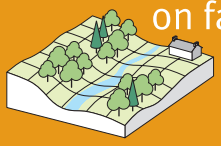
the creation of
small woodlands
on farms



2

Arable Land

the creation of
small woodlands
on farms

April 06: Issue 1

2
Arable Land

2.1 General Objectives

The objectives listed below reflect the role that woodlands play in arable land. When considering where to site new small woodlands, try to identify sites that will add to these cumulative benefits:

- Extend riparian woodland adjacent to watercourses, to emphasise these features in the landscape, stabilise river banks, improve water quality, reduce the impact of nutrient runoff, and create habitats for wide ranging species such as otters
- Reduce wind-borne soil erosion by planning woodlands with your neighbours
- Increase the number of small woodlands around farm buildings, farm tracks and other infrastructure, screen equipment or storage yards, create a setting for buildings, provide additional shelter and security and add to habitat networks
- Link existing woodlands and other habitats, such as ponds, field boundary trees, hedges and areas of less intensively managed land
- Use woodland to shelter and help define preferred public access routes, particularly around villages and towns

Combining arable land and rotational cropping, this is a seasonally dynamic landscape dominated by the pattern of cultivated fields. Small woodlands reinforce this pattern, and tend to be located near to farm buildings, across slightly steeper slopes and alongside watercourses.

Crop Shelter

Policy Woodland

Lowland Broadleaved Native Woodland

Lowland Riparian Woodland

Lowland Game Coverts

2.2 General Guidance

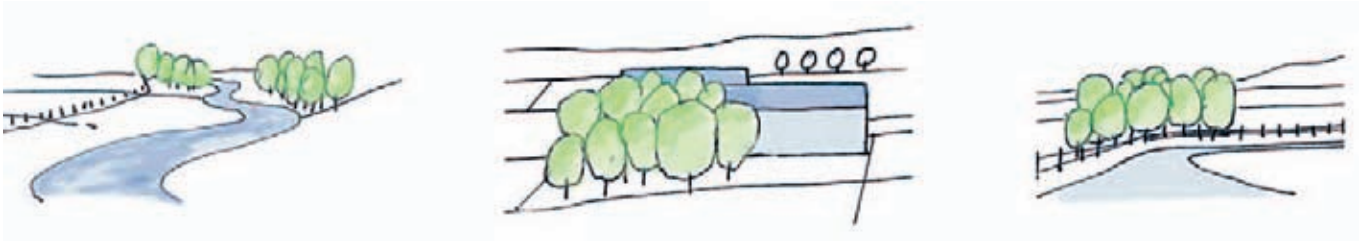
This section gives general guidance on siting and planning the layout of small woodlands on lowland arable land. The guidance takes into account the type of agricultural management involved, and the wider countryside objectives that relate to arable land.

2.2.1 Siting Small Woodlands on Arable Land

New planting that is completely detached from existing features will often appear isolated within the wider countryside and contribute less to the existing landscape structure.

In this landscape, small woodlands are therefore often best located next to an existing feature, such as existing woodland, a watercourse, pronounced hillock, farm steading, or field boundary. The woodland will then integrate more easily into the existing landscape structure.

A survey of your arable land is likely to identify existing woodland and natural or built features that could be used as 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.

2.2.2 Woodland Types on Arable Land

Small woodlands fit well into an arable farmed landscape. Even individual trees, hedgerow trees, avenues and small groups of trees will make a big impact within this cultivated landscape. Generally, the most appropriate woodland types will be small policy woodlands, shelterwoods for crops, screening and shelter for fruit tunnels, cover for game, lowland native woodland or riparian woodland.

Woodland Types

Crop Shelter (Section 2.3): a woodland established primarily to provide shelter for crops

Policy Woodland (Section 2.4): a diverse and multi purpose woodland, historically associated with plantings around country houses

Lowland Broadleaved Native Woodland (Section 2.5): a woodland which can be used for anything from screening buildings to providing shelter

Lowland Riparian Woodland (Section 2.6): a broadleaved woodland of selected native species appropriate for establishing next to watercourses

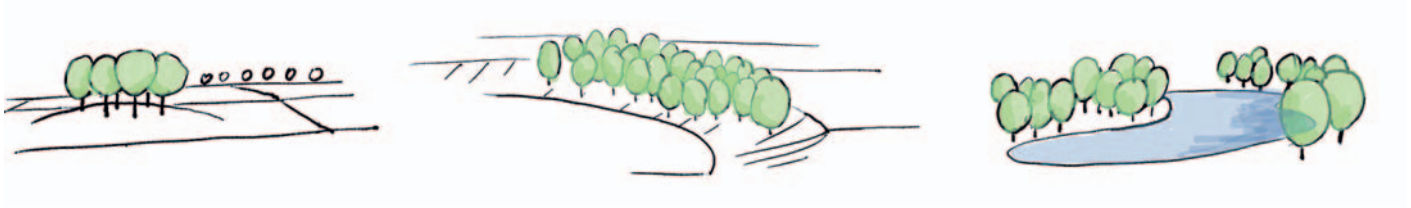
Lowland Game Coverts (Section 2.7): woodland for raising game birds, laid out to provide structure for a driven shoot

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 your area. Local advisers (who can be identified using the contact list in the Annexes), may also be able to offer additional information on the type of woodlands and species that are important in your area.

2.2.3 Shape and Form

Woodland in this landscape can be designed to fit in with the field boundaries, reinforcing the geometric shapes of the field pattern. This can be particularly successful if woodlands link together, creating a physical network that extends around the fields and through the landscape.

In many arable landscapes, field pattern is the most obvious visual feature, and linear shaped woodlands can reflect this pattern by reinforcing the pattern of field boundaries. But the shape of woodlands can also reflect subtle differences in terrain, with beech roundels located on drier knolls, sweeping arcs of broadleaves or pine reflecting the steeper terraces of former riverbanks and irregular clumps of alder and willow providing shelter to wetter land or even a duck pond.



2.2.4 Species Choice

While the choice of species needs to reflect the function of the wood, planting should reflect this fertile and well managed landscape, where large broadleaved trees and mixed policy woodland dominate.

Large broadleaved trees, such as oak, beech, ash and lime, are common in this landscape as they often grow well in the deep soils. They can grow to be impressive in stature, create a sense of maturity and look good in profile across these low-lying landscapes.

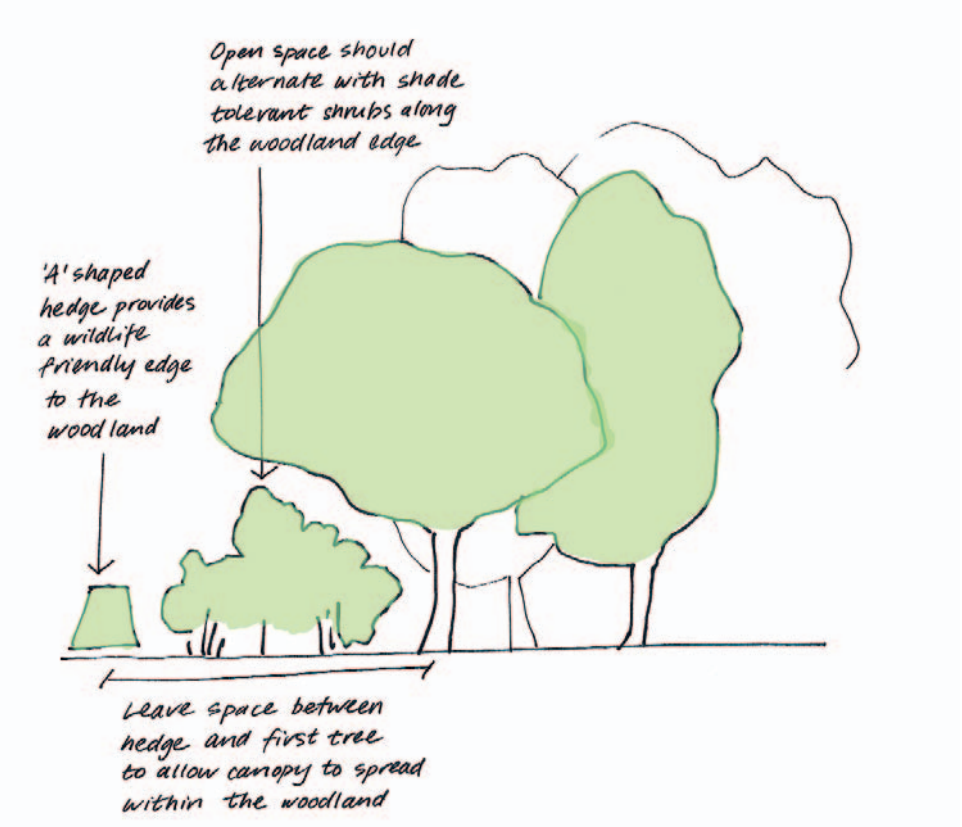
In some parts of the country, there are particular species that are associated with particular landscapes. Beech trees, for example, are a frequent feature in East Lothian and Scots pine is associated with Fife or parts of Aberdeenshire. These trees do well in the soils and climate of the area, and planting 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 if it is likely to encourage the spread of grey squirrels.

2.2.5 Edge Detail

In lowland arable landscapes, hedges are a consistent and characteristic feature. They also provide shelter and game cover in their own right, as well as contributing to the network of habitats in the wider landscape. Hedges are ideal as edge features to small woodlands in arable landscapes. Mixed native species, including berry-bearing shrubs, will be attractive for local wildlife and game. In some areas beech hedges dominate, providing valuable winter shelter as they retain their leaves.

Edge detail of woodland on arable land



2.2.6 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 – their website **www.snh.org.uk**, by following the link to publications and then typing in 'Natural Heritage Futures Series' into the search link.

2.3 Crop Shelter

On arable land, trees and small woodlands can shelter crops and fruit tunnels, reduce wind borne soil erosion, improve the microclimate and reduce spray and fertiliser drift. To meet these objectives, woodland should be designed to reduce the wind speed over a wide area and minimise turbulence. The key features of a woodland required to shelter crops are therefore:

Woodlands used for shelter will usually be linear in form

Wind breaks aim to shelter the largest areas possible, therefore tend to be long and narrow.
Woodlands for shelter should be planted to link in with other woodlands and landscape features, to create a network of habitats linking to the pattern of the wider countryside.

Establishing trees for shelter around more than one side of a field will allow for variable wind direction

The greatest degree of shelter is provided when the wind strikes the woodland at right angles, so planting on more than one side of a field enhances the effectiveness of the woodland.

The woodland should be porous and semi-permeable and can therefore be relatively narrow

For the maximum area of reduced wind speed, create a semi-permeable woodland no more than a few rows of trees wide.
A wide woodland with densely planted trees of any species creates an almost impermeable barrier. The consequences will be a dramatic reduction of wind speed in the immediate lee of the woodland, and then turbulence beyond.

To create a porous woodland, choose species that are less dense in their canopy

Species such as ash, beech, larch and oak maintain a semi-permeable canopy, and their branches continue to reduce winter windspeeds, while some conifers may be too dense, creating an impermeable barrier.

The woodland should include trees that can grow tall to maximise the area of reduced wind speed

Tall trees, such as oak, beech or ash, create the maximum area of shelter, as the area of reduced wind speed will be 20 – 30 times the height of the wood. Oak and ash are tall native broadleaves which will also contribute to biodiversity.

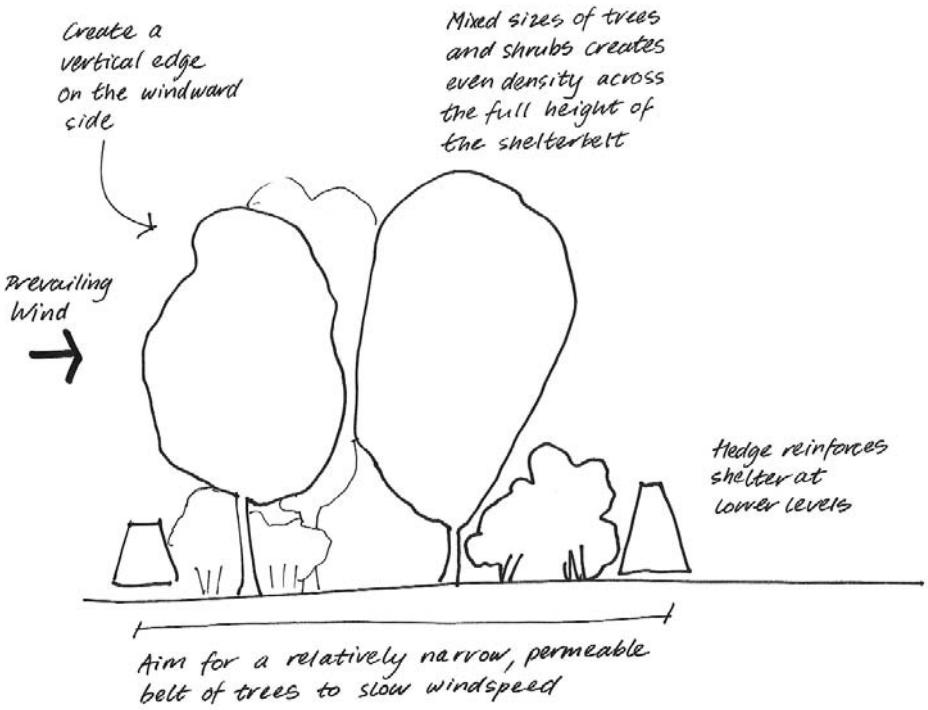
The woodland should include a mixture of shrubs, medium trees and tall trees, and perhaps even a hedge, to ensure consistent porosity at all levels

To create the desired porosity over the entire height of the wood, include shrubs such as blackthorn, hazel, guelder rose, honeysuckle and hawthorn, and small trees such as birch and aspen in the mix, particularly at the edges. Consider selecting trees that can be coppiced to maintain a shrubby layer, such as alder, hazel and ash.
Alternatively, plant a mixed native species or beech hedge (if a local characteristic of the landscape), which will reinforce the shelter at the lower layers.

The woodland should have vertical edges 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 shelterwood for crops summarising key features



Sources of Help and Advice

If you are planning an extensive network of windbreaks and shelterwoods, 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 land and plan a shelter system that suits your needs and the physical conditions on your farm.

The following publication also provides useful additional advice:

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

2.4 Policy Woodland

Fine policy woodland is an asset appreciated by the wider public as well as making an attractive contribution to the amenity of individual farms and estates. Policy type woodland is a good all-purpose small woodland with a variety of potential uses. It can be used to screen structures and public roads, provide a setting for buildings, add autumn colour to a view or manage public access. It can be combined with individual trees, hedgerow trees, avenues and roundels to create an attractive pattern of landscape features. The key features of a small policy woodland are therefore:

The woodland can be in any shape, including roundels, linear or organic forms and geometric shapes that link in with the network of field boundaries

One option is to strengthen the pattern of the field boundaries or the formal layout of buildings and infrastructure.
Alternatively, organic shapes can relate to specific natural features, such as low hills, waterbodies or river terraces.

Large crowned broadleaves and tall conifers should dominate this woodland

Core species, such as oak, beech, chestnut, lime and ash, as well as firs, larches and spruce, create the distinctive, mature, well established character of policy woodland. These species should dominate proposed plantings.
Relatively small trees, such as birch and rowan, should be used sparingly to add interest around the edges of the woodland.

Unusual and exotic species can often be accommodated within this type of woodland

In many parts of lowland Scotland, horse chestnut, lime, red oak, Norway maple, Douglas fir, Grand fir, European larch and smaller quantities of other exotic species contribute colour and diversity of form to policy woodland.
To help identify appropriate species, look and see what has been growing successfully nearby.

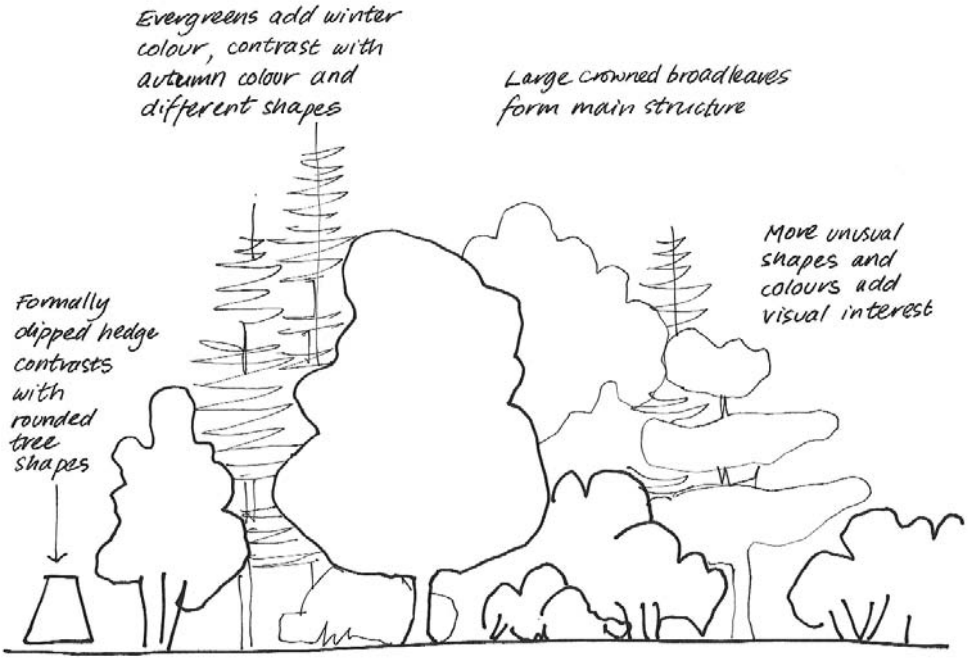
A fine stand of one species can also make a striking feature in the landscape

A copse of beech on a low rise, a small stand of larch, an avenue of lime or horse chestnut trees are all examples of how a single species can be used to good effect.

In lowland landscapes, the edge of a woodland is often the most visually dominant feature and should be planned to maximise its amenity value

The edge of a woodland offers the opportunity to maximise species contrast, such as placing broadleaves with good autumn colour against an evergreen backcloth.
Consider edging the woodland with a well clipped beech hedge, which will contrast with the informal shape of the trees.

Cross section of policy woodland summarising key features



Sources of Help and Advice

If you are planning an extensive network of policy woodland and other landscape features you should contact a forestry consultant or landscape architect for specialist advice. Details of how to contact these advisers are to be found in the Annexes. They will be able to consider the cumulative effects of a series of woodlands and offer advice on other features that may complement the woodland pattern.

The following publication also provides useful additional advice:

Lowland Landscape Design Guidelines, Forestry Authority, 1992, available from the Forestry Commission, describes how to design and manage woodlands in the lowland landscape.

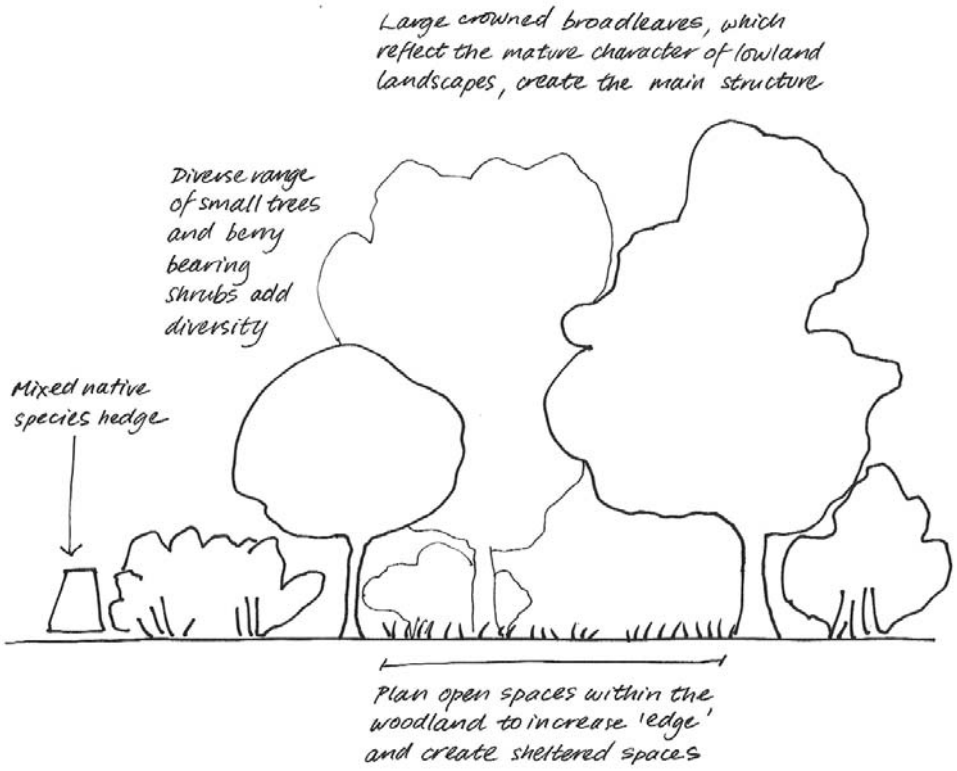
April 06: Issue 1

2.5 Lowland Broadleaved Native Woodland

Native woodlands provide the backbone of important woodland habitats. Areas of semi-natural woodland, ancient woodland sites and opportunities to establish new native woodlands exist within all farmland types. Native woodland is a diverse and naturalistic mixture of trees and shrubs that can be planted to provide habitats for native plants and animals, screen buildings, enhance amenity, provide localised shelter and create interest along public access routes. The key features of a lowland native woodland are therefore:

The woodland can be any shape, although a generous length of 'edge' and a variety of aspect expands the habitat range, therefore an organic shape is often best	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 hedges, uncultivated land, species rich grassland and watercourses	Expanding the range of habitats cumulatively 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 broadleaves, appropriate for the soil conditions of the area	In lowland Scotland, pedunculate oak, silver birch and rowan, with alder, downy birch and ash in wetter areas, are the species which form the basis of much of the native woodland, although local knowledge should be used to inform your species choice. Hazel, hawthorn, dog rose, blackthorn, holly, guelder rose, elder and willow form a useful understorey of shrubs.
In lowland landscapes, the presence and stature of large crowned broadleaves contributes to the quality of the landscape	Large native broadleaved trees, particularly oak and ash, will contribute both to wildlife and the impression of fine, mature, well established woodland which characterises the lowlands.
There may be locally specific native species that could be incorporated into your planting	Sessile oak, wych elm, aspen, gean and common whitebeam 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 lowland mixed broadleaved 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 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 species combinations 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.

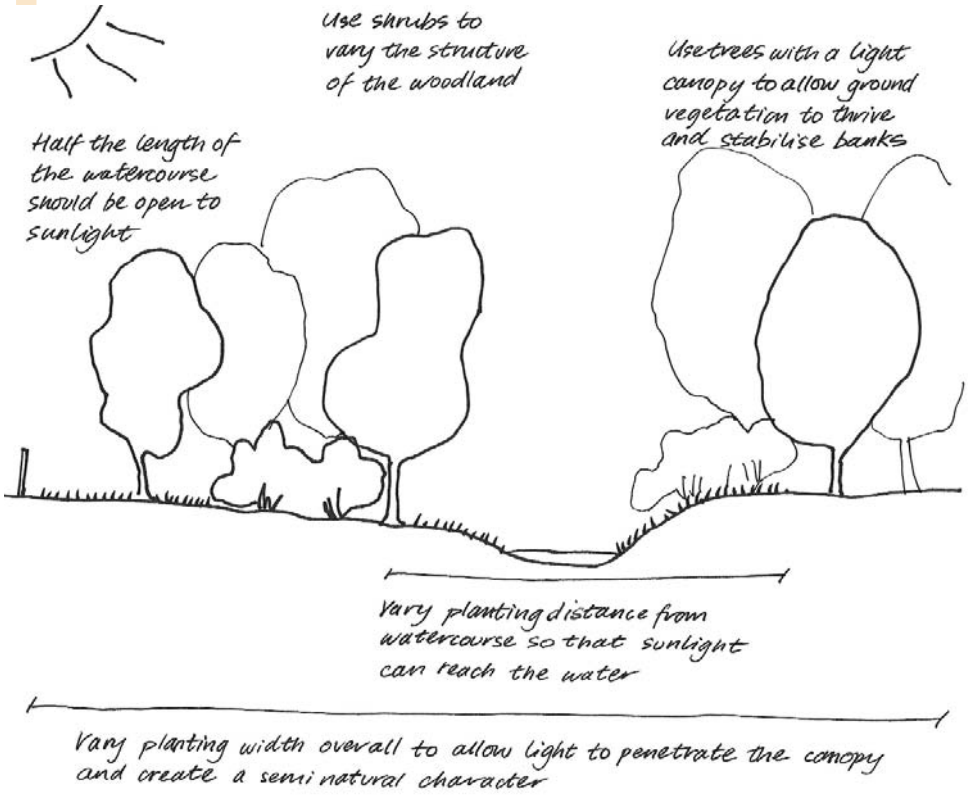
April 06: Issue 1

2.6 Lowland Riparian Woodland

Rivers in lowland Scotland are usually relatively slow moving, winding their way through low-lying straths and floodplains, while small streams are often straightened and channelled. Riparian woodland can be used to stabilise riverbanks and help prevent pollution from reaching watercourses, as well as improve water quality and fresh water 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.
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 lowland riparian woodland summarising key features



Sources of Help and Advice

If you are planning an extensive network of woodlands that 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 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 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.

2.7 Lowland Game Coverts

Woodlands that create shelter for pheasants and other game birds can also be sited 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. The key features required of a woodland to provide lowland game cover are therefore:

Woodlands should be designed to have generous length of 'edge', and therefore tend to be relatively narrow or linear in shape

Pheasants are seldom found more than 50m into a wood. Narrow woodlands and organic shaped woodlands with long external edges are therefore ideal. Creating open spaces within the woodland can also increase the amount of 'edge'.

Several small woodlands are required to 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 ideally be located on low rises which allow guns to be placed below the flight line of flushed birds.

Other landscape features, such as hedges and watercourses should link woodlands, so that game birds can travel between coverts on foot

Wide hedges also provide additional cover for other quarry species, such as partridge, and enhance the network of habitats. This will increase the ecological value of the farm and provide links into the pattern of the wider countryside. Woodlands linked to other features also appear less isolated in the landscape.

Woodland should have a shrubby external edge to provide low level shelter and nesting areas

Shelter for pheasants is required at ground level, and a mixed native species hedge around the perimeter is ideal.
An internal shrub layer including hawthorn, hazel and guelder rose and evergreens such as holly and yew, 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 allow undergrowth to thrive under their light shade, combined with larch and Norway spruce. Besides providing winter warmth and shelter for game birds, Norway spruce is also a good red squirrel habitat.

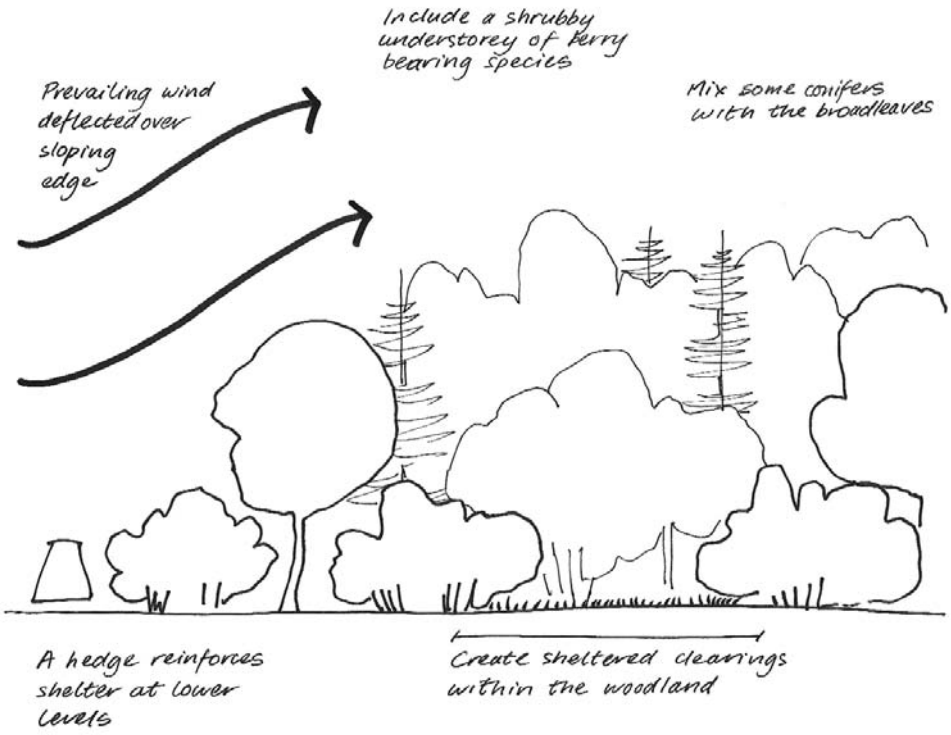
To assist in providing a well managed shoot the woodland should include flushing points, and be planned to encourage birds to rise

Flushing points are groups of open shrubby spaces within the wood, surrounded by medium height trees, from where birds are driven to fly upwards as they leave the woodland.
Berry bearing trees, such as rowan, bird cherry, crab apple and small trees such as willow and birch, should surround these areas.

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

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.

Cross section of lowland game coverts summarising key features



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 is suitable for game, and fits in with the rest of your farming enterprise.

The following publication and website 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.

April 06: Issue 1