

Selection of suitable case studies for testing the methodology for mapping and assessment of ecosystem services

Milestone 23

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Enhancing ecosystem services mapping for policy and decision making



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Summary

In the ESMERALDA project, the objective of Work Package 5 (WP5) is to identify case studies and test how the proposed methods for mapping and assessment of ecosystem services may be used to inform policy and decision-making processes. Testing will enable the refinement of the methods, and the final development of guidelines to support users in the application of the methods to deliver under Action 5 of the EU Biodiversity Strategy. Testing activities will be conducted through a series of workshops in different European contexts, each addressing a different set of themes and regions.

The Milestone report MS23 presents the process through which the ESMERALDA project has identified and selected case studies for testing the methods for ecosystem service mapping and assessment. This includes the definition of five selection parameters (A: Stage in ES mapping and assessment; B: Geographic region; C: Biome; D: Spatial scale; E: Theme), which were used for collecting available case studies from the ESMERALDA partners, as well as the selection of the case studies to be actually used in workshops.

Based on the above-mentioned selection parameters, we prepared an online questionnaire; hence, we collected 31 case studies from the ESMERALDA partners and 1 from an external partner. The selection of the case studies to be used in the project workshops was carried out by taking into account the need to cover different conditions across Europe (see above) and the scope of each workshop (as defined by the project's DoA), by including one case study proposed by hosting partners, and by assigning priority, whenever possible, to case studies proposed by partners with more person/months allocated to WP5.

1. Introduction

Milestone 23 (MS23) relates to work carried out in **"Task 5.1: Identification of case studies exemplifying different conditions, themes and geographical contexts"**. This is the first task in **WP5** whose aim is to identify case studies and demonstrate how the proposed methods for mapping and assessment of ecosystem services may be used to inform policy and decision-making processes. In WP5, testing is also a way of refining the methods (WP3 and WP4), throughout the project.

Therefore, Task 5.1 consists in identifying and selecting case studies in such a way that they are representative of:

- 1. The variety of existing conditions across the EU, in terms of data availability, spatial scale, levels of implementation of EU2020 targets, and expertise and experience in ES mapping and assessment;
- 2. The geographical regions and biomes of the entire EU, including marine areas and the outermost regions;
- 3. The variety of cross-EU themes relevant for ecosystem services, such as Common Agricultural Policy, Green Infrastructure, Natura2000 network, forestry strategy, water policy, energy, business and industry sectors, and health;
- 4. The variety of policy and planning processes that can be used to mainstream ecosystem services in real-life decisions, such as spatial and land use planning, water resource management, flooding under the EU climate adaptation action, energy policy, strategic environmental assessment, protected area planning.

Operatively, testing will be conducted through two sets of workshops (WS), hosted each time by a different ESMERALDA partner. A first set of three workshops (WS3, WS4, and WS5) will test the suitability of the first version of the methods for mapping and assessing ecosystem services (Task 5.2). More specifically, WS3 will test whether the methods have the flexibility required for their application in a variety of geographical contexts and conditions, WS4 will address different themes, and WS5 will address specific biomes and areas, including marine areas and the outermost EU regions.

A second set of two workshops (WS7 and WS8)¹ will illustrate how the final methods can be used to guide real-life policy- and decision-making, across Europe and across themes (Task 5.3). In particular, WS8 will focus on the application of the methods by business and citizens.

In the first set (WS3, WS4, and WS5), each workshop will involve three case studies, while in the second set (WS7 and WS8) the number of case studies for each workshop is two. This is mainly to allow a deeper analysis of the final methods. All the workshops will last 3 days, including 1 day excursion to a case study site, and will be attended by experts of the ESMERALDA consortium and advisory board, stakeholders of EU MS, and local experts.

2. Defining parameters for case study selection

In order to identify case studies that meet the requirements of the project seen above, we defined five main selection parameters, which are presented hereafter.

A. Stage in ES mapping and assessment

This reflects the status of EU Member States in regard to achieving the EU Biodiversity Strategy's Action 5 targets for mapping and assessment of ecosystems and their services. It is based on the

¹ For completeness, WP6 "Flexible methods for ES napping and assessment (final version)" taking place in 8/2017 in Bulgaria is a WP1, 3, 4 organised workshop and not part of WP5.

clustering of EU Member States according to their prerequisites and needs to perform ES mapping and assessment, carried out by WP2 (Deliverable 2.1). Accordingly, EU Member States are clustered into three groups, i.e. Beginners=Stage 1, Mid-level=Stage 2, and Front-runners=Stage 3 (**Table 1**).

Table 1: Clustering of EU Member States according to their prerequisites and needs to perform ESmapping and assessment (WP2 - Deliverable 2.1).

BEGINNERS=STAGE 1	MID-LEVEL=STAGE 2	FRONT-RUNNERS=STAGE 3							
Latvia (3)	Austria (1)	Belgium (1)							
Slovakia (0)	Bulgaria (2)	Finland (6)							
Croatia	Czech Republic (3)	Germany (3)							
Cyprus	Hungary (2+2)	Netherlands (3)							
Estonia	Italy (16)	Portugal (2)							
Greece	Malta (1)	Spain (3)							
Slovenia	Poland (3)	France							
	Romania (3)	Luxemburg							
	Sweden (0)	UK							
	Denmark								
	Ireland								
	Lithuania								
NB. Grayed are countries pro	oposing case studies, in bracket person/r	month in WP5							

B. Geographic regions

This is based on the definition of regions given by the European Union's official multilingual thesaurus (EuroVoc). EU Member States are divided in four regions, shown in **Table 2**.

Table 2: Definition of EU regions according to EuroVoc

l start and the	Eastern	Northern	Southern	Western
of encore the	Bulgaria	Estonia	Cyprus	Austria
۵۰ می افغان ا	Croatia	Latvia	Greece	Belgium
	Czech Republic	Lithuania	Italy	France
	Hungary	Denmark	Malta	Germany
	Poland	Finland	Portugal	Ireland
	Romania	Sweden	Spain	Luxembourg
	Slovakia			Netherlands
	Slovenia			United Kingdom
inter to the second of the				
http://eurovoc.europa.eu/drupa	1/?a=request&uri	=http://euro	voc.europa	eu/100277

In addition, we consider the following nine Outermost regions, i.e. regions that are geographically very distant from the European continent (**Table 3**)

 Table 3: Nine Outermost regions

- Guadeloupe, French Guiana, Martinique, La Réunion, Mayotte (5 French overseas departments)
- Saint-Martin (1 French overseas collectivity)
- Madeira and Azores (2 Portuguese autonomous regions)
- Canary Islands (1 Spanish autonomous community)

http://ec.europa.eu/regional_policy/en/policy/themes/outermost-regions/):

C. Biomes in EU

Following the ESMERALDA Glossary, we adopt the WWF classification of biomes, based on Olson et al. (2001). **Figure 1** shows the list of biomes in Continental Europe (4, 5, 6, 8, 11, and 12) and in the Outermost regions (1, 12, 13, and 14) as well as the spatial distribution of biomes in Continental Europe.

 Table 4 shows the biomes in each EU Member State, including the Outermost regions.





Table 4: Distribution of Biomes in EU-28 countries including Outermost regions (in red) (Olson et al 2001-2004)



* EU Member states with Outermost regions

D. Spatial scale

We adopt the following three spatial scales:

- National;
- Sub-national (i.e. NUTS 1, NUTS 2, and NUT 3: http://ec.europa.eu/eurostat/web/nuts);
- Local

E. Themes

We consider the following themes as being representative for current policy challenges in the EU: Nature conservation; Energy and Climate; Urban and spatial planning; Agriculture and forestry; Marine policy; Green Infrastructures, Natural risk; Business Industry and tourism. We assign the category "ES mapping / assessment study" to case study not specifically linked to a specific sector.

In addition, we consider whether case studies involved real-life policy or planning process. This is relevant for the second set of workshops, where we aim at testing the methods in the framework of an actual planning/decision-making process.

3. Collecting case studies

A. Preparing online questionnaire

Base on the parameter above, we designed an online questionnaire, hence submitted it to the ESMERALDA partners. Here priority was given to those members who had more person/month in WP5, starting from those hosting a workshop. **Figure 2** is a screenshot of the questionnaire.

CASE STUDY 1	Any other comment that can help us to better understand your case study sector?
A.1 please provide the name of the case study area: *	A.6a Was the case study part of a real-life policy or planning process? * o
A.2 Select country (specify relevant outermost region, if applicable) *	A.6b If Yes, please provide some details:
A.3 Spatial scale of the case study (see NUTS levels here <u>http://cc.europa.eu/eurostat/web/autt</u>): * o Sub-antonal (se NUTS 1, NUTS 2, and NUT 3) o Nutional A.4 What are the main ecosystem types present in the case study? *	A.7a Available material about the case study: * o C Nothing o C Documents (eg. papers, reports) not evailable on the web, but can be sent upon request. o C Documents (eg. papers, reports) vauilable on the web.
	4 7b If available place parts link or DOI.
A.5 Sectors addressed by the case study (more choices are possible) *	A.8 Working language
Climate	Specity sanguage to be used to interact with stakeholders, it different from chijusa.
○ Water	
Green Endstructure Green Endstructure Apriculture (creation Agricultural Policy) Common Agricultural Policy Maria policy Torurian Torurian Brains and andraty Forearty Health Urbarigned planning Other	A.9 Any other comment or additional detail that you would like to provide?

Figure 2: Screenshot of the online questionnaires for collecting case studies

B. Case studies proposed by partners

We received a total of 31 case studies from the 15 ESMERALDA partners, plus 1 case study from an external partner (CE SPECTRA), collaborating with CVGZ (see **Table 5**). All the three partners hosting the first set of three workshops (WS3, WS4, and WS5) have submitted at least one case study each. As for the second set of two workshops (WS7 and WS8), the Hungarian partner (REC and MTA OK) have not yet proposed a case study.

PARTNER	NAME	COUNTRY	SCALE	THEME	
CE SPECTRA*	Horský park	Slovakia	Local	MAES	
PLUS	Mondsee Catchment	Austria	Local	Energy and climate	
NIGGG-BAS	Central Balkan	Bulgaria	Local	Many themes	
NIGGG-BAS	Smolyan case study area	Bulgaria	Local	Many themes	
NIGGG-BAS	Ogosta basin	Bulgaria		MAES	
CVGZ	Pilot National Assessment of Ecosystem Services in the Czech Republic	Czech Republic	National	MAES	
CVGZ	Ecosystem Services Trade-offs Assessment in the Třeboň Basin UNESCO Biosphere Reserve	Czech Republic	Local	Nature conservation	
CVGZ	Pilot survey of grassland ecosystem services	Czech Republic	National	Nature conservation	
REC+MTA OK**	To be defined	Hungary			
UNITN	Trento ES-based adaptation to climate change	Italy	Local	Urban spatial planning; Climate & Energy	
BEF	Territorial waters and Exclusinve Economic Zone of Latvia	Latvia	National	Marine policy	
MCAST	Maltese Islands	Malta	Sub-national + National	Agriculture & forestry	
UPOZ	10 polish Large Urban Zones with more than 100.000 inhabitants as defined by the European Urban Atlas.	Poland	Local, Sub- national	Many themes	
UB	Lower Danube floodplain - Greaca area	Romania	Local	Nature conservation	
UB	Long term socio-ecological research site Braila Island	Romania	Sub-national	Nature conservation	
UB	Niraj and Tarnava-Mica rivers	Romania	Sub-national	Nature conservation	
Swedish EPA	dish EPA Alpine region - Sweden		Local, Sub- national	Business industry and tourism	
VITO	City of Antwerp	Belgium	Local	Green infrastructure; Urban/spatial planning	
VITO	Flandres	Belgium	Sub-national	MAES	
VITO	Maarkebeek	Belgium	Local	Natural risk	
SYKE	Helsinki-Uusimaa Region	Finland	Sub-national	Green infrastructure urban/spatial planning	
SYKE	City of Järvenpää	Finland	Local	Green infrastructure urban/spatial planning	
SYKE	Kainuu Region	Finland	Sub-national	Green infrastructure; Business industry and tourism	
CAU	Bornhöved lakes district	Germany	Local	MAES	
VU	Haringvliet	Netherlands	Local	Natural risk	
IST	BALA - Biodiversity of Arthropods from the Laursilva of Azores (1999-2012)	Portugal - Acores	Sub-national	Nature conservation	
IST	The impact of Land-Use Changes in arthropod biodiversity from Azores	Portugal - Acores	Sub-national	Nature conservation	
IST	The impact of land-use Changes in the he Flower visiting insects in Terceira Island	Portugal		Nature conservation	
IST	ISLAND-BIODIV: Understanding biodiversity dynamics IST in tropical and subtropical islands as an aid to science based conservation action		Sub-national	Nature conservation	
IST	SLAM - Long Term Ecological Study of the Impacts of Climate Change in the natural forest of Azores	Portugal - Acores	Sub-national	Nature conservation	
UAM	Madrid rural-urban gradient	Spain	Sub-national	MAES	
UAM	Spanish National Ecosystem Assessment	Spain	National	MAES	
* Partner outsi ** ESMERALDA	ide of ESMERALDA Consortium	itted a case study.			

Table 5: Overview of the case studies proposed by ESMERALDA partners

4. Selecting case studies

Here our main aim was to select nine case studies, which will be used in the first set of workshops (WS3, WS4, and WS5), to test the first version of the methods for mapping and assessment. At this stage, the identification of the case studies for the second set of workshops (WS7 and WS8) is not required. However, we found it useful to advance a proposal already, to ensure that all the requirements for case studies seen above are actually met.

In the selection of the case studies, the main criteria was the scope of each workshop, as briefly described above. Another important selection criterion was the priority given to case studies proposed by partners hosting the workshops. To a lesser extent, we also took into account the person/months in WP5 of the proposing partners.

Given these two plus one criteria, we tried numerous possible configurations that possibly satisfy all the requirements for testing the methods for mapping and assessment. The outcome of this iterative process was the selection of nine case studies for the first set of workshops (WS3, WS4, and WS5), plus six candidate case studies for the second set of workshops (WS7 and WS8).

A. WORKSHOP 3 (WS3): Testing the methods across Europe (Czech Republic, SEPTEMBER 2016) – Three case studies

WS3 will be hold in Prague in September 2016, and will be hosted by the **Global Change Research Centre, Academy of Sciences of the Czech Republic (CVGZ).** It is the first of the three workshops for testing the methods for mapping and assessment. Its aim is to test whether the methods have the flexibility required for their application in a variety of geographical contexts and conditions. Therefore, the main selection criteria was to include a case study from each stage in terms of ES mapping and assessment (i.e. Stage 1 = Beginners; Stage 2 = Lid-level; and Stage 3 = Front-runners).

	NAME	COUNTRY	STAGE	REGION	BIOME	ECOSYSTEM TYPE	SCALE	THEME	PARTNER
A1	Territorial waters and Exclusinve Economic Zone of Latvia	Latvia	Beginner	Northern	4	Marine and coastal waters	National	Marine policy	BEF (3)
A2	Pilot National Assessment of Ecosystem Services in the Czech Republic	Czech Republic	Mid-level	Eastern	4, 5	Agriculture; grassland; forest; aquatic and wetland; urban areas	National	ES mapping assessment study	CVGZ (3)
A3	Bornhöved lakes district	Germany	Front-runner	Western	4, 5	Cropland; woodland and forest; grassland; rivers and lakes	Local	ES mapping /assessment study	CAU (3)

* BIOMES refer to those present in the country in which the case study is located; later, a more detailed classification based on Terrestrial ecoregions could be used.

B. WORKSHOP 4 (WS4): Testing the methods across THEMES (The Netherlands, JANUARY 2017) – Three case studies

WS4 will be hold in Amsterdam in January 2017, and will be hosted by the VU University Amsterdam (VU).

It is the second of the three workshops for testing the methods for mapping and assessment. Its aim is to test the methods across themes. Accordingly, we included one case study dealing with "Natural risk", proposed by the hosting partner (VU). Another case study from Malta, dealing with "Agriculture and Forestry". A third case study is from Poland and concerns 10 Large Urban Zones (LUZ) with more than 100.000 inhabitants; the case study has the advantage of addressing many themes, of which to choose one or two focal themes.

	NAME	COUNTRY	STAGE	REGION	BIOME	ECOSYSTEM TYPE	SCALE	THEME	PARTNER
B1	Haringvliet	Netherlands	Front-runner	Western	4	Wetland, Agricultural ecosystems, Lakes and marshes, Coastal ecosystems	Local	Natural risk	VU (3)
В2	10 polish Large Urban Zones with more than 100.000 inhabitants as defined by the European Urban Atlas.	Poland	Mid-level	Eastern	4, 5	Water; forests; agricultural lands; semi- natural areas; wetlands; urban green areas;	Local, Sub-national	Many themes addressed	UPOZ (3)
В3	Maltese Islands	Malta	Mid-level	Southern	12	Cropland; freshwaters; marine + Heathland and Shrub; Sparsely vegetated land.	Sub- national, National	Agriculture & forestry	MCAST (1)

C. WORKSHOP 5 (WS5): Testing the methods across BIOMES and REGIONS (Spain, APRIL 2017) – Three case studies

WS5 will be hold in Madrid in April 2017, and will be hosted by the Universidad Autónoma de Madrid (UAM).

It is the last of the three workshops for testing the methods for mapping and assessment. WS5 addresses specific biomes and areas, including marine areas and the outermost EU regions. Accordingly, we included one case study from the three proposed by the hosting partner (UAM). A second case study is from Portugal – Azores, which is an Outermost region. A third case study is from Bulgaria, and covers different types of biomes and ecosystem.

	NAME	COUNTRY	STAGE	REGION	BIOME	ECOSYSTEM TYPE	SCALE	THEME	PARTNER
C1	Spanish National Ecosystem Assessment	Spain	Front- runner	Southern	4, 12	14 Ecosystems	National	ES mapping /assessment study	UAM (3)
C2	BALA - Biodiversity of Arthropods from the Laursilva of Azores (1999- 2012)	Portugal - Acores	Front- runner	Outermost region	12	Mountain Sub- tropical forests (Laurel Forests)	Sub- national	Nature conservation	IST (2)
C3	Central Balkan	Bulgaria	Mid-level	Eastern	4, 8, 12	Forest, Urban, Grassland, Heathland and shrub	Local	Green infrastructures; urban/spatial planning	NIGGG BAS (2)

D. WORKSHOP 7 (WS7): Testing the final methods I Policy and decision-making (Italy, JANUARY 2018) – Two case studies

WS7 will be hold in Trento in January 2018, and will be hosted by the University of Trento (UNITN).

The aim of this workshop is to illustrate how the final methods can be used to guide real-life policy- and decision-making, across Europe and across themes. Two policy and decision-making processes (in different sectors and geographical contexts) will be selected and used to analyse how the methods are able to inform the different stages of the processes (including interaction with stakeholders and decision-makers), and to promote outcomes that are more in line with the objectives of the EU Biodiversity Strategy. Candidate policy- and decision-making processes include, for example, spatial and land use planning, water resource management, energy policy, strategic environmental assessment, protected area planning.

We have selected a case study dealing with urban/spatial planning and climate & energy, proposed by the host (UNITN), and two case studies by the partners from Belgium (VITO), from which to choose according to how they evolve.

	NAME	COUNTRY	STAGE	REGION	BIOME	ECOSYSTEM TYPE	SCALE	THEME	PARTNER
D1	Trento ES-based adaptation to climate change	ltaly	Mid-level	Southern	4, 5, 12	Urban parks and green areas	Local	Urban spatial planning; Climate & Energy	UNITN (16)
D2a	City of Antwerp	Belgium	Front- runner	Western	4	Urban green	Local	Green infrastructure; Urban/spatial planning	VITO (1)
D2b	Maarkebeek	Belgium	Front- runner	Western	4	Fresh water ecosystem (river restoration)	Local	Natural risk	VITO (1)

Note: The identification of these case studies has not been required at this stage. However, we put forward a proposal already, to ensure overall evenness in the involvement of different regions, partners, etc.

E. WORKSHOP 8 (WS8): Testing the final methods I Policy and decision-making – Business and Citizens (Hungary, MARCH 2018) – Two case studies

WS8 will be held in Budapest in March 2018, and will be jointly hosted by the **Regional Environmental Center (REC) and Magyar Tudományos Akadémia** Ökológiai Kutatóközpont (MTA ÖK).

As in the previous workshop (WS7), the aim is to illustrate how the final methods can be used to guide real-life policy- and decision-making, across Europe and across themes. Here, the focus is on the application of the methods by business and citizens. We have selected two candidate case studies from Finland, because they have a strong citizen participation component and links with the business sector. The case study from the host partner is still to be defined. An interesting case study is the one from Sweden, involving reindeer husbandry planning as well as natural and cultural values in territorial planning.

	NAME	COUNTRY	STAGE	REGION	BIOME	ECOSYSTEM TYPE	SCALE	THEME	PARTNER
E1	To be identified	Hungary	Mid-level	Eastern					REC - MTA OK (2+2)
E2a	Helsinki-Uusimaa Region	Finland	Front- runner	Northern	4, 6, 11	Forest, agricultural land, urban areas, fresh water areas, sea	Sub- national	Green infrastructure; urban/spatial planning	SYKE (6)
E2b	Kainuu Region	Finland	Front- runner	Northern	4, 6, 11	Forests, mires, agricultural fields, some urban areas	Sub- national	Green infrastructure; Business, industry, tourism	SYKE (6)
E2c	Alpine region, including transition from boreal region and sub-alpine zone	Sweden	Mid-level	Northern	4, 6, 11	Open alpine without vegetation, alpine heathlands, wetlands and shrublands, sub- alpine coniferous forest	Sub- national	Business, industry, and tourism	SEPA (0)

5. Overview of the selected case studies

	NAME	COUNTRY	CONDITION	REGION	BIOME	SCALE	THEME
WS3	Territorial waters and Exclusinve Economic Zone of Latvia	Latvia	Beginner	Northern	4	National	Marine policy
WS3	Pilot National Assessment of Ecosystem Services in the Czech Republic	Czech Republic	Mid-level	Eastern	4, 5	National	ES mapping assessment study
WS3	Bornhöved lakes district	Germany	Front-runner	Western	4, 5	Local	ES mapping /assessment study
WS4	Haringvliet	Netherlands	Front-runner	Western	4	Local	Natural risk
WS4	10 polish Large Urban Zones with more than 100.000 inhabitants	Poland	Mid-level	Eastern	4, 5	Local, Sub-national	Many themes addressed
WS4	Maltese Islands	Malta	Mid-level	Southern	12	Sub-national, National	Agriculture & forestry
WS5	Spanish National Ecosystem Assessment	Spain	Front-runner	Southern	4, 12	National	ES mapping /assessment study
WS5	BALA - Biodiversity of Arthropods from the Laursilva of Azores (1999-2012)	Portugal- Acores	Front-runner	Southern	12	Sub-national	Nature conservation
WS5	Central Balkan	Bulgaria	Mid-level	Eastern	4, 8, 12	Local	Green infrastructure + urban/spatial planning
WS7	Trento ES-based adaptation to climate change	Italy	Mid-level	Southern	4, 5, 12	Local	Urban spatial planning; + Climate & Energy
WS7	City of Antwerp	Belgium	Front-runner	Western	4	Local	Green infrastructure; Urban/spatial planning
WS7	Maarkebeek	Belgium	Front-runner	Western	4	Local	Natural risk
WS8	To be defined	Hungary	Mid-level	Eastern	4	??	??
WS8	Helsinki-Uusimaa Region	Finland	Front-runner	Northern	4, 6, 11	Sub-national	Green infrastructure; + urban/spatial planning
WS8	Kainuu Region	Finland	Front-runner	Northern	4, 6, 11	Sub-national	Green infrastructure; + Business, industry, tourism
WS8	Alpine region, including transition from boreal region and sub-alpine zone	Sweden	Mid-level	Northern	4, 6, 11	Sub-national	Business, industry, tourism

Note 1: BIOMES refer to those present in the country in which the case study is located; eventually, a more detailed classification based on Terrestrial ecoregions could be used Note 2: the pairs of case studies in red are alternative options (only one from Belgium and one from Finland will be used)

Note 3: the last case study in green, could be a backup to the Hungarian case study, or an additional case study