



Ecosystem Services

Ecology and Economics

Part 1

Concepts and Models

1. Ecosystem (Based) (Goods &) Services



“Ecosystem”
from Ecology

-natural science methods-



“Services”

from Economics

-social science methods-

Natural capital

Ecosystem capital

Ecosystems as asset:

Extent, structure and condition of:

Forests, woodlands, rivers, lakes, oceans, coasts, wetlands, grasslands, croplands, heathland, etc.

Ecosystems service flows:

- Provisioning services (food, fibre, energy etc.)

- Cultural services (recreation in nature, spiritual use of nature etc.)

GENERATING

INTEREST

DEPLETABLE

Abiotic assets

Sun, earth

NON-DEPLETABLE

Minerals, fossil fuels

Abiotic flows

Renewable energy (solar, wind, hydro)

INTEREST

Phosphate fertiliser, radiation, etc.

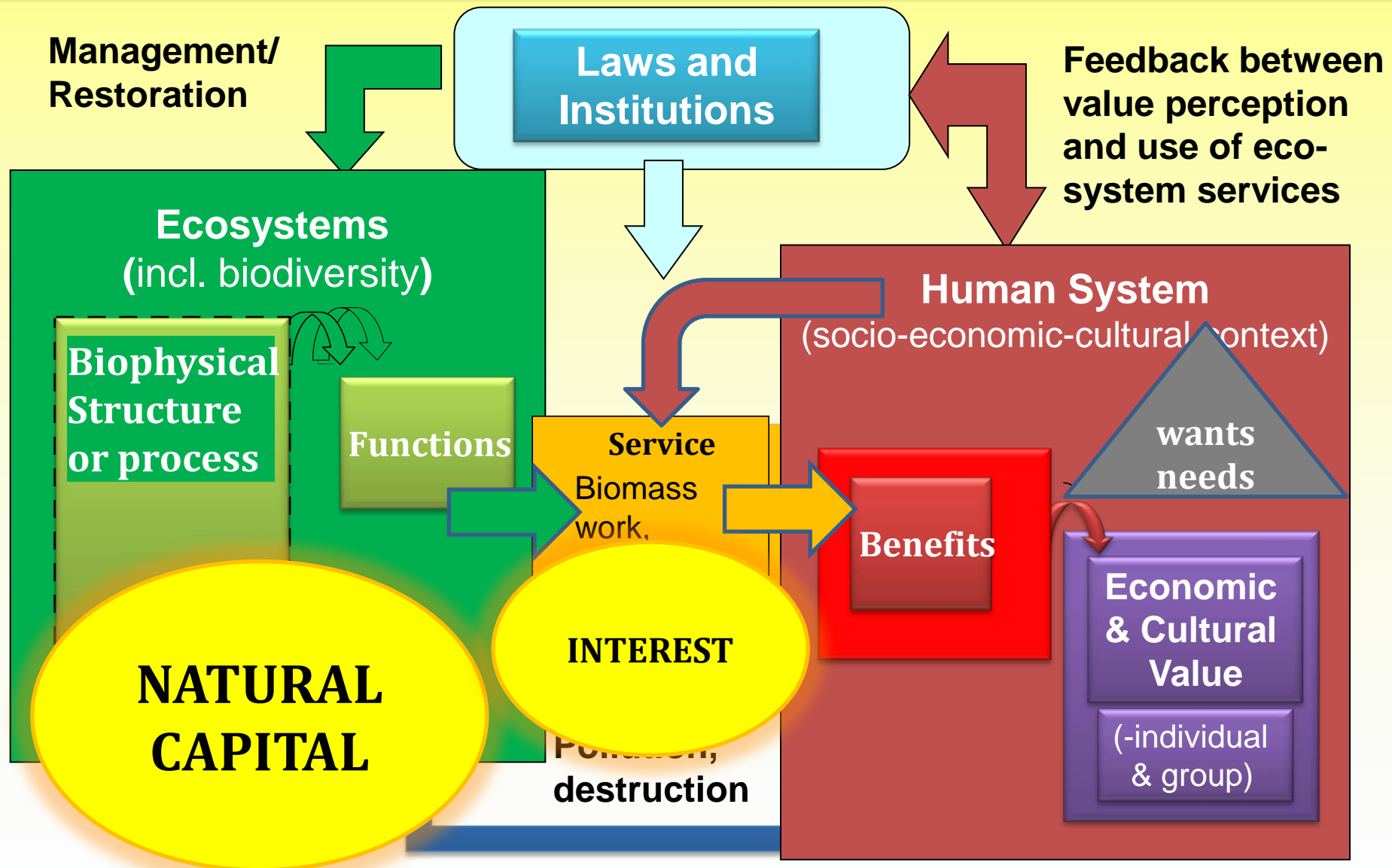
DEPLETABLE

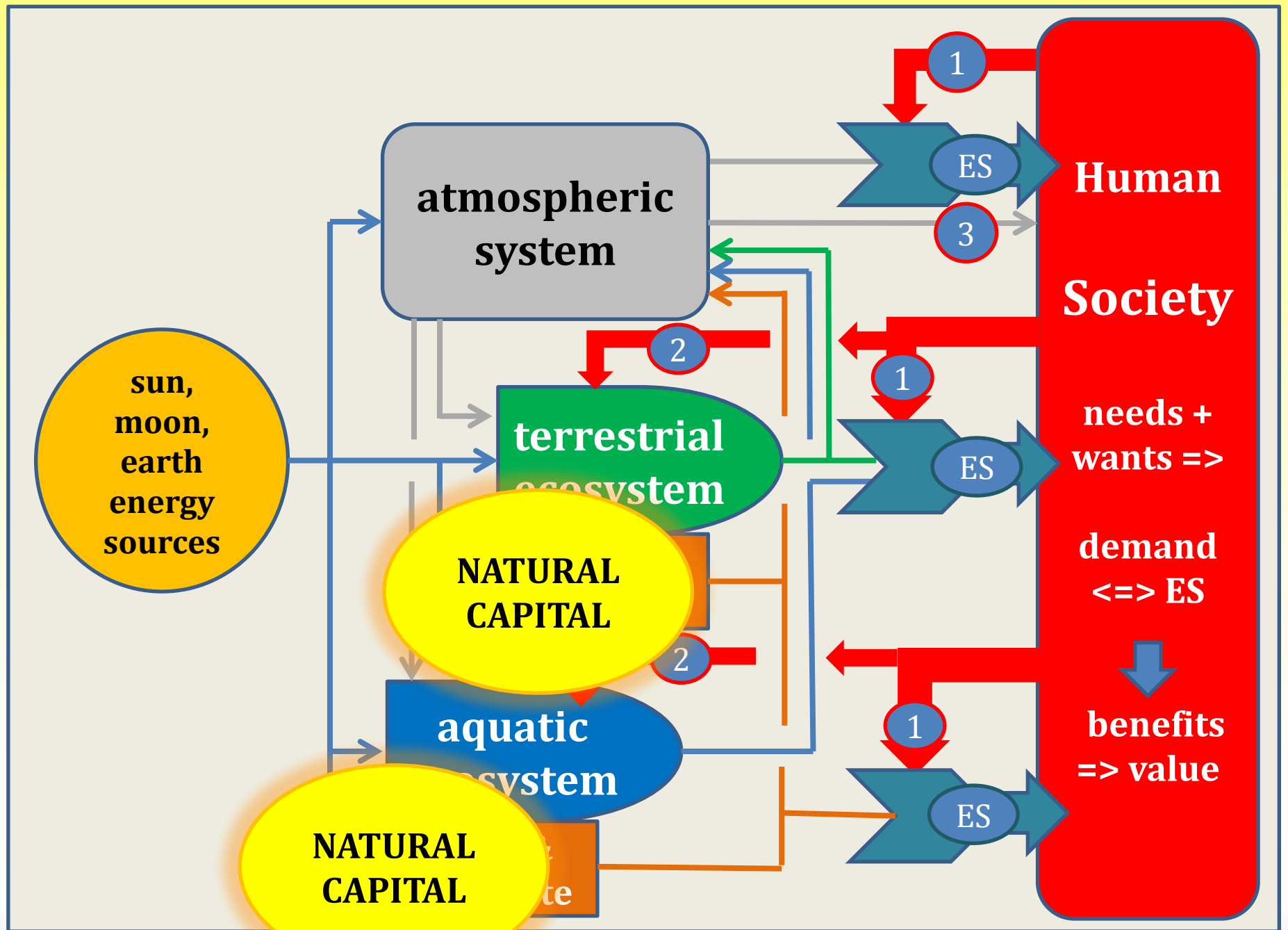
NATURAL CAPITAL

NATURAL CAPITAL

Figure 2. Adapted from EEA (2015), illustrating the different components of our natural capital, encompassing both ecosystem stocks and service flows.

THE ECOLOGICAL – SOCIAL-ECONOMIC - INSTITUTIONAL SYSTEM





CLASSIFICATION

SERVICES

Table 4. Ecosystem services categories in MA, TEEB and CICES

MA categories	TEEB categories	CICES v4.3 group†
Food (food)	Food	Biomass [Nutrition]
Fresh water		Biomass (Materials from plants, algae and animals for agricultural use)
Fibre, timber		[Mediation of] drinking purposes [Nutrition]
Genetic resources		[Mediation of] non-drinking purposes
Biochemicals		Mediation of waste, toxics and nuisances by biota
		Mediation of waste, toxics and nuisances by ecosystems
		[Mediation of] liquid flows
		[Mediation of] mass flows
		Composition and structure
		Soil formation and composition
		Lifecycle maintenance, habitat and gene pool protection
		Pest and disease control
		Lifecycle maintenance, habitat and gene pool protection
		Soil formation and composition
		[Maintenance of] water conditions
		Lifecycle maintenance, habitat and gene pool protection
		Spiritual and/or emblematic
		Intellectual and representational interactions
		Intellectual and representational interactions
		Spiritual and/or emblematic
		Physical and experiential interactions
		Intellectual and representational interactions
		Other cultural outputs (existence, bequest)
MA provides a classification that is globally recognised and used in sub global assessments.	TEEB provides an updated classification, based on the MA, which is used in on-going national TEEB studies across Europe.	CICES provides a hierarchical system, building on the MA and TEEB classifications but tailored to accounting.

PROVISIONING

Ecosystems and Biodiversity (TEEB, 2010)

REGULATING & MAINTENANCE

Common International Classification of Ecosystem Services (CICES, 2013)

Millennium Ecosystem Assessment (MA, 2005)

CULTURAL

A photograph of a forest landscape with several large trees and a path. Overlaid on the image are several callout boxes and arrows. A yellow box at the top points to the canopy. A blue box on the left points to a tree trunk. A green box on the right points to a tree trunk. A blue box at the bottom right points to the ground. A large yellow cross-shaped arrow is in the center, with the text 'SENSE OF PLACE' in the middle. A green box at the bottom contains the title 'Ecosystem Services in a Forest Landscape'.

**VISIBLE
BIODIVERSITY**

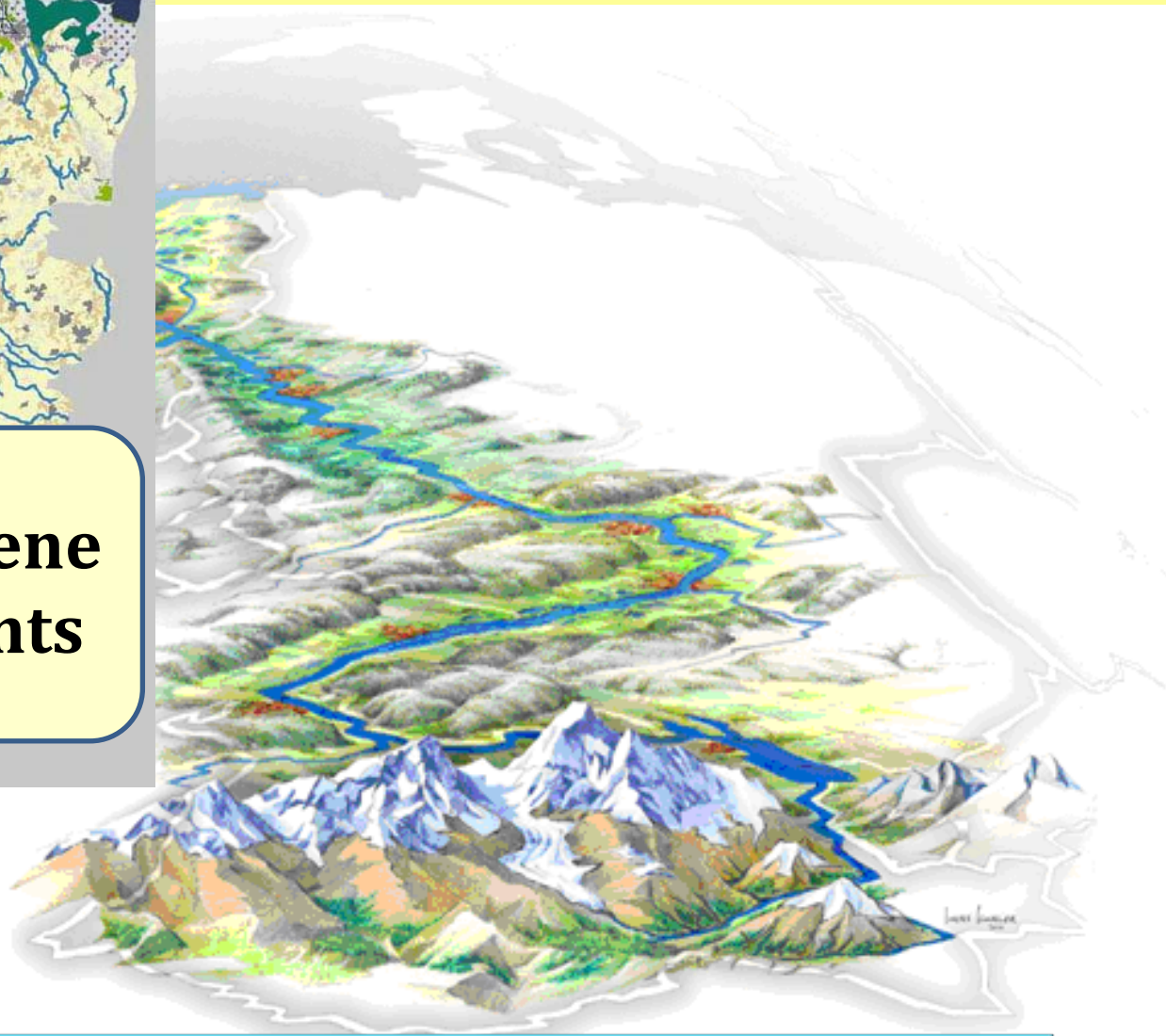
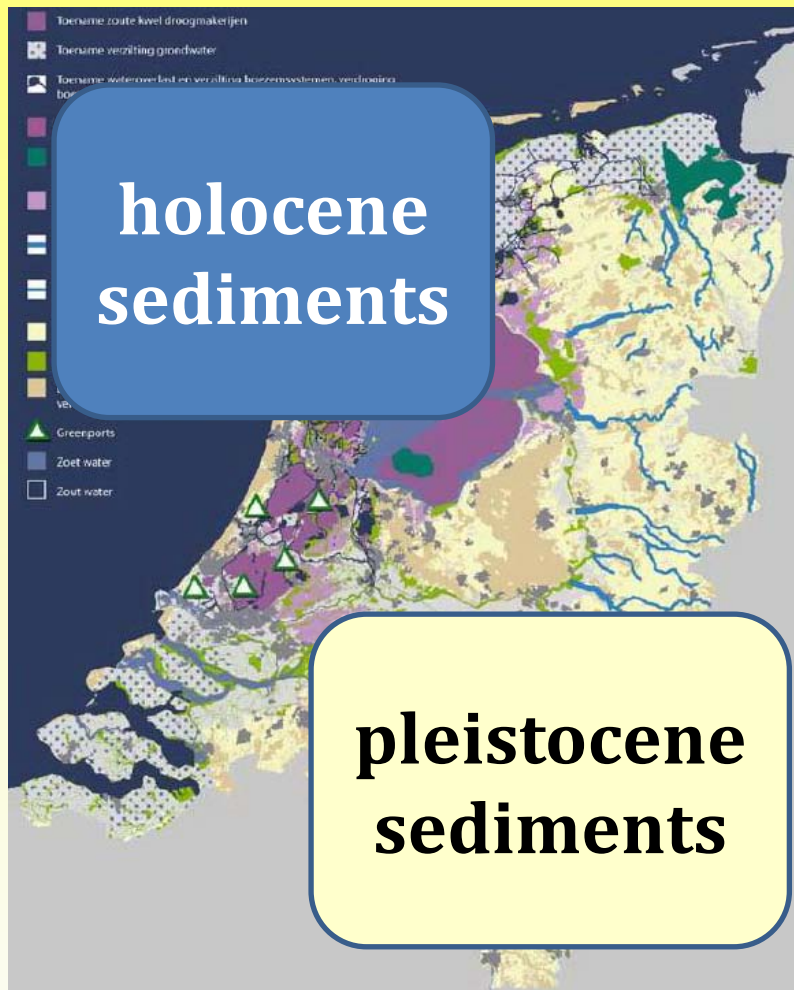
**CARBON
SEQUENSTRATION**

**(POTENTIAL)
TIMBER**

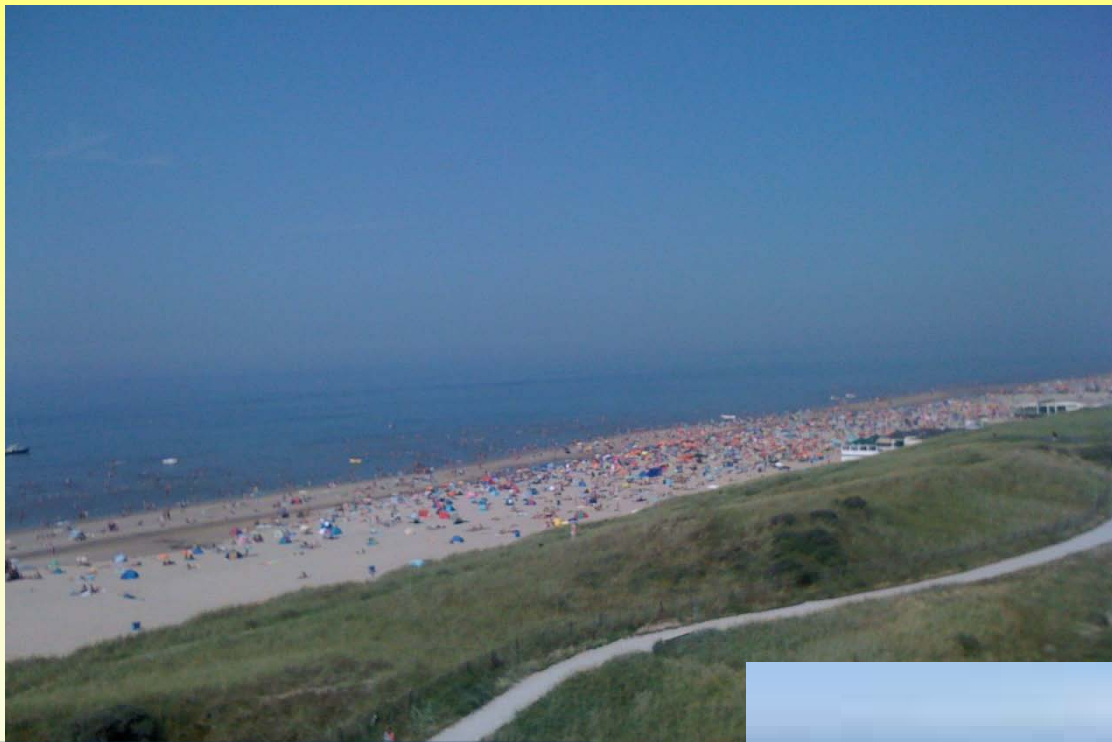
**SENSE OF
PLACE**

**EROSION
PROTECTION**

Ecosystem Services in a Forest Landscape



Ecosystem Services in a Sediment Landscape



bundles of services
from dune systems

the "sand engine"





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Part 2

EU Biodiversity Strategy 2011-2020

European Commission DG Environment



EU biodiversity strategy

EU biodiversity strategy

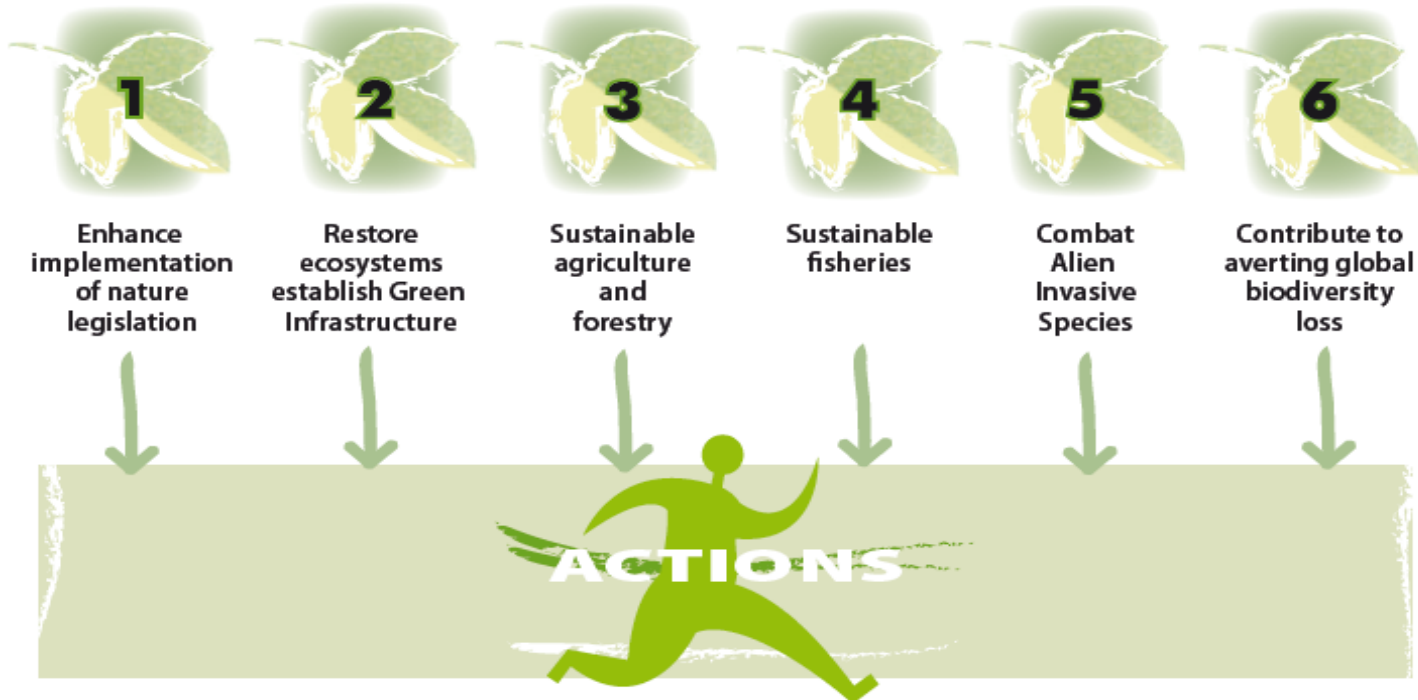
Structure of the EU 2020 Biodiversity Strategy

2050 VISION

2020 headline target

halt biodiversity loss – restore ecosystem services – global contribution

SIX TARGETS



T2. Ecosystem maintenance and restoration

Action 5:

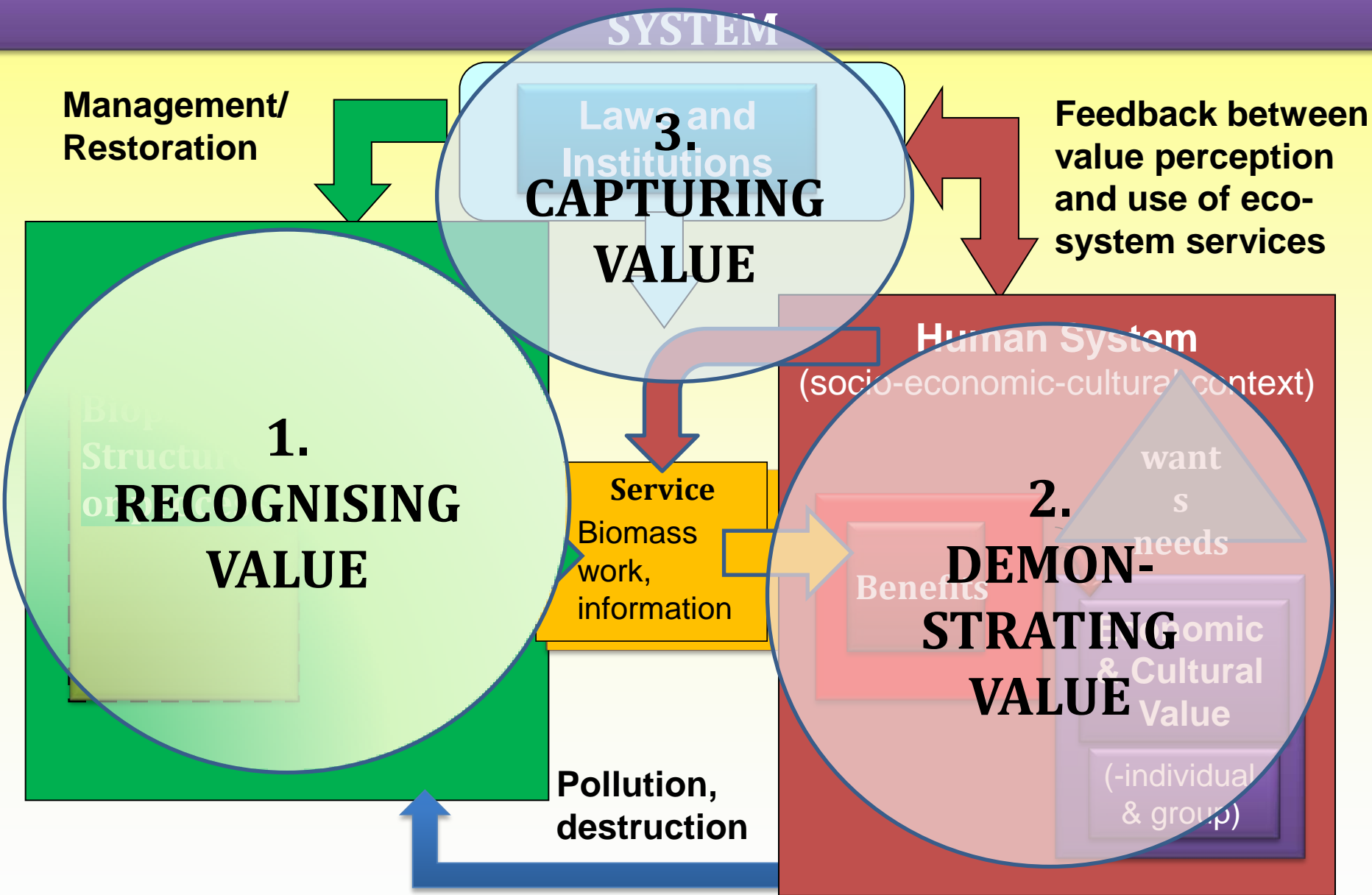
Improve knowledge of ecosystems and their services in the EU

Step 1. → recognising value
map and assess ecosystems and their services **by 2014**

Step 2. → demonstrating value
assess the economic value of these services,

Step 3. → capturing value
values into accounting systems for policy **by 2020**

THE ECOLOGICAL – SOCIAL-ECONOMIC - INSTITUTIONAL SYSTEM



Member states

- Started mapping and assessment

MAES working
group

- 2 reports
- Pilots (at thematic level)

MESEU

- Contract for DG ENV
- Guidance at MS level

TRAIN

ESMERALDA

- H2020
- Guidance on mapping and assessment

IPBES

- Assessments between 2015-2018



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Part 3

The Challenges 2015 -2020

The Sierra Range

Glacier

The Challenges 2015 -2020

1. to complete and improve current biophysical maps and make them useful as a basis for economic MAP, ASSESS & valuation

2. to adapt current ECOSYSTEM valuation methods to assess the SERVICES OF it ecosystem services SEDIMENT SYSTEMS

3. to develop an "easy to implement" basic valuation approach for member states (a valuation guidance document)

The Challenges 2015 -2020

4. to train MS teams to build 2nd generation biophysical maps and produce economic value maps

5. to make the valuation approach more sophisticated:

==> plural values, integrated across multiple dimensions

6. to provide "input" for accounting systems

MULTIPLE TYPES OF VALUE

**economic
values**

**cultural
values**

values

**social
values**

"ecological"
values

Economic values

- **ASSIGNED BY PEOPLE** to **BENEFITS** that contribute to **SURVIVAL, (MATERIAL) WELFARE AND/OR WELL-BEING OF PEOPLE;**

Cultural values

- the "**APPRECIATION**" of the **BENEFITS FROM ECOSYSTEMS VIA GOODS AND SERVICES THAT DEFINE, SUPPORT, AND ENHANCE THE CULTURE OF A SOCIETY**

Social Values

- the *values for groups* of people,
- The *shared preferences among a group*

Ecological values

An expression of APPRECIATION of nature

***UNDERSTANDING THE IMPORTANCE of biophysical features
AS CAUSAL FACTORS in the production of economic or
cultural benefits***

ASSIGN VALUE ...FOR WHAT ?

Reliability &
accuracy
requirement



Awareness raising (reviews,
stories, illustrations)

Accounting (private & public
balance sheets)

Priority-setting (CBA of landuse
zoning, measures, projects)

Instrument design (setting incentive
levels, targeting user groups)

Litigation
(damage & compensation claims)

STEP 3: POLICIES TO CAPTURE THE VALUES FOR SOCIETY

- *subsidies and fiscal incentives*
- *charging for access and use*
- *adaptation/ mitigation strategies*
- *property rights and liability*
- *eco-labelling and certification*
- *payments / compensation for ecosystem services*



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THE END

The Sierra Range

Glacier Bay, Alaska