

# SEEA EEA Revision

## Working Group 2: Ecosystem condition

### Discussion Paper 2.1: Purpose and role of ecosystem condition accounts

**Objective:** to develop a framework for an inclusive account of ecosystem condition derived from an ecological understanding of the ecosystem upon which definitions, concepts and classifications are based.

**Recommendation:** a framework encompassing intrinsic and instrumental values, ecocentric and anthropocentric worldviews, and different outputs to be produced for different purposes and uses.

# What is ecosystem condition?

**Ecosystem condition:** *“the overall quality of an ecosystem asset in terms of its characteristics describing intrinsic and instrumental values, such as water, soil, carbon, vegetation and biodiversity.”*

Ecosystem assets are described by:

- **ecosystem condition** as a quality descriptor
- **ecosystem extent** as a quantity descriptor

Ecosystem condition establishes the link between:

- **ecosystem assets**, their quantity or extent, and changes in assets over time, and
- **ecosystem services**, that is, the stocks and flows of benefits derived from the assets.

## **Aim of recommendations:**

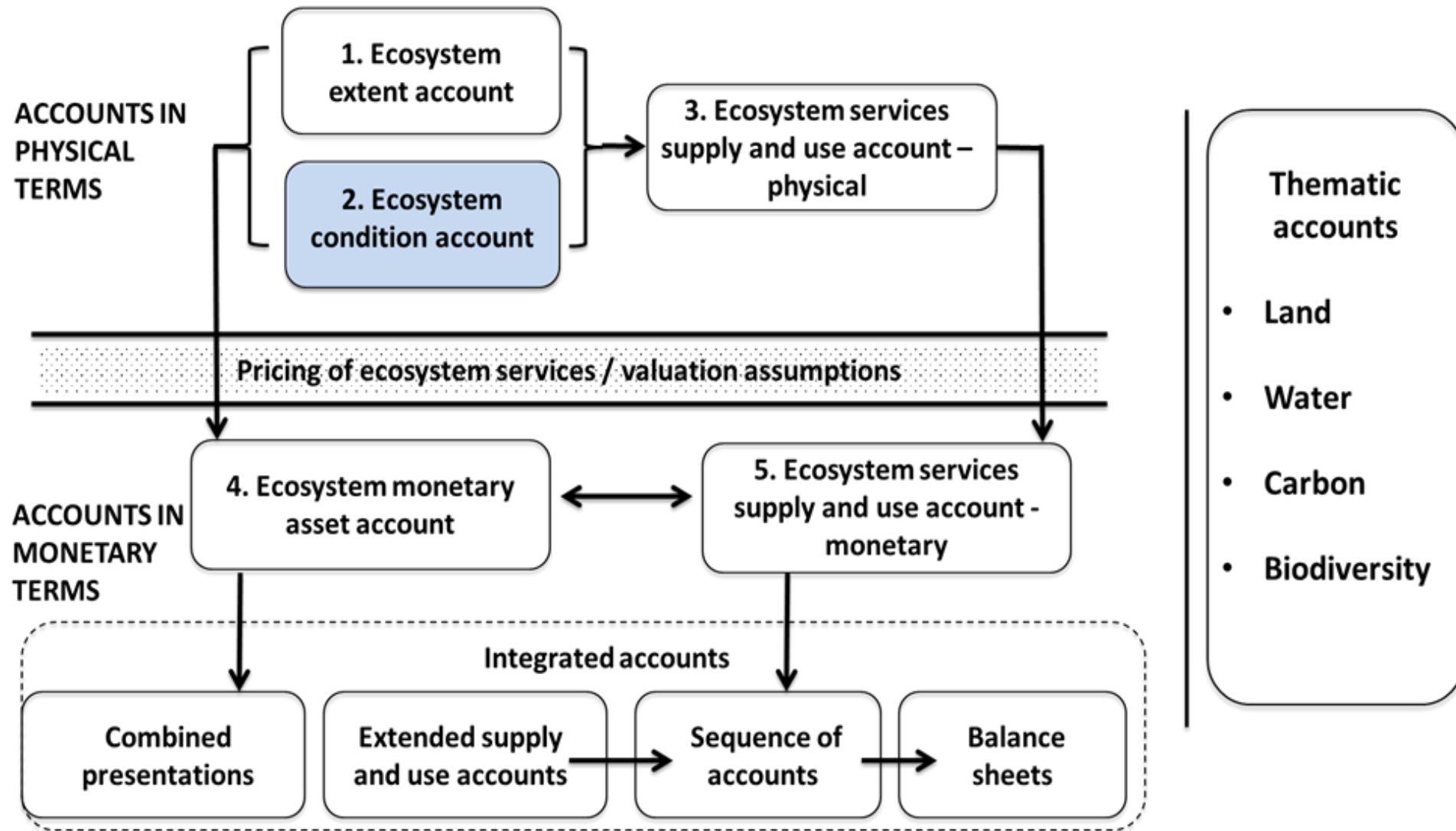
**Approach:** inclusive and flexible description of ecosystem condition accounts to support a range of ecosystem types and potential uses and users.

**Implementation:** biophysical metrics that may / or may not be converted to ecosystem services or monetary values, based on the series of characteristics, variables, indicators to aggregated indices.

## **An inclusive approach:**

- the condition of an ecosystem asset is interpreted as the ensemble of multiple relevant ecosystem characteristics, which are measured by sets of variables and indicators that in turn are used to compile the accounts
- encompasses the perspectives of different users
- allows for different outputs
- application for different purposes

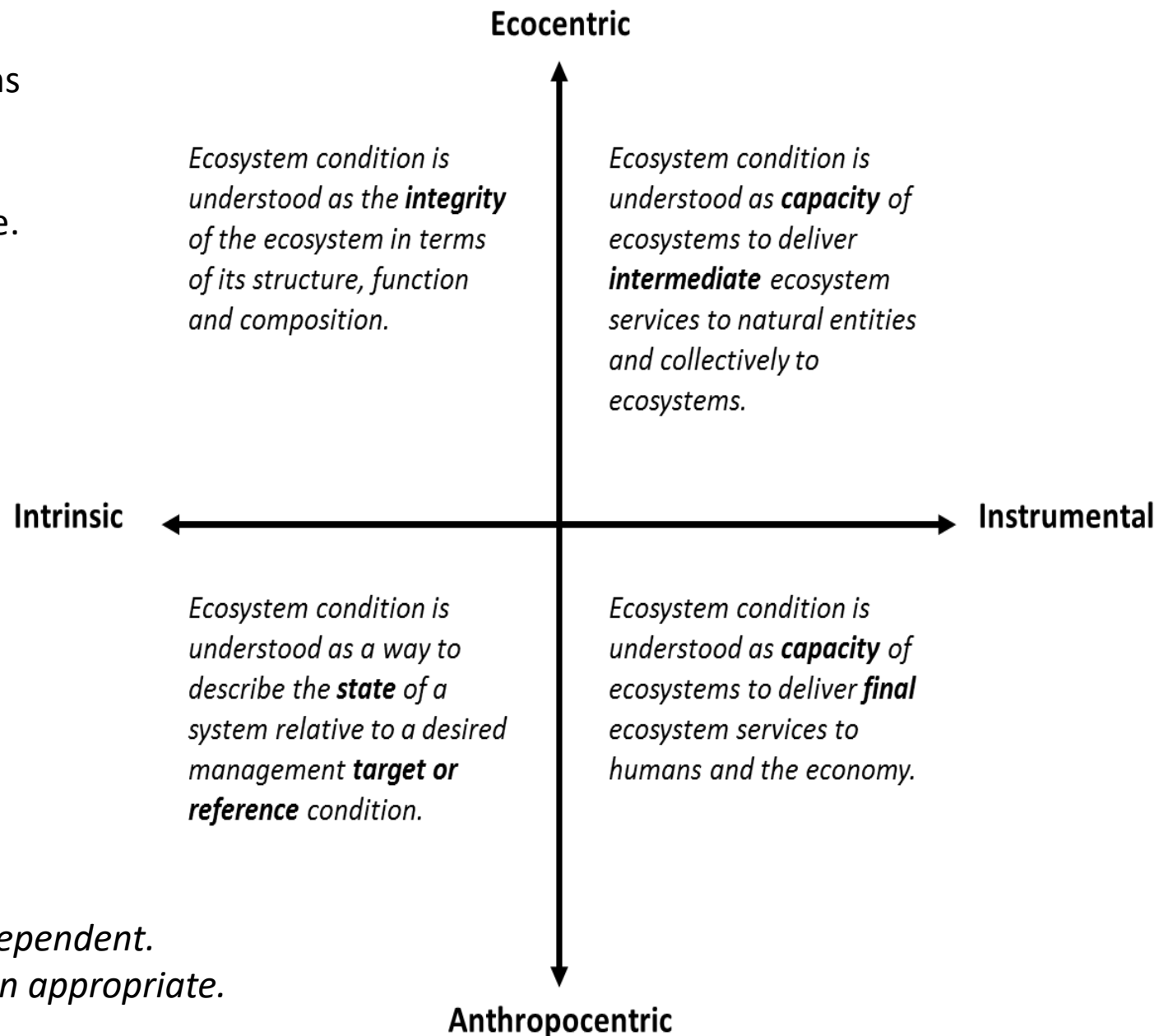
# Place of ecosystem condition accounts within the ecosystem accounting framework



An unresolved question in the ecosystem accounting framework is the link between the information in the thematic accounts (land, water, carbon and biodiversity) and the ecosystem extent, condition and service supply accounts. Much of the information reported in the thematic accounts is used in these three ecosystem accounts, for example as specific indicators of condition or services.

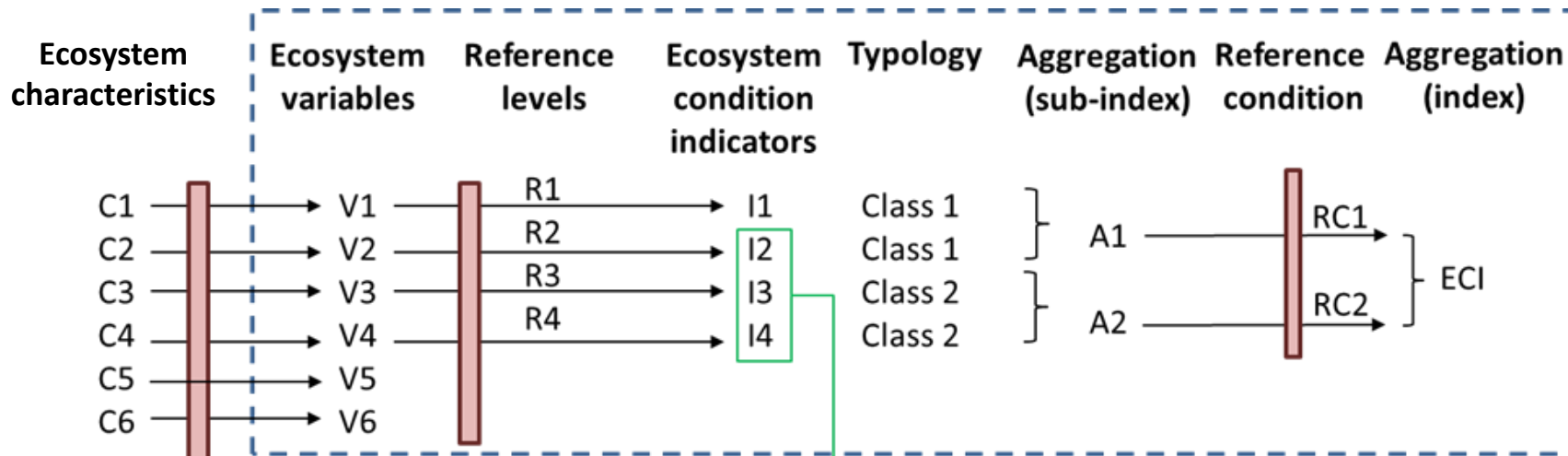
# Multi-purpose approach to assessing ecosystem condition

1. **Intrinsic values** where ecosystem condition is understood as the integrity of the ecosystem in terms of its structure, function and composition, and the intactness/degradation of the ecosystem in terms of ecological 'distance' from an initial or reference state.
2. **Instrumental values** where ecosystem condition is understood as the capacity to supply specific ecosystem services, with both use and non-use values, and as such has a more utilitarian approach.
3. **Ecocentric worldview** – interpretation of ecosystem goods and services in terms of all living things in nature.
4. **Anthropocentric worldview** – interpretation of ecosystem goods and services in terms of human values.



*Values and worldviews are not necessarily linear or independent.  
The framework can be collapsed to one dimension when appropriate.*

# Components of an ecosystem condition account



Ecosystem Condition account with different tables

Selection criteria for variables and reference levels

Ancillary data

A7  
A8  
A9

Ecosystem service capacity

ESC1  
ESC2  
ESC3

Ecosystem service use

ES1  
ES2  
ES3

Ecosystem service demand

D1  
D2

Ecosystem Services account:  
Supply/Use tables

$$ESC = \text{function}(I2, I3, I4, A7, A8, A9)$$

$$ES = \text{function}(ESC, D)$$

# Output tables for ecosystem condition accounts

- a series of tables provide different metrics for condition with progressively additional information

Class	Variables	Ecosystem types					
		Ecosystem type 1			Ecosystem type 2		
		Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Class 1	Variable 1						
	Variable 2						
	Variable 3						
Class 2	Variable 4						
	Variable 5						
	Variable 6						

Class	Indicators	Ecosystem types							
		Ecosystem type 1				Ecosystem type 2			
		Reference level	Year 1	Year 2	Year 3	Reference level	Year 1	Year 2	Year 3
Class 1	Indicator 1								
	Indicator 2								
	Indicator 3								
Class 2	Indicator 4								
	Indicator 5								
	Indicator 6								

# Output tables for aggregated indices

a) Aggregated indicators per ecosystem type for multiple years

Class	Index	Ecosystem types							
		Ecosystem type 1				Ecosystem type 2			
		Reference condition	Year 1	Year 2	Year 3	Reference condition	Year 1	Year 2	Year 3
Class 1	Sub index 1	100				100			
Class 2	Sub index 2	100				100			
<b>Ecological condition index</b>		100				100			

b) Area of each ecosystem type that is covered by various ranges of ecosystem condition relative to the reference condition

Class	Index	Ecosystem types							
		Ecosystem type 1				Ecosystem type 2			
		Condition interval relative to the reference condition	Area Year 1 (ha/%)	Area Year 2 (ha/%)	Area Year 3 (ha/%)	Condition interval relative to the reference condition	Area Year 1 (ha/%)	Area Year 2 (ha/%)	Area Year 3 (ha/%)
Class 1	Sub index 1	Low				Low			
		Medium				Medium			
		High				High			
Class 2	Sub index 2	Low				Low			
		Medium				Medium			
		High				High			
<b>Ecological condition index</b>		Low				Low			
		Medium				Medium			
		High				High			

# Issues for further consideration

1. Relationship between condition, ecosystem service capacity and supply of ecosystem services
  - differences in interpretation of indicators depends on the purpose of the account
1. Selection of appropriate variables, indicators and indices
2. The role of biodiversity in ecosystem condition accounts
3. Assessment of change in state and over time, and appropriate use of reference levels and reference condition
4. Ecological and statistical principles for applying aggregation
5. Practical issues of testing the theory and implementation



# Feedback from reviews

## Majority supportive

- For a broad framing for the description of ecosystem condition
- Recognition of the benefits for engaging with policy makers and other users
- Allows for a range of stakeholders
- Makes explicit that there are different purposes and multiple values that are needed in decision-making
- Definitions and descriptions of the measurement components

## Continuing issues

### 1. Conceptual issues

- Distinction in the role of objective data collection vs purpose-driven reporting
- Consistency with the principles of national accounting and the role of national statistics offices
- Need for coherent statistical outputs
- What components of ecosystem condition should be included in SEEA accounts
  - variables, indicators, reference levels, aggregated indices

### 2. Practical issues

- Range in values should be considered as one- or two- dimensional and is it too broad and hence vague
- A values framework creates too complex a hierarchy of frameworks and different metrics
- Additional guidance is needed about how to apply statistics to the framework that are replicable and comparable
- Demonstration of the links to physical flow accounts and other ecosystem accounts