



Forestry and
Land Scotland
Coilltearachd agus
Fearann Alba

Central Region

Blairadam Forest Land Management Plan 2024-2034 Appendices



Plan Reference No: ---/--/--

Plan Approval Date: --/--/2024

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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.



The mark of responsible forestry





Land Management Plan Details			
LMP Name:	Blairadam Forest		
Grid Reference:	NT 1293 9462 (Site office & car park)	Nearest town or locality:	Kelty
Nearest Post code:	KY4 0JQ (Site office & car park)		
Local Authority:	Fife		
Land Management Plan area (hectares):	1335.25		

Owner's Details			
Title:	Mrs	Forename:	Carol
Surname:	McGinnes		
Organisation:	Forestry and Land Scotland	Position:	Regional Manager
Primary Contact Number:	0131 370 5622	Alternative Contact Number:	07917271577
Email:	carol.mcginnes@forestryandland.gov.scot		
Address:	Five Sisters House, Five Sisters Business Park, West Calder, West Lothian		
Postcode:	EH55 8PN	Country:	Scotland

Approval - to be completed by Scottish Forestry staff:			
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Planning Manager Signature:		Approval Date: (dd/mm/yyyy)	



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Appendix I: Supporting Information

1.0 Forest history & setting

Blairadam forest covers **1335.25 hectares** and will be referred to as ‘the plan area’ or ‘the forest’ in this document. It is shown on [Map 1](#) and located in the north-west of Fife County, with its northern most extent crossing into Perth & Kinross County. Kelty town lies immediately east and Dunfermline City 3.5km to the south. Both are closely associated with the coal mining industry and within the former ‘mining heartlands’ of Fife. Many remnant features of mining and associated heavy industries can be found within the forest itself.

The current forest area was acquired by Forestry and Land Scotland (FLS) through a series of purchases between 1927 and 2020. The tree species composition is mainly fast growing productive conifers. These plantations were sequentially established as acquisition progressed. Key objectives through this period were to increase forest cover and national ‘home grown’ timber reserves. This was in response to severe timber supply shortages during the 1st & 2nd World Wars. The plantations at Blairadam are now providing an important timber supply to a range of wood using industries. Due to their limited age range and lack of windfirm boundaries, there are considerable challenges in moderating the felling programme so that replanting can broaden the age structure of future forest stands.

Prior to state ownership (1927), much of the plan area was controlled by the Adam family estate. Successive generations delivered a wide range of landscaping and industrial developments over the 18th, 19th and 20th centuries. This rich historic record includes picturesque designed landscapes, remnant farmsteads, railways, mines, brickworks and water supply infrastructure. The Family’s cultural and industrial activities over this period continue to influence the forest landscape today.

Table 1 Current land use within the plan area (1335.25 ha)

Land Use Type	% of LMP area
Plantation high forest (incl. abandoned Christmas tree plantations, felled/fallow & windblow)	79.01
Designed open	12.66
Plantable land	3.16
Short rotation coppice (abandoned)	1.91
Successional open (unplanted streamsidess)	1.86
Research plantations	0.49
Unplantable/bare (e.g. rocky outcrops, disused mineral workings)	0.43



Land Use Type	% of LMP area
Built facility (Offices, storage & workshop, visitor car park & picnic areas)	0.06
Forest quarries	0.14
Agricultural land	0.14
Open water	0.13



2.0 Analysis of previous plan

The previous 10 year forest plan was approved on July 24th 2013. A key guiding factor was to maintain and enhance multi-purpose delivery functions of the forest. The main priorities and progress on these are listed in [Table 2](#) (below). In later years, woodland creation on ex-opencast became an important objective and is therefore included below.

Table 2 – 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 retain the production of a sustainable timber crop of conifer and broadleaves for both local and national markets including biofuel.	<p>Management actions for achieving this were through phase 1 and 2 operational felling, thinning and restock programmes outlined in the plan.</p> <p>Clear and replant windblown areas that developed in the January 2012 storm. These were included in the approved phase 1 and 2 operational felling programmes.</p>	<p>2 – Some progress</p> <p>Age restructuring as proposed in the previous plan has made some progress but the even-aged structure and lack of windfirm boundaries in mature crops presented a major challenge. As approved phase 1 & 2 felling coupes progressed windblow often occurred in adjacent coupes, requiring plan amendments. It is now expected to take several more standard forest rotations to achieve.</p> <p>Thinning operations have also been challenging. Many stands deemed suitable for thinning had historically received irregular thinning interventions, and this meant individual trees had not developed good stability characteristics for continued thinning.</p>
Assist in business development and the local economy through retaining and creating additional employment in the forestry, timber and wood processing industries.	Management actions for achieving this objective are through delivery of the above work programmes.	3 – Progress as per LMP
Maximise biodiversity value and environmental	Survey of open areas for potential restoration of open ground habitats.	2 – Some progress Successional open habitat and native broadleaved woodland increased during the last plan, as



Objective	Proposed management actions	Progress to date 1 Little or no progress 2 Some progress 3 Progress as per LMP
<p>quality of both woodland, water and open habitat including bogs.</p>	<p>Use of native tree species following NVC types for the site.</p> <p>Continuing the development of forest habitat networks, particularly in areas of less commercial timber value.</p> <p>Increasing structural and tree species diversity during restructuring, especially in large conifer areas of the forest to improve habitat and continue to support populations of Red squirrel.</p> <p>Safeguard veteran trees, particularly in LEPO areas and expand areas of native woodland. Management of distinct zones for deadwood.</p>	<p>programmed coupes were felled and replanted following the updated restock design. This has improved connectivity to some extent, but more progress is needed to develop a fully connected habitat network. Sitka spruce has started to regenerate profusely in many parts of the forest and its control in young native broadleaf areas has been challenging.</p> <p>Based on previous peat restoration techniques, the assessed peatlands were not deemed to be restorable and therefore no plan amendments were submitted. Updated techniques are likely to increase potential for restoration in the future.</p>
<p>Manage woodlands sustainably to assist with government targets on climate change including selecting areas for CCF management and diversity of species choice.</p>	<p>Application of Low Impact Silvicultural Systems targeted within commercial elements appropriate for thinning that surround high public use areas.</p> <p>Management of mature broadleaved elements in a more detailed and sensitive manner.</p> <p>Introduction of alternative conifer species and creation of windfirm edges. Selection of species through ESC, with consideration of future climate.</p>	<p>2 – Some progress</p> <p>The approved restocking plan incorporated measures to diversify tree species, woodland types and windfirm edges. This has been implemented.</p> <p>Management of originally proposed LISS areas has had mixed success. A key challenge has been interrupted stand stability.</p> <p>Outer zones of LISS areas, adjacent to clearfell coupes have been most vulnerable, particularly mature conifer stands. Several of these fringe stands were amended to clearfell coupes following the onset of severe windblow.</p> <p>Although the thinned mature beech stands have suffered windblow there is still a good spread of trees present.</p> <p>The 100 year old spruce stands in the Glen Valley still</p>



Objective	Proposed management actions	Progress to date 1 Little or no progress 2 Some progress 3 Progress as per LMP
		have good potential for LISS management but there is currently limited recruitment of younger understorey trees which may require proactive intervention to promote spruce natural regeneration or introduce alternative shade bearing conifer species.
Increase opportunity to engage with local community and give them empowerment of the forest and volunteering opportunities meeting WIAT criteria.	<p>Maintain existing waymarked trails.</p> <p>Application of 'Visitor Zone' concept to areas immediately around established path networks and high use areas.</p> <p>Explore opportunities for entrance improvements from the B914 & Kelty.</p> <p>Improve structural and species diversity, improving internal views, protecting key historical features in order to improve overall visitor experience.</p> <p>Develop 'natural play' area.</p> <p>Development of masterplan for FC depot area at Clentry.</p>	3 – Progress as per LMP
Design woodland to improve and enhance both wider and internal landscape including existing designed landscape.	<p>Restructuring of even-aged conifer stands:</p> <p>Phased felling</p> <p>Diversity species, improve woodland edges and increase windfirm boundaries by following the future habitats and species plan.</p>	3 – Progress as per LMP.
Preserve historical and cultural features within the forest.		3 – Progress as per LMP.
Manage forest in a way that reduces the potential impact	Continue to use larch as <i>Phytophthora ramorum</i> is not present and so far seems to be	2 – Some progress



Objective	Proposed management actions	Progress to date 1 Little or no progress 2 Some progress 3 Progress as per LMP
<p>of climate change and increased vulnerability to disease.</p>	<p>a western issue. This may require future amendments to be made to both the felling and restocking decisions if the disease spreads to eastern areas.</p> <p>For Dothistroma Needle Blight (DNB) focus on use of resistant species and good stand management.</p> <p>Regarding Ash die-back, Ash will not currently be used however this may change and maybe reintroduced in coming years where ash is a component of native woodland.</p> <p>Maximise the planting of pure SS crops on low nutrient sites where a combination of limited application of herbicide, fertiliser and/or drainage will enable successful establishment.</p> <p>Maximise the planting of SS/L P (ALP) mixtures on poorer nutrient sites where pure SS is not appropriate.</p> <p>On poorer, wetter sites where pure SS and LP/SS mixtures are not appropriate, establish alternative species such as Birch and Alder (including mixtures).</p>	<p>To date there have been no cases of <i>Phytophthora ramorum</i> in the forest but replanting with larch has now ceased and mature larch has been removed where opportunities have arisen within the approved felling and thinning programmes. Alternatives to larch have been used as per Scottish Forestry guidance and within Forest Plan approval tolerances.</p> <p>Scots pine was not planted during the last 10 years. As described above, thinning has been limited over the last 10 years. Restocking of previous pine crops has generally used more resistant tree species, for example Macedonian pine has been used more recently.</p> <p>Ash was not used in broadleaved restocking subsequent to 2013. It was replaced with resistant species such as oak, sycamore, beech and birch.</p> <p>Sitka spruce has been the main productive conifer used but has often been mixed with Lodgepole pine (on poorer soils), Larch (early years) and Norway spruce.</p> <p>Based on previous peat restoration techniques the assessed peatlands were not deemed to be restorable and therefore no plan amendments were submitted. Updated techniques are likely to increase potential for restoration in the future.</p>



Objective	Proposed management actions	Progress to date 1 Little or no progress 2 Some progress 3 Progress as per LMP
	On the very poor, wet sites restoration to peatland may be an option where conservation values are potentially high, productive values low and the site has been assessed as having the potential to be converted to functional peatland.	
Woodland creation on ex-coalfield ground	Work with partner agencies and private business to restore and create woodland on completed opencast workings.	3 – Progress as per LMP The 1st phase of woodland creation was completed in 2017 and 2018. This was in the area known as Thornton Wood - which was acquired in 2013. The 2nd phase of new planting is proposed in the next 10 year land management plan. This area (called St Ninians) was acquired in 2020 and sits immediately south of 1st phase new planting areas.



3.0 How previous plan relates to today's objectives

The previous plan aimed to deliver a wide range of objectives which are still relevant today.

These included:

- Delivering social and recreation benefits to local and regional communities.
- Improving forest resilience to climate change and plant health issues.
- Producing a sustained supply of timber.
- Protecting and enhancing heritage assets.
- Improving the forest's structural design and attractiveness.
- Expanding new woodland on restored mining ground.

The overall direction of the previous plan is still largely relevant to communities served by the forest today. A number of factors will influence how the forest delivers these objectives in the next plan.

1. The accelerated spread of *Phytophthora ramorum* on larch and updated policy for proactive control of this disease.
2. A stronger policy emphasis on restoration of afforested deep peats and expansion of open habitats. Restoration techniques have significantly improved in recent years and this has increased the available area of restorable deep peat.
3. Mixed success in managing originally proposed LISS areas. The next plan will review how to best manage these areas and where they should be targeted to complement other key objectives.



4.0 Physical attributes of the forest

4.1 Geology

The **underlying bedrock** of the forest was thought to have formed during the Carboniferous Period (362.5 million years ago to 290 million years ago). Approximately 80% is believed to be sedimentary rock formed in shallow seas and deltas. They are rich in carbon and marine/deltaic deposits and closely associated with marine transgression and regression.

The two most abundant sedimentary rock formations are Lower Limestone Formation and Limestone Coal Formation. These are both part of the 'Clackmannan Group', characterised by strongly cyclical units of limestone, mudstone, siltstone and sandstone capped by coal and seatearth, the proportions differing in each of the formations. Coal measures are more abundant in the Limestone Coal Formation. This formation is most prevalent in the east of the forest and areas to the south of the B914. Consequently these zones have been heavily mined. The Lower Limestone Formation has more frequent marine deposits (limestone, mudstone, siltstone & sandstone). This formation is most prevalent in central and western areas of the forest.

Remaining areas of underlying bedrock (approx. 20%) are comprised of basic intrusive igneous rocks (Sills, Plugs & Vents). These often form basic brown earths when exposed to weathering at the surface. They are located at higher elevation zones of the forest, being more resistant to weathering than the surrounding geology. Key examples are Craiggaveral, Kings seat, the Heights of Craigencrow, the ridge underlying coronation plantation and the rock outcrop at Kiery Craigs.

Overlying much of this bedrock are the **superficial deposits**. These are the youngest geological deposits formed during the most recent period of geological time, the Quaternary (last ~2.6 million years). This geological period is marked by more frequent and abrupt changes in climate and the advance of major ice sheets across the northern hemisphere. The main deposit left by these ice sheets was 'glacial till', consisting of unconsolidated (mixed) and often compacted materials (clay, silt, gravel and sand). This material covers approximately 53% of the site and is often associated with clay-rich 'surface water gley' and 'peaty gley' soils. The second largest deposit (23%) is deep peat which formed more recently and covers large zones in the west of the forest. This deposit itself forms the soil.

In restored opencast areas (south of the B914) the main overlying deposit is man-made soil. This, also known as overburden, is the soil/rock removed to access the coal deposits in the underlying bedrock. The overburden is then replaced when the mine is restored and forms the surface soil. Problems associated with this material are compaction, lack of oxygen, organic matter and mycorrhizal fungi and in some cases plant nutrient deficiency.



As described above, the superficial deposits have the greatest influence on soil formation and type within the forest. They make up 88% of geological material directly underlying the soils. The remaining geology directly underlying the soils are the older Carboniferous bedrocks, making up about 12%. The majority of these are the basic intrusive igneous rocks. Where the Lower Limestone Formation and Limestone Coal Formation underlies the soil, clay rich gley soils are often formed (similar to 'glacial till' soil formation).

4.2 Soils

The current record of dominant soil types is shown on [Map 2b](#) and [Table 3](#). Soils have been classified using the Forestry Commission classification system which is described in Field Guide '*The Identification of Soils for Forest Management*' (Kennedy, 2002).

Table 3 Dominant soil types

Soil Group	% of Plan area
Surface-water gleys	36.50%
Peaty gleys	21.50%
Deep peats	21.40%
Man-made/disturbed soils	10.60%
Brown earths	8.10%
Rankers & Skeletal soils	1.60%
Ironpans	0.20%
Podzols	0.10%

Deep peats (soil codes 8 – 11) are concentrated in the west of the forest.

Brown earths and brown rankers are strongly associated with outcrops of igneous rock and sloping ground. The brown earths are more prevalent in north-eastern zones of the forest.

The gley soil types are strongly associated with glacial till and the Clackmannan Group geological formations. The slightly drier and more fertile surface water gley types are more prevalent in the east of the forest, often adjacent to the brown earths. The peaty gleys become more common where the climate is wetter and cooler (see below).

Man-made soils are located on recently restored opencast or historical mining waste deposits.



4.3 Current exposure & climate (Map 2a)

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. DAMS scores show limited potential for thinning and continuous cover forestry (CCF) in the west of the forest. Eastern and southern zones have the lowest exposure rating and thus the greatest potential. In zones between 13 and 16, soil type will be a key determining factor for thinning and use of CCF. For example, in more sheltered zones on restored open-cast to the south of the B914, compaction in man-made soils is likely to limit potential for thinning and CCF in the first rotation.

Climatic zones greatly influence the growing environment in the forest and are strongly linked to DAMS exposure scores. Higher DAMS scores tend to be concentrated in cooler and wetter climatic zones. Lower DAMS scores are concentrated in the warmer and slightly drier zones.

Map 2a combines climatic zones and DAMS exposure ratings to show clear patterns across the forest, particularly from west to east and north to south. Eastern zones will offer greater potential for tree species diversification, thinning and lower impact forest management systems. Southern sheltered zones in proposed woodland creation areas will require special attention to compaction levels in man-made soils. Thinning and CCF management is perhaps more realistic as a long-term objective in these zones and can be reviewed after the first rotation of new planting.

4.4 Future Climate

UK forest research's ecological site classification models have generated future climate projections to 2080. Based on these models there is expected to be a gradual increase in 'warmth' in combination with extended growing seasons. This should increase growth rate and yield of forest crops. A range of tree species will also benefit from this warmer climate but others will become less suitable. There will be fewer sheltered areas in the forest with increased average wind speeds, rainfall and incidence of severe storms. This will increase the risk of flooding within and downstream of the forest. FLS is currently assessing the impacts of peak water flows on road infrastructure such as culverts, which may be at risk.

There are also expected to be fluctuations in the timing of growing seasons which may cause more frequent late spring and early autumn frost damage to trees at the edge of their growing range. Milder winters and warmer growing seasons are likely to increase insect pests, mammal populations, tree diseases and invasive species. A beneficial effect of increased storm damage and



localised flooding is increased deadwood resource and more varied habitat conditions such as wetlands and ponds.

4.5 Hydrology

General drainage patterns

The forest lies within the Leven catchment which covers 42,236 hectares. FLS managed forest within this catchment amounts to 3.99%. Blairadam forest accounts for the majority of this area (~3%).

Drainage from the forest runs through a large area of land, including a number of large Lochs before reaching the River Leven. [Map 3](#) shows the pattern of surface water drainage within and in the vicinity of the forest. The main watercourses are Lochornie burn, Pieries burn, Kelty burn and Drumnagoil burn. These carry the highest water load from the forest, draining from higher elevations in the west to the eastern forest boundary (close to Kelty Town), and then onto Loch Ore. The south-western corner of the forest drains southwards mainly through Linn burn, Gask burn and Meldrum's Mill burn, to Loch Fitty. A small area in the north-west of the forest drains directly into Loch Glow and indirectly to Nettle burn which flows west to Black Devon burn. The outflow from Loch Glow runs north to Gairney burn, which flows directly into Loch Leven. A small area in the north-east of the forest drains to Gairney burn, but the majority of north-eastern zones flow indirectly to Loch Ore. Hence, Loch Ore receives by far the highest water loads from the plan area.

Open Water

At the start of the previous plan there were no mappable open water bodies. A few settlement ponds were scattered throughout the forest but these amounted to no more than 0.11 hectares combined. Following the restored opencast land acquisitions in 2013 and 2020, south of the B914, a number of larger water bodies have come into FLS ownership. These appear to be man-made, and linked to the previous opencast workings. They are developing into important wetland habitats covering about 1.56 hectares in total. The largest of these water bodies eventually feed into Loch Fitty through its' northern inlet. The current estimated area within the boundary amounts to 1.67 hectares. Loch Glow lies immediately on the forest north-western boundary.

Flood Risk

Scotland has been separated into 14 Local Plan Districts for flood risk management purposes. These districts are based on major river catchments and coastal areas. Blairadam forest falls within the Forth Estuary Local Plan District, which identifies a number 'potentially vulnerable areas' (PVAs) in relation to flood risk. In order to target management in PVAs, 'objective target areas' are identified, where action is required to protect assets vulnerable to flooding (typically towns, villages and infrastructure). Actions in relation to forestry and other land based activities are described under 'Natural Flood Management' actions.



‘Kinross, Milnathort, Glenrothes and Kinglassie Potentially Vulnerable Area’ (02/10/04) has been identified to the north of the forest, with 3 objective target areas. These are within Glenrothes drainage catchment which covers 22,181 hectares. Total FLS managed forest within this catchment (including Blairadam) amounts to 1.62%. Only small areas along the forest’s northern fringe (about 65 hectares or 0.29% of the catchment) drain into Glenrothes and there are currently no ‘Natural Flood Management’ actions identified for the PVA’s or Objective Target Areas.

As described under ‘general drainage patterns’ (above), the majority of surface water from the forest travels east to Loch Ore. This drainage then travels into a Potentially Vulnerable Area to the east – ‘Cardenden and Cowdenbeath’ (now Candidate PVA ‘Cowdenbeath 02/10/28c). The catchment area for this PVA is 7,250 hectares. FLS managed forest (including the majority of Blairadam forest) amounts to 16% of this catchment. There is one Objective Target Area downstream of Blairadam forest. This is located on the River Ore at Cardenden town. A recent flood study was completed in 2020. This reviewed NFM actions, as well as other flood protection measures:

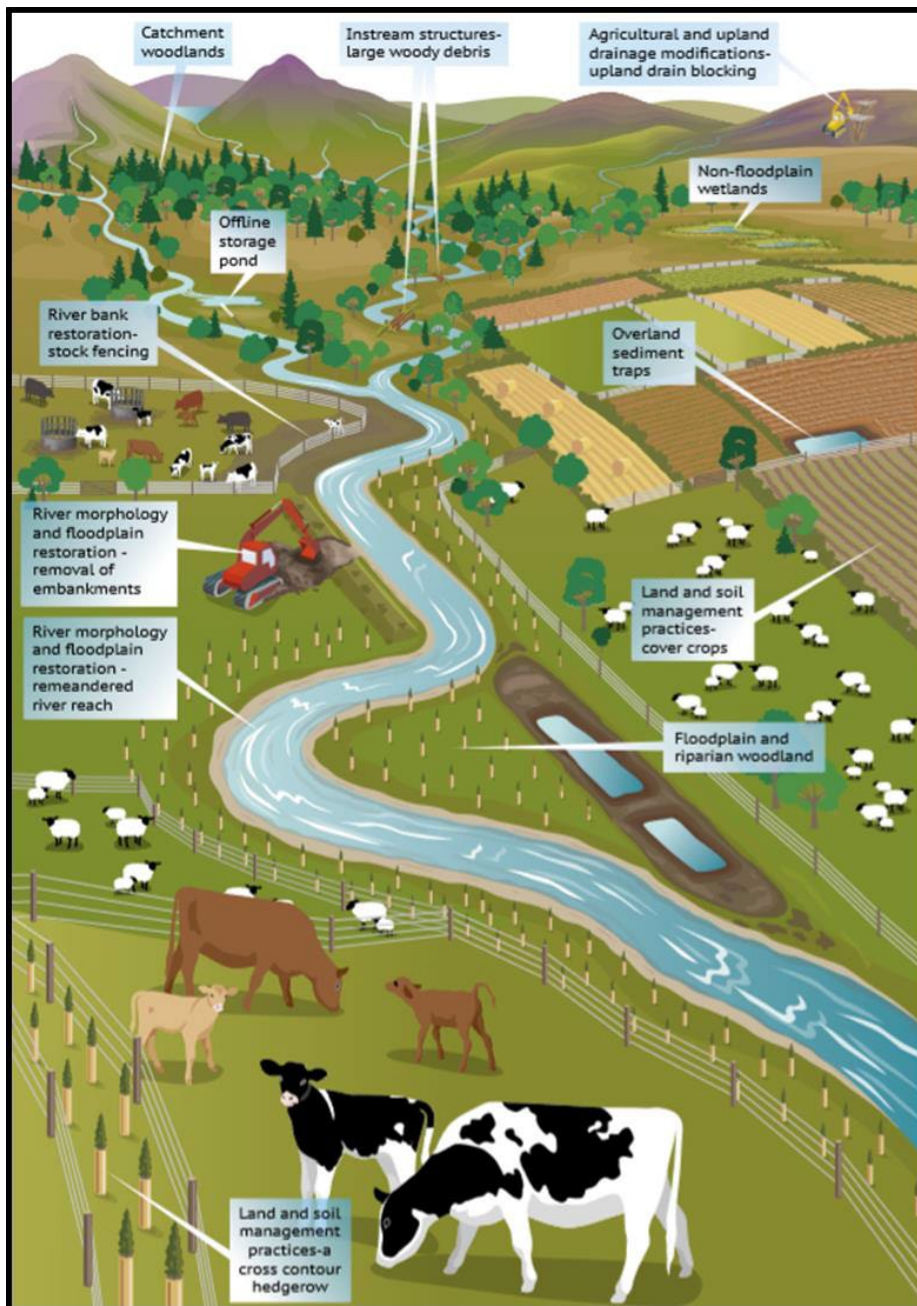
- Localised mitigation measures (direct defences).
- Increased bridge capacity.
- Property level protection.
- Creation of additional storage in upstream lochs.
- Natural Flood Management measures (including land use change).

The study concluded that property level protection, direct defences and increased bridge capacity would be the most effective short-term options. Natural Flood Management (NFM) was noted to provide limited short-term flood risk reduction but was acknowledged as the preferred long-term option to mitigate impacts of climate change, although further evaluation was needed. Upstream NFM measures identified were the creation of floodplains and riparian woodlands, restoration of riverbanks and creation of meanders, creation of on-line and off-line storage ponds, in-stream structures using woody debris to create ‘Leaky Dams’, and using sediment traps or buffer strips along burns.

Figure 1 (below) from SEPA’s ‘Natural Flood Management Handbook’ (2015) and was highlighted in the Cardenden Study. At Blairadam there are opportunities to expand catchment/riparian woodlands and non-floodplain wetlands, particularly in the west of the forest.



Figure 1 River and catchment based natural flood management measures.



Water Condition & Sensitive Target Areas

In relation to **groundwater**, the forest is located over the Dunfermline and Kirkcaldy groundwater body (ID 150645), as identified on SEPA's 'Water Environment Hub' webpage. This is further classified as a 'Carboniferous sedimentary bedrock aquifer which has been extensively mined for coal' (Scotland's aquifers and groundwater bodies, 2015). It comprises 'repetitive sequences



dominated by sandstone and siltstone beds, interbedded with thinner mudstones, limestones and coals'. As the name infers, these groundwater bodies have been significantly altered by mining and, as a result, are categorised as having 'poor' water quality status. Pollutants are slowly being flushed out of these aquifers but this is gradual process with no technically feasible means of speeding up this process.

In relation to **surface water** flows, information from SEPA's Water Environment Hub (*in the following tables*) shows water quality characteristics for the main waterbodies within or influenced by the forest. These waterbodies are shown on [Map 3](#).

Table 4 Water Condition Kelty and Lochornie burns

Quality Characteristic	Condition 2014 (Measured)	Condition 2021 (Projected)	Condition 2027 (Projected)	Condition Long-term (Projected)
Access for fish migration	High	High	High	High
Water flows and levels	High	High	High	High
Physical condition	Good	Good	Good	Good
Freedom from invasive species	High	High	High	High
Water quality	Good	Good	Good	Good
Overall	Good	Good	Good	Good
Pressures on water body, activity responsible & how will this be addressed: No pressures present.				

Table 5 Water Condition Gairney Water (burn)

Quality Characteristic	Condition 2014 (Measured)	Condition 2021 (Projected)	Condition 2027 (Projected)	Condition Long-term (Projected)
Access for fish migration	High	High	High	High
Water flows and levels	High	High	High	High
Physical condition	High	High	High	High
Freedom from invasive species	Good	Good	Good	Good
Water quality	Moderate	Moderate	Moderate	Good
Overall	Poor	Good	Good	Good
Pressures on water body, activity responsible & how will this be addressed: Barrier to fish migration – Legacy structure. SEPA and voluntary organisations working with businesses and local communities. Physical condition – modification to beds, banks and shores from urban and rural land uses. Partnership working to improve status.				



Table 6 Nettly and Black Devon burns

Quality Characteristic	Condition 2014 (Measured)	Condition 2021 (Projected)	Condition 2027 (Projected)	Condition Long-term (Projected)
Access for fish migration	High	High	High	High
Water flows and levels	High	High	High	High
Physical condition	Good	Good	Good	Good
Freedom from invasive species	High	High	High	High
Water quality	Moderate	Moderate	Moderate	Moderate
Overall	Moderate	Moderate	Moderate	Moderate
<i>Pressures on water body, activity responsible & how will this be addressed:</i>				
The concentration of nutrients in the water body is higher than the environmental standard we have set for good status. Assessment of the condition of the water body’s plant and animal communities have found no evidence of any of the adverse effects that elevated concentrations of nutrients can produce. Specifically, there are no indications of any accelerated growth of aquatic plant life resulting in undesirable disturbances to the balance of organisms present in the water body.				

Table 7 Meldrum’s Mill burn and Linn burn

Quality Characteristic	Condition 2014 (Measured)	Condition 2021 (Projected)	Condition 2027 (Projected)	Condition Long-term (Projected)
Access for fish migration	High	High	High	High
Water flows and levels	High	High	High	High
Physical condition	Good	Good	Good	Good
Freedom from invasive species	High	High	High	High
Water quality	Good	Good	Good	Good
Overall	Good	Good	Good	Good
<i>Pressures on water body, activity responsible & how will this be addressed:</i>				
No pressures present.				

Table 8 Loch Glow

Quality Characteristic	Condition 2014 (Measured)	Condition 2021 (Projected)	Condition 2027 (Projected)	Condition Long-term (Projected)
Access for fish migration	Poor	Good	Good	Good



Quality Characteristic	Condition 2014 (Measured)	Condition 2021 (Projected)	Condition 2027 (Projected)	Condition Long-term (Projected)
Water flows and levels	High	High	High	High
Physical condition	High	High	High	High
Freedom from invasive species	Good	Good	Good	Good
Water quality	Moderate	Moderate	Moderate	Good
Overall	Moderate	Moderate	Moderate	Moderate

Pressures on water body, activity responsible & how will this be addressed:

Barrier to fish migration – Legacy structure. SEPA and voluntary organisations working with businesses and local communities.

2014 classification results indicate that nutrient levels in the water body may be higher than those normally required to maintain water plants and animals in a good or better condition. If the assessments confirm that the water body is adversely affected, SEPA will then put in place an appropriate plan of action to address the problem. In meantime, general binding rules have been introduced which are designed to reduce nutrient inputs to the water environment from a wide range of rural land use activities.

Table 9 Loch Fitty

Quality Characteristic	Condition 2014 (Measured)	Condition 2021 (Projected)	Condition 2027 (Projected)	Condition Long-term (Projected)
Access for fish migration	High	High	High	High
Water flows and levels	High	High	High	High
Physical condition	Moderate	Moderate	Good	Good
Freedom from invasive species	Good	Good	Good	Good
Water quality	Poor	Poor	Poor	Good
Overall	Poor	Poor	Poor	Good

Pressures on water body, activity responsible & how will this be addressed:

Physical condition – modification to beds, banks and shores from urban and rural land uses. Partnership working to improve status.

Water quality – diffuse rural sources, priority catchment action public bodies and land managers working together.

Preparatory studies to be undertaken to identify sources and action.



Table 10 Loch Ore

Quality Characteristic	Condition 2014 (Measured)	Condition 2021 (Projected)	Condition 2027 (Projected)	Condition Long-term (Projected)
Access for fish migration	High	High	High	High
Water flows and levels	High	High	High	High
Physical condition	High	High	High	High
Freedom from invasive species	Good	Good	Good	Good
Water quality	Moderate	Moderate	Moderate	Good
Overall	Moderate	Moderate	Moderate	Good

Pressures on water body, activity responsible & how will this be addressed:
 Water quality – diffuse rural sources, priority catchment action public bodies and land managers working together.
 Preparatory studies to be undertaken to identify sources and action.

Table 11 Loch Leven

Quality Characteristic	Condition 2014 (Measured)	Condition 2021 (Projected)	Condition 2027 (Projected)	Condition Long-term (Projected)
Access for fish migration	Poor	Good	Good	Good
Water flows and levels	High	High	High	High
Physical condition	Good	Good	Good	Good
Freedom from invasive species	Good	Good	Good	Good
Water quality	Moderate	Moderate	Moderate	Good
Overall	Poor	Poor	Moderate	Good

Pressures on water body, activity responsible & how will this be addressed:
 Barrier to fish migration – Hydroelectricity generation. Regulation. SEPA and businesses responsible.
 Water quality – diffuse rural sources, priority catchment action public bodies and land managers working together. Preparatory studies to be undertaken to identify sources and action.

Private drinking water supplies

There are several **private water supplies** that could be affected by forest activities (Map 3). FLS has worked with the supply owners to record all known infrastructure and ensure their protection during forest operations.

1. The first is a surface-water drinking supply and has a source point (or sink) that sits ~80 metres out-with the forest boundary. The sink is fed by a burn that runs through the forest.



Further south, the water is channelled through a supply pipe that runs through another part of the forest.

2. The second supply is for the same neighbour but feeds a livestock watering point. The source point lies in an area of broadleaf woodland under LISS management. It is marked by a small stone structure and appears to be groundwater fed. The connecting pipe runs under a forest road and then through another LISS managed broadleaved woodland to the forest boundary.
3. The third is drinking water and supplies Clentry residents, businesses and the FLS office. The water pipe travels from the B914 to Clentry along the tarmac access road. The pipe can be seen under the bridge where the road crosses the Drumnagoil burn. A small associated stone structure has been identified along the tarmac access road on the line of the pipe.

All the above infrastructure, including groundwater catchments, is recorded on the FLS GIS based mapping system.

Forestry Activity

Areas of highest sensitivity:

- Watercourses
- Riparian zones
- Water supplies
- Adjacent Lochs
- Water flows from the forest

Key forest activities operations with potential to impact these areas:

1. Timber harvesting and phasing of felling coupes. This has been challenging as even-aged stands are restructured and windblow is cleared.
2. Initial forest road construction and ground cultivation for restocking.
3. Peat restoration works.

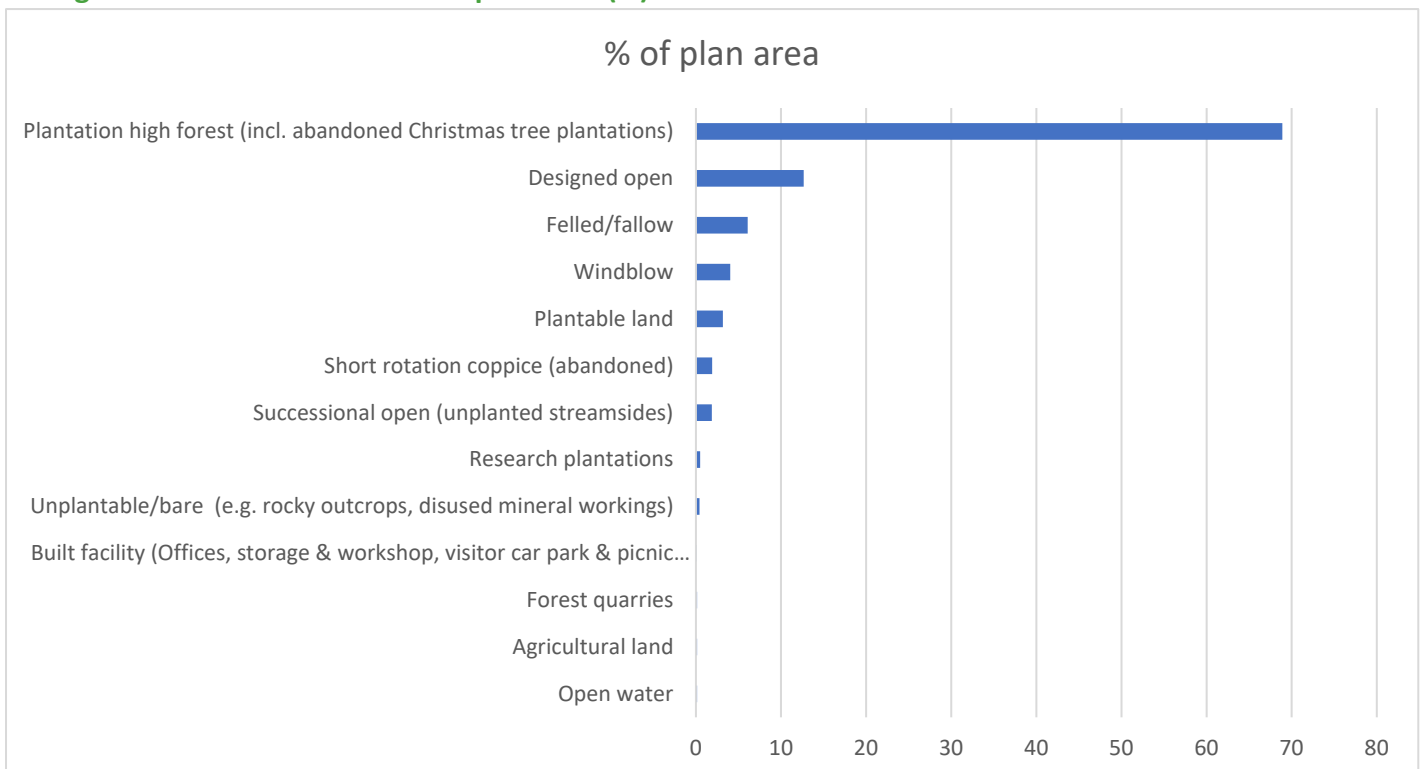


5.0 Current Land Use

Table 12 current land of the plan area

Land use type	Area (Ha)	% of plan area
Plantation high forest (incl. abandoned Christmas tree plantations)	920.06	68.91
Designed open	169.01	12.66
Felled/fallow	81.17	6.08
Plantable land	42.24	3.16
Short rotation coppice (abandoned)	25.54	1.91
Windblow	53.8	4.03
Successional open (unplanted streamsid es)	24.80	1.86
Research plantations	6.50	0.49
Unplantable/bare (e.g. rocky outcrops, disused mineral workings)	5.80	0.43
Built facility (Offices, storage & workshop, visitor car park & picnic areas)	0.86	0.06
Forest quarries	1.90	0.14
Agricultural land	1.90	0.14
Open water	1.67	0.13
Total	1335.25	100

Figure 2 current land use of the plan area (%)





6.0 Tree species, tree age structure & yield class

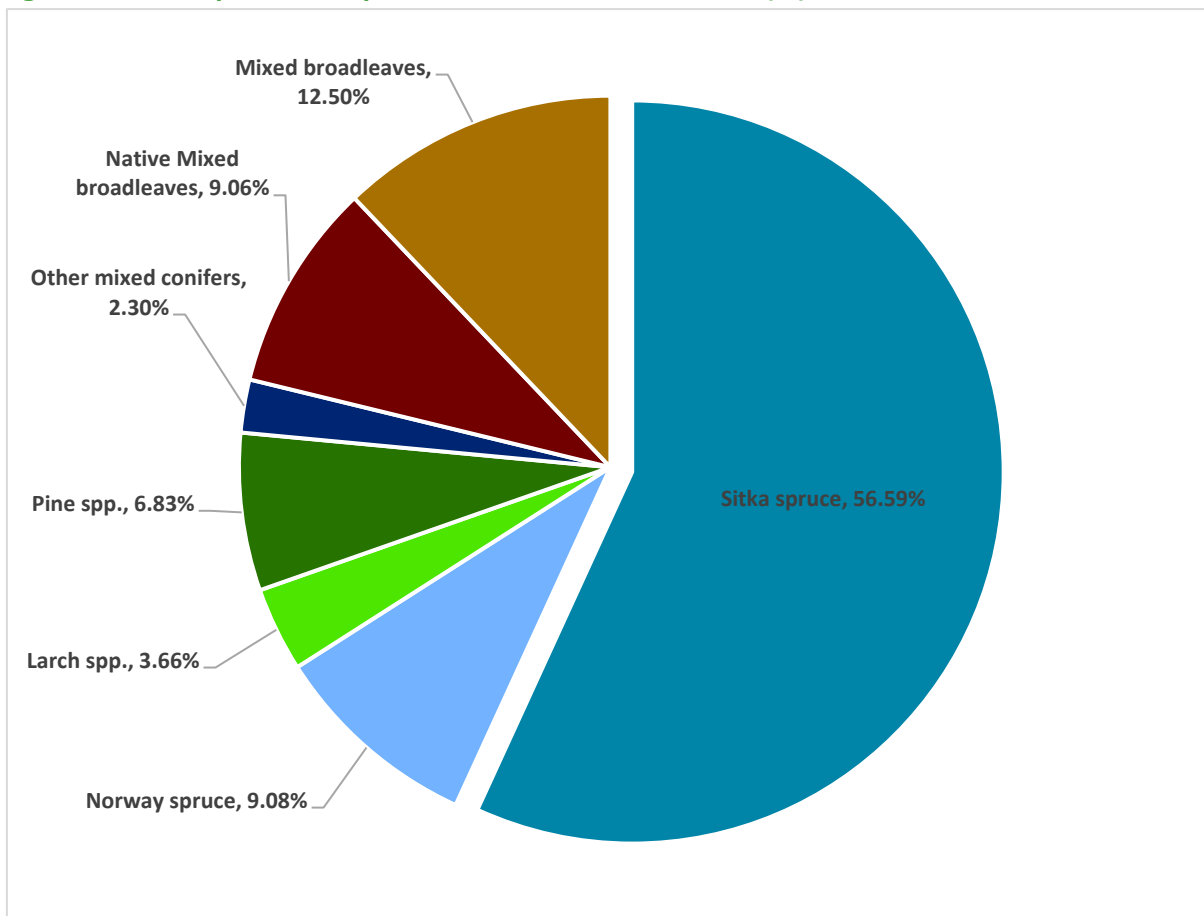
6.1 Tree species composition

Table 13, Figure 3 and Map 4 show current tree species composition of forest stands in the plan area.

Table 13 – Current Forest composition by area & percentage (2023)

Species	Area (Ha)	% of total forest stands
Sitka spruce	569.2	56.59
Norway spruce	91.3	9.08
Pines	68.7	6.83
Larch spp.(Japanese & Hybrid)	36.8	3.66
Other/mixed conifers	23.1	2.30
Mixed broadleaves	125.7	12.50
Native Mixed broadleaves	91.1	9.06
Totals	1005.4	100

Figure 3 – Tree species composition of forest stands 2023 (%)





6.2 Forest age class distribution

Age distribution of forest stands in the plan area is shown in [Table 14](#) & [Figure 4](#).

A large proportion of conifer stands are between 1-20 years and 41-60 years of age. The majority of conifers in the 41-60 age class are now at economic maturity. There is a drop in conifers within the 31 -40 year range and therefore a smaller proportion of conifer stands reaching economic maturity.

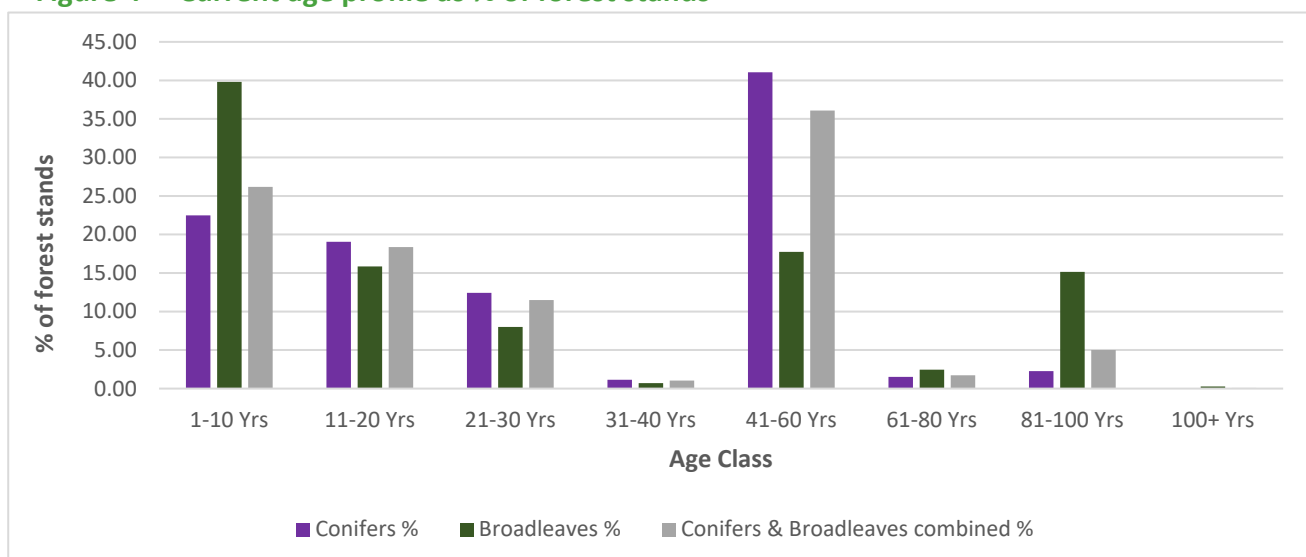
Broadleaves stands have a slightly more balanced age distribution. The majority of stands will be retained well beyond the 41-60 years old, either because they reach economic maturity at a much later age or they are managed for reasons other than timber production.

The charts suggests the greatest opportunity for balancing timber flows from the forest is through management of the 41-60 year old conifer stands.

Table 14 – Age class distribution of all forest stands by percentage (2023)

Age Class (Years)	Conifers & broadleaves combined (%)	Conifers only (%)	Broadleaves only (%)
1-10	26.17	22.48	39.81
11-20	18.37	19.05	15.86
21-30	11.49	12.44	8.00
31-40	1.05	1.14	0.71
41-60	36.09	41.05	17.74
61-80	1.72	1.53	2.45
81-100	5.02	2.28	15.15
100+	0.09	0.04	0.28

Figure 4 – Current age profile as % of forest stands





6.3 Yield class range & land capability for forestry

Yield class is an index used in Britain of the potential productivity of even-aged stands of trees. Yield Class in the plan area has been classified based on previous tariff data, the sub-compartment database, Ecological Site Classification models and site observations. Tree productivity at Blairadam has a strong correlation to climate and soils. Generally, higher yield classes are found in the east of the forest where conditions are warmer, more sheltered, with better drained soils. Although yield classes of up to Sitka spruce 24 are locally present in the west of the forest, many of the peats soils are much lower, with yield classes as low as 6 recorded in localised deep peat areas. An estimated yield class range for some key species is provided below:

- Sitka spruce YC 6 to 24
- Norway spruce YC 6 to 18
- Scots pine YC 6 to 14
- Grand fir YC 16 to 28
- Douglas fir YC 14 to 18
- Japanese and YC Hybrid Larch 8 to 14
- Lodgepole pine YC 6 to 14
- Serbian spruce YC 10 to 18
- Sycamore and Beech YC 4 to 6.
- Oak YC 2 to 4
- Birch YC 2 to 6



7.0 Operational access

(See [Map 4](#))

The plan area has a well established forest road network providing good operational access to most forest stands. The few remaining areas without access comprise some 1st rotation conifer stands planted in the early 1980's and some younger 2nd rotation stands approaching first thinning time. The south of the forest is serviced by numerous old access tracks used during opencast mining. These were designed for heavy plant and haulage but will require some maintenance work for continued operational use. One stretch of this opencast access network is currently too steep for HGVs.

Perhaps the most sensitive operational access in the plan area is the tarmac access road from the B914 to the visitor car park, FLS office and residential/business areas. This is a single lane access road with generally high usage by Clentry residents and businesses, public visitors and FLS staff. Operational access has been challenging in the past and FLS has tried to use alternative entrances where practical. The plan renewal will consider how disruption and potential conflict can be minimised in the long-term.

8.0 Low Impact Silviculture Systems (LISS) potential

The previous forest plan proposed 151.64 hectares of forest stands managed under LISS. The key objective was to implement thinning operations and prescribe late transformation management actions on a coupe by coupe basis in thinning workplans. [Table 15](#) breaks down these areas into the suggested late transformational management types:

Table 15 LISS areas in the previous plan

LISS Management System	Area (ha)
Irregular shelterwood	122.76
Group shelterwood	17.85
Minimum intervention	6.00
Minimum intervention (natural reserve)	5.03

As described in [Section 2.0 \(Table 2\)](#), thinning operations have been challenging. Many stands deemed suitable for thinning had received irregular thinning interventions, and this meant individual trees had not developed good stability characteristics for continued thinning. To date



there has been some localised 1st thinning completed in younger conifer stands. Most of the beech stands planted in the 1930's were thinned in phase 2. Some of these suffered significant windblow post- thinning. A mitigating factor was that blown trees were not in large consolidated groups but dispersed individually (or in small groups) across the stand matrix. This has allowed an overall canopy to be maintained in beech stands.

There has been no thinning carried out in older conifer stands within proposed LISS areas. This is largely due to concerns of continued stability. Several of these stands experienced serious windblow and amendments were approved to clear and restock them. Fortunately the small area of 100 year old spruce located in the Glen valley had been very well thinned previous to the plan. Individual trees in these areas have good stability characteristics and potential for continued LISS management.

The current area under LISS is now 120.5 ha. Within this area there is further spread of windblow and areas of larch that are now subject to Scottish Forestry's *Phytophthora ramorum* action plan. Hence, a further review is required.

In terms of natural regeneration, there are currently low levels within LISS areas. Mature beech stands are being monitored but seeds years are relatively infrequent. Thinning operations and subsequent windblow in phase 2 has increased light levels and a few larger gaps have created opportunities for light demanders such as oak and birch. The 100 year old spruce stands have some natural regeneration where gaps have formed. Spruce is a light demander and will likely require larger gaps to allow younger regeneration to establish. The option to underplant with shade bearing conifers such as Pacific silver fir and Coastal redwood is also being considered. Mixed conifer and broadleaved stands are developing greater structural diversity, mainly due to differing growth rates of the tree species present. Some natural regeneration is forming in these areas and it is hoped thinning to remove groups of larch will promote further regeneration as light levels improve.



9.0 Pathogens

9.1 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. DNB has been recorded across Blairadam in a range of species but is most prevalent in Scots and Lodgepole pine stands. Surveys are conducted every three years, with the last 2 surveys completed in 2018 and 2021. The disease appears to be at an intermediate stage of infection on trees, between early stages with limited needle loss and moderate stages with significant needle loss. There does not seem to be any significant deterioration in tree condition between survey dates but there has been an increase in number of stands infected. The latter could be greater awareness of tree diseases among field staff and consequently more reported field observations.

Scots pine makes up a small proportion of forest stands (2.11%) and younger stands are predominantly in mix with less susceptible species such as Spruce. Lodgepole pine makes up about 4.6% of forest stands. Older crops have often been planted on the most infertile deep peat soils in the west of the forest. Younger crops are entirely in mix with Sitka spruce and planted as a nurse in order to eventually produce a pure spruce crop. The current DNB strategy is to continue to monitor the disease, thin younger crops (where site conditions allow), increase species mixtures and expect a decrease in productivity of Pine species by 1 yield class.

9.2 *Phytophthora ramorum* (*P. ramorum*)

P. ramorum is a fungus-like pathogen 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 (near Kilsyth).

The current area of the forest with larch present is 3.66%. It is spread throughout the plan area in mixtures with other conifers. To date, no infections have been confirmed although infections have recently occurred in nearby plantations in west Fife. Blairadam 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*. The priority will therefore be to remove or establish management access to all forest stands with larch present.

9.3 Ash dieback (*Hymenoscyphus fraxineus*)



Ash dieback is a highly destructive disease of ash trees (*Fraxinus species*), especially the United Kingdom's native ash species, common ash (*Fraxinus excelsior*). It is caused by a fungus named *Hymenoscyphus fraxineus* (*H. fraxineus*), which is of east Asian origin.

Ash makes up a very small component of forest stands within the plan area (0.09%). It is present in a few mixed broadleaved stands planted in 2000 and 2012. In both areas it has succumb to this disease with other species in the mixture now expanding to exploit the growing space. Both areas are not close to high usage visitor zones. Since 2012, alternative native broadleaves have been planted, particularly Oak.

10.0 Landscape

This section is supported by [Map 5 'landscape setting'](#).

To provide the landscape context for this land management plan, three aspects have been considered:

1. NatureScots' Landscape Character Assessment. This categorises specific 'landscape character types' or areas of consistent and recognisable landscape character.
2. Designated areas where the scenery is highly valued *locally*. Local authorities often give these landscapes a local designation. There are two designated areas relevant to the plan area.
3. Important local viewpoints. An assessment of local viewpoints that management will have most impact on.

Designed Landscapes have been covered in [Section 14.0](#)

10.1 Landscape Character Assessment

All landscapes combine natural components (*geology, soils and watercourses*) and human influences (*settlement, land use*) with cultural perceptions (*history, social associations and aesthetic values*). Landscape **Character** is created by the way 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 Scottish Natural Heritage (now NatureScot) commissioned, in partnership with others, a series of 30 regional LCA studies. Together, these identified, mapped and described landscape character across Scotland (*mostly at a scale of 1:50,000*). This resulted in the creation of **Landscape Character Types** which are areas of consistent and recognisable landscape character. These have provided the landscape foundation for natural heritage and planning policy. Blairadam forest is heavily influenced by four landscape character types (see [Map 5](#))

East of the forest:

- Hill slopes (more comparable to Foothills)
- Rugged Lowland Hills

West for the forest:

- Upland Hills
- Foothills - Fife
- Rugged Lowland Hills (to a lesser extent)

Note: On [Map 5](#) areas identified as hill slopes are more comparable to the Foothills, being medium to large scale, open and simple landscapes. The exception to this is are the steep sided valley slopes along some stretches of the Kelty burn and the slopes forming the edge of opencast areas to the south of the B914.

The tables below describe the distinct characteristics of each landscape character type. These help create the setting for each part of the forest and are best read in conjunction with [Map 5](#).

Table 16 NatureScot National Landscape Character Assessment Landscape Character Type 182: Upland Hills
<p>Key Characteristics:</p> <ul style="list-style-type: none"> • Elevated, massive, pronounced, dramatic physical landform. • Distinctive and conspicuous shapes, silhouettes, slopes and skylines. • Open, large scale, rolling hills of upland semi-natural land cover and pasture with peaks, knolls and ridges. • Burns and evidence of active natural systems and processes, such as weathering and erosion. • Varied texture and mainly green/brown colour patchwork of the grasses, bracken, sedge and rush communities with pockets of heather. • Stone dykes, burns and occasional minor roads flowing over and along the contours. • Lack of present day settlements and man-made features, except for Areas of forestry.



Table 16 NatureScot National Landscape Character Assessment

Landscape Character Type 182: Upland Hills

- Regular evidence of ancient human settlement with many historical and archaeological features visible, such as cairns, forts and field systems.
- Vast scale, exposure, openness, peacefulness, simplicity.
- Generally quiet, calm, harmonious, semi-natural, enduring landscape with irregular patterns responding to the landform.
- Weather conditions are important and can rapidly change the experience of the upland landscapes.
- Extensive, panoramic and elevated views across substantial distances and many other landscape types.

Table 17 NatureScot National Landscape Character Assessment

Landscape Character Type 184: Foothills - Fife

Key Characteristics:

- Define the edge of, and provide the distinctive backdrop to, other Landscape Character Types and the extent of views across the lowlands.
- Gentler, more natural and less pronounced than the Hill Slopes but usually steeper and higher than the lowland hills.
- Medium to large scale, open, simple landscapes.
- Evidence of active natural systems and processes e.g. weathering and erosion.
- Burns, often in gullies or folds or narrow valleys.
- Woodlands, steadings and other buildings well related to landform.
- Lack of medium and large settlements but some informal historic building groupings.
- Large number of farm steadings and small country houses.
- Presence of point features, providing each area with its own identity.
- Combination of steep sided, rugged, open landform and land cover on the upper Foothills, and the shallower, smoother, more vegetated or developed landform lower down.
- Some extensive views across other Landscape Character Types.
- Highly conspicuous.



Table 18 NatureScot National Landscape Character Assessment

Landscape Character Type 383: Rugged Lowland Hills

Key Characteristics:

- Hard quartzite hills enclosing the Loch Leven basin.
- Distinctive silhouette and skylines, giving a strong sense of place and orientation.
- Natural and dramatic landform, contrasting with and providing a backdrop to the lower, flatter Loch Leven basin.
- Steep slopes and ruggedness.
- Open, semi natural landcover, with predominance of rough grazing. There are some areas of coniferous forestry, particularly on the Cleish Hills.
- Fine views to the north, south and west across the Loch Leven basin to the Ochil Hills and the Devon Valley and beyond.
- Large scale, exposed, simple landscapes. General lack of built development and the lack of intrusive man-made features (except for some areas of forestry).

10.2 Local Landscape Areas

‘Cleish Hills’ Local Landscape Area (LLA)

The western half of Blairadam forest sits within this LLA, making up about 17% of the LLA area. (see [Map 5](#)). The ‘upland hills’ and ‘foothills’ character types are most influential here and the main land use is coniferous plantation. Current driving forces for change identified in the original review of the LLA were forestry operations, possible windfarm development, opencast mining, potential development associated with the racing circuit at Knock hill and an absence in management of field boundaries in more marginal areas.

LLA management recommendations are to restructure poorly designed commercial forestry to improve angular margins and increase diversity by planting broadleaved species and varying the density of planting. Replace felled spruce with broadleaves on Wether Hill to expose its steep rugged slopes. Rehabilitation of stone walls and planting of field and roadside trees and beech hedges to enhance the strong landcover pattern on lower hill slopes.

Other LLAs potentially influenced by management:

To the east of the plan area lie two other Local Landscape Areas. These are ‘Loch Leven & Lomond Hills’ LLA and ‘Loch Ore & Benarty’ LLA. Although management recommendations do not reference Blairadam forest, the forest’s north-eastern boundary is visible from the south-western and western zones of each LLA (respectively). This is where the rugged upland hills character type rapidly



descends into the Lowland Basins character type, exposing the edge of the forest as a 3 dimensional feature. Most prominent on this edge are mature beech stands on lower slopes and coniferous woodlands along higher slopes. The designed boundary of the forest is also quite striking and created during later stages of Blairadam Estates's expansion, when more natural boundaries were used.

10.3 External views of the plan area

With the exception of the north-eastern boundary (described above) the forest is visible from external viewpoints as a two-dimensional feature (only edges are visible). Key transport routes with forest edge views are the A823, B914, M90 and Cleish minor road. The forest edge is also prominent from residential areas at the eastern boundary of Kelty Town and the core path along the M90 overpass from Kelty Town into the forest. A key aim of the previous plan was to diversify and soften these mainly coniferous edges. This was intended through introduction of open space, broadleaved woodland, species mixtures and more natural, sinuous planting boundaries subsequent to felling. This 'softening' has progressed over the last 10 years and can be seen from many external locations such as the B914, M90, A823 and Kelty Town.

10.4 Views from within the plan area

Visitor experience is greatly influenced by internal views within the forest. Visitor zones already have a diverse structure, with a variety of stands types and tree ages along surfaced paths. This is complimented by designed landscape features which, in many cases, have been enhanced through renovation, retention of open space and provision of interpretation. Further into the plan area, forest structure is becoming more diverse as uniform conifer plantations are restocked with conifer mixtures, native broadleaves and open space. A negative influence on these areas is windthrow in even-aged conifer stands, often creating unattractive and quite enclosed internal views. At higher elevations, larger felling areas have opened up external views, for example, southwards as far as the forth estuary and northwards towards Loch Leven.

To the south of the B914 the landscape is dominated by restored opencast and recent new woodland. This was acquired by FLS in 2 phases between 2013 and 2020. Northern zones, lie at higher elevations and have well established mixed woodland with a network of large rides. Western zones have a smaller-scale setting, with a variety of new mixed woodland, open space, hydrological and heritage features. Western zones contain part of Woodend local wildlife site (see [Section 11.0](#)). Central and southern zones cover the main restored opencast workings and provide a larger scale, more simple landscape. Within these zones new planting was completed on the northern slopes in 2017. There is currently a geometric forest edge between this new planting and remaining unplanted restored ground to the south. The intention is to remove this edge by planting remaining



restored ground during the next plan. A key focal point in the south is the large central 'bing' (or mound of overburden).

11.0 Biodiversity and Conservation

The forest is suitable for a number of protected species and habitats given its size, age 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:

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

11.1 Species and Habitats

The forest already supports a range of priority species identified within national and local biodiversity action plans. These include internationally recognised species and those afforded legal protection. Extensive species records are held in both the FLS mapping system and National Biodiversity Network datasets. These include Badger (*Meles meles*), Eurasian Red Squirrel (*Sciurus vulgaris*), a range of bat, avian and invertebrate species. As the forest continues to mature, and become more structurally diverse, a greater range of habitats are developing. For example, mature windblown conifer stands are increasingly used by Osprey (*Pandion haliaetus*).

The last extensive habitat survey for the forest was completed in 2008. Identified priority habitats were limited to small fragmented areas ranging from 0.5 to 3 hectares in size.

- Wet woodland(1.32ha).
- Lowland mixed deciduous woodland (1.86ha).
- Upland Birch woodland (0.71ha).
- Fen (8.95ha).
- Bog (1.98ha).

The priority 'open' habitats described above were mainly located along forest rides, crop boundaries and riparian zones. Small areas of priority woodland habitat were located within minimum intervention stands, riparian zones and LEPO mixed woodland (adjacent to Blairadam Estate).



The forest plan (approved in 2013) sought to develop more robust habitat networks by expanding and connecting existing open space and broadleaved woodland when adjacent conifers were felled and restocked. It was also an aim to retain connective networks of mature conifers for Red squirrel and dependent Avian species such as raptors. Particular attention was given to riparian networks throughout the plan area, low productivity native wet woodland in the western zones and mixed LEPO woodland in eastern zones. The progression of this strategy is described in [Sections 2.0, 5.0 & 6.0](#) (above) with an increase in native mixed broadleaves and open space throughout the forest.

The 2008 habitat survey is due to be updated in the next 5 years. More targeted peat surveys were completed in 2022, they have identified afforested areas in the west of the forest with high potential for blanket mire restoration (priority habitat NVC M17). These areas are being considered as part of the plan renewal and provide opportunity to increase priority open & wet woodland habitats.

11.2 Statutory Protected Conservation Sites (Map 7)

The forest does not contain legally designated conservation sites (Scheduled Monuments are covered in [Section 13.0](#) below), however Tipperton Moss immediately borders the north-western boundary of the forest. This is one of three mosses making up 'Parkhill and Tipperton Mosses' Site of Special Scientific Interest (SSSI). This biological SSSI contains the only remaining unafforested examples of upland raised mire in Fife, together with a large area of relatively undisturbed blanket bog. The existing crop along this boundary is mature Sitka spruce, planted in 1981. Moving eastwards into the forest (away from this boundary) the land gradually rises to an igneous outcrop. For this reason there is likely to be some hydrological interaction across the boundary as water flows from higher ground (within the forest) to lower ground (within Tipperton Moss).

Other statutory protected sites within the vicinity of the forest are shown on [Map 7](#). Based on currently recorded hydrological networks, these are not hydrologically connected or significantly influenced by land use within the plan area ([Map 3 Hydrology](#)):

- Black Loch SSSI (a natural mesotrophic Loch)
- Lurg & Dow Lochs SSSI (oligotrophic lochs and transition fens)
- Roscobie Hills SSSI (calcareous grassland)
- Roscobie Quarry SSSI (geological site)

11.3 Non-statutory sites (Map 7)

Several locally important wildlife sites sit partly within or close to the plan area.

- Woodend Wildlife Site (designated in December 2000 & partly within the plan boundary)



- Loch Glow Wildlife Site (designated in April 2000 & immediately bordering the north-western plan boundary and hydrologically connected by one southern inlet to the loch).
- Roscobie Reservoir Wildlife Site (designated in April 2000 & located ~250 metres to the south of the plan boundary and hydrologically connected by two northern inlets to the loch)
- Loch Fitty Wildlife Site (designated in December 1999 & located ~350 metres to the south of the plan boundary; connected by a northern inlet & mixed riparian woodland)

'Local wildlife sites' (also known as 'local nature conservation sites') are identified as being of known wildlife importance in a local context. They were assessed by the Scottish Wildlife Trust in 1997 and signal to local planners and developers where there are natural features of some merit. The designation encourages them to consider these sensitive sites early on in the planning process and explore opportunities to enhance the local environment. In the same way, FLS will assess how sites within the plan boundary will be protected and enhanced. It will also review opportunities to improve habitat connectivity, for example where sites are out-with the plan boundary but connected by similar bordering habitats.

Woodend Wildlife Site sits partly within the plan area, to the south of the B914. It is a former mining and quarrying site with spoil heaps, derelict sandstone buildings (Limekiln cottages), old and newly created ponds. Notable habitats are unimproved and semi-improved neutral grassland and marsh habitat. Recorded species are Skylarks, Curlew, Reed bunting, Common frog and Ragged robin. Otter and Water vole may be occasionally present. Within the plan boundary, the site also has some coniferous plantations (planted in 1980 and 1999), scrub habitat (within the unimproved grassland), and NVC W11 Oak woodland (planted in 1980).

Loch Glow sits immediately adjacent to the north-western forest boundary. Within the plan area, there are mature conifer crops and open ground adjacent to the Loch Glow boundary. A small burn originates within the conifer crop and flows across the forest boundary into the Loch. The site is a notable oligotrophic or oligo-eutrophic waterbody with adjacent small areas of semi-improved acid grassland, marshy grassland, and wet modified bog. The Loch supports rare floating Bur-reed and an estimated 119 species of native vascular plants. The surrounding grassland holds Round-leaved Sundew and Common butterwort.

Roscobie Reservoir Wildlife Site is located 250 metres south of the plan boundary and is hydrologically linked by three inlets originating from within the forest. The site is predominantly open water but is surrounded by semi (and unimproved) neutral grassland. It also contains Canary reed grass swamp habitat.



Loch Fitty Wildlife Site is one of the largest natural mesotrophic lochs in Fife and located 350 metres south of the plan boundary. It is hydrologically connected to the previous opencast areas within the forest (including Woodend Wildlife Site) by a northern inlet. This inlet also has mixed and riparian woodland along it. Notable attributes are the mesotrophic standing water, broadleaved semi-natural woodland, semi-improved neutral grassland and dwarf acid shrub heathland. It supports a number of wildfowl and breeding birds, and numerous wetland plant species. The site is currently a Trout fishery. The main threat to the site, when designated, was stated to be open-cast coal extraction.

11.4 Peat Habitats

The total estimated area of deep peat soils within the plan area is 285 hectares based on current soils data. This is all on afforested ground. A peat survey and review carried out in 2022 by FLS open habitat ecologists and forest planners concluded approximately 133 hectares have morphological and vegetation characteristics associated with priority habitat M17 *Scirpus cespitosus – Eriophorum vaginatum*. Some of these are immediately adjacent to existing open peatlands to the west of the forest. Of this 133 hectares, approximately 81 hectares has been identified with high restoration potential and where effective re-wetting will not conflict with other land use objectives or adjacent landowners. There is also opportunity to plant native wet woodland around these restored open habitats. This woodland habitat would act to buffer restored peats from other land use activities, improve riparian woodland connectivity and diversify habitat structure. The remaining deep peat areas (152 ha) may be restored in the future following an assessment of current crop performance and related carbon sequestration potential. Each hydrological unit would need to be assessed separately, taking into account surrounding land use, re-wetting potential and other biodiversity assets.

11.5 Wildflower Meadow

Clentry meadow is a previously sown wildflower meadow in the east of the forest covering 1.94 hectares. It was originally sown in 2005 and, since then, the vegetation has been annually cut and removed during September. The current regime has maintained a good diversity of species from the original seed mix but has also allowed other species to colonise including Common spotted orchid, Ragged robin and Lesser stitchwort. The objective for the site is to continue this cutting regime.

11.6 Open riparian zones (Map 3)

The forest has a wide range of riparian habitats. These include flushed wetlands and native woodland along the Drumnagoil burn, 100 year old conifers along the Kelty burn and deep peats and acidic grasslands along upper stretches of the Lochornie burn. They have also been identified as having a high potential for deadwood habitat in the long-term. A key challenge has been the control of dense spruce natural regeneration in riparian zones, particularly on acidic grasslands and peats or where native woodland has been planted. Many of the burns within the plan area have good potential and suitability for water vole and further survey and monitoring are planned.



11.7 Open water

In the north of the forest a number of small ponds have been created on restock sites, originally created to act as large silt traps. Although these are relatively infrequent they now provide diverse open water habitats. The 2013 and 2020 acquisition of restored opencast workings to the south of the B914 resulted in a notable increase in open water habitats within the plan area. The four largest water bodies in this area have recently been appraised to have ‘moderate’ to ‘good’ suitability for great crested newt. They provide the most valuable open water habitats in the plan area.

11.8 Woodland habitats & their ecological characteristics

Woodland Origin

The Roy military survey map shows most of the plan area as open ground when surveyed between 1747 and 1752. The exception to this was a small area to the east of Blairadam House planted to form geometric avenues of trees delineating the formal grounds of the house. In fact, when the land was purchased by William Adam in 1733 there was reported to be little on the estate other than open heathland, unenclosed cultivation riggs and one single Ash tree known as “The Tree”. Hence there is no current record of ‘ancient woodland’¹ or plantation on ancient woodland within the plan area (Map 7). The oldest afforested areas are recorded as ‘Long Establish Woodland of Plantation origin’ (LEPO)². These are concentrated in the east of the forest and closely match the extent of woodland planting by the Adam Family estate as they expanded their land holding over several generations from 1733. The 1st Edition Ordnance Survey Map of 1854 reveals the boundaries of these LEPO stands. The originally planted trees were felled between both World Wars and the trees present today reflect planting (and restocking) by the Forestry Commission since 1927. The oldest Forestry Commission stands tend to be in less accessible areas of the woodland or comprise slower growing broadleaved species such as beech.

There is a small stand in the east of the forest recorded as being planted in the year 1600 (0.26 hectares) on the sub-compartment database. Recent site observations identified Yew (*Taxus*

¹ In Scotland ‘ancient woodlands’ are those which were present before 1750 (Roy maps) when the first national survey was made by General Roy. In both cases the dates correspond roughly with the time when new woodland planting first became commonplace so that ancient woods are unlikely to have been planted originally.

² Interpreted as plantation from maps of 1750 (Roy maps) or 1860 (OS 1st Edition) and continuously wooded since. Many of these sites have developed semi-natural characteristics, especially the oldest ones, which may be as rich as Ancient Woodland.



baccata) within this stand. It would be difficult to verify the age of these trees without taking core samples.

Western zones of the plan area have remained largely open until acquired and planted with commercial conifers by the Forestry Commission in the 1970's and 1980's. However, there are two small areas within the LEPO boundary; one is a productive conifer plantation (NT 0756 9330), the other (NT 1033 9433) is a small broadleaved natural reserve (see [Section 11.10](#)).

Southern zones of the plan area are dominated by open cast workings and the woodland is relatively young, with no areas of LEPO.

Semi-naturalness

The Native Woodland Survey of Scotland (NWSS) was carried out between 2006-2013. One objective of the survey was to identify semi-natural characteristics in existing forest stands:

- Presence and composition of native tree species
- Presence and composition of natural regeneration.
- Natural woodland structure.

In Blairadam forest only small areas were found with moderate to high levels of semi-naturalness. These are mostly present in LEPO zones ([Map 7](#)). Low levels of semi-naturalness is linked to the Forestry Commission's core objective when the land was acquired, to establish and replant fast growing timber crops using a limited number of highly productive non-native conifer species. Since the survey was completed additional areas of native woodland have been established but will take time to develop semi-natural characteristics. Some of the mature beech and mixed woodland within LEPO zones have developed moderate semi-natural characteristics. LISS management operations and storm damage within these mature stands have both increased their structural diversity over the last ten years.

Woodland habitat connectivity

The connectivity of native woodland habitats and potential for expansion has been analysed by Forest Research - identifying three distinct zones:

1. **'Core' woodland zones:** Woodland habitats of high conservation value (*Ancient & long established, designated sites, high % semi-natural characteristics*).
2. **'Primary' zones:** Where native woodland expansion will best develop ecological connection between core woodland blocks particularly for slow woodland colonisers.
3. **'Secondary' zones:** Areas where native woodland expansion will benefit moderate woodland colonisers.



The previous forest plan aimed to improve connectivity through the felling and restocking programme. In the east of the forest connectivity along riparian networks and adjacent to LEPO woodland has improved. There is still a high degree of fragmentation in the west of the forest, which historically had low levels of native woodland.

Going forward; riparian zones, core visitor zones and stands adjacent to Blairadam Estate have greatest potential for expanding connectivity in the east. In the southern sub-block (to the south of the B914), areas between Woodend local wildlife site and the southern forest boundary (close to Loch Fitty) have good potential. In western parts of the forest the existing network of watercourses provide good potential for improving connectivity.

Forest Research's Ecological Site Classification identifies a range of native woodland habitats³ suitable within the plan area. Prevalent suitable woodland types are NVC W11 & W4, with localised areas suitable for W3, W6, W7, W17 & W18.

Its also important to note the value of mature coniferous woodland for a range of wildlife species. Notable examples recorded in the forest are Red squirrel and numerous raptor species including Osprey.

11.9 Long-term retentions

Long-term retentions (LTRs) are individual, generally stable stands and clumps of trees retained for environmental benefit significantly beyond the age or size adopted for commercial management. Areas prescribed as LTRs in the previous plan covered 18.13 hectares and comprised two areas of mature beech woodland and two areas with abandoned Christmas trees. This relatively small area was offset by the large area of LISS woodland proposed.

11.10 Natural reserves⁴ & minimum interventions⁵

The previous plan assigned two separate broadleaved natural reserves (NRs) at NT 0847 9396 & NT 1033 9433. Each covered a small area and, grouped together, amounted to 5.03 hectares. A recent

³ Classified using the JNCC National Vegetation Classification system of Great Britain.

⁴ Natural reserves are predominantly wooded, usually mature and intended to reach biological maturity. They are permanently identified and in locations which are of particularly high wildlife interest or potential. They are managed by minimum intervention unless alternative interventions have higher conservation or biodiversity value.

⁵ Minimum intervention: management area with no systematic felling or planting of trees. Operations normally permitted are fencing, control of exotic plant species and vertebrate pests, maintenance of paths and rides and safety work.



review of NRs in Central Region concluded the above reserves were highly fragmented and of insufficient size to meet NR objectives. They have therefore been re-categorised as minimum intervention areas.

Minimum intervention areas (MIs) from the previous plan are also highly fragmented, each being less than 2.5 hectares in size and, when combined, totalling 5.2 hectares. Two of the four MIs have significant management conflicts; the first, at grid ref: NT 1097 9554, due to presence of Larch and the second, at grid ref: NT 1214 9345, due to its location - 2 narrow strips between productive conifer stands and the B914 council road.

11.11 Deadwood Potential

The UK Woodland Assurance Standard (UKWAS) target is for an average of 20 m³ of deadwood per hectare, although it is expected actual concentrations will vary widely across a site.

Table 19 (below) shows the proportions of the plan area 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	158.53	100	15853
Medium	322.54	30	9676.2
Low	844.18	15	12662.7

Total future potential is thus estimated at 28.81 m³/ha.

Areas with high deadwood potential are located within riparian zones. Areas with moderate potential are within LEPO woodland. This does not take into account windblow, for example, in broadleaved stands under LISS management. It also assumes that all riparian zones will be planted with native broadleaves but in many cases riparian zones will be left unplanted. A number of old avenues in the east and south of the forest contain veteran broadleaves with high potential for deadwood.

11.12 Invasive Non-Native Species (INNS)

Currently the main threats are from several plant species. These have been identified in small localised areas in the east of the forest.

- Annual operations are ongoing to control small areas of Rhododendron (*Rhododendron ponticum*) along the Kelty burn. Further control is planned for the next 5 years and survey



work is being undertaken on the eastern boundary to assess levels of this species in mature mixed woodland close to Blairadam Estate.

- Annual Operations to control Himalayan balsam have taken place since 2015. This species was identified along lower stretches of the Drumnagoil burn and a tributary to the Kelty burn.
- Three annual operations to control a small area of Japanese knotweed were undertaken from 2015 to 2018. No further record of this species has been identified.

12.0 Crop protection and management of herbivores

The only recorded deer species within the plan area is Roe deer. Blairadam is surveyed as part of the Fife Blocks management unit. Average deer damage levels in this unit over the last three years was 11.74% of unfenced conifers, which is relatively low at a national level. The key challenge historically has been establishment of trees species more susceptible to deer damage, particularly slow growing broadleaves planted in cooler, more exposed western zones of the plan area. Over recent years deer control has significantly increased and the level of control in 2022/23 was over double that of 2016/17. Another key development has been the use of drones with thermal imaging cameras. This is significantly improving management information and decision making for local control teams. It is also allowing deer control contracts to be managed more effectively.

Another challenge for tree establishment (particularly broadleaves) is the Hare population in the forest. This is being monitored but there is no active control at this time.



13.0 Heritage

13.1 Summary

Forestry and Land Scotland maintains extensive archaeological records for the plan area in its heritage database. Important historic environment features are surveyed, recorded, mapped and monitored to ensure and demonstrate Forestry and Land Scotland compliance with the UK Forestry Standard. In 2009 a detailed archaeological survey of the plan area was undertaken. The survey remit included heritage features linked to the designed landscape and industrial activities of Blairadam Estate. The results of this detailed study have been recorded in FLS GIS based heritage layers. The sections below provide a summary of notable heritage features recorded in this study and shown in [Maps 7a & b – Heritage and Conservation](#).

It is likely prehistoric⁶ occupation of this area was widespread given the proximity of three prehistoric hillforts on Dumglow, Saline and Benarty hills. However, evidence of pre-historic activity within the forest is relatively sparse. The few prehistoric features remaining are located in least developed western zones of the forest:

1. The physical remains of a possible stone axe head was found on King's Seat in the 1960's. This was made of soft blue-grey stone, resembling an axe in shape but broken where the cutting edge should have been.
2. Three circular enclosures with associated low turf and stone banks. They are thought to be a possible hut circle, round house, ritual and funerary. This feature is now scheduled as a monument of national importance (see below) and indicates a long history of use and re-use. It is called Roscobie Enclosures and located in the south-west of the forest on a landform called Muckersies Knowes.

There is little remaining evidence of prehistoric activity recorded in the east of the forest. The heritage record is heavily influenced by more recent activities since the 1730's. Much of the land currently managed by Forestry and Land Scotland was once under the control Blairadam estate, owned by the notable Adam family between 1733 and 1925. When William Adam acquired the Blair-Crambeth estate in 1733 there was believed to be little on the land, other than unenclosed cultivation riggs and heathland. Over several generations, the Adam family established new

⁶ The period of human history between the first known use of stone tools (around 3.3 million years ago) and the beginning of recorded history with the invention of writing systems (around 5000 years ago).



woodlands and enclosures, created picturesque ‘designed landscapes’ and viewpoints and oversaw a range of industrial developments. The latter included mines and quarries, associated transport infrastructure, water supply reservoirs and brick manufacturing works. Coal mining in the 19th Century brought the railways and in Blairadam the remnants of this railway network is clearly seen along the Kelty burn where one of the two stone piers (upright supports) of a railway bridge (the ‘hundred foot bridge’) is still present. The bricks used to build these piers are imprinted ‘blairadam’ indicating they were manufactured ‘on-site’ at the brickworks.

FLS GIS based heritage layers are used to identify, protect and enhance these features when planning forest operations. Remaining features of designed landscapes created by the Adam family within the forest are now also recorded and mapped for protection and enhancement. A brief description of these landscapes is covered in [Section 14.0](#) (below).

13.2 Scheduled Monuments

There is one Scheduled Monument within the plan area. This is called Roscobie (*Designation reference SM8550*) and comprises three circular enclosures with associated low turf and stone banks. It is categorised as:

- Prehistoric domestic and defensive: hut circle, roundhouse; settlement.
- Prehistoric ritual and funerary; enclosed cremation cemetery.

The monument is of national importance as the remains of an inter-related group of settlement and ritual monuments of prehistoric date. It retains the potential to provide important information on prehistoric upland settlement, land-use and ritual activity.

Further details of the monument can be found on Historic Environment Scotland’s website:

<https://www.historicenvironment.scot/>

The monument is surveyed annually by both Forestry and Land Scotland and Historic Environment Scotland. Access is from the forest road. It is currently open grassland (former agricultural grazing) with conifer planting adjacent. More recent ground surveys and aerial analysis identified the original scheduled boundary did not fully cover the protected features and an amendment was completed by HES in 2018 to move the boundary west. This subsequently raised that the conifer plantation to the west was encroaching on the revised monument boundary. This stand is Sitka spruce planted in 2002 and the edge of this crop (approximately 20 metres) will need to be included in felling proposals in the land management plan renewal.

There is also an archery club permission operating adjacent to monument. Protection of the monument and restricted access is part of the permission conditions and their activities are monitored closely by Forestry and Land Scotland.



13.3 Other non-scheduled monuments & features of historic interest

Bridges

Numerous bridges linked to historical activities of Blairadam estate are located along the burns that flow through the east of the forest. Of note is Lochornie burn bridge, a substantial stone arched bridge restored in a partnership project with Kelty Heritage Trails Group and Fife Council. This has the characteristic tall narrow arches of the Adam style. Pieres burn bridge, a smaller version of Lochornie burn bridge and likely constructed at the same time. Three bridges along the Kelty burn locally named the Glen bridges which have been heavily modified but now form part of the surfaced path network. The remains of the '100 foot bridge' crossing Kelty burn. The southern pier survives but the northern one was demolished using explosives but a surviving portion rests against the north slope.

Reservoirs

The remains of three reservoirs are located along the Kelty and Lochornie burns. The first two (Lochornie burn) are named 'East Bow Muir' upper and lower reservoirs. They are associated with the remains of several waterworks, set up downstream, and fed urban centres (to the west) in the late 19th Century. Both have been drained and planted with commercial conifers but their boundaries are clearly visible from aerial photography and much of the stonework to control water flow is visible on the ground. The third is located further downstream along the Kelty burn. It once provided water to a sawmill downstream towards Kelty Bridge. To the south of the dam is a double arched bridge and (remains of a spillway) fed by a stone lined channel from the reservoir. The bridge arches have now been restored. The dam has been breached at its northern end and the reservoir base is now a grassy field.

Quarries and Mining

The remains of numerous quarries can be found throughout the plan area. It is likely some of these including two whinstone quarries were excavated to provide stone for the creation of designed landscape boundaries and their maintenance.

Coal has been mined at Blairadam since the 13th century when monks exploited shallow seams along the burn sides. It appears to have been concentrated in the eastern half of the forest and in Thornton Wood to the south. Blairadam house was the only stately home with a shaft and coal yard on the front lawn. As well as a number of old shafts and workings there are substantial remains of 2 large mines: the Blairenbathie Colliery and the Blairenbathie (surface) drift mine. The Colliery was sunk in 1895 and employed about 700 men at its peak. Brick foundations and the associated railway line still survive. The drift mine was opened in 1945 but closed in 1962 due to flooding and difficult geology. Again, its foundations and those of the associated railway line still survive. Across the eastern half of the forest, and Thornton Wood, Coal Authority records show multiple mine entry



points and surface mining zones. This mining heritage has been the main reason for the involvement of the Kelty Heritage Society who had a number of ex-miners as members. There is a wealth of photographs, stories and information to interpret the physical remains. This industrial archaeology coupled with the designed landscape provide a powerful draw for visitors.

Boundaries and Enclosures

A network of boundaries and enclosures can be found throughout the forest and were created through successive phases of Blairadam estate's development. These were not only associated with small farmsteads and agricultural activities but with the designed landscapes created by successive generation of the Adam family. Some enclosures are contained by large banks with formal lines of trees growing on them. Others formed tree lined avenues. Only a few veteran trees now survive along these avenues but the stoned banks area often visible. Numerous ha-has can be found along the designed boundaries. These are ditches with a wall on their inner side below ground level. They are designed to confine grazing animals without interrupting the view and creating the illusion of openness. They can be thought of as a sunken wall or fence.

Brickworks

Another industrial development was Blairadam tile and brickworks which opened in the early 19th century to exploit waste from the coal mines. This is now an irregular area of collapsed trees and swampy ground. Where trees have fallen over, brick and tile can be seen entangled in their roots. There are no solid remains of the works but the individual bricks used in many other walled structures in the forest are imprinted 'blairadam' (e.g. piers of 100 foot bridge on Kelty burn).

Lime Kilns

The remains of two Lime kilns have been recorded. One along the Lochornie burn which was destroyed during the construction of the reservoirs. The other is named Thornton Wood lime workings (to the south of the B914) and is more extensive, having foundations of Kiln houses, the surrounding Lime quarries, linking tramways and the line of a dismantled railway. This area has been left unplanted and forms part of a larger area of open space and non-productive mixed woodland.



14.0 Designed Landscapes

14.1 Summary (Maps 7a & b)

A large part of the land management plan area, together with the neighbouring Blairadam estate, were once both owned and managed as one continuous landscape by successive generations of the notable Adam family of architects from 1733 to 1925. A designed landscape was created on the larger estate in 3 phases by 3 generations of the Adam family. The current Blairadam estate is still owned by the Adam family and has been included in the Inventory of 'Gardens and Designed Landscapes' in Scotland. Only a small proportion of FLS owned land is included in this designation - Kiery Craigs and the eastern end of Squires Wood. However, from surveys conducted by both FLS staff, archaeological consultants and the Garden History Society in Scotland, it is clear that a substantial area of the Adam designed landscape exists within FLS ownership. This includes areas identified by William Adam as being aesthetically important and integral to the Adam landscape design.

14.2 Notable designed landscape areas (Maps 7a & b)

William Adam divided the plantations into 3 different types; Woods of Selection (equivalent to modern thinning and long-term retention), Woods of Succession (equivalent to modern clearfell and replant) and Woods of ornament and policy (see below). With the kind help of the Adam family, FLS staff have now georeferenced William Adams maps and these areas are now recorded in the FLS geographical information system database.

1. Woods of Ornament and Policy - These areas were to be primarily managed for landscape design and aesthetics. Careful attention was to be made to planting and felling to ensure an attractive and impressive landscape was preserved. Timber could be harvested from these areas if it was required for the economics of the estate but had to be done so with care. The following areas come into this category.
2. The Glen (NT - This area was an important one within the Blairadam policy and William Adam gives a thorough description of it in his writings along with prescriptions for future management. Although the current woodland differs in detail and species choice it is nevertheless a highly impressive and attractive area. The Glen contains the oldest Forestry Commission spruce plantings (dating to 1929) which survived the 1968 storm. Careful thinning has created an open woodland with massive specimen spruce trees either side of the Kelty burn. A footpath meanders alongside the burn and the Glen remains one of the highlights of a visit to Blairadam. There has been some planting of broadleaved trees and scots pine.



3. The Kiery Craigs - Arguably the most notable area of the historical landscape, which has not only featured in William Adams writings, but also in Sir Uvedale Prices book “On the Picturesque” and Sir Walter Scotts book “The Abbot”. William Adam’s prescription for the Craigs is to have views open to them and from the top of them, with the top to be crowned by ‘mis-shapen scots pine’. Rhododendron and conifer regeneration growing in front of the Craigs (rock face or crag) has been cleared recently and the vertical rock face is now clearly visible from adjacent paths and roads. Although the top of the Craigs is still crowned with Scots pine and birch, mature Sitka spruce grows behind this and is now affecting the intended character of this feature. It sits within the registered Garden and Designed Landscape of ‘Blairadam House’.

4. Squires Wood (eastern zone) – This is a mixed woodland planted in 1938 and part of the registered Garden and Designed Landscape of Blairadam House. It is mainly comprised of mixed broadleaves (Beech, Sycamore, Oak), Larch and mixed conifers including spruce and scattered ornamental conifers. It is within the LEPO designated zone and has good potential for deadwood and native woodland habitat connectivity. It sits adjacent to Hill Wood (owned by Blairadam House) forming an important back-drop within the registered designed landscape area.

5. Keltyhill Glen - The maps within the William Adam’s book do not describe this area as a wood of Ornament and Policy but it is included under this definition for the following reasons. Firstly, William Adam describes Keltyhill glen as an attractive area and he describes the waterfall (and how it was named) in particular. Secondly, a hand drawn map in the archives at Blairadam house sketch a rough plan of the area and a written instruction to make it look like a “Highland Glen”. Finally Forestry and Land Scotland planting has created attractive mixed woodland some of which is maturing into an area similar to The Glen (above), albeit on a smaller scale.



15.0 Communities & Recreation

The main settlements within or surrounding the forest:

- Clentry hamlet (within the forest);
- Kelty town immediately to the east;
- Cleish hamlet ~1km to the north;
- Kingseat village and Townhill villages ~2 km to the south;
- Cowdenbeath town ~3.2km to the south-east;
- Dunfermline city ~3.5km to the south;

There is currently just over 24 kilometres of core path network within the forest ([Map 6](#)). This includes core paths in the newly acquired ex-opencast areas to the south of the B914. The vast majority of these paths are on forest roads, tracks and fine surfaced path networks. In addition, there is an unlimited number of unsurfaced 'desire line' paths.

Visitor facilities comprise tarmac visitor parking areas, picnic tables and other seating furniture, an extensive fine-surfaced path network (linking to the wider forest road and track network) and a range of interpretation infrastructure linked to the path network, wildlife and heritage.

FLS visitor services teams also continue to implement community and partnership working with local schools and Fife Council. The aim is to encourage communities into the outdoors, promoting informal recreation and educational activities (pond dipping, bushcraft, tree identification) and to improve knowledge of the Scottish Outdoor Access Code.



16.0 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: Management Tables

Felling tables (See maps 10 & 12)

Table 20: Phase 1 clearfell coupes (2024-2028)

Coupe Ref	Gross Area (ha)	Net Area ⁷ (ha)	Sitka spruce (net ha)	Norway spruce (net ha)	Larch (net ha)	Scots pine (net ha)	Firs (net ha)	Other conifers (net ha)	MB (net ha)	Windblow (net ha)	Open (net ha)	Con/MB retained (ha)
06012	19.52	19.35	14.17	0.33	0.5	1.14				3.21	0.12	0.05
06025	1.05	0.73	0.12	0.29	0.32						0.32	0.02
06036	14.16	10.96	7.12	0.13	0.05	0.13	0.27			3.26	3.1	0.1
06040	3.52	2.91	0.05	0.4	1.5		0.16				0.61	0.8
06042	1.66	1.38	1.23	0.15							0.08	0.2
06050	8.59	7.1	2.87				2.84			1.39	0.63	0.86
06055	11.42	9.81	7.99	0.09				0.12		1.61	0.53	1.08
06063	17.32	14.86	8.25	4.12	0.7					1.79	1.72	0.74
06067	1.93	1.3	0.1	0.31	0.89						0.31	0.22
06089	3.55	2.64		2.04						0.6	0.29	0.62
06094	3.82	3.82	1.31					0.08		2.43		
06097	18.79	15.6	12.9		1.62					1.08	3.19	
06103	14.04	13.01	8.29							4.72	1.03	

⁷ Excludes open ground and retained woodland.



Coupe Ref	Gross Area (ha)	Net Area ⁷ (ha)	Sitka spruce (net ha)	Norway spruce (net ha)	Larch (net ha)	Scots pine (net ha)	Firs (net ha)	Other conifers (net ha)	MB (net ha)	Windblow (net ha)	Open (net ha)	Con/MB retained (ha)
06111	15.13	12.32	10.17	0.29						1.86	2.79	0.02
06125	16.35	16.35	Willow spp. currently under 10cm dbh. Not included in total felling areas below.									
06129	23.24	23.24	Willow spp. currently under 10cm dbh. Not included in total felling areas below.									
Totals	134.50	115.79	74.57	8.15	5.58	1.27	3.27	0.2	0	21.95	14.72	4.71

Table 21: Phase 2 clearfell coupes (2029 -2034)

Coupe Ref	Gross Area (ha)	Net Area (ha)	Sitka spruce (net ha)	Norway spruce (net ha)	Larch (net ha)	Scots pine (net ha)	Firs (net ha)	Other conifers (net ha)	MB (net ha)	Windblow (net ha)	Open (net ha)	Retained Con/MB (ha)
06002	9.21	7.58	6.92	0.21						0.45	0.62	1.01
06032	13.21	12.51	0.91	7.46	1.41	2.1			0.31	0.32	0.7	
06037	10.89	9.71	8.87	0.41						0.43	0.61	0.57
06047	4.81	3.11	0.72		0.86	0.86				0.67	0.83	0.87
06063	17.32	14.86	8.25	4.12	0.7					1.79	1.72	0.74
06069	2.77	2.44			2.09	0.35					0.31	
06071	6.27	4.72		2.66	0.13	1.64	0.07			0.22	0.99	0.56
06074	6.01	4.13	2.81		1.32						1.06	0.82
06101	25.80	22.66	17.42		0.72					4.52	0.49	2.65
06105	39.19	38.55	26.13					6.13		6.29	0.64	
06112	7.93	6.77	6.45		0.26					0.06	1.16	
06124	1.25	1.09	1.09								0.16	
Totals	127.34	113.27	71.32	10.74	6.79	4.95	0.07	6.13	0.31	12.96	7.57	6.48



Table 22: LISS licensable felling (Phase 1)

Coupe Ref	Gross Area (ha)	Net felling Area (ha)	Sitka spruce (net ha)	Larch (net ha)	Windblow (net ha)	Con/MB retained (ha)
06006	4.3	1.24			1.24	3.06
06011	8.75	3.73	0.86	2.87		5.02
06035	2.43	0.63			0.63	1.8
Totals	15.48	5.6	0.86	2.87	1.87	9.88



LISS management Table 23 (see map 12)

Coupe number	Coupe area (ha)	Current Species	Silvicultural system	Long term objectives	Proposed operations	LISS fell area (ha)	Comments
06006	4.3	Beech p1938	Irregular shelterwood	Timber production, amenity & designed landscape.	Mainly beech p1938 with scattered small groups of windblow. Select final crop trees (150 stems/ha). Clear windblow, 1.24ha or 30% of stand. Light selective thin remaining crop. Underplant at productive spacing in cleared gaps with 30% Oak in (larger gaps) and 70% beech (smaller gaps) @ 4500 stems/ha (1.5 mx 1.5m). Periodically monitor for natural regeneration of beech.	1.24	Larger groups of windblow make uniform system unviable. Package work with 06006, 06008, 06018 & 06044. Treat restock of cleared windblow as underplanting operation.
06008 & 06018	13.68 & 1.96	Beech p1938; Birch p1973; MB p1938	Uniform shelterwood	Timber production, amenity, designed landscape, research.	Mainly Beech p1938 with scattered single tree windblow. Select final crop trees (150 stems/ha). Light selective thinning & clearance of scattered blown trees. Periodically monitor for natural regeneration of beech & birch.	0	Retain & protect 'XC/MC p1600/38' in coupe 06008. Package work with 06006 & 06044.
06010	2	S.Oak p2020; NMB p2023	Irregular shelterwood	Timber production, amenity, designed landscape, conservation	Pre-commercial clearance of spruce regeneration. Remove tubex guards on oak groups. Monitor birch natural regeneration & precommercial thin as necessary	0	Formative prune Oak if very few single stemmed trees. Can use hard ridge at eastern end of coupe to access to southern areas of 06011.
06011	8.75	Beech/JL/MC p1938	Irregular shelterwood	Amenity, designed landscape & conservation	Fell existing groups of spruce & larch, 3.73ha or 0.42% of stand. Selectively thin remaining broadleaves. Replant cleared gaps with native broadleaves (75%) and ornamental conifers such as Coast redwood (25%) @	3.73	This area sits within the registered 'Garden & Designed Landscape' of Blairadam House. Retain scattered ornamental conifers such as coast redwood. Can use hard ridge at



Coupe number	Coupe area (ha)	Current Species	Silvicultural system	Long term objectives	Proposed operations	LISS fell area (ha)	Comments
					1600 stems/ha (2.5m x 2.5m). Periodically monitor for natural regeneration.		eastern end of 06010 for access to southern areas.
06035	2.43	Grand fir p1972; MB p1972	Irregular shelterwood	Timber production, recreation, amenity.	Clear conifer windblow in central area 0.63 ha or 26% of stand. Replant 50% Coast redwood 50% P silver fir @ 2700 stems/ha (1.9 mx 1.9m). The existing Grand fir (p1972) has not been thinned, which precipitated windblow, but soils and shelter are well-suited to LISS and the surrounding GF stands have stabilised. Retain broadleaves where possible.	0.63	This coupe alongside 06034 and 06046 will help buffer the 100 year old spruce in 06038 from prevailing westerly winds. 06038 is intended to develop an 'old growth' forest structure. 06035 could be packaged with commercial thinning and clearfell of surrounding stands (e.g. thin 06034, thin 06038, CF 06050)
06038	11.77	SS/NS/Beech p1933; SP/MB 1929; Grand fir/MB p1973	Irregular shelterwood	Recreation, amenity, heritage, conservation, timber production.	Light selective crown thinning. Retaining most symmetrically attractive, healthy & stable trees. Underplant up to 20% of area (2.35ha) with alternative conifers as groups of 15 -25 trees: 50% Coast redwood 50% P silver fir @ 2700 stems/ha (1.9 mx 1.9m). Allow gaps between groups to maintain visibility into crop from paths.	0	The oldest and best thinned conifer stands in the plan area. They surround well used visitor zones. The intention is to develop an 'old growth' forest structure that will be regenerated over the next 50 years. The next stage is to start underplanting alternative conifers in groups across the coupe area. Select final crop trees in overstorey so they can be retained during next thinning operations.
06039	7.89	SY/GF/NS/SOK/SS p29/77/77/77/77 Birch/NS p60/77 BE/SY/MB p29/29	Irregular shelterwood	Recreation, amenity, conservation, designed landscape, timber production.	Conifers: Light intermediate thinning. Retain stable Firs, NS, SS. Remove larch, unstable, suppressed conifers. Main broadleaves: Select final crop trees (150 stems/ha). This can be a mixture of the best stems from the species present (Oak, Beech, Sycamore,	0	Package with surrounding clearfell and thinning operations.



Coupe number	Coupe area (ha)	Current Species	Silvicultural system	Long term objectives	Proposed operations	LISS fell area (ha)	Comments
					Cherry etc.). Thin to favour selected final crop trees. Birch stand: Selective intermediate thinning to retain best stems.		
06043	0.85	MB/GF p60/73	Irregular shelterwood	Recreation, amenity, designed landscape.	Light selective thin when clearfell coupe 06043	0	Adjacent to Keiry Craigs designed landscape feature. Minimal work needed – remove any spruce.
06044	1.7	Beech p1932	Uniform shelterwood	Recreation, amenity, designed landscape, timber production	Select final crop (150 stems/ha). Light selective crown thinning of Beech. Periodically monitor for natural regeneration of beech & birch.	0	This is a forest research plantation. Inform FR of thinning operation for their records. Package work with 06006, 06008, 06018
06049	2.49	MB/MC p60/73	Irregular shelterwood	Heritage, designed landscapes recreation, amenity,	Thin to remove large spruce that could damage heritage features if uprooted.	0	Package operation with CF 06050. Stable conifer and broadleaves around industrial heritage features.
06051; 06057	10.21; 4.33	NMB p2014; SOK/Sbi p2020	Irregular shelterwood	Recreation, amenity, designed landscape, conservation.	Precommercial thinning as per individual species requirements. Remove tubex guards on SOK. Favour Oak & Cherry where present.	0	
06113	1.9	Sycamore p2015 Birch natural regeneration.	Uniform shelterwood	Timber production, amenity.	Remove tubex guards. Precommercial thinning if birch in high density.	0	
	74.26					5.6	



Restocking tables (see map 11)

Table 24: Phase 1 (2024-2028) Restocking of clearfell coupes (hectares)⁸

Coupe Number	Total Gross Area (ha)	SS (ha)	NS (ha)	SP (ha)	ALP (ha)	DF (ha)	Other con (ha)	Birch (ha)	Other brlvs (ha)	NMB/MB (ha)	Open (ha)	Ret (ha)	Delivery method	Monitoring Comments
06012	19.52	7.4	0.53	2.04	2.4		1.41	1.51	1.51	0.46	2.21	0.05	Restock planting	SDA ²
06017	13.79	1.39	2.48	1.37		1.36		0.42		4.84	1.48	0.45	Restock planting Notes: Currently Fallow . Private drinking water supply in east of coupe where native broadleaves proposed.	SDA ²
06025	1.05									0.84	0.19	0.02	Restock planting	SDA ²
06036	14.16	3.04	1.04	0.84	3.04			1.63		2.23	2.24	0.1	Restock planting	SDA ²
06040	3.52			0.28			0.28	1.42			0.74	0.8	Restock planting	SDA ²
06042	1.66			0.45				0.45	0.45		0.11	0.2	Restock planting	SDA ²
06050	8.59		1.08	2.6				1.52	1.52	1.01		0.86	Restock planting	SDA ²
06055	11.42							2.72		6.32	1.3	1.08	Restock planting	SDA ²

⁸ This includes peat restoration areas which are recorded as open and noted in description field of table. It also includes existing fallow ground awaiting restock.



Coupe Number	Total Gross Area (ha)	SS (ha)	NS (ha)	SP (ha)	ALP (ha)	DF (ha)	Other con (ha)	Birch (ha)	Other brlvs (ha)	NMB/MB (ha)	Open (ha)	Ret (ha)	Delivery method	Monitoring Comments
06063	17.32	5.82	2.12		1.85		2.12			3.46	1.21	0.74	Restock planting	SDA ²
06067	1.93	0.17	0.28	0.11			0.17			0.8	0.18	0.22	Restock planting	SDA ²
06089	3.55							0.16	1.78	0.73	0.26	0.62	Restock planting	SDA ²
06093	20.32	7.11	1.12	0.39	7.03		0.45	0.84		1.82	1.56		Currently Fallow. Restock planting.	SDA ²
06094	3.82	0.67	0.67	0.9	0.67			0.91					Restock planting	SDA ²
06097	18.79			2.55						5.06	11.18		Peat restoration (11.18ha) & restock planting (7.61ha)	SDA ²
06098	17.46			0.86						1.72	14.88		Currently Fallow. Peat restoration (14.88ha) & restock planting (2.58ha)	
06103	14.04	4.88	1.46		1.91		1.46			2.45	1.88		Restock planting	SDA ²
06111	15.13	4.66			1.33		0.93	1.86		0.81	5.52	0.02	Peat restoration (5.52ha) & restock planting (9.61ha)	SDA ²
06125	16.35	<i>See woodland creation table in section 5.8 – not included in total restock quantity</i>											New planting	SDA ²
06129	23.24	<i>See woodland creation table in section 5.8 – not included in total restock quantity</i>											New planting	SDA ²
Totals	186.07	35.14	10.78	12.39	18.23	1.36	6.82	13.44	5.26	32.55	44.94	5.16		



Table 25: Phase 2 (2029-2034) Restocking of clearfell coupes (hectares)⁹

Coupe Number	Total Gross Area (ha)	SS (ha)	NS (ha)	SP (ha)	ALP (ha)	DF (ha)	Other con (ha)	Birch (ha)	Other brlvs (ha)	NMB/MB (ha)	Open (ha)	Ret (ha)	Delivery method	Monitoring Comments
06002	9.21		2.07	0.84			1.85			3.11	0.33	1.01	Restock planting	SDA ²
06032	13.21	2.68	2.68	0.96	2.68			1.8		1.38	1.03		Restock planting	SDA ²
06037	10.89	2.49				4.98				2.29	0.56	0.57	Restock planting	SDA ²
06069	2.77			0.75				1.4			0.62		Restock planting	SDA ²
06071	6.27	0.18		1.23	0.18			2.46		0.9	0.76	0.56	Restock planting	SDA ²
06074	6.01	0.95	0.95		0.95					1.72	0.62	0.82	Restock planting	SDA ²
06105	39.19	3.15			3.15		1.62	1.62		11.28	18.37		Peat restoration (18.37ha) & restock planting (20.82ha)	SDA ²
06124	1.25			0.26						0.99			Restock planting	SDA ²
06047	4.81	0.21	0.21	0.6				1.2		0.95	0.77	0.87	Restock planting	SDA ²
06101	25.80									8.59	14.56	2.65	Peat restoration (13.72ha) & restock planting (11.24ha)	SDA ²
06112	7.93		4.18				2.09				1.66		Partial peat restoration (1.66ha) & restock planting (6.27ha)	SDA ²

⁹ This includes peat restoration areas which are recorded as open and noted in description field of table. It also includes existing fallow ground awaiting restock.



Coupe Number	Total Gross Area (ha)	SS (ha)	NS (ha)	SP (ha)	ALP (ha)	DF (ha)	Other con (ha)	Birch (ha)	Other brlvs (ha)	NMB/MB (ha)	Open (ha)	Ret (ha)	Delivery method	Monitoring Comments
Totals	127.34	9.66	10.09	4.64	6.96	4.98	5.56	8.48	0	31.21	39.28	6.48		

Table 26: Restocking in LISS coupes (Phase 1 2024-28)

Coupe Number	Total Gross Area (ha)	Net Area (ha)	Other con (ha)	Other brlvs (ha)	NMB/MB (ha)	Open (ha)	Retained from previous crop (ha)	Delivery method	Monitoring Comments
06006	4.3	1.24		1.24			3.06	Underplanting	SDA ²
06011	8.75	3.73	0.93		2.8		5.02	Restock planting	Restock planting
06035	2.43	0.63	0.63				1.8	Restock planting	SDA ²
06038	11.77	2.35	2.35					Underplanting	GPS planted groups SDA ²
Totals	27.25	7.95	3.91		2.8				



Planned forest roads and upgrades (see maps 10 & 13)

Table 27: Forest road requirements 2024-2034

Type & Location	Length (metres)	Net Area ¹⁰ (Hectares)	Roadline Felling (ha) ¹¹	Details	Monitoring
Road A New forest road NT 1176 9269 (St Ninians)	610	0.61	N/A	Length includes HGV passing place (layby). Existing road is too steep for loaded HGV. New road follows landform and will be screened by proposed new planting. Allows access for potential commercial harvest of SRC areas.	GIS Planned road layers (ForesterWeb)
Road B New forest road NT 1216 9356 (Main block east)	267	0.267	0.534	Allows access to phase three coupe clearfell coupe along B914 with some windblow. Road allows quick access of windblow spreads to B914. Length includes HGV turning, passing place & welfare storage.	GIS Planned road layers (ForesterWeb)
Road C New forest road NT 1157 9395 (Main block east)	474	0.474	0.44	Part of new road line runs along existing ride to reduce the felling area. Length includes HGV turning, passing place & welfare storage.	GIS Planned road layers (ForesterWeb)
Road D New forest road NT 1155 9385 (Main block east)	601	0.6010	1.02	Allows access to first thinning & larch clearfell coupe. First section runs on open ground. Length includes HGV turning, passing place & welfare storage.	GIS Planned road layers (ForesterWeb)
Road E New forest road NT 1062 9423 (Main block east)	530	0.53	0.69	Partly on open ground. Crosses under 11kv OHPL but will stop short of High pressure gas pipeline. Allows clearfell of 06074 including removal of larch. Also allows first thinning. Length includes HGV turning, passing place & welfare storage.	GIS Planned road layers (ForesterWeb)
Road F New forest road and bellmouth onto minor council road NT 1026 9496 (Main block west)	218	0.218	0.266	Part of road line is open ground. The roadline ends before reaching 10b deep peats. The new road will allow phased felling of two 10b peat restoration areas (Phase 2 coupe 06101 & Phase 3 coupe 06100) and avoid timber extraction across Lochornie burn and associated wetlands/riparian zones. All timber to be transported south to B914.	GIS Planned road layers (ForesterWeb)
Road G New forest road and bellmouth	189	0.189	0.38	Allows phased clear felling of Phase 1 coupe 06111 and Phase 2 coupe 06112. All timber to be transported south to B914.	GIS Planned road layers (ForesterWeb)

¹⁰ Assuming 10 metre construction width footprint

¹¹ Assuming a 20 metre felling swathe including temporary spoil areas and final roadside verges.



Type & Location	Length (metres)	Net Area ¹⁰ (Hectares)	Roadline Felling (ha) ¹¹	Details	Monitoring
onto minor council road NT 0982 9588 (Main block west)					
Road H New forest road NT 0860 9499 (Main block west)	514	0.514	1.026	Allows clearfell of Phase 2 coupe 06105 and subsequent peat restoration. Approximately 268 metres will be on deep peat soils. Construction design will allow it to function without roadside drains on deep peats soils & enable removal of road stone once harvesting operation complete. Road will be floated on felled timber on deep peat. Area includes HGV turning & passing bay. A ~210 metre spur will be retained on mineral soils to allow access for peat restoration, maintenance and deer control.	GIS Planned road layers (ForesterWeb)
Road I New turning point NT 1079 9656 (Main block east)	30	0.03	0.06	HGV turning point. No existing turning point at the end of this road.	GIS Planned road layers (ForesterWeb)
Existing road upgrade 1 (Main block east) NT 1297 9432	360	0	0	This will allow clearfell of Phase 1 coupe 06055 and avoid loading timber from the tarmac shared access road.	GIS Planned road layers (ForesterWeb)
Existing road upgrade 2 (Main block east) NT 1096 9631	598	0	0	This will increase access options in this area of the forest and reduce access pressure on the forest road to the south which has a high pressure gas pipeline.	GIS Planned road layers (ForesterWeb)
Totals New Roads	3433	3.433	4.42		



Appendix III: Key Woodland Changes (2024-44)

Table 28 – Land use change within forest 2024-2044

Land Use	Area 2024 (ha)	% of Total Plan Area 2024	Area 2034 (ha)	% of Total Plan Area 2034	Area 2044 (ha)	% of Total Plan Area 2044
High Forest ¹	1055.03	79.01	1030.60	77.18	991.30	74.24
Designed open ²	169.01	12.66	266.86	19.99	308.06	23.07
Successional open	24.80	1.86	16.00	1.20	14.10	1.06
Plantable land	42.24	3.16	0.00	0.00	0.00	0.00
Short rotation coppice	25.54	1.91	0.00	0.00	0.00	0.00
Research plantations	6.50	0.49	6.50	0.49	6.50	0.49
Unplantable/bare	5.80	0.43	8.96	0.67	8.96	0.67
Built facilities ³	0.86	0.06	0.86	0.06	0.86	0.06
Quarries	1.90	0.14	1.90	0.14	1.90	0.14
Agricultural land	1.90	0.14	1.90	0.14	1.90	0.14
Open water	1.67	0.13	1.67	0.13	1.67	0.13
TOTALS	1335.25	100	72.39	100	72.39	100

¹Including abandoned christmas trees, felled/fallow & windblow

²Including restored mire habitats.

³Offices, storage & workshop, visitor car park & picnic areas

Figure 5 % Land use change within forest 2024-2044

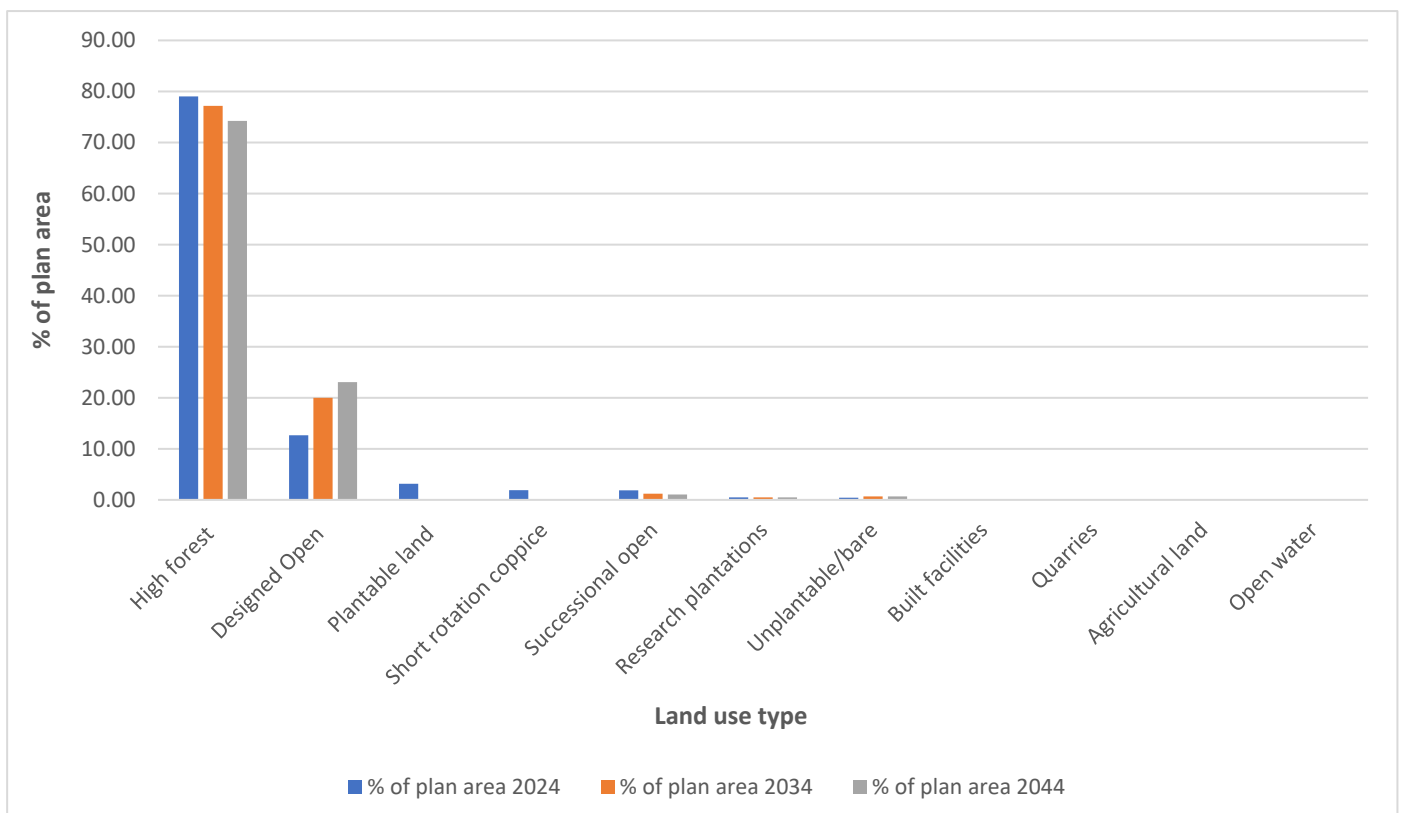




Table 29 Change in tree species 2024-2044

Forest Component	Tree code for Figure *	% of forest stands 2024	% of forest stands 2034	% of forest stands 2044
Sitka spruce	SS	56.59	42.40	37.94
Norway spruce	NS	9.08	9.84	9.84
Pine spp.	Pines	6.83	11.50	12.10
Larch spp.	Larches	3.66	0.00	0.00
Grand/Douglas	Firs	1.23	1.67	2.47
Other/mixed conifers (incl. Serbian spruce, Macedonian pine.)	XC	1.06	2.85	2.97
Native Mixed broadleaves	NMB	6.11	15.22	18.02
Mixed broadleaves	MB	8.72	5.78	5.38
Oak (robur/petraea)	OK	0.73	0.97	1.02
Birch (downy/silver)	BI	2.13	6.27	6.92
Beech	BE	3.00	2.86	2.74
Sycamore	SY	0.78	0.55	0.51
European Ash	AH	0.09	0.09	0.09
TOTALS		100	100	100

Figure 6 % Change in tree species 2024-2044

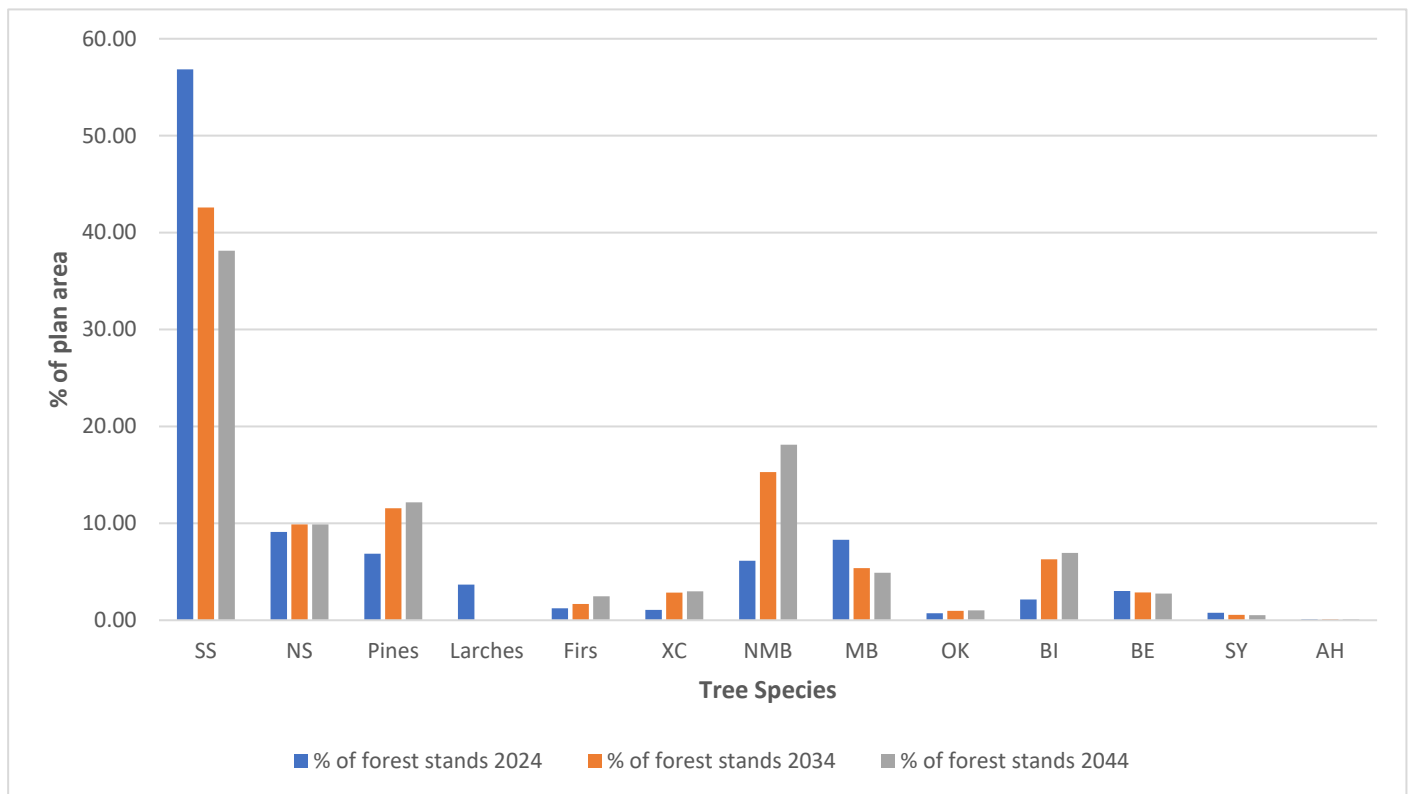
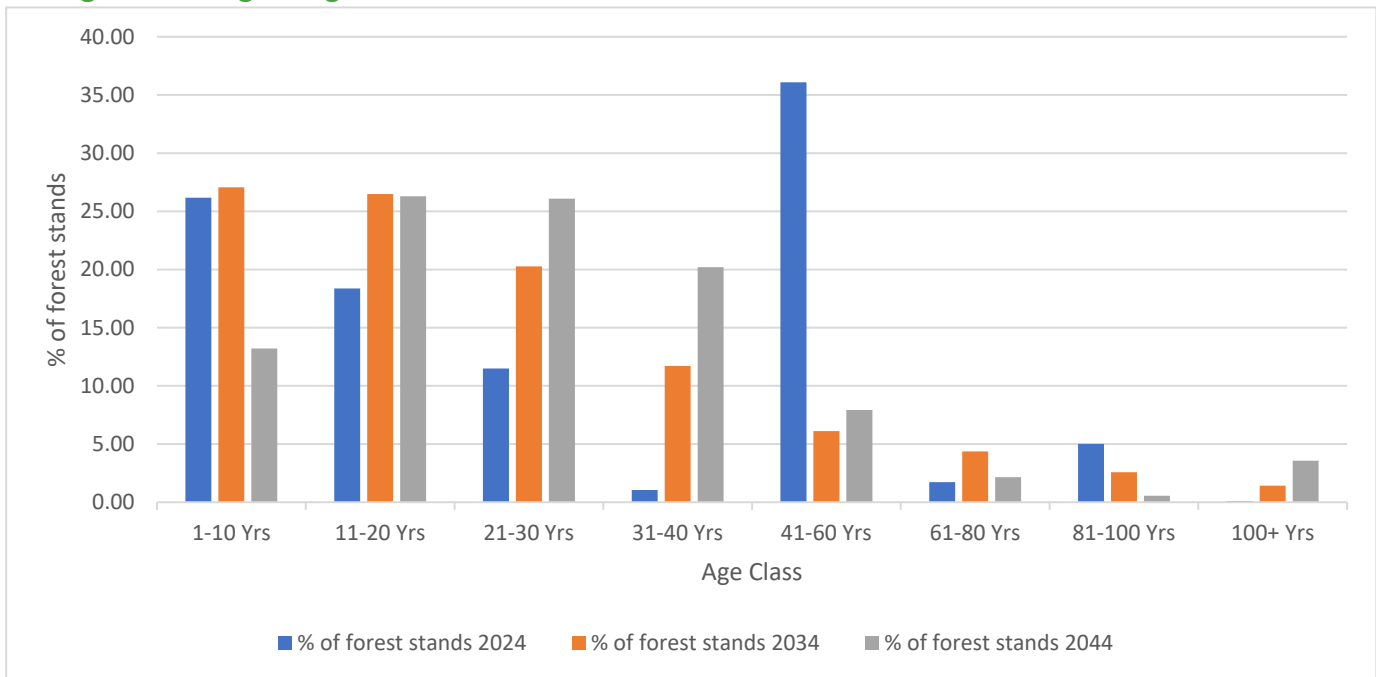




Table 30 Change in age class distribution of forest stands 2024-2044

Tree Age Class	% of Total Plan Area 2024	% of Total Plan Area 2034	% of Total Plan Area 2044
1-10 Yrs	26.17	27.06	13.21
11-20 Yrs	18.37	26.48	26.29
21-30 Yrs	11.49	20.27	26.09
31-40 Yrs	1.05	11.71	20.20
41-60 Yrs	36.09	6.11	7.93
61-80 Yrs	1.72	4.36	2.15
81-100 Yrs	5.02	2.57	0.55
100+ Yrs	0.09	1.43	3.57
TOTALS	100	100	100

Figure 7 Change in age class distribution of forest stands 2024-2044





Appendix IV: List of Maps

1. Forest location
- 2a & b. Climate & soils
3. Hydrology & water supplies
4. Existing forest
5. Landscape setting
6. Visitor zones and recreation
- 7a & b. Heritage & conservation east & west
8. Analysis of constraints and opportunities
9. Future concept design
- 10a & b. Management coupes-Ten year felling, thinning plan
- 11a & b. Future species and habitats & 10 year restock coupes
12. LISS management plan
13. Operational access & timber haulage.
14. Woodland creation on former opencast



Appendix V: Objective, Appraisal, Monitoring & Evaluation

This table 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-term and end of term plan reviews.

Objective	Assessable Criteria	Appraisal Method	Monitoring Method	Monitor Where	Monitor When	Monitor Who	Record Monitoring Where	Evaluation. <i>How does the Appraisal and Monitoring method inform current & future proposals? If you cannot answer this question then the methods may not be appropriate.</i>
To provide a sustainable supply of conifer and broadleaved timber products.	Marketable timber volume output. Thinned conifer & broadleaved stands.	Completion of forest operations proposed in this plan. Assessment of volume output & product breakouts. Assessment of stand characteristics in sub-compartment database: thinning records & stocking density assessment (SDA)	LMP Mid-term review & plan renewal	LMP Mid-term review & plan renewal	LMP 5 year mid-term and 10 year review/plan renewal.	Planning & Programming teams	LMP Mid-term Review. LMP Renewal	The evaluation process will inform planners and delivery teams: <ol style="list-style-type: none"> If volume output and stand interventions need to be increased or decreased. If baseline data on crop yield in the forest is accurate. Where thinning programmes need to be increased or decreased. Where action is required to improve productive stocking as set out in the LMP prescriptions.
Maintain recreational assets and community engagement.	Condition and extent of recreational assets in the forest. Recreational events in the forest. Community feedback. Visitor numbers.	Assess feature condition & number of facilities (incl. paths). Recording of community involvement & visitor services events. Analyse feedback at plan renewal.	LMP mid-term review & renewal.	LMP mid-term review & renewal.	LMP 5 year mid-term and 10 year review/plan renewal.	Planning team, Visitor services team	LMP 5 year mid-term and 10 year review/plan renewal.	The evaluation process will inform planners if a review of management prescriptions is required to protect, maintain or increase recreational assets. The evaluation process will inform planners and the visitor services team if



Objective	Assessable Criteria	Appraisal Method	Monitoring Method	Monitor Where	Monitor When	Monitor Who	Record Monitoring Where	Evaluation. <i>How does the Appraisal and Monitoring method inform current & future proposals? If you cannot answer this question then the methods may not be appropriate.</i>
	Discussions with visitor services teams.	Recording of visitor numbers using people counters.						and how more community engagement and recreational activities should be delivered.
Over the longer term, move to lower impact forest management systems in visitor zones, recognising the value of these areas for local communities and tourism.	Silvicultural system used and LISS operations delivered. Restocking and woodland types established.	Review of LISS management over the plan period. Comparison with approved LISS management coupes & prescriptions. Review of established crops over the plan period – comparison with approved future species & habitats plan and prescriptions.	LMP mid-term review & renewal.	LMP mid-term review & renewal.	LMP 5 year mid-term and 10 year review/plan renewal.	Planning team, Visitor services team	LMP 5 year mid-term and 10 year review/plan renewal.	The evaluation process will inform planners if more resources are required to implement the approved proposals or if more frequent monitoring is required of delivery progress. It may also prompt a review of management prescriptions and use of alternative methods to reach the objective.
Restore priority open peat habitats.	Area of restored peats. Condition of restored peats. Tree colonisation.	Review delivery with peat and programming team. Assess peat morphology, mire vegetation and tree colonisation.	On site surveys Workplan cross-team operation ¾ completion meetings. LMP mid-term review & renewal.	LMP mid-term review & renewal.	At workplan completion. LMP 5 year mid-term and 10 year review/plan renewal.	Planning, Programming & Peat teams	LMP 5 year mid-term and 10 year review/plan renewal.	The evaluation process will inform planners if more resources are required to implement the approved proposals or if more frequent monitoring is required of delivery. It will prompt a review of management prescriptions and consideration of alternative methods to reach the objective if necessary.



Objective	Assessable Criteria	Appraisal Method	Monitoring Method	Monitor Where	Monitor When	Monitor Who	Record Monitoring Where	Evaluation. <i>How does the Appraisal and Monitoring method inform current & future proposals? If you cannot answer this question then the methods may not be appropriate.</i>
Protect and enhance wildlife and hydrological assets.	<p>Protection of identified species and habitats during forest operations.</p> <p>Delivery of future habitats and species plan</p>	<p>Recognition of key features in workplans and operational delivery.</p> <p>Inspect condition of breeding locations, setts, habitats prior to, during & post-operations.</p> <p>Review the delivery of future habitats and species plan.</p>	<p>Review at delivery programme meetings.</p> <p>Workplan cross-team operation ¼ completion meetings.</p> <p>Routine site inspections.</p> <p>Sub-compartment updates.</p>	<p>Programme meetings.</p> <p>Onsite.</p> <p>Sub-compartment database.</p>	<p>Prior to, during and nearing completion of operations and at appropriate intervals e.g. LMP mid-term and 10 year reviews.</p>	<p>Planning team/ Programme Manager/Environment team/ Harvesting team/ /FM team.</p>	<p>LMP Files</p> <p>Fweb conservation layers</p> <p>Work plans</p> <p>LMP Mid-term Review.</p> <p>LMP Renewal</p>	<p>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.</p> <p>Will inform delivery teams where increased controls are required during operations.</p>
Protect & enhance heritage assets, focusing on the designed landscapes linked to Blairadam Estate.	<p>Condition of heritage features</p> <p>Delivery of future habitats and species plan</p>	<p>Recognition of key features in workplans and operational delivery.</p> <p>Inspect condition of heritage features prior to, during and post-operations</p> <p>Review the delivery of future habitats and species plan.</p>	<p>Review at delivery programme meetings.</p> <p>Workplan cross-team operation ¼ completion meetings.</p> <p>Routine site inspections.</p> <p>Sub-compartment updates.</p>	<p>Programme meetings.</p> <p>Onsite.</p> <p>Sub-compartment database.</p>	<p>Prior to, during and nearing completion of operations and at appropriate intervals e.g. LMP mid-term and 10 year reviews.</p>	<p>Planning team/ Programme Manager/Environment team/ Harvesting team/ /FM team</p>	<p>Fweb heritage layers</p> <p>Work plans</p> <p>LMP Files</p> <p>LMP Mid-term Review.</p> <p>LMP Renewal</p>	<p>The evaluation process will inform planners if a review of management coupes and restock design is required to provide greater protection to these features.</p> <p>Will inform delivery teams where increased controls are required during operations.</p>



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.
Manage and mitigate impacts of tree pests and diseases (e.g. <i>Phytophthora ramorum</i> in larch).	<p>Tree species composition.</p> <p>Tree species condition.</p> <p>Quantity & distribution of larch.</p>	<p>Sub-compartment database analysis of larch and other vulnerable species.</p> <p>Tree condition surveys</p> <p>Routine site inspections.</p> <p>FLS Stocking Density Assessment (SDA).</p>	<p>Delivery team routine site visits.</p> <p>Sub-compartment updates.</p> <p>LMP mid- term review and renewal.</p> <p>SDA results analysis</p>	<p>Sub-compartment database.</p> <p>Programme meetings.</p> <p>LMP files</p>	<p>At other appropriate intervals e.g. LMP mid-term and 10 year reviews.</p>	<p>Planning team/ Programme Manager/ Harvesting team/ /FM team</p>	<p>Delivery & Planning Team Records.</p> <p>LMP Mid-term Review.</p> <p>LMP Renewal</p>	<p>The evaluation process will inform planners and the programme manager:</p> <ol style="list-style-type: none"> If the LMP work programme is being achieved (i.e. larch removal). If further adjustments are required to species choice. If an adjustment to thinning intensity is required. <p>For example, if <i>Dothistroma</i> 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.</p>
Continue to diversify tree species and forest structure to increase resilience in a changing climate.	<p>Species composition.</p> <p>Stand stability.</p> <p>Tree growth rates & health.</p> <p>Windfirm edges & fire breaks established as delivery of plan progresses</p>	<p>Sub-compartment database species analysis.</p> <p>Aerial photography checks for windthrow & tree condition.</p> <p>Routine site inspections.</p> <p>FLS Stocking Density Assessment (SDA) to check restocking follows LMP.</p>	<p>Delivery team routine site visits.</p> <p>Sub-compartment updates.</p> <p>LMP mid- term review and renewal.</p> <p>SDA results analysis</p>	<p>Sub-compartment database.</p> <p>On site</p> <p>Programme meetings.</p> <p>LMP files</p>	<p>After operations and at appropriate intervals e.g. LMP mid-term and 10 year reviews</p>	<p>Planning team/ Programme Manager/FM team</p>	<p>Delivery & Planning Team Records.</p> <p>LMP Mid-term Review.</p> <p>LMP Renewal</p>	<p>The evaluation process will inform planners and delivery teams:</p> <ol style="list-style-type: none"> Where and when thinning is possible in the future. Where action is needed to removed diseased species or windblown stands. Which productive species to specify in the future habitats and species plan. <p>Alternative productive species for use in beat up operations (within the regulatory tolerances).</p>



Objective	Assessable Criteria	Appraisal Method	Monitoring Method	Monitor Where	Monitor When	Monitor Who	Record Monitoring Where	Evaluation. <i>How does the Appraisal and Monitoring method inform current & future proposals? If you cannot answer this question then the methods may not be appropriate.</i>
Work in partnership to create woodland on vacant and derelict land.	<p>Delivery of future species & habitats plan.</p> <p>Tree growth rates & health.</p> <p>Effectiveness of partnership working.</p>	<p>FLS Stocking Density Assessment (SDA).</p> <p>Crop growth assessment.</p> <p>Discussions with delivery teams</p>	<p>SDA results analysis.</p> <p>Onsite assessment of crop growth.</p> <p>LMP mid- term review & renewal.</p> <p>Sub-compartment updates.</p>	<p>Sub-compartment database.</p> <p>On site</p> <p>Programme meetings.</p> <p>LMP files</p>	<p>After operations and at appropriate intervals e.g. LMP mid-term and 10 year reviews</p>	<p>Planning team/ Programme Manager/ /FM team</p>		<p>The evaluation process will inform planners and delivery teams:</p> <ol style="list-style-type: none"> 1. Where additional action is required to establish crops. 2. Alternative productive species for use in beat up operations (within the regulatory tolerances) and where this meets management objectives.

