ESMERALDA

Enhancing ecosystem services mapping
for policy and decision making

Country Fact Sheet:
Austria (AT)

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Preface

This country fact sheet is prepared as part of the ESMERALDA work package task 2.1: Stakeholder identification and initial analysis of activities. The initial analysis draws upon information collected by ESMERALDA project partners and previous relevant work on ecosystem mapping and assessment activities and policy and research activities in connection to that.

1. Country status of activities, prerequisites and needs

This fact sheet considers the

- Draft Agenda MAES WG 2015-03-06-rev,
- MAES WG 06 March 2015,
- MESEU Final Technical report 2013-14,
- MESEU Inception Report 2014-15 (Final 29-01-2015),
- MESEU update March 2015,
- MESEU Synthesis Report 2012-2014 (14-01-2015), and
- NCA Draft Reference Document for Consultation 06-01-2015.

Written communication on undertaken MAES related activities have been reported by Joachim Maes (see point 5 references for tracing the source of information for the Austrian fact sheet). Specific for this document is the identification of obstacles and opportunities (Table 1).

As a third activity, the identified MAES representatives and concerned co-workers, verify this Austrian fact sheet.

Table 1: Country status of activities, prerequisites and needs

Status of mapping ecosystem services in the country (1-3)*	**Scale of mapping (1-3)****	**Type of support needed (1-5)*****	**Needed support relates to (1-3)********
1. In initial phase, much support needed	1. National	3. Technical mapping support (data, GIS, mapping methods)	2. WP3 ES mapping methods; 3. WP4 ES assessment methods/tools
* 1. In initial phase, much support needed; 2. On-going, still support needed; 3. Advanced, only little support needed ** 1. National; 2. Regional; 3. Local *** 1. Setting up a national network; 2. Policy and stakeholder identification; 3. Technical mapping support (data, GIS, mapping methods); 4. Lacking personnel with appropriate expertise, 5. Other **** 1. WP2 stakeholder mapping/networking; 2. WP3 ES mapping methods; 3. WP4 ES assessment methods/tools			
Prerequisites and strengths for carrying out the mapping and assessment of ecosystem services: [No Information]			

A thorough literature review is ongoing.

- Ecosystem services and economic development in Austrian agricultural landscapes — The impact of policy and climate change scenarios on trade-offs and synergies (Kirchner et al., 2015).

- Human Appropriation of Net Primary Production, Stocks and Flows of Carbon, and Biodiversity (Haberl et al., 2013).

2. Policy activities

2.1. The current implementation plans and execution of the Biodiversity Strategy and in particular concerned with Target 2, Action 5

MAES related activities in Austria focused on the development of biodiversity indicators. For this, several studies have been conducted by the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management, also dealing with Ecosystem Services. Aim of a study in 20131 was to assess the condition and importance of biological diversity in Austria, to describe Ecosystem Services in a common language and to depict possible conflicts, e. g. effects of soil sealing on various services. The mapping and assessing of ecosystems and their services is also part of the Austrian Strategy on Biological Diversity 2020+ published in 20142.

Other activities so far were undertaken by the Environment Agency Austria, such as a national wide mapping of ecosystems based on the EUNIS classification (105 classes from level 2 to 4) with a spatial resolution of 10 x 10 metres3. Mapping and assessing of a set of Ecosystem Services on a regional level was conducted within the project MUFLAN4 for two case studies in Römerland Carnuntum and Oststeirisches Kernland. A study published in 20115 presented an inventory of ecosystem services in agricultural context, an inventory of ecosystem services of forests6 followed in 2015. Also in 2015, a report examined potentials, requirements and risks of the economic valuation7 of ecosystem services. Furthermore, contributions were made to the project COIN – Cost of Inaction8 by examining the costs of climate change and its effects on two ecosystem services (pest control and pollination). On European scale activities included the participation in MESEU or contributions, e.g. to the creation of the Map of European ecosystem types based on the EUNIS classification and ecosystem assessment as part of ETC-SIA. Further activities regarding mapping and assessing of ecosystems and their services are planned.

2.2. The position of (the) case study / studies in those plans

“Case studies help to illustrate what maps on Ecosystem state and ESSs look like, what they show and thus what they can be used for. They trigger the discussion on benefits and limitation of the concept of ESS and their application. There are several areas, where maps on Ecosystem state and Ecosystem services are used in Austria. These maps were developed in the context of a specific policy but not as a case study in implementing the (EU) biodiversity strategy.”(MESEU, 2015)

2.3. List of the case studies done in the country

(A separate Case Study Fact Sheet is filled in for each case study.)

2.4. The possible future use of (the) case study results in Target 2 - Action 5

“The case study MUFLAN (with the two areas Römerland-Carnuntum and Steirisches Kernland) can be show cases for the implementation of Ecosystem Service mapping on a regional level. The methods applied will be discussed for the national strategy with regard to ESS mapping”(MESEU, 2015)

2.5. Stakeholder involvement

- The Scientific Community for commenting, for a survey on the importance of specific ecosystems for ecosystem services, and the threats for ecosystems and ESSs;
- BirdLife;

- Several departments of university and the alpine union as producers of data;
- The Environment Agency Austria, the Research Centre for Forestry and the Institute for Agricultural Economics as contractors for calculating indicators on the base of the existing data; the Environment Agency Austria also as a contractor for the production of a map of ecosystems.

For the two areas mapped in the MUFLAN project the main addressees were the local administration on the level of the municipalities as the main responsible party for the regional development. Nevertheless, the stakeholder structure differed between the two areas addressed:

- Römerland-Carnuntum: local stakeholder (Vienna Airport), local action groups (LEADER Management), regional management (Stadt-Umland-Koordination, Regionalmanagement Römerland-Carnuntum) and local administration (mayor, municipalities);
- Oststeierisches Kernland: local stakeholder (nature park (Naturpark)) and local administration (mayors, municipalities) A general stakeholder was the Ministry of Forestry, Agriculture, Environment and Water as project steering committee member and funding organisation.

(MESEU, 2015)

2.6. Executive institutes involved by the National Government

In the case study MUFLAN the "Ministry of Forestry, Agriculture, Environment and Water was project steering committee member on the one side and funding organisation (for a part of the project) on the other. There is currently no executive role of the ministry in the local and regional implementation of the project results"(MESEU, 2015)

3. Research activities

3.1. The Ecosystems covered in the country

"There is no prioritisation of ecosystems. All ecosystems in Austria are of the same importance. For the current country case a combination of land use and land cover was used rather than an ecosystem classification. LULC was aggregated to different indicators and used rather than the direct use of LULC. Nevertheless, the LULC can be assigned to different ecosystems based on their characteristics. Ecosystem classification for the MUFLAN Case Study was based on a national LULC classification provided by the national agricultural database (INVEKOS (IACS) and INVEKOS-GIS (LPIS)) and digital cadastral map (DKM). The original LULC classes were grouped to aggregated land cover classes. And these aggregated land cover classes can be assigned to ecosystem classes."(MESEU, 2015)

3.2. The Ecosystem Services covered in the country

Provisioning function:

- Agricultural production (provision of food and fodder for the human society);
- Forest production (provision of wood and wood products for construction and other use for the human society).

Regulation function:

- Soil retention (capacity of the landscape to maintain arable land and prevention of damage from erosion and siltation);
- Water protection (capacity of the landscape to maintain of the quality of water bodies against with regard to nutrients and pesticides);

- Water retention (retention capacity of the landscape and the capacity to mitigate fast run off in extreme precipitation events);
- Carbon sequestration (capacity of the landscape to capture and store carbon in a mid to long term period).

Habitat function:
- Biodiversity (maintenance of biodiversity in particular).

Cultural function:
- Recreation (capacity of the landscape for recreation of humans).

Carrier function:
- Areas for infrastructure (actual use of the landscape for settlement, infrastructure and mining)

(MESEU, 2015).

3.3. The indicators per ecosystem / ecosystem service (cells in the (MAES) matrix)

Table 2 lists the indicators for terrestrial and aquatic ecosystems and/or ecosystem service in Austria.

Table 2: Indicators per ecosystem / ecosystem service for Austria

Function	Service	Indicators
HA	Biodiversity	• Inventory of habitats and species (dry grasslands, meso-dry grasslands, mires and bogs, riparian zones, natural forests, etc.) • Nature protection areas (according to different categories) • Migration corridors for red and roe deer
PR	Agricultural production	• Soil quality characteristics (production potential, Ertragsmesszahl EMZ) • Soil quality characteristics according to the mapping of agricultural soils (relative productivity of the soils for cropland and grassland)
PR	Forestry production	• Size of the forested area (core area or linear feature) • Planning targets according to the national Forest development plan (Waldentwicklungsplan) • Protection status of forested areas
RE	Soil retention	• Erosion potential in kg/ha
RE	Groundwater protection	• Soil permeability • Land use / land cover
RE	Water retention	• Soil permeability • Land use / land cover • Flood retention areas (HQ30, HQ50, HQ100|)
RE	Carbon storage capacity	• Humus ratio of the soils • Land use / land cover
CU	Recreation	• Touristic points and infrastructure • Settlement areas • Landscape diversity (forest ratio) • Noise maps
CA	Infrastructure	• Settlement areas • Traffic infrastructure • Dump sites • Mineral resource extraction sites

3.4. Quantification methods of the indicators

"Data sources: Field work, National Statistics, IACS, FFH-Monitoring, Forestry Inventory. Method: The specific indicators were calculated either directly (e.g. water retention capacity) or by using decision matrices based on the input indicators. All results are mapped to a relative scale ranging from 0, no service capacity, to 5, high service capacity."(MESEU, 2015)

3.5. EU Directive reporting indicators & data used

"Habitat Directive, Water Framework Directive; Outlines and basic habitat information was used from the Natura 2000 sites (FFH Directive, Bird Directive). No further EU Directive reporting indicators & data (e.g. Article 17 reporting of the FFH directive, resolution 36 km^2) were used due to the spatial resolutions of the mapping approach with 1 ha grid size." (MESEU, 2015)

3.6. Scientific analysis

"The approach followed in the case study MUFLAN was compared to previous work done on agricultural landscape services in the area (see Wagner 2006, Wrbka et al. 2011). In addition to that no further analysis on the uncertainty and representativeness was done due to project constraints. For each landscape service a qualitative score ranging from 0 to 5 was attributed. This reflects the capacity of the grid cell to deliver a certain landscape (ecosystem) service. The approach was mainly based on expert judgement e.g. in defining the rules for ecosystems and their underlying ecosystem services."(MESEU, 2015)

3.7. Maps, reports, papers, (language)

BMLFUW (2009): Indikatoren-Bericht zur Biodiversität in Österreich (Indicators for biodiversity in Austria)

BMLFUW (2013): Zustand und Bedeutung der biologischen Vielfalt in Österreich (*This study on the status and the meaning of biodiversity in Austria contains a Map of Ecosystem types in Austria based on the integration of existing inventories and land use information*), http://www.bmlfuw.gv.at/publikationen/umwelt/umweltpolitik_nachhaltigkeit/zustandbiolovielfalt.html

BMLFUW (2014): Biodiversitäts-Strategie Österreich 2020+ (*Austrian Strategy on Biological Diversity 2020+*) http://www.bmlfuw.gv.at/umwelt/natur-artenschutz/biologische_vielfalt/biodiversitaet.html

Bartel, A., Ferner, B., Freudenschuss, S. et al. (2013). MUFLAN - MULTIFUNKTIONALE LANDSCHAFTEN. Aktionsprogramme zur multifunktionalen, ökologisch optimierten Nutzung von Landschaft und Umweltressourcen Teil 1 – Zusammenfassender Endbericht. Umweltbundesamt Report REP-0419, Wien. 54pp. (*Project MUFLAN – Multifunctional Landscapes in two LEADER regions*) http://www.umweltbundesamt.at/umweltsituation/landnutzung/landnutzungumweltressourcen/lanu_muflan/

Götzl, M., Schwaiger, E., Sonderegger, G., Süßenbacher, E. (2011). ÖKOSYSTEMLEISTUNGEN UND LANDWIRTSCHAFT. Erstellung eines Inventars für Österreich. Umweltbundesamt Report REP-0355, Wien. 48pp. (*report from Environment Agency Austria about ecosystem services and agriculture*) http://www.umweltbundesamt.at/aktuell/publikationen/publikationssuche/publikationsdetail/?pub_id=1943

Götzl, M., Schwaiger, E., Schwarzl, B., Sonderegger, G (2015). ÖKOSYSTEMLEISTUNGEN DES WALDES. Erstellung eines Inventars für Österreich (*report form Environment Agency Austria about ecosystem services in forests*) http://www.umweltbundesamt.at/aktuell/publikationen/publikationssuche/publikationsdetail/?pub_id=2137

Schwaiger, E. Berthold, A., Gaugitsch, H., Götzl, M., Milota, E. Mirtl, M., Peterseil, J., Sonderegger, G., Stix, S. (2015). WIRTSCHAFTLICHE BEDEUTUNG VON ÖKOSYSTEMLEISTUNGEN. Monetäre Bewertung: Risiken und Potenziale. Umweltbundesamt Report REP-0523, Wien. 77pp. (*report from the Environment Agency Austria on the economic benefits of ES, their risks and potentials*) http://www.umweltbundesamt.at/aktuell/publikationen/publikationssuche/publikationsdetail/?pub_id=2104

COIN – Cost of inaction. Assessing the Cots of Climate Change for Austria, http://coin.ccca.at/

http://www.umweltbundesamt.at/umweltsituation/naturschutz/biolat/oekosystemleistungen/ (the official link to the portal on ESS from the Environment Agency Austria)

Based on a web research Klug (July 22, 2015) provided links to different reports and papers on ecosystem services assessment and mappings in Austria:

- http://www.bundesforste.at/service-presse/presse/pressedetail/news/von-den-werten-der-natur-bundesforste-und-tu-wien-starten-pionierprojekt-zur-bewertung-von-oekosyst.html (from the Austrian Forestry Agency an assessment of ES and biodiversity)
- http://hw.oeaw.ac.at/0xc1aa500e_0x003144a5.pdf (Climate Change Impact on the Biosphere and Ecosystem Services)
- http://www.austroclim.at/fileadmin/user_upload/StartClim2009_reports/StCl09C_v2_Mai2012.pdf (ES vulnerability of present land use)
- http://www.lter-europe.net/networks/austria/lter-austria-white-paper-2015 (Austrian LTER white paper)
- https://www.researchgate.net/publication/279488077_A_new_high-resolution_habitat_distribution_map_for_Austria_Liechtenstein_southern_Germany_South_Tyrol_and_Switzerland (EUNIS habitat map for estimation of critical nitrogen and sulphur loads used as input for MAES ecosystem type map)

4. References

Klug, H. (2015, July 22). Baseline information of ecosystem service mapping and assessment activities in Bulgaria. *Internal e-mail communication in Esmeralda project*.

MESEU. (2015, February 20). Mapping of ecosystems and their services in the EU and its member states (MESEU): Final technical report 2013-2014. (L. C. Braat, Ed.) *ENV.B.2/SER/2012/0016*, p. 84.