Cultural landscapes and rewilding:
A UK Protected Landscape perspective - Part 2

Current environmental policy context (England)

Alongside planning and housing, transport, waste, energy, economic, health and food production policies

Protected Landscape management plans and the LURA 2023 duty	Statutory management plans reviewed every 5 years supported by a legal duty on all public bodies to seek to further the purposes of designation
The Environment Act 2021 Mandatory 10% Biodiversity Net Gain for development and Environment Improvement Plan 2023 (10 Goals and PLTOF targets)	(1) Create more than 250,000 hectares of wildlife-rich habitats outside protected sites by 2042 (from a 2022 baseline) (6) Reduce net greenhouse gas emissions to net zero by 2050 relative to 1990 levels (7) Restore 130,000 hectares of peat by 2050 (8) Increase tree canopy and woodland cover (combined) by 3% of total land area by 2050 (from 2022 baseline)
Protecting 30% of land and sea for nature by 2030 (supporting global target agreed at UN Biodiversity Summit (COP15))	Only 7.1% land currently counts towards 30x30 (Defra October 2024) Under IUCN interpretation all Protected Landscapes could count (25% of land) if governance and regulation were strengthened
DEFRA Land Use Consultation 2025	9% of land to change away from agriculture for mainly environmental and climate benefits (more peat, woodland and heathland), with a further 9% of land incorporating more trees or managed less intensively.

All about targets - we would really like to see honesty around data quality

How could mathematical and statistical approaches help cultural landscapes address key challenges?

1**. Improve land cover classification algorithms (?) and reliability** for land uses which manifest as small patch sizes (often sub-regional typologies) yet are vital components of a resilient and sustainable cultural landscapes (and currently overlooked in policy and absent from landscape decision tools) e.g.,

- Horticulture and small-scale growing (vegetables, nuts, fruit and seeds)
- Species rich neutral grassland (pasture and hay meadows)
- Natural regeneration

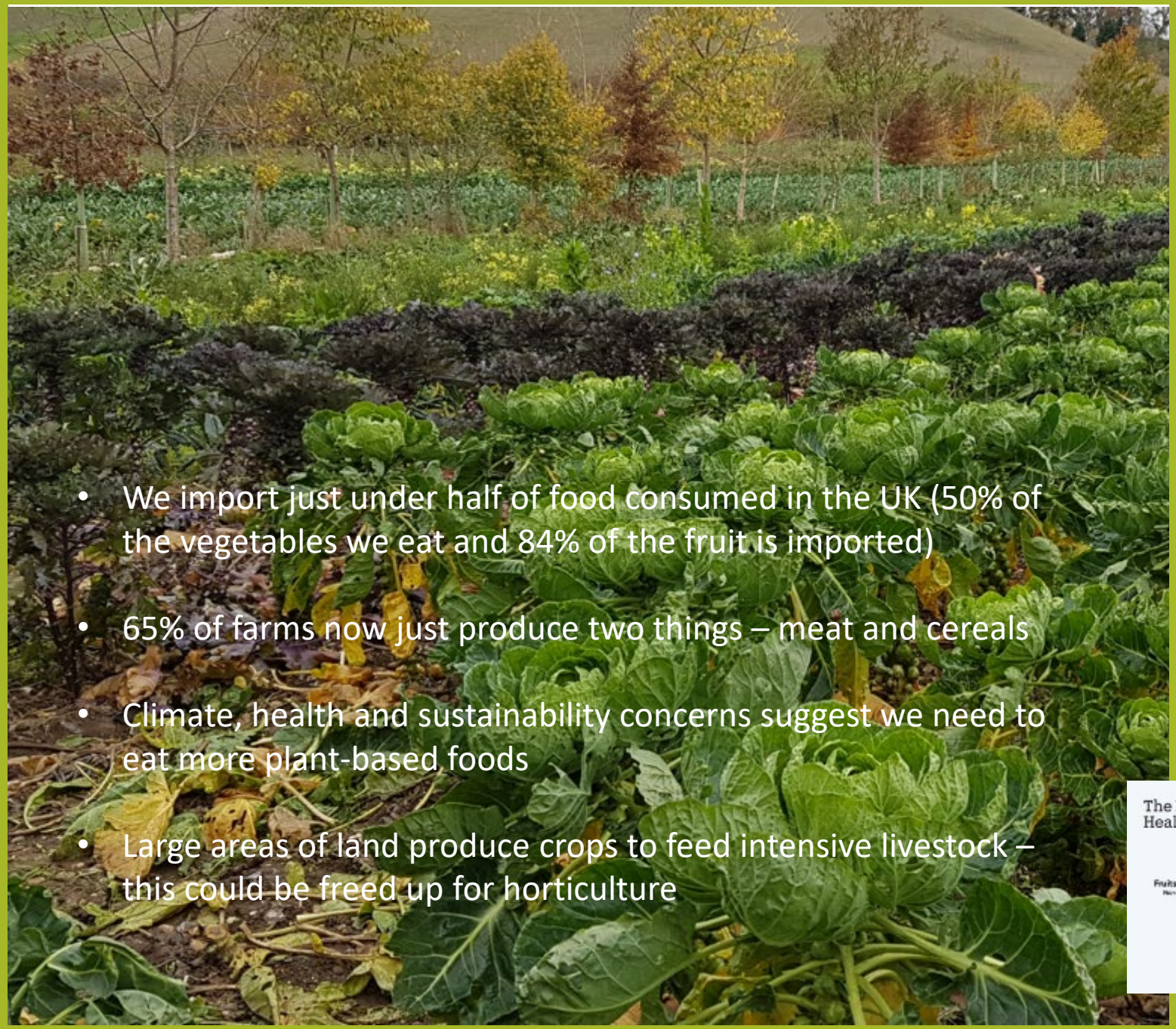
2. **Provide predictive models – 'what if' scenario's** that can challenge accepted norms; illuminate new possibilities; prompt community discussion and inform participative co-creation of landscape-scale management strategies e.g.,

- Unleashing the power of nature's ecological engineers (beavers)

3. **Model populations at an appropriate scale** to aid design of proactive interventions to remove barriers to nature recovery e.g.,

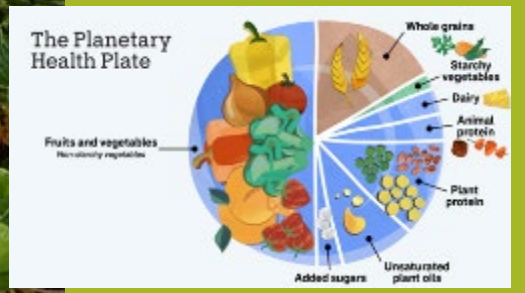
- Grey squirrels (adversely affect timber production, nut growing – and red squirrel survival) – national scale
- Deer (adversely affect coppice regrowth, horticulture and pasture productivity) – sub-regional scale

4. **Explore how land manager attitudes and behaviours can be accommodated in landscape decision models** at a sub-regional scale e.g., procedural guidance on generating appropriate qualitative data to support agent-based modelling, and **consider the needs of land managers as model users** (codesign)



- We import just under half of food consumed in the UK (50% of the vegetables we eat and 84% of the fruit is imported)
- 65% of farms now just produce two things – meat and cereals
- Climate, health and sustainability concerns suggest we need to eat more plant-based foods
- Large areas of land produce crops to feed intensive livestock – this could be freed up for horticulture

Challenge 1. Can we feed ourselves while ‘rewilding’ all of our cultural landscapes, and retaining their character?



We suspect the answer is yes, but

The quality of land cover data for sub-regional policy is poor - we can't build a landscape-scale food/ land use strategy on current national data sets

- e.g. Horticulture is an important land use (and produces 20% of farmgate production value) but it doesn't appear on national land cover maps

We would like to see novel land uses e.g., agroforestry and lost features e.g., orchards, nut platts, market gardens, wood pasture which could help form a template for a self-sufficient local carbon food system integrated into predictive models

Can we improve land cover classification algorithms for under-represented (small patch size) and novel land uses so that scenario modelling land use change at a sub-regional scale can be more helpful and reliable?

We would like to be able to model different routes to food self-sufficiency

- What configurations of mixed/ horticultural holdings might be economically feasible in specific landscapes (e.g., High Weald) ?
- How could this land use change be optimally configured in different landscapes (e.g., High Weald) - what land can grow and at what scale, what land should be excluded)?
- What the are infrastructure needs and how might these be spatially provided for?
- What are the options for delivery (e.g., new county farms, CIC's, planning policy for low-input small-holdings, changes to current farm practices through agri-environment and rural development support)
- = integrating land use and economic models

Rewilding cultural landscapes

Restore nature's capacity to heal, buffer or adapt to change (regenerative land management)

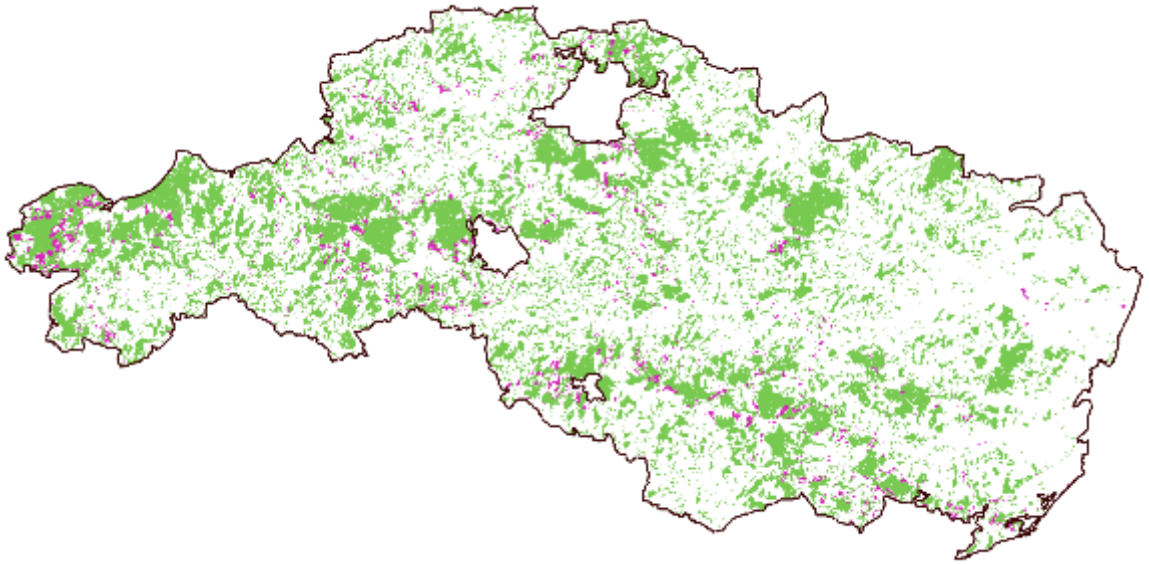
Focus on restoring the biological health of soil, water and air as self-sustaining systems

Co-exist with nature rather than subjugate it - utilise skilled human micro-interventions to produce food as a byproduct of growing biodiversity

Maximise functional agricultural biodiversity

Thread larger scale rewilding projects throughout the landscape

Improving recognition of small patch size natural regeneration



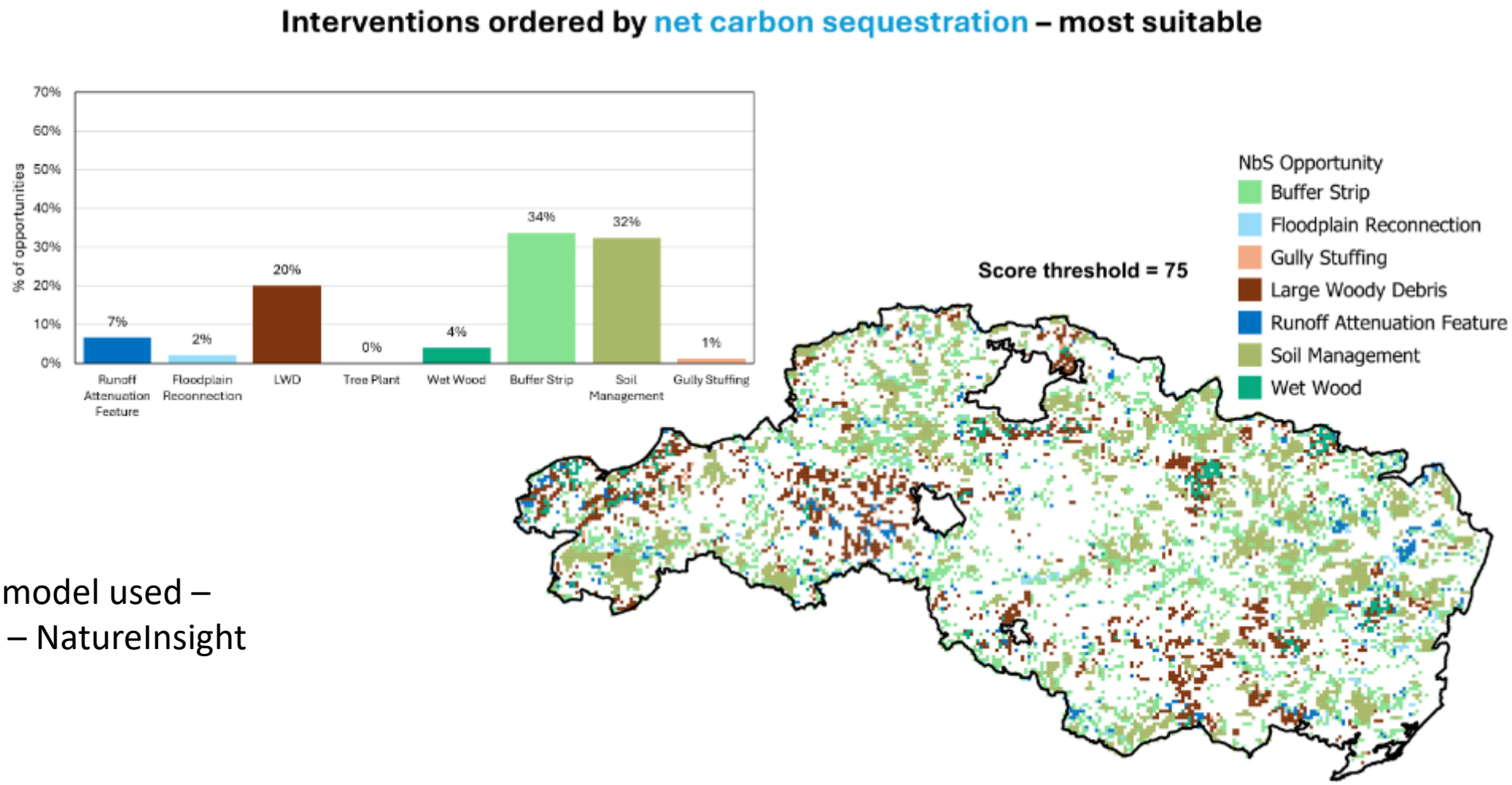
The High Weald currently has 35% tree canopy cover (green)

Environment Improvement Plan: Protected Landscape Target 8 requires an increase in tree canopy and woodland cover (combined) by 3% (from 2022 baseline) = 4,385 ha by 2050

Q Can we reliably identify the fate of abandoned fields/ field corners over the last 20 years (remote sensing/ Lidar?) to understand the rate of natural regeneration and species diversity (roughness/ structural heterogeneity?) at specific time intervals?

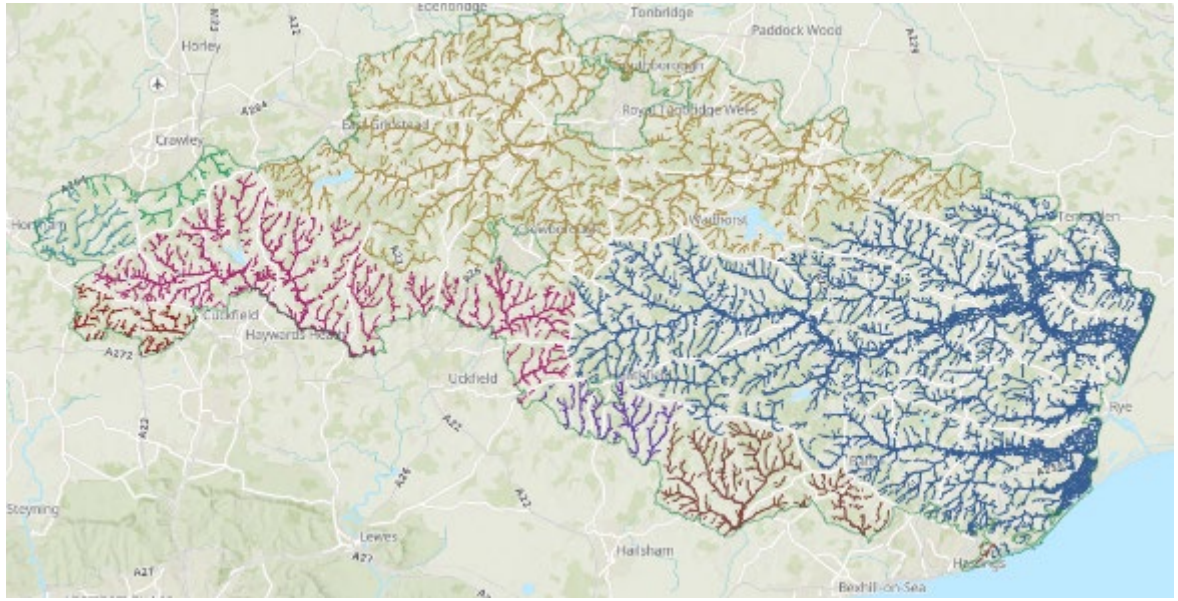
Small abandoned field 2024

Predictive modelling: ‘what if’ we harness natural processes



Current model used –
SCALGO – NatureInsight

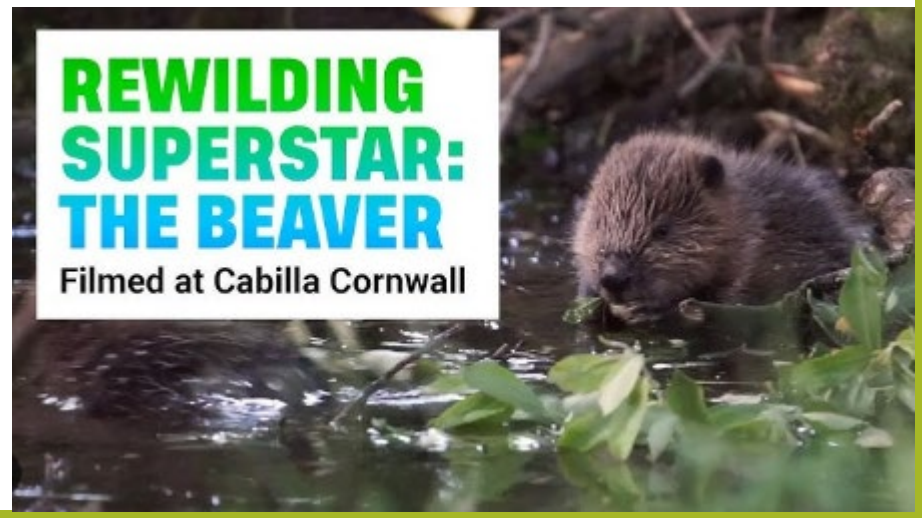
Predictive modelling: ‘what if’ we harness natural processes – beaver release



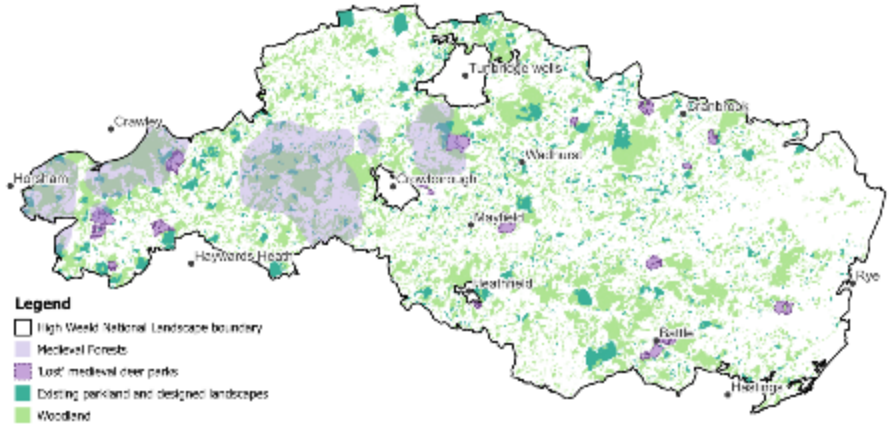
The High Weald covers the headwaters of seven river catchments - Medway (Beult, Eden and Teise), Rother (Brede and Tillingham), Thames (Mole), Arun, Adur, Ouse and Cuckmere.

Environment Improvement Plan: Protected Landscape Target 1 Create more than 250,000 hectares of wildlife-rich habitats outside protected sites by 2042 (from a 2022 baseline)
Target 6 Reduce net greenhouse gas emissions to net zero by 2050 relative to 1990 levels

Q Can we generate a predictive model for beaver release in all catchments simultaneously that tells us something meaningful about the extent of land cover change over time at a farm holding level?



Population modelling to assist conservation management - deer



- Strong cultural associations with deer. The Normans kept fallow deer in deer parks
- Recent drone survey = average deer numbers of 20-25/km² (>50 deer per km²). Population of fallow deer in High Weald likely to be c. 29000 (similar to cattle numbers)
- Impacts on woodland wildlife and farm productivity (1000 breeding fallow deer over a decade can consume est. 60,000 tonnes biomass

Q

Can we build a population model for fallow deer at a regional scale to help us understand spread, effects, and intervention outcomes?

Population modelling to assist conservation management – Grey squirrels

Impact on timber production and success of future agroforestry systems and nut growing

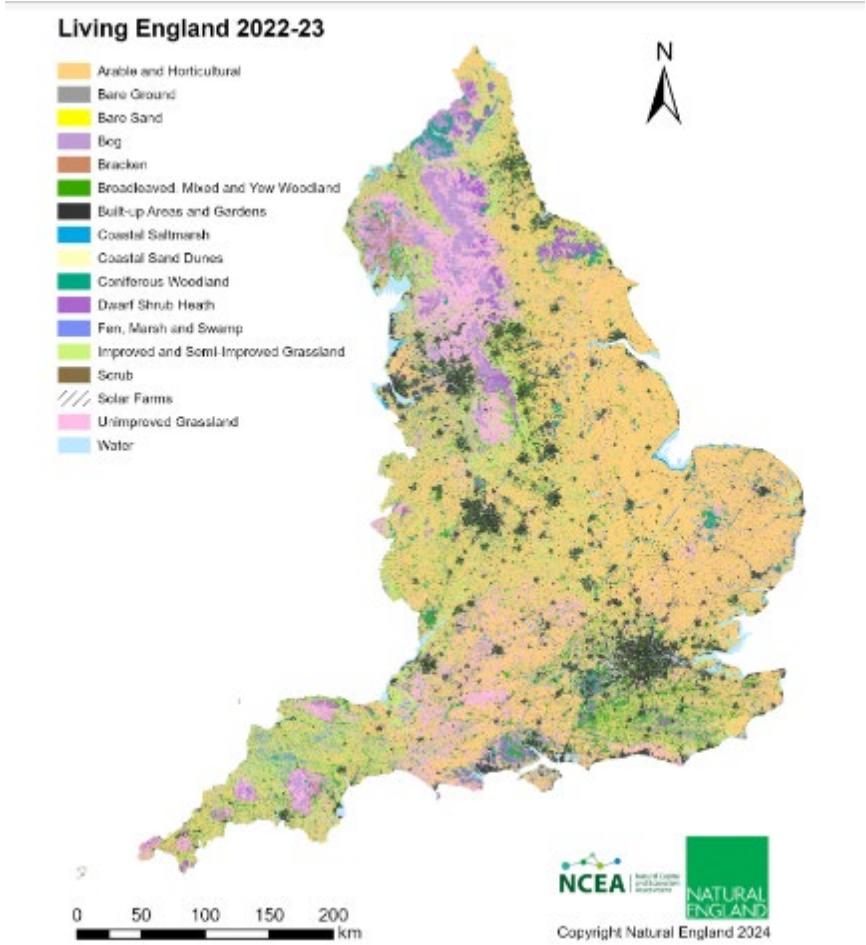
One medium hazel tree (Cob/ Filbut, 7-10 yrs/ 3-4 m^2 of land) can produce 1.5-2kg of shelled nuts (not optimally pruned)

Challenge 2. What is the future for species rich grassland?

97% of our species rich grasslands have been lost since 1970s

Challenge 2. What is the future for species rich grassland?

- Defra has whole directorates for trees and peat but not a single person responsible for grasslands – missed opportunities and perverse outcomes (BNG)
- Strategic gap in policy thinking – no national grassland inventory (we don't have good data)
- Siloed thinking across government – necessary infrastructure lost (abattoirs)
- Grassland is seen as a blank canvas for housing by developers and planning authorities
- Undisturbed soil (healthy soil biology) is unrecorded and undervalued
- Lack of research interest – low input systems/ small farms receive little attention; outcomes from best farms lost by looking at averages



Q

Can we improve land cover classification algorithms for small patch species rich grassland (undisturbed and semi-improved) so that we can more reliably model conservation options?

Understanding the policy challenge through to delivery options helps improve model usefulness, e.g.,

- Classification algorithm and appropriate testing programme to give us best chance to identify and monitor small patch sizes of species rich grassland (small fields, field corners, wider verges)
- Model the extent of core areas and connectivity to allow indicator species like the burnet moth to thrive
- Economic models looking at scale and type of grazing necessary to support farm incomes for low-input farming
- Model spatial distribution of infrastructure needs (such as abattoirs)

Challenge 3: Achieving a fair and just transition to a more resilient cultural landscape

Politics, policy and economics shape the context for landscape decisions, but change is dependent upon the actions of individuals. How to put people into landscape decision models?

Much classic social science data (census/ social media/ preference surveys) is static information – social processes are dynamic

Are there more effective approaches?

- Qualitative deep dives (e.g., semi-structured interviews/ Photovoice) that provide explanatory power
- Making it easier for land managers to interact with models to allow for emergent and adaptive responses
- Using models as heuristic devices to prompt debate
- Developing protocols for genuine codesign

Can we develop procedures to assess and understand the variables that influence land managers' decisions specific to broad sub-regional character areas?