



Ecology, Economics and Society: joining the forces for biodiversity conservation

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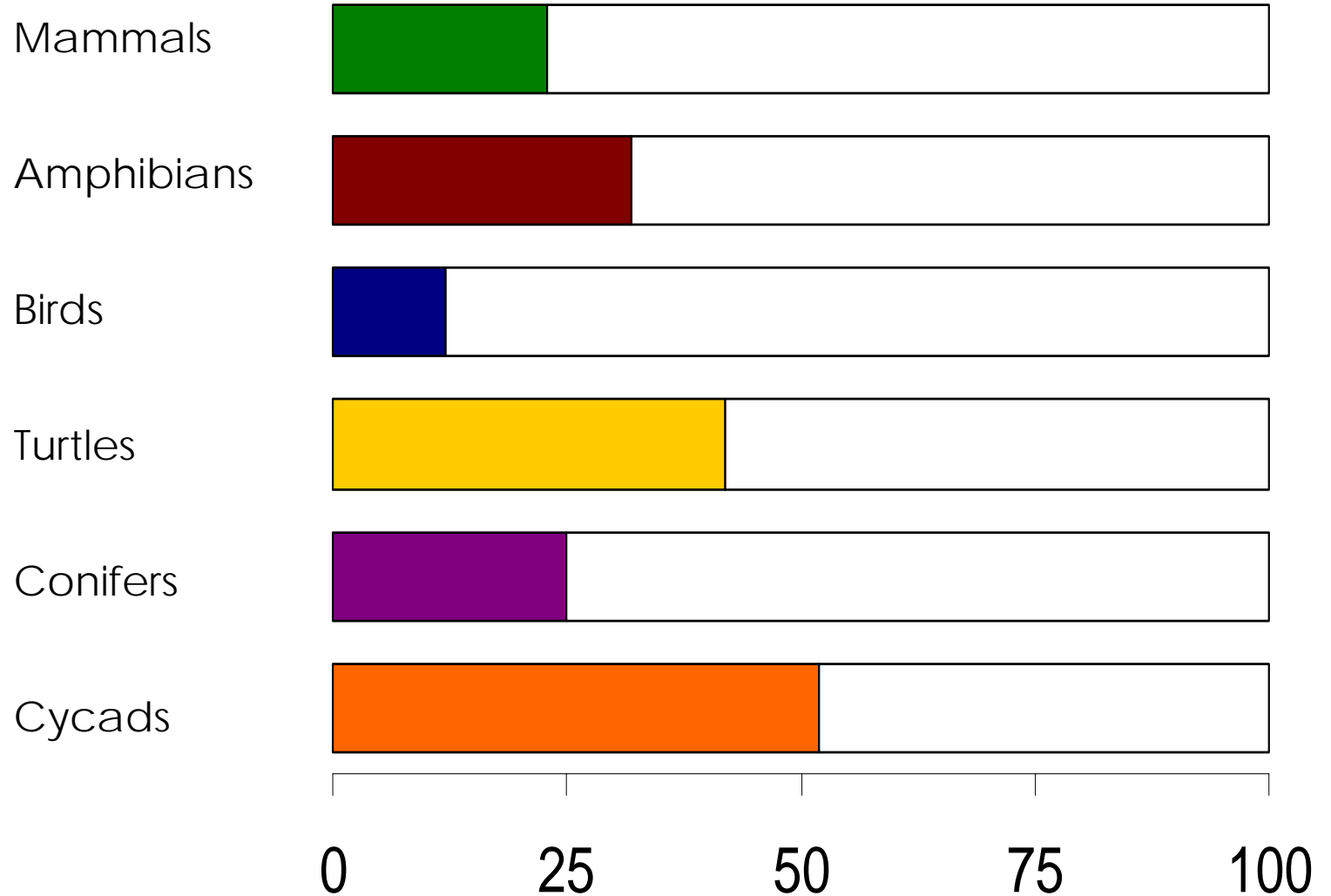
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Why to Conserve?

40% of species is threatened with extinction





Habitat loss



Conservation: Protected Areas



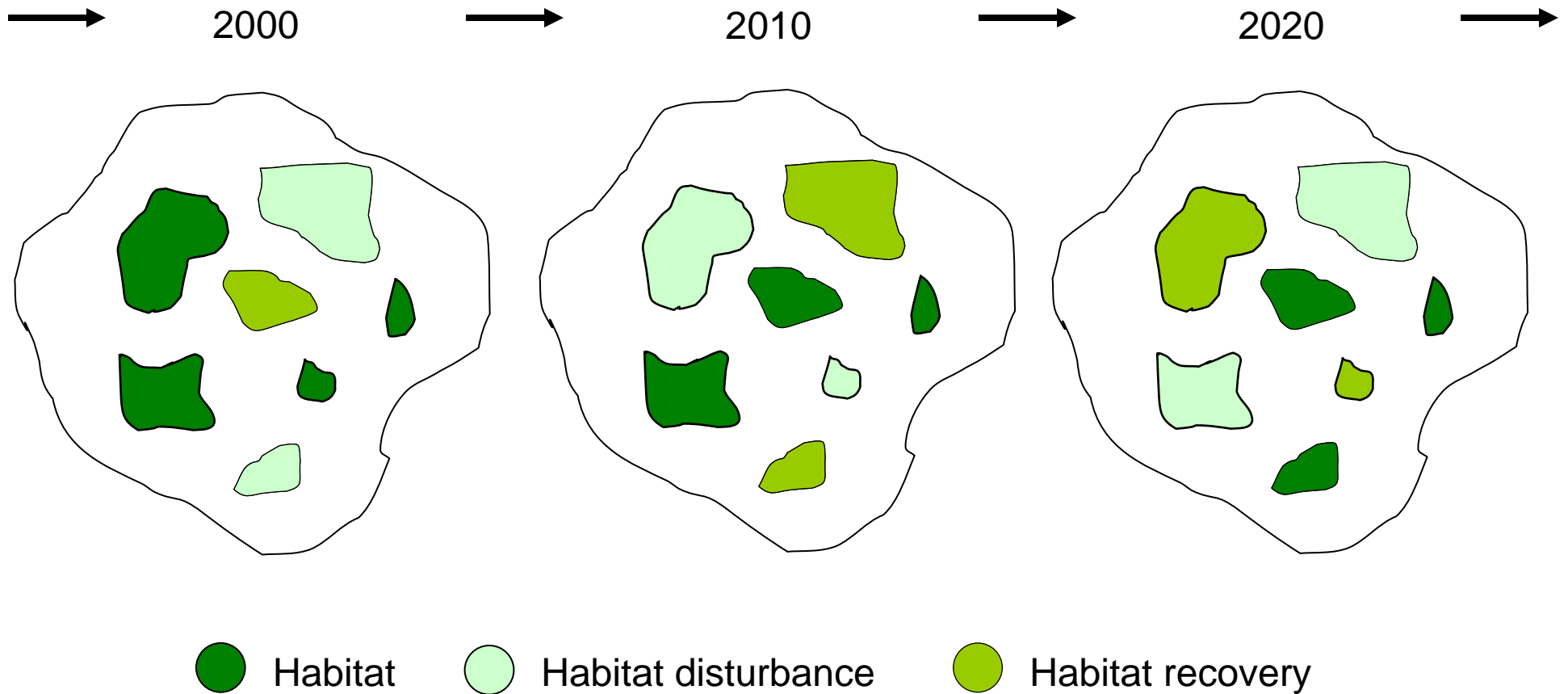
Protected Areas

Prevent habitat loss, but are not static:

- Succession
- Natural Disturbances
- Climate Change
- Interaction with surroundings



Dynamic ecosystem network



Species have to track suitable habitat over time and space

Biodiversity Conservation Goals

Protection of natural environment and species

Conservation planning is often based on static maps of habitats and species occurrence

Estimates of species persistence are overly optimistic...

Enlarge protected area networks?

Intensively-used landscapes

Protected area networks

- Small
- Scattered

Contribution from surrounding landscape

- Competition between different land use types
- Anthropogenic disturbances



Intensively-used landscapes & Conservation

Under what spatial-temporal conditions are species able to persist?

How can such conditions be created?



Which factors are important?

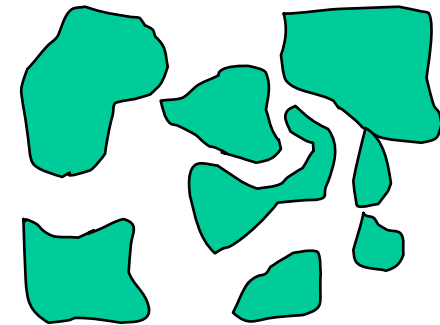
– Disturbance

- Intensity
- Duration
- Spatial extent
- Frequency



– Network properties

- Area
- Connectivity
- Habitat recovery time

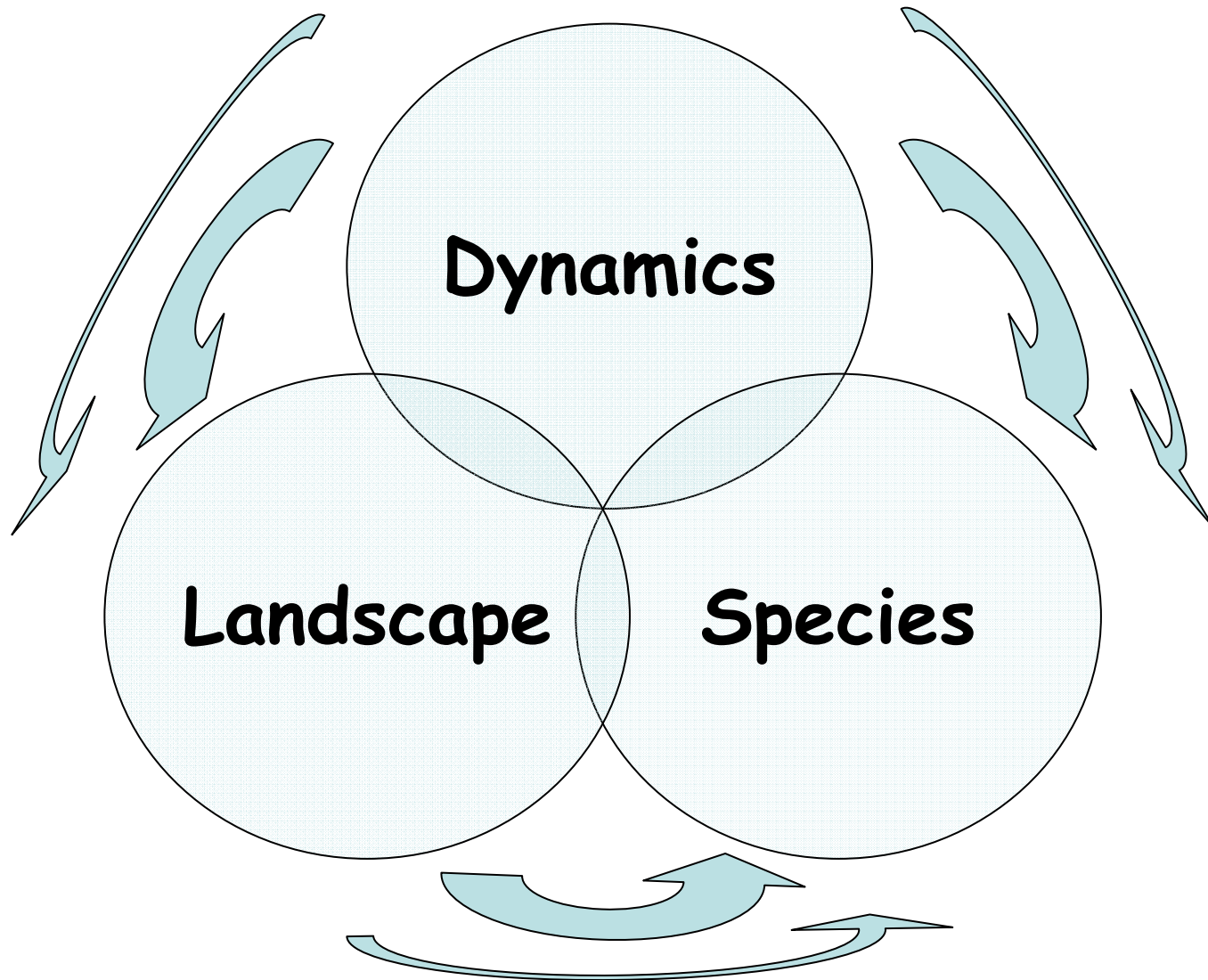


– Species properties

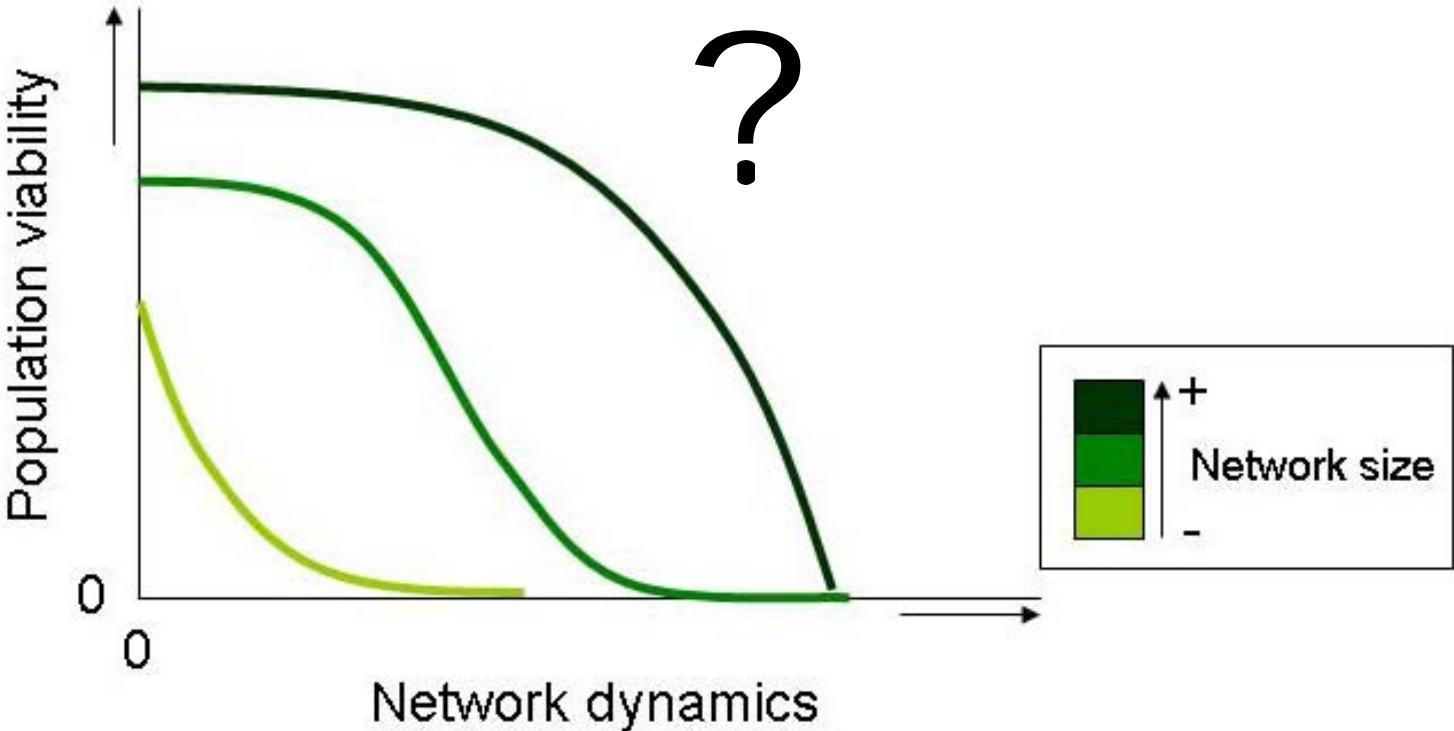
- Habitat/network requirements
- Colonisation ability
- Population growth rate



Interaction between the factors

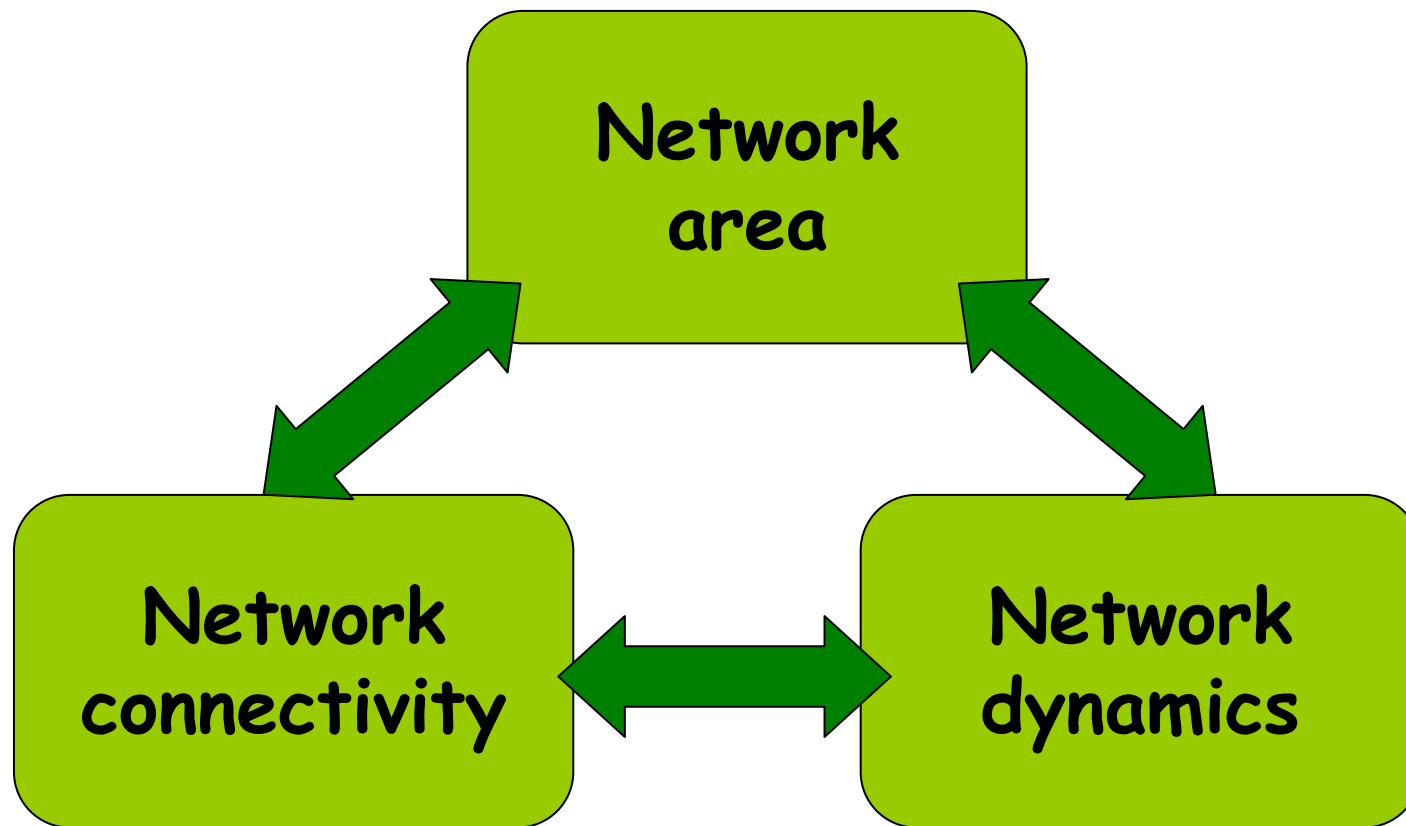


Guidelines conservation planning



Guidelines conservation planning

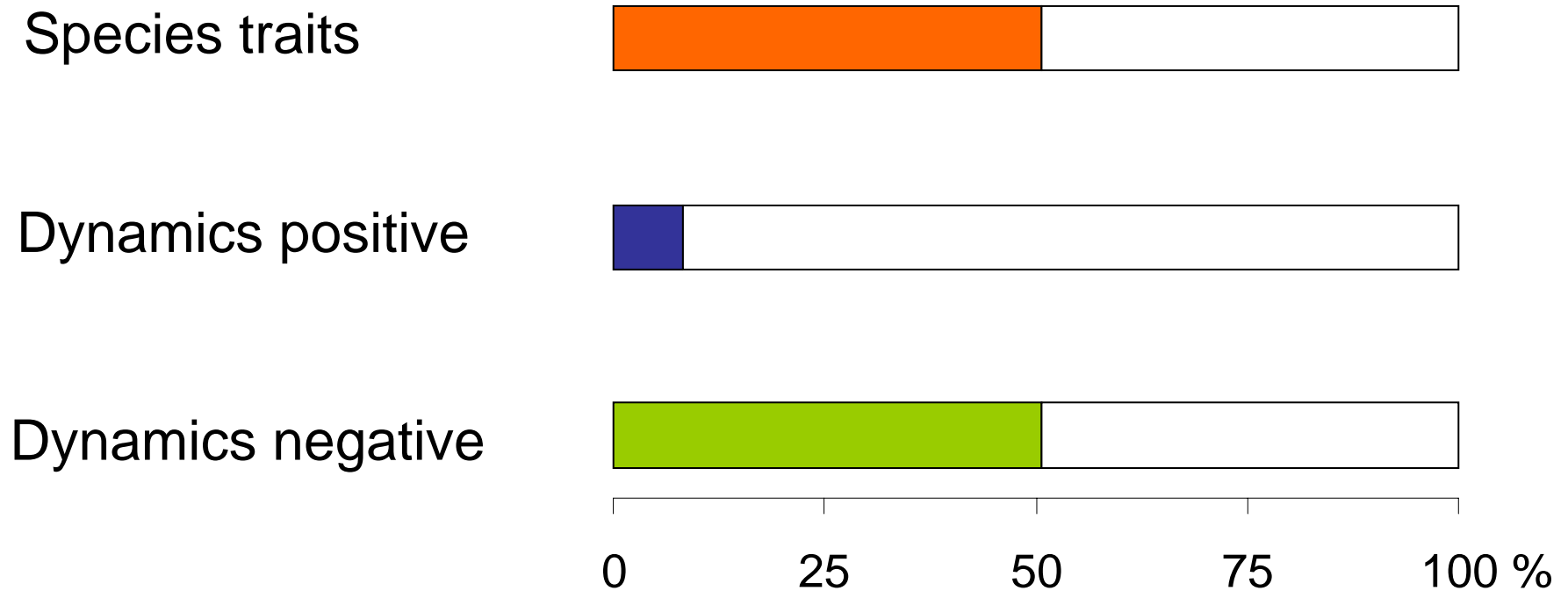
What are the options to planning?



Literature review – what is known?

Population dynamic modelling studies that incorporate habitat dynamics:

N = 20



Literature review

Studies vary widely:

- Population dynamic models
 - Deterministic vs. stochastic
 - Process detail
- Spatial assumptions
 - Spatially implicit, explicit, realistic
- Habitat dynamics
 - Deterministic (succession) vs. stochastic
 - Suitable/unsuitable vs. continuous suitability

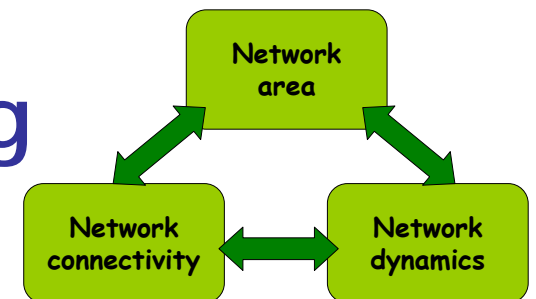
Literature review

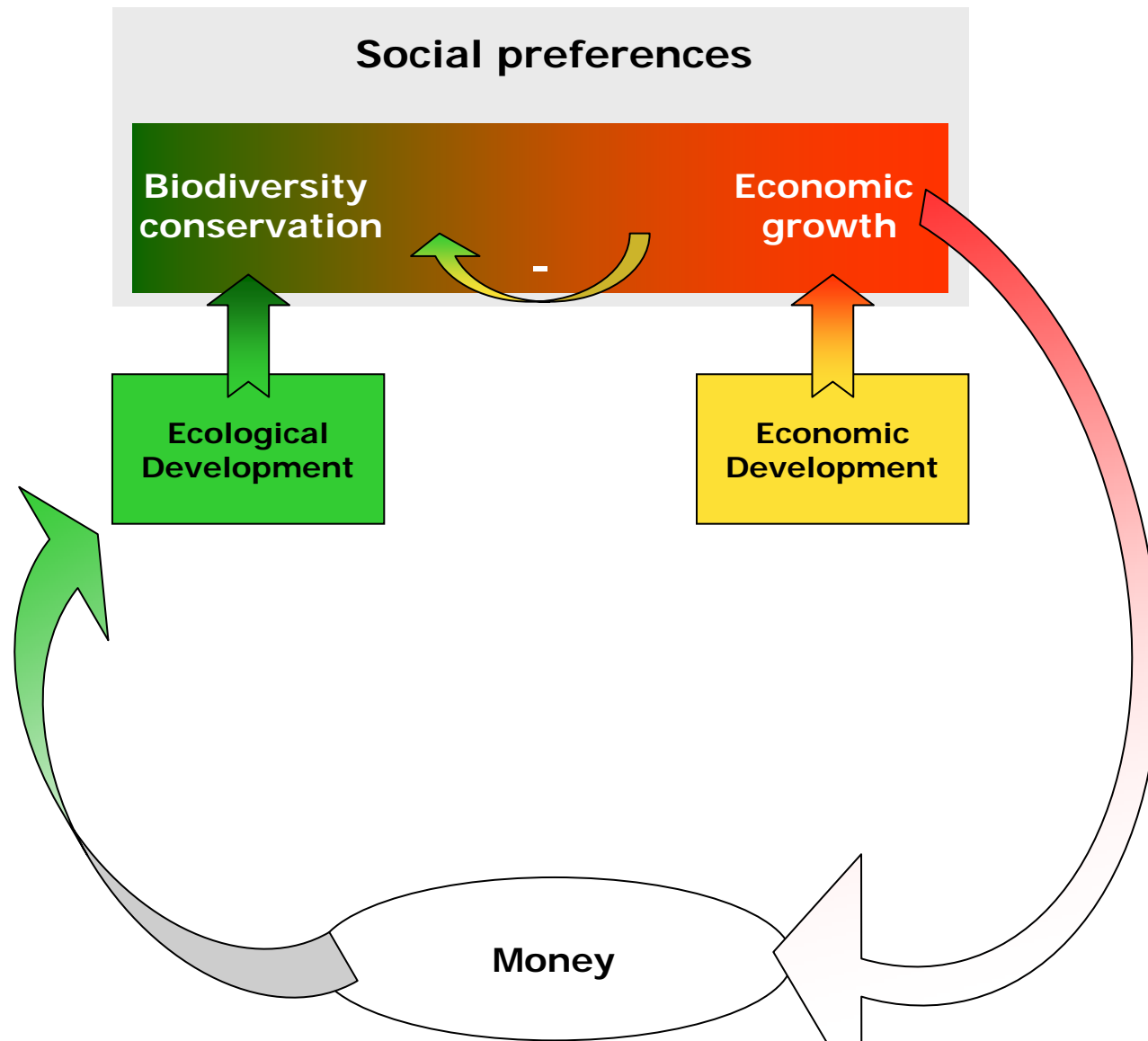
Recommendations are too generic:

- High habitat turnover rate is detrimental
- Aggregated disturbance is worse than random disturbances

Landscapes and species are too abstract

Knowledge gap for species conservation planning in a dynamic world





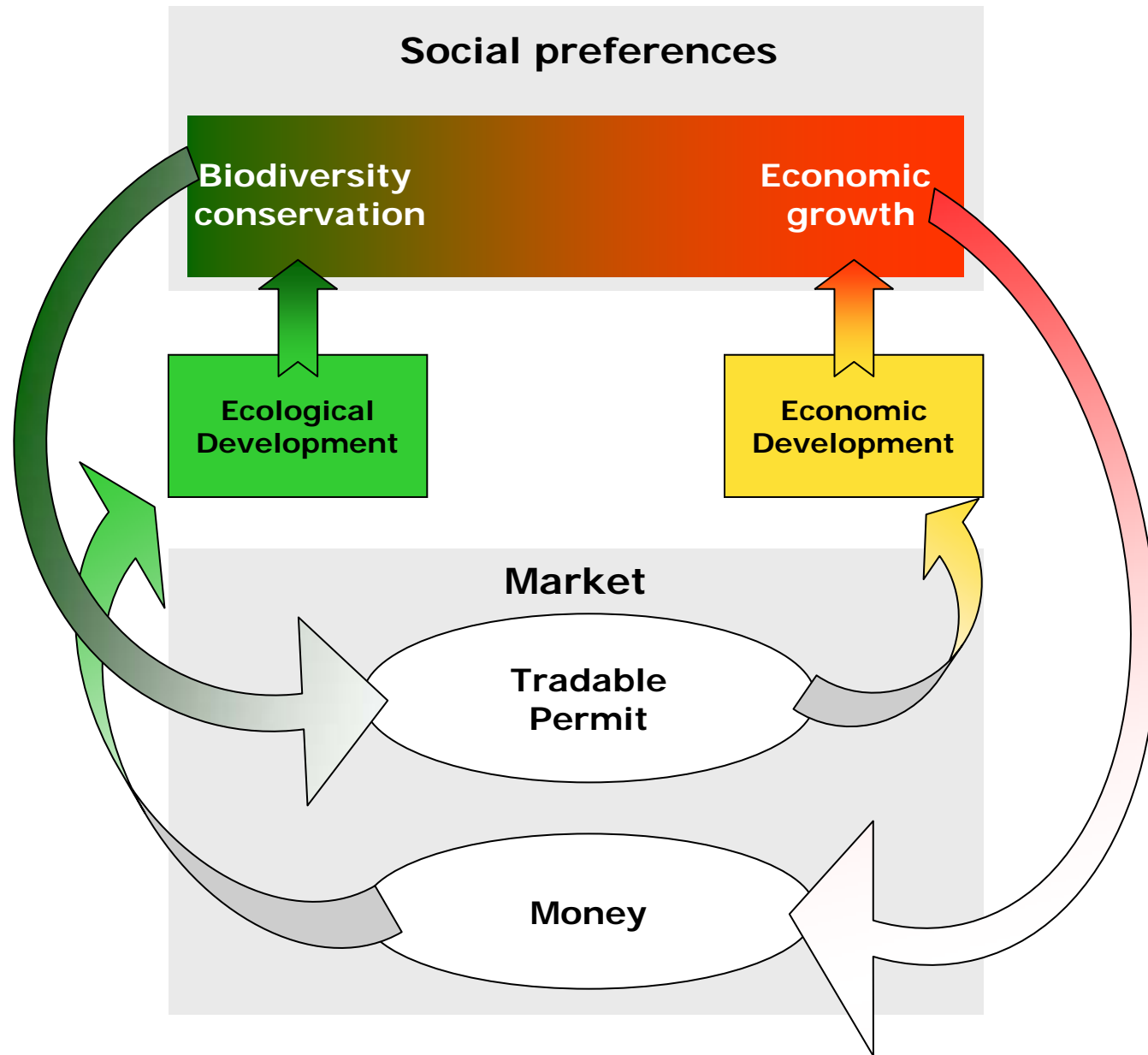
- Economic development is allowed...
- **IF** loss of natural values is compensated by habitat restoration elsewhere.

Habitat compensation

- If it takes place at all, then mostly after the impact has taken place
- 1 to 1 planning:
 - Similar habitat type
 - Close to the impacted location
- Compensation areas are often difficult to find

Not cost-effective, not flexible

Tradable permits



Tradable permits

Potential benefits

- Flexible instrument
- Cost-effective
- Fits in bottom-up policy implementation trend

Constraints

- Spatial and temporal context are very important for biodiversity conservation - sensitivity to market design?

Constraints

Opportunities

