Monitoring site-level biodiversity

A case study from Richards Bay Minerals , South Africa

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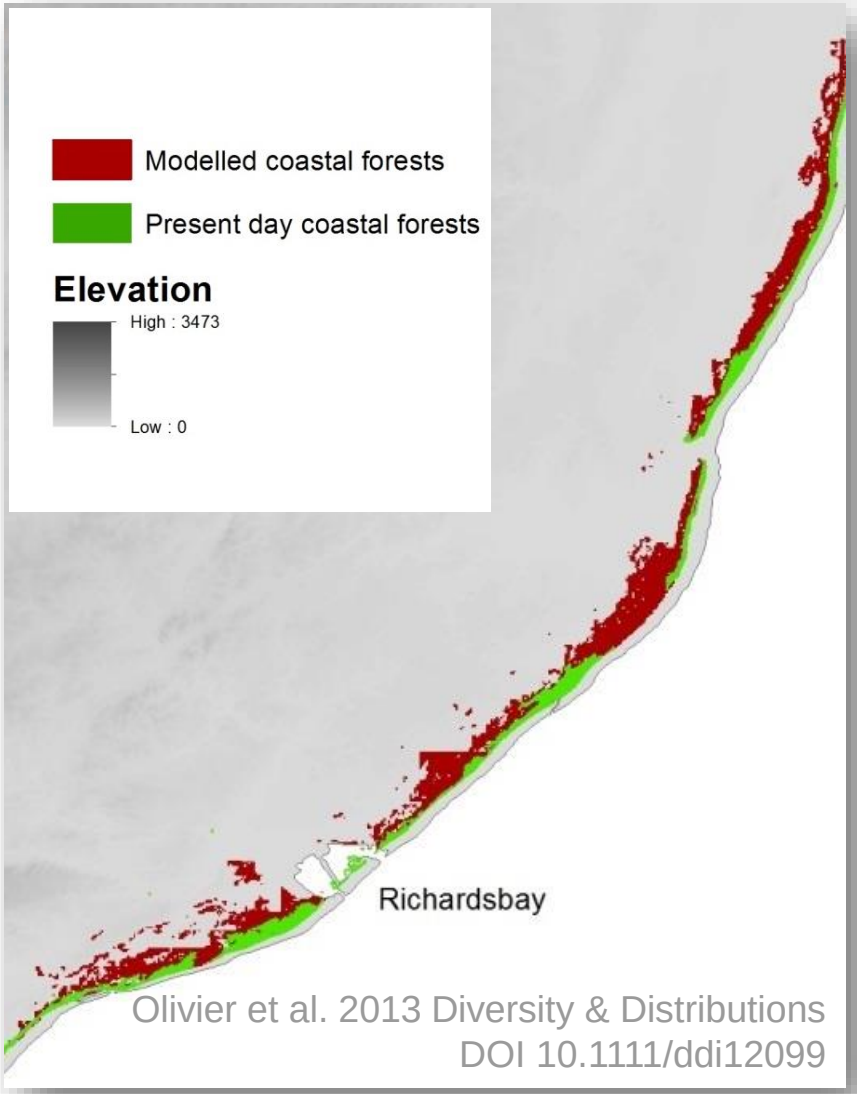
28 June 2017, Proteus meeting, David Attenborough Building, Cambridge

Geographical Context

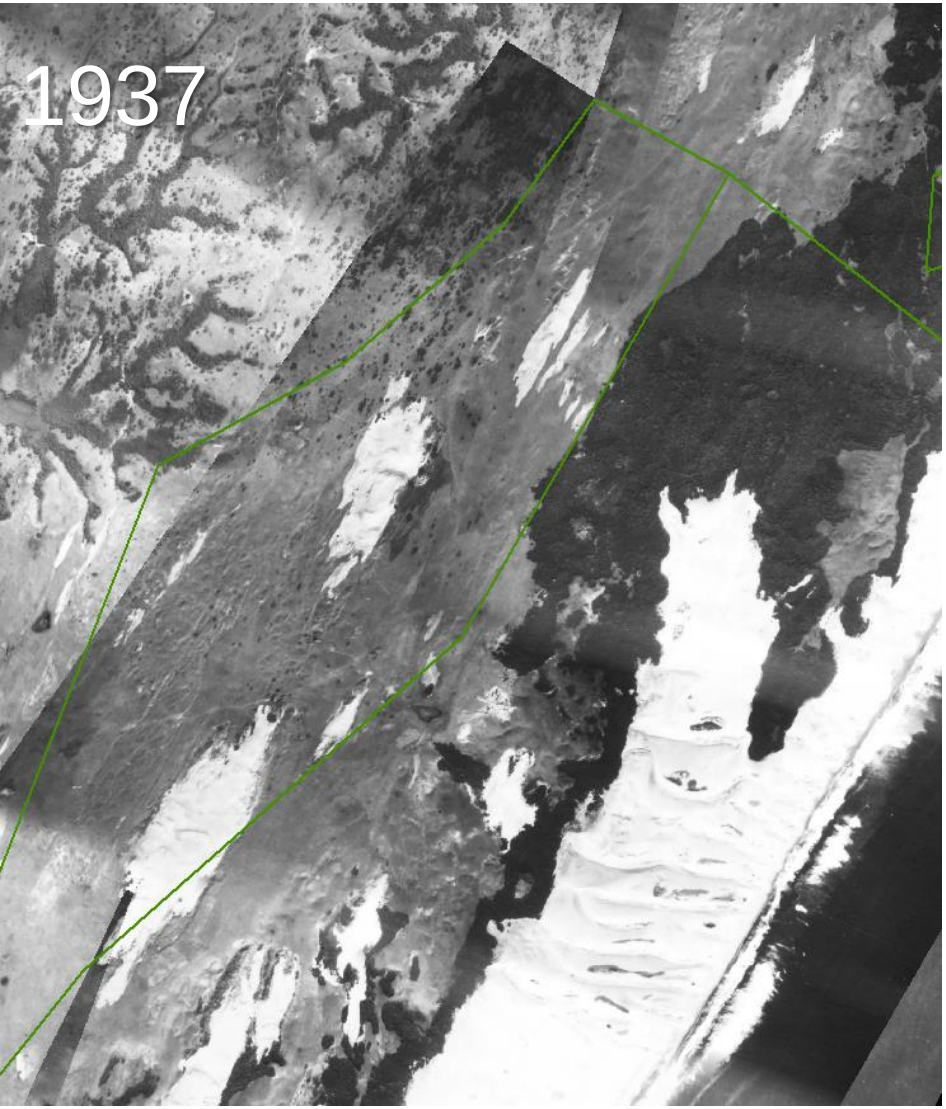
Ecosystem context

- Occur on the coastal dune cordon
- Narrow, highly fragmented, small: 3087 patches (range 0.2–8000 ha)
- Small range: 66 300 ha
- History of exploitation as early as the Iron Age
- Clearing for iron smelting, agriculture, grazing
- Rapid natural regeneration – climate, ecosystem resilience



Olivier et al. 2013 Diversity & Distributions
DOI 10.1111/ddi12099

Capacity for regeneration

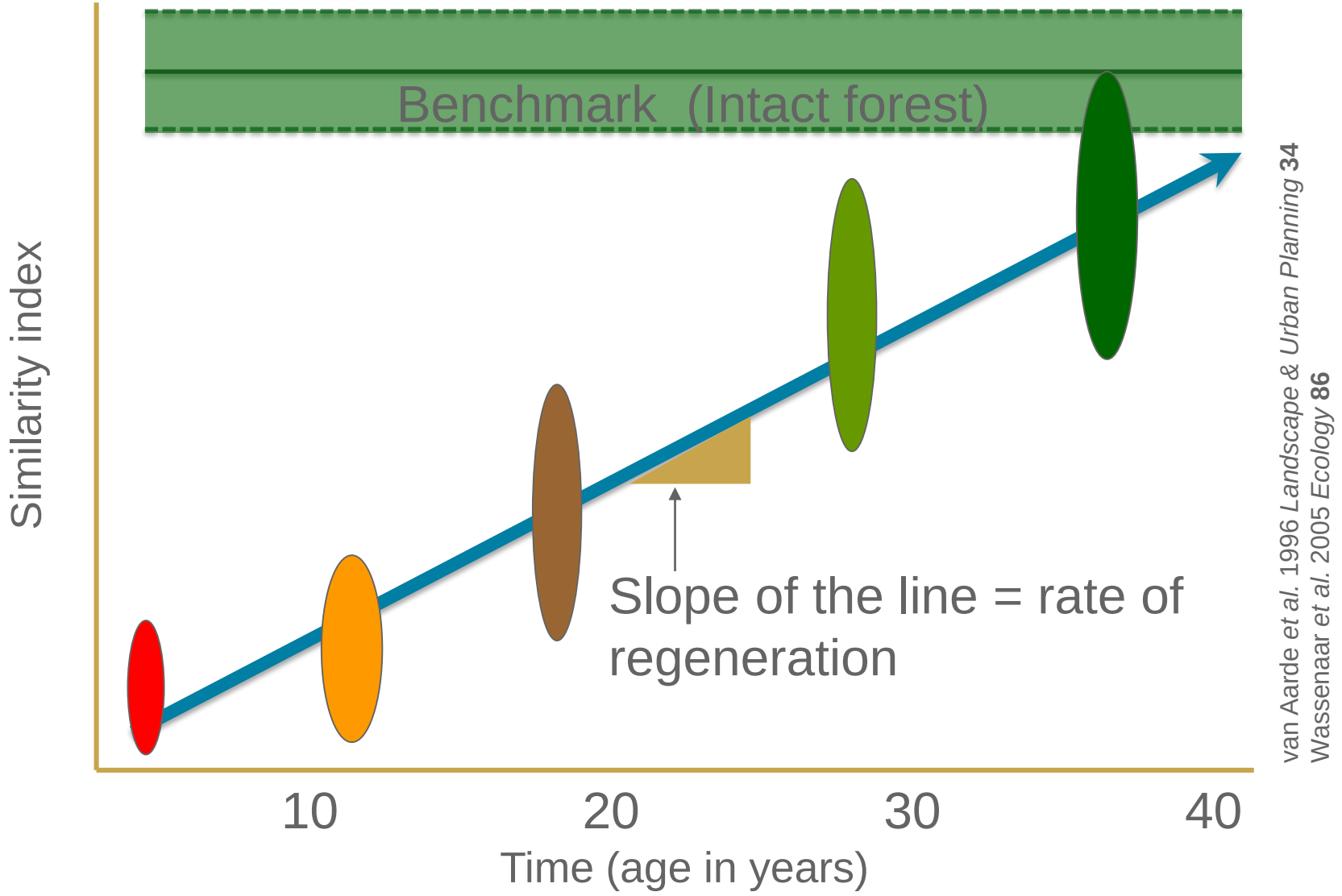


Monitoring & Research Program
1993 - present

Biodiversity metrics - requirements

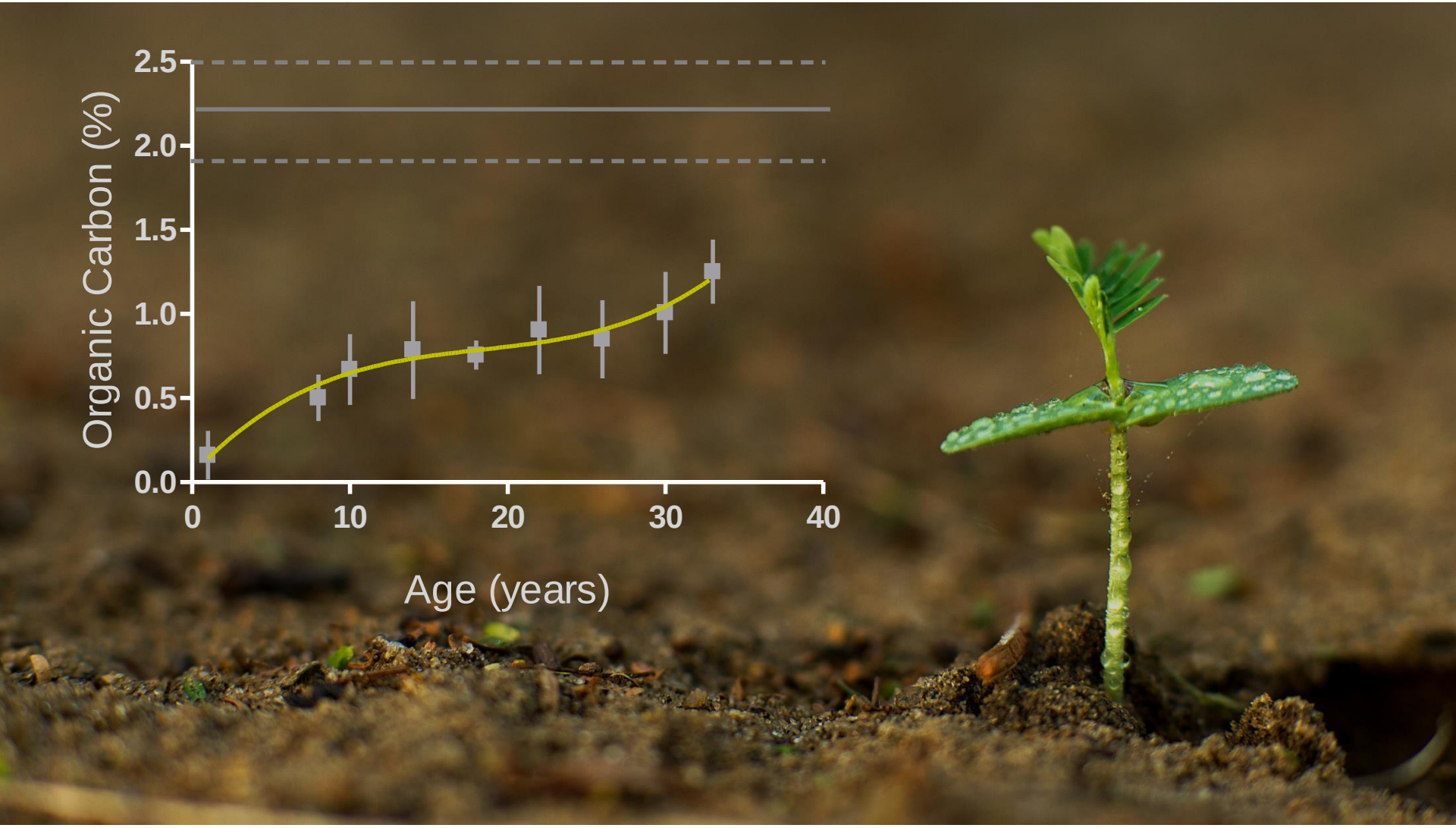
- Repeatable
- Comparable
- Relatively simple
- Applicable across a range of indicators, sites, ecosystems
- Able to relate to baseline information
- Defensible
- Compatible with practical monitoring programs and frequencies
- Purpose

Tracking restoration progress

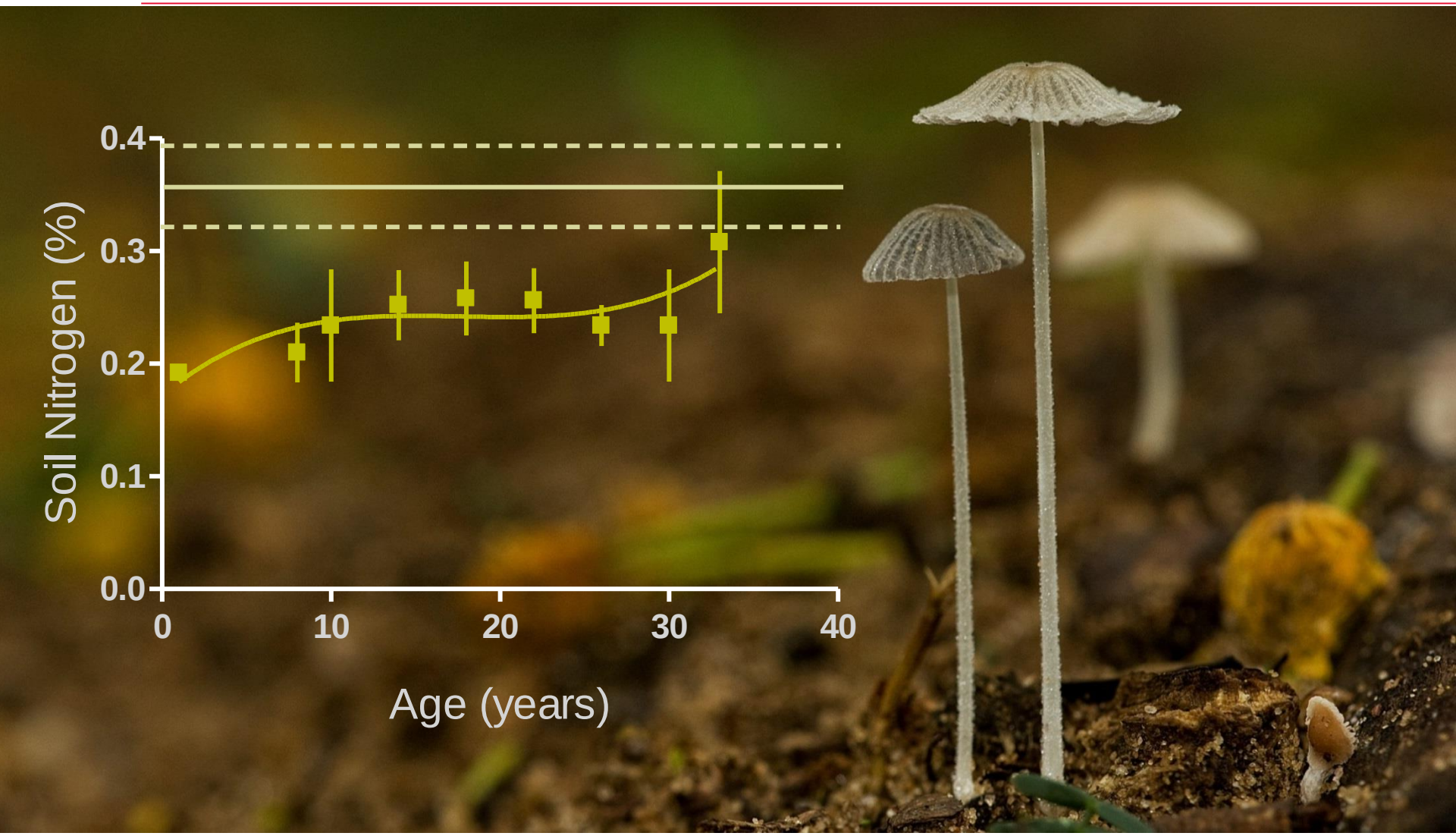


van Aarde *et al.* 1996 *Landscape & Urban Planning* **34**
Wassenaar *et al.* 2005 *Ecology* **86**

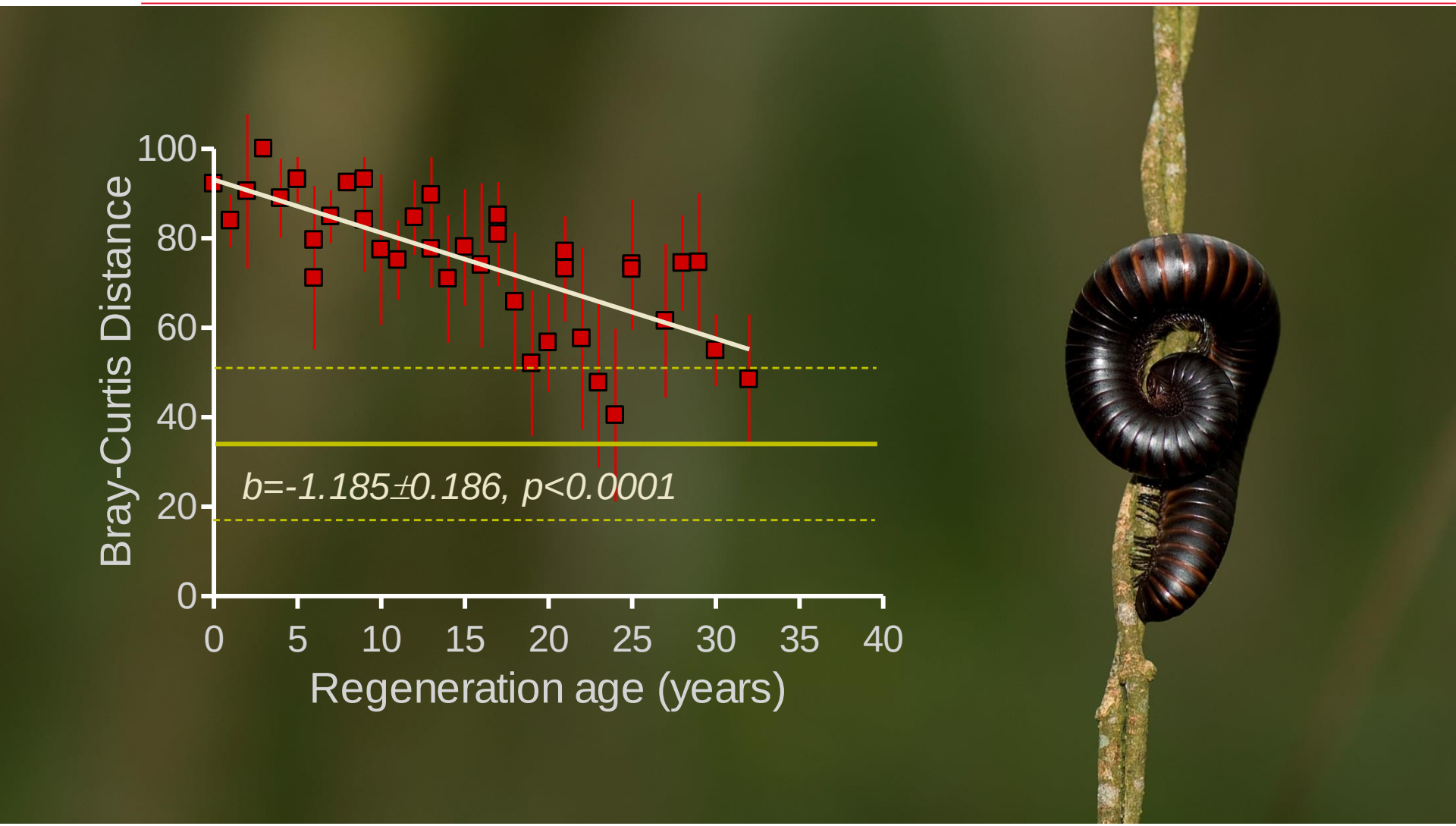
Soil Carbon



Soil Nitrogen

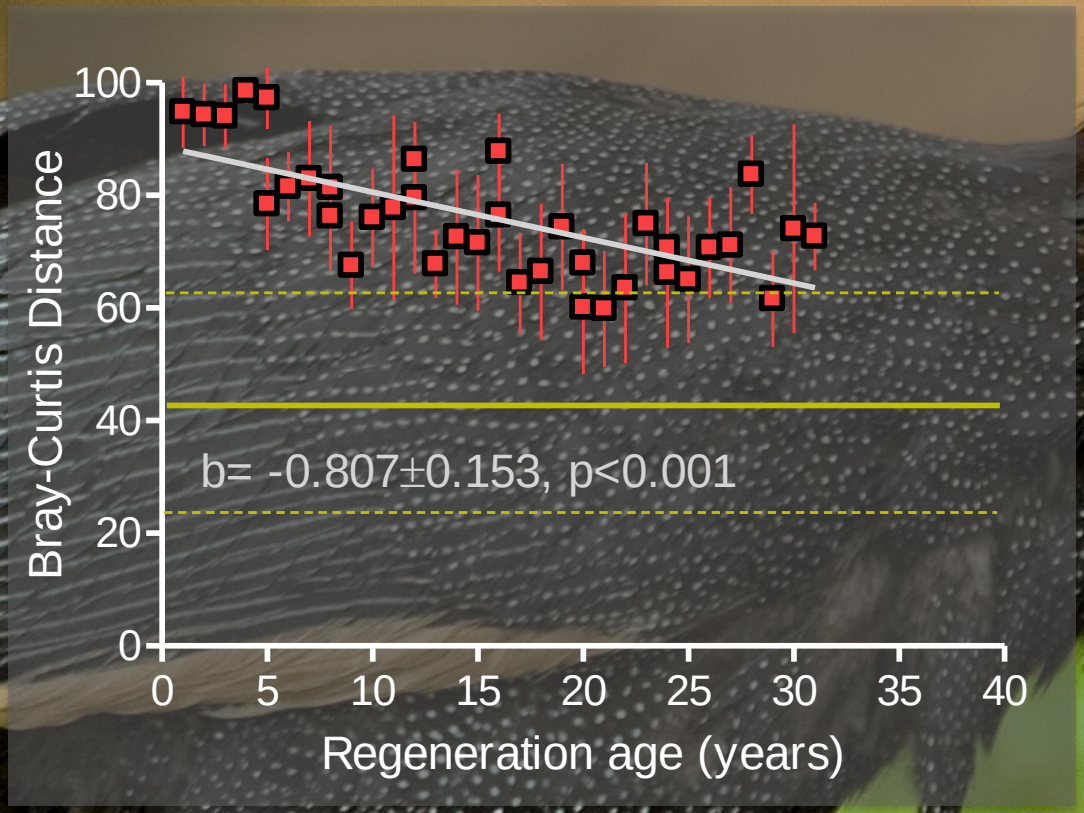


Millipede community



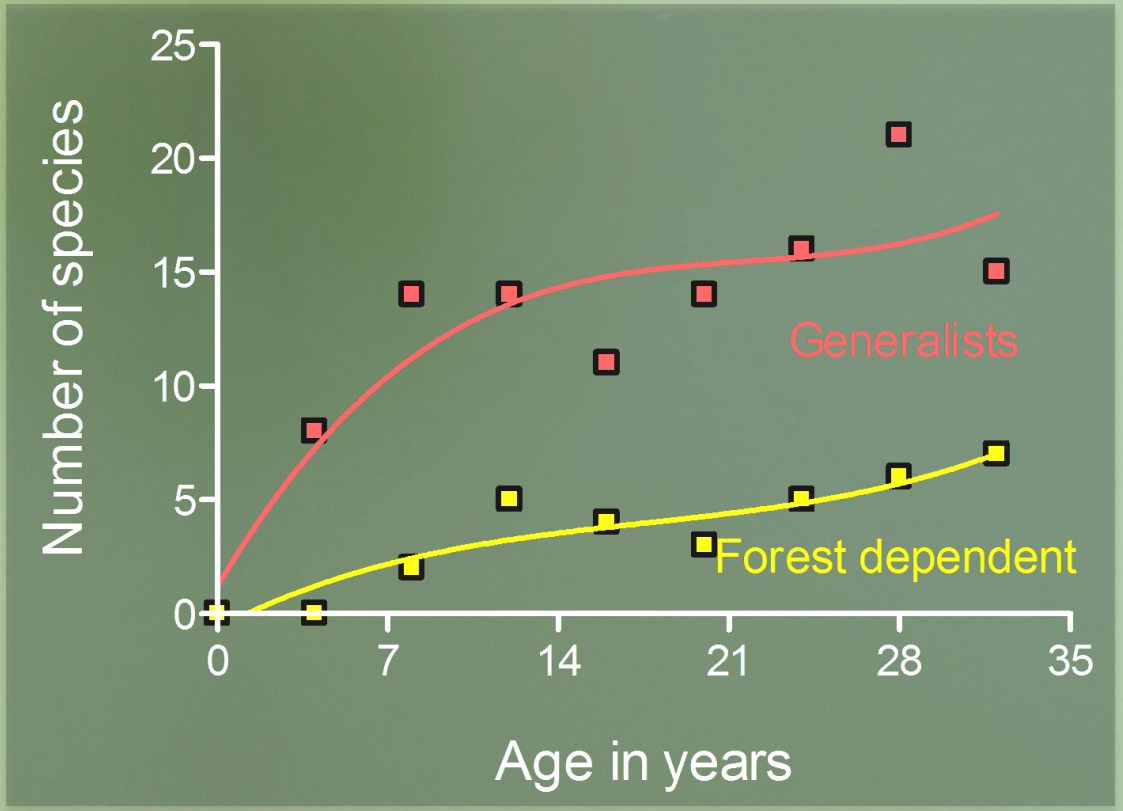
Bird community

Bird assemblages in regenerating forests are converging with the benchmark site



Bird community

About two thirds of all species recorded in old forest occur in rehabilitating sites



Tree community

About half of old forest tree species have colonised rehabilitating sites

Addressing the goal…

Is RBM's restoration program a success?

Yes

- Community structure becomes more similar to the benchmark forests with age as a result of local dispersal
- By starting up ecological processes, limiting unnatural disturbance
- Ecological succession, and later patch dynamics

Questions

Thank you

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