



Oxeye daisies © Ruth Feber

Field margins

Field margins are among the most extensive and ubiquitous uncropped habitats on farmland and have the potential to provide habitat for a range of wildlife. Over-wintering sites for invertebrates, refuges for small mammals, nectar and pollen resources for pollinators, and nesting and feeding sites for birds can all be encouraged by establishing field margins. As well as being habitats in their own right, field margins protect other features, such as hedgerows or watercourses, from farm operations. They can also act as corridors, helping wildlife move through the landscape.

Key points

- Field margins or buffer strips will benefit a range of farm wildlife species
- Different field margin options are possible, such as sowing with a tussocky grass mixture, including wildflowers to benefit nectar feeders, or cultivating margins for rare arable plants
- Aim for a mosaic of patches of taller and shorter vegetation around the farm, cut infrequently once established and do not cut in summer.

Field margins



Female common blue butterfly © nutmeg66 CC BY NC ND 2.0



© Emily Ledder/Natural England

Simple grass-only margins (above) provide breeding and overwintering habitats, while the addition of wildflowers (below) can greatly enhance their value to wildlife



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Field margins are the strips of land between the field boundary (such as a hedge) and the crop. Field margins can be deliberately managed to benefit key farmland species and buffer strips are one of the most popular agri-environment scheme options.

Field margins may contain a great diversity of plants, including those characteristic of woodland (hedge bottoms), wetland (ditch banks), grassland (grass margins) and arable (field corners and crop edges). Field margins can be established around both arable and grass fields; in arable

areas they are especially valuable as they provide undisturbed breeding and overwintering sites for wildlife. They act as buffers, protecting hedgerows, ditches and streams from farming operations, and they form a network across the landscape, often linking bigger areas of wildlife habitat, such as woodlands or wetlands.

Establishing and managing field margins

Field margins can be established and managed in several ways, described below, which will have different consequences for the wildlife that use them.

Sown field margins or buffer strips

Many buffer strips are established by sowing with a simple grass mixture, often including tussocky species such as cocksfoot. Tussocky margins encourage invertebrates such as carabid beetles, which predate aphids, and they can act as a source from which predatory invertebrates can colonise fields. They also provide cover and nesting sites for many small mammals, and habitat for amphibians and reptiles. Wild grass seeds are less important in the diet of farmland birds than broad-leaved weed seeds, but they are consumed by a number of finches and gamebirds.



Field margins help buffer other features, such as ditches, from farming operations

© Rosalind Shaw

However, grass-only strips rapidly form dense swards and can exclude naturally colonising wildflowers, often resulting in low species diversity. Including wildflowers (such as yarrow, black knapweed and oxeye daisy) in the seed mixture will greatly increase the value of margins for wildlife, providing a greater diversity of seed sources and host plants for invertebrate larvae, as well as pollen and nectar supplies for pollinators. Choosing species that flower and set seed at different times throughout the season will be even more beneficial.

Naturally regenerated margins or buffer strips

Field margins can also be established through natural regeneration. If soil fertility is relatively low, and the soil seed bank and local flora relatively rich, these swards may have a higher conservation value than sown ones, making this method of establishment the most beneficial option. The decline of rare arable plants, such as the cornflower, can also be helped through naturally regenerated buffer strips on light or shallow soils that are cultivated every one or two years. Varying the depth and timing of cultivation can enhance plant diversity.



Naturally regenerated margins are the best conservation option on light or shallow soils without grass weed problems

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Naturally regenerated margins can also provide important food resources for birds, both in summer and winter, in the form of weed seeds and grain from volunteer crops and a range of invertebrates. The patchy sward may make it easier for birds to find their prey. However, on very fertile soils, where the existing plant community is poor, or where there is a grass weed problem, naturally regenerated strips may be difficult to manage, and sown grass and wildflower mixtures would be the better option.

Grassland field margins

Field margins, or buffer strips, benefit wildlife in grassland as well as arable situations. Grassland margins can be established by leaving a strip uncut around the edge of grass fields. These measures allow a taller, tussocky sward to develop. This encourages seed production and increases invertebrate abundance, both of which provide food for other wildlife. Field margins in grass fields also buffer other habitats such as hedgerows and ditches, in a similar way to margins in arable fields.



© Ros Shaw

Field margins can develop from the existing grassland, or a grass and wildflower seed mixture can be used to create them, following guidelines for arable fields. The margins will need occasional management, either through grazing or cutting, to prevent too much scrub developing. Agri-environment scheme funding is available for grassland field margins.

Field margins



Margins should not be cut in summer, to allow plants to flower © Raj CC BY NC ND 2.0

Cutting management

Most margins are managed by some form of mowing, initially to aid establishment, and in later years to prevent the encroachment of scrub and maintain floral diversity. In the 12-24 months following sowing, frequent cutting may be needed to help the margin establish but, after this, mowing should be carried out not more than once every two years, or less often if possible. A diversity of structure is especially valuable (Box 1), and this can be encouraged by only cutting margins infrequently, cutting different margins in different years, or cutting half the margin and leaving half uncut. If possible, leaving some woody vegetation or scrub to develop will add to the habitat diversity for wildlife.



Structural diversity of vegetation helps beneficial invertebrates such as spiders © Martin James CC BY 2.0

Margins and buffer strips should not be cut during the late spring or summer, as this removes sources of pollen and nectar when they are crucially important, and may disturb nesting invertebrates, small mammals and birds. Where cutting is needed, for example to maintain the plant diversity of grass and wildflower sown buffer strips, or to control scrub, cutting in autumn will open the sward and reduce competition in winter (Box 2). However, it is still important to leave some patches or strips of the margin uncut each year to provide undisturbed areas for overwintering invertebrates and other species.

Ideally, cuttings should be removed. Leaving cut hay lying, rather than removing cuttings, may slow down the decline of annual weeds, such as black grass, and increase some perennial weeds, such as common nettle. Over the longer term, if the cuttings are left on the margins, plant species able to exploit higher soil nutrient status tend to increase, resulting in a less diverse sward.



Tussocky beetle banks help predatory invertebrates to colonise arable fields © Andrew Smith CC BY SA 2.0

Beetle banks

Beetle banks are linear grassy ridges about 2m wide, created across the middle of large cereal fields. Tussocky grass species, such as cocksfoot, are sown on the bank to provide overwintering cover for invertebrate predators of cereal aphids. Beetle banks also help to reduce field size, enabling predators, such as ground beetles and wolf spiders, to fully colonise the crop before the start of an aphid invasion. The banks do not extend to the field margin so farm machinery can pass, and the field continues being used as a single unit. Tussocky grasses sown on beetle banks also provide ideal habitat for small mammals and are used by ground-nesting birds.



Knapweed is an important component of nectar flower mixes © Miles Wolstenholme

Wild bird seed mixture and nectar flower mixture

Typically, wild bird seed mixture comprises a variety of species, planted in blocks or strips, including cereals, millet, kale, quinoa and sunflower. In general, kale seems to support high densities of the widest range of birds (insectivorous and seed-eating species). Quinoa can support large numbers of finches, sparrows and buntings.

Nectar flower mixtures, designed to provide food resources for invertebrates, contain at least four nectar-rich flowering plants, for example, red clover, birds-foot trefoil, common knapweed and sainfoin. Nectar flower mixtures are particularly valuable for supporting populations of pollinators.



Margins are best situated next to other features, such as hedges © Ruth Feber

Siting of field margins or buffer strips

Permanent grass only, or grass and wildflower, sown margins should not be sited where there are populations of rare arable plants in the crop edge, as the arable plants will not be able to compete with the grassy sward. Cultivated margins are, instead, appropriate for arable plants, as these species need regular disturbance to survive.

Field margins are often best situated next to other features such as hedgerows or wetland features such as ditches. Field margins can help buffer hedgerows and ditches from farm operations, and a diversity of habitats in close proximity will have wildlife benefits, providing a greater range of food resources, shelter and breeding habitats, especially benefitting less mobile species. Corners of fields can be particularly valuable. In general, wider field margins or buffer strips will be best for wildlife.



Linking field margins across a landscape increases their value to wildlife © Rosalind Shaw

Field margins should ideally be established in such a way that they link to each other, and link other habitats across the farm. Increasing the linkages will help maximise their effectiveness as movement corridors for wildlife around the farm and across the landscape. Wood mice, for example, use different habitats at different times of year, often moving out of fields and into woodlands after harvest. A network of field margins, especially alongside other habitats such as hedgerows, will help them move and disperse safely.



Peacock butterfly © Roy Stead CC BY NC ND 2.0

Patchy margin management is best for butterflies

Field margins are important breeding areas for butterfly species on arable farmland. Two of the most well known butterflies are the peacock and small tortoiseshell. These butterflies hibernate in the winter and, after emerging in the spring, lay clusters of eggs on nettle plants. Although an extremely common plant, our studies showed that nettles must be of a certain height and in the right place to be suitable for the caterpillars.

Small tortoiseshell butterflies chose small plants, often young nettle regrowth, on which to lay their eggs. Such leaves are typically higher in water and soluble nitrogen than older leaves, providing better nutrition. Peacock butterflies chose the tips of much taller nettle plants for their eggs, perhaps because the typically larger clusters of caterpillars needed more plant material on which to feed.

Aspect was an important factor for egg-laying, particularly in spring, when clumps of larvae were found on margins that received maximum sunlight. More larval clumps were located on south-facing margins than on any other aspect, for both species. Warmth can increase caterpillar survival rates.

Mowing some areas and leaving other areas uncut will result in structurally more diverse swards, providing greater opportunities for egg-laying and feeding for butterfly species and other invertebrates. Mowing different areas in different years, or not mowing the entire margin width, could be used to help achieve this effect.

Key results

- Even common butterfly species often have precise habitat requirements for feeding or breeding
- Managing field margin vegetation to create structurally different areas will help provide a range of habitats
- Leave some areas uncut, mow different areas in different years, or do not mow the entire margin width



Cluster of peacock caterpillars on common nettle © Ruth Feber



Grass and wildflower mixture © Ruth Feber

Wildflowers on field margins

In a large-scale field experiment we investigated how mowing affected the performance of different sown wildflowers on field margins. The greatest effect was that margins mown in spring and autumn, with cuttings removed, had more species compared to cutting at other times. More germination opportunities in margins that were more open during the autumn and winter appeared to be a critical factor in helping species establish and persist.

Open swards and reduced competition during the winter was particularly beneficial to winter-green species such as lady's bedstraw. Other species, such as cowslip and oxeye daisy required some cutting to maintain their frequency. In contrast, common knapweed did best when it was left uncut in summer and able to regenerate from seed.

Where the local flora are impoverished or the conditions are unsuitable in other ways for naturally regenerated buffers or margins, sowing a mixture with even just a few wildflower species rather than grasses only will have many conservation benefits. Choosing species with similar management requirements can help maximise return on the investment.

Key results

- **Timing of mowing affects wildflower species in field margins differently**
- **If mowing is required, mowing in autumn encourages wildflower species to persist. Mow different areas in different years**
- **If only a few wildflowers are sown, choose species with similar requirements and tailor the management to suit them**



Scabious is a valuable nectar source for many insects
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