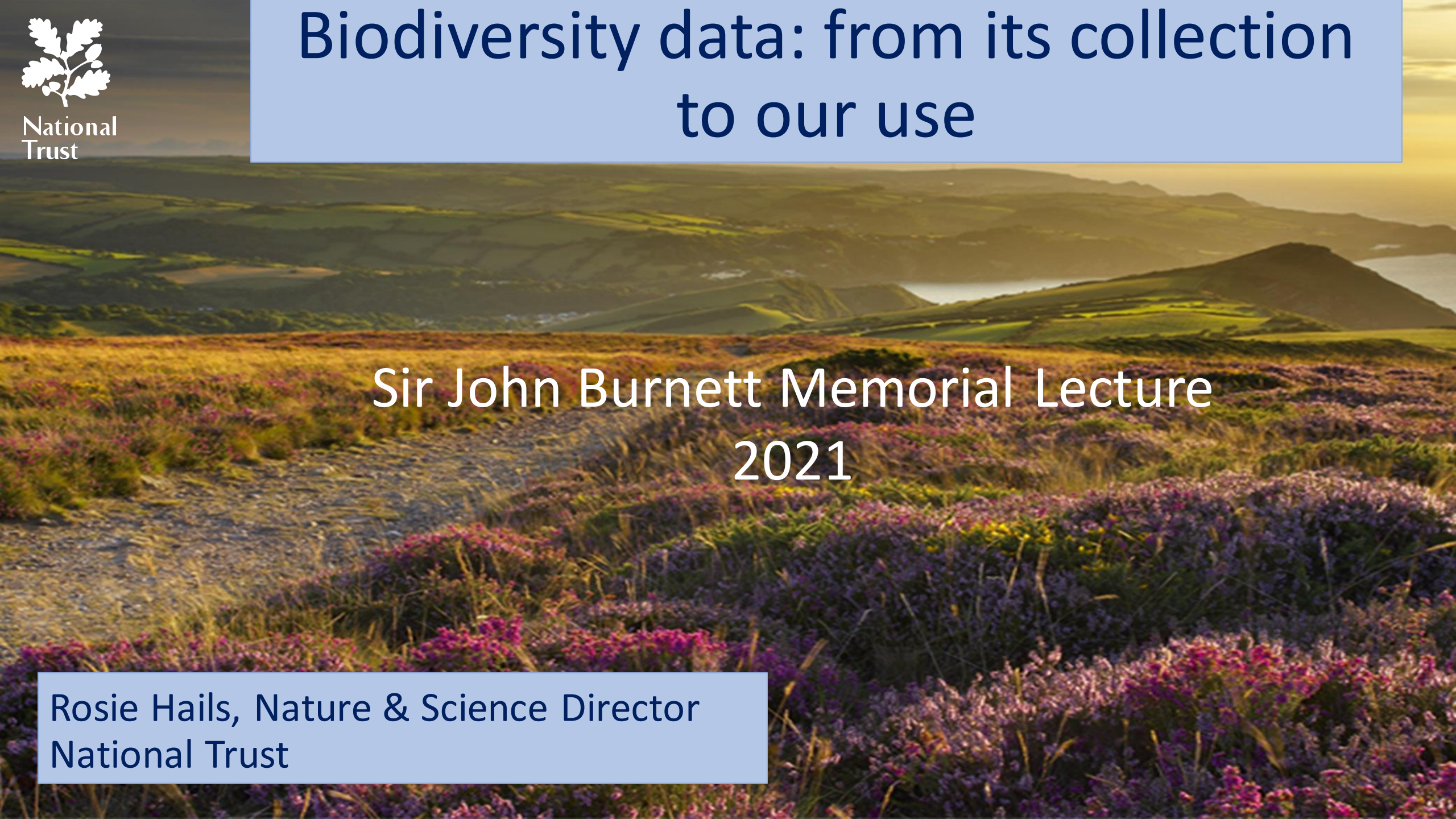
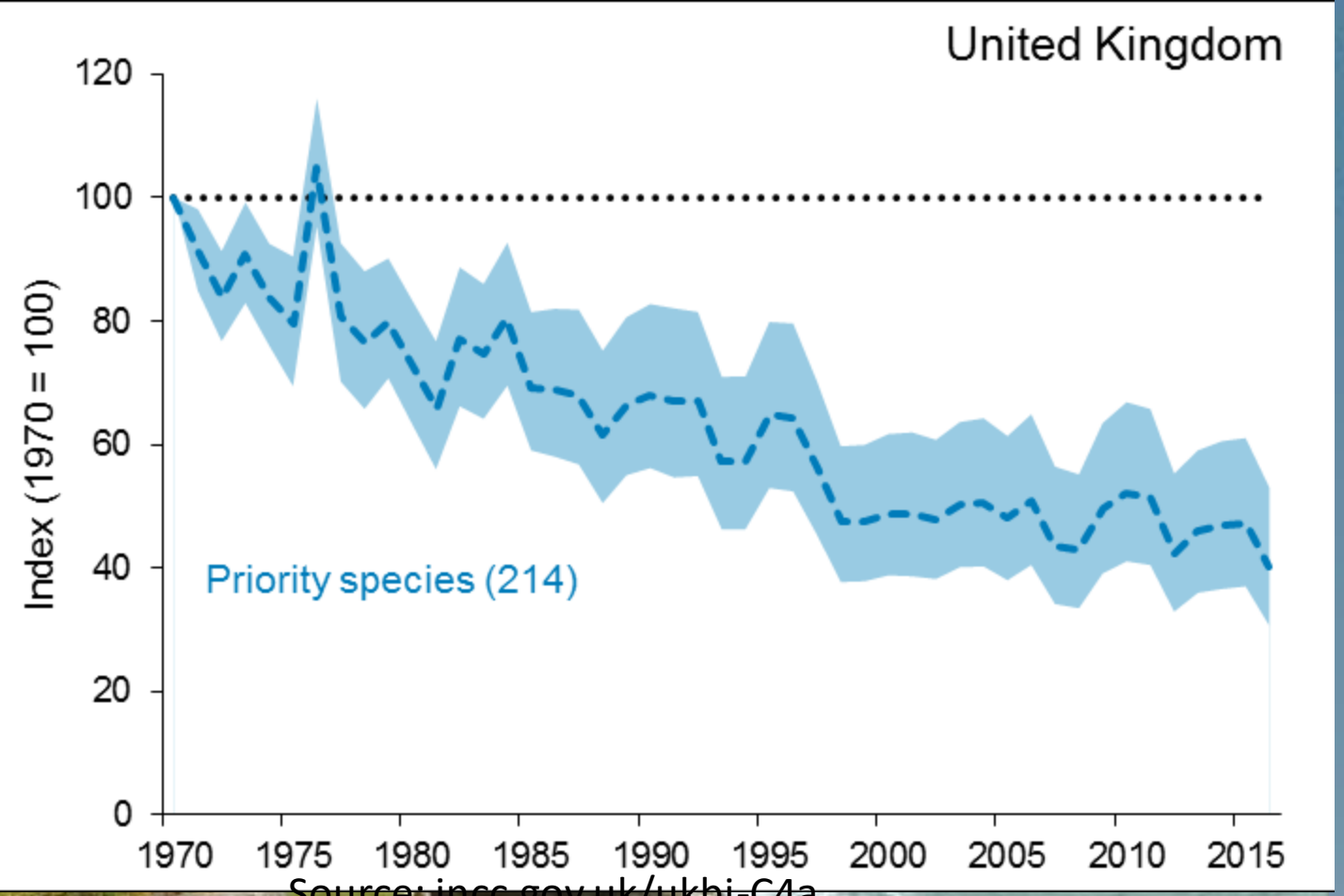
Biodiversity data: from its collection to our use



Sir John Burnett Memorial Lecture
2021

Rosie Hails, Nature & Science Director
National Trust



Source: jncc.gov.uk/ukbi-C4a


National Trust
• 30% of land protected for nature by 2030
• Halt and reverse biodiversity decline by 2030
• Plant 30,000 ha trees pa by 2024/25
• Restore 35,000 ha peatland by 2025 & 280,000 by 2050

> 300 historic properties

> 180 parks & gardens

~ 260,000 ha → 50% in hand; 50% let → 50% FBT; 50% AHA

~ 780 miles coastline

Outcomes on our land

Net zero in carbon

Our land well managed for nature

Outputs on our land (& beyond where specified)

Nature: our targets met for improved designated site condition, land managed to high nature status, and 25k priority habitat restored/created

Endangered species: status improved

Access: Enhanced, increased and inclusive.

Carbon sequestration: by nature & carbon rich habitats, well managed woodlands and by establishing 20 million trees.

Carbon emissions reduction: stocking densities reduced, peatlands restored.

Sustainable rural businesses financially viable, compatible with our strategic goals & delivered by a variety of providers

Heritage & landscape character: sensitively managed and a means to deliver both positive land management and engagement

At a landscape scale: with partners, a further 25K ha habitat restored beyond our land

Other natural capital: especially soil & water, managed sustainably (no minimum standards failures)

Assumption: we raise sufficient resources

Approach

Collaboration

Blending natural processes with targeted management

Deliver multiple benefits

Approach

Collaboration	**Blending natural processes with targeted management**	**Deliver multiple benefits**

Activities on our land (& beyond where specified)

Evaluation framework: consistent frameworks are put in place to evidence benefits to society

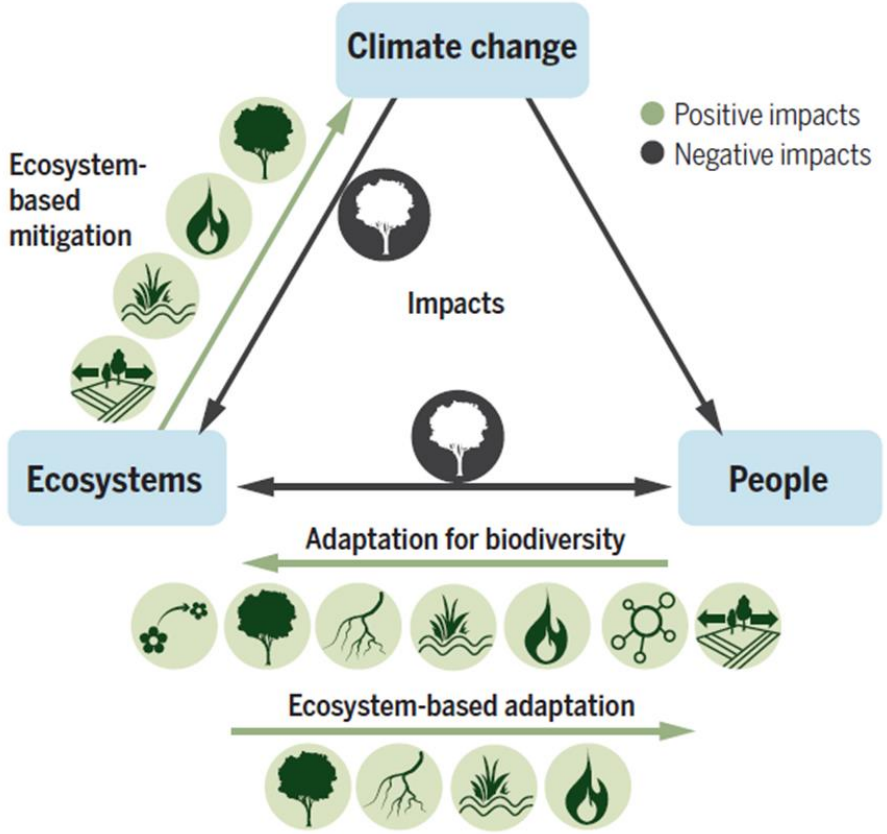
Drive forwards nature accelerators	**Supporting countryside management**	**Fund raising, communications, partnerships & advocacy**	**Inspire people**

Situation: There is a biodiversity and climate crisis - there is an urgent need for land use change to address these issues in ways that complement other benefits to people that derive from land management

Integrated approaches

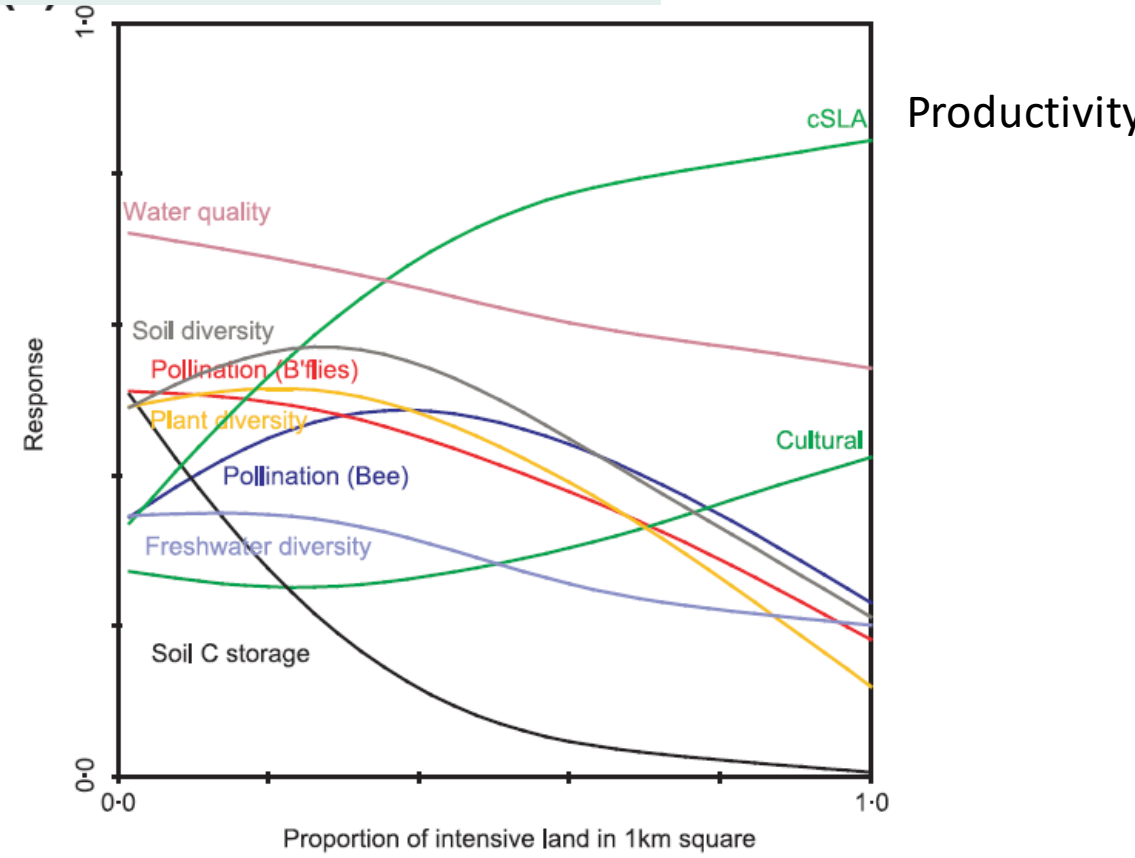
Recovery of nature, response to the climate crisis and delivery of public benefit at the heart of our land use decisions

- Tree planting
- Renovate habitats
  - peatlands and bogs, scrub, wetlands, coastal and marine habitats
- Zero carbon/ circular farming systems
- Landscape heterogeneity
  - improve long-term ecological resilience,
  - ecosystem function
  - multi-species conservation



Trade offs in services from ecosystems

- What is the desirable balance of benefits from land?
- How do we manage land to achieve that balance?
- There are socio-economic and ecological dimensions to answering those questions.



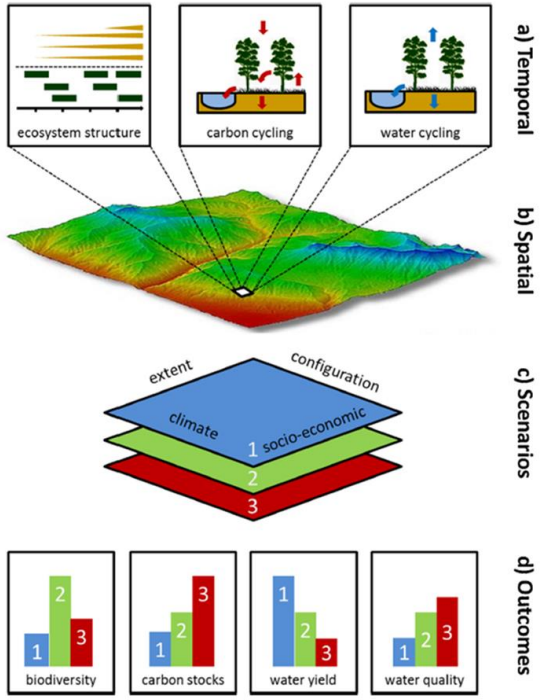
- Figure from Maskell et al 2013. Journal of Applied Ecology 50 p. 561.

Planning Interventions – mapping opportunities

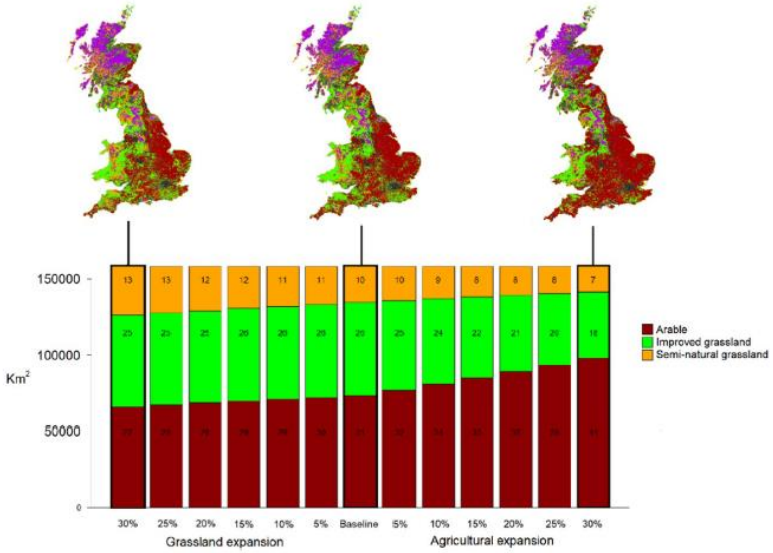
Set constraints

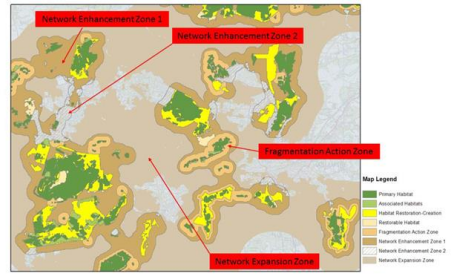
Constraint layer	Land available (ha)	% available
Natural & seminatural habitats	16 233 342	71
Slope >15%	16 704 785	73
High organic carbon soils	16 794 958	73
Urban areas, main roads, rivers, lakes	20 289 135	89
Designated areas	20 469 186	89
Existing woodland	20 566 746	90
Cultural heritage	22 719 325	99
All seven constraints	9 086 465	40

Opportunity map layers



Scenario maps





- Explore different scenarios
- Target landscape scale deployment – large scale linked to beyond our boundaries instead of local targets
- Integrate knowledge & link to partners, property & tenant needs – co-design element

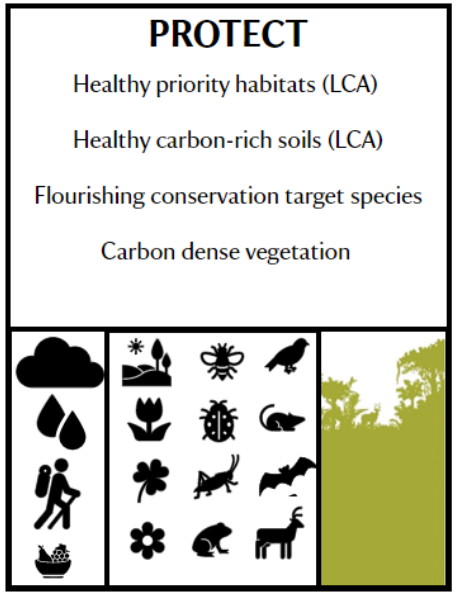
4 broad land uses × 3 types of action...

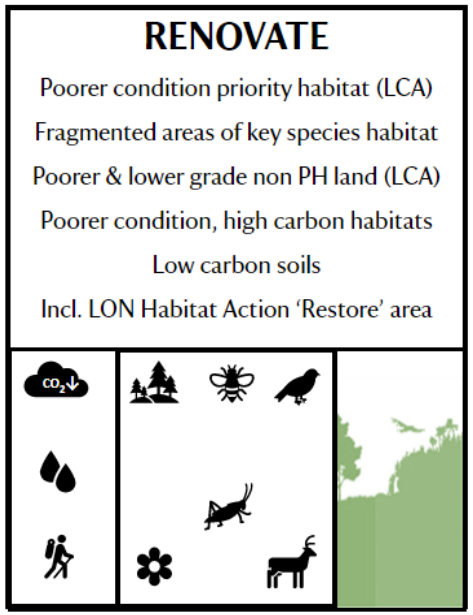
Nature places:
Targeted & adaptive conservation to help maintain high value biodiversity, heritage & culture

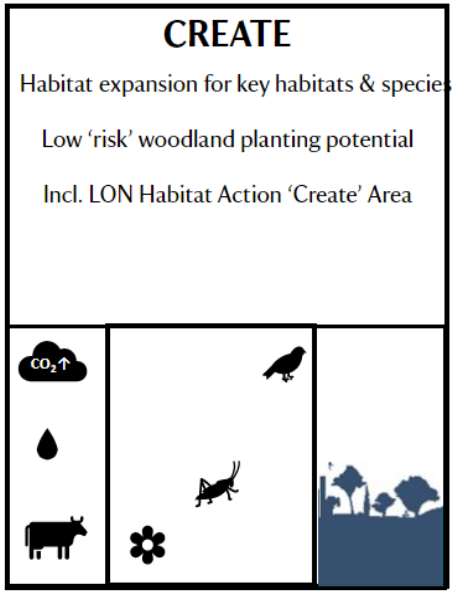
Nature-based solutions:
Focused interventions that help sequester carbon, ameliorate flood risk, improve air & soil quality beyond net zero

Work with natural processes:
Landscape scale, natural process led renovation creating large linked spaces for new nature, that are not focused on a fixed endpoints **('Wilder by design')**

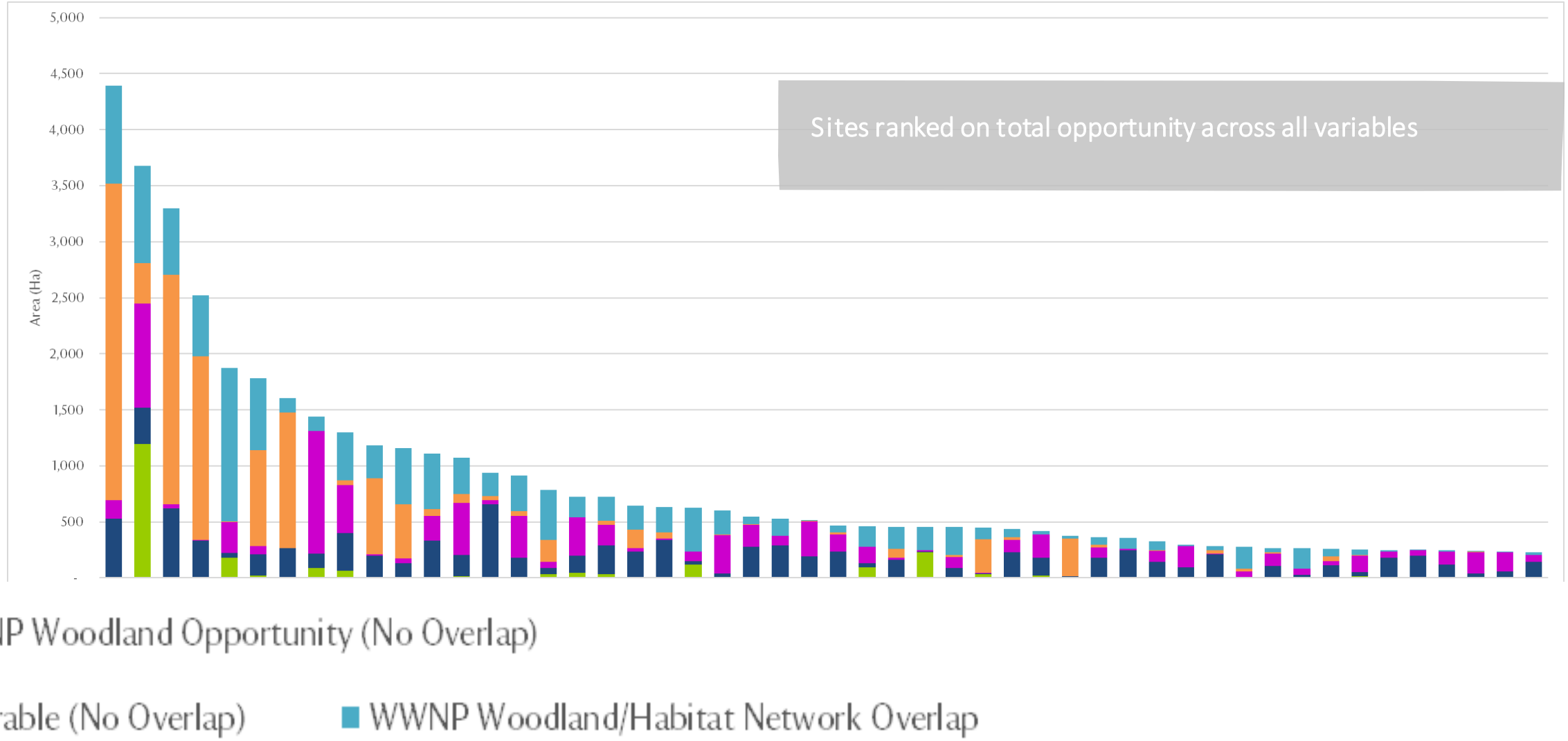
Sustainable food production:
Adopting agroecological approaches on productive land when we decide to farm it







Restoration, Enhancement & Expansion Opportunities



Outcomes on our land

Net zero in carbon

Our land well managed for nature

Outputs on our land (& beyond where specified)

Nature: our targets met for improved designated site condition, land managed to high nature status, and 25k priority habitat restored/created

Endangered species: status improved

Access: Enhanced, increased and inclusive.

Carbon sequestration: by nature & carbon rich habitats, well managed woodlands and by establishing 20 million trees.

Carbon emissions reduction: stocking densities reduced, peatlands restored.

Sustainable rural businesses financially viable, compatible with our strategic goals & delivered by a variety of providers

Heritage & landscape character: sensitively managed and a means to deliver both positive land management and engagement

At a landscape scale: with partners, a further 25K ha habitat restored beyond our land

Other natural capital: especially soil & water, managed sustainably (no minimum standards failures)

Assumption: we raise sufficient resources

Approach

Collaboration

Blending natural processes with targeted management

Deliver multiple benefits

Exmoor Case Study

- Natural process-led restoration
- Introduce species with important functional roles
- Innovative Stage 0 river restoration

Woodland creation target

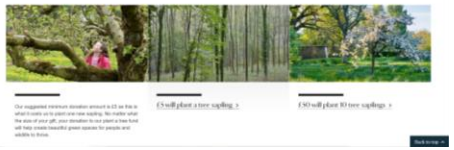
20 million trees by 2030

National Trust to plant 20 million trees in UK over next decade

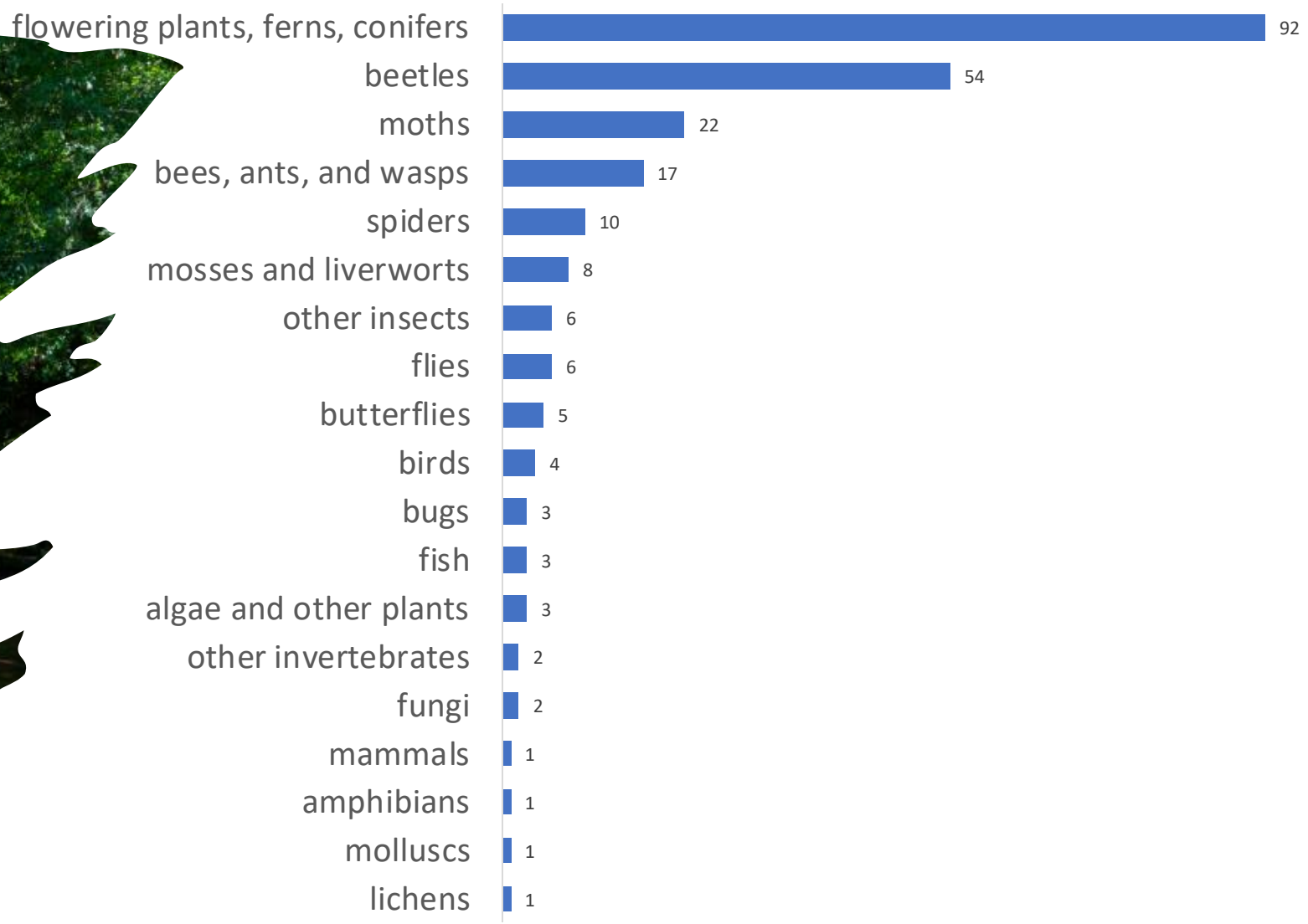
Plan to cover area 1.5 times size of Manchester is part of goal to achieve net zero emissions

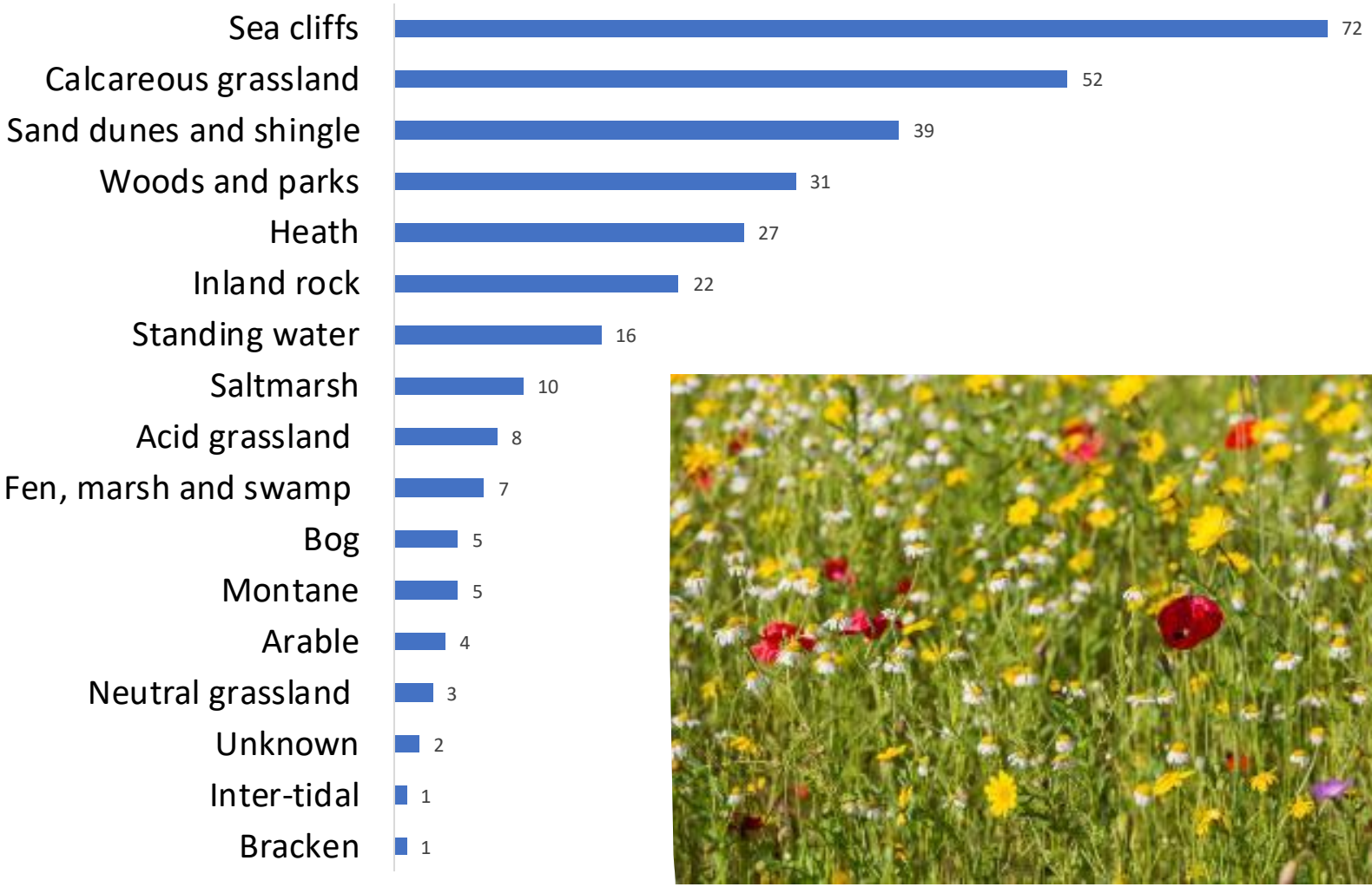
The National Trust is planning to plant 20 million trees over the next decade as part of efforts to achieve net zero emissions by 2030.

How much does it cost to plant a tree?



Significant Species




Sea cliffs 72
Calcareous grassland 52
Sand dunes and shingle 39
Woods and parks 31
Heath 27
Inland rock 22
Standing water 16
Saltmarsh 10
Acid grassland 8
Fen, marsh and swamp 7
Bog 5
Montane 5
Arable 4
Neutral grassland 3
Unknown 2
Inter-tidal 1
Bracken 1

Outcomes on our land

Net zero in carbon

Our land well managed for nature

Outputs on our land (& beyond where specified)

Nature: our targets met for improved designated site condition, land managed to high nature status, and 25k priority habitat restored/created

Endangered species: status improved

Access: Enhanced, increased and inclusive.

Carbon sequestration: by nature & carbon rich habitats, well managed woodlands and by establishing 20 million trees.

Carbon emissions reduction: stocking densities reduced, peatlands restored.

Sustainable rural businesses financially viable, compatible with our strategic goals & delivered by a variety of providers

Heritage & landscape character: sensitively managed and a means to deliver both positive land management and engagement

At a landscape scale: with partners, a further 25K ha habitat restored beyond our land

Other natural capital: especially soil & water, managed sustainably (no minimum standards failures)

Assumption: we raise sufficient resources

Approach

Collaboration

Blending natural processes with targeted management

Deliver multiple benefits

The role of species data in evidencing outcomes

- Using national datasets for a counterfactual analysis
- Developing new apps for our volunteers
- Capturing species data in innovative ways
- Focus citizen science & expertise to address knowledge gaps

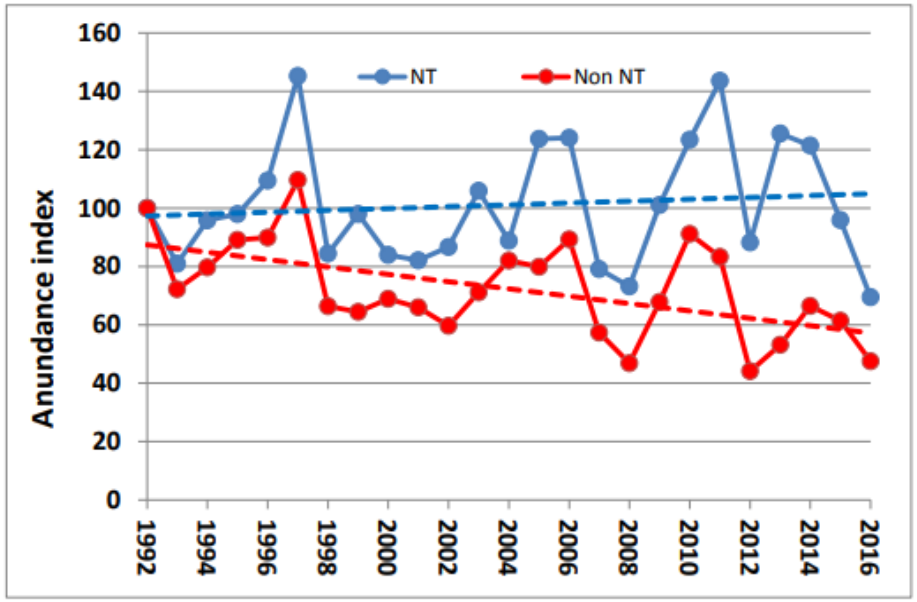
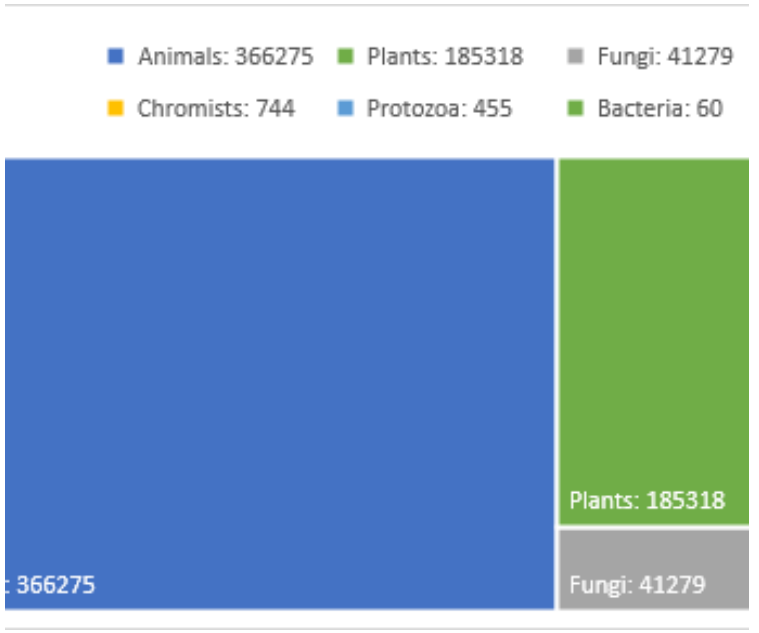
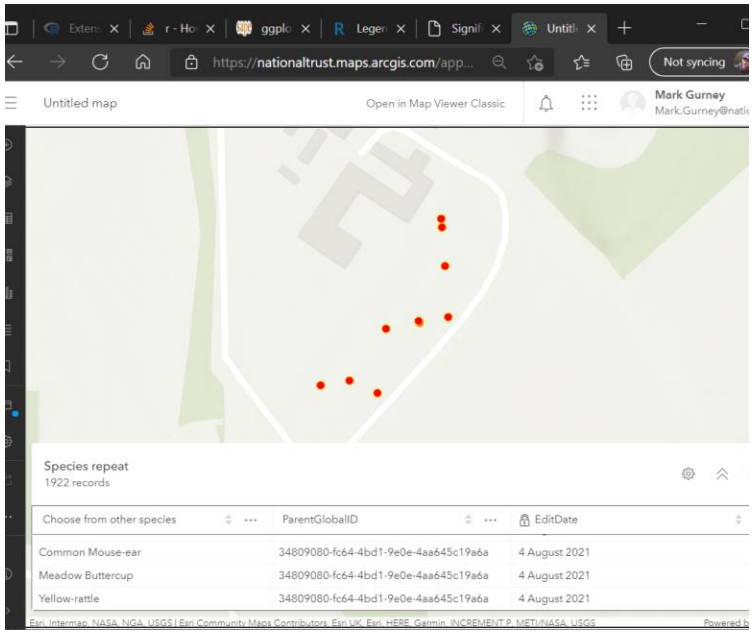


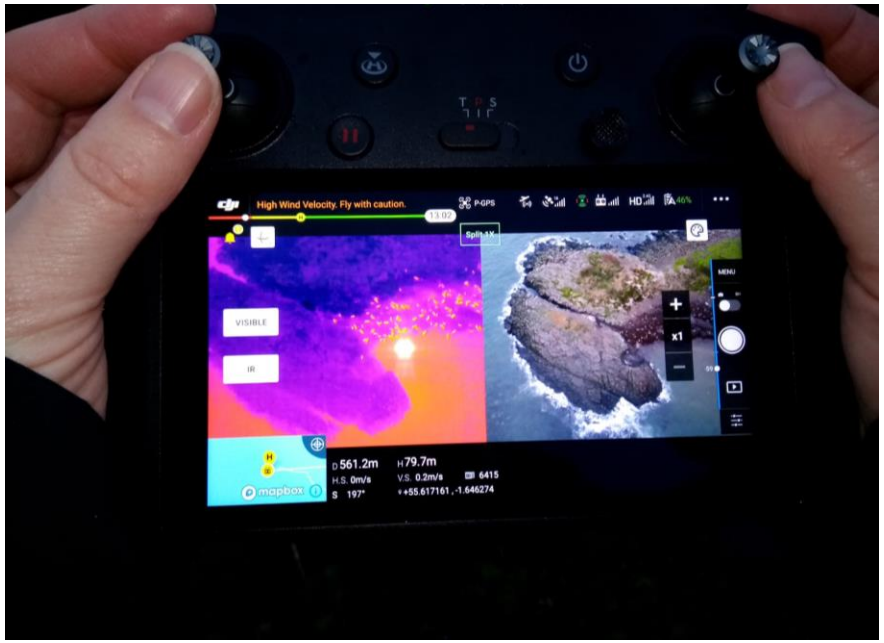
Figure 4 Composite trends in Habitat Specialist on National Trust and non National Trust land. Dashed lines represent the underlying smoothed trend.

Counterfactual analysis

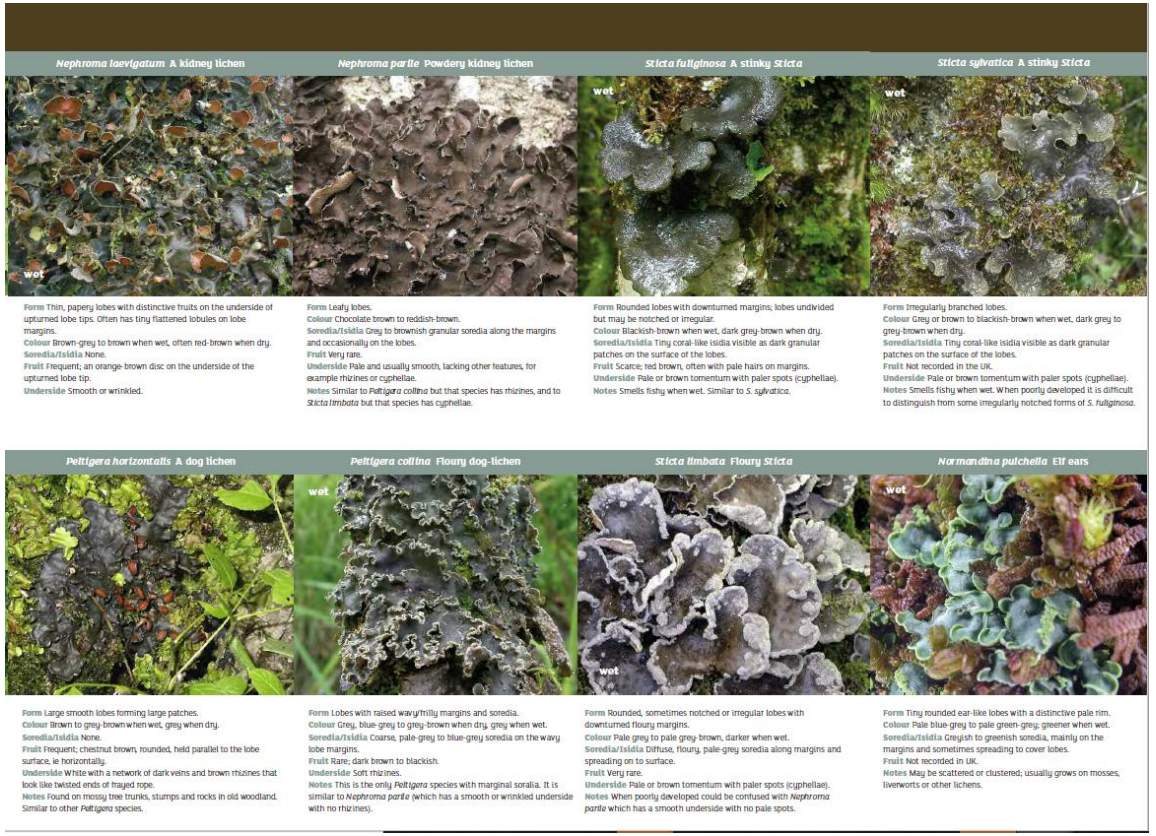




Developing new apps for volunteers: Priority Habitat condition



Capturing species data in innovative ways



Citizen Science to address knowledge gaps

RestREco

Restoring **R**esilient **Eco**systems

- We need a new paradigm for goal-seeking in ***ecological restoration*** which goes beyond ***reference systems***
- We intend to measure ***biodiversity***, ***architecture*** and ***multifunctionality*** at different stages of transition from a degraded state
- We shall identify determinants and measures of ***complexity***, and seek signals of ***emergent properties*** - especially ***resilience*** to perturbation,

Cranfield University

UK Centre for Ecology & Hydrology

National Trust

Forest Research

UNIVERSITY of STIRLING


National
Trust