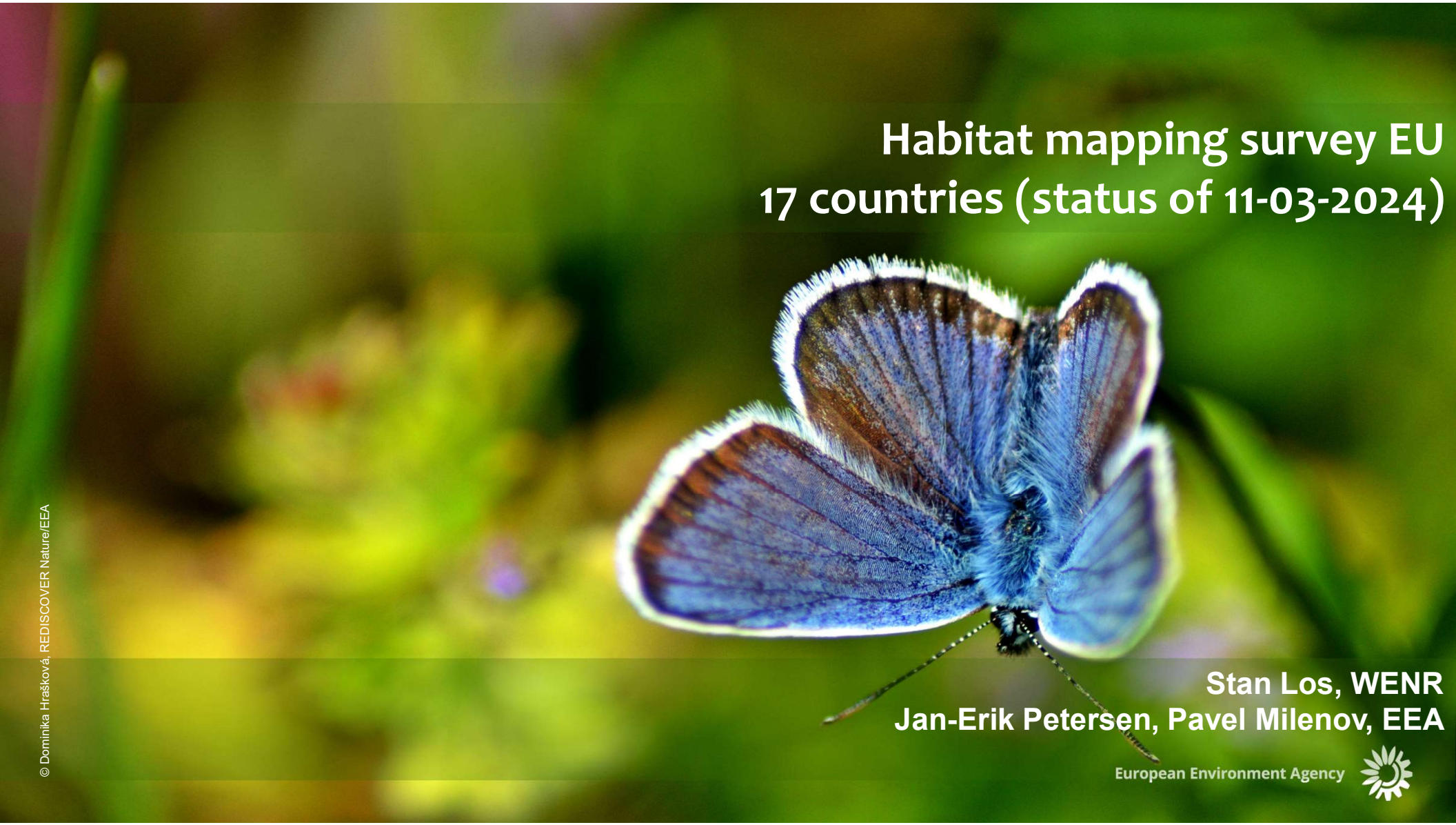


Habitat mapping survey EU
17 countries (status of 11-03-2024)

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European Environment Agency

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Country engagement

- Countries that provided answers:

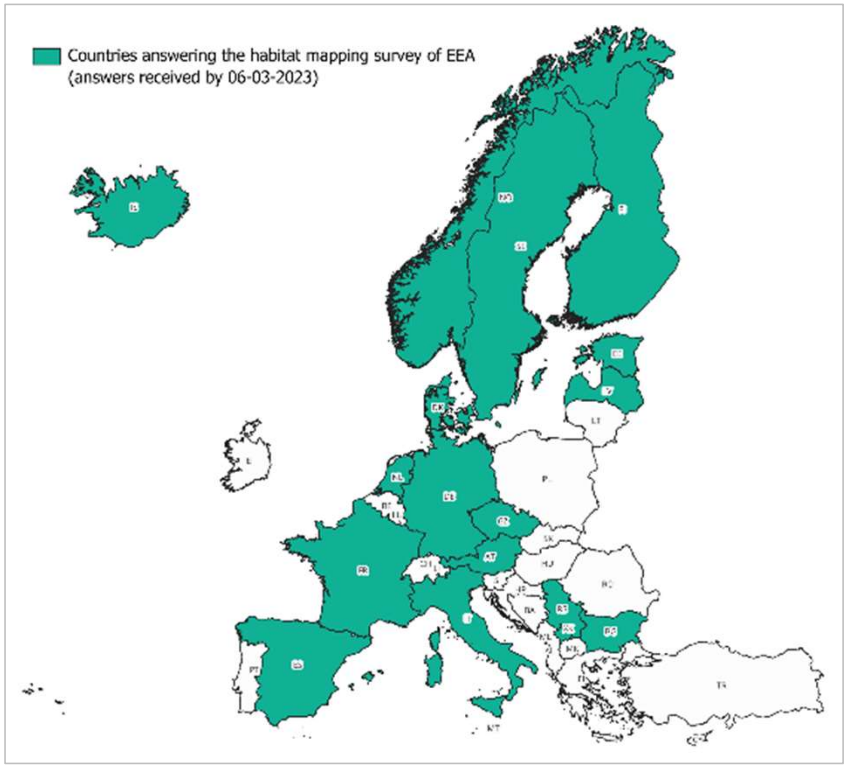
1st round: 17

2nd round: 8 (out of the 17)

- Countries that provided updated information:

AT, BG, CZ, FR, IT, NL, RS, SE

(Austria, Belgium, Chez Republic, France, Italy, Netherlands, Serbia, Sweden)



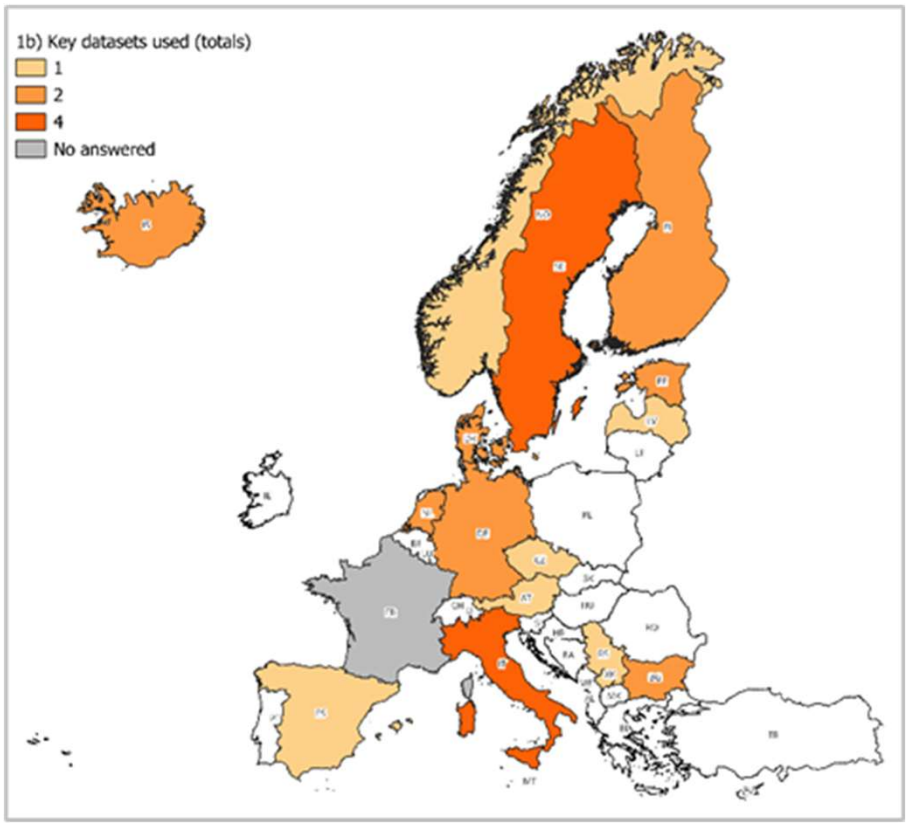
Target responders were the local experts directly engaged in habitat mapping

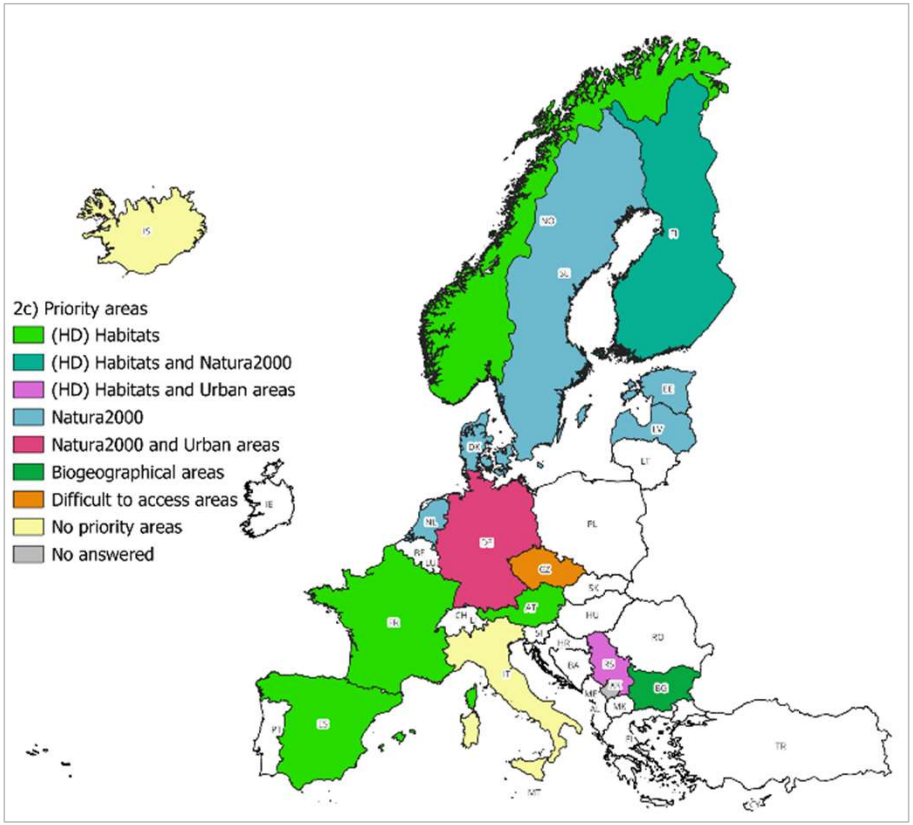
High value dataset on habitats available in INSPIRE portal were also considered in a separate inventory

Conducted by: EEA with support from ETC_BE and CREAF

Survey results compiled in geospatial datasets

- 23 questions in total (grouped in 6 sections)
- Raw data collected is much more detailed





1) Current (ie last 10 years) approach to habitat mapping

a) Which are the most significant methods (in terms of area/share of habitats) used in last 10 years?

- Countries can have multiple methods (also in other slides)

Methods	Total number	Countries
Field Mapping/ survey mapping	7	AT, DK, EE, XK, LV, ES, CZ
Habitat mapping with Land cover maps or other maps	4	BG, EE, IT, RS
Plot based mapping	-	-
Field mapping with support of aerial photographs	6	CZ, DE, IT, NL, NO, SE
Field mapping with support of satellite data	1	IS
Machine Learning and GIS techniques	1	SE
Not answered	1	FR

b) Which are the key current data sets for habitat mapping (incl. reference, website)

Key datasets	Total number	Countries
Habitat Directive/ Vegetation Databases	4	AT, LV, NL, NO
Field survey data	7	BG, DK, FI, IS, IT, NL, SE, CZ
GIS Polygon-based dataset	2	CZ, XK
Orthophotos	5	DK, EE, DE, IT, SE
Satellite data	4	(DE), IS, IT, SE
Soil, Forest, Water, Land Cover databases	7	RS, IT, FI, EE, BG, ES, SE
Not answered	1	FR

c) Do you have a national catalogue of habitats used for mapping? Reference / website?

Answer	Total number	Countries
Yes	13	AT, BG, CZ, DK, FR, IS, IT, XK, LV, NL, NO, ES, SE
Using existing other catalogues/databases	2	EE, RS
No	1	RS
Almost	2	DE, SE
Not answered	1	FI

2) Have you tried to modernise habitat mapping by combining a range of data in a GIS system (moving to 'digital mapping')

a) Do you combine habitat survey data with satellite or other data in a GIS system?

Answer	Total number	Countries
Yes	13	AT, BG, CZ, DK, FI, FR, DE, IS, IT, XK, NL, NO, SE
In some cases	2	LV, RS
Working on it	2	EE, ES
No	-	-
Not answered	-	-

b) What kind of other data are used? Satellite data, soil maps, climate data, other? Please list them.

Data	Total number	Countries
Satellite data	11	AT, DK, FI, FR, DE, IS, IT, NL, NO, ES, LV
Aerial photographs	11	AT, CZ, DK, EE, DE, IS, IT, NL, NO, RS, SE
Drone data	3	AT, IT, NO
LiDAR data	7	DK, FI, DE, NL, NO, SE, LV
DEM/DTM	4	FI, DE, IS, IT
Topographic/geological maps	8	FI, FR, DE, IS, IT, RS, ES, SE
Hydrological maps	1	IS
Species data/maps	1	BG
Climate data/maps	4	CZ, FI, FR, RS
Soil data/maps	8	DK, EE, FI, FR, NO, RS, SE, LV
Forest data/maps	5	CZ, EE, IS, IT, RS
Vegetation data/maps	6	EE, IS, IT, NL, RS, ES
Not specified	1	XK
Not answered	-	-

c) Which areas have the priority for this method? (e.g. Natura 2000 network, urban areas, wetlands...)

Priority areas	Total number	Countries
(HD) Habitats	6	AT, FI, FR, NO, RS, ES
Natura2000	7	DK, EE, FI, DE, LV, NL, SE
Biogeographical areas	1	BG
Difficult to access areas	1	CZ
Urban areas	2	DE, RS
No priority areas	2	IS, IT
Not answered	1	XK

d) How far are you? E.g. pilot project area/ meth. test for certain habitat types / full national coverage

Development progress	Total number	Countries
National coverage/ working	6	FI, IS, IT, NL, SE, FR
Testing phase/ case studies/samples	10	AT, BG, CZ, DK, DE, LV, NO, RS, ES, SE
Beginning phase	2	EE, XK
Planning phase	-	-
Not answered	-	-

3) For use of satellite data: methods and kind of data utilised

a) Which EU habitat classification is used for mapping (EUNIS, Annex 1, other)?

EU habitats	Total number	Countries
Annex 1	13	AT, BG, CZ, DK, EE, IT, XK, LV, NL, NO, ES, SE, (FR)
EUNIS	6	ES, (FR), IS, IT, NL, RS
CORINE	1	IT
Natura2000	2	FI, DE
MAES	1	IT
None	1	FR
Not answered	-	-

b) Are there crosswalk tables to connect a national classification to EUNIS or MAES / other?

Crosswalk tables	Total number	Countries
Yes	10	CZ, EE, FI, FR, IT, IS, NL, NO, ES, SE,
Some	4	BG, IT, XK, NL
Yes, but not used	1	AT
No	3	DK, DE, LV
No need	1	RS
Not answered	-	-

c) What products do you use? E.g. Sentinel 1, Copernicus HRL products etc.

Products	Total number	Countries
Sentinel 1	8	AT, DK, FI, IT, XK, NO, ES, SE
Sentinel 2	11	EE, DK, FI, FR, DE, IT, LV, NL, NO, ES, SE
Landsat 8 (and older)	3	FI, IS, SE
RapidEye	1	IS
Spot5 (and earlier)	2	IS, SE
SuperView	1	NL
WorldView	1	NO
PlanetScope	1	DE
HyMap	1	DE
Copernicus HRL	2	IT, XK
Copernicus HR-VPP	3	AT, DK, NL
Copernicus SWF	1	DE
LiDAR	4	LV, NL, NO, SE
DEM	1	SE
Moisture maps	1	SE
Airborne Optical	3	NL, NO, SE
Drones	1	NO
None	3	BG, CZ, RS
Not answered	-	-

d) For what share (in %) of your country are satellite data used?

Share of sat data used	Total number	Countries
0%	1	NL
~10%	2	AT, LV
100%	4	DK, FR, IS, RS
Varying	5	FI, NO, DE, IT, SE
n.a./can't say for sure	4	BG, CZ, EE, XK
Not answered	1	ES

e) What is the spatial resolution (i.e. 1: 5000, 10 m raster etc.) and form (raster or vector based) of data?

Spatial Resolution	Total number	Countries
10m raster	11	AT, BG, DE, DK, EE, FI, IS, IT, NL, NO, SE
20m raster	1	LV
100m raster	2	(RS), XK
0,1 aerial photos	1	XK
0,2 m aerial photos	2	DK, DE
0,5m aerial photos	1	IT
1:5000 vector map	1	BG
1:10000 vector map	2	EE, DE
1:20000 vector map	1	NL
1:25000 vector map	2	IS, FR
n.a.	1	CZ
Not answered	1	ES

f) Do you combine satellite data with airborne/UAV data? What kind of sensors/resolutions?

Combine data	Total number	Countries
Sat with aerial	2	AT, FR
Sat with drone	1	IT
Sat with LiDAR	1	SE
Aerial with LiDAR	4	DK, EE, FI, LV
Aerial with field survey	2	NL, RS
Drone with field survey	1	DE
No	1	IS
Cannot answer	1	BG
Yes	1	XK
n.a.	2	CZ, NO
Not answered	1	ES

4) Quality assurance

a) What ground truth data is used for validation?

Ground truth data	Total number	Countries
Field observations/ survey monitoring	13	AT, DK, EE, FI, DE, IS, IT, XK, LV, NL, NO, ES, SE
Satellite image interpretation	1	IS
Aerial photographs interpretation	5	FI, IT, XK, RS, SE
UAV data analysis	3	IS, DE, IT
Existing maps	4	AT, ES, IT, NO
Expert knowledge	1	FR
Gridded data from sites	1	BG
n.a.	1	CZ
Not answered	-	-

b) Do you use a (stratified) ground survey for validation?

Validation	Total number	Countries
Yes	8	AT, BG, DK, IS, IT, XK, NO, SE
Sometimes (if needed)	4	EE, FI, DE, ES
Outsourced to experts	1	LV
Not yet, but planned	1	FR
n.a.	3	CZ, NL, RS
Not answered	-	-

c) Any particular challenges in validating satellite data for habitat mapping?

Challenges	Total number	Countries
Many	2	EE, LV
Habitat state/condition and management activities	2	AT, BG
Lack of ground truth data	1	FI
Missing national public databases/ National collaboration	1	NO
Price	1	NO
Small scale habitat classification	1	DK
Remote habitats	1	FR
Clear differences between certain habitats	1	IS
Time difference between reference data/year and remote sensing data	2	DE, IT
Missing data	1	XK
Expert knowledge	1	DE
Use of satellite data	1	CZ
Mapping of riverine water bodies below certain width	1	IT
Geolocation of training data	1	NL
Clouds in timeseries	1	SE
n.a.	1	NL
Cannot tell	1	RS
No	1	SE
Not answered	1	ES

5) Perspective

a) Do you assume your work is a one-off or regular product?

One-off work	Total number	Countries
One-off	3	AT, FI, XK
In between	5	IS, IT, NO, ES, SE
Regular	11	CZ, DK, EE, FI, FR, DE, IT, LV, NL, RS, SE
Not answered	1	BG

b) Do you assume others can use the product? E.g. open source and accessible dataset

Open source	Total number	Countries
Yes	10	CZ, EE, FI, FR, DE, IS, IT, XK, ES, SE
Yes, but not openly available. Need to contact for product use	4	IT, LV, NL, RS
Mostly	2	AT, DK
Developing	2	NO, NL
National scale	1	DK
Not answered	1	BG

c) What are key bottle necks to move forward: data, methods, resources, or?

Key bottelnecks	Total number	Countries
Financial resources	10	AT, CZ, FI, IS, IT, XK, LV, NL, RS, SE
Human resources	5	CZ, EE, FI, DE, IT
Methods/ models	9	AT, CZ, DK, FR, IS, IT, LV, NL, SE
Data	9	DK, EE, FI, FR, IT, LV, NL, NO, ES
Time	1	EE
Not answered	1	BG

6) Recommendations / other comments

a) Have you tried methods or technologies which are not working , or not well? Please name them.

Not working methods	Total number	Countries
Machine Learning dependent on training data	1	DK
Satellite-based habitat identification	1	CZ
Identification of (certain) habitats	3	LV, NL,SE
Use of UAVs	1	FI
No	1	AT, XK
Cannot tell	1	RS
n.a.	1	NO
Not answered	7	BG, EE, FR, DE, IS, IT, ES

b) Any recommendations for use of digital methods in habitat mapping?

Recommendations	Total number	Countries
combination of aerial image and nDSM	1	AT
Use of AI if data is available	1	DK
Use of satellite data	1	FI
Use of LiDAR data	2	LV, SE
Extensive field data	2	FI, NL
Need of experts for field data	4	IT, XK, NL, NO
Early contact with end-user	1	SE
Use of RS methods	1	CZ
No	1	RS
Not answered	6	BG, EE, FR, DE, IS, ES

c) Any recommendations for use of satellite data in habitat mapping?

Recommendations	Total number	Countries
Time series	3	DK, FI, SE
Classifications	1	FI
Ground truth data	2	FI, LV
More satellite data	1	IT
Collaboration of experts	2	IT, NO
Use the appropriate training data and also diverse satellite data as predictors	1	NL
Common web based information system for habitat mapping	1	BG
Using the SLC data	1	XK
No	2	AT, RS
Not appropriate for all cases and scales	1	CZ
Not answered	5	EE, FR, DE, IS,ES

d) Other comments / web links/contact persons

Other comments	Total number	Countries
Role of satellite data for habitat mapping needs to be defined	1	FI
n.a.	3	CZ, LV, SE
National Nature data ('NKK') is validated via field visits, so it can be used as in-situ validation data for RS data	1	SE
No other comments	1	NL
situ-data can be asked, if we get more accurate info about what exactly is needed	1	RS
References to publications	1	IT
Not answered	10	AT, BG, DK, EE, FR, DE, IS, XK,NO, ES