

NOTES ON TREE PLANTING AND THE USE OF NATIVE SPECIES IN NORTH EAST ENGLAND



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The purpose of this guide is to provide basic information when planning woodland planting schemes for conservation and amenity purposes in North East England by suggesting appropriate tree and shrub mixes for the various soil conditions and situations relevant to the region.



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1. Introduction

The purpose of this guide is to provide basic information when planning woodland planting schemes for conservation and amenity purposes in North East England. It is not a definitive guide to tree planting, nor is it designed to be used by commercial foresters, although it may be of value when planning conservation areas within coniferous forests.

The main emphasis of this guide is focused on the planting of native tree species and establishing woodlands which are characteristic of the region. It does this by suggesting appropriate tree and shrub mixes for the various soil conditions and situations relevant to the region. Included are a number of tools in the form of figures and tables that can be used as a reference for development schemes when devising which planting mixes best suit the conditions presented within sites.

It is important to stress that tree planting schemes should only be utilised as a management option when other measures to recover a site have proven unsuccessful and natural regeneration is failing. Incorporating other management schemes offer opportunities for natural colonisation and recovery that will cause less disturbance to surrounding wildlife and can also prove to be more cost effective.

2. Why use native species?

Native trees are determined as species that have colonised the North East since the last ice age and are well adapted to the various soil and climatic conditions. Due to the long established presence of native trees within the region a wide range of other species, whether it be plant, animal or fungi, have harmonised with native trees various functions and are dependent on them for a variety of needs. Therefore, if tree-planting schemes are to have a nature conservation value then ideally a large proportion of native trees should be included.

A predominantly native species mix has the potential to increase the overall species diversity that will be found in the habitat once it has had time to become established. It is important to realise that a large percentage of UK invertebrates are dependent on native trees and find introduced tree species unpalatable so will not adapt to non-native stock.

If a site presents a relatively poor invertebrate community due to dominance of non-native trees and shrubs then consequently associate species, such as birds and certain mammals, which depend on invertebrates for food, will also be poorly represented. **Table 2.1** highlights the difference in association between soil fauna and a range of native and introduced species of tree to help demonstrate how supporting native tree species can be to the invertebrate/mite community.

Table 2.1: The number of plant-eating insects and mite species associated with various native (UK) and introduced trees

Broadleaved - native	No.	Broadleaved - introduced	No.	Coniferous	No.
Oak	423	Sycamore	15	Pine	91
Willows	450	Sweet Chestnut	11	Spruce	37
Birch	334	Horse Chestnut	4	Larch	17
Hawthorn	149	Walnut	3	Fir	16
Blackthorn	109	Holm Oak	2	Juniper	32
Poplar and Aspen	189	Acacia	1	Yew	6
Alder	141	Hornbeam.	51		
Elm	124	Maple	51		
Hazel	106	Holly	10		
Beech	98				
Ash	68				
Lime	57				
Rowan	58				

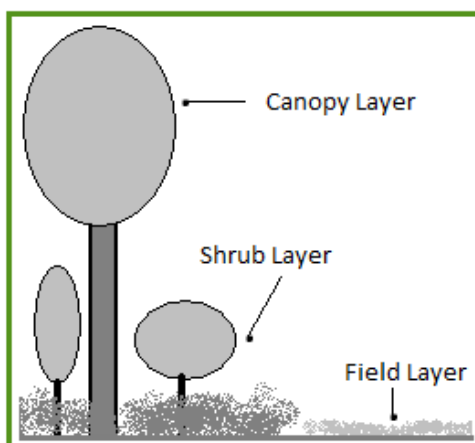
Source: Kennedy and Southwood, (1984) found in Kirby (1992)

In order to achieve the greatest possible ecological diversity and level of naturalness; where wildlife conservation is one of the major objectives, a mixture of tree species native to the targeted area should be planted in order to attract a greater range of associated flora and fauna.

3. Is just tree planting enough?

Tree planting is often seen as a valuable technique for improving the wildlife and landscape resource. To be of value for wildlife, other features will have to be taken into consideration; including the existing wildlife value as tree planting can disturb some specialised species. However, there are instances where tree planting should not be considered as a viable option for conservation. Examples of where tree planting would be inappropriate include planting on existing semi-natural habitat and/or archaeological sites due to the damage that can be caused to site monuments by roots. Ideally, tree planting works best when it is targeted towards areas such as arable or improved grassland.

For a tree planting scheme to be effective there is more to consider than just native trees. The majority of natural woodland sites have three distinct layers (**Figure 3.1**):



- Canopy Layer – Composed of the taller tree species
- Shrub Layer – Composed of smaller scrub species

Figure 3.1: Illustration of Distinct Woodland Layers

Each layer is an important structure as far as biodiversity is concerned, as the canopy and shrub layer provide food and shelter for invertebrates, birds and mammals and the field layer provide an array of different flora throughout the season. The autumn and winter seasons may see very little flower cover and often, the field layer may be completely covered by dead leaves or snow. In contrast, flower cover may increase dramatically in spring, before the trees and shrubs start to grow their leaves again. Similarly, brambles that fruit in the autumn provide an important food source for small birds and mammals and should therefore be present if maximum biodiversity is to be achieved. Many planting schemes overlook the need to plant shrubs along with trees, and consequently when the habitats are established they do not reflect natural structural diversity, creating woodland of far less value to wildlife.

In certain situations, for example on newly reclaimed land, consideration may have to be given to establishing a ground cover prior to tree and shrub planting. If a natural seed source is nearby, grasses and herbs will quickly re-colonise and trees and shrubs may then be planted directly into bare soil. In this situation, weed infestation is even more likely. However, where a natural seed source is some distance from the site and re-colonisation is slow, it may be appropriate to establish a ground cover by direct seeding prior to planting. This could be done in spring/early summer with a view to tree and shrub planting in the following autumn/winter. See **Appendix 1** for recommended grass and herb mixes.

In recent decades, the “tidying up” of the countryside has had a detrimental effect on a number of species, particularly Saproxylic communities’, due to the removal of dead wood resources, which should be left in the habitat to achieve optimum biodiversity. A report by WWF entitled “Deadwood – Living Forests” found that over one third of species living in woodlands rely upon dead or dying wood as a source of food, shelter, organic matter and/or substrate. Therefore, these issues should be considered when creating a woodland habitat, to ensure that the habitat is as natural as possible and has a high biodiversity.

4. Guidance on planning a woodland

4.1. Location

The most important thing to remember when planning to plant woodland is that it is critical to pick the right location. Planting next to an existing woodland site is a better option, for many reasons, than having it standing alone. Building next to an existing site allows wildlife to “move in” to your built woodland sooner, and creates a corridor that facilitates better colonisation and movement through the area as a whole. Also, building next to an existing site increases the sustainability of new woodland, as well as offering a shielding effect from wind-damage. Locations situated near existing woodland also present an opportunity for new woodland to establish feasibly through natural regeneration, which is a preferable option as it allows for greater structural diversity.

4.2. Starting from seed

Whilst it is not always possible from a time aspect that a woodland can be created through natural regeneration, the use of locally obtained seeds and/or bulbs is a good way to create a natural woodland compared to just planting immature trees. Growing trees from seed is a fairly simple process that does not require lots of ongoing time to ensure it is successful. Planting seeds straight into the ground however can be problematic and so it is recommended that the following course of action is taken if growing trees from seed:

- 1) Collect the required amount of seed trays and fill them approximately $\frac{3}{4}$ full with weed-free seed compost.
- 2) Broadcast the seeds onto the top then barely cover them over with some more compost and firm them in.
- 3) Spread some coarse grit on top, approximately $\frac{1}{4}$ inches deep, to prevent heavy rain from scattering the soil and seeds, and then cover the trays with $\frac{1}{4}$ inch mesh wire netting. This will stop vermin from digging up the seeds.
- 4) Once the seed trays are ready find a place outside to stand them that is shaded for most of the day, i.e. behind a shed or a wall. The trays should be stood on a plastic sheet to stop weeds from growing up among the trays.

The seeds will not need attending to until they have grown enough to warrant removing the netting.

4.3. Shape

The shape of the woodland is also important and is a contributor to site biodiversity: The best shape for maximum species diversity is one that is broadly circular in outline and has an indented margin (**Figure 4.1**).

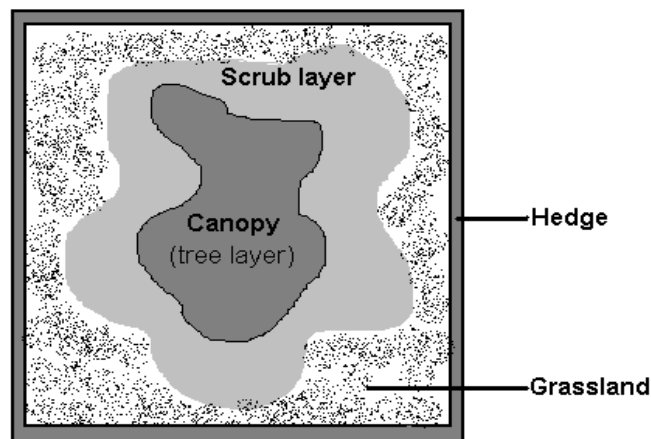


Figure 4.1: Illustrating a suitable shape that could be used when developing woodlands.

Many woodland birds and animals prefer the edge habitat between woodland and non-woodland as it presents a more varied plant structure which allows for a higher light intensity. For these reasons it is also important to create a large ratio of edge habitat to each hectare of woodland once an ideal location (see chapter 4.1) has been established.

In practice this ideal is difficult to achieve due to the management problems it would create on adjacent land for example linear sites such as shelterbelts lack the depth and structure that encourages biodiversity. Such sites can also be detrimentally influenced by adjacent open land resulting in the likelihood that only a few truly woodland species will establish within them. Therefore it is generally not recommended to develop planting schemes that produce this type of area.

5. Woodland structure

5.1. Edge Management

Edge management is important, particularly within small woodlands where there is less opportunity for a distinction between woodland layers (see chapter 3), and woodland edges can also act as a shelter during the phase of woodland establishment. Therefore an ideal edge structure would be a graduation from grassland, integrating into shrub, then into woodland. An edge that forms an immediate transition from open conditions to mature woodland lacks the suitable conditions for many associated woodland species and also leaves woodland vulnerable due to exposure to extreme climates.

There is a range of management options that ensure scrubby edge areas are maintained such as the traditional technique of rotational coppicing. This technique not only manipulates the amount of light breaking through to the lower woodland layers; its spoils can also provide a source of deadwood to encourage Saprophytic communities, or it can be used as a fuel resource. Hedgerows can be a benefit during the establishment phase of new woodland by not only discouraging the accessibility of browsing animals but also offering shelter to other species. Both options are suitable methods of creating structural diversity that an array of wildlife can take advantage of.

5.2. Suitable Woodland Structure

An example of a suitable planting structure, with points regarding edge habitat taken into consideration, is illustrated in **figure 5.1** below.

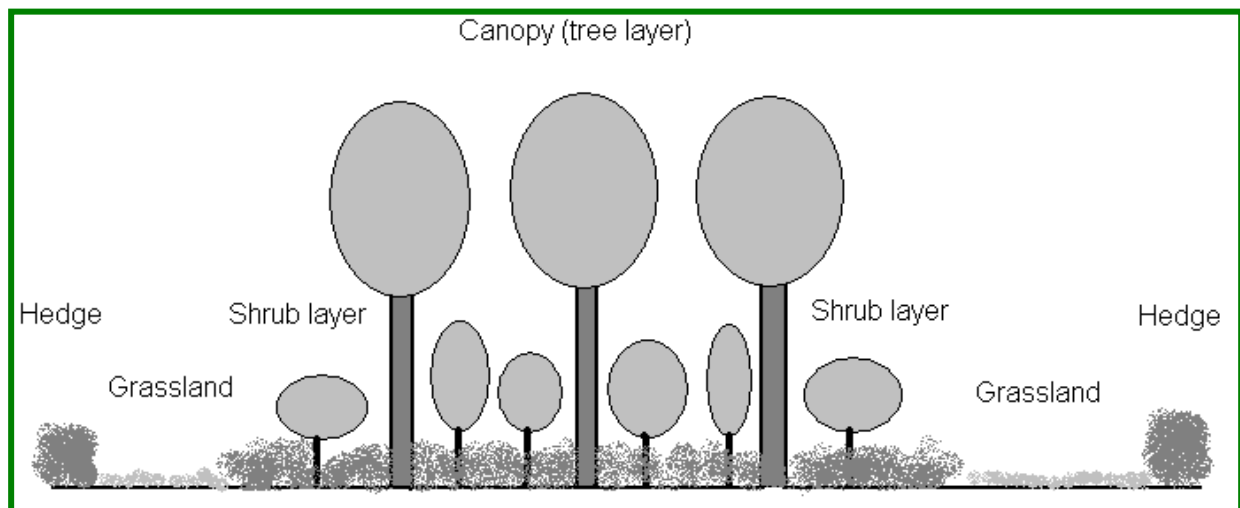


Figure 5.1: Illustration of Suitable Planting Structure for Woodland Development

In relation to Woodland Structure the following points should be considered during development:

- Care should be taken when planting near intensively farmed land to ensure that the woodland has at least a 6 metre scrubby transition zone to protect the newly planted trees from grazing, especially if the scrub consists of species that produce thorns such as bramble.
- Planting in large continuous blocks should be avoided. The ideal situation is to establish a mosaic of small, single-species groups as they tend to be more reflective of natural woodland conditions due to the dispersal rates of native tree species resulting in close colonisation of relatives. As tree species grow at a different rate the small mosaics create a diverse structure within the woodland that is still acceptable in terms of future woodland management.
- Consideration should be given to leaving small areas unplanted. This will have the effect of creating clearings and glades as the surrounding trees establish themselves. These areas will naturally re-colonise with time and woodland management should aim to maintain open areas either by keeping scrub encroachment in check on existing open areas or by clear-felling small blocks on a rotational basis.
- Intermixing tree species randomly can have benefits with regards to wildlife but does not reflect woodland regeneration processes or natural succession, as some tree species can hinder the success of another even at early stages of development by outcompeting and dominating an entire area of woodland. This can have long term management issues as woodland loses diversity of not just its structure, but also its tree species.

6. Deciding on woodland planting mixes

6.1. Regional Variability

Before considering any planting it is important to be familiar with the physical attributes of a chosen location in order to better understand what tree mix will best suit the North East. It is therefore important to point out that natural tree species distribution also varies within the region. **Table 6.1** shows which tree species suits which regional distinction by assigning a + symbol and shading under the suitable areas for each tree species listed. Appendix 2 offers additional information about each of these species and their environmental benefits.

Once familiar with the species that are regionally suitable then more site specific requirements must be recognised to ensure new woodland will establish successfully on its chosen location.

Table 6.1: Regional variation in the distribution of native species in North East England

Species		Regional Area		
Common Name	Botanic Name	Durham	Northumberland	Cleveland
Yew	(<i>Taxus baccata</i>)	+	+ South west only	+
Holly	(<i>Ilex aquifolium</i>)	+	+	+
Gorse	(<i>Ulex europaeus</i>)	+	+	+
Broom	(<i>Cytisus scoparius</i>)	+	+	+
Raspberry	(<i>Rubus idaeus</i>)	+	+	+
Blackberry	(<i>Rubus fruticosus</i>)	+	+	+
Field Rose	(<i>Rosa arvensis</i>)	+		+
Burnet Rose	(<i>Rosa pimpinellifolia</i>)	+	+ East only	+ Coast only
Dog Rose	(<i>Rosa canuna</i>)	+	+	+
Downy Rose	(<i>Rosa spp</i>)	+	+	+
Sweet Briar	(<i>Rosa rubiginosa</i>)	+	+	+
Blackthorn	(<i>Prunus spinosa</i>)	+	+	+
Wild Cherry	(<i>Prunus avium</i>)	+	+	+
Bird Cherry	(<i>Prunus padus</i>)	+	+	+
Hawthorn	(<i>Crataegus monogyna</i>)	+	+	+
Rowan	(<i>Sorbus aucuparia</i>)	+	+	+
Crab Apple	(<i>Malus sylvestris</i>)	+	+	+
Gooseberry	(<i>Ribes uva-crispa</i>)	+	+	+
Silver Birch	(<i>Betula pendula</i>)	+	+	+
Birch	(<i>Betula spp</i>)	+	+	+
Wych Elm	(<i>Ulmus glabra</i>)	+	+	+
English Elm	(<i>Ulmus procera</i>)	+	+	+
Alder	(<i>Alnus glutinosa</i>)	+	+	+
Hazel	(<i>Corylus avellana</i>)	+	+	+
Common Oak	(<i>Quercus spp</i>)	+	+	+
Sessile Oak	(<i>Quercus petraea</i>)	+	+	+
Aspen	(<i>Populus tremula</i>)	+	+	+
Bay Willow	(<i>Salix pentandra</i>)	+	+	
White Willow	(<i>Salix alba</i>)	+	+	+
Crack Willow	(<i>Salix fragilis</i>)	+	+	+
Purple Willow	(<i>Salix purpurea</i>)	+	+	+
Almond Willow	(<i>Salix triandra</i>)	+	+	+
Common Osier	(<i>Salix viminalis</i>)	+	+	+
Goat Willow	(<i>Salix caprea</i>)	+	+	+
Common Sallow	(<i>Salix spp</i>)	+	+	+
Eared Sallow	(<i>Salix aurita</i>)	+	+	+
Dark-leaved Willow	(<i>Salix myrsinifolia</i>)	+	+	+
Ash	(<i>Fraxinus excelsior</i>)	+	+	+
Wild Privet	(<i>Ligustrum vulgare</i>)	+	+	+
Elder	(<i>Sambucus nigra</i>)	+	+	+
Guelder Rose	(<i>Viburnum opulus</i>)	+	+	+
Honeysuckle	(<i>Lonicera periclymenum</i>)	+	+	+
*Juniper	(<i>Juniperus communis</i>)	+	+	
*Small-leaved Lime	(<i>Tilia cordata</i>)	+	+ South only	
*Field Maple	(<i>Aceraceae campestre</i>)	+		+
*Spindle Tree	(<i>Euonymus europaeus</i>)	+	+ South and East only	
*Buckthorn	(<i>Osmunda regalis</i>)	+		+
*Tea-leaved Willow	(<i>Salix phylicifolia</i>)	+	+	

NB: * Indicates trees that are not widely dispersed and are very local in distribution.
These species are not recommended for use in general planting.

6.2. Localised Variability

Localised variability refers to the on-site characteristics that can influence plant mix. **Table 6.2** describes the tree and shrub species that are suitable for planting in a variety of conditions in North East region of England (Northumberland, Durham and Cleveland).

To use the table effectively, follow these guidelines:

1. Decide on whether the site for which you are developing the planting scheme is situated in either Upland or Lowland.
2. Test the soil on which you are planting in order to discover which type of soil the plans are being developed for. This type should then be compared with those listed below and the type that is most relevant to your site should then be chosen:
 1. Well drained, neutral to calcareous soils
 2. Well drained, acidic soils
 3. Moderately drained, neutral to calcareous soils
 4. Moderately drained, acidic soils
 5. Wet, neutral to calcareous soils
 6. Wet, acidic soils
3. Scan down the suitable column (established from the site situation and the soil type figure from above) within the table in order to identify the species that should be used on the site.

Suggested planting mixes are indicated by percentages but there is no reason why this should not be varied to substitute for, or include other species in the list. Indeed, in certain situations, it may be appropriate to include within planting mixes some of the species listed for other soil types.

Those species that are listed in **Table 6.1** as being relatively uncommon and therefore not to be generally planted (illustrated in **Table 6.2** by cross-hatching), may be included within mixes to increase diversity but that they should only be represented in small quantities. Key to Table 6.2 can be found below.

Species recommended for planting in these conditions- with percentage of suggested planting mixes
Species that can be included in planting mixes- in small numbers
Relatively uncommon species- those species that would not normally be considered for planting
Species not recommended for planting in these conditions

Table 6.2: Tree Species and Suitable Physical Characteristics

Tree Species	Upland						Lowland					
	Soil Types						Soil Types					
	1	2	3	4	5	6	1	2	3	4	5	6
Yew												
Small leaved lime												
Field Maple												
Wild Cherry									5			
Bird Cherry			5	10	10	10						
Rowan		10						10				
Crab Apple							2		2			
Silver Birch		30						30				
Birch				30		30				40		20
Wych Elm				15		40						
Alder			10		50				10	10	40	30
Common Oak									30	25		
Sessile Oak		40		15				30				
Aspen				10								
White Willow											10	
Crack Willow											10	20
Common Osier											10	
Ash	40		35		10		40		18			
Shrub Species	Upland						Lowland					
	Soil Types						Soil Types					
	1	2	3	4	5	6	1	2	3	4	5	6
Juniper												
Holly	5	5	10	5				10	5			
Spindle-tree							1					
Buckthorn											10	
Gorse		5										
Broom												
Raspberry												
Blackberry												
Field Rose												
Burnet Rose							2					
Dog Rose	5	5	5				5	5		5		
Downy Rose							5					
Sweet Briar												
Blackthorn	5		5				5	10	5	5		
Hawthorn	10	5	5				10	5	5	5		
Gooseberry												
Sea Buckthorn												
Hazel			15				20		10			
Bay Willow					5							10
Purple Willow												
Almond Willow												
Goat Willow					5						10	
Common Sallow			5	8	20	10				10	10	20
Eared Sallow						10						
Dark-leaved Willow												
Tea-leaved Willow												
Wild Privet												
Elder			5				5		5			
Guelder Rose									5			
Honeysuckle	5			2			5					

7. Using stock of local origin

It is important to ensure that when choosing and purchasing specimens for planting, that they are not only native, but from local original stock and supplies, doing so will ensure the trees will be genetically adapted to the environmental conditions associated with the North East. Doing so also benefits associating wildlife, for example those which are synchronised to tree phenology in order to supply food. Trees sourced from other locations, UK or abroad, will not be as genetically suitable, and use of these trees will likely reduce woodland stability as trees succumb to climatic conditions while also genetically altering locally native species through reproduction.

In order to source locally derived stock within the North East it is important to note that it consists of three regional provenances (10, 20, and 30) each presenting their own ecological and climatic conditions, and from which seed zones are specified. Depending on location the North East consists of seed zone 204 and also partly 109 and 302. The best method to avoid the issue of sourcing stock, such as time and resources, is to consider natural regeneration when forming woodland as it also ensures stability as it will be colonised by local tree species that are adapted to the surrounding environment and supporting climate.

Contact details of suppliers that specialise in specimens of local origin are appended, in **Appendix 3**.

8. Use of Nurse Species

Planting a quick growing species in order to give shelter to slow growing hardwood species in their establishment phase used to be common practice. However, with the development of a range of artificial tree shelters the need for the use of nurse species, particularly in small woodlands, is diminishing. On larger sites wildlife and amenity may be only part of the overall objectives in the establishment of deciduous woodland. An early economic return is often an important consideration and a nurse crop will often provide the solution to this.

Nurse crops tend to be evergreen species; for example pines are used to benefit oak species and larch is used for beech. Nurse crops should not be used where there will be limited future management of a site as they require active management to ensure they do not overcrowd the broad-leaved crop and eventually require removal.

Nurse crops may also contribute to the wildlife resource in the following ways:

- Increasing structural diversity
- Providing evergreen, winter shelter
- Catering for particular species associated with conifers

However evergreen species support a rather limited range of invertebrate species and may also suppress the development of a rich ground flora; therefore should be limited to relatively small proportions within broad-leaved mixes. Birch, although not normally considered as a nurse species makes a suitable alternative as it is also fast growing and does not cast a high degree of shade. Unlike the evergreen species it is native and has a greater number of associating invertebrates. It can also give an economic return by providing firewood. Individual specimens can be left to mature, thus adding to the diversity of the woodlands.

9. Applying Woodland Planting Schemes

The success of woodland creation is dependent on location, structure and localised stock, but there are other external factors that need consideration. Applying schemes is not possible in certain conditions as either the land regarded will not be tolerated by the majority of locally native species or is not suitable for any trees, but may have the potential for different habitat creations such as wildflower meadows.

9.1. Opencast Mining Restoration

Opencast mines suitable for restoration are still degraded sites in terms of soil quality and disturbance and can take a long time before the land is suitable for woodland as nutrients need to be replenished in order for an effective planting scheme to be successful. It could be that woodland just won't be a suitable habitat creation, at least at first, and it is important to consider other options for the land such as:

- Grassland
- Heathland
- Wetland/marshes
- Ponds/open water
- Scrub

Opencast mines can cover a vast area so it is also possible to include the development of a mixture of habitats, including woodland. Some of which could colonise a site naturally and some, such as grassland, have proven to be very successful in reclaiming restored opencast sites. To ensure that woodland can flourish it is important that the species on site reflect the trees found around the site in order for the benefit of increasing genetic diversity and allowing associating wildlife to colonise quicker. Nurse species are not recommended to help the reclamation of woodland due to the uncertainty of future management once the initial five-year establishment phase is completed.

9.2 Magnesium Limestone

The North East has a vast stretch of magnesium limestone rock that influences the soil within these areas, mainly County Durham, creating calcareous conditions. This affects the type of trees that are found naturally within already long established woodlands which are dominated by Ash and Wych Elm and includes other species at their northern limit such as Small-Leaved Lime and Field Maple.

9.3 Colliery Spoil Heaps

Sites that are atop colliery sites present soil conditions that are particularly harsh and the establishment of native trees would be difficult and slow, but some hardy species are tolerant (**Table 9.1**)

Table 9.1: List of native tree and shrub species suitable for planting on mine waste

Trees		Shrubs	
Alder	Rowan	Bramble	Downy Rose
Ash	Silver Birch	Broom	Elder
Birch	White Willow	Burnet Rose	Goat Willow
Bird Cherry	Wild Cherry	Common Sallow	Gorse
Common Osier		Dog Rose	Purple Willow

9.3 Non-native Planting

There are a number of species commonly used for planting which are either introductions or species that are not native in North East England. It is not recommended that these be used for general amenity or conservation planting, but in certain circumstances native trees may not be suitable such as:

- In urban areas where soil is heavily compacted or has a high clay content
- Where a short term small economic return is sought
- To screen industrial buildings

In these cases the following non-native species can be relevant:

- Scots Pine (*Pinus sylvestris*)
- European Larch (*Larix decidua*)
- Large-leaved Lime (*Tilia platyphyllos*)
- Common Lime (*Tillia x vulgaris*)
- Sycamore (*Acer pseudoplatanus*)
- Common Whitebeam (*Sorbus aria*)
- Hornbeam (*Carpinus betulus*)
- Beech (*Fagus sylvatica*)

10. Other Benefits to the Guide

Tree planting schemes such as this can be useful for more than woodland creation. Knowing the basis of which tree species are best suited to an area can be a benefit for other amenity projects such as parks and suburban boundaries, and keeping with the species suitable and sourced from the same location can bring about positive outcomes such as encouraging associating wildlife.

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Appendix 1: Grasses and Herb mixes

Recommending a range of native grass and herb seed mixtures suitable for a variety of soil types in North East England particularly suited to woodland development. Note; It is those cells that are shaded that indicate species to be used, the sowing rate (Kg/ha) is also given here.

Grass Species	Soil Type						
	Woodland / Shade	Acid Soils	Poorly drained/ Wet	Calcareous soils	Dry loams/ neutral	Dry loams/ alluvial	Wet loams/ heavy clay
<i>Agrostis capillaris</i>	0.8	1			1.3	0.2	
<i>Agrostis slolonifera</i>			3.3		1.5		0.4
<i>Alopecurus pratensis</i>						2.2	2.3
<i>Anthoxanthum odoratum</i>		1.6					0.8
<i>Briza media</i>				1.6			
<i>Bromus erecta</i>				7.8			
<i>Cynosurus cristatus</i>		1.2		1	4.5	0.8	
<i>Dactylis glomerata</i>	4.9						2.1
<i>Danthonia descumbens</i>		4.7					
<i>Deschampsia caespitosa</i>	0.6		7.2				1.2
<i>Deschampsia flexuosa</i>		1.2					
<i>Festuca ovina</i>	6	3.1					
<i>Festuca pratensis</i>						11.9	
<i>Festuca rubra</i>	6	9.3		7.8	14	5.5	13.9
<i>Holcus Lanatus</i>	3.2		8.5				1.4
<i>Milium effesum</i>	0.1						
<i>Molinia caerulea</i>			4.9				
<i>Nardus stricta</i>		1.9					
<i>Phleum bertolonii</i>					0.5		
<i>Poa nemoralis</i>	2.2						
<i>Poa pratensis</i>					1.5	1.4	1.4
<i>Poa trivialis</i>							0.5
<i>Trisetum flavescens</i>				0.6	0.7	1	

Flower Species	Soil Type						
	Woodland / Shade	Acid Soils	Poorly drained/ Wet	Calcareous soils	Dry loams/ neutral	Dry loams/ alluvial	Wet loams/ heavy clay
<i>Achillea millefolium</i>		0.07		0.04	0.04	0.02	0.02
<i>Agrimonia eupatoria</i>					0.1		
<i>Ajuga reptans</i>	0.1					0.1	
<i>Alopecurus pratensis</i>						2.2	
<i>Allium ursinum</i>	0.1						
<i>Anemone nemerosa</i>	0.3						
<i>Anthyllis vulneraria</i>				0.5			
<i>Avenula pubescens</i>				5.2			
<i>Bellis perennis</i>		0.05					0.2
<i>Betonica officinalis</i>					0.3		
<i>Caltha palustris</i>			0.6				
<i>Campanula latifolia</i>	0.1						
<i>Campanula rotundifolia</i>		0.03			0.01		
<i>Cardamine pratensis</i>			0.2				
<i>Centurea nigra</i>		0.7		0.3	0.2	0.2	0.4
<i>Cerastrium arvense</i>					0.02		0.03
<i>Conopodium majus</i>	0.3				0.2		
<i>Daucus carota</i>				0.1			
<i>Eupatorium cannabinum</i>			0.05				
<i>Filipendula ulmaria</i>			0.4			0.02	
<i>Frafaria vesca</i>				0.06			
<i>Galium cruciate</i>					0.5		
<i>Galium oderatum</i>	2.3						
<i>Galium saxatile</i>		0.4					
<i>Galium verum</i>				0.2			
<i>Geranium pratense</i>						2.4	
<i>Geranium robertianum</i>	0.2						
<i>Geum rivale</i>			0.6				
<i>Geum urbanum</i>	0.2						
<i>Hyacinthoides non-scripta</i>	1.3						
<i>Hyperichum hirsutum</i>	0.01						
<i>Hyperichum perforatum</i>				0.02	0.01	0.01	
<i>Hyperichum pulchrum</i>		0.05					
<i>Hyperichum tetrapterum</i>		0.02					
<i>Hypochaeris radicata</i>				0.05	0.04	0.04	
<i>Knautia arvensis</i>				0.7	0.9		
<i>Lathyrus pratensis</i>			2.6			1.5	
<i>Leotodon autumnalis</i>		0.3			0.05		
<i>Leotodon hispidus</i>							0.1
<i>Leucanthemum vulgare</i>					0.03	0.03	0.03
<i>Linum catharticum</i>				0.04			
<i>Lotus corniculatus</i>		1.1			0.4		
<i>Lotus uliginosus</i>			0.3				
<i>Lichnis flos-cuculi</i>			0.1			0.01	
<i>Lysimachia nemorum</i>	0.1						
<i>Lysimachia vulgaris</i>			0.1				
<i>Lythrum salicaria</i>			0.02				
<i>Myosotis scorpioides</i>			0.1				

<i>Ononis repens</i>					0.3		
<i>Oxalis acetosella</i>	0.1						
<i>Pimpinella saxifraga</i>				0.2	0.3		
<i>Plantago lanceolata</i>		0.9			0.2	0.1	0.3
<i>Plantago media</i>				0.1	0.02	0.05	
<i>Potentilla erecta</i>		0.4					
<i>Potentilla palustris</i>			0.05				
<i>Primula veris</i>				0.1	0.1	0.8	0.1
<i>Primula vulgaris</i>	0.1						
<i>Prunella vulgaris</i>	0.1	0.3				0.07	0.2
<i>Pulicaria dysentrica</i>			0.01				
<i>Ranunculus acris</i>		0.6					0.2
<i>Ranunculus bulbosus</i>				0.3	0.5		
<i>Ranunculus repens</i>			0.6			0.07	
<i>Ranunculus scleratus</i>			0.05				
<i>Rhinantthus minor</i>				1		0.6	1.2
<i>Rumex acetosa</i>						0.1	
<i>Rumex acetosella</i>		0.5					
<i>Sanguisorba minor</i>				0.9			
<i>Sanguisorba officinalis</i>						0.4	
<i>Sanicula europea</i>	0.2						
<i>Scabiosa columbaria</i>				0.2			
<i>Silene dioica</i>	0.1			0.06			
<i>Stachy palustris</i>			0.3				
<i>Stachys sylvatica</i>	0.1						
<i>Stellaria graminea</i>	0.2				0.1		
<i>Succia pratensis</i>						0.2	0.4
<i>Teucrium scorodonium</i>	0.1	0.2					
<i>Thymus praecox</i>		0.1		0.03			
<i>Torilis japonica</i>	0.2						
<i>Trifolium pratense</i>				0.2	0.1		
<i>Trifolium repens</i>		0.3					
<i>Vicia sativa</i>				0.09	1.6		

Note:

On those sites that are poorly drained and/ or wet various *Carex* and *Juncus* species may be included in the mixture depending on local conditions. Both *Phragmites australis* and *Phalaris aurundinacea* may also be sown on these sites to create reed beds.

The recommended sowing rate for all of the mixtures given above is 30 kg/ha.

Ready prepared seed mixes available

There are ready made seed mixes available from a variety of seed suppliers (see **Appendix 3**), the information given below relates to the '*Emorsgate Wild Seeds*' company.

EW1 Woodland Mixture

This contains a good mixture of shade tolerant species of spring flowering wild flowers and grasses. Consisting of a flower component, **EW1 (F)**, which is made up of woodland species that are adapted to growing amongst established trees, where shading has reduced the available light levels to below 50% of that in the open. This mixture also comprises of a grass component, **EG9**, this includes grasses that will tolerate moderate shading. These grasses ensure there is an initial ground cover and weed suppression in the young plantations and the more open woodland. To a degree these grasses can act as a 'nurse' to the woodland flowers in developing plantations. In new plantations, where shade is likely to take longer than 5 years to develop, it is better to only sow the grass component of the mixture until the level of shade increases, which is then when the flower component can be over sowed. In very shaded areas, where light levels are below 25% of that in the open, grasses will no longer grow, therefore it is only this flower component of the mixture that is needed.

EH1 Hedgerow Mixture

This comprises of species that are tolerant of semi-shade. The mix also comprises of two parts; a wild flower component, **EH1**, and a grass component, **EG9**. All species are particularly suited to planting beneath hedges, woodland margins and rides and glades, be they newly planted or established.

Appendix 2

Native Species of the North East of England

Includes Species and Planting Characteristics

Key to symbols:

Species of high value to birds =



Species of high value to invertebrates =

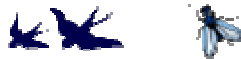


Ash (*Fraxinus excelsior*)



Occurs in woods, scrub and hedges and prefers neutral to alkaline soils. Ash thrives on base rich soils and tolerates exposed conditions so long as there is plenty of light. Suitable for general planting in woodlands and hedgerows and also grows on old mine waste.

Downy Birch (*Betula pubescens*)



Naturally occurs in fens, bogs, water courses, and in wet areas to 750 metres. Will grow on most soils but prefers wet acidic sites and is tolerable of old mine waste. Like most Birch species it matures quickly, therefore useful as a pioneer and nurse species, particularly on poorly drained land and suitable for general planting as a woodland fringe species.

Silver Birch (*Betula pendula*)



Occurs in woods, heaths, old coal heaps and forms a successional stage in the development of sessile oak woodlands. Will grow on most soils, however prefers dry, acid soils and is rare on chalk. Tolerant of dry, exposed and infertile sites like mine waste. Matures quickly, therefore can be useful as a nurse species. Silver birch is more tolerant of dry conditions than downy birch but like downy birch is suitable for general planting in the woodland fringe.

Bramble (*Rubus fruticosus*) also known as Blackberry



Bramble is a fast growing, sprawling shrub that produces flowers and edible fruit. Occurs in woods, hedges, scrubs and heaths and grows on all soil types including old mine waste, this species has a very broad tolerance. Tolerating shade and exposed conditions. Care should be taken to plant only from native stock, and avoid using fruit cultivars. It can be expected to re-colonise sites naturally, therefore this option should be considered.

Blackthorn (*Prunus spinosa*) - also known as Sloe



Blackthorn is a fast growing, small tree; bearing flowers and fruit (sloes). It occurs in deciduous woodland, scrub and hedgerows, on a wide variety of soils to 420 metres. It is not tolerant of dense shade, preferring open woodland. It is suitable for planting in the woodland fringe and in hedgerows.

Broom (*Cytisus scoparius*)



An attractive, flowering, evergreen shrub, fast growing but short lived. It occurs in open woods and heath, on riverbanks, road verges and wasteland. Prefers lots of light, dry and free draining acidic soils and is strongly calcifuge. It is suitable for planting in the woodland fringe and as a scrub species. Will grow on old mine waste. Will colonise suitable sites naturally should a local seed source be available, therefore this option should be considered.

Buckthorn (*Rhamnus catharticus*)

Buckthorn occurs on fen peat, scrub, and hedges and in ash and oak woodlands on calcareous soils. It is a very local species.

Wild Cherry (*Prunus avium*)

Wild cherry is an attractive, fast growing flowering tree that occurs in broad-leaved woodland, scrub, road verges and hedges, preferring heavy neutral to calcareous soils and is light demanding. It is suitable for general planting in the woodland fringe, and in hedgerows. Grows on old mine waste. Take care to avoid the planting of ornamental cultivars.

Bird Cherry (*Prunus padus*)



A small, fast growing tree that occurs in light areas of open broadleaved woods, woodland edges, river and stream banks and fen woodland. Prefers wet acid/calcareous soils and will grow on old mine waste. It is suitable for planting as an understory and woodland fringe species on riparian and valley sites.

Common Alder (*Alnus glutinosa*)



Common Alder occurs typically in wet and water logged woodland and along watercourses up to 500 metres, often forming pure woods in succession to fen or marsh. Tolerates a variety of conditions on wet sites, on acid or calcareous soils and will also grow on old mine waste as long as there is plenty of light offered. It is suitable for planting as a woodland fringe species on wetter ground and can be planted to help improve soil fertility, as this species can act as a nitrogen-fixing nurse on infertile or reclaimed sites.

Crab Apple (*Malus sylvestris*)



Crab apple is an attractive, small, flowering and fruiting tree. It occurs in light areas within woodland margins, hedges and scrub to 380 metres, particularly in older woodlands, as an individual tree or in small numbers. Grows on most soils but avoids peat and highly acidic soils. It is suitable for planting as a woodland fringe or hedgerow species, in small numbers.

Elder (*Sambucus nigra*)



Elder is a fast growing shrub, with attractive flowers and berries that occurs in woods, scrub, waste heaps, roadsides and on disturbed ground, particularly on base-rich and nitrogen rich soils, up to 450 metres. Widespread on a variety of soils but avoids acid conditions. Withstands shade and grows on old mine waste. It may be suitable for planting as an understory or woodland fringe species, however not suited to growing in hedgerows, due to the species' open habit and competitive nature. Natural re-colonisation should be considered as an option.

Field Maple (*Acer campestre*)

Field Maple is an attractive small tree with strong autumn colour. It occurs in woods, hedges and old scrub, mainly on basic soils and tolerates shaded conditions and shallow soils. **Not suitable for widespread planting, may only be considered as a woodland fringe, understory or hedgerow species in the South and East of County Durham on base rich soils and should NOT be planted outside of this area.**

Gooseberry (*Ribes uva-crispa*)

Gooseberry is a small, thorny, fruit bearing shrub, common in light areas within hedges and woods on a variety of soils although it is also found on waste ground and areas of scrub. It may be suitable for planting in small numbers in hedgerows and woodland margins. Care should be taken to plant only from native stock, avoiding the use of fruit cultivars. Natural re-colonisation should be considered as an option.

Gorse (*Ulex europaeus*)



Gorse is an attractive, winter green shrub, with conspicuous flowers. Occurs in rough grasslands, heaths, and on disturbed ground and old mine waste. Tolerates a wide range of soils but prefers light, well-drained and less calcareous soils. It can be useful as a nitrogen fixing, pioneer species. Withstands a high degree of exposure and is particularly useful in areas prone to disturbance and vandalism. Not widely planted due to its invasive nature, as it will colonise suitable, infertile sites readily although it does provide good sites for nesting birds. Natural re-colonisation should be considered as an option.

Guelder Rose (*Viburnum opulus*)



Guelder rose is an attractive shrub producing conspicuous flowers and berries. It occurs in open woodland, scrub and hedgerows, but will grow in most soil conditions, however especially found on damp, heavy, calcareous soils. It is suitable for planting as a woodland fringe or hedgerow species, particularly in lowland and valley sites, and in damper conditions. Natural re-colonisation should be considered as an option.

Hawthorn (*Crataegus monogyna*)



Hawthorn is a small fast growing thorny tree, with attractive flowers and berries. It occurs in scrub, hedges, and open woodland and on waste ground, common on all soils except wet peat to 550m. Tolerant of exposed conditions and grows on old mine waste. It is suitable for general planting as a woodland under-storey and fringe species, and also as the major component in hedgerows. This species can also be used as a pioneer species on difficult or exposed sites.

Hazel (*Corylus avellana*)



Hazel is a fast growing, small tree. Occurs in woods, particularly in the shrub layer and hedgerows to 600 metres and forms scrub on limestone soils. It responds well to coppicing although it can also withstand shade, particularly in oak woods and will grow on damp or dry basic soils, and damp neutral or moderately acidic heavy soils, however not suited to infertile, acidic sites.

Holly (*Ilex aquifolium*)



Holly is an attractive, slow growing evergreen tree that occurs in woods, hedges and all but the wettest or driest soils to 550 metres. Tolerates light but can survive in shade and dry acid/calcareous soils. It withstands pollution and high exposure when established. It is suitable for general planting as a woodland under-storey and fringe species, also as a hedgerow shrub. Provides food source and nest sites for birds.

Honeysuckle (*Lonicera periclymenum*) also known as Woodbine



Honeysuckle is an attractive climbing, flowering shrub which occurs in woodland margins, hedges and scrub on a variety of damper soil types to 620 metres. Not usually appropriate for areas of new planting, due to its climbing habit but is of high conservation value. Can be expected to colonise suitable sites naturally over time, therefore the option of this natural colonisation should be considered.

Juniper (*Juniperus communis*)

Juniper is a local slow growing, evergreen shrub that occurs in open woodland (especially pine and birchwoods), scrub, chalk downland, heaths and moors. It prefers light, dry, acid/alkaline soils (infertile, free draining) to 970 meters. Tolerance to highly calcareous and acidic soil types appear to depend upon the local genotype. **Planting should be restricted to those areas where the shrub occurs naturally, using local plant material.**

OAK (*Quercus sp.*)

Oaks are of an extremely high conservation value, and these species have more associated insect species than any other broad-leaved tree. They are particularly important for their abundance of spring caterpillars which provide one of the main food sources for breeding woodland birds.

Common Oak, (*Quercus robur*) also known as English or Pedunculate Oak



Common oak is a slow growing forest tree that occurs in mixed deciduous woodland, parkland and hedgerows to 300 metres. It will grow in a variety of soils and situations, particularly on heavy basic soils. Also forms mixed woodlands with sessile oak on damper acid sands. It avoids acid peat and shallow limestone soils and is more tolerant of damper conditions than Sessile Oak. It is suitable for general planting as a woodland, parkland and hedgerow tree.

Sessile Oak (*Quercus petraea*) also known as Durmast Oak



Sessile Oak is a slow growing forest tree that occurs in mixed deciduous woods and hedgerows, particularly on light, dry, acidic soils. It is particularly associated with Birch on acidic, leached and infertile soils. More tolerant of drier, less fertile and exposed conditions than common oak and will grow at higher altitudes up to 450 metres. It is suitable for general planting as a woodland and hedgerow tree.

Aspen (*Populus tremula*)

Aspen is a fast growing tree that occurs in woods, scrub, hedges and watercourses, particularly on poorer soils to 500 metres though tolerate wide range of soil conditions it is also light demanding. Good for exposed sites. It is suitable for planting as a woodland fringe species, particularly on sites of poor quality or those that are exposed, and along natural watercourses.

Raspberry (*Rubus idaeus*)



Raspberry occurs in woods, scrub, hedge-banks and heaths, especially in upland areas. Prefers acidic soils and damp, sheltered sites. However this species is not generally suited to new planting. The fruits are of value to birds. If the decision is taken to plant, then care should be taken to plant only from native stock, avoiding fruit cultivars. Natural colonisation should be considered as an option.

Burnet Rose (*Rosa pimpinellifolia*)



Burnet rose occurs on dunes, sandy heaths, old quarries and limestone to 500 metres and grows on old mine waste. Grows on most soil types, preferring free draining, base-rich soils and is tolerant of exposed conditions. It is also light demanding. Suckering species can be planted in hedgerows and scrub on free draining sites. Natural colonisation should be considered as an option.

Dog Rose (*Rosa canina*)



Occurs in woods, scrub, hedges and on roadsides to 550 metres, and grows on old mine waste. Grows on most soil types and tolerant of exposed conditions. It is light demanding and suitable for planting as a shrub in woodland margins and scrub. Natural colonisation should be considered as an option.

Downy Rose (*Rosa mollis*) also known as Soft Downy Rose



Occurs in woods, heaths and scrub to 600 metres, and grows on old mine waste. Also found on hedge-banks and upland road verges. Grows on most soil types but avoids damp conditions. It is tolerant of exposed conditions. This species is in fact difficult to obtain commercially, however if stock can be found then it can be used as an alternative to the Dog rose in planting. Natural colonisation should be considered as an option.

Field Rose (*Rosa arvensis*)

Field Rose occurs in open woodland, hedge-banks and scrub to 380 meters. This species has a broad tolerance of conditions. It is not a widely represented species in the North East of England, therefore it is not generally recommended for planting. If it is decided to plant then it is important to use plants of local provenance. Natural colonisation should be considered as an option.

Sweet Briar (*Rosa rubiginosa*) also known as Eglantine

Sweet Briar occurs in scrub, hedges and disturbed sites, mainly on well-drained, neutral and calcareous soils. It is an uncommon species in the region and therefore it is not generally recommended for planting. Consider natural re-colonisation as an option.

Rowan (*Sorbus aucuparia*) also known as Mountain Ash



Rowan is an attractive small tree, bearing conspicuous flowers and berries. Occurs in woods and scrub to 900m, as well as along stream-sides and on rock and scree. Will grow on a broad range of soils, however prefers light, dry acid soils. Rare or absent on clays and soft limestone. Tolerant of exposed conditions and withstands shade. It can be useful as a pioneer species, suitable for planting in the woodland fringe and under-storey, particularly on poor and exposed sites. Grows on old mine waste.

Sea buckthorn (*Hippophae rhamnoides*)

Sea Buckthorn occurs on fixed coastal dunes and soft cliffs. It is native on the Northumberland coast but probably introduced in Cleveland. Prefers light, dry acid/calcareous soils and tolerates very exposed conditions. It is of very high value to birds. **Not recommended for general planting (can need controlling) but may be of use in special circumstances - high salt concentrations, areas prone to vandalism etc.**

Small-leaved Lime (*Tillia cordata*)



Small-leaved lime is a large forest tree that occurs in woods on a wide range of fertile soils and especially over limestone. Preferring heavier and deeper, alkaline soils. It is intolerant of infertile soils and high exposure. It is a very local species. **Not recommended for general planting in rural situations. Populations should however be conserved where found.**

Spindle-Tree (*Euonymus europaeus*)



Spindle-tree is a small tree that occurs in woodland margins, scrub and hedgerows, mostly on well drained neutral and calcareous soils to 350 metres. It is very local, rare and untypical of the woodland flora in the region and therefore **not recommended for general planting**. However existing populations should be conserved where found and consider natural re-colonisation as an option. Fruits are also of value to birds.

Wild Privet (*Ligustrum vulgare*)

Wild privet is a small fast growing species that is common in deciduous woodlands and hedgerows, particularly on more base-rich soils and on the coast but is tolerant of a broad range of soil conditions. It is suitable for planting in small numbers as a shrub in hedgerows and woodland margins. Consider natural re-colonisation as an option. This should not be confused with the garden privet (*Ligustrum ovalifolium*) which should not be planted.

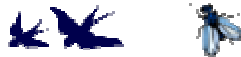
Almond Willow (*Salix trianda*)

Almond Willow is a rare plant in the region that occurs by rivers and ponds and in marshes and fens. It is local and grows on wet, neutral or calcareous soils. Not recommended for general planting, however if the decision is taken to plant it is important to only use cuttings from local plants.

Bay willow (*Salix pentandra*)

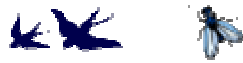
Bay Willow is a fast-growing, small tree that occurs by stream-sides, in marshes, fens and wet woodland to 450 metres. It will only grow on wetter soils. It is suitable for planting in small numbers on damp sites, or adjacent to watercourses and wetlands although where possible use cuttings from local plants.

Grey Willow (*Salix cinerea*)



Grey Willow is a small, fast-growing tree that occurs by ponds and streams and in woods, heaths and fens to 600 metres. Grows on a wide variety of wet soils and old mine waste. Tolerates exposed conditions. It is suitable for planting in scrub and the woodland margins, also on wetlands and along watercourses. This species is particularly useful on poor ground. Where it is possible cuttings of local plants should be used to colonise new sites.

Crack Willow (*Salix fragilis*)



Crack Willow is a large, fast-growing tree that occurs by streams and rivers and in marshes, fen and wet woodlands, and drainage ditches. Will grow on a variety of wetter neutral and alkaline soils, also withstands exposed conditions. It is a light demanding species that is suitable for planting within the woodland fringe, and particularly adjacent to wetlands and watercourses. Where it is possible cuttings of local plants should be used to colonise new sites.

Dark-leaved Willow (*Salix nigricans*)



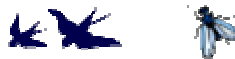
Dark-leaved Willow occurs by lakes and streams and in damp woodland and scrub to 890 metres. Prefers wet, acid soils and tolerates exposed conditions. **Not recommended for general planting**, but could be used in the reconstruction of bank-side vegetation along upland streams. Where it is possible cuttings of local plants should be used to colonise new sites.

Eared Sallow (*Salix aurita*)



Eared Sallow is a medium sized shrub willow that occurs on heaths and moorlands and in damp woods to 780 metres. Prefers wet acid soils and withstands shade. It is suitable for planting in scrub and woodland margins, on wet ground. Where it is possible cuttings local plants should be used to colonise new sites.

Goat willow (*Salix caprea*)



Goat Willow is a small, fast-growing tree that occurs in damp woods, scrubs, and hedges and along watercourses to 820 metres. Prefers wet calcareous sites, but will grow in most soils and situations. Withstands shade and tolerates exposed conditions. Grows on old mine waste and is particularly useful on poor ground. It is suitable for planting in woodland margins and scrub and adjacent to watercourses and wetlands. Where it is possible cuttings local plants should be used to colonise new sites.

Osier (*Salix viminalis*)

Occurs by streams and ponds and in marshes and fens to 400 metres, though is rare in upland areas. Prefers damp neutral to alkaline soils, and will grow on old mine waste. It can be planted adjacent to watercourses and wetlands. Where it is possible cuttings local plants should be used to colonise new sites.

Purple Willow (*Salix purpurea*)



Purple Willow is a large, fast-growing shrub that occurs by rivers and ponds and in marshes and fens to 430 metres. Prefers wet, calcareous soils and will grow on old mine waste. It can be used as a species to be planted along watercourses, particularly major rivers, however not recommended for general planting. **It is important to use stock of local provenance, and where possible use cuttings from the same river catchment.**

Tea-leaved willow (*Salix phylicifolia*)

Tea-leaved Willow is very local, found by fast flowing streams and wet, rocky places on limestone, up to 700 metres. This small tree is not recommended for general planting, however could be of use in the reclamation and restoration of limestone quarries, and also in the reconstruction of bank side vegetation along upland streams. Cuttings should be used from nearby plants.

White Willow (*Salix alba*)



White willow occurs by streams and rivers and in marshes, fen and wet woods on richer, calcareous soils. Tolerates exposed conditions. It is suitable for planting along watercourses and on wetlands, usually on lower lying land. Will grow on old mine waste.

Wych Elm (*Ulmus glabra*) and English Elm (*U. procera*)

Found in mixed woodland and hedges, on moist, well-drained sites. Prefers calcareous soils, but tolerates a broad range, however avoids acidic conditions. Formerly a major component of the regions woodland flora however due to the prevalence of Dutch elm disease, which affected the majority of the Elm population, it is now not recommended for widespread planting. However several disease resistant varieties are being developed and it may be appropriate to use these in certain conditions, particularly where diseased elms have been removed. Under certain conditions the replanting with native stock may be justified in order to maintain, for example, viable populations of species dependant on native elms e.g. the White-letter Hairstreak butterfly. Planting small numbers of the species in new woodlands may also have some value, as due to cyclical die back it will remain a shrub/ small tree.

Yew (*Taxus baccata*)



Yew is a slow growing evergreen tree that occurs in woodland and scrub and tolerant of considerable shade. Prefers limestone rich soils, and is considered native on carboniferous and magnesium limestone soils. It is suitable for planting as an ornamental tree in formal landscapes or as part of planting schemes on calcareous soils. Berries are an important food source to birds, though these and the foliage are toxic to grazing animals.

Appendix 3

Contact Details for Information and Ordering of Native Tree and Shrub Species of Local Origin

Trees Please

Dilston Haugh Farm, Corbridge, Northumberland, NE45 5QY
Tel: 01434 633049 Fax: 01434 636316
e-mail info@treesplease.co.uk
Website: www.treesplease.co.uk

Cheviot Trees Ltd.

Newton Brae, Foulden. Berwick upon Tweed, TD15 1UL.
Tel: 01289 386755 Fax: 01289 386750
Website: www.cheviot-trees.co.uk

For information and ordering of tree and shrub species from native sources

Forestart Ltd.

Church Farm, Hadnell, Shrewsbury, SY4 4AQ
Tel. 01939 210638 Fax. 01939 210563
E-mail queries; sales@forestart.co.uk

For information and ordering details on native grass and flora mixes

Emorsgate Wild Seeds

Limes Farm, Tilney All Saints, Kings Lynn, Norfolk, PE34 4RT.
Tel: 01553 829028 Fax: 01553 829803
Website. www.wildseed.co.uk

British Seed House Ltd.

Camp Road, Witham St. Hughes, Lincoln, LN6 9QJ.
Tel. 01522 868714
Or
Portview Road, Avonmouth, Bristol, BS11 9JH.
Tel. 01179 823691
Website. www.britishseedhouses.com

Landlife

National Wildflower Centre, Court Hey Park, Liverpool, L16 3NA
Tel: 01517 371819 Fax: 01517 371820
Website; www.landlife.org.uk
(Specialists in restoration of derelict and urban land.)

Northumberland Wildlife Trust
The Garden House, St Nicholas Park
Jubilee Road, Gosforth
Newcastle upon Tyne
NE3 3XT
Tel: 0191 284 6884
Fax: 0191 284 6794

Join us: <http://www.nwt.org.uk>

Donate: <http://www.virginmoneygiving.com>

Comment: <http://www.facebook.com/pages/Northumberland-Wildlife-Trust/261711881838>

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