



Blackthorn hedge in blossom.

© Natural England/Allan Drewitt

8. Hedgerows

Climate Change Sensitivity: **Low**

Introduction

By their nature, hedgerows are linear, and consequently are vulnerable to edge effects. Drought and storms are therefore likely to have a greater impact on hedgerow trees than on blocks of woodland. Hedgerows are also vulnerable to changes in the use and management of adjacent land, so any climate change driven intensification of agriculture could have impacts, both on how they are managed and from off-site impacts such as pesticide drift.

Habitat Description

A hedgerow is defined as any boundary line of trees or shrubs over 20m long and less than 5m wide, and where any gaps between the trees or shrub species are less than 20m wide (Bickmore 2002). Any bank, wall, ditch or tree within 2m of the centre of the hedgerow is considered to be part of the hedgerow habitat, as is the herbaceous vegetation within 2m of the centre of the hedgerow.

The original hedgerow Biodiversity Action Plan (BAP) definition was confined to 'ancient and/or species rich' hedges, however, it has now been expanded to include all hedgerows consisting predominantly (at least 80%) of at least one native woody species of tree or shrub. Climbing plants such as honeysuckle and bramble are recognised as integral to many hedgerows, but are not included in the definition of woody species. The definition is limited to boundary lines of trees or shrubs, and excludes banks or walls without woody shrubs on top of them.

Hedgerows are found across the country, but are concentrated in the lowlands. The proportion of trees within hedges increases to the west and north, while in the south-east hedges are associated with larger fields and have fewer trees. The species composition and management of hedges is often regionally distinctive. For example, in Devon and Cornwall, hedges are characteristically found on earth, stone or turf-faced banks, whereas beech hedges are common on Exmoor and the Quantocks, and Damson hedges are characteristic of Herefordshire. These distinctive hedgerow types often make an important contribution to local landscape character.

There are over 550,000km of hedgerow in England, with over 400,000km being actively managed (Carey *et al* 2008).

Potential climate change impacts

Cause	Consequence	Potential impacts
Increased annual average temperature	Longer growing season	<ul style="list-style-type: none"> ■ Increased growth, leading to greater management requirements and an enhanced threat of abandonment. ■ Increased shading of hedgerow herbaceous flora. ■ Changing composition of wildlife in hedgerows.
Warmer winters	Fewer frost events	<ul style="list-style-type: none"> ■ The winter chill requirements of berry species may not be met. Reduced bud, flower and fruit production will affect food resources for wildlife.
Drier summers	Drought	<ul style="list-style-type: none"> ■ Increased mortality and die-back of certain hedgerow tree species, such as beech in the south-east of its range. Drought stress will increase trees susceptibility to pests and diseases.
Wetter winters	Flooding Water-logging of soils Erosion	<ul style="list-style-type: none"> ■ Woody species exposed to prolonged flooding in the growing season will be at risk of dying. ■ The winter trimming of hedgerows will become more difficult in some areas due to wet ground conditions. Winter trimming is preferred to autumn trimming to ensure berries and fruits are available for birds and other species. ■ Wet soil conditions could cause damage to soil structure, leading to increased die-back of hedgerow trees.
Increase in storm frequency	High winds	<ul style="list-style-type: none"> ■ Loss of mature and veteran hedgerow trees.
In combination	Changing patterns of agriculture	<ul style="list-style-type: none"> ■ Intensification of adjacent land use leading to increased offsite impacts such as pesticide drift and nutrient enrichment. ■ Re-intensification leading to a reduction in the use of buffer strips and margins to protect adjacent hedges.
	Increased occurrence of insect pests and pathogens	<ul style="list-style-type: none"> ■ Potential loss or significant reduction in populations of key hedgerow tree species.

Adaptation responses

The current definition of hedgerows includes recently planted and species poor hedges, as well as species rich and ancient types. This, and the regional differences in species composition and management practices, means that appropriate adaptation actions are likely to vary according to hedge type and location.

In the majority of cases, reducing the impact of adjacent land uses through effective buffering will remain a key response, as will some form of management to prevent hedges developing into lines of trees (although lines of trees may have benefits in some circumstances, including providing shade in a warmer climate and acting as windbreak).

When planting, restocking or filling gaps in hedges, consideration should be given to using a diverse range of species, particularly those that are adapted to a wide range of climatic conditions. Accepting and encouraging changes in the composition and structure of hedges will increasingly become a necessary element of ensuring that hedges remain resilient to climate change. Change will need to be undertaken within the context of local landscape character, with gradual rather than transformational change promoted.

Hedgerows may provide opportunities for some species to disperse across the landscape, increasing the potential to colonise newly suitable locations, both locally and nationally. It

should not however be assumed that all, or even most, characteristic woodland species will use or spread along hedgerows – for example, ancient woodland indicator plant species colonise new sites very slowly and the microclimate of a hedge is typically lighter and more prone to fluctuations in temperature than the interior of a woodland.

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

- The most important response to climate change is likely to be effective buffering against the impact of adjacent land uses, through for example the use of grass, uncultivated or low intensity margins, and fencing off livestock. This will become increasingly important whether or not there is an intensification of adjacent land use, as trees stressed by climatic factors such as drought or water-logging are more susceptible to other pressures.
- Regeneration of hedgerow trees and shrubs can be promoted through the management of grazing mammals and vigorous weed species, to promote a greater range of age classes.
- Maintenance of a diverse range of hedgerow structures through appropriate management, ranging from hedgerows that grade from tall scrub, with plentiful side shoots and foliage in the summer, to well-developed shrubs and tall sward grassland with herbs. Aim for a gradual gradation between the two habitats; the wider and more varied the structure the better.
- When establishing new hedges, aim to provide links to the existing hedgerow network and patches of semi-natural habitat in order to promote the movement of species through the landscape.
- When planting or restocking, aim to diversify the range of species and select species and provenances adapted to a wider range of climatic conditions. Where hedgerows contain tree species susceptible to climate change, consider restocking with more resilient species to establish the next generation of hedgerow trees.

Planting up gaps in a hedge. © Natural England/Peter Roworth



Relevant Countryside Stewardship options

TBE3 Management of hedgerows

This option aims to increase blossom availability for invertebrates; provide a vital source of food for over-wintering birds by allowing fruit and berries to ripen; and improve the structure and longevity of hedgerows.

BN5 Hedgerow laying

This option aims to rejuvenate or restore hedgerows by laying to achieve a continuous length of hedge.

BN6 Hedgerow coppicing

This option aims to rejuvenate or restore hedgerows by coppicing to achieve a continuous length of hedge.

BN7 Hedgerow gapping up

This option aims to rejuvenate or restore hedgerows by gapping-up to achieve a continuous length of hedge.

BN8 Hedgerow supplement - casting up

This option aims to replace slipped soil and re-profile earth banks when a hedgerow is being laid or coppiced.

BN9 Hedgerow supplement - substantial pre-work

This option aims to ensure that hedge rejuvenation or restoration can be completed where a hedge is on a particularly difficult site or where substantial extra work is required.

BN10 Hedgerow supplement - top binding and staking

This option aims to strengthen laid hedges by top binding and staking.

Further information and advice

[Hedgelink](#) is a partnership that brings together people and organisations interested in hedgerows to share knowledge and ideas, and to work with farmers and other land managers to conserve and enhance hedgerows.

Natural England (2017) [Countryside hedgerows: protection and management](#). Important hedgerows (as defined in the Regulations) are protected from removal (up-rooting or otherwise destroying) by the Hedgerows Regulations 1997. Various criteria specified in the Regulations are used to identify hedgerows important for wildlife, landscape or historic reasons.

Council for the Protection of Rural England [Hedgerow resources](#).

JNCC (2008) UK BAP habitat description [Hedgerows](#).

Key evidence documents

Bickmore, C. J. (2002). Hedgerow survey handbook: a standard procedure for local surveys in the UK. London: DEFRA.

Carey, P.D., Wallis, S., Chamberlain, P.M., Cooper, A., Emmett, B.A., Maskell, L.C., McCann, T., Murphy, J., Norton, L.R., Reynolds, B., Scott, W.A., Simpson, I.C., Smart, S.M., Ulllyett, J.M. (2008). Countryside Survey: UK Results from 2007. NERC/Centre for Ecology & Hydrology, 105pp.

Firbank, L. & Bradbury, R. (2007). Enclosed farmland. Chapter 7. In: The UK National Ecosystem Assessment Technical Report. UK National Ecosystem Assessment, UNEP-WCMC, Cambridge.

Goulson, D. (2003). Conserving wild bees for crop pollination. *Food, Agriculture & Environment* 1, 142-144.

Hannon, L.D. & Sisk, T.D. (2009). Hedgerows in an agri-natural landscape: Potential habitat value for native bees. *Biological Conservation* 142, 2140–2154.

Hinsley, S.A. & Bellamy, P.E. (2000). The influence of hedge structure, management and landscape context on the value of hedgerows to birds: A review. *Journal of Environmental Management* 60, 33–49.

Mitchell, R.J., Morecroft, M.D., Acreman, M., Crick, H.Q.P., Frost, M., Harley, M., Maclean, I.M.D., Mountford, O., Piper, J., Pontier, H., Rehfish, M.M., Ross, L.C., Smithers, R.J., Stott, A., Walmsley, C.A., Watts, O., Wilson, E. (2007). England biodiversity strategy – towards adaptation to climate change. Final report to Defra for contract CRO32.