

# FARMLAND

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The Big Picture



REWILDING  
REACHOUT 

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**SCOTLAND:** The Big Picture works to drive the recovery of nature across Scotland through rewilding, in response to the growing climate and biodiversity crises.

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We believe that restoring the natural living systems on which all life depends is the responsibility of everyone, and that young people's voices should be heard and valued.

**Rewilding Reachout** is a series of booklets, films and stories shaped by our #NextGen rewilders, a team of inspirational young people who aim to inform and inspire fresh thinking among young Scots around the potential of a rewilded Scotland.

#SBPNextGen

Thanks to National Lottery players





Today, with nearly 8 billion people on Earth, our home is a farmed planet and its remaining wild places exist as shrinking islands in a managed agricultural landscape. In Scotland, 80% of the land is farmed. However, the majority of Scotland's farmed land is used for rough grazing, with its usefulness for other forms of agriculture limited; less than 10% is used to grow crops.

The nature of Scotland's climate and soils means that we have to import a lot of the foodstuffs that fill our supermarket shelves: sugar from Africa, animal feed from South America, cereals from Eastern Europe, and fruit and vegetables from Asia and the Middle East. Like the rest of the UK, Scotland hasn't been self-sufficient in food production for centuries, and in that time our diet has become a lot more varied.

The majority of Scotland's farmed land is used for rough grazing.





# The first farmers

To understand the Scottish landscape today, we really need to understand how it is farmed, and why. Farming began in Scotland at least 6,000 years ago, when the Caledonian forest began being cleared to grow crops. The main crops then were grains from cereals such as wheat and barley, supplemented with cow's milk and wild foods such as hazelnuts and venison.

As the forest retreated and agriculture intensified, wild foods became less common and farms became more self-sufficient. Trade was limited, so people only ate what they could grow. When crops failed, people starved. By the 12th century, a mixed farming system had developed, with livestock kept on crop fields close to the homestead at night, depositing their nutrient-filled dung in this "infield" zone, but grazed further away, on "outfield" grazing pastures, during the day.

By the late Middle Ages most Scottish farming was clustered around small settlements, based on a system known as "run rig" land tenure – referring to the runs and ridges created by wooden ploughs. Within this system a handful of families would farm an area of "in-bye" land together, dividing the land into strips that were periodically redistributed by drawn lots, meaning no individual had continuous use of the best land.





# Scotland's agricultural revolution

In the 1690s, Scotland experienced the Seven Lean Years, when the climate entered a severe cold period, crops failed and famine struck. Individuals resorted to eating grass and one in every seven people died. In response, the Scottish Parliament passed Acts allowing the consolidation of run rigs into fixed holdings and the division of common grazing lands into private ownership. A version of the old run rig system survived into the 20th century in parts of the Hebrides, but on the mainland, the system gradually disappeared.

These changes helped make Scottish farming more productive, but as with other advances in farming efficiency since then, there were other far-reaching social consequences. Many Scots emigrated, while the ill-fated and ultimately disastrous Darien Scheme – which sought to revive starving Scotland's fortunes by establishing a new trading colony in Panama – bankrupted Scotland and ultimately encouraged the creation of the new Kingdom of Great Britain in 1707.

After the Union, attempts were made to improve Scottish agriculture with the adoption of haymaking and the use of nitrogen-fixing clover to boost soil fertility. Turnips, potatoes and cabbages were introduced, greatly improving public nutrition, while lands were enclosed, marshes drained and crop rotation used to further improve production.





The Quiraing on the Isle of Skye is famed for its drama but this geological wonder, like so many others, is surrounded by a largely empty landscape that has been stripped of the rich woodlands that supported a much broader range of wildlife than exists today.

## The clearances

As 18th century farmland became more commercialised, rents increased and traditional subsistence tenants were priced out, leading to the Lowland Clearances. “Cottars”, who had always cultivated their own small plots, were replaced by agricultural labourers who lived in rented village accommodation or at the main farm on new ranch-style farms. Many small settlements were torn down and their occupants forced to gather in purpose-built villages or move to the cities.

Later, the Highland Clearances saw similar displacement of the Highland population to make way for more profitable sheep farming. Those who remained were forced into crofting, living on tiny rented farms, too small to sustain them. During the Highland Potato Famine – a fungal blight that destroyed the potato crop over several years – many Scots were encouraged to emigrate, and many landlords switched from a policy of tenant relocation to a focus on outright eviction.



## The modern era

Scottish farming had always been a struggle against natural constraints on production, including pests, diseases and a harsh climate. But in 1909, everything changed. Fritz Haber worked out how to artificially “fix” atmospheric nitrogen, plucking it out of the air and turning it into a form that plants could use to grow. Ammonium nitrate fertiliser transformed agriculture – and our world.

Haber’s fertilisers were just the start. In 1939, Paul Hermann Muller found that the chemical DDT could be used to kill insect pests. Armed with fertilisers and pesticides, and increasingly working with tractors instead of horses, farmers felt they were finally breaking free from nature’s ancient constraints.

Small, crooked fields were no use any more. Trees, thorns and rushes only got in the way of the new machines. Fields were enlarged, hedges ripped up, rivers straightened, bogs drained and ponds filled in. Farming was now an industrial business and the bond between farmers, their animals and the soil began to erode.







## Successes and failures

In Europe, a Common Agricultural Policy (known as the CAP) was created in 1962 with the aim of increasing agricultural productivity and producing cheap food. However, after the UK joined the European Economic Community in 1972, many farming sectors became dependent on subsidies and by the 1980s the CAP was attracting criticism for stimulating overproduction (creating the infamous rotting "butter mountains" and "wine lakes").

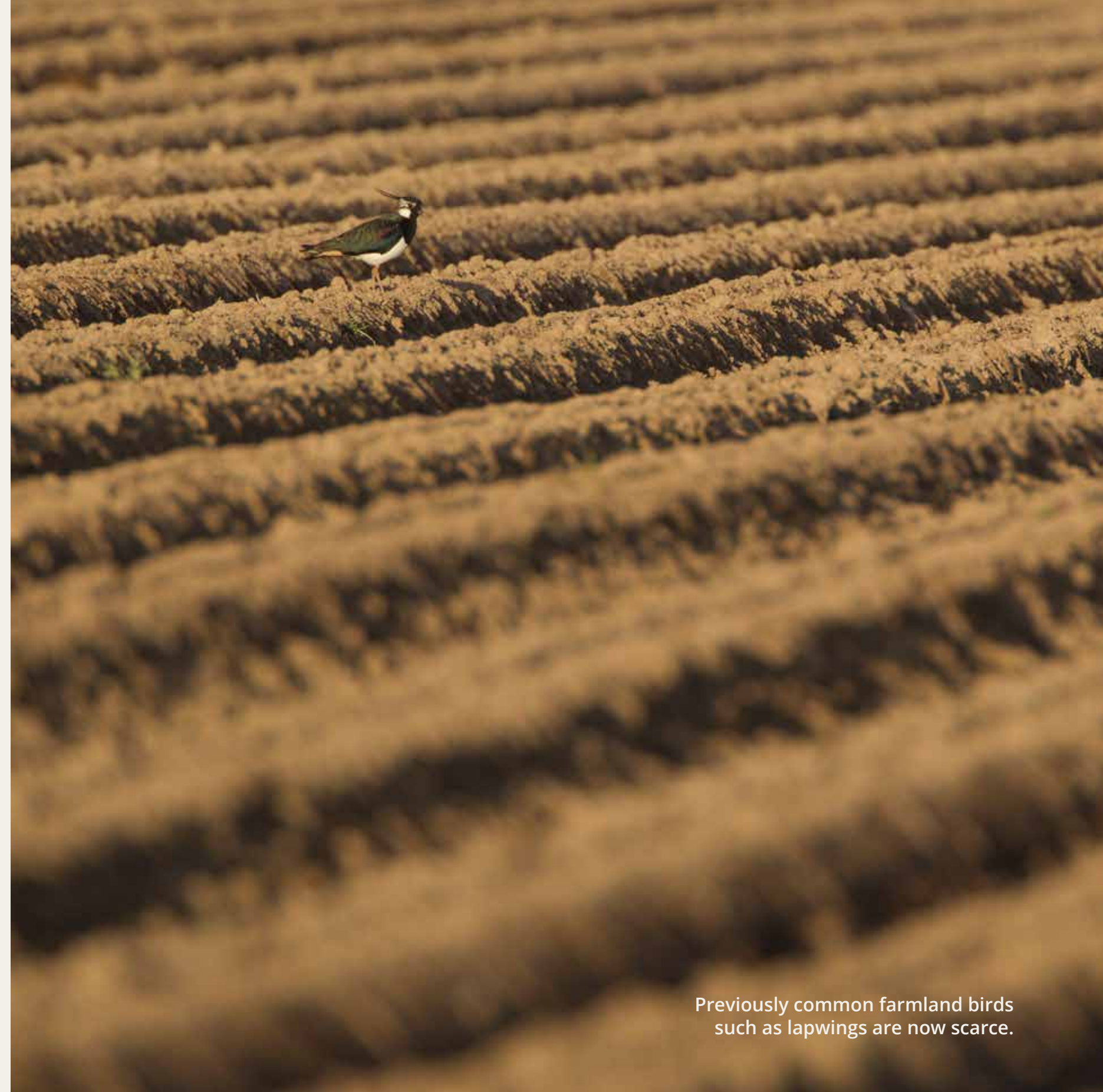
Since then, the CAP has been repeatedly reformed, and protecting the environment has become a key objective, but with only mixed success. Many argue that CAP subsidies have been disastrous for nature, encouraging waste and over-use of chemical inputs. Meanwhile, we still don't know what might replace the CAP in post-Brexit Scotland, or if rural communities and the environment will end up better or worse off.



# Factory farming

Industrial agriculture promised to reduce world hunger, support growing populations and stimulate global prosperity. Between 1960 and 2015, agricultural production more than tripled, and food prices fell. Pushed along by politicians, big business and unforgiving economics, few noticed the harm that farming was doing to the natural world, while those farmers who did notice couldn't afford to change course even if they wanted to.

We now know that industrial farming pollutes the air, accelerates climate change and releases damaging chemicals and growth hormones into our water. Intensive livestock farming is linked to the spread of diseases and increasing antibiotic resistance. Chemical pesticides erode the foundations of our ecosystems, while high stocking densities compact soils, increase flood risk and erase biodiversity. Modern farming has left our soil dependent on the next hit of chemicals or blowing away in the wind. We get cheap food, but in the end, society pays the price.



Previously common farmland birds  
such as lapwings are now scarce.



# Silent spring

Lacking experience of past natural richness, each new generation has come to feel that the terribly impoverished natural heritage they are accustomed to is normal. Conservationists call this **shifting baseline syndrome**. In truth, decades of industrial farming have taken a devastating toll. Nature has been slipping away, almost unnoticed.

Corncrakes and corn buntings have disappeared from most of Scotland. Grey partridges are now rare. Greenfinches, oystercatchers, lapwings, pied wagtails and kestrels were once common but are now scarce. Curlews are in critical decline. Rich hay meadows have been replaced by fast-growing but sterile silage fields. Where the flowers have gone, the thrum of insects and melody of birdsong have fallen silent.

Once a common sight, kestrel numbers have dramatically declined.

There have been winners as well as losers. In recent years, ducks, swans and geese have increased, as have some woodland birds. Colonists moving north with climate change, a reduction in persecution of some species and reintroductions have meant that we have actually gained more species than we have lost in the last 200 years, but what we have lost is the overall abundance of once common birds such as sparrows and starlings.

Around 40 million fewer birds contribute to our dawn chorus in the UK compared with 50 years ago. Across Europe 600 million birds have disappeared since 1980.







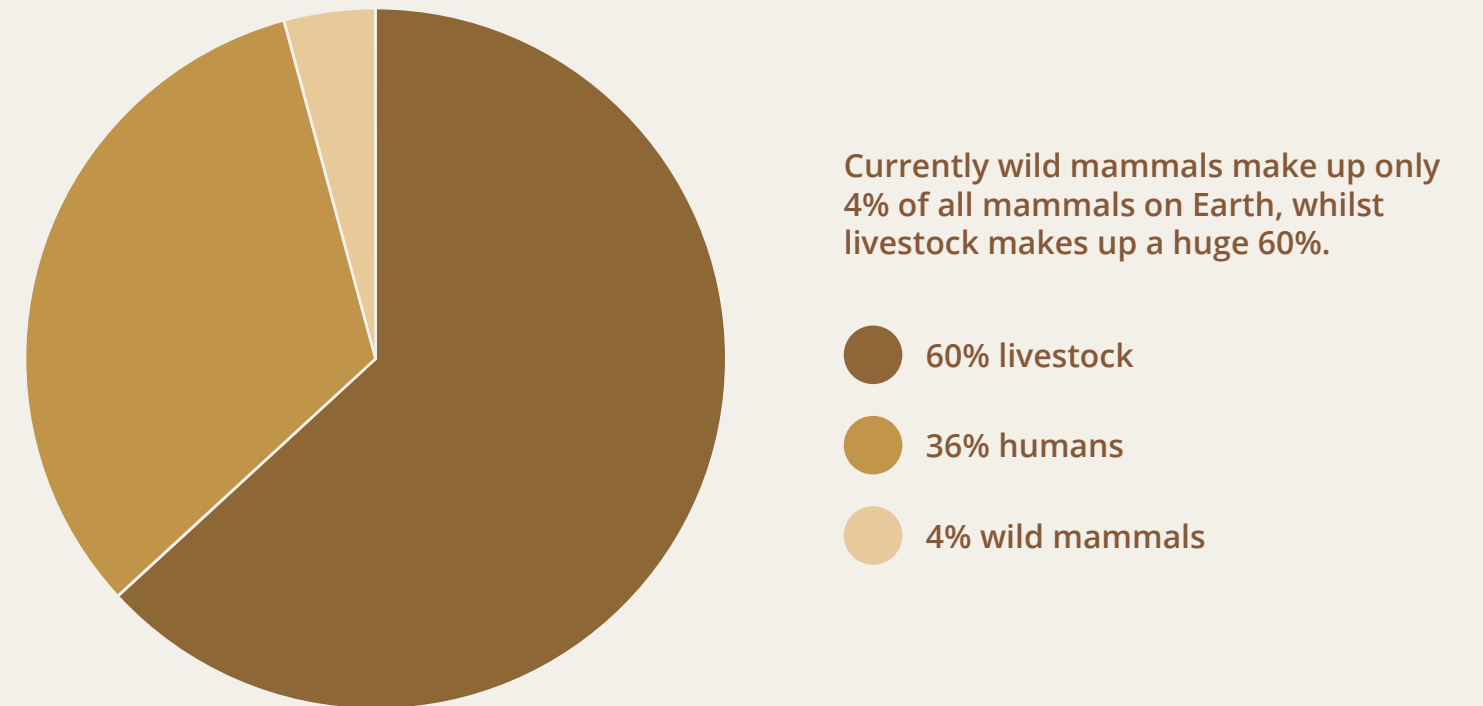
Much more of our farmland could be a riot of floral colour humming with insects and bird life.

## Out of balance

Between 1970 and 2011, livestock increased from 7.3 billion to 24.2 billion animals, worldwide. Agriculture has become increasingly focused on generating animal feed, biofuels and industrial ingredients for processed food products. Fewer people are undernourished – lacking the calories they need – but there are growing numbers of malnourished people, made sick by a poorly balanced diet overly

reliant on processed foods mostly derived from just three crops: wheat, rice and maize.

Our entire civilization is based on farming. We cannot survive without farmers. But while all farming demands some domination of wild nature, many now feel we've gone too far. People are beginning to ask questions about where their food comes from, how it has been farmed and at what cost to the natural world. Responding to this growing public interest, some farmers are already exploring ways to do things differently.





## Back to the future

At the root of a farm's productivity is its soil, and at the root of soil health are worms. Worms are detritivores – organisms that process dead or decaying matter as food. Different worms do different jobs, but earthworms are especially good at improving soil structure, burrowing through the soil and improving soil fertility by releasing the nutrients locked up in dead organic matter.

Soil can be further enriched by good quality dung, with the help of dung beetles (but the more liquid slurry produced by silage-fed cows is less helpful). Old mixed farms used to restore soil fertility by moving livestock onto crop fields and using their dung as fertiliser, but modern farms tend to be focused on either livestock or arable crops. Two mutually beneficial systems are now kept separate, with feed needing to be transported to livestock farms and artificial fertilisers sprayed onto arable farmland.

By contrast, **regenerative farming** seeks to ensure nature is integrated and respected throughout the farming system. This involves farming practices such as managed grazing and no-till farming that reduce emissions, help lock up carbon, reduce the use of synthetic pesticides and fertilisers, tackle pollution and help restore biodiversity. It means recycling more resources on the farm and supporting local supply chains.

Not all existing farming systems are bad for biodiversity. Indeed, some biodiversity depends to a large extent on our farmed landscape. **High Nature Value** (HNV) farming systems often involve grazing semi-natural vegetation at low stocking densities in ways that benefit a range of species, and with 40% of Scotland's farmed land comprising HNV holdings, these rough grazing lands are also associated with immense social and cultural value.

Increasingly, hardy breeds such as Highland cattle are being used to replicate natural grazing processes, once performed by large, wild herbivores, such as aurochs.





# Rewilding and farming

Rewilding is often perceived as focusing on reintroducing missing species, but rewilding is about much more than that. Rewilding offers a way to restore some of the life lost from our countryside, with a focus on wildness more than wilderness. At its simplest, rewilding just means giving nature more freedom. We can't let nature take its course across a crop field, but we can find better ways to coexist with more nature on our farms, finding biological solutions to farming challenges where we can, and only resorting to chemical pesticides when we have to.

Using some land for high intensity agriculture can theoretically allow us to spare more land for nature reserves to protect those species that struggle to survive in human-dominated landscapes, but we also need to normalise greater land sharing with nature, making room for wildlife across our agricultural landscapes.

Carry Farm in Argyll has found a way to blend rewilding with producing food, and is also diversifying into nature-based tourism and crafts such as wool and wood products.





## What can you do to help?

- **Waste less food.** A shocking one-third of global food production is wasted. In the UK, more than 25 million tonnes of CO2 are linked to producing food we simply throw away. That's more than the total CO2 emissions of Kenya. The top three wasted foods are potatoes, bread and milk, and if we wasted less food, much of the land used to create that food could be left to nature instead.
- **Eat sustainably.** This might mean eating less meat, eating a more diverse diet, eating things in season, sourcing sustainable seafood (look for the MSC logo), buying local or organic where possible, and avoiding unnecessary plastic packaging. How you spend your food budget has a big influence on the whole food supply chain. Check out the Soil Association's Agroecology campaign for more info.
- **Do it yourself!** Grow your own veg (even a grow bag on a balcony can yield lots of potatoes or tomatoes), compost your food waste (try an indoor worm farm) or even try foraging for wild foods such as wild garlic or blackberries.
- **Invest in food.** Much of the damage done to our environment by agriculture has been caused by a drive towards cheap food (and clothes). Ultimately, if we want more sustainable farming, we – as individuals and as a society – need to fund the farming systems we want. This might mean paying more for food, and if we don't, nature is left paying the ultimate price.
- **Shop around.** Seek out trusted producers farming in nature-friendly ways, rather than doing your whole shop at supermarkets (which are often associated with maximising profit at the expense of people and the environment). Befriend a farmer, try a local butcher, check out farm shops or look online.

Buying locally grown, seasonal food directly from farmers cuts down on food miles and packaging – good for us, the environment and the climate.





# Glossary

**Arable** – land used (or suitable) for growing crops.

**Biodiversity** – the variety of living organisms, either in a particular habitat or around the world.

**Biofuels** – a fuel, such as wood or ethanol, produced in a relatively short time from living organisms (in contrast to fossil fuels which are made up of dead organisms slowly decomposing over millions of years).

**Corncrake** – a bird, related to coots and moorhens, but which lives in long vegetation on land. Like some other farmland birds, it has suffered catastrophic declines linked to early mowing for silage that has replaced traditional hay harvests in late summer.

**Corn bunting** – a once common farmland bird that has declined by as much as 90% as farming has intensified and increased in efficiency, leaving fewer seeds and insects available for wild birds.

**Crofting** – a form of land ownership and community organisation defined by small-scale food production and shared grazing lands, particular to the Scottish Highlands and Islands (and formerly on the Isle of Man).

**Crop rotation** – the growing of different crops at different times on the same piece of land to avoid exhausting the soil of particular nutrients, and to help control the weeds, pests and diseases that can emerge when a single crop dominates.

**Detritivores** – organisms which feed on dead organic material (usually plants).

**Hay meadow** – a managed field of grasses and wildflowers traditionally harvested for hay (dried grasses and wildflowers) in late summer to provide feed for animals over winter.

**In-bye** – part of a farm, traditionally close to the farm buildings, used mainly for arable and/or grassland production and which is not hill or rough grazing. In-bye areas are surrounded by a fence, wall, ditch or hedge.

**Malnourished** – the consequence of a poorly balanced diet creating either a deficiency, excess or imbalance of nutrients (as opposed to undernourished, when a diet simply lacks sufficient calories). A person can be overweight or obese and malnourished at the same time.

**Pesticide** – a chemical substance or biological agent (e.g. a virus or fungus) that targets “pests” that threaten crops or other favoured plants. Pests include insects, weeds, slugs and snails. Pesticides may also be toxic to humans and other non-target species while their widespread use erodes the foundations of natural food webs.

**Regenerative farming** – a farming system focused on topsoil regeneration, increasing biodiversity, enhancing ecosystem services, increasing resilience to climate change and strengthening the health of farms.

**Rough grazing** – so-called “unimproved” land where no fertilisers or pesticides are used, where livestock feed mostly on native vegetation (rather than sown grass crops).

**Silage** – a winter animal feed made from grass that’s compacted and stored in airtight conditions (typically in plastic bales), without first being dried. It is cut earlier than hay (allowing farmers to take several silage cuts in a year), is more nutritious and is less dependent on good weather, but the switch to silage has created problems for wildlife.

**Subsistence tenants** – farmers who rent land from a landlord in order to grow food on a small scale that may only be enough to feed themselves, producing little or no marketable surplus.

**Sustainable** – any practice that meets current needs without negatively impacting on the needs of future generations. Sustainability is often considered to have three dimensions: environmental, economic and social.



Blaming farmers for the damage farming has done to our environment would be like blaming coal miners for the damage fossil fuels have done to our climate. In reality, these are societal problems. However, this also means we all have the power to drive change, beginning with how we spend the pound in our pockets and ending with our choices at the ballot box. Intensive agriculture will continue, and we need it to meet our need for food, but we also need it to be more sustainable.

We certainly need to encourage a move to more regenerative farming, but existing High Nature Value farming systems also need – and deserve – our support. If we want a healthier landscape, we need to encourage healthier farming by buying food from sustainable, nature-friendly farms. And we need to vote for political parties whose agricultural policies reflect these priorities.



Rewilding offers a way to restore some of the life lost from our countryside.



#### Credits

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SCOTLAND: The Big Picture is a Scottish charitable company limited by guarantee.  
Charity No. SC050432 Company No. SC352287.  
Registered office: Ballintean, Glenfeshie, Kingussie, PH21 1NX.

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