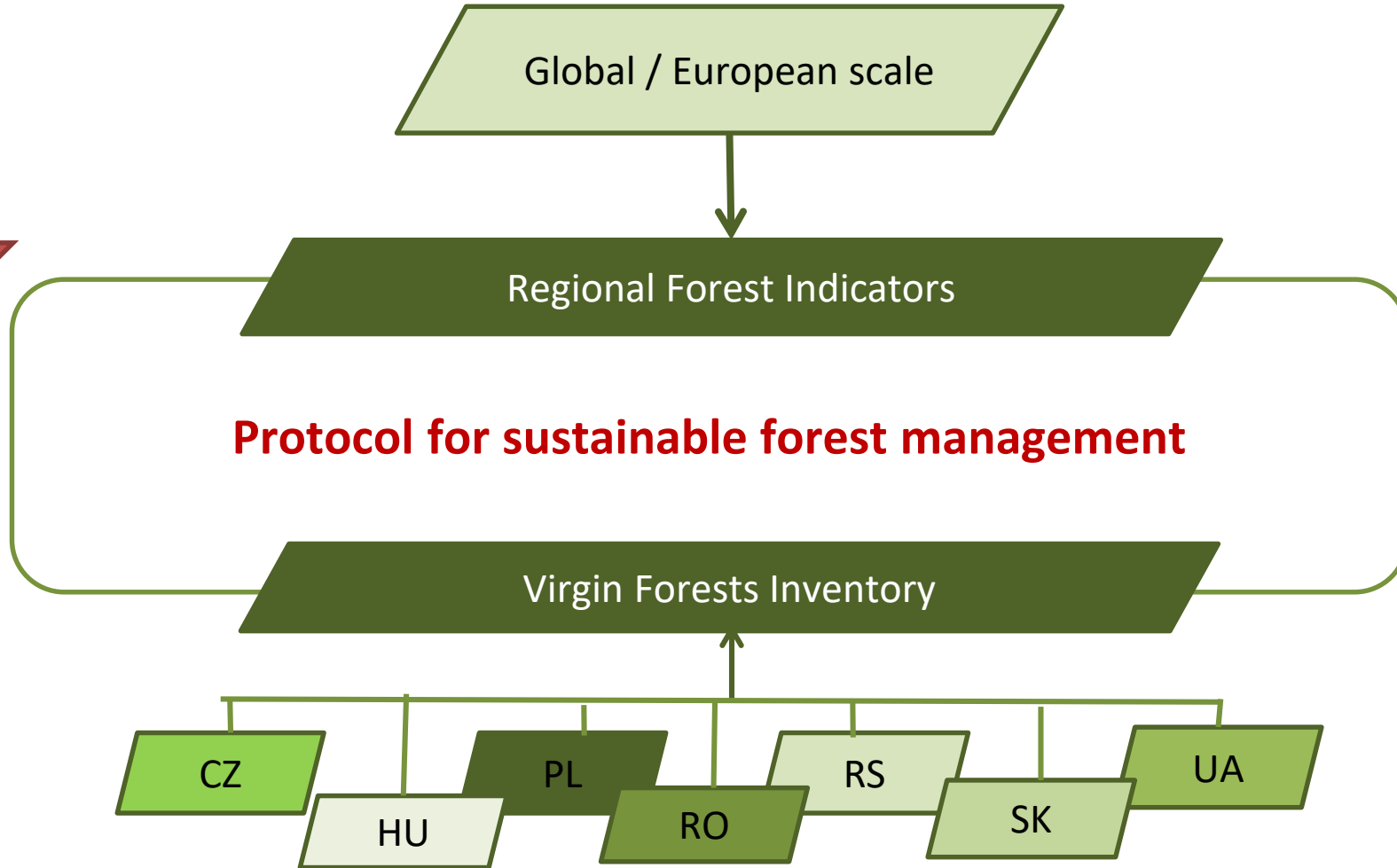
2018

Virgin Forest inventory improvement, Forest typology harmonization (EUNIS), Spatial and temporal dynamics of primary forests and their proximity  
Integrated data platform

# Approach

*Top-down*

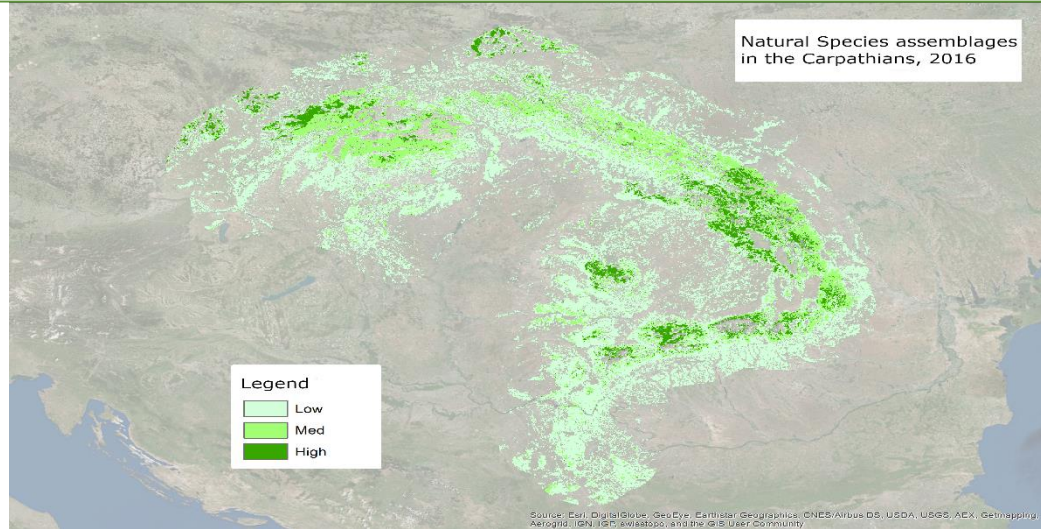
2014-2016



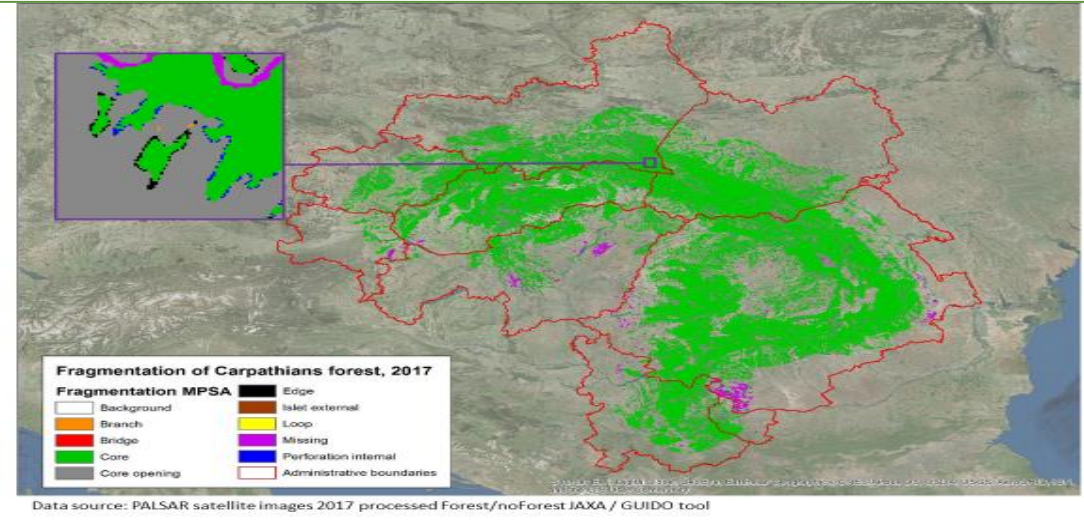
*Bottom-up*

# Sustainable Forest Indicators

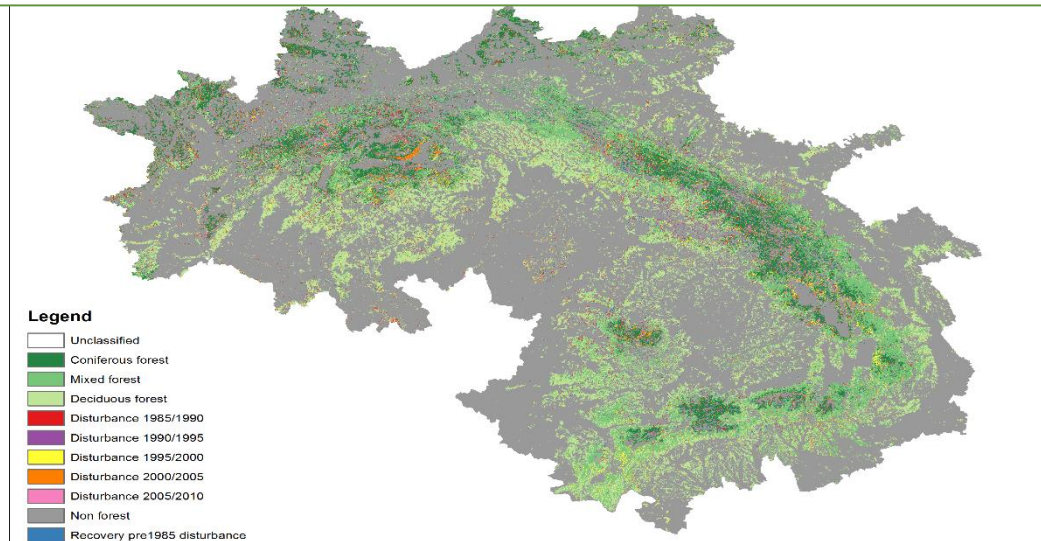
Natural Species assemblages



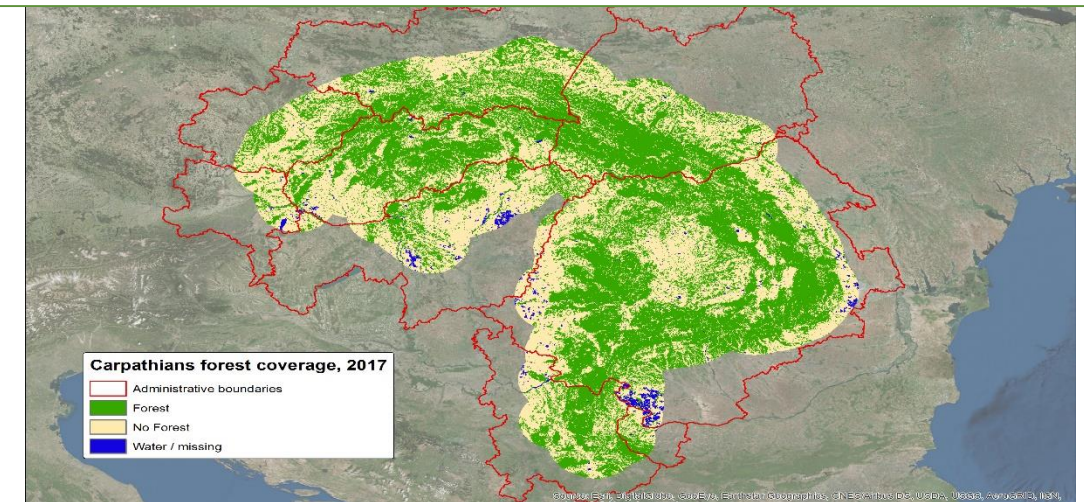
Fragmentation index (Guido, JRC)/ Palsar Forest/no Forest (2015-2017)



Human Disturbance map, Griffiths et al (2014)



Area/Shape of Forest plot = Land cover , Tree Cover Density  
CLC/HRL/PALSAR (2000-2012, 2012-2015, 2015-2017)



# Official Virgin Forest Inventory

Carpathian Convention Implementation Committee

Vienna, 17-19 December 2018



No.	Name of the virgin forest	Based on		Type of property	Latitude N	Longitude E	Altitude		(Administrative) Location							the level of the forests protection (fully protected, in progress, not protected)	
		Forest management plan, edition (year)	Study, edition				minimum	maximum	County	Owner, administrator	Production Unit	basic forest unit (compartment) u.a.	Type of forest: Czech site classification (Viewegh et al. 2003) / Habitat directive classification	Area (ha)	of which surfaces that do not meet the criterion of naturalness		
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
244	<b>Mionší</b>		archive documents, field survey, naturalness assessment	state	49.5333275N	18.6615444E	720	950	Frydek-Místek	Forests of the Czech Republic, state enterprise/Nature Conservation Agency of the Czech Republic			5B6 / 9130	131.01			National Nature Reserve
2107	<b>Travný</b>		archive documents, field survey, naturalness assessment	state	49.5598211N	18.4927431E	530	1203	Frydek-Místek	Forests of the Czech Republic, state enterprise/Nature Conservation Agency of the Czech Republic			5B6, 6F1, 5F1 / 9130	32.10			Nature Reserve
238	<b>Mazák</b>		archive documents, field survey, naturalness assessment	state	49.5252717N	18.4079039E	715	1315	Frydek-Místek	Forests of the Czech Republic, state enterprise/Nature Conservation Agency of the Czech Republic			6F1, 7S1 / 9130, 9410	61.46			National Nature Reserve
237	<b>Mazácký Grúnik</b>		archive documents, field survey, naturalness assessment	state	49.5299775N	18.4324972E	540	940	Frydek-Místek	Forests of the Czech Republic, state enterprise/Nature Conservation Agency of the Czech Republic			5F1, 5B6 / 9130	38.96			Nature Reserve
1883	<b>Smrk</b>		archive documents, field survey, naturalness assessment	state	49.5010147N	18.3646803E	900	1276	Frydek-Místek	Forests of the Czech Republic, state enterprise/Nature Conservation Agency of the Czech Republic			7K2, 7S1, 7Z4, 6F1, 6S1 / 9410, 9130	81.14			Nature Reserve

## Physical features

Name  
Geolocation  
Altitude

## Management features

Year of management plan  
Type of property  
Ownership  
Level of protection  
Area  
Basic forest unit

## Vegetation features

Forest type

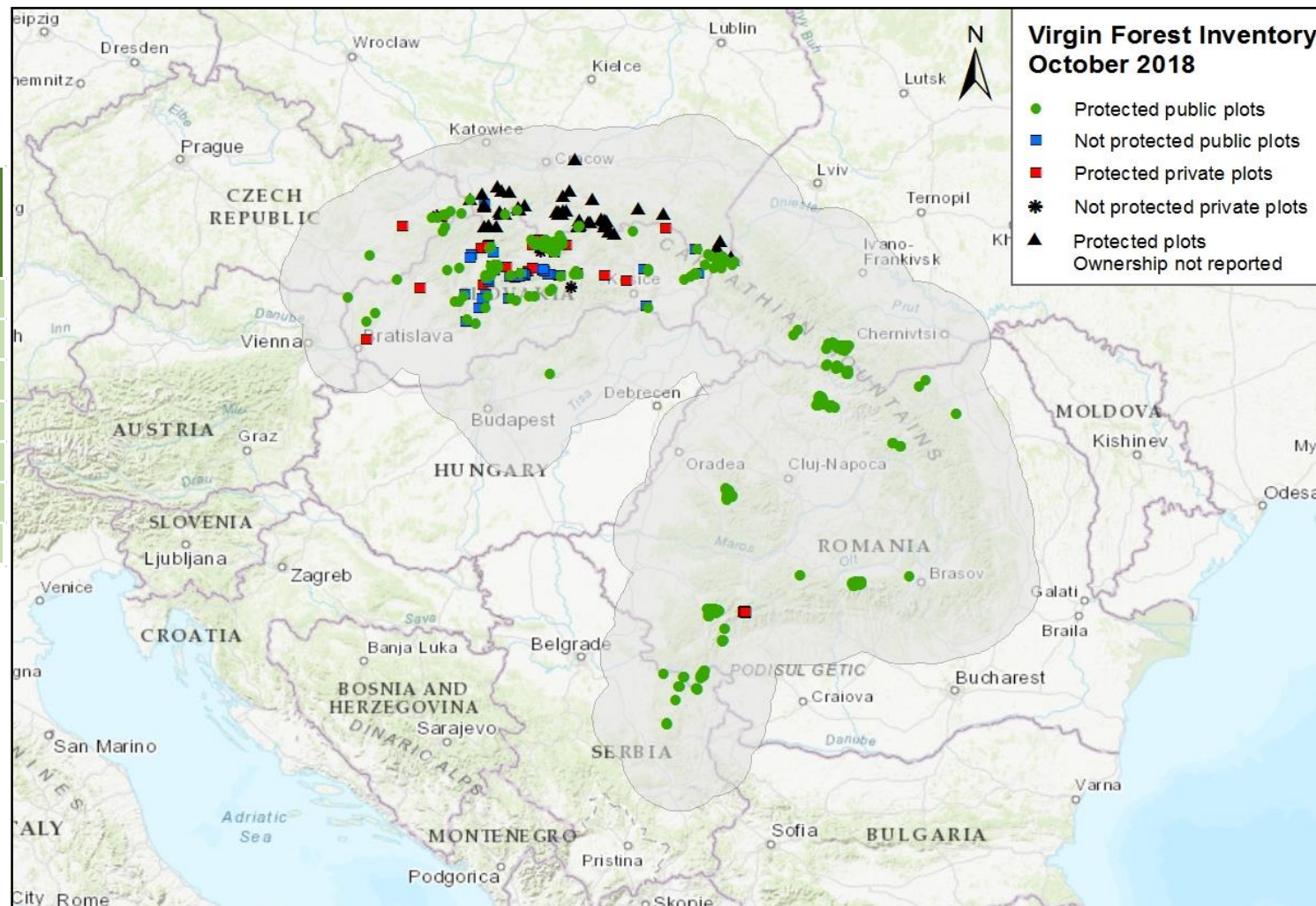
# Virgin Forest Inventory: Outlook

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Vienna, 17-19 December 2018



Country	Number of Plots	Area [ha]	% Protected areas	% Private property
CZ	15	855	93,6	21,5
HU	1	43	100	0,0
PL	57	9098	99,9	0,6 *
RO	515	5916	100	3,2
RS	49	1902	100	0,0
SK	123	8951	81,3	9,2
UA	39	16120	100	0,0

\* Ownership not reported for 55% of the area



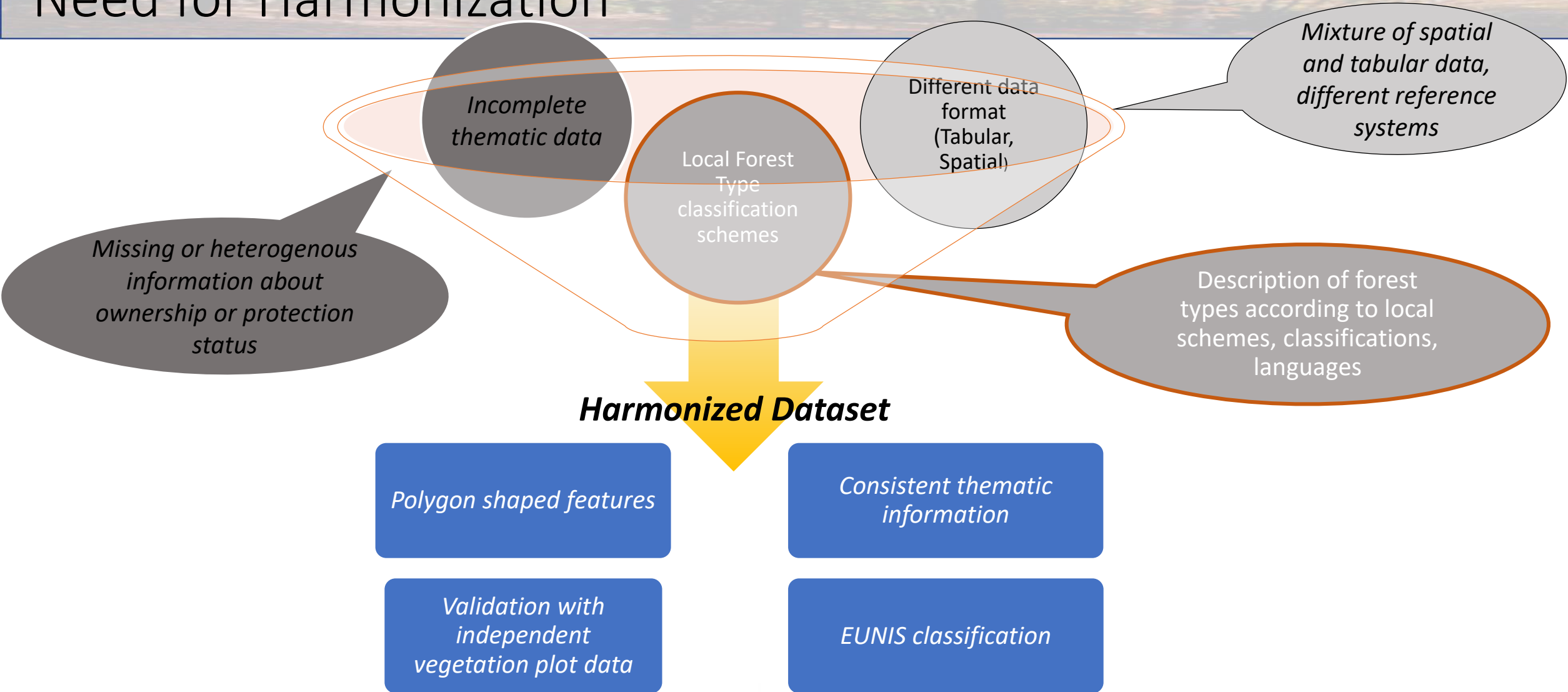
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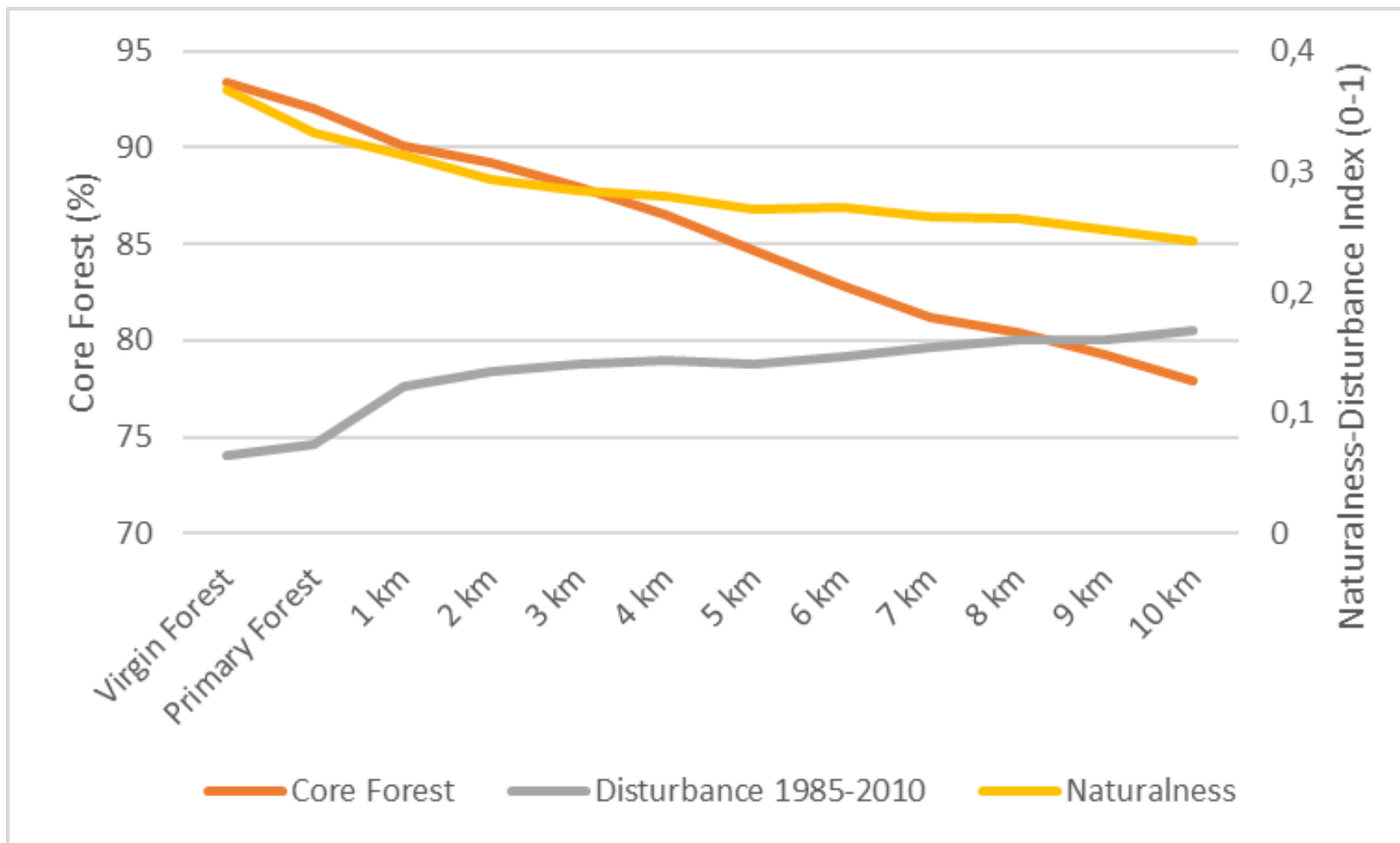


# Virgin Forest Inventory: Need for Harmonization



# Spatial and temporal trends of Sustainable Forest Indicators

Carpathian Convention Implementation Committee  
Vienna, 17-19 December 2018



# Carpathian Web Portal

Carpathian Convention Implementation Committee  
Vienna, 17-19 December 2018



**Virgin forest inventory of the Carpathians** EEA - Carpathian Convention cooperation framework

Search location

**Description:**  
The map is reflecting the location (point) of the last virgin forests identified by each Carpathians Convention Member, namely Czech Republic, Hungary, Romania, Poland, Serbia, Slovakia, and Ukraine. An additional layer is showing the quasi virgin forest collected in Romania.  
The dataset behind the map is based on the tabular input data received from the Convention Member Parties. Each point is indicating the location, the name of the specific forest area and the country which it belongs. Only the input inside the area of study (Carpathian Environment Outlook - KEO) were considered. Additional information was collected, but its standardization and completeness is still on progress.

**Access and Use Constraints:**  
This dataset is created in the agreement framework between the Carpathian Convention Secretariat, the Environmental European Agency (EEA) and the European Topic Centre on Urban, Land, and Soil Systems (ETC-ULS) on supporting the Forest working group.  
This map is provided for general information purposes only, original data belongs to the Member Parties of the Carpathian Convention.

EEA

- Online visualization tool for Carpathian forests
- Localisation of Virgin forest location,
- Based on open standards, published through EEA servers
- Free Access
- Relevant indicators for visual comparison



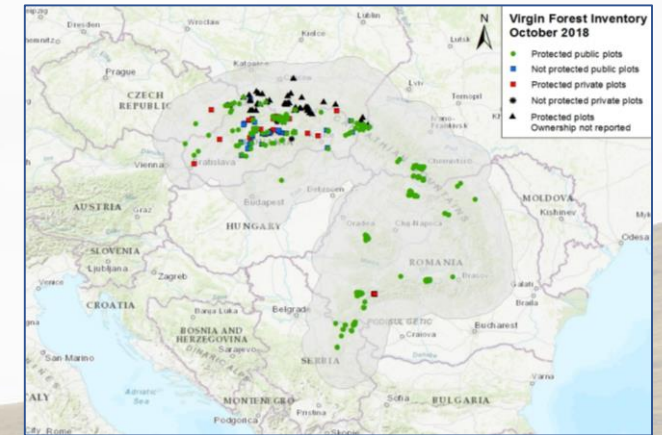
# Conclusions

Only **5.3%** of the sites included in the inventory are privately owned and less than 2% are mixed.

The available information is mostly in areas under N2000 regulation

***Are there unreported private virgin forests ?***

***Are there unreported unprotected virgin forests ?***



## Romania

Country: Over 41,000 Ha identified, of which 9000 already included in the national catalogue (WWF, 10/2018)

2889 Ha (PIN-MATRI)

Quasi-Virgin Forest: 655 Ha

Ukraine Virgin Forest = 48000 Ha (WWF)

***Do we need to update the baseline data ?***

SCC-EEA-ETC/ULS continued efforts on identification and protection, data integration of Carpathians forest in a European framework

- Finalization of the Harmonization and Validation of the Virgin Forest Inventory

- Publication of v2019 of the Virgin Forest Inventory
- Agreement on definition of “protected areas”
- Extension of the inventory also considering other degrees of naturalness ?

Country	Forest Type Harmonization	Tabular Data	Legend
CZ	✓	✓	✓ Complete
HU	✓	✓	✓ Partial
PL	✓	✓	✗ None
RO	✗	✗	
RS	✗	✗	
SK	✓	✓	
UA	✗	✓	

- Analysis of Spatial and temporal trends of indicators
- Validation of the forest cover change products



**Thank you for your attention!**

**Marco Trombetti**

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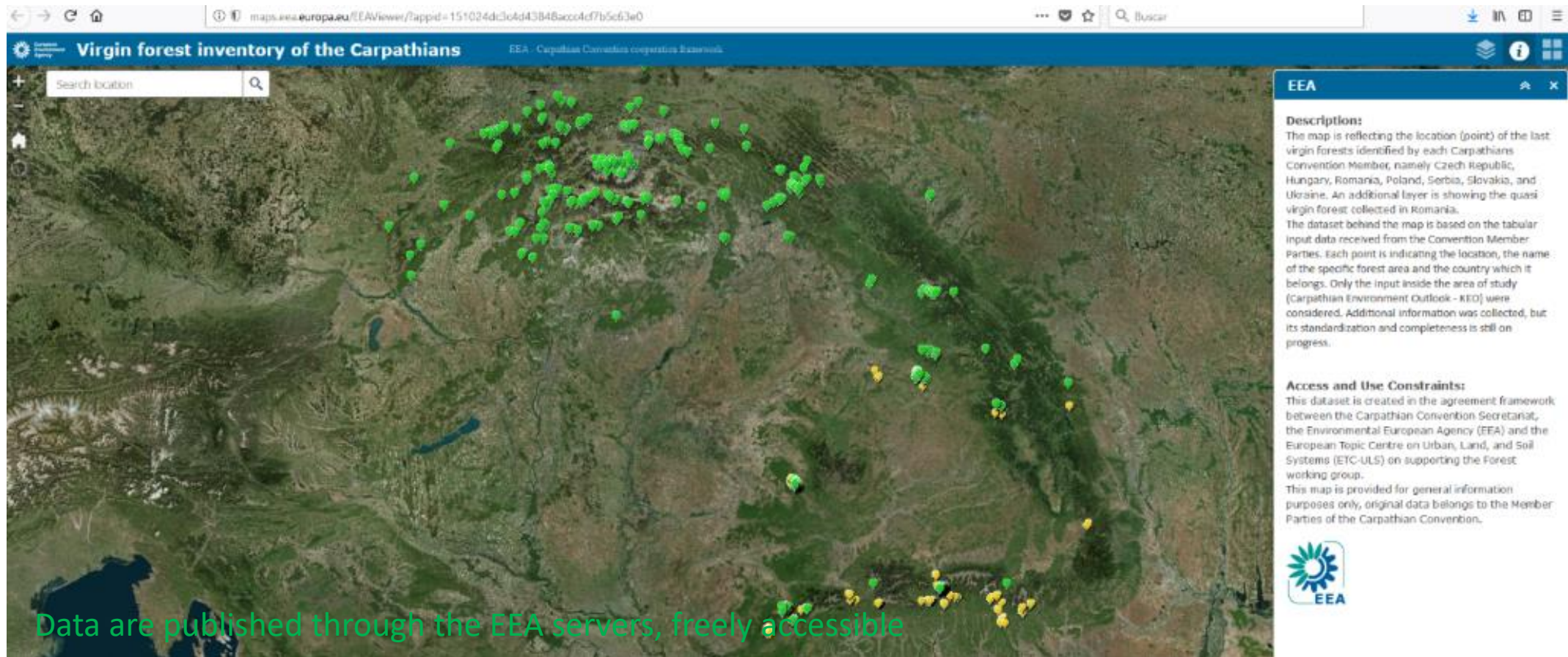


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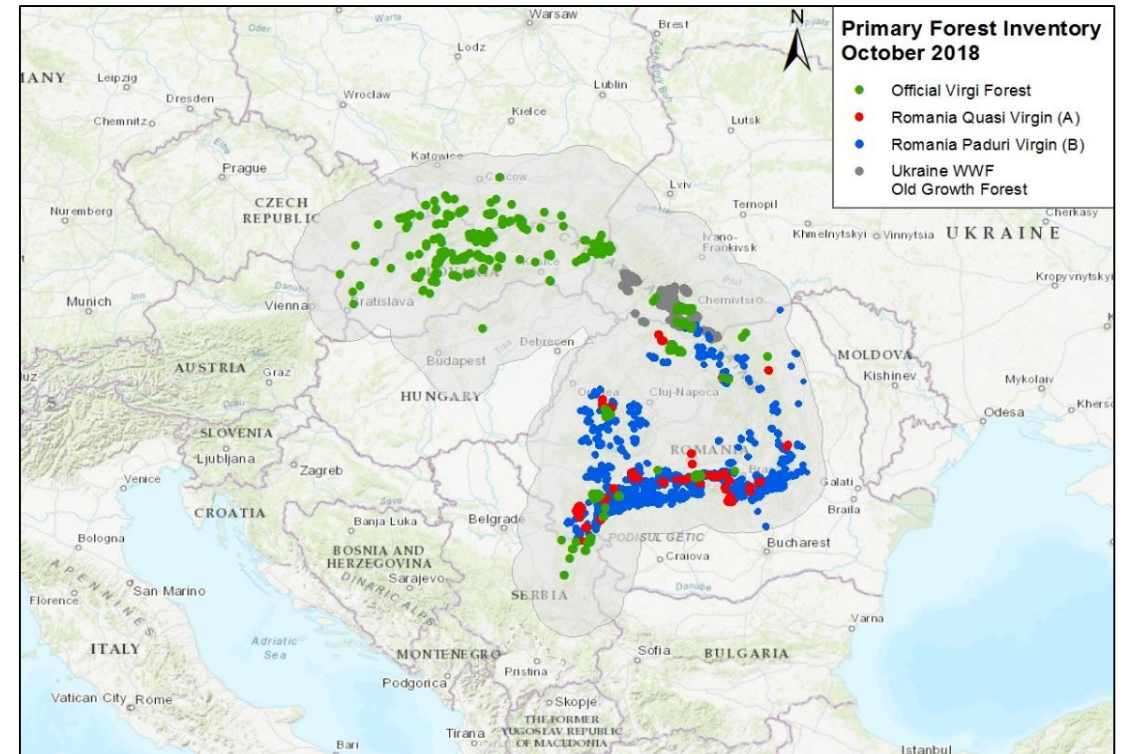
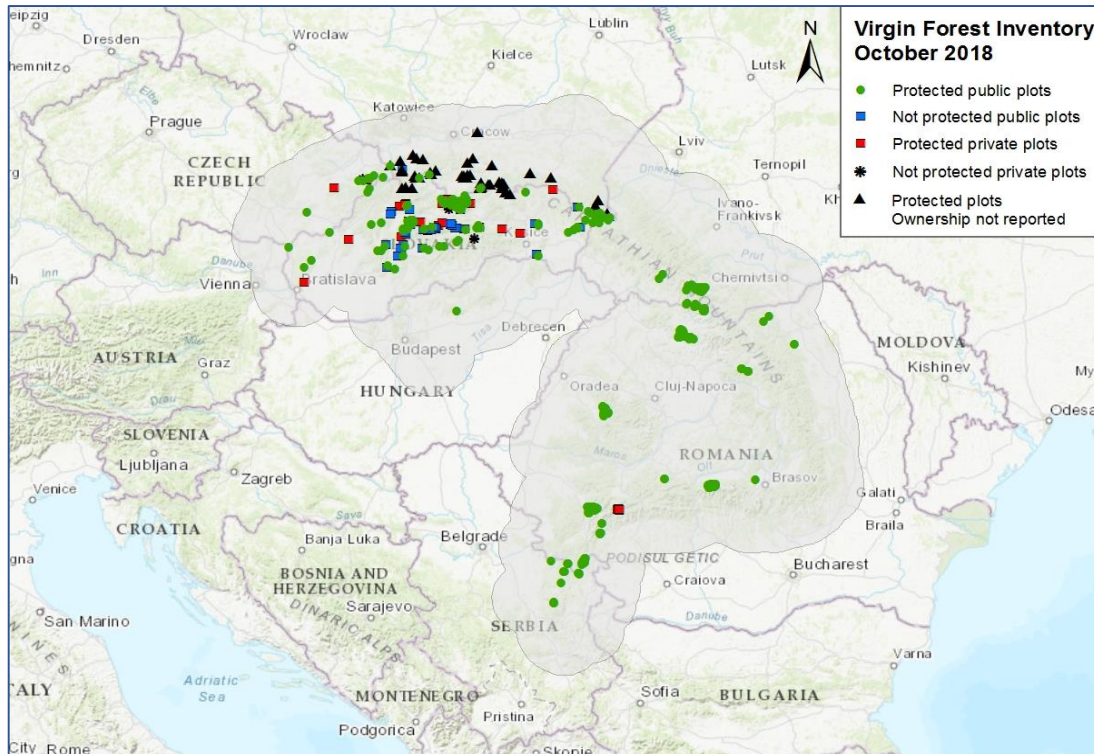
# Carpathians web portal



[Virgin Forest Inventory](#)

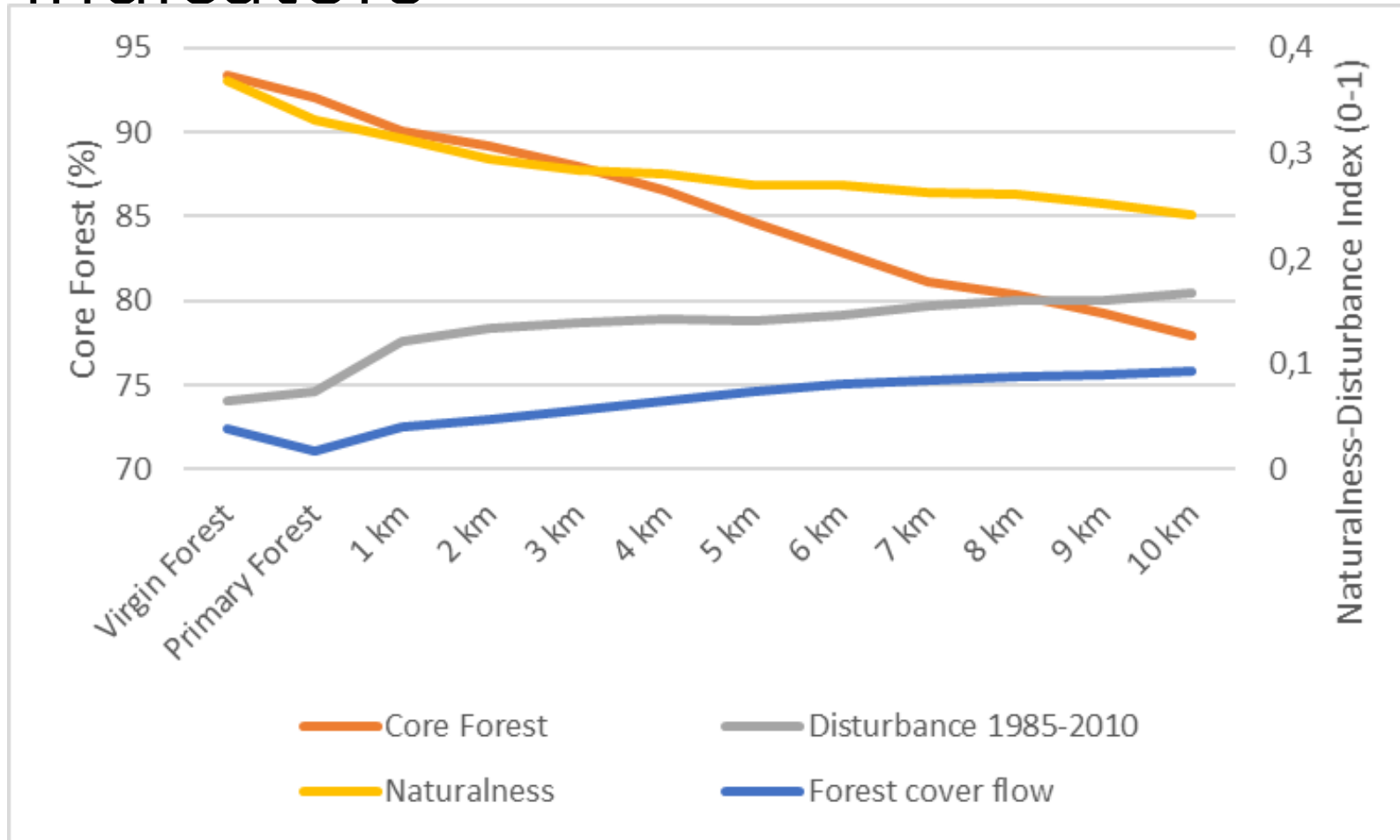
[Administrative boundaries](#)

# Primary Forest Inventory: Outlook





# Spatial and temporal trend of sustainable forest indicators



# Harmonization of the Forest Type Classification

Carpathian Convention Implementation Committee  
 Vienna, 17-18 December 2019



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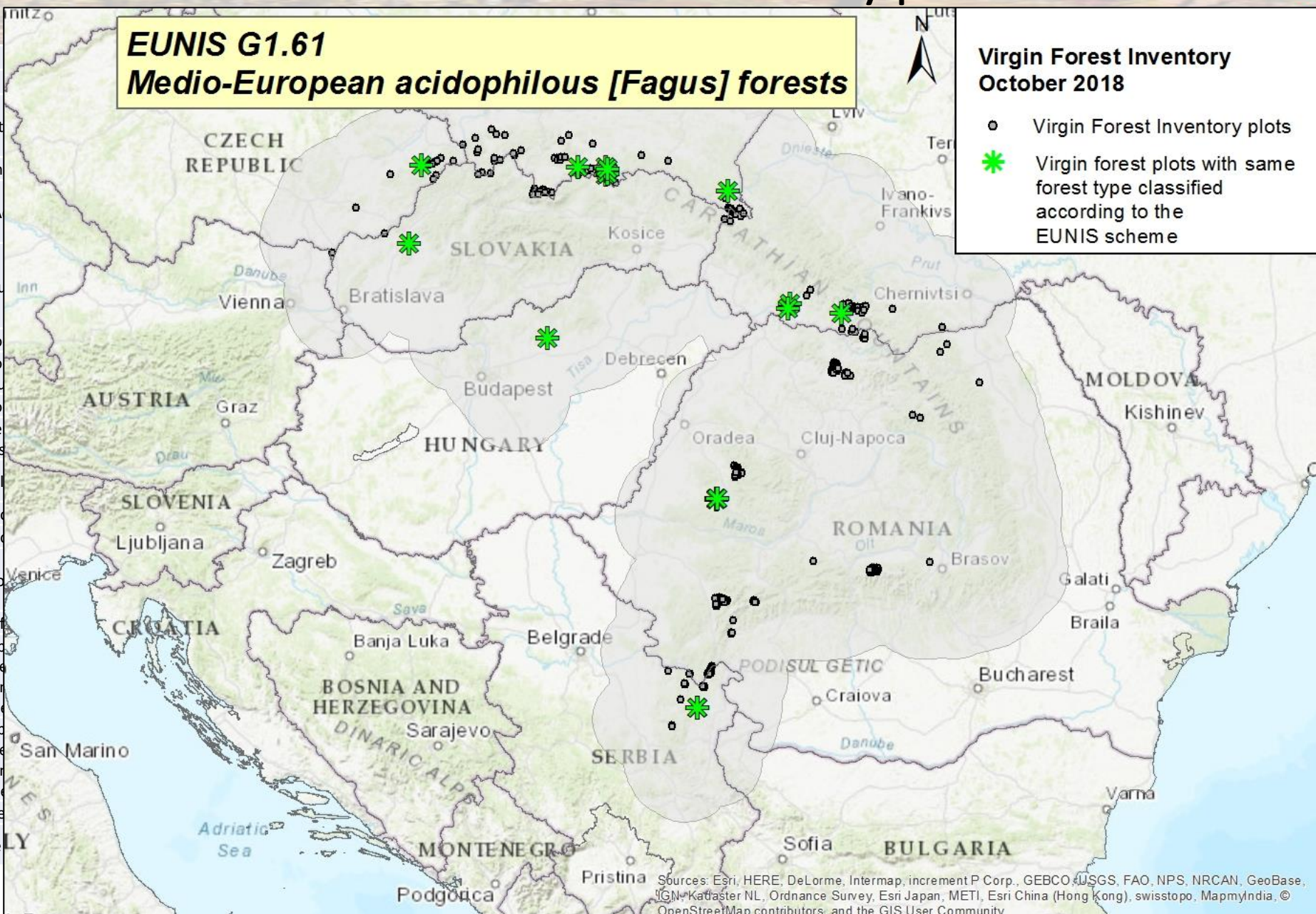
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 ine.

FT	
2.1	Carpat
3.1	Therm
4	Tilio-A
5.1	Asperu
5.2	Luzulo
5.3	Medio
5.4	Medio
6.1	Weste
6.2	Relict
7.2	Bog w
7.3	Bog w
7.4	Alluvio
8	Abies f
9.1	Acidop
9.2	Acidop
9.3	Subme
9.4	Alpine

**EUNIS G1.61**  
**Medio-European acidophilous [Fagus] forests**

**Virgin Forest Inventory**  
**October 2018**

- Virgin Forest Inventory plots
- ★ Virgin forest plots with same forest type classified according to the EUNIS scheme



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

# Conclusions

The first inventory on virgin forests, validated by the Carpathian Countries, covers the entire Carpathian region and may be an important tool to ensure forest protection and strengthen awareness of these forests at both the international and regional levels.

The forest indicators developed by GIS and RS technologies are powerful tools for supporting initiatives on identification, protection and management of forest resources at regional and European scale. Carpathian implementation is ongoing.....

DATA PLATFORM, central infrastructure to allow the sharing of wide-Carpathians data as now hosting the virgin forest inventory, administrative boundaries, then integration of relevant forest related indicators, potential virgin forest collection by additional studies;