

EO 4 Ecosystem Accounting 2022



EU-wide methodology:
towards operationalisation
of the SEEA EA condition
accounts in the EU

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29/11/2022



- **Policy Context & Background**
- **Key Concepts of Ecosystem Condition**
- **From SEEA EA to EU-Wide Methodology**
- **EO-related Challenges & Opportunities**



JRC SCIENCE FOR POLICY REPORT

EU-wide methodology to map and assess ecosystem condition

Towards a common approach consistent with a global statistical standard

Vallecillo, S; Maes, J; Teller, A; Babí Almenar J; Barredo, J.I; Trombetti, M; Abdul Malak, D; Paracchini ML; Carré A; Addamo AM; Czúcz, B; Zulian, G; Marando F; Erhard, M; Liqueste, C; Romao, C; Polce, C; Pardo Valle, A; Jones, A; Zurbaran-Nucci, M; Nocita, M; Vysna, V; Cardoso AC; Gervasini, E; Magliozzi, C; Baritz, R; Barbero, M; Andre V; Kokkoris, I.P; Dimopoulos, P; Kovacevic, V; Gumbert, A.

EU biodiversity strategy 2030: called for an *EU-wide methodology to map, assess and achieve good condition of ecosystems so they can deliver benefits via provision of ecosystem services*



EU-wide Methodology



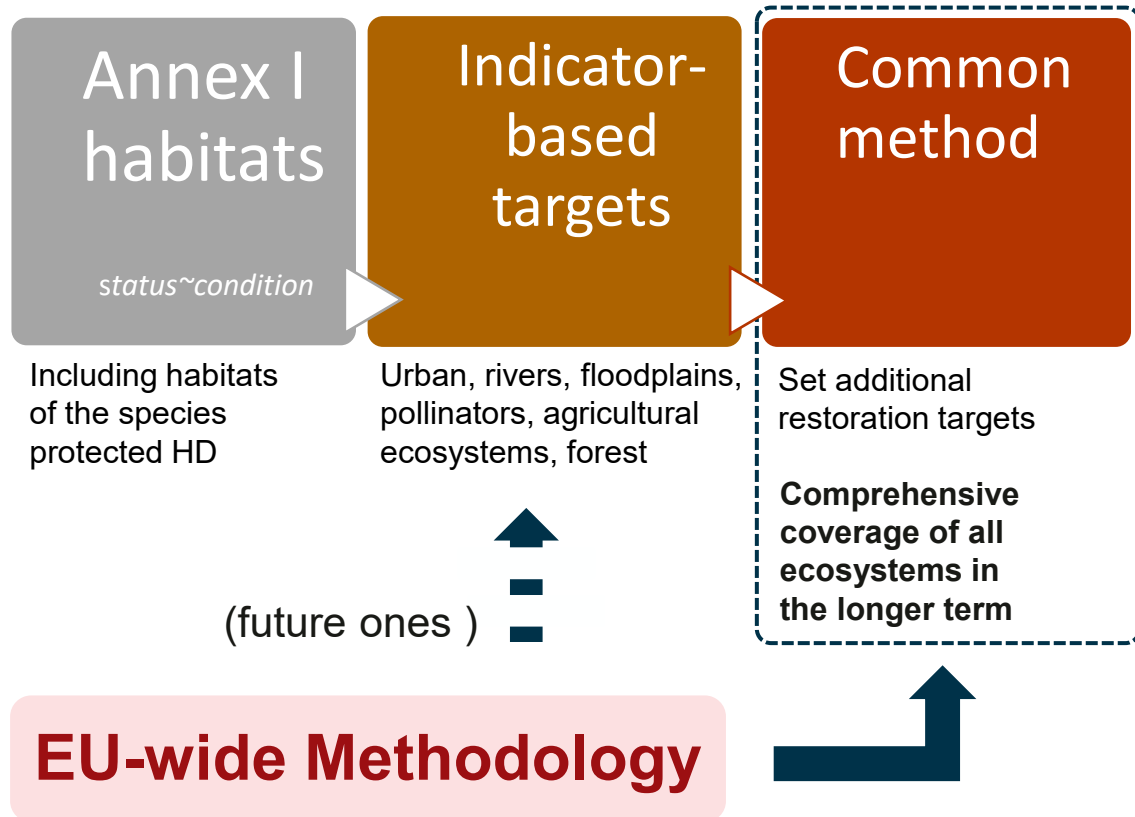
- **Amendment of the Land Use, Land Use Change and Forestry Regulation (LULUCF)**
- **EU Taxonomy Regulation** (sustainable activities)
- **8th Environmental action programme**
- **Sustainable Development Goals (SDGs)**



- **Nature Restoration Law**
- **Amendment of the Regulation on Environmental Accounts**

(Continuity of EU Ecosystem Assessment – MAES condition mapping)
(Alignment of MAES with SEEA-EA)

Nature Restoration Law (NRL)




Amendment of the Regulation on Environmental Accounts

- Ecosystem extent accounts
- Ecosystem condition accounts
- Ecosystem services accounts

EU-wide Methodology

(voluntary variables, increasing mandatory ones, informing on data sources and optimal spatial and temporal resolution)

- Ecosystem Condition** —→ The quality of an ecosystem measured in terms of its abiotic and biotic characteristics (United Nations 2021).
- Good Ecosystem Condition** —→ When it presents good physical, chemical and biological condition, [...] in which species composition, ecosystem structure and ecological functions are not impaired (EU Taxonomy Regulation).
-  (not the same but linked)
- ↓
For anthropogenic ecosystems should also bring long-term socio-ecological resilience
- Reference Condition** —→ Represents the ecosystem condition used to define 'optimal' end points (upper reference levels) of ecosystem condition variables
- Reference Levels** —→ Value of a variable (at Ref. Cond.), against which it is meaningful to compare past, present or future value of that variable

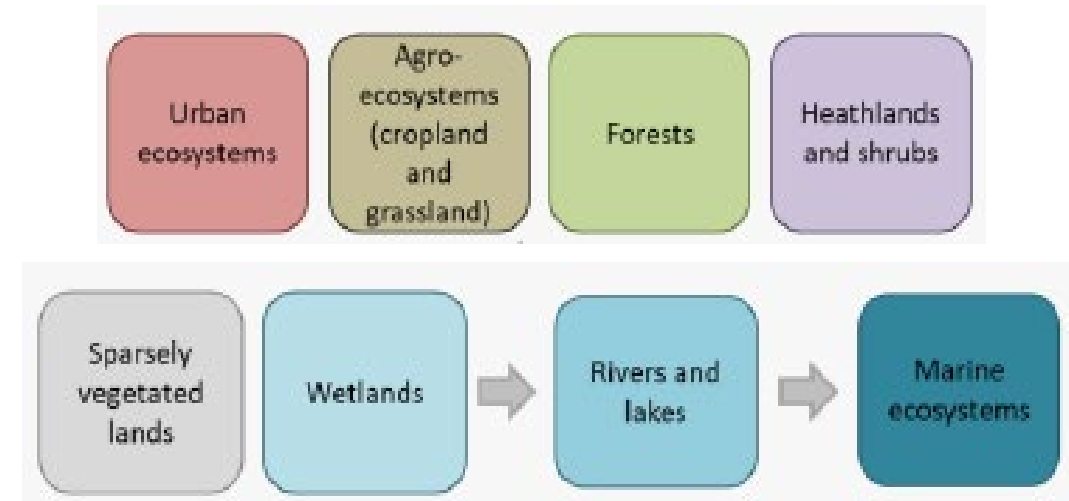
SEEA EA steps for condition assessment

WFD, MSFD

- 1) Selection of condition variables
By ecosystem type
- 2) Definition of **reference levels**
Recommendation for each condition variable
- 3) Aggregation scheme to derive a condition index



EU-wide Methodology



SEEA EA steps for condition assessment

1) **Selection of condition variables*** using the ecosystem condition typology (ECT)

Ecosystem condition typology	
Abiotic	Physical state (soil, water)
	Chemical state (pollutants, nutrients in soil/water)
Biotic	Compositional state (species composition)
	Structural state (veg. cover, biomass)
	Functional state (functional groups, DMP)
Landscape	Land- and seascape (connectivity, land diversity)

* EU Ecosystem Assessment (MAES) → As a starting point

Integration of Data Flows:

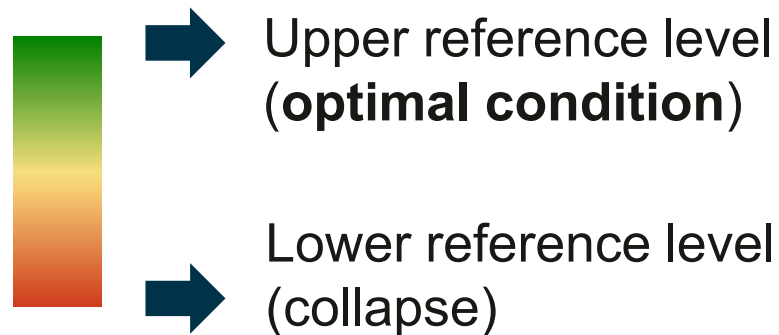
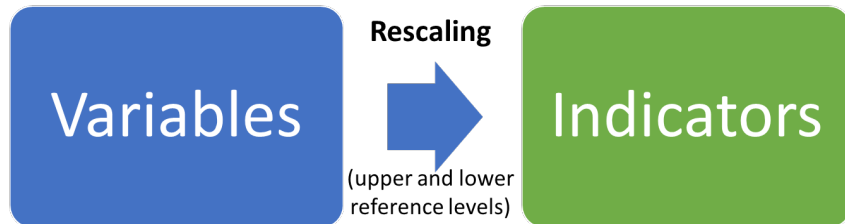
- **EU legislation:** Nature Directives, CAP, EU Forest Strategy, ...
- Targets of the **NRL** and ecosystem variables in the **Regulation on environmental accounts**

- **Data EU monitoring programs** (LUCAS, Copernicus)
- **Modelled scientific geospatial data**

EO

SEEA EA steps for condition assessment

2) Recommendations on **reference levels*** and most suitable methods



Definition of reference levels based on data analysis:

EO

- Reference sites
- Modelled condition
- Statistical methods
- Prescribed reference values (sc. criteria)
- Contemporary condition
- Expert opinion
- Combination of Methods

* Once homogeneous ecosystem sub-types are defined

Example of how condition variables are characterized in the EU Methodology

Ecosystem Condition Typology	Urban approach	Variable	Units	Source of the variable at EU level	Temporal series available	Spatial Resolution	Type ¹
A2. Chemical state	General & Thematic	Air pollutants concentration (NO ₂ , PM _x , O ₃ , SO ₂ , CO)	µg/m ³	EMEP	2000-2018 (from EMEP modelled data updated)	0.1°	Optimal / Modelled
				CAMS	2018 (CAMS expected to be updated regularly)	0.1°	
				Annual AQ statistics from European Environment Agency	2003-2022 (Annual AQ Statistics)	Ground monitoring points	

(EU Methodology – Urban Ecosystems)

Category	Issues	Guiding questions
Practical bottlenecks for implementation	Few pilot ecosystem accounts, especially for condition, and lack of practical guidance	<ul style="list-style-type: none"> • Which kind of guidance would be necessary for facilitating implementation? • Should them be also designed for EO professionals?
	Conceptual and technical complexity of ecosystem accounts makes them knowledge, time and resource demanding	<ul style="list-style-type: none"> • How EO together with automatization of accounts could minimise time effort?
	Lack of consensus and rules on input data, its accessibility, data sampling and data quality standards for accounts	<ul style="list-style-type: none"> • Do we need standards for (EO) input data used in accounting (including thematic, spatial and temporal resolution) ? • Do we need shared open (EO) databases? • Should we develop highly standardised (EO) inventories for ecosystem accounting such as in other fields (e.g. LCA)?
	Lack of consensus on suitable generalizable models	<ul style="list-style-type: none"> • Should condition and services models be standardised before develop standards for (EO) input data inventories?

Adapted from Babi Almenar et al (in progress)

Thanks!

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Link to the EU-wide Methodology:

<https://publications.jrc.ec.europa.eu/repository/handle/JRC130782>