Forestry and Land Scotland
Coilltearachd agus Fearann Alba

Central Region

Selm muir Land Management Plan 2022-2032

Plan Reference No: 032/22/03

Plan Approval Date: 06/06/2022

Plan Expiry Date: 06/05/2032

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			
LMP Name:	Selm muir Forest		
Grid Reference:	NT 0870 6483	**Nearest town or locality:**	Livingston
Local Authority:	West Lothian		
Land Management Plan area (hectares):	91.5		

Owner's Details			
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Version History

Version	Date	Comments
1.0	25/02/2022	Submission to Scottish Forestry
2.0	25/03/2022	Amendments made at request of Scottish Forestry: Proposed felling Tables 7 & 8 have areas conifers and broadleaved areas separated and identified. Figure 3 forest age class distribution 2022-2042' changed to bar chart for better interpretation. Restocking Table 10: error corrected in species description column. Tables 2 and 3 'land use change' and 'forest composition change' recalculated to separate open land awaiting restock from designed open space. Table 12 proposed forest roads: Proposed area for spur road in coupe 97015 amended to reflect accurate area. Table 17 permitted activities within riparian buffers: buffers amended to meet UKFS and water quality guidance.
3.0	04/04/2022	Reference to 'SNH' in the LMP has been changed to 'NatureScot'. Section 7.11.1 text amended relating to mobility of badgers and minimum intervention management.
4.0	05/05/2022	Consultation comments and responses added.
5.0		
6.0		
7.0		
8.0		
9.0		
10.0		

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Table of Contents

1.0 Summary of Proposals

1.1 Key Background Information

This Land Management Plan or **LMP** covers Selm muir forest, an area of land covering 91.5 hectares which was acquired by Forestry and Land Scotland in 1952. It is located at the south-eastern corner of the Central Scottish Lowlands, within the local authority area of West Lothian Council. Livingston Town is the nearest large town, approximately 3 kilometres away, with a population of ~57,000 residents. Although not officially a WIAT woodland (*Woodlands In and Around Towns challenge fund*), Selm muir serves many local communities, providing a well-used outdoor resource for informal recreation. A privately owned water body (*Selm muir Reservoir*) exists within the forest boundary. This is run as a recreational fishing business.

The forest is also located within the Central Scotland Green Network (CSGN) boundary and delivers toward 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. **Table 1** lists the DP30 Objectives which particularly relate to this LMP:

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

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

Key features within Selm muir include:

- The designed beech planted earth-banks which provide a historic connection to the surrounding agricultural landscape & are integral to the internal forest path network.
- The 100 year old Scots pine stands.
- Selm muir reservoir, a man-made waterbody out-with the ownership of Forestry and Land Scotland but completely within the forest boundary. This is used as a private fishing business.

The forest has good productive potential and many zones are able to produce high quality timber. The intention is to maintain this productive potential, whilst expanding native woodland and riparian habitat networks, and diversifying forest species and stands structures for greater resilience to climate change.

In the design process for future native woodland and open space, particular consideration has been given to the forest's well-used path network, heritage features, Selm muir Reservoir and internal and external habitat networks.

This LMP specifically covers the next ten years of forest management but also provides longer term proposals for future habitats and species.

- Main considerations during the drafting of the plan are listed in **Section 1.2.**
- Overarching management objectives of the plan are provided in **Section 1.3.**
- **Section 1.4** summarises key woodland changes of the proposed plan over the next 20 years - in the form of tables and charts.
- More detailed management proposals for the next ten year period are provided in **Section 7.0**.
- Key UKWAS indicators related to the proposed plan are summarised in **Section 1.5**
- A range of supporting maps are found in **Appendix V** and specifically referred to where they support relevant Sections.

1.2 Main Considerations

Larch and *Phytophthora ramorum (P. Ramorum)*

Larch currently comprises ~11.8% of the plan area. It is present both as a component mixture with other species and in pure stands. The forest sits within the 'Priority Action Zone' of Scottish Forestry's '*Phytophthora ramorum* larch Action Plan'. This zone is where actions will have the greatest impact on controlling the spread of *P. ramorum* and although infections have been limited they are gradually increasing. Ideally all Larch would be removed in the first phase of felling. This, however, must be balanced against achieving other sustainable forest management targets.

Silvicultural management of mature forest stands

This LMP will review silvicultural systems used to manage existing forest stands, taking account of site conditions, previous interventions and stand stability. Given the spread of windthrow in many areas, it is clear 'alternative to clearfell' management envisaged in the previous plan, & covering large areas of the forest, has to be reviewed. The LMP will aim to focus lower impact silvicultural systems (**LISS**) and on areas showing the greatest potential for continued thinning and small scale regeneration felling.

Adjacency

Windblow has developed in a concentration of conifer stands planted in the 1950s & 1970s. This LMP will put in place a schedule for clearing these stands economically whilst reducing impacts of adjacency on landscape and hydrological features (*i.e. trying to avoid felling immediately adjacent stands in one operation*). The plan will also consider how the attractive 100 year old pine stands can be regenerated more gradually over a period of 30+ years, using small scale regeneration felling, which again avoids adjacency.

Future forest design

The following factors will be considered to design future habitats and species at Selm muir:

- Strengthening and expanding the forest habitat network.
- Enhancing and protecting riparian zones
- Diversifying forest species and mixtures to make the forest more resilient to climate change.
- Enhancing views along the forest path network by diversifying stand structure, species mixtures, and increasing open space.
- Zoning more intensive crop management systems away from Selm muir reservoir and fishing club to reduce future impact of forest operations and enhance the landscape around the reservoir.

Heritage & conservation

There are no statutory conservation or heritage designations within the forest. This plan will consider increasing protection to key conservation and heritage features through the targeted use of minimum intervention or long term retention management systems and/or through the creation of native woodland habitats in specific zones.

1.3 Selm muir Management Objectives 2022-2032

Corporate Outcomes Relevant to LMP	Operational Actions To Deliver Outcome Relevant to LMP	Draft LMP Objectives
Outcome 1: **Supporting a Sustainable Rural Economy** 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.	• 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. • Developing our forest planning processes to ensure long-term sustainable productivity of the national forests and land. • Providing a sustainable supply of timber to Scotland's timber processing sector. • Support the venison processing sector through our deer management. • Work proactively with our tenants and stakeholders to identify potential added-value opportunities.	• Update silvicultural management prescriptions aiming for tree crop resilience and a sustained capacity to provide timber supplies. Key factors: 1. The present condition of individual stands, their response to past interventions & their past natural development. 2. Current threats to tree health. 3. Accelerated climate change, its impact on tree species suitability and stand management options. • Continue to provide a sustained productive timber resource. 1. Aim to supply a wide range of timber products & sizes. 2. Maximise proportions of saw log quality timber where thinning does not jeopardise tree stability. 3. Reduce the likelihood of windthrow and timber deterioration by gradually reducing the proportion of even-aged tree stands beyond normal rotation age. 4. Increase species mixtures. • Selm muir is a relatively small forest yet provides valued services to local communities and businesses. The plan will identify areas where the primary objective of timber production adversely impacts these other activities & adjust management prescriptions. In many cases this adjustment will be achieved at the restock stage through updated design or a change in the intensity of management. During this process - proactively work with key stakeholders to mitigate impacts as these changes are implemented.

Corporate Outcomes Relevant to LMP	Operational Actions To Deliver Outcome Relevant to LMP	Draft LMP Objectives
Outcome 2: **Looking after Scotland's national forests and land** Scotland's national forests and land are looked after; biodiversity is protected and enhanced; and more environmental services are provided to people.	• Managing the national forests and land to further the conservation and enhancement of biodiversity. • Collaborating with partners on integrated landscape-scale approaches to habitat management and restoration. • Developing an asset management approach to the historic environment within Scotland's forests and land. • Continuing to implement the Larch Strategy in order to reduce the rate of expansion of *Phytophthora ramorum*.	• Where planting is used to regenerate stands, use tree species & provenances resistant to tree diseases & climate change. Remove larch pre-emptively during the term of the LMP. • Protect & seek opportunities to enhance the forest's historical features, recognising their link to the surrounding 'lowland plain' landscape. • Continue to protect species and habitats in the forest The plan will have a particular focus on LEPO Woodland connectivity (Long Established Woodland of Plantation Origin) and the link to Linhouse Water & associated ancient woodland. Retain standing and fallen deadwood wherever possible and protect veteran trees. • Establish minimum intervention areas with the potential to become natural reserves in sensitive locations. • Protect and enhance water features and filter zones. Work proactively with the private fisheries to minimise water siltation throughout the forest, taking active measures prior to and during operations.

Corporate Outcomes Relevant to LMP	Operational Actions To Deliver Outcome Relevant to LMP	Draft LMP Objectives
Outcome 3: **National forests and land for visitors and communities** 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.	• Maintaining walking and biking trails to promote fun in the outdoors, focussing on improving entry level experiences for everyone to enjoy and gain health benefits. • 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. • Enabling outdoor learning and encouraging schools and community groups to make use of the national forests and land. • Continuing to engage communities in decisions relating to the management of the national forests and land. • Continuing to support community empowerment by enabling communities to make use of the national forests and land to benefit their communities.	• Maintain current recreational infrastructure including paths & associated heritage features. • Re-establish the longer distance circular walking route to the north of the fisheries • Where feasible, continue to involve local community groups & organisations to develop informal recreational & educational activities such as forest schools. • Ensure management prescriptions protect and enhance recreational routes and heritage features. • Where visitor & recreation expansion is planned, consider resource capacity and interaction with other forest activities & users (e.g. residential & business interests within the forest).

1.4 Key Woodland Changes

Table 2 – Land use change within forest 2022-2042

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
Felled/Fallow	0	0.0	3.1	3.4	1.8	2.0
High Forest[1]	78.9	86.2	77.1	84.3	76.8	83.9
Open/Unplanted streamsides	8.2	9.0	9.5	10.4	11.2	12.2
Partially Intruded Broadleaf[1]	1.6	1.7	0.5	0.5	0.4	0.4
Unplantable or bare	1.2	1.3	1.3	1.4	1.3	1.4
Windblow[1]	1.6	1.7	0	0.0	0	0.0
TOTALS	**91.5**	**100**	**91.5**	**100**	**91.5**	**100**

[1] These components combined make up the forest tree species in Table 3 below

Figure 1 – % Land use change within forest 2022-2042

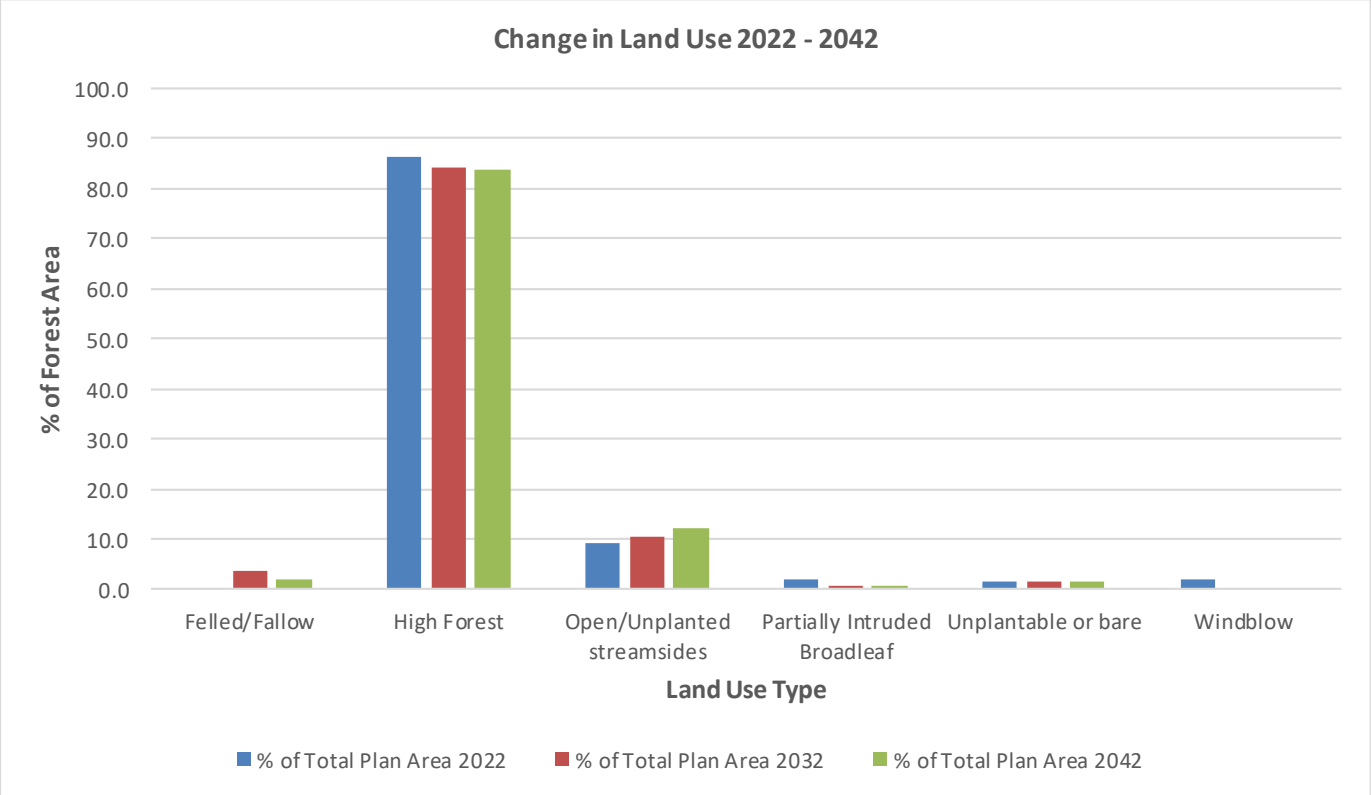


Table 3 Change in forest composition 2022-2042

Forest Component	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	32.2	35.2	30.6	33.4	24.9	27.2
Scots pine	17.8	19.5	17.2	18.8	17.2	18.8
Larch	10.8	11.8	0	0.0	0	0.0
Native mixed broadleaves	9.1	9.9	13.9	15.2	15.7	17.2
Beech	4.9	5.4	4.9	5.4	4.9	5.4
Lodgepole pine	2.2	2.4	1.8	2.0	2.4	2.6
Macedonian pine	0	0.0	2	2.2	2.4	2.6
Birch (downy/silver)	1.8	2.0	1.2	1.3	1.3	1.4
Norway spruce	1.7	1.9	2.3	2.5	4.2	4.6
Western hemlock	0.8	0.9	0.7	0.8	0.5	0.5
Corsican pine	0.3	0.3	0	0.0	0	0.0
Oak (robur/petraea)	0.3	0.3	0.3	0.3	0.3	0.3
Mixed broadleaves	0.2	0.2	2.7	3.0	3.4	3.7
Designed Open	8.2	9.0	9.5	10.4	11.2	12.2
Other*	1.2	1.3	4.4	4.8	3.1	3.4
TOTALS	**91.5**	**100**	**91.5**	**100**	**91.5**	**100**

***Other = awaiting restock (felled/fallow) & unplantable/bare**

Figure 2 Change in forest composition 2022-2042

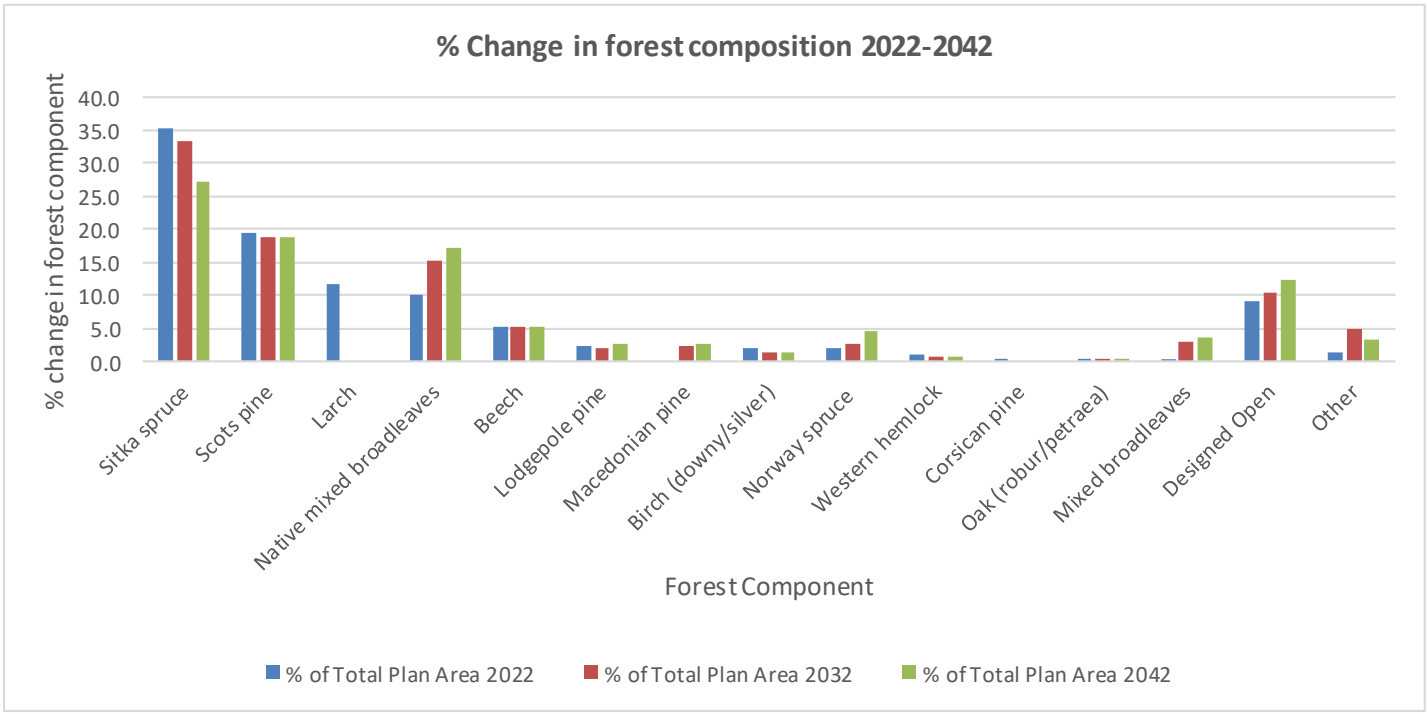
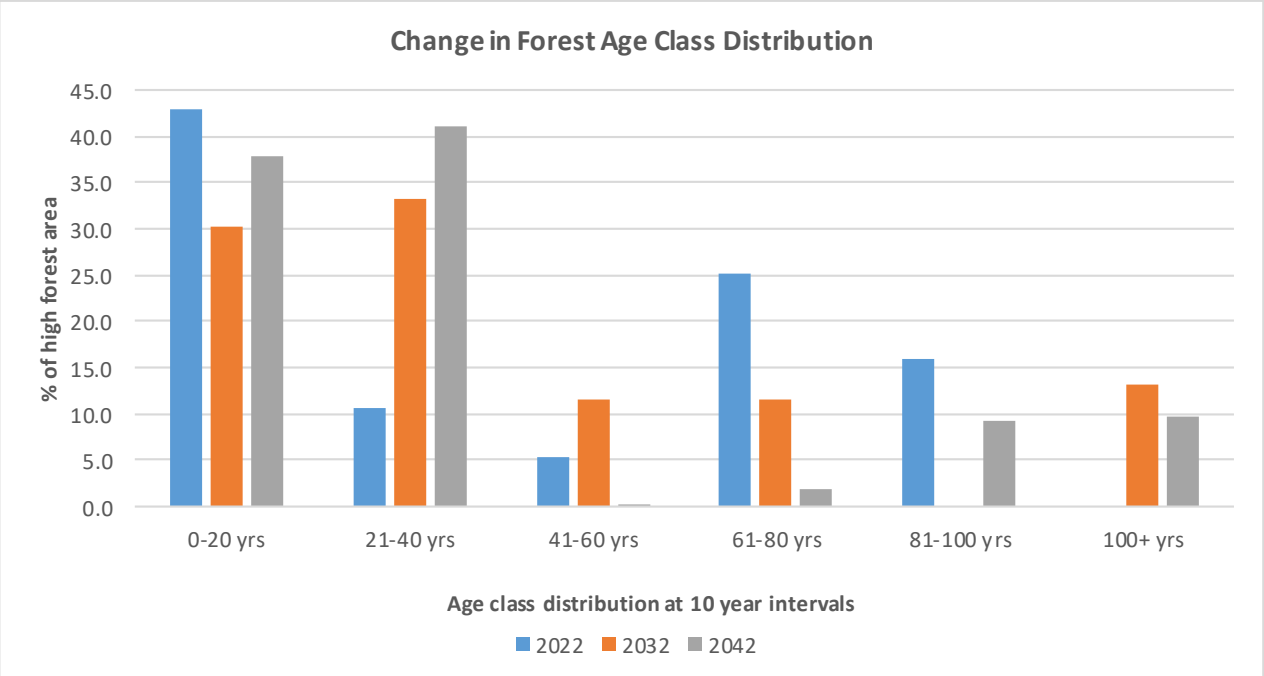


Table 4 Change in forest age class distribution of forest stands 2022-2042

Tree Age Class	% of Total Plan Area 2022	% of Total Plan Area 2032	% of Total Plan Area 2042
0-20	42.9	30.2	37.9
21-40	10.6	33.3	41.1
41-60	5.3	11.7	0.1
61-80	25.2	11.6	2.0
81-100	16.0	0.0	9.2
100+	0.0	13.3	9.7
TOTALS	**100**	**100**	**100**

Figure 3 Change in forest age class distribution of forest stands 2022-2042



1.5 UKWAS Indicators for this Land Management Plan

Table 5

UKWAS indicator	Description	Area (ha)	% of Plan Area
Total LM Plan Area	Total land area within plan boundary	91.52	
Total Current Woodland Area	Sub-cmpts with total trees in the sub-cmpt greater or equal to 20%: High forest (PHF), Windblow (PWB), Partially Intruded Broadleaves (PIB), Seed Stand (PSS), Seed Orchard (FMS), Research Plantation (PRP), Ancient and Ornamental (NAO), Arboreta (NAR), Worked coppice (PWC), Christmas trees (FMC), Felled (PFE) and Burnt (PBU).	78.9	**86.2**
Natural Reserves - Plantation	N/A	0	**0**
Natural Reserves - Semi-natural	N/A	0	**0**
Long term retention and areas managed under LISS and Minimum Intervention	Management coupes of type **Group shelterwood**, Irregular shelterwood, **Uniform shelterwood**, Group selection, Single tree selection, Strip shelterwood, **Long Term Retention**, Coppice with Standards, Pollarded coppice, Coppice, Minimum Intervention (Natural Reserve), **Minimum Intervention**. UKWAS requires at least 1% of the Woodland Management Unit	33.79	**36.92**
Area of Conservation value	Long term retention coupes (10.59ha) & minimum intervention areas (8.3ha)	18.89	**20.64**
Planned Open/Other	Derived from the Future Habitats & Species (Managed Open and Open Successional)	14.3	**15.6**

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

Table 6 Summary of Planned Operations

Planned Operations	2022-2032
Clearfell/Clearfell with seed tree (afforested area)	15.81 hectares
LISS Felling (afforested area)	5.88 hectares
Thinning	41.30 hectares
Clearfell Restock	15.81 hectares
LISS Restock (replanted area)	2.27 hectares
LISS Restock (natural regeneration)	3.61 hectares
Woodland Creation	0
Road Construction	110 metres
Road Upgrade	460 metres

2.2 Proposed felling in years 2022-2032

More detailed prescriptions for clearfell and LISS clearfell are provided in **Section 7.0** (Management Proposals). See also **Maps 10, 11 & 12**.

Total felling phase 1 = 15.46 hectares (9.58ha clearfell & 5.88ha LISS clearfell).
Total felling phase 2 = 6.23 hectares.
Total Felling Plan Period = 21.69 hectares

Table 7 Clearfelling Phase 1 & 2

Felling Coupe	Proposed FY Year	Phase 1 Conifers 2022-2026 (gross ha)	Phase 1 Broadleaves 2022-2026 (gross ha)	% forest area	Phase 2 Conifers 2027-2031 (gross ha)	Phase 2 Broadleaves 2027-2031 (gross ha)	% forest area	Estimated Volume m^3
97002 (Larch Removal)	2023	0.98	0	1.07				93
97006 (windblown)	2023	4.27	0	4.67				811
97007 (part windblown)	2023	4.33	0	4.73				1104
97008 (part windblown)	2029				3.66	0	3.78	882
97016 (Larch removal)	2029				2.57	0	2.80	655
Totals		9.58 ha	0 ha	10.47 %	6.23 ha	0 ha	6.8 %	3545m^3

Table 8 LISS felling Phase 1 and Phase 2 (Low Impact Sivilcultural Systems)
(LISS or clearfelling areas are shown in **Map 11)**

LISS Felling Coupe	Proposed FY Year	Phase 1 Conifers 2022-2026 (gross ha)	Phase 1 Broadleaves 2022-2026 (gross ha)	% forest area	Phase 2 Conifers 2027-2031 (gross ha)	Phase 2 Broadleaves 2027-2031 (gross ha)	% forest area	Estimated Volume m3
97015	2023	1.95	0.32	2.48				578
97017	2023	3.61		3.8				814
Totals		5.56 ha	0.32 ha	6.55 %				1392m^3

2.3 Proposed thinning in years 2022-2032

The different types of thinning prescriptions proposed at Selm muir are detailed in the Management Proposals **Section 7.6 Thinning.** Also see supporting **Map 12** which shows areas proposed for both commercial and non-commercial thinning.

Table 9 Proposed Thinning Breakdown by forest species over LMP period

Thinning by Forest Species (Area in Hectares)	
Tree species	**Area (ha)**
Sitka spruce	13.80
Scots pine	10.46
Broadleaves	8.67
Larch	5.77
Lodgepole pine	2.60
Total Area	**41.30**

2.4 Proposed restocking in years 2022-2032

Total restock phase 1 = 15.46 hectares
Total restock phase 2 = 6.23 hectares
Total Restock Plan Period = 21.69 hectares.

See supporting **Map 13 Future habitats and species**

See **Section 7.0 Restock Prescriptions** for the National Vegetation Classification (NVC) semi-natural woodland planting mixes and other restock specifications.

Table 10 & 11 Reference Notes:

1. Use QCI seed orchard Sitka spruce. Do not use vegetative propagated improved Sitka spruce (VPSS), as prone to late frost damage at Selm Muir.
2. See FC Bulletin 112 Creating New Native Woodlands for recommended NVC species planting mixtures.
3. 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.
4. SDA = Stocking Density Assessment at growth year 1 and growth year 5

Table 10 - Phase 1 (2022-2026) Restocking of felled areas including LISS felled areas (Hectares)												
Coupe Number	**Total Area (ha)**	**Scots Pine (ha)**	**Norway spruce (ha)**	**Macedonian Pine (ha)**	**[1]QCI Sitka spruce (ha)**	**Alaskan Lodgepole Pine (ha)**	**Native mixed broadleaves/ Mixed broadleaves (ha)**	**[2]NVC Type**	**Open land (ha)**	**Restock year**	**Description, Restock Method & Density (Restock/Nat Regen/Alt Area/Coppice/Open)**	**Monitoring Comments**
97002	**0.98**				0.36	0.36	0.13	W11	0.13	2024-25	**Low impact cultivation & planting** QSS/ALP 1:1 Productive Conifers [3]2700 stems/ha (1.9 mx 1.9m) W11 Upland Oak/Birch Woodland 1600 stems/ha (2.5m x 2.5m)	SDA[4]
97006	**4.27**						4.27	W11		2024-25	**Low impact cultivation & planting** W11 Upland Oak/Birch Woodland 1600 stems/ha (2.5m x 2.5m)	SDA[4]
97007	**4.33**	1.75	0.67				0.47	N/A	1.44	2024-25	**Low impact cultivation & planting** SP/NS 2:1 Productive Conifers [2]2700 stems/ha (1.9 mx 1.9m) SP/ASP/SBI/ROW 1:1:1:1 Mixed Woodland 1600 stems/ha (2.5m x 2.5m)	SDA[4]
97015 LISS felled area	**2.27**	1.37	0.68						0.22	2024-25	**Low impact cultivation & planting** SP/NS 2:1 Productive Conifers [2]2700 stems/ha (1.9 mx 1.9m)	SDA[4]
97017 LISS felled area	**3.61**	0.54			0.36		2.71			2024-25	Respace existing understorey **natural regeneration** to promote mixed broadleaves (75%). Allow up to 25% conifers: Within this, Scots pine should be main component with no more than 10% of total LISS area Spruce or Hemlock. Target stocking density 1600 stems/ha (2.5m x 2.5m)	SDA[4]

Table 11 - Phase 2 (2027-2032) Restocking of felled areas (Hectares)												
Coupe Number	**Total Area (ha)**	**Scots Pine (ha)**	**Norway spruce (ha)**	**Macedonian Pine (ha)**	**[1]QCI Sitka spruce (ha)**	**Alaskan Lodgepole Pine (ha)**	**Native mixed broadleaves/ Mixed broadleaves (ha)**	**[2]NVC Type**	**Open land (ha)**	**Restock year**	**Description, Restock Method & Density (Restock/Nat Regen/Alt Area/Coppice/Open)**	**Monitoring Comments**
97008	**3.66**	1.94	0.48				0.52	W11	0.72	2030-31	**Low impact cultivation & planting** SP/NS 3:1 Productive Conifers [3]2700 stems/ha (1.9 mx 1.9m) SP/ASP/SBI/ROW 1:1:1:1 Mixed Woodland 1600 stems/ha (2.5m x 2.5m) W11 Upland Oak/Birch Woodland 1600 stems/ha (2.5m x 2.5m)	SDA[4]
97016	**2.57**	0.1		1.96			0.3	NA	0.21	2030-31	**Low impact cultivation & planting** Macedonian pine Productive Conifers [3]2700 stems/ha (1.9 mx 1.9m) SP/ASP/SBI/ROW 1:1:1:1 Mixed Woodland 1600 stems/ha (2.5m x 2.5m)	SDA[4]

2.5 Forest road requirements 2022-2032

Table 12 forest road requirements 2022-2032
(See Map 10 Management coupes & proposed forest roads)

Planned forest road requirements 2022-2032					
Coupe Number	**Type**	**Total length (metres)**	**Total Area (hectares)**	**Rationale**	**Monitoring Comments**
97005/ 97001)	New spur road with hammer head	60	0.11	Timber haulage access for coupes 97006(fell), 97002(fell) & 97001(thin). Roadside timber will be stacked/loaded on this spur to reduce conflict with fisheries business traffic.	GIS Planned road layers
97005	Upgrade	270	0	Timber haulage access for coupes 97006(fell), 97002(fell) & 97001(thin)	GIS Planned road layers
97015	New spur road with welfare storage area	50	0.09	Welfare/storage area and additional LISS thinning access to coupe 97015	GIS Planned road layers
97015 / 97016	Upgrade	190	0	Additional haulage/stacking/loading access to coupes 97016 (fell) & 97015 (LISS thin)	GIS Planned road layers
Multiple Coupes	Maintenance	1580m		Maintenance work on existing main spine forest road to clean verges, check/repair culverts, level pot holes.	GIS Planned road layers

2.6 Departure from UKFS guidelines

This LMP adheres to UK Forestry Standard Guidelines. However, there will be several adjacent felling coupes during the plan period, this is due to the following factors:

1. The close proximity of severely windblown coupes, particularly those planted in the 1950s.
2. Reducing the spread of *Phytophthora ramorum* and therefore removing Larch stands within the plan period.
3. Starting the process of restructuring and regenerating older pine stands planted in the 1920s.

Mitigation measures employed to reduce the impact of adjacency:

1. Felling coupes have been separated into two phases (phase 1 & phase 2), to avoid adjacent coupes being felled within the same five year period.
2. Where possible thin stands with Larch present as a component, rather than clearfelling the entire stand.
3. Manage the most stable older pine stands using lower impact silvicultural systems – taking advantage of natural regeneration (where this meets long term management objectives) and using smaller felling areas or 'mini-coupes'.
4. Re-design replanting to protect and enhance sensitive features within the forest - such as the reservoir and its inlets, heritage and conservation features.

Key examples:

- The removal of unstable stands surrounding Selm muir reservoir. The northern stand (coupe 97006) will be removed in phase 1 (2022-26) and the southern stand (coupe 97008) will be removed in phase 2 (2027-31).
- The LISS management system used in coupe 97015 phasing the regeneration of the p1920 pine stands over four phases with the final clearfell in the 2050s.
- Thinning of younger Spruce/Larch stands - concentrating on removal of Larch (coupes 97003 and 97018).

It is important to note that implementation of these mitigation measures will be subject to the spread of windblow within retained stands and subsequent safety implications for forest users and the fishing business at Selm muir reservoir, particularly retained stands bordering the banks of the reservoir.

2.7 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

2.8 Tolerance Table

Table 13 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
Scottish Forestry (SF) Approval not normally required (record and notify SF)	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
Approval by exchange of letters and map	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
Approval by formal plan amendment	Y	Felling delayed into second or later 5 year period Advance felling into current or 2nd 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

3.0 Environmental Impact Assessment (EIA) Screening Determination for forestry projects

Proposed Work							
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							
Proposed Work	Select (X)	Area (ha)	Conifer	Broad-leaves	Proposed work	Select (x)	Length (m)
Afforestation					Forest roads	X	110
Deforestation					Forest quarry		
Location of work	New forest road 60m (NT 083 648) New forest road 50m (NT 088 647)						

3.1 Proposed deforestation

N/A

3.2 Proposed forest road works

110 metres as detailed in **Section 2.5**

3.3 Proposed forest quarries

N/A

3.4 Proposed afforestation

N/A

4.0 Introduction

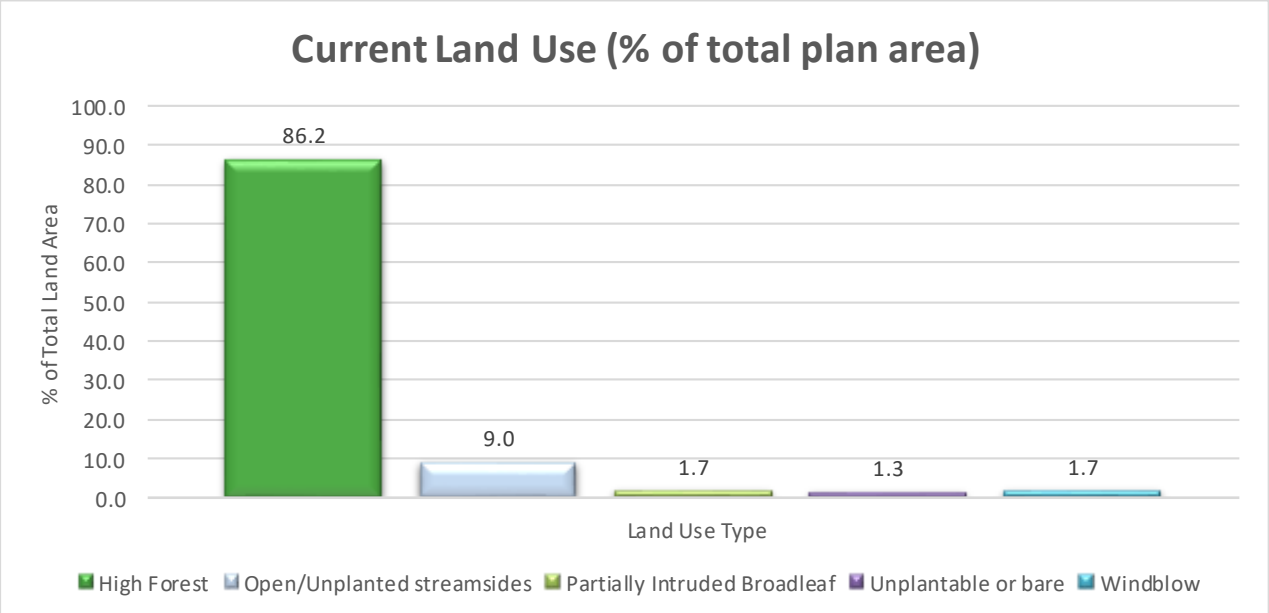
4.1 The existing Land Holding

Selm muir forest is 91.5 hectares in area. **Table 14** & **Figure 4** show the current land use at Selm muir:

Table 14 Area and Percentage Breakdown of Land Use Type within Selm muir

Land Use	Area 2022 (ha)	% of Total Plan Area 2022
Felled/Fallow	0	0.0
High Forest	78.9	86.2
Open/Unplanted streamsides	8.2	9.0
Partially Intruded Broadleaf	1.6	1.7
Unplantable or bare	1.2	1.3
Windblow	1.6	1.7
TOTALS	**91.5**	**100**

Figure 4 Percentage Breakdown of Land Use Type within Selm muir



Appendix I contains the following information about Selm muir forest:

- A review of the previous management plan and how it relates to today's objectives.
- Physical attributes of the forest (soils, wind hazard, hydrology, existing and predicted future climate).

- Analysis of forest stands (composition, age range, growth rate, past management & options for future management).
- Current operational access, plant health issues and wildlife (deer) management.
- Landscape, biodiversity and heritage attributes of the forest and its surroundings.
- Social factors and recreation.

This information is supported by the following LMP maps:

- **Map 1** Location & context.
- **Map 2** Existing forest stands.
- **Map 3** Soils and hydrology.
- **Maps 4, 5 & 6** Wider conservation, heritage, landscape and forest habitat networks.
- **Map 7 & 8** Locally important features & analysis of constraints & opportunities.

4.2 Setting and Context

(See Map 1 Location & Context and Map 7 Locally Important Features)

Selm muir forest lies within West Lothian Council boundary just to the south of Livingston Town with a population of ~57,000 residents. The village of Kirknewton lies just to the north-east with a population of ~2000 residents. The forest is just out-with the WIAT Zone boundary for Livingston, so is not considered an 'urban forest'. However, data from the installed people counters have shown a general trend of increased usage, with a peak of over 18,000 visits to the forest in 2020. Covid-19 long distance travel restrictions will have contribute to the high numbers in 2020 but it is clear that Selm muir is an important outdoor resource for the surrounding urban & rural communities. The two main visitor activities are informal recreation and outdoor education.

The closest major transport routes are the A71 to the north and A70 to the south. Forest entrances are located at both the eastern and western boundaries. The eastern entrance hits a minor road called 'Leyden Road' which in turn links to both the A71 and the A70. The western forest entrance joins to a minor road that becomes a dead-end to the south and links to the A71 to the north.

Unfortunately both routes to the A71 cross under national rail bridges with height restrictions. This limits timber haulage access, so the main viable route for large timber lorries is from the eastern access point, south to the A70.

The western entrance also serves as a legal access for the private fishing business located at Selm Muir reservoir. The reservoir is completely surrounded by the forest but not within FLS legal ownership.

The main services provided by the forest are informal recreation, high to medium grade timber production, forest & riparian habitat connectivity. The forest also provides the access route and setting or immediate backdrop for the fishing business located at Selm muir reservoir.

4.3 LMP Presentation

This LMP (Land Management Plan) covers a distinct forest block called Selm muir forest (91.5 hectares). This forest area is relatively small and, although important features or objectives are identified in certain parts of the forest, it is deemed too small to divide into specific management zones.

5.0 Plan objectives

Appendix I includes a detailed review of the previous plan's objectives and how they relate to today's environment.

The next LMP's overarching Management Objectives are outlined in **Section 1.3 Selm muir Management Objectives 2022-32** (above). These objectives were agreed at an internal scoping meeting held with FLS local delivery teams in June 2021. Feedback and comment from this meeting were combined with detailed desk and site surveys, and liaison with key stakeholders. The information gathered during this process was then used to generate specific management proposals and prescriptions which are outlined in **Section 7.0 Management Proposals**.

Section 6.0 Analysis and Concept illustrates how the information gathered, was schematically analysed to identify important features, constraints and opportunities within the forest and how these relate to the overarching management objectives. This allowed the formation of management concepts or general strategies from which more detailed management proposals and prescriptions could be produced (**Section 7.0 Management Proposals**). This whole process is summarized in **Table 15** (below) and **Maps 8 and 9.**

Appendix IV shows how each overarching management 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.

6.0 Analysis and Concept

6.1 Analysis

The analysis and subsequent concept design process has been summarized in **Table 15** (below). **Map 7 Locally Important Features** and **Map 8 Constraints and Opportunities** identify important features, constraints and opportunities.

6.2 Concept

The analysis was used to identify key features, constraints and opportunities within the forest. The concept design process used this information to generate management concepts or strategies going forward. This whole process is summarized in **Table 15** (below). The formation of general concepts and strategies is illustrated in **Map 9 Concept Design.**

Table 15 – Concept development through analysis of constraints and opportunities

Constraints/Challenges	Opportunities	Concept
Linked Overarching Management Objectives		
Concentration of tree stands planted in 1950s around Selm muir reservoir & main inlet with spreading windblow & larch component vulnerable to *Phytophthora ramorum*. The footpath on the northern boundary has been blocked, the timber value is deteriorating & there are increasingly unattractive interior edge views in this part of the forest.	Opportunity to remove larch & the future risk of *Phytophthora ramorum* infection. Phase felling around reservoir to reduce landscape & hydrological impact. Tailor restock planting & future management to reduce conflict with fishing business, enhance views and riparian zones around reservoir & its main inlet. Reconnect path network along northern boundary of forest and improve forest habitat network (FHN).	See Map 10 & Map 12 (Felling/Thinning): Removal of these stands will take place in two consecutive phases starting in phase 1. Larch will therefore be removed from these areas in the next 10 years. See Map 13 'future habitats & species' – increase open space and native broadleaved planting around reservoir and inlets, enhancing FHN. Long-term commercial conifer planting to be zoned away from reservoir & fishing club shared access road. All replanting to be intimate mixtures to increase crop resilience, landscape diversity & options for future management.
Update silvicultural management prescriptions aiming for tree crop resilience and a sustained capacity to provide timber supplies. The plan will identify areas where the primary objective of timber production adversely impacts these other activities & adjust management prescriptions.		

Constraints/Challenges	Opportunities	Concept
Linked Overarching Management Objectives		
Continue to provide a sustained productive timber resource. Re-establish the longer distance circular walking route to the north of the fisheries Maintain current recreational infrastructure including paths & associated heritage features. Ensure management prescriptions protect and enhance recreational routes and heritage features. Where visitor & recreation expansion is planned, consider resource capacity and interaction with other forest activities & users (e.g. residential & business interests within the forest). Where planting is used to regenerate stands, use tree species & provenances resistant to tree diseases & climate change. Remove larch pre-emptively during the term of the LMP. Protect and enhance water features and filter zones. Work proactively with the private fisheries to minimise water siltation throughout the forest, taking active measures prior to and during operations.		
Dense productive p2002 conifer stands planted close to burns & beech planted earth-banks. Many have a Larch component vulnerable to *Phytophthora ramorum*.	Opportunity to remove Larch &, where drier soils, complete a 1st thinning operation to improve future management access & increase crop stability. Opportunity to expand native broadleave/open space mosaic when conifers clearfelled – thereby enhancing FHN link to Linhouse Water to the west of the forest.	See Map 12 'ten year LMP felling areas & thinning coupes': During the plan period (within the p2002 crops) implement a mix of small-scale felling, commercial line & matrix thinning, & pre-commercial matrix thinning - focussing on the removal of Larch. This will improve future access to these crops should any of the remaining Larch be infected. See Map 13 'future habitats & species': Re-design Restock to maintain a core commercial mixed conifer element whilst expanding native broadleaf/open space mosaic, particularly within expanded riparian zones.
Remove larch pre-emptively during the term of the LMP. Continue to provide a sustained productive timber resource. Update silvicultural management prescriptions aiming for tree crop resilience and a sustained capacity to provide timber supplies. Continue to protect species and habitats in the forest. The plan will have a particular focus on LEPO Woodland connectivity (Long Established Woodland of Plantation Origin) and the link to Linhouse Water & associated ancient woodland.		
Older conifer stands planted in 1920s (~15% of forest) now require action to start the regeneration &	Opportunity to start lower impact small scale felling & restocking with the	See Map 11. 'LISS management & other low impact management areas':

Constraints/Challenges	Opportunities	Concept
Linked Overarching Management Objectives		
restructuring process. They are generally well thinned & stable to wind but some windblow has inevitably started to occur. In some of these stands a dense understorey of 2m – 3m high mixed broadleaved regeneration has established making management of the overstorey more difficult.	intention to achieve full regeneration of these stands by 2050s. Opportunity to take advantage of natural regeneration where the species present meets management objectives & use replanting to retain a core conifer productive component. Opportunity to expand native woodland and open space to improve the FHN & internal views within woodland.	In eastern zones of these stands, enhance the broadleaved habitat network. Take advantage of well-developed broadleaved natural regeneration by quickly removing the conifer overstorey & respacing the broadleaved understorey. In western parts of these stands the objective is to maintain mixed productive conifers in future rotations. Small scale felling & prompt replanting will be used. Scots pine will still remain the dominant future component but Norway spruce will be introduced to provide some diversity & stronger harvesting residue to support harvesting machinery during operations. Programme felling/regeneration interventions at 10 year intervals with the objective to fully regenerate these stands by the 2050s. This longer regeneration timescale will help reduce the landscape & ecological impact. In all zones retain a proportion of well tapered (stable) Scots pine overstorey trees through to 'old growth' phase: (8 to 10 stems per ha or 30m2 to 35m2) for conservation and landscape purposes.
Continue to provide a sustained productive timber resource Update silvicultural management prescriptions aiming for tree crop resilience and a sustained capacity to provide timber supplies. Continue to protect species and habitats in the forest The plan will have a particular focus on LEPO Woodland connectivity (Long Established Woodland of Plantation Origin) and the link to Linhouse Water & associated ancient woodland. Retain standing and fallen deadwood wherever possible and protect veteran trees. Where planting is used to regenerate stands, use tree species & provenances resistant to tree diseases & climate change.		

Constraints/Challenges	Opportunities	Concept
Linked Overarching Management Objectives		
Protect and enhance water features and filter zones Ensure management prescriptions protect and enhance recreational routes and heritage features.		
No current protective land designations within forest.	Opportunity to introduce 'Minimum Intervention' management prescription to certain areas & features within the forest, where operations will be limited (e.g. beech planted earth-banks, isolated old conifer stands with good deadwood potential).	See Map 10 'management coupes & clearfell phases': Beech planted earth-banks to be assigned 'Minimum Intervention' status. These are frequently associated with forest path network. In north-eastern corner of forest, merge p2002 native broadleaved planting with Scots pine p1923 stand to create larger coupe & assign 'Minimum Intervention' status. Records of nesting raptors & old badger sett are held for these stands. See Map 7. 'Selmmuir Local Features': There may be a need to remove some of the larger conifers growing within the Roundell heritage feature in order to protect the earth-banks from windblow when adjacent felling operations take place. Therefore this heritage feature has been placed within a LISS management coupe and not a Minimum Intervention area. This will be reviewed periodically (5 year mid-term review and plan renewal).
Establish minimum intervention areas with the potential to become natural reserves in sensitive locations. Protect & seek opportunities to enhance the forest's historical features, recognising their link to the surrounding 'lowland plain' landscape. Maintain current recreational infrastructure including paths & associated heritage features. Ensure management prescriptions protect and enhance recreational routes and heritage features.		
The threat of several tree diseases & the increased rate of climate	Opportunity to diversify conifer species present in forest & the proportion of within stand mixtures	See Maps 10 & Map 12 with felling and thinning:

Constraints/Challenges	Opportunities	Concept
Linked Overarching Management Objectives		
change makes several species more vulnerable at Selmuir: *Phytophthora ramorum* in Larch, Dothistroma needle blight in Scots and Corsican Pine, increased early frost & drought stress to Sitka spruce.	- to lower the overall risk of plant diseases across forest stands. Opportunity to increase the range of native species present at restocking.	Remove Larch species during the LMP period through a felling & thinning programme. Thinning has also been proposed within broadleaved long term retention areas to remove any Larch that has spread into these stands (through natural regeneration). See Map 13 'future habitats & species': Increase frost resistant species in planting mixes such as Norway spruce. Maintain Scots pine as a core component of many stands for its timber, conservation and landscape values, but also test pine species resistant to Dothistroma needle blight (Macedonian pine). Create new area of native W11 Oak/Birch woodland to north of fisheries. Also increase use of Aspen & Silver birch to improve habitat network & landscape diversity. Future Sitka spruce replanting to be in intimate mixture with Lodgepole pine to increase resilience of these stands.
Where planting is used to regenerate stands, use tree species & provenances resistant to tree diseases & climate change. Remove larch pre-emptively during the term of the LMP. Update silvicultural management prescriptions aiming for tree crop resilience and a sustained capacity to provide timber supplies. Continue to provide a sustained productive timber resource.		

7.0 Long term Management Plan Proposals and Prescriptions

7.1 Overall Management

Lower Impact Silvicultural Systems (**LISS**) also known as Alternative to Clearfell management (ATC) have been reviewed to concentrate on the most stable forest stands. In these stands, thinning has been maintained and trees have developed good characteristics for stability (ratio of tree height to lower stem diameter). Of note are the Pine stands planted in the 1920s (approaching 100 years old) which form an attractive part of the forest's internal structure. LISS management proposals for these stands are detailed in **Section 7.5 LISS Felling, 7.6 LISS thinning, & 7.10** Restocking proposals (below) and illustrated on **Map 11**.

In most conifer stands planted in the 1950s & 1970s, thinning was unable to be maintained and a high proportion a windblow has developed. They are concentrated around Selm muir reservoir and its main inlet and there is an urgent requirement to restructure and regenerate these stands. They also contain a significant proportion of Larch vulnerable to *Phytophthora ramorum*. The proposals for removal and regeneration of these stands including hydrological and safety controls are detailed in **Section 7.2, 7.3, 7.4** (Felling proposals) and **Section 7.10** (Restock proposals). The supporting maps for these sections are **Map 9. Concept design**, **Map 12 LMP 10yr felling proposals** & **Map 13 Future habitats and species**.

Management of younger forest stands will involve:

- 1st thinning interventions in productive stands on drier soils - to increase stability and remove larch.
- Gradual removal of conifers from native broadleave planting, where spruce and larch natural regeneration has spread in. Many of these stands have been designated as long term retentions and will enhance the forest habitat network.

There will also be some minor thinning of naturally regenerated areas along access routes, beech planted earth-banks and footpaths in order to protect these features from large shade bearing conifers and improve visual amenity.

The future habitats and species plan (**Map 13**) aims to push back and zone high volume productive conifer stands away from areas with conservation, hydrological and heritage value or with high visitor usage. In this respect, planting design along footpath networks, beech planted

earth-banks, burns and the reservoir will increase non-productive tree stands, native woodland & open space.

Changes in climatic conditions at Selm muir and current plant health impacts have been considered in felling, thinning and future species proposals. It is proposed to remove the existing larch from Selm muir within the next 10 years. The majority of conifer replanting will be in intimate species mixtures. Scots pine will be maintained as a major component of species mixtures for the following reasons:

- Its' importance to the character and ecology of this forest.
- Its' ability to gradually reach large sawlog diameter.
- Its light shading characteristics which will benefit natural regeneration and native ground flora present.

It is expected that Scots pine yield class may drop slightly if Dothistroma needle blight becomes more widespread in the forest. Macedonian pine will be introduced in small areas as it has shown strong resistance Dothistroma needle blight and is well suited to climatic conditions at Selm muir. Norway spruce will be increased to provide another spruce species, but with greater resistance to late spring frost damage and changing seasons.

Ash will not currently be used in replanting due to severe impacts of Ash dieback, but Aspen will be included in many planting mixes for its high conservation and amenity value.

Over the next 20 years the proportion of native woodlands and open ground will increase to strengthen the forest habitat network and better protect and enhance riparian, heritage and recreational features (See **Section 1.4 Key Woodland Changes and Map 13**) .

In order to recognise conservation and heritage features at Selm muir, minimum intervention and long term retention zones are proposed (See **Map 10 and Map 11**).
These will be focused on the following features:

- Existing native broadleaved stands.
- The designed landscape beech planted earth-banks.
- Older pine stands zoned away from busier areas of the forest, with good deadwood potential and historical records of raptor nesting.

As new native stands are created and existing conifer stands restructured/redesigned there may be opportunity to designate 'natural reserve' status to targeted areas of the forest.

In productive well thinned conifer stands under Clearfell and LISS management, a proportion of stable canopy trees will be retained when areas are felled. These will be left without a fixed time

limit to develop as 'old growth phase' trees. It is hoped these will provide deadwood habitat and a seed source. They will only be removed for health and safety reasons.

The existing forest path network will be retained. Through clearance of windblown stands to the north of Selm muir reservoir (management coupe 97006), a previous footpath route will be re-connected with the wider path network in the forest. This will allow longer distance circular walks at Selm muir.

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

7.2 Hydrological controls during harvesting operations

The UK Forestry Standard Water Guidelines (Forestry Commission, 2017) and the associated Operational Practice Guide 'Managing forest operations to protect the water environment' (Forestry Commission, 2019) both provide detailed information on how to protect the water environment from sediment delivery and siltation; see for example Section 8, pp 36-39, in the latter. Watercourse buffers and restricted operations within these buffers are detailed in **Table 17, Section 7.11.2 Riparian Areas & Hydrology.**

Specific mitigation measures to avoid potential sediment delivery and water discolouration at Selm Muir:

- Operations should focus on ground protection; where brash availability is low, e.g., in areas with broadleaves and Scots Pine, it is imperative to avoid forest operations in adverse weather and reduce machining trafficking to a minimum. Consider using long-reach harvesters. The crop should be felled away from streamsides and any main drains. Any brash heaps should be located away from buffer areas to reduce nutrient leaching to water. When removing wind-blown trees great care is required when extracting across wet ground near to watercourses.

- Establish the location/layout of watercourses, drains and boggy areas and factor these into the harvesting plan; prioritise on avoiding these pathways but if not practical, use extra control measures (heavier brash material, well-designed log bridges, extraction routes that minimise drain/burn crossing points).

- The focus should be on ground protection with silt traps used as additional or emergency measures if deemed necessary. Geotextile barriers provide limited protection from sediment delivery and require maintenance including removal of trapped sediment material to be fully effective. An alternative is to use small settling ponds, but these must be designed well to function effectively. See Figure 34 in 'Managing forest operations to protect the water environment' (FC 2019).

- Avoid fording burns; research indicates that fording is a major source of sediment to the watercourse. Where crossings are unavoidable use well-designed log bridges.

7.3 Health and Safety controls during harvesting operations

It is proposed to zone harvesting operations, associated signage and visitor management so that a specific area is closed off and felling completed before moving to the next area of the forest. This avoids several different stands across the forest being simultaneously worked and visitor confusion over where is safe and unsafe to access.

Prior to operational commencement path networks, access points and well used desire lines will be identified so restricted access signage/tape can be targeted to best effect. Banksmen may be used if there are zones particularly difficult to close off, where members of the public repeatedly disregard signage/tape or where visibility is particularly poor (e.g. summer felling in coupe 97017 with dense broadleaved natural regeneration in the understorey). Paths will be cleared of harvesting residues before operational completion in each zone. Welfare facilities will be provided for onsite workers and located on the new proposed spur roads.

See below **Section 7.4** for safety considerations when conducting felling operations around Selm muir fisheries.

7.4 Clearfell

Clearing of Unstable Stands

Felling of unstable stands surrounding the reservoir will present the greatest operational challenge during the plan period. Key management factors:

- Good communication with the reservoir owner in preparation for and during the work.
- Consideration of felling and haulage times to minimise business disruption.
- Safety controls for use of the shared access road.
- Safety controls when felling along the reservoir boundaries & access road.
- Identification of drainage networks effecting the reservoir inlets and use of siltation control measures (as described in **Section 7.2** and **Section 7.11.2**).

In order to reduce landscape and hydrological impacts, felling around the reservoir will be completed in 2 phases. It is proposed to remove the most severely windblown northern stands (coupe 97006) in 2024 . Subject to the remaining southern stands (coupe 97008) staying stable and safe, a five year interval will be applied before clearing these stands in 2029. **Appendix VI Supporting photos** and **Map 12 Ten year felling areas.**

Where felling areas contain active badger setts a survey will be required to identify main sett entrances aswell as annex, subsidiary and outliers setts. A licence is likely to be required prior to operational commencement. If possible, felling should be planned outside the badger breeding season between December and June.

7.5 Lower Impact Silvicultural Systems (LISS)

See supporting **Map 10** and **Map 11.**

Lower impact silvicultural systems will be used in coupes 97015 and 97017, constituting 16% of the forest area.

Coupe 97015 (11.29 hectares):
This management coupe comprises mainly 100 year old Scots pine with some birch and mixed conifers. It is proposed to regenerate this coupe over a 30 year period, splitting into 4 separate felling areas. After each felling intervention, there will be a ten year interval before the next felling area is created. The first felling intervention will be in 2023 and the final felling intervention will be in 2053.

The western and central felling areas in coupe 97015 (70%) will be regenerated with mixed conifers using restock planting to ensure the desired species and proportions are established (Scots pine and Norway spruce). The first felling intervention will be in 2023 and the final felling intervention in 2053.

The most eastern felling area (30%) will be created in 2042, with light crown thinning undertaken up to this point. Existing and new natural regeneration will be used to restock this felling area. It already has a light understorey of mixed broadleaves and future thinning will allow further recruitment before removal of the canopy in 2042. The area will eventually form part of the connected forest habitat network linking to coupe 97017 & 97011. Management of natural regeneration is described in **Section 7.10.5** (Restocking proposals).

Coupe 97017 (3.61 hectares):

97017 has developed a dense understorey of broadleaved natural regeneration with small proportions of naturally regenerated Western hemlock, Larch, Sitka spruce and Scots pine. As illustrated in **photo 5 Appendix VI**, this mainly broadleaved understorey has become well established. The trees are still young, with flexible stems, but further growth will increase their vulnerability to damage when the overstorey conifers are harvested. The proposal is to proactively remove the overstorey conifers in Phase 1 of this plan, whilst the young natural regeneration is still in a young and resilient condition. Proposals for management of this 'released' natural regeneration (subsequent to removal of the overstorey conifers) is outlined in **Section 7.10.5** (below).

LISS Felling in 97017 will present **higher safety risks** due to the following factors:

- Large size of overstorey trees being removed.
- Low visibility caused by the dense understorey & adjacent beech hedge.
- The shape of the working area, being a long narrow strip
- Proximity of footpath and road infrastructure

The internal delivery teams should strongly consider closing this area off during felling operations. Location of desire lines and previous wild camping sites should be identified for targeted deployment of signage, taping and banksmen (if deemed necessary). Timing of felling should also be considered, i.e. balancing winter ground conditions against better visibility - when broadleaved understorey is not in leaf.

Retention of 100+ year Scots Pine Trees in LISS Felling Areas

In all LISS felling areas, when the canopy is removed at each intervention, retain 8 - 10 scattered Sots pine overstorey trees per hectare ($30m^2$-$35m^2$ spacing). These trees will be retained indefinitely as a seed source and to develop as deadwood habitat. Selection should be based on **stability** of the individual tree and not on timber quality or straightness.

Stability characteristics:

1. Well-developed buttressing.
2. The ratio of tree height to diameter at breast height being less than **80 (see below)**

The ratio of tree height to diameter at breast height (dbh) can be calculated as:

$$H/D = \frac{H}{dbh}$$

*Where: **H** = height (metres); **dbh** = diameter at breast height (metres)*

Table 16 Tree height/diameter ratio and associated stability characteristics

	Open Grown Tree	Forest Stands	
		Stable Tree	Unstable Tree
Height: Diameter Ratio	**<50**	**<80**	**>100**

Safety considerations when selecting trees to retain will include proximity to busy path and road infrastructure, forest boundaries, exposure and stability characteristics of trees available to retain.

7.6 Thinning

See supporting **Map 12** for proposed thinning areas.

In productive stands 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, the Larch component is to be removed, larger tree sizes are being sought or as part of a LISS prescription. A record of thinning operations is recorded at the completion of a thinning operation using basal area sweeps or stems per ha sample plots, the crop information being input to the national sub-compartment database.

Specific details for stand types at Selm muir are described below.

7.6.1 LISS Coupe Commercial Thinning

These mainly p1920's Scots pine stands have been quite heavily thinned in the past, some having a quite open structure. The proposal is to conduct a light crown thinning (in most areas lower than 70% of the MMAI per year), concentrating mainly on the removal of Larch which is scattered throughout the coupe in low proportions. Thinning intensity requirements of the core Pine component will be reviewed through basal area measurements, visual assessment of crown overlap and the need to either promote or control of natural regeneration. In the latter case, areas to be restocked by planting specific conifer mixes should be managed to limit the development of a dense broadleaved regeneration such as birch and rowan. This regeneration will be promoted by continued opening up of the canopy at the east end of 97015 where the intention is to expand the forest habitat network and recruit this natural regeneration as the next forest stand.

7.6.2 Productive Conifer Stands Reaching Commercial 1st Thinning Age

These stands planted in 2002 are Sitka spruce dominated, many planted in mix with Larch or Lodgepole in varying proportions. It is proposed to implement a first thinning operation in over 50% of these stands to increase stability, promote larger diameter output and remove or improve access to remove Larch. Stands growing on wetter peaty gley soils or that would require substantial road construction will be managed as non-thin. Where thinning is implemented it will be a '1 in 7 line thinning', with some matrix thinning, for example, to remove intermixed Larch. All crops with a Larch component present will be included in this first thinning operation (Phase 1) to reduce the presence of Larch and allow quick operational access if *Phytophthora ramorum* is identified in the future.

7.6.3 Long term Retention Thinning

Long term retention areas mainly comprise native broadleaves planted in 2002 or with a small component of conifer (Spruce, Larch or Pine) that has colonized as natural regeneration. The aim is to conduct very light commercial (and localised pre-commercial thinning) to remove Larch and the majority of spruce. There is also some 1920's Scots pine in these stands, which will be lightly crown thinned to improve stability for long term retention. Where native broadleaves can be thinned economically (e.g. for firewood markets) this will be implemented using both systematic and selective techniques as part of the other thinning operations. Where safe to do so, windblown, injured or dying trees will be retained to increase deadwood resource and a proportion of felled trees and logs left on site. Standing deadwood will also be identified at the work planning stage, marked and protected during forest operations.

7.6.4 Pre-commercial Thinning

This operation type will mainly be implemented to remove Larch from young productive crops not ready for commercial thinning (coupe 97014) and to respace natural regeneration where this used as the primary method of restocking (LISS coupe 97017). The LISS pre-commercial thinning prescription is described in **Section 7.10.5 Restocking proposals LISS natural regeneration.**
In all areas, trees will be cut to residue on site using motor-manual operations, ensuring drains are not blocked and path networks are not obstructed.
In order to improve ergonomics and reduce HAVS exposure, clearing saws will be used in preference to chainsaws (where stem diameter is manageable). Strict HAVS control procedures will be followed to meet HSE recommendations.

7.7 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 75 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.

7.8 Restructuring

Selm muir currently has a good distribution of tree age classes and species present (**Appendix I, Section 5.0: Tree species, tree age structure & yield class**).

The main challenges in maintaining this:

1. The requirement to clear and regenerate a concentration of windblown stands planted in the 1950s and 1970s.
2. Removing larch from the forest which has provided visual, structural and ecological diversity.

It is hoped to mitigate these changes by implementing the following proposals:

- Designate new Long term Retention and Minimum Intervention zones. These will help maintain and increase older age classes > 80 years and, in Minimum Intervention areas protect the species present, within these zones.
- Extend the regeneration/restructuring period of LISS stands that incorporate the 100 year old Scots pine. These LISS stands will be restructured over a 30 year period with interventions every 10 years. This will present a considerable risk of windblow and reduce economies of scale (by felling/regenerating smaller areas), however it will help diversify age class structure and reduce the landscape impact of grouping these stands into one clearfell coupe.

- Increasing native woodland, W11 Oak birch woodland, will improve species and structural diversity (See existing Oak woodland in **Appendix VI Supporting photos**)
- New tree species will be introduced to Selm muir such as Aspen and Macedonian pine. Greater amounts of Silver birch will be planted to supplement the existing Downy birch.
- Increasing species mixtures, all restock coupes except 97016 will use intimate species mixtures.
- The future habitat and species plan (**Map 13**) should overall increase the number of distinct forest stands with windfirm boundaries. It is hoped this will increase options to vary felling age of adjacent stands.
- In future habitats and species plans and the mid-term review, use of greater open space may be considered to increase windfirm edges in LISS felling coupe 97015. It is hoped the 10 year interval between interventions will be sufficient.

7.9 Long term retentions and Minimum Intervention Areas

Thinning management in Long term Retentions is described above in **Section 7.6.3**.
Long term retentions (LTRs) will cover 10.59 hectares or 11.57% of Selm muir. They have mainly been concentrated in native broadleaves stands that will form part of the long term forest habitat network. It is proposed to maintain these as primarily native broadleaves by removing Larch and dense areas of spruce natural regeneration. The more isolated 100 year old Scots pine stands have been incorporated as LTRs, where they merge into and complement the existing native broadleaved LTRs. During forest operations, deadwood retention will be encouraged by retaining injured or dying trees, windblow and standing deadwood, where safe to do so. There is potential for some LTRs to be designated as Minimum Intervention coupes in the long term.

Minimum Intervention areas are proposed for coupe 97020 and coupe 97013 shown in **Map 10 and Map 11**. They will cover 8.3 hectares or 9% of Selm muir and will incorporate the majority of beech planted earth-bank features that network through the forest. This will ensure their value and protection is recognized during future operations and planning. Within the LMP period intervention will only be considered where safety of forest users is at risk. Additional zones included for minimum intervention are:

1. Well established areas of Oak woodland approaching 70 years old (**Photo 3 Appendix VI**) that will be expanded in the Future habitats and species plan (**Map 13**).
2. Coupe 97013: A more isolated stand of 100 year old Scots pine, linking to well established native oak/ birch woodland planted in 2002. These areas have high potential for deadwood habitat, located in a quieter part of the forest and have previous records of nesting raptors.

7.10 Restocking proposals , future habitats and species

7.10.1 Proposed species in future habitats and species plan.

The Future Habitats and Species plan is shown on **Map 13** and restocking proposals for the next ten years are summarised in **Tables 10 and 11, Section 2.4.**

Guidelines set out in the Forestry Commission's Ecological Site Classification (ESC) Bulletin 124 have been used to inform the most suitable species and woodland types for particular areas within the forest. This system uses climatic zone, exposure, soil moisture, soil nutrient levels, together with on-site survey of soils and ground vegetation. Other key considerations include plant health risks, amenity and conservation objectives, and future predicted changes in climate (the timing of the seasons, annual rainfall and growing season temperatures).

As emphasized in other sections of the plan it is proposed to remove the majority of larch during the LMP period - there may be first thinning areas where it is impractical to remove all larch without destabilizing the whole stand. No larch is included in the restocking proposals.
Scots pine will be maintained as a dominant species component in many stands. More resilient conifer species will be increased or introduced, such as Macedonian pine (resistant to Dothistroma Needle Blight) and Norway spruce (resistant to late spring frost damage). Norway spruce will be a secondary component intimately mixed with Scots pine. These two species have more manageable relative growth rates and Norway spruce will provide stronger harvesting residues for carrying the load of harvesting machinery. Thinning operations will aim to maintain Scots pine as the dominant species component in this mixture.

Intimate species mixtures will be maintained and increased to broaden future management options and the overall resilience of forest stands. Native amenity mixes and open space will be increased, particularly along path networks, riparian zones, heritage features and the reservoir. It is hoped this will off-set the loss of larch (as an amenity species) in the long term. Native woodland will be increased, to strengthen the forest habitat network and structural/ecological diversity of stands.

7.10.2 Hydrological controls implementing future habitats and species plan

The UK Forestry Standard Water Guidelines (Forestry Commission, 2017) and associated Practice Guide 'Managing forest operations to protect the water environment' (Forestry Commission, 2019) will be followed in implementing this LMP. Watercourse buffers and restricted operations within these buffers are detailed in **Table 17, Section 7.11.2 Riparian Areas**.

Specific mitigation measures to protect the water environment at Selm muir:

- At the operational planning stage identify the drainage network on each site and how this links to Selm muir reservoir inlets and tributaries to the Linhouse Water.

- This will indicate the optimum location for drain outlets and related filter zones. Silt traps should be considered as an additional or emergency measure if deemed necessary. Geotextile barriers provide limited protection from sediment delivery and require maintenance including removal of trapped sediment material to be fully effective. An alternative is to use small settling ponds, but these must be designed well to function effectively. See Figure 34 in 'Managing forest operations to protect the water environment' (FC 2019).

- Low impact cultivation techniques will be used See Section 7.10.2 (below)

- If there is a need to apply pesticides during the crop establishment period controls should focus on protection of the drainage and burn network, reservoir inlets and filter zones immediately surrounding the reservoir. It may be required to increase the spray buffer zones beyond standard UKFS guidelines in coupes containing the reservoir inlets.

- The productive conifer tree line will be pushed back from the southern edge of the reservoir (at least 20 m); this will provide a wider buffer zone from more intensive forest operations into which surface runoff could flow and settle out sediment and nutrients. This would also remove the risk of large conifer windthrow, damaging infrastructure at the fisheries. Closer to the reservoir widely spaced slow growing conifers mixed with shorter native broadleaves, shrubs and open space will be established. This should provide multiple benefits including sediment and nutrient retention.

7.10.3 Restock prescriptions productive conifer

These proposals cover productive conifer restocking in both clearfell coupes (**Map 12**) and felled areas within LISS coupes (**Map 11**) during the 10 year LMP period.

Selm muir has a good propensity to grow sawlog quality conifer timber and thus establishment techniques will aim for this objective. In line with the Regional restocking strategy the management input will generally be:

- Low impact cultivation methods (inverted mounding or manual screef on drier soils and hinge mounding on wetter soils). An assessment will be undertaken once harvesting is completed.

- Restocking 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.
- Weeding as required and identified by site observation during standard crop surveys.
- Top up spraying as requirement and identified during standard crop surveys.
- Standard SDA process at years 1 and 5.

Fallow periods (the period between felling and re-planting) will be short and it is recommended that **replanting take place in the financial year following the felling year**. Hylobius populations are not expected to be high, due to the size of proposed felling coupes and Selm muir's remoteness to large-scale forest harvesting activities to Selm muir. However pine forests tend to have greater population densities than other conifer species. Top up spraying operations pose a greater risk to hydrology than use of pesticide treated trees so it is recommended **treated trees** are used to avoid the need or reduce top up spraying during the establishment period.

Growth **competition** from weeds is seen as a more challenging factor. Ground vegetation will need to be monitored subsequent to felling and a general weeding programme budgeted if necessary. In **LISS felling areas competition from fast growing broadleaved natural regeneration** (particularly birch) will need to be controlled. It is recommended a budget be committed in the business plan to control this regeneration prior to planting or in the first growing season (motor manual operations) to allow the conifers to quickly establish. A small proportion of these broadleaves should be retained in the restock for diversity.

7.10.4 Restock prescriptions for planted native and amenity woodland

The **native woodland** type identified at Selm muir is a transition between W11 upland oak/birch woodland with bluebell and W17 upland oak/birch with blaeberry. There are also localized wet areas where W4 birch woodland with purple moor grass is more suitable. Ecological Site Classification data together with site observations have confirmed the native broadleaved replanting proposed in the next ten years tend towards **W11 upland oak/birch woodland**.

Recommend all areas should be replanted in the financial year following the felling year to achieve a minimum final target density of 1600 stems/Ha. Low impact cultivation methods will be used (inverted mounding or manual screef on drier soils and hinge mounding on wetter soils).

In **coupe 97006** (north of the reservoir) it is recommended that low specification **deer fencing** is used to establish the W11 upland oak/birch woodland. Deer control has been problematic in the woodland, particularly in the vicinity of the reservoir and footpath network. Species such as Oak are particularly vulnerable to deer browsing and have required physical protection to establish at Selm muir in the past. It is also important that the coupes surrounding the reservoir are

established quickly to reduce landscape impacts of felling. It is hoped that coupe 97006 can be quickly established before coupe 97008 (south of the reservoir) is cleared in 2029.

In areas shown as **native mixed broadleaves/open space**, planting density should be maintained at 1600 stems per ha but zoned or mixed with open space areas to achieve 50/50 distribution of woodland to open space. These areas will form a mosaic of woodland and open space habitats important in riparian zones and linked to the mixed habitat mosaics at Linhouse Valley Site of Special Scientific (to the west of Selm muir). It is expected that a conifer component may develop in these areas through natural regeneration; this can be accepted however should be managed to ensure it remains a minor component.

Native amenity mixed woodland is proposed to increase structural and landscape diversity along footpaths, heritage features and the reservoir. The following species and proportions will be used:

- Scots pine 25%
- Silver Birch 25%
- Aspen 25%
- Rowan 25%

This amenity mix will be restocked to achieve a minimum final target density of 1600 stems/Ha. It is recommended that **physical protection** such as tree guarding is used for more sensitive species such as Aspen and Silver birch to ensure their proportions are maintained in the amenity mixture. established as part of the mixture It is expected that some other species may colonise these areas through natural regeneration (e.g. Downy birch and Spruce); this can be accepted however should be managed to ensure it remains a minor component.

7.10.5 Restock prescriptions LISS natural regeneration areas

This section specifically relates to LISS coupe 97017. This area has developed a dense understorey of broadleaved natural regeneration with small proportions of naturally regenerated Western hemlock, Larch, Sitka spruce and Scots pine.
As illustrated in **photo 5 Appendix VI**, this mainly broadleaved understorey has become well established, however there is expected to be some damage and loss during the removal of the overstorey conifers. Following this harvesting operation, the coupe will be surveyed to assess the natural regeneration to quantify densities and species composition. The first operation will involve respacing this natural regeneration to promote broadleaves, completely remove larch and ensure Spruce and Western hemlock o not exceed 10% of the coupe area or dominate localized zones. Target species proportions:

- 75% mixed broadleaves.
- 25% mixed conifers (aim for Scots pine as main conifer component with no more than 10% Spruce/Western hemlock, remove all larch).

Target stems per hectare should be no less than 1600. Machine extraction racks and areas with lower densities should be incorporated into standard beat up/maintenance operations to meet the above target density and species proportions.

7.10.6 Restock prescriptions badger sett buffer zones

Appendix VIII provides a more detailed specification for planting and associated works around badger setts. All planting of any known sett location will be at low density within specified buffers (see **Appendix VIII**). No planting should take place within 3 metres from sett entrances. The planted species will be small native tree and shrub species (e.g. rowan, birch, hawthorn, etc) and not larger tree species.

Deer fencing will need to be designed and installed outside a 30 metre buffer zone, with access provision to allow badger movement if deemed necessary.

Delivery teams will consult with internal Environment advisor for optimum species, spacing, timing of planting and other controls in line with the Regional Policy **Appendix VIII**.

7.11 Biodiversity and Environment

The LMP has been prepared in cognisance of relevant legislation and policy, including European and domestic environmental legislation, UK nature conservation policy and local biodiversity guidance. Guidance relevant to the site is listed below:

- The Conservation (Natural Habitats &c.) Regulations 1994 as amended.
- The Wildlife and Countryside Act 1981 (as amended).
- Scottish Planning Policy.
- UK Forestry Standard.
- West Lothian Local Biodiversity Action Plan.

More details on the forest's existing biodiversity and heritage resource are provided in **Appendix I, Section 11**. Management proposals have been prescribed to protect and expand this existing resource in line with the above guidance, and the UK Woodland Assurance Scheme.

7.11.1 Habitat and Species Management

Within the forest, badger populations are located within an unstable stand of mixed conifers. During the next plan period, it is proposed this area will be cleared and converted to native broadleaved woodland. Within the set entrance buffer zones (specified in **Appendix VIII**) lower densities of small native trees and shrubs will be planted (see **Section 7.10.6 restock proposals**) . When this native woodland is properly established the management prescription of clearfell will be reviewed, with preference given to lower impact silvicultural systems or long term retention management.

In addition to badgers, there are sightings of Tawny owl, Buzzard and Common amphibians within the forest. There are also areas with a dense field layer of blaeberry (*Vaccinium myrtillus*) within birch and Pine stands.

In line with regional and national environment priorities Forestry and Land Scotland as a partner in the "Scottish Raptor Monitoring Scheme" (SRMS) will continue its work to protect and support raptor populations within our land holdings. Working with local conservation organisation's and the SRMS's local raptor study groups opportunities will be identified as part of the work plan process to protect and bolster these priority species through habitat creation, modification and the monitoring of populations.

Proposals in this plan for the design of future habitats and species are aimed to improve and expand habitats that will support a diverse range of species. Large old growth phase trees will be promoted in many areas together with minimum intervention management in quieter zones to promote nesting raptors. Deadwood resource will be promoted and high potential deadwood areas better protected - which may benefit many species including invertebrates, bryophytes and bats. Riparian open and native broadleaved habitat will be increased to improve habitat connectivity and structural diversity.

Priority habitats currently known on site are localised areas of 'upland flush, fen & swamp', 'mixed deciduous woodland' & 'wet woodland'. The design of future habitats and species will aim to link and extend these areas, particularly along riparian corridors. The aim is to increase the overall habitat connectivity throughout the woodland and create a stronger link to the wider forest habitat network, particularly to the west of the forest along the Linhouse Water. The majority of native broadleaves stands in Selm muir have been placed under lower impact management – long term retention and minimum intervention.

Within the lifetime of this plan, Forestry and Land Scotland will conduct the following operations:

1. **Bat Habitat Creation/Improvements:** It is proposed to create bat roost habitat for example through the installation of bat boxes where veteran broadleaves are located along linear woodland features, open stream sides and pockets of native woodland. The beech planted hedge banks will provide a good opportunity for this.
2. **Pond and Wetland Creation:** Installation of a number of small scrape ponds (between 4-6 dependant on budget and costs). These will be located in the long term retention area of low density broadleaved woodland (coupe 97005) - to the south west of the reservoir. Work would avoid the removal of any native tree species however limited thinning may be required to allow vehicular access. Ponds would be circa 5 m x 5 m and between 1- 2 m deep with shallow margins. Ideally the margins will be planted with a native wetland species mix to increase biodiversity, provide additional habitat for pollinators and kick start the colonisation of the site by native wetland plant species currently absent, all seed will be of guaranteed Scottish native provenance.
3. **Pollinator Habitat Corridors:** Using the existing road infrastructure as a footprint the roadside margins will be planted with a perennial wildflower seed mix to diversify the existing ground and field layer vegetation and increase the habitat quality for a range of pollinators.

7.11.2 Riparian Areas & Hydrology

All operations will follow UK Forestry Standard operational practice guidance 'Managing forest operations to protect the water environment'. Hydrological protection measures relating to specific forest operations in Selm muir are provided in **Section 7.2 Hydrological controls during harvesting operations** & **Section 7.10.2 Hydrological controls implementing future habitats and species plan**.

A key factor in protecting the water environment is the use of riparian buffer zones within which forestry activities are restricted. Legally specified buffer zones around watercourses and water supplies are relatively narrow (2 metres for water courses and 5 metres for water supplies), however in order to comply with the UK Forestry Standard in conducting forestry activities these zones will be extended to the following:

- **10 metre buffer around watercourses with channel width up to 2 metres width.**
- **20 metre buffer around watercourses with channel width over 2 metres width.**
- **50 metre buffer around drinking water supplies.**

Table 17 summarises the limited activities that are permitted within these buffer zones. This guidance also applies to restocking, although low density native riparian woodland linked to open space is permitted and can provide significant benefits in relation to siltation control and riparian/wetland habitat diversity.

Table 17 Activities permitted within specified buffer riparian buffer zones

Forest Operations	Watercourse		Water supply[2]
	<2 metres wide	> 2 metres wide[1]	
Buffer Width	**5 to 10 metres**	**20 metres[1]**	**50 metres**
Cultivation	No mechanical cultivation within these buffers		
Drainage	Not permitted		
Fertilisers	Only hand applications of inorganic fertiliser. Organic fertiliser not permitted		
Pesticides	Only the dry planting of pretreated trees, unless the product is approved for use in or near water[3]		
Roads/Quarries	No quarrying. Roads should be kept out of buffer areas unless there is a need for a crossing		
Harvesting	No trafficking (except for watercourse crossings). Brash should be minimized.		
Vehicle/machine maintenance	Not permitted (including the storage and handling of fuel oils, lubricants and chemicals)		

Table Notes:

[1]The 20 m buffer width also applies to lakes, reservoirs, large ponds and wetlands, and should be measured from the edge of the standing water.

[2]Concentric buffers for wells and boreholes but focus on the upslope or upstream area of springs and intakes.

[3]Note that the use of such products may require consent from the relevant water authority and users must adhere to the specific guidance on their use.

In order to comply with the above recommendations, future design of the forest shown on Map 13 Future Habitats and Species has made the following changes:

- Productive coupe boundaries have been pushed back from burns, inlets and reservoir banks, in many cases to the maximum recommended buffers in **Table 17**. Within these buffer or filter zones, non-productive native and amenity woodland have been designed with open space.
- Productive conifer coupe design has been revised to limit the need to cross key burns. Where this is unavoidable limited 'pinch points' or narrowing's in the riparian buffer have been created to provide sufficient log material to allow well-constructed log bridges.

During the production of this LMP, the reservoir inlet locations and connecting drains have been updated to provide more accurate information on which to base the design of future riparian zones and productive conifer boundaries. This will also allow the internal delivery teams to implement more effective and targeted riparian protection measures during forest operations.

7.11.3 Ancient Woodland and Deadwood

Although there are no ancient woodlands within the forest approximately 65% of Selmmuir is recorded as Long Establish Woodland of Plantation origin. Currently the oldest and most developed woodland features are the old Scots pine stands planted in 1923 and the network of beech earth-banks recorded as being planted in the 1950s. The beech earth-banks have a high deadwood ecological potential and have been placed under minimum intervention management. The 100 year old pine stands have been placed under LISS management with a proportion placed under long term retention and minimum intervention management. Given Selmmuir's proximity to the largest remnant ancient woodland in West Lothian (Calderwood SSSI) along the Linhouse Water, native woodland and its connectivity has been expanded and strengthened, particularly in the west of the forest where it connects to the Linhouse Water forest habitat network.

The UK Woodland Assurance Standard (UKWAS) target is for an average of 20 m^3/ha, although it is expected that actual concentrations will vary widely across the site.
Table 18 shows the proportions of the forest currently having high, medium and low deadwood potential:

Assessed Deadwood Potential	Area (Hectares)	Future Volume Estimate (m^3/ha)	Total Future Volume (m^3)
High	8.84	100	884
Medium	17.96	30	539
Low	64.72	15	970

Total future potential is thus estimated at 26 m^3/ha.

A range of management proposals will be used to increase deadwood and high potential areas within the forest:

Deadwood will be concentrated where it will provide the highest ecological benefit:

- Where windblown stands are cleared in phase 1 and phase 2, a proportion of windblown stems will be made safe and left in situ. They will be concentrated within riparian zones, proposed native woodland areas and adjacent to beech planted earth-banks.
- In long term retention areas, where safe to do so, windblown, injured or dying trees will be retained.
- In LISS management areas, where the use of natural regeneration is proposed, a proportion of windblown stems and large stable canopy trees will be retained. Standing deadwood will also be retained in these areas where safe to do so.
- In LISS management coupes that will be restocked with productive conifers a proportion of large stable canopy trees will be retained, where safe to do so.

7.11.4 Invasive species

There are currently no Invasive non-native species (INNS) recorded within the woodland. An extended phase 1 habitat survey is proposed during the LMP period, this will include the identification and mapping of INNS if present.

7.11.5 Wildlife (Deer Management)

Deer control in the forest has become more difficult due to limited safe open and woodland edge zones and increasing visitor numbers and desire lines often through quite dense vegetation in the understorey layers of forest stands. However, browsing levels particularly on conifer crops has been low, with crops able to establish without targeted control being required. Slow growing broadleaved species such as Oak have been more heavily browsed and physical guarding has been required to establish these species. As more native broadleaved planting is implemented over the next ten years protection measures will be required. Due to the difficulty of active deer control, it is recommended that physical protection in the form of deer and rabbit fencing is used for larger areas of native woodland planting (coupe 97006). For smaller areas of mixed planting it is recommended that individual guarding is used for the more sensitive species (e.g. Oak, Aspen & Silver birch) to achieve quick establishment. Maintaining access along well used desire lines and footpaths will be an important consideration where deer fencing is installed.

Implementation of the future habitats and species plan (**Map 13**) will gradually increase open space and woodland edge habitat. As a result, more areas may come available to carry out safe deer control. This will be reviewed as restock sites are delivered over the LMP period.

The use of deer shooting mounds is not considered appropriate for this forest, given the high visitor use, location and size restock coupes, and resulting landscape impacts. This will be reconsidered at the plan mid-term review and renewal stages.

7.11.6 Landscape

The beech planted earth-banks provide an important internal landscape resource, creating a sense of place within the woodland. They have been placed under minimum intervention management, recognizing their value. During this LMP period management intervention will only be safety reasons.

In order to maintain and improve long term internal views of the forest, the future habitats and species plan (**Map 13**) has redesigned many productive conifer boundaries, pushing them back from key features such as the beech planted earth-banks, footpaths, riparian zones and the reservoir banks. In such zones open space, non-productive amenity and native woodland has been incorporated to diversify stands structures and internal views.
Phased clearance of unattractive windblown stands around the reservoir will provide opportunity to implement the above changes. This clearance, though covering two phases (10 years), will be a significant change for the reservoir, increasing exposure. It will therefore be important to re-establish woodland cover as quickly as possible (e.g. use of deer fencing for the native woodland in coupe 97006).

Lower impact silvicultural management in older Pine stands will spread their regeneration time over a longer period (30 years). Intervention will use smaller coupe sizes, designed to reduce the visual impact of felling. A proportion of large canopy trees will be retained indefinitely across these cleared areas where safe to do so . This approach carries the risk of windthrow in remaining stands and will need to be reviewed as the plan is implemented.

External views of the forest's most prominent edges (**Map 6 & Appendix VI, Photos 11 to 14**) will be most influenced by felling and restocking coupes along the forest boundary. The impact of felling Coupe 97006 (**Map 10**) should be mitigated by the retention of minimum intervention beech planted earth-banks. As explained above, quick establishment of the native woodland in this coupe will be important.

LISS felling coupe 97017 will present the largest change from external viewpoints during the plan period. The condition and growth of existing natural regeneration in this coupe will be closely monitored post-felling, with management intervention if necessary to ensure establishment of the next forest stand. Small scale felling in coupe 97015 should have limited impact due the shape and size of each proposed felling area.

7.12 Heritage

FLS maintains extensive archaeological records for Scotland's forests and land within our heritage database. Important historic environment features are surveyed, recorded, mapped and monitored by Central Region to ensure and demonstrate Forestry and Land Scotland compliance with the UK Forestry Standard. This ensures that undiscovered historic environment features are mapped and recorded prior to forestry management operations and ensures the continued comprehensive protection of the known archaeological resource. **Map 7 – Locally Important Features** identifies the various heritage features within the forest.

There are no scheduled monuments within or immediately adjacent to the forest.

7.12.1 Non-scheduled Archaeology

The designed beech planted earth-banks have been covered extensively in this plan and have greatly influenced the future habitats and species proposals. They will now be placed under minimum intervention management.

The circular earth-bank feature with a sunken centre (noted as a 'Roundel' in our records) is located near the eastern end of the forest (NT 0981 6526) . The earth-banks were planted with beech at the same time as the surrounding beech earth-bank network. There are also large Scots pine trees within its boundary and some management may be required to protect the earth banks if the large pine become unstable and if public safety is at risk. Otherwise there will no other forest operations within or immediately around this feature.

Six carved rectangular, upstanding marker stones are present, in linear format. Two on the northern forest boundary (NT 0842 6501, NT 0874 6521), one on the southern forest boundary (NT 0895 6455) and three along an old ride that cuts north to south through the centre of the forest (NT 0883 6497, NT 0885 6488 & NT 0888 6479). It is thought these may be delineating an old administrative boundary. They have been protected from cultivation and other forest operations in the past and will continue to be protected during future operations.

7.13 Operational Access

Selm muir has two forest entrances, one at the eastern boundary and the other at the western boundary. The forest road network totals approximately 2.14 kilometers, linking both the east and west entrance and allowing economic operational access for most of the site (i.e. machine extraction distances 500m or less).

The closest major transport routes are the A71 to the north and A70 to the south. The eastern entrance hits a minor road called 'Leyden Road' which in turn links to both the A71 and the A70. The western forest entrance joins to a minor road that becomes a dead-end to the south and links joins the A71 to the north.

Unfortunately both council roads to the A71 cross under national rail bridges with height restrictions. This limits timber haulage access and the main viable route for large timber lorries is from the eastern access point, south to the A70.

7.13.1 Forest Roads

Some minor forest road extensions and upgrades are required to implement the next 2 phases (10 years) of forest management. These are summarized in Section 2.5, Table 12 & Map 10 Management coupes, clearfell phases and proposed roads.
The road extensions are required:

- To provide storage space for welfare units and other operational equipment during harvesting and restocking.
- To reduce user conflict on the fishing club shared access road during the felling, timber haulage and restocking of coupe 97006 and the thinning and larch removal in coupes 97001 and 97002.

Existing road upgrades will improve safe transport along the existing shared access road and the existing spur road adjacent to coupe 97016. This latter spur road will be extended in the future to provide access to 97010 and 97012 (not within this LMP period).

7.13.2 User Conflict

As with the harvesting operations, the forest road upgrade and construction work in the west of the forest has potential to conflict with ongoing activities at the fishing club.

Key factors that should be considered by the FLS delivery team:

- Good communication with the reservoir owner in preparation for and during the work.
- Safety controls for use of the shared access road.
- Identification of drainage networks effecting the reservoir inlets and use of siltation control measures as required.

During all operations clear signage should be installed at forest entrances to inform operational access requirements. These entrances are currently used as parking places for the majority of

forest visitors and may have significant numbers of vehicles parked at either side of the bellmouth.

7.14 Recreation

The main recreation activity at Selm muir is informal visitor usage (walking, some cycling and outdoor education).

Forestry and Land Scotland has no formal recreation facilities at this forest but does conduct regular safety inspections and minor maintenance along the informal path network and at forest entrances.

Although visitor numbers have increased in recent years, the forest does not have significant recreational capacity relative to other FLS managed forests in Central Region (e.g. Carron Valley, Devilla and Blairadam forests). Therefore there are no proposals to increase recreational infrastructure within the forest at the present time.

The management focus will be:

1. Maintenance of the existing footpath network, for example clearance of windblow currently blocking the northern path in coupe 97006 (**Map 10**).
2. Improving forest design, particularly along footpaths associated with the beech planted earth banks.

The people counters are due to be updated in the next few years, which should provide more accurate information on visitor usage. The mid-term review will again assess visitor demand and the potential for increased infrastructure.

FLS will continue to work closely with Selm muir fishing club. The future habitats and species plan aims to gradually reduce intensive forest operations immediately around the reservoir and enhance the landscape in this zone. The spur road that is proposed to enable the clearance of coupe 97006 (**Map 10**) could potentially be used as a parking place for forest visitors. This would reduce congestion at the entrance to and along the shared access road. The risk of fly-tipping would need to be considered in opening up this infrastructure, unfortunately this activity has increased and become difficult to control without restricting access for legitimate users.

There is some potential to link the south of Livingston town to the west of the forest along the Linhouse Water and Morton reservoir. FLS is open to working with other landowners to promote this link if deemed sustainably viable. The fishing club at Selm muir reservoir may also develop recreation facilities that would enhance provision in the west of Selm muir.

FLS are open to working with West Lothian Council and outdoor interest groups such as 'Friends of the Pentlands' to consider walking links in the future where deemed sustainably viable.

7.15 Woodland Management in Visitor Zones

Visitor Zones have been identified in areas where FLS encourage and manage access or where the woodland managed by FLS interacts with popular access routes. Visitor Zones are mapped on **Map 14**. 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 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. The beech planted earth-banks associated with many of these visitor zones will only be managed for safety reasons, otherwise they should be considered minimum intervention.

8.0 Critical Success Factors

The success of this plan will be based on the following:

1. The achievement towards the management objectives set out in **Section 1.3 Selmmuir Management Objectives.**
2. The implementation of operations set out in **Section 2.1 Summary of Planned Operations**
3. Compliance with the UK Forestry Standard and UKWAS guidelines.

Appendix IV: Objective Appraisal, Monitoring & Evaluation details how each management 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.

Appendix I: Supporting Information

1.0 The Existing Forest

History of the land holding

Selm Muir forest was acquired in 1952 by what is now Forestry and Land Scotland. Much of the forest is designated as LEPO woodland or Long Established Woodlands of Plantation Origin. Whilst this demonstrates a long history of woodland management within its boundaries, there has been some interruption in forest cover and the land is shown as agricultural in the Roy military survey maps of 1752-55. However, the name 'Selm' may originate from 'Selms' or 'Selmys' which has been described as a 'moss with a sallow copse'. This may indicate the reason for its transition back to forest (from agricultural land) and is reflected in the W4 National Vegetation Classification for Selm Muir ('Downy birch – Purple moor grass' woodland).

The forest is surrounded by more intensively drained improved grazing land, a predominantly agricultural landscape. This 'lowland plain' setting also contains scattered policy woodlands and shelterbelts associated with historical designed landscapes, mansions, gatehouses and small hamlets. Designed landscape boundaries are reflected within the forest by the old beech planted earth-banks shown on the 1st edition Ordnance survey maps of 1852 and linked to the LEPO woodland. They extend beyond the forest boundary into the wider agricultural landscape.

The 1st edition Ordnance survey map of 1852 identifies the presence of Selm Muir reservoir. This is a disused reservoir about 1.2 hectares in size created through the construction of an earth embankment along its north-western and south-western boundaries. This small waterbody is completely surrounded by the forest but now privately owned. It is currently used as a private fishing business which has access rights from the western forest entrance.

This Land Management Plan will replace the previously approved Forest Design Plan Selm Muir 032/08/10 which originally ran from 2008 to 2018 but was extended until 30th March 2023.

2.0 Analysis of previous plan

The general objective of the previous plan was to manage the forest to achieve multiple fore st benefits. It was proposed to manage most areas using Alternative to Clearfell (ATC) systems and gradually enhance structural diversity of the woodland whilst protecting its heritage, recreation, water and wildlife attributes.

Table 19 – Progress on previous LMP objectives

Objective	Proposed management actions	Progress to date 1 Little or no progress 2 Some progress 3 Progress as per LMP
To meet the UK Forestry Standard. The Strategic Plan for Scottish Lowlands Forest District sets out the framework for this to be achieved, detailing policies for achieving maximum public and environmental benefit from the forests.	Management actions for achieving this objective are through the felling, thinning and restock programmes outlined in this plan. Delivery of these operations are carried out using the 'workplan' process. This process involves completion of section A by the planning, environment and communities teams setting out the objectives of each operation in line with the FDP proposals, UKFS requirements, & all baseline constraints & sensitivities. Section B is then completed by the delivery team setting out how the which defines the UKFS and UKWAS relevant requirements that must be met. This is followed up by close supervision & monitoring of each operation. Finally, a ¾ operational completion meeting is held on site to check the objectives have been achieved &	2 - Operations carried out at Selm Muir have been implemented in accordance with the UK Forestry Standard & The District Strategic Plan, with measures taken during felling, re-stocking, and road construction activities to minimise impacts to adjacent land and properties, and to mitigate against likely impacts on the environment and watercourses. Due to developing windblow and a re-assessment of thinning potential is was deemed a small delay period be applied to monitor stand stability and review management options. This meant that extensive thinning and mini-coupe clearfelling was not undertaken. The next LMP process will review alternative to clearfell management options and update intervention actions.

Objective	Proposed management actions	Progress to date 1 Little or no progress 2 Some progress 3 Progress as per LMP
	quality/safety standards have been met.	
Maintain the supply of timber for the Scottish wood-using industry.	This would be achieved through the following actions: 1. Clearfelling two older stands (*coupes 97003 &97004*) that were largely windblown (a total of 7.7 hectares). 2. In remaining older stands (*60+ years old*) extensive thinning and small scale mini-coupe felling (mini-coupe felling amounting to 2.3 hectares).	2 – <u>Clearfell Coupes</u> The clearfell of heavily winblown coupes 97003 & 97004 was completed in phase 1 and these coupes have been restocked as scheduled. This combined with the thinning (detailed below) produced approximately 2300 m^3 of softwood timber. <u>Thinning</u> A limited level of thinning was completed during the clearfell of 97003 & 97004. This was approximately 1.6 hectares in the south of coupe 97005 (*just to the north-east of coupe 97004*). The objective was to help stabilise the stand edge exposed during the clearfell of coupe 97004. In remaining stands a re-assessment of thinning was carried out during phase 2. This considered past interventions, development of windblow, stand spacing, soils & exposure. It was deemed a small delay period be applied to monitor and review stand stability. The next LMP process will update intervention actions. <u>New Forest Road</u> In additional, an amendment to the FDP was made in 2011: the construction of 700 metres of Class B forest road to link the east and west forest entrances. The key objective of this new road was to: 1. Overcome haulage constraints caused by bridge height restrictions on two of the three Council roads leading to the forest. 2. Reduce the impact of longer distance machine extraction. 3. Reduce the impact of timber haulage on the private fishing business.

Objective	Proposed management actions	Progress to date 1 Little or no progress 2 Some progress 3 Progress as per LMP
		This will allow continued restructuring/re-balancing of tree age classes within the forest whilst better zoning activities to reduce future conflict/disruption. <u>Restock Planting</u> <u>Coupe 3:</u> This was a hydrologically sensitive coupe containing the inlet to Selm muir fisheries. Low density direct planting of native mixed broadleaves was undertaken in 2012. This comprised Sessile oak, Rowan and Hawthorn @ 600 stems per hectare. The Oak was planted in tree tubes and it was anticipated natural regeneration of mixed broadleaves would infill to meet target planting densities of 1600 per hectare. The Oak in tubes has required subsequent beat up and maintenance but has slowly but steadily established over the plan period. Natural regeneration has also been slow to establish but is now increasing. The composition of natural regeneration is mainly Birch, Willow and a small component of Larch, Scots pine & Spruce. There may be opportunity to manage for small scale firewood sales in the future as the Fisheries plans to create holiday accommodation with wood burners. <u>Coupe 4:</u> Was cultivated using trench mounding. The conifer species was reviewed after significant challenges during the clearfell due to lack of material for the extraction mats. The resultant restock mix was Sitka spruce/Hybrid larch 3:1 in intimate mixture. The crop established well in the first two years then the Spruce suffered some late frost dieback and subsequent beat up operations used Norway spruce. Scots pine natural regeneration has formed a small component of the crop. The Sitka was vegetative propagated improved stock and is expected to reach yield class 18.

Objective	Proposed management actions	Progress to date 1 Little or no progress 2 Some progress 3 Progress as per LMP
Improve recreation value of the forest and preserve features of archaeological interest.	1. Upgrade & maintain informal path infrastructure. 2. Protect features of archaeological interest such as the beech planted earth-banks and marker stones. Plant back from these features where coupes are restocked.	2 – Both management actions have been largely achieved. A variety of low key access improvements have been carried out on established pedestrian desire lines which generally follow old beech field boundary features within the wood. Improvements include laying of stone on wet and poached sections of path, and the provision of culverts. The construction of the new road to link the east and west parts of the forest has greatly improved through access and created a number of loop path options by linking into the existing informal network. Unfortunately windblow has spread in coupe 97005 to the north of Selm muir fisheries during phase 2, which has blocked one of the longer distance informal loop paths. Forest schools have been run by local community groups and FLS community rangers. People counters have also been installed to monitor public use so that the current access infrastructure can be reviewed. The new road construction passed through one of beech earth-banks. All other archaeological features have been protected or undisturbed during operations. Restocking along these earth-banks has been pushed back to provide more protection in the future.
To enhance the benefits for wildlife by increasing age and species diversity and improving links to the Forest Habitat Network (FHN) based on the watercourse corridors.	1. Retain link to 'Linhouse Water' forest habitat network. 2. Use restock planting and thinning to enhance the forest habitat network.	2 – Clearance of the heavily windblown coupe 97003 containing Selm muir reservoir inlet has allowed the creation of open space and native broadleaved planting to enhance this riparian habitat network. Although the new road construction has separated one of the beech planted earth-banks, subsequent native mixed broadleaved planting and natural regeneration along the road has strengthened the link to existing broadleaved planting areas and west to 'Linhouse Water' forest habitat network.

Objective	Proposed management actions	Progress to date 1 Little or no progress 2 Some progress 3 Progress as per LMP
		Thinning has been very limited as explained above. The habitat network in other areas of the forest has been maintained and protected.
To improve the external and internal views of the forest.	1. Thinning and clearance of windblow to enhance internal edge views and open up the beech planted earth-banks and associated paths (*where previous conifer crops have been planted in close vicinity to these features*)	2 – Clearance of the identified windblown areas has been completed (*Coupe 97003 & 97004*). This has increased structural diversity and opened up views within the woodland and looking out towards the pentland foothills to the south. Restocking with a mix of native and conifer species has increased diversity. The beech earth-banks and associated paths have been enhanced by pushing back the boundaries of conifer replanting and the use of broadleaved restock. Thinning has not been undertaken as explained above. The new road construction has also opened up views of along beech planted earth-banks and surrounding stands.
To protect water quality and the physical integrity of streams.	1. Clearance of windblown areas along streams. Enhancement of habitat and filtration zones by creating a mix of open space and broadleaves along riparian zones at restock.	3 – This has been achieved through the felling and restock programme. Particular management focus has been given to Selm Muir fisheries, coupe 97003 was direct planted (not cultivated) with native broadleaves and is now developing a fen type habitat immediately along the reservoir inlet. However additional windblow areas have developed along streamsides during the term of the plan which will be dealt with in the next LMP.

3.0 How previous plan relates to today's objectives

This new revision of the plan will incorporate management prescriptions preparing the forest for new biotic and abiotic environmental pressures:

The spread of several plant diseases across the UK presents significant ecological and economic risks to forest stands at Selm Muir.
Ramorum disease caused by *Phytophthora ramorum* has been highly destructive over the last 10 years, with larch particularly susceptible. National strategies are now in place to control the spread of this disease and the restocking of Larch is avoided.
Dothistroma needle blight caused by a fungus *Dothistroma septosporum* could cause loss in productivity of Pine stands at Selm Muir, making them more susceptible to other environmental stresses.
Ash dieback caused by *Hymenoscyphus fraxineus* has been highly destructive to the native ash population. Native woodland new planting and restocking generally avoids the planting of ash for this reason.

Climate change impacts that may particularly affect Selm Muir are changing seasons, increased frequency of severe weather events, warmer temperatures, increased winter rainfall, increasing wind speeds and frequency of winter storms. The immediate impact of these changes are an increased occurrence of late spring frost damage to young Sitka spruce crops, the spread of windthrow and decreased stability of older forest stands, the impact of forest operations such as thinning and ground preparation on wetter soil types. All the above factors will need to be considered in the future management of Selm Muir in relation to species selection and choice of silvicultural systems, management of riparian areas and forest habitat networks.

Conservation, heritage and recreation prescriptions in the previous plan are still relevant to today's objectives. Selm muir fisheries are developing their business model and have shown interest in working with FLS to increase public use of the forest.

Landscape objectives largely follow the objectives of the previous plan with internal edge views being the most important and the link with older designed landscape features such as the beech planted earth-banks. The increasing proportion of unstable stands over 60 years will need to be addressed in the next plan with consideration given to internal edge views and the pace of structural change in the woodland.

4.0 Physical attributes of the forest

Soils & landform

Selm Muir forest lies within a shallow, fairly flat valley between 'Selms Tops' hill (222m) to the north and Corston Hill (348m) to the south. Its soils are influenced by Glacial till deposits left during the last glacial stage in Britain (the Devensian). Erosion of these deposits and the drainage pattern of the area has created several of soil types of medium to poor nutrient status. Surface water gleys (medium nutrient status) cover nearly 60% of the forest and wetter peaty gleys (poor nutrient status) cover 37%. Some localised areas of drier brown earth soils are present on the northern fringes where the slope incline gently increases. The terrain rises from north-east to south-west from ~185 m above sea level (asl) to ~215 m asl. This creates a general drainage pattern from the south of the forest to the north.
(see **Map 3 – Soils & Hydrology**).

Current climate & exposure

Two climatic zones greatly influence the growing environment at Selm muir. Southern areas of the forest are considered to be within the 'cool, moist and moderately exposed' climatic zone. Central and northern parts of the forest (particularly surrounding the reservoir) are considered to be within the 'cool, moist and **highly** exposed' climatic zone. Some localised pockets at the north-eastern end of the forest are within the '**warm**, moist and highly exposed' climatic zone.

Detailed Aspect Method Scoring (DAMS) is a measure of windiness of a site using the angle to the horizon in the eight compass points, weighted towards the prevailing wind direction. Scores range from 0-24, the higher the score the greater the exposure. Scores below 13 are regarded as sheltered, and 13 to 16 regarded as medium exposure. Beyond DAMS score 16, opportunities for stand thinning are limited. Selm Muir is at the high end of the 'medium exposure' range, having scores of 15 to 16.

The combination these climatic conditions, together with gley soil types of medium to poor nutrient status means that a good range of productive conifers will grow at Selm Muir, but there should be some caution in choice of silvicultural systems used and thinning must be maintained through the crop cycle if forest stands are to remain stable.

Future Climate

UK Forest Research Ecological Site Classification models project the climate at Selm muir for 2050 and 2080 will change from 'cool, moist and moderately to highly exposed' conditions to a '**warm**, moist and moderately to highly exposed' climate.

This expected increase in warmth will slightly increase the number of forest species suitable to grow at Selmmuir. Also, the longer growing season is expected to improve productivity of those forest species.
However, there are expected to be changes that will pose a risk to forest stands. Fluctuation in the timing of growing seasons is already causing more frequent late spring and early autumn frost damage to commercial species such as Sitka spruce. Choice of provenance will be important in mitigating these changes. Milder winters and a warmer growing season is likely to increase insect pests, mammal populations, tree diseases and invasive species. Increased average wind speeds, rainfall and incidence of severe storms will present challenges to thinning and silvicultural systems used. It will also put greater pressure on the hydrological network in Selm Muir and flood risk to surrounding catchment systems and urban areas.

Hydrology

Flood Risk

Drainage from the eastern half of the forest feeds into 'Edinburgh Gogar Burn' and 'Edinburgh Gogar Burn Airport' drainage areas which form the 'Edinburgh Gogar Burn' Natural Flood Management zone. Within this zone the 'South Gyle, Broxburn and Bathgate (Potentially Vulnerable Area 10/27)' has been identified where infrastructure assets are vulnerable to flooding. Selm Muir's hydrological contribution to these drainage areas is very small, only 0.92% of the 'Edinburgh Gogar Burn' drainage area and 0.65% of the 'Edinburgh Gogar Burn Airport' drainage area. There are no Natural Flood Management zone actions currently identified by SEPA or the Local Authorities for Selm Muir forest.

Drainage from the western half of the forest feeds into Linhouse Water, a tributary to the River Almond. The latter again feeds into the 'Edinburgh Gogar Burn' Natural Flood Management zone which will eventually run through the 'South Gyle, Broxburn and Bathgate (Potentially Vulnerable Area 10/27)'. As detailed above Selm muir's hydrology makes a very small contribution to the River Almond catchment and in-turn the Edinburgh Gogar Burn' Natural Flood Management zone.
Within the forest, surface water drainage runs along flat to gently sloping gradients through a network of internal drains. The most immediate effects of forest management will be at Selm muir reservoir. This small water body (about 1.2 hectares in size) acts to hold drainage from the western half of the forest and then discharge (through its outlet) to adjacent farmland running to Gogar Burn at the northern boundary of the forest. Although the reservoir is not within the FLS ownership boundary, it is completely surrounded by the forest. The reservoir has two inlets in the form of open drains. They are sourced from within the forest and run through a mix of productive conifer and unproductive broadleaved stands, the latter containing the final stretch of these inlets before they enter the reservoir. There is further scope to enhance the design along these inlets in the next plan.

Water Condition

SEPA's Water Environment Hub identified the following water quality characteristics for water courses Selm muir feeds directly into.

- Gogar Burn is in overall poor condition. The main factor for this is access for fish migration. In terms of water quality, flows and levels, physical condition and freedom from invasive species, the burn is classified as being in moderate to high quality condition.
- Linhouse Water is in overall poor condition. Again the key factor for this is access for fish migration. In terms of water quality, flows and levels, physical condition and freedom from invasive species, the burn is classified as being in good to high quality condition.

Forestry Activity

As described above, the greatest impact from forest operations will be at Selm Muir Reservoir. Felling and restocking coupes will be designed to mitigate this impact in the short and long-term. The design of riparian networks will be reviewed, as will future forest stands immediately surrounding the Reservoir. Close working and consultation with the reservoir owner will be integral to this process.

5.0 Tree species, tree age structure & yield class

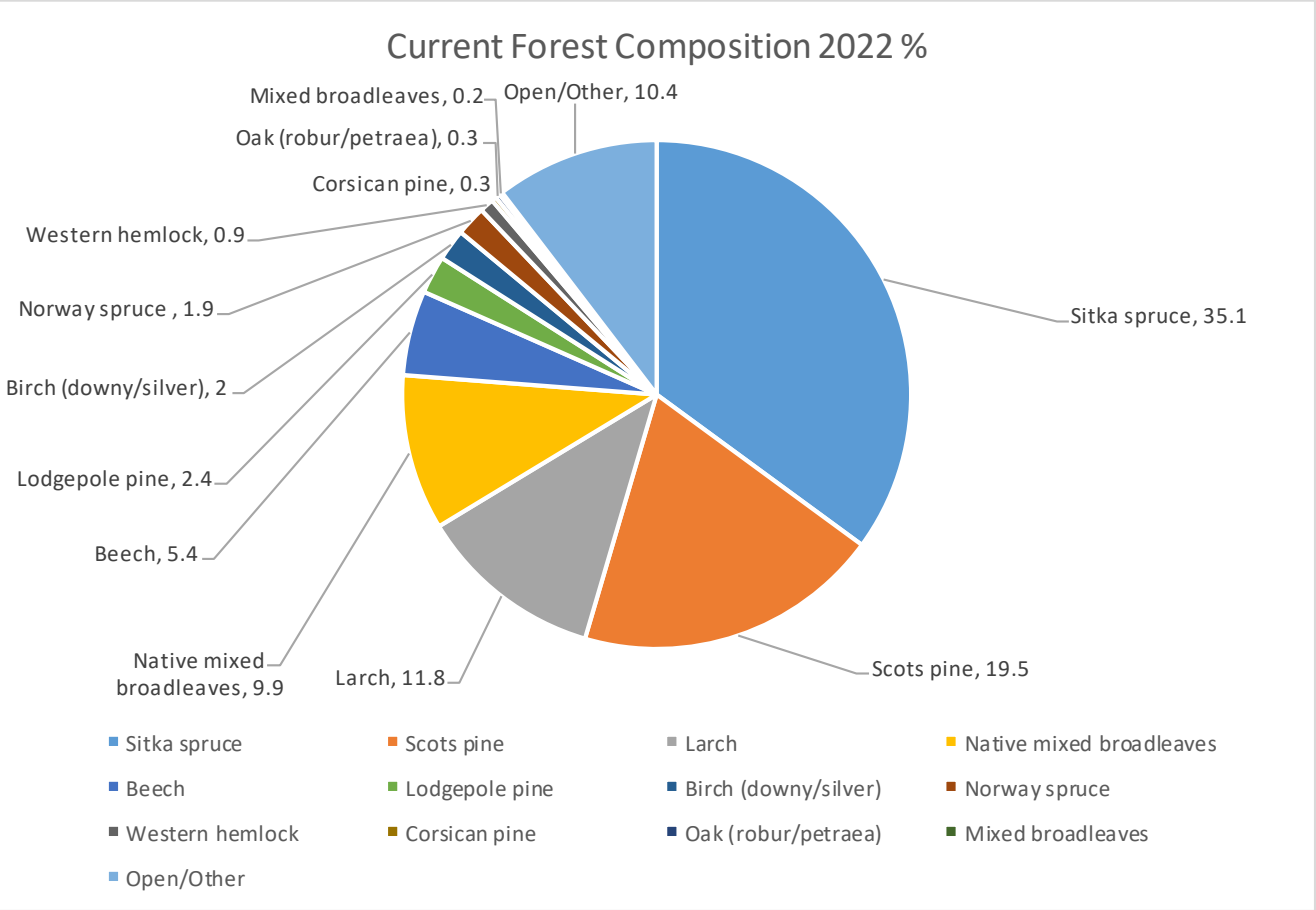
Map 2, Table 20 and **Figure 5** show the current species composition of the Selm muir forest. Both the table and figure show that the forest is predominantly conifer (~71% of the forest area), with the largest components being Sitka spruce (~35%) and Scots pine (~19%). Larch forms the next largest component making up nearly 12% of forest stands, it is present mainly in mixture with Pine or Spruce. Japanese, European and Hybrid Larch are all present, the latter in younger crops under 20 years old. Other conifers present in very small proportions, and mainly in mixture, are Norway spruce, Western hemlock, Lodgepole and Corsican pine.

In relation to broadleaves, Beech constitutes the largest pure crop component, and is concentrated on the designed landscape earth-banks formations running throughout the forest and then linking to the surrounding farmsteads. The existing Beech is recorded as being planted in the 1950's. Native mixed broadleaves form just over 10% of forest stands, mainly in younger crops planted since 2002 but also arising from natural regeneration (particularly birch). Oak currently forms a very small component found within in the mixed broadleaves crops and on its own. This has mainly been planted. Localised mixed broadleaved stands (not wholly native) are present where Beech has started to regenerate, particularly along and adjacent to the old beech planted earth-banks.

Table 20 – Current Forest composition by area & percentage (2022)

Species	Area (Ha)	%
Sitka spruce	32.2	35.2
Scots pine	17.8	19.5
Larch	10.8	11.8
Native mixed broadleaves	9.1	9.9
Beech	4.9	5.4
Lodgepole pine	2.2	2.4
Birch (downy/silver)	1.8	2.0
Norway spruce	1.7	1.9
Western hemlock	0.8	0.9
Corsican pine	0.3	0.3
Oak (robur/petraea)	0.3	0.3
Mixed broadleaves	0.2	0.2
Open/Other	9.4	10.3

Figure 5 – Current Forest Species Composition 2022 (%)



The projection for species composition over the next 20 years, following the proposals of this Land Management Plan are found in **Section 1.4 Woodland Changes – Table 3 and Figure 2**.

The existing forest has a well distributed age structure (**Table 21 & Figure 6**). However, there are a higher proportion of stands in the younger 0 – 20 year age range and the 60+ age range, with fewer stands in the mid-range (20 - 60 years). In the last 40 years there has been a move away from the use of Pine towards Spruce (**Figure 5**), and away from Beech towards native mixed broadleaves. About 42% of forest stands are within the 0 – 20 year age class. Much of this was planted in 2002 using mainly Spruce, with Larch and native broadleaves. Just over 40% of forest stands are over 60 years old. These are made up mainly of Pine, Larch and Beech, the latter concentrated along the old earth bank network. The oldest, predominantly Pine stands (p1920's) have been well thinned and are quite stable but approaching the age where they will need to be regenerated. The slightly younger mainly Pine and Larch mixed stands (p1950's) have not been consistently thinned and many have become unstable and started to blow over.

Table 21 – Current Forest Age by Area

Age Class (Years)	Area (Ha)	%
0-20	34.8	42.9
21-40	8.6	10.6
41-60	4.3	5.3
61-80	20.5	25.2
81-100	13	16.0
100+	0	0

Figure 6 – Current Forest Age by Area

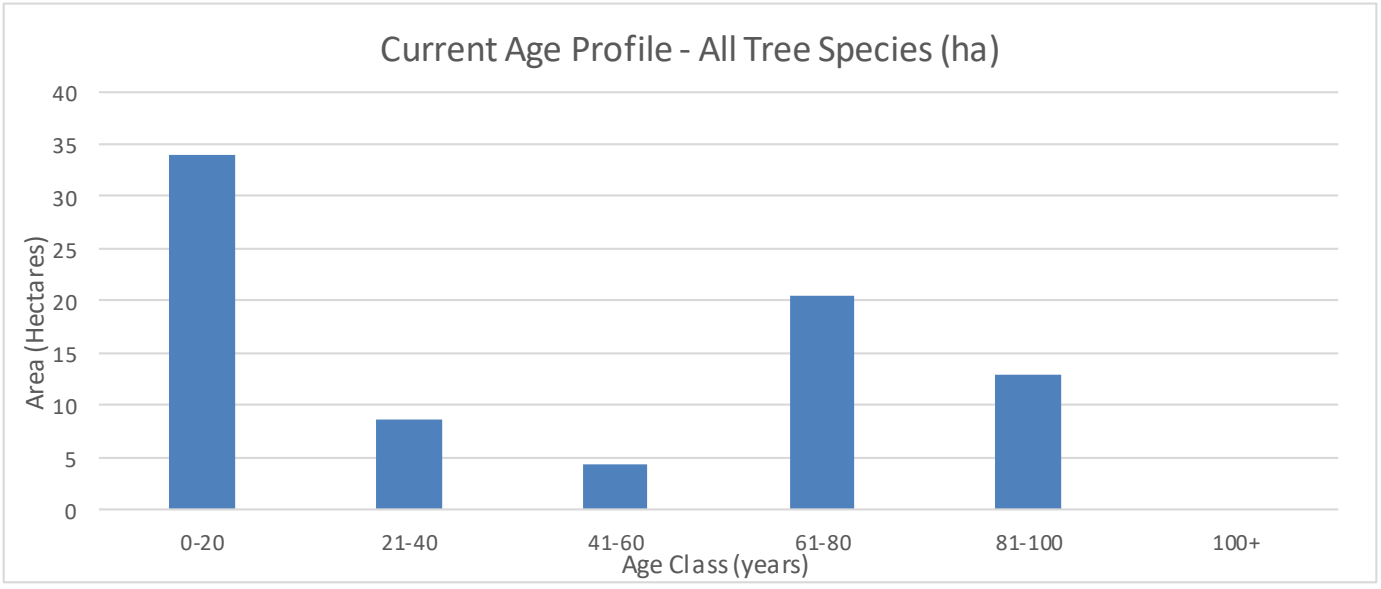


Figure 7 shows there is a good age distribution of broadleaved stands but with low proportions on the 60+ age range (only the beech earth-banks).
Over the next 10 years the aim will be to clear and replant unstable conifer stands with severe windblow (mainly p1950's Larch & Pine), and also to start the process of regenerating the older stable Pine stands planted in the 1920's, particularly where an understorey has developed. The aim for broadleaves will be to maintain and protect the older beech planted earth banks, which offer good deadwood potential and are a valuable landscape and heritage feature. Native broadleaves will be maintained and increased with the aim to eventually move more of the forest area to old growth native mixed broadleaved stands.

Figure 7 – Current Forest Age Conifers and Broadleaves

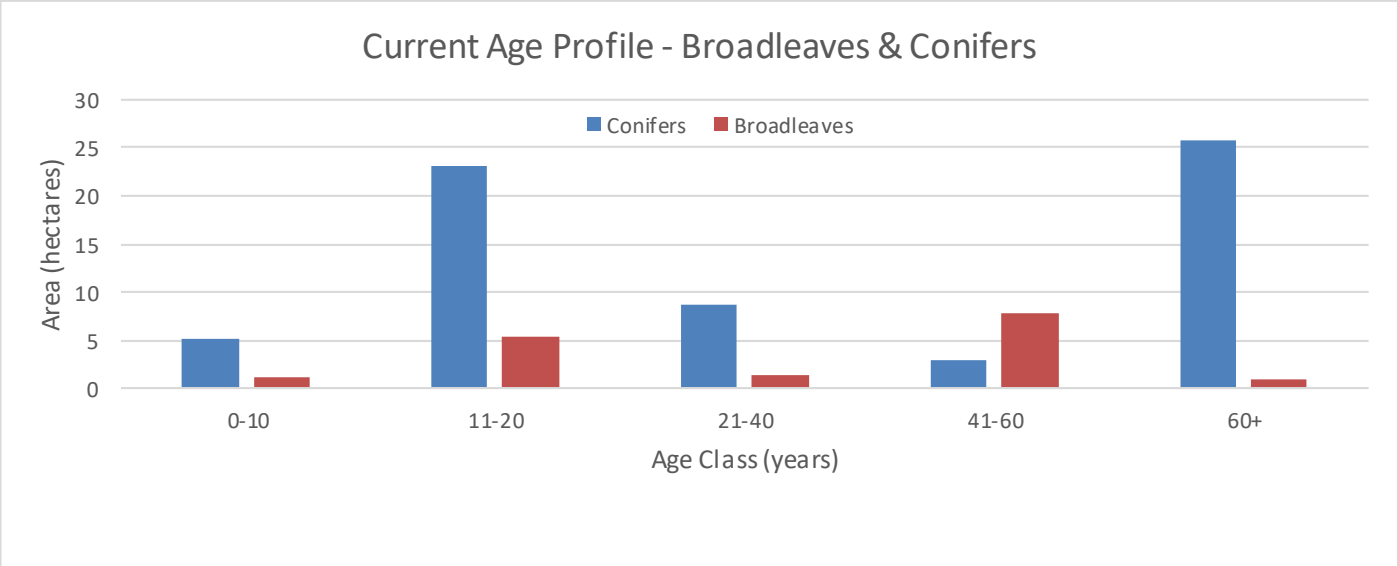
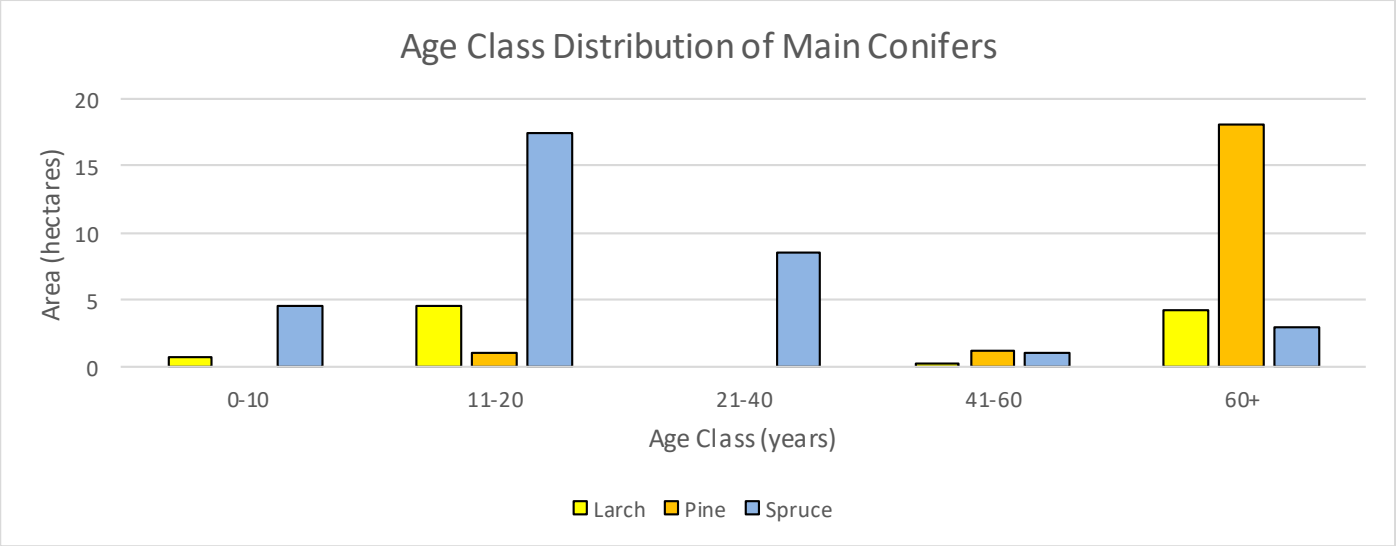


Figure 8 – Current Forest Age Conifers Main Conifers.



The peaty and surface water gley soils and a 'cool, moderately exposed and moist' climate produce the following yield classes for the main forest species:

- Sitka spruce yield classes 14 to 18
- Scots pine 6 to 10
- Norway spruce 12 to 16
- Hybrid Larch 10 to 14
- Japanese Larch 8 to 10
- Birch 4
- Beech & Oak 2 to 4.

The surface water gleys and localised brown earths tend to produce the higher yield class range for each species.

6.0 Operational access

Selm muir has two forest entrances, one at the eastern boundary and the other at the western boundary. The forest road network totals approximately 2.14 kilometers, linking both the east and west entrance and allowing economic operational access for most of the site (i.e. machine extraction distances 500m or less).
The closest major transport routes are the A71 to the north and A70 to the south. The eastern entrance hits a minor road called 'Leyden Road' which in turn links to both the A71 and the A70.
The western forest entrance joins to a minor road that becomes a dead-end to the south and links joins the A71 to the north.
Unfortunately both council roads to the A71 cross under national rail bridges with height restrictions. This limits timber haulage access and the main viable route for large timber lorries is from the eastern access point, south to the A70.
The western entrance also serves as a legal access for busy private fishing business located at Selm Muir reservoir. The reservoir is completely surrounded by the forest but not within FLS legal ownership.
In the long-term additional road construction, branching off from the existing forest road, will be needed to access p2002 commercial crops in the south-west and north of Selm muir.
In order to complete the next 10 year work program some minor spur extensions and maintenance to the existing forest road network will be required.

7.0 Low Impact Silviculture Systems (LISS) potential

The last forest plan provided a management prescription for alternative to clear fell (ATC) across most of the forest, this is a form of lower impact silviculture (LISS). The aspiration was to thin these stands and then fell & regenerate small coupes using restock planting. Unfortun ately, during the last 10 years, windblow has been recorded in many of the mature stands, particularly those planted during the 1950's. The 2014 forest plan mid-term review and more recent 2020 thinning review identified many ATC stands as unsuitable for continued thinning.
Several factors contributed to this:

- Delayed thinning interventions (particularly in p1950's stands), in many cases as a result of poor access or potential conflict with adjoining land owners.
- Resulting poor tree stability and stem taper.
- DAMS exposure scores at or close to 16, combined with peaty gley soils in many areas.
- Heavy previous thinning in older stands planted in the 1920's, this left very little brash residue for machines to run on and little volume output from thinning.

In the next plan there is still be scope for LISS management, but it is likely to be more focussed to localised areas with the greatest potential:

- Previously thinned.
- Less emphasis on maximising production.
- Good access.
- Drier soils.
- Lower DAMS.
- Landscape benefits.
- Least conflict with other activities within and adjacent to the forest.

8.0 Pathogens

Dothistroma Needle Blight (DNB)

DNB (also known as Red Band Needle Blight because of the colourful symptoms it shows on pine) causes premature needle defoliation, resulting in loss of yield and, in severe cases, tree mortality, particularly in many Pine species. Pine species currently make up ~21% of forest stands at Selm muir. Surveys to date have not yet detected DNB but it is likely to affect crops in the future as the climate warms. Corsican pine will be more suitable in Selm muir as the climate warms but unfortunately is particularly susceptible to DNB. The productivity of Scots pine stands

is expected to decrease by at least 1 yield class due to DNB but this species has an important landscape character value in Selmmuir and also benefits the blaeberry dominant ground flora in many parts of the forest.

In the next plan there will be a shift from using pure Scots pine crops to mixed conifers crops with Scot pine as the primary component. Macedonian pine crops will also be introduced to maintain the character of the woodland and the ground flora. This species has shown strong resistance to DNB. Lodgepole pine, which is susceptible to DNB, will only be used as a nursing and self-thinning component in mix with Sitka spruce.

Phytophthora ramorum (P. ramorum)

P. ramorum is a fungus-like pathogen of plants that is causing extensive damage and mortality to trees and other plants in parts of the United Kingdom. Larch in particular is extremely vulnerable, and high infection and mortality levels are currently causing significant issues in south-western parts of Scotland. Instances of *P. ramorum* within Central Region forest blocks are now starting to increase and recently more severe outbreaks have been identified, for example Carron Valley forest.
Larch currently comprises ~12% of forest stands at Selmmuir and is present as a component mixture with other species. The forest sits within the 'Priority Action Zone' of Scottish Forestry's 'Phytophthora ramorum larch Action Plan'. This zone is where actions will have the greatest impact on controlling the spread of *P. ramorum* and although infections have been limited they are gradually increasing. Ideally the Larch would be removed in the first phase of felling. This, however, must be balanced against achieving other sustainable forest management targets. Selmmuir has some key sensitivities that justify removing Larch over a longer period, one single felling intervention to remove all Larch would:

1. Have a detrimental hydrological and landscape impact at Selmmuir reservoir.
2. Would destabilise 1st thinning coupes where Larch makes up at least half of the crop and is intimately mixed with the other crop component.
3. Would negatively impact the age restructuring process in the forest and the aim to produce a more balanced flow of timber.

This plan will aim to evaluate the key priorities for the forest and establish a balanced management proposal for the removal of Larch.

9.0 Landscape and Land Use

Landscape Character

See **Appendix VII** for a definition of the landscape designations and character areas listed below. This section is supported by **Map 6 The Wider Landscape** & **Appendix VI - Supporting Photos.**

Selm muir sits within a shallow flat valley between two higher areas of ground, to the north (Selm tops 222m asl) and the south (Corston Hill 348m asl). On its western edge the Forest links to a narrow wooded network encompassing the 'Almond and Linhouse Valley' Local Landscape Area. This local designation follows a steep sided mixed woodland gorge running northwards to the south-east corner of Livingston Town. The views of Selm muir from the town are limited by both this wooded feature and Selm tops hill. It is therefore not a prominent feature in itself but forms part of a wider mixed woodland network and rolling landscape seen from higher parts of the town. In contrast and immediately surrounding the north, south and eastern forest boundaries is fertile improved agricultural land, described by the NatureScot landscape character assessment of 1999 as a 'Lowland Plain' character area (**Appendix VII**) . This character area covers almost 70% of the forest and greatly influences how it sits within the immediate landscape (from an external and internal perspective). In this respect Selm muir provides important edge views from local paths, minor transportation routes, scattered hamlets and farms. The forest is linked to this wider 'lowland plain' landscape through a network of small shelterbelt field boundaries and scattered small Policy woodlands. An important historic feature that contributes to this link are the designed beech planted earth-banks that form a linear network throughout the forest and out into the surrounding landscape. Many of the attractive walking routes within the forest run along these old earth-bank features. Their preservation has been much greater within the forest than the surrounding agricultural landscape.

The south-western edge of Selm muir sits within the NatureScot 'Upland Fringes' character area (**Appendix VII**). It is greatly influenced by southward views to Corston Hill at the fringes of the 'Pentland Hills' Local Landscape Area. There is a slightly more exposed, upland feel in this part of the woodland. Furthermore, from the top of Corston hill and the associated long distance walking route to the Pentlands, Selm muir is a prominent feature in the wider landscape.
See **Supporting Photos (Appendix VI)**

However, from all viewpoints looking towards the forest, external edge or two dimensional edge views are most important. Therefore the external 'profile' of the forest will much depend on the following attributes along the external forest boundaries:

1. Species and age distribution of forest stands,
2. Design and position of open space.

Within the forest, edge or profile views are again very important, the older p1923 pine stands create attractive open structures but younger unthinned p1950 Pine and Larch stands are starting to blow over creating less attractive enclosed surroundings. Some of these stands felled in the last plan period have opened up wider views to the upland fringes (southwards) and provided greater diversity in stand edge structure. They have also allowed opportunity to diversify species and introduce more native broadleaves.
See **Supporting Photos (Appendix VI)**

10.0 Neighbouring Land Use

The surrounding land-use predominantly consists of fertile agricultural grazing land with small scale shelterbelts and policy woodlands. In addition to traditional farming practices there has been important business diversification close to the forest with holiday accommodation and wedding facilities developed at Leyden Farm to the south. This business is connected via a marked footpath that forms a longer distance route south to the Pentland Hills Regional Park.

Selmmuir Reservoir which is entirely encompassed within the forest is now run as a fishing business, the owner is looking to expand the business and develop a café for fishing club members and informal forest visitors. Forest management around the reservoir will have increased native woodland and open space.

On the north-western boundary of the forest, a narrow strip of mixed woodland (150 metres wide) owned by West Lothian Council links to an important forest habitat network that incorporates Linhouse Glen Local Nature Reserve and Site of Special Scientific Interest (SSSI; approximately 0.5km away) and Amondell and Calderwood Country Park and SSSI (approximately 2km away). This woodland network contains core paths and open public access that eventually links to the south of Livingston Town with a population of approximately 58,000 residents (approximately 2km away).

11.0 Biodiversity and Conservation

The forest is suitable for a number of protected species and habitats given its position in the landscape and adjoining land uses. The LMP has been prepared in cognisance of relevant legislation and policy, including European and domestic environmental legislation, UK nature conservation policy and local biodiversity guidance. Guidance relevant to the site is listed below:

- The Conservation (Natural Habitats, &c,) Regulations 1994 as amended.
- The Wildlife and Countryside Act 1981 (as amended)
- Scottish Planning Policy
- UK Forestry Standard
- West Lothian Local Biodiversity Action Plan

Priority Habitats and Species

Within the forest badger populations are located within an unstable stand of mixed conifers. During the next plan period, it is proposed this area will be converted to native broadleaved woodland and with lower density planting of small native trees and shrubs within 30m of the sett entrances. Due to the mobility of badgers it would be problematic to designate specific areas as minimum intervention. Once the native woodland in this coupe is properly established it is likely the management prescription will be changed to Lower impact silvicultural systems or Long term retention.

Priority habitats currently known on site are localised areas of 'upland flush, fen & swamp', 'lowland mixed deciduous woodland' & 'wet woodland'. The design of future habitats and species will aim to link and extend these area, particularly along riparian corridors and parts of the forest that connect to the forest habitat network and associated fen and unimproved grassland habitats to the west of the forest.

Legally Protected Conservation Sites

Selm muir does not contain legally designated conservation sites, however two Sites of Special Scientific Interest (SSSI) are located within close proximity to the forest and linked by an important forest habitat network along the Linhouse Water and its tributaries.

Linhouse Valley SSSI is approximately 0.6km west of Selm Muir. The key natural features are unimproved lowland acid and neutral grasslands, valley fen and upland mixed ash woodland. The woodland habitat is recorded as remnant ancient woodland and extends to within 0.3km of Selm muir's western boundary. A narrow strip of mixed woodland 80-100 metres wide running along a tributary to the Linhouse Water connects Selm muir to the SSSI and ancient woodland habitat.

Calderwood SSSI is located further north along the Linhouse Water approximately 1.7 kilometres from Selm muir. It is the largest remnant of ancient woodland in the Lothians and the natural features are upland oak woodland, valley fen and unimproved neutral grassland. The site also contains two ponds which are breeding habitat for great crested newt.

Ancient Woodland and Deadwood Potential

Approximately 65% of Selm muir forest is recorded as Long Establish Woodland of Plantation origin. Currently the oldest and most developed woodland features are the old Scots pine stands planted in 1923 and the network of beech earth-banks recorded as being planted in the 1950s. The beech earth banks have a high deadwood ecological potential and there is opportunity to retain a proportion of the older Scots pine, both at the stand level and single tree level, through to 'old growth' phase.
Given Selm muir's proximity to the largest remnant ancient woodland in West Lothian (Calderwood SSSI) along the Linhouse Water, it will be important to expand and connect native woodland throughout the forest and particularly on its western edge where it connects to the Linhouse Water.

Other species and habitats

In addition to badger, there are sightings of Tawny owl, Buzzard and Common toad and frog. There are also areas with a dense field layer of blaeberry (*Vaccinium myrtillus*) within birch and Pine stands.

Invasive Non-Native Species (INNS)

There are no INNS recorded within the woodland The planned extended phase 1 habitat survey will include the identification and mapping of INNS if present.

Wildlife (Deer Management)

The only deer species recorded in the forest are Roe deer and population densities are relatively low due to the small size of the forest and high number of forest users, particularly dog walkers. Brown hares have also been recorded in the woodland.
Browsing levels on young conifer crops have been low with good leader condition recorded throughout. Faster growing broadleaves such as Birch and Rowan also establish well and there is good evidence of broadleaved natural regeneration along busy path networks. Oak planted in the last 10 years has been browsed quite heavily where not physically protected by guarding.

Deer culling has been very limited, partly due to low crop damage levels and also due to the high numbers of walkers and limited safe areas. The **Future Habitats and Species plan** (**Map 13**) will create slightly larger areas of open space for deer management. In some areas of the forest physical protection/guarding will be required to establish more sensitive tree species.

12.0 Heritage

FLS maintains extensive archaeological records for Scotland's forests and land within our heritage database. Important historic environment features are surveyed, recorded, mapped and monitored by Central Region to ensure and demonstrate Forestry and Land Scotland compliance with the UK Forestry Standard. This ensures that undiscovered historic environment features are mapped and recorded prior to forestry management operations and ensures the continued comprehensive protection of the known archaeological resource. **Map 7 – Locally Important Features** identifies the various heritage features within the forest.

Scheduled Monuments

There are no scheduled monuments within the forest or that will be affected by forest management operations in the future.

Non-Scheduled Monuments

A circular earth-bank feature with a sunken centre (noted as a'Roundel' in our records) is located near the eastern end of the forest. This is was planted with beech at the same time as the surrounding beech earth-bank network, but also has large Scots pine trees within its boundary. This feature has been protected from cultivation and other forest operations and has been recorded in our heritage constraints records.

Three carved rectangular, upstanding marker stones are present along an old ride that cuts north to south through the centre of the forest. It is thought these may be delineating an old administrative boundary. They have been protected from cultivation and other forest operations in the past and recorded in our heritage constraints records.

Designed Landscapes

There are no nationally important 'gardens and designed landscapes' recorded within Selm muir, however as described above, the beech planted earth-bank features form an important historic landscape record. They have formed an important part of the informal path network, linking almost all parts of the forest and, on some boundaries, beyond into the agricultural landscape. They significantly contribute to the feeling of 'Genius loci' or 'Sense/spirit of place' within the forest.

13.0 Social Factors & Recreation

The Scottish Index of Multiple Deprivation (SIMD) is a relative measure of deprivation across Scotland. If an area is identified as 'deprived', this can relate to people having a low income but it can also mean fewer resources or opportunities. SIMD looks at the extent to which an area is deprived across seven domains: income, employment, education, health, access to services, crime and housing. The surrounding communities in Kirknewton, East and Mid Calder and Livingston Town show that deprivation and unemployment levels are relatively low in this area, however small localised pockets exist within the communities of Livingston and some of the villages.

SIMD is less helpful at identifying the smaller pockets of deprivation found in more rural areas, compared to the larger pockets found in urban areas. Hence it is likely there will be struggling rural communities surrounding Selm muir. There is certainly evidence of land use diversification in areas such as new woodland creation, recreation and tourism.

In relation social services, forest schools have been run by both internal FLS staff and external suppliers, permissions are in place for limited harvesting of young birch natural regeneration along specified road verges. This is for feed and bedding for Zoos. Informal recreation (walking and cycling) along the path and road network provides a healthy, safe environment for local communities to exercise and enjoy the outdoors.

There is also opportunity to manage the forest in a way that will enhance the environment and reduce operational conflict around Selm muir reservoir. Selm muir fishing club own and manage the reservoir.

Recreation

See **Map 7 Locally Important Features**; **Map 14 Visitor zones** & **Appendix VI Supporting photos.**

The main recreation activity at Selm muir is informal local visitor usage (walking, some cycling and outdoor education).

Forestry and Land Scotland has no formal recreation facilities at this forest but does conduct regular safety inspections and minor maintenance along the informal path network and at forest entrances.

Although not formally meeting the 'Woodlands in and Around Towns' criteria for urban woodland, it is clear that Selm muir provides an important resource for surrounding urban &

rural communities. The installed people counter data has been intermittent but shows a recent increase in visitor numbers with a peak of over 18,000 visits in 2020. Covid-19 long distance travel restrictions have likely contributed to these numbers, resulting in greater demand for local outdoor areas. The people counters are due to be updated in the next few years, which should provide more accurate information on visitor usage trends over the next plan period.

Forest schools and outdoor education activities have historically been staged in the older Pine stands. They are very low key and easy to relocate during forest operations.

Visitors mostly drive to Selm muir parking their vehicles at the forest entrances and then walking in. There are no recorded public rights of way (PROW) or Core paths, though non-vehicular informal access is permitted throughout the forest. There is a sign posted long distance walking route that runs through the Pentland Hills Regional Park from the south of Selm muir. This route has well maintained signage and access infrastructure - managed by 'Friends of the Pentlands'. It provides excellent views of Selm muir and the surrounding landscape to the north and of the dramatic rise into the Pentland Hills to the south.

There is some potential to link the south of Livingston town to the west of the forest along the Linhouse Water and Morton reservoir. The fishing business based at Selm muir reservoir may develop recreation facilities that would enhance provision in this area.

The creation of a spur road at the western end of the forest (from the shared fishing club access road) would significantly reduce user disruption during the felling of coupe 97006. In the longer term, this spur may serve as an informal parking area for forest visitors, reducing congestion at this forest entrance.

FLS are open to working with West Lothian Council to help develop walking links in this area.

14.0 Statutory requirements and key external policies

In addition to those already referenced within the main text the following key policy or guidance documents which have influenced this plan are listed here:

- UK Woodland Assurance Standard 4, 2018
- Central Scotland Green Network Vision
- NatureScot Landscape Character Assessments Type 185 Lowland Hills and Valleys & Type 154 Lowland Valley Fringes.
- SEPA Flood Risk Management Maps
- SEPA Water Environment Hub
- Scottish Forestry Bulletin 62 – Silviculture of Broadleaved Woodland
- Scottish Forestry Practice Guide 8 – The management of semi-natural wet woodlands
- Scottish Forestry Practice Guide 14 – Restoration of Native Woodland on Ancient Woodland Sites
- Scottish Forestry Practice Guide 21 – Choosing stand management methods for restoring planted ancient woodland sites
- Scottish Forestry Information Note 40 - Transforming Even-aged Conifer Stands to Continuous Cover Management
- Natural Reserves - Guidance for their selection and management on the NFE in Scotland
- Minimum Intervention Areas - Guidance for their selection and management on the NFE in Scotland
- Long-Term Retentions - Guidance for their selection and management on the NFE in Scotland

Appendix II: Land Management Plan Brief

This Land Management Plan or **LMP** covers Selm muir forest, an area of land covering 92.5 hectares which was acquired by Forestry and Land Scotland in 1952. It is located at the south-eastern corner of the Central Scottish Lowlands, within the local authority area of West Lothian Council. Livingston Town is the nearest large town, approximately 3 kilometres away, with a population of ~57,000 residents. Although not officially a WIAT woodland (*Woodlands In and Around Towns challenge fund*), Selm muir serves many local communities, providing a well-used outdoor resource for informal recreation. A privately owned water body (*Selm muir Reservoir*) exists within the forest boundary. This is run as a recreational fishing business.
The forest is also located within the Central Scotland Green Network (CSGN) boundary and currently delivers toward 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. Table 1 lists the DP30 Objectives which particularly relate to this LMP:

Table 22. How this plan contributes to the Central Scotland Green Network Project

Ref	Objective	Primary Workstream(s)
HA6	Increase habitat connectivity	Natural Climate Solutions Placemaking
Green Infrastructure		
GI2	Increase the quality and functionality of greenspaces within the CSGN	Natural Climate Solutions Placemaking Health and Wellbeing Green Recovery

Key features within Selm muir include:

- The designed beech planted earth-banks which provide a historic connection to the surrounding agricultural landscape & are integral to the internal forest path network.
- The 100 year old Scots pine stands.
- Selm muir reservoir, a man-made waterbody out-with the ownership of Forestry and Land Scotland but completely within the forest boundary. This is used as a private fishing business.

The forest has good productive potential and many zones are able to produce high quality timber. The intention is to maintain this productive potential.

Main Considerations

Larch and *Phytophthora ramorum*

Larch currently comprises ~11.8% of the forest area at Selm muir and is present both as a component mixture with other species and in pure stands. The forest sits within the 'Priority Action Zone' of Scottish Forestry's '*Phytophthora ramorum* larch Action Plan'. This zone is where actions will have the greatest impact on controlling the spread of *P. ramorum* and although infections have been limited they are gradually increasing. Ideally the Larch would be removed in the first phase of felling. This, however, must be balanced against achieving other sustainable forest management targets.

Silvicultural management of mature forest stands

This LMP will review silvicultural systems used to manage existing forest stands, taking account of site conditions, previous interventions and stand stability. Given the spread of windthrow in many areas, it is clear 'alternative to clearfell' management envisaged in the previous plan, & covering large areas of the forest, has to be reviewed. The LMP will aim to focus lower impact silvicultural systems and on areas showing the greatest potential for continued thinning and small scale regeneration felling.

Adjacency

Windblow has developed in a concentration of conifer stands planted in the 1950s & 1970s. This LMP will put in place a schedule for clearing these stands economically whilst reducing impacts of adjacency on landscape and hydrological features (*i.e. trying to avoid felling immediately adjacent stands in one operation*). The plan will also consider how the attractive 100 year old pine stands can be regenerated more gradually over a period of 30+ years, using small scale regeneration felling, which again avoids adjacency.

Future forest design

The following factors will be considered to design the future habitats and species at Selm muir:

- Strengthening and expanding the forest habitat network.
- Enhancing and protecting riparian zones
- Diversifying forest species and mixtures to make the forest more resilient to climate change.
- Enhancing views along the forest path network by diversifying stand structure, species mixtures, and increasing open space.
- Zoning more intensive crop management systems away from Selm muir reservoir and fishing club to reduce future impact of forest operations and enhance the landscape around the reservoir.

Heritage & conservation

There are no statutory conservation or heritage designations within the forest. This plan will consider increasing protection to key conservation and heritage features through the targeted use of minimum intervention or long term retention management systems and/or through the creation of native woodland habitats in specific zones.

Selm muir LMP 2022-32: Draft Management Objectives

Corporate Outcomes Relevant to LMP	Operational Actions To Deliver Outcome Relevant to LMP	Draft LMP Objectives
Outcome 1: **Supporting a Sustainable Rural Economy** [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.]	• 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 • Developing our forest planning processes to ensure long- term sustainable productivity of the national forests and land. • Providing a sustainable supply of timber to Scotland's timber processing sector • Support the venison processing sector through our deer management. • Work proactively with our tenants and stakeholders to identify potential added-value opportunities.	• Update silvicultural management prescriptions aiming for tree crop resilience and a sustained capacity to provide timber supplies. Key factors: 1. The present condition of individual stands, their response to past interventions & their past natural development. 2. Current threats to tree health. 3. Accelerated climate change, its impact on tree species suitability and stand management options. • Continue to provide a sustained productive timber resource. 5. Aim to supply a wide range of timber products & sizes. 6. Maximise proportions of saw log quality timber where thinning does not jeopardise tree stability. 7. Reduce the likelihood of windthrow and timber deterioration by gradually reducing the proportion of even-aged tree stands beyond normal rotation age. 8. Increase species mixtures. • Selm muir is a relatively small forest yet provides valued services to local communities and businesses. The plan will identify areas where the primary objective of timber production adversely impacts these other activities & adjust management prescriptions. In many cases this adjustment will be achieved at the restock stage through updated design or a change in the intensity of management. During this process - proactively work with key stakeholders to mitigate impacts as these changes are implemented.

Corporate Outcomes Relevant to LMP	Operational Actions To Deliver Outcome Relevant to LMP	Draft LMP Objectives
Outcome 2: **Looking after Scotland's national forests and land** [Scotland's national forests and land are looked after; biodiversity is protected and enhanced; and more environmental services are provided to people.]	• Managing the national forests and land to further the conservation and enhancement of biodiversity • Collaborating with partners on integrated landscape-scale approaches to habitat management and restoration. • Developing an asset management approach to the historic environment within Scotland's forests and land • Continuing to implement the Larch Strategy in order to reduce the rate of expansion of *Phytophthora ramorum*	• Where planting is used to regenerate stands, use tree species & provenances resistant to tree diseases & climate change. Remove larch pre-emptively during the term of the LMP. • Protect & seek opportunities to enhance the forest's historical features, recognising their link to the surrounding 'lowland plain' landscape. • Continue to protect species and habitats in the forest The plan will have a particular focus on LEPO Woodland connectivity (Long Established Woodland of Plantation Origin) and the link to Linhouse Water & associated ancient woodland. Retain standing and fallen deadwood wherever possible and protect veteran trees. • Establish minimum intervention areas with the potential to become natural reserves in sensitive locations. • Protect and enhance water features and filter zones. Work proactively with the private fisheries to minimise water siltation throughout the forest, taking active measures prior to and during operations.

Corporate Outcomes Relevant to LMP	Operational Actions To Deliver Outcome Relevant to LMP	Draft LMP Objectives
Outcome 3: **National forests and land for visitors and communities** [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.]	• Maintaining walking and biking trails to promote fun in the outdoors, focussing on improving entry level experiences for everyone to enjoy and gain health benefits. • 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. • Enabling outdoor learning and encouraging schools and community groups to make use of the national forests and land. • Continuing to engage communities in decisions relating to the management of the national forests and land. • Continuing to support community empowerment by enabling communities to make use of the national forests and land to benefit their communities	• Maintain current recreational infrastructure including paths & associated heritage features. • Re-establish the longer distance circular walking route to the north of the fisheries • Where feasible, continue to involve local community groups & organisations to develop informal recreational & educational activities such as forest schools. • Ensure management prescriptions protect and enhance recreational routes and heritage features. • Where visitor & recreation expansion is planned, consider resource capacity and interaction with other forest activities & users (e.g. residential & business interests within the forest).

Appendix III: Land Management Plan Consultation Record

Table 23 Land Management Plan Consultation Record

Consultee	Date contacted	Date response received	Issue raised	Forestry & Land Scotland Response
West Lothian Council (WLC) Parks & Woodland Manager	Contacted by FLS 29/06/2021	WLC Response 30/06/2021	Thanks you for getting in touch. The Parks & Woodland Team are now responsible for Access in West Lothian. There is no core path or plans to designate a core path through the woodland or equally plans to develop the route to Thieves Road that we are aware of. It may be worth getting in touch with Pentland Hills as I have a feeling that the Friends of the Pentlands may have signed this route. I've copied in Jessica as she should be able to help with this. From the Access point of view we would need to make sure that where access is to be restricted for forestry operations that this is well notified and signed with alternative routes if possible. Also that if required Section 11's are in place.	Noted
West Lothian Council (WLC) Countryside Ranger	Contacted by FLS 25/11/2021	WLC Response 13/01/2022	Thank you for your email regarding access in and around Selm Muir. Your map looks correct, according to our records, although you should be aware that there is currently no footbridge over Linhouse Water on LW41 (west of Morton Farm). Re' aspirations for wider connectivity, we're	

Consultee	Date contacted	Date response received	Issue raised	Forestry & Land Scotland Response
			always keen to see such things improved and we are happy to discuss with landowners if they'd like advice on the matter, but because we don't own land east of Linhouse Water, and any funds we're able to secure via external grants are only being directed to upgrading existing core paths (we've just done the Linhouse Circular) and existing WLC sites, we aren't in a position to establish new links I'm afraid. We hope to have an Access Ranger in post soon, who will hopefully be able to take a more holistic view of this kind of thing in future.	Noted
Local Resident	10/03/2022	16/03/2022	As a local resident I'd like to receive updates please.	Thank you for your e-mail. For updates to the Selm Muir Forest Land Management Plan please check our consultation webpage (link below) where you can download the proposals for management, with accompanying maps. https://forestryandland.gov.scot/what-we-do/planning/consultations/selm-muir-lmp Planned operations within the forest and any updates to our proposals can be found in the above link.

Consultee	Date contacted	Date response received	Issue raised	Forestry & Land Scotland Response
				In relation to specific forest operations, the relevant member of staff leading that operation will normally contact neighbours directly bordering a site.
Adjacent Land Owner	15/03/2022	25/03/2022	Thank you for your letter with online information about Selm muir future planning. We Farm Leyden Farm which has land marching either side of Selm muir woods. We appreciate that the woodland area needs further cultivation and tree management, however the increase to dog walkers is causing a major effect on our farming. The has been a major increase in dog attacks on our sheep , just last week we had four sheep killed due to dogs chasing and attacking sheep. A netted fence may help to solve this problem . As it is now at the stage that we are trying to avoid putting sheep in theses adjacent fields. Signage would also help as members of the public do not seem to have countryside awareness and often walk through fields with either livestock or cropped , leaving litter as they go and gates not always left as found. We would therefore appreciate if you could include both signage and fencing in any future plans as this is having a major monetary and distressing effect on our farming business.	Thank you for your e-mail. As per our direct response to you FLS have erected signs at various access points in the forest to educate dog walkers and highlight that we are monitoring their activity during site visits. Your details have been passed to the local forest manager to discuss March fence maintenance. FLS would advise notifying the police of dog attack incidents. You can also notify our local staff, who will record incidents and increase routine visits if necessary If you have any other issues or queries regarding management of the forest, please do not hesitate to contact our Visitor Services team based at Five Sisters Office, West Calder. Tel: 0300 067 6600 or email: enquiries.central@forestryandland.gov.scot
Ecology & Biodiversity Team West Lothian Council	30/03/2022	12/04/2022	**Reference:** Selm Muir Land Management Plan 2022 **Title:** West Lothian Council Parks and Woodland Team -Response **Response from West Lothian Tree and Woodland**	**FLS Response to West Lothian Tree and Woodland**

Consultee	Date contacted	Date response received	Issue raised	Forestry & Land Scotland Response
			Officer: West Lothian Council's officers welcome the use of LISS and a greater diversity of species. We would be interested to have a site meeting with the Planning Forester to discuss the detail regarding LISS proposals, so that those of us trying to introduce more LISS and species diversity into woods within West Lothian can share information. In turn, this would be fed into future Forestry & Woodland Strategies as appropriate. **Response from West Lothian Council Ranger Service:** In terms of access within the site boundaries, we welcome the retention of existing path networks and the recovery of the longer loop by the fishery. We would encourage all landowners to facilitate public access during forestry operations where safe to do so, using diversions rather than closures, and to keep restrictions to a minimum. **Response from West Lothian Council Ecology & Biodiversity Officers:** In general, the plan looks well considered and it's positive to see specific actions with regards to improving habitats for protected species. There are a couple of points to draw your attention to. **Question 2: What do you most like about the**	**Officer:** FLS would be happy to meet at Selm muir to discuss LISS management. We are still at an early stage in testing these management systems and sharing of ideas would be welcomed. We would also compliment West Lothian Council's woodland management approach at Beecraigs Country Park. They have implemented an excellent thinning and LISS management strategy within the Country Park. **FLS Response to West Lothian Council Ranger Service:** We will endeavour to keep paths open, where safe to do so, during active operations.

Consultee	Date contacted	Date response received	Issue raised	Forestry & Land Scotland Response
			plan, and why? The plan has incorporated LISS management for a large area which is a welcomed approach not seen enough in commercial plantations. There is good diversity of species planned and the plan will see an overall increase in native broadleaf cover which is positive. The inclusion of habitat enhancement/ species enhancement work is welcomed and encouraging. **Q3 Is there a part of the plan that you would like to see improved, if so how?** Section 7.11 and Appendix VIII. The western edge of the block sits within the primary zone for native woodland creation and is immediately adjacent to a section of core native woodland (non FLS land). The plan should further recognise the potential of the area to better connect native broadleaf habitat within 97001 as indicated in Map 5 (Primary Zone - for native woodland expansion) by reducing the SS/ALP components if not replacing them entirely. The section would be more appropriate as BL woodland (could be productive). Additionally, the plan would benefit from inclusion of/ additional non-wooded habitats such as grassland and fen habitat.	**FLS Response to West Lothian Council Ecology & Biodiversity Officers Q3:** In the short-term we have proposed to revert coupe 97006 to native broadleaved woodland to the north-west of the Reservoir – Future Habitats & Species Map 13. This links directly to the area of core native woodland on the northwest boundary of Selm muir (Map 5). This will also allow clearing of the windblown conifer stands to the north of the reservoir and re-connecting the informal path network along the northern boundary of the forest. With the exception of small areas of Larch, the main conifers stands in 97001 are not due to be felled until phase six of the land management plan (2047-2051) – Map 10. The future habitats and species plan Map 13 shows that we will reduce the conifer areas is this coupe and increase non-productive broadleaves. Overall we propose to significantly increase native broadleaves and open space within the forest but would also need to maintain a productive conifer

Consultee	Date contacted	Date response received	Issue raised	Forestry & Land Scotland Response
				element in order to fund non-commercial management objectives. Certainly at the next plan renewal we can review the habitat networks to further improve connectivity as the future habitats and species plan is implemented.
			Q4. Please add any further comments relating to the plan here? General: The LMP refers to "SNH" in several sections which should be updated to NatureScot. Section 7.11.1: Personally, I would remove the sentence "Due to the mobility of badgers it would be difficult to designate specific areas as minimum intervention" I understand the reasoning behind the statement but it's not required and not really true. Badger setts can be in the same location for generations. Dispersal into new areas (if undisturbed) is actually relatively slow for the species so in theory, a woodland could be managed for the species so long as there is sufficient resources surrounding the sett. Appendix VIII is wrong and potentially could cause a wildlife crime to be committed. The mitigation measures listed does not negate the need for licencing. A licence must be sought for works affecting the sett. A standard forestry licence may not be appropriate here, depending on sett usage and operational activities. The SFO may be appropriate	**FLS Response to West Lothian Council Ecology & Biodiversity Officers Q4:** Thank you for your comments, I have amended Section 7.11.1 regarding minimum intervention management and badger activity. We will review management prescriptions for this coupe (97006) when the native woodland has established. Some references to 'SNH' relate to previous publications they produced when using this name. For clarity I have changed all 'SNH' references to 'NatureScot'. This revised copy has been re-submitted to Scottish Forestry. Appendix VIII is a method statement specifically relating to planting operations once felling has been completed. Before felling, our standard policy is to consult with NatureScot and apply for a license as required. This planting method statement describes controls we have previously agreed with NatureScot as a separate procedure once the felling has been completed. NatureScot have also been consulted on this plan's proposals and will be able to advise us of any changes required with regard to Appendix VIII.

Consultee	Date contacted	Date response received	Issue raised	Forestry & Land Scotland Response
			for felling works but is not likely to be appropriate for planting post felling. The statement in point 2 in particular is of concern. The sensitive period is incorrect. Badgers most sensitive season is 30th November - 1st July where an exclusion zone of 30m for vehicle access would be required. The other mitigation measures listed are also not appropriate without further consultation with NatureScot licencing team.	
Scottish Water	21/04/2022	N/A	**Drinking Water Protected Areas** A review of our records indicates that there are no Scottish Water drinking water catchments or water abstraction sources, which are designated as Drinking Water Protected Areas under the Water Framework Directive, in the area that may be affected by the proposed activity. **Scottish Water Assets** A review of our records indicates that there are no assets within the site but there is a 600mm DI trunk water main running round the site boundary. This should be confirmed however through obtaining plans from our Asset Plan Providers. Details of our Asset Plan Providers are included in the SW list of precautions for assets, which can be found on the activities within our catchments page of our website at www.scottishwater.co.uk/slm.	Noted

Consultee	Date contacted	Date response received	Issue raised	Forestry & Land Scotland Response
			All Scottish Water assets potentially affected by the activity should be identified, with particular consideration being given to access roads and pipe crossings. If necessary, local Scottish Water personnel may be able to visit the site to offer advice. All of Scottish Water's processes, standards and policies in relation to dealing with asset conflicts must be complied with. In the event that asset conflicts are identified then early contact should be made with HAUC Diversions Team via the Development Services portal - https://swastroprodweb.azurewebsites.net/home/default. All detailed design proposals relating to the protection of Scottish Water's assets should be submitted to the HAUC for review and written acceptance. Works should not take place on site without prior written acceptance by Scottish Water. Scottish Water have produced a list of precautions for a range of activities. The list of precautions for assets details protection measures to be taken if there are assets in the area. Please note that site specific risks and mitigation measures will require to be assessed and implemented. The document/s and other supporting information can be found on	

Consultee	Date contacted	Date response received	Issue raised	Forestry & Land Scotland Response
			the activities within our catchments page of our website at www.scottishwater.co.uk/slm. It should be noted that the proposals will be required to comply with Sewers for Scotland and Water for Scotland 4th Editions 2018, including provision of appropriate clearance distances from Scottish Water assets.	
Website Consultation Feedback Response	09/03/2022		**1. What aspects of the proposed Land Management Plan are you most interested in?** Recreation and access. **2. What do you most like about the plan, and why?** The plantation of new species & recreational space for outdoor activities. **3. Is there a part of the plan that you would like to see improved, if so how?** Recreational & Parking space, creating a small carpark and a flat grass plain for general outdoor use close to the entrance. **4. Please add any further comments relating to the plan here?** Where possible please leave smaller trees around the fishery.[TS(1)]	Thank you for your comments. **3.** FLS regularly review provision of car parking areas across the Estate and try to balance this with the level of demand and facilities in the area alongside the costs of managing and maintaining a car park facility. Other considerations include the risk of fly tipping or ant-social behaviour. **4.** The proposals for forest stands around the fishery will involve phased harvesting of the windblown conifers. The subsequent replanting design immediately around the fishery will be a mix of

Consultee	Date contacted	Date response received	Issue raised	Forestry & Land Scotland Response
				smaller native broadleaves, a small proportion of slow growing pine and open space. This should diversify the forest structure and views immediately around the fishery & reduce operational conflict in the long term.
Website Consultation Feedback Response	10/03/2022		**1. What aspects of the proposed Land Management Plan are you most interested in?** Recreation and access. **2. What do you most like about the plan, and why?** Seems sensible, if perhaps a bit conservative. **3. Is there a part of the plan that you would like to see improved, if so how?** You're the experts, but I wonder if more 70's pines should be replaced with native trees. **4. Please add any further comments relating to the plan here?**	Thank you for your comments. **3.** Overall, native broadleaved areas in the plan proposals will increase, with the aim of improving habitat connectivity and diversifying forest structure. However, we would like to maintain a core productive conifer element at Selm muir, the pine stands contribute to the existing character of the woodland & in many areas are able to reach 100+ years in age. They also provide a sustainable source of larger diameter timber products to national markets.
Website Consultation Feedback Response	11/03/2022		**1. What aspects of the proposed Land Management Plan are you most interested in?** Wildlife. **2. What do you most like about the plan, and why?**	Thank you for your comments.

Consultee	Date contacted	Date response received	Issue raised	Forestry & Land Scotland Response
			Much of the plan is too technical for me. However, I am glad that there is a plan to produce timber in a sustainable way whilst retaining access to the public. **3. Is there a part of the plan that you would like to see improved, if so how?** How are you going to look after and encourage wildlife? **4. Please add any further comments relating to the plan here?** It is very long and detailed without a short summary which lay people would understand. I don't recall anything specific regarding looking after wildlife; but perhaps it is hidden in the detail of tree species and felling plans.	**3. & 4.** The environment proposals can be accessed in the 'main plan document' - available on our consultation website under 'Central': https://forestryandland.gov.scot/what-we-do/planning/consultations#central The main plan document can be navigated through the 'table of contents'. By clicking the relevant section in the table of contents you will be taken directly to that section. The environment proposals are in **Section 7.11**. Subsequent to plan approval these documents will be available in the following link under 'Central': https://forestryandland.gov.scot/what-we-do/planning/active
Website Consultation Feedback Response	15/03/2022		**1. What aspects of the proposed Land Management Plan are you most interested in?** Landscape impacts. **2. What do you most like about the plan, and why?** **3. Is there a part of the plan that you would like to see improved, if so how?**	Thank you for your comments. **3.** Please see FLS response to consultation feedback recorded above (received as separate

Consultee	Date contacted	Date response received	Issue raised	Forestry & Land Scotland Response
			We Farm the land either side of Selm muir and would like the public educated on countryside access. Having a major increase on dog attacks to our livestock Fencing and signage would help. Paths being routed away from the farm land . Dog walkers are a problem not having them under control or having them on a lead. **4. Please add any further comments relating to the plan here?** Education on countryside codes and access. Look at ditch clearance and drainage of water so as not causing flooding or run off to neighbouring land.	communication on 15/03/22). FLS would be happy to work with neighbours to educate visitors on responsible access to the outdoors including poster campaigns and engagement. The site has no formal paths so people access the site under Scottish Outdoor Access Code SOAC. **4.** FLS will work with adjacent neighbours to ensure existing drains are maintained. We work on the legal basis of the common law right for a landowner to allow natural drainage of water onto lower ground and the obligation that the owner of the lower property accept water from the higher property .
Website Consultation Feedback Response	16/03/2022		**1. What aspects of the proposed Land Management Plan are you most interested in?** Landscape impacts. **2. What do you most like about the plan, and why?** See below. **3. Is there a part of the plan that you would like to see improved, if so how?** See below. **4. Please add any further comments relating to the plan here?**	Thank you for your comments **4.** We are aware of the finger & waymarking post located within Selm muir forest and will ensure their

Consultee	Date contacted	Date response received	Issue raised	Forestry & Land Scotland Response
			I am the Planning Officer for the Friends of the Pentlands (FoPH) to which this consultation has been intimated. Selm Muir is some 2k north of the A70 and the forestry proposals will not have any significant or adverse visual impact on the Pentlands. Para 7.14 of the draft Management Plan says that "FLS are open to working with West Lothian Council and outdoor interest groups such as Friends of the Pentlands to consider walking links in the future where deemed sustainably viable". There is an existing Pentlands access path which runs through Selm muir for a short distance. The path, running from the W entrance of SM to Little Vantage, was developed by FoPH, with support from W Lothian Council, and FoPH maintains it. Some 500-600 metres of the path with a finger post and waymarking post are located in the wood before it turns out of the wood up a farm track to Leyden Old House. The only implication, which we can identify, of the plan for this path section is that the planned maintenance work on the main spine forest road to clean verges, check/repair culverts could see the removal of these posts. We confirm our willingness to work with FLS regarding this section of the path to the Thieves Rd	protection during all forest operations. If you would like to discuss any issues relating to access in the forest please contact our Visitor Services team based at Five Sisters Office, West Calder. Tel: 0300 067 6600 or email: enquiries.central@forestryandland.gov.scot

Consultee	Date contacted	Date response received	Issue raised	Forestry & Land Scotland Response
			and any walking links at any relevant locations.	
Website Consultation Feedback Response	17/03/2022		**1. What aspects of the proposed Land Management Plan are you most interested in?** Recreation and access. **2. What do you most like about the plan, and why?** Replanting. **3. Is there a part of the plan that you would like to see improved, if so how?** Impact on walking in the area due to works undertaken. **4. Please add any further comments relating to the plan here?** Will an area to park cars be included in your proposals?	Thank you for your comments. **3.** Works are planned to minimise impact on public access and keep visitors safe. **4.** FLS regularly review provision of car parking areas across the Estate and try to balance this with the level of demand and facilities in the area alongside the costs of managing and maintaining a car park facility. Other considerations include the risk of fly tipping or ant-social behaviour.
Website Consultation Feedback Response	21/03/2022		**1. What aspects of the proposed Land Management Plan are you most interested in?** Recreation and access. **2. What do you most like about the plan, and why?** That the forest is being looked after and preserved	Thank you for your comments.

Consultee	Date contacted	Date response received	Issue raised	Forestry & Land Scotland Response
			long term. **3. Is there a part of the plan that you would like to see improved, if so how?** Path network upgraded. **4. Please add any further comments relating to the plan here?** Would love to see the path network upgraded and a parking area off leyden rd.	**4.** FLS regularly review provision of facilities including paths and car parking areas across the Estate and try to balance this with the level of demand and facilities in the area alongside the costs of managing and maintaining any additional facilities.
Website Consultation Feedback Response	24/03/2022		**1. What aspects of the proposed Land Management Plan are you most interested in?** Recreation and access. **2. What do you most like about the plan, and why?** It is a lovely area and should be maintained. **3. Is there a part of the plan that you would like to see improved, if so how?** **4. Please add any further comments relating to the plan here?** It would be great to have dog waste bins.	Thank you for your comments. **4.** Provision of bins places a huge demand on resources to keep bins emptied and maintained and can create a larger litter problem in some areas. We encourage visitors to take their litter home and dispose of responsibly.

Appendix IV: Objective, Appraisal, Monitoring & Evaluation

The success of this plan will be based on the following:

3. The achievement towards the management objectives set out in **Section 1.3 Selmmuir Management Objectives.**
4. The implementation of operations set out in **Section 2.1 Summary of Planned Operations**
5. Compliance with the UK Forestry Standard and UKWAS guidelines.

Table 24 (below): Objective Appraisal, Monitoring & Evaluation details how each management 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.

Objective	Assessable Criteria	Appraisal Method	Monitoring Method	Monitor Where	Monitor When	Monitor Who	Record Monitoring Where	Evaluation. *How does the Appraisal and Monitoring method inform current & future proposals? If you cannot answer this question then the methods may not be appropriate.*
Update silvicultural management prescriptions aiming for tree crop resilience and a sustained capacity to provide timber supplies.	Species composition. Stand stability. Marketable timber volumes. Tree growth rates & health.	Sub-compartment database species analysis. Production forecast. Aerial photography checks for windthrow & tree condition. Routine site inspections. FLS Stocking Density Assessment (SDA).	Delivery team routine site visits. Sub-compartment updates. LMP mid- term review and renewal. SDA results analysis	Sub-compartment database. On site Programme meetings. LMP files	After operations and at appropriate intervals e.g. LMP mid-term and 10 year reviews	Planning team/ Programme Manager/ Harvesting team/ /FM team	Delivery & Planning Team Records. LMP Mid-term Review. LMP Renewal	The evaluation process will inform planners and delivery teams: 1. Where and when thinning is possible in the future. 2. Where action is needed to removed diseased species or windblown stands. 3. Which productive species to specify in the future habitats and species plan. 4. Alternative productive species for use in beat up operations (within the regulatory tolerances).
Continue to provide a sustained productive timber resource. **Aim to supply a wide range of timber products & sizes.** **Maximise proportions of saw log quality timber where thinning does not jeopardise tree stability.** **Reduce the likelihood of windthrow and timber deterioration by gradually reducing the proportion of even-aged tree stands beyond normal rotation age.** **Increase species mixtures.**	Productive stands in forest. Productive species composition. Growth rates of productive species Age class distribution of productive stands & windfirm edges Productive stands with intimate species mixtures	Sub-compartment database species, mixtures and age class analysis. Production forecast stand assortment tables. Sub-cpt & management coupe database analysis of windfirm edges FLS Stocking Density Assessment (SDA).	LMP mid- term review and renewal. Sub-compartment updates. SDA results analysis	Sub-compartment database. Programme meetings. LMP files	After operations and at appropriate intervals e.g. LMP mid-term and 10 year reviews.	Planning team/ Programme Manager/ Harvesting team/ /FM team	Planning Team Records. LMP Mid-term Review. LMP Renewal	The evaluation process will inform planners and delivery teams: 1. Which productive species and mixtures to specify in the future habitats and species plan. 2. If further design adjustment is required in relation to coupe size and ride networks - to increase windfirm edges and age class diversity.

Objective	Assessable Criteria	Appraisal Method	Monitoring Method	Monitor Where	Monitor When	Monitor Who	Record Monitoring Where	Evaluation. *How does the Appraisal and Monitoring method inform current & future proposals? If you cannot answer this question then the methods may not be appropriate.*
The plan will identify areas where the primary objective of timber production adversely impacts these other activities & adjust management prescriptions	Impacts of timber production on other forest users and objectives Implementation of management proposals around Selm muir reservoir and fishing club.	Analysis of feedback from FLS Teams & complaints records for Selm muir at Mid-term. Routine site inspections. Ongoing discussions between Estates team/Planning team and fisheries owner	LMP mid-term review & renewal.	LMP files	At appropriate intervals e.g. LMP mid-term and 10 year reviews	Planning team/Estates team/Environment team/Visitor services team	LMP files, mid-term review and renewal	The evaluation process will inform planners if further zoning of forest activities is required in the design review process (mid-term review/plan renewal).
Where planting is used to regenerate stands, use tree species & provenances resistant to tree diseases & climate change. Remove larch pre-emptively during the term of the LMP.	Species composition. Tree health Presence and quantity of larch.	Sub-compartment database analysis of larch and other vulnerable species. Aerial photography checks for tree condition. Routine site inspections. FLS Stocking Density Assessment (SDA).	Delivery team routine site visits. Sub-compartment updates. LMP mid- term review and renewal. SDA results analysis	Sub-compartment database. Programme meetings. LMP files	Prior to and nearing completion of operations. At other appropriate intervals e.g. LMP mid-term and 10 year reviews.	Planning team/ Programme Manager/ Harvesting team/ /FM team	Delivery & Planning Team Records. LMP Mid-term Review. LMP Renewal	The evaluation process will inform planners and the programme manager: 1. If the LMP work programme is being achieved (i.e. larch removal). 2. If further adjustments are required to species choice. 3. If an adjustment to thinning intensity is required. For example, if Dothistroma needle blight starts to significantly reduce yields in Scots pine, then heavier thinning of these stands may be required and a change in species choice at restock.

Objective	Assessable Criteria	Appraisal Method	Monitoring Method	Monitor Where	Monitor When	Monitor Who	Record Monitoring Where	Evaluation. *How does the Appraisal and Monitoring method inform current & future proposals? If you cannot answer this question then the methods may not be appropriate.*
Protect & seek opportunities to enhance the forest's historical features, recognising their link to the surrounding 'lowland plain' landscape.	Condition of heritage features Delivery of future habitats and species plan	Recognition of key features in workplans and operational delivery. Inspect condition of heritage features prior to, during and post-operations Review the delivery of future habitats and species plan.	Review at delivery programme meetings. Workplan cross-team operation ¾ completion meetings. Routine site inspections. Sub-compartment updates.	Programme meetings. Onsite. Sub-compartment database.	Prior to, during and nearing completion of operations and at appropriate intervals e.g. LMP mid-term and 10 year reviews.	Planning team/ Programme Manager/Environment team/ Harvesting team/ /FM team	Work plans LMP Files LMP Mid-term Review. LMP Renewal	The evaluation process will inform planners if a review of management coupes and restock design is required to provide greater protection to these features. Will inform delivery teams where increased controls are required during operations.
Continue to protect species and habitats in the forest. **The plan will have a particular focus on LEPO Woodland connectivity (Long Established Woodland of Plantation Origin) and the link to Linhouse Water & associated ancient woodland.** **Retain standing and fallen deadwood wherever possible and protect veteran trees.**	Protection of identified species and habitats during forest operations. Delivery of future habitats and species plan	Recognition of key features in workplans and operational delivery. Inspect condition of breeding locations, setts, habitats prior to, during & post-operations. Review the delivery of future habitats and species plan.	Review at delivery programme meetings. Workplan cross-team operation ¾ completion meetings. Routine site inspections. Sub-compartment updates.	Programme meetings. Onsite. Sub-compartment database.	Prior to, during and nearing completion of operations and at appropriate intervals e.g. LMP mid-term and 10 year reviews.	Planning team/ Programme Manager/Environment team/ Harvesting team/ /FM team.	Work plans LMP Files LMP Mid-term Review. LMP Renewal	The evaluation process will inform planners if a review of management coupes and restock design is required to provide greater protection enhancement of habitat and species. Will inform delivery teams where increased controls are required during operations.

Objective	Assessable Criteria	Appraisal Method	Monitoring Method	Monitor Where	Monitor When	Monitor Who	Record Monitoring Where	Evaluation. *How does the Appraisal and Monitoring method inform current & future proposals? If you cannot answer this question then the methods may not be appropriate.*
Establish minimum intervention areas with the potential to become natural reserves in sensitive locations.	LMP approval and updating of management coupe information to reflect this. Management activity within these areas.	Recognition of minimum intervention areas in workplans and operational delivery. Assess type and intensity of management within these areas. Review the delivery of future habitats and species plan.	Review at delivery programme meetings. Workplan cross-team operation ¾ completion meetings. Routine site inspections.	Programme meetings. Onsite. Sub-compartment database	Prior to and nearing completion of operations and at appropriate intervals e.g. LMP mid-term and 10 year reviews.	Planning team/ Programme Manager/Environment team/ Harvesting team/ /FM team.	Work plans LMP Files LMP Mid-term Review. LMP Renewal	The evaluation process will inform planners if a review of management coupes and restock design is required to provide greater protection enhancement of these features. Will inform delivery teams where increased controls are required during operations.
Protect and enhance water features and filter zones. Work proactively with the private fisheries to minimise water siltation throughout the forest, taking active measures prior to and during operations.	Water quality Condition of riparian zones Delivery of future habitats and species plan	Recognition of key features in workplans and operational delivery. Inspect condition of riparian/hydrological features prior to, during and after operations. Inspect water quality prior to, during and after operations. Review the delivery of future habitats and species plan.	Review at delivery programme meetings. Workplan cross-team operation ¾ completion meetings. Routine site inspections. Delivery and Estates team communicaton with fisheries Sub-compartment updates.	Programme meetings. Onsite. Sub-compartment database.	Prior to, during and nearing completion of operations and at appropriate intervals e.g. LMP mid-term and 10 year reviews.	Planning team/ Programme Manager/ Harvesting team/ /FM team.	Work plans LMP Files LMP Mid-term Review. LMP Renewal	The evaluation process will inform planners if a review of management coupes and restock design is required to provide greater protection enhancement of these features. It will inform delivery teams if additional controls & better communication are required during the planning and implementation of operations.

Objective	Assessable Criteria	Appraisal Method	Monitoring Method	Monitor Where	Monitor When	Monitor Who	Record Monitoring Where	Evaluation. *How does the Appraisal and Monitoring method inform current & future proposals? If you cannot answer this question then the methods may not be appropriate.*
Maintain current recreational infrastructure including paths & associated heritage features. Ensure management prescriptions protect and enhance recreational routes and heritage features. Re-establish the longer distance circular walking route to the north of the fisheries	Path and associated heritage feature condition. Clearance of obstructions along all paths prior to operational completion. Delivery of future habitats and species plan	Assess feature condition and safe passage along forest path network. Review the delivery of future habitats and species plan.	Review at delivery programme meetings. Workplan cross-team operation ¾ completion meetings. Routine site inspections. Sub-compartment updates.	Programme meetings. Onsite. Sub-compartment database.	Prior to, during and nearing completion of operations and at appropriate intervals e.g. LMP mid-term and 10 year reviews.	Planning team/ Programme Manager/ Visitor services team/ Harvesting team/ /FM team.	Work plans LMP Files LMP Mid-term Review. LMP Renewal	The evaluation process will inform planners if a review of management coupes and restock design is required to provide greater protection enhancement of these features. It will inform delivery teams if additional controls are required during the planning and implementation of operations.
Where feasible, continue to involve local community groups & organisations to develop informal recreational & educational activities such as forest schools. **Where visitor & recreation expansion is planned, consider resource capacity and interaction with other forest activities & users (e.g. residential & business interests within the forest).**	Community involvement Number of events. Visitor numbers Staff resource capacity Potential conflict with other forest objectives and activities	Recording of community involvement and visitor services events. Recording of visitor numbers using people counters. Assessment of staff capacity, expansion type and impacts of expansion on other objectives, activities and important features.	LMP mid-term and 10 year reviews.	LMP mid-term review and renewal meetings	LMP mid-term and 10 year reviews.	Planning team/ Visitor services team and other delivery teams	LMP Mid-term review and renewal documents.	The evaluation process will inform planners and the visitor services team how and if community involvement, educational activities or other recreational expansion can be delivered within the forest.

Appendix V: List of Maps

1. Forest location and context
2. The existing forest
3. Soils and hydrology
4. Wider conservation and heritage features
5. Wider forest habitat network
6. Wider landscape
7. Locally important features
8. Analysis of constraints and opportunities
9. Concept design
10. Management coupes, clearfell phases and proposed forest roads
11. LISS and other low impact management areas
12. LMP ten year felling and thinning coupes
13. Future habitats and species
14. Woodland management in Visitor Zones

Appendix VI: Supporting Photos

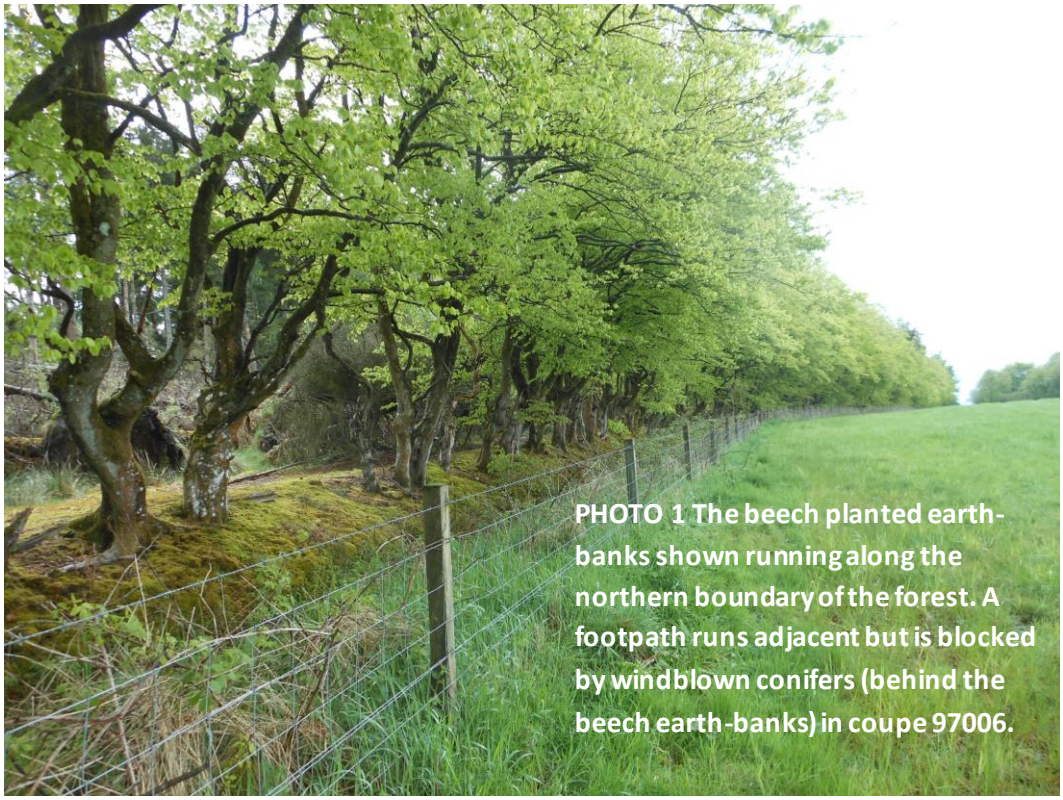


PHOTO 1 The beech planted earth-banks shown running along the northern boundary of the forest. A footpath runs adjacent but is blocked by windblown conifers (behind the beech earth-banks) in coupe 97006.

PHOTO 2 Beech planted earth-bank running along the south-west boundary of the forest with associated footpath. The beech earth-banks extend outside the forest into the wider agricultural landscape (background).

PHOTO 3 Native mixed broadleaved area planted in 1950's has good future potential for deadwood and will form part of the native forest habitat network. This area has been incorporated into Minimum Intervention coupe 97020.

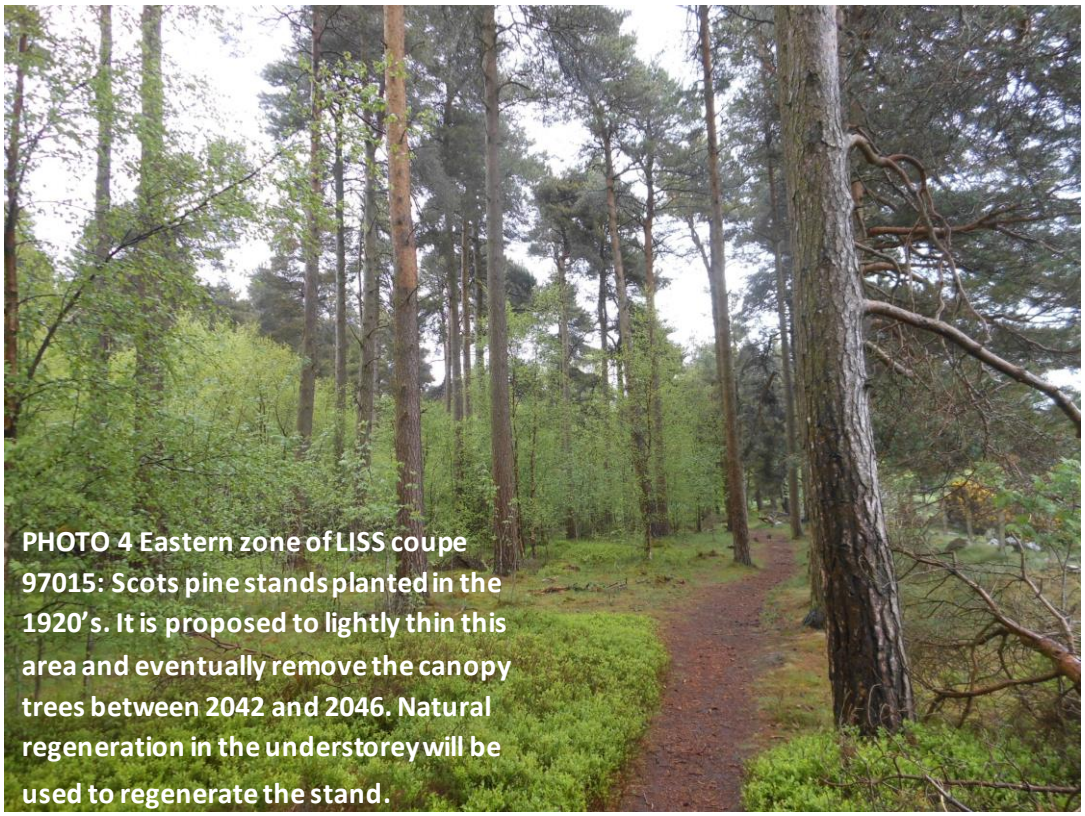


PHOTO 4 Eastern zone of LISS coupe 97015: Scots pine stands planted in the 1920's. It is proposed to lightly thin this area and eventually remove the canopy trees between 2042 and 2046. Natural regeneration in the understorey will be used to regenerate the stand.

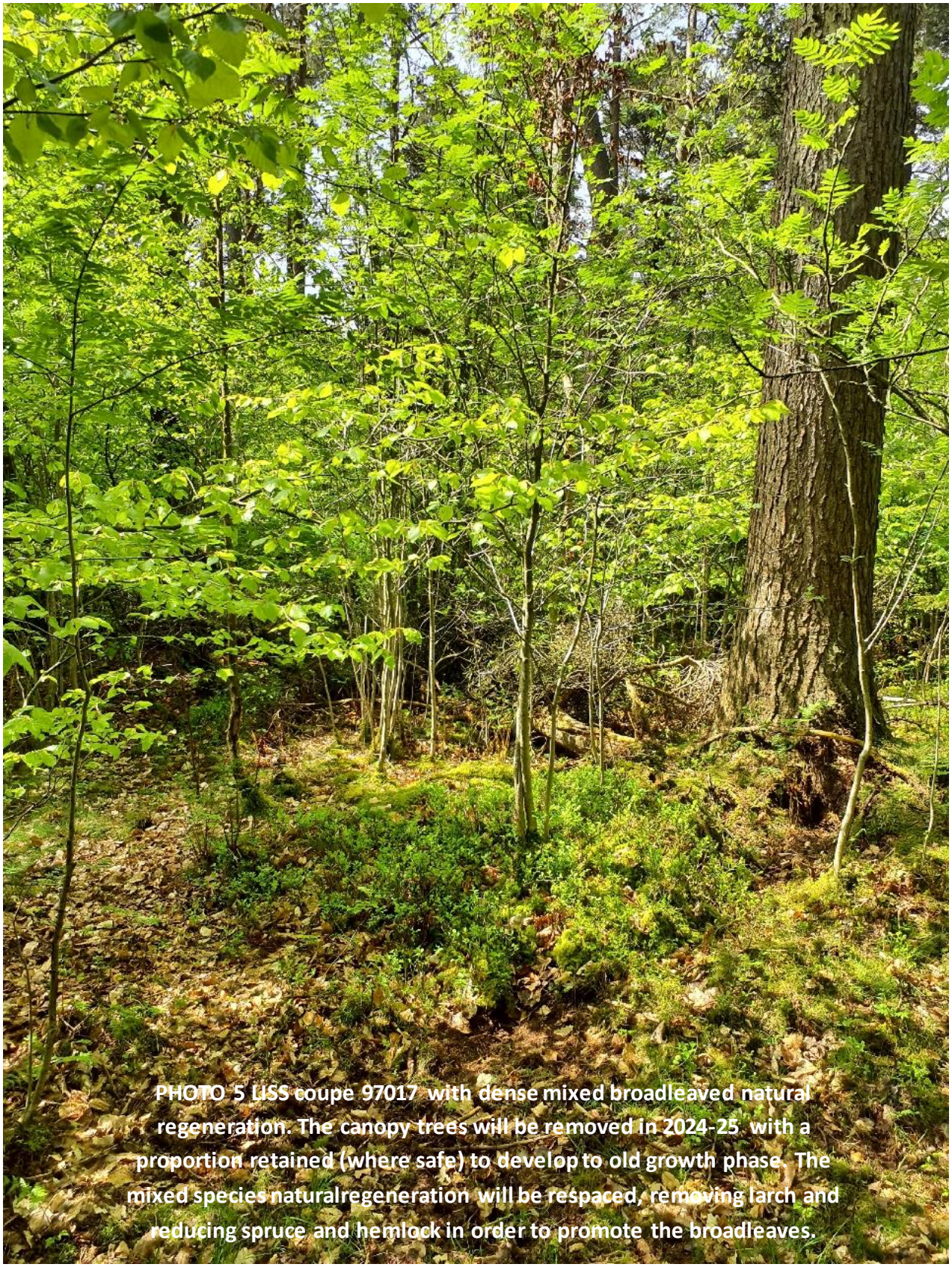


PHOTO 5 LISS coupe 97017 with dense mixed broadleaved natural regeneration. The canopy trees will be removed in 2024-25 with a proportion retained (where safe) to develop to old growth phase. The mixed species naturalregeneration will be respaced, removing larch and reducing spruce and hemlock in order to promote the broadleaves.

PHOTO 6 Coupe 97014 – the upper extent of main inlet to Selm muir reservoir. The inlet forms in 97014 and runs through 97007 & 97005 before reaching the reservoir. The future habitat & species plan will expand open space along the inlet channel when 97014 is felled.

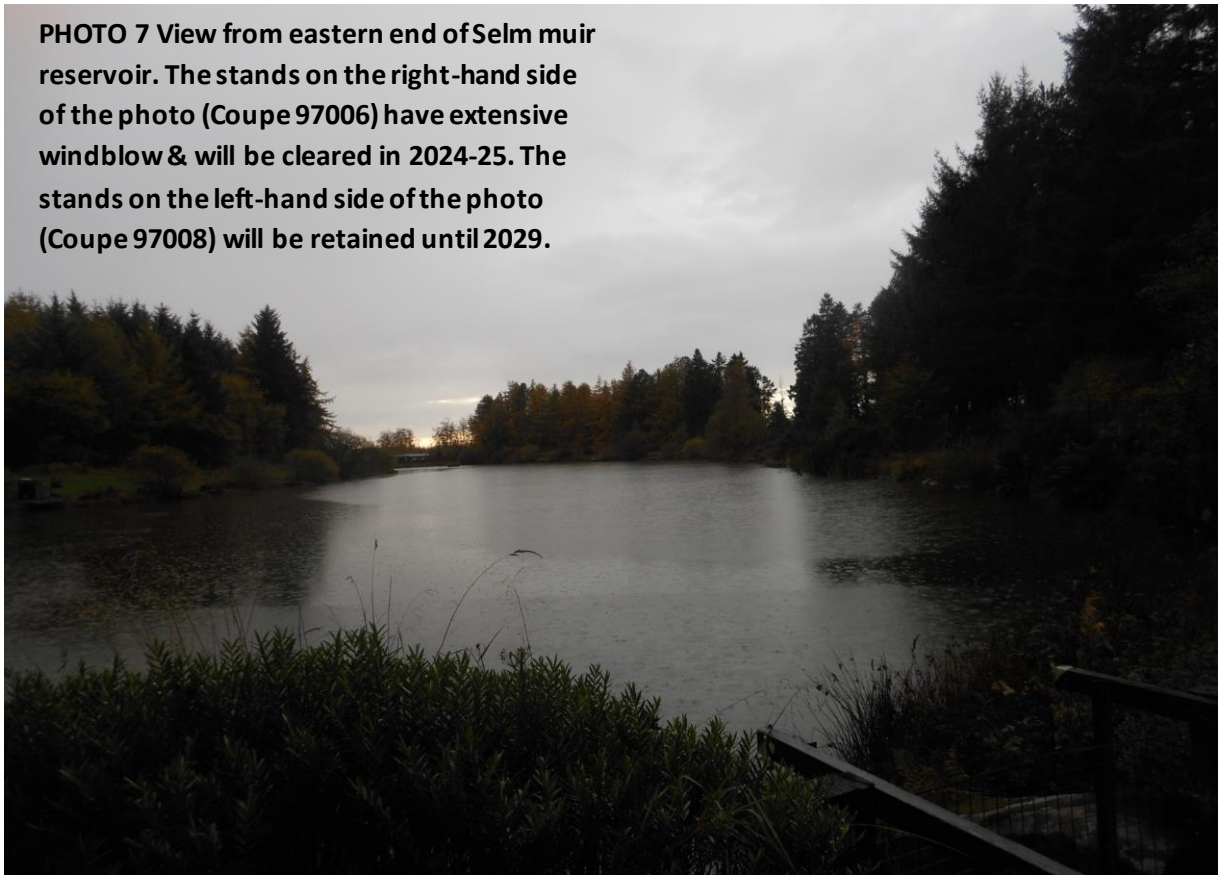


PHOTO 7 View from eastern end of Selm muir reservoir. The stands on the right-hand side of the photo (Coupe 97006) have extensive windblow & will be cleared in 2024-25. The stands on the left-hand side of the photo (Coupe 97008) will be retained until 2029.

PHOTO 8 Coupe 97008 - unthinned 1950s stands along southern boundary of the reservoir, its car park & shared access road. These stands will be retained until 2029 but monitored closely as a potential safety risk to the reservoir users. Future productive conifer planting will be pushed back from this boundary and replaced with open space and slower growing amenity woodland.

PHOTO 9 Materials used for forest education events. These can be relocated quickly to other areas of the the forest when forest operations are taking place.

PHOTO 10 Internal forest views from beech earth banks and associated footpath with young amenity planting (in the foreground) and mature conifer stands (in the background). This woodland design will be expanded as part of the proposed future habitats and species plan.

PHOTO 11 External view of Selm muir forest northern boundary and surrounding 'lowland plain' agricultural landscape from Leyden road (see Map 6 Wider landscape VP1)

Photo 12 External view of Selm muir forest southern boundary and surrounding 'lowland plain' agricultural landscape from Leyden road (see Map 6 Wider landscape VP2)

PHOTO 13 View of Selm muir forest, in the background, just to the west of the long distance footpath link between the forest and the Pentland Hills Regional Park (see Map 6 Wider landscape VP3)

PHOTO 14 View of Selm muir forest, in the background, just to the north of Corston Hill 'trig point' (see Map 6 Wider landscape VP4)

PHOTO 15 Well maintained footpath infrastructure on long distance route linking Selm muir forest to Pentland Hills Regional Park (maintained by the 'Friends of the Pentlands')

Appendix VII Landscape Designations & Character Areas

1. Local Landscape Areas

In many places in Scotland, the scenery is highly valued locally. Local authorities often give these landscapes a local designation.

Local Landscape Area (LLA), following Scottish Government policy, is the name used for the local landscape designation. Previous names include Special Landscape Area and Area of Great Landscape Value.

All local landscape designations:

- help to protect a landscape from inappropriate development
- may encourage positive landscape management
- play an important role in developing an awareness of the landscape qualities that make particular areas distinctive
- promote a community's sense of pride in its surroundings

Local landscape designations occur across Scotland. Local development plans show their location (and associated policy).

Selm muir forest sits immediately adjacent to two areas designated for their local landscape importance:

1. **The Pentland Hills Local Landscape Area**
2. **The Almond and Linhouse Valley Local Landscape Area**

Further information on these areas and their key characteristics can be found on the West Lothian Council Website.

2. Landscape Character Types

All landscapes combine natural components (such as geology, soils and watercourses) and human influences (such as settlement and land use) with cultural perceptions (such as history, social associations and aesthetic values).

Landscape Character is created by the way the physical components come together and can be defined as "a distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another". Although landscape character is also about experience and sense of place it is not about opinions or judgements on whether one landscape is considered better or worse than another.

Landscape Character Assessment (LCA) identifies, describes and maps variation in landscape character in a systematic way.

Between 1994 and 1999, NatureScot commissioned, in partnership with others, a series of 30 regional LCA studies. Together, these identified, mapped and described the landscape character of all of Scotland (mostly at a scale of 1:50,000). This resulted in the creation of Landscape Character Types - areas of consistent and recognisable landscape character.

These have provided the landscape foundation for natural heritage and planning policymaking. The studies have been used widely in the development planning system.

This information was updated in 2019 as a result of advances in digital technology, additional complementary datasets produced, and changes in development patterns and pressures.

The following Landscape Character Types are present within or sit immediately adjacent to Selm muir forest:

NatureScot National Landscape Character Assessment

Landscape Character Type 274: **Lowland Plain**

Location and Context

The Lowland Plain Landscape Character Type stretches westward from the periphery of the City of Edinburgh across the lowland plain of West Lothian to Livingston. It rises gradually to the south, reaching a high point at Dalmahoy Hill (246 metres). It is high quality agricultural land with substantial but localised urban fringe influences around motorways and Edinburgh Airport.

Key Characteristics:

- Smoothly rolling, large scale agricultural plain with local interruptions of volcanic hills forming visual foci.
- Rivers cut through the farmland in incised valleys.
- High quality agricultural land with a predominantly rural character, divided into a strong pattern of large arable fields by fences, hedges, occasional walls and a network of shelterbelts.
- Policy woodlands and shelterbelts associated with designed landscapes, mansions, gatehouses and boundary walls contributing to character.
- Numerous villages and hamlets, including industrial settlements.
- Substantial but localised urban fringe influence around Edinburgh Airport, motorways and settlement expansion.
- Gentle sinuous sweep of the Union Canal as it leaves Edinburgh and heads north-west.
- Industrial heritage legacy, with prominent quarrying, landfill and shale bing impacts.
- Important setting for western Edinburgh.

NatureScot National Landscape Character Assessment

Landscape Character Type 269: **Upland Fringes - Lothians**

Location and Context

Along the northern margins of the upland areas of Lothian lies a fringe of transitional landscapes. These are differentiated from the true uplands by a more productive range of land cover types including improved grassland together with arable land, particularly in the east, and coniferous woodland, particularly in the west.

Key Characteristics:

- Broadly undulating, landforms forming a series of smooth rounded hills and slopes, some steep-sided and some gently sloping, shelving gradually from the Uplands northward to merge with rolling farmlands.
- Occasional hills where underlying geology incorporates harder strata.
- Varied scale, openness and land use reflecting transitional nature between upland and lowland.
- Incised watercourses have etched v-shaped valleys into the slopes, often forming deep cleughs.
- Occasional larger rivers flow through similar, but larger-scale, v-shaped channels;
- Remnant heather moorland and rough grassland on high ground gives way to improved grassland and then to arable land on the lowest elevations, with a parallel transition from post and wire fence and walls to beech and hawthorn hedges.
- Some areas of extensive coniferous forest, but tree cover is more frequent in the form of shelterbelts.
- Deciduous woodland is restricted to steeper land in river channels, though this includes some important ancient woodlands.
- Dispersed settlement pattern of farmsteads and clusters of cottages, with occasional small villages.
- Distinctive character of rural road network, dense in places, including local features such as fords and bridges.
- Quarries, overhead lines and busy A roads which have localised influence in some parts of the landscape;
- Clearly transitional landscape between lowland and upland characters.
- Views across the lowland, and to the coast in the east, backed by the ridge lines of the hills to the south.

NatureScot National Landscape Character Assessment

Landscape Character Type 269: **Lowland River Corridors - Lothians**

Location and Context

The Lowland River Corridors - Lothians Landscape Character Type forms deeply incised, narrow meandering river valleys. They occur in three locations in West Lothian;

- The River Avon valley, which forms the north-west boundary of West Lothian with Falkirk administrative area between Linlithgow and Avonbridge.
- The River Almond valley which runs north from Mid Calder to Newbridge, extending into Midlothian and up to the M8.
- The Linhouse/Murieston/Camilty Water valley which runs north from the foothills of the Pentland Hills down to between East and Mid Calder.

Key Characteristics:

- Predominantly deeply incised, narrow, meandering, distinctive, intimate river valleys formed by the rise and fall of sea levels since the end of the Ice Age.
- Changing to more open, shallower and less well defined corridors towards the upstream and downstream ends of the river corridors.
- Densely wooded, enclosed steep-sided valley with mainly semi-natural broadleaf woodland.
- The gorge-like valleys are sparsely settled, with isolated steadings amongst pastoral farmland on the higher, shallower slopes.
- Significant recreational value due to public access.
- Outstanding landscape features including aqueducts and viaducts.
- Other features of interest in the landscape include rapids, weirs, waterfalls and mills.

Appendix VIII Afforestation - Planting near Badger Setts Method Statement

Aim

To safeguard badger setts on afforestation sites, where setts are within the proposed planting area

Rationale

- To allow tree planting near badger setts on firm consolidated soils, without the need for a licence. Please note that this methodology does not apply to sandy soils where risk of tunnel collapse is much greater.
- To minimise disturbance during afforestation to badgers and their setts.
- To avoid future undesirable attention resulting from leaving setts within incongruous open areas within the newly planted woodland.
- To reduce the need for future management near setts.
- To optimise the area that can be planted.

Method Statement

1. All works carried out with due care and attention to minimise the risk of setts being damaged, or of causing disturbance to badgers in setts.

2. All operations will take place during the planting season November – April. Where possible, the most sensitive period for the badgers March – April will be avoided, but if this is not possible, no activity will take place after 1300 each day within 30m of the breeding sett.

3. No mechanical ground preparation within 20m buffer zone, as per current NatureScot guidance for operations around badger setts.

4. Plant native broadleaf species at low stocking densities 625 – 1200 per hectare (4mx4m – 2.8mx2.8m spacing). Low stocking density reduces time required working near the sett.

5. All trees planted at least 3m away from any sett entrance.

6. Planting is 'flat planting' by hand with a planting spade, using single slot or T slot planting technique, to a depth no greater than 20cm.

7. Hand screefing (at time of planting) – removal of competing vegetation within 1m diameter around the planting position with the blade of the planting spade

Or

8. Chemical screefing – creating a 1m diameter planting position free of competing vegetation using either

- glyphosate - broad spectrum herbicide applied spring/summer, or
- Propyzamide - grass-only herbicide at time of planting in grassy areas only. Propyzamide is applied in winter.

(7 & 8 May be used to enhance the planting positions, to improve survivability and reduce the requirement for beat up (replacing dead trees within the first three years).

9. 30cm vole guards, or 60cm spiral or tree guards supported by canes, may be used to reduce browsing damage to the newly planted trees. Canes pushed in by hand to a depth no greater than 20cm.

10. All planting and related operations within 20m of any sett (and 30m of the breeding sett) will take place before 1300, and preferably earlier to prevent disturbance in period before dusk foraging period.

11. Works within 20 metres of any one sett entrance would be completed within 2 hours.

12. If the above protection measures cannot be met a licence will be applied for.