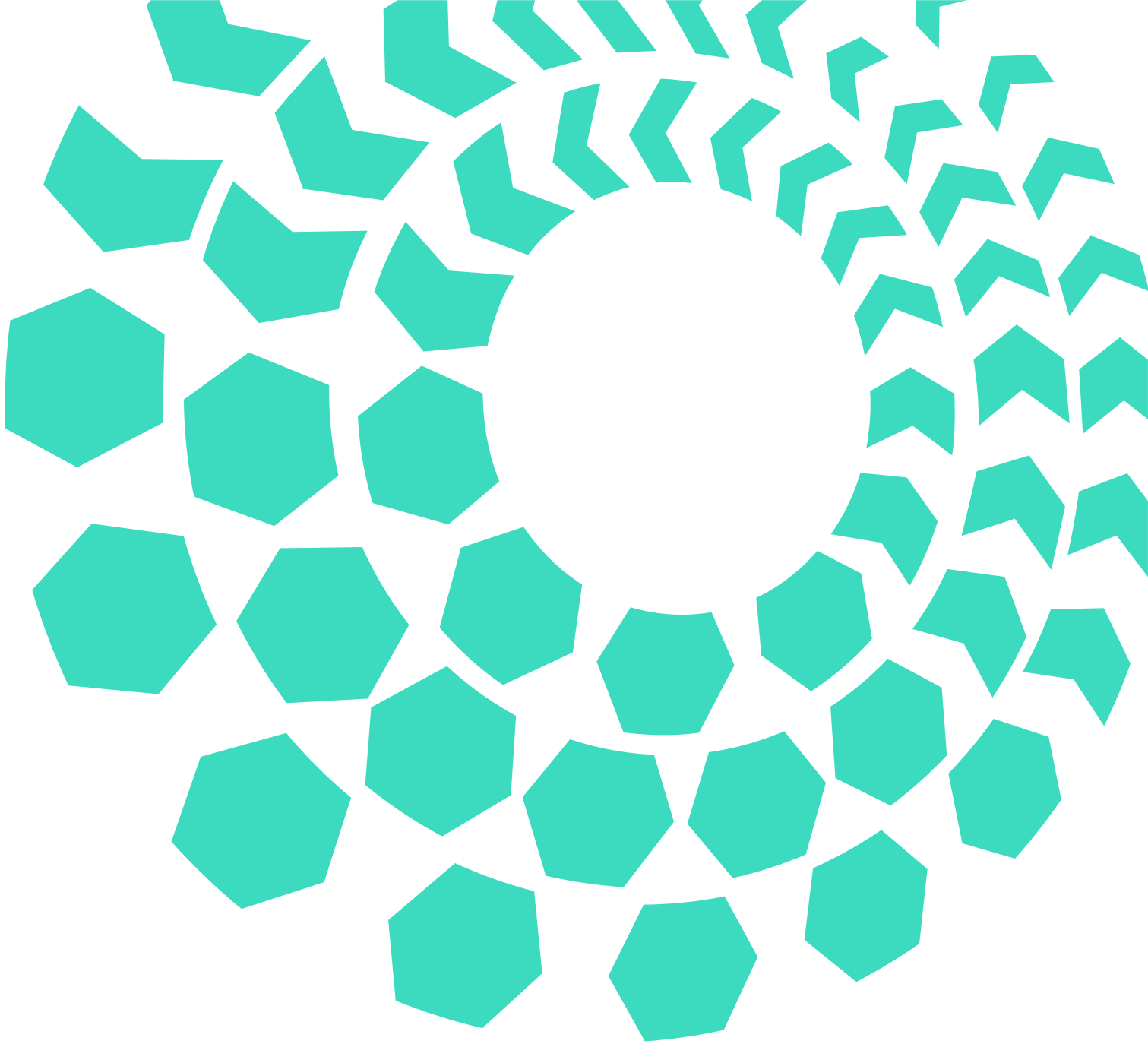
ISEP
Biodiversity &
Natural Capital

Harnessing technology to measure and manage nature



ISEP Biodiversity and Natural Capital Network, 22 September 2025

Housekeeping

- You're on mute
- Ask us questions using Questions function
- Slides will be shared with participants
- The presentation will be recorded and posted on the ISEP website
- Timekeeping

Today's speakers

Maggie Fennell Wells

Principal Green and Blue Infrastructure Consultant, Land Management, The Environment Partnership

Katie Medcalf

Environment Director, Environment Systems

Nina Schonberg

Nature Recovery Networks Development Officer, Ulster Wildlife

Paul Armstrong

Public Affairs Manager, The Woodland Trust

Ian Houlston

Director, LDA Design

Technology and nature

Dr Katie Medcalf CEnv
(katie.medcalf@envsys.co.uk)

Environment Systems

- Trusted providers of evidence and insight to government, industry, environmental and agricultural organisations since 2003
- World-class team of environmental scientists, geospatial analysts, policy experts and software developers
- Offices in Aberystwyth, Edinburgh, Harwell, and Bogota

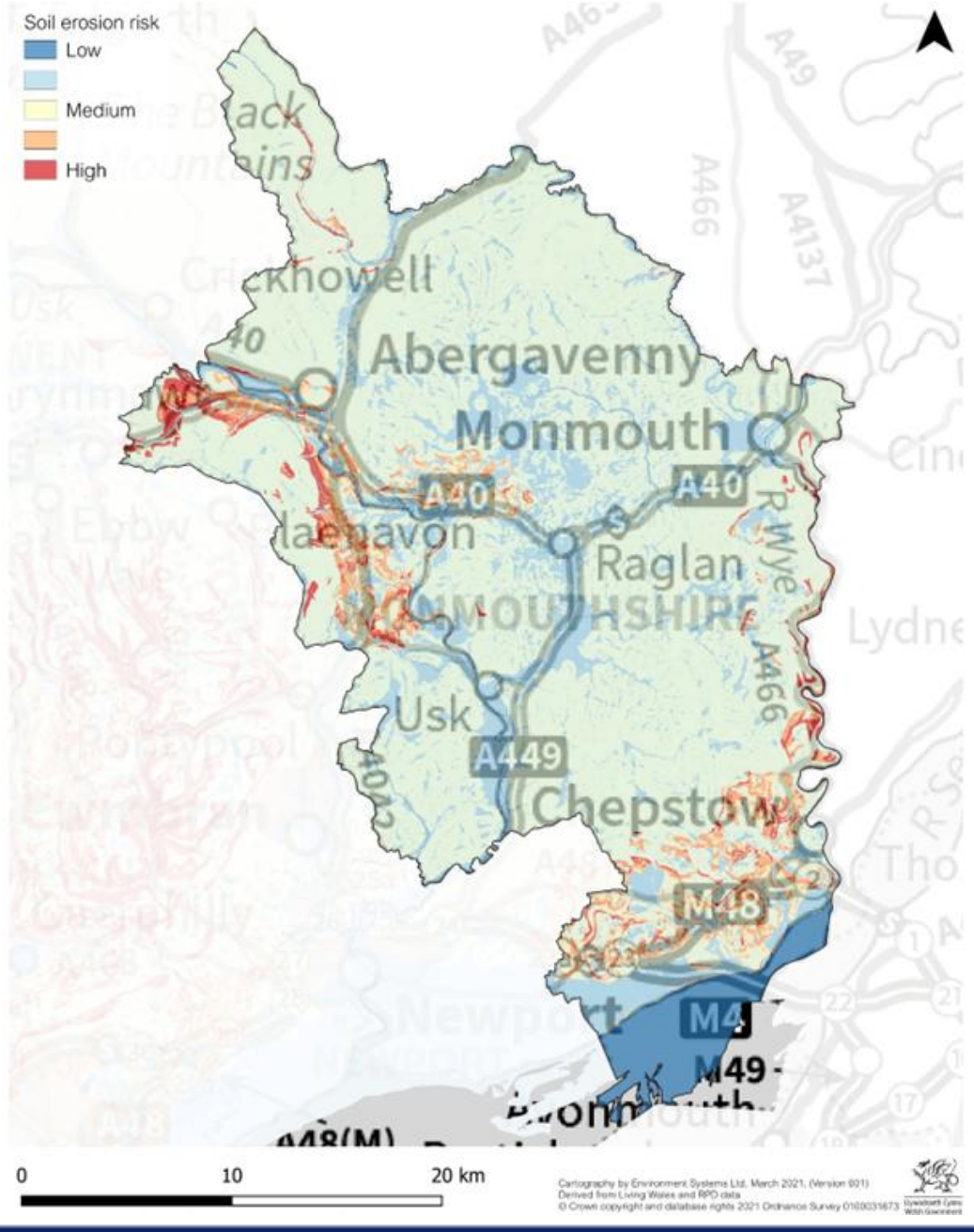
Environment
- Natural capital evaluation
- Nature based solutions
- Ecology and environmental monitoring
- Climate change impacts and adaptation

Agriculture
- Crop intelligence
- Field trials

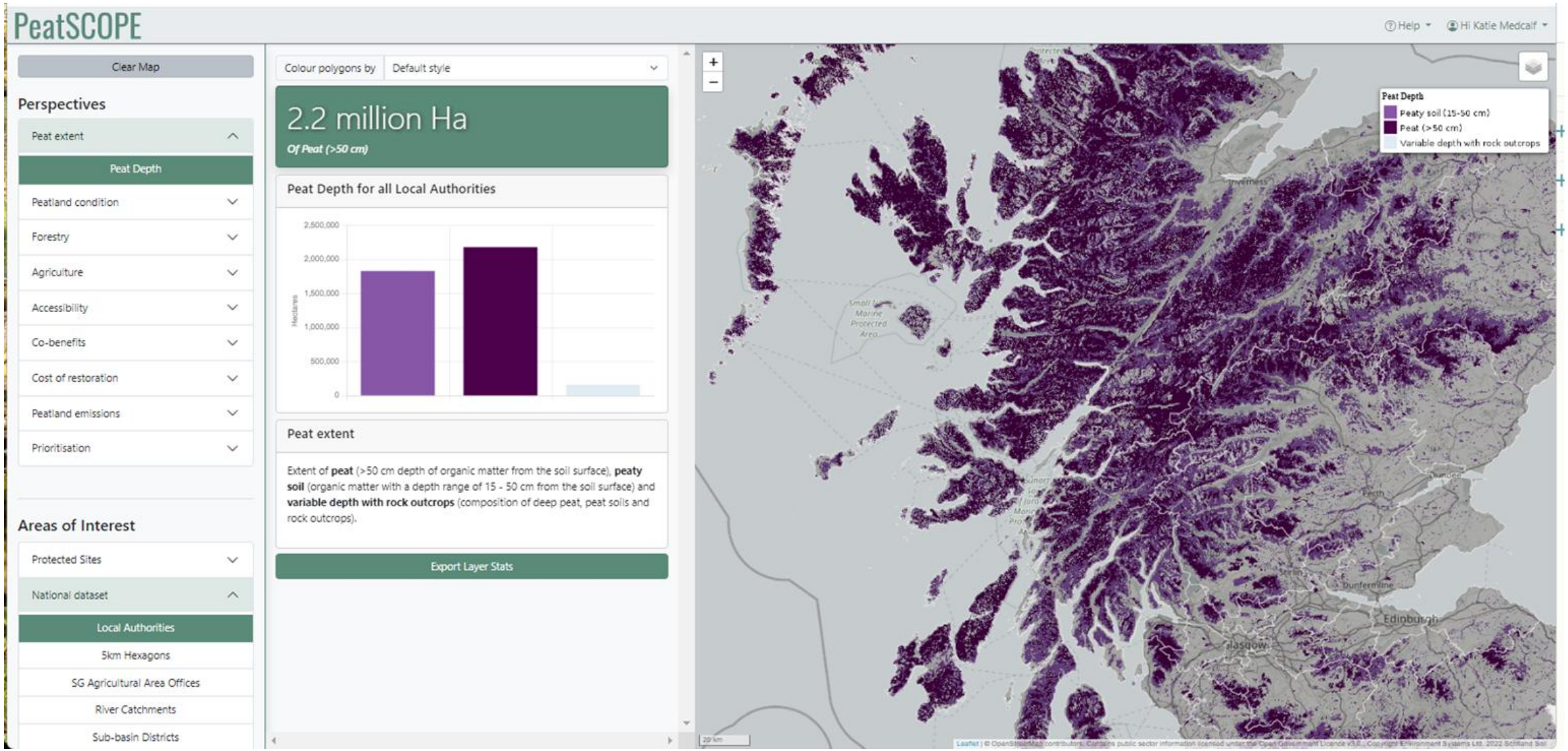
Technology
- Earth observation
- Modelling and analytics

Tech and biodiversity work together

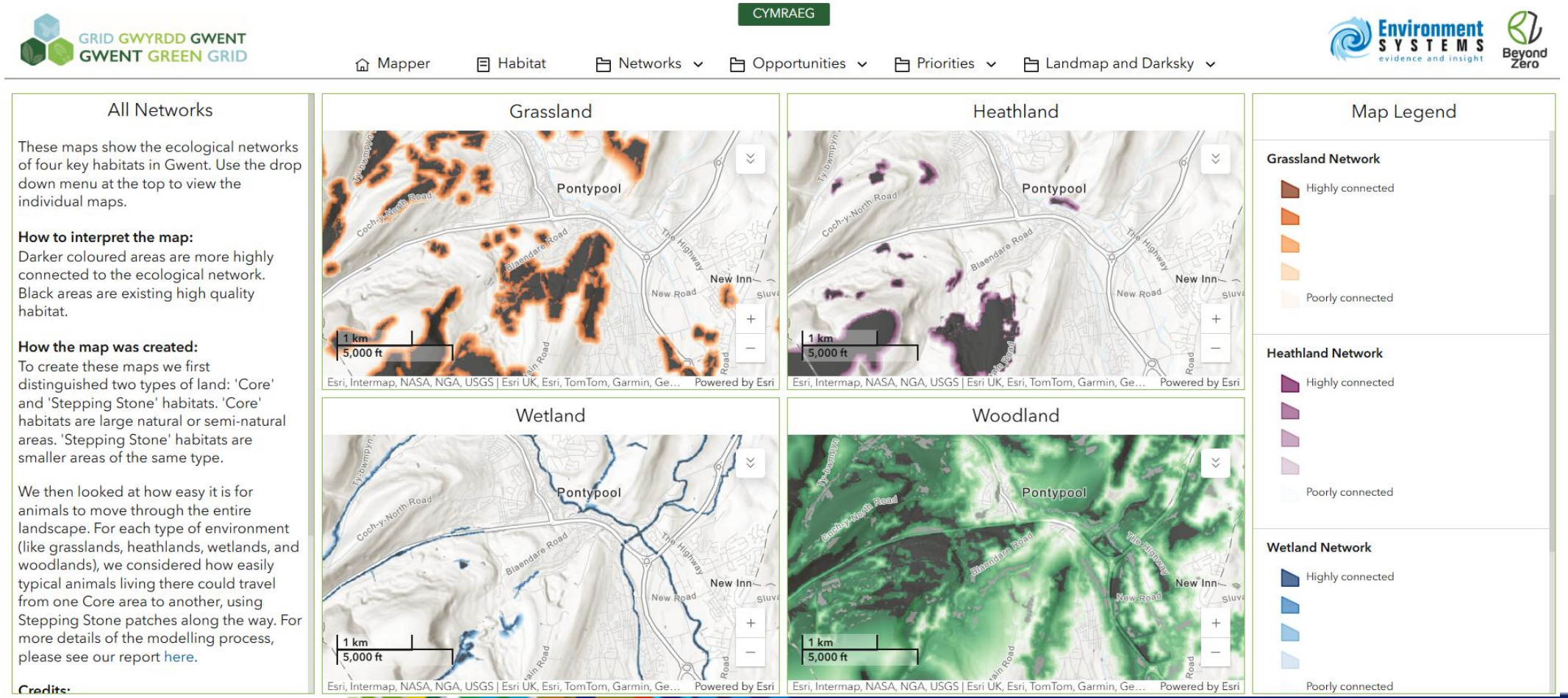
Near real-time monitoring & modelling

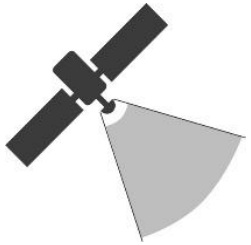


PeatSCOPE (www.peatscope.com)



Maintaining and enhancing biodiversity at a landscape level – updating habitat maps and nature networks





Data

Information

Analysis

Knowledge

Decisions

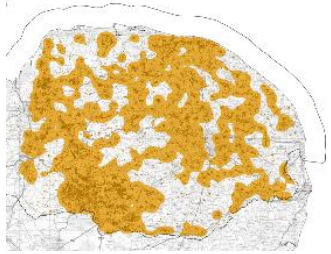
Outcomes

Data can be derived from satellites

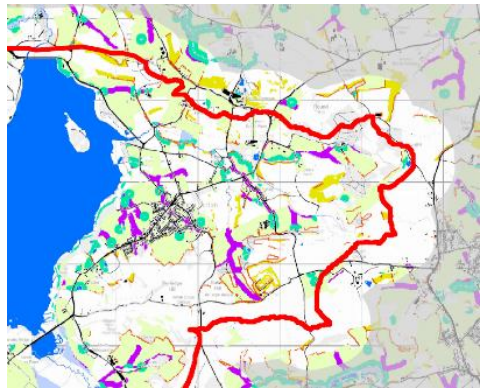
- Habitat
- Landform/Hydrology
- Soils/Geology

Bio-Physical Potential

Impacts



Opportunities



SENCE

Spatial Evidence for Natural Capital Evaluation

Data Science
(Earth observation and GIS)

Project Name: Satellite imagery of Goat grazing trials at Stanner Rocks NNR

Stakeholder: Natural Resources Wales (NRW)

Location: Stanner Rocks NNR

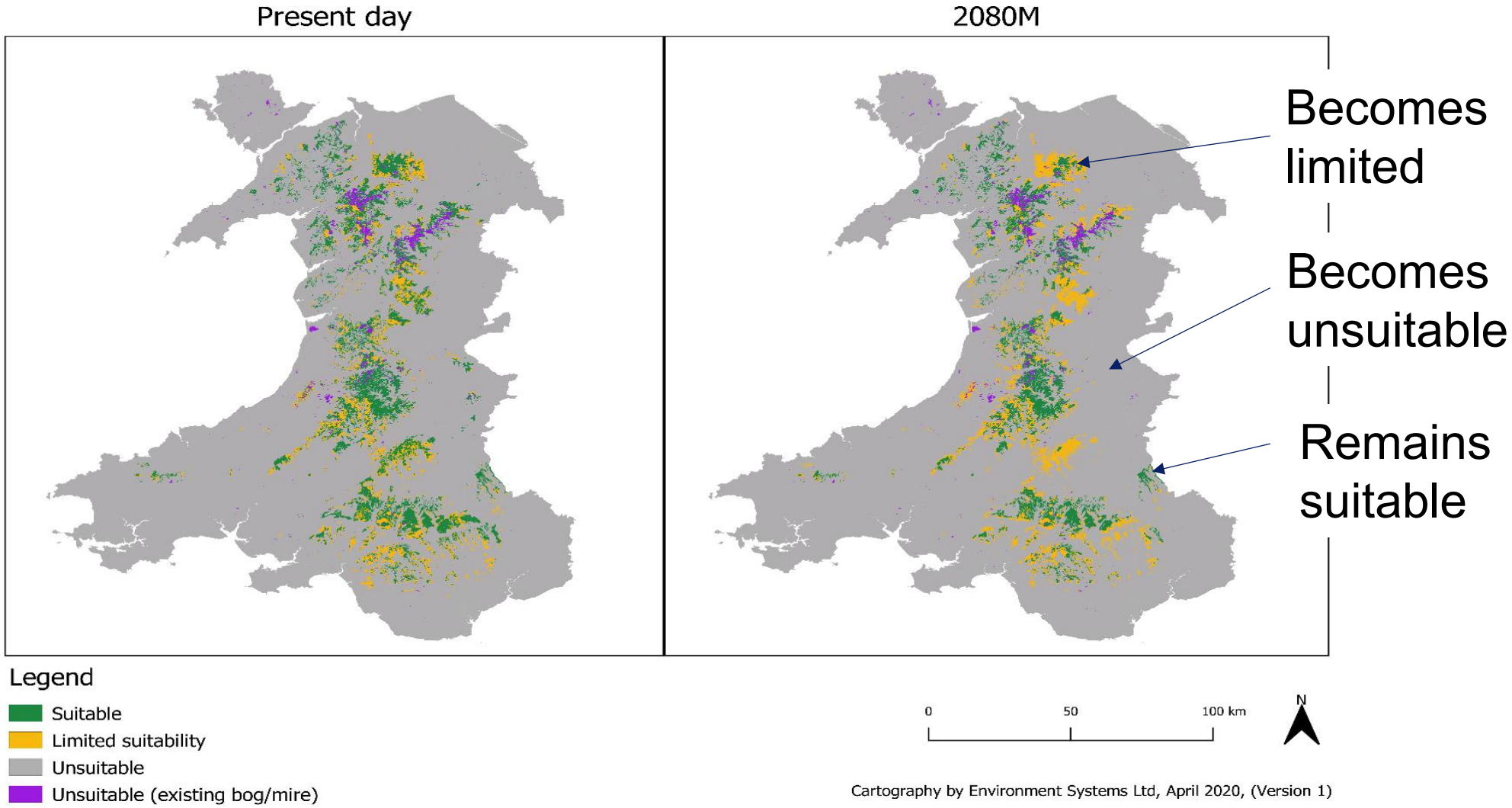
Time period: 2025

What we did: Remote sensing analysis over the last 10 years in Stanner Rocks NNR, examining the degree of scrub encroachment which threatens some of the rarest bryophyte species in Wales. Additionally, tracking the impact of innovative scrub management strategies involving GPS-based virtual fencing systems.

Successful Outcomes: Scrub encroachment management practises are confirmed to be effective, providing evidence for continued financial support. Additionally, a baseline is established for informing ongoing conservation efforts.

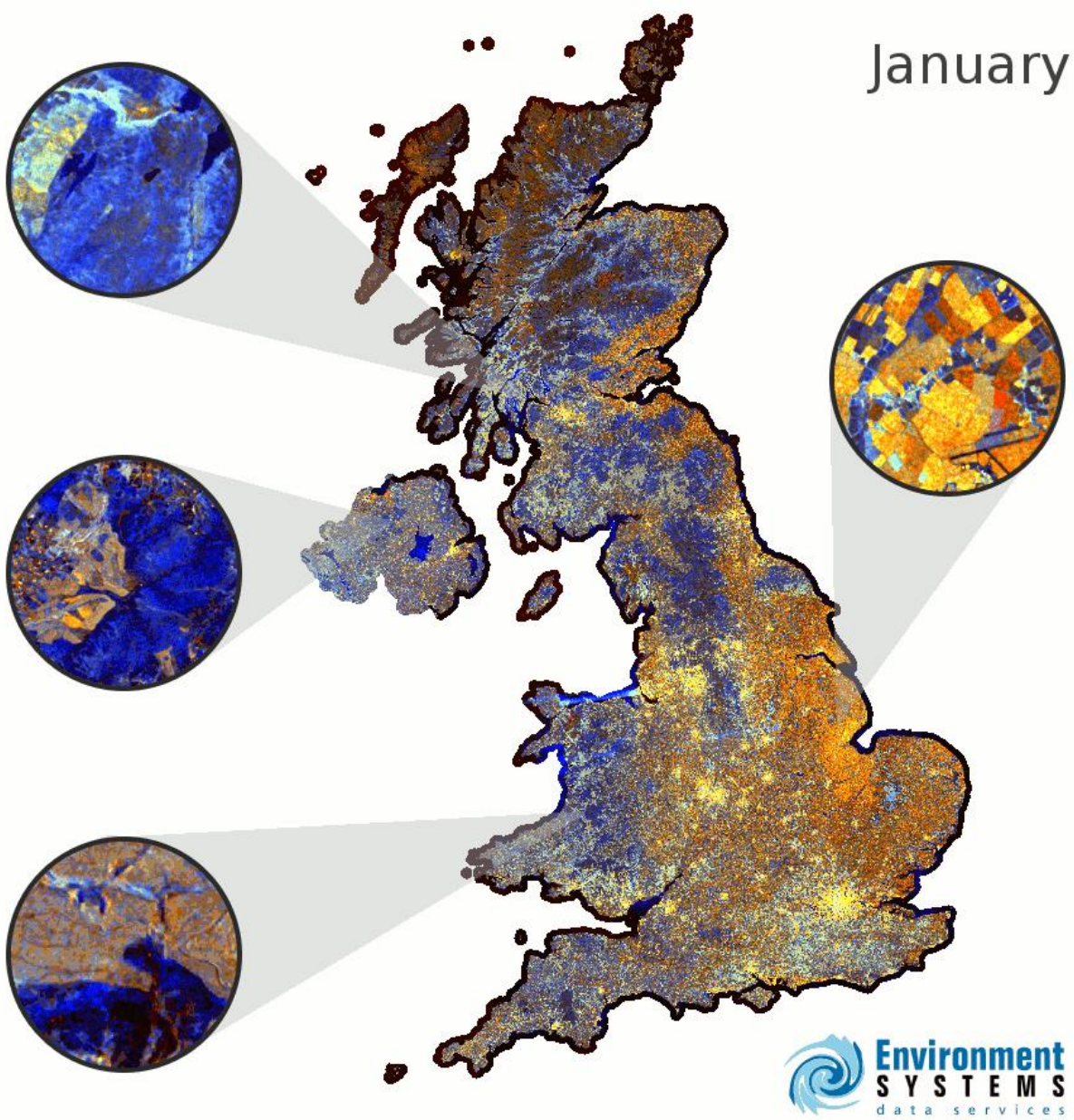
Photos by Finn Whatley

Nature and the climate emergency: understanding risks



Insights at scale

- Always-on, accessible data insights from Sentinel satellite Earth observations
- Our Data Services provides near real-time insights into environmental and agricultural decision making
- Globally scalable

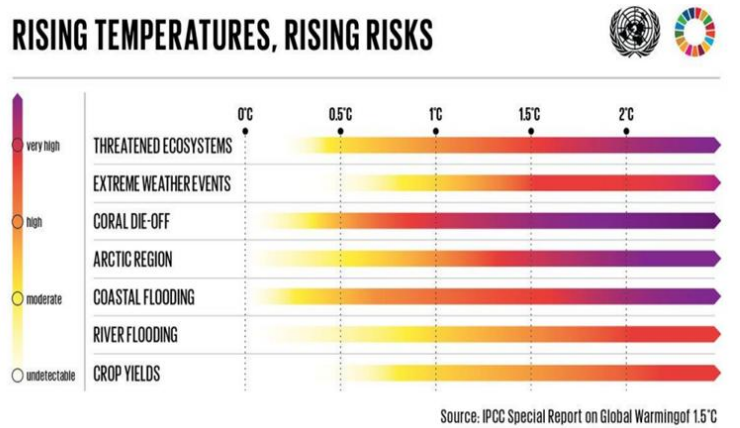


Tech and nature

- Nature, especially our native species and habitats are our life support system,
- Tech is hugely useful in trying to map, model, monitor and understand our natural world and how it is benefiting us all.
- It’s a fast-moving field with new advances, data types and methods constantly evolving to help us better manage our environment.
- It is relevant to a huge range of people from governments, companies, nature bodies and other NGOs, Local Government, Master Planners, Hosing Association and Developers
- Tech can help nature thrive — and when nature thrives, so do we

Thank you

katie.medcalf@envsys.co.uk



Harnessing technology to guide actions for Nature's Recovery in NI

Ulster Wildlife

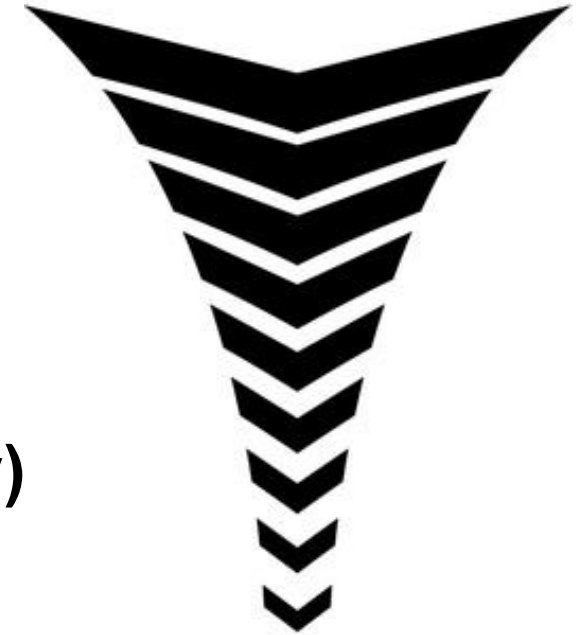
WOODLAND TRUST
NORTHERN IRELAND

Nina Schönberg & Paul Armstrong

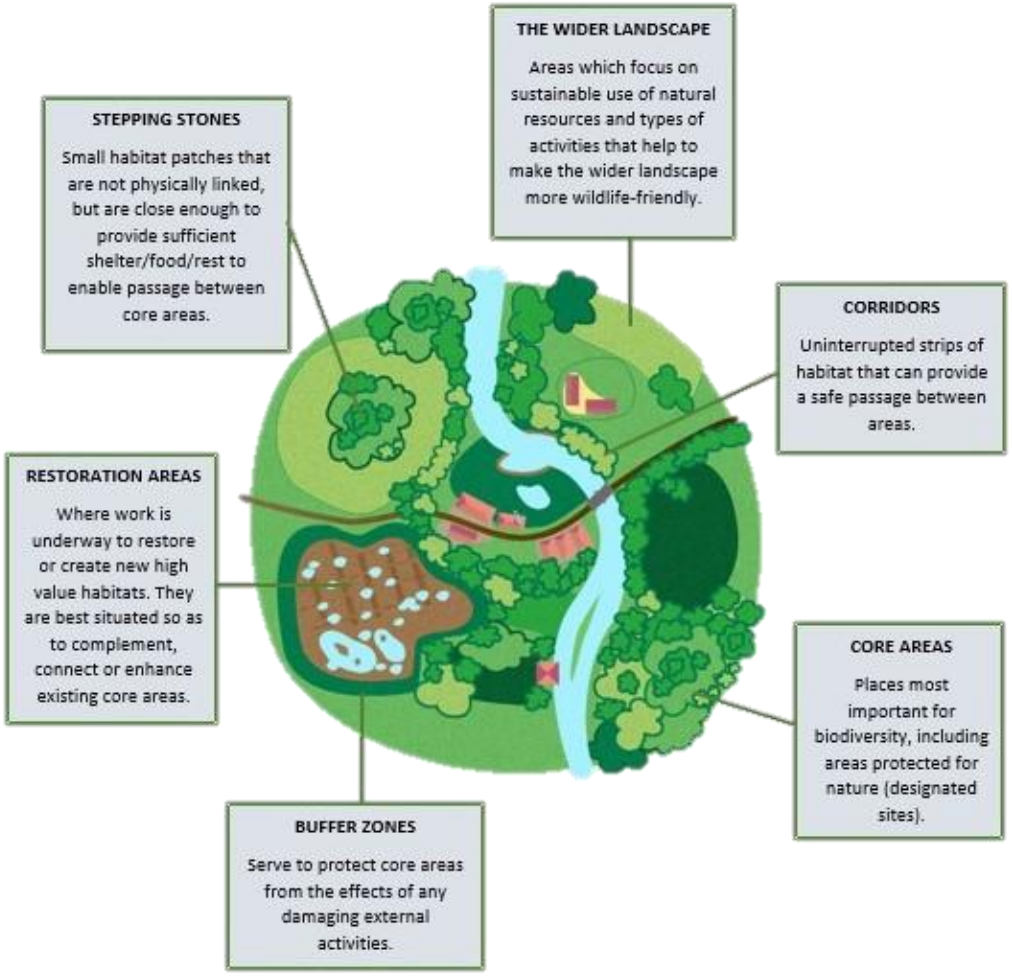
@NRN_NI

Content

- **The big picture (Nina)**
  - **Modelling for National Habitat Network maps**
  - **Modelling Climate Change Vulnerability**
- **Narrowing down into woodlands (Paul)**
  - **Production of Woodland Opportunity Maps**
- **Site specific tech (Nina via Simon Gray)**
  - **Haughie's Bog-the use of tech to guide restoration work and ecological monitoring**



More, Bigger, Better and Joined-Up spaces for Nature and People



#NatureRecoveryNetworksNI

The Initiative: Building Capacity to Deliver Nature Recovery Networks in Northern Ireland

- Northern Ireland Landscape Partnership
  - National Trust NI
  - RSPB NI
  - Ulster Wildlife
  - Woodland Trust
- Focus
  - Habitat Networks+ Climate Change Vulnerability
  - Case studies
  - Knowledge-sharing & upskilling
  - Recommendations & Advice

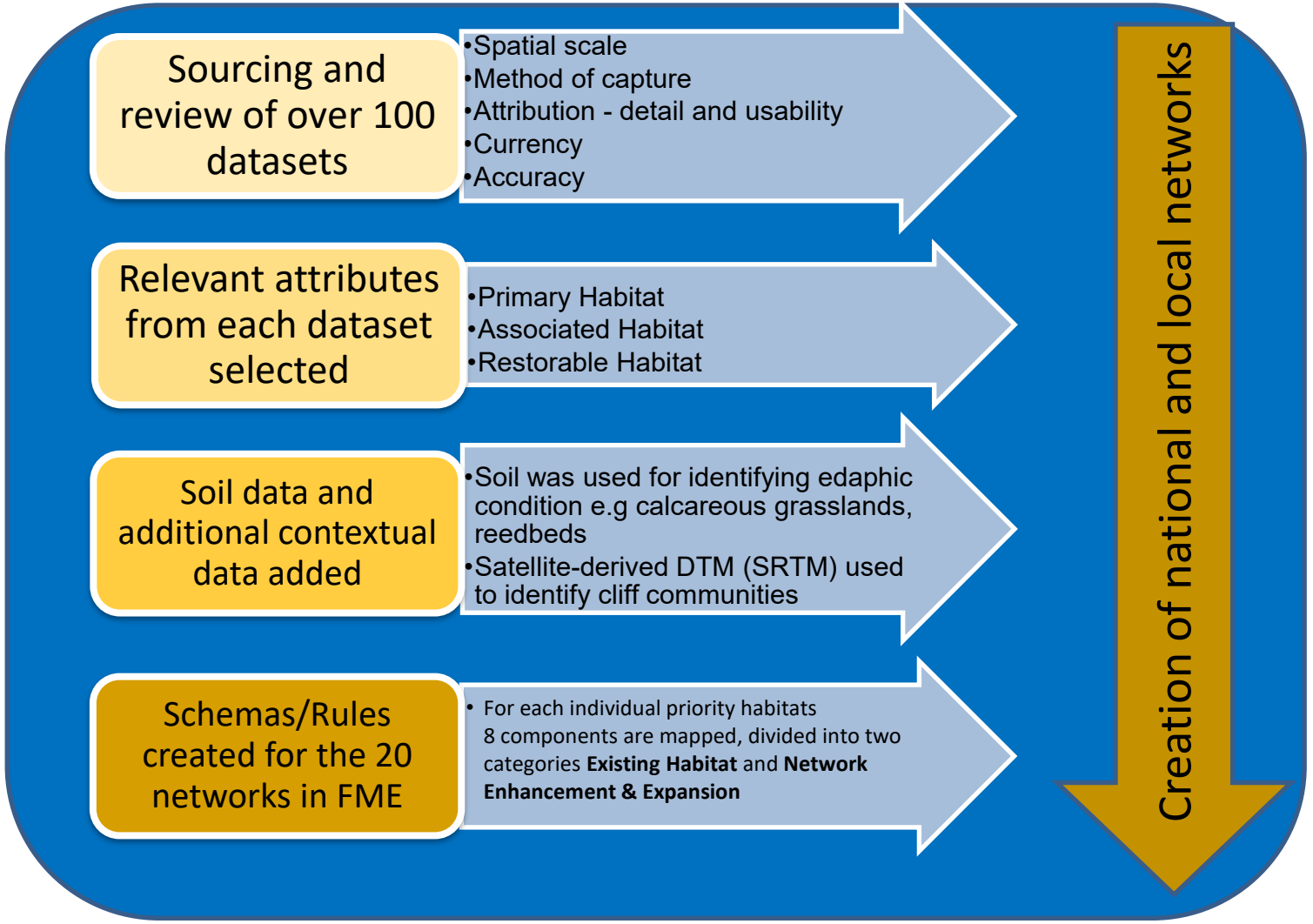
NI Landscape Partnership meeting at Clandeboye Estate in June2022

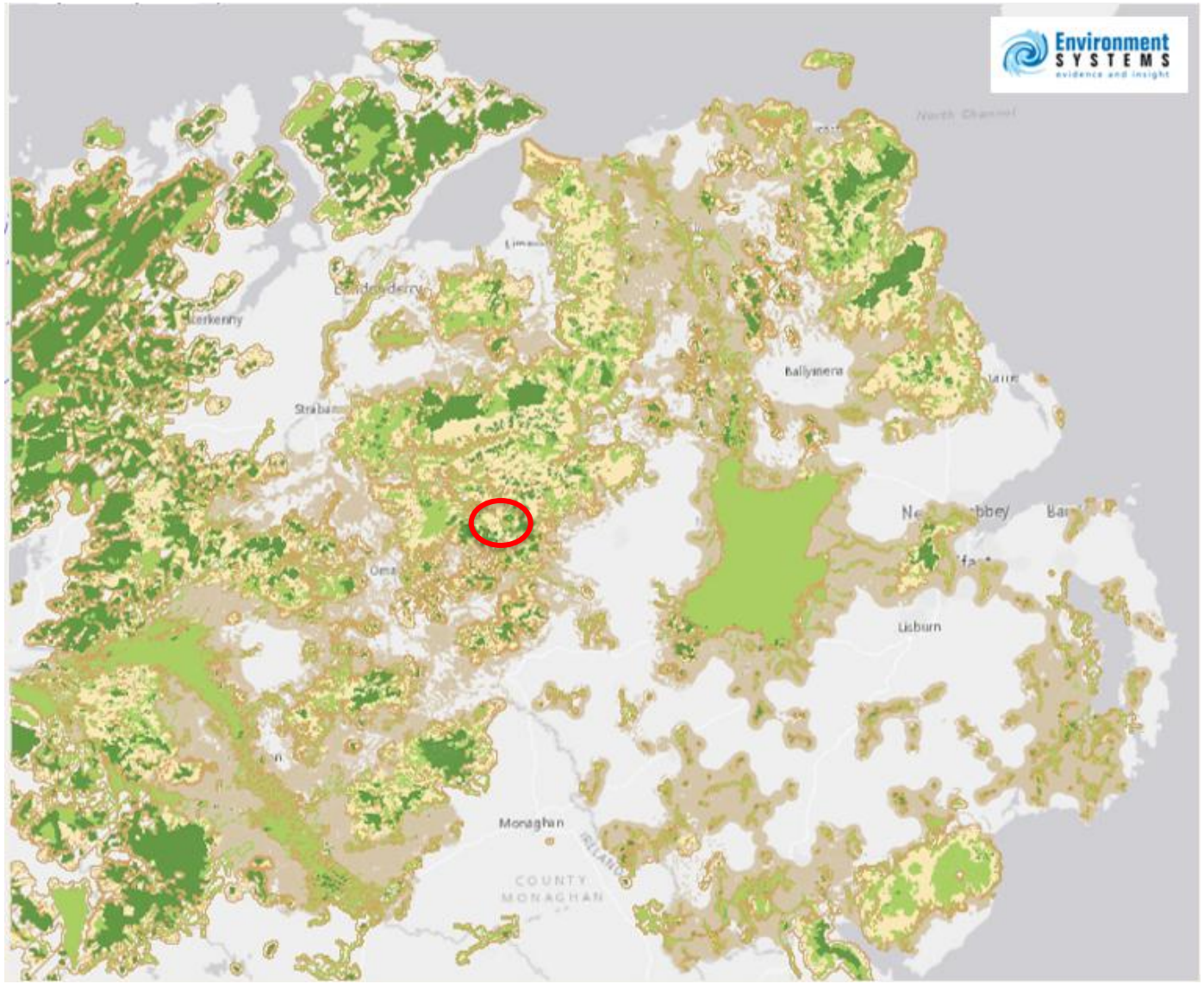
#NatureRecoveryNetworksNI

National Habitat Network Maps

Dr Gemma Bell
Project Manager

Dr Katie Medcalf
Project Director



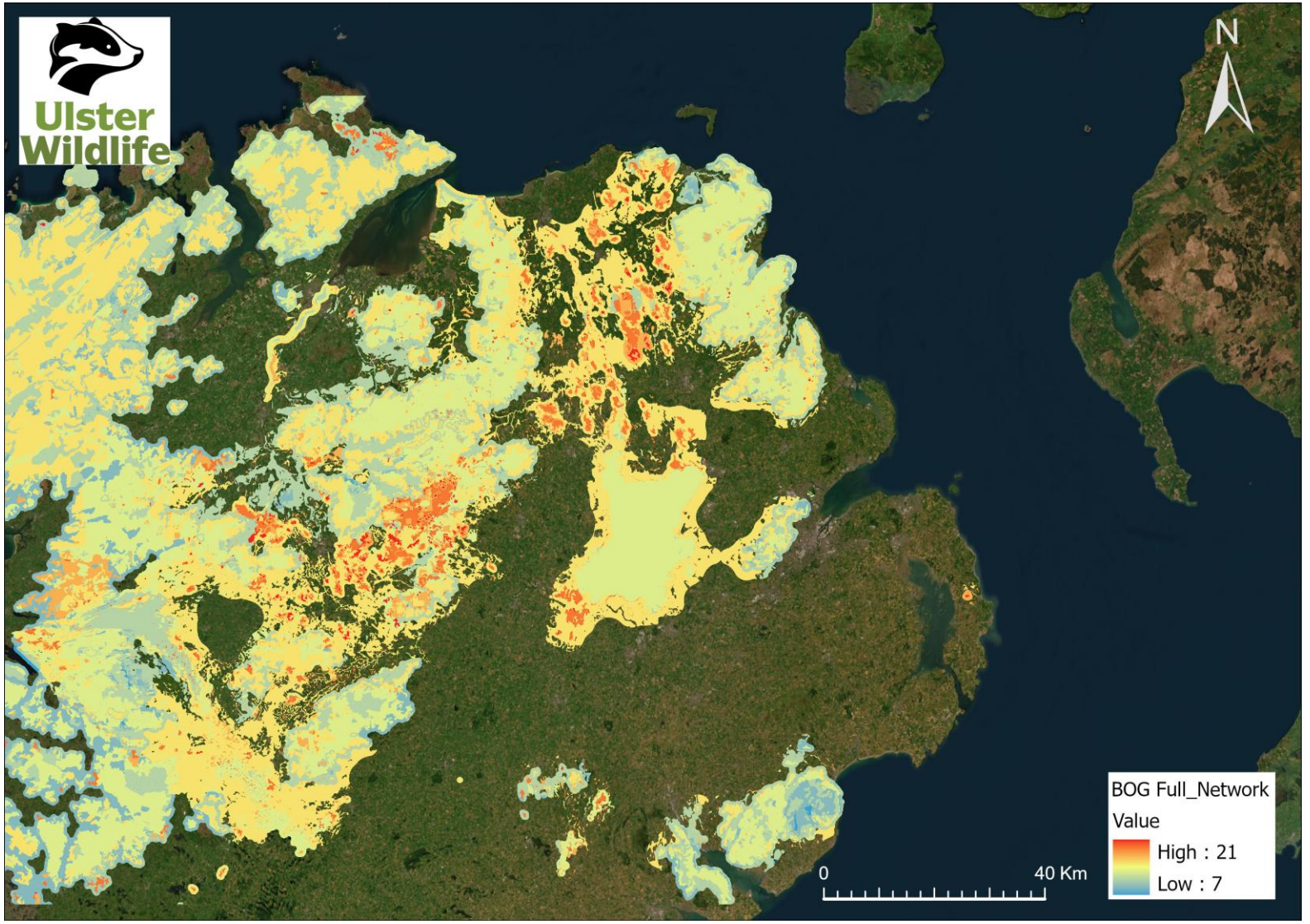


#NatureRecoveryNetworksNI

Modelling Climate Change Vulnerability

- Habitat sensitivity to climate change
- Habitat patch size
- Degree of fragmentation
- Topographic variability
- Coastal vulnerability
- Current condition
- Pollution pressures, comprising of three components:
  - Edge effect
  - Diffuse pollution risk
  - Atmospheric nitrogen risk

#NatureRecoveryNetworksNI



Environment SYSTEMS
evidence and insight

#NatureRecoveryNetworksNI

part of The Wildlife Trusts

Join us & together we can
BRING NATURE BACK
www.ulsterwildlife.org/join

Ulster Wildlife

WOODLAND COVER

Northern Ireland

9%

Republic of Ireland

11%

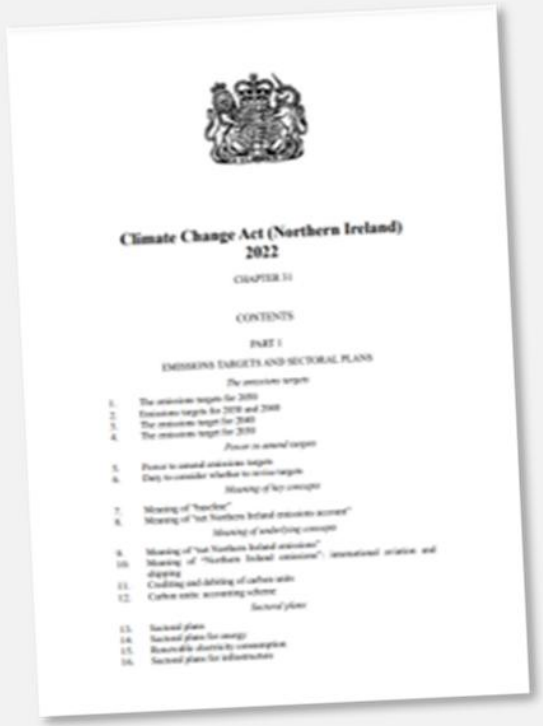
United Kingdom

13%

European Union

38%

CLIMATE CHANGE ACT (NORTHERN IRELAND) 2022



Climate Change Act (Northern Ireland) 2022

CHAPTER 31

CONTENTS

PART 1

EMISSIONS TARGETS AND SECTORAL PLANS

The emissions targets

1. The emissions targets for 2050
2. Emissions targets for 2030 and 2040
3. The emissions target for 2040
4. The emissions target for 2050

Power to amend targets

5. Power to amend emissions targets
6. Duty to consider whether to revise targets

Meaning of key concepts

7. Meaning of "baseline"
8. Meaning of "net Northern Ireland emissions account"

Meaning of underlying concepts

9. Meaning of "net Northern Ireland emissions"
10. Meaning of "Northern Ireland emissions", international aviation and shipping
11. Crediting and debiting of carbon units
12. Carbon units: accounting scheme

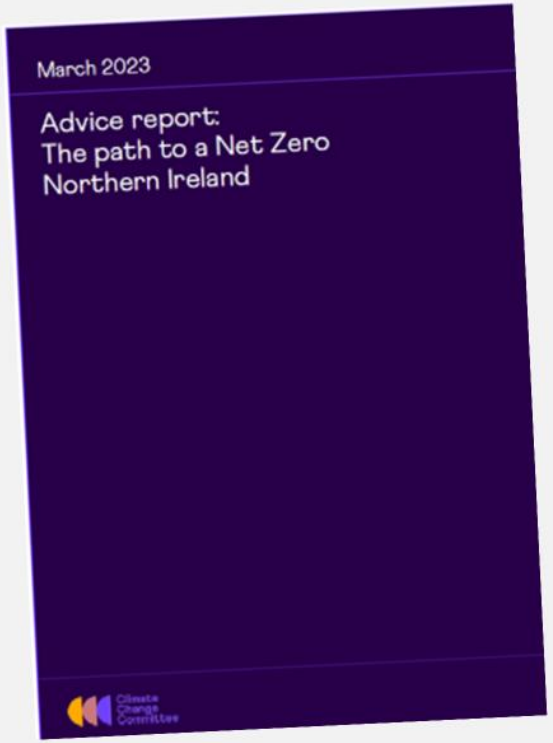
Sectoral plans

13. Sectoral plans
14. Sectoral plans for energy
15. Renewable electricity consumption
16. Sectoral plans for infrastructure

"The Northern Ireland departments must ensure that the net Northern Ireland emissions account for the year 2050 is at least 100% lower than the baseline."

WOODLAND TRUST
NORTHERN IRELAND

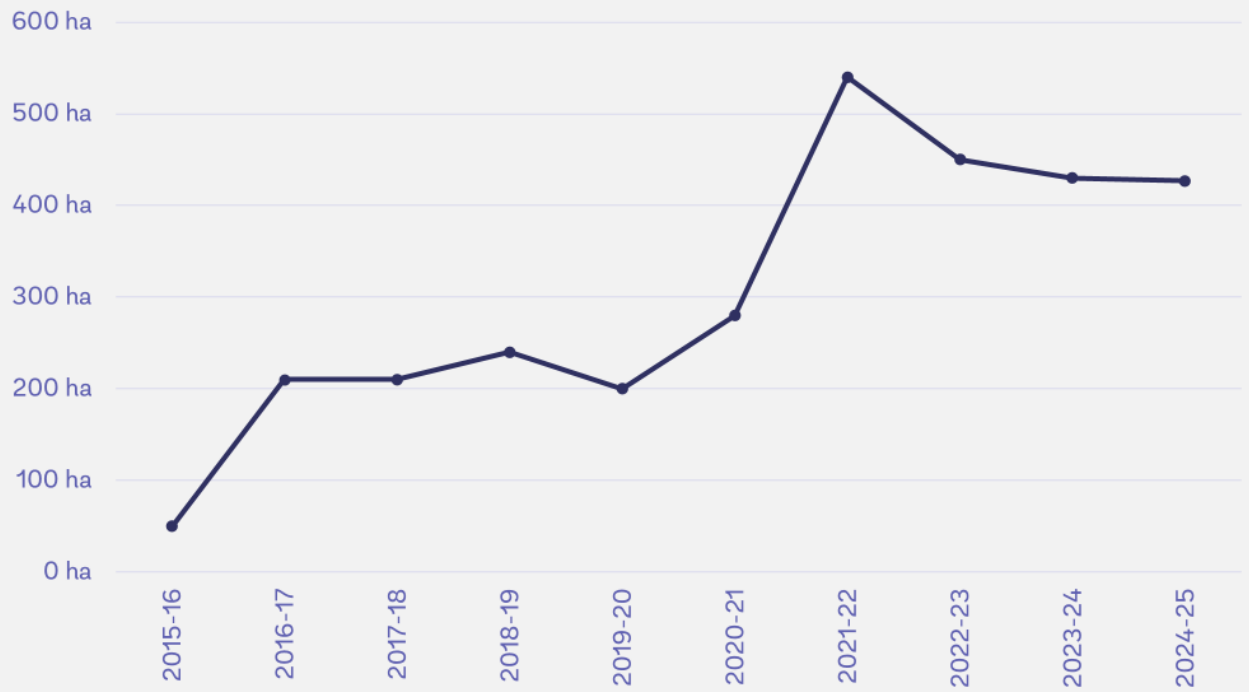
CLIMATE CHANGE COMMITTEE ADVICE



"Increasing annual afforestation rates to reach 3,100 hectares by 2035 and 4,100 hectares by 2039 remaining at this level until 2050."

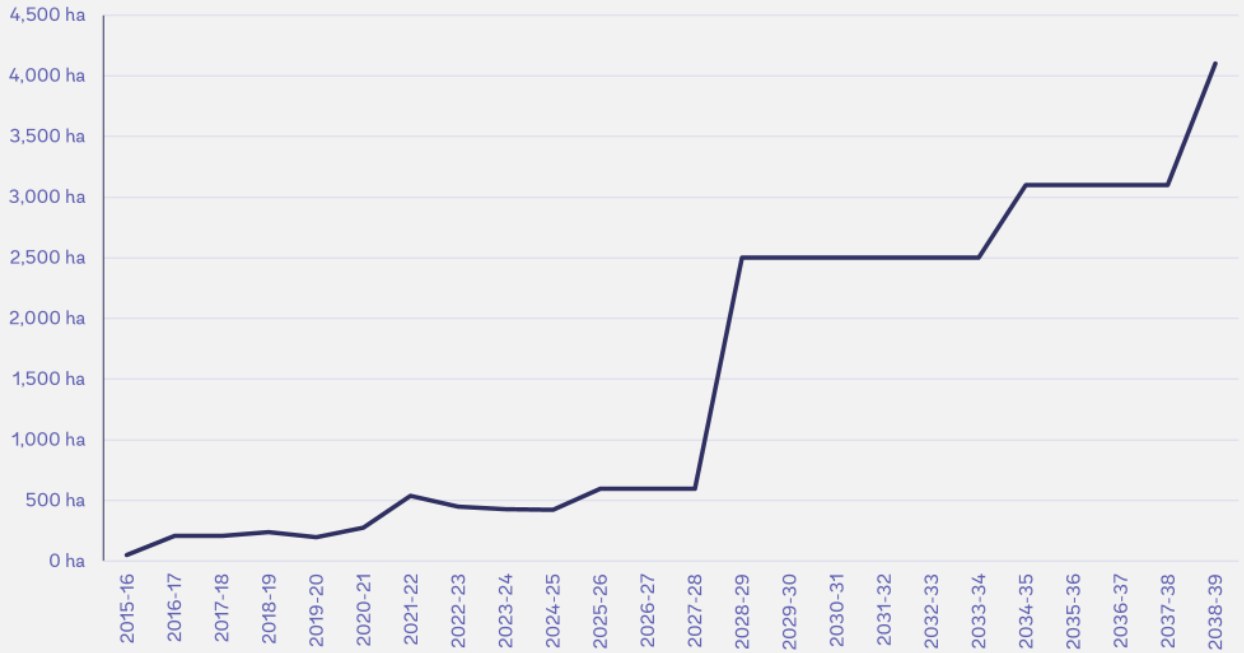
WOODLAND TRUST
NORTHERN IRELAND

WOODLAND CREATION



WOODLAND TRUST
NORTHERN IRELAND

WOODLAND CREATION



WOODLAND TRUST
NORTHERN IRELAND

WOODLAND CREATION

Forests for Our Future:
"9,000 hectares of new woodland over the next 10 years to help our environment and economy."

WOODLAND TRUST
NORTHERN IRELAND

Policy Paper

Emergency Tree Plan for the UK

How to increase tree cover and address the nature and climate emergency

January 2020

WOODLAND TRUST

"The UK does not have the time or resources to tackle the climate and biodiversity crises separately."

"The majority of tree cover expansion should be delivered with native woods and trees, due to the importance of tackling the nature and climate crises together."

SCOPE AND PURPOSE

- To evaluate the suitability of land in Northern Ireland for woodland establishment, and whether this would be an appropriate land use change.
- To support the formulation of ambitious woodland establishment targets within the broader framework of addressing nature recovery and climate change in Northern Ireland.
- Built on the Nature Recovery Network mapping work undertaken in 2021.
- A range of other national datasets were collated to spatially model other biophysical and non-biophysical factors.

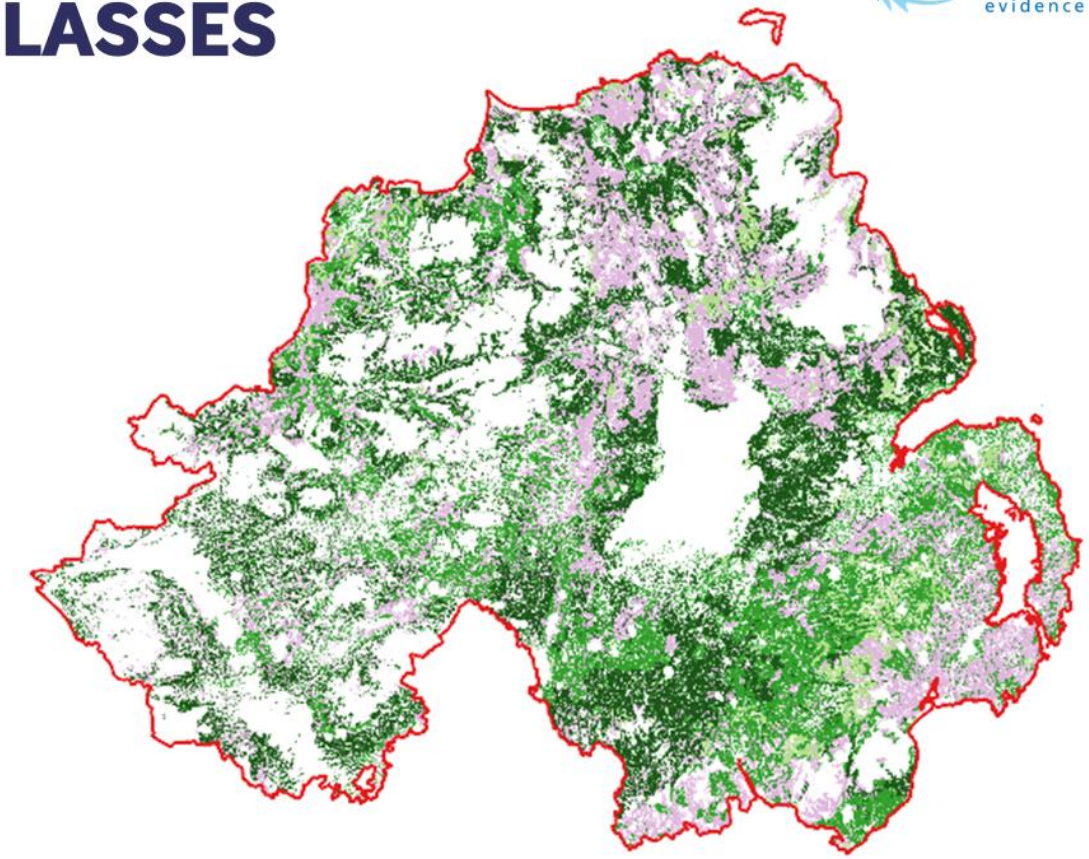
MAP OF WOODLAND SUITABILITY CLASSES

Environment SYSTEMS
evidence and insight

Legend

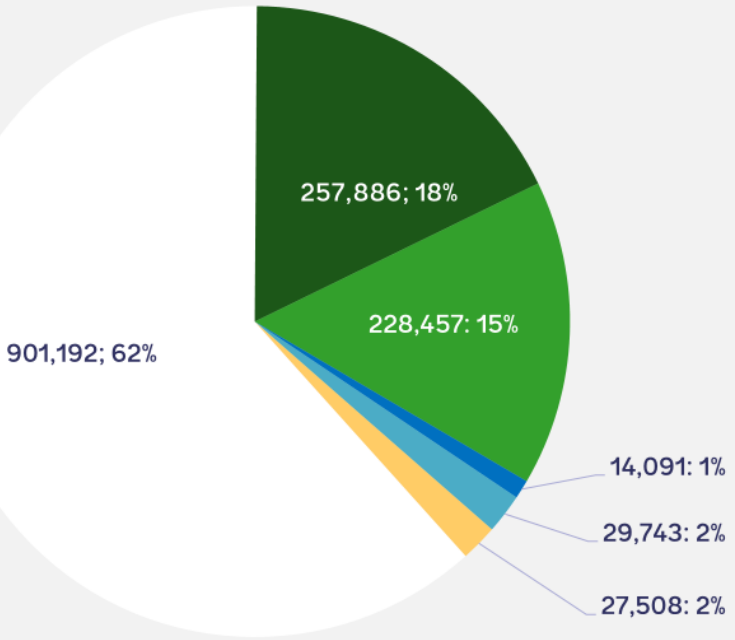
Overall Suitability

- Most suitable
- Most suitable with sensitivities
- Moderately Suitable
- Unsuitable (other land use)
- Unsuitable



PROPORTIONS OF WOODLAND SUITABILITY CLASSES

- Most suitable
- Most suitable with sensitivities
- Moderately Suitable
- Moderately suitable with sensitivities
- Urban greenspace sensitivity
- Unsuitable



WOODLAND TRUST
NORTHERN IRELAND

KEY FINDINGS

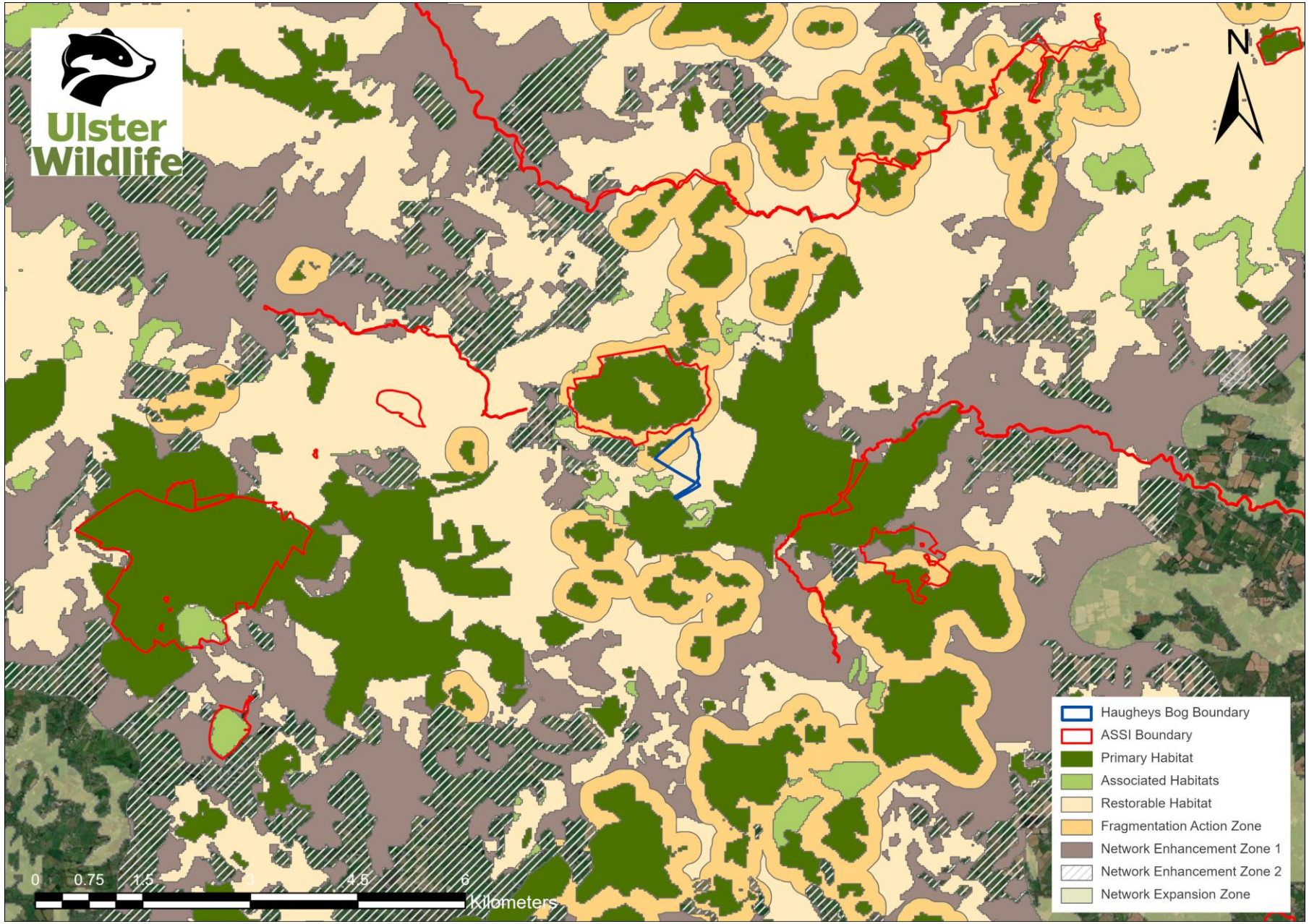
- Northern Ireland has a total land area of 257,886 ha classified as the Most Suitable category for woodland establishment, sufficient to plant an estimated 412,618,224 trees (based on the lowest stocking rate of 1,600 stems/ha); this class offers the greatest potential for woodland establishment.
- The area of land within the Most Suitable class (18%) is more than double the land area required to meet the CCC's recommendation.

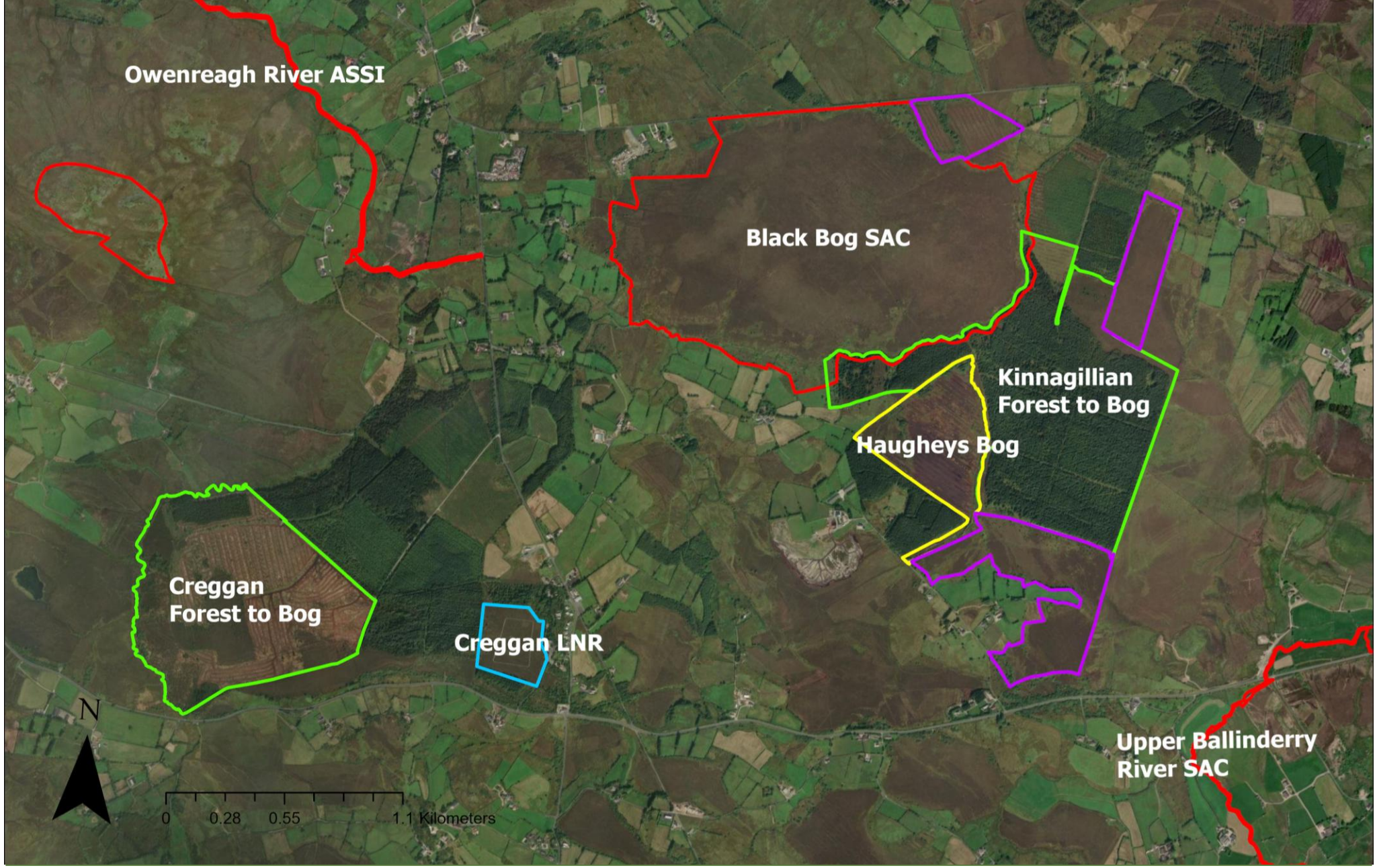
Haughey's Bog, Co. Tyrone

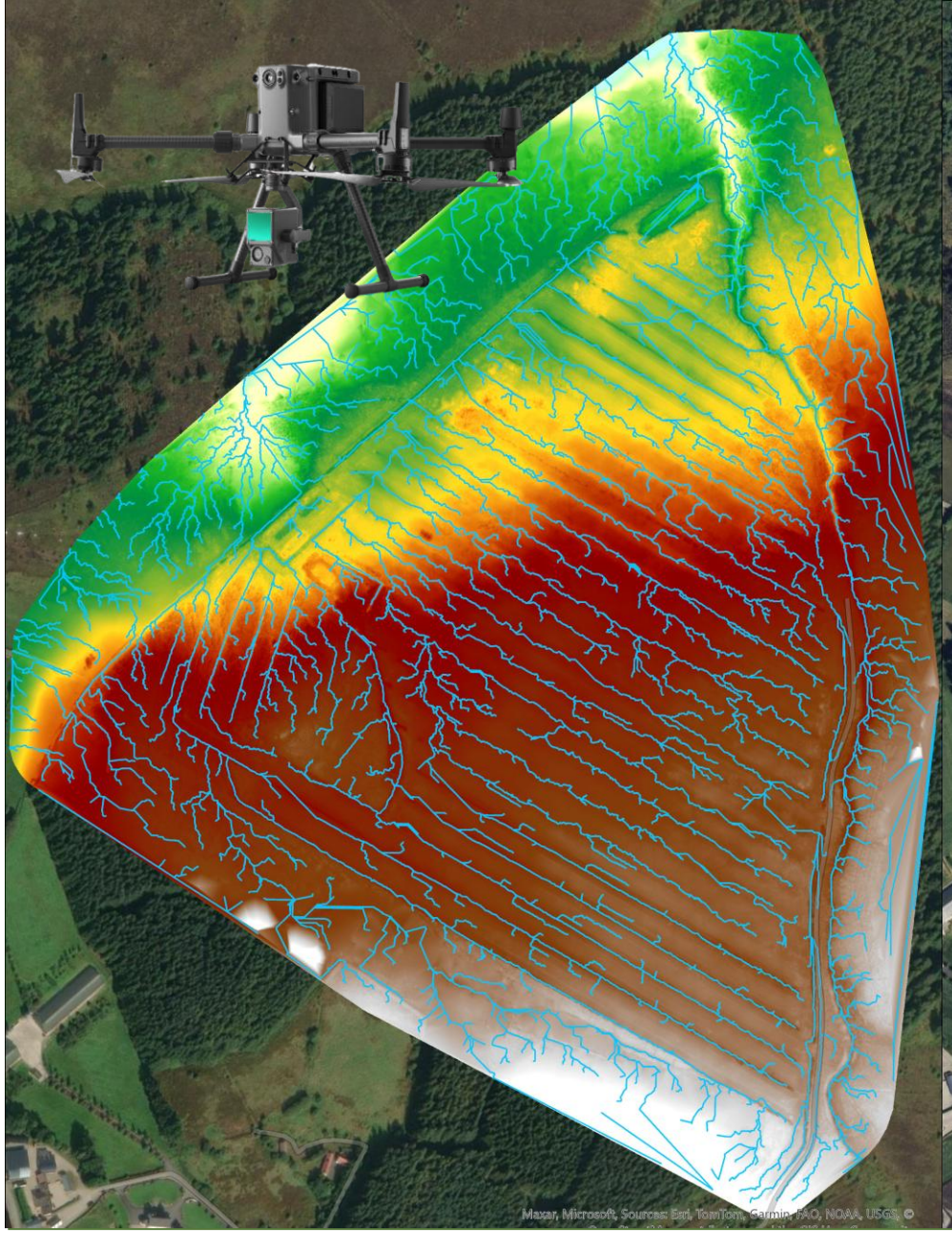
part of The Wildlife Trusts

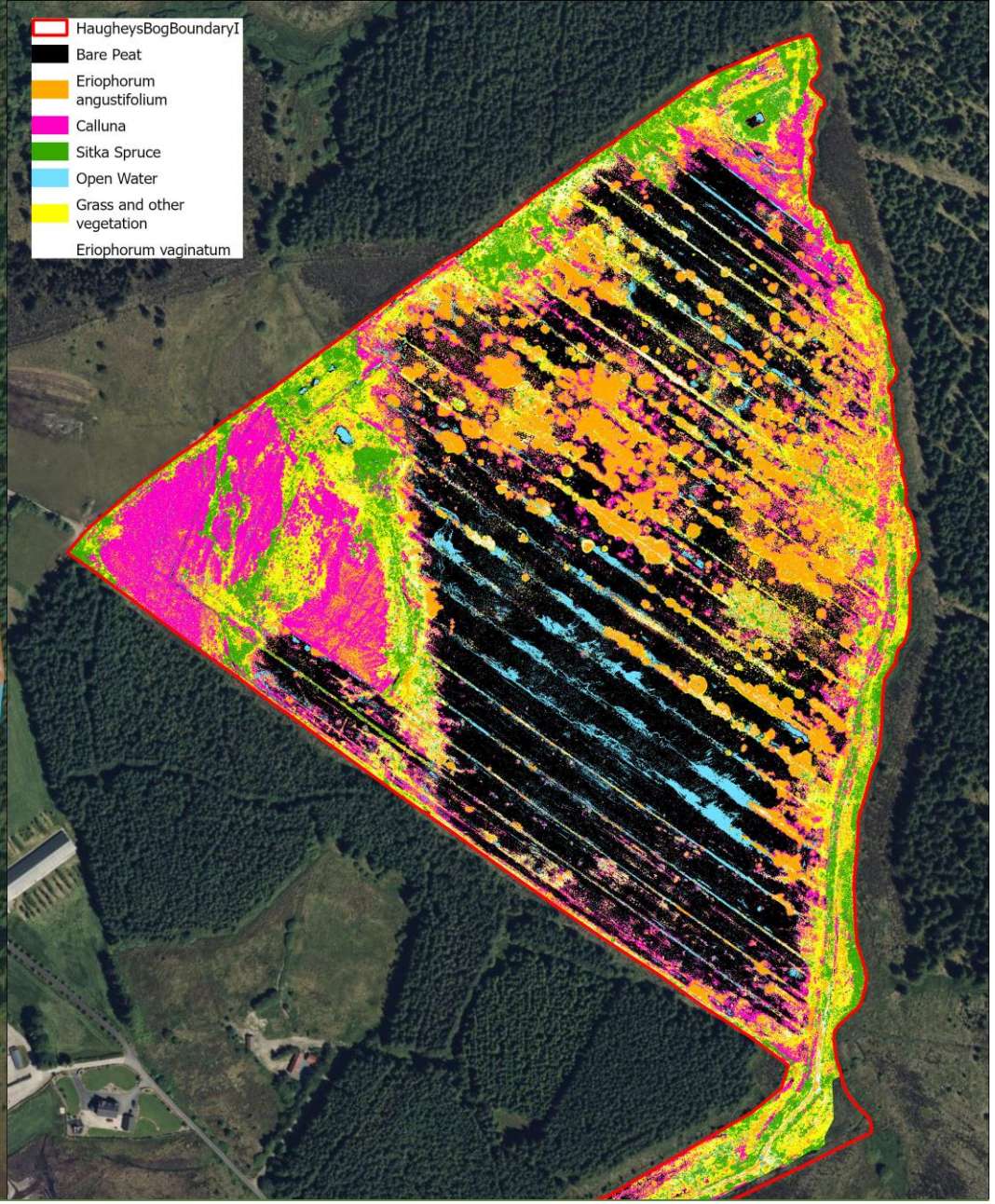
Join us & together we can
BRING NATURE BACK
www.ulsterwildlife.org/join

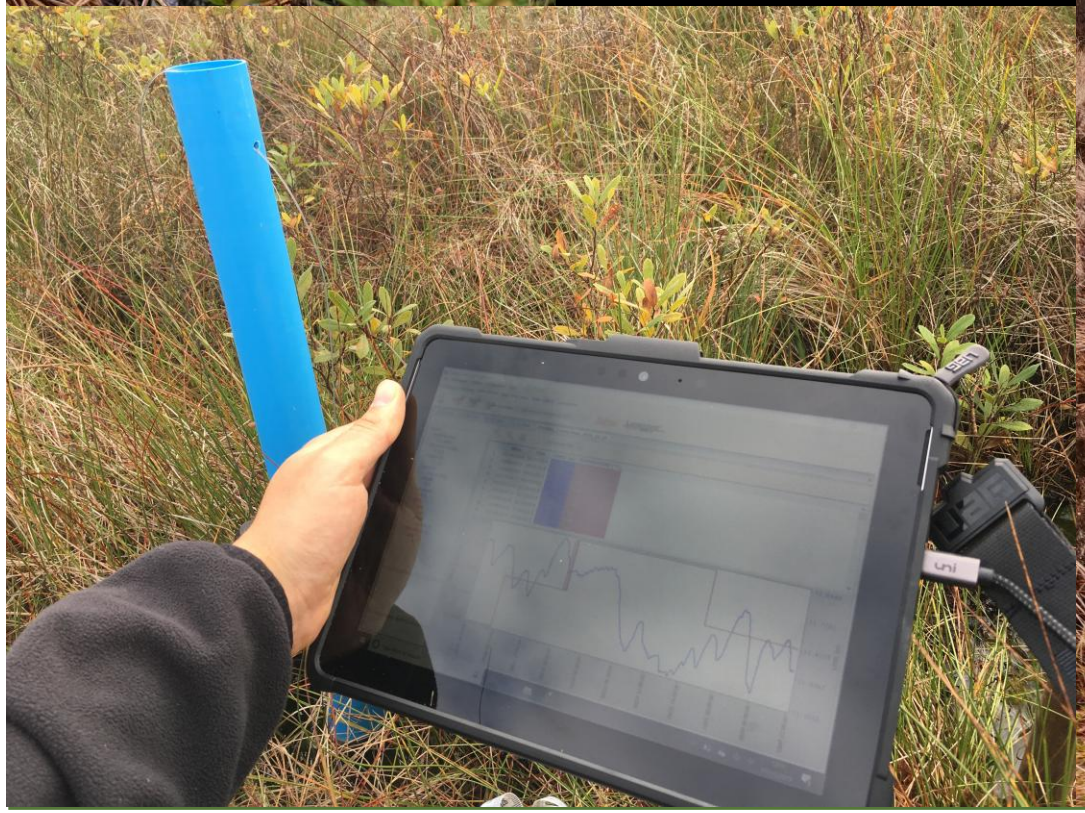
Ulster Wildlife

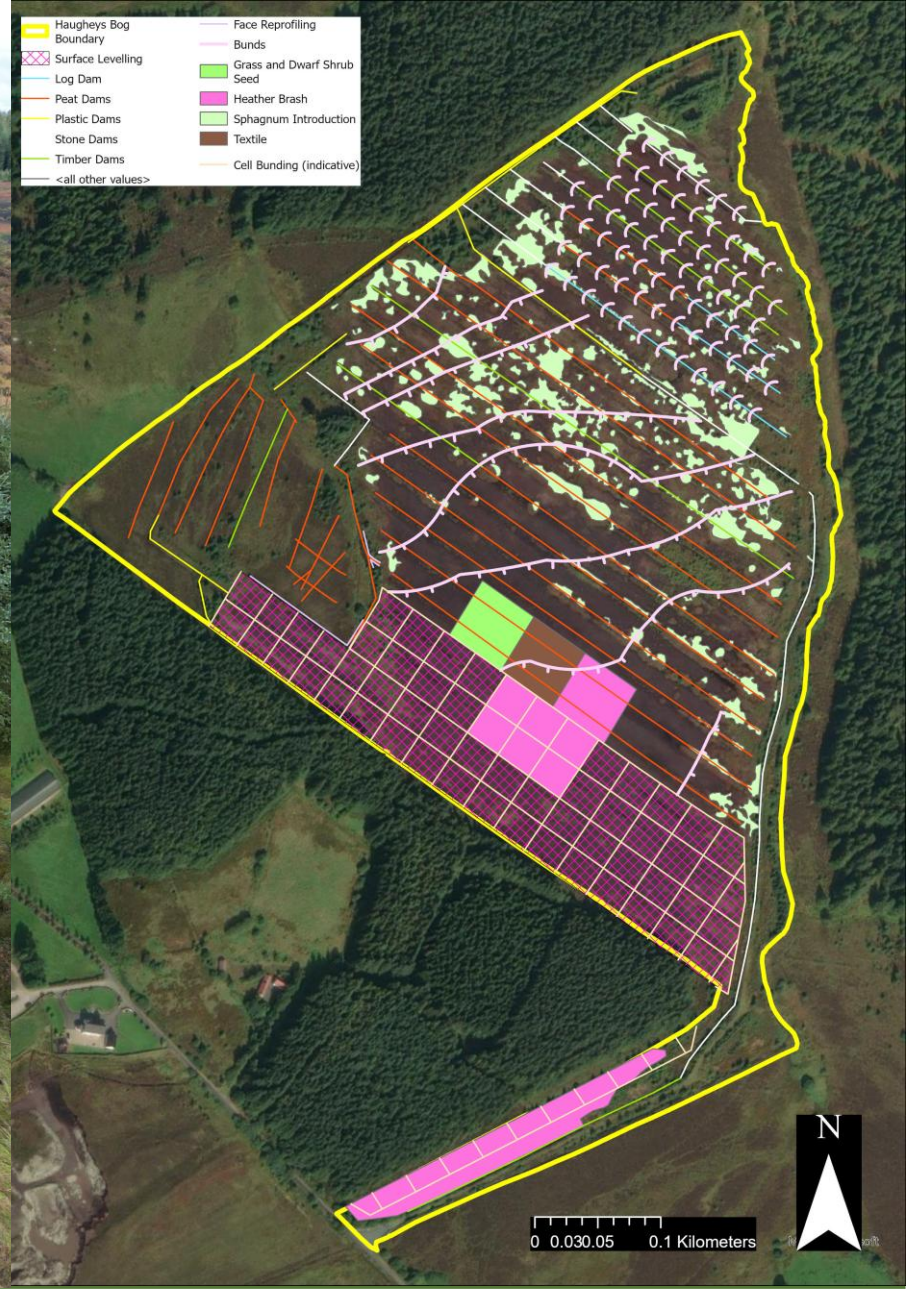












Thank you!!

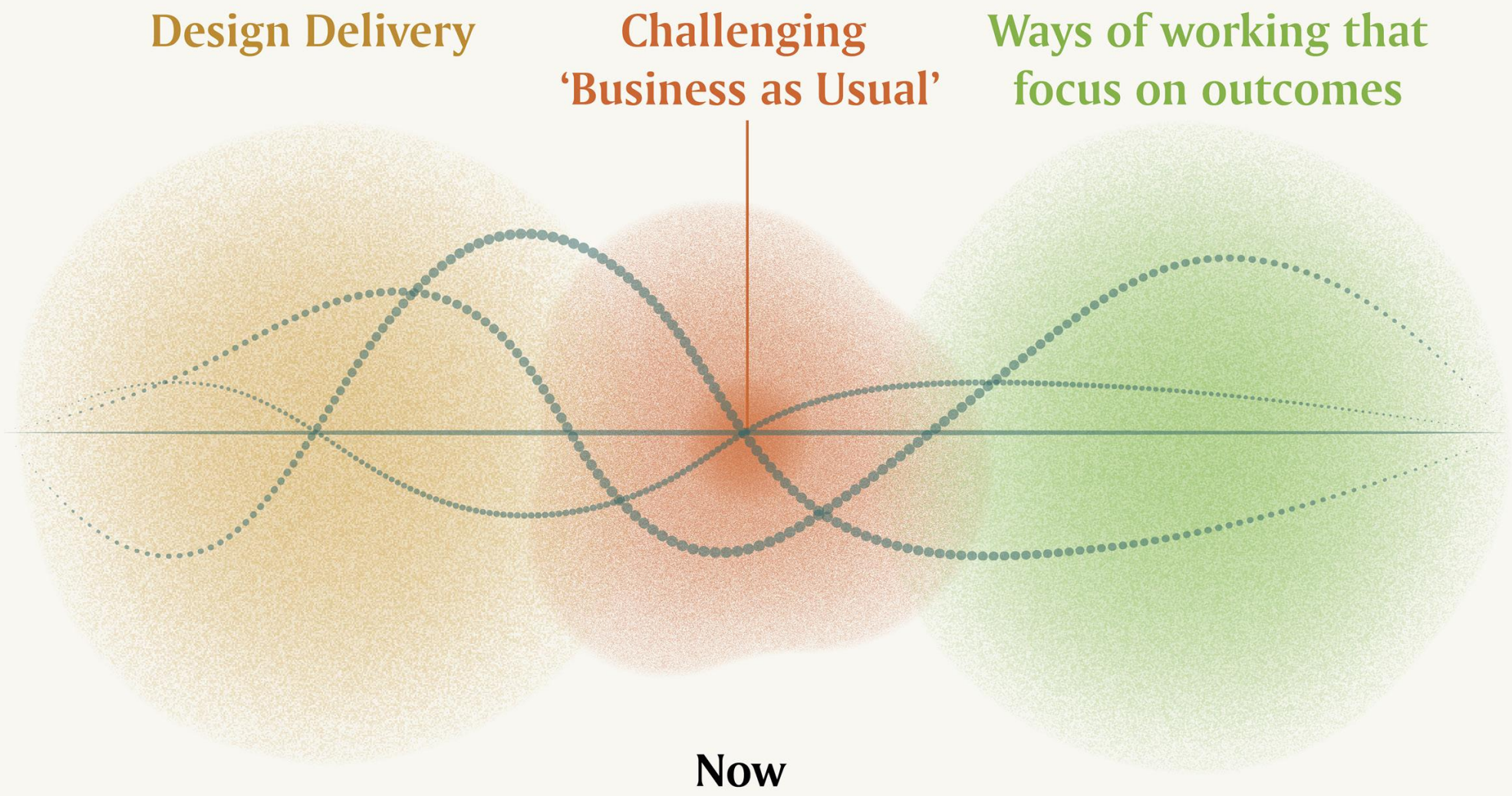
Nina Schönberg- nina.schonberg@ulsterwildlife.org
Paul Armstrong- paularmstrong@woodlandtrust.org.uk

A Natural Capital Approach to Placemaking

Ian Houlston, LDA Design

22 September 2025

A time of rapid change

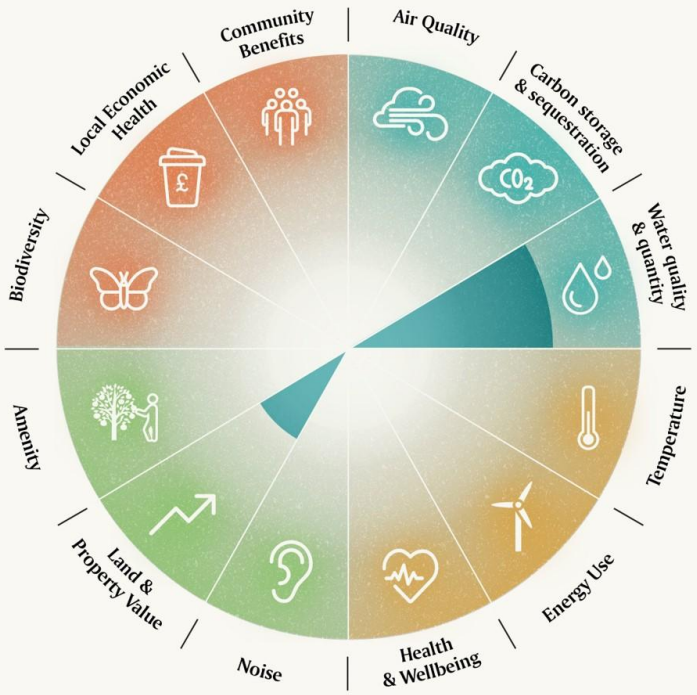



Cultural
Provisoning
Supporting
Regulating
Ecosystem Goods and Services
Maximising the Benefits Nature Provides
Knowledge, inspiration & learning
Recreation and tourism
Mental and physical health and wellbeing
Sense of Place and aesthetic values
Spiritual and religious connections
Sustainable Food
Renewable Energy
Fresh water
Materials
Natural medicines
Photosynthesis
Soil formation and healthy soils
Nutrient cycling
Habitats and connectivity
Biodiversity and genetic diversity
Water regulation and flood management
Disease and pest regulation
Purification of soil, water and air
Climate regulation and carbon storage
Pollination

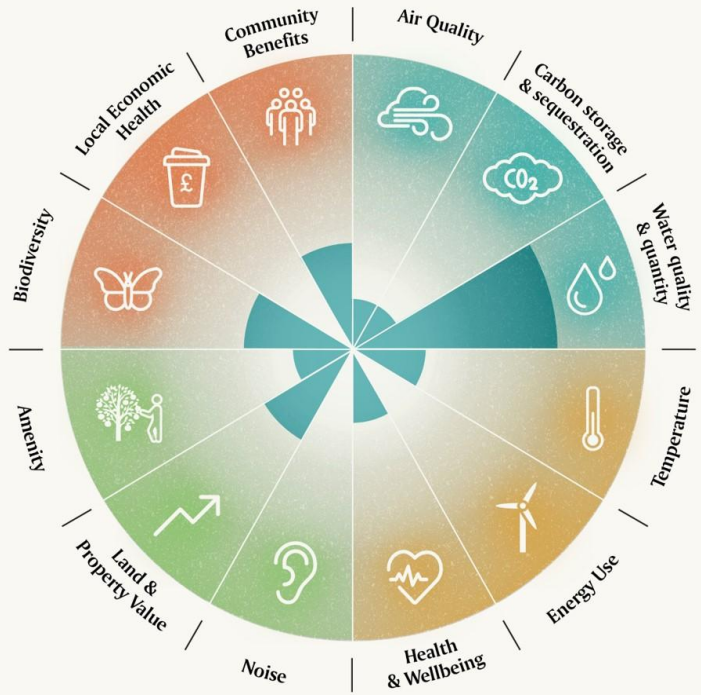
LDA Design based on Treeconomics 'The Benefits of Trees' (Version 2, 2023)


Improved air quality
Habitat for wildlife and part of connected networks
Visual screening
Reduced impacts of noise
Support to pollinators and enhanced crop yields
Inviting and accessible places for social interaction and outdoor recreation
Sense of place and continuity with the past
Source of timber, fuel, fodder and wild /foraged food
Agroforestry
Shelter for crops, livestock and people
Improved recovery time from illness
Reduced stress and mental wellbeing benefits
Carbon sequestration and storage
Restoration of soil health
Summer shade and cooling in extreme temperatures
Intercepts rainfall, slows infiltration and reduces risk of flooding
Access to nature and natural systems
Intercepts sediments, pollution and nutrients entering watercourses

Example: Benefits of Nature Based Solutions to Natural Flood Management



Conventional Approaches



NFM

Evidence built on Big Data is Essential

The Environment Agency has published a new **Working with Natural Processes Evidence Directory** updating the internationally recognised product first released in 2017.

Informed by significant scientific research including more than 700 papers, the directory summarises the latest evidence for 17 natural flood management (NFM) measures relating to river and floodplain, woodland, run-off, and coast and estuary management.

Julie Foley, Environment Agency Director of Flood Risk Strategy and National Adaptation, said:

"With climate change increasing the threats of flooding and coastal erosion, we must work together with nature to boost resilience across the country.

That's why the Environment Agency is mainstreaming the use of natural flood management alongside the use of traditional engineered defences.

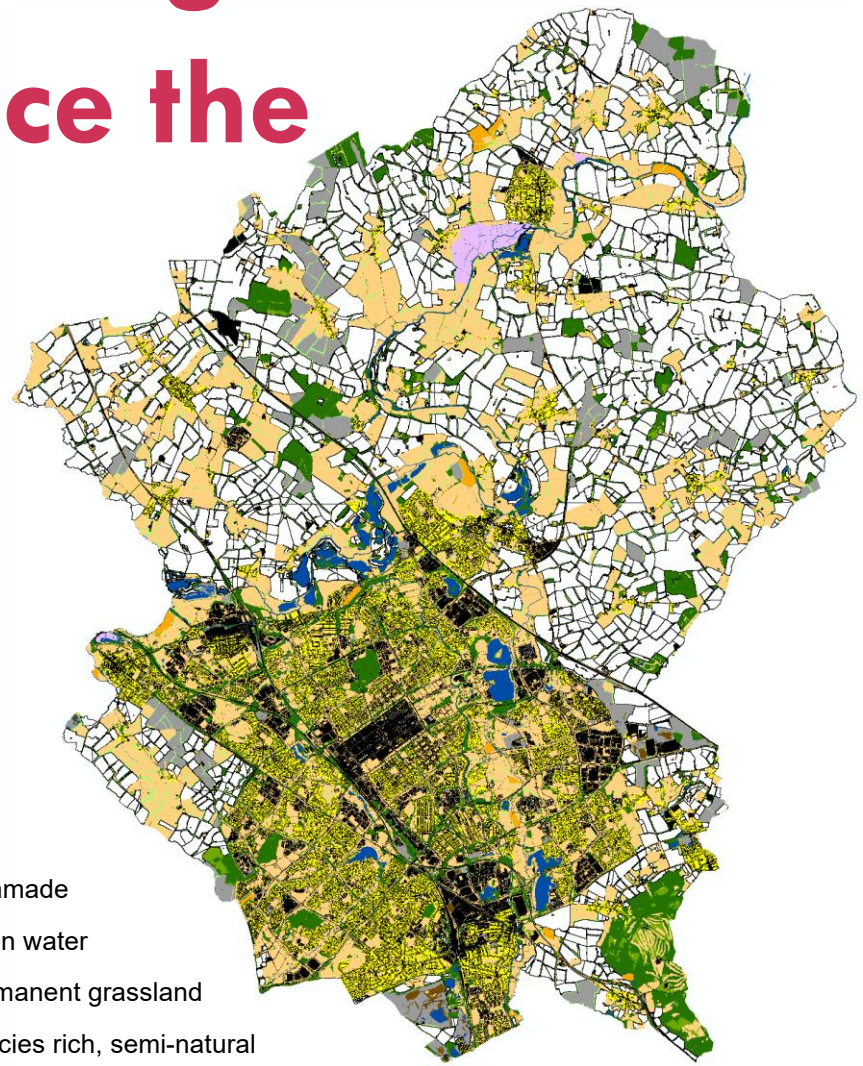
Our £25 million Natural Flood Management Programme was shaped by the Working with Natural Processes Evidence Directory. Through this fund we are testing our approaches to future investment and the delivery of natural flood management".

Satellite Imagery and modelling technology is used to produce the habitat map

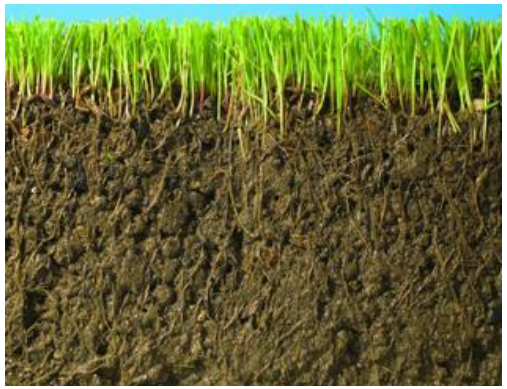
Remote sensing / satellite and aerial imagery

Field data and validation

Existing data sets

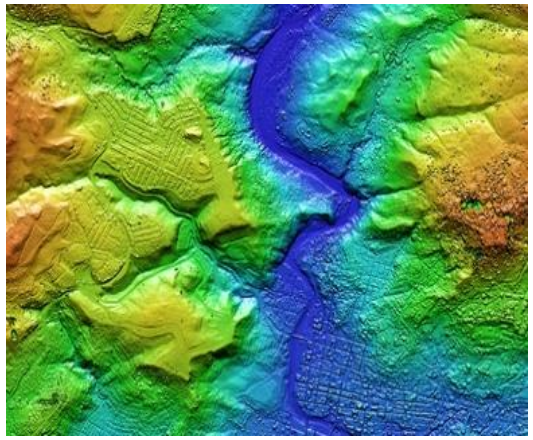


Computer modelling of natural capital assets and to optimise nature-based solutions



Soil & Geology

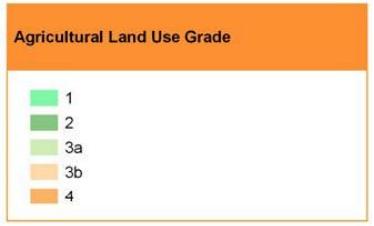
Management / Cultural

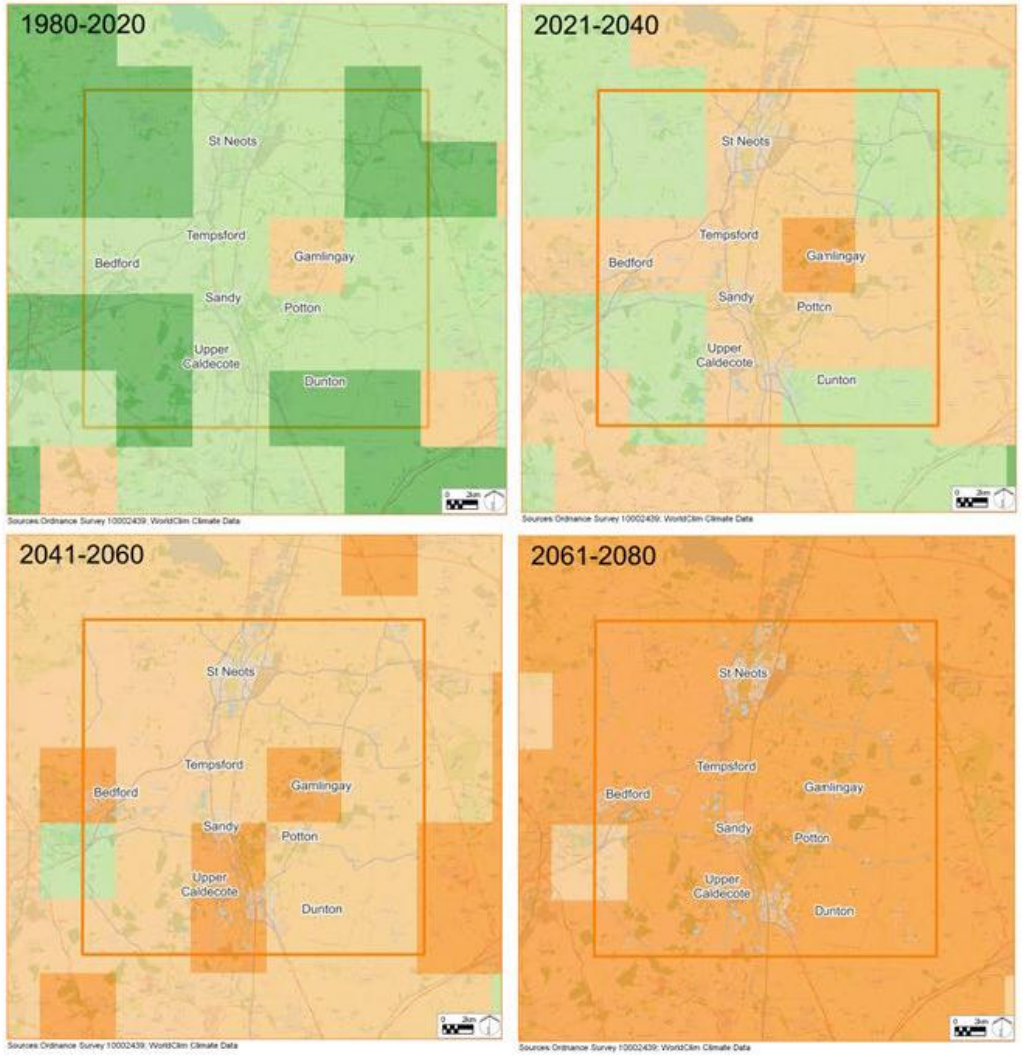


Landform & Hydrology

Habitat

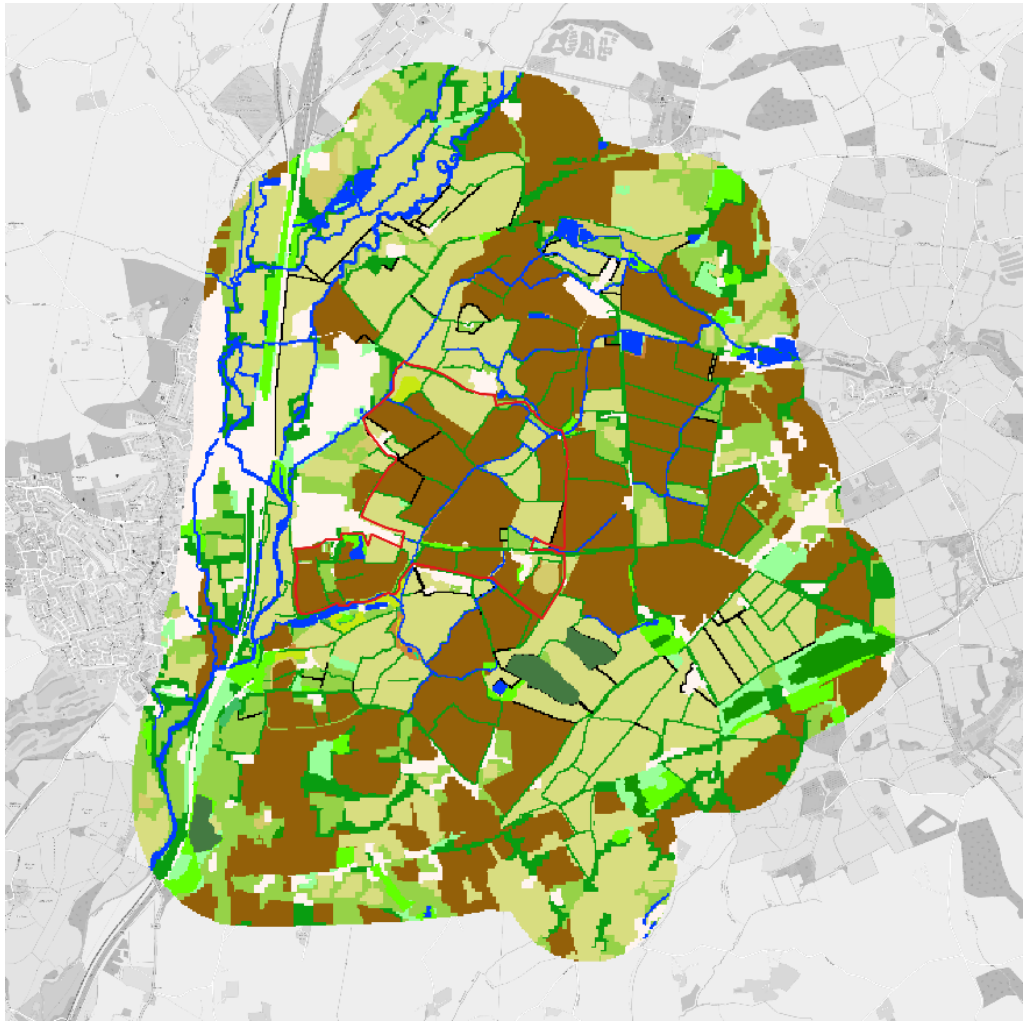
Modelling climate change scenarios to identify the potential effects, including to natural capital assets and their performance, will influence decisions in the way land is used.



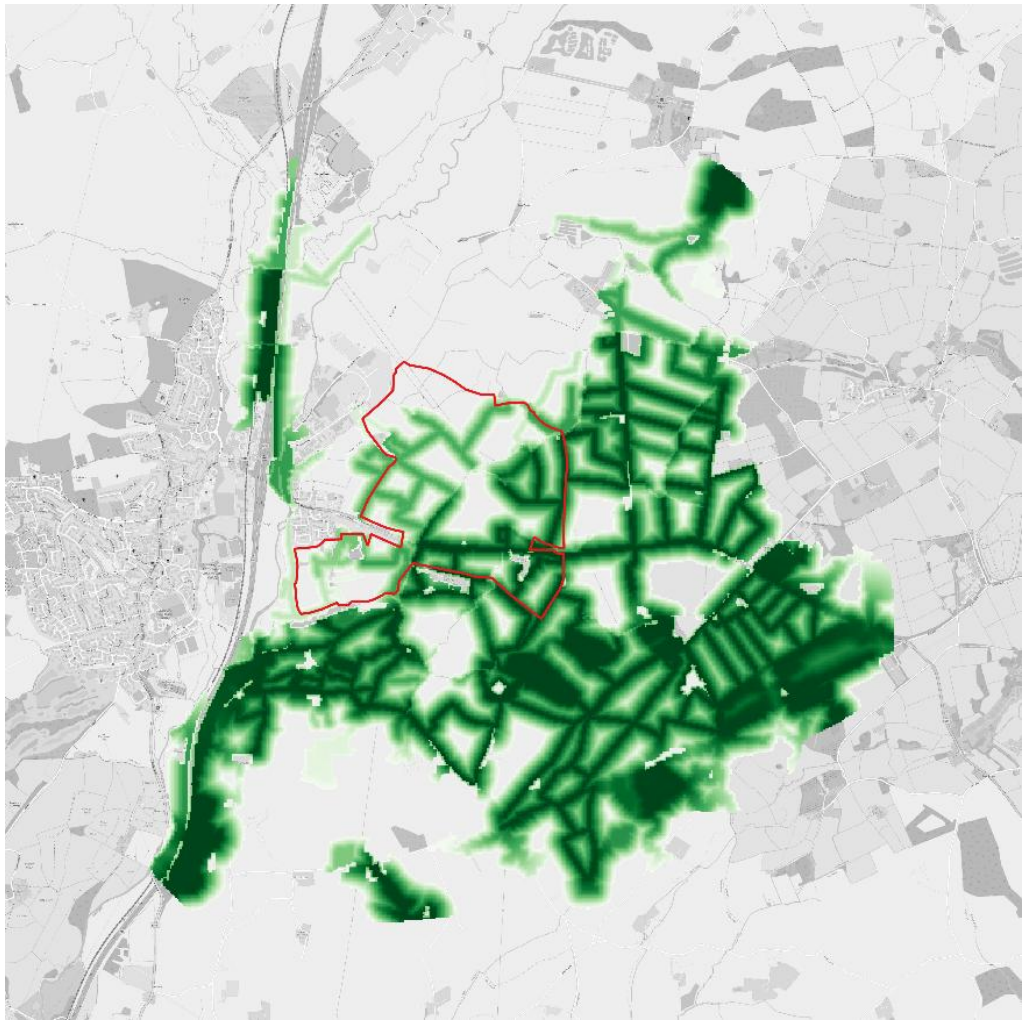


Case Study
East Cullompton:
An Ecosystems Approach to Masterplanning

LDA Design

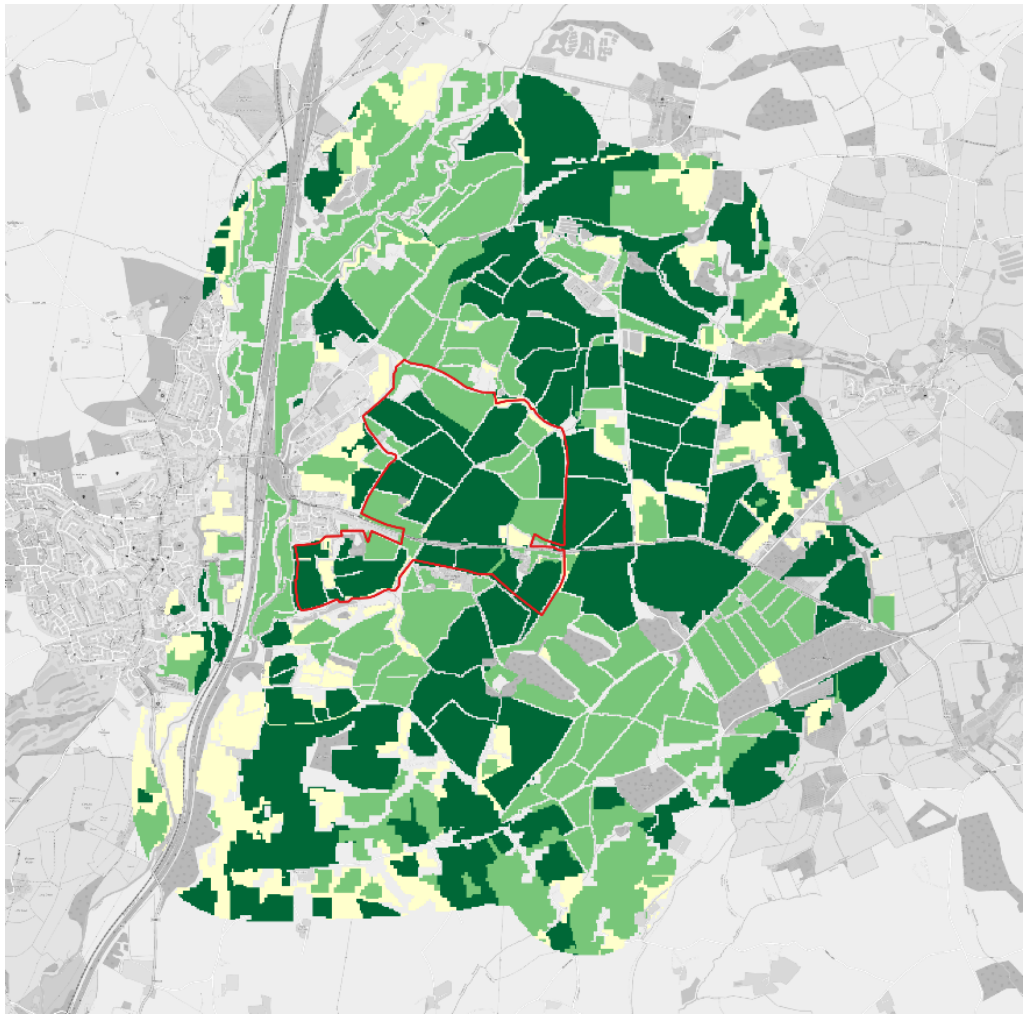


Habitat

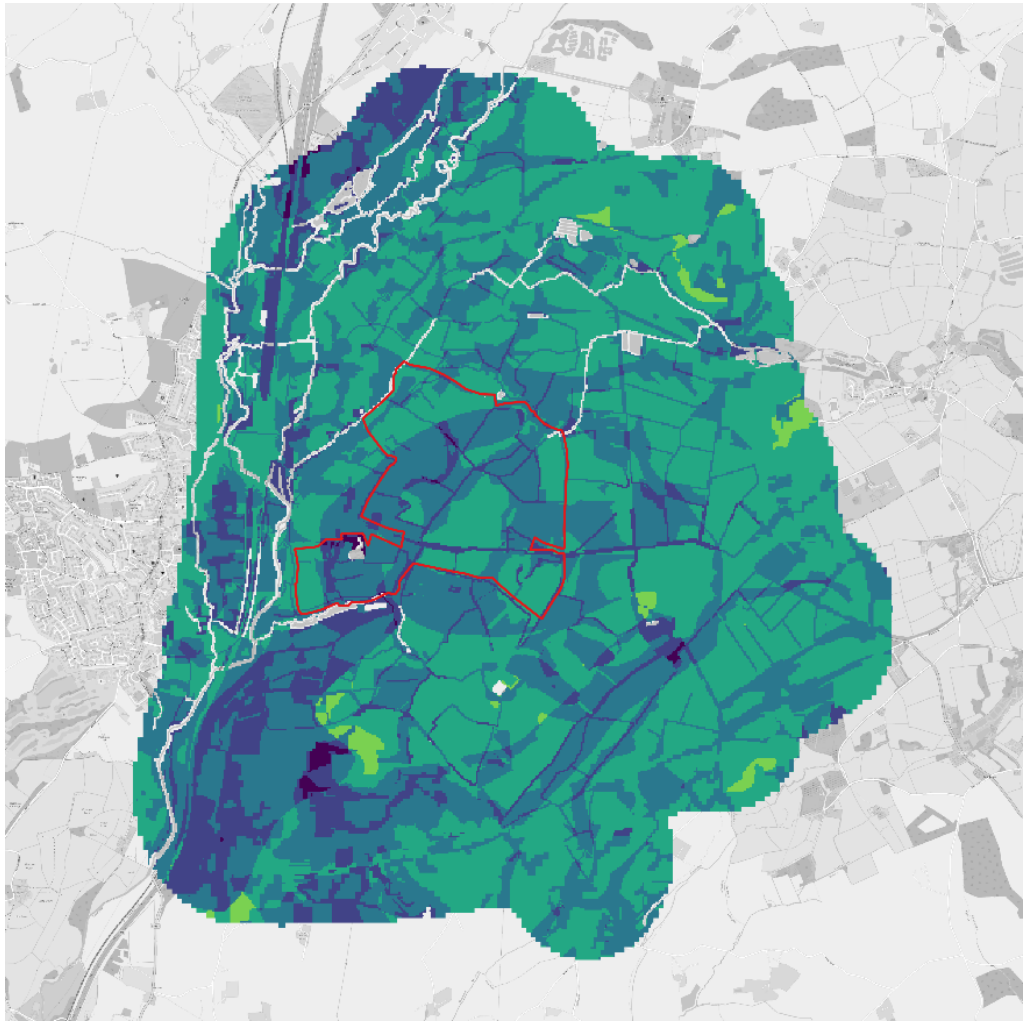


Woodland Network

Carbon Stock

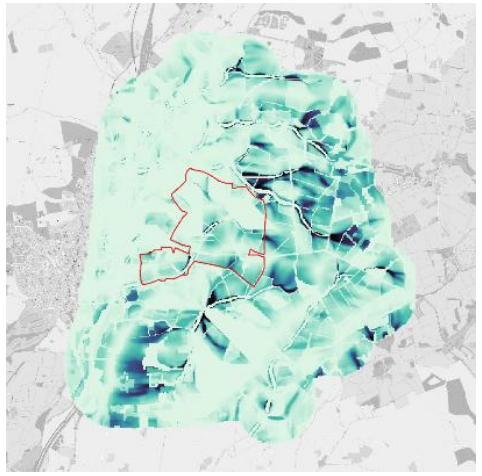


Carbon Opportunities



Natural Flood Management Stock

Natural Flood Management Opportunities



Erosion Risk

We have an opportunity right now to use advances in technology and data capture to significantly enhance our approach to placemaking, planning and design. An approach that enables us to confidently deliver ‘good design’ and the environmental outcomes needed to mitigate, adapt and build resilience to climate change and help nature recover.

This will go beyond the traditional mitigation of impacts and offsetting. It will enhance our mission to build and maintain beautiful and new development and infrastructure.


The Coffee Shop


HOSPITAL
COFFEE
Thank You

Panel discussion

Maggie Fennel-Wells

Principal Green and Blue Infrastructure Consultant, Land Management, The Environment Partnership

Katie Medcalf

Environment Director, Environment Systems

Nina Schonberg

Nature Recovery Networks Development Officer, Ulster Wildlife

Paul Armstrong

Public Affairs Manager, The Woodland Trust

Ian Houlston

Director, LDA Design

ISEP
Biodiversity &
Natural Capital

Thank you for attending!

BANC@isepglobal.org