

Leveraging transformative change in spatial planning for valuing biodiversity

FROM RIGOR TO IMPACT

- Despite more data and mandatory environmental assessments (SEA and EIA) in spatial planning, biodiversity loss continues. Current approaches often overlook how ecosystems function and interact across space.

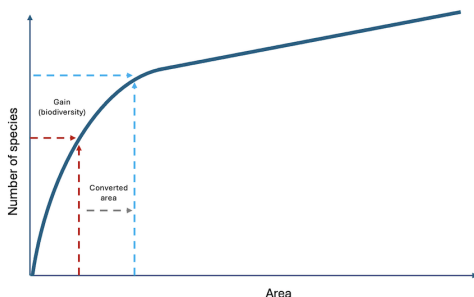
ECOLOGICAL PRINCIPLES FOR BETTER PLANNING

- The BioValue project introduces two key biological principles to guide biodiversity-sensitive spatial planning:
 - Species-Area Relationship (SAR)** and **Source-Sink Dynamics**.

PLANNING WITH SYSTEMS THINKING

- Causal-loop diagrams help embed these principles, revealing how area, connectivity, and quality interact. This supports spatial planning that is ecologically grounded, system-aware, and more effective in conserving biodiversity

Key biological principles



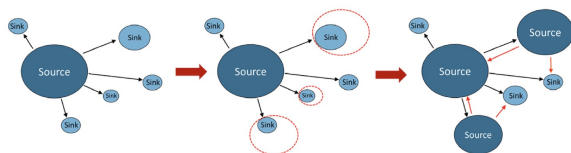
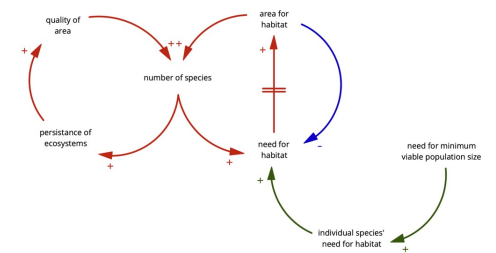
Species–Area Relationship and Biodiversity Gain

The species–area relationship (SAR) shows how even small reductions in habitat area can result in disproportionate losses in biodiversity. Conversely, increasing habitat can lead to nonlinear biodiversity gains.

[Figure adapted from Petersen et al., 2024, as presented in Kørnøv et al., 2024]

Key leverage points for spatial planning

- Habitat areas** – critical for species richness (SAR)
- Connectivity** – enables movement and resilience
- Habitat quality** – defines source strength and system health



Source–Sink Dynamics in Habitat Networks

Some habitats (sources) support surplus individuals that sustain less viable areas (sinks). Planning decisions that disrupt or enhance these dynamics can significantly alter species viability at landscape scales.

(Figure adapted from Petersen et al., 2024, as presented in Kørnøv et al., 2024)

Source for poster:
Causal Map Tool of Cause-Effect relations and Biodiversity Mitigation Hierarchy Connected to Spatial Planning (Kørnøv et al., 2024)



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