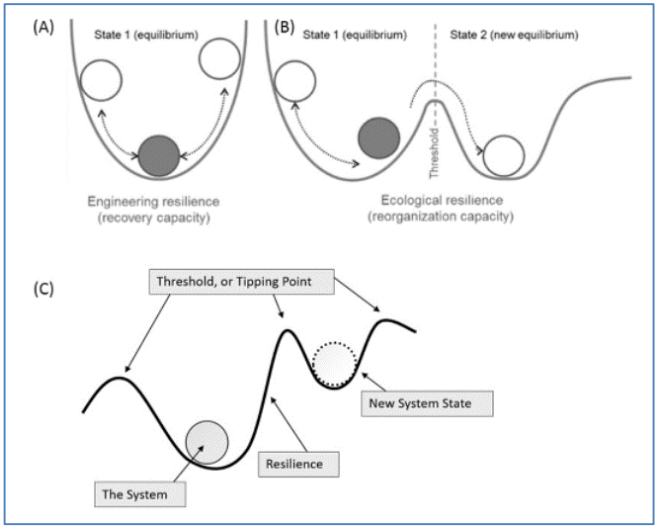
Developing resilient forested landscapes - how do we integrate different land uses sustainably?

Alison Hester

The James Hutton Institute

What is a resilient forested landscape?

- A resilient (forested) landscape has the capacity to:
  - ‘absorb’ disturbances whilst retaining the same basic structure and functions
  - adapt to change (e.g. climate), much of which is uncertain…

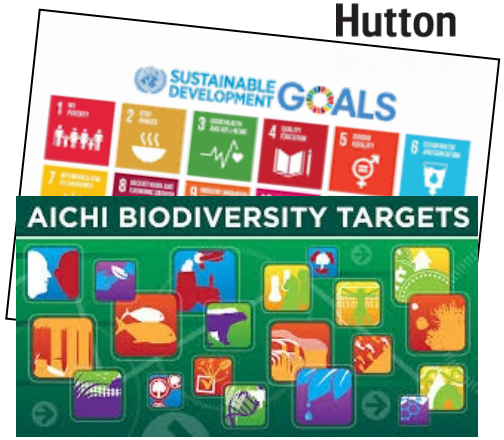


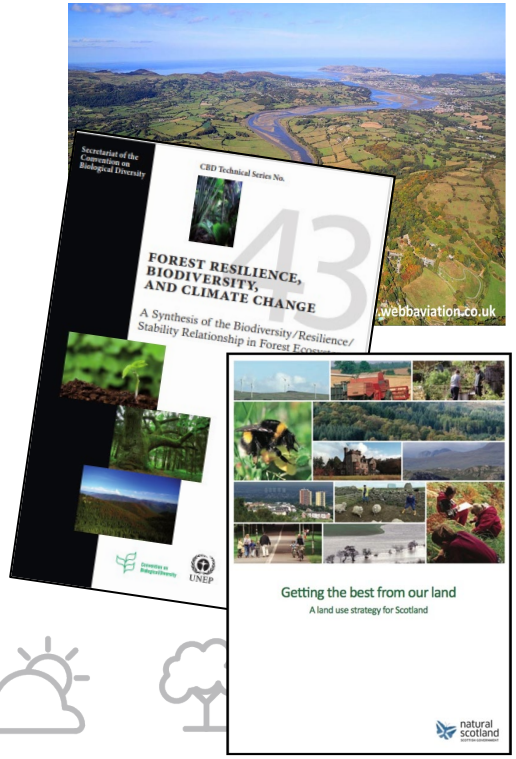
From Thoms *et al.* 2018 *Geomorphology* 305.

- Forests in the landscape provide many benefits – *environmental, economic, social* – major global losses of forest cover have had diverse detrimental effects on landscape resilience…
- Restoration of forested landscapes is critical but has many challenges!

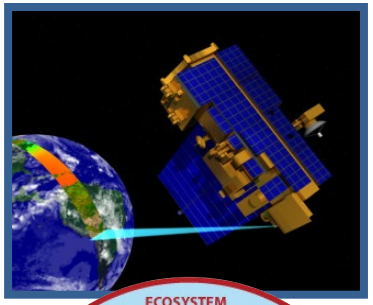
Key issues for integrating forests and other land uses ‘sustainably’

- Global sustainability policies and targets need successful national-to-local implementation
- Most European (global) landscapes are complex mosaics of multiple land uses (socio-ecological systems)
- Land use planning must balance multiple demands alongside other pressures, e.g. climate change
- Requires coordinated, *multi-sectoral* science-driven targets, supported by strong national governance.

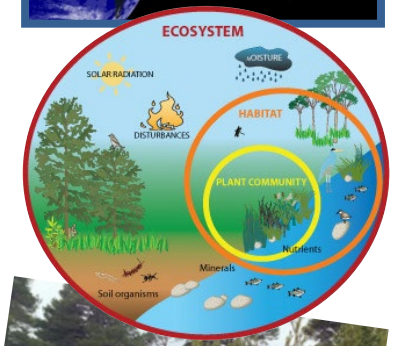




Research to inform integrated land use decisions – three main areas



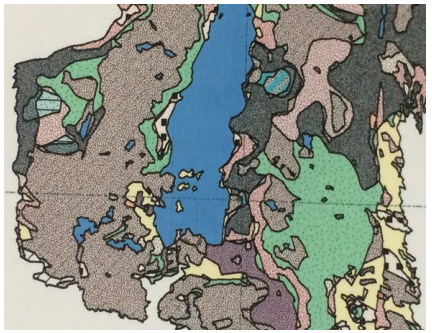
1. **'Research engine-room'** – e.g. mapping natural resources, species & habitat functioning, understanding resilience…
   - Ecosystem Services / benefits (actual, potential)
   - Global change context…
2. **Stakeholders** – perceptions, needs, impacts (spatial and temporal)…
3. **Governance** – regulatory context, social structure, decision-makers, accountability…



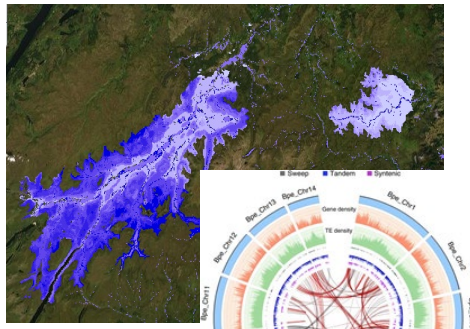
Integrating forests and other land uses: 1. 'Research engine-room'

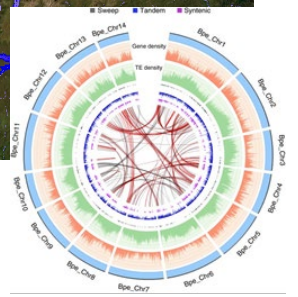
The James Hutton Institute

- **Forest area and configuration** within the landscape – major effects on forest function, services and resilience
- **'Beyond the trees' – locating new forests for added benefits (**e.g. reduced flood risk…)
- **Future-proofing current decision-making:**
  - *Genetics* – capacity for climate adaptation; species range-shifts…
  - *Tree disease spread* - importance of landscape configuration-climate interactions…
  - *Changing suitability for other land uses…*



*





Salojärvi et al. 2017 Nature Genetics

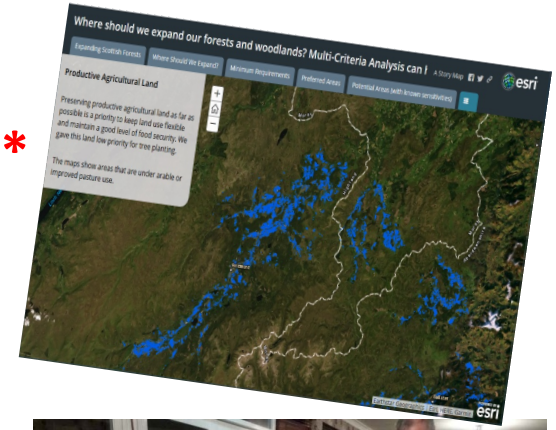
*

* MORE INFO ON DISPLAYS

2. Stakeholders

- Socio-ecological systems can rarely achieve specific ‘best’ outcomes – people have different preferences, needs and perceive land use trade-offs differently…

- Growing toolkit of **participatory methods** to facilitate collective understanding and consensus-building…
  - These are a key component of successful application of land use mapping tools
  - Allow people to explore ***and discuss*** consequences of different land use choices.



*

*** MORE INFO ON DISPLAYS**

3. Governance

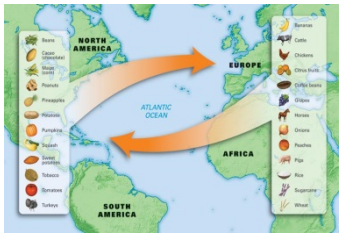
- **Regulatory context** - importance of *integrated* land use policies and instruments
- **Decision-makers -** Government (policy design); Govt, NGOs, private sector (funding/other support); land managers (implementation) – with strong influence from consumers and other citizens
- **Processes of implementation –** e.g. social networks; adaptive co-management ('learning by doing'); *public-private partnerships*…

* MORE INFO ON DISPLAYS

Summary of key issues for sustainably integrating forests and other land uses

The James Hutton Institute

- Impacts of land use configuration on *function, resilience and added benefits* from forests and other land uses
- Understand and incorporate what and who is affected by and involved in land use trade-off decisions
- Recognise the role of *scale* (space and time) in analysing and addressing land use options
- Address social and political processes of land use decision-making, and complexity involved in governing socio-ecological systems.



Thank you

The James Hutton Institute

Session on 24 Oct: *"Semi-natural forests and forest plantations: ES and trade-offs in the face of land use and climate change"*
– presentations available online after the conference.

Athena SWAN Bronze Award

We are a Living Wage Employer

Scottish Government
Riaghaltas na h-Alba
gov.scot