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Mapping and Assessment of Ecosystems and their Services (MAES):

An analytical framework for mapping and assessment of ecosystem condition

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What is MAES?

EU Biodiversity Strategy

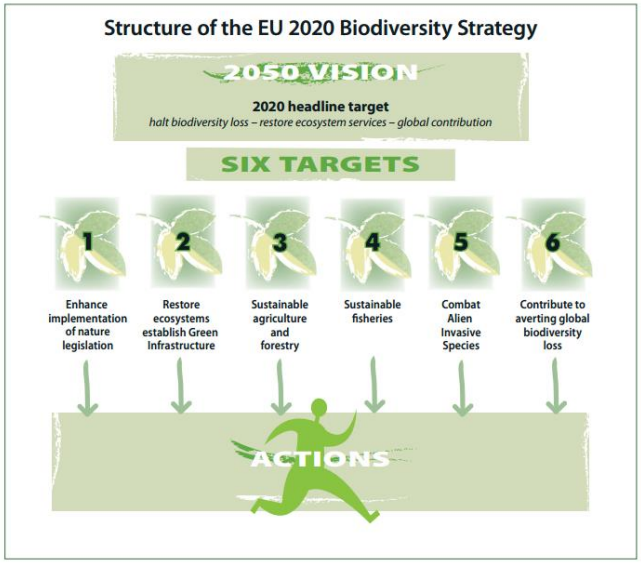
→ Halt the loss of biodiversity and ecosystem services in the EU and globally

Target 2

→ Maintain ecosystem services and restore ecosystems

Action 5

→ **M**ap and **A**ssess **E**cosystems and their **S**ervices in the entire EU territory; economic valuation; develop natural capital accounts



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MAES working group oversees the implementation of Action 5

Research community
H2020 projects
www.esmeralda-project.eu

European Commission,
European Environment Agency

Cities and regions
Stakeholders

EU Member States
and other countries

TASKS of the Working group

1. Guidance for member states

2. Common ecosystem assessment pilots

3. EU wide assessment

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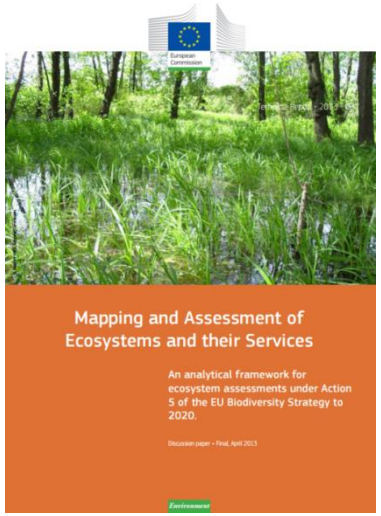
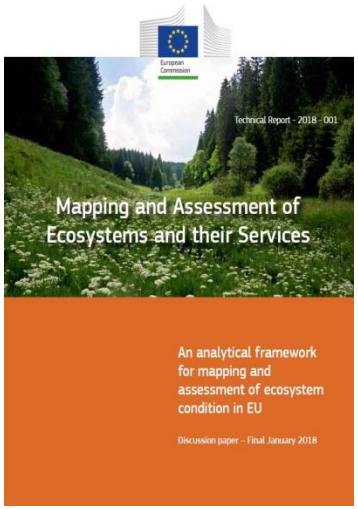
Guidance documents (MAES reports)

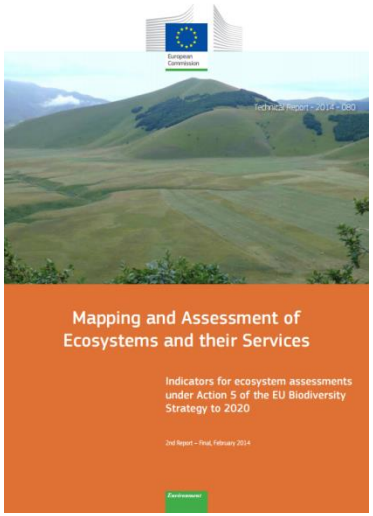
Conceptual framework and **typologies**



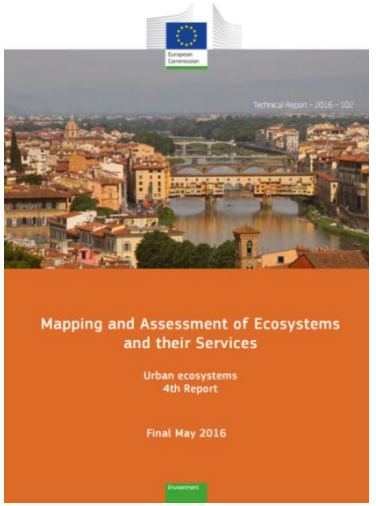
Indicators for **ecosystem condition**



Indicators for **ecosystem services**



Urban ecosystems



http://biodiversity.europa.eu/maes

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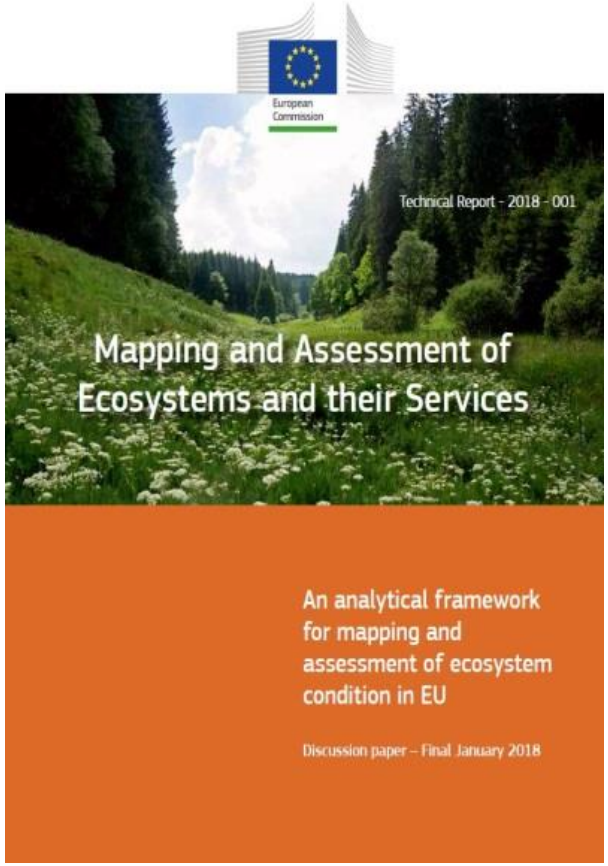
Are Europe's ecosystems **healthy** so that they can continue providing multiple ecosystem services in a sustainable way?



➔ What is ecosystem condition?

➔ How to measure ecosystem condition?

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Key challenges for an analytical framework on ecosystem condition

➔ Pressures - Ecosystem condition – Ecosystem Services

➔ Integrating the EU environmental legislation (data reporting streams)

➔ Policy relevant for other EU and national policies

➔ Provide a basis for natural capital accounts

➔ Mapping: spatially explicit (current land, water or sea cover, use and management)

➔ Measureable against a baseline condition (trends)

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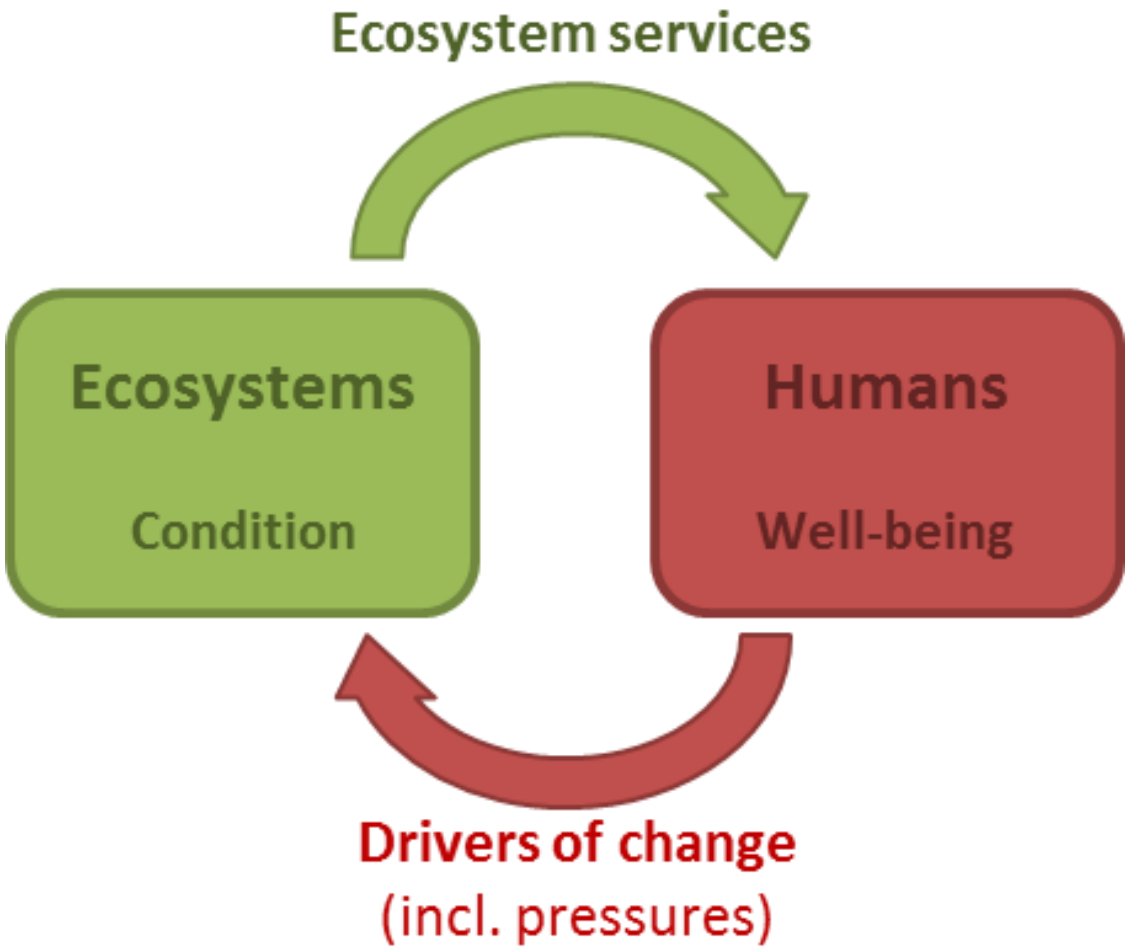
A simple conceptual model



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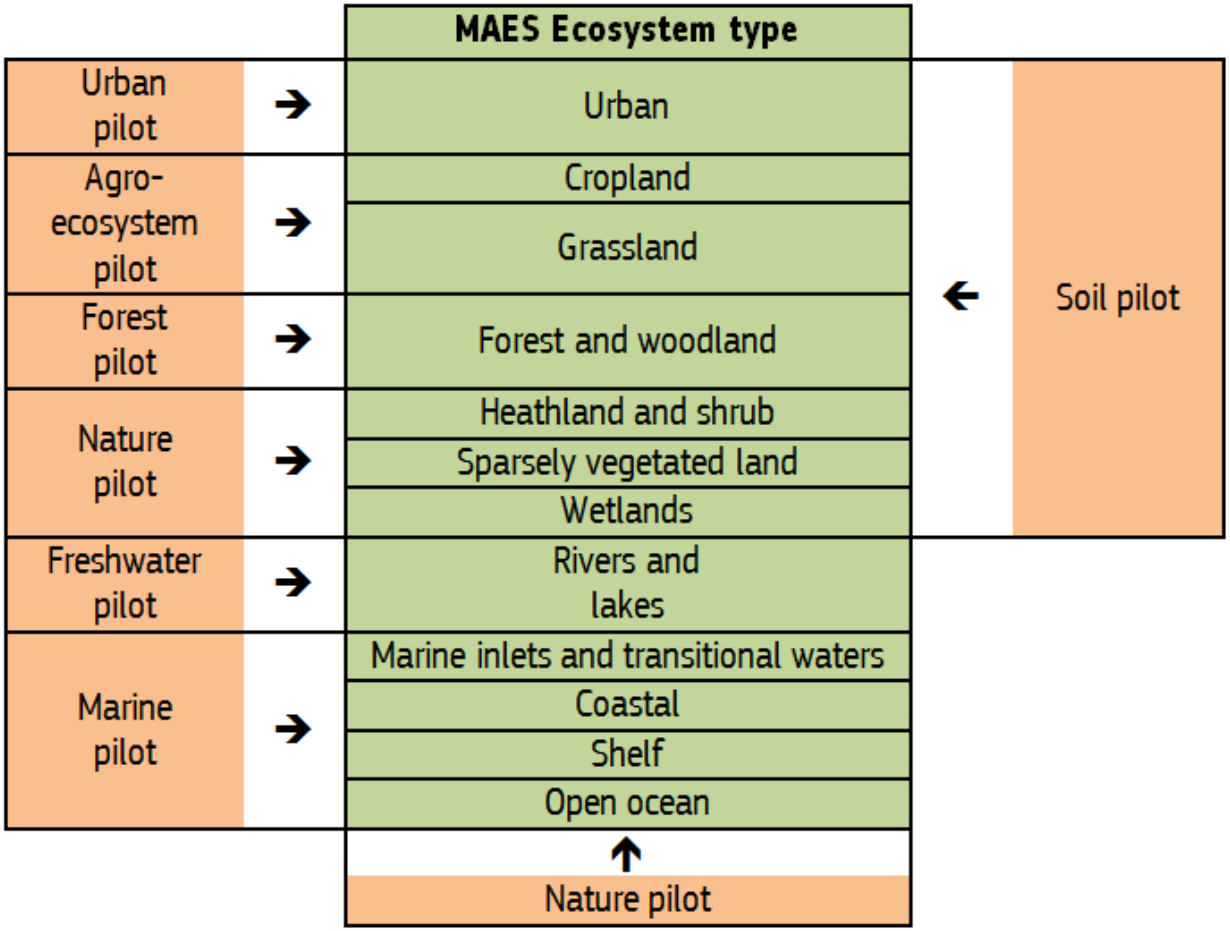
The MAES pilot approach



Organisation of the MAES work into pilots (pools of expertise) and ecosystem types

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The MAES pilot approach

- ➔ Single analytical framework but ecosystem-specific approach
- ➔ Input from EU Member States and EU services
- ➔ Cross fertilization among the pilots

A consistent approach for measuring the condition of 12 different terrestrial, freshwater and marine ecosystems covering the whole EU

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Ecosystem condition: the physical, chemical and biological condition or quality of an ecosystem at a particular point in time

How do we measure ecosystem condition?

➔ What (how much) are the pressures?

➔ Abiotic measurements

➔ Biotic measurement (structure and function)

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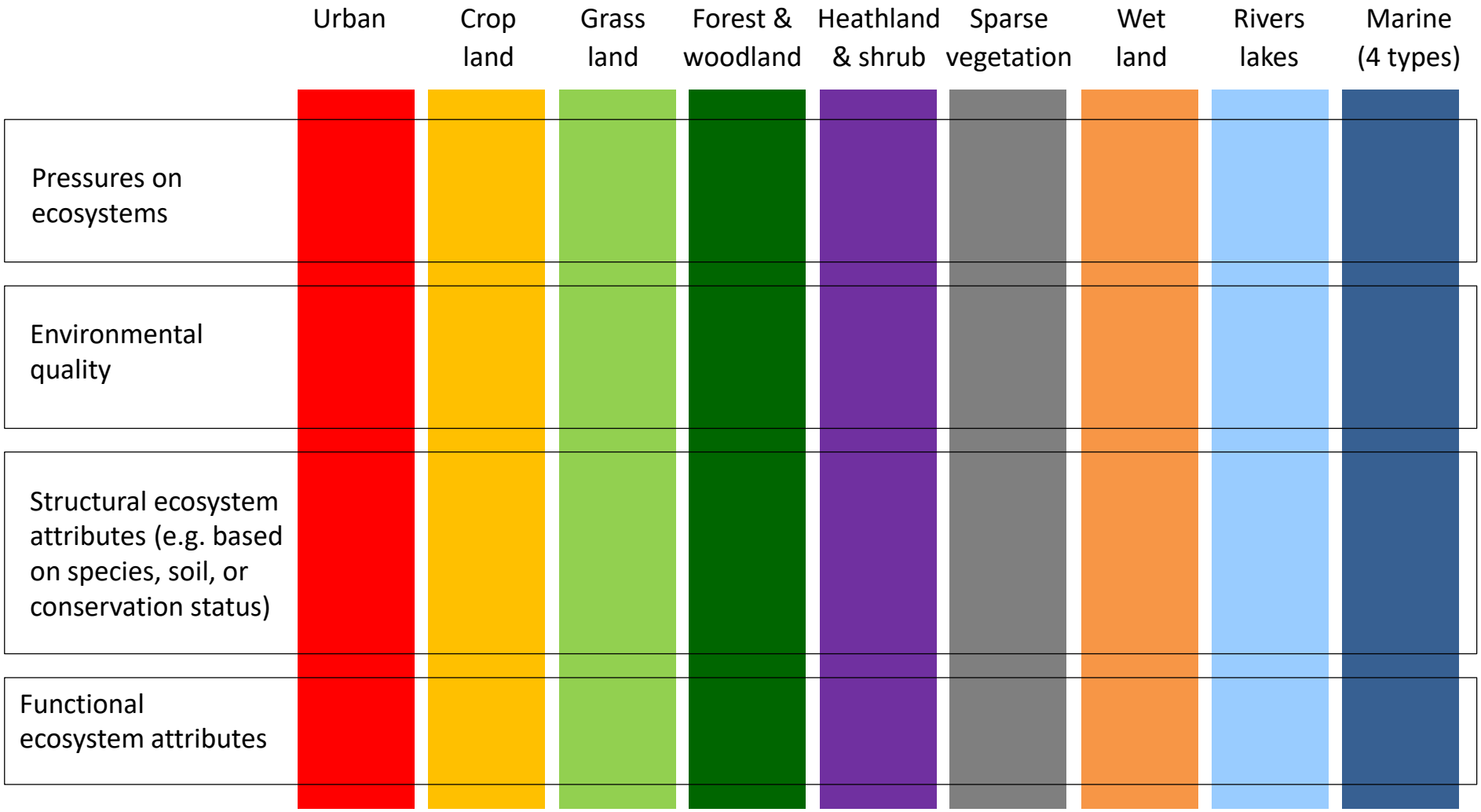
Pressures	Habitat conversion and degradation (land conversion)
	Introductions of invasive alien species
	Pollution and nutrient enrichment
	Over-exploitation
	Climate change
	Other pressures

Ecosystem Condition	Environmental quality (physical and chemical quality)		
	Ecosystem attributes (biological quality)	Structural ecosystem attributes	Structural ecosystem attributes (general)
			Structural ecosystem attributes based on species diversity and abundance
			Structural ecosystem attributes monitored under the EU nature directives
			Structural soil attributes
		Functional ecosystem attributes	Functional ecosystem attributes (general)
			Functional soil attributes


Urban
Crop land
Grass land
Forest & woodland
Heathland & shrub
Sparse vegetation
Wet land
Rivers lakes
Marine (4 types)
Pressures on ecosystems
Environmental quality
Structural ecosystem attributes (e.g. based on species, soil, or conservation status)
Functional ecosystem attributes

5th MAES report on condition

➔ Indicator tables per MAES ecosystem type (7 terrestrial types, 1 freshwater type and 4 marine types)

➔ **Key indicators** (policy relevant + data available) per ecosystem type

➔ Examples of **policy narratives** linking pressures, ecosystem condition and ecosystem services

➔ **Integration** across ecosystem types for integrated ecosystem assessment

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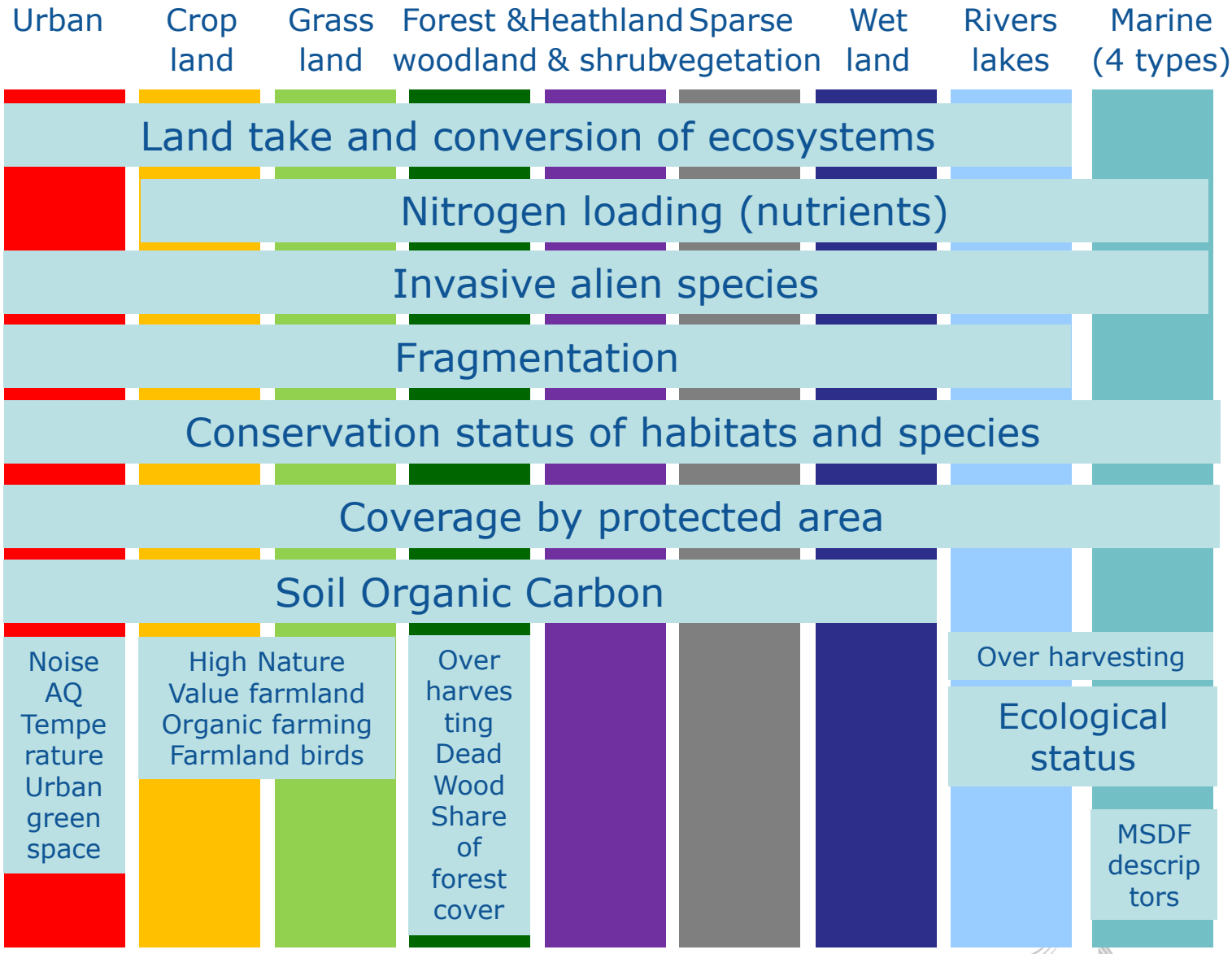
Key indicators



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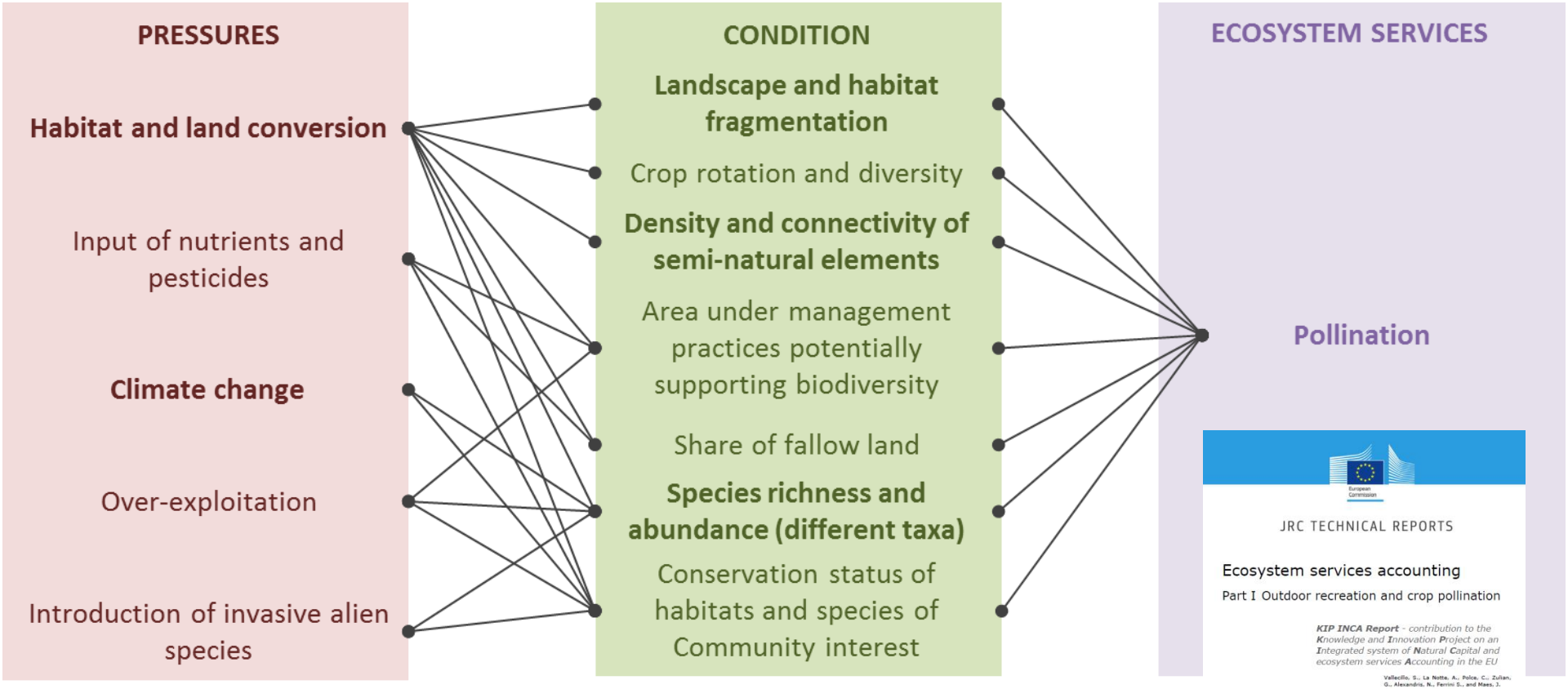
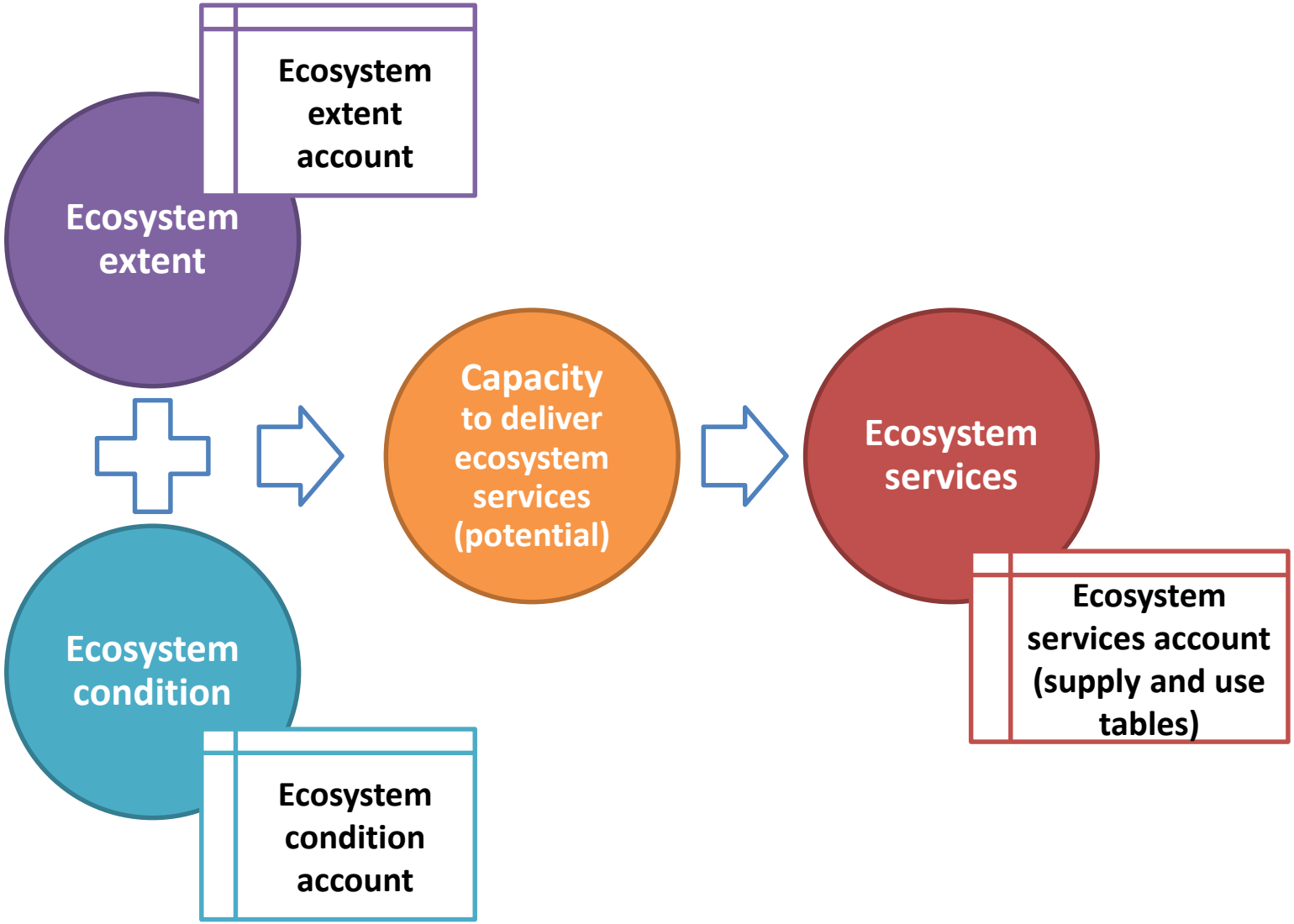
Links to other indicator frameworks and ensuring policy relevance

➔ Streamlined with 19 specific (environmental) policies or existing indicator frameworks of the European Commission, including

- ➔ Streamlined European Biodiversity Indicators
- ➔ Agri-Environment Indicators
- ➔ Marine Strategy Framework Directive descriptors
- ➔ Sustainable development goals

Linking condition to services (pollination in cropland)




Ecosystem extent account
Ecosystem extent
Capacity to deliver ecosystem services (potential)
Ecosystem services
Ecosystem services account (supply and use tables)
Ecosystem condition
Ecosystem condition account

Conclusion

➔

The report contains a comprehensive and consistent list of indicators for ecosystem condition for 'vertical' and 'horizontal' ecosystem assessment and for natural capital accounting

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