

**Cool
Farm®**

Cool Farm Tool

Biodiversity guidance note

What is biodiversity and why is it important?

Biodiversity refers to the variety of species on earth. This diversity of plants, animals, insects and microorganisms underpins essential 'ecosystem services' like nutrient recycling which are essential for human life and the health of the planet¹. However, biodiversity is in a state of decline and global populations of species have decreased by 68% since 1970, with millions threatened with extinction⁴.

What is the link between biodiversity and agriculture?

Agriculture is a key driver of biodiversity loss as it diverts land for agricultural use where systems are often intensively managed, depleting nutrients and emitting pollutants¹. Yet, as agriculture is dependent upon many of the ecosystem services provided by rich biodiversity, such as soil formation, provision of clean water and pollination, agricultural practices need to adapt to nature-friendly methods to be sustainable.

Key components for farmland biodiversity

There are several key components that can be incorporated within an agricultural environment to encourage higher biodiversity on farmland.

A **diverse landscape**, or a variety of landscape features including natural and semi-natural environments, is necessary to support a variety of species². For example, it has been found that over 63% of animal species depend on semi-natural habitats to survive within agricultural areas³. Maintaining or adding **hedgerows, field margins, ditch banks, ponds, and grasslands** are examples of how this can be achieved on farmland.

Shelter for species within agricultural areas is important. This is particularly relevant during certain times, for example when species are nesting or raising young or when harvesting is happening on the farm². Providing **nest boxes** or **designating unharvested areas** can ensure animals have access to refuges.

Having **sufficient food supply** is a key factor in species survival and reproductive rates. Increasing access to food, by **planting wild bird seed or cover mixture, adding**

wildflower strips, or providing supplementary food, can support species abundance, survival, and productivity².

Crop diversity increases the diversity of soil microbes, which positively impacts soil structure and health, and subsequently biodiversity^{2, 5}. It also boosts the genetic diversity of crops, which improves crop resilience to disease. This can be achieved by growing a **range of crops**, rather than monocultures, for example by carrying out **crop rotations, intercropping or companion cropping**.²

Excessive chemical inputs contaminate soil and water sources, with subsequent negative impacts on species richness and abundance². **Reducing pesticide and fertiliser use**, or replacing it with more **nature-friendly alternatives**, can help minimise these impacts.

Connectivity between habitats is essential, as the number of species that can survive within a habitat is dependent on the size of the area and distance to other habitat patches. Connecting habitats via **corridors** can help to achieve this¹⁰.

Setting aside **uncultivated areas** within farmland provides refuges and foraging sites for animals, insects, ground-nesting birds, and space for plants and fungi². This can be achieved by adding grass or flower buffer strips or margins or including grass or herbal leys in crop rotations.

Farming practices for enhancing biodiversity

These key components for biodiversity can be delivered through different on-farm practices. The practices that are most applicable to any given farm will differ between farms. However, a list of some example beneficial farm practices is given below. These are supported by evidence from a synopsis about farmland biodiversity conservation by [Conservation Evidence](#) and by the information provided within the [Biodiversity Performance Tool](#).

This list provides an indication of practices a farmer might implement to boost biodiversity on their farm. However, we recommend that farmers seek advice from a local ecologist or agronomist to check what practices would be most suitable and beneficial within their local context.

TABLE 1. AGRICULTURAL PRACTICES FARMERS MAY ADOPT TO IMPROVE BIODIVERSITY

| PRACTICE | DESCRIPTION |
|---|---|
| Add organic matter | Addition of compost, manure or plant matter to soils |
| Field margins sown with flowers | Create or maintain flower-rich margins around fields, either by leaving unmown to naturally regenerate or by sowing flower seed mixes |
| Watercourses | Maintaining and managing on-farm watercourses for biodiversity |
| Reduce pesticide use | Minimising the amount of synthetic pesticides applied to land |
| No spring mowing/grazing | Delaying mowing or grazing to occur after plants have flowered and bird chicks have fledged |
| Field margins sown with perennial grasses | Create or maintain grass-rich margins around fields, either by leaving unmown to naturally regenerate or by sowing grass seed mixes |
| Reduced tillage | Reduce the intensity of tilling to reduce vehicle passes and soil disturbance |
| No tillage | Switch to system where fields are not tilled to reduce vehicle passes to almost zero and reduce soil disturbance |
| Adjust grazing levels to appropriate levels | Adjust stocking rates to suit local conditions and employ rotational or mob grazing |
| Cover crops | Plant cover crops when fields would otherwise be bare to reduce soil erosion and increase soil nitrogen |
| Hedgerows | Plant or maintain species-rich hedgerows |

How can the CFT biodiversity tool help?

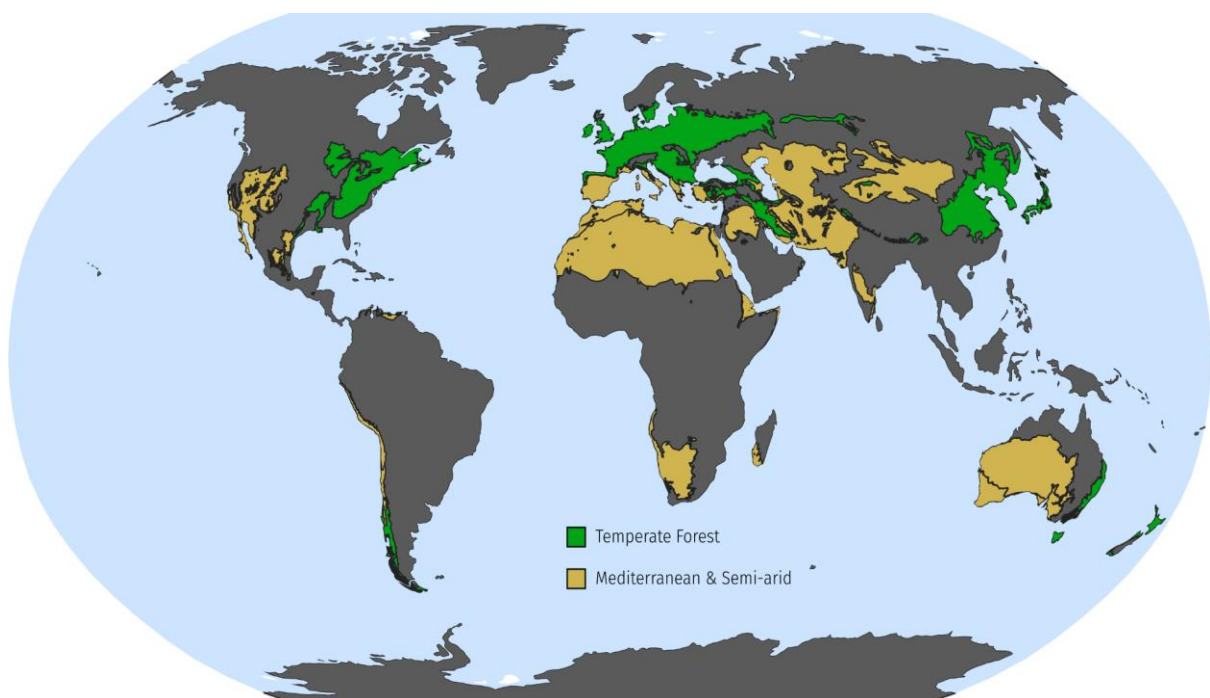
The Cool Farm Biodiversity tool quantifies how well your farm management practices support biodiversity, at farm scale. Points are awarded for wildlife-friendly actions in four areas: Diversity of products; Production practices; Small natural habitats; and Larger natural areas and landscape. Points are also awarded separately for a number of different indicator species groups, covering plant, animal, insect and microbial species, to allow farms to set different objectives for their biodiversity management.

The Cool Farm Tool's biodiversity assessment (CFT Biodiversity) uses expert judgement and evidence-based analysis to evaluate farm management actions for their biodiversity benefits. The actions listed are those expected to benefit on-farm biodiversity, according to the judgement of farm biodiversity experts. The scoring is evidence-based. The scores assigned to each action are weighted according to scientific evidence, compiled and assessed by the University of Cambridge Conservation Evidence project, working with international panels of biodiversity experts. The underlying evidence is openly accessible at www.conservationevidence.com.

The purpose of providing scores is to allow users of the tool to quantify their baseline impact on biodiversity at farm scale, and to measure and drive improvements over time. It can also highlight where a farm is underperforming to help guide the development of Biodiversity Action Plans.

There are many useful sources that can provide advice on actions that could be taken to improve biodiversity on a farm. Different actions will be suitable for different contexts and users are strongly encouraged to seek advice from a local ecologist or agronomist. Some initial information is available from the sources below, but we encourage you to seek further information for your local context.

FIGURE 1. GLOBAL MAP OF THE TEMPERATE FOREST AND THE MEDITERRANEAN AND SEMI-ARID ECOREGIONS BASED ON THE WORLD WILDLIFE FUND. FARMS FALLING IN THE FOREST GREEN AND BROWN AREAS CAN USE THE CURRENT VERSION OF CFT BIODIVERSITY



To view frequently asked questions in relation to the Cool Farm Tool click [here](#).

Sources for guidance on improving your farm's biodiversity performance:

Biodiversity Performance Tool (BPT)

- A biodiversity-focused tool that provides input to elaborate sound personalised biodiversity action plans to implement on farmland, based on user inputs
- The [BPT User Manual](#) provides detailed information on the evidence behind the action plans

Farm Wildlife

- A partnership of organisations that provides local advice about farming in the UK for the benefit of wildlife find the website by clicking [here](#).

Fair to Nature

- UK certification scheme which focuses on promoting land management needed for biodiversity to flourish. The main component of [Fair to Nature](#) certification is asking farmers to designate 10% of their farmed land to be managed for nature. Using scientific research and the six key elements recommended by the [Farm Wildlife partnership](#) Fair to Nature use this information to state what type and number of habitats are required to make up the 10% area.

Case studies include:

- *Lordington Lavender*
Since working with RSPB and adopting land management methods such as wildflower margins they have seen an increase in not only insects but also endangered bird species such as Turtle Doves and Yellowhammers at their Lavender farm based in South Downs. To view more Fair to Nature case studies, click [here](#).

Local ecology services or farming networks, examples include:

Nature Friendly Farming Network (NFFN)

- UK-based network, open to farmers and the public, that raises awareness of nature-friendly farming, shares insights and experience and works together for better policies for food and farming link to their website is [here](#).

Biodiversity Agriculture Soil Environment (BASE UK/ BASE Ireland/ BASE France)

- [BASE](#) is a farmer-led knowledge exchange organisation for individuals interested in regenerative agriculture

Farming & Wildlife Advisory Group (FWAG)

- Organisation comprising local FWAG groups across England, that help farmers understand the environmental value of their land and make the most of the agri-environment options possible. Find their website [here](#).

References

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3. Duelli, P. and Obrist, M.K., 2003. Regional biodiversity in an agricultural landscape: the contribution of seminatural habitat islands. *Basic and applied ecology*, 4(2), pp.129-138
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