RETHINK FARMING

A PRACTICAL GUIDE FOR FARMING, NATURE & CLIMATE

Nature Friendly Farming Network

FOREWORD

Martin Lines

UK Chair, Nature Friendly Farming Network

Farming is facing its toughest test yet: one where biodiversity is being lost from our fields, the UK market is jolted by post-Brexit adjustment, consumer demands are changing and the harsh realities of climate change are becoming even starker.

The latest UK climate projections suggest an additional 0.6°C of warming between now and 2050, on top of the one degree we have already exceeded since pre-industrial levels. Along with this, summer rainfall is projected to decrease by 22% and winter rainfall to increase by 12% by the 2080s, with a rise in sea level of between 3 and 37cm across the UK. These risks will only exacerbate the ongoing degradation of the UK's natural environment, which has the lowest level of biodiversity among G7 nations.

As global temperatures increase, future adaptation will be futile and our world will suffer increasingly volatile and extreme weather events, which will negatively impact our natural resources, remaining biodiversity and food security.

What is increasingly apparent is how the role of farmers, crofters and land managers must evolve to one that urgently delivers on nature recovery and climate mitigation, alongside producing healthy and nutritious food.

COP26 - when UN delegates meet in Glasgow to discuss a global response to the climate crisis – presents a pivotal moment when a shared pathway will be agreed for limiting global temperature rise within 1.5°C. In doing so, the UK Government has been clear that any action must also protect and restore nature. Ahead of this, we are offering a series of solutions in areas where farming can strengthen adaptation and build resilience to climate impacts.

For our sector, this is crucial.

Nature is farming's greatest resource – one which supports the foundations of a successful business. If we do not reverse biodiversity's declines and accelerate species recovery, then farming will cease to be profitable or sustainable.

Making space for nature on farms and crofts is no longer an option - it is a necessity.

The actions presented in this report highlight how nature-based solutions can help elevate our climate and biodiversity ambitions in seven areas where farming is integral: Soil, Water, Biodiversity, Carbon Management, Landscape Approaches, Food Quality and Prosperity.

The case studies in this report clearly show how farming can deliver for environmental restoration, climate mitigation and the rural economy – while making better business sense in the process.

These food producers, among a growing number across the UK, are addressing rapidly degrading soil health, minimising chemical waste, protecting water quality, adopting low input systems, reducing their carbon footprint, improving carbon sequestration, enhancing wildlife, restoring habitats and mitigating flooding. These regenerative and agroecological practices, among many others, can make positive long-term changes that our society desperately needs.

It is now up to Governments across the UK to deliver policies that will support the sector in scaling up climate and nature-friendly systems through financial incentives and environmental schemes which empower inclusive action.

These actions must be 'Bigger, Better and more Joined-Up' to deliver restoration at scale. We must work together to find innovative ways of coordinating efforts in multiple areas of delivery so we can establish coherent and resilient ecological networks that allow nature and people to thrive.

If farming is to stand resolute against an unpredictable future and urgently transition to whole farm system approaches, then we need clarity on public spending commitments and active support from consumers.

We have reached a critical moment in time. If we don't embrace on-farm solutions to address the biggest joint crises of our time, then farming itself will struggle to build the resilience necessary to adapt to a warming world.

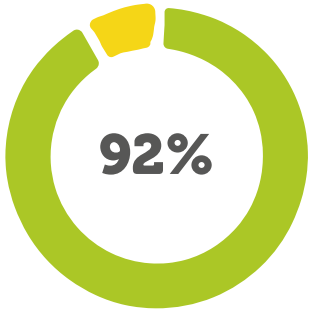
What are we waiting for?

Image: ©Sorcha Lewis

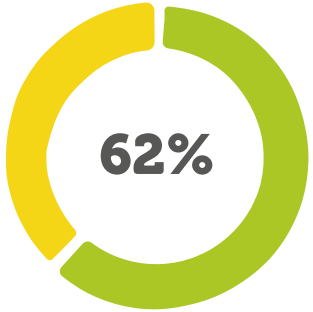
SUPPORT FOR CLIMATE MITIGATION AND NATURE RECOVERY ON UK FARMS

New research conducted by the Nature Friendly Farming Network amongst 726 of their public and farmer members reveals demand for climate- and nature-friendly farming. The results show overwhelming concern about how climate change and biodiversity loss will affect UK farmers and public support calls for the sector to do more to address climate change and wildlife losses.

What Farmers Think

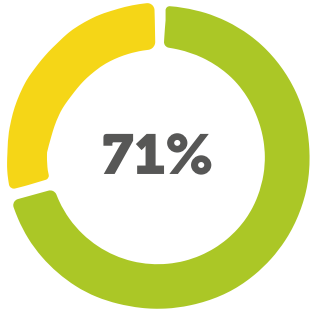


of farmers are concerned about the effects of climate change and 86% are concerned about the effects of biodiversity loss on their business

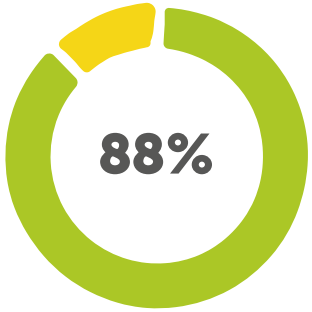


are worried that the climate and nature emergencies could result in farmers going out of business compared to 3% that are not at all worried

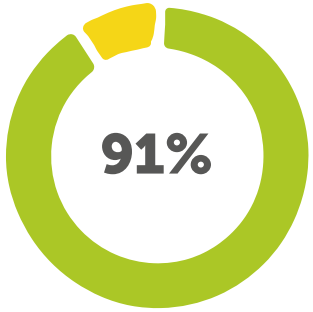
think nature-friendly farming can support climate mitigation and restore biodiversity



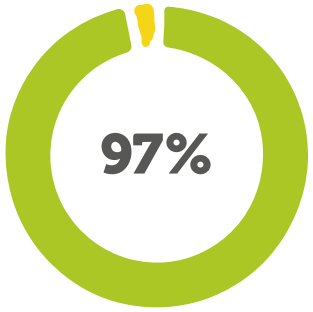
do not think the industry is currently equipped and resourced to address climate and nature loss at the same time as sustainably producing food at scale



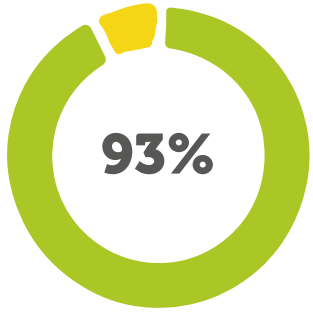
think farmers need to be better encouraged to enter environmentally ambitious schemes to meet net-zero targets and to reverse biodiversity loss



think working with nature will help farms achieve long-term viability



think consumers need to be better educated about the value of natural assets on farms, including how their successful management is a public benefit



think food labels should clearly identify production measures

What The Public Thinks

of people want farming to do more to address climate change and biodiversity loss, with 97% thinking nature-friendly farming is a solution

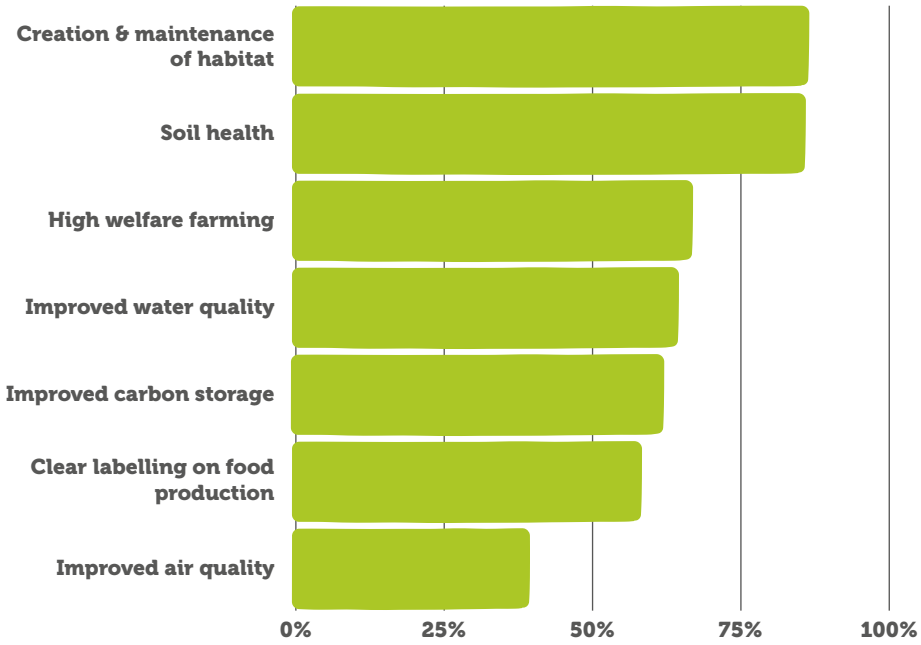
are concerned about how climate change will affect UK farmers

want to see public money support farmers in storing carbon, improving soil health, restoring nature and protecting water quality

want environmental standards that mitigate climate change, protect habitats and restore nature to be enshrined in law

The majority (over 50%) want to support habitat creation, soil health and high welfare farming as a priority

Public Priorities



Soil

"The difference between dirt and soil is: Dirt is dead. Soil is alive."
Donna Maltz

Healthy soils are the life force of a thriving farm business. The ground beneath our feet is key to feeding us, supporting biodiversity and storing huge amounts of carbon. But despite soil's ubiquitous presence on every farm across the UK, our soils are damaged by practices that have diminished its fertility, health and biodiversity. As our soils are threatened, so too, is farming's ability to maintain food production and profitability.

- In England and Wales, it is estimated that soil degradation has led to increased costs of up to **£1.4 billion** per year with 2 million hectares affected by erosion and 4 million hectares suffering from compaction
- Between 1978 and 2003 it is estimated that soils in England and Wales have lost soil carbon at a rate between **0.6% - 2% per year**
- **Studies** have found that the soils under gardens and allotments are healthier than the average intensively managed arable farm
- In Northern Ireland, only **18% of soils** are at optimum fertility for phosphorus and potassium
- Intensive farming has caused arable soils to lose 40-60% of their organic carbon through relentless tilling and disturbance

30

football pitches are lost in the UK every minute due to soil degradation

5%

of the UK's carbon emissions are a result of the degraded state of peatland soils

Image: ©Sorcha Lewis

On-Farm Solutions

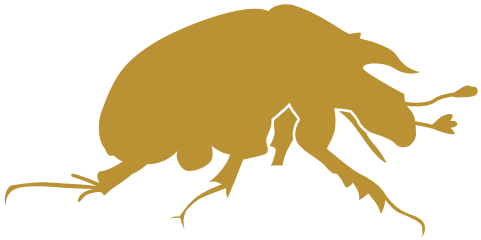
As farmers, we have a major role to play in ensuring our soils are fertile and resilient.

Building soil health leads to improved plant and animal health, water quality, reduced risk of flooding, higher carbon storage, reduced pest and disease pressures, and resilience to extreme weather due to climate change.

In periods of drought or flooding, healthy soil is our greatest ally. Due to soil's organic matter, it can naturally store water essential for nature and food production in dry periods. During heavy rainfall, it can soak up and slow down the flow of water. Organic carbon in healthy soil can store up to 10 times its weight in water and is an excellent food source for the many microorganisms that build soil structure. Thriving biodiversity beneath the soil is as much a form of livestock as the life above ground. Earthworms, in particular, are vital in creating pores within the soil, so water can filter easily without pooling on the surface, which leads to run-off or erosion.

We can help improve soil quality by using nature-friendly techniques that are proven to regenerate soil health, such as, but not limited to:

- Undertaking routine soil analysis
- Testing soil organic matter levels
- Establishing green cover: plant cover crops to avoid bare soil over winter, as this leads to lost nitrogen
- Minimising soil disturbance by reduced tillage or direct drilling, which promotes a soil's biodiversity
- Reducing soil compaction from machinery and livestock
- Reducing reliance on pesticides
- Introducing mob-grazing or rotational grazing
- Farming within the natural carrying capacity of our land, helping to achieve **maximum sustainable output**
- Designing crop rotations and planting native trees or plant species for the nutrients they draw into the soil, including the introduction of temporary leys in livestock systems
- Earthworm and dung beetle activity is a sign of a soil's health. Encourage soil organisms by offering undisturbed habitat and provide food sources through cover crops



Dung beetles are thought to be worth about £367million to the current UK cattle industry every year in ecosystem service, including increasing herbage yields by breaking dung down quickly, removing conditions for parasites and increasing nutrient cycling in the soil.

"Soil is essential for life on earth. It is the earth's living skin we all rely on, but take for granted. One quarter of all known species live within soil. Just one teaspoon can hold more organisms than there are people on the planet. Soils hold more carbon than our atmosphere and vegetation combined. As Lady Eve Balfour, founder of the Soil Association said: 'The health of soil, plant, animal and man is one and indivisible'. The Soil Association holds true to this statement today."

Liz Bowles - Soil Association

"Dung beetles have been and continue to be detrimentally affected by changes in land use and agricultural practices with nearly 50% of 60 species threatened or nationally scarce. Dung beetles need livestock to thrive, and changes in land usage and loss of permanent pasture has led to a decline in their populations. However, farmers and landowners can play a positive role in both protecting and enhancing populations of these ecosystem engineers."

Claire Whittle MRCVS – LLM Farm Vets, **Dung Beetles for Farmers**

A Farmer's Journey

James Hopkinson

An arable farmer and a member of the Soil Regenerative Agriculture Group in Scotland

"With no soil, we cannot grow crops, rear animals, nor feed the population. It is vital to preserve and nurture our soil as humanity depends on it." – James

The Soil Regenerative Agricultural Group was set up in 2019 and James is one of five farmers within the group who work collaboratively to share knowledge on soil health improvement. James started his transition to soil-friendly practices in 2016 and within two years, began to see the benefits of the systems he employed.

"When it comes to soil, I'm not particularly scientific about it. I like to use my spade, my eyes, my hands and my nose. For me, the decisions made on the level of tillage required is all based on the time I spend in the field with my spade, where it reveals my success or failure. This time aids me in deciding on the appropriate level of tillage and drilling techniques, or where nutrients are needed."

"A soil regenerative system is a long-term approach. There are some short-term benefits, such as lower fuel consumption, but the real benefits come much later, as seen through better soil drainage, carrying capacity, nutrient retention and input reduction."

"Our system creates a year-round cover across the farm, in most instances for wildlife, and 10% of productive areas around every field have been put down to permanent cover for wildlife habitats, which is beneficial to a variety of wildlife, insects and pollinators."

"The challenge has been in managing the transition from conventional to regenerative and retaining a viable, profitable business at the same time as reducing the very inputs which have provided us with consistent yields, and in most cases, profitability in the past. But with reduced inputs comes reduced borrowing and spend, which in turn, improves cash flow. The challenge is in striking the balance between reduced yields and return. Every farm business is different, and it was important to understand our financial position, so we could temper our transition and cut back accordingly."

For James' top recommendations for improving soil health, visit **our website**.

Kenneth Loades, James Hutton Institute

"Soil health is critical for providing services to agriculture and the wider environment, including storage of carbon; however, it can easily be taken for granted and degraded. Defining 'soil health' is something of a challenge, but this should not detract from the need to maintain a healthy soil.

But how we can manage our soils to remain healthy? There is no panacea and each soil needs nurturing relative to its local landscape.

A healthy soil will retain organic matter and nutrients and allow plants to grow, and these plants could be ones capable of fixing nitrogen from the atmosphere, thereby reducing the need to apply artificial nitrogen fertilisers. The root systems of some plants can be colonised by bacteria capable of mitigating the emission of nitrous oxide gases, a potent greenhouse gas, from soil. As the climate changes, rainfall intensity is likely to be more frequent, increasing the importance of maintaining a good soil structure to reduce overland water flow, soil erosion, and flood risk. These are just some examples of the potential benefits of a healthy soil. Each element of soil health can be straightforward to understand but understanding interactions between soil health elements is complex. It is essential in farming to manage soil health due to the multiple roles that soil can play at a local, regional, and national level."

Water

"The single raindrop never feels responsible for the flood."
Douglas Adams

A healthy freshwater environment is essential for all life on Earth. With water accounting for 71% of the world's surface, less than 2.5% of this is freshwater – and freshwater is crucial. In the UK, 200,000 km of our rivers, streams, ponds and wetlands sustain many species of wildlife, including mammals, birds, invertebrates and fish, and good quality water is also essential for people.

Currently, our freshwater environment is in a dire condition - partly due to agricultural pollution where intensive farming practices have had a significant impact through leeching excess nutrients and sediment into water courses.

Water is further implicated on farmland through the intensifying impacts of climate change. The increasing severity of our weather means the UK climate is becoming wetter, with extended periods of rainfall and flooding now seven times more likely. Floods can seriously damage farmland, including property, livestock and infrastructure, making mitigation crucial.

Reportedly, an **estimated 1.8 million** people across the UK are at significant risk of coastal, surface or river flooding. With around 70% of UK landmass used for agriculture, farmers have a growing responsibility to ensure their land is sufficiently prepared to tackle flood risk.

- In **England and Wales**, only 14% and 46% of rivers respectively meet the standards for good ecological status, and in Northern Ireland, only 31% of waterbodies are classified as good or high quality
- In **Scotland**, 22 % of rivers, estuaries and coastal waters have been adversely affected by land use and pressures such as overgrazing.

113

water bodies in **Wales** have quality failures due to agricultural pollution

40%

of water in **England** suffers from agricultural pollution

Image: ©James Robinson

On-Farm Solutions

For farmers to become part of the solution in improving water quality figures year-on-year, we need to work with nature. The following practices will help protect nearby waterways and minimise the risk of soil and product runoff.

- Avoid bare soil over winter and consider planting cover crops, which have been shown to reduce nitrate losses into water
- Create grass buffer strips or thick, tussocky margins of at least 6 metres along watercourses
- Undertake nutrient management planning to ensure any applications of synthetic fertilisers and manure efficiently meet crop requirements without the risk of excess
- Match livestock numbers with the natural carrying capacity of the land to reduce reliance on artificial inputs
- Fence waterways to protect them from livestock
- Consider creating new wet features, where possible, to support more wildlife
- Use drip trays to reduce drips and spills into drainage systems
- Reduce chemical pesticide use and opt for introducing IPM as part of a whole farm system approach and consider precision technology for a highly targeted method of application
- Plant native trees and hedgerows for resilience against flooding – the roots run deep, allowing a larger, deeper area of the soil profile to retain water, which means the ground can infiltrate water at a greater rate. Planting hedges along a slope can be a great way of reducing and capturing water runoff, which would otherwise continue its journey downstream. Ensure any plans for tree planting won't threaten existing farmland habitats or species by seeking practical advice from the Woodland Trust
- Peatland restoration – healthy, intact peatland acts like a sponge and will soak up flood water

A Farmer's Journey

Samantha Kenyon
Livestock farmer in North Wales

"Put simply, if we didn't work with nature and didn't try to improve water flow and quality with our "slow the flow" approach, there wouldn't be much farm - nor access to our woodland - left. The devastation previously caused here by practices that worked against nature has meant the loss of much soil and farm infrastructure (tracks, woodland and livestock fences), so that the farm was becoming unviable." – Samantha

Located on the banks of River Elwy, Samantha's farm historically flooded once every seven years, but due to progressively adverse weather, it now experiences flooding once or twice a year. Flood prevention has become one of the farm's key priorities and they have adopted several practices to mitigate extensive flood damage. This includes increasing the cover of native trees, such as willow and alder, to help retain the soil at the same time as providing habitat for local wildlife. They have also fenced off their livestock and stopped application of chemical inputs to reduce runoff and improve soil conditions.

Their next steps are to create a flood basin, where a 27-acre field will be taken out of conventional production and made into an area where flash floods can be held back. The basin will include a wet woodland area to help catch sediment and to create a more diverse habitat, with floodplain meadow grassland rich in a diverse mix of plant species to support biodiversity.

"I measure impact by how much farmland I save compared to that which was being lost under the conventional mismanagement. I also measure the impact by how well wildlife survives each flood. We have seen how beneficial our approaches have been for local wildlife, with a diverse range of birds nesting here for the first time in over 40 years. The species thriving on our farm include kingfishers, pied flycatchers, barn owls, collared doves, hoverflies, bees, bats and more."

Samantha's combination of soil maintenance and water management has resulted in methods that underpin both food security and biodiversity, at the same time as mitigating the worsening effects of our warming planet.

How can farmers be supported to implement flood prevention work on farms?

"With the lack of financial support and grants available for this kind of vital work to our river valleys, we can only afford to address the worst areas ourselves. It really is a race against time for this farm, and the wildlife that calls it home, and to turn things so it is safe and sustainable."

"There are other areas of field-edge river bank which desperately need work and habitat creation to help save many small aquatic birds, such as the moorhens, who, along with soil at the field's edge, get washed away with each flood. We need farm grants suited to the practicalities of slowing flood water using nature-friendly approaches as soon as possible because good riparian works up and down our rivers are long overdue."

Read more of Samantha's case study **here**.

Images: ©Samantha Kenyon

A Farmer's Journey

Landscape Scale Farming Project in Snowdonia, Wales

Ffermwyr yr Wnion

Ten farms, all located within the Afon Wnion catchment, are part of a landscape project set up in 2020 and the group aims to collaboratively address local issues of flood risk and water quality. The Snowdonia National Park Authority and Gwynedd Council are also involved. Rhys Evans, one of the project's farmers, shares the experience so far.

"Farming in the hills of Meirionnydd has its challenges, not least due to the high rainfall we receive. This project coordinates a variety of activities that deliver for water management, including tree and hedgerow planting, peatland restoration, and the creation of pools and ponds. We plant at a rate of seven saplings per metre – one of the farms created around a 1000m of hedgerows last winter - so that's a lot of planting."

3,725m

In Spring 2021: around 3,725 metres of hedgerows were established across the 10 farms – equating to over 26,000 trees

4,000m

By March 2022: a further 4,000 metres will be established, bringing the total number of trees planted closely to 55,000

"On some of the hills, historic man-made peatland drainage channels facilitate the flow of water off the mountain, which reduces the peat's ability to act like a sponge. We're working to block these man-made drainage channels, helping to slow down the flow of water downstream. This will aid in reducing localised flooding and improve water quality. Some of these ditches are also quite deep and well hidden, meaning that sheep can get stuck - so another added benefit will be a reduction in sheep mortality rates"

"The work being done by each farmer not only yields positive results for water and flood protection, but it also delivers benefits for biodiversity, pollinators, air quality and helps tackle climate change."

"Hedgerows provide a home, food, shelter and corridors to travel for wildlife. They also provide food for pollinators throughout the year when crops aren't in flower, as well as places to nest. Over time, we expect the flood pools to develop into fascinating ecosystems that will support aquatic wildlife, whilst controlling non-native invasive species, such as Japanese knotweed and Himalayan balsam, and allowing native riparian species to re-establish. Bog specialist plants will re-establish along the restored peatland drainage channels, whilst pockets of woodland and scattered trees will attract a variety of wildlife."

"The actions we've undertaken for nature don't hinder the farming enterprise - in fact they benefit business, livestock and the farm's natural assets - which are the very building blocks of food production. It's easy to fall into the mindset that nature and food production are mutually exclusive – but in reality, they go hand in hand."

What support do you need from government to continue farming collaboratively in a nature-friendly way?

"One of the things that Welsh government can do to facilitate collaboration would be to include a bonus payment for farmers working together to tackle issues over the wider landscape. Wildlife, climate change, flooding and water quality issues don't stop and start at farm boundaries - they're issues that need tackling at a landscape scale. Funding for facilitation support would also be beneficial in future government schemes. "

Read more of Ffermwyr yr Wnion's case study **here**.

Snowdonia National Park Authority - Rhys Owen, Head of Conservation, Woodlands & Agriculture

"The Snowdonia National Park Authority is no stranger to working in partnerships - and at scale. It's at the forefront of working with groups in geographical regions as a means of delivering societal goods, biodiversity improvements and tackling issues that require actions on a wider scale. The work we facilitate and fund is aimed at promoting nature-friendly farming, which from a water and flood prevention perspective, delivers numerous benefits to both farmers and the environment."

Biodiversity

"Becoming Nature Positive means reversing the current decline of biodiversity so that ecosystem restoration is underway and species are increasing in abundance and fewer are threatened with extinction."
JNCC, Nature Positive 2030

Right now, nature is in crisis.

- The UK **ranks** in the lowest 12% of countries globally for biodiversity intactness
- We have lost more than 44 million breeding birds in less than half a century – vanishing at a rate of one pair **every minute**
- The **State of Nature** report shows 41% of species in long-term decline and 15% at risk of extinction
- There has been a 97% decline in wildflower meadows since 1930

1/4

of UK mammals are at threat of **extinction**

50%

of **hedgerows** have been lost since the 1950s

Image: ©Sorcha Lewis

In recent decades, farming's relationship to nature has been viewed as something to control or to push to the outer margins. In some cases, to eradicate entirely. In a post-war drive to intensify food production, hedgerows were ripped from their roots and habitats destroyed. Since then, nature has suffered great declines that maintain a downward trajectory, putting society right in the middle of a nature emergency.

Yet the natural capital accessible to farmers are the very foundations upon which productivity and healthy food are possible. When nature is thriving, farm business thrives. In instances when nature's natural fertility is exhausted or valuable species are in little abundance, then farming suffers the costs of substituting for these losses, whether it's inputs to feed soil health or chemicals to control pests and disease. The reality of nature's loss rings loud and clear: without biodiversity, farming cannot exist.

86%
are farmers concerned about the effects of biodiversity loss on their business

78%
want to see a legally binding target to halt the loss of nature

Greater action is crucial to reversing biodiversity decline and farmers' actions to re-establish nature, to protect and restore biodiversity, needs to be underpinned by nature-positive targets across the UK. This is necessary to turn the tide and to encourage more farmers to transition to whole farm system approaches with nature-based solutions at its core.

Without nature recovery targets, how can farming secure a profitable, resilient future?

On-Farm Solutions

Nature-friendly farming can pave the way to a nature-rich future, and in turn, help improve soil health, establish pest control as part of an Integrated Pest Management approach, support pollinators which are vital for the pollination of crops and wildflowers, provide shelter for livestock and secure economic returns through environmental payment schemes and reduced inputs.

Functioning ecosystems also provide farm resilience to climate change by giving vital wildlife protection against environmental stressors, such as unpredictable weather patterns. As the UK enters the next stage of post-Brexit policy, a public money for public goods approach will see biodiversity recovery rewarded.

Agriculture is uniquely positioned to introduce approaches that will directly influence biodiversity's increase by developing systems for managing grasslands and wetlands, integrating more hedgerows and trees, and restoring carbon-rich habitats, such as peatlands.

Incorporating nature-based approaches to improve the quality of habitat across farmland will make more space for wildlife to feed, nest and shelter. The more diverse the approaches, the greater the breadth of biodiversity. These approaches, among many, hold the key to unlocking nature's recovery:

- Management of field boundaries, such as stone walls and hedgerows.
- Wet features, such as ponds, streams or ditches are crucial for wildlife – keep these free from pollution
- Field margins and wildlife corridors: create pathways for wildlife to safely traverse. Connecting farmland corridors between farms allows nature to travel safely across a wider area
- Flower-rich habitats: exclude livestock from meadows during the flowering season, alternate cutting periods so flowering plants can set seed and reintroduce cattle after cutting as they trample seed into the ground
- Seed-rich habitats – retain at least 10% of winter stubble until mid-February to provide seed food for farmland birds and consider wild bird seed mixes or leaving cereal headlands unharvested
- Can you create good quality habitat across at least 10% of your farm?

The Climate Change Committee (CCC) recommends the UK's hedgerow network should be increased by **40%** to support the UK Government's goal of reaching net-zero by 2050. **Hedgerows** are an excellent home for nature, and of the 1,149 UK priority species, 130 are associated with hedgerows - many of which play a vital role in pollinating crops and are natural predators of crop pests.

How can we maximise the environmental benefits of hedgerows?
Allow them to grow tall and wide, trim on a rotation so some remain uncut each year, and allow room for flower growth in the surrounding field margins, keeping these areas free from fertilisers and pesticides. Tussocky grass margins can be cut every three years.

Image: ©Sorcha Lewis

A Farmer's Journey

Sorcha Lewis

Livestock farmer in Elan Valley, Mid Wales

"Biodiversity is as much a working part of our farm and it is woven into the fabric of the uplands. When farming systems have over-stretched the balance - through inorganic fertiliser, over-stocking or under-stocking - it has costs for biodiversity that can negatively impact our productivity, quality and welfare of our stock with additional economic costs." – Sorcha

As upland farmers, Sorcha, and her husband, Brian, farm with nature to retain a traditional balance within a conventionally managed landscape at Troedrhiwdrain. To support biodiversity across their farm, they use organic manure on meadows in low quantities, manage traditional hay meadows (some a Site of Special Scientific Interest) with sensitive grazing and cutting schedules, retain rhos pasture (wet grassland), and plant ffridd trees as shelter for livestock, choosing local tree species that provide habitat and forage for birds, including rare upland invertebrates such as the Welsh clearwing moth.

"Our meadows run down to the reservoir edge and help to slow the journey of the rainfall. Acting as a buffer between the reservoir and meadow is one of the most important places for rare wildflowers and invertebrates. These natural margins remain uncut, which is beneficial for pollinators after the main meadows are cut."

After periods where the cattle are removed from the meadows, their livestock is returned to sites where they can help manage habitat for wildlife, including grazing Molinia grass which out-competes important grassland flowers. Some of their nature-friendly approaches include adopting sustainable stocking rates, creating a pond, lowering inputs (including using bracken as bedding for stock and poultry, so they negate the need for straw or hay), and installing bird and bat boxes. The species benefitting from their approach includes ring ouzel, golden plover, small heath butterfly, tormentil mining bee, water vole, cuckoos and curlew, among many more.

"We have been learning the ideal capacity for the number of cattle on the land and this makes the day-to-day management easier and within the constraints of hill life. We have seen benefits in our stock being healthier from reduced stocking numbers and from eating a diverse, herb-rich diet. We don't suffer from foot rot or disease from holding higher stocking rates. When we introduced our cattle, we saw a huge difference in how they manage the more competitive vegetation, creating the ideal conditions for a diverse range of wildflowers to grow, which supports valuable invertebrates."

"Every farm has the potential to deliver changes to make a positive impact on the environment. We all have a part to play and farmers can deliver for the public and climate."

How can government support farmers in the future?

"Rewarding farmers who are delivering government goals for climate and biodiversity is sensible. Farmers should be paid for this land management, as local knowledge is crucial in supporting any biodiversity recovery. Invest in support to local abattoirs, butcheries and community farm shops, which will put value into nature-friendly food, at the same time as shortening supply chains and reducing mileage."

Read more of Sorcha's story **here**.

Images: ©Sorcha Lewis

A Farmer's Journey

James Robinson
An organic dairy farmer in Kendal, South Cumbria

"Biodiversity is important to me because it helps to create a huge cycle of life around the farm across many different habitats. When you start making room for nature, the place comes alive." – James

James' 300-acre farm has been free from artificial fertilisers or pesticides for the past 16 years and he opts for regular soil testing to maintain the right level of nutrients to benefit both his cows and local wildlife. Multi-species swards are planted to nurture biodiversity from the ground up with herbal leys - including clovers, chicory and plantain - that help to fix minerals into the soil. This diverse plant life supports insects and pollinators, which attract an abundance of birds and mammals, including breeding thrushes, finches and tree sparrows, a red-listed species,. Their hedgerows act as necessary corridors for movement, so species, such as bats and hawks, can travel safely between habitats.

James' approach to supporting nature includes planting woodland, leaving areas of grassland ungrazed, maintaining sensitive hedgerow management and fencing off watercourses to improve water quality, so there is less silt and soil from his cattle on the banks.

7 miles of hedgerows
Some 20-22ft tall

"We have always managed our hedges in a traditional rotation of hedgelaying about every 20-25 years, so we have a full mosaic of ages and sizes, which benefits much more wildlife than a landscape covered in the same size or shaped hedge. While we trim the outer hedges alongside the roadside for safety, we don't flail the interiors."

"Within a few years, the hedges were taller and bushier and there was more fruit and nuts for wildlife to forage. It also provided greater shelter for livestock and they can always be seen behind the hedge after a stormy night."

"Doing a few small projects all around the farm can soon collectively make a huge difference. Start small and leave hedges around a few fields unflailed, then the following year leave some more – that way there is a good range of hedgerow heights. Plant a few trees as it doesn't take much to make a small coppice."

How can government support nature-friendly farming?

"Constant wet summers and milder winters are causing land to become waterlogged. Flash floods are much more common now than they have ever been in our family's 145-year history at Strickley Farm. If we give up land to store and slow down floodwater to wider public benefit, then we should be rewarded."

Read more James' farming journey **here**.

Kathryn Smith, Farm Wildlife
"The decline in farmland wildlife over recent decades is well documented. We see this story echoed across other landscapes in the UK and around the rest of the world, culminating in the biodiversity crisis we currently face. Without a thriving natural world, our ability to produce food is compromised. Addressing this crisis is in all our interests, and farming is uniquely placed to make a significant, and important, contribution.

Many nature-friendly farmers are already making a difference, but this must be scaled up if we are to see meaningful change. The actions in this report offer a vision for a more sustainable and biodiverse future, something upon which we all depend. It is vital that the wider farming community is able to access the right information, support and knowledge to undertake this vital work and that the right policies are in place to facilitate a prosperous future for our wildlife and our farmers."

Carbon Management

"Farming looks mighty easy when your plough is a pencil and you're a thousand miles from the corn field."
Dwight D. Eisenhower

Climate change - and the subsequent challenges that farming faces - is influenced by increased carbon in the atmosphere, among other greenhouse gas emissions. This is caused when emissions far outweigh what the planet can naturally remove from the environment (sequester) and store in assets, such as soil, peatland, trees or hedges.

The balance between emissions and carbon storage was something nature could maintain, but since the Industrial Revolution, our emissions have increased while nature's ability to absorb and store carbon has dramatically reduced due to environmental degradation.

10%

of the UK's total greenhouse gas emissions are from agriculture and this does not include farm inputs or agricultural machinery. UK agriculture contributes 70 per cent of nitrous oxide emissions and nearly half of total methane emissions

5%

of the UK's annual GHG emissions are emitted from peatlands per year

27%

of emissions in Northern Ireland are from agriculture with little reduction since 1990

16MM

tonnes of carbon dioxide are emitted from degraded UK peatlands each year

Image: ©Sorcha Lewis

The UK has committed to an ambitious path to net-zero – a 63% reduction from 2019 to 2035. In England and Wales, the net-zero target is 2050. In Scotland, it is 2045. Northern Ireland has still to set its target. But for net-zero to be possible, farming needs to urgently adopt low-carbon practices by both reducing existing emissions, protecting existing carbon stores and actively removing carbon from the atmosphere through sequestration.

87%
of farmers strongly agree that the government should value other habitats which are capable of storing carbon - such as hedgerows, heathlands, peatlands and grasslands - equal to woodland creation

74%
of farmers are currently working towards net-zero or have implemented carbon reduction measures

What support do farmers need to reach net-zero?

"More guidance on what needs to be done."

"Support in accurately measuring carbon sequestration on the farm, be it soil, trees, hedgerows or peatland."

"Reliable calculators that don't just record the negatives and a standardised recording system."

"Alongside targets, they need to provide multiple options as there is not a one size fits all solution for this."

*All quotes were provided anonymously during our survey.

On-Farm Solutions

Many actions can be undertaken to reduce farm emissions, increase carbon storage and sequestration, at the same time as delivering for nature and wildlife. When we improve the restoration and protection of diverse habitats, not only do we increase the volume of carbon we can remove from the atmosphere, but we also increase our resilience to extreme weather.

As we move closer to achieving net-zero, and reinstate the balance between what we sequester and emit, we must avoid any actions where carbon savings could result in perverse outcomes for nature, wildlife and the environment.

80%
of people are concerned that net-zero targets could drive woodland creation that threatnes natural habitats and biodiversity if not implemented by a "right tree right place" approach

Some of the ways this can be done includes:

- Undertaking a farm carbon audit to understand the sources of carbon sinks and emissions
- Restoring and managing peatlands, including areas of farmed lowland peatland
- Planting native trees and conserving existing woodland, including sensitive hedgerow management
  - **Estimates** of the carbon stock of UK hedgerows range between 15 tonnes per hectare to 30-40 tonnes per hectare, depending on size, and in England alone, it is **estimated** that existing hedgerows in England store as much as 9 million tonnes of carbon.
  - The **Climate Change Committee's** call for restoring and increasing hedgerows across the UK, and if integrated with a 10% increase of farmland trees, could increase annual carbon sequestration by over 1 $MtCO_2e$ by 2035 and nearly 3$MtCO_2e$ in 2050.
- Restoring soil health – **soils** store significant amounts of carbon as soil organic matter at about 3.5 times greater than plants and prolonged cultivations can cause the loss of 20-67% of carbon
- Incorporating agroforestry into productive areas of the farm
- Protecting and restoring species-rich grasslands and heathlands – a third of the earth's carbon is stored in grassland soils
- Enhancing coastal habitats, such as saltmarshes
- Protecting wildlife habitats, such as meadows, trees, margins, ditches or ponds
- Reducing fuel use
- Reducing use of artificial fertilisers – a major source of nitrous oxide which has 300x the warming potential of carbon dioxide

As the sector take strides towards a net-zero future and carbon markets begin to establish, there is still a lack of clarity on selling carbon credits. While this may pose a potential income, there remains a lack of standardisation across carbon calculators which is essential if businesses are to benchmark effectively. Reaching net-zero should be the core focus until carbon rights are effectively determined - along with a singular soil carbon code - so a farm's footprint can be sufficiently evaluated and measured.

Image: ©Sorcha Lewis

A Farmer's Journey

Dave Reay
A sheep farmer in Kintyre, Scotland

"The swathe of tools and metrics across carbon calculators means it's hard to make fair comparisons. For Scotland and the rest of UK, we could really do with a standardised tool, especially if this can be well supported by advisors so it's not just an exercise in death by spreadsheets." – Dave

In 2019, Dave's farm carried out a carbon audit across every field to measure soil carbon, including depth, profiles, moisture and chemistry, alongside above-ground storage in hedgerows and trees. Once a baseline was established, he set out to make the necessary changes to his farming practices to increase carbon uptake and storage. The first step was taking one third (10ha) of the land out of grazing, as an area with significant degradation due to poaching, and planting two-thirds of this with native trees and shrubs using the soil survey to identify the right tree in the right place. The remaining land has been returned to acid grasslands and rides.

"For the carbon audit work, the big benefit is being able to see how things are changing farm-wide and down to individual fields. It will take another 5-10 years before changes in soil carbon will be detectable, but at least we have something to compare progress against each time we measure it."

"The tree and shrub planting gives us an immediate increase in above-ground carbon, but we've also seen regeneration in these areas through 'islands' of existing trees (mainly hazel, willow, oak and rowan) now spreading outwards. The diversity of plant and insect species has soared thus far, but we'll need to keep at work on maintaining a diversity of habitats with large blocks of connected woodlands. I expect to get a healthy increase in soil carbon, as it's pretty low in the heavily grazed areas."

"The soil sampling was hard work. We did it all manually and intensively to get a robust baseline, so it took a fair bit of time. The other challenge remains striking the right balance between planting, natural regeneration and cutting. We're still in very early days, but planning planting carefully is going to pay dividends when it comes to managing things down the line."

Read more of Dave's carbon management here.

Image: Top: ©Sorcha Lewis, Left: ©Dave Reay, Bottom: ©Sorcha Lewis

A Farmer's Journey

David Lord
Arable farmer in North East Essex, England

"Carbon management is the foundation on which profitable and resilient farm businesses are built Carbon management and natural biodiversity are mutually inclusive – farming systems that focus on carbon management are also nature friendly - and profitable which is of course what we all want." – David

David's carbon management approach involves using a diverse rotation of crops, using cover crops, retaining surface residue, minimising tillage and using direct drilling.

"Our main source of carbon emissions remains nitrogen fertiliser, which we have reduced by 30% since 2014, but we are striving to improve further. The two biggest drivers of improving our carbon management have been reducing fertiliser use and improving soil health and function. Our biggest challenge and next obvious step is to integrate livestock into the rotation using mob grazed herbal leys."

"Diverse cover crop mixtures serve many purposes: they pull carbon from the air and sink it deep into the soil while allowing soil biology to thrive thus improving crop health and reducing fertiliser requirements."

"Most of our heavy land hasn't been ploughed for over 20 years, with a move to minimal tillage allowing a straightforward progression into no-till and cover crops in 2014. Benefits were immediate in terms of cost-saving, but it took a couple of years to see obvious changes to soil health and structure. Nature will thrive given the right conditions."

Read the rest of David's transition to low-carbon farming **here**.

Guto Davies
A livestock farmer in North Wales

"Carbon is central to the productivity of the farm - it's closely related to efficiency, productivity and profitability. Climate change is a concern to us all – it affects food production, farm business, the wider economy and society, and not least our future generations. It's important that we, as farmers, undertake actions to reduce our impact on the climate." – Guto

Guto farms at Hafod Las, a beef and sheep farm in Ysbyty Ifan, North Wales. Like many farmers in the area, low-input farming practices have been implemented here for generations. Guto opts to work with nature, rather than against it, and has taken advantage of agri-environmental schemes to maximize productivity and enrich the environment.

He has undertaken work to improve carbon management, including soil analysis, blocking 25km of man-made ditches to restore the upland peatland, hedgerow planting and incorporating farmland trees. Whilst all of this helps to sequester carbon, it also creates wildlife habitats, reduces soil erosion, enhances water quality and alleviates flood risk.

"But we're continuing to learn. After all, we've inherited this landscape from our forefathers, but we have also borrowed it from our children. The aim is to produce healthy food of high standard that improves the environment and biodiversity all in one product."

Public funding has been important factor in being able to fund some of this work. As such, future Government schemes should reward farms appropriately for the carbon that farmers sequester, be it in healthy soils, hedgerows, trees or peatland.

"If we're serious about tackling climate change, we need long term financial support that reward farmers for good agricultural practices. It's one of the best ways of justifying continued public expenditure within the sector."

Agroforestry

Agroforestry is the process of planting or enabling natural regeneration of trees, shrubs and hedges on farmland with the aim to add more value to an agricultural landscape with benefits to biodiversity, improved carbon sequestration, flood prevention, harvestable yield, and shelter and forage for livestock.

Helen Chesshire, Lead Farming Advocate, Woodland Trust:

"Agroforestry is simply the deliberate integration of trees and shrubs within farming systems and includes traditional practices such as hedgerows, shelter belts and wood pasture as well as more innovative approaches such as alley cropping. Any farmer can reap the benefits of a more resilient farming business whilst helping to deliver a wide range of public goods via agroforestry. We are demanding that the new environmental land management schemes across the UK must support and incentivise farmers to expand the area of agroforestry."

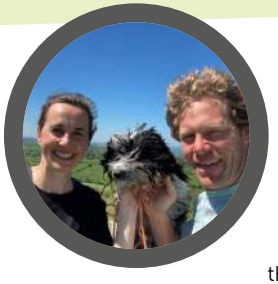
Liz Bowles, Soil Association:

"There are countless opportunities to grow a range of tree crops for human and animal consumption, for animal welfare and soil health, for building, and even woody products for use on farm and to replace plastics. The potential benefits are clear both to individual farms and to the wider environment."

Despite agroforestry's countless benefits to farms, its uptake is low across the UK – with only 3.3% of land cover used for this purpose. With the target set by UK Government for carbon neutrality by 2050, agroforestry is not only a vital on-farm solution to make this target feasible, but it also provides safe habitat for many species to thrive. When it comes to tree planting, it is crucial farmers ensure a 'right tree right place' approach, which will guarantee the safety of existing habitats and wildlife. Inappropriate tree planting can have negative consequences on many of the species we are seeking to protect and enhance.

Images: ©Nic Renison

A Farmer's Journey



Nic and Paul Renison
Livestock farmers in Cumbria, England

Nic and Paul Renison farm at Cannerheugh Farm on the edge of the Pennines overlooking the Eden Valley and the Lake District. Cannerheugh is a 350-acre upland farm with a mix of unimproved and improved pasture susceptible to the Helm Wind - a furious easterly wind and the only named wind in the UK. Agroforestry was an ideal land management approach that would provide their farm with windbreaks to prevent soil erosion and shelter for their livestock.

Nic says: *"We moved to the farm in 2012 and our need for smaller fields and shelter led us to work with the Woodland Trust and some stewardship schemes. Planting started in 2014 and we have since planted over 2km of hedges (12,000 trees) and also riparian corridors and pockets of woodland around the main grazing block. On the fell ground, we have planted a 6ha block to protect a water course from erosion. We have used a mixture of species, all native, such as Oaks, Aspen, Willow, Blackthorn, Field Maple, Wild Rose, Hawthorn, Hazel, Bird Cherry, Scots Pine and Rowan."*

"The benefits increase as the years go on and our hedges are now nearly seven years old, providing much needed windbreaks and also shade from the sun. But this is only part of the story - bird life, insect life and general job satisfaction make this one of our best investments yet."

"We combine our tree and hedge planting with mob grazing, which has created better grass growth and improved diversity, seen through the increase of clover which is beneficial to the sward by fixing nitrogen into the soil."

"Ultimately, making space for woodland has helped us to make the farm more profitable. We have a reduced need for inputs and reduced lamb loss as our trees and hedges provide much needed shelter. Six years ago, we stopped using fertiliser, sprays and ivermectin. This has led to a continual improvement in biodiversity and soil health, which we measure by earthworm activity and dung beetle populations – all good indicators of soil health."

If you want to know more about planting trees, shrubs on hedgerows on farmland, and to seek advice for planting the right tree in the right place, visit **Woodland Trust**, **Soil Association**, **Soil Association - Scotland**, **The Organic Research Centre**, **Glastir Woodland Creation**, **Coed Cadw/ Woodland Trust**.

Landscape Approaches

"Alone we can do so little; together we can do so much."
Helen Keller

At this crucial tipping point, in the throes of a climate and nature crises, the imperative is on scaling up environmental restoration. While every action to restore our landscape is vital, an individual's actions can only deliver so much. When collaboration is fostered between farmers, local communities and environmental advisors - with a shared ambition to deliver more for nature - then greater outcomes can be achieved.

As custodians of the rural landscape, farmers have strong local knowledge for building environmental management plans from a regional and farmer-led perspective. By working together, we can achieve the biggest wins - from improving the quality of specific sites to supporting diverse species to thrive in the wider countryside.

"Landscape approaches" or "farmer clusters" are schemes that coordinate a group of farmers to work in partnership across a region. Under the guidance of a group advisor or facilitator, farmer clusters aim to address landscape challenges, such as biodiversity loss, soil health or water quality, while delivering greater benefits on a wider scale. These projects are often supplemented by agri-environment schemes.

81%

of farmers are not involved in a landscape approach scheme or farmer cluster

85%

would consider joining one to work towards achieving climate- or nature-friendly outcomes

78%

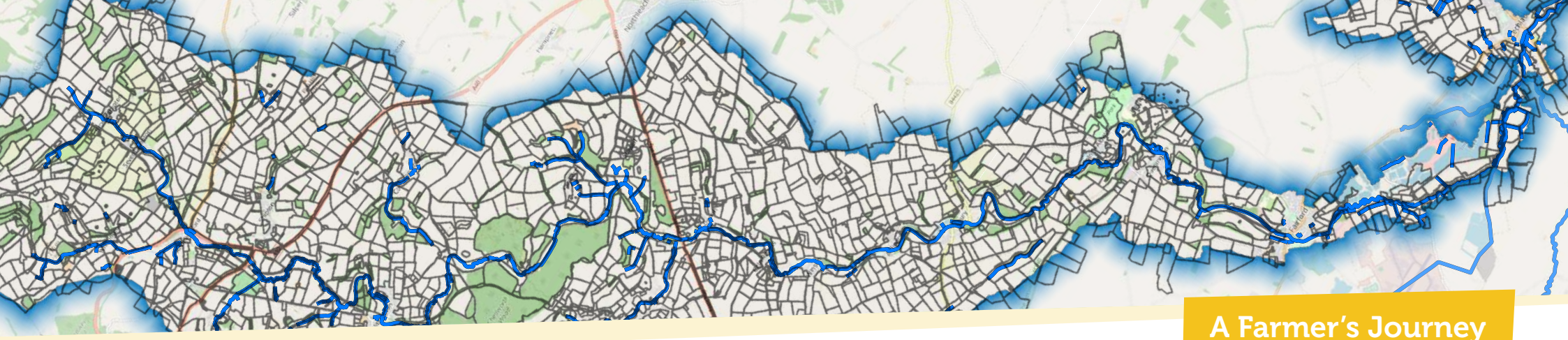
believe landscape approaches enable farmers to enact greater climate and biodiversity benefits

Image: ©Sorcha Lewis

Image: Left: ©Sorcha Lewis, Right: ©FWAG

Embracing collaborative farming

- Consider working with neighbours and local expert advisors to identify key local priorities for nature restoration and environmental land management and share ideas on how these can be restored
- Engage with local Councils to better understand the species and habitats that need supporting in your area
- Seek to enter land management schemes and initiatives which encourage landscape-scale projects:
  - England, Scotland & Wales: **Farmer Clusters**
  - England: **Local Nature Recovery Scheme**
  - Northern Ireland: **EFS Group Scheme**
  - Wales: **Farming Connect Discussion Groups**
  - Wales: **Agrisgôp**
  - Scotland: **Regional Land Use Partnerships**



A Farmer's Journey

The Farmer Guardians of the Upper Thames

Jenny Phelps MBE, Senior Farm Environment Advisor, FWAG

"As part of the Farming and Wildlife Advisory Group's (FWAG) Environmental Land Management (ELM) Scheme Trail, 12 tenant farmers of the Ernest Cook Trust Estate in Gloucestershire formed a farmer cluster to demonstrate how to deliver more ecosystem services and natural capital recovery by working together across the landscape.

Supported by FWAG, they helped create a connected natural capital map using UK Habitat classification and commissioned biodiversity recording across their land. The mapping of land use and management allows scientists from Rothamsted to scientifically attribute ecosystem attribution and public goods delivery from the land. The natural capital mapping allows a gap analysis from the current land management, creating an opportunity map for investment in natural capital recovery. Working together as a farming and landowning community creates shared opportunities for investment for landscape-scale biodiversity recovery, carbon capture and reduces the risk of flood and drought.

Coming together, farmers can manage water across the landscape to underpin ecosystem service recovery from a foundation of healthy biodiverse, aerobic soils, managing habitats and species collectively. Farmers can offer what they wanted to restore on their land. The ELMs trial resulted in the planting of 60,000 hedge and tree plants across the Upper Thames.

This case study demonstrates how simple investment-ready projects could be replicated by groups of farmers working together along water bodies to help bring future resilience to their local communities."

Ernest Cook Trust Coln and Leach Farmer Cluster in Gloucestershire, England

The Coln and Leach Cluster, supported by FWAG, was set up in 2017 after it was recognised that more local action along waterbodies was highly beneficial to productive and nature-friendly farming.

"The first year was about establishing a baseline of land use and management, and surveying with volunteers and specialists for habitats and species. This created a shared vision for natural capital recovery and where, as farmers, we could offer restoration opportunities, such as hedge and shelterbelt planting, that are appropriate for landscape-scale recovery. This kind of surveying needed the specialist advisers at FWAG, who constantly bid for funding to support us."

"Seeking support from local specialist advisers can help unpick the complexity of funding streams and opportunities. The advisers can also help with collecting mapping data and evidence to create a baseline into which they can facilitate coordinated investment and resource from multiple local sources. By creating a platform for investment, farmers can identify what restoration they want to do on their land and then funders offering natural capital recovery grants (for hedge and tree planting, habitat, soil and river restoration) can be signposted to opportunities that complement and enhance farm businesses."

The project's assessment sought to prioritise the action needed to help society in a climate emergency, including re-localisation of food supplies, clean and well-managed water, reduction of flooding and drought risk; rebuilding healthy soil; sequestering carbon; and creating habitat connectivity and management to underpin ecological recovery. The benefits of this have enabled better guardianship of vulnerable species, such as grey partridge.

Food Quality

"Farming is more than the effect on the landscape: it sustains the local food industry, supports tourism, and gives people an income in places that might otherwise be abandoned."
James Rebanks, The Shepherd's Life

In 2019 the UK imported

1 million

tonnes of **soya** for livestock feed from high deforestration risk areas

As key players in the food industry, farmers have an opportunity to contribute to a culture where food safety, environmental welfare and nutritional security are guaranteed. Across the UK, farmers are poised to provide many of the solutions needed to address the climate & nature crises. By actively participating in a system that fixes the problems of the past, farming can meet the needs for cleaner water, healthier soil, reduced emissions, improved carbon storage and higher biodiversity.

As the role of a farmer is evolving to include nature recovery and climate mitigation, so, too, should our food system. Farmers need a supply chain that ensures food is affordable rather than cheap – where farmers earn a fair return for producing food that is healthy and sustainably produced. Every cog in the food industry – from farm to fork – is responsible for contributing to what will shape the vitality of our natural world and the health of society.

With UK Governments developing incentives for nature-friendly farming, it is vital that the supply chain supports farmers in their transition to agroecological, whole-farm systems. But as it stands, the supply chain is currently weighed against these efforts.

- Out of the top 50 most popular fruit and vegetables consumed in the UK, only 16 can be produced here – the rest are imported
- Nearly **95% of groceries** are sold through the top nine supermarkets, resulting in a growing imbalance of **bargaining power** within food supply chains
- Dietary related ill-health is estimated to cost the NHS up to £6 billion per annum
- The UK's overseas environmental footprint has **increased by 15%** since 2015

UK Governments need to ensure the quality of produce is matched by market recognition of value. Current labelling systems make it hard for those operating to high standards to differentiate in the market i.e. law stipulates that to use the term 'grass-fed' you only need to be 51% grass-fed, making it impossible for those who are 100% grass-fed or Pasture for Life to market effectively.

Image: ©Polly Davies and Graeme Wilson

CLEAR is campaigning for a solution through mandatory labelling for all food types, both domestically produced and imported, where the method of production for growing, rearing and processing is accounted for. Such a robust and transparent labelling regime would encourage the adoption of nature-friendly practices through consumer-led incentives.

97%
of people want UK food labels to be clearer on production

99%
want to support farmers who are restoring nature, mitigating climate change and protecting the environment.

67%
of farmers do not think their countries current food strategy supports high environmental standards behind food production

86%
of farmers do not think the government is sufficiently protecting farmers from unfair competition through trade agreements

92%
of farmers are not confident that government trade policies will support environmental ambition at home and abroad

"The wonderful thing about food is that you get three votes a day. Every one of them has the potential to change the world."
Michael Pollan

Key Recommendations to UK Governments

- Target public procurement to invest in sustainable, nature-friendly food systems
- Ensure trade deals do not undermine nature-friendly farming at home by preventing the import of commodities linked to deforestation or conversion of carbon-rich ecosystems
- Review existing planning policies with a focus on developing sustainable food systems, through shortening supply chains and improving transparency, as well as encouraging a greater diversity of food retail outlets
- Ensure trade deals mean the UK is globally trading in a way that helps landscape recovery whilst raising the bar of other country's standards to effectively address climate change on an international scale

Vicki Hird, Head of Sustainable Farming, Sustain and author of 'Rebugging the Planet'

"Critical to a sustainable, resilient and healthy farming future is a supportive and well-regulated marketplace. What people are offered to eat, in a school canteen or a supermarket shelf should be traded in a way that helps the kind of great farmers described in this report. It should provide them with a decent price and relationship that means that they can protect nature, grow healthy crops and rear high welfare livestock whilst protecting the farmed environment.

Government should help by regulating the supply chain, investing in shorter more farmer-focused infrastructure, and by paying for those public benefits that the markets can't - such as wildlife, clean water and public engagement. But it is clear we do not have this yet. The rewards for many farmers are low despite being the part of the food chain taking the most risks in working with natural systems and an increasingly unstable climate. Those that are managing to create great food and protecting nature, as described in this report, are doing so despite the system or because they have been lucky in securing a responsive, probably more direct customer base.

But all consumers should have access to decent quality food. Irrespective of income, they do want to know what they are buying is of good quality, and that it hasn't harmed the land, workers or animals. Clear honest labelling is important as are a more diverse supply chain and retail options. And to increase access for all, the market as well as government must support all farming to transition to agro-ecological, high welfare systems. Neither consumers or farmers should have to face imported foods on the shelves produced with banned substances or practices here. A vision that delivers on these healthy, nature friendly farm systems is vital."

A Farmer's Journey

Denise Walton
Livestock farmer in Berwickshire, Scotland

"Farming with nature is a core moral issue and key to our commercial business and marketing ethos. It also importantly makes our farm a more stimulating and enjoyable working environment." – Denise

Denise and her family produce beef farmed to certified organic and Pasture for Life standards, with an on-farm butchery and charcuterie facility. Some 90% of their livestock are born and reared on the farm and they co-operatively buy remaining livestock products from other organic farms in the area, with smaller enterprises of lamb, mutton and pork. Peelham farm has been awarded for the quality of its food and environmental ethos, winning The Scottish Rural Award for Agriculture and Great Taste Gold Awards for Charcuterie, among others.

"We have invested heavily in farm habitat infrastructure, through hedgerows, woodlands and open water – all are carbon-storing and biodiversity enhancing. We use no petrochemical based artificial inputs or animal feeds and evidence demonstrates the increased nutrient density of meat in organic pasture-only and free-range systems. We assess our livestock carcasses on their return to our on-farm butchery for quality and receive direct feedback from consumers."

"Less is more on our farm – it allows the farm to relax and express itself through ecosystems that function and it also reduces our costs."

"The wildlife benefits of our farming systems are part of our USP when selling meat and food labels need to better convey information on sustainable, agroecological systems that deliver on climate and nature recovery."

Read the rest of Denise's case study **here**.

Stephen Alexander
Livestock farmer in Greyabbey, Northern Ireland

"It is better to work with, rather than pushing against, nature. It means our farming practices are sustainable and we are utilising the natural environment to produce the best beef we possibly can." – Stephen

Stephen rears 100% grass-fed native pedigree Dexter cattle as certified Pasture for Life producers. Promoting good soil health is vital to their farming system and they choose minimal tillage, or at times no-till, which requires fewer inputs, less fuel use and reduced heavy farm machinery. Their farm's focus on optimising their soil fertility ensures a sward high in quality for their Dexters to graze on.

"Unlike grass, our pasture contains a variety of plant species such as wildflowers, herbs, legumes, rushes, as well as a diverse hedgerow. This provides our Dexters with a diet that is rich in vitamins and minerals grown from healthy soil. Our Dexters graze on a wide variety of shrubby marginal ground, including National Trust coastal grazing, where they graze seaweed."

Food quality is improved through Stephen's high animal welfare standards. His grazing management includes allowing his cattle to browse and graze freely throughout the year, including the winter months, which influences the characteristics of his beef.

"We have good herd health status as seen through low antibiotic use and 95% of our cattle have never had antibiotics. We observe our herd self-medicating through their varied diet as they instinctively know where and what to graze. After calving, we often observe the cows grazing at hedgerows."

"Our grazing management means we do not routinely use anthelmintics, and instead, we perform faecal egg counts on samples of our cattle. This ensures that treatment is only carried out if required and may help reduce the resistance beginning to be seen in some populations of parasites."

Read more of Stephen's approach to 'less but better' **here**.

A Farmer's Journey

Polly Davies and Graeme Wilson
Mixed farmers in the Vale of Glamorgan, Wales

"We spend seven days a week working on the farm, therefore it's important that what we produce reflects our time, effort and personal investment - that we could stand behind it as a high-quality product." – Polly

Polly and Graeme are arable, horticulture and livestock farmers who have a closed organic system, where fertility building allows them to maintain a productive set of rotations. They produce enough arable crops, including protein-rich beans, to feed the livestock through the winter.

"We have no external fertility inputs, using instead composted animal manure in conjunction with fertility building rotations. The livestock is reared on pasture for the majority of the year but housed from late November to March when they are fed homegrown rations."

"We produce high-quality lamb and beef that goes to a supermarket organic supply chain in quantities of 80% and 60% respectively. The remainder supplies our onsite retail butchery that serves the communities surrounding the farm. We also put 45 homegrown rare breed pigs through the shop each year. We have also established an all-Wales supply chain using traditional stone ground mills for our wheat and currently grow vegetables for a 60 share Community Supported Agriculture scheme that runs for six months of the year. The veg is managed principally by hand."

"Our stocking rates are low for our 700 acres - that is a function of the space required to provide feed for the animals in a closed system. It means that there is inbuilt diversity in the system and that no one element is large enough to do harm. If one element gets too much the balance of enterprises and the balance of nature gets out of sync."

Read more of Polly and Graeme's nature-friendly systems **here**.

Neil Heseltine and Leigh Weston
Livestock farmers in Malham, England

"From a farming perspective, I like to think we haven't diversified. Instead, what we've done is turned our farming down, so the farming is more profitable when at one time it wasn't." – Neil

Neil and Leigh breed pedigree Belted Galloway cattle and Swaledale sheep in 1100 acres of limestone scenery in the Yorkshire Dales National Park. Their land is between 1200 and 1800ft, so they choose hardy native breeds that can cope with weather and marginal grassland. They are chemical-free, using a scythe to control the grassland, and joined a conservation grazing scheme in 2004, which has fundamentally shifted their farming mindset.

"I was extremely conventionally minded, and once we got involved in conservation grazing, I realised we could graze the land in a way that is positive for biodiversity at the same time as being beneficial for our livestock. Animals managed in the right way, grazing at the right time of the year and to the right stocking rate is the biggest benefit to biodiversity and herd health."

"We have two Sites of Special Scientific Interest on our land and our approach allows these areas to flourish under our protection. We have Barn Owls nesting and an increase in flora and herbs, including the restoration of a traditional hay meadow."

"Our cattle lead a natural outdoor life, grazing all year round without the use of any imported feeds, and they mature slowly at a natural rate. Raising animals on pasture alone is important to us, as it raises animal welfare standards by allowing them to exhibit natural behaviour. This shows in the quality of the beef we produce."

"Our farming approach has become about re-establishing a relationship with nature and our livestock are a part of that system. The end product, whether it's wool, meat or eggs, is a by-product of a system that exists in harmony with its natural surroundings. This means a high-quality product with awareness of the impact every choice has in the process of putting it on the consumer's plate."

Read more of Neil's case study **here**.

Prosperity

"Agriculture is a fundamental source of national prosperity."
J. J Mapes

96%

of people want to see public money support farmers in storing carbon, improving soil health, restoring nature and protecting water quality

The innovation that stimulates the local economy is often guided by farm businesses who adapt to face modern challenges, forge direct routes to market and value their natural capital by working in harmony with nature. While regional circumstances and market demands differ across the UK, nature-friendly farming can help secure a nature-rich and profitable future that is ready for the challenges ahead.

But even with public investment, many farm businesses fail to make a decent livelihood or have difficulty breaking even. This is despite the average UK farm size having more than **doubled** since 1960, from 40ha to 86ha, and since 2011, the number of UK farmers has declined by nearly a quarter.

Over centuries the UK's landscape has evolved with nature, resulting in a symbiotic relationship in which nature and farming both thrived. But in recent decades, this balance has been disrupted through intensification, and as a result, nature and many farm businesses are clinging to the edge.

Image: ©Helen O'Keefe

Professor Tim Benton

Research Director of the Environment and Society Programme at Chatham House

"The rural economy depends, to a large extent, on the natural capital embedded in the countryside. Natural capital – the value to people of the natural environment and the services it provides – underpins food production through soil fertility, suitable climate, pollination and natural enemy services that help prevent pest outbreaks.

The issue is that the relentless march of productivity growth has incentivised the situation that we are spending natural capital faster than it can recover. The incentives to be unsustainable are significant, and many farmers feel they cannot make a profit unless they raise production to the maximum. Whilst this has been a norm in thinking, is this really the case? Possibly no, for three main reasons.

First, undermining natural capital leads to long-term degradation of function and undermines resilience: just when, in a world of changing climate, resilience is needed evermore.

Second, simplistic economic thinking underpins business models that suggest economies of scale lead to greater profits. But the evidence is accumulating that the greatest profits may come with producing less with less: working with nature rather than substituting inputs for nature.

Third, as well as driving environmental externalities, the "cheaper food paradigm" is driving poor dietary health, creating significant healthcare costs in the UK and globally, which dwarf the economic value of farming. Couple this with growing awareness from citizens of the need for greater sustainability, gives scope for significant changes in the market, via demand: where eating "less but better" is a growing view.

Over the next decade, the profitability of sustainable agriculture will become increasingly apparent – especially in the UK as public monies invested in agriculture change, where perhaps only those farms that truly value natural capital will survive.

A Farmer's Journey

Helen O'Keefe
Crofter in Sutherland, Scotland

"Crofters manage huge areas of land, which include massive carbon stores (in the form of peat) and huge areas of globally rare and sensitive habitats which shelter many threatened species. They also produce food from this land without intensive inputs and have done for generations, in a way that not only works within environmental constraints but also helps to sustain rural communities and local economies." – Helen

Helen was chosen as the Scottish Crofting Federation's Young Crofter of the Year for 2021. On her croft, Middleton Croft in Elphin in the northwest highlands, she rears livestock – selling eggs, lambs, fleeces and yarn – and grows fruit and vegetables for sale. Helen started a collective food hub, The Green Bowl, after coordinating with other food producers in her community to increase direct sales by selling online and delivering locally.

"Crofting areas often do not have good access to fresh fruit and vegetables and, in recent history, most agriculture produce from the area (primarily livestock) has been exported, so the vast majority of food consumed here is imported from outside the Highlands. I'm focusing on producing more food that can be sold and eaten locally. This reduces the environmental impact of food transport and distribution, reduces pressure on intensive agriculture in other areas (including the "off-shoring" of environmental impacts), provides a higher quality of food (taste, nutrition and freshness) for local people and allows local crofters to create a viable agricultural business from their crofts."

"Selling directly gives more control over price, so less uncertainty and a much more stable, independent market than selling into wholesalers or the normal livestock system. It provides a buffer against external market factors (like Brexit). It is also more personally rewarding."

"Crofting is, by its nature, low intensity, which allows more space for nature to thrive. I'm continuing this practice while making small changes: introducing some very small-scale horticulture and incorporating edible aspects to shelterbelts and silvopasture trees to produce more food from my croft."

The croft's tree planting will provide habitat for woodland species, shelter for livestock and also improve the conditions for grass growth, reducing the need for bought-in feed. The trees offer some forage material for the livestock, improving stock health by providing valuable minerals and nutrients that would otherwise have to be fed as a supplement.

"Different grazing practices and cutting hay can provide habitats that are ideal for certain wading birds that were previously here in high numbers but are now in significant decline. We still have better populations of several vulnerable breeding wader species than many other areas, with snipe, oystercatcher, curlew, golden plover, greenshank and dunlin all maintaining good populations thanks partly to extensive crofting practices. The Common Grazing (and some of the less-improved crofts) is also a remarkably rich hotspot for floral and fungal diversity, along with associated insect assemblages, with an unusual mix of temperate oceanic and boreal species which are found in only one or two other locations in the country."

Read more of Helen's grazing rotations, including the challenges of setting up a local food hub, over on **our website**.

Images: ©Helen O'Keefe

A Farmer's Journey

Tony Davies
Livestock farmer in Elan Valley, Wales

"Over ten years ago, we reduced the sheep numbers by 65%, however with increased lambing percentages and carcase sizes the actual financial value of the lamb sales only reduced by 25%. Combined with drastically cutting import costs (no fertiliser and minimal feed purchased) farm profits rose by £20,000." – Tony

Tony is a fifth-generation farmer at Henfron Farm, where his family have farmed since 1860, and he is committed to low-carbon, low-input farming. Since 2005, he has completely altered the farming system to reduce inputs. The farm is off-grid and they generate their electricity and heat using wind power, solar and biomass heating. Tony produces biochar which he blends with composted livestock bedding and sheep's wool. With fewer inputs, lowered overheads and working within the land's carrying capacity, Tony has improved his profitability.

"I calculated the projected profits before reducing sheep numbers. My analysis calculated the number of sheep the farm needed to comply with regulations, manage with limited inputs and maximise profits. Not surprisingly this number was similar to the number of breeding ewes that my ancestors kept on the farm over a hundred years ago."

Across the farm, 95% of the grassland and woodland is classed as SSSI, including wildflower hay meadows and 300ha peat bogs.

"I'm a producer of environmental services or 'public goods' such as wildlife habitats, clean water, flood mitigation and carbon sequestration. These habitats are managed by Welsh Mountain sheep and a small herd of Dexter cows. The low-carbon lamb, mutton, wool and beef could be considered a by-product of these outputs. The farm management focuses on environmental improvements, as well as the creation of a financially viable, sustainable business that supports the family."

Read Tony's full case study **here**.

Helen Keys
Mixed farmer in Tyrone, Northern Ireland

"We believe that our mission as farmers is to leave the place better than we found it. If we don't, we are damaging our assets which makes no sense. If we do it right, agriculture is a mutually beneficial enterprise for farmer and nature." – Helen

Helen, alongside her partner, Charlie Mallon, have a variety of income streams from selling rotational crops, like potatoes and oats, with their main income coming from growing flax to turn it into linen. Their scutched fibre returns more profit from one crop planted across three acres than the whole farm would have generated in previous years as a dairy or suckler herd farm.

"We started growing flax a few years ago without really realising that there is a huge gap in the processing in the UK. Bit by bit we worked out how to do it at a commercial scale – retting, scutching, spinning, weaving. The last bits are going into place now and we have a waiting list for sustainable locally grown textile."

With support from Innovate UK, Helen and Charlie developed **Source Grow** – an online platform that helps farmers to decide what to grow based on their soil, their location and what is in demand from local restaurants. Farmers also receive recommendations for what to grow that are informed by what other farmers are already growing – to reduce competition and support more profitable, niche products. Using this platform, farmers can then sell to restaurants through a weekly pick-up and delivery service.

Helen shares more of her farming story **here**.

A Farmer's Journey

Patrick Barker
Arable farmer in Mid-Suffolk, England

"Having a productive and profitable business is crucial to our ability to manage the land but that most certainly does not mean we do that at the detriment of the land. Creating a healthy balance between arable production and the natural environment is key to a productive landscape in every sense." – Patrick

Patrick and his family have been on a mission to achieve their farm's **Maximum Sustainable Output (MSO)** by reducing fertiliser and sprays and undergoing carbon audits. While they are on a steady year-on-year reduction towards MSO, fertiliser and sprays show to be the main carbon and economic cost to the business – making increasing beneficial natural predators and improving soil health key ambitions.

"Our farm profitability has increased through the farming practices we have adopted. Marginal land, awkward corners and low yielding areas are removed from arable production and are entered as alternative options in ES schemes, so we can generate a financial and environmental return. Every measure that has been put in place to reduce our fertiliser and spray usage has a cost-saving and we have not seen yield decrease as a result."

"Upping our efficiencies has seen less fuel used on a day-to-day basis and has freed up time to take on more contracting work so generating more income off-farm and spreading the costs of machinery over a wider area. By dramatically reducing cultivations, we found that a high horsepower, high fuel-use crawler tractor was surplus to requirements and the machinery fleet has been scaled down as a result."

Read more of Patrick's farming approach **here**.

The actions highlighted throughout this report have proven to improve natural capital while simultaneously enhancing biodiversity, mitigating climate change and making good economic sense. As those who have ventured down a nature-friendly path can attest - simple changes reduce the need for artificial fertilisers, lessen input costs and maximise returns enroute to increased profitability.

A healthy countryside can support farm businesses which recognise that restoring nature is pivotal to achieving success. Farmers can benefit from a range of income streams, including public investment for their role in averting the climate and nature emergency, support from consumers who want goods produced in a way that serves to protect and restore nature, alongside private investment through land management schemes.

The trajectory of a nature-friendly farming future - one that safeguards a diverse, vibrant environment – can deliver much-needed resilience in a warming world.

Image: Top: ©Hedley Wright & Brian Barker, Left: ©Patrick Barker, Right: ©Hedley Wright & Brian Barker

Statements from Supporters

The NFFN is grateful for the ongoing support from its advisory partners and other leading organisations including RSPB, Soil Association, Woodland Trust, Butterfly Conservation and more.

Liz Bowles,
Associate Director Farming & Land Use, Soil Association

"Soil Association endorses this report, coming as it does at such a critical time in planetary history, with climate change starting to have the impacts predicted 30 years ago and our food supply chains starting to "creak". Farmers need support urgently to move to systems that work with nature and not against it. This report sets out what farmers are already doing to farm with nature, but it is a matter of urgency that we find ways to accelerate this change to meet the climate and nature crises we face."

Honor May Eldridge,
Plantlife

"We welcome the new Rethink Farming report from the NFFN. It's critical to make farmers central to tackling the climate and nature emergencies together. Farming with nature has huge value for protecting and restoring species-rich grasslands, in particular wildflower meadows, which would help sequester carbon and contribute to climate resilience."

Helen Chesshire,
Lead Farming Advocate, Woodland Trust

"Thoughtful integration of trees into farming systems, otherwise known as agroforestry, will help farmers restore nature, tackle climate change and produce sustainable, healthy food. As the ancient proverb states 'The best time to plant a tree was 20 years ago. The second-best time is now.' This is a timely report."

Lucy Bjorck,
Senior Policy Officer, RSPB

"This comprehensive report is uncompromising in its critique of the current state of farming and bold in its vision for the way forward. It's clear from the farmers showcased here that a better future is within our grasp if we can put in place the right framework to support nature friendly farming."

Gill Perkins,
CEO, Bumblebee Conservation Trust

"BBCT welcomes NFFN's new Rethink Farming report. Farmers play a pivotal role in helping us to address the dual climate and nature emergencies. Farms have potential to provide a diverse range of habitats across their land, which not only help a variety of wildlife but also help to improve crop pollination, natural pest control, soil health, and to reduce pollution and greenhouse gas emissions. In particular, protecting and restoring open flower-rich habitats, particularly meadows and grasslands, will help to sequester carbon, enhance biodiversity and contribute hugely to the beauty of our natural environment."

Russel Hobson,
Director of Evidence and Resources, Butterfly Conservation

"As an NFFN supporter, Butterfly Conservation commends the Rethink Farming report promoting sustainable land management to solve the climate and biodiversity crisis we face."

Statements from Supporters

Dorothy Driver,
Amphibian and Reptile Conservation

"We support NFFN in their work in putting nature and climate at the heart of farming - a much needed commitment due to the dramatic biodiversity loss we are experiencing in the UK (and globally) and the need to tackle the climate emergency. Amphibians and reptiles are part of this picture of decline; concerted effort is required to bring about their recovery. For many species farmland is a key habitat, where targeted habitat creation and management (at scale) on farmland is an important aspect to their conservation."

Rob Macklin,
Senior National Consultant, Sustainable Farming, National Trust

"'Rethinking Farming' highlights the urgent problems facing agriculture from climate change to soil degradation and biodiversity loss. Against these challenges, this report shows the positive impact of nature-friendly farming practices that are so important to restore and maintain the natural capital on which farming depends."

Thanks to the James Hutton Institute, Farm Wildlife and Sustain for their supporting contributions within this report.

Kathryn Smith,
Farm Wildlife

Kenneth Loades,
James Hutton Institute

Vicki Hird,
Head of Sustainable Farming, Sustain

Image: ©Sorcha Lewis

Join the NFFN for free at
www.nffn.org.uk/join-us

www.nffn.org.uk
#RethinkFarming @NFFNUK

Images: Front Cover: Top Left: ©James Hopkinson, Bottom Left: ©Sorcha Lewis, Top Right: ©Sorcha Lewis, Rear Cover: ©Sorcha Lewis