

Conservation management on an arable farm



Introduction



Good conservation management is all about choosing the right measures, putting them in the right place, and managing them in the right way.

This booklet explains the principles of best practice conservation management on arable land, and the eight points to consider when planning an approach on your farm.

- 1 Look after established wildlife habitats.
- 2 Maximise the environmental value of field boundaries.
- 3 Create a network of field margins.
- 4 Establish flower-rich habitats.
- 5 Provide winter food for birds.
- 6 Use spring cropping or in-field measures to help wildlife.
- 7 Use winter cover crops to protect water.
- 8 Establish in-field grass areas to reduce soil erosion and run-off.



The key to successful wildlife conservation is to maximise the variety of habitats and features on your farm.

A combination of agri-environment scheme options and Campaign for the Farmed Environment (CFE) voluntary measures can be used to implement your plan.

Other considerations for environmental protection on farmland:

- good **soil management** to prevent erosion and compaction
- **integrated pest management** techniques to minimise pesticide use
- **planning the use of fertiliser applications** to minimise losses through leaching, erosion and run-off.

The priorities for soil and water are to:

- protect vulnerable soils
- reduce and slow down surface run-off
- buffer watercourses.

These general principles should be considered alongside local priorities

for soil, water and wildlife. If you need further advice, consult an environmental advisor.

What are the benefits?

- **Improved profits** – most arable farms have field margins that are better managed for the environment, especially if agri-environment funding can be used.
- **Boosts crop pollination and pest control** – by providing pollen and nectar sources for pollinators and habitat for crop pest predators.
- **Protects soils** – by avoiding bare fallow land through the winter, and taking possible channels for soil erosion and run-off out of production.
- **Builds upon what you are already doing** – this package can be adopted on any arable farm to improve the quality of the whole environment.
- **A good farmed environment with minimum impact on agricultural production** – this guidance focuses on high quality environmental features, so less area is needed.

1 Look after established wildlife habitats



Richard Winspear

Start by assessing what already exists on the farm.

Maintaining or restoring existing wildlife habitats, eg woodland, ponds and flower-rich grassland, is critical to the survival of wildlife on the farm, and may negate the need to create new habitats. Less productive land can be used to create new habitats to complement what already exists.

Here are the most effective measures to improve the wildlife value of the main uncropped habitats found on arable farms.

Farm woodlands

- Remove some trees in even-aged stands to create a variety of age and structure.
- Retain deadwood and wet areas.
- Create a gradual transition between the canopy and open land around edges and rides (see Figure 1).
- Re-stock with native species.

Trees

- Retain dying hedgerow and in-field trees, where safe to do so. Leave fallen deadwood or stack alongside the tree trunk.

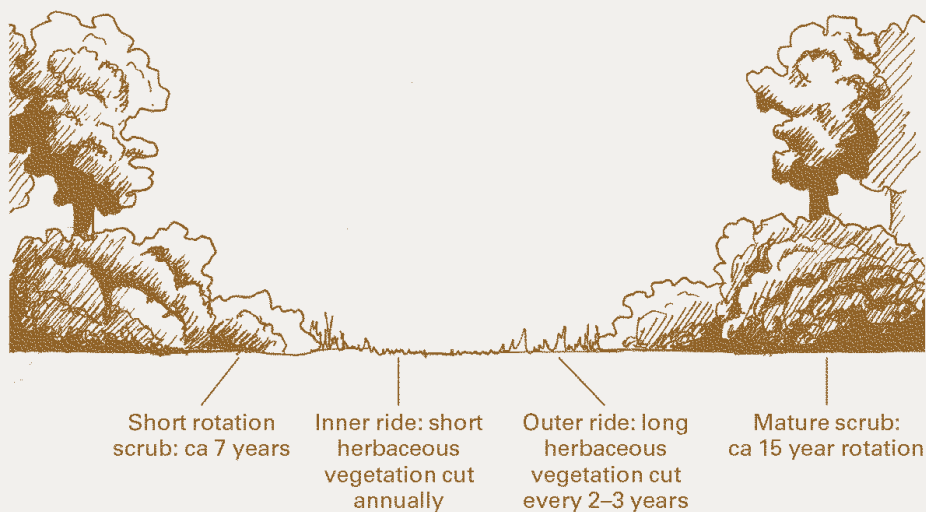


Figure 1. Section of a ride illustrating the important features for wildlife.

- Avoid cultivating beneath tree canopies to prevent damage to the roots.
- Replace dead trees to retain the total number of trees in the landscape.

Areas of scrub and rough grassland

Rough grassland and scrub provides vital habitat for wildlife.

- Keep areas of elder, rose, bramble, ivy and traveller's joy as very valuable sources of pollen, nectar and fruit for wildlife.
- Coppice scrub to retain a bushy structure.

Flower-rich grasslands

- Cut and remove, or graze, the vegetation when flowering plants have set seed. Leave some grass uncut beside the field boundaries to provide shelter for insects.
- Control pernicious weeds by pulling, weed-wiping or spot-spraying.

Farm ponds

- Buffer ponds and protect water sources

from pesticides, fertilisers and soil erosion.

- Maintain an open aspect if possible, especially on the south bank to allow in light. Trees can be beneficial as long as they do not overhang more than 25% of the pond.
- Create a gradated edge to increase the 'draw-down zone' – the area that is exposed when the water level falls.
- If it is necessary to remove pond plants, clear a third of the area each year. Don't leave plants or dredgings on the pond edges.
- Leave adjacent grassland undisturbed as a habitat for insects and amphibians.

Farm buildings

Buildings can be important roosting and nesting sites for bats and birds.

- Erect bird and bat nestboxes.
- Bats are legally protected. Seek advice from a licensed bat ecologist before starting any work on farm buildings where bats may be roosting.

2 Maximise the environmental value of field boundaries



Emily Field

The priorities for field boundary management are to protect them and the margins from pesticide and fertiliser applications, and to create a diverse structure. Well-managed hedges and ditches underpin a thriving wildlife network that aids crop protection and pollination.

General

- Trim established hedgerows and mow ditches on a two to three year rotation to boost flowers, fruit and shelter – this is most suited to hedges dominated by hawthorn and blackthorn, and ditches where rotational management will not compromise drainage.
- Do not cut all hedges or ditches in the same year. Ideally, cut no more than half in any one year and avoid doing this during the bird nesting season between March and August.



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Martin Warren



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- Create buffer strips to protect boundaries from pesticide drift and fertiliser applications.

Hedges

- Include a range of native flowering shrub species traditional to the area to benefit pollinators when planting new hedges or planting up gaps.
- Restoring a good structure by coppicing or hedge-laying thickens the base of a hedge and improves shelter for wildlife. If trimmed on a two to three year rotation, hedges might need laying or coppicing only once in a lifetime.
- Retain mature and dying hedgerow trees as valuable wildlife habitat where it is safe to do so.
- Establish new hedgerow trees to maintain or restore former numbers within the landscape.
- Taller hedges are best suited to the farm's wooded areas to act as corridors between woods for wildlife movement. Taller hedges are less suited to farm areas used by ground-nesting birds, eg lapwings and grey partridges.
- Protect hedges and trees from

cultivation that might cause root damage.

Ditches

- Clear out ditches no more than once every five years, where this does not impede field drainage, to minimise disturbance to aquatic wildlife. Clear short stretches on rotation by leaving one side uncut to allow fastest re-colonisation by aquatic insects and plants.
- Avoid steepening banks and over-deepening ditches. Maintain graduating banks of 30° where plants and insects can thrive.
- Provide an underwater ledge at the base of one bank to create water about 30 cm deep, as most aquatic life lives in shallow water.
- Obtain a licence from the Environment Agency if widening and bunding sections of a ditch. Such work can slow water flow, trap sediment and provide a haven for aquatic wildlife.
- Aim to maintain variety within the landscape, since shaded and open ditches support different wildlife.

3 Create a network of field margins

Kirsty Brannan



The highest priority is to buffer watercourses, ideally with a minimum of six-metre buffer strips. Wildflower or grass margins can also be used to boost numbers of beneficial insects and small mammals, and help to buffer hedges, ponds and other environmental features.

- A range of habitats can be created in the margin. Before sowing grass margins, consider creating flower-rich habitats on a proportion of the margins (see page 10).
- Remove compaction before sowing margins. Ensure cocksfoot does not exceed 10% of the sward mixture, as this can dominate margins and will not capture run-off effectively.
- Control weeds and establish a perennial sward by regular mowing in the first year.



Richard Wispear



Emile Jones (http://emilejones.com)



Richard Wispear

- Prevent spray drift and fertiliser applications reaching watercourses with permanent buffer strips of at least six-metres wide.
- Use wider buffer strips to improve infiltration in areas prone to run-off, especially on heavy soils.
- Reduce and slow surface run-off with in-field grass buffer strips and beetle banks (see page 18).
- Avoid soil compaction in margins acting as buffer strips for watercourses by cutting infrequently and not using them for access or storage.
- Split management of wider margins: leave the half next to the field boundary uncut for three years and cut the half next to the crop annually before harvest. This provides both a variety of rough, tussocky grassland and open grassland.
- Cut no more than half the field margins on a rotation after September to protect bumblebee nests.
- If the margin is flower-rich, annual cutting and removing vegetation will reduce nutrient levels for the benefit of flowering plants.

4 Establish flower-rich habitats

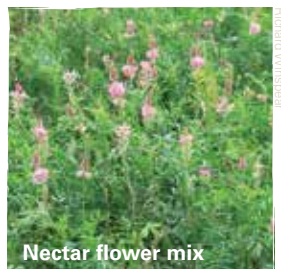
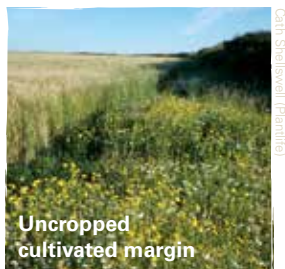


Flower-rich habitat on at least one per cent of arable land will help support beneficial insects and a wealth of wildlife that feeds on insects. Many insects require sources of pollen and nectar from March to October. Flower-rich areas also help integrated pest management and crop pollination. Native flowering plants in grasslands and crop margins support the greatest diversity of

insects, but agricultural legumes can be sown where it is not possible to retain or restore native plant populations.

Which type of flower-rich habitats to create

- 1 On **light chalky or sandy soils** with mainly **less-competitive broadleaved weeds**, ie NOT grass weeds, cleavers or high densities of chickweed or redshank, try **uncropped cultivated margins**.



- Cultivate the margin annually in spring or autumn to a depth of about 15 cm (6 in) and create a fine seed bed.
 - Do not apply pesticides before the annual plants have set seed – typically in September – and do not apply any fertilisers.
- 2 On light chalky or sandy soils with grass weeds and highly competitive broadleaved weeds**, eg cleavers, sow a perennial grass and wildflower seed mix to create **wildflower margins**.
- Use native seed wherever possible, and ideally of local provenance.
- 3 On medium to heavy soils with predominantly grass weeds and highly competitive broadleaved weeds**, eg cleavers, try **nectar flower mixtures**, re-established every three to four years.
- For **wildflower margins** and **nectar flower mixtures**:
- create a fine, stale seedbed using cultivations and glyphosate.
 - broadcast the seed and roll.
 - apply no fertiliser– native flowering plants and legumes thrive in nutrient-poor soils.
 - cut regularly in the first year to control weeds.
 - cutting and removing vegetation each autumn will increase the longevity of the flower-rich sward.
 - Create a network of flower-rich margins at least 6 m wide or regular patches of at least 0.25 ha at a rate of roughly four patches per 100 ha.
 - South-facing slopes without shading provide warmth and sunlight for insect activity.
 - Close proximity to undisturbed habitats is important for some insects, eg bumblebees, that require flowers for feeding and undisturbed grassland for nesting.
 - Rotate **uncropped cultivated margins** and **nectar flower mixtures** with arable cropping to prevent the build up of pernicious weeds.
 - Link flower-rich habitats with other insect-rich habitats and potential bat roosting sites.

5 Provide winter food for birds



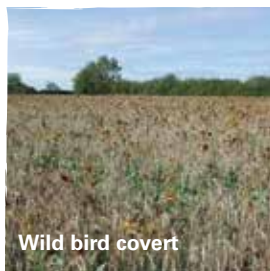
Chris Knights (nsrb-images.com)

Providing seed for birds is best achieved by leaving overwintered stubbles on at least five per cent of arable land, or growing seed-rich crops as wild bird cover on two per cent of arable land. Fodder crops grown on stubbles, eg stubble turnips, are used by seed-eating birds as livestock graze the crop. Farmland bird populations fare better in areas where overwintered stubbles

are retained or wild bird covers grown.

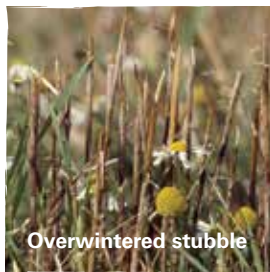
Overwintered stubbles

- Leave stubbles unsprayed and uncultivated until at least mid-February to benefit farmland birds.
- Avoid using a pre-harvest herbicide which will boost winter seed food and enable a green cover to establish reduce the risk of soil erosion, run-off and nitrate leaching into watercourses.



Richard Wainwright

Wild bird covert



Andy Hay (ashbarnings.com)

Overwintered stubble



Richard Wainwright

Brassica fodder crop

Wild bird cover

- Ideally wild bird covers are mixtures of at least one cereal crop and one oil-rich crop, eg quinoa, oilseed rape or fodder radish, sown in the spring (using spring crop varieties) and left unharvested to provide seeds throughout the following winter.
- Crops can provide seed food over two winters by including at least one biennial crop, eg kale, which provides seeds in the second winter. However, cereals are most beneficial for many farmland birds so it is better to use annual mixes with a high proportion of cereals or establish different patches in alternate years to have a source of cereal grain every year.
- On land where it is difficult to establish a good spring crop, eg heavy clay soils, it may be better to drill a mixture of winter crop varieties in the autumn. These provide food for birds in only the second winter, so it is important to drill different patches in alternate autumns to provide seed every year.
- Wild bird covers may need crop protection and fertiliser applications to ensure a good yield. Refer to your

handbook for guidance if this is part of your agri-environment scheme.

- It is good practice to rotate wild bird seed mixtures with arable cropping every few years to prevent the build up of pernicious weeds and diseases.

Brassica fodder crops

- Weedy stubble turnips provide seed food for birds as the crop is grazed off. Rough cultivation may be necessary soon after grazing where there is a risk of soil erosion or run-off.

Supplementary feeding

- Consider using cereals and oilseeds to supplement the availability of bird food during winter. Supplementary feeding should be additional to the measures above, when wild bird seed plots can become depleted in late winter and early spring.
- This technique is particularly valuable when drilling conditions or seasonal weather conditions prevent establishment of a good wild bird cover crop.

6 Use spring cropping or in-field measures to help wildlife



Andy Hay (rsob-images.com)

Spring crops provide better habitat for a range of plants, insects and birds, eg lapwings and skylarks. Use rotational fallows, skylark plots in winter cereals or, if breeding lapwings occur, fallow plots to support ground-nesting birds where spring cropping forms less than 25% of the arable area.

Skylark plots

- Skylark plots are small uncropped patches in winter cereal fields that provide access to the ground for foraging skylarks during the nesting season.
- If two skylark plots are created per hectare of winter cereals, they take up less than 0.33% of the cereal area, but improve skylark chick production by 50%.
- Skylark plots are a minimum of 16 m², eg 4 m x 4 m, and can be established



Chris Knights (iStockimages.com)



Richard Winspear



Chris Knights

by switching off the drill during drilling or spraying out the cereal crop before 31 December.

- Once established, they are treated the same as the surrounding of the cereal crop.
- The optimum density of skylark plots is two per hectare.
- The optimum location is at least 80 m from field boundaries.

Fallow plots

- Fallow plots should not be created on land liable to run-off or erosion.
- Fallow plots for ground-nesting birds are a minimum of one-hectare. They are best located in the precise

area where species eg lapwings or stone-curlews have nested before, and away from woods, tall hedges, trees, telegraph wires and any other features that could act as cover or perches for predators.

- Fallow plots in arable fields where chicks can walk onto grazed pasture are ideal for providing both nesting and foraging habitat.
- Cultivate fallow plots for nesting lapwings before mid-March and leave undisturbed until mid-July. For stone-curlews, it is best to leave until September, unless on-farm advice can be sought.

7 Use winter cover crops to protect water



Graham uney

On soils prone to nitrate leaching (generally light soils)*, a winter cover crop will capture residual nitrogen on cultivated land left fallow over winter. Such cover is not necessary if stubble is retained until at least mid-February and forms a green cover.

- If land is to be left fallow after harvest and the stubble of the previous crop cannot be retained through the winter, then sow a winter cover crop into a rough seed bed after cultivation, but before 15 September to prevent nitrate leaching into watercourses.
- Use *Phacelia*, vetch, ryegrass, grazing rye, barley or mustard; avoid sowing mustard if brassicas are part of your rotation, as the risk of clubroot will

* For soil and water issues relevant to your farm, refer to 'What's in your backyard?' in the 'At home & leisure' section of the Environment Agency's website: www.environment-agency.gov.uk.



Ben Dillon



Chris Bailey



Richard W. Innes

increase. Seek advice on the correct seed mix to suit local conditions.

- Sow at a seed rate that will provide a dense cover to prevent soil erosion.
- Do not apply any fertiliser or manure.
- Destroy the cover crop immediately before establishment of the next crop to reduce potential nitrate losses.
- Maize and other late harvested crops can be undersown with a grass or clover-based mix to establish a green cover after harvest.
- If overwintered stubbles (not maize) are retained, then avoid using pre-harvest desiccants to encourage a green cover (see image top right).
- Keep stubbles unsprayed and uncultivated for as long as possible – at least until mid-February – to feed farmland birds through the “hungry gap” from January to April.

8 Establish in-field grass areas to reduce soil erosion and run-off



Peter Thompson

Consider alternative uses of cropped land vulnerable to soil erosion* or liable to act as channels for surface run-off, eg long or steep slopes or field corners.

- Check your farm on days with high rainfall and identify areas where water is clearly running within fields or there is evidence of soil erosion.

- Is this due to use of high risk crops, eg maize or potatoes? If so, consider removing such crops from the rotation in affected fields.
- Is this due to poor soil structure, damaged drainage or obvious compaction in acute areas of the field? If so, consider changing soil husbandry to include disrupting the compaction layer when conditions allow, managing tramlines and pinch points,

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- increasing organic matter layers and/or improve your drainage.
- Is there evidence that this is a frequent occurrence, eg are erosion channels forming? If so, consider taking small areas out of production permanently using one of the following measures:
 - 1 convert vulnerable in-field areas to unfertilised and ungrazed grassland
 - 2 convert the field or part-field to woodland or biomass cropping with willow or poplar.
 - 3 if the whole field is at risk, consider alternative land use, eg low-input extensively grazed grassland.
 - Cut rough grassland no more than once every three years to protect the soil directly and help trap any sediment in run-off from farther up the slope.
 - Cut on rotation in March to minimise the risk of run-off. This may provide nesting opportunities for birds and bumblebees.
 - Do not use the grass area for regular vehicle access, turning or storage, as this can cause soil compaction.
 - Reduce and slow down surface run-off on long sloping fields next to a watercourse with in-field grass buffer strips along the field contours.
 - Use beetle banks – raised grass banks along the contour lines of large arable fields – to reduce soil erosion and run-off in fields with anything more than a gentle slope (1:20 or 3°) and to boost beneficial insects in fields greater than 20 ha. Beetle banks can act as a useful integrated pest management tool and reduce crop pests by helping beneficial ground beetles to overwinter.
 - A raised bank with a tussocky grass sward is created by ploughing inwards from either side, and seed is broadcast. Use a mix with about 30% cocksfoot and 70% finer grasses, eg fescues.
 - To boost the wildlife value, other wildlife features can be established either side of a beetle bank, eg wild bird cover or a wildflower margin.

The Campaign for the Farmed Environment (CFE) is encouraging farmers and land managers across England to protect and enhance the environmental value of farmland through environmental measures that sit alongside productive agriculture.

The CFE helps farmers and land managers choose the right environmental measures, put them in the right place and manage them in the right way – to protect soil and water, and benefit wildlife.

By working with the CFE, voluntary initiatives, eg Greenhouse Gas Action Plan, Tried & Tested and the Voluntary Initiative, can demonstrate how the farming industry is addressing environmental issues alongside profitable farming.

Visit www.farmwildlife.info for further advice and information

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The Birds Directive provides protection for all wild birds in the EU. The EU LIFE+ Programme is the continuation of the LIFE Programme adopted in 1992 to support EU environmental policy and legislation. It funds RSPB work which supports wildlife-friendly farming, creating a positive profile through promotional activities and furthers sustainable development.

Front cover images: Moss carder bee by Bumblebee Conservation Trust, farmer by Niki Williamson, marbled white and hares by Richard Winspear, grey partridge by Chris Knights (rsbp-images.com) and natterers bat by Bat Conservation Trust.

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