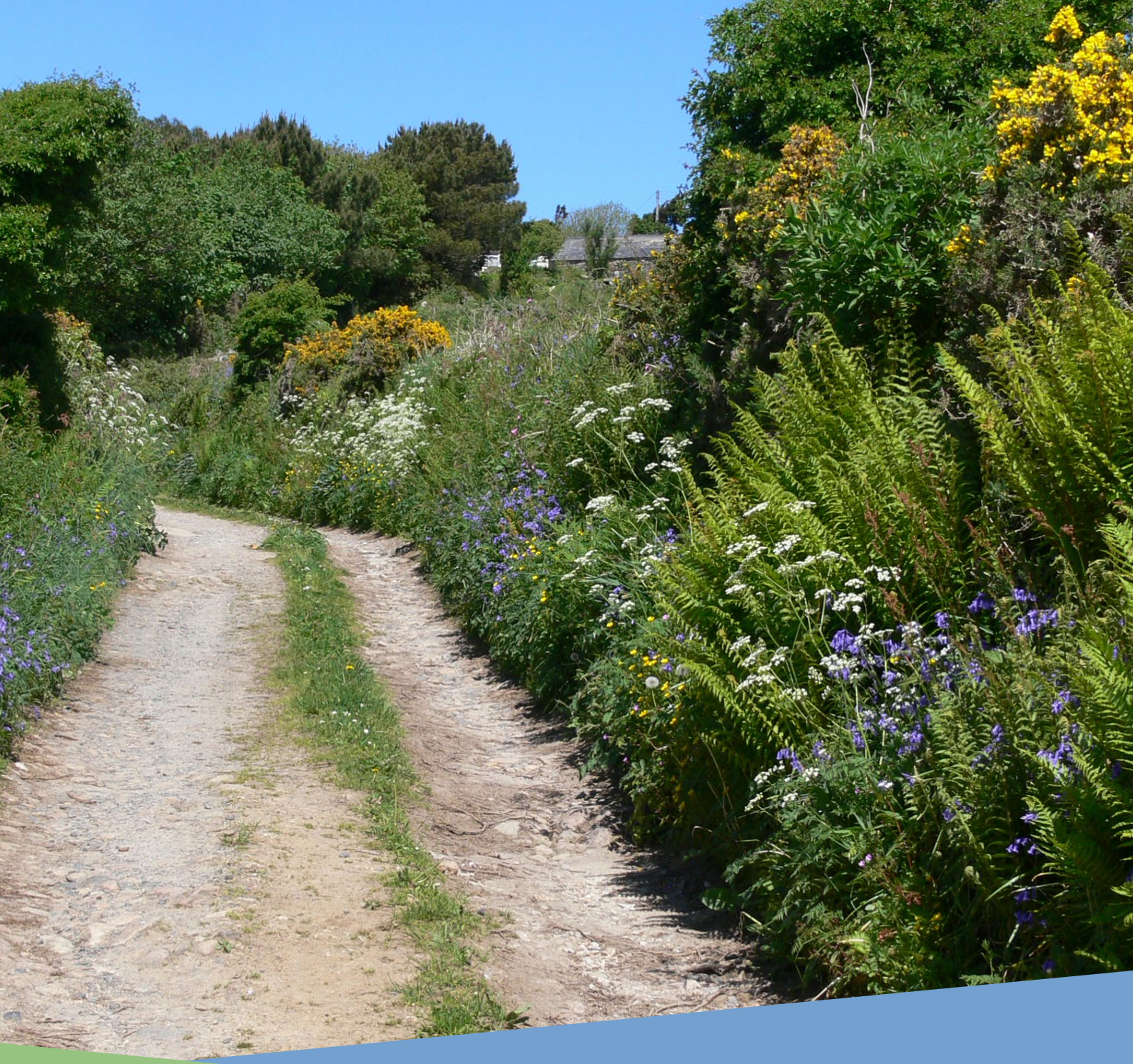


Habitats

Hedgerows

Kat Stanhope

Rebuilding nature
Good practice guidance for ecological restoration

CIEEM

This document is part of a series written by experts in ecological restoration from the UK and Ireland, led by members of CIEEM's Ecological Restoration Special Interest Group. The series is prefaced by ten good practice principles for ecological restoration, set out in *Rebuilding nature: Good practice guidance for ecological restoration*, and includes five Overarching Topics that apply to any ecological restoration project in the terrestrial, freshwater and marine environments of the UK and Ireland:

- **Integrating Ecosystem Services into Ecological Restoration**
- **Project Planning and Implementation**
- **Physical Environment**
- **Large Scale Nature Recovery and Restoration**
- **Monitoring**

Accompanying the five Overarching Topics are the habitat specific documents applicable to ecological restoration projects.

Habitat type

We may think we know what is meant by the term hedgerow, but there is no universal definition of a hedgerow agreed between the UK and Ireland. This chapter defines a hedge or hedgerow as a line of closely spaced, woody vegetation which forms a barrier or boundary, such as between neighbouring properties, with or without trees.

Hedgerows are common throughout the UK and Ireland but not in the rest of Europe. Traditionally used to mark boundaries and contain livestock, some hedgerow systems date to prehistoric times (CPRE, 2021). Oliver Rackham postulated three origins of hedgerows in England (Rackham, 2001):

- Planting, as with more recent hedgerows and those installed following the Enclosure Acts in Britain between 1750 and 1850, where wide, open fields and common lands were broken up into individually owned plots.
- Colonisation of trees and shrubs along fence lines and ditches between adjacent managed areas such as arable fields (i.e. from neglect of another boundary feature).
- As ghosts of woodlands that have been removed (assarts), leaving their edges or remains as field boundaries.

Hedgerows may still be protected by Enclosure Acts which may require that hedgerows are retained and managed in perpetuity. Many records of inclosure (the process of dividing and assigning common land to individual owners, as defined by the Enclosure Acts) are deposited in Local Records Offices.

Hedgerows need managing to maintain their function. The lack of management can change the way the habitat is defined and categorised. For example, relict hedgerows are those which are no longer managed and may have become lines of sparse trees without an understorey, although their original intention was to provide a feature of closely spaced woody vegetation.

Sub-habitats

All hedgerows come under UK Habitat Classification (UKHab, 2023) **h2 Hedgerows** (Level 3), defined as:

'*Lines of shrubs that have the base of their leafy canopies <2 m in height from the ground, so that the woody linear feature as a whole appears as a 'shrubby' hedgerow, even though some of the woody species in it are capable of growing into trees. Hedges in good condition have the base of their leafy canopies <0.5 m from the ground.*'

This category is further divided at Level 4 into h2a Hedgerow priority habitat and h2b Other hedgerows. The UKHab category 34 Ecologically valuable line of trees is defined as having one or more mature, veteran or ancient trees present. Hedgerows are distinct from UKHab categories 71 earth bank, and 72 stone faced bank.

UKHab also excludes woody linear features comprising trees without a shrub layer as hedgerows, even when showing signs of historic hedgerow management. However, woodland as lines of trees and hedgerows are included together in the Statutory Biodiversity Metric version 4.0 (Defra, 2023) which lists thirteen hedgerow types.

Under the JNCC Phase 1 Habitat Survey (JNCC, 2010), hedgerows are categorised as J2 Boundaries, subdivided into intact hedge, defunct hedge, hedgerow with trees, and species-rich hedge. A habitat translator between habitat categories used in the UK is available within the UK Habitat Classification Document (UKHab, 2023).

In *A Guide to Habitats in Ireland* (Fossitt, 2000) hedgerows occur under the classification of woodland and scrub: hedgerows - WL1 and treelines - WL2, being used for any linear strips of woodland or scrub that are less than 4 m wide.

The standard procedure for baseline surveys in the UK is set out in the *Hedgerow Survey Handbook* (Bickmore 2002) and for the Republic of Ireland in the *Hedgerow Appraisal System* (Foulkes *et al*., 2013).

Context

Hedgerows are the most widespread semi-natural habitat in the UK and Ireland. Estimates of the length of hedgerows present in the UK and Ireland differ depending on the methods and criteria used. However, some published estimates are:

- approximately 457,000 km in England, excluding woody lines over 6 m tall; this excluded category includes many overgrown hedges that have transitioned into lines of young trees
- over 22,000 km in Scotland (NatureScot, 2024)
- approximately 106,000 km in Wales (NFU Cymru, 2022)
- approximately 110,000 km in Northern Ireland (Department of Agriculture, Environment and Rural Affairs, 2023)
- approximately 689,000 km in the Republic of Ireland (Teagasc, 2021).

In 2014, hedgerow surveys of 119 intensively managed farms in the Republic of Ireland found that hedges were the most abundant and frequently occurring wildlife habitat, but 90% of these hedges were classed as low quality and only 1% classed as high quality (Teagasc, 2021).

Hedgerows provide food, shelter and breeding sites for a wide range of wildlife and provide habitat links to allow wildlife to move across the landscape, especially where surrounded by high intensity agriculture. It is difficult to picture a rural lowland landscape in the UK and Ireland without the familiar sight of a spring hedge full of hawthorn blossoms.

Hedgerows indicate our cultural history, often marking historic parish boundaries and bordering ancient field patterns and sunken lanes. An ancient hedgerow is a hedgerow that was in existence before the Enclosure Acts of 1720 - 1840 in Britain. They are important for their wildlife value, historical significance, and cultural value. Because of their age, some hedgerows may also include ancient and other veteran trees, classed as irreplaceable habitat in England in the Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024. More information on ancient and veteran trees can be found in the following documents:

- Defining and Surveying Veteran and Ancient Trees. Neville Fay, Treework (March 2007).
- Ancient and veteran trees: An Assessment Guide. The Woodland Trust (June 2022)
- Keepers of time: ancient and native woodland and trees policy in England Government's statement on England's ancient and native woodland and ancient and veteran trees. Defra (May 2022).

Importance

Hedgerows are recognised as priority habitats across England, Wales, Scotland, and Northern Ireland, and feature within the following national biodiversity strategies published by the UK and Irish governments:

- Biodiversity 2020: A strategy for England's wildlife and ecosystem services (Defra 2011);
- The Nature Recovery Action Plan for Wales 2020–21 (Welsh Government 2020);
- Tackling the Nature Emergency – Scottish biodiversity strategy to 2045 (Scottish Government 2022, updated 2023);
- Ireland's 4th National Biodiversity Action Plan 2023–2030 (Government of Ireland 2024, updated 2026).

Hedgerows defined as Priority Habitats are those with 80% or more cover of at least one woody UK native species, where each UK country can define their list of woody native species. Climbers such as honeysuckle *Lonicera periclymenum* and bramble *Rubus fruticosus agg.* are recognised as integral to many hedgerows, although they require other woody plants to be present to form a distinct woody boundary feature; as such they are not included in the definition of woody species.

In the Republic of Ireland there is more focus on the status of EU Protected Habitats and Species listed on the European Council Directive on the Conservation of Habitats, Flora and Fauna on the conservation of natural habitats and of wild fauna and flora 92/43/EEC. Although this does not include hedgerows, many Annex II species rely on hedgerows for food, shelter or commuting (for example, bats).

As well as supporting biodiversity, hedgerows have several ecosystem service functions including providing timber and wood fuel; maintaining climate regulation through carbon sequestration and pollution removal; protecting soils and freshwater systems; and nutrient and water cycling.

The UK Climate Change Committee (CCC) has recommended that the area of hedgerows be increased by 20% by 2025 with better management of existing hedgerows in order to support the UK government's goal of net-zero carbon emissions. The Government of Ireland's Climate Action Plan 2024 includes a target to plant 2,000 km of new hedgerows by 2030. Soil Organic Matter (SOM) under hedges is greater than that on adjacent arable land, owing to the range of root depths and lack of ground disturbance (Anderson, 2024), so establishing more hedges, or restoring existing poor-quality hedges, has the potential to help balance carbon losses from agriculture and increase overall sequestration.

Hedgerows can support biodiversity on a landscape scale, forming effective wildlife corridors. The potential for hedgerow restoration in the UK and Ireland is huge, as it is relatively easy and inexpensive compared to other habitats, does not require a large area, and benefits can be quick to realise, with hedgerows maturing within 10 to 15 years.

An overview of hedgerows within our landscapes and related threats to their conservation.

Biodiversity

Importance

Hedgerows provide food, shelter and breeding sites for a wide range of wildlife including birds, bats and dormice *Muscardinus avellanarius,* and can allow species to move across the landscape by linking habitats.

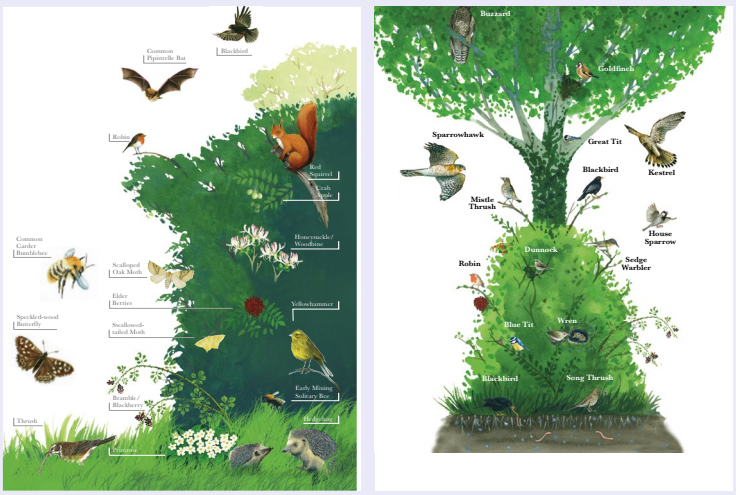
The UK Biodiversity Steering Group (1995) identified that over 600 plants, 1,500 insects, 65 birds and 20 mammal species utilise UK hedgerow habitats. For example the caterpillar of the brown hairstreak butterfly *Thecla betulae* feeds on new blackthorn *Prunus spinosa l*eaves in spring after hatching from eggs which have overwintered on the plant.

Similar statistics are available for the Republic of Ireland. Of 110 bird species regularly recorded during the breeding season in the Countryside Bird Survey in Ireland, 55 use hedgerows and 35 species nest in hedgerows (Keena, 2020) (**Figure 1**).

Figure 1

'The Value of Hedges: Biodiversity'

(reproduced with kind permission from Catherine Keena, Teagasc)



Threats

Loss of hedgerows in the landscape after World War II has been due largely to intensification of agriculture. The loss has slowed since the 1990s, but neglect, damage and removal remain significant threats.

In 1950, a Forestry Commission assessment concluded that Great Britain had 1 million km of hedgerow (Forestry Commission, 1951). The UKCEH Countryside Survey, the longest integrated national monitoring programme of the countryside for Great Britain, began in 1978. Between 1984 and 1990 alone, hedgerow length declined by approximately 19%, and by 2007 the total reduction since the 1950 baseline had reached approximately 52%.

Hedgerow removal leads to a loss of habitat structure and increased field size, causing reduced species dispersal, removal of wildlife food and shelter, and a decline in species diversity (Sutherland & Hill, 1995). Studies have shown that removing hedgerows and abandoning hedge management on farmland is likely to have adversely affected different species groups, for instance yellowhammers (a declining species) in southern England (Bradbury *et al.*, 2001).

Carbon and climate change

Importance

Hedgerows can act as a store of carbon (EPA, 2014) with some studies suggesting that this is on average comparable to estimates for forests (Dexler *et al.*, 2021). Hedgerow-bordered fields hold greater Soil Organic Carbon (SOC) stocks due to the increased soil moisture and reduced temperature under the hedgerow, which results in slower carbon decomposition (Van Den Berge *et al.*, 2021).

As part of the Resilient Dairy Landscapes project, researchers quantified the change in SOC stock as a result of planting hedgerows in Cumbria. The study found that the top 50 cm of soil beneath hedgerows stored, on average, 31% more carbon than the adjacent intensively managed grass fields, with old hedgerows storing almost double that amount. The larger SOC stocks found beneath older hedgerows compared to young ones indicate that these stocks progressively build up over time, contributing to offsetting emissions. The same study showed that a 40% increase in hedgerow length across England will result in 4.7% of present-day agricultural CO_2 emissions from agriculture being sequestered each year for four decades and this figure could rise to 6.4% by increasing hedgerow width by just 50 cm (Biffi *et al.*, 2023).

See Anderson (2024) for more on carbon in ecosystems.

Threats

Removal of hedgerows through development and agricultural intensification can release stored carbon in both timber and soils.

The current rate of hedgerow planting funded by agri-environment schemes is too slow to meet the UK government's targets. The private sector has higher planting rates, highlighting that private sector funding is needed alongside public funds to ensure that hedgerow planting will contribute towards reaching net-zero targets.

A Hedgerow Carbon Code is under development with the aim of unlocking the environmental and income-generating potential of hedgerows by providing a matrix to calculate the carbon store held within a hedgerow, based on species composition, height, and length. This is being piloted by the Game & Wildlife Conservation Trust (GWCT) on their Allerton Project, a 320 ha demonstration farm in Leicestershire, England.

Water, air quality and flood alleviation

Importance

Hedgerows perform a water quality and flood management function by intercepting rainfall, slowing overland runoff and increasing infiltration.

Hedgerows can also improve air quality, by removing particles and pollutants from the air.

Threats

Removal of hedgerows can increase the run-off of nutrients into water courses from soil erosion, resulting in eutrophication. Decreased tree and shrub cover results in increased flood peaks and can lead to faster flows, increasing erosion.

Culture and recreation

Importance

Hedgerows provide a link with our cultural heritage through reminders of the traditional, rural landscapes and the historic ways of living that created them. Some of our oldest trees survive in hedgerows, following the ancient lines of feudal and parish boundaries.

Threats

Removal of hedgerows or poor hedgerow management threatens both the longevity and condition of hedgerows in our landscapes and their links to cultural heritage.

Agriculture

Importance

Soils under hedgerows can provide important functions on farmland, including promoting infiltration and storing runoff, increasing earthworm diversity, and hosting distinct fungal communities (Holden *et al.,* 2019).

The first hedges functioned as land boundaries and stock proof barriers, leaving strips of trees and shrubs as woodland was cleared for cultivation. They also provide forage and shelter for livestock and crops. Historically hedgerows would also have supplied wood for timber and fuel, hips and poles, and fruits, berries, and nuts.

Some 20% of UK cropland depends on pollination from which is derived about 19% of farm-gate crop value (Breeze *et al.,* 2011), while 10% of the total economic value of food production in Europe depends on insect pollination (Gallai *et al*.,

2009). Pollinators support healthy ecosystems, pollinating crops and flowers which in turn provide food for other wildlife. Hedgerows can be important for crop pollinators, such as bumblebees and butterflies, providing a safe refuge all year round and supporting insects with a reliable food source thanks to a range of pollen and nectar-producing plants.

Threats

Removing or mismanaging hedgerows can undermine their contribution to climate change and ecosystem services and provide less benefit to agriculture.

Ecosystem service provision

Importance

The many ecosystem services supplied by hedgerows include (NatureScot, 2023):

- *Provisioning*: Crops (and feed), water supplies, livestock containment, wild foods
- *Cultural:* Landscape and aesthetic value, cultural heritage
- *Supporting:* Nutrient cycling, soil formation, water cycling
- *Regulating:* Local climate regulation, carbon storage and sequestration, pest and disease regulation, soil quality and erosion regulation, water purification, air purification, pollination, flood control.

See CIEEM's Overarching Topic: Integrating Ecosystem Services into Ecological Restoration.

Threats

All of the above.

Intervention measure

Creation, enhancement and translocation are relatively simple to achieve for hedgerows compared to other habitats. All three approaches may be suitable within a single site.

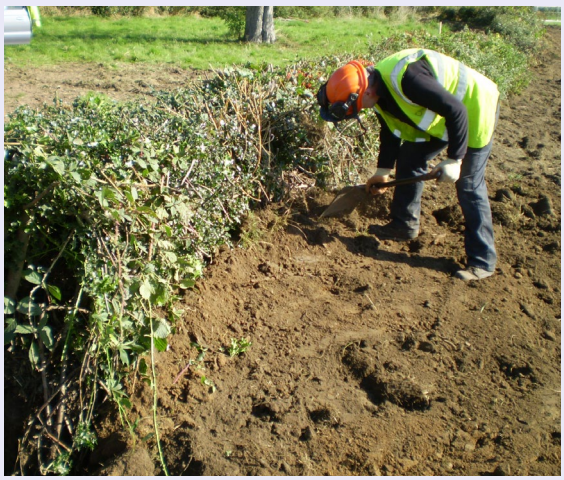
Around 70% of the land cover in the UK (Defra, 2024) and 66% in Ireland (CIA, 2025) is agricultural, which means there is huge scope for farmers and land managers to plant and restore hedgerows. Almost every development site, particularly in the lowlands, has boundaries which could feature a hedgerow where these are appropriate to the landscape, rather than a fence or wall. This would also improve ecosystem service provision.

Translocation is the process of moving soils, and other features such as trees, shrubs, individual plants, leaf litter and deadwood, to rescue hedgerows or parts thereof that would otherwise be lost. Following the mitigation hierarchy (avoid, minimise, compensate, enhance), the preferred approach is to retain or enhance existing hedgerows rather than translocate them. However, mature hedges that provide landscape structure, visual screening and wildlife corridors can be excavated and moved to a new location rather than being cut down and chipped during site clearance operations. Established hedges are valuable wildlife habitats and translocation can be a way to maintain hedgerow maturity and complexity, as well as ensuring the use of native species of local provenance. The planning and process of translocation can be time consuming and costly, and the outcomes cannot be guaranteed. However, translocation of hedgerows can be easier and quicker than for other habitat types and there is evidence of successful translocations, which rely on good aftercare and on-going management. For case studies of hedgerow translocation see Box and Stanhope (2010). The standard industry best practice guidance is *Habitat translocation: a best practice guide* (Anderson, 2003).

Figure 2

Hedgerow at a receptor site in Staffordshire following translocation.

Photo credit: Kat Stanhope (April 2024)



Processes, what to consider and general principles

Hedgerow enhancement and creation is relatively simple and low cost. The Defra Statutory Biodiversity Metric (Defra, 2025) classifies all hedgerows as having a low technical difficulty of creation and enhancement.

Key considerations for hedgerow creation schemes can be similar to tree planting schemes, and are summarised from page 10 below. Many of these can also be applied when considering the enhancement or translocation of hedgerows.

There are many guidance documents available on how to plant and manage hedgerows, some of which are specific to the different countries of the UK and Ireland (see Case Studies and Useful Resources section below).

Box 1

Taking account of the Defra Statutory Biodiversity Metric in the creation or translocations of hedgerows

In England, the Environment Act 2021 introduced a legal requirement for all new developments to achieve a 10% increase in biodiversity units, implementing the Biodiversity Net Gain (BNG) approach using a metric developed by Defra that compares habitats before and after development. Whilst some projects may have to deliver 'instant' hedgerows for screening rather than specific ecological enhancements, all created, enhanced, and translocated hedgerows on a project can aim to achieve the criteria for UK priority habitat in good condition, which will require maintenance and long-term management.

The time taken for newly created and enhanced hedgerows to reach their target condition (poor, moderate or good) can be anywhere from 1 to over 30 years. The Statutory Biodiversity Metric and its associated guidance do not currently specify how to deal with translocated habitats. In the absence of formal guidance, it is recommended that this can be dealt with by including a figure under the 'Habitat created in advance (years)' which amends the 'Standard or adjusted time to target condition' to the relevant years. For example, in the Statutory Biodiversity Metric, a mature species-rich native hedgerow of good condition if newly created would have a Standard time to target condition of 12 years. If a mature hedgerow was coppiced and translocated on site with proper maintenance, it could be expected to regrow and achieve good condition in two years following translocation.

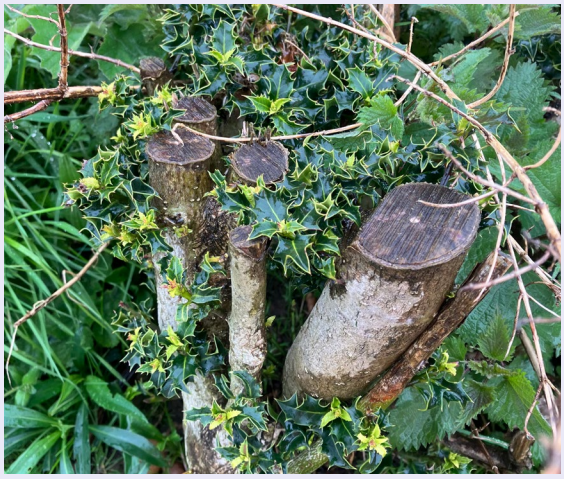
This can be captured under tab 'B-2 On-site Hedge Creation' with the 'Habitat created in advance (years)' given as 10 such that the 'Standard or adjusted time to target condition' appears as 2. A similar method can be used when using 'instant' hedgerows or more mature trees and shrubs within the planting specification.

Note that other nations have different approaches. Wales has not introduced a BNG metric; instead, it has implemented a mitigation hierarchy and Stepwise approach as set out in Planning Policy Wales (Welsh Government, 2024). In Scotland, National Planning Framework 4 (NPF4) Policy 3b requires all major developments to include significant biodiversity enhancement, implemented through planning policy rather than legislation. The Scottish Government has commissioned NatureScot to develop a Scottish-specific biodiversity metric (the Scottish Planning Biodiversity Metric (SPBM)) rather than adopting the English Defra metric. The SPBM is expected to be available in 2027, with a consultation planned for mid-2026 on a working draft metric tool and accompanying guidance. There is currently no formal legislation or policy regarding biodiversity enhancement in Northern Ireland or the Republic of Ireland.

Figure 3

Regrowing holly on translocated coppiced hedgerow at a receptor site in Staffordshire following translocation.

Photo credit: Kat Stanhope



Key considerations for hedgerow restoration

Objectives

Consider the drivers for hedgerow restoration that will affect the approach to creation, enhancement or translocation, and use these to plan and design the approach.

General objectives may be to:

- ☐ enhance existing hedgerows through planting or management to increase their condition and/or achieve criteria for habitat of principal importance;
- ☐ plant to connect existing or proposed habitats in the landscape;
- ☐ retain the structure and composition of existing hedgerows by translocating to new locations which will connect existing or proposed habitats.

Location

New or translocated hedgerows should complement or fill gaps in the existing hedgerow network or join up other woody and scrub habitats. Geography, geology and ground conditions will affect the choice of species.

The decision of where to enhance existing hedgerows should be carried out on a case-by-case basis, but most enhancements will consist of gap filling, adding trees, increasing species diversity and/or bringing hedgerows back into 'good' management. Gap filling is easier if there are very large gaps in a hedgerow - space is required to plant trees and shrubs in the gap, and creating the right ground conditions for new planting or translocation can affect existing planting.

For translocated hedgerows, the receptor site should be as similar as possible to the donor site and preferably within the immediate vicinity, for both nature conservation and logistical reasons. This may require soil surveys and tests at both the donor and receptor sites, as well as consideration of geophysical properties such as topography, hydrology, aspect, and shade.

Public interfaces

Planting or translocating hedgerows alongside public rights of way may add interest and mark the route but could also obstruct the view and create a management burden.

Consider accesses and how wide these need to be for vehicles or people, and whether field gates or stiles will be required.

High hedges can cause disputes between neighbouring landowners due to blocking views and shading. A 'high hedge' is defined under Part 8 of the Anti-social Behaviour Act 2003, which applies to England and Wales, as being a line of two or more evergreens, rising to a height of more than 2 m.

Specific restrictions

Hedgerows created or translocated close to building foundations should refer to *Building Near Trees Guidance* (NHBC, 2025) which provides guidance on tree species selection based on their ability to cause soil shrinkage (which can cause building subsidence if the foundations are not adequate).

There may be operational restrictions on where hedgerows and hedgerows with trees can be planted in relation to transport infrastructure such as railway lines and live highways, and near energy infrastructure such as overhead electricity transmission lines and underground cables. Companies such as Network Rail, Highways England and utility companies publish guidance on restrictions and recommendations for planting near to their infrastructure.

Purpose and design

The aims and objectives ('purpose') for hedgerow restoration should be clear and used to assess future maintenance inspections or to monitor against. The hedgerow's purpose will affect the species mix and management, and should be considered early in the design process.

The design should consider the width and height of the hedgerow at maturity and whether the hedge will include standard trees (i.e. those allowed to grow into trees rather than be managed as shrubs). The design should also consider access for management on both sides of the hedge, including at maturity (i.e. a line of whips, if managed successfully, can soon bush out to a wide hedgerow, taking up space on either side and blocking accesses).

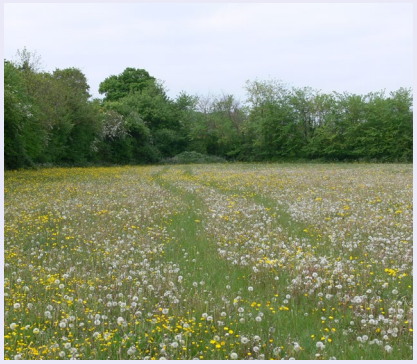
To maximise wildlife potential and ecosystem service provision, hedgerow height at maturity should aim for at least 1.5 m. Taller and wider hedgerows have more capacity for carbon storage and are generally associated with higher biodiversity. For some bat species, taller hedgerows provide better flightlines. One study found that the occurrence and activity of long-eared bats *Plecotus* spp. along hedgerows in farmed landscapes was positively and directly influenced by hedgerow height, induced by sympathetic management. These short-range echolocator species mainly rely on linear features for commuting from their roost to foraging habitat. Irregularly managed hedgerows may act as better acoustic landmarks than annually trimmed ones due to their greater height, roughness, and width (**Figure 4)**. Tall hedgerows are also associated with a greater abundance of flies and increased insect diversity for improved bat foraging (Froidevaux *et al.,* 2019).

If there are constraints on the height of new hedgerows in some part of a site, selecting plants with a maximum height that corresponds with the desired height of the hedge, such as compact varieties of native shrubs which are available from nurseries, can minimise the maintenance required.

Figure 4

An unmanaged hedge and ditch in NW Essex, England, on chalky boulder clay.

Photo credit: Penny Anderson



Ground preparation

See CIEEM's Overarching Topic: Physical Environment.

Consider information on local soil conditions which may not be optimal for typical hedge species, such as heavy clays or areas prone to waterlogging.

- England and Wales: Landis Soilscapes Viewer
- Scotland's Environment Web National Soil Map
- UK Soil Observatory: the Soils of Northern Ireland
- Republic of Ireland: Teagasc Soil Maps

The ground should be prepared in advance of planting or translocation. Young hedgerow plants can be carried in a cultivated strip of soil or by individual slit planting, with larger plants that will become hedgerow trees being planted in a pit. Young trees and shrubs will establish better with a minimum of 150 mm of topsoil with a good nutrient base and organic content. Nutrients or organic matter may need to be added to poorer soils.

Whilst it is generally not necessary to add nutrients for enhancing or translocating existing hedgerows, there may be merit in adding organic matter to the receptor trench, or mulching a translocated hedgerow, to reduce the effects of drought stress caused by the exposure of roots and root trimming. The key considerations when preparing for hedgerow translocation are:

- **Coppicing and root trimming:** with larger and older specimens it is preferable to coppice the above-ground parts of the hedge and trim the roots. This reduces the weight and unwieldiness, making the hedge suitable for moving with non-specialist machinery. Note that some species may be more sensitive to coppicing or root trimming, which could render them less successful as transplants.
- **Lifting**: lifting the hedgerow from the donor site should be done by a low ground pressure tracked machine with a suitable reach, such as a 360-degree excavator, likely more than 30 tonnes, with a bucket width of 1.5 m, depending on ground conditions. The bucket of the excavator should be used to move the existing hedgerow in sections as large as possible with minimal disturbance. The bucket should be sufficient to remove roots from a depth of approximately 1 m, though most roots will be within the first 0.5 m (**Figures 5 and 6**).
- **Ground preparation and backfilling:** the trench or wide slot at the receptor site should be prepared immediately prior to translocation to prevent the soil drying (**Figure 7**). The size of the trench will depend on the size of the hedgerow to be translocated. After translocation the trench can be backfilled with either soil alone or soil mixed with soil nutrients and organic matter.
- **Timing**: excavate, move, and replant each hedgerow section in the dormant season and on the same day to prevent the roots drying out and becoming damaged.

Figure 5

Hedgerow in process of translocation using a 360 digger mounted flat plate on the HS2 project in Buckinghamshire.

Photo credit: Stuart Lowe

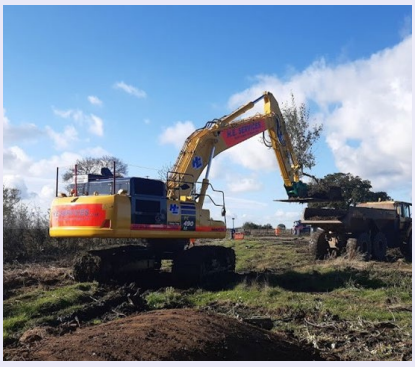


Figure 6

Hedgerow being moved between the donor and receptor site in an articulated hauler (dump truck) on the HS2 project in Buckinghamshire

Photo credit: Stuart Lowe

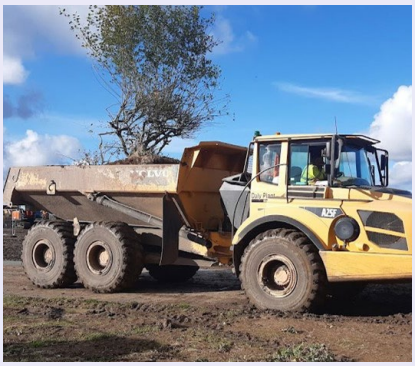
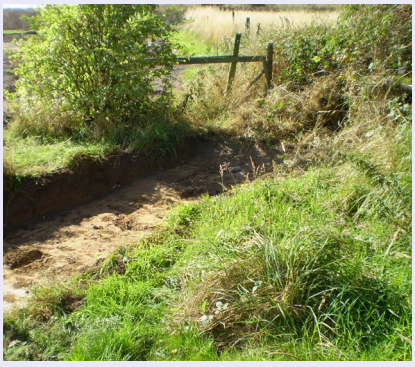


Figure 7

Receptor trench prepared in advance of receiving translocated hedgerow.

Photo credit: John Box



Mulching and soil ameliorants can be applied to newly created or translocated hedgerows. Mulching and/or use of herbicides can suppress weed growth and reduce competition for young, planted trees and shrubs from non-target species such as grasses and nettles which can become vigorous following ground disturbance, particularly on fertile soils.

Although mulching and herbicides can suppress the ground flora of the hedge, a lack of maintenance of competing species, at least in the aftercare period immediately following planting or translocation, can lead to tree and shrub failure. Drought conditions in spring and early summer, before plants have established, can lead to losses. Mulching can improve water

retention of the soil, reducing drought stress on the plants, as in many cases it may not be feasible to water them. The risk of drought stress can be reduced by planting small juvenile stock at the right time of year with good workmanship, which may reduce the need for mulching (which can add additional cost).

Providing a ditch beside a hedgerow, even if this is a 'blind ended' ditch, can make moisture available for the hedgerow roots by holding water and slowing local run-off. Many hedges in wet clay soils have ditches beside them, for example in Essex. However, be sure that the ditch is designed such that it does not intercept water and carry it away from the hedge entirely, leading to drought.

For areas which are prone to flooding, planting hedgerows on small embankments, sometimes known as kested hedgerows, can improve the growth of the hedge, prevent soil waterlogging, and enhance the natural flood management and water quality benefit by intercepting and temporarily storing overland flow. In Devon and Cornwall hedgerows are often planted on top of walls or mounds (see Devon Hedge Group: Devon hedges and **Figure 8**). Advice on natural flood management measures for farmers, including planting and managing hedgerows, has been produced by the Eden Rivers Trust (2018).

Figure 8

Flower-rich hedge-banks along an old track, Devon, England.

Photo credit: Penny Anderson

The site where the hedgerow is to be enhanced, created or translocated from/to, may need the removal of 'non-target' species such as invasives/non-natives. The spread of any invasive species throughout the site or off the site needs to be considered. Assess the risk of accidentally moving plant diseases to the site on translocated plants, soil or equipment. A thorough biosecurity risk assessment should be carried out and a biosecurity plan may be required (see Scotland's Centre of Expertise for Plant Health: Biosecurity best practice for conservation for further advice). Note that there are areas where otherwise non-native species may have become naturalised, for example *Fuchsia magellanica*, a planted escapee from South America, has naturalised in hedgerows and coastal regions in Ireland (**Figure 9**).

Figure 9

Fuchsia hedge, Achill Island, County Mayo, Ireland

Photo credit: Penny Anderson

Specification

Most larger landscaping schemes will need a specification created for planting or translocation. The specification is part of the design and sets out how the site should be prepared, including site clearance and soil preparation. It should include the planting specification (species, age, whether pot grown or bare root), how the species should be planted or seeded,

protection and aftercare. The specification does not have to be complex or long but is needed to direct how works on site will be done. It is particularly important if others are carrying out the site preparation, planting and aftercare on your behalf.

For larger landscaping schemes, the specification may form part of contract documentation. An example of a contract specification document can be found within the Standards for Highways Manual of Contract Documents for Highway Works, covering the UK.

Species mix

For planting schemes, selecting the right plants at the right size is key. Species that are local to the area, have a range of provenance, and are of small size offer the best chance of establishment and being climate resilient. Species that already occur in hedgerows in the area are more likely to thrive in the local climate and soils and be in keeping with the character of the landscape.

Thorn trees, such as blackthorn *Prunus spinosa* and hawthorn *Crataegus monogyna* (also called whitethorn or mayflower), are good for structure, stock proofing and wildlife shelter, and they produce flowers and fruit for invertebrates, birds, and small mammals. Along with hazel *Coryllus avellana,* these will probably form the basis of most hedge mixes, though they should not collectively make up more than approximately 70% to allow other species diversity.

A typical mix in lowland England for a newly planted hedgerow could include hawthorn (50%), field maple *Acer campestre* (20%), blackthorn (15%), and smaller percentages of other locally appropriate species which may include hazel, holly *Ilex aquifolia,* wild privet *Ligustrum vulgare*, guelder rose *Viburnum opulus,* dog rose *Rosa canina,* dogwood *Cornus sanguinea*, buckthorn *Rhamnus cathartica,* wayfaring tree *Viburnum lantana* and spindle *Euonymous eurapeaus*. However, there will be variations on the best mix throughout the UK and Ireland, many of which will be based on landscape character areas such as that published by the Durham Hedgerow Partnership (Hedgerow Species Mix). It is advisable to refer to local guidance. The canopy of hedgerow trees could shade shrubs below, and therefore it is better to plant more shade tolerant species, such as holly, beech *Fagus sylvatica* and hazel, adjacent to hedgerow trees. Holly is culturally significant in some areas of the UK and may be desirable to include in mixes. Design the hedgerow species mix to be attractive to animals and to provide food, including pollen, in different seasons (see People's Trust for Endangered Species – Hedgerow plant diversity). Include 'non-woody' species in the planting design such as climbers and ground flora, using plug plants or seeding the hedgerow base.

Consider the level of management that will be needed when selecting species. The way the newly planted hedgerow is intended to be managed in the long-term, and the level of management resources which will be available, should influence which species you plant. Blackthorn is vigorous and invasive; without management it can dominate many other species within the hedge including sending out sucker growth into adjacent areas. Elder *Sambucus nigra* is also quite vigorous and often encourages large gaps to form within the hedge. Hawthorn, blackthorn, and hazel can withstand regular trimming. Most broadleaved trees and shrubs coppice well, except for beech. Dogwood, spindle, blackthorn and guelder rose are difficult to lay. Species like ash *Fraxinus excelsior,* oak *Quercus* spp. and willow *Salix* spp. can grow very large.

Planting

Most designs for thick, wildlife friendly hedgerows will be based on two staggered rows of plants with 0.4-0.5 m between the rows, and five or six plants for every metre of hedgerow. See *Tree and hedge planting a step-by-step guide* (The Tree Council, 2021). If the intention is for some plants to become trees within the hedgerow, plant these as taller/older specimens at irregular spacing of at least 20 m to allow full crown development, and protect with tree guards. Using taller specimens with tree guards will reduce the risk of the plants being accidentally cut to a uniform height with the rest of the hedgerow plants. If planting a hedge as part of an agri-environment scheme, there may be rules on plant height and spacing to meet the requirements of grant payments.

Age/size

The age of the woody species planted will affect the time taken to establish a mature hedgerow. Young bare root plants are relatively cheap and readily available but will take longer to mature. Larger pot grown plants will be more expensive and may

be less readily available. Establishment periods should aim for between 5 and 10 years, depending on the objectives of the hedgerow. For most planting designs using shrubs and trees, the specification will be for whips; whips are sold from nursery suppliers in various heights – generally 30-40 cm (2 feet), 40-60 cm (2-3 feet), 60-80 cm (over 3 feet) and in faster growing species 80-100 cm are sometimes available. Designs will rarely include larger specimen trees as it is difficult to source nursery stock of larger size and the costs per tree are high.

Translocation is a way to retain the species mix of a hedgerow including plants of local provenance. However, in the author's experience, some species respond better to translocation than others. For example, holly, especially if not translocated in early spring and if subject to drought stress, can lose their leaves in the first growing season due to the shock of translocation, which may or may not come back in subsequent growing seasons.

The National Plant Specification (NPS), covering Britain, is a tool used to support the selection, specification and delivery of plants through the UK's horticultural and landscape industries. The NPS provides detailed guidance on how to accurately specify planting material, with clearly illustrated definitions and descriptions, as well as an explanation of terminology. The tool is supported by the Landscape Institute and the Horticultural Trades Association. However, it may include non-native species, cultivars, and those which are more suited for ornamental and amenity value. Cultivars are produced from cutting and grafting techniques, producing clones of the original tree. This can make them more susceptible to disease as there is no genetic variation which may provide resistance to disease. However, some cultivars may be more suited to an urban environment where a controlled canopy form or size is beneficial, or where feature trees are selected for colour or leaf form.

Sourcing trees

The origin of plants or seeds can determine their adaptability, quality and wildlife value. Consider the source of trees and shrubs, such as a reputable local nursery, and whether they can supply the species and size of stock needed in time for the correct planting season. Any proposed species for planting should ideally be grown in nurseries in the UK and Ireland. Most reputable nurseries throughout the UK and Ireland will operate under a plant passport scheme (UK Gov: Issue plant passports to move regulated plant material in Great Britain; Government of Ireland: Plant Passports and Authorisation Application Process).

With both an uncertain climate and current limited knowledge of tree genetics, a wide genetic base is recommended to build in resilience to an unpredictable future climate. A mix of provenances may be advisable, for example using native trees species of more southerly origin in more northerly planting schemes such that they may be more adaptable to future increasing temperatures (Whittet *et al*., 2019).

Consider the latest guidance from the relevant government on plant health and diseases before selecting your planting mix. Current plant health issues can be found on:

- Pests and Diseases - UK Plant Health Information Portal
- Northern Ireland Plant Health Risk Register | Department of Agriculture, Environment and Rural Affairs
- Information about plant health on the Government of Ireland website.

Also refer to the *Plant Healthy* certification endorsed by the Forestry Commission: Plant Healthy. Elm *Ulmus* procera and ash have become less used in planting schemes due to prominent and widespread diseases (Dutch elm disease and ash dieback), although there are some disease-resistant varieties of elm that can now be purchased from nurseries.

Constraints & Permissions

Many constraints and limitations are those you would find on other development or habitat creation projects, such as the presence of overhead or underground utilities, buried archaeology and historic features, and seasonal wildlife conflicts (see CIEEM's Overarching Topic: Project Planning and Implementation).

Although hedgerows are a common part of the landscape in most of the UK and Ireland, creation or translocation into characteristically open landscapes may have a detrimental effect on landscape and wildlife. For example, breeding birds like lapwing *Vanellus vanellus* and curlew *Numenius arquata,* which prefer wide open spaces, may become more vulnerable to predators such as crows and foxes which are attracted by hedgerows.

Hedgerows have specific legal protection in England and Wales under The Hedgerow Regulations 1997 (as amended), which make it illegal to remove most countryside hedgerows without prior permission from the local planning authority. The Regulations apply to any boundary line of trees or shrubs consisting predominantly of at least one woody native species, over 20 m in length and less than 5 m wide, where gaps between the trees or shrubs are under 20 m wide (The Hedgerow Regulations 1997). Accompanying guidance further clarifies that any bank, wall, ditch, or tree within 2 m of the centre of the hedgerow forms part of the hedgerow habitat, as does the herbaceous vegetation within 2 m of the centre (Bickmore, 2002). The definition excludes banks or walls without woody shrubs growing on top of them. If enhancing or translocating hedgerows in England or Wales, consider the protection of 'important' countryside hedgerows (i.e. one that is not in or marking the boundary of a private garden) (Natural England and Defra, 2024). Scotland and Northern Ireland do not have dedicated countryside hedgerow protection legislation equivalent to that in England and Wales.

In the UK, you do not need planning permission to create a hedgerow in a private garden. Planting a hedge on agricultural land is generally not considered a material change of use and does not typically require planning permission, though local policies and notification requirements should always be checked. In the Republic of Ireland, hedgerow planting is similarly unlikely to require planning permission as it does not ordinarily constitute "development" under the Planning and Development Act 2000, though this should be verified with the relevant local authority if in doubt.

If you are enhancing an existing hedgerow, this will generally not require permission. However, cutting or trimming a hedgerow in order to undertake enhancements may be relevant where the hedgerow is protected or qualifies as an important hedgerow under The Hedgerow Regulations 1997 in England and Wales (see also The Management of Hedgerows (England) Regulations 2024).

Hedgerow creation as part of the landscape design of a development may need permission. This should be checked with the relevant local planning authority. Some local planning authorities have their own guidance on what information needs to be provided with a planning application for proposed hedgerows, such as the Hedge Planting Specifications for Planning Applications produced by the Forest of Dean District Council.

Some planning permissions may require the retention of hedgerows on development sites; their removal would therefore constitute a breach of planning consent. A Tree Preservation Order (TPO) is an order made by a local planning authority in England to protect specific trees, groups of trees, or woodlands in the interests of amenity (MHCLG and DLHC, 2014). In Wales, TPOs are made by local planning authorities under separate but similar legislation and policy guidance issued by the Welsh Government. While TPOs do not normally apply to hedgerows, they may be used to protect individual trees within a hedge, or an old hedge that has developed into a line of trees of reasonable height.

Regardless of whether formal permission is required, it is best practice to inform neighbouring landowners, public users and other individuals or groups with a specific interest in the land, of proposed works.

Plant Protection

Tree protection in the form of guards and fences is a key issue to consider, as is weed suppression to the base of the trees using mulch, mulch mats, compostable film or herbicide.

Assess the predation risk from livestock, deer, rabbits or other foraging animals to determine whether to use stock proof fencing or individual tree guards. New hedgerows or coppiced and translocated hedgerows can be fenced either side for protection, which may be easier and more economical than trying to protect individual plants (**Figure 10**). Fencing can make access for aftercare and maintenance difficult, so ensure the design includes access routes such as gates, and space between the fence and the planting.

Figure 10

Newly planted blackthorn and hawthorn hedge funded by the National Parks and Wildlife Service Plan scheme, protected against cattle grazing by fencing. County Cavan, Ireland, June 2023.

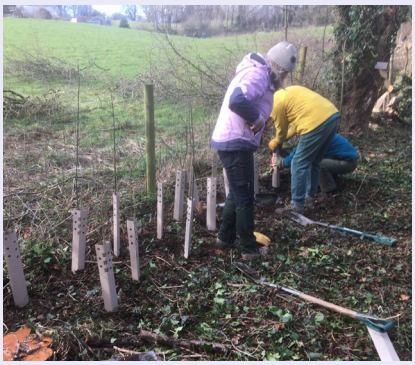
Photo credit: Jim Martin.

If deer grazing is potentially an issue and fencing is not an option due to site constraints or costs, then taller tree guards of minimum 1.2 m may be required. Tree guards, as well as grazing protection, offer young trees a favourable microclimate. Consider sustainability; there is a range of sustainable, biodegradable, and photodegradable tree guards on the market. Most of these need to be used with stakes and ties, so include this in quantities and costs. The Woodland Trust has been carrying out research since 2019 on sustainable tree guards (Tree Guard Research: Plastic-free Alternatives - Woodland Trust) (**Figure 11**).

Figure 11

Volunteers planting a hedge, using cardboard guards for protection.

Photo credit: John Box.



Generally, protection is only needed during early establishment and can then be removed to make future management easier and to allow greater wildlife access to the established hedgerow. If using non-degradable guards of fencing, factor in the time and allowance to remove and reuse or responsibly dispose of materials.

Maintenance and management

Hedgerows are a man-made habitat and need management to remain functional and achieve their intended purpose. Inspections and management activities and timings should be captured in a Habitat Management and Monitoring Plan (HMMP).

In arable settings hedges are ideally bordered by field margins so that the hedges are not damaged by agricultural operations. An arable field margin is a herbaceous strip or block at the outer 2-12 m of an arable field that is intentionally managed to benefit wildlife, typically within a crop rotation that includes an arable crop (Maddock, 2008).

A newly planted hedge should be allowed to establish for at least a year before trimming it. In the following spring, the leading shoots of shrubs can be pruned just above a bud to encourage the generation of multiple shoots, leading to dense, bushy growth. After this initial period, the hedgerow can settle for a couple of years before cutting more regularly.

The aftercare, or maintenance, period is generally considered to be the first five years after planting or translocation, when more regular intensive activities and replants may be necessary. Ensure the management plan includes a programme of maintenance inspections in the aftercare period, including a beat-up assessment (a tree success/failure check usually carried out in the aftercare period) typically in late summer/autumn. Failed plants will need replacing within the next planting season. *The Trees in Towns II report* (Britt & Johnston, 2008) commissioned by the Department of Communities and Local Government, which assessed the quality and quantity of trees in urban areas in England, highlighted that as much as 25% of all planting undertaken in the public sector fails. Although there has not been any comparable survey undertaken in the private sector, anecdotal evidence indicates that the failure rates are similar. Contracts for tree failures in new planting schemes generally allow for approximately 10% to 20% failure with replanting in the aftercare period, although failures should decrease each year throughout the aftercare period.

Early inspections should also check for the presence of weeds and invasive species which may need pulling or spot treatment with herbicide. Mowing or strimming vigorous grasses and non-target species around the hedgerow base may also be required, although this can inadvertently damage young trees if the mower/strimmer cuts into them or their tree guards. The use of mulch, mulch mats and compostable films can reduce weed suppression and the need for strimming or herbicide treatment.

After five years, a long-term management phase may include frequent activities such as trimming, and less frequent activities such as laying (**Figures 12 & 13**), which can improve structure and longevity (usually only after 10–15 years of growth and then on a 10–15 year management cycle).

Figure 12

Hedge laying by Wirral Conservation Volunteers in 2024, England.

Photo credit: Tom O'Boyle

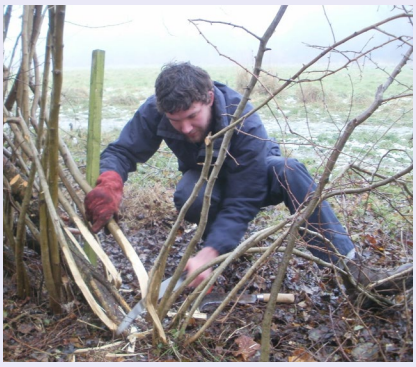
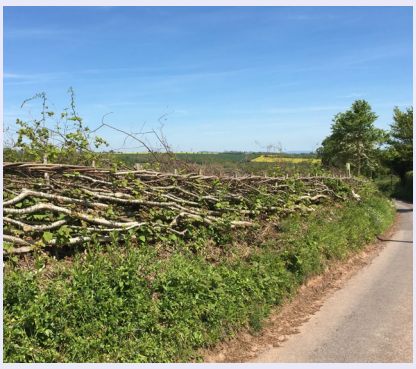


Figure 13

Recently laid hedge near Hereford, England.

Photo credit: Penny Anderson



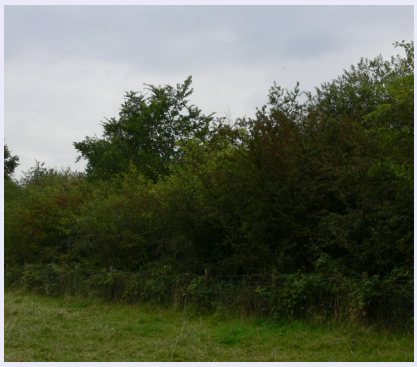
Management is one of the most effective ways to enhance existing hedgerows, but their quality is highly sensitive to how this management is applied. Excessive intervention, such as the overuse of flail mowers, can degrade structure and ecological value, while insufficient management can lead to neglect and decline. This is an increasing concern as traditional practices like hedgelaying become less economically viable. Furthermore, overly uniform management, as has occurred under some agri-environment schemes, can reduce habitat diversity and resource availability, potentially harming certain species, including those of conservation concern (Graham *et al.*, 2018).

Management regimes affect the structure of hedgerows (their width, density, and connectivity) and determine their carbon and biodiversity profile (Teagasc, 2022; Black *et al.,* 2023).The reintroduction of traditional management practices, such as layering and increasing hedgerow width, can increase the biodiversity value and the carbon sink potential of established hedgerows (Black *et al.,* 2023). For example, management to increase the width and height of hedges near Manchester Airport's second runway was used as mitigation for the loss of other hedgerows (**Figure 14**).

Figure 14

Increased width and height of hedges near Manchester Airport's second runway as mitigation for loss of others.

Photo credit: Penny Anderson

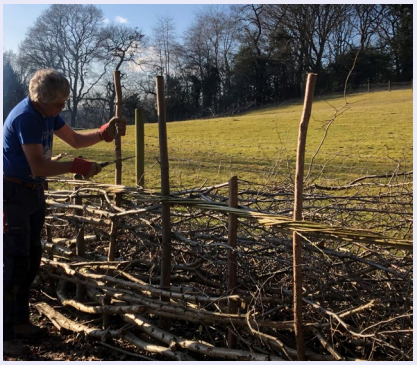


Laying or pleaching (partially cutting and bending stems to interweave living growth) an older hedgerow can be a way to bridge gaps without needing new woody planting. Some 'standard trees' could also be allowed to grow within the hedge to create variation in structure, although the presence of standard trees can make large scale mechanical management of hedgerows more difficult.

Figure 15

Volunteers hedgelaying, cutting the excess off supporting stakes.

Photo credit: John Box



Depending on the purpose of the hedge, most can be managed to be dense at the base, rising to an apex (an 'A-shaped' hedge). To prevent the hedgerow turning into a line of trees, the management should top the hedgerow to a height where a hedge cutter can reach the top. Machine management of hedgerows using hedge cutters or flails can damage trees and shrubs within the hedgerow if not done carefully, making plants more vulnerable to disease. Trimming is essential for long-term maintenance, but for the best wildlife structure it is better to trim every 2-3 years rather than annually.

The hedgerow management rules, which came into force in 2024 for rural payment schemes in England, prevent farmers cutting hedgerows from 1 March to 31 August. Equivalent protections apply elsewhere: in Wales, similar cross-compliance

and rural support scheme rules restrict cutting during the bird nesting season; in Scotland, the Wildlife and Countryside Act 1981 (as amended) makes it an offence to intentionally damage or destroy the nest of any wild bird while in use or being built, effectively limiting hedge cutting during this period; and in the Republic of Ireland, the Wildlife Act 1976 (as amended) prohibits the cutting, grubbing, burning or destruction of vegetation, including hedgerows, between 1 March and 31 August, subject to limited exemptions.

Deadwood can be an important resource for biodiversity and should not be removed unless there is an overriding health and safety reason to do so.

There is abundant guidance online for managing hedgerows for wildlife, such as:

- People's Trust for Endangered Species (PTES) Creating a hedge management plan
- PTES photo gallery of good and bad examples of hedgerow structure affected by management Hedge structure photo galleries
- The Woodland Trust How to Care for Your Trees - Plant Trees
- The Wildlife Trusts How to manage a hedgerow for wildlife | The Wildlife Trusts
- Advice from the UK government Farming Blog Plant and manage hedgerows
- Woolton (2024) for information on managing hedges for invertebrates.

Monitoring

See CIEEM's Overarching Topic: Monitoring.

If monitoring against a project's objectives is required, the monitoring techniques and criteria to judge success should be set out in the project plan and/or the Habitat Management and Monitoring Plan. Standard hedgerow survey techniques can be used for both baseline and monitoring surveys. The standard procedure for baseline surveys in the UK is set out in the *Hedgerow Survey Handbook* (Bickmore 2002) and for the Republic of Ireland in the *Hedgerow Appraisal System (*Foulkes *et al*., 2013).

If assessing the condition of created, enhanced, or translocated hedgerows in the Defra Statutory Biodiversity Metric, users should use the condition assessment for hedgerows, which is based on the *Hedgerow Survey Handbook* (Bickmore 2002) and *Definition of Favourable Conservation Status (*Staley *et al*., 2020).

The People's Trust for Endangered Species (PTES) have developed two hedgerow monitoring approaches. *The Great British Hedgerow Survey* is for volunteers, community groups, and wildlife groups and the *Healthy Hedgerows* App is for landowners and farmers, providing rapid assessment and instant management options.

Monitoring a hedgerow covered under an agri-environment scheme, such as England's Sustainable Farming Incentive (SFI), Scotland's Agri-Environment Climate Scheme (AECS), or Ireland's Agri-Climate Rural Environment Scheme (ACRES), may require specific forms of monitoring evidence, so you should refer to the relevant scheme's guidance.

Programme

For any scheme, even a simple programme should be created, to make sure the design, ordering of plants, and ground preparation is in time for the planting season. Planting of all bare-root, root-balled and cell-grown deciduous plants should take place during favourable weather and soil conditions between the start of November and the end of March. Planting earlier within this window is preferential when the ground is still warm but not waterlogged and before the risk of frosts. March planting needs to be reviewed in relation to weather conditions, ground conditions and plant dormancy. Planting outside of the November to March window can hugely affect plant survivability.

Translocating hedgerows should also be carried out in the plant dormant season between November and March, and in conditions where the ground is not frozen or waterlogged. As they are mature plants, they benefit from moist ground so that they are not shocked by dry conditions; otherwise, watering may be required.

Budget / funding

The budget available for the project will affect the design. The budget should cover the planning and design, planting, maintenance, management, and any required monitoring. It may also need to cover fees for third parties such as consultants and planting contractors, and any legal agreements needed to access land.

There are grants available for hedgerow creation (subject to change), including:

- Welsh Government: Small Grants – Environment (Hedgerow Creation): general rules booklet
- Scottish Government: Rural Payments and Services: Creation of Hedgerows
- Ireland Teagasc | Agriculture and Food Development Authority 2023 – Hedgerows and ACRES requirements
- UK Government and Natural England Countryside Stewardship Higher Tier Scheme | BN11: Planting new hedges
- The Tree Council's Branching Out fund
- The Woodland Trust MoreHedges fund

Case studies and useful resources

The following are key references for hedgerow creation, enhancement, translocation and management (full details and links can be found in the References):

- Anderson, P (2003). *Habitat translocation – a best practice guide.*
- Gilbert, O. L. & Anderson, P. (1998). *Habitat Creation and Repair.*
- Parker, D. M. (1995). *Habitat Creation – a critical guide ENS21*.
- Box, J. & Stanhope, K. (2010). *Translocating Wildlife Habitats: A Guide for Civil Engineers.*
- Sutherland, W. J. & Hill, D. A. Eds. (1995). *Managing habitats for conservation.*

There is a wide range of hedgerow information and guidance available on the internet, including from a number of not-for-profit groups interested in hedgerow conservation such as Hedgerows Ireland, The English Hedgerow Trust, and Hedgelink. There is a wide range of hedgerow restoration projects throughout the UK and Ireland, some of which have provided online case studies. A few of these are listed below:

- Improving hedges on a farm in the Forest of Bowland AONB. How hedges can increase biodiversity and help you meet net zero targets. National Farmers Union News, 12 July 2021.
- Hedgerow planting and hedge laying at a farm in Buckinghamshire. Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust (BBOWT) Hedgerow Havens case study: a haven for wildlife at Rectory Farm.
- Sympathetic management of hedges for wildlife on a mixed farm with arable crops and cattle/sheep grazing in Worcestershire. Farm Wildlife Case Study: Bumper crops from hedgerows at Upper Hollowfields Farm, Worcestershire.
- Hedgerows planted under the Rural Development Programme 2014-2020, the Green Low-carbon Environmental Scheme (GLAS) in the Republic of Ireland. National Rural Network; Glas – Hedgerows: A Case Study.
- Campaign to Protect Rural England (CPRE) report on Farming and hedgerows: stretching the boundaries (November 2022) containing farming case studies in England, Wales and Scotland.
- The economics of harvesting wood for heating fuel from hedgerows. Case study: Hedge at Locks Park Farm, Hatherleigh. Devon Hedge Group, October 2010.
- Managing hedges for firewood production on a livestock farm in southwest England. Ross Dickinson and Sally Westaway, AFINET 2019.
- Guidance on translocating hedges with a case study on the widening of the B3264, Kingsbridge. Devon hedges and development 1: moving hedges. Devon Hedge Group, 2015.

Biography

Kat Stanhope

CEnv, FCIEEM, has over 25 years' experience in relation to biodiversity issues and environmental management. This has involved the design, implementation and management of habitat enhancement, creation, and translocation on a number of large and nationally significant infrastructure projects including in the water, road and rail industries. Kat is currently Strategic Biodiversity Net Gain Manager at National Grid.

Publication of this guidance is kindly supported by National Grid

The publication of this guidance, which is kindly supported by National Grid, provides an important source of information to those professions who will lead the legacy of nature restoration. National Grid Group's operations in the UK include National Grid Electricity Transmission (NGET), which owns the high voltage transmission system in England and Wales; National Grid Electricity Distribution (NGED), which owns and operates electricity distribution networks in the Midlands, the South West and Wales; and National Grid Ventures (NGV), which owns and operates energy businesses in competitive markets, including sub-sea electricity interconnectors. National Grid are embarking on the largest overhaul of the electricity grid in generations, playing a key role in supporting the transformation of the energy system to achieve a cleaner and more affordable energy future. As part of this transformation, National Grid's proposed approach to Biodiversity Net Gain also presents an opportunity to deliver a positive change for nature, the environment, and communities - maximising the benefits and value from habitat creation, restoration, and enhancement.

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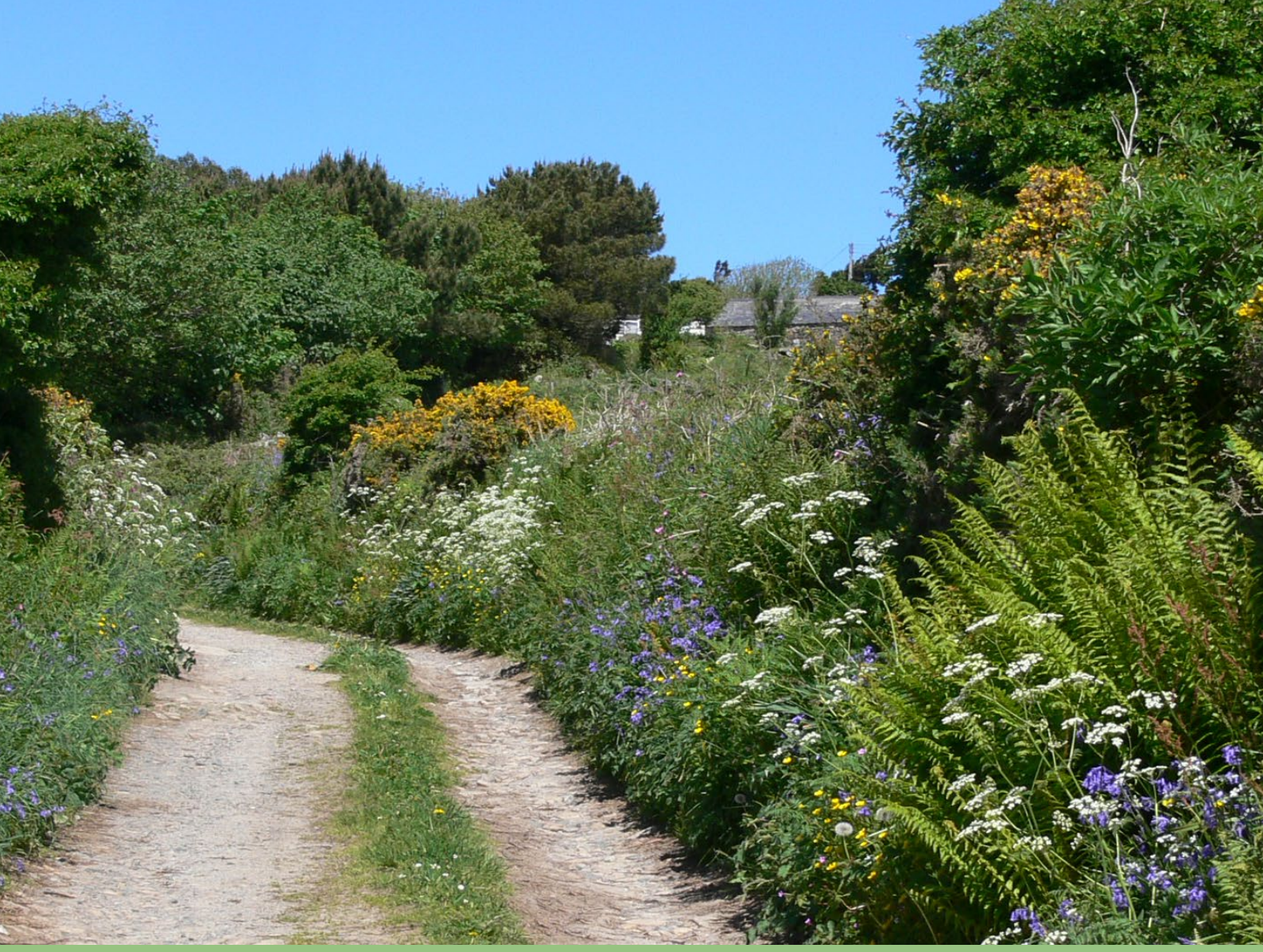

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