



Forestry and  
Land Scotland  
Coilltearachd agus  
Fearann Alba

# Central Region

## Heart of Scotland Land Management Plan 2022-2032

### Main Document

Arns/Fannyside, Rawyards, Wester Moffat, Dunsyston, Chapelhall, Nether Bracco, Eastfield, and Southrigg blocks.



**Plan Reference No: 032/23/01**

**Plan Approval Date: 19/10/2022**

**Plan Expiry Date: 18/10/2032**

We manage Scotland's National Forest Estate 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.



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Land Management Plan Details			
<b>LMP Name:</b>	Heart of Scotland		
<b>Arns/Fannyside Grid Reference:</b>	NS 8022 7463	<b>Nearest town or locality:</b>	Cumbernauld
<b>Rawyards Grid Reference:</b>	NS 7764 6661	<b>Nearest town or locality:</b>	Airdrie
<b>Wester Moffat Grid Reference:</b>	NS 7867 6580	<b>Nearest town or locality:</b>	Airdrie
<b>Dunsyston Grid Reference:</b>	NS 79926447	<b>Nearest town or locality:</b>	Airdrie
<b>Chapelhall Grid Reference:</b>	NS 7858 6281	<b>Nearest town or locality:</b>	Chapelhall
<b>Eastfield Grid Reference:</b>	NS 8896 6377	<b>Nearest town or locality:</b>	Harthill
<b>Nether Bracco Grid Reference:</b>	NS 8395 6587	<b>Nearest town or locality:</b>	Caldercruix
<b>Southrigg Grid Reference:</b>	NS 9207 6618	<b>Nearest town or locality:</b>	Armadaile
<b>Local Authority (All Blocks):</b>	North Lanarkshire		
<b>Land Management Plan area (hectares):</b>	669.35		

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## Version History

Version	Date	Comments
1.0	28/01/2022	Submitted to Scottish Forestry on this date.
2.0	16/05/2022	Revised felling phases and species/habitats proposals for Nether Bracco. Revised woodland change statistics. Removal of EIA screening requirement for Nether bracco. Revised management maps for Nether bracco.
3.0	06/06/2022	<b>Section 7.5</b> 'Other Tree Felling in Exceptional Circumstances': "The maximum volume of felling in exceptional circumstances covered by this approval is 75 cubic metres per Land Management Plan per calendar year." <b>Changed to</b> "...40 cubic metres per Land Management Plan per calendar year"
4.0	20/06/22	Additional new forest road information added on LMP maps and Section 2.6: Explains rationale for proposed new road routes in relation to site sensitivities and minimising environmental impacts. Colour coding for associated road symbols made consistent across LMP maps.
5.0	20/06/22	Added reference to the Chalara Ash Dieback – Action Plan Toolkit for Scotland (June-2021). Reference to Historic Scotland – changed to Historic Environment Scotland.
6.0	26/07/2022	Advice from Naturescot and the Bean Goose Advisory Group incorporated regarding disturbance mitigation during forest operations. Also reference to the Taiga Bean Goose Advisory Group and the requirement to consult at the work planning stages of forest road construction and subsequent operations. ( <b>Section 2.6</b> – Arns; <b>Section 7.12</b> Biodiversity & Environment; Appendix 1 Land Management Plan Consultation)
7.0	31/08/2022	Website google form FLS consultation feedback & responses added.
8.0	28/09/2022	Consideration of Black Grouse added to Management Proposals Section 7.12



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## 1.0 Summary of Proposals

The Management objectives for this Land Management Plan (**LMP**) are detailed in Section 1.4 (below).

To meet the UK Forestry Standard, this LMP sets out proposals to be undertaken by the Central Region in the blocks which make up this Heart of Scotland Land Management Plan area.

The Heart of Scotland LMP area is comprised of several forest blocks within North Lanarkshire.

The forest blocks are located within the Central Scotland Green Network (CSGN) boundary and deliver towards several of the project themes or workstreams, as set out in the Delivery Plan 2030 (DP30), these being Natural Climate Solutions, Place-making, Health and Wellbeing, and Green Recovery. Objectives set out in the Delivery plan which particularly relate to this plan include: -

**Table 1. How this plan contributes to the Central Scotland Green Network Project**

Ref	Objective	Primary Workstream(s)
<b><i>Biodiversity and ecological coherence</i></b>		
HA2	Increase the area of restored peatland within the CSGN	Natural Climate Solutions Placemaking
HA5	Increase the quality/condition of habitats	Natural Climate Solutions Placemaking
HA6	Increase habitat connectivity	Natural Climate Solutions Placemaking
<b><i>Green Infrastructure</i></b>		
GI2	Increase the quality and functionality of greenspaces within the CSGN	Natural Climate Solutions Placemaking Health and Wellbeing Green Recovery

Additionally, Rawyards, Wester Moffat, and Eastfield, are located within the Woodlands In and Around Towns (WIAT) boundary, with the western portion of the Dunsynton forest block also located within a WIAT area (see Map 2A – 2H Landscape Types and WIAT).



The Concept and Future Habitats and Species maps illustrate the long-term vision for the management of the Forest blocks making up the Heart of Scotland Plan area.

(see Maps 6A -6H – Concepts, and Maps 9A-9H - Future Habitats and Species)

## 1.1 Heart of Scotland Land Management Plan Area Blocks & Plan Presentation

The Heart of Scotland Land Management Plan area extends to 669.35 ha and is made up of the following forest blocks: -

- Arns / Fannyside, Cumbernauld
- Rawyards, Airdrie
- Wester Moffat, Airdrie
- Dunsyston, Airdrie
- Chapelhall, Chapelhall
- Eastfield, Harthill
- Nether Bracco, Forrestfield
- South Rigg, Armadale

The extent of each of the Forest blocks making up the Heart of Scotland Forest area is given in the following table: -

**Table 2. List of individual land blocks within this plan**

Forest Block	Block Ref no.	Area Ha
Arns/Fannyside	73	268.32
Rawyards	80	20.66
Wester Moffat	80	7.09
Dunsyston	77	82.70
Chapelhall	77	5.10
Nether Bracco	75	163.03
Eastfield	92	45.38
South Rigg	76	77.07
		<b>669.35</b>

The LMP Maps 1 and Maps 1A-1G show the location and site boundaries of the Forest blocks.

This plan briefly describes each of the blocks making up the forest area, and examines aspects and proposals relating to the forest, with reference made to the relevant blocks in



context. More detailed descriptions of each of the forest blocks is provided in the Appendices to this plan (see Appendices III-X).

## 1.2 List of Supporting Maps

1. Location and Context	2. Designations
1 Heart of Scotland Combined Forest Blocks Context	2 Heart of Scotland WIAT and Landscape Types
1A Arns	2A Arns
1B Rawyards & Wester Moffat	2B Rawyards
1C Dunsyston	2C Wester Moffat
1D Chapelhall	2D Dunsyston
1E Nether Bracco	2E Chapelhall
1F Eastfield	2F Nether Bracco
1G Southrigg	2G Eastfield
	2H Southrigg
3. Soils and Drainage	4. Existing Forest Stock
3A Arns	4A Arns
3B Rawyards	4B Rawyards
3C Wester Moffat	4C Wester Moffat
3D Dunsyston	4D Dunsyston
3E Chapelhall	4E Chapelhall
3F Nether Bracco	4F Nether Bracco
3G Eastfield	4G Eastfield
3H Southrigg	4H Southrigg
5. Survey and Analysis	6. Concept Design
5A Arns	6A Arns
5B Rawyards	6B Rawyards
5C Wester Moffat	6C Wester Moffat
5D Dunsyston	6D Dunsyston
5E Chapelhall	6E Chapelhall
5F Nether Bracco	6F Nether Bracco
5G Eastfield	6G Eastfield
5H Southrigg	6H Southrigg
7. Management Coupes and Silviculture	8. Felling Proposals and Planned Roads
7A Arns	8A Arns
7B Rawyards	8B Rawyards
7C Wester Moffat	8C Wester Moffat
7D Dunsyston	8D Dunsyston
7E Chapelhall	8E Chapelhall
7F Nether Bracco	8F Nether Bracco
7G Eastfield	8G Eastfield
7H Southrigg	8H Southrigg
9. Thinning Proposals	10. Forest Access
9A Arns	10A Arns
9B Rawyards	10B Rawyards
9C Wester Moffat	10C Wester Moffat
9D Dunsyston	10D Dunsyston
9E Chapelhall	10E Chapelhall
9F Nether Bracco	10F Nether Bracco
9G Eastfield	10G Eastfield
9H Southrigg	10H Southrigg
11. Future Habitats and Species	
11A Arns	
11B Rawyards	
11C Wester Moffat	
11D Dunsyston	
11E Chapelhall	
11F Nether Bracco	
11G Eastfield	
11H Southrigg	





## 1.3 Key Background Information

### Site Descriptions:

The Heart of Scotland Forest comprises 8 separate forest blocks which vary in terms of location and setting, size, composition and management objective.

A brief description of each block is provided in this section. Further details relating to each site are included as Appendices to this plan - see Appendices III-X

- **Arns/Fannyside**

Arns / Fannyside is 268.32 ha in extent. The site is fringed by conifer plantation, agricultural land and open moorland.

There is approximately 65.46 ha of existing woodland present of which 35.93ha is predominantly conifer forest, some of which is windblown. The remaining land is mainly open moorland, which forms part of Fannyside Muir, part of which has undergone peatland restoration.

The nearest settlements are Cumbernauld, which is ~500m to the north-west, Jawcraig, which is ~3.1km to the east and Slamannan, which is ~4.1km to the south-east. There are other dwellings and farms in the surrounding area, including adjacent to the northern boundary.

Fannyside Loch and Palacecrigg Country Park to the south-west. The south of the block is within the Slamannan Plateau Site of Special Scientific Interest and Special Protection Area, designated for the Taiga Bean Goose population. The site is crossed by a public road constructed over peat.

- **Rawyards**

Rawyards extends to 20.66 ha. It comprises 9.2ha of mixed, mainly native woodland, birch, and native broadleaf plantation, with 11.46 ha remaining as open ground.

Rawyards is located to the north-east of the built-up area of Airdrie, with agricultural and industrial land to their northern and eastern boundaries. As well as being adjacent to Airdrie, the settlement of Plains is located ~900m east from the Rawyards block, with a number of individual dwellings and farms in the surrounding area.



- **Wester Moffat**

Wester Moffat extends to 7.09 ha, is located on north-eastern edge of the conurbation of Airdrie and is adjacent to Wester Moffat Hospital (now a care home). The site also fringes the North Calder Water.

The woodland present is mixed age broadleaf woodland.

- **Dunsyston**

Dunsyston extends to 82.70 ha. It comprises 62.14 ha of forest, which is predominantly conifer. The remainder of the land is generally open, with a small agricultural field of ~1ha located to the south of the block and separated from the main woodland areas by a public road.

Dunsyston is located on the southern edge of the Moffat Mills area on the eastern edge of Airdrie, and is fringed by a mix of urban area, woodland, and agricultural land.

The nearest settlements are Airdrie, which extends to the northern edge of Dunsyston. There are other dwellings and farms located at Easter Dunsyston, to the immediate south of Dunsyston, and Craigends and Gartness Farms, Roughrigg reservoir is located to the south-east of Dunsyston and is a water supply serving the area.

A small section of the block sits within Ladybell's Moss SSSI which is located to the north-east of Dunsyston. A former colliery was located within the site in the south-eastern corner of the area, with some features still discernible.

- **Chapelhall**

Chapelhall is a small block of broadleaf woodland the eastern edge of the A73 Road corridor and fringes a short section of the Shotts Burn.

The site extends to 5.10 hectares and consists of recently planted central blocks of mixed broadleaf planting with some more mature semi-natural woodland which forms a riparian corridor along the watercourse. The site is crossed by a large overhead electricity service with an associated wayleave. Woodland cover accounts for 3.79ha of the site, with the remainder being open space.



To the north and south of the site are areas of agricultural grazing land.

The nearest settlement is Chapelhall which is located to the east on the other side of the A73 road corridor.

- **Eastfield**

Eastfield and Muirhead covers 45.38ha. It comprises of 33.94ha of forest, which is predominantly conifer plantation, together with areas of birch, ash and oak planting. The remainder of the land comprises open space.

The forest block is surrounded by agricultural land to the south – with the settlement of West Benhar on the southern boundary – and due north, with a quarry to the immediate north-west and the settlement of Eastfield to the north-east.

Other nearby settlements are Harthill, ~500m north-east, and Shotts ~3km south-west, with some farms and other dwellings in the surrounding area. There are two historic farmstead sites within the north of the block.

- **Nether Bracco**

Nether Bracco is 163.03ha. It comprises ~133.34 ha of predominantly conifer plantations, which includes a substantial amount of larch planting, managed as natural reserve under the previous Management Plan. There is a substantial open area in the south-east of the block which has undergone peatland restoration.

Nether Bracco is located within an agricultural landscape, with a large quarry to the immediate east. The nearest settlements are Hillend (~1.1km) and Caldercruix (~1.6km) to the north-west and Kirk of Shotts, ~1.2km to the south. Nether Bracco Farm is located on the northern boundary (through which current access is available) with other farms and dwellings within the surrounding area.

There is a Local Natural Reserve within the northern part of the block, with a further Local Nature Reserve to the immediate east, and a Scheduled Monument to the south and west which extends between the two sections of the forest block

- **Southrigg**

South Rigg is 77.07ha. It comprises of 67.97ha of mainly coniferous plantation, with the remainder of the land generally open or open water. It is surrounded by agricultural land, conifer plantation and windfarm development, with the M8 running in close proximity to its southern boundary. The nearest settlements are Armadale, ~880m to the north-east and Whitburn, ~1km to the southeast. Southrigg Farm sits on the northern boundary of



the southern part of the block, with other farms and individual dwellings in the vicinity. There is a Local Nature Reserve within the northern part of the block.

### Silvicultural Potential:

Table 3 sets out the Land Capabilities for each of the Forest blocks in terms of assessed Land Capability for forestry (LCF) and Land Capability for agriculture (LCA).

**Table 3. Heart of Scotland land capability for forestry and agriculture**

Forest Block	LCF	Land capability	LCA	Land capability
Arns/Fannyside	F5	Land with limited flexibility for the growth and management of tree crops	5.3	Land capable of use as improved grassland. Pasture deteriorates quickly
Rawyards	F4	Land with moderate flexibility for the growth and management of tree crops	4.2	Land capable of producing a narrow range of crops, primarily on grassland.
Wester Moffat	F3	Land with good flexibility for the growth and management of tree crops	3.2	Land capable of average production, though high crop yields can be obtained
Dunsyston	F4 (west) F5 (east)	Land with moderate flexibility for the growth and management of tree crops Land with limited flexibility for the growth and management of tree crops	4.2	Land capable of producing a narrow range of crops, primarily on grassland.
Chapelhall	F4	Land with moderate flexibility for the growth and management of tree crops	4.2	Land capable of producing a narrow range of crops, primarily on grassland.
Nether Bracco	F5	Land with limited flexibility for the growth and management of tree crops	5.3	Land capable of use as improved grassland. Pasture deteriorates quickly
Eastfield	F3	Land with good flexibility for the growth and management of tree crops	5.2	Land capable of use as improved grassland. Pasture but may be difficult to maintain.



Forest Block	LCF	Land capability	LCA	Land capability
Southrigg	F5	Land with limited flexibility for the growth and management of tree crops	4.2	Land capable of producing a narrow range of crops, primarily on grassland.

Land Capabilities for Forestry across the Forest range from F3 to F5, with the majority of the land falling within the F5 land classification, with limitations in terms of species choice and tree growth.

Arns / Fannyside has previously been assessed as non-productive and was not included in the assessment of silvicultural potential under the previous Management Plan. Proposals under this plan aim at felling a substantial proportion of the remaining standing timber on the site and given the scale of operations, it is likely that a substantial proportion will, with suitable access, be extracted from site.

Timber production is a key objective for the Dunsyston, Nether Bracco, and initially at Southrigg block under this Plan. Felling proposed at Southrigg is to facilitate habitat restoration works. For all three blocks, access for management will be required in the form of new forest roads, which will factor in terms of the economic viability of the proposals.

The woodlands at Rawyards, Wester Moffat and Chapelhall are primarily recreational in function, with management of these areas geared towards the provision of areas for public access. The woodlands primarily broadleaf with a mixed species composition. Any timber production from proposed management operations under this plan is likely to be limited in scale, and given access constraints, operations are likely to be carried out as a fell to residue operation with arisings utilised or dispersed on site.

Eastfield is also an area with a key recreational function mainly serving the Eastfield and Harthill communities. The woodland is however a significant size and has areas of productive conifer woodland as part of its planting composition. Management proposals for the woodlands include for felling and thinning operations. These harvesting operations will again require access improvements in the form of new forest roads.



**Table 4 Heart of Scotland Forest Yield Classes by Forest Block**

	<b>Arns</b>	<b>Rawyards</b>	<b>Wester Moffat</b>	<b>Dunsyston</b>	<b>Chapelhall</b>	<b>Nether Bracco</b>	<b>Eastfield</b>	<b>Southrigg</b>	<b>Grand Total</b>
<b>Yield Class</b>	Area (Ha)	Area (Ha)	Area (Ha)	Area (Ha)	Area (Ha)	Area (Ha)	Area (Ha)	Area (Ha)	Area (Ha)
<b>0/ OG</b>	202.56	11.46	0.47	20.56	1.31	29.69	11.44	9.12	<b>286.61</b>
<b>2</b>	14.9	1.49	5.57	12.26	0.67	7.25	2.06	13.19	<b>59.39</b>
<b>4</b>	2.74	0.6	1.05	6.27	3.12	34.87	9.09	1.36	<b>59.1</b>
<b>6</b>	16.67	0.3		0.53		12.73	0.25	0.96	<b>37.44</b>
<b>8</b>	18.7	0.77		1.86			5.45	23.62	<b>58.4</b>
<b>10</b>	2.52	6.04		1		0.53	0.43	0.35	<b>10.87</b>
<b>12</b>	9.52			7.55		13.02	1.13	2.95	<b>34.17</b>
<b>14</b>	0.71			8.62		19.93		12.62	<b>41.88</b>
<b>16</b>				24.05		26.47		12.9	<b>63.42</b>
<b>18</b>						18.54	4.6		<b>23.14</b>
<b>20</b>							4.05		<b>4.05</b>
<b>24</b>							6.88		<b>6.88</b>
<b>Grand Total</b>	<b>268.32</b>	<b>20.66</b>	<b>7.09</b>	<b>82.7</b>	<b>5.1</b>	<b>163.03</b>	<b>45.38</b>	<b>77.07</b>	<b>669.35</b>

The yield classes reflect site conditions, woodland composition (with broadleaf dominated blocks reflecting a generally lower yield) and are generally lower on the more exposed sites with soils of low nutrient status.

The source and currency of the data is not known, and on some sites, particularly those issues relating to waterlogging, growth on the ground does not appear to reflect the relatively high yield classes recorded.



**Table 5 Heart of Scotland Forest Age Classes by Forest Block**

	Arns	Rawyards	Wester Moffat	Dunsyston	Chapelhall	Nether Bracco	Eastfield	Southrigg	Grand Total
Age Class	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)
n/a/OG	202.86	11.46	0.17	20.56	1.31	29.69	11.44	9.12	<b>286.61</b>
1-10		9.2					5.13		<b>14.33</b>
11-20	18.51			2.42		23.15			<b>44.08</b>
20-25				17.45			6.06		<b>23.51</b>
25-30	25.52		4.63	39.92	3.54			8.75	<b>82.36</b>
30-35							12.55	37.19	<b>49.74</b>
35-40							8.74	22.01	<b>30.75</b>
40-45					0.25	103.81			<b>104.06</b>
45-50	21.43								<b>21.43</b>
50-55						6.38	1.46		<b>7.84</b>
70-75			1.99						<b>1.99</b>
120-125			0.3						<b>0.3</b>
121-125				2.35					<b>2.35</b>
<b>Grand Total</b>	<b>268.32</b>	<b>20.66</b>	<b>7.09</b>	<b>82.7</b>	<b>5.1</b>	<b>163.03</b>	<b>45.38</b>	<b>77.07</b>	<b>669.35</b>

There is some variation in age class within the forest, but the majority of the woodland is relatively young and has been established within a relatively short time-frame.

Diversification of the age structure is anticipated through a programme of phased felling and the management of selected suitable woodlands as long-term retention, continuous cover forest, and natural reserve areas.



## 1.4 Main Considerations

### Larch and *Phytophthora ramorum*

- There is larch present within the woodland mixes at Dunsyston, Eastfield and Muirhead, Nether Bracco and South Rigg.
- Due to the increased likelihood of infection by *Phytophthora ramorum* (PR) in this area, a strategy for the management, removal and restocking of larch in these locations is proposed in this plan, Larch is present at in the forest blocks at Dunsyston, Nether Bracco, Eastfield, and Southrigg and Dunsyston and Nether Bracco have been identified as difficult coupes.
- Larch removal will influence various other considerations, including site access, habitat management, harvesting operations, crop stability, and appropriate restocking.

### Peatland Restoration

- There are several areas within the Forest which have been identified as having potential for peatland restoration, or where there is opportunity to enhance previous restoration works. This includes at: Arns, Nether Bracco, and South Rigg.
- Restoration projects need to be considered through assessment of hydrology, comparative carbon sequestration under forest, resolving access issues and a methodology for safely clearing existing conifer plantation, particularly at Arns and at Southrigg.

### Access

- A number of the blocks where there are aspirations for operational work have access issues, with either no or low quality roading. Proposals for the provision of roads to fulfil the for-site management in line with LMP management proposals and future aspirations for timber production or peatland restoration.
- North Lanarkshire Council are considering proposing a new bypass road for Airdrie which is likely to be routed through the Dunsyston block. This may provide a solution for operational access, but the timeline of this proposal is uncertain, and may not be delivered to a timescale which would support proposed larch removal works.
- Timber transport requirements will be agreed with the local timber transport group.





## Other

- There is scope to continue timber production at in several of the blocks, and the productive potential of these locations should not get lost in resolving the above issues.
- Wildlife management is currently working well across these blocks, but if there is extensive restocking following larch removal, the protection of these plantings will need to be considered.
- There are a number of neighbour issues in some of the forest blocks. These include maintenance of site boundaries, encroachment, stock management, drainage, shading, tree stability, and fly-tipping, and are particularly associated with smaller sections of recreational woodland positioned close to areas of housing.
- Chalara Ash Dieback is another plant health issue which is impacting on the forest area. Although ash makes up a relatively small proportion of the overall Forest composition (accounting for 0.4% of the Forest area), there will be some impact and consequent management consideration in relation to public safety, landscape and biodiversity. Actions to manage these issues will be guided by the framework set out in the Ash-Dieback: Action Plan Toolkit for Scotland (June-2021).



## 1.5 Management Objectives

Corporate Outcomes Relevant to LMP	Operational Actions To Deliver Outcome Relevant to LMP	LMP Objectives
<p>Outcome 1: Supporting a Sustainable Rural Economy</p> <p>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 investments.</p>	<ul style="list-style-type: none"> <li>• Managing the national forests and land in accordance with the UK Woodland Assurance Scheme (UKWAS) to ensure that timber and other products produced by FLS are guaranteed to be from a sustainably managed resource.</li> <li>• Developing our forest planning processes to ensure long-term sustainable productivity of the national forests and land.</li> <li>• Providing a sustainable supply of timber to Scotland's timber processing sector; and</li> <li>• Support the venison processing sector through our deer management.</li> </ul>	<ul style="list-style-type: none"> <li>• To create a strategy for the removal of larch in the most appropriate way for each block.</li> <li>• To ensure sustainable productivity through considered species selection and using silvicultural systems which have been applied appropriately to respond to soil conditions, habitat types and proposed operational variables across the blocks;</li> <li>• That the protection of planted crops is ensured through game management, through establishment on to the long-term; and</li> <li>• To undertake bog restoration projects where appropriate, providing opportunity to generate income through the peatland carbon code.</li> </ul>



Corporate Outcomes Relevant to LMP	Operational Actions To Deliver Outcome Relevant to LMP	LMP Objectives
<p>Outcome 2: Looking after Scotland's national forests and land</p> <p>Scotland's national forests and land are looked after, biodiversity is protected and enhanced, and more environmental services are provided to people.</p>	<ul style="list-style-type: none"> <li>• Managing the national forests and land to further the conservation and enhancement of biodiversity.</li> <li>• Taking specific conservation action for vulnerable priority species (e.g. bat species, lapwing, large heath, species which will utilise the watercourse and pond within the site).</li> <li>• Supporting policy development and research, and act as a testbed for new and innovative approaches to forestry and land management; and</li> <li>• Developing an asset management approach to the historic environment within Scotland's forests and land.</li> </ul>	<ul style="list-style-type: none"> <li>• To contribute to the conservation and enhancement of the site's biodiversity value through appropriate design e.g. tree species choice, retaining areas of priority open habitat, particularly considering the areas of SSSI and SPA.</li> <li>• To consider larch restocking species for habitat and biodiversity, particularly where larch is being removed from areas managed as Natural Reserve.</li> <li>• To protect historical features and maintain access to the Scheduled Monument and heritage assets across the blocks; and</li> <li>• To enhance bog, fen, and meadow habitats where appropriate across the blocks.</li> </ul>



Corporate Outcomes Relevant to LMP	Operational Actions to Deliver Outcome Relevant to LMP	LMP Objectives
<p>Outcome 3: National forests and land for visitors and communities</p> <p>Everyone can visit and enjoy Scotland's national forests and land to connect with nature, have fun, benefit their health and wellbeing and have the opportunity to engage in our community decision making.</p>	<ul style="list-style-type: none"> <li>• Continuing to remove barriers to ensure that people from all backgrounds can and do access the full range of benefits of the national forests and land.</li> <li>• Continuing to engage communities in decisions relating to the management of the national forests and land.</li> <li>• Continuing to support community empowerment by enabling communities to make use of the national forests and land to benefit their communities.</li> </ul>	<ul style="list-style-type: none"> <li>• To maintain opportunities for public access within the blocks, at a standard relevant to each.</li> <li>• To look for opportunities to design out antisocial behaviour; and</li> <li>• To work closely with neighbours to ensure that any concerns are included in the LMP process and solutions can be provided which work for all involved.</li> </ul>



## 1.6 Woodland changes over the LMP period

Table 6 – Land Use change within Heart of Scotland Plan Area

Land Use	Area 2022 (ha)	% of Total Plan Area 2022	Area 2032 (ha)	% of Total Plan Area 2032	Area 2042 (ha)	% of Total Plan Area 2042
Agricultural Land	1.1	0.16%	0	0.00%	0	0.00%
Felled	0	0.00%	0.4	0.06%	14.7	2.20%
High Forest	377.14	56.34%	266.3	39.78%	246.9	36.89%
Open	274.31	40.98%	393.85	58.84%	402.95	60.20%
Open Water	0.1	0.01%	0.1	0.01%	0.1	0.01%
Partially Intruded broadleaves	0.7	0.10%	0.5	0.07%	0	0.00%
Unplantable or bare	6.4	0.96%	3.1	0.46%	0.2	0.03%
Unplanted Streambanks	4.7	0.70%	4.5	0.67%	4.5	0.67%
Windblow	4.9	0.73%	0.6	0.09%	0	0.00%
<b>TOTALS</b>	<b>669.35</b>	<b>100%</b>	<b>669.35</b>	<b>100%</b>	<b>669.35</b>	<b>100%</b>



Table 7 – Change in Forest Composition within Heart of Scotland Plan Area 2022-2042

Species Composition	Area 2022 (ha)	% of Total Plan Area 2022	Area 2032 (ha)	% of Total Plan Area 2032	Area 2042 (ha)	% of Total Plan Area 2042
Sitka spruce	272.34	40.7%	145.6	21.8%	108	16.1%
Larch	13.1	2.0%	4.2	0.6%	2.9	0.4%
Scots pine	15.5	2.3%	14.5	2.2%	13.1	2.0%
Lodgepole pine	10.5	1.6%	19.9	3.0%	45.1	6.7%
Norway spruce	0	0.0%	1	0.1%	2.7	0.4%
Mixed conifers	3.3	0.5%	1.3	0.2%	1.3	0.2%
Other conifers	1	0.1%	1	0.1%	1	0.1%
Birch (downy/ silver)	27.6	4.1%	16.1	2.4%	15.9	2.4%
European Ash	2.5	0.4%	2.5	0.4%	2.4	0.4%
Oak (robur/petraea)	2.5	0.4%	2.5	0.4%	2.5	0.4%
Native mixed broadleaves	7.1	1.1%	39.9	6.0%	44.8	6.7%
Mixed broadleaves	27.3	4.1%	27	4.0%	26.7	4.0%
Open/Other	286.61	42.8%	393.85	58.8%	402.95	60.2%
<b>TOTALS</b>	<b>669.35</b>	<b>100%</b>	<b>669.35</b>	<b>100%</b>	<b>669.35</b>	<b>100%</b>

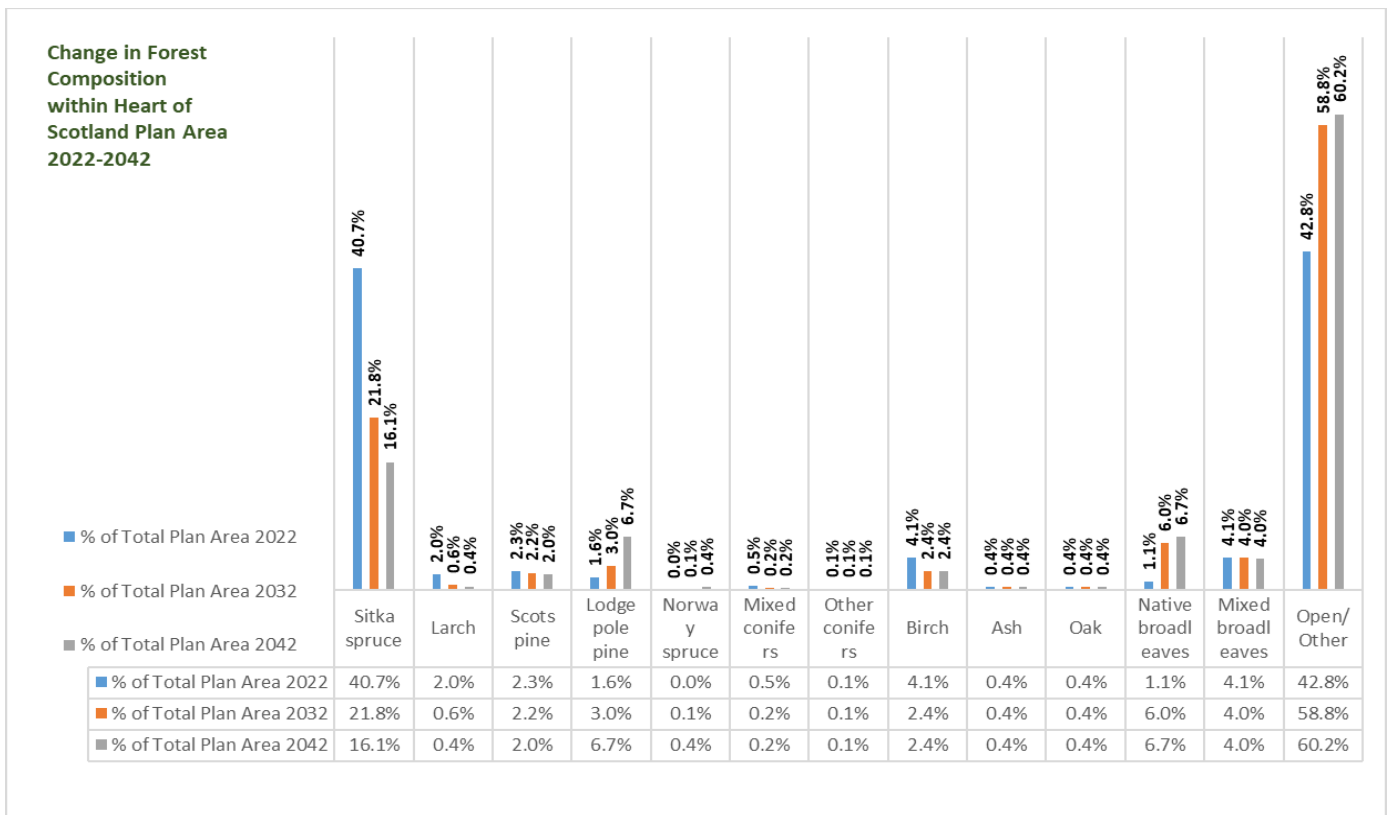




Table 8– Age Class change of forest stands within Heart of Scotland Plan Area

	% of Total Plan Area 2022	% of Total Plan Area 2032	% of Total Plan Area 2042
All 0-5 Years	0.0	10.2	18.6
All 6-10 Years	4.4	23.7	10.8
All 11-15 Years	0.0	0.0	10.7
All 16-20 Years	6.5	5.5	25.7
All 21-30 Years	34.3	7.6	6.0
All 31-40 Years	21.1	32.9	6.4
All 41-60 Years	32.3	15.9	18.6
All 61-80 Years	0.0	2.2	1.3
All 81-100 Years	0.4	0.0	0.0
All 100+ Years	1.2	1.9	2.0
<b>TOTALS</b>	<b>100</b>	<b>100</b>	<b>100</b>

Figure 1 – Age Class change of forest stands within Heart of Scotland Plan Area

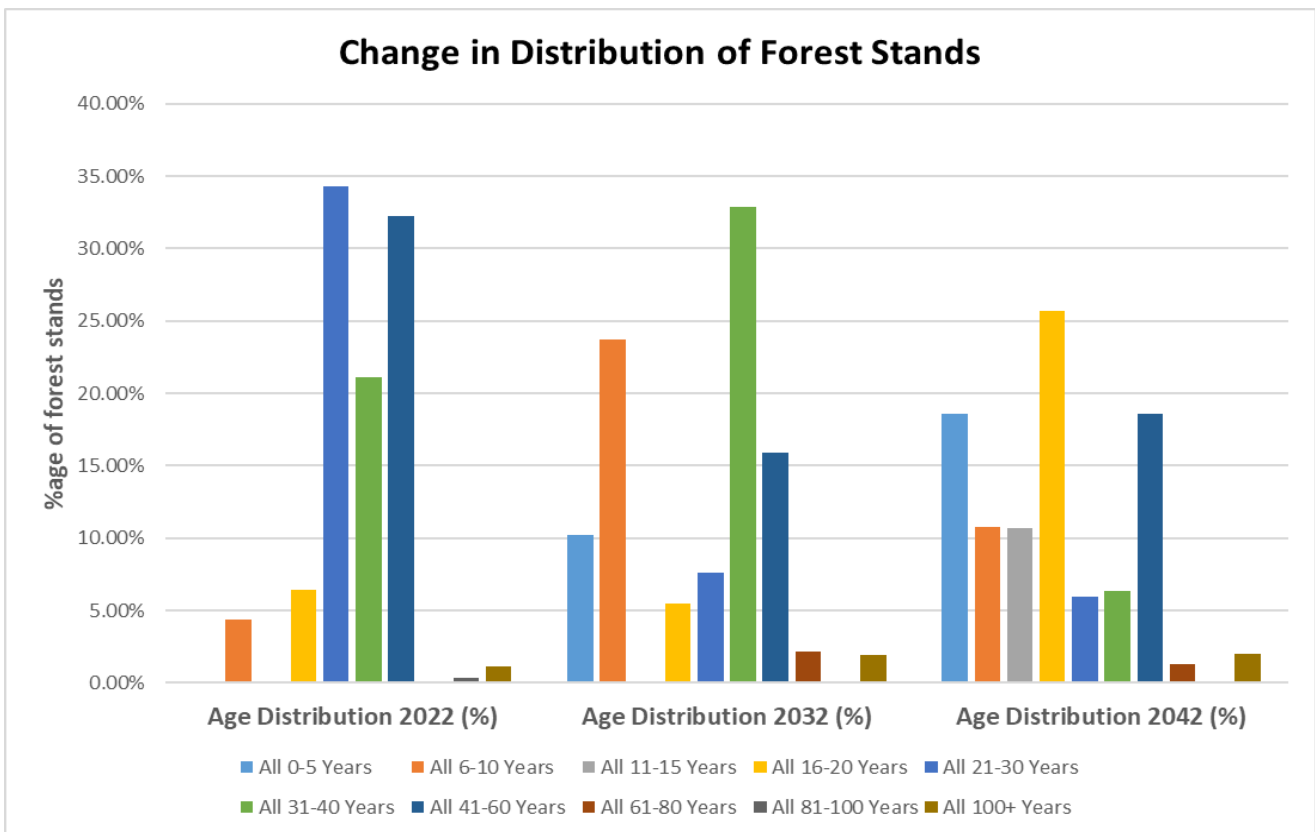




Table 9 – UKWAS Indicators of Proposed Plan

UKWAS indicator	Description	Area (ha)	% of Plan Area
Natural Reserve – Plantation Origin	Natural reserves are predominantly wooded, usually mature and intended to reach biological maturity. They are permanently identified and in locations which are of particularly high wildlife interest or potential. They are managed by minimum intervention unless alternative interventions have higher conservation or biodiversity value.	65.4	18
Natural Reserve – Semi-natural		0	0
Long-term Retention	Individual, stable stands and clumps of trees retained for environmental benefit significantly beyond the age or size generally adopted by the woodland enterprise.	96	14.1
Total Area of Land with Conservation Value	Includes natural reserves, minimum intervention coupes, long-term retentions, LISS management coupes. Designated/protected sites.	184.7	27.7
Planned Open	Managed Open and Successional Open.	367.4	55





## 2.0 Scottish Forestry Regulatory Requirements

All proposals have been produced in accordance with a range of government and industry standards and guidance as well as recent research outputs. A full list of current standards and guidance can be found [here](#)

### 2.1 Summary of Planned Operations

Approval is sought for 129.24 ha felling, 56.52 ha of thinning, and 5822m of new forest roading within the next 10-year operational period.

**Table 10 Summary of Planned Operations**

Planned Operations	2022-2031
Clearfell/Clearfell with seed tree (afforested area)	129.24 ha
LISS Felling (afforested area)	0
Thinning	56.52 Ha
LISS Restock (replanted area)	0
Woodland Creation (New Planting)	1.14 Ha
Road Construction	5822 m
Hard Standing – Timber stacking, loading and turning areas)	0.15 ha



## 2.2 Proposed felling in years 2022-2032

The proposed felling in the first two LMP phases will entail clearfelling of 188.57 ha of woodland. Most of this felling relates to the felling of productive conifer areas which have reached the end of their rotation period.

Although the intention is to restock most of the areas, some felling is geared at creating the opportunity for habitat restoration proposals, and the intention is to restore such areas to bog habitat (subject to the wider FLS peatland programme.)

(See Maps 8A-8H: Felling proposals and planned roads)

**Table 11 Clearfelling over the 10 year LMP period**

Felling Coupe	Phase 1 2022-2026	%	Phase 2 2027-2031	%
<b>Arns</b>				
73006	2.24	1.9%		
73007	3.55	3.0%		
73008	6.48	5.5%		
<b>Eastfield</b>				
92001	5.17	4.4%		
92007	1.61	1.4%		
<b>Nether Bracco</b>				
75005	9.52	8.1%		
75006			12.01	100.0%
75007	43.55	37.1%		
<b>Southrigg</b>				
76003	1.68	1.4%		
76005	43.43	37.0%		
<b>Totals</b>	<b>117.23</b>	<b>100.0%</b>	<b>12.01</b>	<b>100.0%</b>



## 2.3 Proposed thinning in years 2022-2032

**Table 12 Thinning Breakdown by land block and management coupe**

(See Maps 9B-9H: Proposed Thinning)

Thinning 2022 - 2032 (Area in Hectares)	
Management Coupe	Area
<b>Wester Moffat</b>	
80017	1.3
<b>Dunsyston</b>	
77001	4.49
77002	1.99
77004	6.12
77007	3.45
77010	0.02
77011	10.96
<b>Chapelhall</b>	
77014	2.34
<b>Eastfield</b>	
92002	13.92
92003	9.00
92006	3.58
<b>Total Plan Thinning Area (Hectares)</b>	<b>56.52</b>

Thinning in the first two phases of the LMP will focus on the respacing and selective thinning of mixed woodland and broadleaf areas to maintain species diversity and visual amenity.

Some of the thinning proposed will also target Larch for removal under FLS's Larch Strategy, and will also target Chalara affected ash where this is present in the planting mix.



## 2.4 Proposed restocking in years 2022-2032

A limited amount of restocking and new planting is proposed within the first 10-year period of this LMP. Both areas are located within the Dunsyston Forest Block.

Where sites are being replanted, the fallow period will be 1 to 2 years. The forest blocks in this plan are relatively small with no recent felling, hence *Hylobius* populations have not had the chance to build up. Weed competition is deemed a more challenging factor for establishment, which will be monitored and controlled.

One area of restocking is proposed. This follows on from group felling of larch in one location to the north of the main block as part of the FLS Larch Strategy to control *P.ramorum*.

The small agricultural field currently under a grazing let is also proposed for planting.

(see Maps 12A-12H: Future Habitats and Species)

Total restock phase 1 = 75.23 hectares

Total restock phase 2 = 11.83 hectares

**Total Restock Plan Period = 87.56 hectares**



Table 13 Phase 1 Restocking of felled areas 2022-2027

Coupe Number	Total Area (ha)	Sitka spruce (ha)	Lodgepole pine (ha)	Scots Pine (ha)	Norway spruce (ha)	Mixed Conifer (ha)	Mixed Broadleaves (ha)	Birch (ha)	Native mixed broadleaves (ha)	NVC Type <sup>3</sup>	Restock year	Restock Planting (stems/hectare and square spacing)	Monitoring Comments (including and reason not to restock)
Arns 73007	1.65								1.65	W3/W4	2025	1600 stems/ha (2.5m x 2.5m) W3 wetter ground. W4 drier ground	SDA <sup>4</sup>
Arns 73008	6.46								6.46	W3/W4	2025	1600 stems/ha (2.5m x 2.5m) W3 wetter ground. W4 drier ground	SDA
Nether Bracco 75007	43.88	25.55	7.51	1.97			0.37	1.23	7.25	W4	2025	Productive Conifers <sup>2</sup> 2700 stems/ha (1.9 mx 1.9m) Broadleaved/Mixed Woodland 1600 stems/ha (2.5m x 2.5m)	SDA
Nether Bracco 75005	9.86	2.46	2.02						5.38	W3/W4/W7	2025	Productive Conifers <sup>2</sup> 2700 stems/ha (1.9 mx 1.9m) Broadleaved/Mixed Woodland 1600 stems/ha (2.5m x 2.5m)	SDA
Southrigg 76003	1.31					0.11	1.2				2025	1600 stems/ha (2.5m x 2.5m)	SDA
Southrigg 76005	5.79								5.79	W3/W7	2025	1600 stems/ha (2.5m x 2.5m)	SDA
Eastfield 92001	5.17	2.59	1.55		1.03						2026	<sup>2</sup> 2700 stems/ha (1.9 mx 1.9m)	SDA
Eastfield 92007	1.61								1.61	W4	2026	1600 stems/ha (2.5m x 2.5m)	SDA



Table 14 Phase 2 Restocking of felled areas 2028-2032

Coupe Number	Total Area (ha)	Sitka spruce (ha)	Lodgepole pine (ha)	Scots Pine (ha)	Norway spruce (ha)	Mixed Conifer (ha)	Mixed Broadleaves (ha)	Birch (ha)	Native mixed broadleaves (ha)	NVC Type <sup>3</sup>	Restock year	Restock Method & Initial Density (Restock/Nat Regen/Alt Area/Coppice/Open)	Monitoring Comments (including and reason not to restock)
Nether Bracco 75006	11.83	6.63	2.86						2.34	W3/W4/W7	2025	Productive Conifers <sup>2</sup> 2700 stems/ha (1.9 m x 1.9m) Broadleaved/Mixed Woodland 1600 stems/ha (2.5m x 2.5m)	SDA

1. SDA = Stocking Density Assessment at growth year 1 and growth year 5
2. Productive conifer restock planting at full initial density of 2,700 stems/ha to achieve a final density of 2,500 stems/ha at year 5, with an emphasis on achieving overall stocking.
3. See [Section 7.7.3 Restock Prescriptions](#) for NVC semi-natural woodland type and planting mix.



## 2.5 New Planting (Woodland Creation)

A small area of land at Dunsyston which has previously let for grazing has been identified for new woodland planting. The field extends to 1.14ha and is located to the south of and separated from the main blocks at Dunsyston, on a road junction close to the main woodland entrance. The site is fringed to the north and west by minor roads, to the south by a small-holding, and to the east by Roughrigg Reservoir.

The proposed main purpose of the woodland is amenity, with nature conservation, shelter, and timber production being secondary functions.

## 2.6 New forest road requirements 2022-2032

One of the key issues currently restricting management of the larger productive woodland blocks in the Heart of Scotland Forest area is the lack of suitable management access to the timber crops for the purposes of thinning, harvesting, and restocking. There has been no great need to form this access in previous management phases as the majority of the woodland areas were even-aged and developing through establishment phase to this point of time where they have reached their end of rotation.

Limited access may have in the past restricted opportunities for thinning of some of the woodland areas and as a result the majority of the productive conifer areas have been managed under a no-thin regime, which will have foreshortened the crop rotation period.

The formation of access roads is proposed now that productive areas have reached harvesting age. The proposed access aims to serve the management requirements over the whole plan period and beyond and will make current and future phases of work accessible, facilitating the future management of the blocks more generally. Management is considered practically impossible without the formation of these proposed routes.

In addition to the formation of forest access roads, there will be a requirement to create hard standing areas for timber stacking, turning areas/hammerheads for maneuvering vehicles, passing places within the forest to accommodate two-way traffic, and splays for junctions and access onto the public road network.

On some of the sites, the nature and extent of these features will be restricted by site conditions. For those forest blocks from which timber is to be extracted, an off-road access for



timber wagons to access, turn, load, and re-join the public highway network, with adequate visibility splays to ensure safe traffic management will be a minimum requirement.

Sites from which timber is proposed to be extracted in this LMP period are Arns/Fannyside, Dunsyston, Nether Bracco, Eastfield, and Southrigg. All sites will require forest roads and the provision of hard standing and turning areas to enable operations.

In all cases the line of the proposed roads were selected following a check for any existing site constraints, including the Heart of Scotland GIS layer of Conservation Records, National Biodiversity database (NBN) records, Pastmap and Canmore records, and a walk-over survey of the line of the proposed forest road construction with the routes selected revealing no conservation issues relating to existing biodiversity or cultural heritage interest. A further walk-over assessment will be carried out at the detailed road planning stage to ensure that any site sensitivities are mitigated for prior to construction.

Proposals for the provision for management access to serve the proposed management operations set out in this plan are shown on Maps 8A-8H – Felling proposals, Maps 9A-9H – Thinning Proposals, and Maps 10A-10H - Forest Access.

**5822 m** of new forest road installation is proposed within the Heart of Scotland LMP area within the 10-year plan period. The proposed roads are required to facilitate management access, and in particular to enable access for proposed thinning and harvesting operations where no suitable access currently exists.

Drainage and water crossing requirements will be further assessed at the construction stage. Forestry and Water guidelines will be observed at all times.

The following table lists the extent of proposed new forest roading proposed for each of the forest blocks. The text below this table summarises the rational for each land block within the plan.





**Table 15 New forest roads required**

(See Maps 8A-8H: Felling proposals and planned roads)

New forest road requirements 2022-2032				
Land Block	Total length (metres)	New forest road width (metres)	Area Additional Hard standing (hectares)	Monitoring Comments
Arns Fannyside	387	15	0.03	Planned road Hard standing
Dunsyston	1439	15	0.03	Planned road Hard standing
Eastfield	1138	15	0.03	Planned road Hard standing
Nether Bracco	1810	15	0.02	Planned road Hard standing
Southrigg	1048	15	0.04	Planned road Hard standing

### Arns

**387 m** of forest road work is proposed at Arns/Fannyside within the 10-year plan period.

A small paddock is located to the west of Arns House (NGR: 8086 7547) and let for grazing. The existing field access will be altered and upgraded to provide access into the Forest block from county road for harvesting and restocking proposals. The access will involve the construction of a new section of forest road suitable for timber wagons to access and turn, and potentially an area of ~300m<sup>2</sup> of hard standing to provide a stacking area for timber and storage for welfare units. It may be possible to form the access whilst retaining grazing rights within the area. There are no other constraints relating to the construction of this northern section road.

To the east there is an existing access (NGR: NS 8189 7506) from the public highway onto a forest ride which leads into the forest block. This access is proposed for upgrading to enable access for forestry machinery and to provide loading access for timber wagons. The upgrading will take the form of the construction of a bellmouth access and approximately 80 metres of new forest road, with hard standing areas formed to provide areas for vehicle turning, welfare and timber stacking. To the north-east of this proposed entrance point (separated by the public highway) is Slamannan Plateau Site of Scientific Interest and Special Protection Area. This is a key habitat for the Taiga bean goose (*Anser fabalis fabalis*). In order to mitigate disturbance to the bean geese we will aim to complete this work outwith September to February (inclusive) – in order to negate disturbance during these key feeding periods. As part of this plan's



consultation the Bean Goose Advisory Group have been consulted and will again be consulted during the operational planning stage for any further mitigation measures required.

The proposed construction of both the above forest roads will provide access up to but will avoid construction on the areas of peatland habitat which are proposed for restoration. Harvesting access beyond these points to extract recoverable timber will be through the formation, use, and subsequent removal of brash roads.

The proposed forest roads follow lines of existing rides to provide access up to the areas fringing peatland.

### Dunsyston

**1439 m** of forest road work is proposed at Dunsyston within the 10-year plan period

A new forest road is proposed to provide access to the main productive woodland blocks which are scheduled for harvesting within the plan period. The new road will minimise disruption to the established recreational path network and provide a suitable management access route to serve operational needs.

The proposed forest road construction route has also been selected to avoid areas of archeological and biodiversity interest on the site and will for the most part be constructed through areas of plantation woodland. Crossing points have been selected to avoid disturbance to existing recreational routes and to avoid disturbance to or the crossing of water features.

Constraints checks, the Heart of Scotland GIS layer of Conservation Records, and a walk-over survey of the line of the proposed forest road construction have revealed no issues relating to existing conservation interest.

The accesses into the site will also need upgrading, along with a section of former public road (no longer maintained as such), and suitable access controls put in place to prevent issues arising from unauthorised vehicular use such as fly-tipping.

Areas of hard standing for timber stacking and loading will be required to accommodate timber extraction operations. It is anticipated that ~300m<sup>2</sup> of hard-standing will be required

### Eastfield

**1138 m** of forest road work is proposed at Eastfield within the 10-year plan period.

The proposed roads will be formed along the line of existing rides and will provide extraction routes for the areas of proposed felling and thinning in the compartments to the north and south of Benhar road.



The provision of stacking areas is also anticipated for both the north and south compartments, these proposed to be located close to the nearest timber wagon access points. It is anticipated that ~300 m<sup>2</sup> of timber stacking area will be required to serve the proposed harvesting operations and future needs.

A walk-over survey of the proposed routes noted little of interest in terms of the ground flora. No recent records of biodiversity interest have been made along the proposed routes, but historic records of butterfly interest have been recorded in the past. There are also historic records of water voles activity on nearby sections of the River Almond which flows adjacent to the southeastern edge of the site

Prior to construction a further walk-over survey of the route is recommended to check for the presence of species of conservation interest.

### Nether Bracco

**1810 m** of forest road work is proposed at [block] within the 10-year plan period.

An access road to the main forest block is required to facilitate proposed harvesting operations scheduled in Phases 1, 2 and 4 of this LMP. There is currently no access into and through the forest block, and the proposed road will also serve future restocking operations and ongoing management.

A right of access exists from the A89 public road to the site which will also need to be upgraded to make suitable for harvesting equipment and timber extraction. Permissions for this route are in place.

A walk-over survey of the proposed routes noted few sensitivities in terms of the ground flora. and no records of biodiversity interest have been noted. Forestry and Land Scotland's own conservation records have identified areas of peatland and boundary dykes to be of interest. The proposed road line has been selected to avoid disturbance to these areas.

### Southrigg

**1048 m** of forest road work is proposed at Southrigg within the 10-year plan period.

This comprises **558 m** in the southern block and **510 metres** in the northern block.

The new forest roads are proposed to give access for harvesting operations and to facilitate timber extraction from coupes 76005 and 76003. There is an established right of access leading to both block boundaries, but no management access exists within the blocks. Coupe 76005 covering most of the southern block is proposed for felling in Phase 1 of this plan to facilitate bog



restoration. Coupe 76003 in the northern block is proposed for felling in Phase 1 of this plan to facilitate the removal of larch. The new road into northern block will later be used to service the felling of coupe 76001 in Phase 3 of this plan.

Areas for turning, timber stacking, and loading will be required to facilitate timber extraction. An estimated ~400m<sup>2</sup> of hard standing is anticipated.

The proposed roadlines and turning areas have been subject to constraints checks and a walk over survey, with no issues relating to conservation or biodiversity interest arising.

The roads have been selected to be constructed on areas of mineral soil and to avoid areas proposed for peatland restoration. Access for the harvesting and extraction of recoverable timber on the areas of peatland proposed for restoration will be carried out on a series of temporary brash roads.

### Forest Quarries

No forest quarries are proposed within the Heart of Scotland LMP area within the 10-year plan period. The stone requirements for the forest roads, splays and hard standing areas are anticipated to be primarily sourced from the FLS quarry at Heathlands in Forth.

## 2.7 Departure from UKFS guidelines

All operations will be conducted in accordance with Forest Industry Best Practice Guidance and the UK Forestry Standard.

## 2.8 Standards and guidance on which this LMP is based

This land management plan has been produced in accordance with a range of government and industry standards and guidance as well as recent research outputs. A full list of these standards and guidance can be found here: <https://scotland.forestry.gov.uk/managing/plans-and-strategies/land-management-plans/links>



## 2.9 Tolerance Table

Table 16 Regulatory tolerances for changes to the approved land management plan

Action Required	Map Required (Y/N)	Adjustment to felling period	Adjustment to felling coupe boundaries	Timing of restocking	Change to species	Wind throw response	Adjustment to road lines	Designed open ground
<b>Scottish Forestry (SF) Approval not normally required (record and notify SF)</b>	N	Fell date can be moved within 5-year period where separation or other constraints are met	<10% of coupe size.	Up to 5 planting seasons after felling (allowing fallow periods for Hylobius).	Change within species group, e.g. Scots pine to birch,  Non-native conifers, e.g. Sitka spruce to Douglas fir,  Non-native to native species (allowing for changes to facilitate Ancient Woodland policy).			Location of temporary open ground, e.g. deer glades if still within overall open ground design  Increase by 0.5 ha or 5% of area - whichever is less
<b>Approval by exchange of letters and map</b>	Y		10-15% of coupe size.	5 years +	Change of coupe objective that is likely to be consistent with current policy (e.g. from productive to open, open to native species).	Up to 5 Ha	Departures of greater than 60 m from the centre of the road line	Increase of 0.5 ha to 2 ha or 10% - whichever is less  Any reduction in open ground
<b>Approval by formal plan amendment</b>	Y	Felling delayed into second or later 5-year period  Advance felling into current or 2 <sup>nd</sup> 5 year period	>15% of coupe size.		Major change of objective likely to be contrary to policy, e.g. native to non-native species, open to non-native,	More than 5 Ha	As above, depending on sensitivity	More than 2 ha or 10%  Any reduction in open ground in sensitive areas  Colonisation of open Areas agreed as critical



### Tolerance Table Notes

- <sup>1</sup> Felling sequence must not compromise UKFS, in particular felling coupe adjacency. Felling progress and impact will be reviewed against UKFS at 5-year review.
- <sup>2</sup> No more than 1 ha, without consultation with SF, where the location is defined as 'sensitive' within the Environmental Impact Assessment (Forestry) 1999 Regulations(EIA).
- <sup>3</sup> Tolerance subject to an overriding maximum of 20% designed open ground.
- <sup>4</sup> Where windblow occurs, SF must be informed of extent prior to clearance and consulted on clearance of any standing trees.

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

### Forestry and Land Scotland's Larch Strategy

The management of larch and controlling the spread of *Phytophthora ramorum* relates to the revised [Scottish Forestry Phytophthora ramorum action plan](#) published in June 2021. The blocks all fall within the Priority Action Zone and under the FLS Larch Strategy the aim is to undertake preparatory planning for sites. This LMP currently proposes the early removal of larch from forest blocks. Further tolerances have been applied for areas of larch requiring felling under Statutory Plant Health notices in other areas of Scotland. However, felling to remove larch from the Heart of Scotland Forest area under this LMP should offset the need for additional tolerances.

### Restocking Options.

Where larch is to be felled and replaced guidance for the selection of suitable replacement species will be followed.

In landscape terms the replacement of larch with native broadleaves on woodland edges is deemed appropriate in terms of softening these visible margins, and in terms of maintaining visual diversity.



## 3.0 Environmental Impact Assessment (EIA)

### Screening Determination for forestry projects

Proposed Work							
<i>Please put a cross in the box to indicate the type of work you are proposing to carry out. Give the area in hectares and where appropriate the percentage of conifers and broadleaves</i>							
Proposed Work	Select (X)	Area (ha)	Conifer	Broad-leaves	Proposed work	Select (x)	Length (m)
Afforestation					Forest roads	X	5822
Deforestation	X	65.47	65.47		Forest quarry		
Location of work		Across the Heart of Scotland Land Management Plan Area					

#### 3.1 Proposed deforestation

**65.47 ha** total of deforestation is proposed within the Heart of Scotland LMP area within the 10- year plan period.

The proposed deforestation relates directly to proposals to restore areas of bog habitat. Details of the proposed deforestation along with separate EIA Screening Determination Forms are included in the appendices to this plan - see Appendices XI & XII.

- **Arns 20.23 ha** of deforestation is proposed at Arns within the 10-year plan period
- **Southrigg 45.28 ha** of deforestation is proposed at Southrigg within the 10-year plan period



### 3.2 Proposed forest road works

Details of the proposed forest roads and the rationale for installation are in Section 2.6 (above)

### 3.3 Proposed forest quarries

No forest quarries are proposed within the Heart of Scotland LMP area within the 10-year plan period. The stone requirements for the forest roads, splays and hard standing areas are anticipated to be primarily sourced from the FLS quarry at Heathlands in Forth.

### 3.4 Proposed afforestation

A small field currently let for grazing is proposed for planting under this LMP period. The field is located within the Dunsyston block and is located close to the main site entrance. The main function of the woodland will be as an amenity feature with additional benefits in terms of shelter and increased conservation values.

### 3.5 Additional regulatory requirements

Planning consent is likely to be required to obtain necessary approvals for the road accesses proposed at Arns, Dunsyston, and Nether Bracco where links are proposed connecting to public roads with the entrances proposed for the access and egress of timber lorries and forestry machinery. The movement of timber from the farm access road at Southrigg may also require a review by the local authority roads department.

The areas proposed for the removal of trees and subsequent restoration of bog habitats at Arns is located adjacent to part of the Slammanan Plateau SSSI and SPA area. NatureScot will be consulted on the proposals along with other interest groups, including neighbouring landowners, and the Taiga Bean Goose Action Group.

There are also proposals to erect fencing along the edge of Lady Bells Moss to exclude livestock from the designated area. NatureScot will be consulted on this proposal.

Proposed felling and extraction of timber at Nether Bracco will extend to the edge of the designated area of the Mid Bracco Scheduled Ancient Monument. Historic Environment Scotland will be consulted on the proposals.





## 4.0 Introduction

The proposals set out in this plan aim to meet with the various objectives set out in the FLS Corporate Plan 2019 - 2022, although the contribution to be made will vary according to the nature of, and flexibility offered by, the individual woodlands.

The woodland management and proposed works will vary according to the woodland property. In each case FLS will adhere to the standards set out in the UK Forestry Standard and to the standards set out in the UK Woodland Assurance Scheme.

### 4.1 The existing Land Holding

The Heart of Scotland LMP area is 669.35 hectares in total. The current land use is as follows:

**Table 17 – Forest composition of Heart of Scotland Plan Area**

Species Composition	Area 2022 (ha)	% of Total Plan Area 2022
Sitka spruce	272.34	40.70%
Larch	13.1	2.00%
Scots pine	15.5	2.30%
Lodgepole pine	10.5	1.60%
Norway spruce	0	0.00%
Mixed conifers	3.3	0.50%
Other conifers	1	0.10%
Birch (downy/ silver)	27.6	4.10%
European Ash	2.5	0.40%
Oak (robur/petraea)	2.5	0.40%
Native mixed broadleaves	7.1	1.10%
Mixed broadleaves	27.3	4.10%
Open/Other	286.61	42.80%
<b>TOTALS</b>	<b>669.35</b>	<b>100%</b>



Figure 2 Pie-chart: Forest composition of Heart of Scotland Plan Area

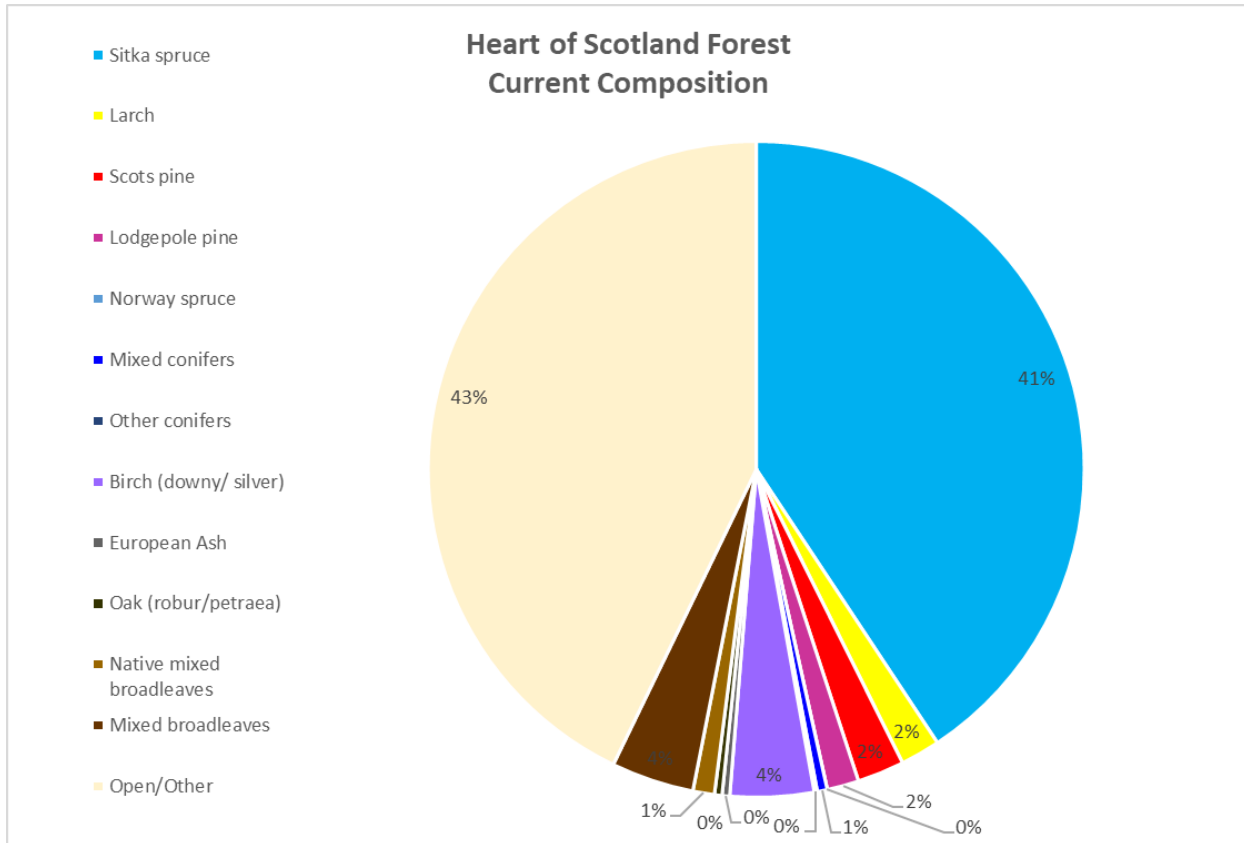
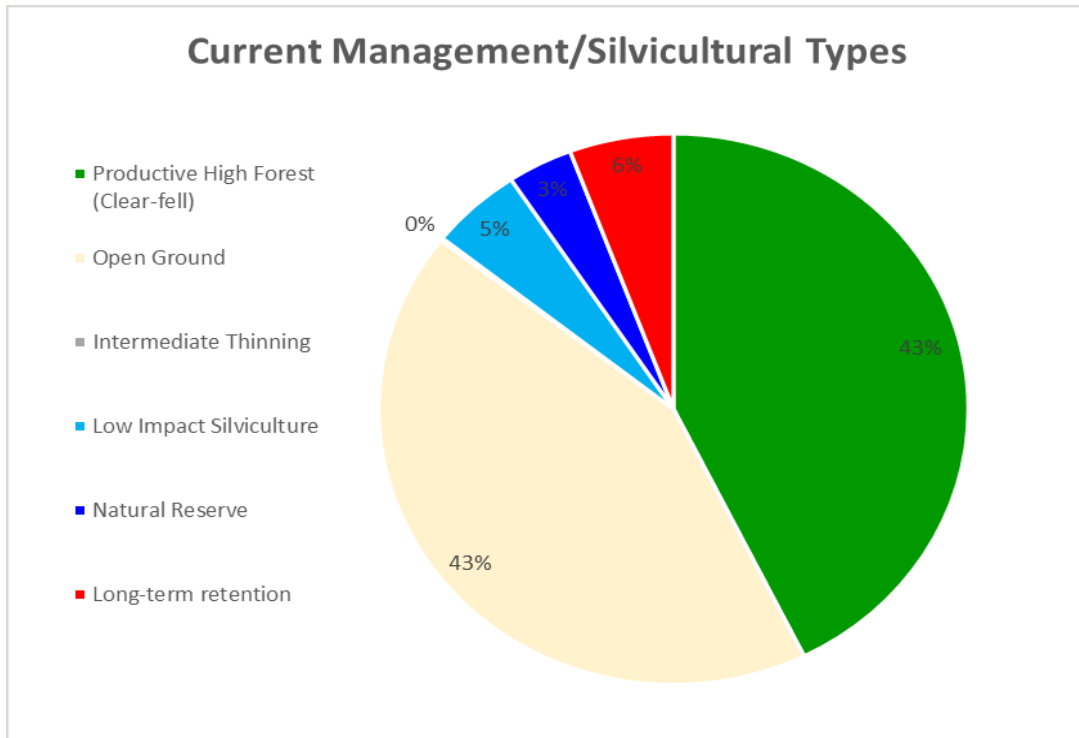


Table 18 – Current Silvicultural Management Regimes in Heart of Scotland Plan Area

Management Type	Mmt Code	Sum of Area ha	%
Productive High Forest (Clear-fell)	1	285.8	42.7%
Open Ground	5	286.61	42.8%
Intermediate Thinning	10	0.95	0.1%
Low Impact Silviculture	14	33.76	5.0%
Natural Reserve	15	23.97	3.6%
Long-term retention	19	38.26	5.7%
<b>Grand Totals</b>		<b>669.35</b>	<b>100.00%</b>



Figure 3 Pie-chart: Current silvicultural management regimes in Heart of Scotland Plan Area



Currently the focus of management across the Forest is that of productive forestry, with a smaller proportion of the woodland areas management under a low input management regime for the purposes of amenity, biodiversity, and recreational provision.

43% of the forest is allocated to open ground, mainly representing areas for nature conservation, but also for recreational purposes and service wayleaves.



**Table 19 – Land Use within Heart of Scotland Plan Area**

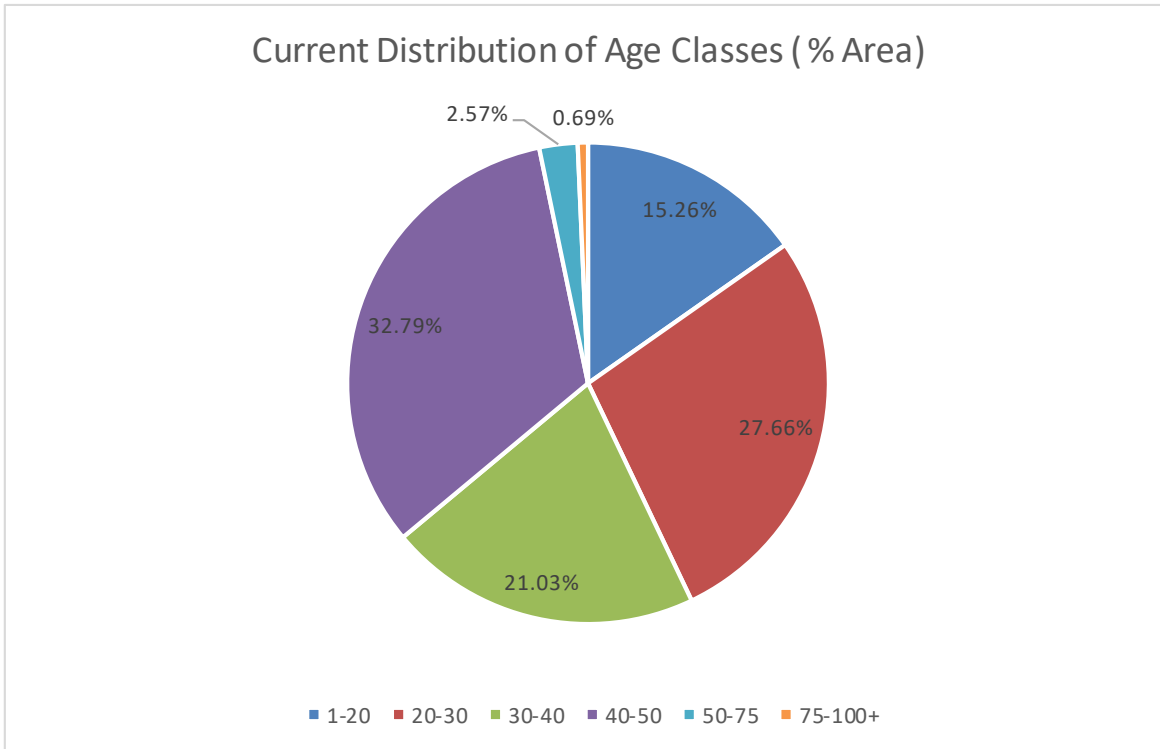
Land Use	Area 2022 (ha)	% of Total Plan Area 2022	Area 2032 (ha)	% of Total Plan Area 2032	Area 2042 (ha)	% of Total Plan Area 2042
Agricultural Land	1.1	0.16%	0	0.00%	0	0.00%
Felled	0	0.00%	0.4	0.06%	14.7	2.20%
High Forest	377.14	56.34%	266.3	39.78%	246.9	36.89%
Open	274.31	40.98%	393.85	58.84%	402.95	60.20%
Open Water	0.1	0.01%	0.1	0.01%	0.1	0.01%
Partially Intruded broadleaves	0.7	0.10%	0.5	0.07%	0	0.00%
Unplantable or bare	6.4	0.96%	3.1	0.46%	0.2	0.03%
Unplanted Streambanks	4.7	0.70%	4.5	0.67%	4.5	0.67%
Windblow	4.9	0.73%	0.6	0.09%	0	0.00%

**Table 20 – Current forest Age Classes within Heart of Scotland Plan Area**

Age Class	Area (ha)	%age
1-20	58.41	15.26%
20-30	105.87	27.66%
30-40	80.49	21.03%
40-50	125.49	32.79%
50-75	9.83	2.57%
75-100+	2.65	0.69%
	<b>382.74</b>	<b>100.00%</b>
OG	286.61	
Grand Total	<b>669.35</b>	



Figure 4 Pie-chart: Forest Age Class Distribution within Heart of Scotland Plan Area



Further information about each of the blocks is available in Appendices III – X.



## 4.2 Setting and Context

### Landscape Character Types

The Heart of Scotland Forest is spread across two distinct Landscape character types

The following table provides a summary description as set out in the Glasgow and Clyde Valley Landscape Character Assessment, and indicates which of the forest blocks to which the description applies: -

**Table 21 – SNH Landscape character type for specified blocks in Heart of Scotland plan**

Landscape Character Type (LTC)	LCT 201 Plateau Farmland	Forest Block: - Rawyards, Wester Moffat, Dunsyston, Chapelhall, Eastfield
<b>Description</b>		
<p>The Plateau Farmlands is an exposed landscape with the uniformity of landform offering very little shelter from wind. Drainage often takes the form of very meandering streams through broad and shallow valleys. Streams have little visual impact on the landscape.</p> <p>An escarpment of varying prominence marks the northern edge of the moors, and the transition to lower farm land or urban areas. Agricultural land use is fundamental to the character of this landscape, dominated by pastoral farming, consisting mostly of sheep farming. Because of the uniformity of the landform, fields tend to be large, rectilinear, and evenly spaced, suggesting rationalisation and improvements during the 18th and 19th Centuries. The extensive agricultural use of the plateau farmlands means that there are few areas of conservation significance.</p> <p>Field boundaries are increasingly defined by post and wire fences. However, many older beech and hawthorn hedges still exist in various states of repair. In higher areas, dry stone dykes and ditches can be found.</p> <p>Large areas of forestry occur in several areas, for example to the north of Carnwath and Carstairs. Many more recent commercial forestry areas are located on higher, less productive ground.</p> <p>A few larger settlements exist on these plateaux, notably the new town of Cumbernauld, where a dense woodland framework has been used to structure and set the urban form into its context.</p> <p>There are wide views across this open, transitional LCT, but few visual foci. The area appears in the foreground when seen in views from or towards adjacent moorland and hills. There are numerous single and small-scale wind turbines which, in this open transitional landscape, can be seen from adjacent moorland and hills, roads and settlements within the LCT.</p>		



**Table 22 – SNH Landscape character type for specified blocks in Heart of Scotland plan**

Landscape Character Type (LTC)	LCT 231 Central Plateau Moorlands	Forest Block: - Arns, Nether Bracco, Southrigg
<b>Description</b>		
<p>Central Plateau Moorlands is located on the eastern boundary of North and South Lanarkshire. The moors rise from about 250 metres in the north to about 350 metres in the south. The large-scale topography is comparatively level and regular, with extensive shallow basins rising to soft contoured ridges. River valleys, such as that of the North Calder and Luggie Water are not prominent significant features.</p> <p>The Plateau Moorlands consist of blanket bog, heather and grass moorland. There are a number of waterbodies present, many of them enlarged to provide water supplies for the Glasgow conurbation.</p> <p>Recent initiatives, such as the Slamannan Bog Restoration Project, have restored areas of degraded raised bog.</p> <p>There have been extensive conifer plantations established within the LCT, although some areas of these have been felled recently to accommodate wind farm development. The afforestation has significantly modified the original character in terms of colour, textures and the length of views possible. There is a general lack of elevation, which means that the forests create dark horizons, rather than being visible in their full extent and contrasts with surrounding moorland. Where forestry permits, views tend to be relatively open across the surrounding valleys and adjacent hill groups. There are a number of man-made features visible, particularly road corridors and electrical infrastructure, though few visual foci are present.</p> <p>Within the central plateau, a low altitude, together with a series of important transport corridors linking Glasgow and Edinburgh, means that settlement is extensive. There has been significant wind energy development on the Plateau Moorlands, taking advantage of their upland exposure, yet relative proximity to large centres of population. Examples of other tall structures include communications masts on either side of the M8 motorway near Harthill.</p> <p>The landscape has an exposed and relatively remote character where wind turbines are not present, although enclosure within the forests can be well defined. Wind farms have reduced the perception of undeveloped character, although this is still associated with higher, exposed areas of remoter moorland.</p> <p>The Central Plateau is underlain by coal measures, though a number of significant igneous intrusions and dykes (to the east of Airdrie for example) are present. The presence of coal reserves and, to a lesser extent, hard rock deposits, has had a major effect on the landscape within the Central Plateau area. Extensive commercial peat extraction has also been carried out. Cumulatively, these activities have had a major influence on the landscape in the form of bings and tips, areas of derelict land, operating open-cast workings and associated industrial infrastructure including disused railway embankments. Hard rock quarries are also visible features in some areas.</p>		



### Climate, Elevation and Exposure

In general the climatic conditions across the Central Belt of Scotland and encompassing the Heart of Scotland Forest Area is typified by a rainfall range from 1700mm/annum in the west, to 800mm/annum in the east.

High winds occur, predominantly from the south-west. The frequency of strong winds and gales is higher than in other parts of the United Kingdom.

There is generally higher than average cloud cover with ~1,400 hours of sunshine per year. The mean annual air temperature in the Forest District is 9°C with an average daily maximum temperature at Glasgow in July of 19°C.

The climate variation west to east, and local variation, allows for a variety of woodlands and tree types in the district, although the variation across the various blocks in the Heart of Scotland Forest is less pronounced.

**Table 23 – Elevation range and climatic zone for forest blocks in plan**

Block/Area	Elevation (AOD)	Climatic Range	DAMS
<b>Arns</b>			
<b>Chapelhall</b>	130-140m	<ul style="list-style-type: none"> <li>• Warm - Moderately exposed</li> <li>• Moist</li> </ul>	14-15
<b>Dunsyston</b>	150-220m	<ul style="list-style-type: none"> <li>• Warm - Moderately exposed</li> <li>• Moist to Cool - Highly exposed</li> <li>• Moist</li> </ul>	14-17
<b>Eastfield and Muirhead</b>	220-250m	<ul style="list-style-type: none"> <li>• Cool, Moderately exposed</li> <li>• Wet to Cool, Highly exposed</li> <li>• Wet</li> </ul>	15-18
<b>Nether Bracco</b>	220-270m	<ul style="list-style-type: none"> <li>• Cool, Moderately exposed</li> <li>• Wet to Cool, Highly exposed</li> <li>• Wet</li> </ul>	15-18
<b>Rawyards</b>	180-190m	<ul style="list-style-type: none"> <li>• Warm - Moderately exposed</li> <li>• Moist to Warm, Highly exposed</li> <li>• Moist</li> </ul>	16
<b>South Rigg</b>	170-180m	<ul style="list-style-type: none"> <li>• Warm, Moderately exposed</li> <li>• Moist to Warm, Highly exposed</li> <li>• Moist</li> </ul>	15-16
<b>Wester Moffat</b>	220-250m	<ul style="list-style-type: none"> <li>• Warm, Moderately exposed</li> <li>• Moist</li> </ul>	14-16





FLS launched a Climate Change Plan in December 2021 and will continue to enhance its work in key areas of forestry so that Scotland’s forests and land contribute more towards climate action. Its conservation management will –

- Reduce biodiversity loss and carbon loss
- Increase productive and native woodland creation and
- Capture - and store - more carbon emissions.

Climate change predictions suggest that the climate will become generally warmer, with drier summers and wetter winters. The impacts of climate change are already being felt in many areas of forestry and need to be considered in relation to future management options.

### Soils

The soils present within the forest blocks are predominately poorly drained gley soils, and deep and shallow peat soils, which again offer limited drainage.

**Table 24 – Soils types present for forest blocks in plan**

Block/Area	Soils
<b>Arns</b>	Mainly deep peats represented by FC soil code Types with fringing areas of typical surface water gleys [FC soil code: 7]
<b>Dunsyston</b>	Generally surface water gleys [FC soil code: 7] and typical brown earths [FC soil code: 1] with some made earths and an area of blanket bog
<b>Chapelhall</b>	Generally surface water gleys [FC soil code: 7]
<b>Eastfield and Muirhead</b>	Generally surface water gleys [FC soil code: 7]
<b>Nether Bracco</b>	Generally typical brown earths [FC soil code: 1] and blanket bog [FC soil code: 11]
<b>Rawyards</b>	Generally surface water gleys [FC soil code: 7]
<b>South Rigg</b>	Generally Trichophorum, Calluna, Eriophorum, Molinia bog [FC soil code: 9e], with typical groundwater gley [FC soil code: 5] and some areas of made soils, typical surface water gley and upland sphagnum bog
<b>Wester Moffat</b>	Generally brown surface water gleys [FC soil code: 7b]



Soils are a key factor in determining the appropriate the future management of the sites, and in particular those sites which have been afforested on deep peat soils and have low yield.

On these soil types, trees have generally fared poorly, through a lack of drainage and nutrient deficiency in some cases, and on some sites fire damage is an issue (particularly the planting at Arns and Southrigg).

To maintain trees on these sites would require a significant input of resources in terms of vegetation control, fertilisers, and additional drainage.

Many of these peatland sites are recognised as Priority habitats and restoration of these to bog and wetland habitat is the favoured management option.



## 5.0 Overall Plan objectives

The FLS Corporate Plan sets out the objectives for achieving maximum public and environmental benefit from the forests. This LMP fits into that framework and shows how it will be implemented in this part of the forest.

To succeed in realising the Scottish Forestry Strategy 2019-2029, six Priorities for Action been identified for implementation:

*Ensuring forests and woodlands are sustainably managed.*

*Expanding the area of forests and woodlands, recognising wider land-use objectives.*

*Improving efficiency and productivity, and developing markets.*

*Increasing the adaptability and resilience of forests and woodlands.*

*Enhancing the environmental benefits provided by forests and woodlands.*

*Engaging more people, communities and businesses in the creation, management and use of forests and woodlands.*

From this five Corporate Outcomes have been developed to demonstrate how these Priorities will be realised through forest operations. These Corporate Outcomes are:

*Supporting a sustainable rural economy.*

*Looking after Scotland's national forests and land.*

*National forests and land for visitors and communities.*

*A supportive, safe and inclusive organization.*

*A high-performance organization.*

The following set of management objectives have been identified for the ongoing management of the Heart of Scotland Forest area.

The objectives relate directly to FLS Business Plan Outcomes: -

### **Outcome 1: Supporting a Sustainable Rural Economy**

#### **Identified Objectives**

- 1. To create a strategy for the removal of larch in the most appropriate way for each block**  
(The removal of Larch from the Heart of Scotland Forest Blocks relates to plant health and the spread of *Phytophthora ramorum*)



- 2. To ensure sustainable productivity through considered species selection and using silvicultural systems which have been applied appropriately to respond to soil conditions, habitat types and proposed operational variables across the blocks.**

(The appropriateness of species selection and of current and future management strategies for each of the sites is considered.)

- 3. That the protection of planted crops is ensured with game management, through establishment on to the long-term.**

(The appropriateness of species selection and of current and future management strategies for each of the sites is considered.)

## **Outcome 2: Looking after Scotland's national forests and land** **Identified Objectives**

- 4. To contribute to the conservation and enhancement of the site's biodiversity value through appropriate design e.g. tree species choice, retaining areas of priority open habitat, particularly considering the areas of SSSI and SPA.**

(Restocking proposals under this plan have taken into consideration the potential for enhancing biodiversity values as part of future replanting proposals. Restocking has also taken into account adjacent areas in the selection of species with a view to enhancing and complimenting adjacent areas of habitat interest.)

- 5. To consider larch restocking species for habitat and biodiversity, particularly where larch is being removed from areas managed as Natural Reserve**

(There are potential conflicts with felling, particularly any pre-emptive larch felling, will need to be monitored and managed. Special consideration will be given to restock species & to whether 'Natural Reserve' status is still appropriate.)

- 6. To protect historical features and maintain access to the Scheduled Monument and heritage assets across the blocks.**

(This objective is delivered through the work plan process to ensure all departments and information is integrated at the operational planning process for each site.)

- 7. To enhance bog, fen and meadow habitats where appropriate across the blocks.**

(Bog restoration opportunities have been identified, focusing on Arns/Fannyside and Southrigg forest blocks. Bog restoration projects will be undertaken where appropriate. There will be a key delivery focus on removing low yield conifers from the Priority Habitat bog complex and link this through a Forest Habitat Network (FHN) based on watercourse corridors and adjacent bog systems.)



### Outcome 3: National forests and land for visitors and communities

#### Identified Objectives

**8. To maintain opportunities for public access within the blocks, at a standard relevant to each.**

(Current access provision and maintenance requirements are considered sufficient for each site and there are no current proposals for significant visitor infrastructure within the plan period. However, restock design and silvicultural systems have been tailored to the recreational demand at each site.)

**9. To look for opportunities to design out antisocial behaviour.**

(Anti-social activity such as fly-tipping, littering, outdoor drinking, fire-raising, and vandalism are a perennial problem for woodlands located within the urban and peri-urban fringes of settlements. Opportunities to manage out anti-social behaviour through a variety of means will be explored over the life of this plan.)

**10. To work closely with neighbours to ensure that any concerns are included in the LMP process and solutions can be provided which work for all involved**

(Opportunities to consult with neighbouring landowners, households, and communities with an interest in the woodland areas will be taken through the plan consultation process and through ongoing liaison and site activities.)

## 5.1 Key Issues – Bog Habitat Restoration

This Land Management Plan uses Scottish Forestry guidance on Deciding Future Management Options for Afforested Deep Peatlands, identifying any Priority Bog Habitats.

Within the Heart of Scotland Forest Area there are 3 Forest Blocks – Arns, Nether bracco and Southrigg - within which bog habitats are identified as being present, with potential for restoration or continued management to maintain the existing habitat. These will contribute to the national Biodiversity Action Plan, as well as Carbon sequestration targets set by the Climate Change Act 2019 and Scotland's 2018-2032 Climate Change Plan. Forest blocks.

Criteria for restoration of these areas as set out in the FCS Practice Guide Deciding future management options for afforested deep peatland (FCS 2015) has been considered in assessing the suitability of these sites for peatland restoration.

Arns and Southrigg blocks fall within the required criteria for the restoration of bog habitat. (See Appendix XI – Peatland Restoration Proposals)



### Arns:

The primary habitat at the Arns/Fannyside Forest block is blanket and intermediate bog, covering the majority of the site.

The initial phase of tree planting at Arns was carried out in 1972 but large areas failed as a result of site conditions and fire damage, with a number of fire events affecting the area. Currently the site comprises of a matrix of different ages of heather, bog and fen habitats with some pine regeneration, and some blocks of remnant planting largely confined to non-peatland soils on the northern and eastern margins of the site.

Most of the drains on the flat upper plateau have become blocked with sphagnum, and are retaining water, and the plough furrows, created to facilitate tree planting, are also filling up.

One main drain, however, has eroded deeply and is still actively draining the site.

Recent bog restoration works have been carried out at Arns to the east of the formerly planted area, with the project implemented through Buglife as part of a European EcoLife project.

The site fringes areas of the Slammanan Plateaux SSSI and SPA and forms part of a larger complex of peatland and wetland habitats, with partners in the project: Scottish Wildlife Trust, RSPB, and North Lanarkshire.

The potential to extend the areas of bog restoration westwards across areas of largely failed conifer plantation has been identified.

### Nether Bracco:

Peatland restoration was recently implemented on an area located in the south-eastern corner of the main block at Nether Bracco. This area forms part of a more extensive peatland area currently under a young crop of conifer.

The potential to extend the area of peatland restoration has been identified. There are however other issues relating to mineral interests and the future use of the site which are currently being considered, and until the matters are clarified no further habitat restoration works are proposed.

The smaller northern compartment at Nether Bracco was also identified as an area of peatland with potential for restoration. This is a wet, low-lying area but the trees planted are growing reasonably, and the justification to restore the site was assessed to be low given the relatively high yield classes being achieved.



### Southrigg:

Both forest blocks at Southrigg were planted on areas dominated by peaty soils.

The main block to the south is low-lying and ground conditions are particularly wet with large areas of the tree crop exhibiting poor growth rates and wind damage. The wet sites conditions severely limit access for management operations but also indicates a high potential for peatland and wetland habitat restoration.

A northern area of the of smaller block to the north also consists of peatland, which sits slightly higher in the landscape. Access to the site for management purposes is limited, and potential for bog habitat restoration has also been identified for this area once the existing crop has reached felling age.

This block will not continue to grow productive timber after the current crop is felled, the enhancement of the bog is of greater value to the multi-purpose objectives of FLS Central Region.

## 5.2 Key Challenges

### Management Access

Access into most of the sites for the purposes of management, and in particular the sites which have a largely productive role, is restricted. In some cases access is not currently provided for, a situation which is of concern and in need of resolution given that many of these areas are at reaching the end of crop rotation period and are scheduled for felling and restocking operations.

The productive areas at Arns, Nether Bracco, and Southrigg are further restricted in terms of access by ground conditions which are generally wet with a high water table to be contended with.

Proposals under this plan aim to make suitable access provision to allow scheduled management operations to proceed on these sites through the construction of forest roads. Where ground conditions prove restrictive in terms of road construction, it is anticipated that some areas of the woodlands will only be accessible to harvesting equipment through the formation of brash roads formed from materials on site.

At Dunsyston, a new management access route is proposed to form a suitable route for harvesting equipment and to minimise disruption to the existing public recreation network established on the site.



## Plant Health

There are a number of plant health issues affecting the Heart of Scotland Forest blocks

One key concern currently is the spread of *Phytophthora ramorum* into the Central Region with potentially devastating economic effects on areas of larch, as well as posing a risk to other susceptible woodland species (e.g. oak).

FLS have developed a larch strategy which aims at preparing for early removal of larch from difficult to reach areas. This is one of the key objectives of this plan and impacts several of the forest blocks within the Heart of Scotland Forest, namely Dunsyston, Nether Bracco, Eastfield, and Southrigg.

Proposals for the removal of the majority of larch from these areas are set out under this plan.

Chalara Ash Dieback (CAD) is another prevalent plant health issue which has spread rapidly nationally. Ash trees are susceptible to recurring infection which can result in the death, with younger trees being particularly vulnerable. There is currently no practical method of treating or preventing the infection, and current policy is to monitor the occurrence of the disease with a view to identifying trees with a natural resilience.

CAD raises issues with older trees in terms of their structural condition and safety, and monitoring of mature ash, particularly in publicly accessible areas is carried out annually or more often if required (e.g. within Welcome and Interactive visitor Zones)

Dothistroma Needle Blight (DNB) is another plant disease which is widespread and impacts mainly on pines, but also on other conifer species. The presence of the disease is recorded within the area but has yet to be confirmed within the Heart of Scotland Forest blocks. The impact of the disease is commonly limited to a loss or restriction of needle growth (and of timber production as a result) but can result in tree deaths in severe cases. Current policy regarding the presence of DNB is to monitor its impact, and to accept the resultant loss of timber yield.

## Deer Management

The forest blocks within the Heart of Scotland Forest currently consist mainly of fully established trees which are at low risk of suffering severe damage for deer browsing. Deer management nonetheless remains an important concern requiring on-going monitoring and management.

Deer browsing levels will impact areas of semi-natural woodland and areas proposed for management under a Low Impact Silvicultural system (LISS) and/or continuous cover forestry, particularly successional woodland layers are reliant on natural regeneration or under-planting.





Proposals for restocking following felling operations will also require protection from, and the control of deer numbers, to ensure successful tree establishment.

High numbers of deer give rise to issues relating to the health of the population, incidences of deer-vehicle collisions, and is likely to impact on adjacent woodland properties.

Generally there is some form of control and deer numbers are currently viewed as being manageable. The control of deer is carried out in-house and through a series of contracts let annually to reliable and fully certified contractors.

Figures relating to deer damage and cull requirements are monitored by FLS and deer management targets are authorised through NatureScot.

The figures are illustrated in the following table for the lowlands area of Central Region:

**Table 25 – Historical and projected figures for deer populations and control.**

Financial Year (FY)	<sup>1</sup> Pop <sup>n</sup> . at 1st April (Start of FY)	Recruitment <sup>2</sup>	Pop <sup>n</sup> . at 31st Aug	FY Cull 1st Apr - 31st Mar	Set % Cull	% Cull achieved.	Pop <sup>n</sup> . at 31st Mar (End of FY)
2017/18	6156	2155	8311	<b>1785</b>	0	21	6526
2018/19	6526	2284	8810	<b>1739</b>	0	20	7071
2019/20	7071	2475	9545	<b>1860</b>	0	19	7685
2020/21	7685	2690	10375	<b>2041</b>	0	20	8334
2021/22	8334	2917	11251	<b>2925</b>	26	26	8326
2022/23	8326	2914	11240	<b>3372</b>	30	30	7868
2023/24	7868	2754	10622	<b>3186</b>	30	30	7435
2024/25	7435	2602	10037	<b>3011</b>	30	30	7026
2025/26	7026	2459	9485	<b>2846</b>	30	30	6640

 Recorded data

 Data projections

<sup>1</sup> Figures relate to FLS owned land in the Lowland area of Central Region

<sup>2</sup> Recruitment levels estimated as constant at 35%. No recent Census data is currently available to indicate the impacts of deer migrations/movements on FLS properties

<sup>3</sup> Targets are based on damage levels which are independently assessed by Strath Caulaidh on various selected plots each year.



Recently deer numbers have been steadily rising on FLS in the lowlands area of Central Region properties, and projections for future cull targets aim to bring the population level down to a stable and sustainable level, based on acceptable levels of damage.

### Special Landscape Areas

Although none of the blocks are located within Special Landscape Areas (SLA), there are several located in the fringing areas. Views from these locations looking onto the Heart of Scotland Forest blocks have been considered. SLAs with vantages looking onto forest blocks include Avonbridge West, Bathgate Hills, and Blackridge Heights to the East, Bar Hill to the North, Gartloch to the West, and the Clyde Valley to the South.

### Ancient Woodland

There are few areas of ancient woodland present across the Heart of Scotland Forest areas. Small areas of ancient woodland area recorded at Wester Moffat and Dunsyston represented by valley woodlands along watercourses fringing the sites, and remnants of policy woodland planting.



### SSSI/SAC Designations

There are SSSI designations present within the Arns and Dunsyston Forest Blocks.

The SSSI designation at Arns covers a substantial area of bog habitat to the southwest of the site and forms part of a larger area of interest extending from Fannyside Loch eastwards to the Slammanan Plateau. The Slamannan Plateau SSSI area shares much of its extent with a Special Area for Conservation designation. Aside from the habitat interest represented by peatland habitats and waterbodies, the main interest identified in the area is the use of the site by Taiga Bean Geese as a wintering roost.

A small area of land within these designated areas, and outwith of the Arns Forest block to the west is also designated as a Special Protection Area (SPA).

At Dunsyston the north-eastern corner of the site forms part of the Lady Bells Moss SSSI, designated for its peatland habitat interest.

Management of these SSSI areas follows in accordance with the NatureScot approved SSSI Management Plans which are in place for both sites.

### Features of Archaeological Interest

There are several features of archaeological interest recorded as present within the Forest blocks. These are listed in the following table by forest block, and are shown on Maps 2A-2G - Designations: -

**Table 26 – Features of archaeological interest.**

Feature designation	Name	Description	Grid Ref	Status
<b>Eastfield</b>				
Undesignated	Muirhead Farm boundary	Old hedgerow / boundary feature matching OS	NS890640	Local Importance
Undesignated	Easter Muirhead	Site of farmstead, no visible building remains found, mature trees present and field boundaries, track.	NS889638	Regional Importance
Undesignated	Easter Muirhead pond	Wet depression at bottom of slope with bunds built to hold back water.	NS889637	Local Importance



Feature designation	Name	Description	Grid Ref	Status
Undesignated	Muirhead Farm	Site of Farmstead with remnant hedgerows and tracks. No remains of the original building exist apart from a concrete base on which artificial bunds were created to represent building remains.	NS890639	Local Importance
Undesignated	Easter Muirhead gatepost	Stone at break in drystone dyke with 4 metal spikes in the top, at point where there was an entranceway/ gate.	NS889638	Local Importance
<b>Dunsyston</b>				
Undesignated	Easter Dunsyston rig and furrow	Rigg and furrow underneath mature SP, similar to remnant in Wester Dunsyston - shelterbelts protected the feature from modern ploughing.	NS799647	Other Sites
Undesignated	HLA Relict Area	RCAHMS HLA data; TYPE = Late 20th Century-Present Woodland Plantation; RELICTYPES Medieval/Post-medieval Medieval/Post-medieval Settlement and Agriculture	NS798646	Uncategorised
Undesignated	Dunsiston colliery	Building, colliery, miners' row	NS802644	Regional Importance
<b>Rawyards</b>				
Undesignated	Rawyards Curling Pond	Curling Pond - features in large painting by John Levack of a curling match here 1855/6, the land was owned by Gavin Black, Laird of Rawyards.	NS777666	Uncategorised
<b>Wester Moffat</b>				
Undesignated	Wester Moffat gate post	Carved stone gate post to about 1.2m high standing at the side of a modern path. Fluted sides with one hole to hang a gate.	NS786658	Local Importance
<b>Nether Bracco</b>				
Undesignated	Nether Bracco boundary dyke	Old drystone dyke that appears to only run along this section of the eastern march boundary. Still upstanding to about 0.5m in general but a bit collapsed.	NS847650	Local Importance



### Scheduled Ancient Monuments (SAM)

There are no scheduled features present within the forest blocks. There is one Scheduled monument which forms a boundary with the Nether Bracco forest block, this being Mid Bracco, a historic agricultural landscape recognised for its good state of preservation.

### Other Historic Records

There are a limited number of recorded historic features present within the forest blocks. Recorded features are listed in the following table:

**Table 27 – Historical records**

NMRS Name	SITE TYPE	GRID REF	URL
EASTER MUIRHEAD (Eastfield)	FARMSTEAD(S) (PERIOD UNASSIGNED)	NS 8895 6388	<a href="https://canmore.org.uk/site/82447/">https://canmore.org.uk/site/82447/</a>
DUNSISTON COLLIERY (Dunsyston)	BUILDING (PERIOD UNASSIGNED), COLLIERY (PERIOD UNASSIGNED), MINERS ROW (PERIOD UNASSIGNED)	NS 8023 6445	<a href="https://canmore.org.uk/site/82169/">https://canmore.org.uk/site/82169/</a>
MONKLAND CANAL, NORTH CALDER WATER (Westfer Moffat)	CANAL FEEDER (PERIOD UNASSIGNED)	NS 7884 6554	<a href="https://canmore.org.uk/site/209700/">https://canmore.org.uk/site/209700/</a>
EASTFIELD, GOLF COURSE (Eastfield)	GOLF COURSE (20TH CENTURY)	NS 88888 64049	<a href="https://canmore.org.uk/site/350582/">https://canmore.org.uk/site/350582/</a>



## 6.0 Analysis and Concept

### 6.1 Analysis

Each of the Forest blocks were surveyed as part of the preparation of this plan.

An analysis of the survey information collected on each site was carried out, the results of which are summarised on maps 5A -5H Survey and Analysis

The sites differ in character across the Forest area, but several key points were noted which apply across a number of the blocks. These include: -

- Areas of planting which are growing poorly in relation to the site conditions.
- A lack of management access limiting forest operations
- Areas of windblow resulting from delayed thinning and waterlogged ground conditions
- The presence of site services and the need to safeguard these
- The presence of adjacent habitats and the need to safeguard these.
- Anti-social issues affecting a number of the sites.
- Areas of young planting which are reaching thinning age
- The presence of paths and recreational features on urban and peri-urban fringe sites, and the need to maintain these.
- The need to maintain boundary features, including hedges and fencing.
- The impacts of plant health issues which is felt across a number of the forest blocks, particularly impacting areas with ash and larch.
- The safeguarding of important habitats which are identified as present in most of the blocks.
- The presence of heritage features.
- Tree health and safety issues, particularly on sites with recreational provision.
- The presence of designated features both within and adjacent to a number of forest blocks, and the protection of these.
- Areas of woodland with high biodiversity values and the appropriate management of these areas.
- The presence of EU protected species (and signs of these) on several sites.
- The presence of invasive non-native species (INNS) is noted on some sites.
- Deer management remains an issue on most sites and is of concern given proposals for restocking in future management phases.



## 6.2 Concept

Supporting Maps: Concepts Maps 6A – 6H.

The key management plan objectives have been considered alongside each of the sites in terms of their condition and management requirements, as highlighted by the site survey analysis of key features.

A list of key opportunities and constraints have been distilled from this analysis which have given rise to management concepts. The concepts have in turn given rise to management proposals which aim at achieving the set objectives.

The analysis of opportunities and constraints and the arising management concepts have been summarised in the following table: -

**Table 28 – Concept development through analysis of constraints and opportunities**

Linked LMP Management Objectives		
Constraints/Challenges	Opportunities	Concept
<b>1. To create a strategy for the removal of larch in the most appropriate way for each block</b>		
Limited management access is a key constraint to proposed operations	Larch is present within the Dunsyston, Nether Bracco, Eastfield and Southrigg.  Thinning and felling operations are proposed for each of the affected blocks, presenting an opportunity for larch removals	The provision of management access to facilitate scheduled felling and thinning operations is proposed.
<b>2. To ensure sustainable productivity through considered species selection and using silvicultural systems which have been applied appropriately to respond to soil conditions, habitat types and proposed operational variables across the blocks.</b>		
Management access is a key constraint. Additionally some sites proposed for felling are not proposed for restocking, and instead are proposed for habitat restoration.	Most of the areas of productive woodland are scheduled for felling over the LMP period. The felling works spread over 4 phases, and will be carried out alongside thinning operations where appropriate	The provision of management access to facilitate current and future felling and thinning operations is proposed.
<b>3. Protection of planted crops is ensured through game management</b>		



Linked LMP Management Objectives		
Constraints/Challenges	Opportunities	Concept
Restocking of felling areas over the plan period will introduce young trees which will be at risk to herbivore damage	Currently the woodland areas within the Heart of Scotland forest Blocks are fully established and at low risk to deer damage.	Deer population levels will be controlled to limit levels of damage. Susceptible species will be individually protected where required.
<b>4. Contribute to biodiversity values through appropriate design</b>		
Management constraints relating to access should be resolved through the provision of access for harvesting operations.	Proposals for new planting and restocking following felling offers an opportunity to restructure these woodland areas and design to compliment adjacent conservation interests.	Restock areas to improve habitat connectivity and increase conservation and biodiversity values in line with NVC Woodland types.
<b>5. Consider alternative species for restocking larch areas for habitat and biodiversity</b>		
Much of the larch planting is concentrated on open forest edges providing amenity and visual diversity. Larch in conifer mixtures is likely to be removed by selective thinning.	The removal of larch from the Heart of Scotland Forest blocks is proposed. Larch is present within the forest area as small blocks or in mixture with other conifers.	Restock felled larch areas with appropriate replacement species, with native broadleaves being an appropriate choice for forest edge planting
<b>6. To enhance peatland, fen and meadow habitats where appropriate across the blocks</b>		
Areas proposed for bog restoration will only be planned if commitment is made to fund, and operational & skills resource is available for implementation	Open ground habitats contribute to ~42% of the forest area at present. These include areas of peatland, fen and grassland habitats which are proposed for retention. Areas proposed for habitat restoration will result in an increase in important bog habitats	Prepare bog restoration plans and seek funding to carry out habitat restoration proposals. Use newly appointed peatland advisors and delivery managers to survey & prepare restoration proposals for plan.
<b>7. Maintain opportunities for public access</b>		
<b>8. Look at opportunities to design out antisocial behaviour</b>		





Linked LMP Management Objectives		
Constraints/Challenges	Opportunities	Concept
<p>Sites are currently well catered for in terms of access and recreational provision with little scope for increasing provision.</p> <p>Anti-social issues remain a constraint in terms of recreational provision and maintenance</p>	<p>Sites within which public access is promoted and provisioned continue to be managed and maintained at appropriate levels.</p>	<p>Maintain site recreational provision at an appropriate level.</p> <p>Explore opportunities for community engagement and site management</p>
<p><b>9. Work closely with neighbours</b></p>		
<p>Need to identify stakeholders with an interest in the forest over a number of forest blocks of disparate character.</p> <p>The ability to meet the aspirations of stakeholders is likely to be constrained by available resourcing.</p>	<p>Opportunity to inform and consult with interested parties regarding the future management of the forest area.</p> <p>Opportunity to identify concerns and address these through the LMP process.</p>	<p>Identify key stakeholders for the heart of Scotland Forest and actively seek their feedback on LMP proposals.</p>



## 7.0 Long term Management Plan Proposals and Prescriptions

### 7.1 Management

All proposals have been designed in accordance with sound silvicultural and environmental principles, falling within the framework outlined by the UK Forestry Standard, the UK Woodland Assurance Scheme, FC Bulletin 124 Ecological Site Classification for Forestry and the current FC edition of Forest & Water Guidelines. A full list of current standards and guidance can be found [here](#).

All proposals have been designed in accordance with sound silvicultural and environmental principles, falling within the framework outlined by the UK Forestry Standard, the UK Woodland Assurance Scheme, FC Bulletin 112 Creating New Native Woodlands, FC Bulletin 115 Alternative Silvicultural Systems, FC Bulletin 124 Ecological Site Classification for Forestry and the current FC edition of Forest & Water Guidelines.

This plan has considered the natural and historic environment as well as green network opportunities.

Most of the woodlands in the Heart of Scotland Forest area are first rotation plantations. A significant proportion of the planting in larger blocks is productive conifer. Management of these areas has largely been based on a no-thin regime, and since establishment little work has been carried out in these areas in terms of altering the stocking densities of structure of the woodlands. One exception to this has been seen at Dunsyston where the removal of larch from some areas of mixed conifer planting has been carried out for reasons of plant health, with more of this type of selective thinning proposed to help prevent the spread of *Phytophthora ramorum* in the Central Region Forest District.

There are opportunities for thinning of productive conifer areas located on better soils such as at Eastfield, but in some areas the window for thinning without the risk of windblow has passed. Where this is the case clearfelling is proposed.

Areas of mixed and broadleaf woodland are present across the Forest and are represented to a greater or lesser extent in each of the forest blocks. These are generally managed as continuous cover forestry, mainly for their amenity and conservation values, and are proposed for retention in the landscape in the long-term.



These areas are proposed for management under Low-impact Silvicultural Systems, including Irregular shelterwood systems, Long-term retention woodlands, and Natural reserve areas

Where the woodlands are well-established, with regenerating sub-canopy layers, and/or are inaccessible for the purposes of management, no management intervention is proposed in terms of thinning or restructuring, and works will generally be limited to tree safety works as and when required.

More recently planted areas are proposed for thinning to reduce competition, maintain species diversity, and improve light levels to encourage regeneration shrub and ground flora layers to develop.

Supporting maps sets for Management Proposals section:

- Maps 2A-2H – Designations Maps
- Maps 7A-7H – Management coupes and silviculture
- Maps 8A-8H – Felling proposals and planned roads
- Maps 9A-9H – Thinning proposals
- Maps 11A-11H – Future habitats and species

## 7.2 Clearfelling

Supporting Maps: Maps 8A-8H Felling Proposals and Planned Roads

Proposed felling coupes within the plan period are detailed in Section 2.2 and Table 11. Felling coupes have been selected based on a variety of factors including: -

- The condition of the current woodland/crop
- Site conditions, including exposure, soils, drainage
- The presence and location to windfirm edges
- Future management proposals and requirements

For plant health purposes phase 1 & 2 coupes include areas of pure and mixed Larch stands in line with FLS's Larch Strategy with the objective to remove all Larch within the Plan period.

A number of issues have been identified in relation to proposed larch removals within the Heart of Scotland Forest Area : -



- Larch is particularly present at Dunsyston, Nether Bracco, and is present in lesser quantity at Southrigg and Eastfield.
- Hard to reach areas of larch should be prioritised. (Difficult coupes have been identified at Nether Bracco and Dunsyston)
- Larch removal should avoid large coupes where possible
- The need to consider windblow and coupe design.
- Plan proposals should set out the best approach for larch removals.
- Alternative restocking species for larch removals need to be carefully considered to maintain diversity in the forest - including ecological, silvicultural and visual (landscape) diversity.

Some phase 1 and 2 coupes are in close proximity however where this is the case felling/restocking timings will be staggered to allow the crops to achieve a difference in crop height of at least 2 metres (i.e. 5 years +)

Some coupes have areas of broadleaf planting introduced to diversify the forest blocks and planted for amenity and conservation purposes. There are also individual mature broadleaf trees retained at the time of establishment as historic field boundary and landscape features. It is intended that these trees will be retained and excluded from felling works.

## 7.3 Thinning

Supporting Maps: Maps 9A-9H – Thinning Proposals

FLS policy generally assumes that all productive crops will be thinned, unless:

- Thinning is likely to significantly increase the risk of windblow.
- Operations are likely to require an unacceptably large investment in relation to the potential benefits due to access or market considerations.
- Thinning is unlikely to improve poorly stocked or poor-quality crops.

In the case of the Heart of Scotland Forest blocks, the areas of productive conifer woodland have to date been managed under a no-thin regime, largely due to the risk of windblow in exposed locations, low growth rates on sites with challenging edaphic conditions, and a lack of suitable management access affecting the viability of potential thinning opportunities.



Younger blocks of productive woodland have been identified which will now benefit from thinning (where site conditions are suitable). These areas have been proposed for thinning within the plan period, with suitable access proposed where required to facilitate these operations and future management of the forest blocks.

Areas of more recently planted broadleaf and mixed woodland make up a significant proportion of smaller woodland blocks. These woodlands are also generally located closer to areas of settlement, with management priorities steered towards amenity and recreational provision. In these woodland areas thinning is proposed both to maintain woodland health and continue to provide recreational and amenity benefits. The main objectives will be to maintain species and structural diversity, increase light levels, and to retain and increase sightlines.

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.

## 7.4 Continuous Cover Forestry (CCF/LISS)

Supporting Maps: Maps 7A-7H – Management Coupes and Silviculture.

Although some areas of the forest have been identified as having potential for management as continuous cover forestry under a low-Impact Silvicultural system, the anticipation is that these areas are too small and fragmented, and as a result are unlikely to be treated as such.

For the most part these areas are proposed for management as areas of Long-term Retention with limited intervention proposed.

These areas are predominately to broadleaf or mixed woodland where timber production is not the main objective.



## 7.5 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 covered by this approval is 40 cubic metres per Land Management Plan 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.

### 7.5.1 Chalara Ash Dieback

With the help of a recently formed Ash Dieback Risk Group, Scotland is gearing up to deal with a significant increase in damage likely to arise from ash dieback over the coming years, particularly the risks posed by dead or dying trees near public roads and forest tracks. To help with these developments, Scottish Forestry has commissioned the Tree Council to help support organisations across Scotland and in June 2021 the Tree Council produced an 'Ash Dieback Action-Plan Toolkit for Scotland' to help support landowners, consultants, practitioners and land managers.

FLS has now integrated this guidance into its strategic level Ash Action Plan and its ongoing tree safety inspections. Priority areas of survey are all zones where Ash is within falling distance of all public roads, railways, neighbouring properties, amenity areas and car-parks, passable forest roads and well used way-marked trails and public rights of way.

Surveys have been undertaken within the Heart of Scotland forest blocks to quantify tree numbers and priority/non-priority work programmes. Priority tree safety works are progressing within the existing tree safety work programmes and FLS will work to Scottish Forestry and



NatureScot guidance where pre-emptive felling is deemed necessary.

## 7.6 Restructuring

Areas proposed for clearfelling offers an opportunity for restructuring of the Forest in line with the Management Objectives

In the case of areas identified for peatland restoration, the restructuring will take the form of de-forestation and restoration of areas of priority habitat, which will also provide the opportunity to restock areas of fringing woodland areas to associated native woodland types. These areas will, once established, be generally managed as areas for Long-Term retention.

Other felling will provide opportunities to restock and diversify the species composition and through the phasing of felling, diversify the age structure of the woodland blocks.



## 7.7 Restocking proposals

Supporting Maps: 12A-12H future habitats and species

In restocking of the woodland areas proposed for felling within the plan period, species selection has taken into account site conditions, extant plant health issues, management objectives, and site use.

A mix of productive conifer, productive and semi-natural broadleaved woodlands are proposed, along with areas of open ground.

The woodlands have been matched to the soils and ground vegetation, using the guidelines set out in the Forestry Commission's Ecological Site Classification (ESC) Bulletin 124. ESC uses climatic zone, exposure, soil moisture, and soil nutrient levels to inform the type of woodland most suited to the sites.

A number of ESC sample plots were selected across the forest area, the locations of each are shown on Maps 2A-2G – Soils and ESC. The number of points were selected to reflect the extent of the forest blocks represented, and the range of site conditions such as soil types, drainage, altitude, and levels of exposure.

Where sites are being replanted, the fallow period will be 1 to 2 years. The forest blocks in this plan are relatively small with no recent felling, hence Hylobius populations have not had the chance to build up. Weed competition is deemed a more challenging factor for establishment.

Soils and drainage conditions vary across the Forest area. Ground preparation will be appropriate for each site where restocking is proposed.

Due to current issues relating to plant health, neither larch species nor ash are proposed to form part of the restocking mixes.

A summary of the ESC results obtained from inputting the sample points is shown in the Table 25 below.

### Key to ESC Results – Table 29

Suitability	
VS	Very Suitable
S	Suitable
M	Marginal





**Table 30 – Ecological Site Classification Results**

Forest Block	Grid Ref	ESC Ref Point	Modelled YC_SS	DAMS	WHC	Indicated NVC 1	Suit-ability	Woodland NVC Type	Indicated NVC 2	Suit-ability	Woodland NVC Type
Arns	NS811748	A1	21	17	4	W3	VS	Sallow with bottle sedge	W4	S	Birch with purple moor grass
	NS812752	A2	5	16	4	W3	VS	Sallow with bottle sedge	W5	S	Alder with greater tussock-sedge
Chapelhall	NS786628	C1	26	14	5	W4	S	Birch with purple moor grass	W7	S	Alder-ash with yellow pimpernel
Dunsyston	NS802645	D1	20	16	5	W4	S	Birch with purple moor grass	W7	S	Alder-ash with yellow pimpernel
	NS798644	D2	23	14	3	W4	S	Birch with purple moor grass	W7	S	Alder-ash with yellow pimpernel
Eastfield	NS885637	E1	17	17	5	W4	S	Birch with purple moor grass	W7	S	Alder-ash with yellow pimpernel
Nether Bracco	NS840653	N1	8	18	5	W4	M	Birch with purple moor grass	n/a	n/a	
	NS838658	N2	20	16	5	W11	VS	Oak-birch with bluebell/wild hyacinth	W6	S	Alder with stinging nettle
	NS842650	N3	9	18	5	W4	M	Birch with purple moor grass	n/a	n/a	
	NS834662	N4	5	16	4	W4	M	Birch with purple moor grass	n/a	n/a	
	NS841666	N5	21	16	4	W11	VS	Oak-birch with bluebell/wild hyacinth	W6	S	Alder with stinging nettle
Rawyards	NS775667	R1	22	17	4	W4	S	Birch with purple moor grass	W7	S	Alder-ash with yellow pimpernel
Southrigg	NS914664	S1	14	16	4	W4	M	Birch with purple moor grass	n/a	n/a	
	NS927661	S2	23	15	4	W6	VS	Alder with stinging nettle	W7	S	Alder-ash with yellow pimpernel
Wester Moffat	NS788658	W1	26	15	4	W11	VS	Oak-birch with bluebell/wild hyacinth	W7	W10	Mixed broadleaved with bluebell/wild hyacinth



### 7.7.1 Restock Prescription Productive Conifer

The primary function of this forest type is to produce a significant volume of softwood timber for the saw log market, pallet, small roundwood and firewood markets.

As such and as per the Regional restocking strategy the management input will generally be:

- Low impact ground preparation methods tailored to soil type, terrain and harvesting residues present.
- Restock planting at full initial density of 2,700 stems/ha to achieve a final density of 2,500 stems/ha with an emphasis on achieving overall stocking.
- Standard top up spray and weeding as required
- Standard stocking density assessment surveys at year 1 and year 5

The primary components of the productive conifer at Dunsyston and Nether Bracco will remain as Sitka spruce due to its productive potential and site suitability.

Restocking will avoid the use of larch, due to its plant health issues.

Instead diversity of conifer blocks will be achieved using other site suited alternative conifer species such as Norway spruce, Lodgepole pine, Scots pine, Western red cedar, and Pacific silver fir.

Scot's pine and Lodgepole pine are also at risk in terms of the threat posed by DNB. The planting of these species in mixture with other conifers will hopefully reduce the DNB inoculum load between individual pine trees.

**Table 31 High productivity conifer planting mixes**

Species	%	Comments
High productivity Standard Sitka spruce stand		
Sitka spruce	90	Main productive species
Norway spruce	10	In groups towards edges of blocks
	<b>100</b>	
High productivity mixed conifers stand		
Sitka spruce	50	Main productive species
Pacific silver fir	10-50	One or more of these species dependent on site suitability.
Norway spruce	10-50	
Lodgepole pine	10-50	
Noble Fir	10-50	
Scot's pine	10-50	
	<b>100</b>	



**Table 32 Spruce/Pine mix on less fertile soils**

Species	%	Comments
Sitka spruce	50	As intimate mix
Lodgepole pine	50	
	<b>100</b>	

### 7.7.2 Restock Prescription Mixed Woodland and Mixed Broadleaves

Mixed conifer/broadleaved woodland and mixed broadleaved woodland will be used where non-native species are already present and existing species provide an amenity benefit. The woodland will primarily have an amenity function, but some low quality timber may be harvested during amenity thinning work. The following establishment techniques will be used:

- Low impact ground preparation methods tailored to soil type, terrain and harvesting residues present.
- Restock planting to achieve a final density of 1,600 stems/ha with an emphasis on achieving overall stocking.
- Standard weeding as required.
- Standard stocking density assessment

**Table 33 Mixed Woodland**

Species	%	Comments
Sessile oak	15	
Sycamore	20	
Silver birch	15	Towards visible edges
Rowan	10	Towards visible edges
Downy Birch	5	
Aspen	5	
Bird cherry	5	Towards visible edges
Scot's pine	10	
Norway spruce	5	
Western Red Cedar	5	
Noble Fir	5	
	<b>100</b>	

**Table 34 Mixed Broadleaves**

Species	%	Comments
Sessile oak	20	
Sycamore	20	
Beech	15	
Rowan	10	Towards visible edges



Silver Birch	15	
Bird cherry	5	Towards visible edges
Hornbeam	5	
Aspen	3	
Hawthorn	5	
Holly	2	
	<b>100</b>	

### 7.7.3 Restock Prescription Semi-natural Woodland

A range of native woodland mixes are proposed to best fit with the site conditions extant at each of the proposed planting locations.

For non-productive woodlands within the plan area, native woodland restock will be the primary woodland type:

- Low impact ground preparation methods tailored to soil type, terrain and harvesting residues present.
- Restock planting to achieve a final density of 1,600 stems/ha with an emphasis on achieving overall stocking.
- Standard weeding as required.
- Standard stocking density assessment

The following mixes and range of species are proposed, although percentages may vary dependent on particular site requirements. It is proposed that all planting is undertaken in small species groups of 10-25

**Table 35 NVC W3 - Sallow with bottle sedge**

Species	%	Comments
Grey sallow	50	
Bay Willow	20	
Downy Birch	20	On drier sites
Eared Willow	5	
Common alder	5	
	<b>100</b>	

**Table 36 NVC W4 - Birch with purple moor grass**

Species	%	Comments
Downy Birch	60	
Grey sallow	15	
Bay Willow	5	On drier sites
Eared Willow	5	



Common alder	5	
Silver birch	5	On drier sites
Sessile oak	2	On drier sites
Hazel	3	On drier sites
	<b>100</b>	

**Table 37 NVC W7 - Alder-ash with yellow pimpernel**

Species	%	Comments
Common alder	55	
Grey willow	20	
Downy Birch	10	
Bird cherry	3	On drier sites
Rowan	3	
Hawthorn	3	On drier sites
Guelder rose	2	On drier sites
Sessile oak	2	
Hazel	2	On drier sites
	<b>100</b>	

**Table 38 NVC W11 - Oak-birch with bluebell/wild hyacinth**

Species	%	Comments
Sessile Oak	45	
Downy Birch	40	
Silver birch	5	On drier sites
Rowan	5	
Hazel	3	
Hawthorn	2	
	<b>100</b>	

## 7.8 Woodland Creation

A small area of land at Dunsyston which has previously let for grazing has been identified for new woodland planting. The field extends to 1.14ha and is located to the south of and separated from the main blocks at Dunsyston, on a road junction close to the main woodland entrance. The site is fringed to the north and west by minor roads, to the south by a small-holding, and to the east by Roughrigg Reservoir.

The proposed main purpose of the woodland is amenity, with nature conservation, shelter, and timber production being secondary functions.



The proposed planting will consist of two native woodland mixes. NVCW7 woodland is proposed on the more exposed eastern edge to provide a fringe of shelterwood. NVCW11 woodland is proposed for the remaining woodland area, with a fringe composed mainly of associated woody shrub species along the roadside fringes. Open ground will be retained at the field entrance for management access purposes, and along the southern edge of the area as a buffer between the woodland planting and the adjacent small-holding.

Ground preparation will consist of chemical screefing, with planting being carried out at 1600 stems/ha. Physical protection from browsing will be achieved through upgrade of the existing stock fence to form a barrier to Roe deer. This will be monitored and maintained through to establishment.

## 7.9 Open land

### 7.9.1 Peatland Areas

Existing and recently restored areas of bog habitat are present in the Arns, Dunsyston and Nether Bracco Forest Blocks. These areas will continue to be managed as bog habitats. In the case of the SSSI areas present at Arns and Dunsyston management will continue to be implemented in accordance with the agreed SSSI management plans for the respective areas.

A short section of protective stock fencing is proposed to be erected at Dunsyston to exclude stock from the SSSI area. The stock is encroaching onto the area from neighbouring farmland. Discussions are ongoing with the landowner concerned regarding improvements to the boundary fences.

### 7.9.2 Peatland restoration areas and associated lagg bogs

Areas of Annex priority 1 bog habitat have been identified at Arns, Nether Bracco, and Southrigg with potential for restoration and/or expansion.

A number of issues have been identified relating to the achievement of this objective which will require addressing: -

- Areas of poor growth, windthrow, and issues relating to fires has impacted on the viability of woodland areas on these properties. Fire damage at Arns is a particular issue.
- There are ongoing discussions with the adjacent quarry operation regarding the potential extension of operations onto the Nether Bracco larger (southern) sub-block.



- The potential restoration areas in Nether Bracco smaller (northern) sub-block are exhibiting reasonable timber growth rates (YC 14-16) with good potential for timber production & carbon sequestration. The peatland habitat is localised and fragmented. Hydrologically, it would be difficult to separate this unit from the surrounding productive forest stands. Currently these areas do not meet the criteria for restoration under the FCS Practice Guide - Deciding future management options for afforested deep peatland, and will be left to grow to the end of their rotation period.
- Operational challenges at Southrigg relating to the wet site conditions and access.
- Access rights for the south part of Southrigg are unclear; there is no access to the northern part of the Southrigg block. Work to resolve access is ongoing but not yet resolved.

FLS propose to expand and restore peat bog habitat at Arns and Southrigg within the Land Management Plan period. Restoration will be undertaken following the clearance of the existing tree cover in accordance with the Peatland Restoration Plans set out for each of the proposed restoration areas.

(See Appendix XI for detailed peatland restoration proposals)

### 7.9.3 Grassland management

There are significant areas of open ground present within the forest blocks which represent a variety of grassland habitats. In general, these areas will be retained as grassland areas without management intervention and left to develop naturally.

### 7.9.4 Ride management

A number of the forest blocks have been established with a system of access rides separating the blocks. These rides vary in width and vegetation cover, with some forming vegetated linear strips between the blocks, and others being shaded by adjacent woodland canopies and reverting to bare or sparsely vegetated ground. No management intervention is proposed for these rides.

## 7.10 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.

Important Visitor Zones are located in the following woodland blocks (Maps 10A – 10E Visitor Zones):

- Dunsyston
- Rawyards
- Wester Moffat
- Chapelhall



- Eastfield

All or part of these woodland blocks fall within the Woodlands In and Around Towns (WIAT) boundary, being close to urban settlements and there being a high demand for informal recreation within the woodlands.

Three levels of management are identified in visitor zones.

### **Welcome Zone**

- Welcome Zones provide a clear sense of having arrived at a destination. These should have a simple and easy to follow layout, and give confidence and reassurance by being tidy, well maintained, uncluttered and easy to navigate.

### **Interactive Zone**

- This zone is which visitors are anticipated to actively use for recreation e.g. walk or cycle, ride a horse, play, sit, ski, explore a nature trail, mountain bike or visit an archaeological site.

### **Passive Zone**

- Passive zones form a backdrop to the wider setting, In these areas is normally less focused on recreation and often more on management for other objectives.

## **7.10.1 Maintenance of Visitor Zone Infrastructure**

Those Forest blocks which are provisioned with a footpath network are monitored to manage and maintain the condition of paths in a safe and useable condition.

Most of the paths serving these forest blocks are currently in good condition but erosion resulting from failed drainage and anti-social use of the routes by motorbikes and quad bikes results in damage requiring repair.

At Wester Moffat one section of the path network has eroded as a combination of failed cross drainage and surface damage by motorbikes. This section of path is located on a sloping section of the main path network leading down to the North Calder Water. Repairs to this path section are proposed, along with provision for other repair works likely to arise over the plan period.

The existing path networks are considered to adequately serve current levels of site use, and no extension to the current provision is proposed.





## 7.10.2 Woodland Management within 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 Maps 10A – 10E Visitor Zones, and these specify management interventions identified to be carried out in the next ten years.

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.

## 7.11 Hedges

A number of the Forest blocks have hedges associated with their boundaries. These include the Rawyards, Dunsyston, Chapelhall, and Eastfield blocks.

The hedges generally are informal features which are periodically trimmed back on an annual basis to prevent encroachment on adjacent road corridors and footpaths.

The periodic management of hedges along highways and footpaths will be continued over this plan period.

## 7.12 Biodiversity & Environment

### 7.12.1 Habitat & Species Management

The various woodland and open priority habitats as well as the species they support will continue to be conserved and developed as per the management detailed below.

#### **Woodland**

FLS will maintain semi-natural and new native broadleaved woodlands. Areas of Ancient Woodland recorded at Wester Moffat and Dunsyston have mature mixed-age riparian features with a layered canopy structure. There is limited accessibility and little need for management intervention. These areas are proposed to be managed as Natural Reserves but will be monitored in terms of tree safety where they overlap with interactive visitor zones.



### **Ponds and Lochs**

There are a number of small waterbodies and wetlands present across the Heart of Scotland Forest sites. These will be protected from forest operations in accordance with the Forest and water guidelines. No works are proposed to influence these areas.

### **Lowland Raised Bog**

During the period of the last plan, areas of blanket and basin bog at Arns and Nether Bracco were restored through tree felling and drain blocking operations. The restoration works at both sites was implemented with the assistance of Peatland Action funding.

These sites will continue to be monitored and management continued to maintain their hydrological and ecological integrity.

Following national guidance we will continue to mitigate the effects of forestry operations on protected species throughout the length of this plan following Scottish Forestry Guidance Note 31: Forest Operations and Wildlife Protection.

Ongoing monitoring of populations and habitats will inform direct operations through the work plan process, allowing site specific mitigation to be developed and implemented.

### **Taiga Bean Geese**

At Arns forest block a key species associated with the 'Slamannan Plateau' Special Protection Area is the Taiga Bean Goose. In the long-term it is expected the expansion of open habitat and removal of conifers will have a positive effect for this species, increasing feeding habitat and reducing the potential for predation at conifer forest edges. In the short-term to mitigate disturbance to the bean geese we will aim to complete this work outwith September to February (inclusive) –inorder to negate disturbance during these key feeding periods.

As part of this plan's consultation the Bean Goose Advisory Group have been consulted and will be a key partner in ensuring future forest operations minimise disturbance to this species .

### **Black Grouse**

The areas of Dunsyston, Nether Bracco and Southrigg fall broadly within the Pentlands core conservation area for black grouse as identified within the "Strategic Action Plan for Black Grouse Conservation in Southern Scotland".

Although historic populations of black grouse remained within these areas until the early 1990's, populations began to dwindle throughout the later half of the 20th century. Increased habitat fragmentation, urban expansion, intensification of agriculture, woodland expansion and degradation of moorland habitats are cited as key contributing factors in the decline of this species. No black grouse have been recorded within 15 km of any of these sites since 1991.



Forestry and Land Scotland will aim to restore and improve habitat for black grouse and a range of species by:

- Restoring degraded peatlands & maintaining and expanding existing peatlands at Arns, Southrigg and Nether bracco. This will improve habitat quality and restore connectivity between historically fragmented habitats;
- Limit the use of deer fencing where possible, particularly in close proximity to open habitats and employ the use of strike markers where deer fencing is absolutely necessary;
- Design woodlands to include soft edged broadleaf scrub, particularly along borders of non-native conifers such as at Nether bracco and Southrigg;
- Continue to monitor and survey the areas in order to identify and protect species of conservation concern.
- Work with other agencies and landowners to develop conservation strategies.

### Raptors

There is known to be significant levels of raptors within the central Scotland area, and it is anticipated that a number of these species will frequent the forest blocks.

Management proposals include the long-term phasing and spread of coupe phases, which will in time result in the retention of significant mature canopy and along with areas proposed for low impact silvicultural, long-term retention, areas of minimum intervention, and natural reserve areas it is anticipated that forest management operations will have a neutral impact on raptors.

FLS will continue to follow Scottish Forestry Guidance Note 32: Forest operations and birds in Scottish forests and as such we will continue to carry out systematic pre-operational checks to search for active nests of important birds at least two weeks before operations start and act in cognisance with current legislation.

### Water Vole

Evidence of water vole activity has been recorded in the past to the south of the Eastfield Forest block. No recent survey or recording has been carried out and it is unclear if there is still a water vole population present in the area.

Given the proximity of previous sightings to areas of proposed harvesting activity, a further site survey will be carried out prior to the commencement of operations and act in cognisance with current legislation.



### Badgers

Evidence of badger activity has been recorded on several sites, in particular at Wester Moffat, Dunsyston, Nether Bracco, Eastfield and Southrigg.

Operations proposed on each of these sites will include a pre-operational check to identify and protect badger setts (if present) and to mark and avoid disturbance to latrines and badger runs where identified.

All works will be carried out in accordance with Forest Practice guide 9 – Forest Operations and Badger Setts, and act in cognisance with current legislation.

### 7.12.2 Riparian Areas

Water courses are present within most of the forest block areas, in the form of an adjacent river (North Calder Water), and numerous burns, streams, and canalised water features forming flowing ditches around and through the sites.

Each of these features offers the opportunity to manage areas of fringing woodland appropriately to create appropriate riparian buffers and provide varied light conditions by varying the canopy cover along their margins.

The distribution of the taller vegetation elements could also be managed to reflect the stream orientation, ensuring that sufficient light reaches the stream and banks to support the development of a marginal vegetation.

### 7.12.3 Deadwood

Deadwood can be trees or limbs in the early stage of decomposition, e.g. veterans or dying individual trees. The UK Woodland Assurance Standard (UKWAS) target is for an average of 20m<sup>3</sup> of deadwood/hectare of woodland.

Opportunities for the retention and creation of deadwood habitat will be offered through thinning and felling operations proposed under the LMP.

The aim is to use natural processes by retaining dead, windblown or snapped stems or those created during previous operations. These should be retained wherever possible to create an even mix of standing, fallen and/or stacked deadwood.

Deadwood Ecological Potential (DEP) varies across the sites. Assessment figures are based on the current woodland areas. These will be subject to change in terms of the areas of woodland cover in light of proposed habitat restoration and the clearance of woodland. However, the relative proportions in terms of DEP categories are not anticipated to alter significantly.



A summary breakdown of this potential and distribution is given in the following table: -

**Table 39 Deadwood Potential Heart of Scotland**

Assessed Deadwood Ecological Potential (DEP)	Woodland cover (ha)	Future Volume Estimate (m <sup>3</sup> /ha)	Total Future Volume (m <sup>3</sup> )
<b>HIGH</b>	110.61	50	5530.5
<b>LOW</b>	311.21	20	6224.2
<b>MEDIUM</b>	37.66	10	376.6

Creation of deadwood habitat will be concentrated in areas where it will provide the highest ecological benefit, such as: -

- Riparian and wet woodland areas
- Natural reserves and long-term retentions
- Ancient semi-natural woodland
- Areas of significant existing deadwood

In line with FLS Deadwood Policy the following additional actions should be adopted in the remaining High and Medium DEP areas: -

- Retain small groups of live trees and/or single large trees to develop into deadwood.
- Leave one very large fallen stem, if possible, on each site (>20cm diameter at breast height (dbh)).



#### 7.12.4 Invasive Species

There are few invasive species of concern present within the Heart of Scotland Forest Blocks.

There are two reports of areas of Japanese knotweed being present. One report is at Arns Forest and is a historic report of roadside contamination of the site, which has been treated and will require continued monitoring.

Another report is the presence of Japanese Knotweed within the mature woodland block at Eastfield which is proposed for felling. Prior to felling this area of Knotweed should be treated and excluded from working areas to prevent contamination resulting from the following timber operations.

No *Rhododendron ponticum* has been recorded within the Heart of Scotland Forest blocks, although some rhododendron cultivars are noted as being present at the main entrance into the Wester Moffat forest block. The extent and nature of this amenity feature should be monitored for signs of reversion to stock (which may be *R.ponticum*), and in terms of the extent of the group, to monitor spread beyond acceptable limits.

Pheasantberry or Himalayan honeysuckle (*Leycesteria formosa*) was noted as present in Wester Moffat. Himalayan Honeysuckle has been declared a noxious weed in New Zealand and Australia but is not thought to be particularly invasive in the UK, although its presence has been increasingly recorded in woodland surveys, and it is considered to be an alien (non-native) invasive plant in Ireland. It is proposed that its presence and extent is monitored.

#### 7.12.5 Wildlife (Deer Management)

Full details of proposed deer management can be found within Central Region Deer Management Strategy (in conjunction with the Deer Overview Map), but the main objectives within the Heart of Scotland Forests are:

- To enable restocking to take place without the need for deer fencing and to achieve a stocking density of 2500 stems per hectare at year five in accordance with Operational Guidance Booklet (OGB) 4.

Management aims to:

- Ensure all Biological resources on the National Forest Estate remain in favourable condition (as per NatureScot guidelines).
- Maintain a sustainable deer population.



### 7.12.6 Landscape

In producing this LMP FLS has considered the landscape character of the area and the features outlined in NatureScot’s landscape character assessment.

The impact of management proposals on the wider landscape is not anticipated to be significant given the relative remoteness of the main felling and restocking areas, and with the more visible coupes proposed close to settlements (in particular at Eastfield) and road corridors being limited in size.

Where possible screening will be retained to limit the visual impact of felling coupes, making use of FLS and other areas of existing neighbouring woodland.

### 7.12.7 Hydrology

All operations will follow best practice as detailed in the current Forest and Water Guidelines. Timber extraction will normally avoid crossing burns or main drains, but, where necessary, each crossing point will be culverted or bridged. Branches will be kept out of watercourses and trees will generally be felled away from the watercourses.

#### NFM Study Areas

Two of the forest block areas intersect with National Flood Management Study areas. At Arns 90.32 ha of the site are located on the edge of the Linlithgow Avon Valley Study Area, and at Nether Bracco 25.37 ha of the southern edge of the main block is located within the Blackridge Study Area.

In both cases the areas of overlap also include areas of existing open ground. At Arns, areas of woodland cover are proposed for felling and permanent removal, whereas at Nether Bracco, the felled areas are proposed for restocking with a significant proportion involving conversion from coniferous to native broadleaved woodland.

**Table 40 Proportion of NFM Study Areas affected by Heart of Scotland LMP 10 Year Felling Proposals**

NFM Study Area	Forest Block	NFM Study Area (ha)	Study Type	LMP Area of Proposed felling	% of NFM area
Linlithgow Avon River	Arns/ Fannyside	19727.48	Fluvial - runoff and sediment management	90.32	0.46%
Blackridge	Nether Bracco	1691.92	Fluvial - runoff and sediment management	25.37	1.50%



In both cases the areas of overlap with the catchment equate to a small percentage of the overall catchment.

Proposals for peatland restoration at Arns will have a long-term benefit in terms of the retention and slow release of run-off from the site. Similarly the conversion of coniferous to native woodland at Nether Bracco is anticipated to have a number of positive impacts including improved water quality and slowing run-off from the site.

## 7.13 Heritage

Several heritage features are identified across the Forest area. Their presence has been recorded and taken into account and the forest design stage. Management proposals under this LMP will similarly take cognisance of these features and suitable buffers will be applied to these features.

This will be carried out in accordance with the guidance provided in the Forests and Historic Environment Guidelines (2011), the SF policy document: Scotland's Woodlands and the Historic Environment (2008), and the supporting FLS Historic Environment Planning Guidelines.

Features typically have buffers ranging from 5-10 metres depending on their nature but these can be wider or, in some cases are not required. These operational constraints are identified on site and surveyed by Forest Regional staff prior to any work being undertaken to ensure that features can be marked and avoided.

Work prescriptions will similarly protect relevant historic environment features, keeping the features and their buffered protection areas clear from ground disturbing operations and planting.

Opportunities to enhance the setting of important sites will be considered on a case-by-case basis.

### 7.13.1 Scheduled Archaeology

There are no scheduled archaeological features present within the heart of Scotland blocks. Nether Bracco is located adjacent to and shares a boundary with the Scheduled Ancient Monument (SAM) at Mid Bracco, which is recognised as being a relatively undisturbed historic agricultural landscape. A suitable buffer will be applied along the edge of the SAM area (in consultation with Heritage Environment Scotland) and will be maintained throughout.





### 7.13.2 Non-Scheduled Archaeology

Appropriate buffers will be applied and maintained around pertinent non-scheduled archaeological features, these will be kept open and free of trees. All operations in the vicinity of such features will be conducted in accordance with UK Forestry Standard and be in accordance with the Forests and Historic Environment Guidelines (2011)

## 7.14 Operational Access

### Forest Roads (See Maps 8A-8H Felling proposals and Planned Roads)

There are extensive areas of productive woodland reaching the end of their predicted rotation periods and which are scheduled for harvesting within the period of this LMP.

In general the affected forest blocks currently lack suitable access to facilitate felling and timber extraction operations. In preparation for the proposed felling and restocking operations a number of new forest roads are proposed to service the affected blocks and enable operations to progress.

New forest roads are proposed in **Section 2.6 and Table 15** to provide required access at Arns/Fannyside, Dunsyston, Nether Bracco, Eastfield and Southrigg forest blocks. The following table summarises the proposed roading requirements: -

In addition to the provision of forest roads, operations will require the provision of suitable access and egress points, and hard standings for timber stacking and loading, turning areas or hammerheads for maneuvering harvesting equipment (harvesters, forwarders, timber wagons etc.)



## 8.0 Critical Success Factors

The success of this plan will be based on whether the objectives set out in **Section 1.0 Summary of Proposals** and **Section 5.0 Overall Plan Objectives are achieved**.

**Table 41 Objective Appraisal, Monitoring & Evaluation** details how each objective will be appraised, where and when each objective will be monitored; by who and where it will be recorded. This will enable an evaluation of success as part of the mid and end of plan reviews.



Table 41 Objective Appraisal, Monitoring & Evaluation

Objective	Assessable Criteria	Appraisal Method	Monitoring Method	Monitor Where	Monitor When	Monitor Who	Record Monitoring Where	Evaluation. <i>How does the Appraisal and Monitoring method inform current &amp; future proposals? If you cannot answer this question then the methods may not be appropriate.</i>
<b>To create a strategy for the removal of larch in the most appropriate way for each block</b>	Composition of woodland	Assess presence of larch, trends in removal & operational access to remaining larch stands	Delivery Team survey & sub-cpt updates & LMP mid-term review	LMP	After operations and at appropriate intervals e.g. mid-term and 10-year reviews	Programme Manager/ Harvesting Team/ Planning Team	Against the LMP	The removal of areas of larch will be scheduled within the work programme. Areas of larch to be treated have been identified and scheduled for removal. The operations will be monitored by the Programme Manager & Harvesting Manager. At mid-term review the planning team will assess remaining larch within the plan area and review the management proposals to meet this objective.
<b>To ensure sustainable productivity through considered species selection and using silvicultural systems which have been applied appropriately to respond to soil conditions, habitat types and proposed operational variables across the blocks.</b>	ESC & Site growth rate, species composition	Assess changes in species types, ages, growth rates (e.g. leader growth/leaf colour) species proportions & distributions	Site survey SDAs SCDB Query Delivery Team sub-cpt updates LMP mid-term review	Onsite. SCDB SDA results	After operations and at appropriate intervals e.g. mid-term and 10-year reviews	Forest Management Team/ Planning Team	Against the LMP	Monitoring the diversity of species and structure of the canopy will allow for comparisons to be made overtime which will inform the planning team as to whether the plan is working and whether adjustments are required allowing the district to adjust expectations and business plan for alternative management methods.
<b>That the protection of planted crops is ensured with game management, through establishment on to the long-term.</b>	Browsing damage levels Deer control numbers	Assess trends in deer control numbers & browsing damage levels.	Site survey SDAs Deer control records	Onsite. SDA results Deer control results	At appropriate intervals e.g. mid-term and 10-year reviews	Planning Team	SDAs	Monitoring of younger crops at risk at regular intervals for signs of deer pressure will allow for comparisons to be made overtime which will inform the planning team as to whether control measures are adequate for crop protection, or whether adjustments are required.



Objective	Assessable Criteria	Appraisal Method	Monitoring Method	Monitor Where	Monitor When	Monitor Who	Record Monitoring Where	Evaluation. <i>How does the Appraisal and Monitoring method inform current &amp; future proposals? If you cannot answer this question, then the methods may not be appropriate.</i>
<b>To contribute to the conservation and enhancement of the site's biodiversity value through appropriate design e.g. tree species choice, retaining areas of priority open habitat, particularly considering the areas of SSSI and SPA.</b>	ESC Habitat assessment Vegetation Tree species & Land use	Changes in species types. Open habitat survey and assessment	Site survey SCDB Query	Onsite. SCDB	After operations and at appropriate intervals e.g. mid-term and 10-year reviews	Environment Team	Against the LMP Against the site management plans for SSSI and SPA areas	Monitoring the woodland composition and structure and the composition and condition of open habitats will allow for comparisons to be made overtime which will inform the Environment manager as to whether the plan is working and whether adjustments are required, allowing the district to adjust expectations and business plan for alternative management methods.
<b>To consider larch restocking species for habitat and biodiversity, particularly where larch is being removed from areas managed as Natural Reserve</b>	ESC Plant indicator species Landscape impact	Forester Web Sub-compartment updates	Site survey SCDB Query	Onsite	After operations and at appropriate intervals e.g. mid-term and 10-year reviews	Environment Team Planning Team	LMP	Monitoring of replacement planting for successful establishment will allow evaluation of species choice an appropriateness in terms of site conditions and design purpose, in terms of landscape, conservation, and silviculture.
<b>To protect historical features and maintain access to the Scheduled Monument and heritage assets across the blocks.</b>	Historic features	Changes in condition	Site survey	Onsite. Aerial photos	Prior to and during operations. At mid-term and 10-year review	Environment Team	Forester Web Heritage Module	Monitoring the condition of heritage features allows the Environment Manager and Visitor Services Manager to evaluate whether implementation of the plan has adversely affected any features e.g. has increased visitor numbers increased pressure on features or have operations damaged features? Any issues can be captured and mitigated against in future.



Objective	Assessable Criteria	Appraisal Method	Monitoring Method	Monitor Where	Monitor When	Monitor Who	Record Monitoring Where	Evaluation. <i>How does the Appraisal and Monitoring method inform current &amp; future proposals? If you cannot answer this question, then the methods may not be appropriate.</i>
<b>To enhance bog, fen and meadow habitats where appropriate across the blocks.</b>	Open habitat survey. Land use	Changes in Vegetation. Changes in land use. Changes to drainage patterns.	Site survey SCDB Query	Onsite. SCDB	After operations and at appropriate intervals e.g. mid-term and 10-year reviews	Environment Team Planning Team	Against the LMP	Monitoring open habitats in terms of type, quality and management will allow for comparisons to be made overtime which will inform the Environment Manager as to whether the plan is working and whether adjustments are required allowing the district to adjust expectations and business plan for alternative management methods.
<b>To maintain opportunities for public access within the blocks, at a standard relevant to each.</b>  <b>To look for opportunities to design out antisocial behaviour.</b>	Site use. Maintenance and management requirement	Path survey. Duty of care Survey Site survey Maintenance reports.	Site survey People counters (where installed)	Onsite. People counter data.	After operations and at regular intervals e.g. annually	Stewardship Team Visitor Services Team	Visitor Services Module	Monitoring the levels and nature of site use by the public and levels of provision will allow for comparisons to be made overtime which will inform the Visitor Services Manager as to whether the plan is working and whether adjustments are required allowing the Region to adjust expectations and business plan for alternative management methods.
<b>To work closely with neighbours to ensure that any concerns are included in the LMP process and solutions can be provided which work for all involved</b>	Neighbour contacts. Site records Land Agent cases Complaints records in AIRS	Monitoring of march fence conditions. Complaints records in AIRS. Land Agent case records.	Planning Team discussions with Land Agent & Stewardship Team	Onsite. Internal staff communication	During operations. At time of contact. At mid-term and 10-year review	Planning Team, Stewardship Team, Land Agent	GIS Fencing data. Land Agent case records, AIRS	Monitoring the condition march boundaries, AIRS complaints records and Land Agent cases and how issues raised have been addressed allows the Planning Team to evaluate whether implementation of the plan has maintained good neighbour relations. Any issues can be captured and mitigated against in future.