



WOODLAND
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WTPL, RICHARD BECKER

Dawn hedge

HEDGEROWS AND HEDGEROW TREES

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Hedgerows and hedgerow trees

Trees and hedges in the landscape

Hedgerows are important features in the landscape; offering food and shelter for wildlife, providing historical and cultural links, and providing landscape-scale connectivity. Although they have been around for centuries, they are under threat from removal and poor management.

The Countryside Survey classes a hedge as: a line of woody vegetation that has been subject to

management so that trees no longer take their natural shape. These are also known as 'managed' hedgerows. There are also 'relict' hedgerows that were originally planted as hedges but are no longer managed.¹

Loss of hedgerows

During the 20th century an estimated half of all hedgerows were lost from the countryside,

the majority due to agricultural intensification between the 1940s and 1970s. The 2007 Countryside Survey of Great Britain found the length of 'managed' hedgerows declined by 6.2 per cent between 1998 and 2007, and only 48 per cent that remained was in good structural condition.

As a threatened habitat, there is a dedicated Hedgerow Biodiversity Action Plan. The original Habitat Action Plan (HAP) only covered ancient and/or species rich hedges, but this was increased to include all hedgerows where at least one native woody tree or shrub was dominant (at least 80 per cent of the hedge).

Hedgerow trees

Along with the hedges themselves, hedgerow trees are important resources. It is estimated there are around 73 million hedgerow and park trees in Great Britain. Many of these are aging and offer veteran features for specialist wildlife. There are issues with a loss of hedgerow trees and lack of future recruitment. This is linked to intensive agriculture practices, poor management techniques and disease.

Dutch elm disease had negative impacts on hedges, as the English elm, *Ulmus minor* var. *vulgaris*, was a major hedgerow tree. Ash, *Fraxinus excelsior*, is now the most frequent hedgerow tree and forms the dominant landscape feature in some areas. The threat of ash dieback, *Hymenoscyphus fraxineus* (previously *Chalara fraxinea*), could see the loss of many of these and we may need to think about mitigation.

www.hedgeline.org.uk contains a wealth of hedge related information.

¹ <http://www.countrysidesurvey.org.uk/sites/default/files/pdfs/reports2007/CS-UK-Results2007-Chapter05.pdf>

Benefits of hedges

Hedgerows are important for humans and wildlife; they provide a wide range of services that help support the healthy functioning of ecosystems.

Wildlife services

As the most widespread semi-natural habitat in the UK, hedgerows support a large diversity of flora and fauna. There are 130 Biodiversity Action Plan species closely associated with hedges and many more that use them for food and/or shelter during some of their lifecycle. They are a good source of food (flowers, berries and nuts) for invertebrates, birds and mammals. In intensively farmed areas they offer a refuge for wild plants and animals.



Upland hedge tree on wall boundary

Hedges provide wildlife corridors, facilitating the movement of species through landscapes and from one habitat patch to another. Some species, such as the hazel dormouse, *Muscardinus avellanarius*, struggle to cross large open areas like farmed fields. Therefore, if there is no wildlife-friendly feature connecting one piece of habitat to another they are not able to move through the landscape. This can be particularly problematic if, for example, their habitat patch becomes too fragmented or unsuitable to live in and they need to find alternatives to survive.

Regulating ecosystems

'Regulating services' control ecosystem processes like air quality, water purification and pollination. In terms of the air we breathe, hedgerows help produce oxygen and capture harmful particulates – especially important in urban areas that produce more atmospheric pollutants. They also help reduce the urban heat island effect and store carbon.

Hedges that bound agricultural land act as a barrier and can reduce the amount of pesticides, fertilisers and eroded soil reaching watercourses. They can also reduce flooding by increasing infiltration rates and slowing water flows, this can help to store water in the soil for use at a later date.

The trees and shrubs that make up hedgerows provide shelter for wildlife, but also for livestock throughout the year. They help sustain key pollinators that support productive farming and natural predators that feed on crop pests. Open-grown trees in hedges can become ancient and offer a greater diversity of habitat niches for species to colonise.

Cultural values

'Cultural services' are non-material benefits directly linked to people and values, including recreation, spiritual enrichment and cognitive development. Hedgerows can date back to prehistoric times and can help tell the history of human interactions with the land.



Hazel dormouse

They can also offer educational opportunities for people to learn species identification. Traditional techniques such as hedge laying, which has distinctive regional styles, can also be taught.

Hedges can provide aesthetically pleasing landscape features that can have positive benefits for psychological wellbeing. They can also offer natural screens that hide unsightly developments and protect people's privacy.

Other services

Hedgerows can provide food for humans. Blackberries, sloes, elderflowers and haws have been used over the centuries in many recipes and are still foraged today by people keen for some wild food.

Hedges and hedgerow trees can also provide woodfuel for landowners, but it is important for this to be sustainably managed so as not to negatively affect any wildlife value. Pollarding is a traditional technique linked to woodfuel and the provision of fodder and bedding for livestock.

This long list of benefits shows how important hedgerows can be in the landscape and the need for them to be maintained, now and in the future.

Hedgerow management for wildlife

Hedgerows are much more than just boundaries. They provide important food and shelter for many different species. Invertebrates, mammals and birds, some of high conservation status, use hedgerow habitats. Hedges also provide connectivity between other habitats, such as woodland, across less wildlife-friendly areas, such as large arable fields.

Active management of hedgerows restricts their growth, preventing the woody vegetation from expanding, and is part of their overall definition. However, management is not standardised and some practices can be more damaging than others. Heavy or badly timed management can reduce the amount of flowers and berries available to UK's fauna



Rural craft - hedge laying



Redwing

at crucial points in the year. Unmanaged hedges are shown to produce more berries than managed ones, but some management is needed to prevent hedges turning into lines of trees or gappy, unconnected remnants.

When to cut?

Modern agriculture practices have led to British hedgerows being cut after harvest, in late summer or early autumn. This seriously reduces the amount of berries available to overwintering birds, such as fieldfares, *Turdus pilaris*, and redwings, *Turdus iliacus*. A detailed study found most hedgerow berries, on non-cut hedges, had been naturally foraged by mid-January. So, postponing cutting until February or March was advised.¹

A number of key hedgerow plants, such as hawthorn, *Crateagus monogyna*, only flower or fruit when the wood is at least two years old. Under the Agri-Environment Scheme (AES), the Environmental Stewardship scheme was adopted in England in 2005. The Entry Level Stewardship (ELS) included options for cutting hedgerows no more than every two years, or a maximum of three years. In 2011 in England, 41 per cent of hedgerows were managed under AES and 32 per cent of these were cut every two years.

A study by Staley et al. (2012)² looked at the responses of hawthorn hedges in lowland eastern England to cutting management that differed in both frequency and time. They analysed the number of flowers and mass of berries over a five year period from 2005. They were trying to find out if there was a consistent increase in flower and berry production as the frequency of cutting was reduced; and if the removal of berries by autumn cutting was offset by low frequency cutting.



Hoverfly on hawthorn blossom

Less is more

Their results showed hedgerow cutting reduced the number of flowers available in the spring by up to 75 per cent. They also showed cutting to reduce the biomass of berries available to wildlife in the winter by up to 83 per cent. This was compared to monitored uncut hedges.

Over the five year period, the study showed that reducing the frequency of cutting from every year to every three years increased the number of flowers by 2.1 times, supporting important pollinator insects such as bees, and the mass of berries by 3.4 times.

Their overall advice was for land managers to decrease the frequency of hedgerow cutting from every two years to every three years, and to cut later in winter rather than autumn. This would ultimately provide more flowers for early invertebrates in spring and more berries for birds trying to survive the winter.

The study provided part of the evidence base used by Natural England and Defra for a revision of the ELS in 2012, which was altered to include much stronger financial incentives for farmers to cut their hedges only once in every three years. But if landowners did cut their hedges every two years that it was done in January/February rather than autumn.

A more recent study by Facey et al. (2014)³ supported the above research by showing increased abundance and diversity of moths on hedges cut less frequently and in winter rather than autumn. Moths are an important part of the food web, being eaten by animals such as bats and birds. Landowners are strongly advised to cut hedgerows only every three years and to wait until late winter.

¹ Croxton, P.J. & Sparks, T.H. (2004). Timing of berry depletion rates of three common hedgerow shrubs. *Agriculture Ecosystems & Environment*, 104, 663-666.

² Joanna T. Staley, et al. (2012). Long-term effects of hedgerow management policies on resource provision for wildlife. *Biological Conservation*, 145, 24-29.

³ Facey S.L., et al. (2014). *Lepidoptera communities and agri-environment schemes; examining the effects of hedgerow cutting regime on Lepidoptera diversity, abundance and parasitism. Insect Conservation and Diversity published online May 2014, DOI: 10.1111/icad.12077*

Hedges for bTB biosecurity

Bovine tuberculosis (bTB) has serious impacts on farmers' livelihoods and considerable costs to taxpayers. It is estimated the disease will cost around £1 billion over the next decade.

Currently, figures for bTB outbreaks seem to be falling due to the enforcement of better testing and biosecurity on farms. Many identify these areas as having great potential in the fight against bTB. Badger and cattle vaccinations are also areas of importance and more work is needed on both. Wales currently has a badger vaccination programme in place and a more comprehensive proposal for rolling out badger vaccinations in England was recently announced.



Badger

Along with the above measures, there have been controversial trials on badger culling. Badgers are deemed to be a wildlife reservoir for bTB, though there is evidence of the disease being transmitted both ways and cattle may also be an important vector for badgers contracting bTB. However, 25-70 per cent of bTB breakdowns are estimated to be of non-badger origin¹, the majority being attributed to cattle-cattle transfer.

Wildlife-friendly farming

A study by Mathews, et al. (2006)² provides evidence of wildlife-friendly farms having reduced risk of bTB in cattle herds. Among the reasons for this, hedgerows appear to be a key factor for improved biosecurity; in particular, a greater availability, width and continuity of hedges. Many studies have focused on cattle movements as an important disease transmission vector, but less on other cattle-management variables.

The research looked at the associations between habitat and other factors that lead to the risk of bTB in dairy cattle. Predictors included farmland habitat, topography, indices of badger density and herd size. Data was

analysed from 60 herds with a recent history of bTB and 60 controls from farms in disease hotspots.

The analysis provided models for bTB incidence; hedgerows appeared in 19 of the 21 top-ranking models. Key factors were:

- Number of wildlife strips (ungrazed buffer strips adjacent to field boundaries from which cattle were excluded, usually by fencing).
- Number of hedgerow gaps.
- Hedgerow abundance.

'Hedge-poor' farms, those with few hedgerows and large field sizes, were found to have greater risk of bTB outbreaks than 'hedge-rich' farms. The study also found the availability, width and continuity of hedgerows to be more important than badger abundance in affecting bTB incidence. Other studies have also found little evidence of an association between badger density and bTB risk.

Cattle and badger contact

Although the reasoning behind the findings requires further investigation, the researchers suggest habitat could influence cattle contact rates or be associated with agricultural management practices in ways relevant to bTB transmission. For instance, greater availability of favourable habitat could reduce contact between cattle and badgers, and reduce the risk of cattle ingesting potentially contaminated soil.

Cattle and badgers both use hedgerows; cattle for grazing the long swards and badgers for commuting along and as latrine sites. Live TB bacteria can be found in the faeces of infected individuals (cattle and badgers). It is thought badgers may contract TB by foraging through cattle faeces for beetle larvae, while cattle could become infected from consuming grass contaminated with badger faeces.

When long grass is readily available and hedgerow density is high, cattle will noticeably avoid grass contaminated by active badger latrines. Cattle will also concentrate on the outer edge of the buffer strip, whereas badgers favour the denser core. This reduces badger-

cattle contact rates and can help reduce the risk of bTB transmission from badgers to cattle and vice versa. So hedgerows could be an effective biosecurity measure.

Human TB is a 'social' disease inextricably linked to poverty, overcrowding, poor ventilation and malnutrition. Human and bovine TB are >99 per cent genetically identical, with similar host responses and disease profiles. Wildlife-friendly farms are thought to be healthier for livestock than more intensive, less wildlife-friendly ones. This in itself may have a positive effect on keeping bTB out of the herd.

This is further evidence that wildlife-friendly farms not only benefit biodiversity, they can also have positive impacts on farming. It is therefore important that hedgerows are maintained and restored across agricultural landscapes.

¹Natural England (2011) Consultation on guidance to Natural England on the implementation and enforcement of a badger control policy – Natural England's response. See http://www.naturalengland.org.uk/Images/1112019badgercontrol_tcm6-27539.pdf

²Mathews, F. et al. (2006). Bovine tuberculosis in cattle: reduced risk on wildlife-friendly farms. *Biology letters*, 2, 271-274.



Cattle

The Long Forest Project

The loss of hedgerows from towns and villages has been shown to have negative consequences for wildlife, farming and people. Hedgerows are important wildlife corridors, they support invertebrates that control pests and pollinate crops, and they offer aesthetic beauty, as well as contributing to air quality.

The initial phase, 2012-2014, of The Long Forest Community Hedgerow Project covered the Brecon Beacons National Park (BBNP) area. It enabled the planting of mixed, locally grown, native species hedges and supported the management of existing hedges. It was open to anyone within the area interested in caring for the network of farm, wayside and garden hedgerows that form an important part of the local landscape.

This Keep Wales Tidy project was jointly funded by the Brecon Beacons Trust and the Sustainable Development Fund. It provided guidance, training, equipment, materials and subsistence for volunteers working on practical hedgerow improvement projects and associated activity.

Successful volunteer involvement

Volunteers of the project planted new hedges in rural and urban locations throughout the very large National Park area. Project staff trained volunteers in planting techniques and aftercare of the young trees. Hedge laying training days were held, along with techniques on the use and maintenance of hedging tools. As well as community volunteers, others attending the training included farmers, graduate students, smallholders, gardeners and Local Authority employees. By the end of the current funding phase (May 2014) around 4,000 new hedgerow trees had been planted and 2,586 volunteer hours spent in practical activity.



Hedgelaying Training
Cwmdu

The Long Forest project importantly only bought native species of plants grown by local suppliers.

As well as supporting local businesses, this minimised the risk of importing tree pests or diseases into the project area. Local community woodland groups supplied some sustainably-produced tree stakes. This provided the groups with an income and meant imported bamboo canes were not used.

Along with planting, volunteers have also removed litter and fly-tipped green waste from hedgerows and other wildlife habitats. This helped raise awareness of the negative impact gardeners can have by dumping garden waste into fragile natural habitats. This can include introducing diseases and toxic chemicals, and invasive species that outcompete and reduce native biodiversity.



Hedgerow-bordered
lane, Llanfrynach

Community group members and school pupils have learnt hedgerow survey techniques. They are now able to assess the condition, biodiversity and connectivity of the BBNP's agricultural, urban and garden hedges using the Hedgerow Evaluation and Grading System. Small mammal activity was also recorded in some areas, using footprint tunnels and bat detectors. Improvements to existing hedges were then made, through planting and hedge laying.

Wide-ranging benefits

One element of the project involved mentors working with disadvantaged members of the community; helping to raise awareness of the local environment and overcome some of the issues they may face. Part of this included working with a group with drug and alcohol dependency, some of whom were also homeless.

Working outside on practical activities can have very positive benefits on people's mental and psychological health and wellbeing.

The benefits of the project included establishing community groups that support individuals' wellbeing, helping people to feel safer in their local area, encouraging people to support their local wildlife and habitats, and helping volunteers gain confidence and skills. There was plenty of positive feedback from people involved in the project.

Alongside the obvious environmental and biodiversity improvements, the project provided many community benefits. It has introduced people to the pleasures of practical conservation and formed new community groups. It has given free training in practical hedge management skills to smallholders,

self-employed gardeners, students, volunteers and Local Authority staff. It has involved the agricultural community and has enabled some interesting pioneering co-operation between landowners, conservation bodies and voluntary groups.

The initial phase of the project has now ended, exceeded all its targets and been well received. Keep Wales Tidy and the Woodland Trust are now exploring possibilities for extending this popular community hedgerow project in partnership in other parts of Wales.



Laid hedge at Llanfrynach

Trees in hedgerows

The UK's tree resource is certainly not confined to woodland habitats. There are an estimated 73 million hedgerow and park trees in the UK¹, making trees outside woods a significant part of our landscape. Some are found in open wood pasture and parkland settings, but many are standard trees in hedgerows.

Trees in open-grown settings are more likely to become ancient trees as they have less competition for light and resources from younger trees. As they age over time they provide important habitat niches for specialist species that rely on features like decaying heartwood for survival. Hedgerow trees are ecologically important, but their numbers are declining.

The English elm, *Ulmus procera*, was a key hedgerow tree and an iconic part of the landscape for hundreds of years. Sadly, Dutch elm disease resulted in the death and felling of a significant proportion of the UK's elms. Flailing is a modern and rather brutal method of cutting hedges. It can damage important hedgerow communities and prevent recruitment of new and future standard hedgerow trees.

Seventy per cent of the UK is agricultural land, around 18.7 million hectares, and hedgerows are traditional features of this. They define boundaries between separate fields and different estates. But more than that, they are reservoirs for natural predators that control crop pests, they sustain pollinators that support the growth of our food supplies, they act as windbreaks to protect crops, provide shade and shelter for animals in all seasons, and prevent erosion of precious top soil.



Hedge and trees

Creating new hedgerows

For some years the Woodland Trust has worked with landowners to create new woodland (MOREwoods scheme); for buffering ancient woods, connecting habitats and providing wildlife-friendly areas. Prior to 2012 hedgerows had not been part of this creation work, but hedgerows and hedgerow trees are under threat and action needs to be taken. These landscape features help build resilience in the face of a changing climate, increasing numbers of pests and diseases, and intensifying extreme weather events.

A pilot project ran over the 2012/13 planting season, which aimed to create new hedges with standard trees outside woodland settings. Eleven pilot areas were selected, in counties including Lincolnshire, Warwickshire and Dorset, and landowners chosen that were keen to be involved.



PENNY MAYES

Dog rose

Each hedge was planted with five plants per metre, as a double row hedge, with one tree every six metres. The species mix proportions were standardised across all projects. Shrub species used were hawthorn, *Crataegus monogyna*, blackthorn, *Prunus spinosa*, hazel, *Corylus avellana*, field maple, *Acer campestre*, crab apple, *Malus sylvestris*, dogwood, *Cornus sanguinea*, and dog rose, *Rosa canina*. Standard trees were selected from the list used for MOREwoods planting, including oak, *Quercus* sp., and rowan, *Sorbus aucuparia*. The minimum length for each hedge was 100m.

The pilot resulted in 19 successful schemes, creating a total of 6,062m of hedgerow at an average of 319m per scheme. The number of standard trees planted was 1,274. The project also generated a great deal of interest from people outside the pilot areas, demonstrating a clear demand for more. The motivations for landowners planting hedgerows were for wildlife, shelter, woodfuel, landscape, dormice, water projects, agroforestry, security, aesthetics, legacy and game cover. The scheme has now been extended across the whole of England.

¹Brown, N. & Fisher, R. (2009). *Trees outside woods: a report to the Woodland Trust*. Available online: <http://www.woodlandtrust.org.uk/learn/publications/>



ZORINA THE GEEK

Basking comma butterfly

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