



Forestry and  
Land Scotland  
Coilltearachd agus  
Fearann Alba

# Auchenroddan and Brownmoor

## Land Management Plan 2023-2033

### South Region-V1.2

**Plan Reference No:**

**Plan Approval Date: 09/01/2023**

**Plan Expiry Date: 09/01/2033**

We manage Scotland's national forests and land to the United Kingdom Woodland Assurance Standard – the standard endorsed in the UK by the international Forest Stewardship Council® and the Programme for the Endorsement of Forest Certification. We are independently audited.

Our land management plans bring together key information, enable us to evaluate options and plan responsibly for the future. We welcome comments on these plans at any time.



The mark of  
responsible forestry



# Contents

## 1.0 Objectives and Summary

- 1.1 Plan overview and objectives
- 1.2 Summary of planned operations

## 2.0 Analysis and Concept

## 3.0 Management Proposals - regulatory requirements

- 3.1 Designations
- 3.2 Clear felling
- 3.3 Thinning
- 3.4 Other tree felling in exceptional circumstances
- 3.5 Restocking
- 3.6 Species diversity and age structure
- 3.7 Road operations and quarries
- 3.8 EIA screening requirements for forestry projects
- 3.9 Tolerance table

## 4.0 Management Proposals – guidance and context

- 4.1 Silviculture
  - 4.1.1 Clear felling
  - 4.1.2 Thinning
  - 4.1.3 Low Impact Silviculture Systems (LISS) / Continuous Cover Forestry (CCF)
  - 4.1.4 Long term retention (LTR) / Minimum intervention (MI) / Natural reserve (NR)
  - 4.1.5 Tree species choice / Restocking
  - 4.1.6 Natural regeneration
  - 4.1.7 New planting
  - 4.1.8 Protection
  - 4.1.9 Road operations, Timber haulage and other infrastructure
- 4.2 Biodiversity
  - 4.2.1 Designated sites
  - 4.2.2 Native woodland
  - 4.2.3 Ancient woodland / Plantation on Ancient Woodland sites (PAWs)

- 4.2.4 Protected and priority habitats and species
- 4.2.5 Open ground
- 4.2.6 Dead wood
- 4.2.7 Invasive species
- 4.3 Historic Environment
  - 4.3.1 Designated sites
  - 4.3.2 Other features
- 4.4 Landscape
  - 4.4.1 Designated areas
  - 4.4.2 Other landscape considerations
- 4.5 People
  - 4.5.1 Neighbours and local community
  - 4.5.2 Public access
  - 4.5.3 Renewables, utilities and other developments
  - 4.5.4 Support for the rural economy
- 4.6 Soils
  - 4.6.1 Protection and Fertility
  - 4.6.2 Cultivation
  - 4.6.3 Deep peats
- 4.7 Water
  - 4.7.1 Drinking water
  - 4.7.2 Watercourse condition
  - 4.7.3 Flooding

Appendix I	Description of woodlands
Appendix II	EIA screening opinion request form (attached)
Appendix III	Consultation record
Appendix IV	Tolerance table
Appendix V	Historic Environment records

Map 1	Location
Map 2	Key Features
Map 3	Analysis and Concept
Map 4	Management

Map 5	Thinning
Map 6	Future Habitats and Species
Map 7	Road Operations and Timber Haulage
Map 8	Current Woodland Composition
Map 9	Soils
Map 10	DAMS
Map 11	Landscape Character Types
Map 12	Heritage Features
Map 13	Visitor Zones

# 1.0 Objectives and Summary

## 1.1 Plan overview and objectives

### Plan name

Auchenroddan & Brownmoor

### Forest blocks included

Auchenroddan, Brownmoor, Lockerbie House

### Size of plan area

Auchenroddan (294ha), Brownmoor (115ha), Lockerbie House (19ha).

Total plan area = 428 ha

### Location

See Location map ([Map 1](#))

### Long Term Vision

These small woods are valued by the local community and offer visitors a quiet place for recreation and relaxation. Areas of permanent woodland provide self-regenerating quality timber, whilst native woodland shades watercourses and provides a home for wildlife.

### Management Objectives

1. Promote alternatives to clearfelling to minimise soil disturbance and create more structurally diverse forests
2. Work with natural regeneration of desired species to establish a future forest that yields high quality timber products
3. Recover windblown timber but with careful consideration for other management objectives
4. Ensure the forests remain inviting and attractive for local recreational users
5. Remove all larch early in the plan period
6. Develop woodland on the north face of Brownmoor that contributes to the local landscape and can be managed effectively

## Critical Success Factors

- Thinning interventions must be timely and effective
- Where natural regeneration is being encouraged it must be managed, protected and enhanced to ensure establishment objectives are met
- Western hemlock in Brownmoor must not be allowed to spread further - early intervention in the plan period is essential
- Advanced warning of forestry operations that will effect public access must be displayed at the forest entrance (particularly at Brownmoor)

## 1.2 Summary of planned operations

Table 1

Summary of Operations over the Plan Period	
Clear felling (gross)	60 ha
Thinning (potential area)	341 ha
Restocking (gross)	84.5 ha
Afforestation	0 ha
Deforestation	0 ha
Forest roads	60 m
Forestry quarries	0 ha

The forest is managed to the UK Woodland Assurance Standard – the standard endorsed in the UK by the *Forest Stewardship Council* and the *Programme for the Endorsement of Forest Certification*. Forestry and Land Scotland is independently audited to ensure that we are delivering sustainable forest management.

## 2.0 Analysis and Concept

The planning process was informed by collecting information about the woodland, which is presented in **Appendix I** and on the Key Features map (**Map 2**). During the development of this plan we have consulted with the local community and other key stakeholders, and a Consultation Record is presented in **Appendix III**.

Below lists the objectives for the plan area and how the key features present opportunity or constraint. The Analysis of these form the concept for this Land Management Plan.

**Objective:** Promote alternatives to clearfelling to minimise soil disturbance and create more structurally diverse forests

- **Opportunities:**
  - Continuous Cover Forestry (CCF) has been applied already in some parts of the plan area
  - The forests are only moderately exposed (with DAMS under 16) and so windblow risk is low – supporting thinning and CCF
  - Machine access is mostly very good and will help facilitate timely interventions
  - Soils are largely suitable for establishing long-term stability
- **Constraints:**
  - Storm Arwen damage in Auchenroddan has opened up areas of the forest
  - Required Larch clearance in Brownmoor will impose clearfelling
  - Complex CCF prescriptions can be off putting and may not be followed through as required
- **Concept:**
  - Auchenroddan – the Strip Shelterwood trial will be continued, and other areas of the forest identified for low impact silviculture
  - Brownmoor – areas for low impact silviculture will be identified, with particular attention on the visible north face (although it is recognised that larch felling will create open areas initially)
  - Prescriptions for work will be simple and achievable

**Objective:** Work with natural regeneration of desired species to establish a future forest that yields high quality timber products

- **Opportunities:**
  - Mature stands of desired species (e.g. SS, NS and DF) are present to act as seed source
  - Soils are mostly suitable for the establishment of natural regeneration (e.g. brown earths and surface water gleys)

- **Constraints:**
  - Western Hemlock is not a desired species in the plan area but is regenerating well in Brownmoor
  - Some other desired species (to increase diversity) are not already present
  - Weediness (e.g. grass and broom) establishes quickly
  - Risk of deer browsing – particularly in Auchenroddan
- **Concept:**
  - Mature Western Hemlock will be felled to remove the seed-source
  - The Sitka spruce natural regeneration in the Strip Shelterwood in Auchenroddan will be used to develop the next rotation. As will regeneration of other desired species elsewhere, such as the Norway spruce on the north face in Brownmoor.
  - Enrichment planting will be used to complement natural regeneration if required. This will also be used to introduce new species, contributing to greater diversity
  - All measures will be used to maximise success of natural regeneration – such as scarifying and targeted deer control

**Objective:** Recover windblown timber but with careful consideration for other management objectives

- **Opportunities:**
  - Forest roads and machine access is good
  - Most wind damage is windblow rather than windsnap so it should be possible to recover quality timber products
- **Constraints:**
  - New 'brown edges' will be exposed to winds and be more vulnerable to damage
  - Loss of mature woodland has a negative impact on some wildlife – especially red squirrels
- **Concept:**
  - Identify felling coupe shapes that minimise the risk of future wind damage to the surrounding woodland
  - Recover as much timber as possible from the windblow, but consider leaving stable mature trees as future seed source where appropriate

**Objective:** Ensure the forests remain inviting and attractive for local recreational users

- **Opportunities:**
  - Developing a mix of species and forest structural diversity along the main public access routes would enhance the visitor experience

- Chance to review the orientation board and seating at Brownmoor
- Chance to consider existing key view points and consider new opportunities
- **Constraints:**
  - There are no significant challenges to achieving this
  - Any new furniture will need to be maintained
- **Concept:**
  - Enhance the visitor experience by using a mix of tree species, open space and management techniques – which is compatible with other objectives of the plan
  - Brownmoor - refresh the orientation board and review seating provision

**Objective:** Remove all larch early in the plan period

- **Opportunities:**
  - Forest roads and machine access to larch stands is mostly good
  - Larch is mostly mature and currently not infected so can be recovered and sold as logs
  - Mature Western Hemlock in Brownmoor can be harvested at same time as Larch
  -
- **Constraints:**
  - Some stands of larch are located amongst other species (although not in an intimate mix)
  - Removing the larch stands will open up the canopy – especially on the north face of Brownmoor
  - Potential landscape impact of larch felling
- **Concept:**
  - Remove larch using resilient felling coupe shapes, which also relate to landform - thus reducing the risk from windblow and potential visual impact

**Objective:** Develop woodland on the north face of Brownmoor that contributes to the local landscape and can be managed effectively

- **Opportunities:**
  - The current stand structure offers various options for the long-term management of this area
  - Growing conditions (climate and soils) are suitable for CCF and/or native woodland
- **Constraints:**
  - Western Hemlock is currently growing thickly under the mature canopy, but is not a desired species here

- **Concept:**
  - Replace the larch with Scots pine (and native broadleaves) to complement the existing stands of this species
  - Continue to manage the Norway spruce as CCF
  - Commit to the removal of Western Hemlock regeneration

Different management options for achieving the plan's objectives were considered against the constraints and opportunities identified during scoping and consultation. The preferred approach is summarised on the Concept map (**Map 3**).

# 3.0 Management Proposals - regulatory requirements

This land management plan was produced in accordance with a range of government and industry standards and guidance as well as recent research outputs, recognised at the time of its production. A full list of the current standards and guidance which guide the preparation and delivery of FLS Land Management Plans can be found using the link [HERE](#).

## 3.1 Designations

The plan area forms part of, includes, or is covered by the following designations and significant features.

Table 2

Designations and significant features		
Feature type	Present	Note
Site of Special Scientific Interest (SSSI)	No	
National Nature Reserve (NNR)	No	
Special Protection Area (SPA)	No	
Special Area of Conservation (SAC)	No	
World Heritage Site (WHS)	No	
Scheduled Monument (SM)	No	
National Scenic Area (NSA)	No	
National Park (NP)	No	
Deep peat soil (>50 cm thickness)	No	
Tree Preservation Order (TPO)	No	
Biosphere reserve	No	
Local Landscape Area	No	
Ancient woodland	Yes	LEPO in all blocks
Acid sensitive catchment	No	
Drinking Water Protected Area (Surface)	No	

The Key Features map (**Map 2**) shows the location of all designated areas and significant features. Any deep peats are indicated on the Soils map (**Map 9**).

## 3.2 Clear felling

Sites proposed for clear felling in the plan period are identified as Phase 1 and Phase 2 coupes on the Management map (**Map 4**).

Table 3

Clearfell Summary by Phase and Coupe Number			
Phase	Coupe Number	Fell Year	Gross Area (ha)
1	33014	2023/24	22.8
1	44005	2023/24	6.4
1	44776	2023/24	4.0
1	44007	2023/24	1.4
1	33003	2024/25	12.2
1	33004	2024/25	4.6
2	33013	2027/28	1.4
2	33019	2027/28	7.2
			<b>Total</b> 60

Table 4

Clearfell by Species							
		Net Area (ha) by Main Species >20% (or MC, MB)					
Coupe Number	Fell Year	WH	HL	JL	NS	SS	Coupe Total
33014	23/24	0.1			1.2	20	21.3
44005	23/24		1.4	3.3		0.8	5.5
44776	23/24		1.7	1.4		0.9	4.0
44007	23/24		1.3				1.3
33003	24/25					11.7	11.7
33004	24/25					4.4	4.4
33013	27/28					1.4	1.4
33019	27/28					7.1	7.1
<b>Plan Area Total</b>		<b>0.1</b>	<b>4.4</b>	<b>4.7</b>	<b>1.2</b>	<b>46.3</b>	<b>56.7</b>

NB Coupe totals: Table 3 shows gross coupe area / Table 4 shows net area of species

Table 5

Scale of Proposed Felling Areas										
Total Woodland Area			428.5 ha							
Felling	Phase 1	%	Phase 2	%	Phase 3	%	Phase 4	%	Long Term Retention	%
Net Area (ha)	51.4	12	8.6	2	61.7	14.4	23.4	5.5	1	0.2

### 3.3 Thinning

Potential sites for thinning in the plan period are identified on the Thinning map (**Map 5**).

This covers an area of 341 ha

Thinning will normally be carried out at, or below, the level of marginal thinning intensity (i.e. removing no more than 70% of the maximum MAI, or YC, per year). Higher intensities (no more than 140 % of maximum MAI, or YC, per year) may be applied where thinning has been delayed, larger tree sizes are being sought or as part of a LISS prescription. In all cases work plans will define the detailed thinning prescription before work is carried out and operations will be monitored by checking pre and post thinning basal areas for the key crop components.

### 3.4 Other tree felling in exceptional circumstances

FLS will normally seek to map and identify all planned tree felling in advance through the LMP process.

However, there are some circumstances requiring small scale tree felling where this may not be possible and where it may be impractical to apply for a separate felling permission due to the risks or impacts of delaying the felling.

Felling permission is therefore sought for the LMP approval period to cover the following circumstances:

Individual trees, rows of trees or small groups of trees that are impacting on important infrastructure (as defined below\*), either because they are now encroaching on or have been destabilised or made unsafe by wind, physical damage, or impeded drainage.

\**Infrastructure includes forest roads, footpaths, access (vehicle, cycle, horse walking) routes, buildings, utilities and services, and drains.*

The maximum volume of felling in exceptional circumstances over the plan area covered by this approval is 75 cubic metres per calendar year.

A record of the volume felled in this way will be maintained and will be considered during the five year Land Management Plan review.

[N.B. Trees may be felled without permission if they: are of less than 10 cm diameter at breast height (1.3 m); pose immediate danger to persons or property; are completely dead; or are part of Authorised Planning Permission works or wayleave agreements].

## 3.5 Restocking

Proposed restocking is shown on the Future Habitats and Species map (**Map 6**).

Table 6

Restocking							
Phase †	Coupe Number	Gross Area (ha)	Proposed Restock Year	Species	Method *	Minimum stocking Density (s/ha)	Note
F	33012	22.6	22/23	DF, NS, NF, SP, NMB	R	Conifers 2500 NMB 1600	
F	33029	1.9	22/23	DF	R	2500	
1	33014	22.8	25/26	SS, NS, SP/NMB, NMB	R	Conifers 2500 NMB 1600	SP/NMB = 70%/30%
1	44005	6.4	25/26	SP/NMB, NS/XC	R	2500 (probably a little lower for the SP/NMB)	SP/NMB = 70%/30% NS/XC = 60%/40%

Restocking								
1	44776	4.0	25/26	NMB, SP, BE	R	SP 2500 NMB, BE 1600		
1	44007	1.4	25/26	NMB, SP	R	SP 2500 NMB 1600		
1	33003	12.2	26/27	NMB, SS, DF	R	NMB 1600 SS, DF 2500		
1	33004	4.6	26/27	SS/XC, NMB	R	SS/XC 2500 NMB 1600	SS/XC = 80%/20%	
2	33013	1.4	29/30	NMB	R	1600		
2	33019	7.2	29/30	SP, NMB	R	SP 2500 NMB 1600		

<b>Total</b>	84.5
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NMB = Native mixed broadleaves / XC = other conifer species

† recently felled awaiting restock (F) / Phase 1 (1) / Phase 2 (2)

\* replant (R) / natural regeneration (NR) / plant alternative area (ALT) / no restocking (None)

If the Restock or natural regeneration should fail to reach 1600 stems per hectare (Native Broadleaves) or 2500 sph (productive Conifers) the site will be beaten-up to the required planting density. This will be assessed at year 3 and year 5 after planting with beat up by at least year 5.

## 3.6 Species diversity and age structure

The following tables show how the proposed management of the forest will help to maintain or establish a diverse species composition and age-class structure, as recommended in the UK Forestry Standard. The current woodland composition is shown on **Map 8**.

Stands adjoining felled areas will be retained until the restocking of the first coupe has reached a minimum height of 2m. Where this is not possible (e.g. due to windblow risk), the planned approach to achieving height separation between adjacent coupes is outlined in section 4.1 – Clear felling.

Table 7

Plan area by species		Current		Year 10		Year 20	
Species		Area (ha)	%	Area (ha)	%	Area (ha)	%
Sitka spruce		258.1	60	203.6	48	160.8	38
Other conifers		79.3	19	102.5	24	128.1	30
Native broadleaves		34.4	8	54.7	13	66.9	16
Other broadleaves		2.2	1	2.2	1	2.2	1
Fallow		32	7	42	10	44	10
Open ground		22	5	23	5	26	6*
<b>Total</b>		<b>428</b>	<b>100</b>	<b>428</b>	<b>100</b>	<b>428</b>	<b>100</b>

\*this is less than the UKFS guideline of 10%, see section 4.2.5

Chart 1

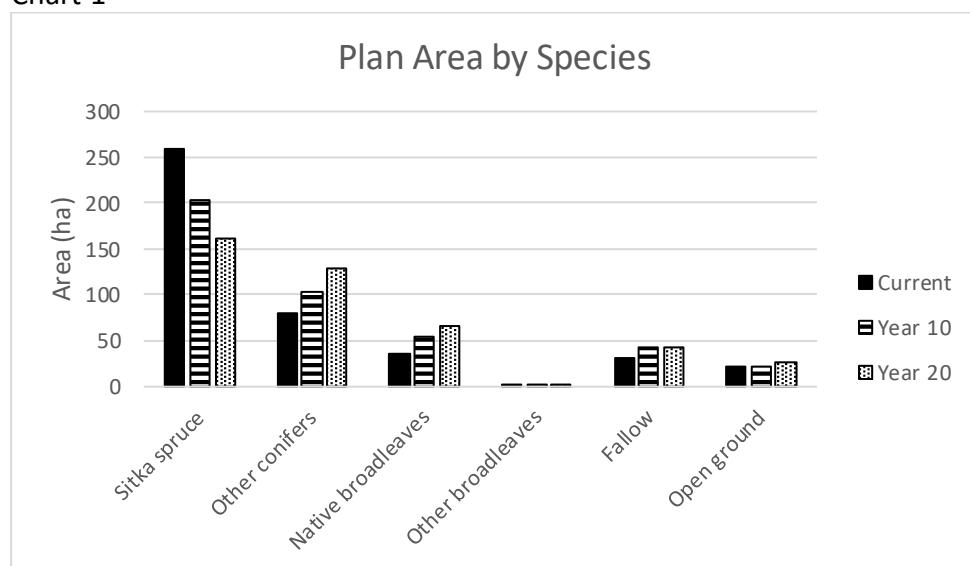
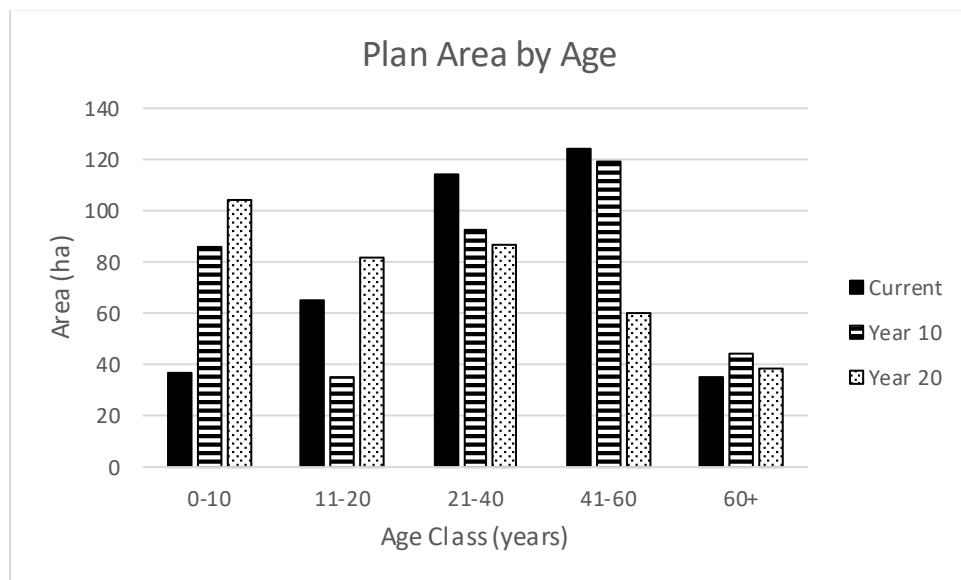


Table 8

Plan area by Age							
Age Class (years)		Current Area (ha)	%	Year 10 Area (ha)	%	Year 20 Area (ha)	%
0 – 10		36.7	10	85.9	23	104.5	28
11 – 20		64.7	17	35.2	9	81.6	22
21 – 40		114.1	30	92.5	25	87.1	23
41 – 60		123.8	33	119	32	60.4	16
60+		34.9	9	44.1	12	38.5	10
<b>Total</b>		<b>374.2</b>	<b>100</b>	<b>376.7</b>	<b>100</b>	<b>372.1</b>	<b>100</b>

Chart 2



## 3.7 Road Operations and Quarries

Planned new roads, road realignments, road upgrades, new quarrying, and timber haulage routes are shown on the Road Operations and Timber Haulage map ([Map 7](#)).

Table 9

Forest Road Upgrades, Realignments, New Roads and New Quarrying				
Phase	Name / Number	Length (m)	Year	Operation
1	Lockerbie House upgrade	370m	2024	Bring shared access up to standard
1	Lockerbie House new road	60m	2024	Create spur into block to provide basic working area for operations
1	Auchenroddan upgrade (C337)	680m	2026	Upgrade road to coupe 33019

## 3.8 Environmental Impact Assessment (EIA)

Any operations requiring an EIA determination are shown in the table below. If required, the screening opinion request form is presented in [Appendix II](#).

Table 10

EIA projects in the plan area		
Type of project	Yes / No	Note
Afforestation	No	
Deforestation	No	
Forest roads	Yes	See Table 9
Forestry quarries	No	

## 3.9 Tolerance table

Working tolerances agreed with Scottish Forestry are shown in [Appendix IV](#).

# 4.0 Management Proposals – guidance and context

## 4.1 Silviculture

This section makes reference to 'Forest Development Types' (FDTs). They provide guidance for a long-term vision outlining the development of the species composition and structure of a forest stand, encouraging greater species and structural diversity. More background about FDTs (including detailed information for each FDT) can be found here:

[www.forestryresearch.gov.uk/tools-and-resources/fthr/forest-development-types/](http://www.forestryresearch.gov.uk/tools-and-resources/fthr/forest-development-types/)

### 4.1.1 Clear felling

Refer to Map 4

Cutting down larger areas (>0.25 ha) of woodland at one time is known as clear felling. Replacement trees are then established by planting or through natural regeneration. The cycle repeats over a rotation of around 50 years depending on the tree species.

Coupes for clearfelling during the plan period:

#### 33014

(22.8 ha)

Fell year = 2023/24

Species = SS (P74/P81), NS (P67), WH (P74)

Large areas of timber stage windblow. Good roadside access. Harvester/forwarder. Good ground conditions for working. Product = limited snap damage so logs should be recoverable. Two watercourses run through the coupe and must be protected from damage and diffuse pollution. The roadside herb-rich wetland indicated on the Concept map (Map 3) should be undisturbed during operations. Restocking with Norway spruce, Sitka spruce, Scots pine and native broadleaves – suggested FDT 1.1.2 (Sitka spruce CCF), FDT 1.2.2 (Norway spruce CCF), FDT 2.1.2 (Scots pine CCF), FDT 9.4.1 (Willow).

#### 44005

(6.4 ha)

Fell year = 2023/24

Species = JL (P51), HL (P91), SS (P91)

Multiple timber stage stands across the north face. Access will be mostly from the lower road. A temporary forwarder track may be required along the top ride to assist with removal of timber (however this must be managed carefully to minimise ground disturbance).

Harvester/forwarder. Slopes are steep but manageable. Product = logs. Restocking with Scots pine, Norway spruce, native broadleaves (see section 4.1.3).

#### **44776**

(4.0 ha)

Fell year = 2023/24

Species = HL (P89/P91), JL (P54), SS (P50)

Three separate timber stage stands. Good roadside access. Harvester /forwarder. Good ground conditions for working. Product = logs. High voltage overhead powerline runs along west edge of coupe. Restocking with Scots pine, beech and native broadleaves – suggested FDT 2.1.1 (Scots pine), 6.1.2 (Beech) and 7.1.2 (Birch and short-lived broadleaves).

#### **44007**

(1.4 ha)

Fell year = 2023/24

Species = HL (P03)

Two small separate unthinned pole stage stands.

North stand: roadside access; harvester/forwarder; low dbh and so limited product options, probably pallet. Restocking with Scots pine – suggested FDT 2.1.1 (Scots pine).

South stand: poor access, isolated from road by SS stand; probably hand fell-to-recycle.

Restocking with native broadleaves – suggested FDT 7.2.2 (Birch and oak).

Neither stand has any significant hazards or constraints.

#### **33003**

(12.2 ha)

Fell year = 2024/25

Species = SS (P82)

Timber stage stand with significant windblow. Good access. Good ground conditions for working. Harvester/forwarder. Product = logs. Water course runs along eastern edge of coupe and must be protected during operations. The western edge of the coupe is LEPO: any stable veteran broadleaf trees should be protected from damage; identify opportunities to enhance deadwood potential. Restocking with native broadleaves, Sitka spruce and Douglas fir – suggested FDT 1.1.2 (Sitka spruce CCF), FDT 3.1.2 (Douglas fir CCF), FDT 5.2.1 (Oak and birch).

#### **33004**

(4.6 ha)

Fell year = 2024/25

Species = SS (P82)

Timber stage windblow. Good roadside access. Good ground conditions for working. Harvester/forwarder. Product = limited snap damage so logs should be recoverable. Water course runs along eastern edge of coupe and must be protected during operations. Restocking with Sitka spruce and native broadleaves (see section 4.1.3).

### **33013**

(1.4 ha)

Fell year = 2027/28

Species = SS (P81)

Timber stage stand. Good roadside access. Harvester/forwarder. Product = logs. Water course runs through south of coupe and must be protected during operations. Overhead telephone cable and underground mains water pipe (serving the private residence) run along edge of road/cope. Restocking with native broadleaves – suggested FDT 7.1.1 (Birch).

### **33019**

(7.2 ha)

Fell year = 2027/28

Species = SS (P60/P81/P84))

Timber stage stand. Road access requires upgrading. Harvester/forwarder. Product = logs. Water course runs along south edge of coupe and must be protected during operations. Restocking with Scots pine (or Lodgepole pine) and native broadleaves – suggested FDT 2.1.1 (Scots pine) and FDT 9.1.1 (Alder).

To achieve the UK Forestry Standard of separation between adjacent crops, adjoining coupes should not be felled before the restocking of the first area has reached an average height of at least two metres. We expect this to be achieved in 5 years following planting. Any unforeseen reduction in separation during the period of the plan will be formally agreed with Scottish Forestry as an amendment. Felling will be undertaken once trees in adjacent restocked coupes have reached 2 m height.

## **4.1.2 Thinning**

Refer to **Map 5**.

Thinning in forestry is the selective removal of a proportion of trees growing in a forest in order to provide more growing space for the remaining trees. The aim is often to increase the amount of timber produced over the life of the forest, but the process can also increase biodiversity and make trees more resilient to environmental stresses or outbreaks of pests and diseases. Within the plan area there is a presumption to thin unless conditions are unfavourable (e.g. very wet soils, exposure to high winds).

Many of the plan's objectives are critically reliant on timely thinning interventions. Areas of CCF (as outlined in section 4.1.3) require thinning to develop stable stands with seed trees that will produce the next rotation. Elsewhere, thinning will help to create more open and attractive woodland for visitors.

The type and intensity of thinning depends on the objectives of the particular stand of trees, but will always comply with the conditions in section 3.3.

### 4.1.3 Low Impact Silviculture Systems (LISS) / Continuous Cover Forestry (CCF)

Refer to **Map 4**.

These are approaches to forest management that seeks to create more diverse forests, both structurally and in terms of species composition, by avoiding clearfelling. The development of more diverse forests is a sensible way to reduce the risks posed by future changes in the climate and biotic threats.

#### (33004) / 33005 / 33006 / 33007 / 33008

These coupes, totalling 52 ha will be managed under a strip shelterwood system. Coupe 33004 will be brought back into this system once the windblow has been cleared and it has been restocked.

The site was identified in the previous plan as being suitable for trialling this type of CCF and it is the intention to now make this management approach permanent. The first strips were felled in 2015, along with a thinning of the whole area. Subsequent strips were felled in 2019.

The original reasons for starting the trial:

- Desire to explore and implement alternative silvicultural systems
- Will deliver timber production objective - but lower impact on soils plus maintenance of forest environment
- Similar unit costs for felling/extraction compared to clearfelling
- Good evidence of natural regeneration = savings in restock costs
- Suitable landform offering some protection from occasional winds from north-east [NB – this was proved correct during Storm Arwen in 2021 although there was still some damage]
- Low external visibility = low landscape impact
- Stakeholders were very supportive of CCF approach for multiple benefits (e.g. SEPA, SNH)

These still hold true, and indeed the importance of developing forest diversity and resilience through continuous cover is now more important than ever to help meet the climate and biodiversity crises.

CCF prescription (based on site objectives, best practice, and lessons learned to date):

1. Strips of approximately 30m width (<50m) are cut in regular intervals of 3 – 6 years, advancing against the prevailing wind direction (Figure 1 indicates the direction of progressive felling for each of the coupes). The limited width of the strips should ensure the area can be populated with natural regeneration (seed dispersal by wind). It is anticipated that the whole area will be under regeneration within around 25 years. Considering the establishment of the current regeneration, the next strip felling is likely to be in 2024.



Figure 1: Direction of progressive strip-felling for each coupe

2. Strip design can be flexible with regard to shape, width and straightness. Strips do not need to be straight lines.
  3. Leave seed trees in felled strips – but only if wind firm. The late transformation of these stands will limit options in the first strip rotation, but second rotation selective thinning will offer more choice.
  4. Strip felling operations should be designed to create suitable seedbed conditions for natural regeneration. This includes brash removal and avoiding undue soil compaction.
  5. On good seed years consider scraping the recently felled strip with a digger. This scarification will improve seedbed conditions. It is preferable to encourage natural

regeneration (rather than beating-up) as this will continue the genetic line of trees most site adapted and resistant to pests/diseases.

6. Monitor and manage deer browsing to ensure establishment.
7. Dense natural regeneration should be respaced, and can be used to fill gaps (if carried out before trees become too high). Elsewhere, gaps may need to be beaten-up with the appropriate species. Manual respacing may seem timely/costly but compared to traditional ground preparation/planting the trial to date has shown it to be perhaps cheaper overall.
8. Retain (spaced) birch regeneration but remove more invasive species such as willow and gorse.
9. The next phase strip felling can go ahead when regeneration on the last strip is established (ideally ~1.5m height). However, too much delay will have a knock on effect meaning that the later planned strips may become unstable before they are reached. Next estimated strip felling due 2024.
10. Identify and select potential seed trees in future strips and crown thin to increase stability. Remove in-crop windblow at the same time. These operations can be undertaken at the same time as a planned strip felling.
11. Note on tree species and proportions. Sitka spruce and shade tolerant conifers will be the dominant species in this strip shelterwood - generally FDT 1.1.5 (Sitka spruce and shade tolerant conifers).
  - a. SS will make up 60-80%.
  - b. Other conifers will make up 20-40%. Suitable options include DF, ESF and WRC and should be selected for the local site conditions. Initially these species will need to be planted amongst the existing SS natural regeneration, but in time will hopefully self-seed.
  - c. These mixtures are generally compatible but management must aim to secure the secondary conifer species if this is being compromised by profuse SS regeneration.
  - d. Beating-up (either by respacing or planting) will target areas of sporadic natural regeneration to ensure adequate stocking density.
  - e. Stocking density for the young stands should be 1500-2500 trees/ha.
  - f. Minor species can contribute to the mix but should be <10%. These may include Beech on brown earths and Sycamore on gleys, for example.
  - g. Opportunities to add other species should be taken throughout the entire shelterwood process.
12. Wind damage. It is expected that these coupes will experience some wind damage and this can be cleared during the thinning and strip felling operations. However, in the event of catastrophic windblow no more than one fifth of the CCF area will be clear felled in any five year period.

### **33028 / 33029**

Both coupes will be managed as uniform shelterwood helping to retain a woodland climate and continuous canopy cover.

Coupe 33028 = FDT 1.2.2 (Norway spruce CCF) and 3.1.2 (Douglas fir CCF).

Coupe 33029 = FDT 1.1.2 (Sitka spruce CCF).

#### CCF prescription:

1. A uniform opening of the canopy should be achieved as a natural development of thinning practice. Therefore thinning interventions must be timely. Both coupes require their first thinning early in the plan period.
2. First thin = selective crown thin. Select 100-150 final crop trees per hectare.
3. Establish access racks for directional felling to support the CCF development.
4. Continue crown thinning focussing on crown competition status of final crop trees until they reach target dbh (>60cm).
5. Use target diameter harvesting / selective felling to create opportunities for natural regeneration and to diversify stand structure.
6. Supplement by planting if necessary.

### **11201**

Lockerbie House wood will be worked via small coupe felling of between 0.25 and 2 ha.

Initially the focus will be on removing the plantation conifers and then encouraging natural regeneration of native broadleaves. At no time in any five year period will more than 20% of the timber be removed from the area. There is an expectation that Sitka spruce natural regeneration will appear after the removal of the mature stands. This will be monitored and managed to ensure the natural regeneration of native broadleaves is successful.

### **44003 / 44010 / 44009 / (44005)**

The steep north face of Brownmoor has been under several different CCF management types over the years, none of which received the required interventions. In 2003 ten circles of 25m diameter were cut through the mature conifer stands with the intention of moving towards a group shelterwood, but no further action was taken. The previous plan for Brownmoor proposed a new approach of arranging the face into a grid of square micro-coupes (<0.25ha) split into five groups – one group to be felled every five years, with the first felling planned for 2013. No fellings were completed. The main factors contributing to this inaction were access problems and resource availability. It is therefore proposed to simplify the management approach.

#### CCF prescription:

##### **44003**

The existing Scots pine is very poor form but is interspersed with native broadleaves such as birch and rowan and has a bilberry dominated ground flora, and overall the stands are developing nicely into a NVC W18 type woodland. The soils here are heavily podzolic and so

site conditions are ideal – the current poor form in the SP is more likely due to provenance. Gaps adjacent to this existing woodland that will be left after larch felling (coupe 44005) will be planted with suitable provenance SP and associated native broadleaves to expand the area of this woodland type. Managing towards a FDT 2.1.7 (Scots pine and birch) will also meet the plan's social objectives by creating more open woodland of natural appearance, and an attractive spring and autumn aspect. CCF methods will develop uneven-aged and complex stands, with a long timeline before final harvesting (c. 100 – 140yrs).

#### 44010

The west side of the banking (where soils are slightly more fertile) is currently dominated by Norway spruce, with other shade tolerant conifers present. The aim here is to continue managing as FDT 1.2.4 (Norway spruce and shade tolerant conifers) . The mixed-species and diverse age structure is likely to be attractive and popular for amenity and recreation.

Western hemlock, although currently growing very well under the NS will be removed as it has been decided that this will become invasive at the expense of other conifer regeneration, and create dense stands that would not meet the visitor experience objective. Other conifers that will be encouraged or potentially underplanted include Douglas fir, other firs, and Western Red Cedar. Conditions for NS regeneration and CCF are good, and patience is needed! Natural regeneration in NS often proves difficult because target dimensions (>50cm dbh) may be reached before the first seed crops are produced, as is the case here. Good seed crops in NS are rarely produced before an age of 50-60 years (and then at around 10 year intervals). The current NS here is c.70 years old and so we are only just beginning to enter the period when natural regeneration will develop. We therefore need to consider a rotation of 80 -120 years to allow seedlings to establish. The required interventions during the plan period are:

1. Monitor desired species composition, stand density, stability and health, and thin accordingly.
2. Identify final crop (FC) trees (150-250 per ha).
3. Apply a low thinning unless a crown thinning is still required to benefit the FC trees.
4. Assess conditions for natural regeneration, and improve conditions if necessary (i.e. light, seedbed).
5. The simplest CCF approach will be to manage under a shelterwood system. Reduce to 35m<sup>2</sup>/ha initially and then further once regeneration has established.
6. Beyond this plan period, the main tasks will be to monitor regeneration (supplemented by planting if necessary) and to gradually complete the final harvesting.

#### 44009

The north-west corner and strip between the roads will be managed as predominantly broadleaf, accepting that there will be some conifers. Working towards FDT 7.2.2 (Birch and Oak) oak is likely to require planting, but any existing natural regeneration will be recruited.

Beech will be minor species here. WH regeneration needs clearing from this area, and will be suppressed by the planned removal of the mature WH nearby. Gradually an uneven-aged, complex stand will develop of a natural appearance and high conservation value. The main tasks for the plan period are to clear the WH, thin the existing broadleaves, recruit/plant SOK. These small areas could be managed in the future using a group selection approach.

#### 4.1.4 Long term retention (LTR) / Minimum intervention (MI) / Natural reserve (NR)

Refer to **Map 4**.

##### Long term retention

Although less than 1% of the plan area had been designated as LTR, there will continue to be significant proportions of mature woodland ( $>40$ yrs = 43% at Year 10). Both LTR areas are in Auchenroddan and will provide multiple benefits including a food source for red squirrel.

##### Minimum intervention

36ha of the plan area (8%) has been classified as 'minimum intervention' where activities will be limited to: wildlife management; removal of invasive exotics/non-native tree regeneration that could reduce value for biodiversity or colonise surrounding stands; actions to benefit specific species of conservation priority; firefighting; and ensuring tree safety along access routes. The objective in these areas is to encourage the development of semi-natural habitats.

##### Natural Reserve

This is the highest level of minimum intervention where management activities are strictly limited in favour of natural processes and ecological continuity. The only exceptions are matters of safety, tree health and damage to neighbouring property. This designation has been applied to two small areas in the south of Auchenroddan (total 3.4 ha).

#### 4.1.5 Tree species choice / Restocking

Refer to **Map 6**.

The soils and climate over the plan area offer excellent growing conditions for a range of tree species. Care has been taken to select 'the right tree for the right place' to ensure that the woodland is healthy, diverse and productive. Over the plan period and beyond there is a decrease in the proportion of Sitka spruce along with an increase in other conifer species and

native broadleaves. This will help to meet the plan's objectives, particularly around landscape and the visitor experience, whilst also making the forests more resilient.

In Auchenroddan, the mature beech hedgerows and veteran trees throughout the forest and along boundaries will be retained, and enhanced where opportunities arise.

All broadleaf planting will be native to the area and should complement and/or enrich existing naturally growing scrub and woodland to give the most ecological value.

The Restocking Strategy for Scotland's National Forest Estate explains that we will minimise chemical usage in restocking (insecticides and herbicides) by considering options at the site scale, and using tactics such as delayed planting to achieve this.

#### 4.1.6 Natural regeneration

Natural regeneration of the desired species in CCF areas will be recruited as the next rotation, and it will be important that thinning/CCF interventions avoid damage to young trees.

There should be a preference for natural regeneration of broadleaf areas (to maintain provenance and improve the chances of establishment) but where this is unlikely or has not been successful then these areas should be planted/beaten up to the required stocking density and site requirements.

It is expected that some of the riparian zones, designed open ground and broadleaf areas will fill in with natural regeneration of both conifers and broadleaves. This will be managed in such a way as to ensure that, where practicable, it does not significantly impose a negative impact upon the objectives of the plan or create a negative impact upon the watercourse in terms of shading and acidification.

In productive sites where natural regeneration is occurring, these will be monitored and recorded in the FLS sub-compartment database. Where this is the desired species, we will endeavour to use it to establish the required stocking density. If stocking density is too low it will be beaten up by year 5. If the natural regeneration is too dense it may be necessary to clear and restock. Where the natural regeneration is not the desired species it will be considered against the plan objectives and tolerance table and either accepted (with a plan amendment if necessary) or removed.

#### 4.1.7 New planting

No new planting within the plan area.

## 4.1.8 Protection

### Deer

The plan sits within the Eskdalemuir Deer Management Unit (DMU). Roe deer are the only species present in the plan area.

The main objectives within the DMU are:

- To enable re-stocking to take place without the need for deer fencing and to achieve the appropriate stocking density at year five.
- To maintain impact levels in accordance with FLS local policy of less than 10% on all commercial tree species.
- To maintain a sustainable deer population.

Currently the three year average browsing impacts across this DMU are within target objectives.

Deer impacts in Brownmoor are minimal, in part due to the wood being surrounded by open farmland. In Auchenroddan, strategically located deer glades will be established to target control where it is most needed. Deer management here has recently come back in house and numbers of deer are being reduced to acceptable densities.

### Tree Pests and Diseases

Larch die back (*Phytophthora ramorum*):

The felling and thinning interventions set out in this plan will remove all remaining larch within the plan period in accordance with the Scottish Forestry ‘*P. ramorum* on larch action plan’ (2021) - the plan area is in the *P. ramorum* ‘Risk Reduction Zone’. At the present time, larch will not feature in the future restock mix. FLS guidance for biosecurity will be adhered to. Measures include removing debris, mud, soil and needles from equipment, vehicles and footwear before entering and leaving the site. This will apply to all staff and contractors, and the requirements will be included in all work plans. The public will also be advised to ‘keep it clean’ through ongoing awareness campaigns.

### Fire

FLS continues to work closely with the Scottish Fire and Rescue Service (SFRS) to prevent and tackle wildfires that threaten Scotland’s National Forests and Land. FLS support SFRS in their lead role for fire prevention and suppression through creating annual fire plans, maintaining a duty rota, and providing additional logistical support. FLS’s primary objective is always to protect people’s health, safety and wellbeing.

## 4.1.9 Road Operations, Timber Haulage and Other Infrastructure

**Map 7** shows the existing forest road network, planned new roads and upgrades, main egress points, and agreed Timber Transport Routes.

One small section of new road is planned within Lockerbie House wood, continuing on from the shared access track on neighbouring land which will itself require significant upgrading to bring it up to standard for timber vehicles. Positive discussions between the neighbour and FLS are ongoing to agree the best option. The works will be completed in Phase 1 of the plan.

The road to coupe 33019 will be upgraded in 2026 (Phase 1) in preparation for the felling of the coupe in 2028.

Egress points (public road number and haulage restrictions):

- Auchenroddan – U353A - Consultation timber transport route.
- Lockerbie House – B723 - Consultation timber transport route.
- Brownmoor – B7076 – Agreed timber transport route

Dumfries and Galloway Council Roads Team must be contacted prior to any extraction from Auchenroddan and Lockerbie House to determine any restrictions required, and the impact on haulage.

The existing quarry in Auchenroddan will remain active to provide stone for road repairs.

## 4.2 Biodiversity

UK Forestry Standard guidance is to manage a minimum of 15% of the forest management unit with conservation and the enhancement of biodiversity as a major objective. The figure for this plan is 35% and is made up of areas designated as natural reserve, long term retention and minimum intervention (11%) along with continuous cover woodland (24%).

### 4.2.1 Designated sites

There are no designated sites within the plan area.

### 4.2.2 Native woodland

The plan area currently consists of 34 ha of native woodland and this will increase to 67 ha once the plan is fully realised. Current native woodland is predominantly riparian zone scrub

with some larger areas of developing birch woodland. New native woodland has been targeted in locations to improve connectivity with existing areas both within and adjacent to the plan area. Where the plan shows mixed broadleaf woodland in riparian corridors we will ensure that this is established at the appropriate density (1600sph) and in most cases within a 50:50% mosaic of open space and woodland. Monitoring will be required to ensure that native woodland establishes and is not compromised by non-native natural regeneration, which should be removed early before it reaches >10cm dbh.

#### **4.2.3 Ancient woodland / Plantation on Ancient Woodland sites (PAWs)**

There is no historical ancient woodland of semi-natural origin within the plan area, however a small area outside and to the south of Auchenroddan is linked to the forest by a strip of LEPO (long-established plantation origin) woodland, and this will be enhanced by planned native broadleaf planting within the plan area.

Both Lockerbie House and Brownmoor are LEPO woodlands in their entirety and any remnant features of high biodiversity value (e.g. veteran trees, deadwood) should be identified, protected and where possible enhanced during work planning for all forestry operations.

#### **4.2.4 Protected and priority habitats and species**

All forest management operations involve a planning process before work commences which includes checks for wildlife and important habitats. Work plans will be adjusted if necessary to avoid disturbance, and opportunities to further protect species or enhance habitats will be identified.

Throughout the plan area care has been taken to design in habitat connectivity, linking native woodland areas and riparian zones both internally and with the surrounding land.

Species identified as requiring specific conservation measures:

##### Red squirrel

FLS has a single licence to cover forest management activities that may affect red squirrels on the national forest estate (NFE). This is in accord with the Scottish Biodiversity Strategy's aim to resolve species management issues. All works within the Plan area will follow the assessment and mitigation actions set out as conditions of this licence.

Significant parts of the plan area will be managed as continuous cover forestry, which will provide a continuity of mature conifers and provide food and shelter for red squirrels (and other wildlife).

#### Bat species

Auchenroddan: bat roosts have been recorded in several of the mature broadleaves and these will be protected and retained. A bat box scheme is monitored regularly and provides additional roosts to complement the natural opportunities.

### 4.2.5 Open ground

Most open ground in the plan area is classified as successional open, where some natural regeneration will be tolerated as long as it is compatible with the plan objectives. Open space in the plan area currently is 5% and will increase slightly to 6% by year 20. This is less than the UKFS guideline of 10%, but this quantity can also include ground managed for conservation and enhancement of biodiversity as the primary objective. The lack of open space is therefore compensated for by the planned diversity of species and ages, and the use of varied silvicultural systems.

Fallow clearfell sites will contribute to transitional open space throughout the forest.

### 4.2.6 Dead wood

Opportunities for retaining or creating deadwood will be identified during the planning of all felling and thinning works, favouring areas with the highest deadwood ecological potential. Valuable deadwood and deadwood areas will be marked on contract maps. Areas of natural reserve will offer some of the best opportunities for the development of standing and fallen deadwood. Where it is safe to do so, standing mature dead trees will be retained as these offer excellent potential for a range of species.

### 4.2.7 Invasive species

#### Grey squirrel

The spread of non-native grey squirrels throughout this area is a concern for the conservation of local populations of native red squirrels. FLS is committed to supporting efforts to control grey squirrels in the plan area.

## 4.3 Historic Environment

Refer to **Map 12**.

Our key priorities for archaeology and the historic environment are to undertake conservation management, condition monitoring and archaeological recording at significant historic assets; and to seek opportunities to work in partnership to help to deliver Our Place in Time: the historic environment strategy for Scotland (2014) and Scotland's Archaeology Strategy (2015). Significant archaeological sites will be protected and managed following the UK Forestry Standard (2017) and the FCS policy document Scotland's Woodlands and the Historic Environment (2008). Harvesting coupes, access roads and fence lines will be surveyed prior to any work being undertaken in order to ensure that upstanding historic environment features can be marked and avoided. At establishment and restocking, work prescriptions remove relevant historic environment features from ground disturbing operations and replanting. Where appropriate, significant historic assets are recorded by archaeological measured survey, see active conservation management and may be presented to the public with interpretation panels and access paths. Opportunities to enhance the setting of important sites and landscapes will be considered on a case-by-case basis (such as the views to and from a significant designated site).

The Regional Historic Asset Management Plan includes conservation management intentions for designated historic assets on the National Forest Estate. Details of all known historic environment features are held within the Forester Web Heritage Data and included within work plans for specific operations to ensure damage is avoided. Significant historic environment features will be depicted on all relevant operational maps.

Areas of historic environment interest should be checked both on FLS's internal historic environment records and also with the Council's HER prior to the commencement of forestry activities. Any upstanding features should be clearly marked, both on the ground and on operational maps. Care should be taken to avoid any damage to surviving structural elements.

### 4.3.1 Designated sites

There are no designated sites within the plan area.

### 4.3.2 Other features

Auchenroddan: Whitecastle Knowe (Regional Importance) – features of the settlement are still visible on the ground and once the existing trees are removed in 2033 (coupe 33010) the site will be left as open ground incorporating an appropriate buffer.

Several other undesignated Historic Environment Records are present in the plan area (see **Appendix V** and **Map 12**).

## 4.4 Landscape

### 4.4.1 Designated areas

There are no designated sites within the plan area.

### 4.4.2 Other landscape considerations

The main consideration for landscape is how to manage the highly-visible north face of Brownmoor. The larch here needs to be removed in line with the Scottish Forestry larch action plan (2021) - but by incorporating a small proportion of other conifers the final coupe shapes aim to be sympathetic with the landform, and therefore minimise the visual impact from Ecclefechan and the motorway. This unavoidable felling (and the reasons) was well communicated with the local community at our public drop-in event. In the long-term this face will be largely managed under continuous cover forestry with a mix of conifer and broadleaf species – ensuring the forest remains an attractive backdrop for local residents.

## 4.5 People

### 4.5.1 Neighbours and local community

Many people from the local community have taken an active interest in the development of the plan and their aspirations have been incorporated where they do not conflict with the objectives of the plan and are consistent with FLS's approach to land management.

From community consultation (see Appendix III) it is clear that Auchenroddan and Brownmoor are popular destinations for recreation. Brownmoor in particular is highly valued by the community in and around Ecclefechan, and many people expressed how important it was for them during Covid-19 for exercise and wellbeing. Lockerbie House wood has very limited known recreational use, however it is used regularly by the neighbouring activity centre.

### 4.5.2 Public access

The forest road networks in both Auchenroddan and Brownmoor are used by visitors for walking, cycling and horse riding. Some sections are designated as core paths. There are no formal recreation facilities at either location, other than a picnic bench and welcome board at Brownmoor. There will be a review of the seating provision in Brownmoor after users raised the possibility of adding more around the road loop. The welcome board will also be

replaced and updated to help orientate new visitors. A few users highlighted the trig point in Brownmoor – and opportunities to create open ground around it will be investigated during the plan period and beyond.

Visitors are welcome to explore FLS land, and will only be asked to avoid routes while certain work is going on that will create serious or less obvious hazards for a period (e.g. tree felling). Scotland's outdoors provides great opportunities for open-air recreation and education, with great benefits for people's enjoyment, and their health and well-being. The Land Reform (Scotland) Act 2003 ensures everyone has statutory access rights to most of Scotland's outdoors, if these rights are exercised responsibly, with respect for people's privacy, safety and livelihoods, and for Scotland's environment. Equally, land managers have to manage their land and water responsibly in relation to access rights and FLS will only restrict public access where it is absolutely necessary, and will keep disruption to a minimum.

Signage will be placed at the forest entrances to provide advanced warning to visitors of any planned works that will effect access.

### **Woodland Management in Visitor Zones**

Visitor Zones have been identified in areas where FLS encourage and manage access or where the woodland managed by FLS interacts with popular visitor sites or access routes. Visitor Zones are mapped on **Map 13**.

In these areas, single trees or small groups of trees will be removed when necessary to protect facilities, infrastructure and trails, or to enhance the setting of features, or to maintain existing views.

Woodland in these zones will also be thinned, or trees re-spaced, for safety reasons (including to increase visibility to ensure that sites are welcoming and feel safe) and where it is necessary to enhance the experience of the forest setting, through the development of large trees, or preferential removal of trees to favour a particular species.

### **4.5.3 Renewables, utilities and other developments**

Refer to **Map 2**.

#### Electricity

- A high-voltage overhead powerline runs along the western edge of Brownmoor.
- Overhead and underground powerlines run along the north-west edge of Auchenroddan.

- An overhead powerline enters Auchenroddan from the north and links to the private residence in the forest.
- Overhead powerlines cross the vehicle access routes in both Auchenroddan and Lockerbie House.

#### Communications

An overhead telephone line enters Auchenroddan from the north and links to the private residence in the forest.

#### Water

See section 4.7.1

These features will be incorporated into future work planning (where applicable), and all necessary precautions taken to protect them. Safe working practices will be applied when working around hazardous utilities. Liaison with neighbours, utility companies and other associated stakeholders will form part of this planning process.

### 4.5.4 Support for the rural economy

The forests in the plan area provide the local community with opportunities for informal recreation. Brownmoor is also ideally positioned to provide these opportunities to visitors staying in the caravan park.

FLS supports a sustainable rural economy by managing the national forests and land in a way that encourages sustainable business growth, development opportunities, jobs and investment.

## 4.6 Soils

### 4.6.1 Protection and Fertility

There will be minimal soil disturbance and machine movement on sites with clayey soils to reduce the risk of compaction or damage to the soil structure. Brash mats (or alternative measures) will be used to protect sensitive soils. Felling residue will usually be left on site to allow nutrient recycling, with consideration for the practicalities of restocking.

### 4.6.2 Cultivation

Where required, the choice of ground cultivation technique will consider the short-term benefits for establishment against any long-term side effects on tree stability, access for future forest operations and the environment. There will be a preference for the least intensive technique.

In areas of low impact silviculture there is no requirement for cultivation (indeed this is one of its main benefits). Where necessary, scarification may be used in these areas to improve the seedbed for natural regeneration.

### 4.6.3 Deep peats

There are no known deep peats within the plan area.

## 4.7 Water

### 4.7.1 Drinking water

1. A private water supply point and associated pipeline is recorded in Lockerbie House wood. This has been checked with the neighbour who confirms that it is no longer used or required. Consequently, FLS will now seek formal agreement to disconnect this historical supply point.
2. A mains water pipeline enters Auchenroddan from the north and links to the private residence in the forest. It runs through coupe 33013 which is planned for clear felling in Phase 2. Discussions with the resident during consultation were positive and they were supportive of clearing this windblown strip of trees and moving it to permanent open space and broadleaves to protect the water pipe in the future. Scottish Water identified this asset during consultation (see Appendix III). As advised, FLS will contact the Scottish Water Asset Plan Provider prior to any works starting, requesting a site visit. The location of the water pipe (and a sufficient buffer) will be identified as advised by Scottish Water and clearly marked on site. All guidance from Scottish Water will be adhered to, particularly in relation to working near/in the agreed buffer, or crossing the pipe. Any unavoidable pipe crossings will use best practice techniques such as log bridges or steel plates (as advised by Scottish Water).

All private drinking water supply points (and pipes) are recorded as a layer in our Forester Web GIS (included in **Map 2**). This is consulted during the work plan process for all forest operations to ensure their protection. Affected neighbours will be consulted prior to any works commencing. Features will be clearly marked on all contract maps, as well as on the

ground. The design of the future forest has incorporated an open space or broadleaf buffer of at least 50m around these supply points to minimise future disturbance.

## 4.7.2 Watercourse condition

The Nethercleugh Burn is recorded by SEPA as in poor condition, but this is due to fish barriers outside the plan area.

All watercourses have been given a buffer of native broadleaves and/or open space, or pass through areas of low impact silviculture or minimum intervention. These riparian zones will develop during the plan period and beyond as areas are felled and restocked, and will help protect water quality whilst also creating new connected wildlife habitats.

All forestry operations will meet the requirements of the UKFS Guidelines on Forests and Water, and also com[ply with the Forestry and Water Scotland guidelines.

## 4.7.3 Flooding

There are no specific flood prevention considerations within the plan area at this time (see Description of Woodlands). The scale and timing of felling in the forest, along with an increasingly diverse age structure is likely to have a beneficial impact on downstream flood risk and may contribute to flood alleviation.

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# Appendix I: Description of Woodlands

## Topography and Landscape

Elevation is mostly between 50m and 200m. There is a trig point in Brownmoor sited at 157m. The highest point in Auchenroddan is 217m on the flank of Newbigging Hill.

The topography can be generalised as rolling with small rounded hills, with small, narrow and shallow valleys. There are some steeper slopes in places, such as the north edge of Brownmoor which is very prominent from Ecclefechan and the M74. Lockerbie House has three very deep gullies running through it. The woods are visible from various locations in the surrounding area, but as part of the wider landscape, and so reducing their prominence. There are no significant natural waterbodies.

There are no landscape designations for the Plan area.

**Map 11** shows the SNH Landscape Character Types for the plan area:

- Upland Fringe LCT 172
- Foothills LCT 175

## Geology and Soils

The geology for Auchenroddan and Lockerbie House is a bedrock of metamorphosed sandstones and mudstones (CARGHIDOWN FORMATION - METASANDSTONE AND METAMUDSTONE), overlain with superficial deposits of glacial till. Brownmoor has a sedimentary bedrock (TYNE LIMESTONE FORMATION - SANDSTONE, SEATEARTH, SILTSTONE AND LIMESTONE), whilst superficial deposits of glacial till are scarce - only found along narrow zones along both the north and south edges.

Soils types within the plan area are shown on **Map 9**.

Brownmoor is dominated by peaty surface water gleys over the flatter 'plateau' with podzols on the steep north face. Pockets of brown earths are found around the external

edges. Lockerbie House is almost entirely brown earths. Auchenroddan has significant areas of brown earth but the majority of the lower ground is typical surface water gley.

There are no deep peats within the plan area.

## Climate

The current climate of the LMP area is highlighted pink on the table below

Accumulated temperature (day-degrees above 5°C)										
		>1800	1800-1475	1475-1200	1200-975	975-775	775-575	575-375	375-175	<175
Moisture Deficit (mm)	>200									
	180-200	Warm	Dry							
	160-180									
	140-160									
	120-140	Warm	Moist		Cool	Moist				
	90-120									
	60-90		Warm	Wet						
	20-60				Cool	Wet		Sub-Alpine		
	<20									Alpine

Climatic Zones in Great Britain (shading indicates combinations not present)

DAMS (windiness) scores range from 11 to 17 – i.e. moderately exposed (see Map 10). Mature stands in Auchenroddan suffered badly during Storm Arwen (2021), with significant windblow.

The future climate is unlikely to change significantly. This is based on projections for 2080 (medium-high climate scenario).

## Hydrology

**Map 2** shows all watercourses, open water, and recorded water supplies.

The plan area sits in the Solway Tweed river basin district. Auchenroddan sits within the catchments of Nethercleugh Burn and Dryfe Water; Brownmoor within those of Pennyland Burn and Kirtle Water. All these feed the wider catchment of the River Annan.

### Water quality

Bodies of surface waters (as identified by SEPA) within the plan area:

Name: Nethercleugh Burn      Overall Condition: Poor

Impacted condition / Responsible pressures (Responsible activity):

Access for fish migration / barrier to fish migration (production of non-renewable electricity)

### Flooding

There are no known risks to the plan area from flooding.

There are no Potentially Vulnerable Areas, or known areas prone to significant flooding downstream from the plan area that will be negatively impacted by land management decisions.

### Water supplies

The plan area does not sit within either a Scottish Water - Drinking Water catchment area, or a Drinking Water Protected Area (Surface).

There is one known private water supply point in Lockerbie House wood. This historically fed Lockerbie Manor but it has been confirmed with the neighbour that the supply is no longer used.

The private residence within Auchenroddan is serviced via a mains water supply pipe that crosses FLS land to the north.

## Adjacent land use

Both woods are predominantly surrounded by fields and farms. Lockerbie House wood is bordered to the west by a busy outdoor activity centre. Auchenroddan is connected to smaller areas of private woodland in some places.

## Public access

**Map 2** and **Map 13** show the location of promoted trails – core paths run through Auchenroddan and Brownmoor. There are no formal FLS facilities, however a waymarked walk was decommissioned in Brownmoor several years ago and an orientation board and picnic table remain.

Both woods are well used by the local community for recreation – particularly Brownmoor, where the wood is a well-loved backdrop to the village. The local community is of a scattered rural nature, with the village of Ecclefechan right next to Brownmoor, and the larger town of Lockerbie sitting between the two woods. In Brownmoor there are low levels of anti-social behaviour, mostly rubbish around the old bunker.

There is a defined right of vehicle access for the private residence in Auchenroddan.

## Historic environment

Historic environment records for the forest are shown in **Appendix V** and on **Map 12**.

There are no designated sites within the plan area.

## Biodiversity

There are no designated sites within the plan area.

There are no recorded Priority Habitats in the plan area, apart from native woodland. However, there are a number of locations that show rich biodiversity such as the deep gullies in Lockerbie House wood.

A number of Priority Species have been recorded – including red squirrel in both woods, and a number of bat species in Auchenroddan where a bat box scheme has been in place for some years.

The Ancient Woodland Inventory shows all of Brownmoor and Lockerbie House as ‘Long established woodland of plantation origin’ (LEPO) interpreted as plantation from maps of 1860 and continuously wooded since. This type of woodland is also found in the south-west corner of Auchenroddan, and although quite small here it is contiguous with similar woodland on adjoining private ground which itself then joins with a site identified as ‘ancient of semi-natural origin’.

There are two existing Natural Reserves in Auchenroddan. These have been identified for long-term ecological continuity.

There is excellent deadwood potential, especially along the watercourses and in older stands of woodland.

Open ground is scarce in both woods (5% excluding fallow). Virtually all the land area is under woodland cover.

## Invasive species

Grey squirrel are present in both woods, and FLS are supporting control measures.

## Woodland composition

The current composition of the plan area is shown on **Map 8**.

12% of High Forest is first rotation. 88% is second or subsequent rotation.

Current woodland management (and % of plan area):

Clearfell (69%)

Long term retention (2%)

CCF / LISS (25%)

Minimum intervention (<1%)

Natural reserve (<1%)

Yield class examples (average): SS = 19, DF = 17, NS = 15

## Plant health

### Phytophthora ramorum

The plan area sits in the Risk Reduction Zone (RRZ) as identified by Scottish Forestry. Most of the larch in Auchenroddan has previously been removed through SPHNs and pre-emptive felling. There is some larch in Lockerbie House wood mixed in with other conifers.

Brownmoor has some large stands of mature larch on the steep north face. All larch in the plan area is likely to become infected in the short-term.

### Dothistroma needle blight (DNB)

DNB has not been recorded in the plan area.

### Ash dieback

The number of trees in the local area effected by ash dieback has increased significantly in recent years, but there are only small quantities of ash in the plan area.

## Infrastructure

The main vehicle access points are at NY 1224 8805 (Auchenroddan), NY 1415 8364 (Lockerbie House) and NY 2041 7394 (Brownmoor). These are also the main egress points for timber transport, which merge onto a 'consultation' timber transport route for Auchenroddan and Lockerbie House, and an 'agreed route' for Brownmoor.

There is a well-established road network through Auchenroddan and Brownmoor, providing adequate access to most sites. Most are Class A and B roads, but some less well used sections would require upgrading for use by timber traffic. Vehicle access into Lockerbie House wood is currently restricted due to the poor condition, and significant works would be required to bring this up to standard.

There is an active quarry in Auchenroddan.

# Appendix II: EIA screening opinion request form

Overleaf/attached if required

## Appendix III: Consultation record

Consultee	Date contacted	Date of response	Issues raised	FLS response
Scottish Forestry	17/6/22	22/6/22	No specific issues raised for consideration.	Invited to scoping meeting but no one was able to attend
SEPA	17/6/22	4/7/22	<p>Auchenroddan:</p> <ul style="list-style-type: none"> <li>Opportunity to improve riparian zones for ecological value and water quality.</li> <li>Further investigation into private water supply (Lockerbie House) and appropriate management of source area</li> </ul> <p>For both locations:</p> <ul style="list-style-type: none"> <li>Good site planning for pollution prevention</li> <li>Use of low risk intrusive cultivation techniques</li> <li>Access tracks should avoid peats</li> <li>Replace any fords with suitable crossing</li> <li>Wash down machinery prior to site departure to avoid spread of invasive species</li> <li>Tree guard removal plan</li> </ul>	<p>Riparian zones have been improved by increasing native broadleaf / open space buffers, whilst also creating habitat networks through the forest.</p> <p>The water supply at Lockerbie House has been confirmed by the neighbour as not in use and not required.</p> <p>All work planning will follow current best practice to prevent pollution. Where accidental incidents do occur they will be dealt with swiftly and notified to SEPA.</p> <p>The least intensive technique of ground cultivation will always be the preferred option. The increased use of low-impact silvicultural systems is an example of this.</p> <p>No deep peats in plan area.</p> <p>No fords in plan area.</p> <p>Biosecurity measures will be implemented. The standard procedure of keeping vehicles, machinery, tools and footwear clean will be supplemented with additional measures for specific threats.</p>

Consultee	Date contacted	Date of response	Issues raised	FLS response
				All plastic tubes will be removed off site once they are no longer required and the trees are established.
Nature Scot	17/6/22	No response		
Historic Environment Scotland	17/6/22	14/7/22	<p>“I can confirm that there are no scheduled monuments, category A listed buildings, Inventory battlefields or Inventory gardens and designed landscapes within the woodland boundary at either Auchenroddan or Brownmoor. We therefore have no comments to make regarding this consultation.”</p> <p>Consult local authority archaeologist</p>	Local authority archaeologist was contacted during external scoping (see below)
Scottish Water	17/6/22	14/7/22	<p>No Scottish Water drinking water catchments or water abstraction sources, which are designated as Drinking Water Protected Areas under the Water Framework Directive.</p> <p>There are Scottish Water Assets within Auchenroddan: 12" Asbestos Cement trunk main near site boundary and a 1½" AC main within the site. This should be confirmed through obtaining plans from our Asset Plan Providers. All Scottish Water assets potentially affected by the activity should be identified, with particular consideration being given to access roads and pipe crossings.</p>	Prior to any works close to the mains water pipe (especially felling of coupe 33013) the Asset Plan Provider will be contacted to ensure the pipe is correctly located and protected from damage.

Consultee	Date contacted	Date of response	Issues raised	FLS response
			Proposals will be required to comply with Sewers for Scotland and Water for Scotland 4th Editions 2018, including provision of appropriate clearance distances from Scottish Water assets.	
Dumfries and Galloway Council - Roads	17/6/22	No response		
Dumfries and Galloway Council - Archaeology	17/6/22	2/11/22	Confirmed that all sites and issues have already been identified	No response required
Dumfries and Galloway Council – Countryside Access	17/6/22	21/6/22	No issues. Core paths clearly marked on map.	No response required
ConFor	17/6/22	No response		
South of Scotland Timber Transport Officer	17/6/22	No response		
River Annan District Salmon Fishery Board	17/6/22	No response		
RSPB	17/6/22	No response		

Consultee	Date contacted	Date of response	Issues raised	FLS response
Saving Scotland's Red Squirrels	17/6/22	22/6/22	<p>Carry out all relevant surveys.</p> <p>Consider breeding season when planning felling works.</p> <p>Consider ways to improve/maintain suitable habitat, including connectivity and species / age diversity.</p> <p>Recommend grey squirrel control efforts are implemented</p>	See section 4.2.4
Visit Scotland	17/6/22	No response		
Butterfly Conservation Scotland	17/6/22	No response		
Kirtle and Eaglesfield Community Council	17/6/22	No response		
Hoddom and Ecclefechan Community Council	17/6/22	No response		
Lockerbie and District Community Council	17/6/22	No response		

Consultee	Date contacted	Date of response	Issues raised	FLS response
Manor Adventure (owners of Lockerbie Manor activity centre)	24/8/22	Site visit on 28/9/22	FLS legal right of access to Lockerbie House wood passes across their land.	See section 4.1.9
General public (online survey publicised via press release, social media and posters)	Open for responses between 26/8/22 and 09/10/22	n/a	<p>30 people attended the drop-in event, and 29 online responses were received. The feedback has been grouped into the following themes:</p> <p><u>Use / Connection</u></p> <p>Walking (individuals, groups and families)</p>	<p>The community feedback was considered during the plan development, and the final plan seeks to maintain the values shared with us, whilst addressing any concerns.</p>
Local community (public drop-in event publicised via press release, posters and local contacts)	Event held at Ecclefechan Village Hall on 08/09/22	n/a	<p>Local running clubs use both woods for training and races (advance warning of road closures would be helpful).</p> <p>Dog walking</p> <p>Local resident</p> <p>Caravan owner (at local site)</p> <p>Exercise / wellbeing</p> <p>Photography</p> <p>Playing / exploring with friends</p> <p><u>Good points / Values</u></p>	<p>See sections 4.5.1 and 4.5.2 for information on public access.</p> <p>See section 4.2 for information on wildlife and native woodland.</p> <p>See section 4.4.2 for information on the impacts of felling on landscape.</p>

Consultee	Date contacted	Date of response	Issues raised	FLS response
			<p>Easy access for recreation. Green space for local people. Great walks. No need for car (Brownmoor locals).</p> <p>Supports tourism (Brownmoor – caravan park)</p> <p>Well used. Valued by local community.</p> <p>Somewhere to walk dogs safely.</p> <p>Beauty. Views (Brownmoor).</p> <p>Peace and quiet. Great places to de-stress and relax. Safe.</p> <p>Flora and fauna. Nature.</p> <p>Local history (e.g. military firing range in Brownmoor).</p> <p>Backdrop to Ecclefechan (Brownmoor).</p> <p>Brownmoor benches. Remaining bench at viewpoint is much valued and kept maintained by locals (e.g. strimming, repairs). Additional benches would be welcome around loop.</p> <p>Brownmoor trig point – fun trying to find it! Perhaps open up more?</p> <p>Childhood memories.</p> <p><u>Bad points / Concerns</u></p>	

Consultee	Date contacted	Date of response	Issues raised	FLS response
			<p>Dog fouling (Auchenroddan)</p> <p>Campfires</p> <p>Need to keep as a place of tranquillity without spoiling</p> <p>Upkeep of benches (Brownmoor)</p> <p>Impact of forestry works on wildlife</p> <p>Impact of forestry works on view from Ecclefechan (Brownmoor)</p> <p>More views into trees would be nice</p> <p>Road surface difficult to walk on in certain areas, after recent works (Brownmoor)</p> <p>Would like to see more native trees (Auchenroddan)</p>	

# Appendix IV: Tolerance Table

	Maps Required (Y/N)	Adjustment to felling period *	Adjustment to felling coupe boundaries **	Timing of Restocking	Changes to Restocking species	Changes to road lines	Designed open ground ***	Windblow Clearance ****
<b>FC Approval normally not required</b>	N	<ul style="list-style-type: none"> <li>Fell date can be moved within 5 year period where separation or other constraints are met.</li> </ul>	<ul style="list-style-type: none"> <li>Up to 10% of coupe area.</li> </ul>	<ul style="list-style-type: none"> <li>Up to 3 planting seasons after felling.</li> </ul>	<ul style="list-style-type: none"> <li>Change within species group e.g. evergreen conifers or broadleaves.</li> </ul>		<ul style="list-style-type: none"> <li>Increase by up to 5% of coupe area</li> </ul>	
<b>Approval by exchange of letters and map</b>	Y	<ul style="list-style-type: none"> <li>Advance felling of Phase 2 coupe into Phase 1</li> </ul>	<ul style="list-style-type: none"> <li>Up to 15% of coupe area</li> </ul>	<ul style="list-style-type: none"> <li>Between 3 and 5 planting seasons after felling, subject to the wider forest and habitat structure not being significantly compromised.</li> </ul>		<ul style="list-style-type: none"> <li>Additional felling of trees not agreed in plan.</li> <li>Departures of &gt; 60m in either direction from centre line of road</li> </ul>	<ul style="list-style-type: none"> <li>Increase by up to 10% of coupe area</li> <li>Any reduction in open space of coupe area by planting.</li> </ul>	<ul style="list-style-type: none"> <li>Up to 5ha</li> </ul>
<b>Approval by formal plan amendment may be required</b>	Y	<ul style="list-style-type: none"> <li>Felling delayed into second or later 5 year period.</li> <li>Advance felling (phase 3 or beyond) into current or 2nd 5 year period.</li> </ul>	<ul style="list-style-type: none"> <li>More than 15% of coupe area.</li> </ul>	<ul style="list-style-type: none"> <li>More than 5 planting seasons after felling, subject to the wider forest and habitat structure not being significantly compromised.</li> </ul>	<ul style="list-style-type: none"> <li>Change from specified native species.</li> <li>Change Between species group.</li> </ul>	<ul style="list-style-type: none"> <li>As above, depending on sensitivity.</li> </ul>	<ul style="list-style-type: none"> <li>In excess of 10% of coupe area.</li> <li>Colonisation of open space agreed as critical.</li> </ul>	<ul style="list-style-type: none"> <li>More than 5ha.</li> </ul>

## NOTES:

\* Felling sequence must not compromise UKFS, in particular felling coupe adjacency

\*\* No more than 1ha, without consultation with FCS, where the location is defined as 'sensitive' within the Environmental Impact Assessment (Forestry) 1999 Regulations (EIA)

\*\*\* Tolerance subject to an overriding maximum 20% open space

\*\*\*\* Where windblow occurs FCS should be informed of extent prior to clearance and consulted on where clearance of any standing trees is required

## Larch Tolerance Table

	<b>Adjustment to Felling period</b>	<b>Timing of Restocking and species component</b>	<b>Felling of larch within a mixed coupe</b>	<b>Changes to Road Lines</b>
<b>FC Approval normally not required</b>	Fell date for phase 2 can be moved forward where larch comprises 50% or more of the coupe species component.	changes to restocking proposal that exclude larch and closely related species in the same genus, eg Sitka and Norway Spruce.  Up to 3 planting seasons after felling		
<b>Approval normally by exchange of letters and map</b>	Felling moved between phases 1 and 2 where larch comprises less than 50% of the coupe species component	Changes to restocking proposals that include larch or closely related species in the same genus, eg Sitka and Norway Spruce.  Between 3 and 5 planting seasons after felling	Areas of pure larch up to 20% of coupe area within phase 1 and 2 can be felled to remove the sporulating host, with restocking deferred until the rest of the crop is felled. Where the Larch constitutes more than 20% of the coupe component, then the whole coupe must be felled and restocked together.	New road lines (subject to EIA screening opinion) or tracks within existing approved plans necessary to allow the extraction of Larch material.  Where necessary Prior Approval should be dealt with directly with the relevant Regional Council
<b>Approval by formal plan amendment is required</b>	Advance felling into current or 2 <sup>nd</sup> phase for pre-emptive larch removal			Where a new public highway entrance or exist is required. Where necessary Prior Approval should be dealt with directly with the relevant Regional Council

Larch felled in the autumn and winter, when the presence of P ram cannot be assessed visually must be treated as infected and will therefore require a movement licence. When carrying out operations where the clearance has not been on the Public Register or through the consultation procedure it is important that due diligence is undertaken to identify sites that will require to be protected.

# Appendix V: Historic Environment records

Refer to Map 12

Historic Environment Records						
Designation	Name	Feature Description (and reference number on Map 12)	Grid Reference	Importance	Area (ha)	
Undesignated	Upperhall	1 Farmstead. No evidence on ground. Not recorded on FLS Forester Web. HER ref: MDG25470	NY 12712 87922			
Undesignated	Auchenroddan	2 Prehistoric enclosure. Most of the visible features are just outside FLS land. Not recorded on FLS Forester Web. HER ref: MDG7134	NY 11684 89283			
Undesignated	Renwick's Well	3 Well. No evidence on ground. Not recorded on FLS Forester Web. HER ref: MDG25471	NY 11829 89604			
Undesignated	Whitecastle Knowe	4 Settlement. Features visible on ground.	NY 130 899	Regional	1.1ha	
Undesignated	HLA Relict Areas	5 18th-19th Century Plantation Enclosures	NY 146 832 NY 122 877 NY 119 884 NY 120 898 NY 204 731	Uncategorised		
Undesignated	Brownmoor Wood	6 Enclosure. Depicted on 1 <sup>st</sup> edition map, but no present evidence on ground	NY 203 724	Local	0.1ha	