Woodland & scrub

### Options especially relevant for woodland & scrub

<table>
<thead>
<tr>
<th>Code</th>
<th>Countryside stewardship options / capital items</th>
<th>Potential benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE1</td>
<td>Protection of in-field trees on arable land</td>
<td>Mid</td>
</tr>
<tr>
<td>BE2</td>
<td>Protection of in-field trees on intensive grassland</td>
<td>Mid</td>
</tr>
<tr>
<td>WD1</td>
<td>Woodland creation - maintenance payments</td>
<td>Higher</td>
</tr>
<tr>
<td>WD2</td>
<td>Woodland improvement</td>
<td>Higher</td>
</tr>
<tr>
<td>WD3</td>
<td>Woodland edges on arable land</td>
<td>Mid</td>
</tr>
<tr>
<td>WD4</td>
<td>Management of wood pasture and parkland</td>
<td>Higher</td>
</tr>
<tr>
<td>WD5</td>
<td>Restoration of wood pasture and parkland</td>
<td>Higher</td>
</tr>
<tr>
<td>WD6</td>
<td>Creation of wood pasture</td>
<td>Higher</td>
</tr>
<tr>
<td>WD7</td>
<td>Management of successional areas and scrub</td>
<td>Mid</td>
</tr>
<tr>
<td>WD8</td>
<td>Creation of successional areas and scrub</td>
<td>Higher</td>
</tr>
<tr>
<td>WD9</td>
<td>Livestock exclusion supplement - scrub and successional areas</td>
<td>Mid</td>
</tr>
<tr>
<td>TE4</td>
<td>Supply and plant tree</td>
<td>Higher</td>
</tr>
</tbody>
</table>

### Key points

- Cropped areas are important for a range of species
- Reducing pesticides and fertilisers on field edges or whole fields encourages plant and invertebrate diversity
- Incorporating stubbles, fallows, and spring cropping will benefit farmland birds and other wildlife

### Management summary

- **Woodland management**
  - Coppicing
  - Ride creation or widening
  - Leave darker areas for specialists
  - Opens up areas of woodland and creates a dynamic environment
  - Allows light into the woodland to benefit species such as butterflies
  - Many rarer invertebrates have specific requirements for dark, damp woodland areas

- **Woodland creation**
  - Seek advice on existing habitats
  - Plant native species
  - Woodlands that extend existing ones or link other habitats are especially important
  - Seek advice on woodland creation and management
  - Woodland should not be planted in existing areas of high biodiversity e.g. meadows
  - Native species support more wildlife
  - Can help species move through the landscape

- **Scrub**
  - Balance management to have a variety of ages, structures and locations of scrub
  - Provides good habitat for a range of invertebrates and birds
  - Scrub at sheltered field corners and woodland edges is especially beneficial

- **In-field trees**
  - Retain and protect in-field trees
  - Valuable for a range of wildlife

While creating habitats alongside cropped areas is extremely beneficial to wildlife, the cropped area itself can deliver enhanced benefits for wildlife through reducing inputs, incorporating stubbles and fallows, and adjusting rotations.

Cropped areas of the farm are valuable for a range of wildlife. Some species, such as arable plants, flourish under conditions of regular annual disturbance, and require absence of broad-leaved herbicides and low levels or absence of fertilisers. Invertebrates are helped by changes in management that enhance plant communities, in turn supporting other groups such as birds. Cropped areas are particularly important for a number of declining farmland birds, such as skylark, which need open areas of the field for feeding and nesting.

Find out more at:
- www.forestry.gov.uk
- www.woodlandtrust.org.uk
- www.buglife.org.uk
- www.naturalengland.org.uk
- www.ptes.org
- www.butterfly-conservation.org
There are a number of ways in which cropped areas can be managed to help increase their wildlife value, which are supported by agri-environment scheme funding. Conservation headlands, fallow plots, spring cereals, overwinter stubbles and careful management of inputs will all help wildlife. Together with field margin management, sympathetic crop management will also benefit predatory invertebrates such as beetles and spiders, which help control crop pests.

**Conservation headlands**

Conservation headlands were originally developed by the Game and Wildlife Conservation Trust, to help halt the decline of the grey partridge. A conservation headland is the outer edge of a cereal crop (around 6-24m wide), which has reduced pesticide inputs (only to control grass weeds and some insect vectors of plant viruses). Summer use of insecticides and the use of herbicides targeted at broad-leaved plants are avoided. Fertilisers are not used on the headland.

Conservation headlands particularly benefit gamebirds such as the native grey partridge and the introduced red-legged partridge and pheasant. They provide nesting and brood rearing areas and abundant invertebrates, such as sawflies, that are important in the diet of their chicks. All three gamebird species feed chicks at field edges rather than centres, particularly where broad-leaved weeds are present as host plants for invertebrate prey. Under reduced herbicide regimes, cereal crops provide insect food as well as an ideal sward structure for cover from predators and adverse weather conditions.

Conservation headlands can also help other wildlife. Rare arable plants that depend on regular cultivation of cropped areas will benefit from the lack of herbicide use, while small mammals will make use of the more abundant supplies of seeds and invertebrates that are found in conservation headlands (Box 7).

**Fallow plots**

Where naturally regenerated stubble is left fallow over the following growing season, the patchy, diverse vegetation that regenerates provides an insect rich habitat during the summer and an undisturbed breeding area for ground nesting birds and mammals, such as the brown hare. The benefits of fallows for invertebrates largely depend on seed bank diversity. Fallows can also have an agronomic benefit, allowing soil fertility to recover and soil structure to improve following continuous cultivation. Management of fallows for wildlife should aim to delay cultivation or mowing of the vegetation until at least late July to protect ground-nesting birds.

**Spring cereals**

Spring-sown cereal crops offer better wildlife benefits than winter-sown cereals as they can normally be grown with no insecticide sprays and many of the spring germinating weeds, such as fat-hen, are very beneficial for birds and insects. They also have a crop structure that is suitable for a number of ground nesting birds, including skylarks, which enables birds to nest and feed within the crop. RSPB research has identified a noticeable difference in skylarks’ nesting activity in spring wheat compared to winter wheat. Skylarks in spring-sown crops nest for longer and can raise two or three broods, but in winter crops most stop nesting in late May, raising just one brood, as the crop becomes too tall and dense and stops the birds having easy access to the ground.

**Undersowing**

The addition of a grass/clover ley as an understorey to cereal crops increases the diversity of the habitat, making them insect-rich foraging grounds for birds such as grey partridges and corn buntings. It also benefits farm wildlife such as the brown hare. The undersown crop will also help prevent pollution by reducing soil erosion and run-off at source.

Any undersown grass leys should be maintained until the crop is harvested, which should be not be before 1 July. The grass ley remains in place until the following summer.
Overwinter stubbles
Retaining stubble following the harvest of combinable crops until the following year is a valuable option for wildlife. Overwinter stubbles can be moved around the farm within the normal rotation and fit into most arable systems.

This option will provide winter food sources for farmland birds and habitat for brown hare with further wildlife benefits from spring-grown crops. Stubbles have traditionally been one of the most important sources of seed food and shelter for farmland birds over the winter. Spilt grain and weed seeds among the stubble can attract large flocks of finches, larks and buntings.

Stubbles for wildlife should ideally be left unploughed as late as possible (end of February). Sawflies spend the winter as pupae in the soil, and another benefit of late ploughed stubbles is that sawflies can emerge safely and provide important food for birds. To deliver widespread benefits for seed-eating birds, 10-20% of arable land should be left as late ploughed stubbles. The value of stubbles for wildlife is dependent on them providing a rich source of seeds, so management of the previous crop is important.

Skylark plots
Skylark plots are undrilled or sprayed-out patches in winter cereal fields. In a conventional winter cereal field, skylarks can forage easily during spring but, by June, they struggle to find food in the tall and dense crop. However, in fields with skylark plots, skylarks can continue to forage easily throughout the season because of the less dense patches of habitat. Two plots per hectare in winter wheat can boost skylark productivity by around 50%. Skylark plots are usually created by switching off the drill to create undrilled patches at least 3m wide. Plots need to be located away from hedges and field edges, in large fields of more than 5ha.

Low input cropping and organic management
Reduced pesticide use can be carried out over the whole field, rather than just the field edge, and this may be supported by agri-environment funding. An integrated farming approach that combines measures such as choosing crop varieties for disease resistance, minimum tillage and precision farming to optimise nutrient and crop protection inputs has the potential to deliver significant financial and environmental benefits.

Many of the environmental benefits of integrated farming relate to soil and water conservation but there are also specific benefits for wildlife, particularly through measures that reduce nutrient and pesticide inputs (Box 8). Reduced crop inputs are likely to increase plant diversity within the crop, with associated benefits for rare arable plants, insects and seed-eating birds, through increasing summer and winter food availability. Many of the more desirable weeds for wildlife are the less competitive or more easily controlled species, making it possible to consider management techniques that might allow some non-crop plants to flourish without encouraging the problem species.

Restrictions on pesticide and fertiliser use are greatest in organic farming systems. Research has shown organic cereals to have higher numbers of non-crop plants, which in turn increases the numbers of predatory spiders in the crop, which respond to the increased structure in the understorey vegetation.

Rare arable plants
Many species of arable plants are rare, declining or of conservation concern. Some of the species that can be found in arable fields are cornflower, pheasant’s eye, corn buttercup and Venus’s looking glass. Arable plants need annual ground disturbance in either spring or autumn, minimal competition from a crop (either an unfertilised crop or no crop sown at all) and no application of herbicides. Arable plants favour sands and freely draining acidic soils or chalk and limestone derived soils, including clays, in sunny situations. Sites tend to have been in arable cultivation for a long time (often more than 100 years).

The richest seed banks are often on field edges, where management may be most easily focused. Cultivated margins and conservation headlands are effective ways of encouraging arable plants. Organic farming, or other low-intensity regimes, such as low-input spring crops and summer fallows can also encourage arable plants and increase the diversity of insect life throughout the crop.
Wood mice prefer conservation headlands

Conservation headlands, where the outer 6m or so of cereal fields receive reduced selective pesticide applications, can be very beneficial for wildlife and are widely supported through agri-environment scheme funding. Conservation headlands were originally developed by the Game Conservancy Trust (now the Game and Wildlife Conservation Trust) and were shown to have higher abundances of insects and arable weeds than fully sprayed headlands, which in turn supported populations of grey partridge.

Insects and arable weed seeds are also eaten by small mammals such as harvest mice and wood mice and so conservation headlands might be beneficial in other ways. To find out whether wood mice could tell the difference between conservation headlands and other within-crop areas we fitted tiny radio-transmitters to wood mice and tracked their movements. It was clear that mice preferred to spend more time in conservation headlands and unsprayed headlands compared to sprayed headlands and mid-field areas. Further investigations revealed that in these areas they were pausing more often to feed.

Key results
• Conservation headlands are beneficial for small mammals such as wood mice
• There is a higher diversity of plants and invertebrates in conservation headlands
• These provide rich food sources for small mammals

Methiocarb affects wood mice

Methiocarb is a non-specific carbamate pesticide that is widely used to control slugs and snails on farmland. It is usually applied as cereal-based pellets and may thus potentially be attractive to other, non-target species. Wood mice are known to eat methiocarb pellets and may therefore be particularly at risk of exposure.

We wanted to investigate whether broadcast applications of pellets affected the size of wood mouse populations, and whether these effects varied with the timing of application. To answer these questions, we captured, marked and released wood mice on four fields. One of the fields was treated with methiocarb in autumn, two of the fields were treated in spring, and the remaining field was not treated and acted as a comparison.

The results showed that broadcast application of methiocarb pellets caused a significant decline in wood mice in both spring and autumn. Importantly, though, the decline was greatest in fields treated in autumn. This may have been due to seasonal variation in food availability, and the ease with which pellets were found by mice.

We conclude that the use of methiocarb pellets could have an impact on wood mouse populations and, potentially, on species that feed upon wood mice, such as tawny owls and kestrels. If methiocarb pellets need to be used, spring applications may have fewer adverse effects than autumn applications.

Key results
• Wood mouse populations declined in fields treated with methiocarb pellets
• The greatest declines were observed on fields treated in autumn, compared to fields treated in spring
• Changing the timing of methiocarb applications may reduce their impact on non-target wildlife species
Crops

Management summary

<table>
<thead>
<tr>
<th>Key actions</th>
<th>Potential benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservation headlands</td>
<td>Selective inputs to field headlands</td>
</tr>
<tr>
<td></td>
<td>No fertilisers or broad-leaved herbicide</td>
</tr>
<tr>
<td></td>
<td>Encourages rare arable plants and insect communities</td>
</tr>
<tr>
<td></td>
<td>Provides key food items for birds such as grey partridge</td>
</tr>
<tr>
<td>Stubbles, fallow plots and spring cropping</td>
<td>Overwinter stubbles are a rich source of seeds and spilt grain</td>
</tr>
<tr>
<td></td>
<td>Natural regeneration on fallow plots results in a diversity of vegetation structure</td>
</tr>
<tr>
<td></td>
<td>Spring cropping needs fewer inputs, and has a more open sward</td>
</tr>
<tr>
<td></td>
<td>Supply vital food for wintering farmland birds</td>
</tr>
<tr>
<td></td>
<td>Reduces soil disturbance allowing some invertebrates to complete their life cycles</td>
</tr>
<tr>
<td></td>
<td>Plant and insect communities are enhanced, supporting other wildlife</td>
</tr>
<tr>
<td>Low input farming</td>
<td>Reducing inputs to field edges or whole fields</td>
</tr>
<tr>
<td></td>
<td>Benefits plant and invertebrates, and reduces risk of harming non-target species</td>
</tr>
</tbody>
</table>

Options especially relevant for crops

<table>
<thead>
<tr>
<th>Code</th>
<th>Countryside stewardship options</th>
<th>Tier</th>
</tr>
</thead>
<tbody>
<tr>
<td>AB2</td>
<td>Basic overwinter stubble</td>
<td>Mid</td>
</tr>
<tr>
<td>AB4</td>
<td>Skylark plots</td>
<td>Mid</td>
</tr>
<tr>
<td>AB5</td>
<td>Nesting plots for lapwing and stone curlew</td>
<td>Mid</td>
</tr>
<tr>
<td>AB6</td>
<td>Enhanced overwinter stubble</td>
<td>Mid</td>
</tr>
<tr>
<td>AB7</td>
<td>Whole crop cereals</td>
<td>Mid</td>
</tr>
<tr>
<td>AB10</td>
<td>Unharvested cereal headland</td>
<td>Mid</td>
</tr>
<tr>
<td>AB13</td>
<td>brassica fodder crop</td>
<td>Mid</td>
</tr>
<tr>
<td>AB14</td>
<td>Harvested low input cereal</td>
<td>Mid</td>
</tr>
<tr>
<td>OP1</td>
<td>Overwintered stubble</td>
<td>Mid</td>
</tr>
<tr>
<td>OP3</td>
<td>undersown cereal</td>
<td>Mid</td>
</tr>
<tr>
<td>OR3</td>
<td>Organic conversion - rotational land</td>
<td>Mid</td>
</tr>
<tr>
<td>OT3</td>
<td>Organic land management - rotational land</td>
<td>Mid</td>
</tr>
</tbody>
</table>

Grasslands

Lowland grasslands range from intensively managed grazed pastures and silage fields, through to remnant patches of species-rich downland and floodplain meadows. Modern intensive agricultural grasslands are very different from the grasslands of even 50 years ago, with far fewer species. Nonetheless, the management of these grasslands can be modified to enhance their value for wildlife.

Semi-natural grasslands are home to an enormous number of plants and invertebrates. Such grasslands are often the result of a long history of a particular grazing or cutting regime, and have very special value. The wide range of plants provides food for a great variety of invertebrates. These, in turn, support a rich fauna of birds and mammals.

Key points

- Grasslands are valuable for a range of wildlife
- Species-rich meadows and grasslands are rare habitats to be protected and cherished
- Agriculturally improved grasslands are less species-rich, but can still be managed to help wildlife
Grasslands have changed dramatically over the last sixty years. The introduction of inorganic fertilisers, increasing mechanisation, drainage, increased stock densities, reseeding of old pastures and a switch from hay to silage production have all contributed to reductions in sward diversity. The pockets of species-rich grassland that remain are habitats to be protected and cherished for the abundance and diversity of wildlife they support.

Agricultural grasslands range from being semi-natural to improved, depending largely on the number of different species found. More improved grasslands tend to have fewer species and therefore lower biodiversity or wildlife value. The more species a grassland has, the less likely it is that it has been fertilised.

**Semi-natural grasslands**

There are five main types of semi-natural grassland in England: limestone (calcareous) grasslands, marshy grasslands, acid grasslands, lowland meadows and pastures and upland hay meadows.

Chalk downland (a type of limestone grassland) is often unsuitable for intensive agriculture because of the nutrient-poor, shallow soil and difficult slopes. For this reason it has often survived uncultivated; however, its shallow soil structure makes it extremely fragile and easy to destroy. The decline of extensive grazing has meant that many areas of downland have reverted to scrub or other less rare habitat. Chalk downland needs to be managed carefully to safeguard its unique flora and fauna. Ideal grazing regimes create varied turf structure with some short and some tall areas, with the precise level of grazing depending on the interests of the site.

Acid grasslands are less well known than lowland meadows or limestone grasslands. They tend to occur as mosaics with lowland heathland. The tussocky vegetation and bare ground that characterise lowland acid grassland allow a wide range of invertebrates to thrive including solitary wasps, butterflies and moths. In some areas, such as Breckland, soil disturbance is an important part of conservation management to help these species thrive.

Lowland hay meadows that are rich in wildflowers are a rare and irreplaceable habitat. Closing fields off from grazing livestock allows broad-leaved plants to flower and seed, providing summer food for seed-eaters like linnets, and nectar and pollen for insects. The continuation of haymaking provides a greater diversity of wildflowers, habitats for insects and mammals, and food for birds.

By managing grassland with low or very low inputs, soil erosion and run off from the farm can be reduced. Permanently grassed areas will slow down the flow of water on natural drainage pathways and reduce the channelling of runoff water, which can produce rills and gullies. Grassland managed or retained with little or no fertiliser has a greater value to wildlife, such as butterflies and bees, and will sustain a wider variety of plants. Permanent grassland is also an important historical feature demonstrating how farming has shaped our landscape over the centuries.

Wet grassland is a highly valuable habitat for a range of plant and animal species. These areas are especially important for wintering and breeding wildfowl and waders, and support a rich variety of other wildlife, including dragonflies and damselflies, water beetles, and wetland vegetation. Wet grasslands are usually managed by grazing, mowing, or both, and the timing of management, its intensity and frequency, all influence the habitat (Box 10). Some species-rich wet grasslands, such as floodplain meadows, have been managed in the same way for hundreds of years, and care should be taken not to change this.
Agriculturally improved grasslands

Even in agriculturally improved grasslands, modifications can be made to improve the habitat for wildlife. Increasing plant diversity in productive swards results in a greater variation of sward structure, and this can be achieved by the inclusion of even just a couple of species other than ryegrass. Timothy, cockfoot and red fescue are generally suitable species. Adding legumes or herbs to the sward can be even more beneficial.

Farmyard manure is the best fertiliser to use from the wildlife point of view as it boosts soil invertebrates. Earthworms, for example, are encouraged where manure has been applied the previous season, with benefits for wildlife species such as hedgehogs (Box 9). Solid manure brings invertebrates to the soil surface where they are more accessible to birds.

Mechanical operations such as spreading, rolling, topping and harrowing can be particularly damaging to ground-nesting birds in the spring so, wherever possible, they should be timed before or after the breeding season in fields with breeding birds.

Similarly, the timing of mowing for silage is important. Early mowing, whether for hay or silage, can destroy eggs and chicks, so late mowing is preferable. Later mowing will also allow flowering, providing pollen and nectar sources for grassland invertebrates. Even better, if some plants can be left to go to seed, this will provide food for birds late into the year, and even through the winter.

Leaving uncut margins and corners in grass fields provides a refuge for wildlife from farm operations. Such structural, tussocky areas are good habitat for voles and other small mammals, which are preyed upon by owls and kestrels. Invertebrates, including pollinators and other beneficial invertebrates, will also benefit from these uncut areas.

Some grassland statistics

Around 100,000ha of semi-natural grassland survives in England. This is roughly 3% of the total area of grassland. About half of this is lowland calcareous grassland (chalk downland and wold and other limestone grasslands such as the Cotswolds and Mendips). The rest consists of lowland meadows and pastures (20%), lowland acid grassland (10%), purple moor-grass/rush pastures (10%), upland hay meadows (10%) and upland calcareous grassland (10%). These figures are approximate, and in many parts of England the exact extent of the surviving resource is still not known.

Most surviving wildlife-rich grasslands in Britain are isolated fragments of formerly much larger grassland landscapes or farmland rich in grassland habitats. It is estimated that, overall, 97% of lowland meadows in England have been agriculturally improved or lost since 1940.

(Source: www.grasslands-trust.org)

Arable reversion to permanent grassland

The reversion of arable land to permanent grassland is a major work area funded through agri-environment schemes. Arable reversion can have a number of environmental benefits including ecological, landscape, archaeological and resource protection benefits. It may provide opportunities for the re-creation of species-rich grassland and other valuable habitats such as wetland and heath, and habitats can be created to benefit specific species, such as wet grassland for wading birds and wildfowl. It can provide a buffer from fertiliser run-off and sprays, for example, alongside Sites of Special Scientific Interest (SSSIs), rivers and other important wildlife areas. Additionally, areas of existing semi-natural habitat can be linked, creating larger, more coherent blocks. Additional grazing can be provided which may aid the management of other habitats, for example by allowing stocking rates to be reduced, or by making grazing of small areas of semi-natural grassland more viable. Details of how to undertake arable reversion are found on the Natural England website.
How to help hedgehogs

The unmistakable hedgehog, although widespread, is believed to be suffering severe population declines. Possible factors include changes in land use, resulting in loss of habitat (such as rough pastures and hedgerows) that they need for feeding and breeding. Pesticide use, particularly molluscicides, may also be a factor. Finding out how hedgehogs use the landscape in which they live is a crucial part of understanding how declines might be reversed. We marked hedgehogs to find out where they spent their time and we surveyed a range of factors which characterised the fields occupied by hedgehogs.

The surface availability of earthworms was the principal factor affecting whether or not a field was occupied, together with the number of molehills, which themselves are associated with earthworm abundance. Another important factor was the proximity of badgers. Badgers are significant predators of hedgehogs, and fields occupied by hedgehogs tended to be further away from fields with signs of badger activity. However, many hedgehogs were also closer to urban settlements, which happened to be further from badger activity.

Grassland management that increases earthworm populations, together with the provision of other habitats such as hedgerows and woodland habitats, and reductions in pesticide use, will have important benefits for hedgehogs on farmland.

New discoveries of rare plants: true fox-sedge

True fox-sedge is a Red Data Book plant classified as Nationally Vulnerable. Until 2004, its presence in Oxfordshire was limited to just a few sites along the River Ray, but in 2004/2005 eight new sites were found by a BBOWT/WildCRU survey, proving that the Upper River Ray floodplain is an important stronghold for the species. The area has been remarkably unaffected by intensive farming practices and retains an uncommon amount of species-rich grassland, along with abundant wetland areas such as ponds and ditches. These are probably critical factors in the survival of the true fox-sedge.

True fox-sedge does not appear to grow under intensive agricultural management. It grows well under hay-cutting and light grazing management, and also where no management is carried out at all. It was not found close to larger watercourses, possibly due to past engineering / maintenance, but also because it may not tolerate deep or running water.

Regular flooding, and the availability of agri-environment scheme grants in the Upper Ray floodplain, make extensive management a relatively attractive option in this area. Heavy clearance of watercourses is no longer carried out and there is little arable land in the floodplain. The primary threat is hedgerow and scrub growth, causing too much shade. This should be monitored, with landowners advised and assisted where necessary to carry out management work.
Ponds are an extremely valuable habitat for wildlife on farmland. Species such as frogs, toads, and dragonflies rely on ponds for at least part of their life cycle, while others live in ponds for the whole of their lives. Other wildlife, including grass snakes, bats, and birds, benefit from the plants and invertebrates that are associated with ponds. Many different pond types have wildlife value, but good water quality and shallow banks with emergent vegetation are especially important.

Key points

- Farm ponds are very important wildlife habitats
- Good water quality and shallow banks are especially important
- Consider creating one or more ponds on the farm, in places where they will receive clean water, to help wildlife