

BEST

Building biodiversity into an ecosystem service-based approach for resource management

How does land use affect multiple ecosystem services?



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Focal questions

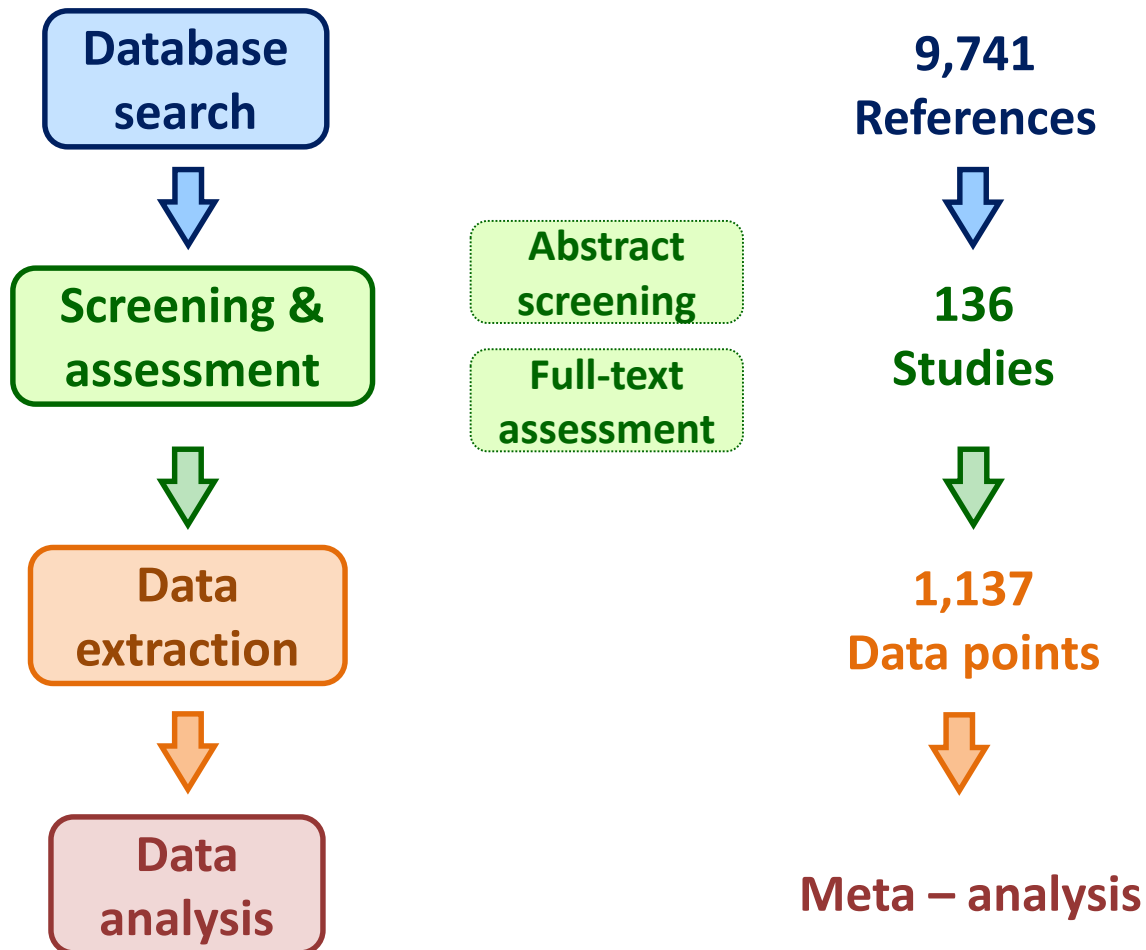
- How does service provision correlate across land uses?
- How do you maximise flows of all services and their resilience at broad (e.g. catchment) scales?
- Does biodiversity tell us anything about services that land use doesn't?

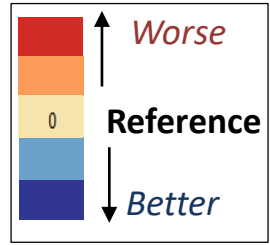
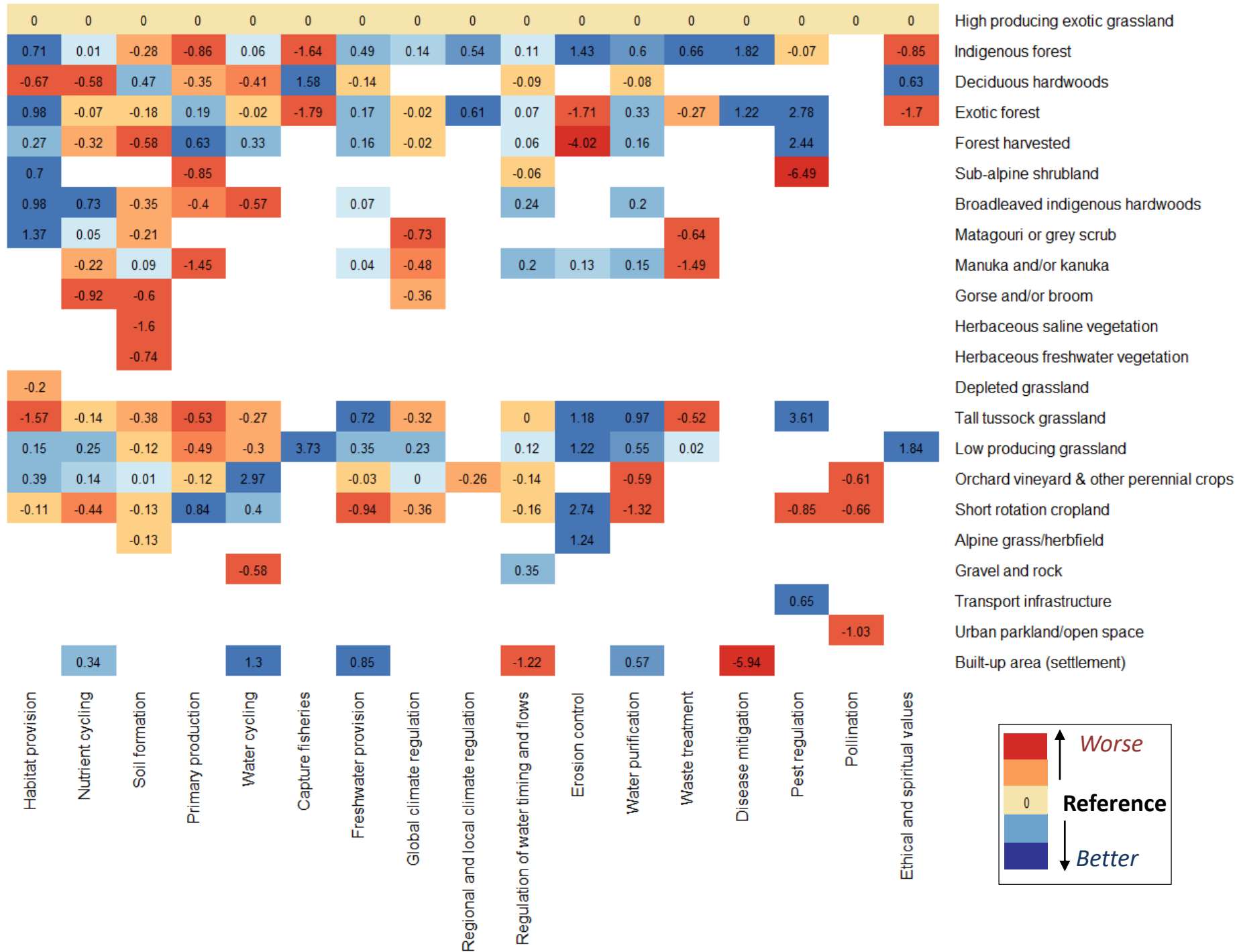
Literature survey & meta-analysis

**Land cover effects on ecosystem service provision in New Zealand
(1970 – 2015)**

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Land cover effects on ecosystem service provision in New Zealand
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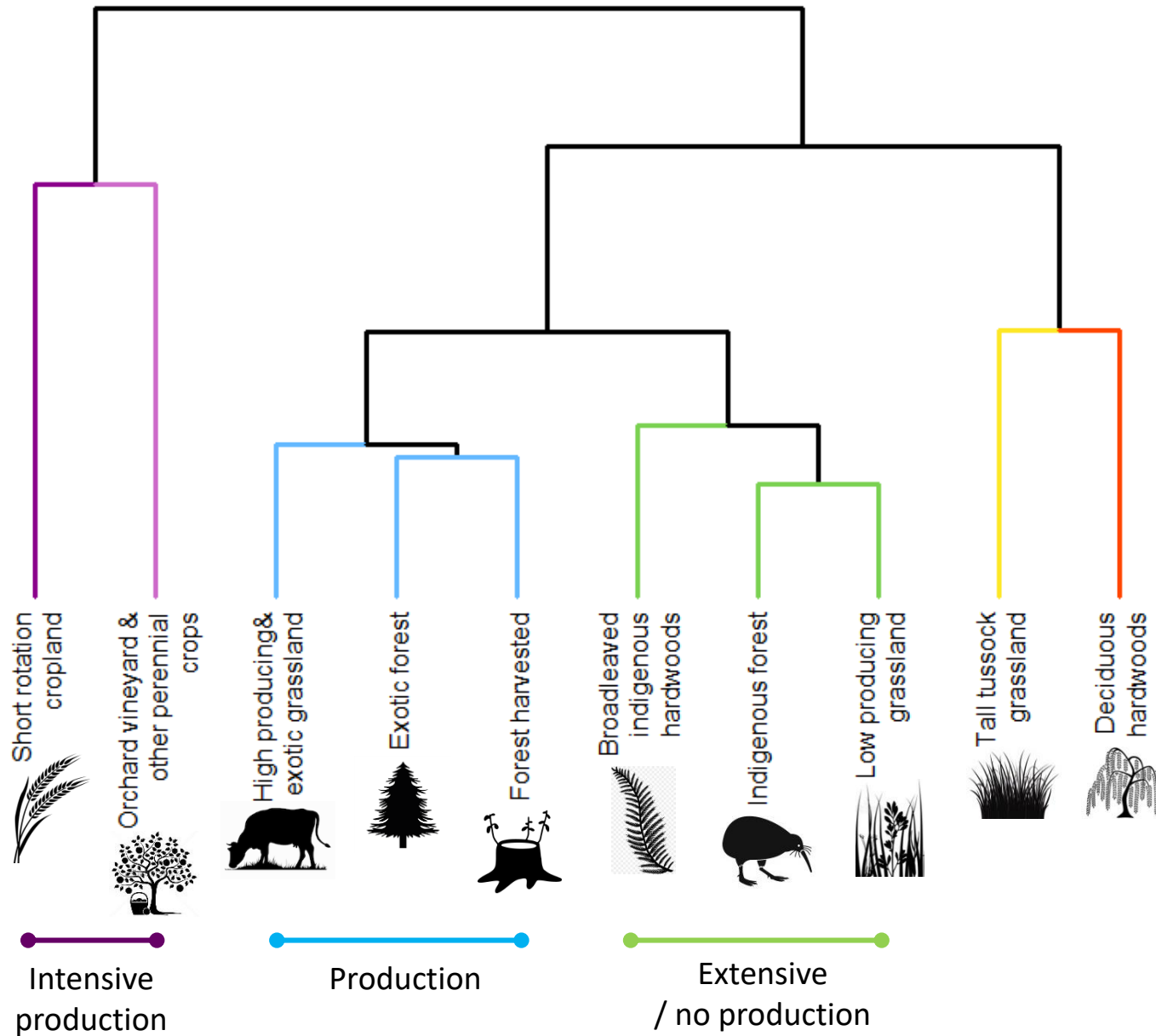


First take-home messages

- No “silver bullet” land cover to provide all ecosystem services
- Trade-offs are always present
- Provisioning of multiple services requires a mosaic of land covers in the landscape

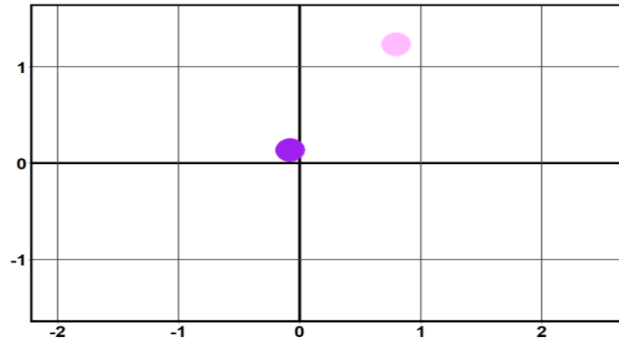
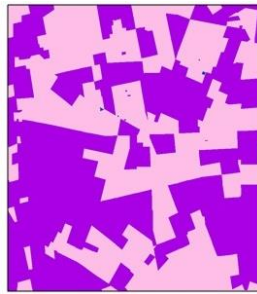


Land cover differences in ecosystem services

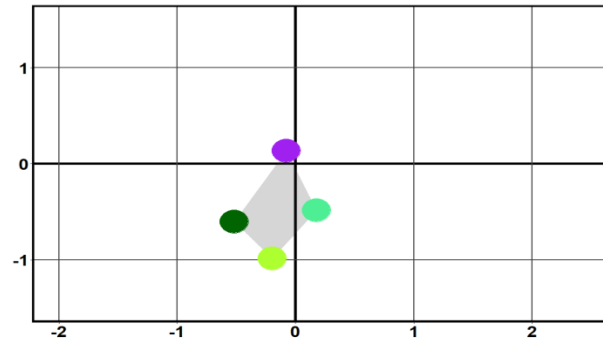
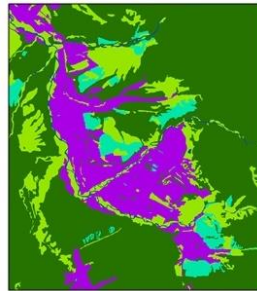


Multiple service provision across landscapes

Case 1



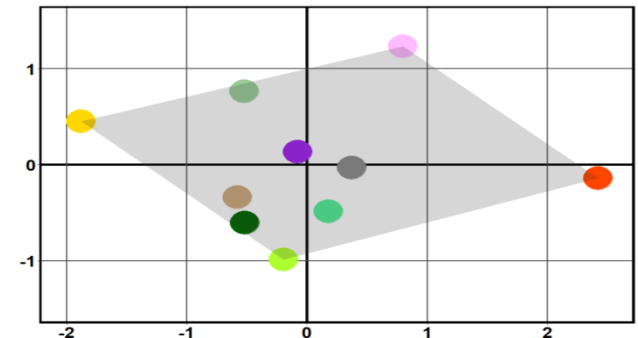
Case 2



Land covers

- Broadleaved indigenous hardwoods
- Deciduous hardwoods
- Exotic forest
- Forest harvested
- High producing exotic grassland
- Indigenous forest
- Low producing grassland
- Orchard, vineyard & other perennial crops
- Short - rotation cropland
- Tall tussock grassland

Case 3



Second take-home messages

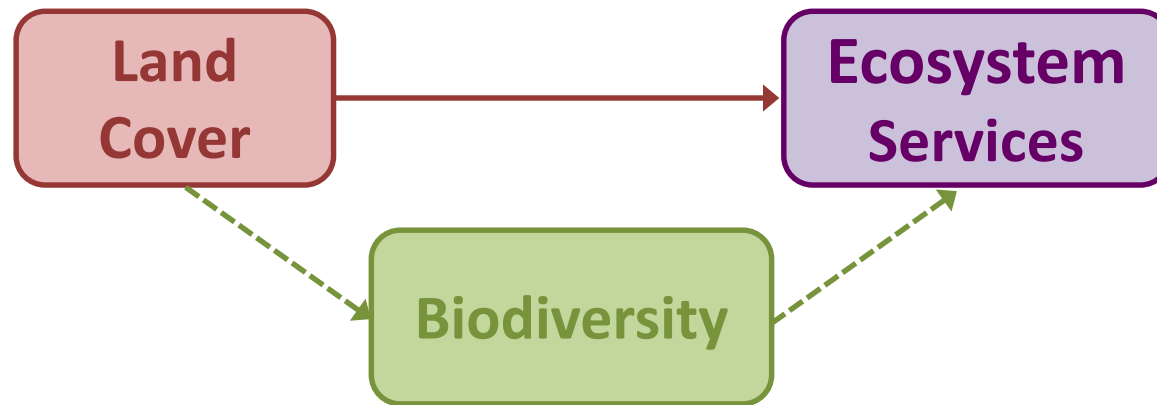
- Land covers provided similar services if they had the same:
 - Production intensity (presence of native vegetation cover) ✓
 - Forest cover ✗
- A balance between **diversity** and **redundancy** of land covers is needed to supply multiple services



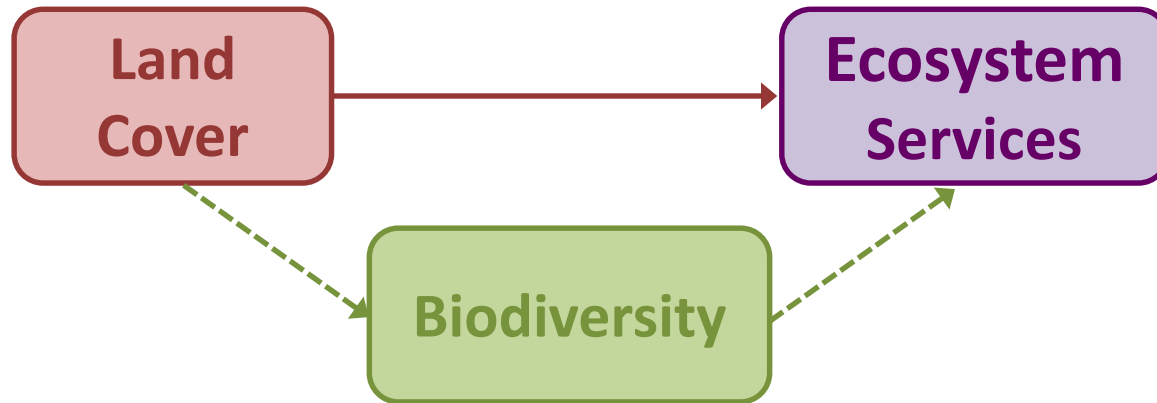
Does biodiversity tell us anything that land cover doesn't?



Does biodiversity tell us anything that land cover doesn't?



Does biodiversity tell us anything that land cover doesn't?



**11 studies also had biodiversity data
(species richness)**



Third take-home messages

- Land cover often provides a **good surrogate** measure for the effect of biodiversity on ecosystem service provision
- **Exceptions** to this are:
 - Habitat provision
 - Regulation of water timing & flows
 - Erosion control
- Improving biodiversity could **alleviate** or **intensify** land-cover impacts on:
 - Habitat provision
 - Water cycling
 - Nutrient cycling



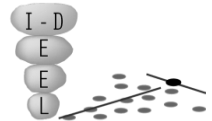
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INTER-DISCIPLINARY
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the
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complexity
in ecology

& many thanks to you...

