Land Use

Alessandro Gimona
[& many others]

Brief overview

- People
- Biophysical
- Tools & data

See contact email address at bottom of slides

Greenspace and mental health

Greenspace in urban areas can contribute to people's **physical and mental health**, reducing the burden on the NHS

Our research found a **significant relationship** between **reduced prescriptions** for mental health medication **and greenspace** in areas with higher deprivation

This outcome was also found for **areas with higher black and minority ethnic populations**

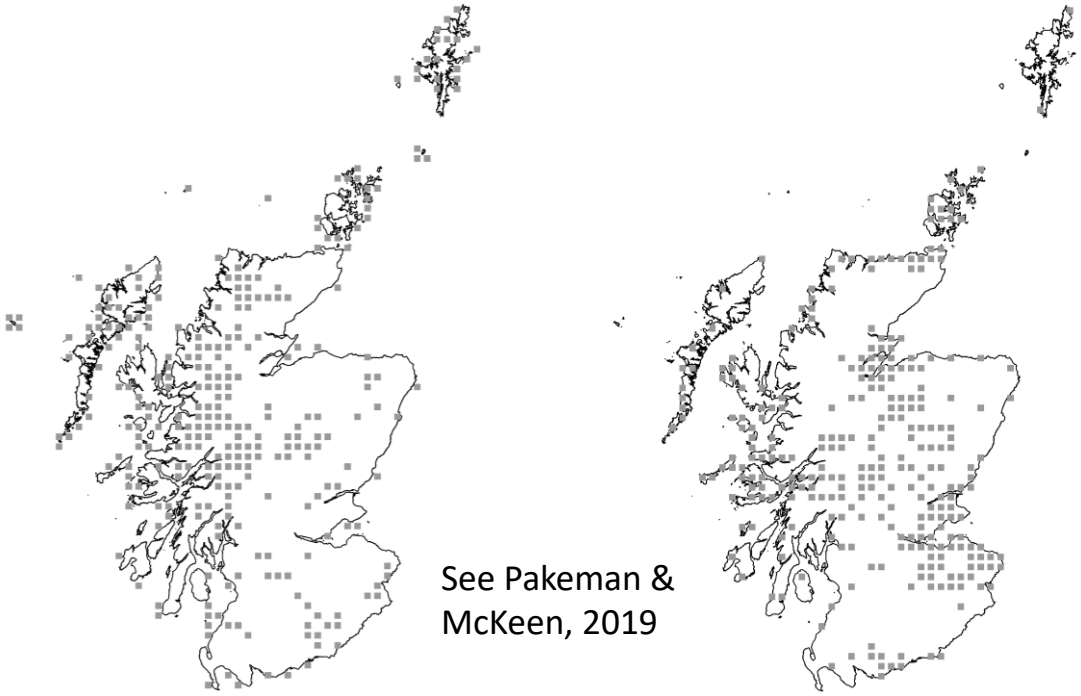
The results highlight the benefits of providing greenspace **close to populations who may otherwise engage less with nature**

Contact: Alistair.McVittie@sruc.ac.uk

Targeting of agro-environmental incentives - Biodiversity

Weighted by rarity

Minimum number of sites to represent all species



See Pakeman & McKeen, 2019

Contact: Robin.pakeman@hutton.ac.uk

How to prioritise?

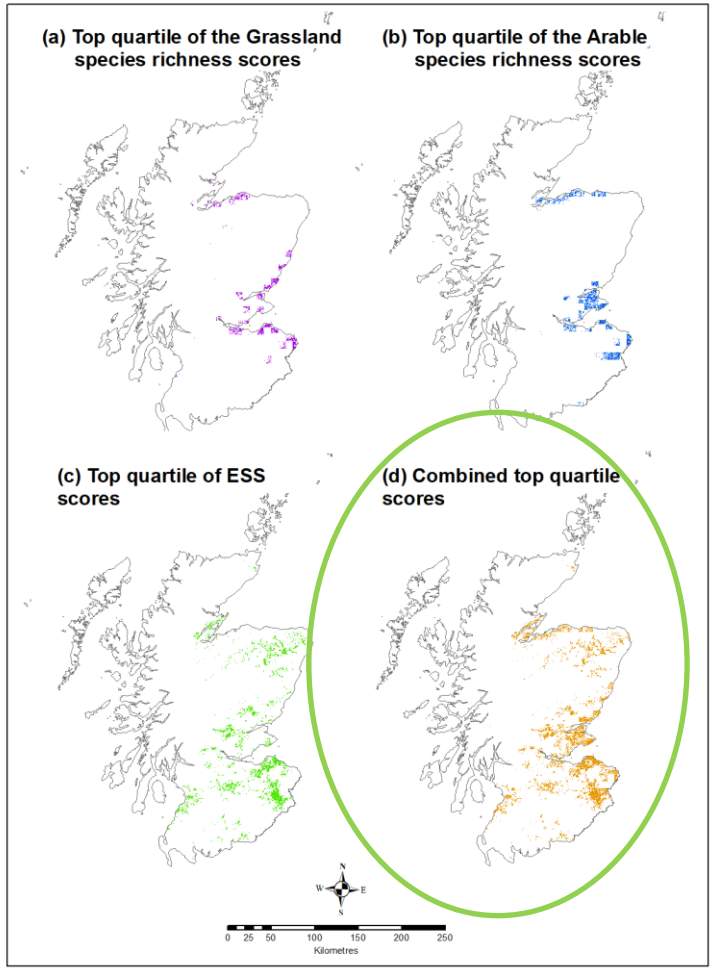
Based on the Scottish Biodiversity List (priority by the SG) + **short list by experts, based on relevance to agri-env. schemes**

Some 80+ spp selected (**vertebrates, invertebrates, plants)**

Choice of metric depends on whether **full coverage preferred** or more weight is given to the **species with smaller ranges**.

Approach **easily generalized** to other countries and extended

Targeting of agro-environmental incentives – Biodiversity + ESS



Same species list **+ 4 ecosystem services:**

Pollination, Carbon Storage, Nutrient Retention, Sediment Retention

Spp. distribution **data downscaled** at 100 m (by land cover)

ESS and Biodiversity are complementary for targeting incentives

Contact: Alessandro.gimona@hutton.ac.uk

How to incentivise farmers to adopt agri-environmental practices at the landscape scale?

Re-orientation of agri-environmental policy **from individual level** support to collective (**landscape**) scale support? (Kuhfuss et al. 2019)

Underlying factors for successful collective approaches: **combination of existing social capital and provision of external support** (facilitation and funding)

How to incentivise farmers to adopt agri-environmental practices at the landscape scale?

Incentivising collection action around environmental objectives

i. Creating and supporting institutions

Building on **existing local institutions** to design incentives

Supporting **farmers groups**

Supporting the organisation of **partnerships between farmers and public or private entities**

ii. Adapting the design of Agri-environmental Schemes

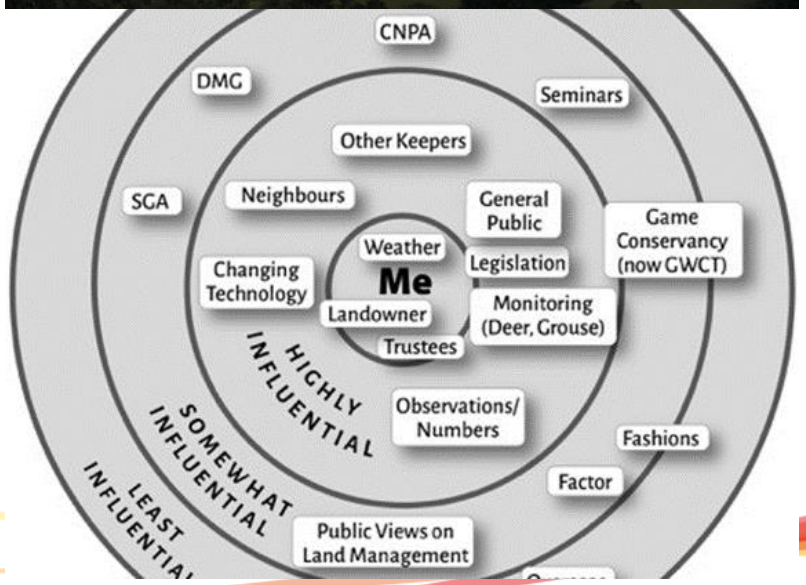
A range of tools proposed and assessed in the literature (**collective payments, bonusses, auctions, collective result based schemes**)

These can be **combined and used to best suits local social and environmental characteristics**

Example: collective **result-based payment schemes** appear to work best in regions with high social capital and environmental results are easily identifiable (Lozada-Ellison et al. 2021)

Contact: Laure.Kuhfuss@hutton.ac.uk

Landscape partnership research - Lessons learnt



Successful partnerships **seek new knowledge and understanding**

Successful partnerships **need time for relationships and networks** to build

Lack of trust is a **key barrier** to learning

Understand reasons behind the lack of engagement

Landscape partnership research - Lessons learnt

Level out **power dynamics**

Building **connections** with communities **needs £££**

Targeted funding can catalyse new partnerships

Capture learning outcomes.

Contact: antonia.eastwood@hutton.ac.uk

Exploring Catchment Partnerships

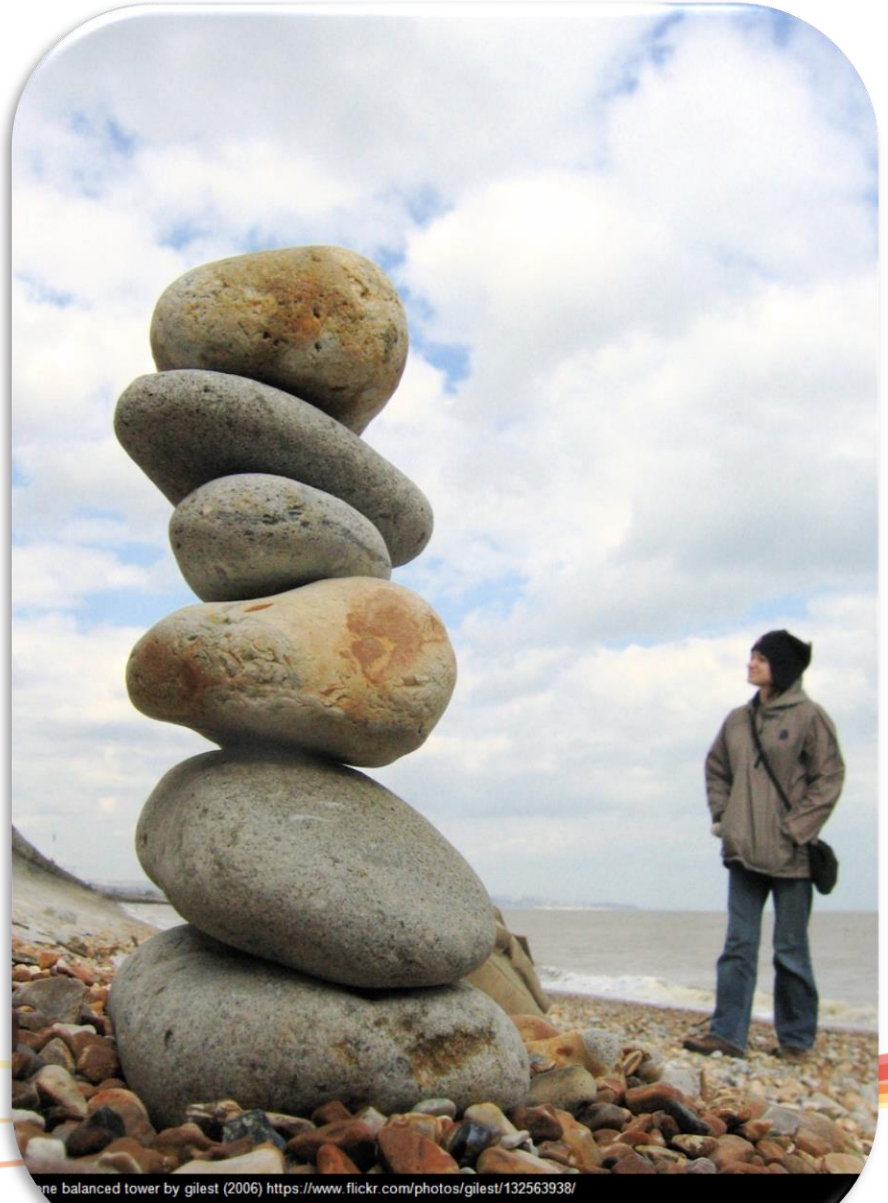
Partnerships have to 'navigate' multiple policy and funding priorities to realise multiple-benefits

Partnerships need coordination, and coordinators need resourcing. Integration is done by people who invest significant effort in networking and communicating – it doesn't just happen**.**

It's not one size fits all. Some coordinators take a steering and coordinating role, others manage and deliver projects. **What is important is to reflect on this over time.**

Questions remain over private sector partners and innovative hybrid financing. Private sector seems increasingly relevant but most partnerships still mainly involve public bodies & NGOs.

Exploring Catchment Partnerships



Capitalise on existing experience to inform new partnerships and processes (e.g. RLUPs, Riverwoods, LENS initiatives)

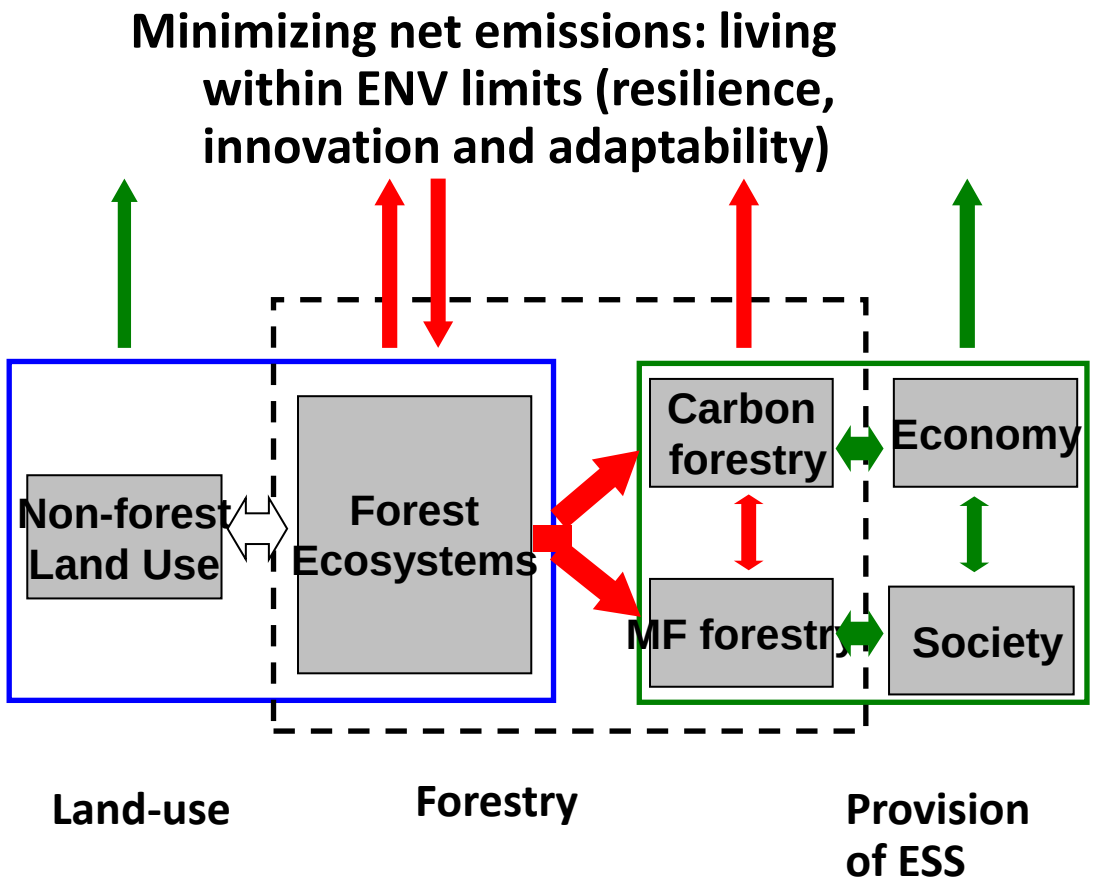
Provide opportunities to network and to learn on partnership working – *it is valued*

Catch 22 - partnerships can help us achieve holistic environmental management, but **integration is needed of environmental policy implementation processes**.

Outputs: https://www.hutton.ac.uk/research/projects/water-integration slides, papers, video, reports & briefings.

Contact: Kerry.Waylen@hutton.ac.uk

Social Innovation for Sustainable Environmental Management



Acquired knowledge for advising on **resilient interventions for attaining multiple benefits** from using natural assets in economically efficient & socially acceptable ways & managing trade-offs

Empirical evidence e.g., from economic & institutional analyses **of afforestation in landscapes**

Improved understanding of **good practices** & **lessons learned** derived from projects **enabled us to advise** on reinforcing of sustainability associated with human-environmental interactions

Contact: maria.nijnik@hutton.ac.uk

Social Innovation for Sustainable Environmental Management

Clarified **how SI can be initiated, developed & spread** and what can be its diverging developing pathways

how SI can be enhanced & what can be its impacts on the ground & how these can be assessed

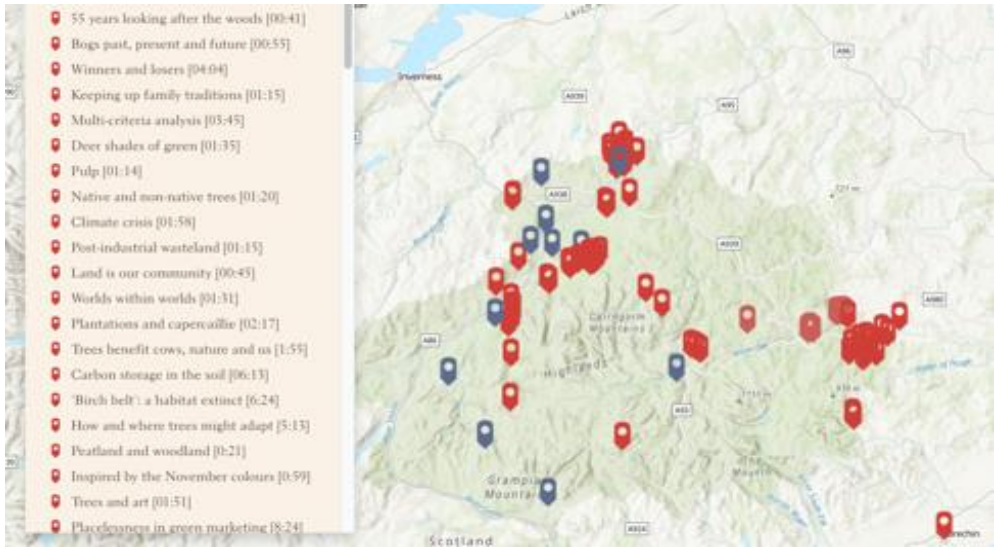
Potential of SI for transformative changes to help revive communities & bring prosperity to rural areas

Created a unique database of 450 examples of SI with 243 validated, with **over 30 examples in rural Scotland**

Contact: Maria.nijnik@hutton.ac.uk

Digital Storymapping with video is a useful deliberation tool for linking past, present & future land uses

- We recorded and mapped video stories with diverse stakeholders exploring what constitutes ‘The Right Tree in the Right Place, then tested with workshops.



Empathy-building between stakeholders; especially learning about experiences, methods & knowledge outside of usual ‘silos’ & comfort zones

Understanding **the geographical contingencies of stakeholder experiences & values**

Potential of Storymapping for **deliberating e.g. around spatial dimensions of responding to climate change** (e.g. species/habitat migration, ways of reaching net zero)

Contact: Katrina.brown@hutton.ac.uk

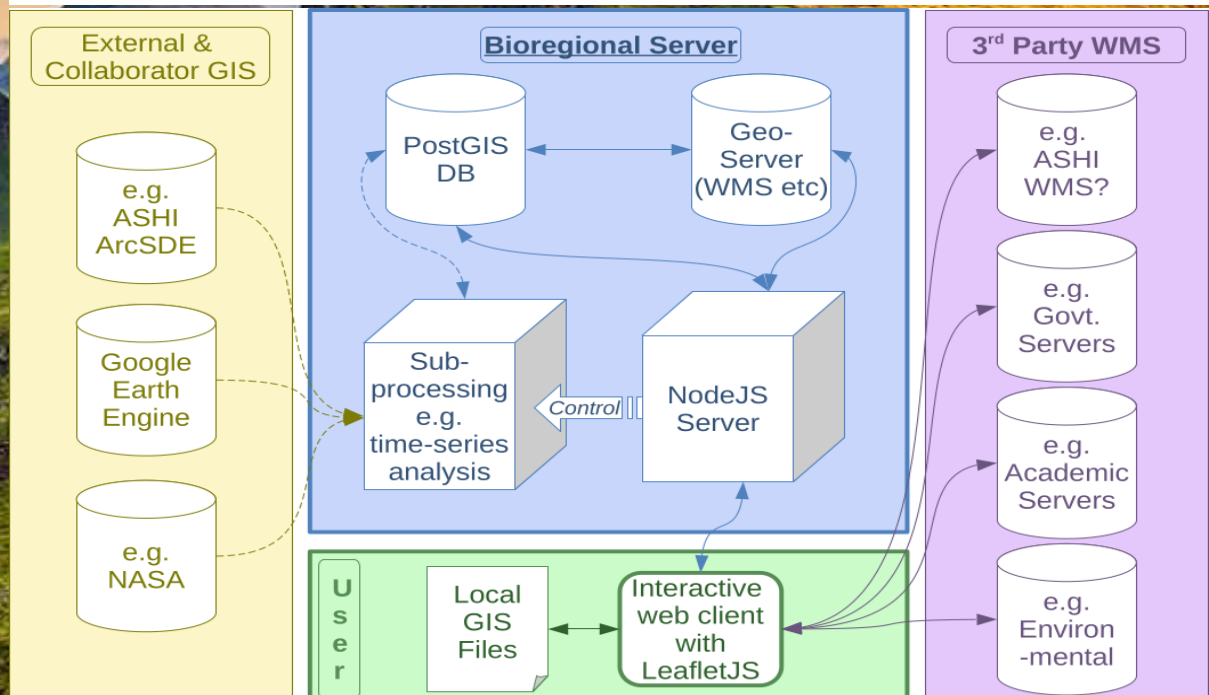
Bioregional Mapper

The Bioregional Mapper is:

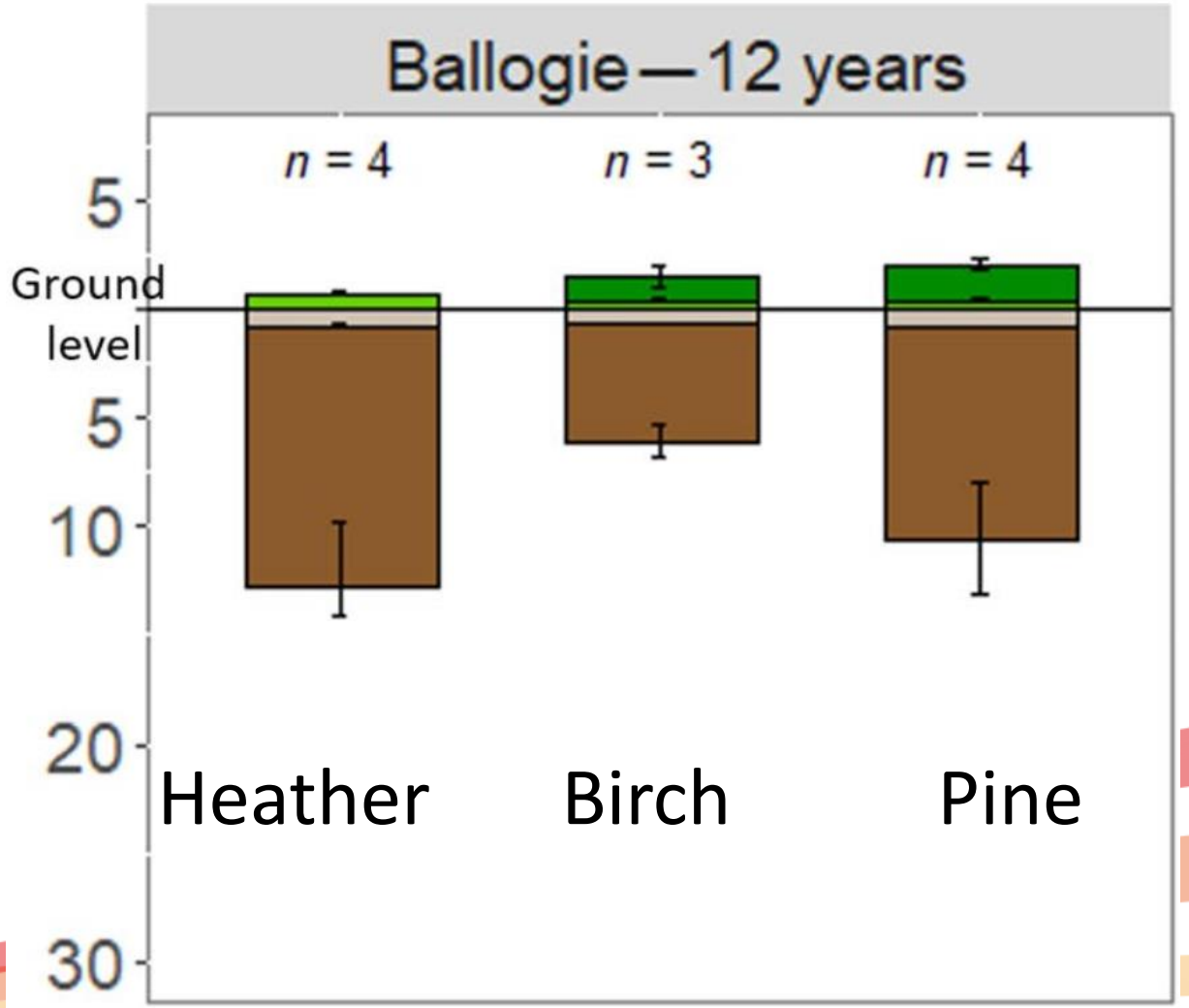
- a web-based mapping/GIS editing utility,
- a communication tool for stakeholder engagement,
- a citizen science data gathering tool,
- Tool for future-state visioning,
- a PPGIS tool for land-use monitoring and land-use change.

https://vimeo.com/643920114

Contact: Jonathan.ball@hutton.ac.uk



Natural regeneration: better for carbon storage?

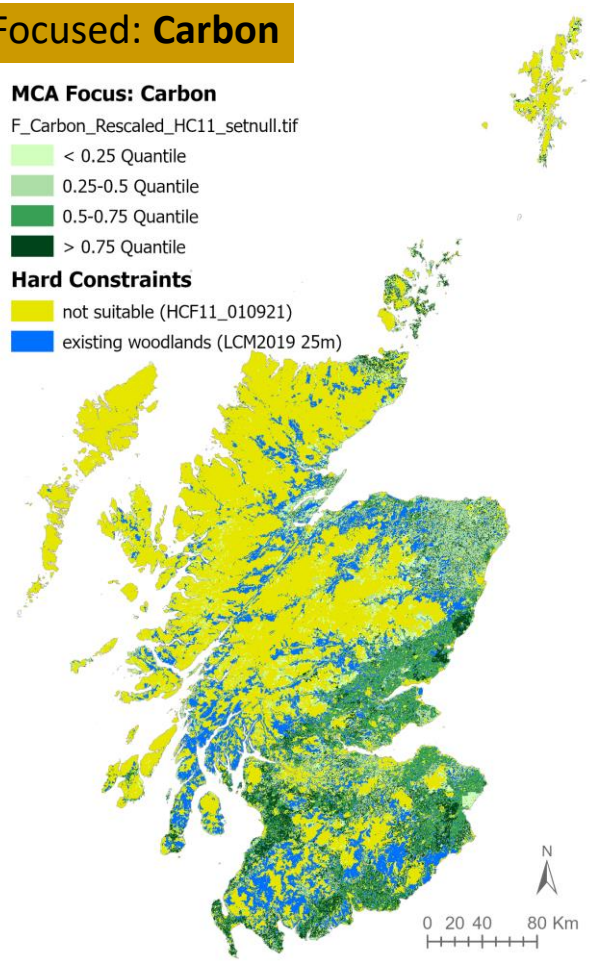


No net C gain on decadal timescales on organic rich soils
Changes in soil microbial community driving soil C losses?

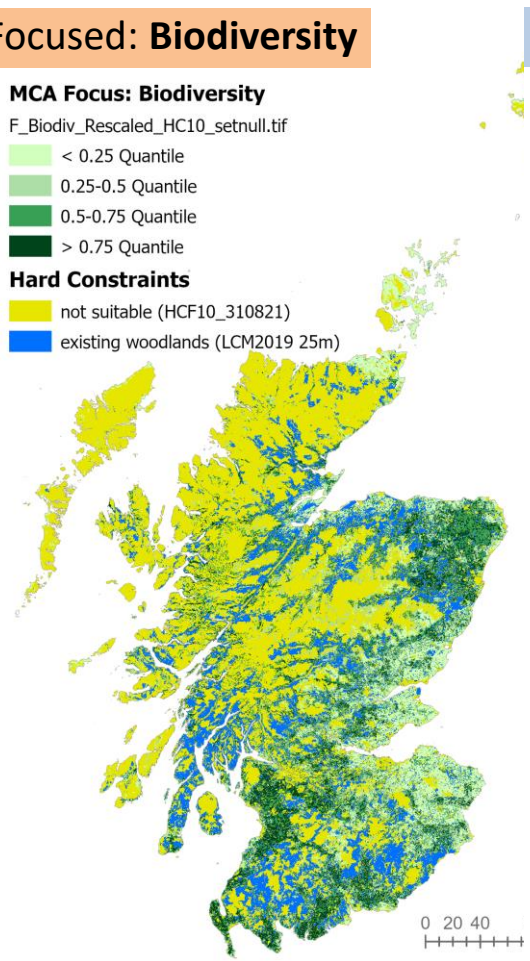
Contact: ruth.mitchell@hutton.ac.uk

Woodland Expansion – options for 500K ha

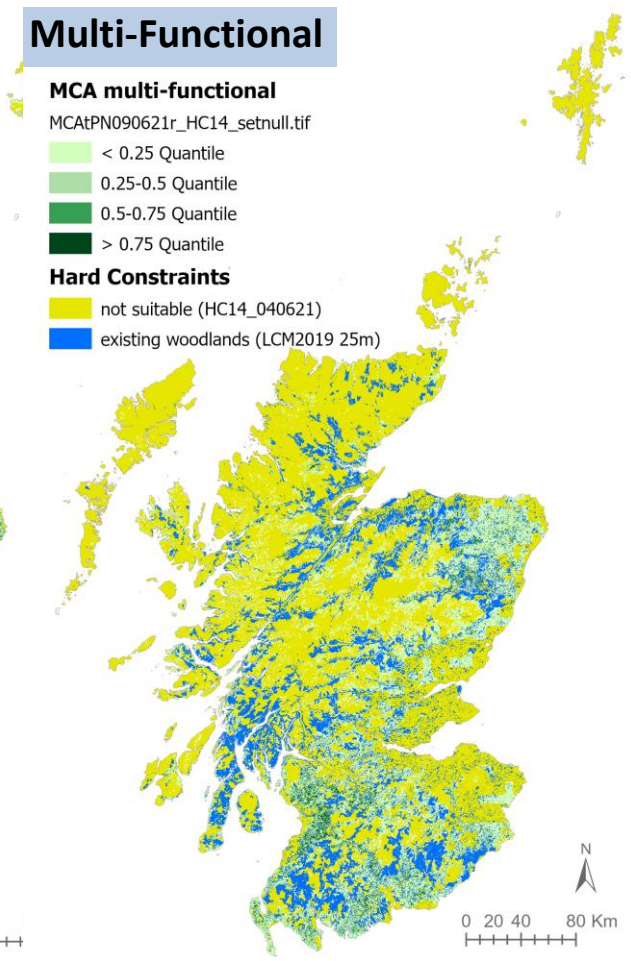
Focused: **Carbon**



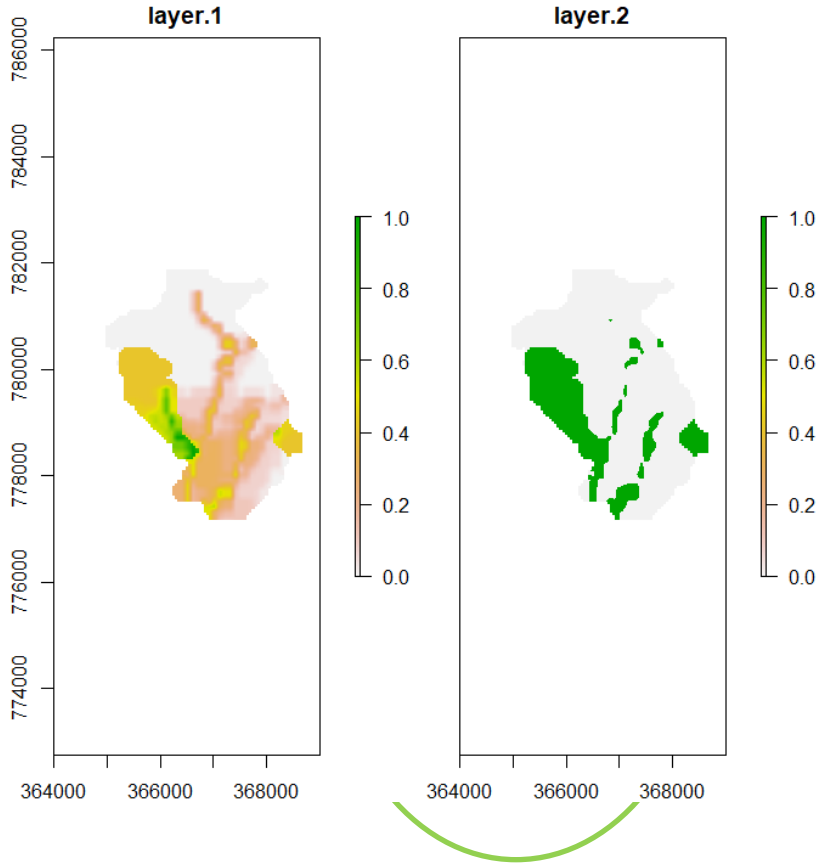
Focused: **Biodiversity**



Multi-Functional



Visualisation of future scenarios of woodland expansion

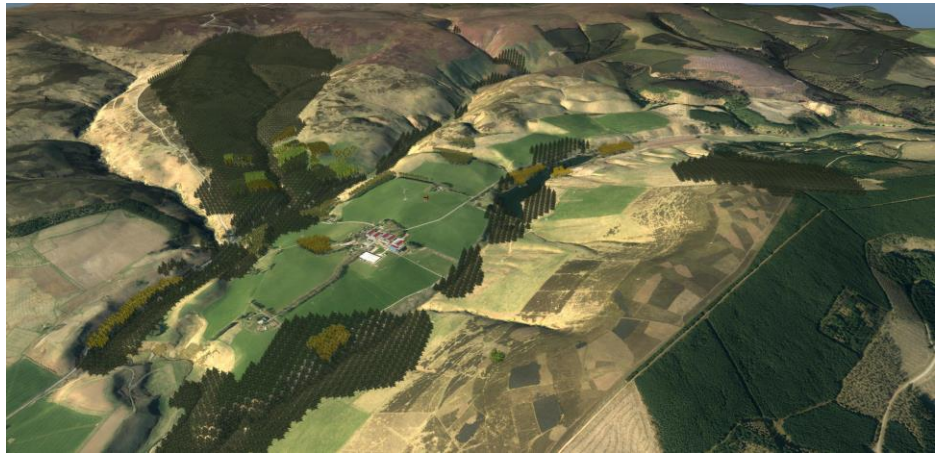


Based on spatial MCA

Carbon Nutrient retention+ economic viability

Visualisation of future scenarios of woodland expansion

Native Scenario with Scots pines and Birch



Commercial Scenario with Sitka spruce

Based on spatial MCA

Carbon Nutrient retention+ economic viability

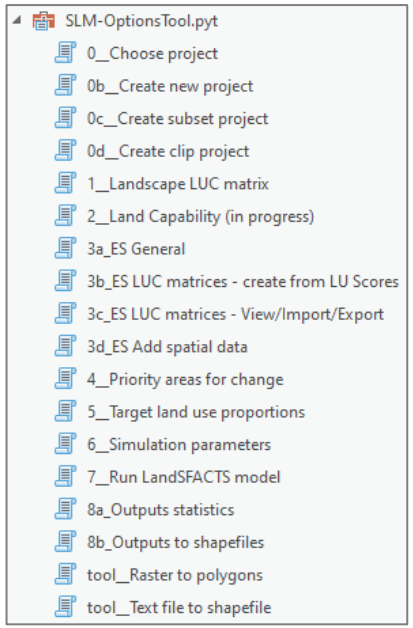
Contact: Chen.wang@hutton.ac.uk

Exploring options for sustainable Land Use Management –

The James Hutton Institute

SLM-OT
(landsFACTS)

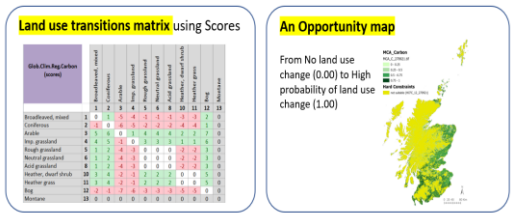
Tool interface within ArcGIS Pro



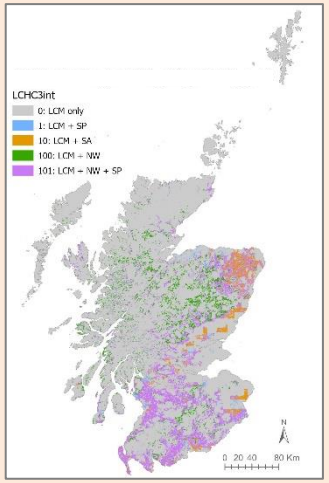
Inputs

Land use changes benefitting Ecosystem Services

for each Ecosystem Service

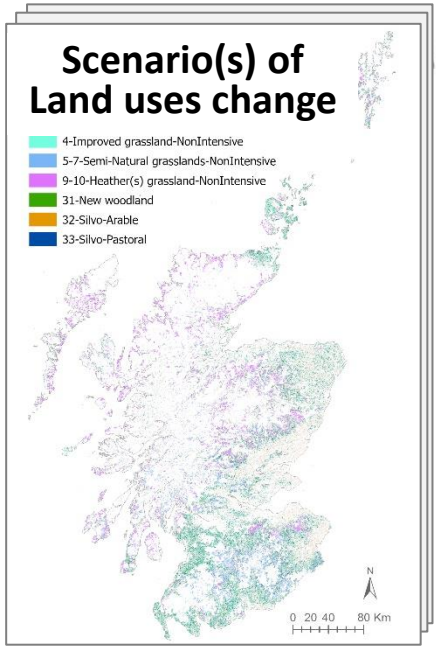


Potential LU change

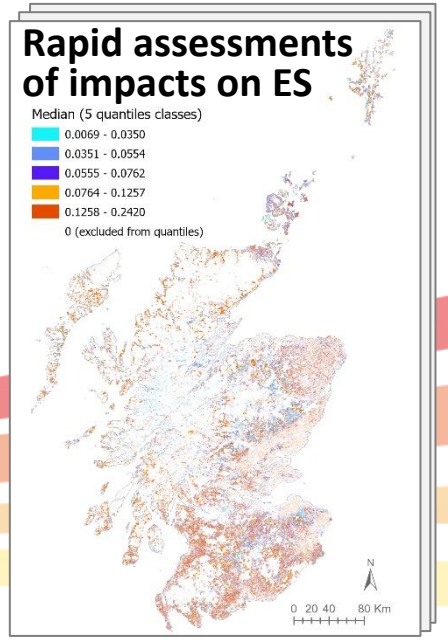


Targets hectares

Scenario(s) of Land uses change



Rapid assessments of impacts on ES



Habitat connectivity: Lemmings tool

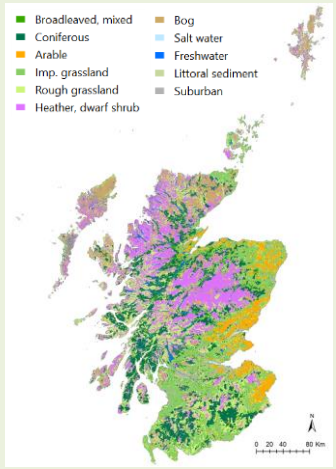
Individual movements though the landscape

Main inputs

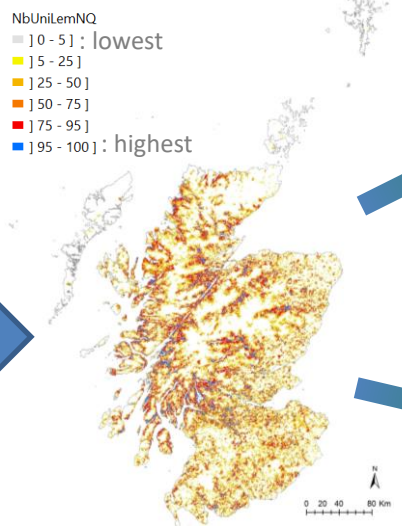
Per land use / habitat:

- Seeded (start)
- Energy gained/lost
- Crossability

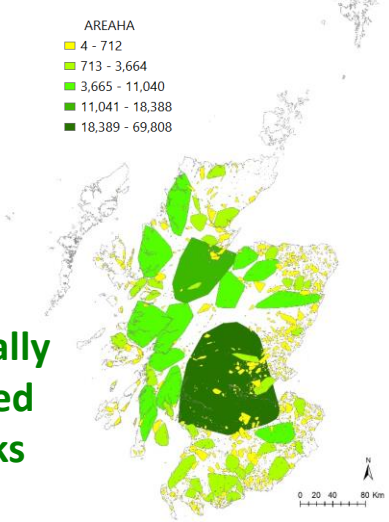
Land use map



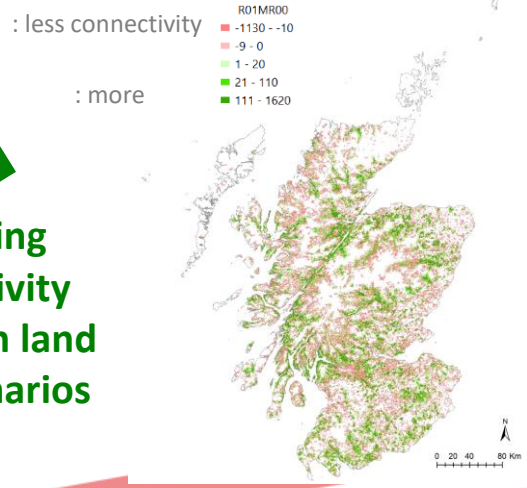
Connectivity (individuals' traffic)



Functionally connected networks



Comparing connectivity between land use scenarios



Interactive Web Tool – Prioritise Woodland Expansion

SEFARI

Help

Criteria Weights

For each selected criteria, choose its weight between 0 and 1 and the method you want. Then press Go!. If you want to store a combination, press Save!. If you want to store your final combination press Save for real

Criteria

[POS] PositiveCarbonBudget

0 — 1 — 1

[POS] DistanceFromBroadleaves

0 — 0.48 — 1

[POS] NutrientExport

0 — 0.74 — 1

[POS] FluvialRisk

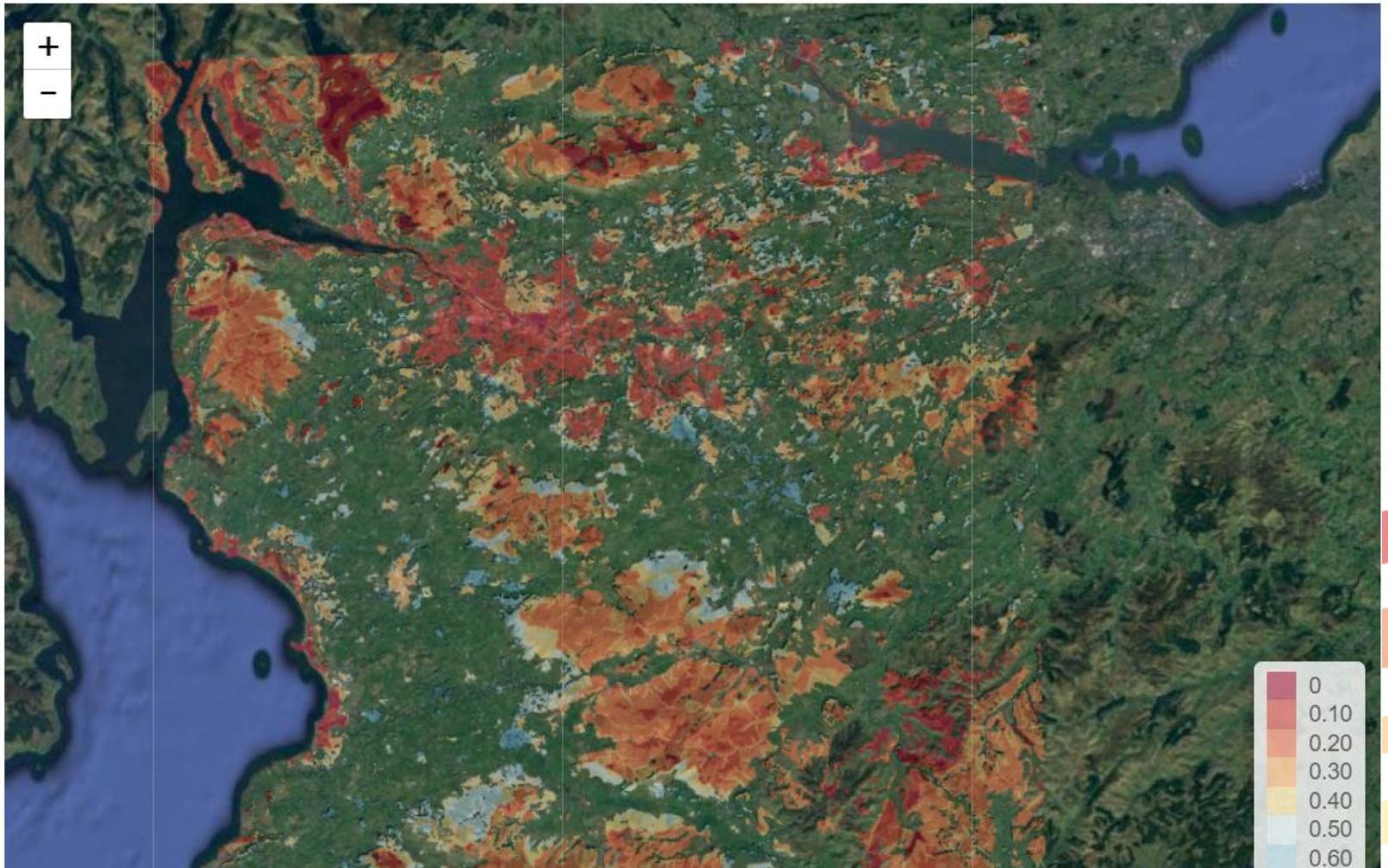
0 — 0.72 — 1

[POS] RiverShading

0 — 0.82 — 1

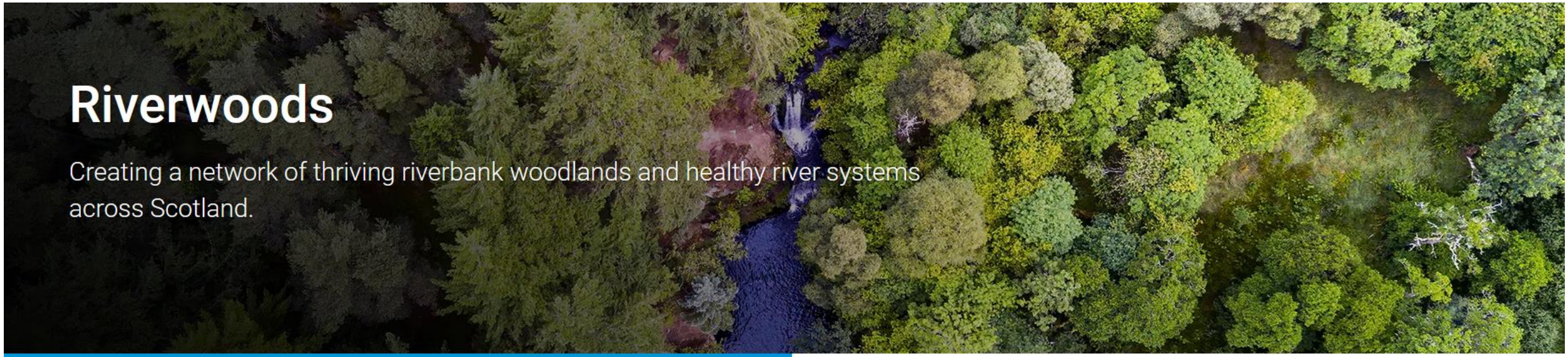
Mapping area

The best value is 1 (blue) and the worst 0 (red) for the project chosen Expansion considering these criteria, the weights selected and the chosen method



Prioritising Areas For New Riparian Woodlands

Contribution to:



A decade to make a difference

The UN Decade on Ecosystem Restoration runs from 2021 to 2030. It is a rallying call for the protection and revival of ecosystems all around the world, for the benefit of people and nature.

With Scotland's streams and rivers covering an amazing 125,000km (12.5 times the length of the country's coastline), improving riparian habitat has the potential to create transformative change that will deliver significant

Collaboration. Innovation. Action.

Interactive web tool – Prioritise Peatlands Restoration

SEFARI

Contact: Alessandro.gimona@hutton.ac.uk

Help

Criteria Weights

For each selected criteria, choose its weight between 0 and 1 and the method you want. Then press Go!. If you want to store a combination, press Save!. If you want to store your final combination press Save for real

Criteria

[POS] Carbon

0 — 0.49 — 1

[POS] Condit

0 — 0.2 — 1

[NEG] Dom

0 — 0.42 — 1

[NEG] Eros

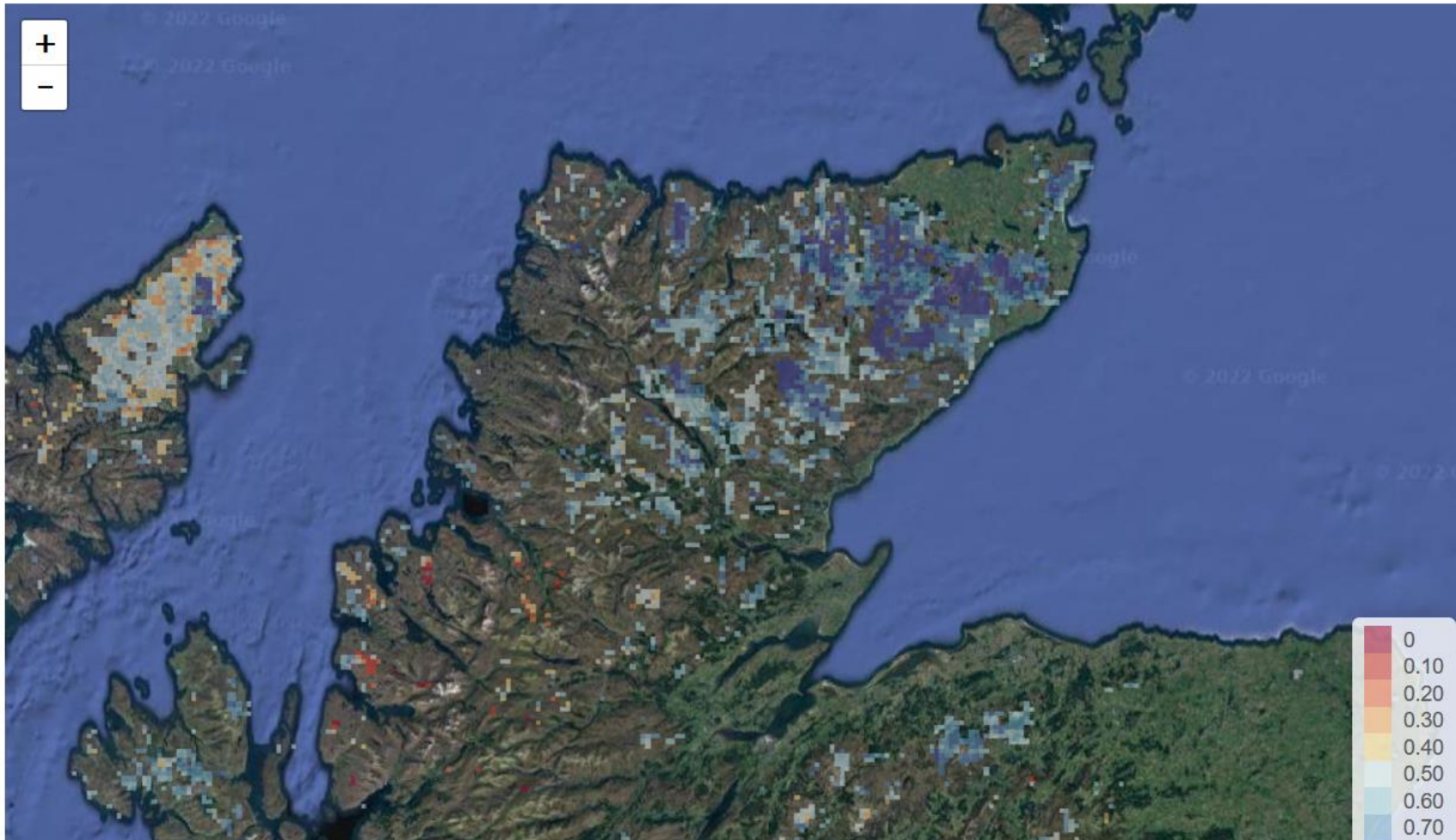
0 — 0.83 — 1

Go

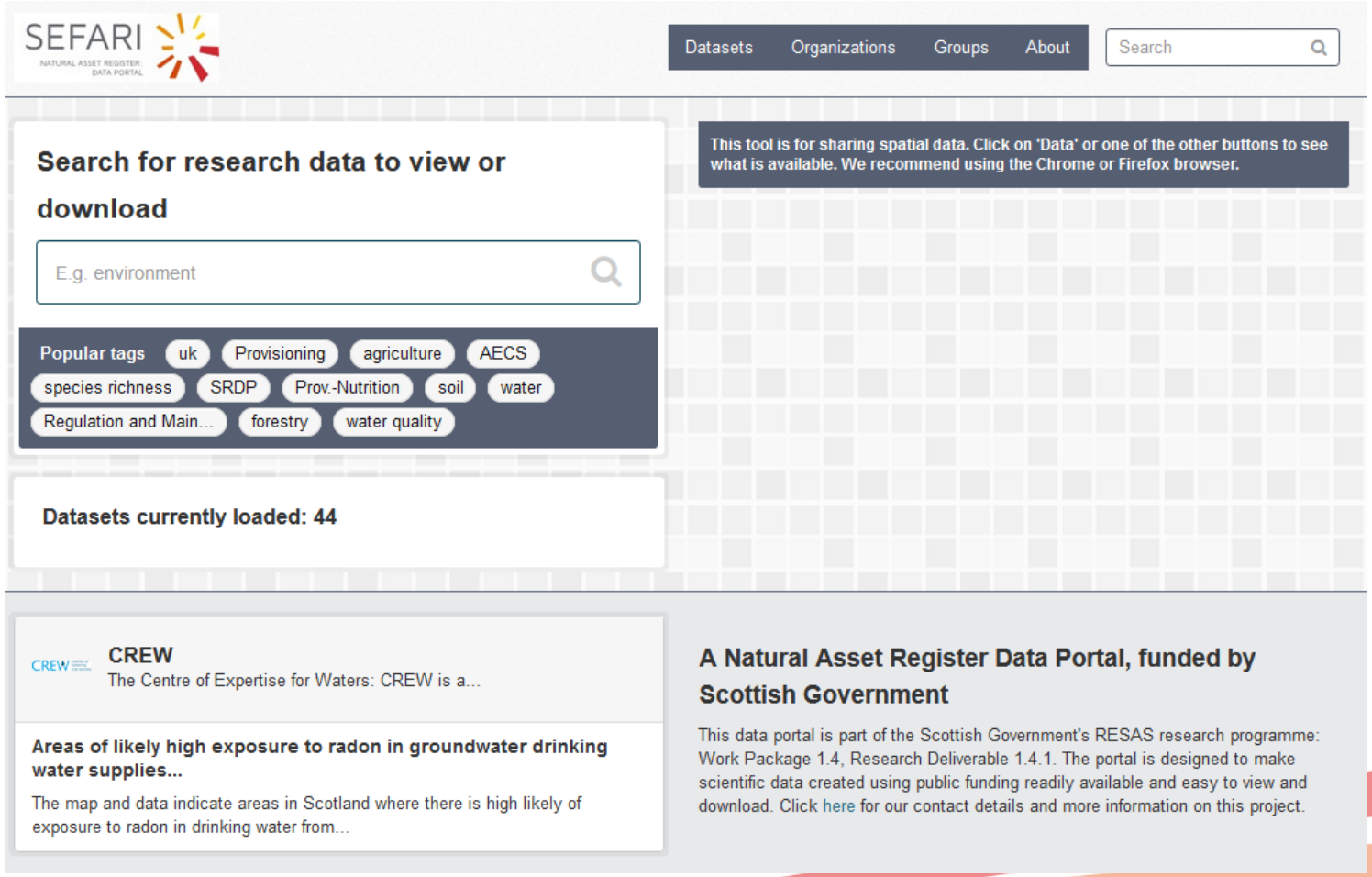
Download Raster

Mapping area

The best value is 1 (blue) and the worst 0 (red) for the project chosen Expansion considering these criteria, the weights selected and the chosen method



Natural Asset Register: Data Portal



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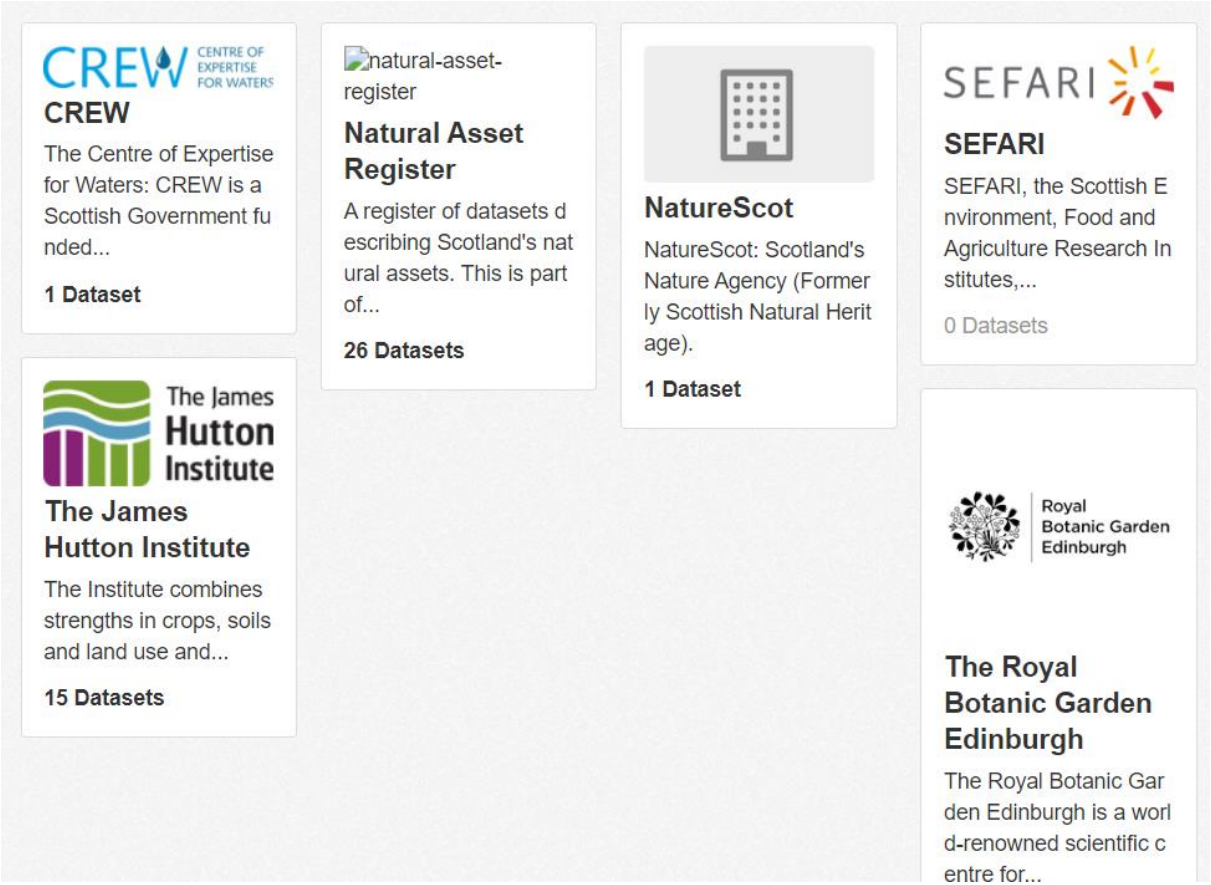

https://openscience.hutton.ac.uk/

or https:/nar.hutton.ac.uk

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44 datasets with almost 120 individual resources (downloads & web services)

Research data describing soils, water, cultural services and more

Contact: David.donelly@hutton.ac.uk

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Thanks for your attention