Conservation headland. Hope under Dinmore, Herefordshire

9. Arable field margins

Climate Change Sensitivity: **Low**

Introduction

The vulnerability of arable field margins to climate change is most likely to arise from changes in land use and agricultural practices. These may change in response to climate changes at both the local and global level, often driven by economic factors. Changes in the distribution and scale of arable production across the country represent both a threat and an opportunity for arable field margins.

The direct impacts of climate change are likely to be less important in the short to medium term.

Habitat Description

Arable field margins are herbaceous strips or blocks around arable fields that are managed to provide benefits for wildlife or to reduce water and soil run-off into water courses. Where they are managed for wildlife they are classed as a priority habitat. Arable field margins are usually sited on the outer 2-12m margin of the arable field but some can extend further into the field. The limit of arable field margin priority habitat is defined by the extent of any management undertaken specifically to benefit wildlife.

Arable field margins include cultivated, low-input margins; margins sown to provide seed for wild birds; margins sown with wild flowers or agricultural legumes and managed to provide pollen and nectar resources for invertebrates; and margins providing permanent grass strips with mixtures of tussocky and fine-leaved grasses. Areas of grass established as cross-compliance requirements are excluded from this definition, but all other strips of grassland created by sowing or natural regeneration, such as field margins or beetle banks, are included.

Arable field margins occur across much of lowland England in both arable and mixed (arable and livestock) farmland. Targeted habitat support for farmland birds, arable plants and other farmland biodiversity through government initiatives such as Environmental Stewardship and Countryside Stewardship has encouraged farmers and landowners to create arable field margins on their land. The field margins with the greatest diversity of arable plants are generally found in the Southern and Eastern counties (Walker *et al* 2006). There are just over 100,000 hectares of arable field margins across England. Most have been developed since the mid-1990s when incentive payments to create them first became available.

Potential climate change impacts

Cause	Consequence	Potential impacts
Higher average temperatures	Longer growing season Increase in pests and diseases	■ An expansion of arable agriculture in the north and west of England at the expense of pasture could create opportunities for new arable field margins. Changes in the growing season will increase the likelihood of phenotypic mismatch between flowering plants and their pollinators and those species that rely on them for nectar and food (Memmott *et al* 2007, 2008). ■ An increase in agricultural use of summer insecticides could reduce insect numbers and pollination.
Drier summers		■ Drier conditions could lead to changes to community composition, with increases in plants such as Alexanders *Smyrnium olusatrum*, common cudweed *Filago vulgaris*, asparagus *Asparagus officinalis*, dwarf mallow *Malva neglecta*, small-flowered crane's-bill *Geranium pusillum*, and meadow brome *Bromus commutatus* (Mirchell *et al* 2007). ■ An increase in the area of bare ground. ■ An increased risk of dieback in drought prone locations.
In combination		■ The introduction of new crops, with associated changes to management, could alter the area and type of field margins. Depending on market conditions and environmental incentives, some areas could see more intensification.

Adaptation responses

Maintaining or expanding the area of land available for margins is likely to be the most effective adaptation response, although this would need to be considered within the wider context and the best use of resources. The potential expansion of arable cropping into some areas of the west and north could assist this, but changes to global food supply, national food security issues and other pressures on land could make less land available overall for conservation.

The protection of margins from chemical inputs from adjacent cropped areas will remain a key measure to ensure their ongoing resilience to climate change.

Microclimates may vary considerably and lower temperatures resulting from shading, e.g. by hedges or slopes, could help to maintain some species *in situ*.

Field margins are likely to play a role in allowing some species to move within a landscape and find new locations locally or as part of a larger-scale change in distributions. There are some caveats to this, in that some species have limited mobility, and field margin habitats will not be suitable for others. However, as we move towards a more connected landscape-scale view of agri-environment and other land use interventions, we are likely to see more specific and tailored use of field margin habitat to facilitate suitable mobilisation corridors.

Some of the potential adaptation options for this habitat are outlined below.

- Maintain or expand the area of land available for arable field margins.
- Ensure that margins are protected from agricultural inputs to adjacent crops.
- Where possible, locate margins in a range of locations to provide variety of aspect, soil type and shading.
- Maximise the diversity of margins to provide a range of habitats and to assist in the movement of species through the landscape.

- Select the most appropriate management options for specific objectives. For example, uncropped cultivated margins have been demonstrated to be the most suitable option for arable plants, exhibiting the widest diversity of annuals, perennials, grasses, forbs (non-woody broad-leaved plants other than grass), and spring and autumn germinating species (Still and Byfield, 2007), while tailored sown mixes deliver the greatest benefit for farmland birds.
- In planted margins, tailoring the diversity of flowering species to ensure the continued provision of pollen and nectar throughout the extended season.
- In planted margins, include species and cultivars that are able to tolerate and flower under hotter, drier summers.

Arable margin

Relevant Countryside Stewardship options

The following Countryside Stewardship options may help with achieving some of the above adaptation actions:

SW1 4-6m Buffer strip on cultivated land

These low intensity grass buffer strips are established by sowing and can be used for a wide variety of purposes such as creating new habitat and protecting existing ones and capturing surface water run-off.

AB8 Flower-rich margins and plots

This option creates a flower-rich grass margin alongside arable cropping. The strip is managed by a programme of sequential cutting to provide habitat and foraging sites for insects and wild birds.

AB9 Winter bird food

This option is a sown mix of cereals and legumes and provides important food resources for farmland birds, especially in winter on arable land and mixed farms. The aim is to maximise the production of small seeds suitable as bird food in either annual or annual/biennial mixtures, whilst also providing a source of invertebrates for birds.

AB1 Nectar Flower mix

This option aims to boost the availability of essential food sources for a range of nectar-feeding insects, including butterflies and bumblebees through the planting mix of at least four nectar-rich plants (e.g. red clover, alsike clover, bird's-foot-trefoil, sainfoin, musk mallow, black knapweed). It provides valuable benefits to wildlife at a landscape scale and is ideally suited to larger blocks and small fields.

AB3 Beetle banks

Beetle banks are raised tussocky grass banks, between 3m and 5m wide that run from one side of a field to the other, whilst still allowing the field to be farmed. They provide habitat for ground nesting birds, small mammals and insects including those that feed on crop pests.

EF10, HF14 Unharvested, fertiliser free conservation headlands

AB10 Unharvested cereal headland

This option consists of a 6-24m wide cereal headland along the edge of an arable crop with no fertiliser and restricted herbicide and insecticide regimes. It provides an important food supply for birds, and habitat for arable plants and insects, within any arable field during the cropping year.

AB11 Cultivated areas for arable plants

An arable field margin is cultivated annually in either spring or autumn to provide a fine surface ideal for seed germination. These margins will provide beneficial management for rare arable plants, insects and foraging sites for seed-eating birds.

Further information and advice

JNCC (2008) UK BAP habitat description **Arable Field Margins**.

Key evidence documents

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