Keeping EA in touch with dynamic impacts and objectives: Systems Thinking

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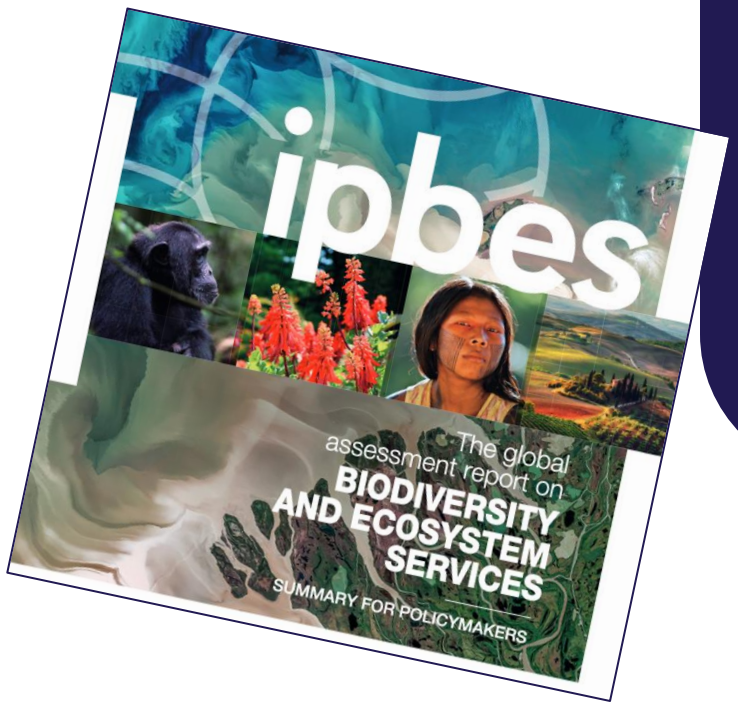
EU funded project - BioValue

BioValue

Transformative change for biodiversity

BioValue



”The **direct drivers of change in nature** with the **largest global impact** have been … **changes in land and sea use**…”

IPBES (2019)

Transformative change for biodiversity

Biodiversity challenges

Global pressures on biodiversity

Spatial planning

Need for transformative change for biodiversity in spatial planning

BioValue

Environmental assessment

How EIAs and SEAs assess biodiversity impacts

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Environmental assessment

How EIAs and SEAs assess biodiversity impacts

Data

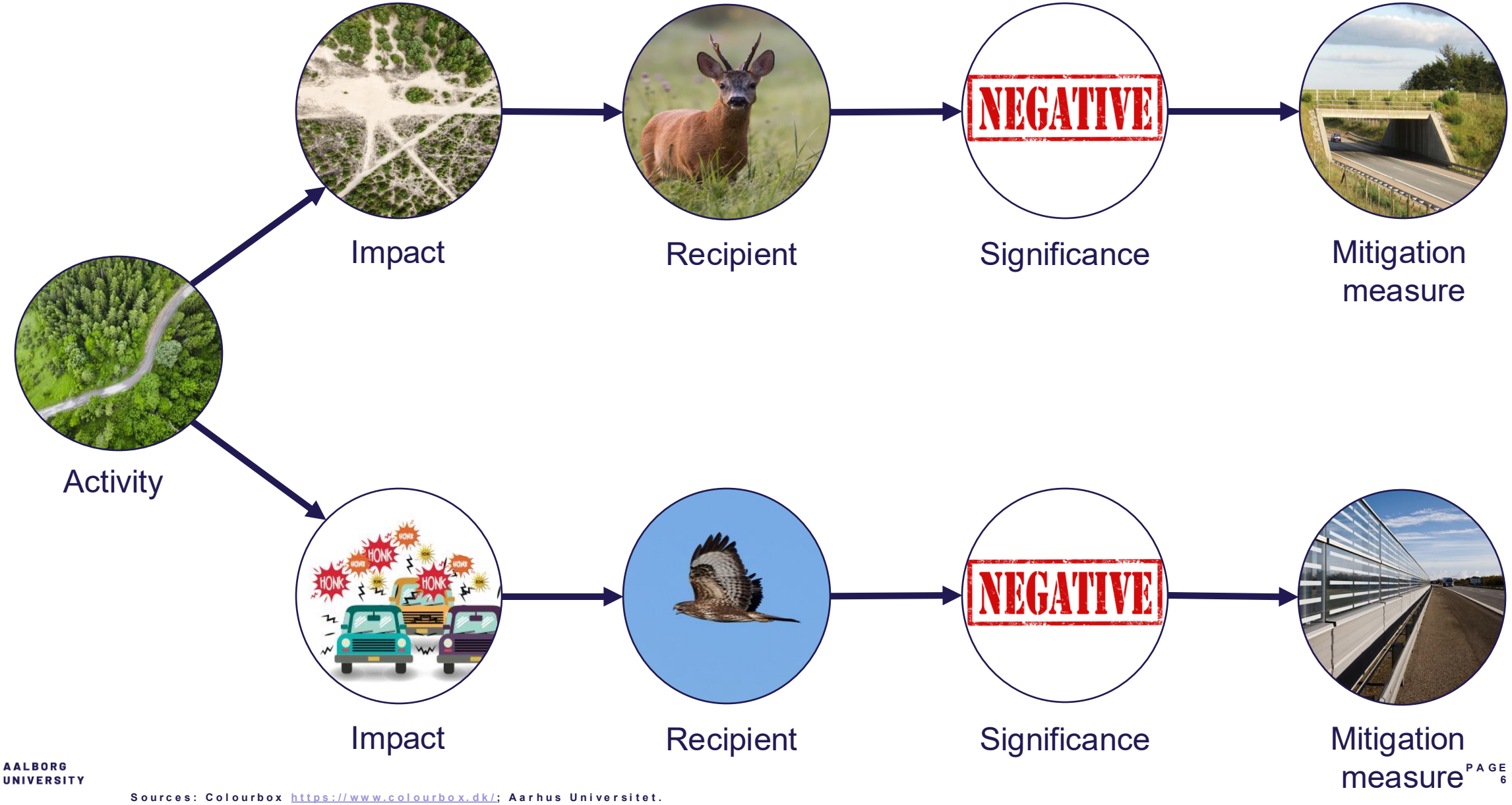
Approx. **200 EAs** from

- Denmark
- Portugal
- Spain
- Germany

Analysis

Annotated causalities for how biodiversity impacts are addressed

Environmental assessment



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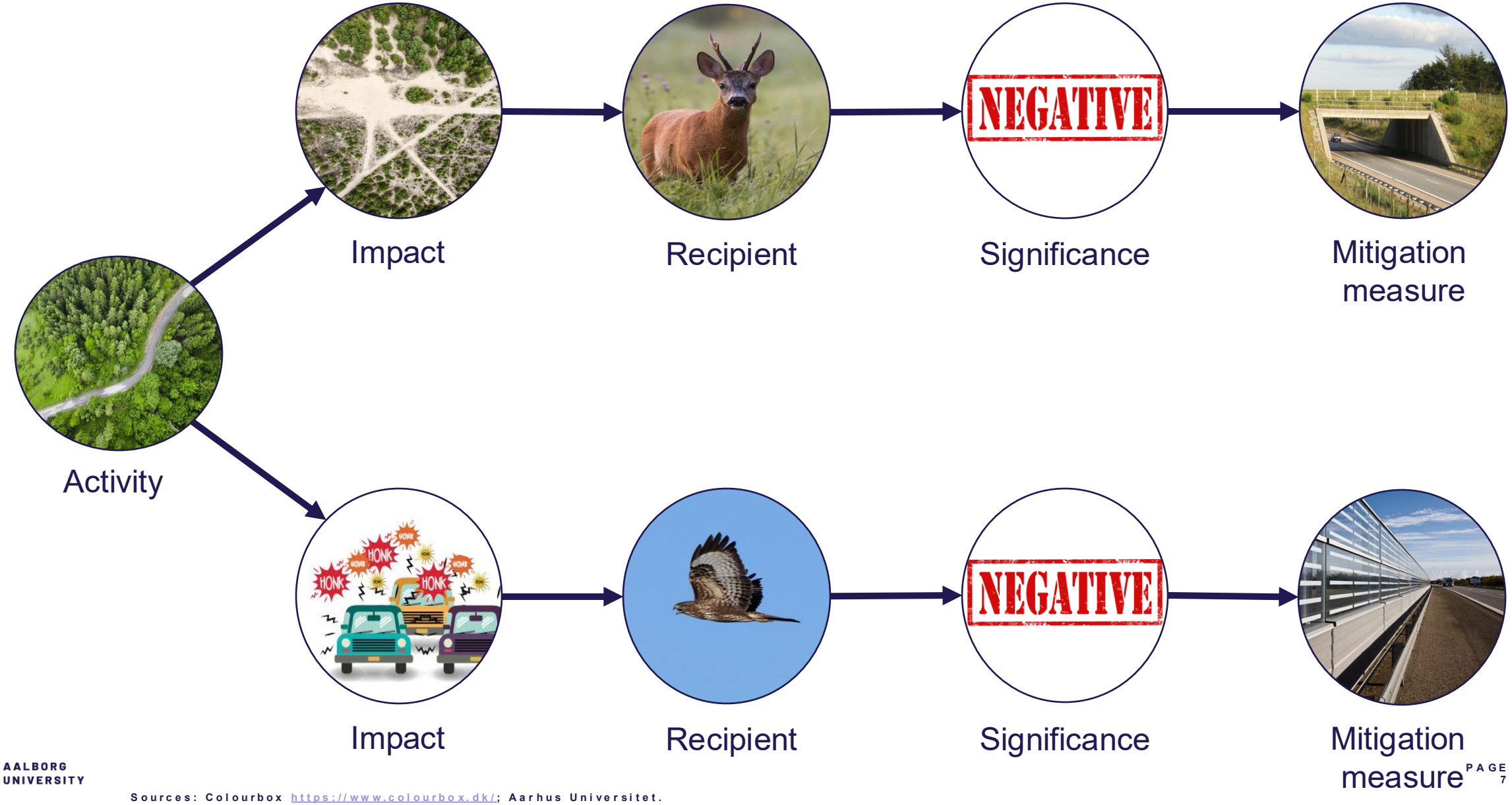
Sources: Colourbox https://www.colourbox.dk/; Aarhus Universitet. Danmarks Miljøundersøgelser (2011). https://www2.dmu.dk/pub/fr839.pdf

Environmental assessment



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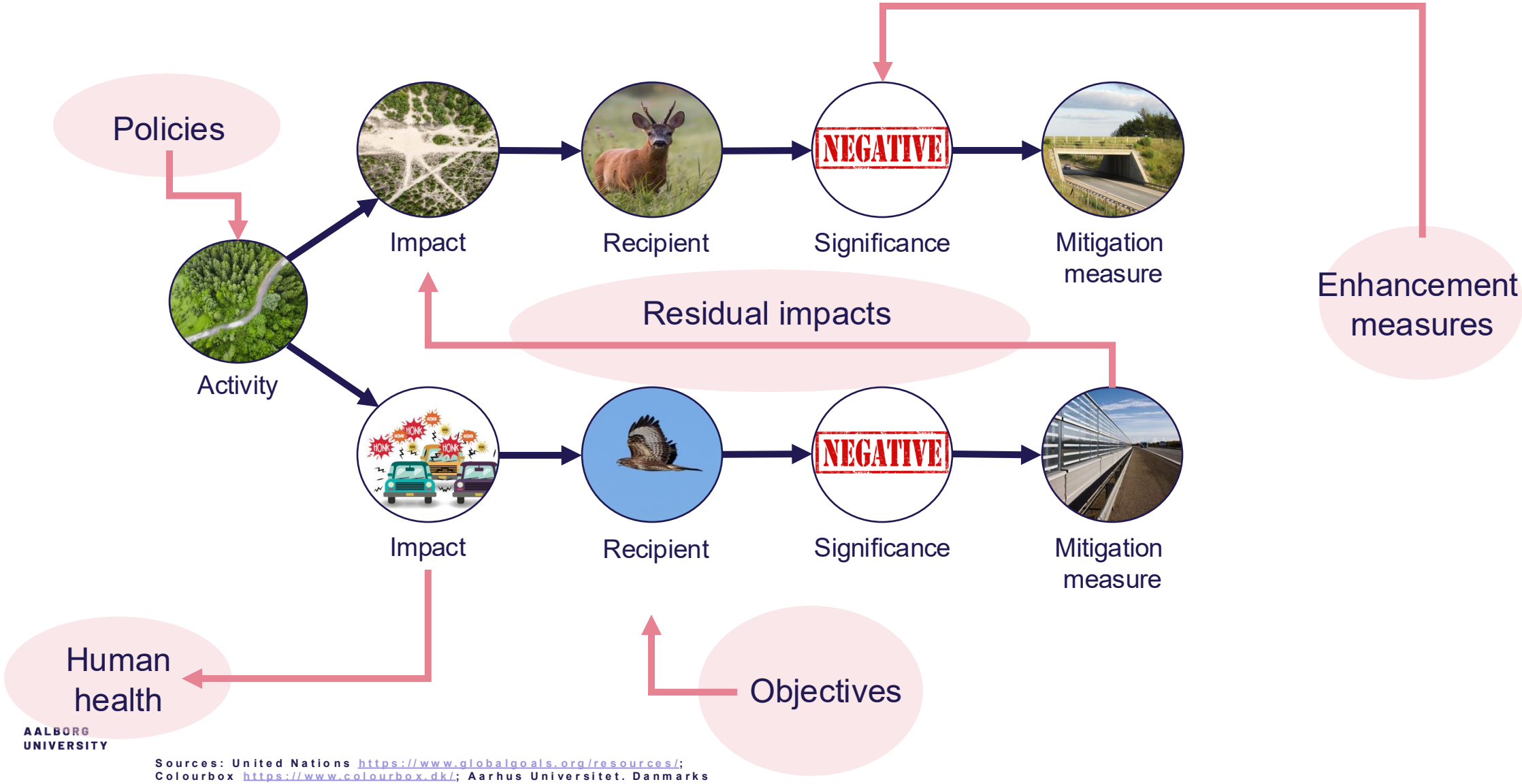
Environmental assessment



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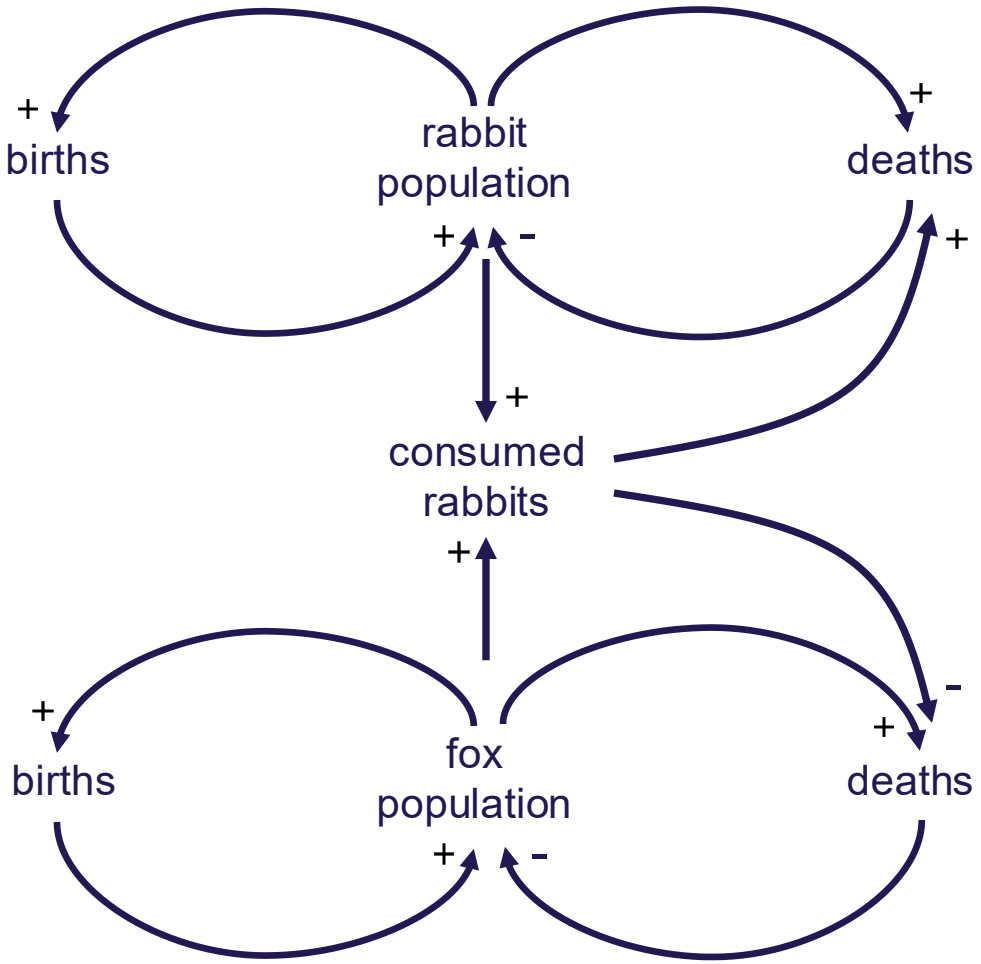
Systems thinking

”…systems thinking … gives us the freedom to **identify root causes of problems and see new opportunities**”

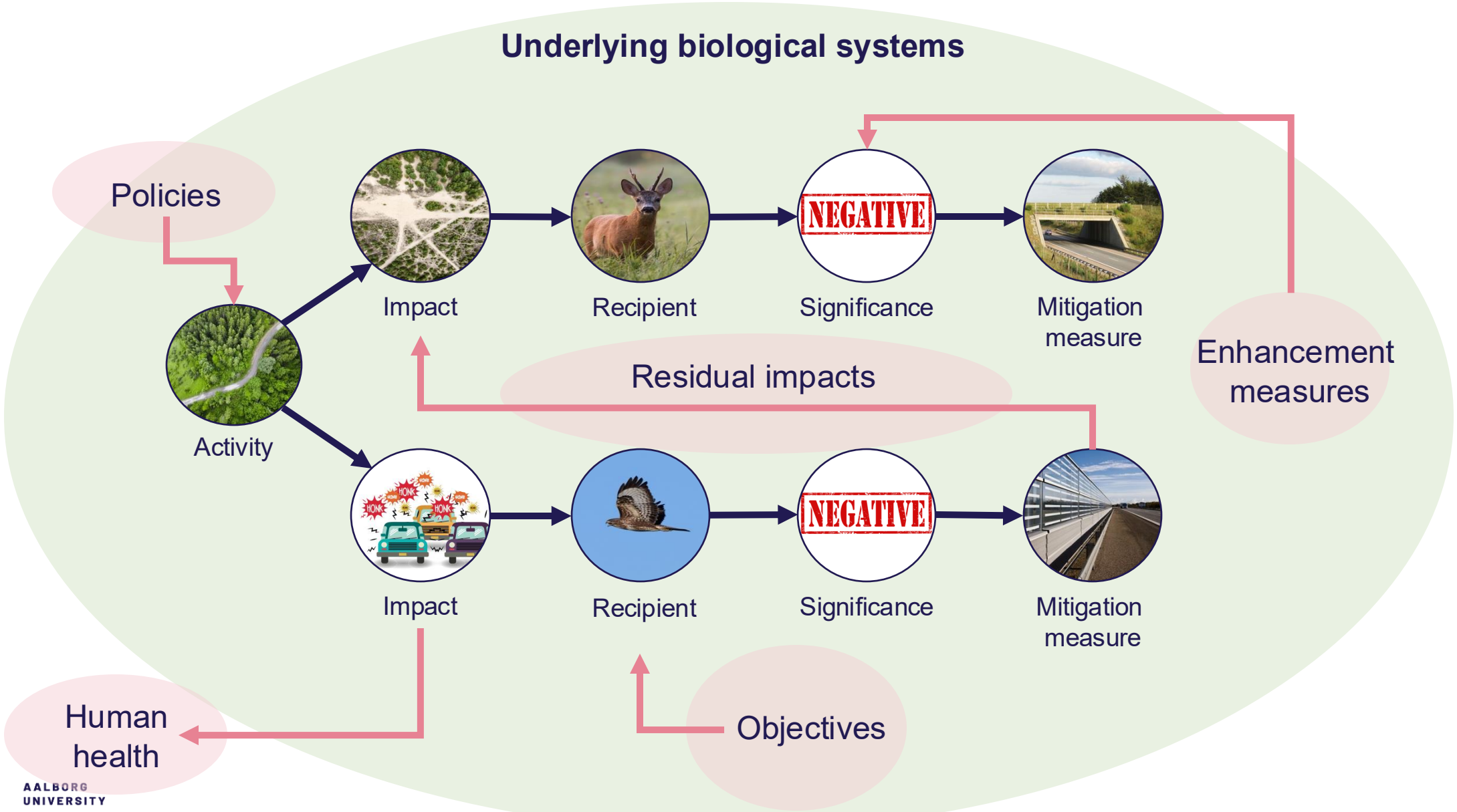
-Donella Meadows, *Thinking in Systems, p. 2*

Causal-loop diagrams (CLD) – relations between entities in a system



Example inspired by Walters et al. (2017)

Systems thinking



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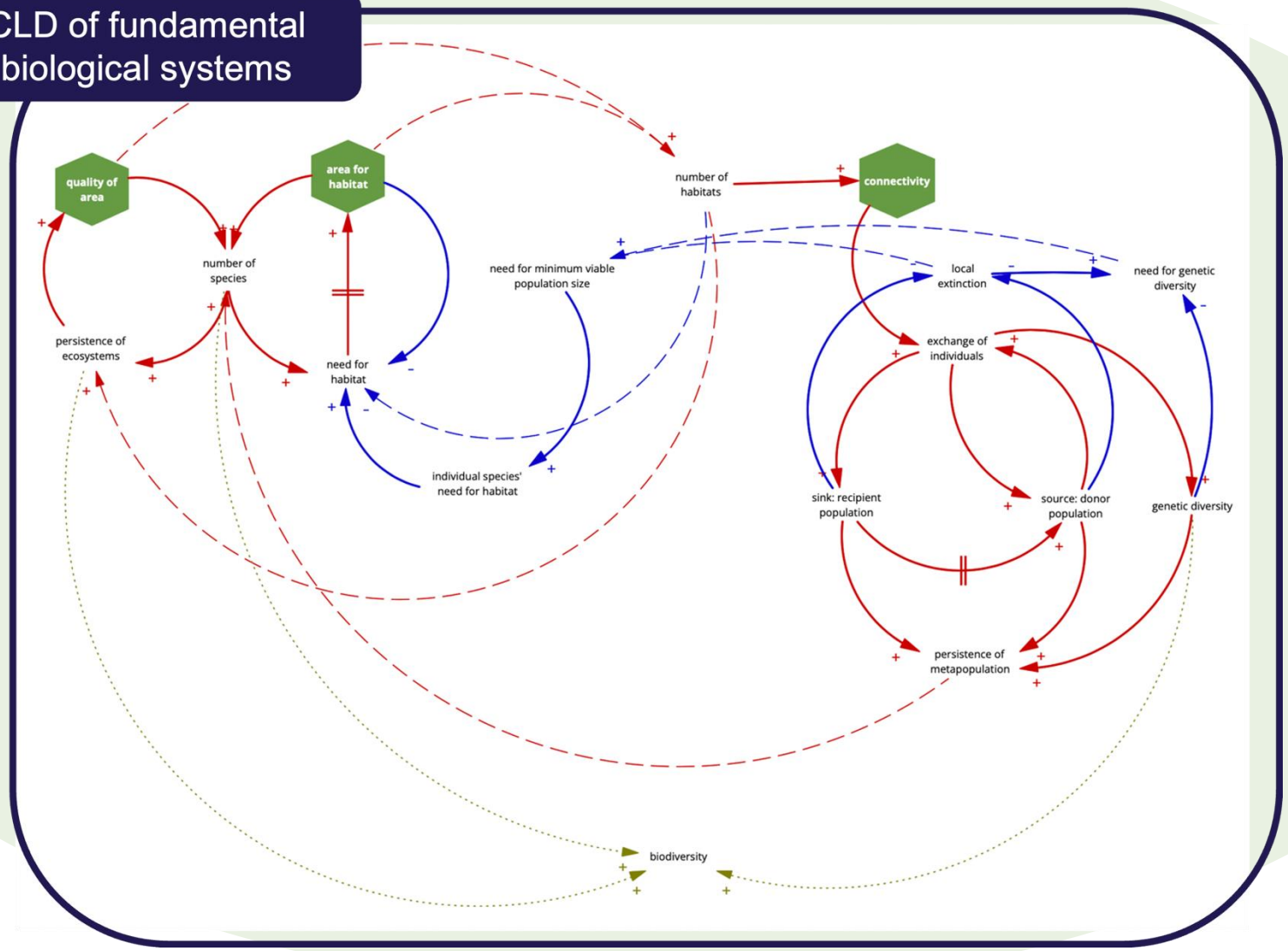
Biological principles

CLD of fundamental biological systems



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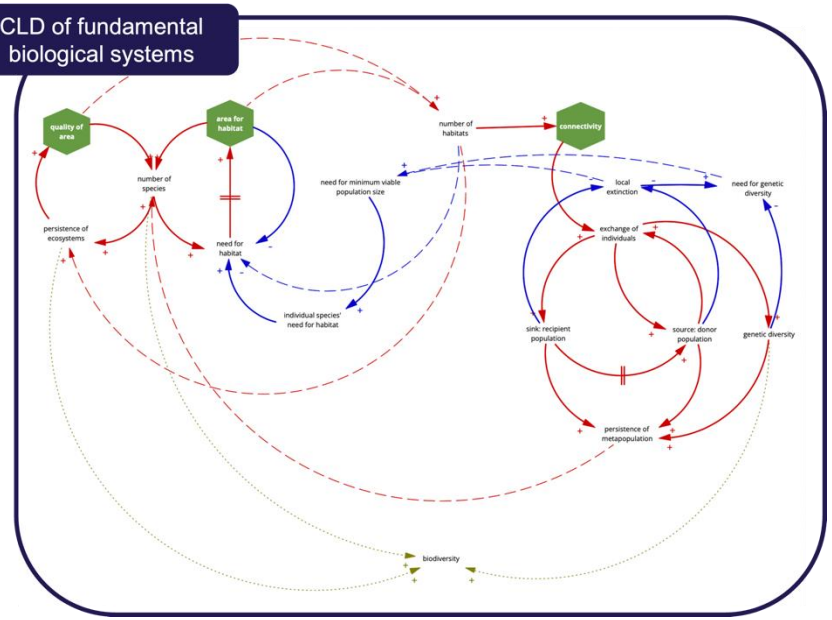
Biological principles

CLD of fundamental biological systems



1.

Area of habitat

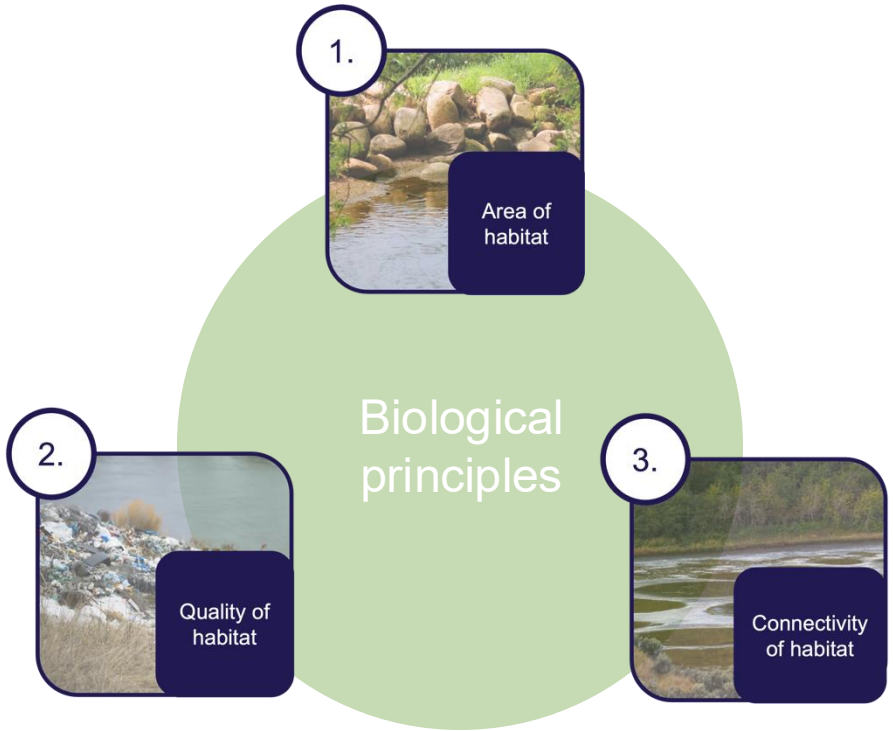
2.

Quality of habitat

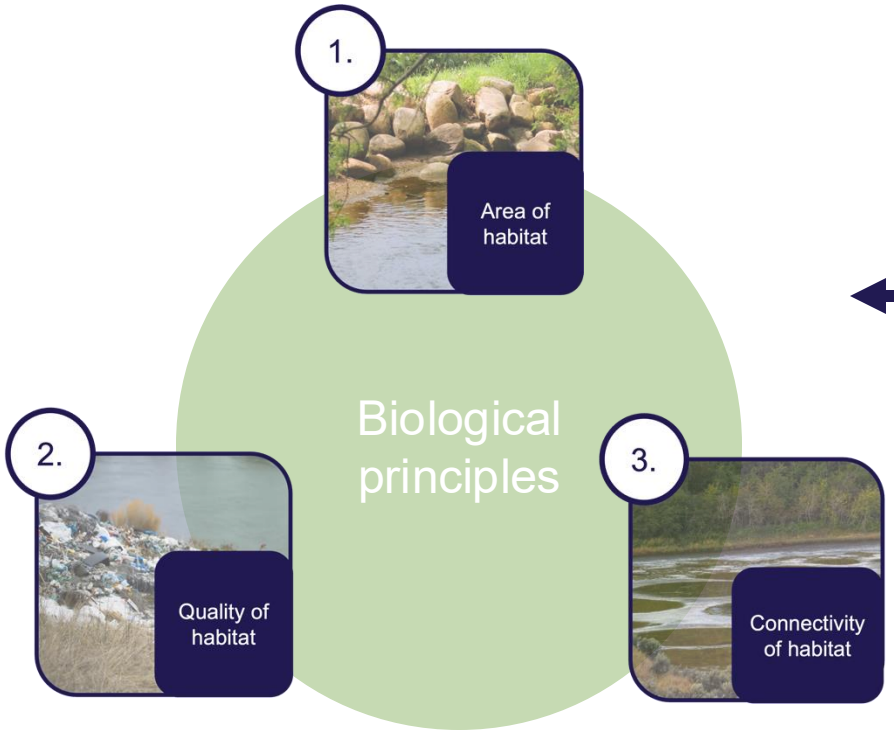
3.

Connectivity of habitat

Biological principles



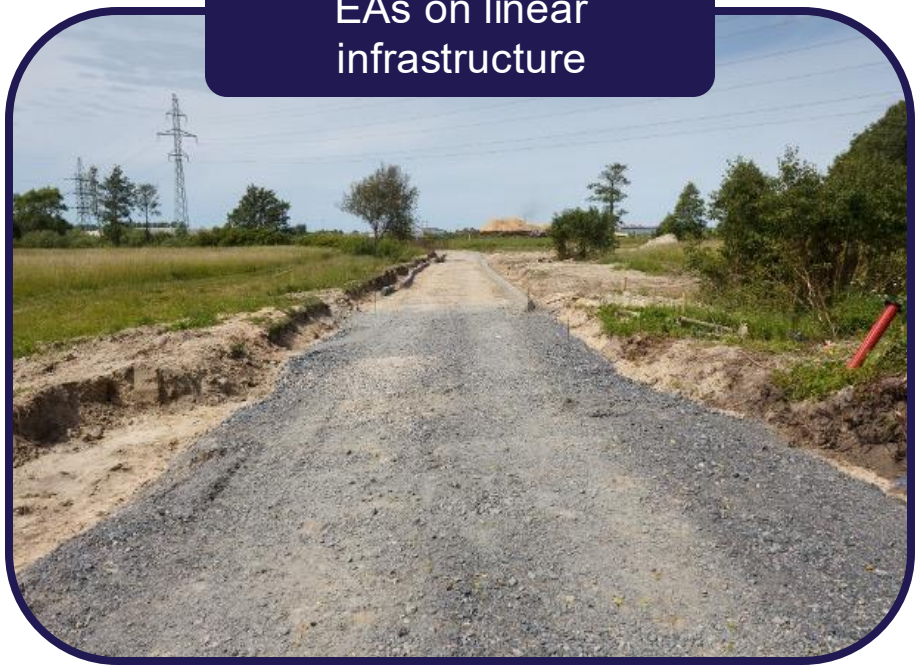
Biological principles

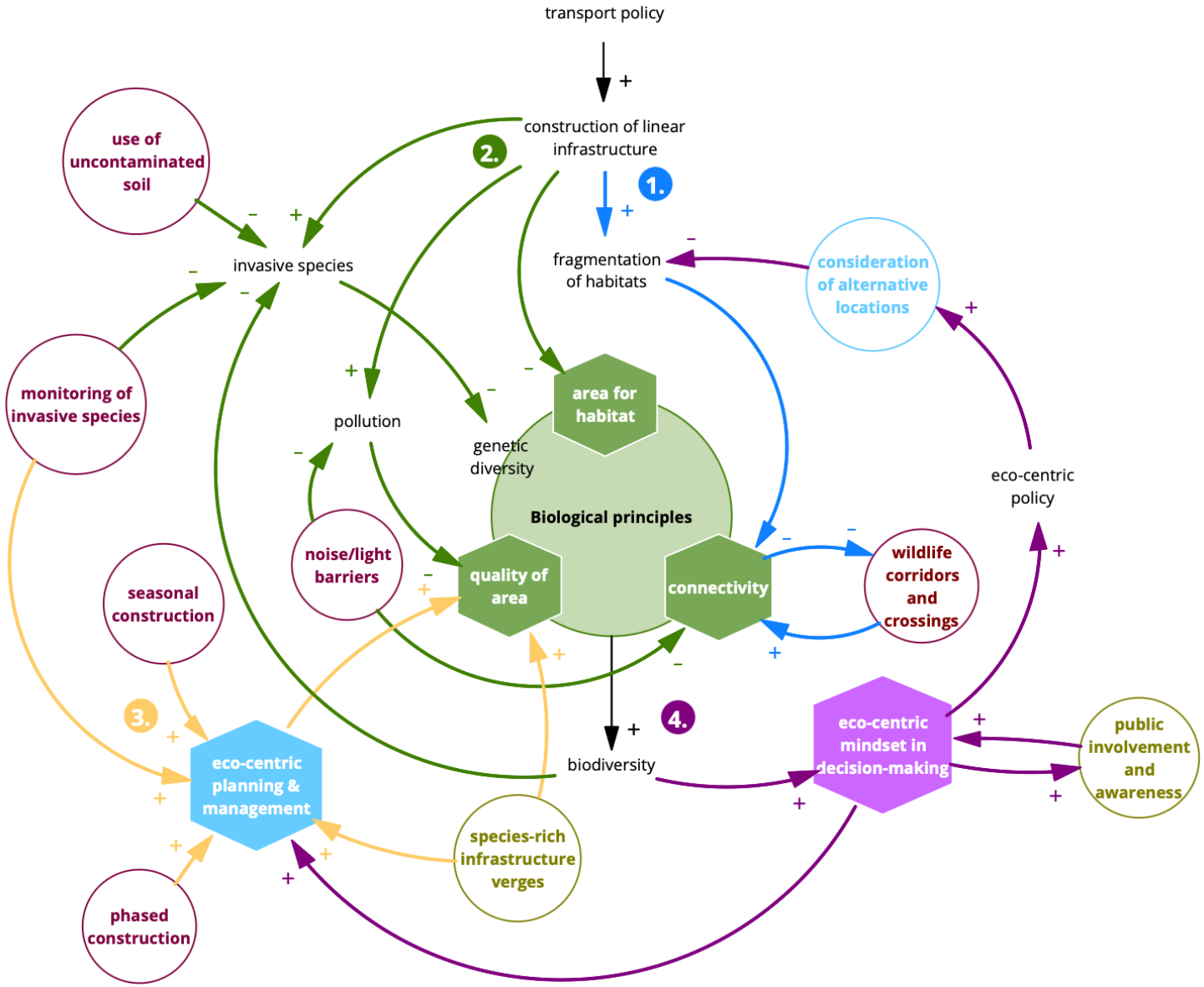


Spatial planning system

Annotation of causality data from approx. 200 SEAs and EIAs

EAs on linear infrastructure





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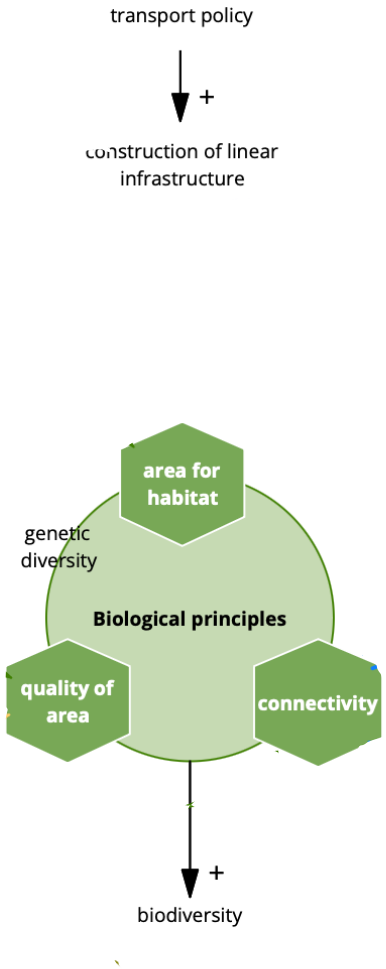
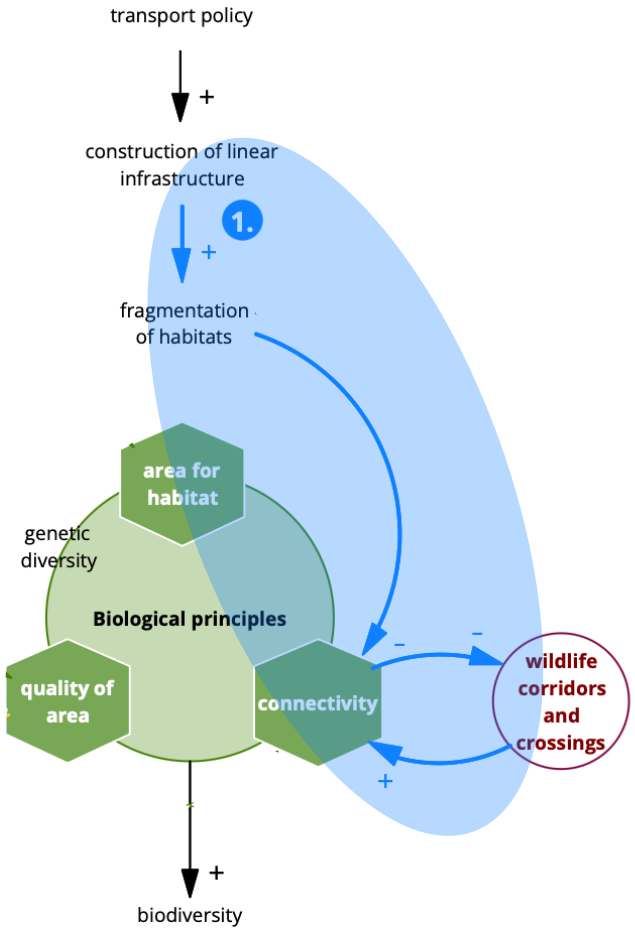

transport policy
+
construction of linear infrastructure
area for habitat
genetic diversity
Biological principles
quality of area
connectivity
+
biodiversity

Fragmentation of habitats



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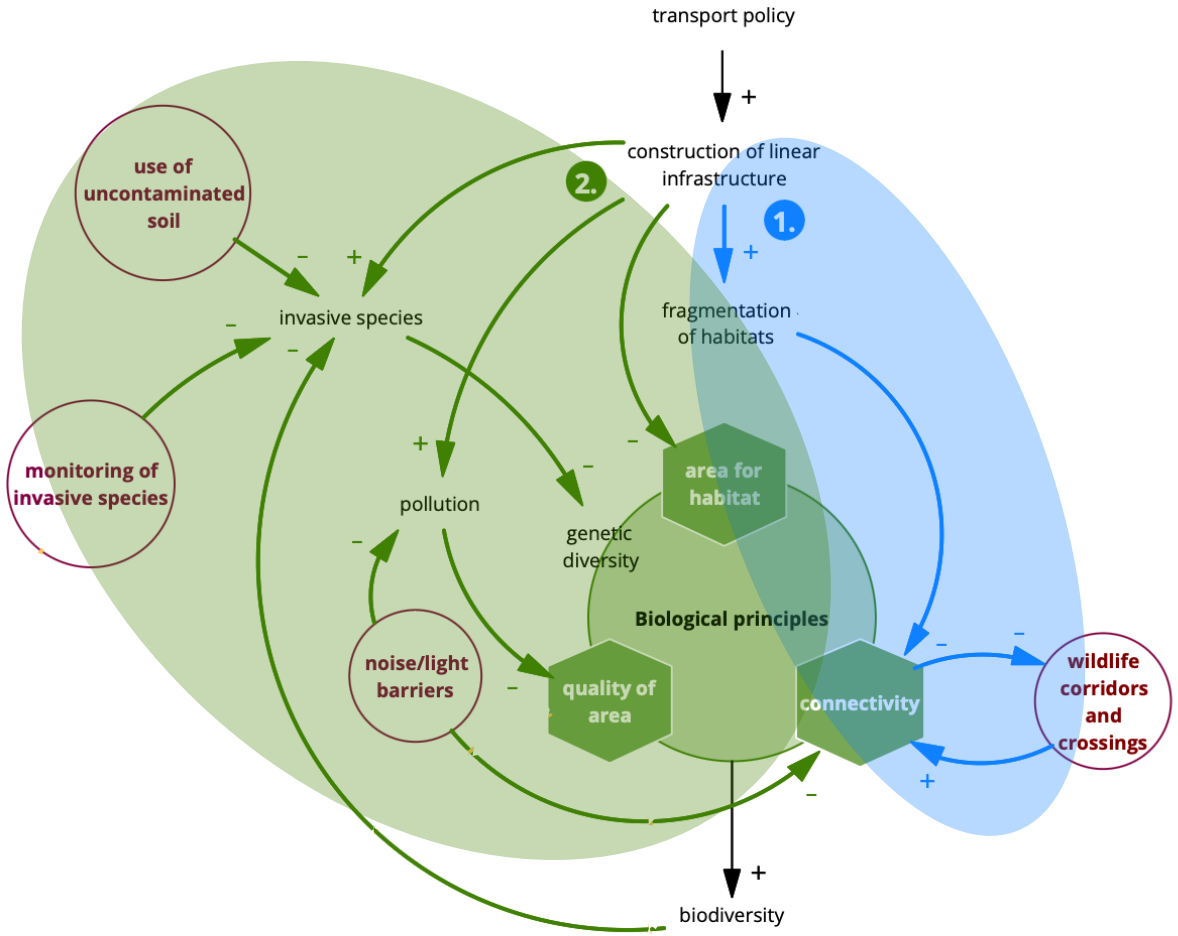
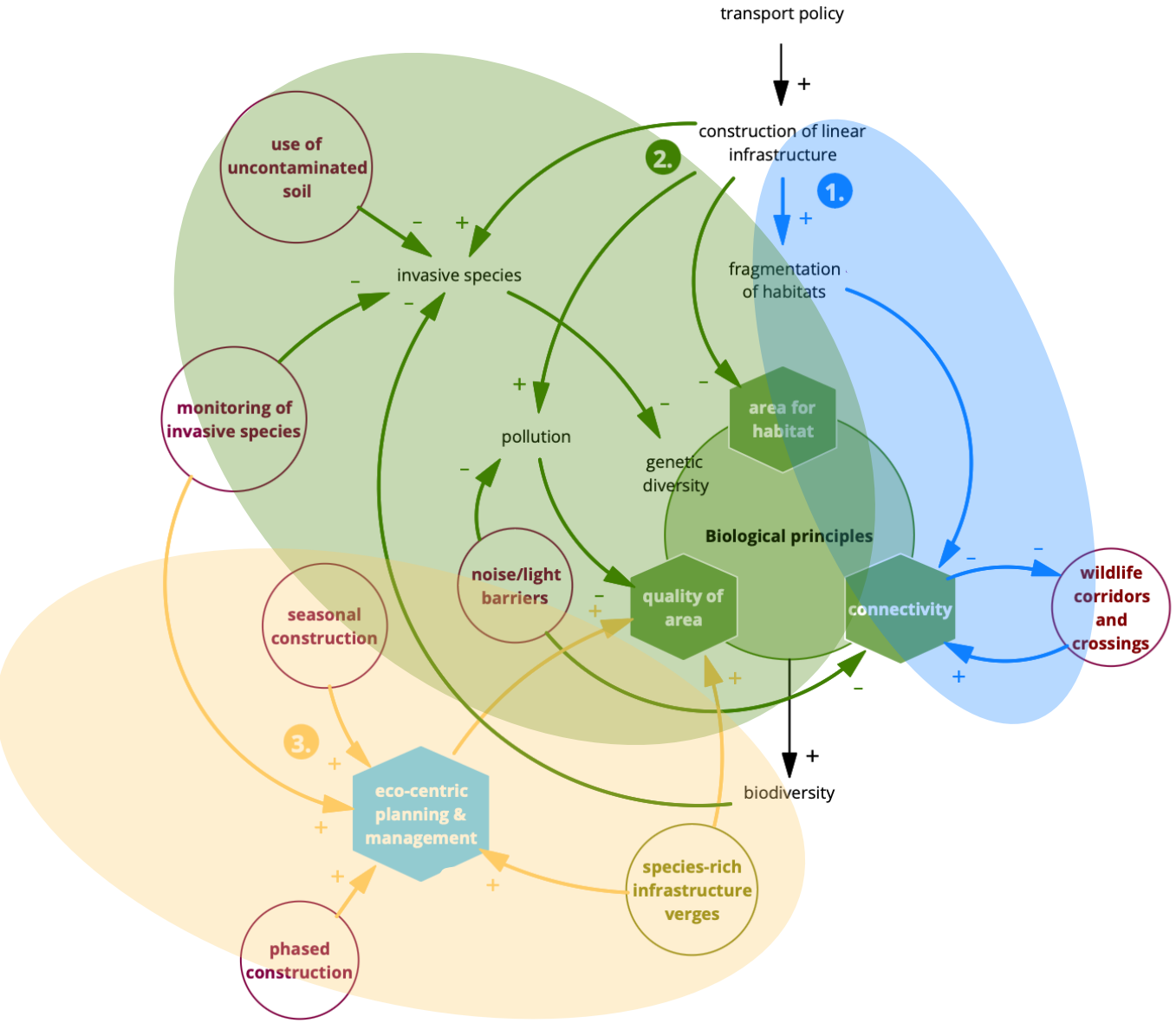


Fragmentation of habitats

Road development



Fragmentation of habitats

Road development

Planning and management

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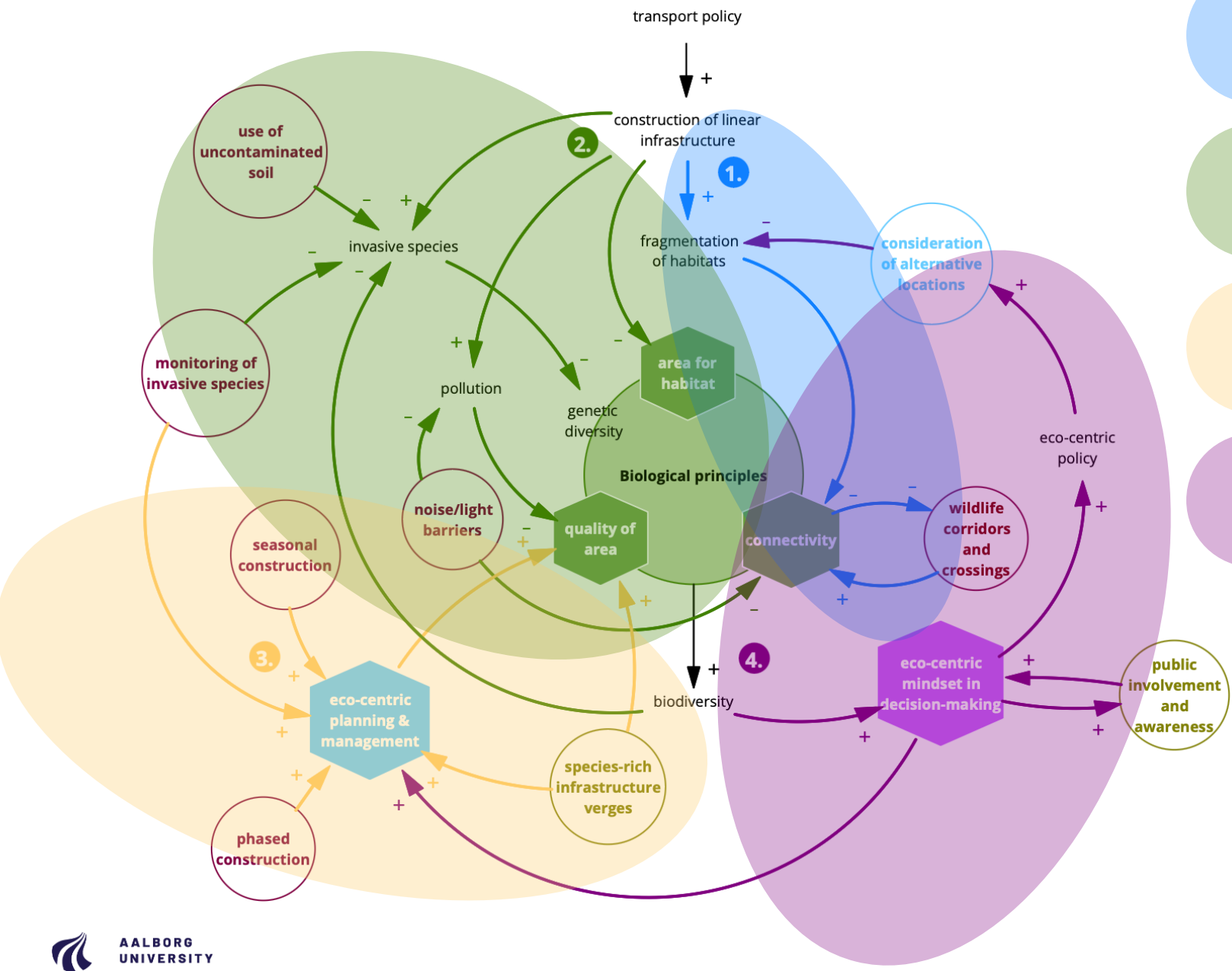

Fragmentation of habitats

Road development

Planning and management

Mindsets in decision-making

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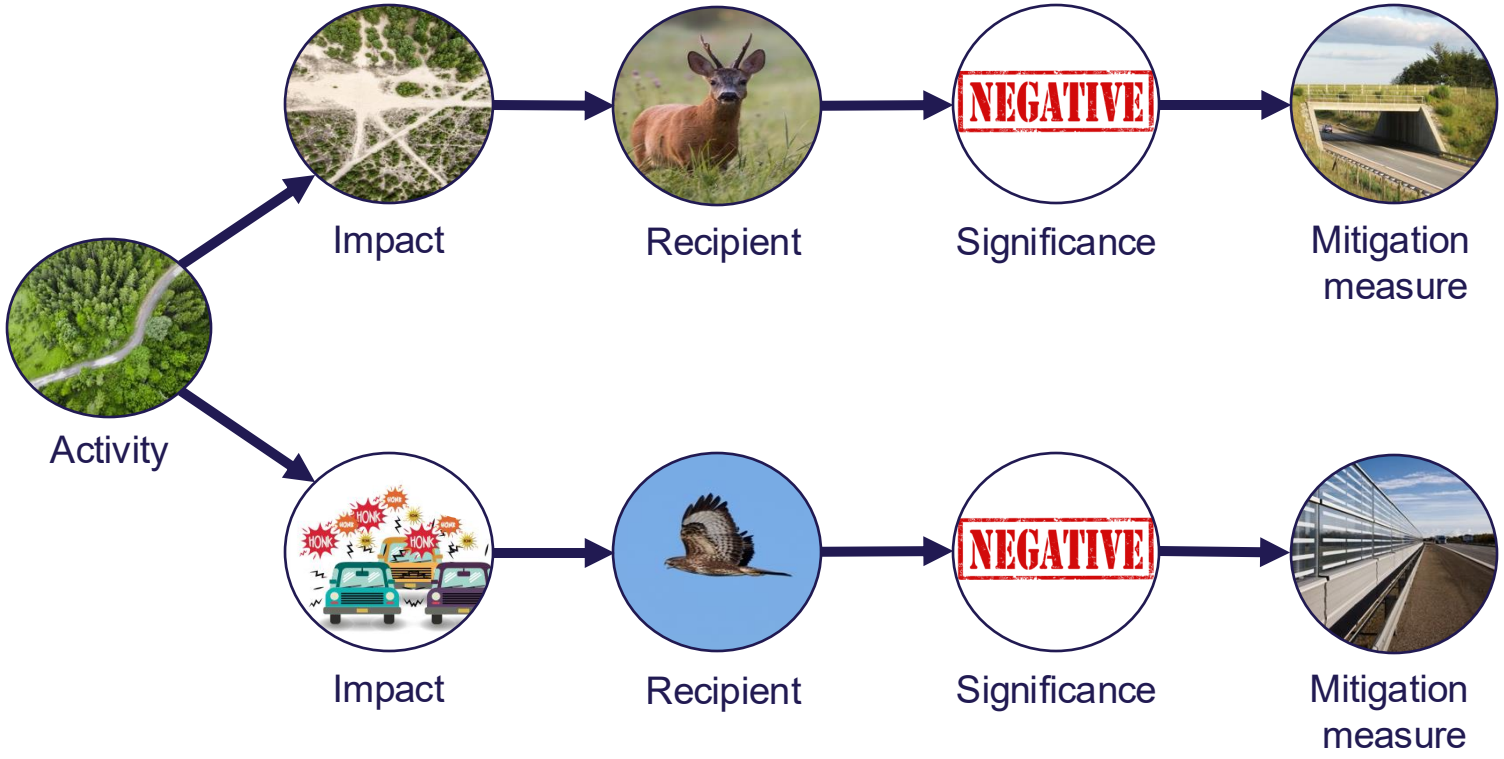
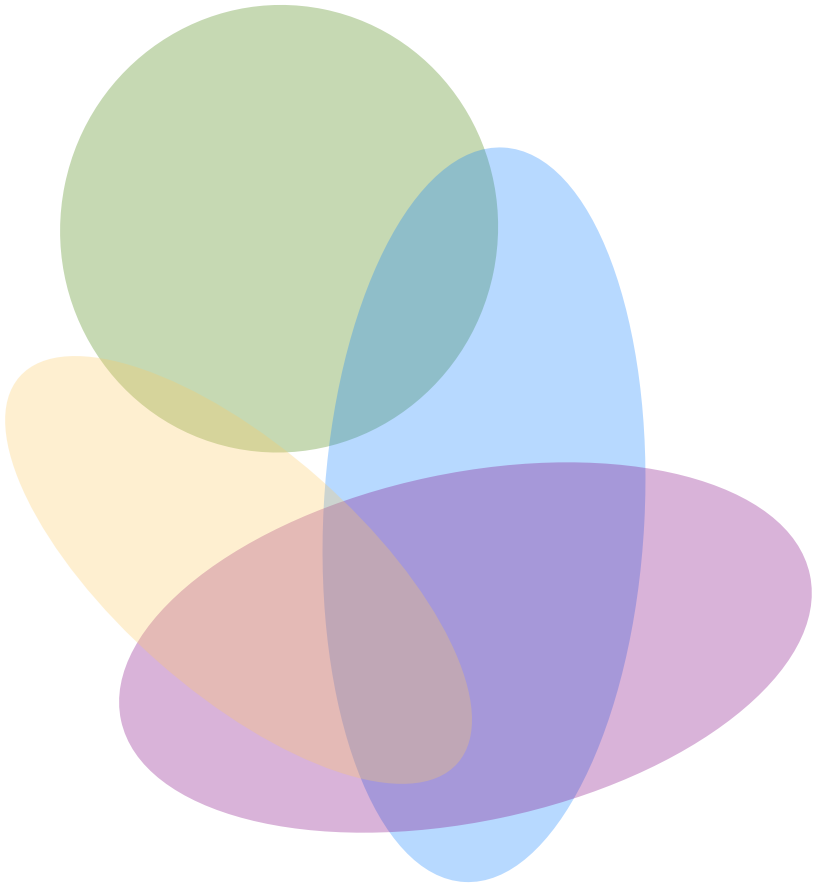

Activity
Impact
Recipient
NEGATIVE
Significance
Mitigation measure
Impact
Recipient
NEGATIVE
Significance
Mitigation measure



Activity impacts

- Fragmentation of habitat
- Pollution from road development

Planning & policy levels

- Transport policy
- Planning and management

Governance levels

- Mindsets in decision-making

Objectives

- Biological principles (area, quality, connectivity)

What does systems thinking offer?

1. Move from linear descriptions to dynamic understandings of impacts – identifying feedback mechanisms and leverage points
2. Can help visualize complex systems
3. Keep impacts connected to their guiding principles and objectives

Why EA?

4. Pre-established arenas for identifying impacts, relevant policies and objectives, and mitigation and enhancement measures
5. Serves as a crucial decision support in spatial planning that can inform transformative change

Let’s continue the conversation!

Message me your questions or comments in the IAIA25 app.

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References

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- Meadows, Donella. Thinking in Systems

Images:

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