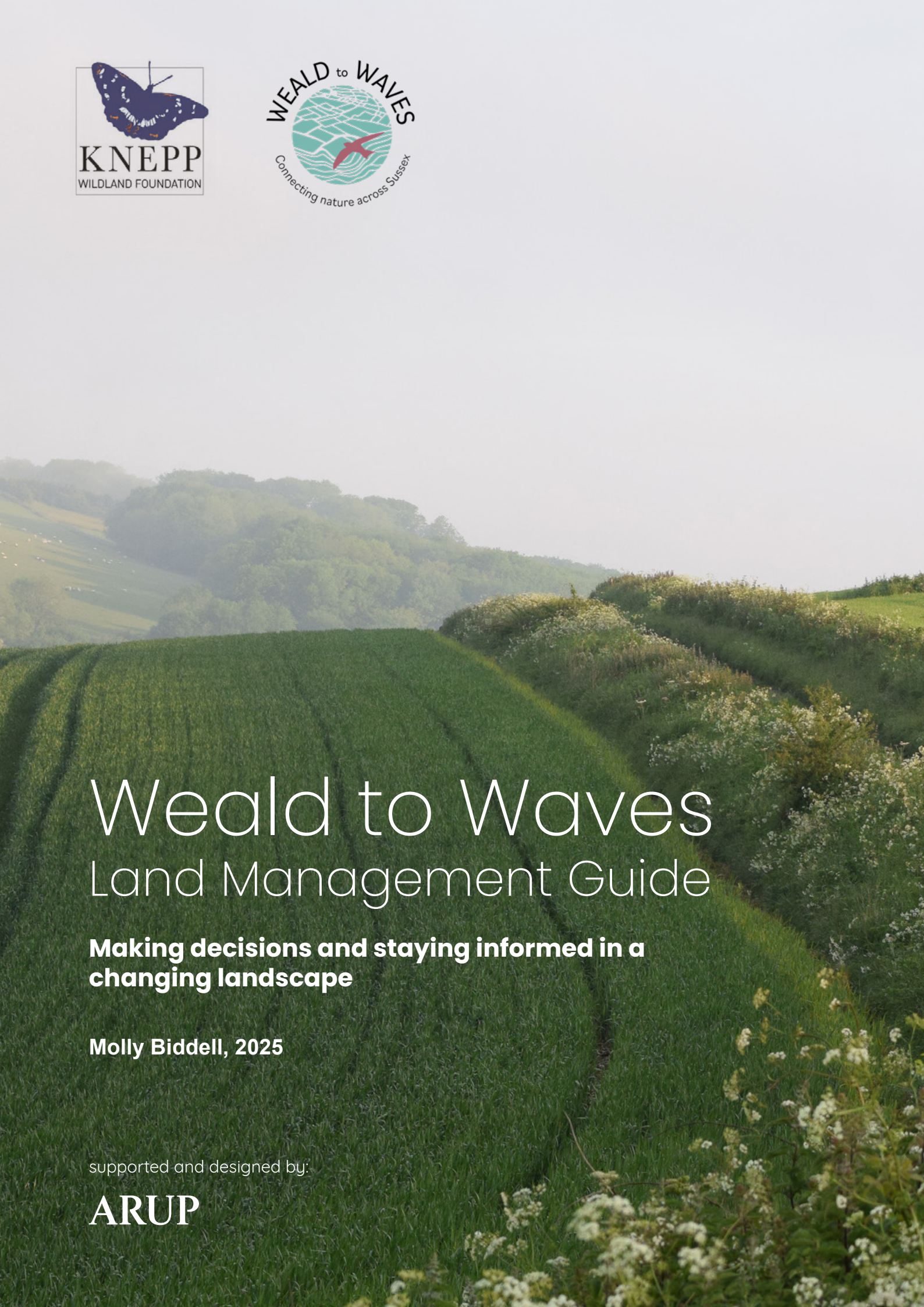


Weald to Waves
Land Management Guide

Making decisions and staying informed in a changing landscape

Molly Biddell, 2025

supported and designed by:

ARUP

Contents

01

A moment of change for land management

Credit: Alex Briggs

Land management in the UK is at an incredibly exciting moment. There are multiple drivers of change that are making us as land managers sit back and re-assess our opportunities, purpose and vision.

The triple threat of the climate, biodiversity and public health crises is forcing us to think differently about how to best use our land. These crises pose risks to our rural businesses, but also create potential opportunities. More and more land managers are focusing on increasing the resilience and sustainability of their businesses through concepts such as regenerative agriculture, creating more space for nature and delivering nature-based solutions.

There is a growing awareness of the potential of land to deliver the long-term solutions that society requires. Many of these nature-based solutions can generate ecosystem services (or environmental benefits) which are valuable to businesses and society. For example, carbon sequestration, biodiversity uplift, improving water quality, clean air etc. The biodiversity and climate crises have reinforced the environmental value of land.

At a domestic level, leaving the European Union and it's Common Agricultural Policy means that land managers in the UK are now led by new devolved agri-environmental policies.

In England we are in a seven-year Agricultural Transition period which sees the complete phasing out of the Basic Payment Scheme and the introduction of the new Environmental Land Management schemes which pay land managers for delivering environmental benefits. This is a significant shift in the economics of domestic agricultural policy.

The post war 'Feed The Nation' mentality has meant that for the past century, land has mainly been deemed valuable for the calories that it can produce. However, this is changing, moving towards a more holistic and nuanced understanding of land and all the benefits and services that it can produce.

But the UK is a small island with many pressures and demands on it. We want to use our land to provide sustainable, nutritious food, to create connected space for nature, to sequester carbon, to restore our river systems, to build affordable homes, to generate renewable electricity, and to have space for people to access beautiful landscapes and enjoy outdoor recreation and boost their wellbeing. There are a lot of different uses and opportunities for rural land – working out how we best use it and what we do where is complicated. There have been calls on the government to create a Land Use Strategy which provides a framework for land use decisions, and the conversation around what good land use across the UK looks like is important and live.

Factors to think about when considering land management changes

*What is the **geology** of the landscape?*

*What is the **soil type?***

*Which **river catchment** is the land within? How does the site's **hydrology** function?*

*Who **manages the land** and what skillset / knowledge is available?*

*How **connected** is the landholding?*

*What is the **history** of the landscape?*

***Who benefits** from the landscape?*

Credit: Alex Briggs

> ***Occupation of land*** *– is it owned freehold, leasehold, is it part of a tenancy or licence?*

> *What is the* ***financial structure*** *of the business?*

> *What* ***local communities*** *belong to the landscape?*

> *What is the broader* ***landscape context?***

> *Is the land within any designations –* ***SSSI, SPA, SAC, National Landscape or National Park*** *etc? What does this restrict and what opportunities does this create?*

02

Making space for nature and regenerative land use

Credit: Alex Briggs

Land management is driven by many factors – economics, location, resources, markets, soil type, transport links, ecology, hydrology, and personal vision to name a few. What constitutes good land management is subjective and open to interpretation.

However, there is a growing realisation that investing in the ecological resilience of our land is important if we are to continue to benefit from and thrive within our landscapes. There is a growing emphasis on building soil health, helping our watercourses and wetlands function better, creating space for precious habitats and species and allowing natural processes to take place.

Transitioning to regenerative agriculture and creating more space for nature are two key ideologies / methods that can be used across rural land to create environmentally resilient landscapes that generate multiple benefits.

Making Space for Nature

The UK is one of the most nature depleted countries on earth. Since 1970, the abundance of species studied in the UK has declined by 19% on average. Nearly one in six species is at risk of being lost from Great Britain, indicating a significant biodiversity crisis. Approximately 43% of bird speciesare in decline. More than half of the UK's flowering plants (54%) and bryophytes (59%) have decreased in the areas where they were once common. Additionally, pollinators such as bees, hoverflies, and moths have seen an 18% decline.

Habitat loss and degradation, climate change, pollution, and invasive species have all contributed to the decline of nature. Urban development, agricultural intensification, and land use changes have significantly reduced natural habitats, impacting the abundance and richness of biodiversity. Additionally, climate change impacts, such as shifting weather patterns and increased extreme events, have further stressed local ecosystems.


Credit: Rachel Bicker


Credit: David Phillips

If given a chance however, nature can rebound. Nature is inherently resilient, and we humans can help nature thrive because we possess the ability to restore and protect our environment. Humans are one of the greatest ecosystem engineers on the planet, for good and for bad. When we focus our efforts on restoration and creation amazing things can happen, particularly when we are operating and thinking at a landscape scale. Restoring and creating habitats that provide migration pathways for species through the landscape are becoming increasingly important; by making space for nature, we enhance biodiversity and promote sustainable practices in our environments.

Food crops need not make way for habitats, if we are to restore nature at scale, we need to achieve this alongside sustainable food production. Working together is essential if we are going to have a significant impact, and the restoration of nature needs to make financial sense for those committing to changes that would otherwise reduce their revenue.

Integrating nature into urban and rural spaces yields numerous ecological, social, and economic benefits. In 2021 the office for national statistics calculated the total asset value of ecosystem services in the UK as just over £1.5 trillion.


Credit: Libby Drew

Climate Resilience

Natural areas play a crucial role in mitigating climate change effects by improving air quality, reducing urban heat, and managing stormwater. An estimated 1,335,686 tonnes of air pollution were removed by nature in the UK in 2021, with an annual value of around £2.5 billion.


Credit: Alex Briggs

Health and Well-being

Access to nature has been linked to improved mental health, physical activity, and overall quality of life. Green spaces can serve as vital areas for community interaction and personal reflection. Health benefits from recreation alone were valued at £445 billion.

Economic Opportunities

Investing in green infrastructure can lead to job creation in sectors like landscaping, conservation, and sustainable agriculture. Additionally, attractive green spaces can increase property values and tourism. Renewable electricity provisioning increased by 275% between 2011 and 2021, from 21,899 gigawatt hours (GWh) to 82,142 GWh.

There is now widespread realisation of the need


Credit: Alex Briggs

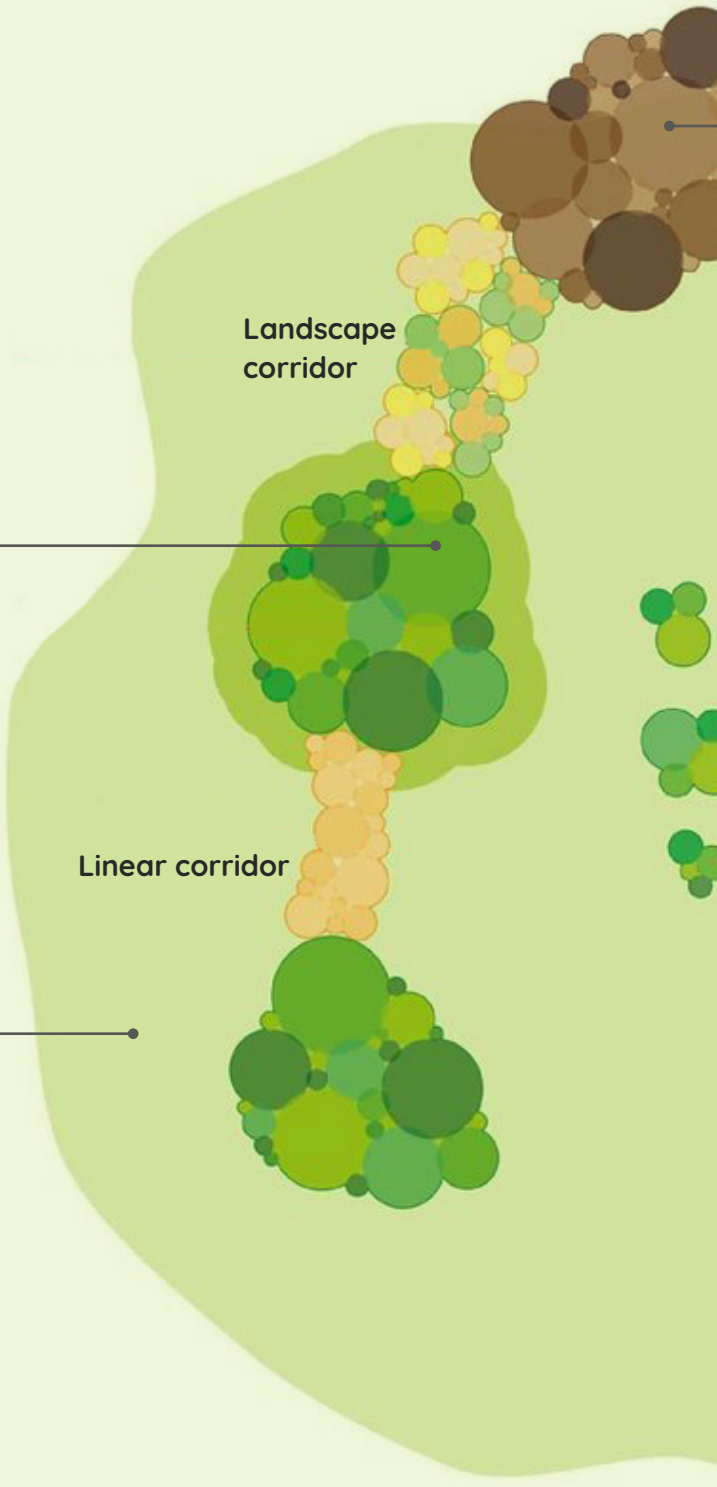
to restore precious habitats and ecosystem processes, and national policy is supportive of creating more space for nature and organisations are more interested in how they can support nature restoration. But with limited funds at our disposal how can we ensure we have the biggest impact? Landscape -scale thinking and the creation of functional corridors for biodiversity and nature is part of the solution.

Creating corridors and joining the dots

In response to the biodiversity crisis Professor Sir John Lawton was tasked with reviewing England's wildlife sites and the connections between them. The "making space for nature" report concluded that England's collection of wildlife sites were too small and too isolated to function for biodiversity, leading to declines in multiple species. The report concluded that we need more, bigger, better and more joined up sites to create a sustainable, resilient and more effective ecological network for England. This is the theory behind the creation of Weald to Waves.

Core areas of high nature conservation value form the heart of the network. They contain habitats that are rare or important because of the wildlife they support or the ecosystem services they provide. Core areas provide places within which species can thrive, large enough to support breeding populations of key species, and from which they can disperse to other parts of the network. We want to improve the quality and size of these sites.

Sustainable use areas comprise most of our landscape, including farmland, recreational land, towns and cities. Nature confined to core areas becomes too isolated and vulnerable to local extinctions, hugely decreasing the ecosystem services such as pollination or flood risk mitigation. To allow nature to thrive, and to benefit from ecosystem services, the Weald to Waves corridor needs to comprise both wildlife habitat and sustainable human land use, which is where solutions such as regenerative agriculture become so important.



Credit: Lawton 2010

Restoration areas are areas where measures are planned to restore or create new high value areas (which will ultimately become 'core areas') so that ecological functions and species populations can be restored.

Corridors and 'stepping stones' are spaces that improve the functional connectivity between core areas, enabling species to move between them to feed, disperse, migrate or reproduce. This is crucial to ensure the resilience of these species and to prevent isolated populations from disappearing. We need to create and enhance connections between sites through physical corridors or stepping stones.

Buffer zones are areas that closely surround core areas, restoration areas, 'stepping stones' and ecological corridors, and protect them from adverse impacts from the wider environment. They reduce the pressures on wildlife by improving the wider environment.

The Lawton Principles

The Lawton principles have steered and guided action for England's wildlife and habitats since the review was published in 2010, but a lack of urgency combined with very little public funding has seen only marginal gains over the last 14 years. More and sustained effort is needed across all sectors with private investment needed to supplement public money.

Making space for nature is not just about creating and restoring habitats, far more is needed if we are going to make a difference, nature needs:

"Making Space for Nature" is not just about conserving wildlife; it is about fostering a deeper connection between people and their environment. By creating spaces where nature can thrive, communities can benefit holistically, ecologically, socially, and economically. Society has a responsibility to protect the natural world while enriching our own lives through the beauty and benefits of nature and inspire a collective movement towards a healthier planet for future generations.

Greener Infrastructure and more green spaces that not only support wildlife but also enhance urban aesthetics and provide recreational opportunities for communities. Wildlife friendly urban parks, green roofs, green bridges over and under road and rail infrastructure.

Community Involvement is vital. Engaging local communities is crucial for success. Workshops, volunteer days, and educational programs foster a sense of stewardship and responsibility towards local environments.

Strong Policies and Regulations that protect natural spaces. Collaboration within and with government bodies and organisations helping to ensure that conservation efforts are supported at all levels.

Sustainable Practices support nature recovery by reducing the pressures our environment is facing. Promoting sustainable land use practices such as regenerative agriculture, organic farming, permaculture, continuous cover forestry and habitat restoration efforts that prioritise native species and ecological balance.

Research and Monitoring is essential to understand and evidence interventions for biodiversity. Monitoring programs help assess the health of ecosystems and guide future actions, we need to recognise mistakes and learn from them.

Regenerative agriculture / nature friendly farming

Regenerative agriculture is an approach to farming that focuses on revitalising and enhancing the health and biodiversity of agricultural ecosystems. This holistic and systems-based method aims to restore soil health, increase biodiversity, improve water cycles, and strengthen the resilience of farming communities. Unlike the conventional agricultural systems that have dominated in Europe and America of the past century, which often rely on synthetic inputs and monoculture, regenerative agriculture emphasises ecological harmony and sustainable practices.

Regenerative agriculture practices are being adopted by farmers across the UK as a way to build soil fertility, increase climate and water resilience, reduce reliance on expensive inputs and increase the economic margins of their businesses.

Six principles of regenerative agriculture

The six principles of regenerative agriculture form the foundation for practices that aim to restore and enhance the health and biodiversity of agricultural ecosystems. These principles are designed to work in harmony with nature, improving soil health, water retention, and ecosystem resilience.

1. Don't disturb the soil

Objective: To protect soil structure and microbial communities.

Practices: Reduce or eliminate tilling and ploughing to prevent soil erosion, maintain soil organic matter, and preserve the habitat for beneficial organisms. No-till or low-till farming techniques are commonly used.

2. Grow a diverse range of crops

Objective: To enhance ecosystem biodiversity and resilience.

Practices: Implement crop rotations and polycultures, where multiple crop species are grown together. Diverse plantings improve soil health, reduce pest and disease pressure, and support a wider range of beneficial insects and wildlife.

3. Keep the soil surface covered

Objective: To protect the soil from erosion, retain moisture, and provide habitat for soil organisms.

Practices: Use cover crops, mulch, and residue from previous crops to ensure that soil is covered year-round. Cover crops also add organic matter to the soil when they decompose.

4. Keep living roots in the soil

Objective: To provide continuous nourishment to soil microorganisms and improve soil structure.

Practices: Grow perennial crops or use cover crops during the off-season to keep living roots in the soil as much as possible. This helps stabilize the soil, enhances water infiltration, and supports a healthy microbial community.

5. Bring grazing animals back to the land

Objective: To mimic natural ecosystems and enhance nutrient cycling.

Practices: Use managed grazing systems, such as rotational or holistic grazing, where livestock are moved frequently to prevent overgrazing and allow pastures to recover. Livestock can help incorporate organic matter into the soil, control pests, and stimulate plant growth.

6. Context

This principle recognises that each farm has its own set of challenges. It could be environmental constraints such as soil type, rainfall or season length. Financial constraints, local market conditions or family and team objections.

Buzzwords

Language is complex, and there are many buzz words in the world of land management. Below are all the words for regenerative farming (according to ChatGPT).

- Agroecology
- Agroforestry
- Biodynamic farming
- Carbon farming
- Composting
- Cover cropping
- Holistic management
- Integrated pest management (IPM)
- Keyline design
- Managed grazing
- No-till farming
- Organic farming
- Permaculture
- Polyculture
- Regenerative agriculture
- Silvopasture
- Soil health
- Sustainable agriculture
- Water management
- Windbreaks

Where to find out more about regenerative agriculture

Documentaries

- Kiss The Ground
- 6 inches of Soil
- Roots So Deep

Podcasts

- Regenerative Agriculture Podcast
- Farmerama Radio
- The Thriving Farmer Podcast
- The Regenerative Agriculture Club

Websites / companies

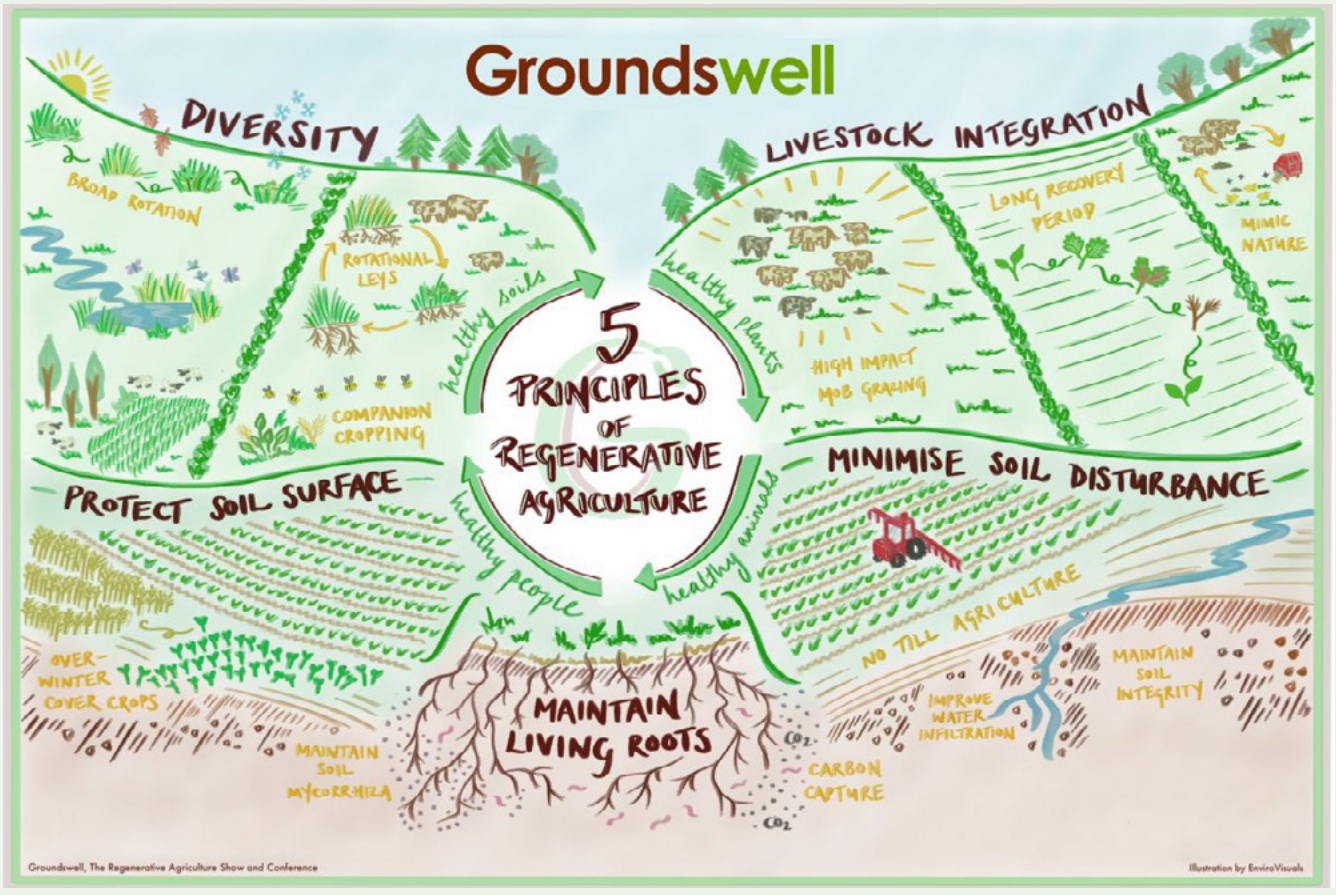
- Soil Association - Provides comprehensive insights into regenerative agriculture practices and benefits, with a focus on organic farming in the UK. Soil Association
- Sustainable Food Trust - Explains the principles and impact of regenerative agriculture, including case studies and news updates. Sustainable Food Trust
- Pasture for Life - Focuses on pasture-based livestock farming and its role in regenerative agriculture. Pasture for Life
- Agrovista - Offers resources and guides on regenerative agriculture, tailored to UK farming needs. Agrovista
- Yeo Valley Regenerative Farming - Describes their initiatives and practices in regenerative dairy farming across their UK farms. Yeo Valley Regenerative Farming
- Regenerate Outcomes - Offers mentoring and training for farmers transitioning to regenerative agriculture in the UK. Regenerate Outcomes

Books

- Dirt to Soil: One Family's Journey into Regenerative Agriculture by Gabe Brown
- The Soil Will Save Us: How Scientists, Farmers, and Foodies Are Healing the Soil to Save the Planet by Kristin Ohlson
- Kiss the Ground: How the Food You Eat Can Reverse Climate Change, Heal Your Body & Ultimately Save Our World by Josh Tickell
- Call of the Reed Warbler: A New Agriculture, A New Earth by Charles Massy
- Restoration Agriculture: Real-World Permaculture for Farmers by Mark Shepard
- Ravenous by Henry Dimbleby

Festivals

- Groundswell Festival



Credit: Groundswell-5-Principles

Credit: Alex Briggs

03

Post Brexit Agricultural Policy

Credit: Alex Briggs

Environmental Land Management is England's new scheme for supporting land managers.

The Agricultural Act 2022 legislates for our post-Brexit policies, which are then created by Defra. Post Brexit agri-environmental policy is devolved meaning England, Scotland and Wales all have different support schemes.

There are three elements to the Environmental Land Management Scheme:

1 The Sustainable Farming Incentive

2 Countryside Stewardship

3 Landscape Recovery

The Sustainable Farming Incentive (SFI)

The Sustainable Farming Incentive scheme pays farmers and land managers to take up or maintain sustainable farming and land management practices that:

- protect and benefit the environment
- support food production
- improve productivity

These practices are referred to as SFI actions. Each action receives a different payment rate. Annual payment values are paid in quarterly instalments. SFI agreements usually last 3 of 5 years, depending on which SFI actions are selected. There are over 100 actions to choose from.

Most land is eligible for SFI, however there are some SFI actions which are targeted at certain priority habitats, species or heritage features. There are other SFI actions which are only intended to be done on 25% of the farm, these are known as 'limited area' actions.

Examples of SFI actions (accurate as of 2024):

- **CSAM3** – Herbal Leys - £382 per hectare per year – 3 year agreement
- **WBD4** – Arable reversion to grassland with low fertiliser input - £489 per hectare per year – 5 year agreement
- **CIGL2** – Winter bird food on improved grassland - £515 per hectare per year – 3 year agreement
- **CAHL1** – pollen and nectar flower mix - £739 per hectare per year – 3 year agreement
- **AHW5** – nesting plots for lapwing - £765 per hectare per year – 3 year agreement

A full list of actions can be found here.

The Sustainable Farming Incentive was paused for applications on the 11th March 20205. This guide will be updated when the scheme opens up again.

How to apply

1 **Eligibility Check**

2 **Review SFI Standards**

3 **Register with Rural Payments Agency (RPA):** If you are not already registered, sign up with the RPA, as all applications must go through their system.

4 **Online Application:** Log in to the Rural Payments service online. Ensure your land details are up to date, as these will be used in your application.

5 **Create a Land Management Plan:** Prepare a land management plan that aligns with the SFI standards. This plan should detail how you will implement the sustainable practices on your farm.

6 **Submit Application:** Complete and submit your application through the Rural Payments service. You will need to provide details about your farm, the land parcels you are including, and how you intend to meet the SFI standards.

7 **Await Confirmation:** After submission, your application will be reviewed by the RPA. You may be contacted for additional information or clarification.

8 **Agreement Offer:** If your application is approved, you will receive an agreement offer detailing the payment rates and requirements.

9 **Accept Agreement:** Review the agreement offer and, if satisfied, accept it to formalise your participation in the SFI.

10 **Implementation and Reporting:** Implement the sustainable farming practices as outlined in your land management plan. You will need to keep records and may be required to report on your progress to the RPA.

11 **Payments:** Receive payments as per the terms of your SFI agreement. These payments are typically made quarterly.

For more detailed guidance and specific deadlines, refer to the official government resources or contact the RPA directly.

Overview of SFI – https://www.gov.uk/government/publications/sustainable-farming-incentive-scheme-expanded-offer-for-2024/sfi-scheme-information-expanded-offer-for-2024#managing-your-sfi-agreement

Agricultural Policy: **CS**

Countryside Stewardship (CS)

You can apply for Countryside Stewardship to get paid to:

- increase biodiversity
- improve habitat
- expand woodland areas
- improve water quality
- improve air quality
- improve natural flood management

There are 8 types of CS schemes available in 2024

- **Higher Tier** - Higher Tier grants are for multi-year management options and capital items for the most environmentally important sites, including commons and woodlands. These are usually in places that need complex management, such as creating or restoring habitats, and improving woodland
- **Capital Grants** – provide 3 year agreements offering capital items for boundaries, trees and orchards ; water quality ; air quality ; natural flood management
- **Higher Tier Capital Grants** – provide 3 year agreements for capital items alongside other agreements
- **Protection and Infrastructure Grants** – for capital items that support woodland improvement and help mitigate beaver activity in certain areas
- **Woodland Management Plan Grants** – a one off payment to create a 10-year woodland management plan
- **Wood Tree Health Grants** – helps to restock or improve woodland after tree health problems

Countryside Stewardship is due to be developed over the coming years to deliver ambitious outcomes for local nature recovery.

Agricultural Policy: **CS**

How to apply

1 **Eligibility Check**

2 **Review Scheme Options**

3 **Register with Rural Payments Agency (RPA)**

4 **Obtain an Application Pack**

Request Pack: Request an application pack from the RPA, either online through the Rural Payments service or by contacting them directly.

Download Guidance: Download the guidance documents and read them thoroughly to understand the application process and requirements.

5 **Prepare Application**

Choose Options: Select the appropriate options and capital items that align with your environmental objectives and the specific needs of your land.

Create a Farm Environment Record (FER): Prepare an FER, which includes maps and details of environmental features on your farm.

Complete Application Forms: Fill out the application forms, including detailed information about your farm, chosen options, and proposed management practices.

6 **Submit Application**

Deadline Awareness: Be aware of the submission deadlines. Applications are typically submitted in the spring.

Submission Methods: Submit your completed application pack to the RPA. This can often be done online or via post.

7 **Await Confirmation**

Application Review: The RPA will review your application. They may conduct site visits or request additional information.

Decision Notification: You will be notified of the decision. If approved, you will receive an agreement offer.

8 **Agreement Acceptance**

Review Offer: Carefully review the agreement offer, which will detail the payment rates and management requirements.

Sign Agreement: Sign and return the agreement to formalize your participation in the CSS.

9 **Implementation and Management**

Implement Practices: Begin implementing the chosen environmental practices and management options as per your agreement.

Record Keeping and Reporting: Keep detailed records of your activities and any required evidence for compliance.

10 **Receive Payments**

Payment Schedule: Receive payments according to the terms of your agreement. Payments are typically made annually or based on specific milestones.

Examples of CS actions (accurate as of 2024):

- CT4 – creation of inter-tidal and saline habitat on arable land - £812 per hectare per year
- AB10 – unharvested cereal headland - £1072 per hectare per year
- GS6 – management of species rich grassland - £646 per hectare per year
- SW12 – making space for water £1489 per hectare per year
- WD5 - restoration of wood pasture and parkland £371 per hectare per year

A full list of actions can be found here: Overview of CS - https://www.gov.uk/guidance/countryside-stewardship-get-funding-to-protect-and-improve-the-land-you-manage

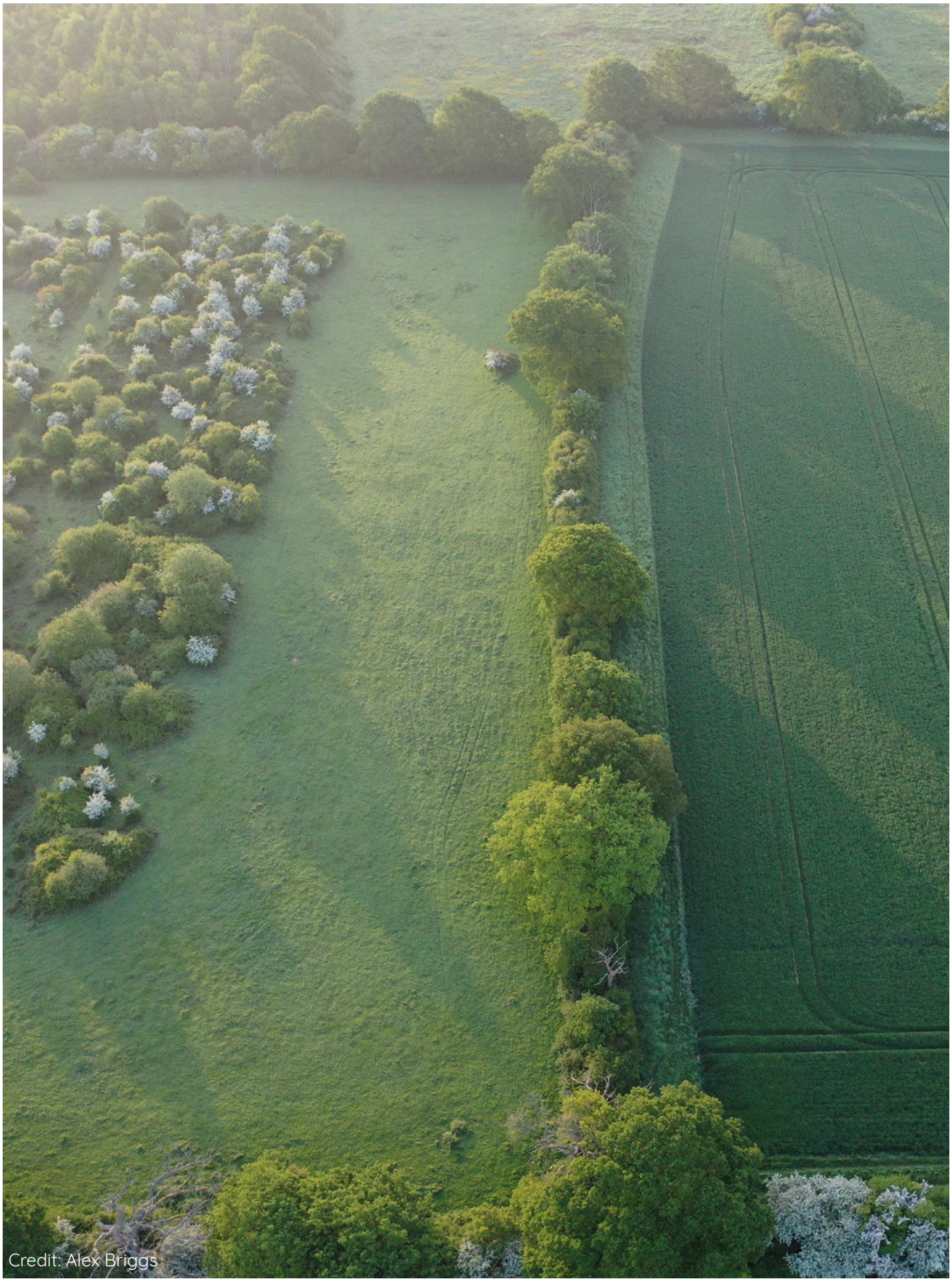
Other government support schemes available to land managers in England

- England Woodland Creation Offer
- Farming in Protected Landscapes
- Farming Equipment and Technology Fund
- Water Management Grant
- Slurry Infrastructure Grant
- Improve animal health and welfare
- Natural Environment Investment Readiness Fund

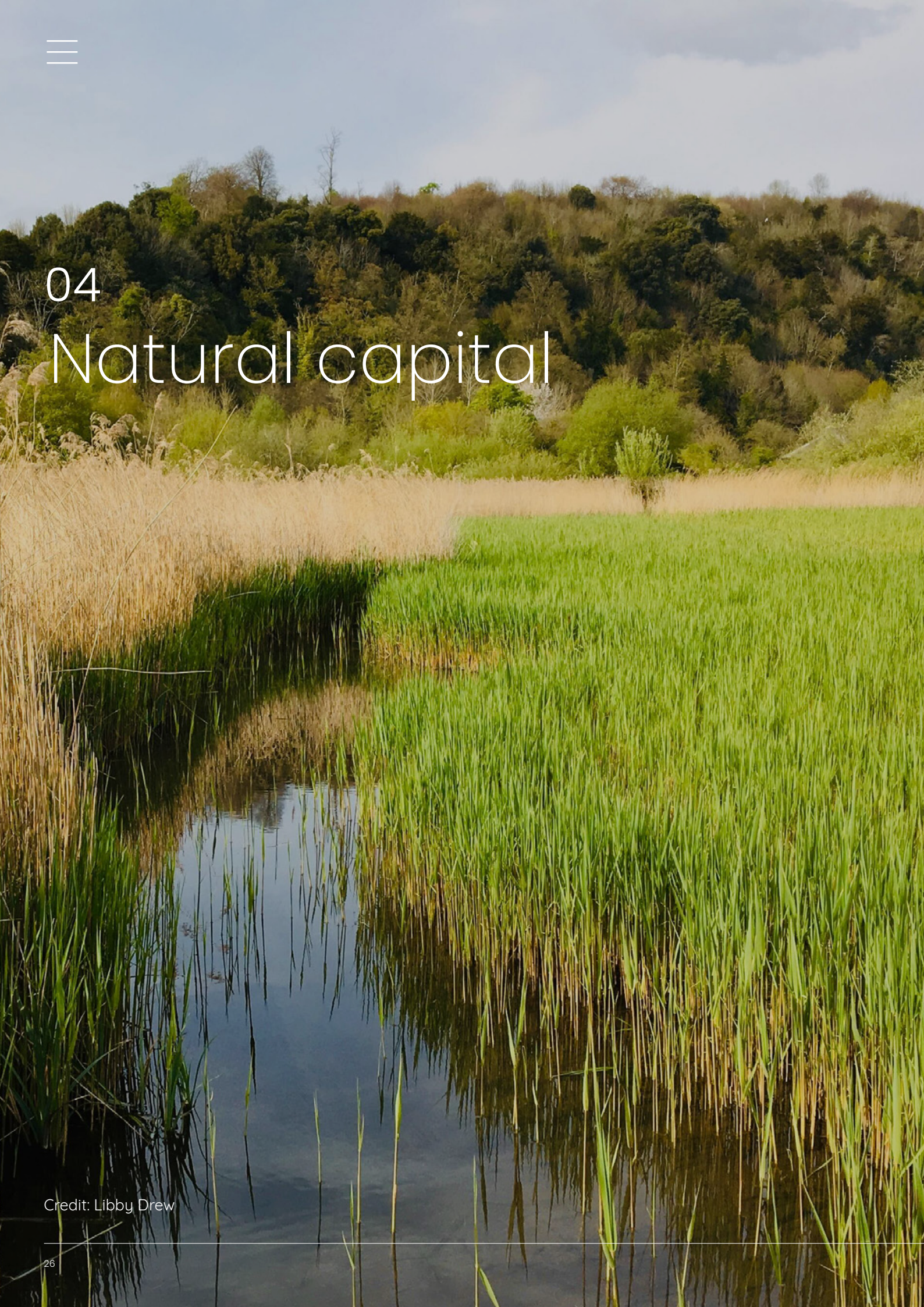
Applying to multiple schemes

You are able to apply for multiple Defra schemes (i.e Countryside Stewardship and Sustainable Farming Incentive) provided that the activities you're paid for under each scheme are compatible and you will not be paid twice for a similar activity on the same area of land at the same time (known as 'double funding').

Actions you are interested in	Government schemes you should look at
Creating a woodland	England Woodland Creation Offer
Regenerative agriculture	Sustainable Farming Incentive
Agro-forestry	Sustainable Farming Incentive and Countryside Stewardship
Creating new habitats	Countryside Stewardship
Creating a cluster	CS Facilitation Funding
Woodland management	Countryside Stewardship
Habitat management	Countryside Stewardship
Landscape scale nature restoration	Landscape Recovery


Credit: Alex Briggs

04
Natural capital



Credit: Libby Drew

What is natural capital? Natural capital refers to nature and the resources it provides – water, soil, air, flora, fauna, minerals etc. Natural capital is a way of understanding that these resources are valuable to society – humans are dependent on nature's resources for our existence.

The natural capital is the tangible natural 'asset' eg a woodland and we use the word ecosystem service to describe the services it provides eg carbon sequestration and biodiversity.

Historically, we have not accounted for our reliance on natural capital, leading to a system that undervalues and extracts from nature to a point that we now face a global climate and biodiversity crisis. Natural capital thinking allows us to see nature as intrinsic to our existence (businesses, well-being etc) and as something we need to invest into in order to secure society's future.

Economic growth has been reliant on the extraction of resources from nature, yet natural systems can provide valuable services as well as resources. Increasingly, investment in these services, known as nature-based solutions, is proving to be a cost-effective method of tackling the environmental challenges we face.

Glossary

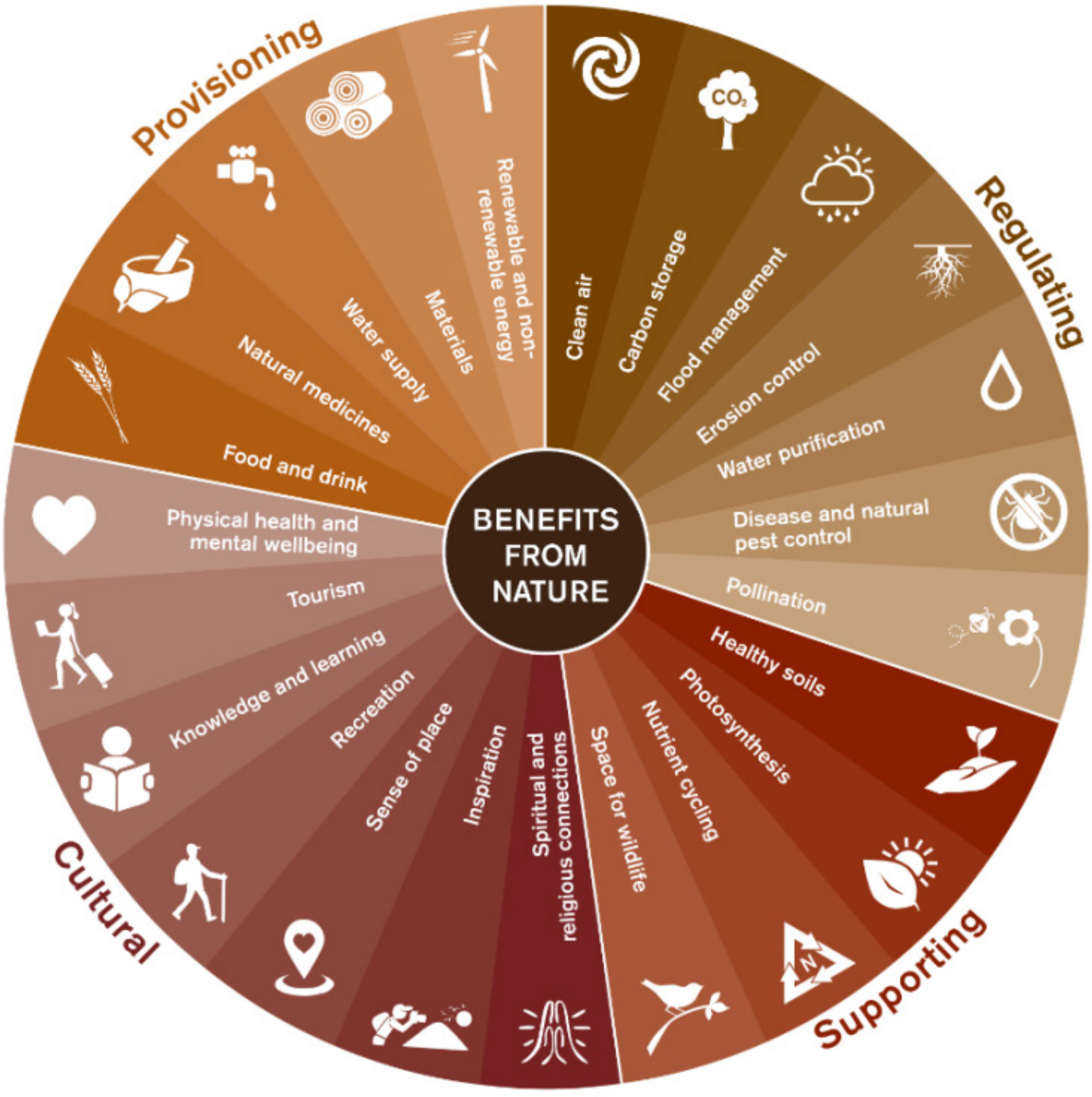
Natural capital - The world's stock of natural resources, including geology, soils, air, water and all living organisms.

Ecosystem service - The benefits to society that flow from natural capital, for example food and fibre, carbon sequestration, pollination, water regulation, recreation and wellbeing.

Nature based solution - Actions to protect, restore and sustainably use ecosystems and natural resources to address social, economic and environmental challenges.

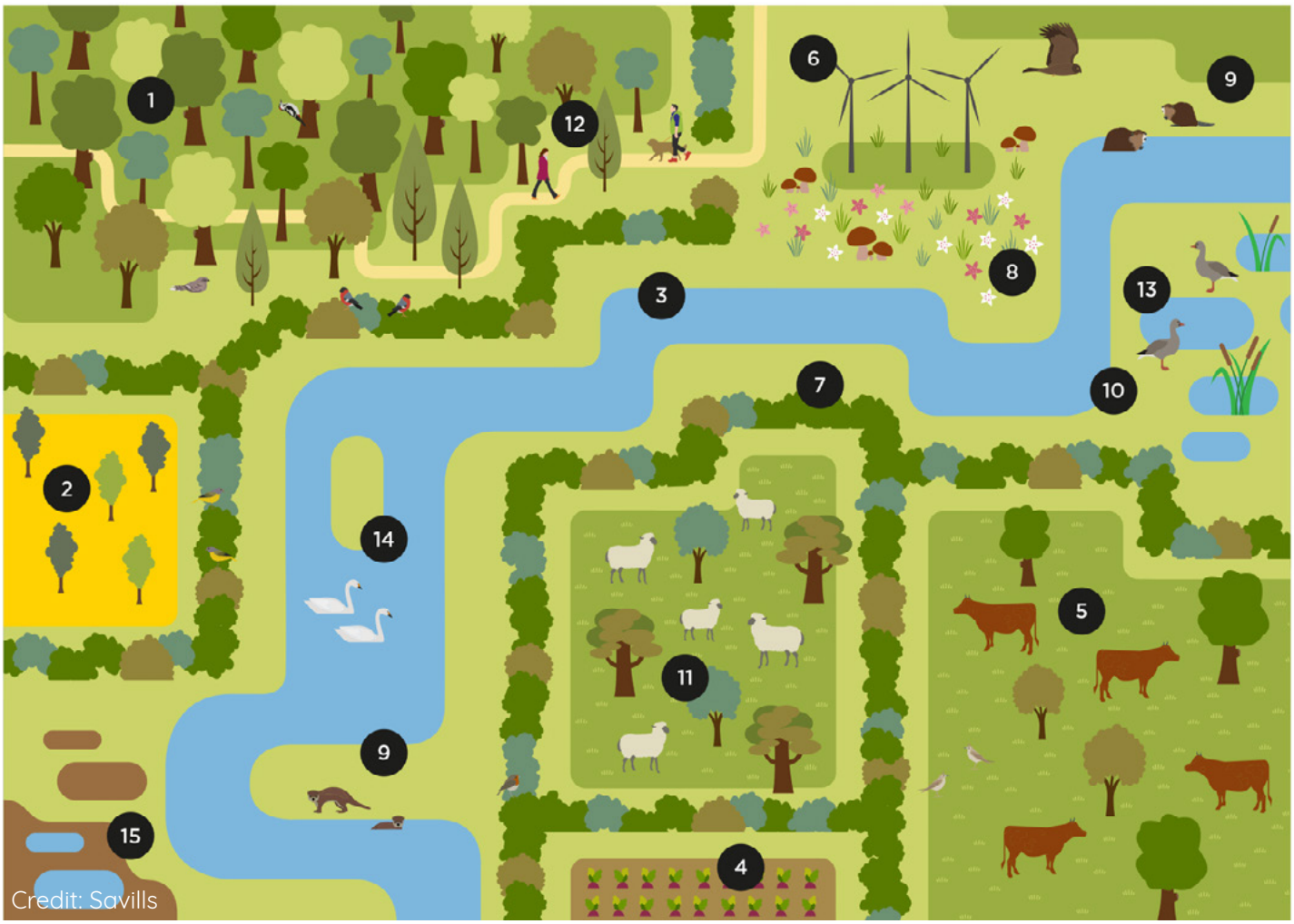
Nature market - A nature market is a system or platform where natural capital and ecosystem services are traded. This can include markets for carbon credits, water rights, biodiversity credits, and other ecosystem services that have economic value. By creating economic value for ecosystem services, nature markets aim to encourage businesses, governments, and individuals to invest in and protect the environment.

Types of ecosystem service:



Credit: Nature Scot

Multiple nature-based solutions can be delivered in one landscape



Credit: Savills

1 Woodland creation

2 Agroforestry/ silvopasture

3 Water cooling/ filtering

4 Food production

5 Adopting regenerative agriculture principles

6 Renewable energy generation

7 Hedge planting

8 Biodiversity provision

9 Species protection

10 Nutrient reduction

11 Building soil fertility

12 Access to green space (public access, engagement and education)

13 Wetland creation

14 Flood management

15 Peatland restoration

Why are we talking about natural capital?

Understanding natural capital enables farmers to assess their own business's environmental resilience as well as possibly benefit from emerging natural capital markets, where demand for certain ecosystem services is growing. Land managers are in a unique position to be able to deliver ecosystem services.

Equally, investing into natural capital and ecosystem services reduces long term operational risks for farming businesses, increasing business resilience. For example, wetland creation holds water within the farmed landscape and reduces the risk of flooding on more productive areas of the farm. Increasing pollinator habitat and soil organic matter also increases on-farm productivity.

The potential benefits of engaging with natural capital, from a farmer's perspective are:

1. Understanding the environmental impact of your own business, and therefore take action to reduce risks and increase the business's environmental resilience.
2. Tap into emerging natural capital markets and harness a new income stream for generating additional ecosystem services.
3. Collaboratively deliver environmental benefits at scale, future-proofing farming businesses and creating resilient landscapes and catchments.

05

Emerging nature markets

Credit: Libby Drew

Nature markets, also known as environmental or ecosystem service markets, refer to market-based mechanisms that aim to provide financial incentives for the conservation and sustainable management of natural resources and ecosystem services. These markets recognise the economic value of the benefits provided by nature and enable transactions that support environmental sustainability.

Who are the buyers in nature markets?

More and more companies are looking to reduce their environmental impacts, either because of targets they have set or because of environmental legislation. This creates a demand for the environmental services that well managed landscapes can provide. Examples of demand drivers include:

- Voluntary environmental targets e.g. net zero emissions target or a nature positive target
- Environmental legislation e.g. Biodiversity Net Gain, Polluter Pays
- Environmental reporting and disclosures e.g. Taskforce for Nature Related Financial Disclosure, Taskforce for Climate Related Financial Disclosure, Corporate Sustainability Reporting Directive
- Social license to operate e.g to increase client and employee retention
- Supply chain requirements – to increase resilience.

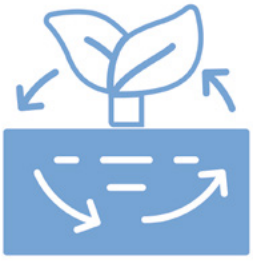
Ecosystem Services

Markets for ecosystem services are emerging and standards, protocols and processes for nature market transactions are in continual development. Nature markets need to be data based and well evidenced, to prove that the money paid into the project is making a measurable difference.

In nature markets, additionality is an important principle which refers to the requirement that a project or action must result in environmental benefits that would not have occurred without the intervention being funded. In other words, the positive impact, such as reduced carbon emissions or enhanced biodiversity, must be additional to what would have happened under a business-as-usual scenario.

Biodiversity net gain

Biodiversity credits



Voluntary carbon markets

Nutrient neutrality

Water neutrality

Natural Flood Management

Water quality

Green social prescribing, public access

Biodiversity Net Gain

Biodiversity Net Gain (BNG) is an approach to development that aims to leave biodiversity in a better state than before. BNG is legislated for in the Environment Act 2021 and is a legal requirement for all developments in England as of February 2024. BNG requires all developments in England to achieve a 10% uplift in biodiversity in order to receive planning permission.

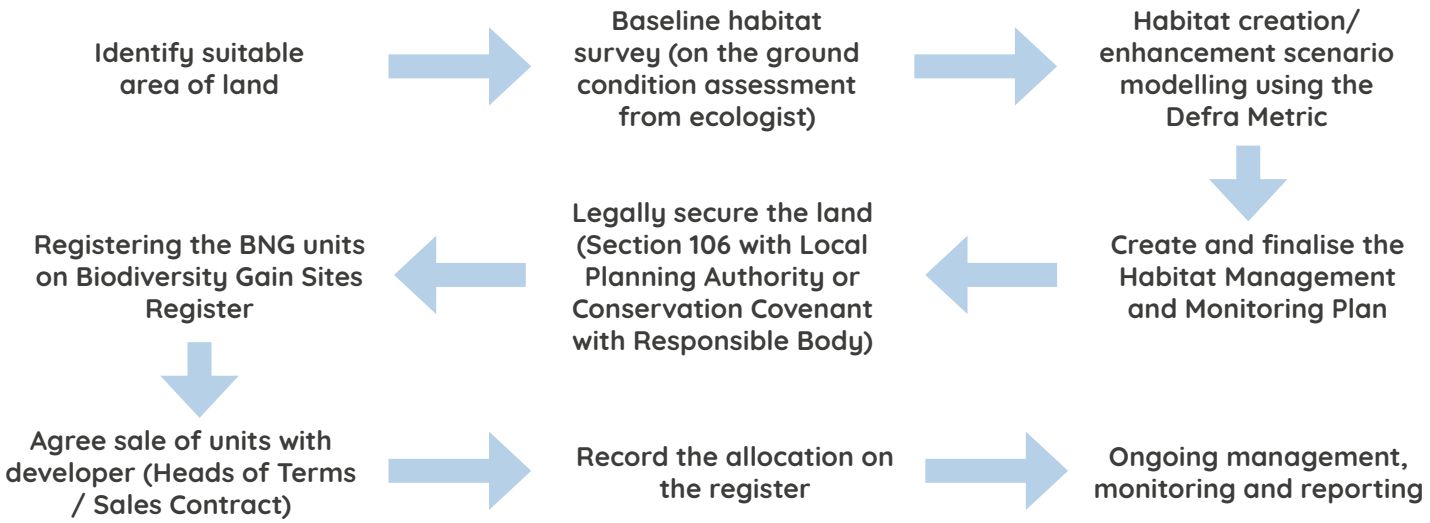
How it works – BNG uses the Defra Metric to measure biodiversity. This metric uses habitat as a proxy for biodiversity. The metric is accessed here. Developers conduct a biodiversity baseline survey of their site, and then calculate how many BNG units will be needed to offset the impact of the development and provide a 10% uplift.

Developers can then choose to either deliver these BNG units onsite or purchase BNG units from an offsite habitat bank. This provides an opportunity for land managers who create habitat banks to sell BNG units and generate an income stream for habitat restoration/creation.

How does a land manager deliver BNG units?

Delivering BNG units from an offsite habitat bank as a land manager is not easy and at this early stage in the market, it comes with certain risks, but BNG is an exciting potential income stream for nature restoration. In terms of BNG unit prices, they range from £20,000 - £60,000, and vary depending on the habitat type created/restored. The amount of BNG units delivered from a piece of land also varies depending on the project, but sits around 2 – 5 units / hectare.

BNG units can be sold to any development, however there is an incentive to deliver the BNG units within the same Local Planning Authority and/or National Character Area as the development, through a favourable multiplier within the Defra metric.



Pros of delivering BNG units

- Creates an income stream for biodiversity
- First step in making the business case for nature in England
- Significant income potential
- Compliance market place – here to stay
- Creates an income stream for less calorifically productive areas of land
- BNG plans can integrate with existing farming practices
- Creates more beautiful / abundant landscapes

Cons of delivering BNG units

- No ‘standard way’ to do BNG yet
- Agreements take time and investment to deliver
- Level of demand unclear (quantity/type/location)
- Relatively small market
- Locationally specific market
- Level of supply unclear
- Dependent on Local Planning Authority capacity
- Incentivises uplift not ongoing maintenance
- Land is legally secured for nature for 30 years
- Taxation of income is uncertain
- Impact on land values is uncertain

Voluntary carbon markets

Carbon can be sequestered and stored through multiple different land uses and nature-based solutions. Woodland creation, peatland restoration and building soil organic matter are the three most established ways of sequestering carbon in the UK, but carbon is also sequestered through planting new hedges, restoring wetlands and saltmarsh, scrub creation and several other land uses. UK nature-based carbon markets focus on leveraging natural processes to capture and store carbon, contributing to the country's climate change mitigation efforts. These markets enable businesses and individuals to invest in projects that enhance carbon sequestration through activities such as reforestation, habitat creation, peatland restoration, and soil management. Participants can buy carbon credits, which represent a certain amount of carbon dioxide removed from the atmosphere.

Using carbon credit income to fund a nature-based solution is possible, however carbon prices are currently not high enough to make the business case for carbon income being the sole project income. Carbon prices currently range from £5 - £100 per tonne of carbon, but it is thought that they should increase over time. Whether carbon will become commodified, with one global price or whether it will remain charismatic with multiple different prices for different types of projects and outcomes, is yet to be determined. Many nature-based projects are baselining their carbon stocks and registering with an existing code with the intention of selling credits in the future once the price of carbon credits increases.

In order to avoid green washing and to ensure that UK carbon markets are high integrity, nature-based carbon sequestration projects go through a process of validation and verification. There are a series of codes and standards set up to do this.

- Woodland Carbon Code
- Peatland Code
- Wilder Carbon
- UK Carbon Code of Conduct
- The UK Soil Carbon Code sets out minimum requirements to appraise existing and future soil carbon codes, standards and schemes.
- A Saltmarsh Code and a Hedgerow Code are also in creation in the UK

There is a lot of ground truthing data and evidence that needs to be collected to provide better information on carbon sequestration within different habitats across the UK. Satellites, drones, soil tests and lidar imagery are just some of the ways we can measure carbon stocks within our landscapes.

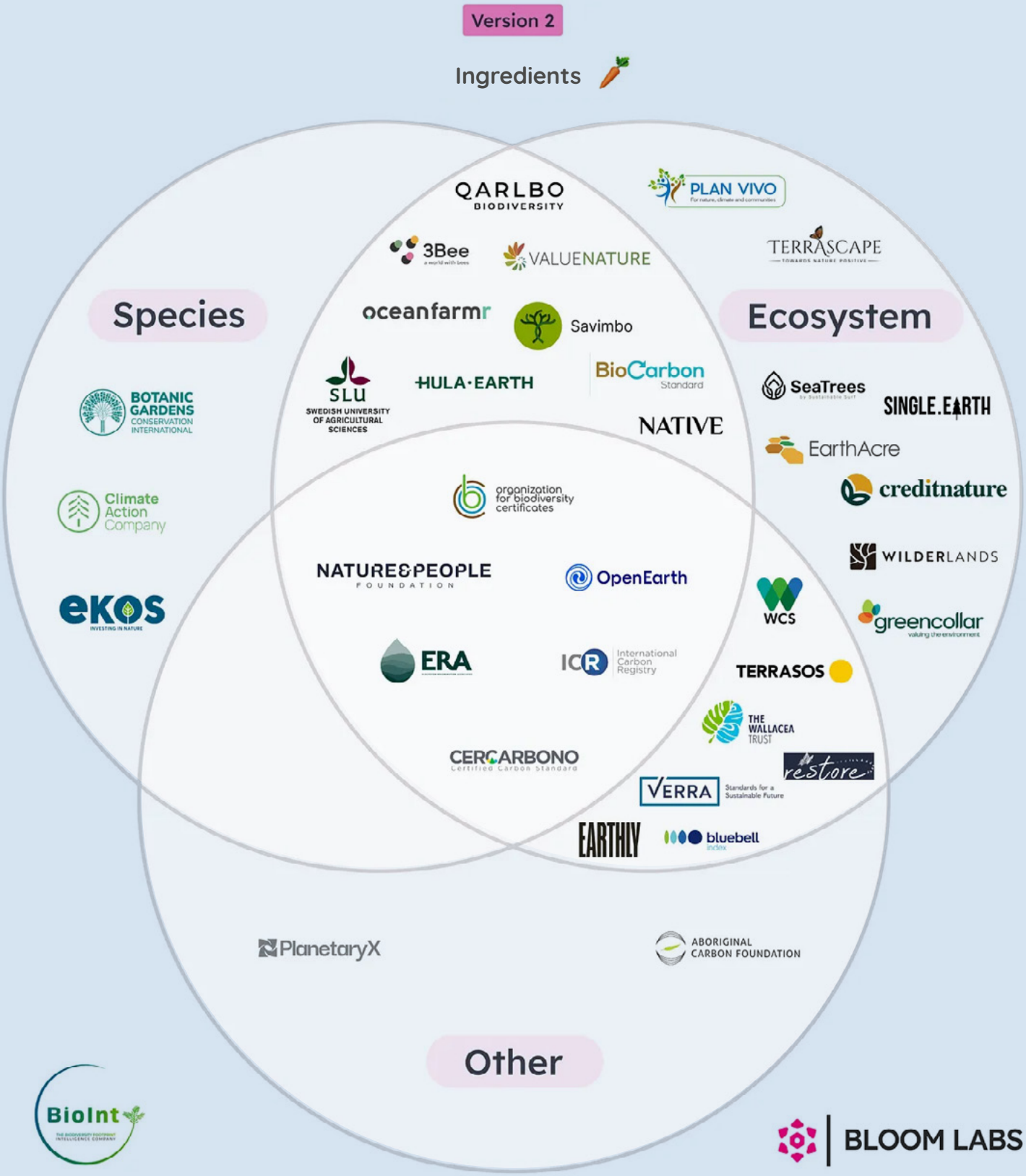
This recently published report on carbon levels within lowland scrub provides a guide for carbon baselining across UK based projects.

Voluntary biodiversity credits

There is growing interest in the potential to sell biodiversity credits into a growing voluntary market. Organisations may be looking to purchase biodiversity credits to fulfil a nature positive target or to offset their unavoidable impact on nature. As more and more companies report on their impacts and dependencies on nature investment into biodiversity may grow. However, the drivers for this market will take a few years to fully kick in and create serious levels of demand. There is debate as to how this market might play out.

There is no standardised methodology for measuring biodiversity for this voluntary marketplace, meaning there are several different organisations developing their own methodologies and verification schemes.

What goes into biodiversity credit calculation?



Credit: Bloom Labs

Nutrient neutrality

Nutrient neutrality is a policy aimed at preventing new developments from increasing nutrient pollution in sensitive environments, particularly in rivers, lakes, and coastal areas in protected areas. This approach ensures that any potential increase in nutrients, such as nitrogen and phosphorus, caused by new housing is offset by measures that reduce nutrient levels elsewhere. The goal is to maintain or improve water quality and protect ecosystems from eutrophication, which can lead to harmful algal blooms and loss of biodiversity.

In areas of the UK where nutrient neutrality is required, for example in the Solent, Tees and Test river catchments and coastal regions such as Poole Harbour, land managers can be paid to provide nutrient mitigation solutions such as wetland creation.

Other opportunities

Applying natural capital thinking to rural businesses which have the potential to deliver significant environmental and social benefit, creates opportunities for re-thinking income streams. Other areas that have potential for monetising ecosystem services include:

Water

- Quantity - land management to restore rivers to better function, slowing the flow and holding more water within catchments and on floodplains reduce the impact of flooding further downstream and also increase landscape resilience to flooding.
- Quality – the creation of wetlands and riparian strips that slow the flow of water and allow for better water filtration can reduce the negative impacts of water pollution. Land managers can also transition to less chemically intensive farming methods to reduce pollutant run off into river courses.
- Companies whose operations are at serious risk from flooding, drought and pollution, are increasingly interested in supporting land managers (whether through payments or other types of incentives) to restore hydrological systems.

Access to green space

The health and wellbeing benefits of access to green space are becoming much better known and prioritised. This creates many opportunities for land managers to deliver important services to people through increasing access. Many of these opportunities can also deliver an income. Examples include:

- Nature tourism
- Green social prescribing
- Care farming
- Forest schools
- School visits
- Volunteer groups

Stacking vs bundling

Stacking and bundling are two approaches to managing and monetising ecosystem services on agricultural or natural lands.

Stacking

Stacking refers to the practice of managing land to simultaneously produce multiple ecosystem services, each of which can be sold or compensated separately. For example, a farmer might establish a woodland along a river to deliver carbon credits whist the woodland also slows, stores and filters floodwater and increases biodiversity. Each of these services - carbon sequestration, natural flood management, and biodiversity - can be sold as separate credits or receive separate payments. The services are distinct and independently valuable, allowing the landowner to "stack" multiple revenue streams from the same piece of land.

Bundling

Bundling involves grouping multiple ecosystem services together and offering them as a single package or product, rather than selling them separately. For example, a project might enhance biodiversity, improve water quality, and provide recreational opportunities. These benefits are bundled together and sold as a comprehensive credit or service. In bundling, the focus is on the holistic value of the combined services, rather than their individual market values.

Key Differences

- Complexity: Stacking can be more complex to manage, as it requires careful accounting and verification of each service separately. Bundling simplifies the transaction by offering a comprehensive package.
- Pricing: It is hard within a bundled model to know what the true value of the product should be, there is a risk of undervaluing the benefits of each ecosystem service as they are combined together.

Selling ecosystem services

Once initial natural capital opportunities have been identified, farmers should seek advice from experts, particularly ecologists who best understand the environmental potential of landscapes. It is at this point that farmers will want to start to identify potential income streams for the ecosystem services they might be able to generate. This will then dictate who they speak to next - it may involve going straight to a purchaser such as a developer, or it may be much easier to initiate those conversations through a Cluster group or organisation such as Weald to Waves, or local agents offering brokerage services. There is a difference here between whether a farmer is just looking for an income stream for the sale of ecosystem services or whether a farmer also requires repayable finance to create those services in the first place (e.g. to cover the costs of habitat creation). This will lead to different conversations with different people.

Next Steps

The next step is to baseline and quantify the environmental uplift that can be generated, either through ground truthed ecological surveys and using models like the Defra Metric or Carbon Codes. Once this has been done, farmers should have a clear idea of exactly what they are offering to the market.

There is no standard legal template for the sale of ecosystem services and defining what a sale looks like is the part of the process that is the least developed and requires the most innovation. Again, working with entities like Weald to Waves will enable farmers to learn best practice and have access to legal experts who can help shape ecosystem sale agreements.

Nature market	Market readiness
BNG	The market is operational, but it takes time to develop and deliver a habitat bank from which to sell BNG units. The level of demand for BNG units from developers is relatively unknown, but as the BNG regulation impacts upcoming developments, demand is likely to become clearer. Over time the shape of this marketplace will become clearer, but it is here to stay.
Woodland carbon	There are growing numbers of woodland creation and peatland restoration projects that are Woodland Carbon and Peatland Code accredited, however very few UK woodland/peatland carbon credits have been sold as many land managers are banking credits until carbon prices rise.
Biodiversity credits	The theory around this marketplace is continually establishing, however the drivers for the purchase of UK based biodiversity credits will take some time to create a significant level of demand. Whether demand for biodiversity offsetting is likely to come from a voluntary marketplace or whether the focus will remain within company's supply chains is yet to be seen.
Nutrient neutrality	Where nutrient neutrality is relevant, transactions are happening between offsets sites and developers. However, the market is relatively small and there are questions over the efficacy of certain offsets - currently they tend to operate on more of a bespoke project by project basis.

Final thought

Natural capital is a fundamentally new way of understanding our farming businesses, and with it comes new opportunities. However, a word of caution - many of these opportunities are still fledgling and require innovation and early adopters to work out what best practice could and should look like. If you are not prepared to take on the level of risk that comes with early adoption, the best thing to do for the time being is ensure you understand the marketplace and it's fundamentals and engage with local collaborative clusters and large scale networks where you can learn more and hear from case studies. Don't rush into anything and don't let the tail of natural capital markets wag the dog of land use change. Make sure your land management decisions are contextualised within your own landscape and your own business.

Recommended reading on natural capital and emerging nature markets:

- Green Finance Institute Introduction to Nature Markets
- Finance Earth have some good publications here
- Carbon Pulse's newsletter, one of which focuses exclusively on biodiversity
- Bloom Labs page is good for more in detail biodiversity market analysis.

Credit: Alex Briggs

06
Supply Chain Sustainability

Credit: Alex Briggs

Another driver of change for farming businesses is the food supply chain. Many farmers sell direct into food supply chains, and food retailers are becoming increasingly interested in sustainability which in turn creates opportunities and risks for producers.

Food supply chains care about sustainability because they want to ensure long-term resource availability, reduce environmental impact, and meets consumer demand for ethically produced goods. Sustainable practices help maintain soil health, conserve water, and minimise carbon footprints, which are crucial for the resilience and efficiency of food production. Additionally, sustainability in supply chains enhances brand reputation, complies with regulatory requirements (such as net zero targets), and can lead to cost savings by optimizing resource use and reducing waste.

UK supermarkets such as Tesco, Sainsbury's, Waitrose, Marks & Spencer and Morrisons have committed to supporting regenerative agriculture as part of their sustainability efforts. The key question is how this plays out for farmers – will farmers be paid to deliver regenerative farming, or will they be expected to? In other words, will regenerative farming become a opportunity for value add for farmers or become a condition of market access to the supply chain.

This is something for farmers and producers to be aware of as we watch sustainability targets play out across supply chains.

07
Working collaboratively

Credit: Libby Drew

Change can be risky, it often requires upskilling and additional capacity. Working collaboratively is one way to make this easier.

The rise of the cluster

UK farming clusters are collaborative groups of farmers, landowners, and sometimes other stakeholders who work together to achieve shared environmental and agricultural goals across a landscape. These clusters are designed to address issues such as biodiversity conservation, soil health, water management, and sustainable farming practices on a larger scale than individual farms could achieve alone.

Clusters are often either self-funded or funded by Defra's Facilitation Fund.

Operating at a cluster scale is beneficial not only for the landscape but also for individual farmers looking to leverage emerging nature markets as being able to deliver ecosystem services at scale is often more attractive for large scale investors / buyers. It also means farmers can share knowledge and use the cluster to broker deals, operating in a cooperative model. An example of this is the Environmental Farmers Group.

New green skills

Doing something different or changing the focus of a business often requires new skills, particularly when the change is in an emerging area such as nature markets or regenerative agriculture. There is a huge opportunity for the rural sector to broaden its employment through bringing in people with new, diverse skills and knowledge to support exciting new projects.

A future UK green economy must have the rural sector and nature-based solutions at its heart. It is worth thinking broadly when assessing which skills you may require for a new project. This is an opportunity to repeople the rural sector and encourage people from non-rural backgrounds to seek fulfilling careers in delivering nature-based solutions.

Types of skills required for new projects:

- Facilitators
- Drone flyers
- Data analysts
- Financial modellers
- Ecosystem brokers
- Community engagement experts
- Ecologists
- Hydrologists

Another way to bring new skills into businesses is through volunteering. Volunteer networks across rural businesses are growing and are great opportunities to engage and empower local communities whilst also benefiting from volunteer time and skills.

Credit: Alex Briggs

08
How to do this stuff

Credit: Libby Drew

Deciding what to do on your rural business can be daunting, and making sense of all the changes within policy, regulation and markets is complex. Particularly when no two rural businesses are the same, each comes with its own context and opportunities.

The responsibility of being a land manager and deciding what happens to a parcel of land is significant. Importantly, change can't be rushed as land management is a long-term process and decisions are made for decades not for days. However, this responsibility is an incredibly exciting one, particularly at a moment when rural land management is the key to delivering nature-based solutions that society really needs right now.

Who can help you

Firstly, seek advice – there are lots of well-informed subject matter experts ready to help with land use decisions. Some are paid and some offer advice and help for free. Below are some examples:

- Farming organisations – CLA, NFU, AHDB, Soil Association, Nature Friendly Farming Network, Pasture for Life
- eNGOs – Weald to Waves, Wildlife Trusts, RSPB
- Government organisations – Natural England advisors, Forestry Commission
- Land agents
- Agronomists, farming consultants
- Regenerative farming companies
- Forestry advisors
- Ecologists
- Local biodiversity recording groups
- Resources from other farmers and land managers – visiting other projects, learning from case studies, YouTube channels, books, films and social media accounts

It's important to incorporate a broad range of views and advice in order to inform your decision making, everyone has a particular view, collating these perspectives and feeding them into your final decision is the land manager's ultimate responsibility.

Understanding what you've got

The best place to start when looking at doing something new or making a land management change is to make sure you know exactly what you're working with, from a land perspective. In other words, you need to fully understand your natural capital. Chances are, as the land manager, you already have a pretty good understanding of what you've got, the condition it is in and where there's room for improvement, but its worth formalising this knowledge as a type of baseline.

Maps are a good starting point, using mapping layers and models from organisations such as the Land App to understand where best to focus on change. It's important to think within the context of the whole farm and broader landscape, thinking strategically about what is the best land use where and what changes you might like to see - where would you like to restore and create new habitats for example, or which part of your farm floods the most and how might you be able to fix this with natural flood management techniques?

What do I need to know?

1 **Geology** – this underpins everything you might be able to do on your land, it will dictate what types of habitats could be on your land, how water will flow across land and what you might be able to grow.

2 **Hydrology** – understanding and mapping where and how water is flowing across your land, knowing which catchment your land is within.

3 **Current land use** – which parts of the business are in arable, grassland, woodland or other habitat types, in particular priority habitats that may exist on your land holding.

4 **Designated habitats** – any habitat-based designations such as SSSI, SAC or SPA.

5 **Protected species** – any species protected by legislation such as the Wildlife and Countryside Act, 1981.

6 **Land history** – its helpful to know the history of the land you are managing – what was it once and how has it ended up as it is? A helpful free resource for understanding this is the National Library of Scotland's side by side online map which allows you to compare two maps with a large range of historical maps to choose from.

7 **Problem areas** – it might be helpful to list out the problems within your land management system, for example crop areas which aren't productive or struggle to achieve the margins you would like, areas that flood a lot or are at risk of wildfire, areas of woodland impacted by disease, areas you'd like to graze but require fencing, the list goes on. These may become priority areas for action.

8 **Carbon calculation** – it can be helpful to understand your operations through the lens of carbon accounting, in order to understand the risks of your business. Using a free carbon calculator like the Farm Carbon Toolkit provides an overview of which parts of your business emit the most carbon and which are the best carbon sinks. This is a helpful exercise if you want to increase the efficiencies of your business as often reducing carbon emissions correlates with reducing your input costs. This is an essential exercise if you are interested in selling carbon credits as its important to ensure you are operating at net zero emissions before you sell carbon credits to an external buyer.

9 **Skills and capacity** – one of the most important things in undertaking a new approach or project is that your business has access to the right skillsets, knowledge and critically, the capacity to undertake the work. Without this, the project won't be as successful as possible.

Deciding what to do

Actually deciding what to do will come down to a variety of factors. There are likely to be trade-offs to consider, and multiple scenarios to model. Below are some examples of these types of factors.

Making the business case

As rural businesses, whether or not a new initiative/management practice/project/strategy is viable comes down to the fundamental question of whether it makes financial sense. Below are some of the key opportunities for income, although the list is not exhaustive. Many of these income opportunities can be stacked on top of each other, although some can't.

Income opportunities

- Crops / livestock products into supply chains
- Crops / livestock products sold direct to customer
- Sustainable Farming Incentive
- Countryside Stewardship
- Landscape Recovery
- Biodiversity Net Gain
- Nutrient neutrality
- Carbon credits
- Eco-tourism
- Education
- Tenancies
- Partnerships – livestock partnerships or joint ventures etc
- Development – housing or renewables

Once you have decided

Once you have decided on the most appropriate scenario, it is important to think about the data you want to collect to demonstrate the changes your new project is making. For example, if you decided to do a habitat creation project you will need to baseline the area in its current state and then decide how to monitor how the habitat will change over time. This is important to demonstrate the impact of your project, particularly if you want to sell the ecosystem services your project is creating. Equally, for regenerative agriculture, its important to work out your Key Performance Indicators which you will measure as you transition to regenerative farming in order to inform your management decisions and confirm what you are doing is creating the impact you hope it would.

Ecological baselines and monitoring change

*Why carry out **ecological surveys?***

Ecological surveys provide detailed information and understanding of the habitats and the species within a given area. They are usually carried out in response to a proposed development, a change in land use, or nature restoration goals. Their purpose is to provide an objective view of the status of an area and its wildlife, against which potential impacts of changing land use can be assessed and mitigated for, or opportunities for wildlife enhancements identified. Repeating ecology surveys at regular intervals allows us to monitor changes in habitat condition or species populations over time, acting as an evidence base for positive or negative outcomes.

*What are **ecological surveys?***

Ecology surveys can be broadly divided into two categories; habitat and vegetation surveys which characterise the type and status of habitats or plant communities, and wildlife surveys which determine the presence of particular species or wildlife groups. A single type of ecological survey is unlikely to tell you everything about the ecology of a site. For example, a winter bird survey will only sample the presence or absence of bird species within a given window of time, whereas a breeding bird survey will gather evidence of species breeding activity through multiple visits to a site. The value is often in the summarising report which interprets and presents an overview the findings, highlighting important discoveries and any potential issues. An ecological assessment will combine various survey methods to provide a more comprehensive understanding of the wildlife and habitat condition on the land.

*Why follow **standard survey methodologies?***

Standard ecology surveys involve the use of systematic methods that are objective, repeatable and effective at gathering the required information. Professional ecology surveys involve trained fieldworkers implementing industry-standard methodologies. Applying the right survey technique is crucial for gathering data which accurately reflects the subject at hand, and it is important that the ecologists follow the same rigorous approach so that results can be compared between sites or to any future surveys.

*What **surveys should I do?***

Choosing the most appropriate type of survey depends on the specific landowner's goals and objectives. A good approach is to outline the specific question (or questions) being asked, as this will help narrow down the data and evidence needed, and therefore the methods required to sample that data. An experienced ecologist will help determine the best approach and confirm whether a one-off rapid survey is needed, a more in-depth study involving multiple visits, or a regular programme of monitoring. For an in-depth understanding of land parcels and the habitats present, a habitat survey is generally a good starting point. A habitat classification survey, such as UKHabs or Phase 1 will provide maps and information classifying the habitats present, allowing a better understanding of the land. An Extended Phase 1 Survey assesses the potential of habitats to support protected species and those of conservation concern, flagging the appropriate wildlife surveys to follow up with.

For example, if your goal is to restore a specific area of species-rich grassland on a site, then a National Vegetation Classification (NVC) survey might be appropriate, providing detailed botanical maps, summarising and outlining the extent of the different plant communities. If restoration of all the habitats is the aim, then baseline habitat condition surveys for each habitat type would document a baseline and provide evidence against which future changes can be measured. If a goal was to evidence change in populations of Great Crested Newt, then annual surveys during the amphibian breeding season would be most appropriate.

When?

It is important to plan ecology surveys well ahead of time, as certain habitats and wildlife groups are seasonally active, meaning they can only be accurately assessed at certain times of the year. If you miss the seasonal window for a survey, you will then need to wait for the following year. Wildlife surveys typically take place during the spring and summer when most species are actively breeding. The optimal period for most vegetation and habitat surveys is typically between May and September when flowering is at its peak. There are a few exceptions where surveys are most appropriately done in the winter, such as bat hibernation checks and winter bird surveys, and a few surveys can be completed at any time of the year.

*How **frequently?***

The frequency of a survey depends on the subject matter being studied and the available resources. Some surveys might only require a single visit within a summer season, others could require multiple or regular visits to the site to collect a representative sample. When beginning a programme of habitat or wildlife monitoring, collecting baseline data is key to provide the evidence base for comparisons in future years. Baseline surveys generally do not require repeating every year, as the habitat or species needs sufficient time to respond to the changes on a site for any effects to be detectable. Being consistent in the survey approach and effort is important in ensuring results are comparable over time.

Who?

Ecologists tend to have varied skill sets and different specialisms due to the broad nature of ecology as a subject. An experienced ecologist will be confident in their approach to the chosen methodology, and sufficiently competent at species identification of the taxonomic group being surveyed. This person could be a professional ecologist, an unpaid expert amateur, or a volunteer who has received specialist training in a particular survey technique. For surveying European Protected Species, a surveyor is required to hold an appropriate class survey license issued by Natural England. Bottle trapping surveys for Great Crested Newts, Hazel Dormouse nest box checks, or roost checks for any bat species all use different methodologies and require a separate wildlife licence. For specialist surveys relating to Biodiversity Net Gain purposes, experienced professionals with the appropriate training must be employed.

Target	Survey type	Notable Points
Habitat Classification and Condition	• National Vegetation Classification (NVC) • Phase 1 Habitat Survey • UK Habitat Classification System (UKHabs) • Habitat Condition Survey	Only requires a single visit, with results usually valid for two consecutive years depending on the habitat type. May require in-depth quadrat surveys by an experienced botanist.
Plants	• National Vegetation Classification (NVC) • Rapid Assessments • Targeted Species Survey • Freshwater Macrophyte Survey	Usually only requires a single visit by a competent botanist, additional effort may be required to sample the early spring species. NVC requires in-depth quadrat surveys by an experienced botanist.
Landscapes	• Fixed Point Photography • Drone photography • LiDAR vegetation survey	A standard camera on a fixed post is sufficient, or an aerial drone with GPS. A LiDAR sensor mounted drone will require professional expertise.
Large Mammals	• Camera Trapping • Field Signs and Tracking: Badgers, Otters, Water Voles, American Mink • Deer Impact Assessment • Deer Exclusion Zones	High quality trail cameras which can withstand low temperatures work best deployed by experienced fieldworkers. Drones with infrared sensors are often used for deer surveys.
Small Mammals	• Small Mammal Live Trapping • Hazel Dormouse Nestbox Checks • Hazel Dormouse Footprint Tunnels and Nut Searches • Harvest Mouse Nest Searches	Hazel Dormice are a European protected species and require a licence to survey, although the passive methods of footprint tunnels and nut searches do not require a license. The trapping of shrews also requires a license.
Birds	• Common Bird Census (territory mapping) • Breeding Bird Survey (fixed transects) • Winter Bird Survey (fixed transects)	Territory mapping surveys are the ideal approach for estimating the number of breeding birds an area is supporting. The optimum method often depends on size of survey area and resources available.
Reptiles	• Reptile Refugia Survey	Artificial refugia are made of cut roofing felt and placed in appropriate areas by experts. Smooth Snake and Sand Lizard are European protected species and require licenses to survey.

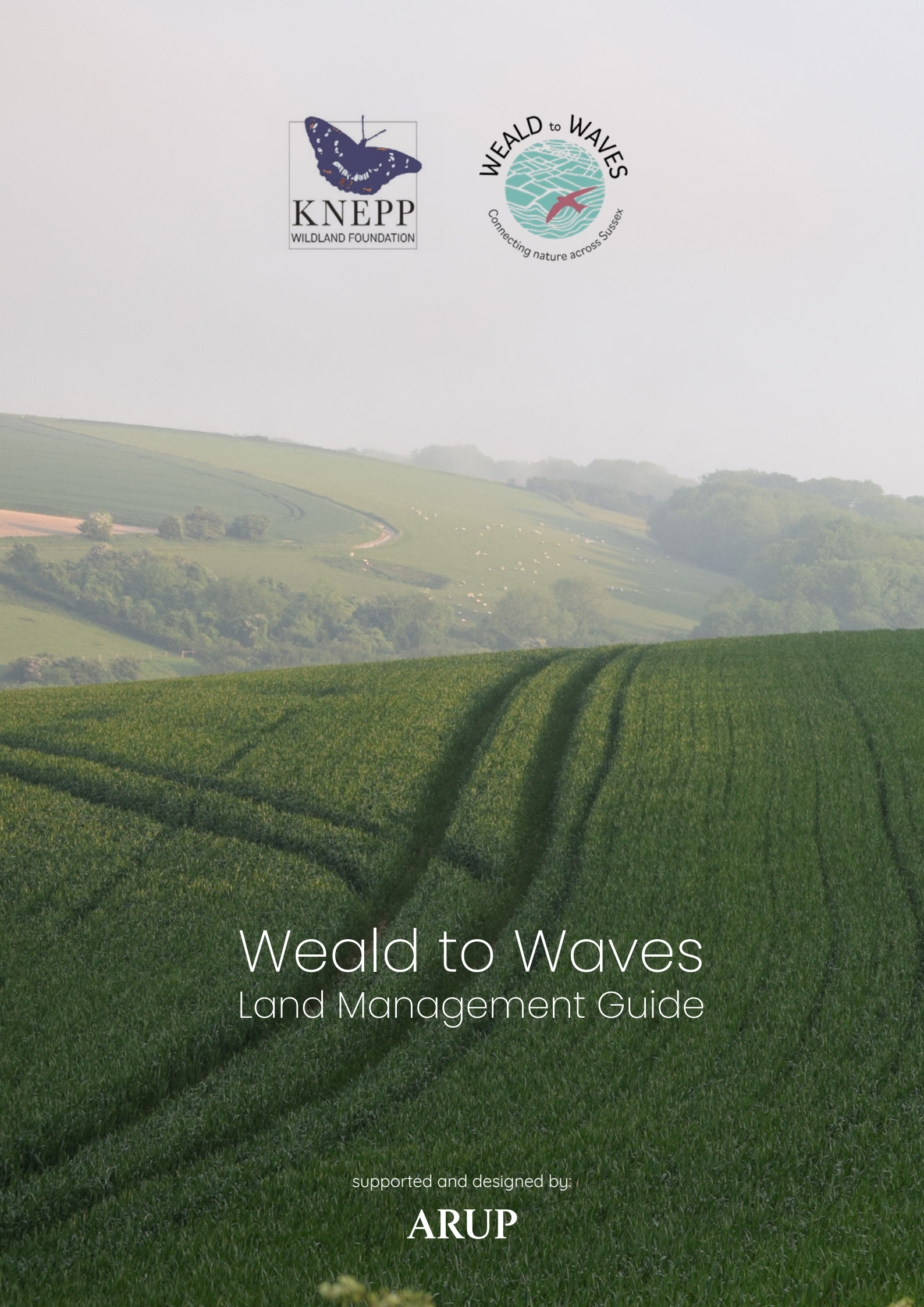
Target	Survey type	Notable Points
Amphibians	• eDNA • Great Crested Newt Habitat Suitability Index (HIS) • Newt surveying (Bottle trapping, torching, netting, egg searches, terrestrial searches) • Natterjack Toad Survey	Crested Newts and Natterjack Toads are European protected species which require a license to survey. eDNA sampling and the HSI assessment are non-invasive survey methods so do not require a licence.
Fish	• Electrofishing Survey	Electrofishing samples fish populations to determine abundance, density and species composition. It requires trained operatives using specialist equipment.
Bumblebees	• Bumblebee Transect	A fixed walking route for recording species and abundances. The transect is walked on a regular basis, ideally every month.
Butterflies	• Butterfly Transect	A fixed walking route for recording species and abundances. The transect is walked ideally on a weekly basis, or fewer visits targeting peaks in the survey season, depending on available resources.
Moths	• Moth Trapping	Overnight trapping with a UV light directing moths into a container where they can be identified and counted. Mercury Vapour light traps are considered the most effective method.
Terrestrial Invertebrates	• Sweep Netting • Beating Tray • Suction Sampling • Pitfall Trapping • Targeted Species Counts (Mark-recapture)	Terrestrial invertebrate surveys require a competent entomologist with experience in a variety of sampling techniques and identification to species level for multiple invertebrate groups.
Soil	• Soil Nutrients and pH • Soil Organic Matter/Carbon • Soil Structure • Soil Texture	Soil sampling and analysis can provide useful information about mineral, structural and biological health, and comparisons between land parcels.
Hydrology	• Hydrogeological Mapping • Groundwater Dependent Terrestrial Ecosystems (GWDTE) Assessment • NVC Communities Mapping • Water Table Depth	Due to the seasonal patterns of water availability, multiple survey visits may be required to fully understand the dynamics of the ecosystem.

Sussex ecology survey season calendar

Sussex ecology survey season optimal timings by month.

Survey type	January	February	March	April	May
American Mink (trapping)					
Amphibians					
Badgers					
Bat activity					
Bats (roost)					
Bats (hibernation)					
Birds (breeding)					
Botany - NVC					
Botany - Rapid assessment					
Bryophytes					
Bumblebees					
Butterflies					
Clearwing moths					
Dormice					
Fish - electrofishing					
Fungi					
Habitat survey - Phase I					
Habitat survey - UKHab					
Habitats - Condition assessment					
Invasive plant species					
Invertebrates - Freshwater					
Invertebrates - Terrestrial					
Lichens					
Moth trapping					
Nightingales					
Otters					
Reptiles					
River habitat condition					
Water Voles					
White-clawed Crayfish					
Wildlife Recording Events					

June	July	August	September	October	November	December



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