CROSSCUT FORESTRY

WOODLAND MANAGEMENT & CONSULTANCY

Ben Sca Redesign Wind Farm, Isle of Skye

Technical Appendix 5.4:

Assessment of Potential Areas For Woodland Removal and Peatland Restoration

November 2023

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1. Summary

Crosscut Forestry Ltd was commissioned by EDP Renewables on behalf of Ben Sca Wind Farm Limited (the Applicant) to assess the suitability of woodland within the Coishletter Forest complex for conversion from "forest to bog" (peatland restoration) as part of the proposed Habitat Management Plan (HMP) for the proposed Ben Sca Redesign Wind Farm, located near Edinbane on the Isle of Skye.

A forestry survey area, comprising two woodland compartments, identified to the west and east of the existing Ben Aketil Wind Farm track (**Figure 5.4.1: Location Map**) was identified as having potential for peatland restoration comprising approximately 76.27ha of which an estimated 62ha is under woodland cover. The forestry survey area is north of and adjacent to the woodland which was assessed for its suitability for "forest to bog" restoration as part of the consented Ben Sca Wind Farm, Ben Sca Wind Farm Extension and neighbouring proposed Balmeanach Wind Farm (a project also being developed by EDP Renewables). The adjacent woodland areas are included in the outline HMPs for the consented development and proposed Balmeanach Wind Farm (**Figure 5.4.1**). It is proposed that the "forest to bog" restoration areas will compensate for the loss of blanket bog and other peatland habitats arising from the construction of the wind farm whilst also providing the opportunity to 'bolt on' to the restoration proposed for the consented development, thereby potentially increasing its value as well as the value of the additional restoration areas.

The woodland is part of the extensive Coishletter Forest complex established in the early 1990's predominantly with Sitka Spruce/Lodgepole Pine (SS/LP) in intimate mixtures, with a small section of pure Sitka spruce. The forestry survey area has been broken down into three separate crop stratifications to identify the yield class of the trees **(Figure 5.4.2: Crop Stratification).** The yield class refers to the productive capacity of a crop. More specifically it is the mean annual increment of timber volume a crop is expected to achieve. It is measured in cubic meters of timber per hectare per year. The stratifications are shown in Table 1.

Stratification	Yield Class (m3/ha/yr)
A	SS 8/6 LP 6
B	SS 6 LP 4
Fail	SS <6 LP <4

Table 1: YC Stratification

Crops were deemed to have failed where they fell short of yield class 6 for Sitka spruce and/or yield class 4 for lodgepole pine and they are at an age where an increase in their growth rate is unlikely. These are the lowest mapped yield classes for each species within the Forest Research yield classification system. **Figure 5.4.2** shows that the poorest yield class of trees (B and Fail) are mostly located in the forestry compartment to the east of the Ben Aketil Wind Farm track. Much of the compartment to the west of the track is shown to just fall into yield class A.

Poor yield classes are a result of the woodland being established on nutrient poor unflushed eroded bog where peat depths regularly exceed 0.5m and in many areas are >1.0m and exposure is severe.

Forest to bog restoration is in effect woodland removal and as such must be assessed against the requirements of the Scottish Governments Control of Woodland Removal Policy (2009) (CoWRP) and Forestry Commission guidance '*Deciding future management options for afforested deep peatland*' (2015).

None of the trees in the forestry survey area is the type of woodland identified in the CoWRP where there is a strong presumption against its removal.

The policy does presume to protect all woodland, but woodland removal is acceptable where certain criteria are met.

The policy states that compensatory planting is required in most cases but removal without a requirement for compensatory planting, is appropriate where it would contribute significantly to:

• enhancing priority habitats and their connectivity;

• enhancing populations of priority species;

• enhancing nationally important landscapes, designated historic environments and geological Sites of Special Scientific Interest (SSSI);

• improving conservation of water or soil resources; or

• public safety.

When assessing the woodland to be removed against the Forestry Commission's guidance 'Deciding future management options for afforested deep peat' (2015), the very low yield class, the depth of peat on site and the clear benefits of restoration, indicate that the proposal to fell without the need for restocking is appropriate at this site.

As a result, the requirements of CoWRP are met, as any deforested area is to be restored to peatland and integrated into the wider site HMP therefore *'significantly enhancing priority habitats* (in this particular case – blanket bog) *and their connectivity'*.

2. Introduction

Cameron Ross of Crosscut Forestry Ltd has been instructed to produce this report to provide supporting information for a planning application to amend the design of the consented Ben Sca Wind Farm and Ben Sca Wind Farm Extension (Proposed Development) located on the Isle of Skye approximately 2.5km southwest of Edinbane.

This report identifies the potential impact of the Proposed Development and assesses the proposed "forest to bog" restoration against the requirements of the Scottish Governments Control of

Woodland Removal Policy (2009) (CoWRP) and associated Scottish Forestry guidance '*Deciding future management options for afforested deep peatland*' (2015).

Site visits were made on 7th & 13th November 2023 to assess the extent and condition of the woodland and Cameron Ross was assisted by David Pelly MICFor (Crosscut Forestry Ltd).

3. Site Description

The forestry survey area is located at an elevation of 70-160m on the north and west facing slopes of Monadh Choisleadar on the Coishletter Estate, approximately 2.5km southwest of Edinbane, Isle of Skye (central grid reference: NGR 132000, 850000). The existing coniferous woodland is dominated by intimate mixtures of Sitka Spruce/Lodgepole Pine (SS/LP) with a small area of pure Sitka Spruce planted in 1990/91.

The woodland which would be directly affected by the peat restoration proposals are described specifically in Section 5.2 Woodland Description.

4. Legislation, Policy & Guidance

The purpose of this report is to provide supporting information to the Environmental Impact Assessment (EIA) for the planning application and to aid efficient decision-making in relation to the Proposed Development by ensuring that the Applicant considers the existing trees and woodlands during the development process in adherence to the relevant guidance and statutory and non-statutory regulations.

In their Scoping Response (dated 17 November 2023) The Highland Council (THC), noted that Scottish Forestry strongly advises that developers ensure that any proposed changes to woodland address the requirements of the Control of Woodland Removal Policy and other relevant guidance. Scottish Forestry and Highland Council will expect the impacts of the Proposed Development upon woodlands to be assessed against the requirements of the Scottish Government's Policy on '*Control of Woodland Removal*' (2009) (CoWRP) and Scottish Forestry guidance '*Deciding future management options for afforested deep peat*'(2015).

The Scottish Government's Policy on 'Control of Woodland Removal' (2009) and Policy 6, Woodland & Trees of the National Planning Framework 4 (NPF4) (2023) include presumptions in favour of protecting woodland. Removal should only be permitted where it would achieve significant and clearly defined additional public benefits.

Where woodland is removed in association with development, developers will generally be expected to provide compensatory planting. The criteria for determining the acceptability of woodland removal and further information on the implementation of the policy is explained in the 'Control of Woodland Removal Policy, and this should be considered when preparing development plans and determining planning applications.

However, for woodland on deep peat, the greenhouse gas and wider environmental implications of future management are more significant than on other sites. For this reason, Scottish Forestry are likely to support applications for felling without conventional restocking on peatland sites that are less suitable for second rotation forestry or where there is a clear benefit of restoration.

The guidance '*Deciding future management options for afforested deep peat*' (2015) explains the factors to consider when seeking approval for felling on peatland habitats and identifies the criteria where restoration to peatland is preferred over conventional restocking.

5. Woodland Survey

5.1 Methodology

During the site visits, the forestry area was surveyed with the aim of identifying areas of different crop types and ages **(Figure 5.4.3: Species Map)** to inform the most suitable areas for restoration to peatland. Planting date information was provided by the Applicant.

Measurements of the height of the trees were taken using a Suunto clinometer. The height measurements were used to calculate the general yield class (growth rates) of the stands in accordance with *Forestry Commission Booklet 48 Yield Models for Forest Management.* There was a total of 58 sample plots where the height of the largest diameter tree for each species was measured.

No formal peat depth survey was included in the Scope of Works but to further inform the report, peat depths were checked at approximately 50m intervals whilst walking on site. Approximately 63 peat depth samples were recorded to inform on peat depth across the site. Soil pits were dug within each stratification area to clarify soil makeup. Vegetation surveys were conducted at each soil pit and a note of the type and abundance was taken along with supporting photos.

The existing crop data and the Ecological Site Classification (ESC) tool were used to assess the sites' potential for tree growth as per Scottish Forestry Practice Guide – *Deciding Future Management Options For Afforested Deep Peatland.* Soil and vegetation data from the survey points were used to inform the ESC report.

5.2 Woodland Description

5.2.1 Woodland

The woodland within the forestry survey area was planted with a main crop of SS/LP in intimate mixture (61.67ha) over two planting seasons - 1990-91 on double furrow deep ploughed ground with regular cross drains in the western section. A small section of pure Sitka spruce (0.33ha) is established on the lower slopes in the northwest of the forestry survey area at an elevation of 80 – 90m and was planted in 1990.

Photo 1: Typical example of Sitka spruce and Lodgepole pine mixture at Ben Sca

The woodland which has been assessed is adjacent to existing peatland habitats and importantly is close to areas approved for restoration for the consented development and those proposed for the neighbouring Balmeanach Wind Farm, should it gain consent.

Growth rates are variable across the whole forest but are generally poor to very poor within the forestry survey area and the already identified peatland restoration areas for the consented development and proposed Balmeanach Wind Farm. A combination of harsher climatic conditions and poor site nutrition prevail in these areas and there are many areas where the crop has not fully closed canopy.

General Yield Class calculations for the crop identified three separate growth stratifications which are broken down as follows:

Stratification	Yield Class
A	SS 8/6 LP 6
B	SS 6 LP 4
Fail	SS <6 LP <4

Table 2: YC Stratification

These are exceptionally poor growth rates which are a result of low nutritional value of the soils and the exposed nature of the site. **Figure 5.4.2** shows that the poorest yield class of trees (B and Fail) are mostly located in the forestry compartment to the east of the Ben Aketil Wind Farm track. Much of the compartment to the west of the track is shown to just fall into yield class A.

The site has a DAMS score of 20. DAMS (Detailed Aspect Method of Scoring) is simply a measure of the windiness of a site calculated from various criteria including elevation, aspect, and exposure. A score of 19 -22 is classed as severely exposed and is very close to a level (>22) that is deemed unsuitable for productive forestry.

Summary of Top Heights

Species	Average Height (m)	
Stratification	**Sitka Spruce**	**Lodgepole Pine**
A	10	9.9
B	7.5	7.4
Fail	≤ 6	≤ 6

Table 3: Stratification/ Species Height

Summary of Woodland Removal Area

Strata	Species	Age	Yield Class		DAMS	Average Peat Depth (m)	Area (Ha)
			SS	LP			
A	SS/LP	32	8/6	6	20	>1	42.42
B	SS/LP	32	6	4	20	>1	11.52
Fail	SS/LP	32	<6	<4	20	>1	8.06

Table 4: Summary

5.2.2 Vegetation

It total, four vegetation survey plots were conducted across the proposed area. The following species were found to be abundant at each point in varying ratios of dominance:

- Ling heather *(Calluna vulgaris)*
- Purple moor-grass *(Molinia caerulea)*
- Deer grass *(Trichphorum cespitosum)*
- Bog Cotton *(Eriophorum angusifolium)*
- Bog moss *(Sphagnum Spp)*

To a lesser extent but still found at most survey points:

- Bog asphodel *(Narthecium ossifragum)*
- Cross leaved heath *(Erica tetralix)*
- Mountain fern moss *(Hylocomium splendens)*

- Soft rush *(Juncus effusus)*

Typically, the vegetation was a mosaic of Ling heather, purple moor-grass and deer grass consistently scattered with *Sphagnum* pools across the low-lying compartments and on drier knolls patches of *Racomitrium Spp* were found. Drainage channels and plough lines were typically waterlogged and filled with *Juncus Spp* or *Sphagnum Spp*. There is a strong similarity to the NVC M17 *(Trichophorum cespitosum-Eriophorum vaginatum)* blanket mire community although modification through ploughing and drainage will have changed the composition.

Photo 2: Example of a Sphagnum pool found at Ben Sca

Photo 3: Example of Sphagnum colonising stagnant drainage channels

According to Averis *et al* (2004) the NVC M17 habitat is widespread in upland areas of western Great Britain. It is most common and extensive in the western and northern Highlands and the Hebrides. The habitat is rare globally and can support a rich array of invertebrates and in turn provide a food source for British upland birds. Averis suggests that afforestation caused a significant reduction in the community within Scotland during the 1940's – 80's.

5.2.3 Soils

Peat depths were recorded at approximately 50m intervals en-route across the site. 63 peat depths were recorded and were consistently exceeding 1m across the forestry survey area.

In addition to peat probing, soil pits were dug across each stratification point to provide greater data for ESC.

The soil pits indicated peat over 1m dominated the forestry survey area. The water table was shallower than the peat over 1m and likely restricting rooting depth.

Photo 4: Over 1m of peat in Strata A

Using the *Identification of Soils for Forest Management* (2002) field guide soils were identified as unflushed eroded bogs and more specifically shallow hagged bogs with aspects of pooled bogs in the wetter areas.

6. Findings

In summary, if the Proposed Development was to proceed, it is anticipated that up to 62ha of forestry could be removed in addition to the 38.53ha which has already been consented and therefore the '*Control of Woodland Removal Policy*' is a material consideration.

The policy includes a strong presumption against removing the following types of woodland:

- Ancient semi-natural woodland;
- Woodland integral to the value of designated natural conservation sites;
- Scheduled Monuments;
- National Scenic Areas;
- Woodlands listed within the Inventory of Gardens and Designed Landscapes;
- Woodlands critical to water catchment management or erosion control;
- Woodlands listed as 'Plantations on Ancient Woodland Sites' (PAWS); and
- woodland removal where it would lead to fragmentation or disconnection of important forest habitat networks.

None of the above are applicable to the forestry survey area and, although the policy does presume to protect woodland, removal of other woodland types is acceptable where certain criteria are met.

Compensatory planting is required in most cases but removal without a requirement for compensatory planting, can be appropriate for woodland on deep peats, where the greenhouse gas and wider environmental implications of future management are significant.

The Forestry Commission guidance *'Deciding future management options for afforested deep peat'* (2015) states that "*we (Forestry Commission Scotland) are likely to support applications for felling without conventional restocking on peatland sites that are less suitable for second rotation forestry or where there is a clear benefit of restoration*".

The Forest Research decision support tool *Ecological Site Classification (ESC)* provides guidance on the suitability of sites for the growth of key tree species, but the guidance expects this data to be used in conjunction with site specific data to assess the site's potential for tree growth.

Three ESC survey points were used, one in each identified growth stratification area. The following grid references were identified for each stratum which were based on soil and vegetation surveys at key representative points.

Strata	ESC Survey Point (NGR)	Suitability	
		SS	W4
A	NG 317 495	Unsuitable	Marginal
B	NG 323 501	Unsuitable	Marginal
Fail	NG 325 497	Unsuitable	Marginal

Table 5: ESC Points

Using data from the soil and vegetation surveys the Ecological Site Classification data shows the forestry survey area as unsuitable for Sitka Spruce with the Soil Nutrient Regime being the limiting factor. The growth rate of the current crop and the consistent deep peat across the forestry survey area supports this data. Species and NVC ESC reports are appended to this report as **Annexes 5.4A, 5.4B** and **5.4C**.

The guidance note suggests sites should be suitable or very suitable for a species for conventional restocking to be undertaken.

The guidance does state that sites not suitable for conventional restocking should be considered for conversion to peatland edge woodland where ESC shows the site has potential for woodland providing >20% canopy cover.

ESC indicates that the forestry survey area is marginal at best for W4 – Birch with Purple Moor Grass Peatland Edge Woodland, but when considering local site conditions including Soil Moisture Regime and Soil Nutrient Regime, along with the wider benefits of enhancing priority habitats and their connectivity, the removal of these woodland areas would be appropriate within the context of the '*Control of Woodland Removal Policy*'. This is in accordance with the conclusion (and as agreed with Scottish Forestry) that those areas already previously identified for woodland removal and peatland restoration in relation to the consented development could be removed within the context of the '*Control of Woodland Removal Policy'* without the need for replanting.

It is considered that the areas of poorest woodland growth within the forestry survey area (mostly comprising yield classes B and fail), to the east of the Ben Aketil Wind Farm access track would be most suitable for peatland restoration. This area (26.2ha) is identified on **Figure 5.4.1** and described further in **Technical Appendix 5.3: Outline Habitat Management Plan (OHMP)**.

7. References

- FC. Scotland (2009). 'The Scottish Government's Policy on Control of Woodland Removal. https://forestry.gov.scot/publications/285-the-scottish-government-s-policy-on-control-of-woodland-removal
- FC. Scotland (2015). 'Deciding future management options for afforested deep peatland'. *Forestry Commission Scotland Practice Guide.* Deciding Future Management Options for Afforested Deep Peatland (forestry.gov.scot)
- A. Averis et al (2004). 'An illustrated guide to British Upland Vegetation. *Joint Nature Conservation Committee.* https://data.jncc.gov.uk/data/a17ab353-f5be-49ea-98f1 8633229779a1/IllustratedGuideBritishUplandVegetation-2004.pdf
- F.Kennedy (2002). 'Field Guide: The Identification of Soils for Forest Managers. *Edinburgh: Forestry Commission.*

Annex 5.4A: NG 317 495 ESC Reports – NVC and Tree Species (Strata A)

Ecological Site Classification Report - Native Woodland Classification

Eastings(m)	*Northings(m)*	*Grid Reference*	*Climate Scenario*	*Site Class*	*Filter*	*Brash*	*Drainage*	*Fertiliser/Nurse*
131700	849500	NG317495	Baseline climate 1961-1990	Cool - Severely exposed - Wet	All species	No brash present	No drainage installed	No fertiliser

Site Variables

Modifications	*AT*	*CT*	*DAMS*	*MD*	*SMR*	*SNR*
Default	1183.0	3.0	20.0	79.0	Wet	VP2 Very poor
Final	1183.0	3.0	20.0	79.0	Wet	VP2 Very poor

Woodland	*Suit.*	*Limiting*	*AT*	*CT*	*DAMS*	*MD*	*SMR*	*SNR*	*Version*
W1-Sallow with marsh bedstraw	●	SNR	●	●	▲	●	●	●	4(A)
W2-Alder with common reed	●	SNR	●	●	▲	●	●	●	4(A)
W3-Sallow with bottle sedge	●	SNR	●	●	●	●	●	●	4(A)
W4-Birch with purple moor grass	▲	SNR	●	●	●	●	●	▲	4(A)
W5-Alder with tussock-sedge	●	SNR	●	●	●	●	●	●	4(A)
W6-Alder with stinging nettle	●	SNR	●	●	▲	●	●	●	4(A)
W7-Alder-ash with yellow pimpernel	●	SNR	●	●	▲	●	●	●	4(A)
W8-Mixed broadleaved with dogs mercury	●	SNR	●	●	▲	●	●	●	4(A)
W9-Mixed broadleaved with dogs mercury(Upland)	●	SNR	●	●	●	●	▲	●	4(A)
W10-Mixed broadleaved with bluebell/wild hyacinth	●	SNR	●	●	●	●	●	●	4(A)
W11-Oak-birch with bluebell/wild hyacinth	●	SNR	●	●	●	●	●	●	4(A)
W12-Beech with dogs mercury	●	SMR	●	●	●	●	●	●	4(A)
W13-Yew	●	SMR	●	●	▲	●	●	●	4(A)
W14-Beech with bramble	●	SMR	●	●	●	●	●	●	4(A)
W15-Beech with wavy hair-grass	●	SMR	●	●	●	●	●	●	4(A)
W16-Oak-birch with bilberry/blaeberry	●	SMR	●	●	▲	●	●	●	4(A)
W17-Oak-birch with bilberry/blaeberry(Upland)	●	SMR	●	●	●	●	●	●	4(A)

Ecological Site Classification Report - Native Woodland Classification									
W18-Scots pine with heather		SMR							4(A)
W19-Juniper with wood sorrel		SNR							4(A)
W20-Salix lapponum-Luzula sylvatica		SNR							4(A)

Ecological Site Classification Report

Eastings(m)	Northings(m)	Grid Reference	Climate Scenario	Site Class	Filter	Brash	Drainage	Fertiliser/Nurse
131700	849500	NG317495	Baseline climate 1961-1990	Cool - Severely exposed - Wet	All species	No brash present	No drainage installed	No fertiliser

Site Description and Variables

The site has a cool, severely exposed and wet climate. Exposure constraints may limit species options and the ability to thin woodlands without significant risk of windthrow. The soils are wet moisture status and vp2 very poor nutrient status. Wet soils may cause flotation problems for heavy machinery on establishment, and on harvesting, if only lightly crowned species are present (e.g. birch). Tree species recommendations in ESC do not take account of each countries regulatory approval process, so prior to including species in a forest plan advice should be sought from relevant forestry authorities.

Modifications	AT	CT	DAMS	MD	SMR	SNR
Default	1183.0	3.0	20.0	79.0	2.0(Wet)	0.5(VP2 Very poor)
Final	1183.0	3.0	20.0	79.0	2.0(Wet)	0.5(VP2 Very poor)

Species	Abbr.	Suit(Ecol)	Suit(Timber)	Yield	Limiting	AT	CT	DAMS	MD	SMR	SNR	Version
Corsican pine	CP	●	●	3	DAMS	●	●	●	●	●	▲	3.3(A)
Lodgepole pine	LP	▲	▲	5	DAMS	●	●	▲	●	●	▲	3.1(A)
Macedonian pine	MCP	▲	▲	5	DAMS	●	●	▲	●	●	▲	3.1(C)
Maritime pine	MAP	●	●	0	DAMS	▲	●	●	▲	●	▲	3.1(C)
Monterey/Radiata pine	RAP	●	●	0	MD	●	●	●	●	●	▲	3(C)
Scots pine	SP	▲	▲	4	SMR	●	●	▲	●	▲	▲	3.3(A)
Weymouth pine	WEP	●	●	0	SMR	●	●	●	●	●	●	3(C)
Norway spruce	NS	●	●	1	SNR	●	●	●	●	●	●	3.3(A)
Oriental spruce	ORS	●	●	0	DAMS	●	●	●	●	●	●	3(C)
Serbian spruce	OMS	●	●	3	SNR	●	●	●	●	▲	●	3(B)
Sitka spruce	SS	●	●	5	SNR	●	●	●	●	●	●	3.4(A)
Sitka spruce (Imp.)	Imp.SS	●	●	6	SNR	●	●	●	●	●	●	3.4(A)
Douglas fir	DF	●	●	0	DAMS	●	●	●	●	●	●	3.1(A)
Hybrid larch	HL	●	●	0	DAMS	●	●	●	●	●	▲	3(A)
Japanese larch	JL	●	●	3	SMR	●	●	●	●	●	▲	3(A)
European larch	EL	●	●	0	SMR	●	●	●	●	●	●	3(A)
Western red cedar	RC	●	●	0	SNR	●	●	●	●	●	●	3.1(A)
Japanese red cedar	JCR	●	●	0	SMR	●	●	●	●	●	●	3(B)
European silver fir	ESF	●	●	2	SMR	●	●	●	●	●	●	3(B)
Grand fir	GF	●	●	0	DAMS	●	●	●	●	●	●	3(A)
Noble Fir	NF	●	●	0	SMR	●	●	●	●	●	●	3(A)
Nordmann fir	NMF	●	●	0	DAMS	●	●	●	●	●	●	3(C)

Ecological Site Classification Report												
Pacific fir	PSF			0	SMR							3.4(C)
Leyland cypress	LEC			0	DAMS							3(B)
Western hemlock	WH			0	SMR							3(A)
Giant redwood	WSQ			0	SMR							3(B)
Coast redwood	RSQ			2	SNR							3(B)
Lawson's cypress	LC			0	DAMS							3(B)
Downy birch	PBI			3	DAMS							3.2(A)
Silver birch	SBI			0	SMR							3.2(A)
Big leaf maple	AMA			0	DAMS							3.1(C)
Norway maple	NOM			0	DAMS							3(B)
Sycamore	SY			0	SMR							3.3(A)
Beech	BE			0	DAMS							3.1(A)
Roble beech	RON			0	DAMS							3.1(B)
Ash	AH			0	DAMS							3(A)
Pedunculate oak	POK			0	DAMS							3.1(A)
Red oak	ROK			0	SMR							3(B)
Sessile oak	SOK			0	DAMS							3.2(A)
Aspen	ASP			0	SNR							3.2(A)
Black poplar	BPO			0	SNR							3.1(A)
Rauli beech	RAN			0	DAMS							3.1(B)
Common alder	CAR			2	SNR							3.2(A)
Red alder	RAR			0	SNR							3(B)
Grey alder	GAR			4	SNR							3.1(B)
Italian alder	IAR			0	DAMS							3.2(B)
Shining gum	ENI			0	SMR							3(C)
Cider gum	EGU			0	DAMS							3(C)
Rowan	ROW			0	SMR							3.3(A)
True service tree	TST			0	DAMS							3(A)
Wild service tree	WST			0	SMR							3(A)
Black walnut	JNI			0	SMR							3(B)

Ecological Site Classification Report												
Common walnut	JRE			0	DAMS							3(B)
Hornbeam	HBM			0	DAMS							3(A)
Small-leaved lime	SLI			0	SNR							3(A)
Wych elm	WEM			0	SMR							3(A)
Wild cherry	WCH			0	DAMS							3(A)
Sweet chestnut	SC			0	DAMS							3(A)
White willow	WWL			0	SNR							3(C)
Holly	HOL			0	DAMS							3(C)
Willow (SRC)	SRC			0	SNR							3(C)
Eucalyptus glaucescens (SRF)	SRF			0	SNR							3(C)

Annex 5.4B: NG 323 501 ESC Reports – NVC and Tree Species (Strata B)

Ecological Site Classification Report - Native Woodland Classification

Eastings(m)	*Northings(m)*	*Grid Reference*	*Climate Scenario*	*Site Class*	*Filter*	*Brash*	*Drainage*	*Fertiliser/Nurse*
132372	850157	NG323501	Baseline climate 1961-1990	Cool - Severely exposed - Wet	All species	No brash present	No drainage installed	No fertiliser

Site Variables

Modifications	*AT*	*CT*	*DAMS*	*MD*	*SMR*	*SNR*
Default	1168.0	3.0	21.0	76.0	Wet	VP2 Very poor
Final	1168.0	3.0	21.0	76.0	Wet	VP2 Very poor

Woodland	*Suit.*	*Limiting*	*AT*	*CT*	*DAMS*	*MD*	*SMR*	*SNR*	*Version*
W1-Sallow with marsh bedstraw	●	SNR	●	●	●	●	●	●	4(A)
W2-Alder with common reed	●	SNR	●	●	●	●	●	●	4(A)
W3-Sallow with bottle sedge	●	SNR	●	●	●	●	●	●	4(A)
W4-Birch with purple moor grass	▲	SNR	●	●	●	●	●	▲	4(A)
W5-Alder with tussock-sedge	●	SNR	●	●	●	●	●	●	4(A)
W6-Alder with stinging nettle	●	SNR	●	●	●	●	●	●	4(A)
W7-Alder-ash with yellow pimpernel	●	SNR	●	●	●	●	●	●	4(A)
W8-Mixed broadleaved with dogs mercury	●	SNR	●	●	●	●	●	●	4(A)
W9-Mixed broadleaved with dogs mercury(Upland)	●	SNR	●	●	●	●	▲	●	4(A)
W10-Mixed broadleaved with bluebell/wild hyacinth	●	SNR	●	●	●	●	●	●	4(A)
W11-Oak-birch with bluebell/wild hyacinth	●	SNR	●	●	●	●	●	●	4(A)
W12-Beech with dogs mercury	●	SMR	●	●	●	●	●	●	4(A)
W13-Yew	●	SMR	●	●	●	●	●	●	4(A)
W14-Beech with bramble	●	SMR	●	●	●	●	●	●	4(A)
W15-Beech with wavy hair-grass	●	SMR	●	●	●	●	●	●	4(A)
W16-Oak-birch with bilberry/blaeberry	●	SMR	●	●	●	●	●	●	4(A)
W17-Oak-birch with bilberry/blaeberry(Upland)	●	SMR	●	●	●	●	●	●	4(A)

Ecological Site Classification Report - Native Woodland Classification									
W18-Scots pine with heather		SMR							4(A)
W19-Juniper with wood sorrel		SNR							4(A)
W20-Salix lapponum-Luzula sylvatica		SNR							4(A)

Ecological Site Classification Report

Eastings(m)	Northings(m)	Grid Reference	Climate Scenario	Site Class	Filter	Brash	Drainage	Fertiliser/Nurse
132372	850157	NG323501	Baseline climate 1961-1990	Cool - Severely exposed - Wet	All species	No brash present	No drainage installed	No fertiliser

Site Description and Variables

The site has a cool, severely exposed and wet climate. Exposure constraints may limit species options and the ability to thin woodlands without significant risk of windthrow. The area is coastal (within 3km of sea) so certain species may experience saltburn, a protective belt comprising one or more of Sycamore, Sitka spruce or Lodgepole pine may mitigate those effects. The soils are wet moisture status and vp2 very poor nutrient status. Wet soils may cause flotation problems for heavy machinery on establishment, and on harvesting, if only lightly crowned species are present (e.g. birch). Tree species recommendations in ESC do not take account of each countries regulatory approval process, so prior to including species in a forest plan advice should be sought from relevant forestry authorities.

Modifications	AT	CT	DAMS	MD	SMR	SNR
Default	1168.0	3.0	21.0	76.0	2.0(Wet)	0.5(VP2 Very poor)
Final	1168.0	3.0	21.0	76.0	2.0(Wet)	0.5(VP2 Very poor)

Species	Abbr.	Suit(Ecol)	Suit(Timber)	Yield	Limiting	AT	CT	DAMS	MD	SMR	SNR	Version
Corsican pine	CP	●	●	2	DAMS	●	●	●	●	●	▲	3.3(A)
Lodgepole pine	LP	▲	●	4	DAMS	●	●	▲	●	●	▲	3.1(A)
Macedonian pine	MCP	●	●	4	DAMS	●	●	●	●	●	▲	3.1(C)
Maritime pine	MAP	●	●	0	DAMS	▲	●	●	▲	●	▲	3.1(C)
Monterey/Radiata pine	RAP	●	●	0	DAMS	●	●	●	●	●	▲	3(C)
Scots pine	SP	▲	▲	4	SMR	●	●	▲	●	▲	▲	3.3(A)
Weymouth pine	WEP	●	●	0	SMR	●	●	●	●	●	●	3(C)
Norway spruce	NS	●	●	1	SNR	●	●	●	●	●	●	3.3(A)
Oriental spruce	ORS	●	●	0	DAMS	●	●	●	●	●	●	3(C)
Serbian spruce	OMS	●	●	2	DAMS	●	●	●	●	▲	●	3(B)
Sitka spruce	SS	●	●	5	SNR	●	●	●	●	●	●	3.4(A)
Sitka spruce (Imp.)	Imp.SS	●	●	6	SNR	●	●	●	●	●	●	3.4(A)
Douglas fir	DF	●	●	0	DAMS	●	●	●	●	●	●	3.1(A)
Hybrid larch	HL	●	●	0	DAMS	●	●	●	●	●	▲	3(A)
Japanese larch	JL	●	●	3	DAMS	●	●	●	●	●	▲	3(A)
European larch	EL	●	●	0	SMR	●	●	●	●	●	●	3(A)
Western red cedar	RC	●	●	0	DAMS	●	●	●	●	●	●	3.1(A)
Japanese red cedar	JCR	●	●	0	SMR	●	●	●	●	●	●	3(B)
European silver fir	ESF	●	●	2	SMR	●	●	●	●	●	●	3(B)
Grand fir	GF	●	●	0	DAMS	●	●	●	●	●	●	3(A)
Noble Fir	NF	●	●	0	SMR	●	●	●	●	●	●	3(A)
Nordmann fir	NMF	●	●	0	DAMS	●	●	●	▲	●	●	3(C)

Ecological Site Classification Report												
Pacific fir	PSF			0	SMR							3.4(C)
Leyland cypress	LEC			0	DAMS							3(B)
Western hemlock	WH			0	SMR							3(A)
Giant redwood	WSQ			0	SMR							3(B)
Coast redwood	RSQ			1	DAMS							3(B)
Lawson's cypress	LC			0	DAMS							3(B)
Downy birch	PBI			3	DAMS							3.2(A)
Silver birch	SBI			0	DAMS							3.2(A)
Big leaf maple	AMA			0	DAMS							3.1(C)
Norway maple	NOM			0	DAMS							3(B)
Sycamore	SY			0	SMR							3.3(A)
Beech	BE			0	DAMS							3.1(A)
Roble beech	RON			0	DAMS							3.1(B)
Ash	AH			0	DAMS							3(A)
Pedunculate oak	POK			0	DAMS							3.1(A)
Red oak	ROK			0	SMR							3(B)
Sessile oak	SOK			0	DAMS							3.2(A)
Aspen	ASP			0	SNR							3.2(A)
Black poplar	BPO			0	SNR							3.1(A)
Rauli beech	RAN			0	DAMS							3.1(B)
Common alder	CAR			2	SNR							3.2(A)
Red alder	RAR			0	DAMS							3(B)
Grey alder	GAR			4	SNR							3.1(B)
Italian alder	IAR			0	DAMS							3.2(B)
Shining gum	ENI			0	SMR							3(C)
Cider gum	EGU			0	DAMS							3(C)
Rowan	ROW			0	SMR							3.3(A)
True service tree	TST			0	DAMS							3(A)
Wild service tree	WST			0	SMR							3(A)
Black walnut	JNI			0	SMR							3(B)

Ecological Site Classification Report												
Common walnut	JRE			0	DAMS							3(B)
Hornbeam	HBM			0	DAMS							3(A)
Small-leaved lime	SLI			0	DAMS							3(A)
Wych elm	WEM			0	SMR							3(A)
Wild cherry	WCH			0	DAMS							3(A)
Sweet chestnut	SC			0	DAMS							3(A)
White willow	WWL			0	SNR							3(C)
Holly	HOL			0	DAMS							3(C)
Willow (SRC)	SRC			0	SNR							3(C)
Eucalyptus glaucescens (SRF)	SRF			0	SNR							3(C)

Annex 5.4C: NG 325 497 ESC Reports – NVC and Tree Species (Strata C)

Ecological Site Classification Report - Native Woodland Classification

Eastings(m)	*Northings(m)*	*Grid Reference*	*Climate Scenario*	*Site Class*	*Filter*	*Brash*	*Drainage*	*Fertiliser/Nurse*
132500	849700	NG325497	Baseline climate 1961-1990	Cool - Severely exposed - Wet	All species	No brash present	No drainage installed	No fertiliser

Site Variables

Modifications	*AT*	*CT*	*DAMS*	*MD*	*SMR*	*SNR*
Default	1152.0	3.0	21.0	72.0	Wet	VP2 Very poor
Final	1152.0	3.0	21.0	72.0	Wet	VP2 Very poor

Woodland	*Suit.*	*Limiting*	*AT*	*CT*	*DAMS*	*MD*	*SMR*	*SNR*	*Version*
W1-Sallow with marsh bedstraw	●	SNR	●	●	●	●	●	●	4(A)
W2-Alder with common reed	●	SNR	●	●	●	●	●	●	4(A)
W3-Sallow with bottle sedge	●	SNR	●	●	●	●	●	●	4(A)
W4-Birch with purple moor grass	▲	SNR	●	●	●	●	●	▲	4(A)
W5-Alder with tussock-sedge	●	SNR	●	●	●	●	●	●	4(A)
W6-Alder with stinging nettle	●	SNR	●	●	●	●	●	●	4(A)
W7-Alder-ash with yellow pimpernel	●	SNR	●	●	●	●	●	●	4(A)
W8-Mixed broadleaved with dogs mercury	●	SNR	●	●	●	●	●	●	4(A)
W9-Mixed broadleaved with dogs mercury(Upland)	●	SNR	●	●	●	●	▲	●	4(A)
W10-Mixed broadleaved with bluebell/wild hyacinth	●	SNR	●	●	●	●	●	●	4(A)
W11-Oak-birch with bluebell/wild hyacinth	●	SNR	●	●	●	●	●	●	4(A)
W12-Beech with dogs mercury	●	SMR	●	●	●	●	●	●	4(A)
W13-Yew	●	MD	●	●	●	●	●	●	4(A)
W14-Beech with bramble	●	SMR	●	●	●	●	●	●	4(A)
W15-Beech with wavy hair-grass	●	SMR	●	●	●	●	●	●	4(A)
W16-Oak-birch with bilberry/blaeberry	●	SMR	●	●	●	●	●	●	4(A)
W17-Oak-birch with bilberry/blaeberry(Upland)	●	SMR	●	●	●	●	●	●	4(A)

Ecological Site Classification Report - Native Woodland Classification									
W18-Scots pine with heather		SMR							4(A)
W19-Juniper with wood sorrel		SNR							4(A)
W20-Salix lapponum-Luzula sylvatica		SNR							4(A)

Ecological Site Classification Report

Eastings(m)	Northings(m)	Grid Reference	Climate Scenario	Site Class	Filter	Brash	Drainage	Fertiliser/Nurse
132510	849752	NG325497	Baseline climate 1961-1990	Cool - Severely exposed - Wet	All species	No brash present	No drainage installed	No fertiliser

Site Description and Variables

The site has a cool, severely exposed and wet climate. Exposure constraints may limit species options and the ability to thin woodlands without significant risk of windthrow. The area is coastal (within 3km of sea) so certain species may experience saltburn, a protective belt comprising one or more of Sycamore, Sitka spruce or Lodgepole pine may mitigate those effects. The soils are wet moisture status and vp2 very poor nutrient status. Wet soils may cause flotation problems for heavy machinery on establishment, and on harvesting, if only lightly crowned species are present (e.g. birch). Tree species recommendations in ESC do not take account of each countries regulatory approval process, so prior to including species in a forest plan advice should be sought from relevant forestry authorities.

Modifications	AT	CT	DAMS	MD	SMR	SNR
Default	1152.0	3.0	21.0	72.0	2.0(Wet)	0.5(VP2 Very poor)
Final	1152.0	3.0	21.0	72.0	2.0(Wet)	0.5(VP2 Very poor)

Species	Abbr.	Suit(Ecol)	Suit(Timber)	Yield	Limiting	AT	CT	DAMS	MD	SMR	SNR	Version
Corsican pine	CP	●	●	1	DAMS	●	●	●	●	●	▲	3.3(A)
Lodgepole pine	LP	●	●	3	DAMS	●	●	●	●	●	▲	3.1(A)
Macedonian pine	MCP	●	●	3	DAMS	●	●	●	●	●	▲	3.1(C)
Maritime pine	MAP	●	●	0	DAMS	▲	●	●	▲	●	▲	3.1(C)
Monterey/Radiata pine	RAP	●	●	0	DAMS	●	●	●	●	●	▲	3(C)
Scots pine	SP	▲	▲	4	SMR	●	●	▲	●	▲	▲	3.3(A)
Weymouth pine	WEP	●	●	0	SMR	●	●	●	●	●	●	3(C)
Norway spruce	NS	●	●	1	SNR	●	●	●	●	●	●	3.3(A)
Oriental spruce	ORS	●	●	0	DAMS	●	●	●	●	●	●	3(C)
Serbian spruce	OMS	●	●	2	DAMS	●	●	●	●	▲	●	3(B)
Sitka spruce	SS	●	●	5	SNR	●	●	●	●	●	●	3.4(A)
Sitka spruce (Imp.)	Imp.SS	●	●	5	SNR	●	●	●	●	●	●	3.4(A)
Douglas fir	DF	●	●	0	DAMS	●	●	●	●	●	●	3.1(A)
Hybrid larch	HL	●	●	0	DAMS	●	●	●	●	●	▲	3(A)
Japanese larch	JL	●	●	2	DAMS	●	●	●	●	●	▲	3(A)
European larch	EL	●	●	0	SMR	●	●	●	●	●	●	3(A)
Western red cedar	RC	●	●	0	DAMS	●	●	●	●	●	●	3.1(A)
Japanese red cedar	JCR	●	●	0	SMR	●	●	●	●	●	●	3(B)
European silver fir	ESF	●	●	2	SMR	●	●	●	●	●	●	3(B)
Grand fir	GF	●	●	0	DAMS	●	●	●	●	●	●	3(A)
Noble Fir	NF	●	●	0	SMR	●	●	●	●	●	●	3(A)
Nordmann fir	NMF	●	●	0	DAMS	●	●	●	▲	●	●	3(C)

Ecological Site Classification Report												
Pacific fir	PSF			0	SMR							3.4(C)
Leyland cypress	LEC			0	DAMS							3(B)
Western hemlock	WH			0	SMR							3(A)
Giant redwood	WSQ			0	SMR							3(B)
Coast redwood	RSQ			1	DAMS							3(B)
Lawson's cypress	LC			0	DAMS							3(B)
Downy birch	PBI			3	DAMS							3.2(A)
Silver birch	SBI			0	DAMS							3.2(A)
Big leaf maple	AMA			0	DAMS							3.1(C)
Norway maple	NOM			0	DAMS							3(B)
Sycamore	SY			0	SMR							3.3(A)
Beech	BE			0	DAMS							3.1(A)
Roble beech	RON			0	DAMS							3.1(B)
Ash	AH			0	DAMS							3(A)
Pedunculate oak	POK			0	DAMS							3.1(A)
Red oak	ROK			0	DAMS							3(B)
Sessile oak	SOK			0	DAMS							3.2(A)
Aspen	ASP			0	SNR							3.2(A)
Black poplar	BPO			0	SNR							3.1(A)
Rauli beech	RAN			0	DAMS							3.1(B)
Common alder	CAR			1	DAMS							3.2(A)
Red alder	RAR			0	DAMS							3(B)
Grey alder	GAR			4	SNR							3.1(B)
Italian alder	IAR			0	DAMS							3.2(B)
Shining gum	ENI			0	SMR							3(C)
Cider gum	EGU			0	DAMS							3(C)
Rowan	ROW			0	SMR							3.3(A)
True service tree	TST			0	DAMS							3(A)
Wild service tree	WST			0	SMR							3(A)
Black walnut	JNI			0	SMR							3(B)

Ecological Site Classification Report												
Common walnut	JRE			0	DAMS							3(B)
Hornbeam	HBM			0	DAMS							3(A)
Small-leaved lime	SLI			0	DAMS							3(A)
Wych elm	WEM			0	SMR							3(A)
Wild cherry	WCH			0	DAMS							3(A)
Sweet chestnut	SC			0	DAMS							3(A)
White willow	WWL			0	SNR							3(C)
Holly	HOL			0	DAMS							3(C)
Willow (SRC)	SRC			0	SNR							3(C)
Eucalyptus glaucescens (SRF)	SRF			0	SNR							3(C)