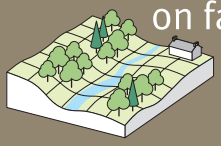
the creation of
small woodlands
on farms



4

Hill Land

the creation of
small woodlands
on farms

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4
Hill Land and Unimproved Grazing

4.1 General Objectives for Small Woodlands

- Create links between existing but isolated shelterwoods on the hill ground and the lowland woodland pattern
- Establish new shelterwoods that extend from the break in slope and tie into the existing pattern of woodland
- Extend areas of riparian woodland adjacent to watercourses, to emphasise these features in the landscape, help improve water quality and reduce the impact of nutrient runoff, and create extensive habitats for wide ranging species such as otters
- Link existing woodlands and other habitats, such as wetland, dykes and scrub
- Use woodland to shelter and define public access routes on the approach to the hill
- Identify opportunities to extend natural regeneration or areas of scrubby vegetation that are good for wildlife

This largely unfenced land is a mosaic of heather, rough grassland, wet land and scrub. There may also be some existing shelterwoods, woodland in gullies and often large areas of forest or semi-natural woodland. This is also likely to be the land where natural regeneration of woodland species may occur when grazing is reduced.

Upland Native Woodland

Upland Riparian Woodland

Upland Stock Shelter

Upland Game Coverts

4.2 General Guidance

This section gives general guidance on siting and planning the layout of small woodlands on hill land and unimproved grazing. The guidance takes into account the type of agricultural management involved, and the wider countryside objectives that relate to managing largely unfenced and often semi-natural landscapes.

4.2.1 Siting Small Woodlands on Hill Land and Unimproved Grazing

Small woodlands are very difficult to site in isolation on unfenced hill land, where they will often appear too small and detached from other landscape features in such a relatively large scale and open landscape.

It is therefore best to locate new small woodlands where they can be associated with other landscape features, such as gullies, or low down on the hill where they can be linked to other woodland in the landscape. In all cases, new woodlands should extend to the head dyke or enclosed fields. The woodland will then integrate more easily into the existing landscape structure.

A survey of your farmland is likely to identify existing woodland or other natural features that could be used for the focus of new planting while still meeting your farming objectives.

A survey also gives you an opportunity to identify existing sensitive habitats, areas of cultural importance and built features that should be not be planted.

4.2.2 Woodland Types on Hill Land and Unimproved Grazing

Small woodlands are difficult to site within a relatively large-scale open hill landscape of primarily semi-natural vegetation. Generally, the most appropriate woodland types will be native woodland or riparian woodland. Shelterwoods for stock or game coverts should only be planned if they can form part of broader network of planting, extending uphill from the floor of a glen or existing woodland pattern.

Woodland Types

Upland Native Woodland (Section 4.3): a diverse woodland which can be used for anything from screening buildings to providing shelter

Upland Riparian Woodland (Section 4.4): a broadleaved woodland of selected native species appropriate for establishing next to watercourses

Upland Stock Shelter (Section 4.5): a woodland established primarily to provide shelter for stock

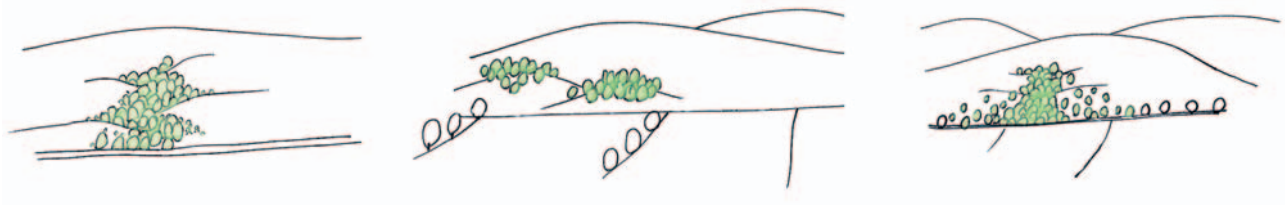
Upland Game Covert (Section 4.6): woodland for raising game birds, laid out to provide structure for a driven shoot

The type of woodland you choose should reflect your objectives and fit in with the surrounding landscape. In some areas there may be very specific and locally distinctive tree species, woodland habitats or features. These are often easy to identify by looking around an area, but local advisers, who can be identified using the contact list in the Annexes, will be able to offer additional information on the type of woodlands and species that are important in your area.

4.2.3 Shape and Form

Woodland in this landscape can be designed to reflect the undulations of the topography and organic shapes of the semi-natural vegetation patterns. Well sited woodland will be associated with natural landform and features, and should then be shaped to complement their irregular forms.

In many areas of hill land, small woodlands appear as a feature, perhaps as a linear regenerated woodland associated with a gully, a straggly clump of whin scrub extending across less grazed slopes, or as individual point features created by remnant birch or other native woodland. There are also more extensive shelterwoods and upland game coverts, which if well sited and shaped can enhance the landscape. All too often, however, they are sited where they are isolated from any other feature, and geometrically shaped in a way that does not link into the natural topography or vegetation pattern.



In this type of upland farmland, woodland should be shaped to the reflect rolling topography and natural features, such as irregularly shaped cleughs or distinct knolls. Often, establishing less dense planting on the edges of the woodland will create a more natural appearance. A more irregularly shaped external edge is also an important contribution to wildlife habitat and helps to provide shelter from wind blowing from any direction.

4.2.4 Species Choice

While the choice of species needs to reflect the function of the wood, species choice needs also to take into account the often open and exposed character and poorer soils of this relatively harsh upland environment.

The semi-natural vegetation pattern and the less intensively managed landscape lends itself to the establishment of native broadleaf and conifer species, especially those that are well adapted to growing in this environment. Birch, rowan and willow will often be found in sheltered cleughs and perhaps even regenerating along burnsides, while along the lower slopes of the hills there may be more extensive woodlands of birch, Scots pine and even juniper.

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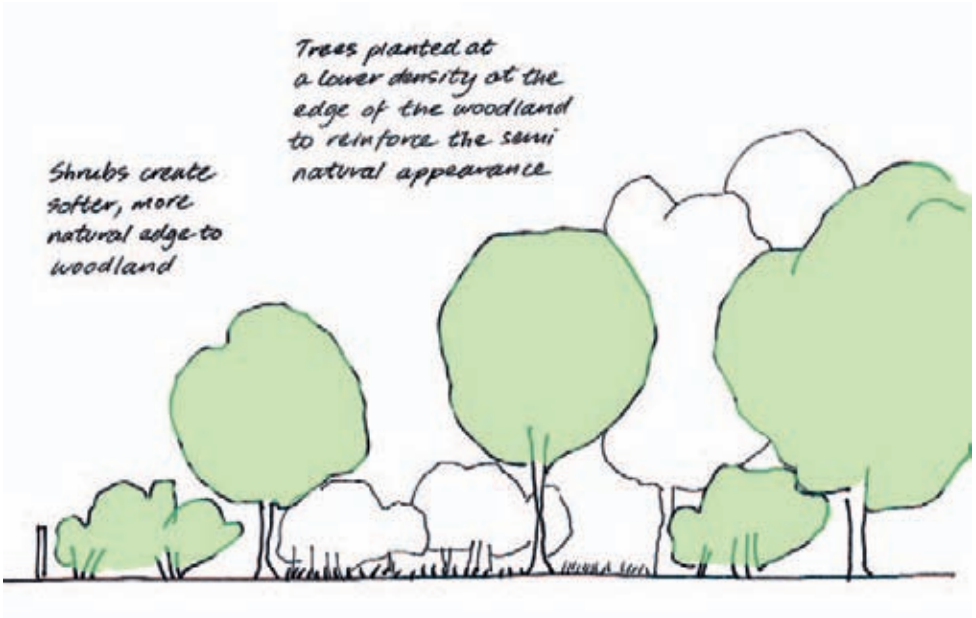
These upland landscapes are often where existing forests of commercially grown conifers dominate. These are primarily composed of non-native species that have also been used in the past for establishing shelterwoods and game coverts in the uplands. Such non-native conifers are not recommended for small woodlands on upland farms because although they grow quickly, they require thinning and eventual felling and replacement, all of which can be uneconomic on a small scale.

In some parts of the country, there are particular species that are associated with particular landscapes. Stands of Scots pine, or mature birch trees, can be found in elevated parts of Aberdeenshire and the higher reaches of the Border hills. These trees do well in the soils and climate of the area, and planting them will also reinforce the individuality of the local landscape.

When choosing species, avoid planting invasive species, such as beech and sycamore, where they could seed into existing native woodlands. Invasive shrubs such as rhododendron should be avoided altogether, and beech should also not be planted where it is likely to encourage the spread of grey squirrels.



Edge detail of woodland on hill land and unimproved grazing

4.2.5 Edge Detail

Where woodland is placed adjacent to stock grazing, the edge should aim to maximise shelter for animals. In some places an existing dyke can be used as a woodland boundary. More frequently, however, a gradation of tree species, including shrubs, can provide similar sheltering attributes. Less dense planting along the edge of a woodland will create a more natural appearance. A mosaic of low shrubs and small trees alongside larger trees creates a more natural appearance by creating a 'soft' edge between the more open moor or grassland and the woodland. This also enhances the wildlife value of the woodland habitat.

4.2.6 General References

For general advice on planting and managing woodlands and trees, the following publications by the British Trust for Conservation Volunteers are recommended:

Woodlands, A Practical Handbook, BTCV, which provides a systematic guide to managing existing woodlands and planting new woodlands for a variety of objectives. It is available from BTCV Enterprises Ltd, Conservation Centre, Balby Road, Doncaster, DN4 0RH (01302 572200), or can be ordered through the website **www.btcv.org/shop**.

Tree Planting and Aftercare, A Practical Handbook BTCV, which provides a detailed guide to planting and design of new woodlands for a variety of objectives. It is available from BTCV Enterprises Ltd, Conservation Centre, Balby Road, Doncaster, DN4 0RH (01302 572200), or can be ordered through the website **www.btcv.org/shop**.

Advice on current practice and new initiatives in relation to farm woodlands can be found in *Farm Woodland News,* a short newsletter edited by the Scottish Agricultural College. Current and back issues are available to download from the SAC website on **www.sac.ac.uk** - type 'Farm Woodland News' into the Advanced Search box.

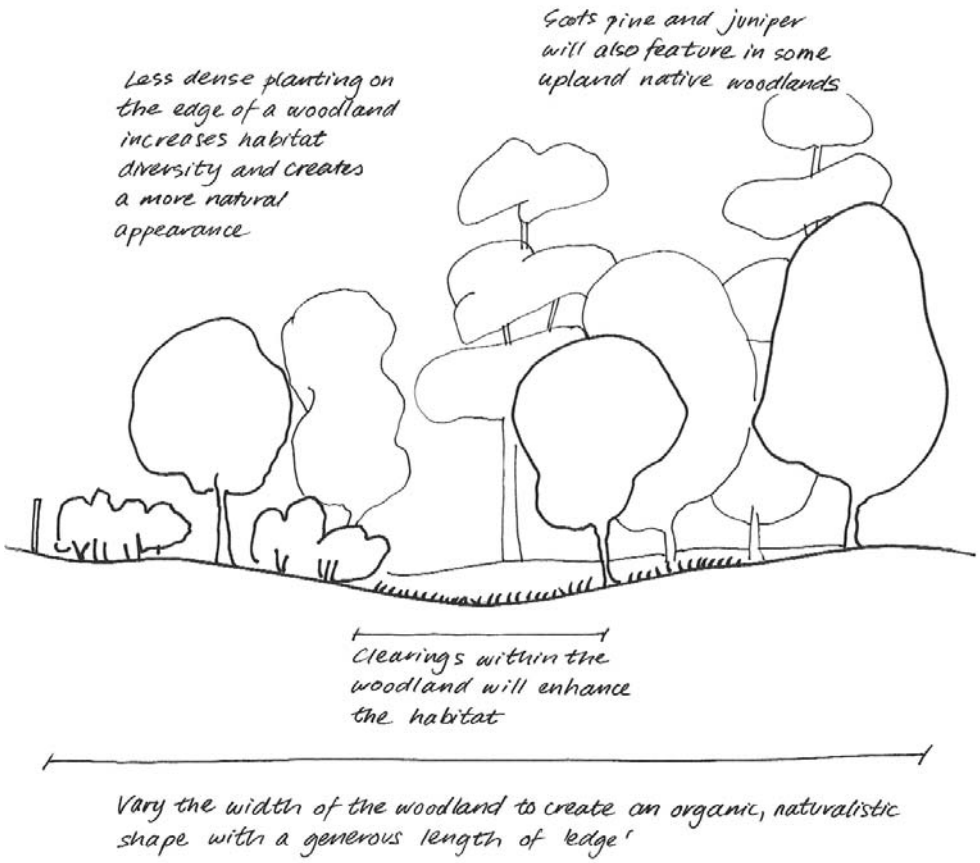
General advice on the key objectives for managing the natural heritage can be found in the Natural Heritage Futures publication for your area, which can be obtained from SNH publications at Battleby, Redgorton, Perth, PH1 3EW (01738 444177), or can be ordered through, or down loaded from, the website **www.snh.org.uk**, by following the link to publications and then typing in 'Natural Heritage Futures Series' into the search link.

4.3 Upland Native Woodland

Native woodland in upland areas tend to range from mixed broadleaved woodland with unimproved grassland to Scots pine and juniper woods with an understorey of heather, blaeberry and other native shrubs. Native woodland is a diverse mixture of trees and shrubs that can be used to provide a habitat for native plants and animals, enhance amenity, provide localised shelter and create interest along public access routes. The key features of a native woodland on upland areas used for grazing are therefore:

The woodland should be relatively natural in shape, with curving margins that reflect the landform and provide a generous length of 'edge'	An organic woodland shape creates a more naturalistic appearance and may include fenced off areas of uncultivated ground vegetation which increases habitat value. The amount of 'edge' can be increased by retaining open spaces within the woodland.
Woodlands should be linked to other habitats, such as dykes, wetland, existing woodlands, species rich grassland and watercourses, to create an extensive habitat network	Expanding the range of habitats increases the ecological value of the farm. Creating woodland links between uncultivated areas enhances the habitat network and the pattern of the wider countryside.
Woodland structure should be as diverse as possible	The woodland should combine tall trees with small trees and shrubs, and dense cover with sheltered open spaces to provide the maximum range of habitats.
Species should be locally native, appropriate for the soil conditions of the area	Sessile oak, downy birch and rowan are species that form the basis of much of the mixed broadleaved native woodland, although local knowledge should be used to inform your species choice. Hazel, hawthorn and willow form a useful understorey of shrubs. In the north and east, Scots pine and juniper form the basis of native woodland on higher ground.
There may be locally specific native species that could be incorporated into your planting	Sessile oak, aspen, juniper and gean are all locally specific species which may occur in your area or on your soil types.
Woodland should aim to contribute to local biodiversity	Local ecological and woodland advisers can advise you on species and habitats which depend upon native woodland in your area.

Cross section of upland native woodland summarising key features



Sources of Help and Advice

If you are planning a network of native woodlands, you should contact a forestry consultant or ecological adviser for specialist advice. Details of how to contact these advisers are to be found in the Annexes. They will be able to look at the range of habitats on your farm and advise on how best to integrate new woodlands.

The following publications and websites also provide useful additional advice:

Native Woodlands of Scotland, Forestry Commission, which provides a good introduction to the range, history and types of native woodlands in Scotland

Creating New Native Woodlands, Forestry Commission Bulletin 112, 1994, available from the Forestry Commission, outlines the range of native woodland types across the UK, and advises on how to identify the appropriate woodland for your area and soil type.

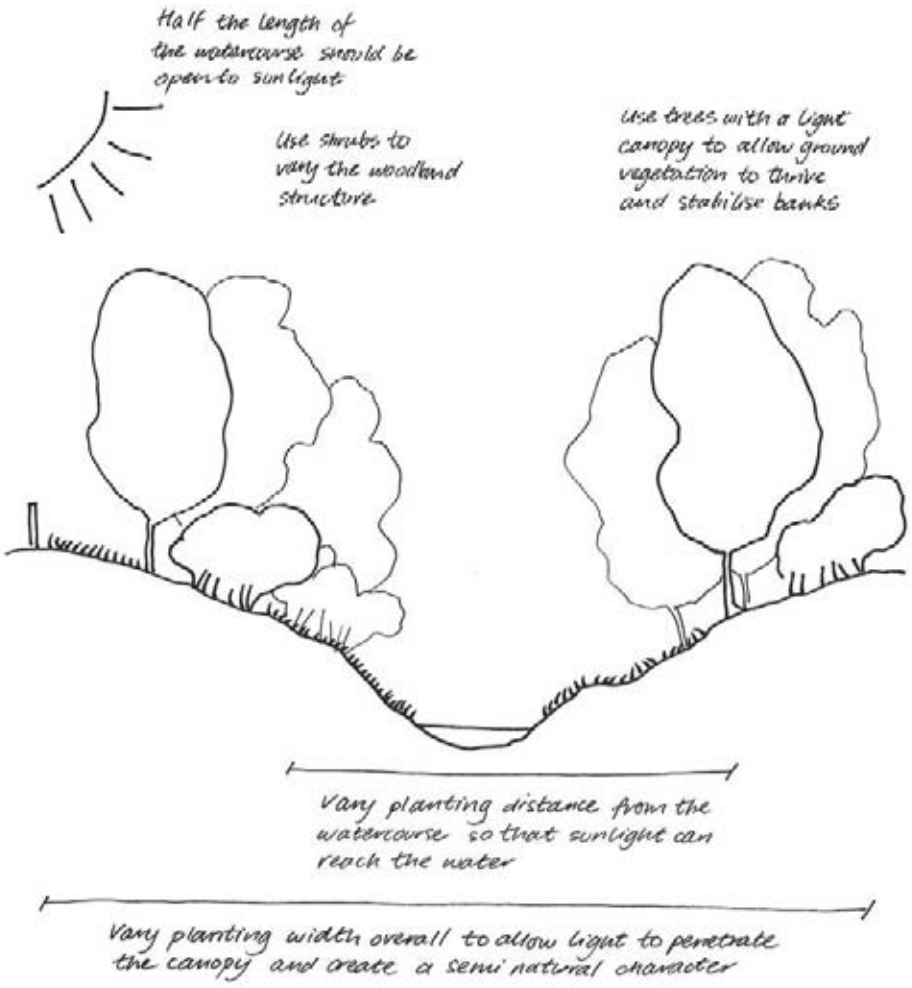
Habitat Networks for Wildlife and People, Forestry Commission and Scottish Natural Heritage, 2003, which provides a general introduction to habitat networks.

www.scottishnativewoods.org.uk This website provides some background information on riparian woodland, and the organisation has several publications related to riparian and other native woodland types.

4.4 Upland Riparian Woodland

Hill land tends to be located along the upper reaches of the main river systems, or on steeper land where burns and tributaries dominate. Riparian woodland can be used to stabilise riverbanks and help prevent pollution from reaching watercourses, as well as improve water quality and freshwater habitats. Riparian woodland can also contribute to flood plain management. The key features of a riparian woodland are therefore:

Riparian woodland should be linear in form, as it will follow the line of the watercourse	Riparian woodland should ideally extend at least 25m from the edge of the watercourse.
The outer edge of the woodland should vary in distance from the watercourse, to create a relatively naturalistic shape	Woodland planting along watercourses should vary in width and be organically shaped. This creates a more natural appearance, but also increases the length of edge which is good for wildlife.
Tree species should be locally native broadleaves, appropriate for growing in wetter areas and mainly light foliaged to allow ground vegetation to thrive	Species may have to be flood tolerant and are likely to include alder, willow, ash, downy birch, hazel and aspen. Open or partially wooded conditions along the river banks will ensure that ground vegetation thrives and minimises bank erosion. Avoid too many heavily shading trees, such as alder and beech.
Trees should alternate with areas of permanent wetland, seasonal wetland and open space to create a diverse riparian habitat	Existing wetland habitats, species rich flushes, sedges, rushes and other wetland vegetation are likely to be important habitats in their own right which should be maintained within a framework of new woodland.
Alternating areas of open space along the riverside creates important dappled shade	It is recommended that half the length of a watercourse is left open to sunlight, with the remainder in dappled shade, to maintain a good fresh water habitat. In this respect open ground to the south of a watercourse is the most valuable for improving biodiversity.
It may be that riparian woodland can be established through regeneration	Where native seedling trees have been suppressed by continuous grazing, riparian woodland may become re-established once stock has been removed.
Riparian woodland can be an important component of wider flood plain management	If you are considering undertaking wider flood plain or river habitat management, you should liaise with your riparian neighbours to coordinate a collaborative initiative.



Cross section of upland riparian woodland summarising key features

Sources of Help and Advice

If you are planning an extensive network of woodlands which include riparian woodland, or a collaborative initiative on flood plain management, you should contact a forestry consultant or ecological adviser for specialist advice. Details of how to contact these advisers is found in the Annexes. They will be able to look at the range of habitats on your farm and advise on how best to integrate riparian woodland with other woodland networks.

The following publications and websites also provide useful additional advice:

Restoring and Managing Riparian Woodlands, Parrott, John and Mackenzie, Neil, 2000, available from Scottish Native Woods. This booklet describes the benefits of riparian woodlands, their relationship with freshwater ecosystems, and gives practical advice on their establishment and management.

Forests and Water Guidelines, Forestry Commission, 2003, describes riparian habitats and their management, as well as offering guidance on forest operations around watercourses and advice on managing riparian vegetation.

Habitat Networks for Wildlife and People, Forestry Commission and Scottish Natural Heritage, 2003, which provides a general introduction to habitat networks.

www.scottishnativewoods.org.uk This website provides some background information on riparian woodland, and the organisation has several publications related to riparian and other native woodland types.

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4.5 Upland Stock Shelter

On hill land, woodland for shelter is primarily established for sheltering stock. To meet this objective, woodland should be designed to provide a narrow strip of calm in the immediate lee of the trees. In exposed upland areas, however, growing tall trees may be difficult, and one option is to consider planting areas of woodland which, once well established, can be grazed as woodland pasture, providing shelter within the wood. Alternatively, creating a mosaic of smaller, shrubby woods provides areas of shelter to meet specific management needs, such as feeding areas or land used for turning out young stock. The key features of a woodland required to shelter stock on hill land are therefore:

Woodlands for shelter should be located where they can link in with existing established shelterwoods, or at least extend upwards from the head dyke

Creating links within the existing pattern of woodland and other landscape features maximises the efficiency of the shelterwoods as a whole and contributes to the wider landscape pattern and habitat network.

Woodlands for stock shelter will inevitably be linear in form, but can also be quite wide to create a dense barrier

Shelterwoods usually aim to provide stock shelter along the greatest length of field edge possible, and therefore tend to be broadly linear in form.
The most efficient linear shelterwoods are at least 12 times longer than the height of the trees at maturity.

Establishing an organic woodland shape will allow for variable wind direction

The greatest degree of shelter is provided when the wind strikes the woodland at right angles, so planting woodlands which provide sheltered corners will give maximum shelter.
Care should be taken not to create pockets where stock may become trapped in poor weather.

Woodlands for stock shelter should be dense and relatively impermeable, with a particular focus on a dense lower storey

To achieve a significant reduction in wind speed to the immediate lee of a woodland, a dense tree and shrub woodland structure should be established. A well grown shrubby layer of willow and scrub species enhances the sheltering value of the woodland. Avoid growing large numbers of conifer species; they tend to suppress any shrub layer and become leggy as they mature, creating a draughty understorey.

A relatively wide shelterbelt of a minimum of 30m will create an impermeable barrier

Even broadleaves can create an almost impermeable barrier, even in winter, if planted in a belt more than 30m wide.
Also, with their lighter canopy cover, an understorey can be more easily established to further add to the effectiveness of the shelter.

The woodland should include trees that can grow tall to maximise the area of shelter

Tall trees, such as Scots pine, oak and even well established birch, create the maximum area of shelter on the leeward side. In more exposed upland areas, it may be better to establish several small woodlands than aim for tall trees.

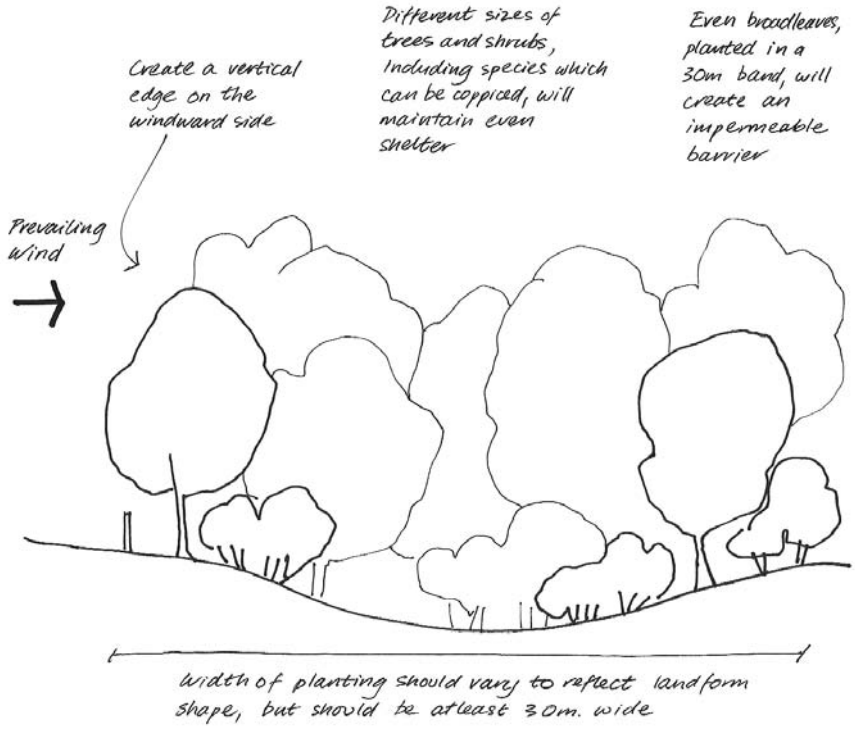
The woodland should include a dense mixture of shrubs, medium trees and tall trees to create an even density

To create an even density across the height of the wood, include shrubs such as willow, juniper, and perhaps even hazel and small trees such as downy birch, rowan, and aspen in the mix.

The edges on the windward side of the woodland should be vertical when viewed in cross section

Vertical edges create the largest area of reduced wind speed in the lee of the woodland – a sloping cross section tends to only deflect wind, which then quickly returns to ground level on the leeward side.

Cross section of upland shelterbelt for stock summarising key features



Sources of Help and Advice

If you are planning an extensive network of shelterwoods and windbreaks, you should contact a forestry consultant or agricultural adviser for specialist advice. Details of how to contact these advisers are to be found in the Annexes. They will be able to analyse wind speeds across your farm and plan a shelter system that suits your needs and the physical conditions.

The following publication and website also provides useful additional advice:

Woodlands for Farm Shelter, SAC, 1992, which provides a useful, illustrated summary of shelter wood design and management, including detailed species recommendations.

4.6 Upland Game Coverts

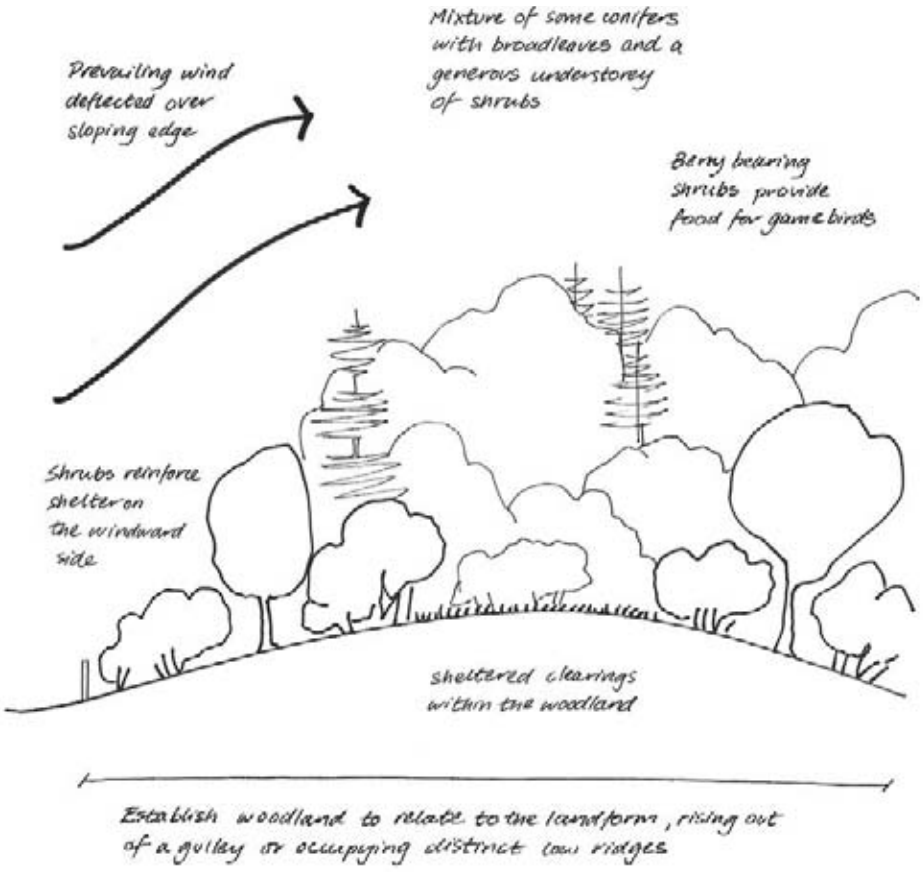
Woodlands that create shelter for pheasants and other game birds can also be located to create a fine driven shoot that will enhance the sporting value of a farm. To meet this objective, well spaced coverts that provide warm shelter, nesting cover and roosting places should be located where a successful drive can flush out fast, high flying birds. Generally, these woodlands will be located on relatively low-lying and more sheltered landscapes, but there may be opportunities to locate coverts along the lower slopes of more open hill land. The key features required of a woodland to provide upland game cover are therefore:

Woodlands should be located where they can link in with small woods on low-lying land	A framework of woodlands provides better support for a driven shoot, therefore linking into woodlands across lower lying land will provide cumulative benefit.
Woodlands should be designed to have generous length of 'edge', therefore tend to be linear or organic in shape	Pheasants are seldom found more than 50m inside a wood. Narrow woodlands and organic shapes are therefore ideal, but spaces within the woodland can also increase the amount of 'edge'.
Several small woodlands located on raised ridges will create the framework for a successful driven shoot	The recommended pattern is a series of small coverts arranged 200m to 500m apart. These coverts should be ideally located on low knolls that allow guns to be placed below the flight line of flushed birds.
Game coverts should link to dykes, watercourses, lowland woods and hedges so that game birds can travel between coverts on foot	Other landscape features also provide additional cover for other quarry species and enhance the network of habitats, increasing the ecological value of the farm and linking into the pattern of the wider countryside. Woodlands linked into other features also appear less isolated in the upland landscape.
Woodland should have a shrubby external edge to provide low level shelter and nesting areas	An internal shrub layer including willow, hawthorn, hazel and evergreens such as holly, yew and juniper, reinforces warmth and year round shelter. Avoid using invasive species, such as rhododendron.
The central core of the woodland should provide trees that are appropriate for roosting	The ideal mix contains 60 – 70% broadleaves and 30 – 40 % conifers. Preferred trees for roosting include oak, ash, and gean which cast only light shade, allowing undergrowth to thrive, combined with larch, holly, yew and spruce.
To assist in providing a well managed shoot, the woodland should include flushing points and be planned to encourage birds to rise	Flushing points are groups of open shrubby spaces within the wood, surrounded by medium height trees, from where birds are driven to fly upwards. Berry bearing trees, such as rowan and small trees such as willow and birch, should surround these areas.

The woodland should ideally have sloping edges when viewed in cross section, so that wind is deflected over the woodland, maintaining a sheltered internal environment

Cross section of upland game covert summarising key features

It is difficult to create permeable shelterwoods which will also be useful game cover, as a game covert should not be draughty.
A sloping cross section will deflect the wind away from the wood, but it will then quickly return to ground level on the leeward side of the woodland.



Sources of Help and Advice

If you are planning a new, extensive network of game coverts, you should contact an adviser at the Game Conservancy Trust, a forestry consultant or agricultural adviser for specialist advice. Details of how to contact these advisers are to be found in the Annexes. They will be able to analyse the terrain on your farm and plan a system of woodlands which suits game, and fits in with the rest of your farming enterprise.

The following publications and websites also provide useful additional advice:

Woodland Conservation and Pheasants, A Practical Guide A Game Conservancy Trust Conservation Guide, available to download on line (**www.gct.org.uk**) or from the Game Conservancy Trust. This leaflet provides a good introduction to creating woodlands that will enhance pheasant management.

The Game Conservancy Trust website, **www.gct.org.uk** offers advice and a wide range of publications on managing habitats for game.