Forestry and Land Scotland
Coilltearachd agus Fearann Alba

Angus Glens
Long Term Forest Plan
2026 - 2036

V1.0

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

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

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I hereby apply for a permission to fell the trees described in this application and I certify that:

- I have notified all stakeholders that may be affected by the felling in this application and sought their views prior to submitting this application.
- I am authorised to sign legal contracts on behalf of Forestry and Land Scotland.
- Any necessary consents from any other person(s) if required, have been obtained.
- I have made the necessary checks with the local planning authorities regarding Tree Preservation Orders and Conservation Areas.
- I hereby acknowledge that Scottish Ministers may process any of my personal data contained in or relating to this application in accordance with the terms of Scottish Forestry's Privacy Notice, a copy of which is available at www.forestry.gov.scot.
- Where applicable and appropriate I have submitted an EIA screening opinion form for operations contained within this application under the Forestry (Environmental Impact Assessment) (Scotland) Regulations 2017.
- I have read and understand this application fully and, to the best of my knowledge and belief, the information given in this application is complete, true, and accurate.
- I accept that any false or misleading information provided in this application constitutes an offence and may result in any felling permission based on this application being revoked at any time.
- I have read and understand Scottish Forestry's Privacy Notice, a copy of which is available at https://forestry.gov.scot/privacy-complaints-freedom-of-information-and-requests-for-information.

Signed, Pp Regional Manager		Signed, Pp Conservator	
FLS Region	East Region	SF Conservancy	
Date		Date of Approval	
		Date Approval Ends	
		Plan Ref. No.	

Contents

Section A Description of Woodlands 6

A.1 Property Details 6

A.2 Location and Background 6

A.3 Existing Schemes and Permissions 7

A.4 Stakeholder Engagement 9

A.5 Long Term Vision and Management Objectives 12

A.6 General Site Description 15

A.6.1 Topography and Landscape 15

A.6.2 Geology and Soils 15

A.6.3 Climate 17

A.6.4 Hydrology 19

A.6.5 Windthrow 20

A.6.6 Landscape and Adjacent Land Use 20

A.6.7 Access and Recreation 21

A.6.8 Historic Environment 22

A.6.9 Biodiversity 22

A.6.10 Invasive Species 25
A.7 Woodland Description 25
A.8 Plant Health 30
Section B Analysis of Information 32
B.1 Opportunities and constraint analysis 32
B.2 Concept 44
Section C Management Proposals 45
C.1 Silvicultural practice 45
C.2 Management Prescriptions 45
C.2.1 Felling 46
C.2.2 Thinning 49
C.2.3 Low Impact Silvicultural Systems (LISS) 50
C.2.4 Long Term Retentions (LTR) / Natural Reserves 51
C.2.5 Restocking Proposals, Future Habitats and Species 52
C.2.6 Protection and Deer management 63
C.2.7 Fence erection / removal 64
C.2.8 Road operations 64
C.2.9 Public access 65
C.2.10 Historic environment 66
C.2.11 Biodiversity 69
C2.12 Plant health 71
C.2.13 Management of invasive species 71
C.2.14 New Planting 72

C.2.15 Other 73
C.2.15.2 Hydrology 74
Appendices 80

Section A Description of Woodlands

A.1 Property Details

Property Name:	Glen Prosen and Glen Doll
Grid Reference (main entrance):	**Glen Prosen** NO 2909 6805 **Glen Doll** NO 2853 7605
Nearest town or locality:	Kirriemuir
Local Authority:	Angus Council

A.2 Location and Background

These iconic glens are the southern gateway to the Cairngorms National Park. T**his proposed Long Term Forest Plan (LTFP) covers 1600ha of plantation forest in Glen Doll and Glen Prosen**. It is an important opportunity to work with our neighbours and partners, to achieve landscape scale habitat restoration in the Cairngorms National Park to benefit nature recovery, climate resilience, and people's well-being. The area forms part of the South Esk catchment which has recently been identified as a priority for public agency joint working and identified as a priority landscape to deliver nature recovery under the Scottish Biodiversity Strategy.

This LTFP comprises two areas: **Glen Prosen** forest block and **Glen Doll** forest block.

Glen Prosen Forest covers **877 ha** and lies in the upper part of **Glen Prosen**, close to where the public road terminates. There are two access points into the forest, one leading off the public road and the other by an access route at Cramie Farm. The forest block

has two river valleys running through it, separated by ridges of higher ground, giving varied topography from low lying wet areas to steeper hill sides and elevated upland. Most of the **Glen Prosen** forest is composed of Sitka spruce, Scots pine, larch and Lodgepole pine, which was planted between 1961 and 1970, and there are areas of earlier planting from the 1950s of Scots pine and larch. The forest functions primarily for timber production and has a low landscape and recreation impact. There is good potential to develop riparian woodland zones along the Special Area of Conservation (SAC) -designated watercourses and for woodland creation above the existing crop on open hill ground.

Glen Doll forest covers **702ha** situated at the head of Glen Clova and is one of the southern gateways to the Cairngorms National Park. As a gateway site, **Glen Doll** attracts a wide range of visitors from the summer walker to the winter mountaineer and has a ranger centre and education room, public toilets, car parking and picnic areas. It also sits in the Deeside and Lochnagar National Scenic area and provides a striking feature on the edge of the Cairngorms massif, having been heavily influenced by past glacial activity. This steep-sided and enclosed glen provides a marked contrast to the broad, flowing landscape of Glen Clova. The forest is directly adjacent to the Corrie Fee National Nature Reserve and the Red Craig Special Site of Scientific Interest (SSSI) for geology and is located partly within the forest boundary. The rivers within the Glen form part of the South Esk Special Area of Conservation. There is a diverse area of mature mixed conifers around **Glen Doll** Lodge, as part of a designed landscape feature for that residence. **Glen Doll** forest was planted in the 1950s and 60s, with a mix of Scots pine, Lodgepole pine, larch and Norway spruce and Sitka spruce. These mature, even-aged crops have been significantly impacted by storm damage in recent years.

A.3 Existing Schemes and Permissions

Type: **Glen Doll** Land Management Plan
Ref. No: 033/T/G/10 (6)
Details: Expired 19/11/2020, extended to 19/11/2022

Type: **Glen Prosen** Land Management Plan
Ref. No: 033/T/G/13/5
Details: Expired 20/12/2023

Type: **Glen Doll** Felling Permission - active
Ref. No: FPA-11379
Details: Expires on 1st July 2026 – felling permission for windblow coupes, granted 1st July 2024.

This LTFP combines what have previously been two separate plans, under new objectives for nature, people and climate, to provide a cohesive vision for our land holdings in the Angus Glens. The purpose is to outline felling and thinning proposals over 20 years, with the first 10 years (2025-2035) in detail along with restocking proposals for the whole plan area. This first 10- year period is particularly important because it relates to the part of the plan that requires specific approval from Scottish Forestry (SF). Longer term management is included in the plan to provide an indication of the direction of travel and context.

The plan will be reviewed after five years to ensure the objectives set out in the LTFP are still appropriate for the management of the forest in the current conditions. All operations, both planned and completed, will also be reviewed to ensure they are still necessary to achieve the stated objectives. The management of the woodland is certified and will always adhere to the UK Forestry Standard (UKFS) and the UK Woodland Assurance Standard (UKWAS).

A.4 Stakeholder Engagement

During the development of this LTFP, we have consulted publicly including local communities and stakeholders known to have an interest in the forest. Appendix I summarises the issues that were raised during consultation.

Between October 2023 and May 2025 during three public consultation periods, we held 17 events and public drop-ins, attended by over 400 people. Five of these were in **Glen Doll** Ranger Centre, where there was a display showing plans and encouraging visitors to leave feedback via the survey forms and postbox. We received 284 written responses concerning the proposed land management plans for the area and we have engaged multiple local and national stakeholders, talking to them through 43 face-to-face, site based, and online meetings.

Key issues and considerations identified during scoping

Ecological restoration

There is an appetite for significant native woodland restoration and expansion, especially in **Glen Prosen** where there is a particular scarcity of native trees, and in **Glen Doll** where there are new opportunities following windblow events to restructure and diversify the forest and restore ancient woodland with more native species. Damaged and eroding areas of peatland need to be restored. There are areas of particularly rare, and nationally important, montane willows and other alpine plants and scrub in the crags, which would greatly benefit from reduced herbivore pressure, natural regeneration and expansion.

Climate change

To contribute towards mitigating climate change land management should focus on sequestering carbon through woodland establishment, peatland restoration and good soil management. To adapt to the impact of climate change i.e. increased temperatures and extreme weather, we are seeking to increase diversity of habitats and species to create resilience against pests and diseases, and create habitats and woodland that can increase capacity of the land to slow down the flow of water and hold water in the land, so as to mitigate downstream flooding and protect against wildfire. As part of this LTFP we have developed a wildfire plan to mitigate increasing risks and help us to respond in an emergency -see Appendix VI.

Silviculture

Storm Arwen (November 2021) led to large areas of windblow and destabilisation, especially within older, mature crops – leading to an increase in felling activity and a higher rate of change. This storm damage has led to a reduction in timber values, increased operational risk during harvesting as well as increased vulnerability of the standing trees to further storm damage.

There have been Statutory Plant Health Notices (SPHNs) in the neighbouring Glen Isla for *Phytophthora ramorum* (fungal disease), and both **Glen Doll** and **Glen Prosen** contain areas of larch that require roading work to access, presenting challenges in the event of a SPHN notification. There was also detection of *Dendroctonus micans* (beetle that poses a threat to commercial forestry due to its destructive feeding habits) in Kirriemuir in 2021, which may present a threat to spruce and pine if this spreads into the glens.

Much of the conifer plantations in **Glen Doll** and **Glen Prosen** are of a mature, even age, reaching or exceeding optimum size for harvesting. They are on steep ground with limited access and considerable environmental and site constraints. We will need to balance timber income potential with the rate of change in the forest. In the future it may be possible to achieve a low impact silviculture system (LISS) that is productive through more diverse native species of broadleaf and conifer and enhances ecological restoration objectives.

Landscape

The Glen Doll forest block is located at the north western end of Glen Doll where it forks at the confluence of the White Water and the River South Esk. As the gateway to the southern part of the Cairngorms National Park **Glen Doll** is located within a National Scenic Area, noted for its dramatic and rugged landscape, wild and remote feeling and strong evidence of glacial processes

Glen Prosen forest block is located at the north western end of Glen Prosen where it meets the southern Cairngorms and mountains of Mayar and Driesh and is part of the 'Upland Glen' landscape character area. The majority of the forest block is located within the Cairngorm National Park (CNP) and the upper reaches of the glen, north of Kilbo Bothy, is a Wild Land Area (Cairngorms WLA 15).

Protected species and habitats

There are a variety of protected mammals and birds in the glens, as well as priority plant species which will benefit from creating a more diverse mosaic of habitats. The rate of change within existing forests will need to be managed sensitively and areas requiring protection may impact on access for operations each year.

Designated sites

The glens lie in an area of designated sites: Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC), Special Protection Areas (SPA), National Scenic Area (NSA), National Nature Reserve (NNR), Cairngorms National Park, notifiable for a variety of exceptional flora, fauna, geology and landscape reasons. Some of these areas are in poor condition and need restoration, for example the River South Esk SAC would benefit from water course restoration to improve the habitat for spawning salmon. The area surrounding **Glen Doll** lodge is designated as a Historic Designed Landscape, comprising a diverse selection of well established, non-native conifers which are contained within an area of ancient woodland present on the Roya maps.

Herbivore impact

Large transitory populations of deer in and around the glens pose challenges for woodland establishment and other habitat restoration and will need to be managed by a combination of culling and fencing initially. Highly mobile deer population means that we need to work with neighbours that may have differing management objectives, and within the Caenlochan Section 7 Agreement of the South Grampian Deer Management Group. Other herbivores such as rabbits, voles and mountain hares will also need consideration when protecting new woodland creation.

Access for operations

Timing of land management operations may be limited by environmental and visitor considerations. Site factors such as weather, altitude, slopes, and daylight hours in winter will impact operations. Some of the windblown crop does not have sufficient road access and will require new roading/track construction to harvest. The public roads are timber transport consultation routes. They are single track and, in **Glen Prosen** particularly, require maintenance/upgrade to allow for timber haulage to take place – this has

been addressed through a joint project between FLS, Angus Council and other neighbouring landowners. A grant was awarded from the Timber Transport Fund to create new passing places on the public road into Glen Prosen in late 2025, allowing for safer access in and out of the glen for all road users.

Visitors, recreation and community

The glens are popular areas for long and short distance hiking/biking/horse riding trails, and include the Kilbo Path, the summits of Dreish and Mayar, as well as connecting **Glen Prosen** and **Glen Doll** – access needs to be considered when planning operations. Some trails in **Glen Doll** are currently closed due to windblow, which needs addressing. Local communities have expressed interest in being involved in our plans; community wellbeing and the establishment of a working landscape is an important intended outcome.

A.5 Long Term Vision and Management Objectives

Vision

Scotland's Forestry Strategy 2019-2029 sets out the vision for forestry in Scotland: "In 2070, Scotland will have more forests and woodlands, sustainably managed and better integrated with other land uses. These will provide a more resilient, adaptable resource, with greater natural capital value, that supports a strong economy, a thriving environment, and healthy and flourishing communities.

FLS will continue to help deliver the vision for forestry in Scotland. In so doing, the vision for FLS is as follows: "Forests and land that Scotland can be proud of." FLS will work towards this vision by delivering its mission, which is: "To look after Scotland's forests and land, for the benefit of all, now and for the future."

We will achieve our vision and mission by making a positive contribution to the economy, environment and people of Scotland by:

- Protecting our forests and land.
- Growing the value of our business; and
- Investing in our people and communities.

Our expression of this for FLS Angus Glens will be:

Our hundred-year vision is that the Angus Glens will be a flourishing mosaic of habitats stretching from rivers to mountain tops in the southern Cairngorms. Thriving woodlands, peatlands and heathlands will support rich wildlife, balanced deer populations and the landscape will be resilient to climate extremes - vegetation will slow floods, cool rivers, and lock away carbon. The glens will inspire learning, enterprise and innovation, benefitting communities near and far.

Strategic Aims

Nature: manage the forest and land to increase biodiversity, enhance protected features, and facilitate landscape scale ecological recovery by enabling natural processes.

People: provide opportunities for education, learning, health and well-being through recreational and working use of the site for the benefit of communities near and far.

Climate: manage the forest and land to help with flood risk reduction, fire resilience, carbon sequestration and storage; and sustainable timber production.

Plan objectives are influenced by local site factors and may be applicable to the whole plan area or more specifically to individual management zones.

Table 1: objectives for both **Glen Prosen** and **Glen Doll**

Objective	Critical Success Factor
1. Create new native woodland and scrub using varied species and structural composition.	Integration into a mosaic of open and wooded habitats, with habitat development closely monitored.
2. Restore peatland (damaged by erosion, drainage and overgrazing) to capture carbon, slow the flow of water and benefit biodiversity.	Areas identified through surveying and assessment and programme of restoration works in place.
3. Undertake/facilitate river restoration and management for freshwater and riparian habitats, including riparian tree and shrub planting in **Glen Prosen** and enhancing riparian areas in **Glen Doll**.	Riparian networks felled within plan period and native broadleaves planted.
4. Enhance, protect and expand montane scrub in high mountain crag zones and surrounding open habitats.	Creation of an alpine tall herb and montane scrub mosaic.
5. Protect and restore priority open habitats such as heathland, grassland, wet flushes.	Improved habitat conditions and species diversity.
6. Enhance responsible and inclusive access for visitors of varying abilities where appropriate.	Creation of new viewpoint and low-level walk-in **Glen Doll** and informal access through new woodland creation in **Glen Prosen**.
7. Harvest mature timber crops in plantations, including removing windblow, to achieve commercial income.	Felling achieved in plan period, meeting production targets.

8. Integrate existing plantations into the landscape and habitat restoration aims for the site.	More varied and native species composition, interlocking with surrounding landscape and neighbouring woodland creation schemes, and managing for protected woodland species.
9. Management to enhance plant health and minimise impact of existing diseases.	Monitoring *Phytophthora ramorum* and pro-active management of the larch crop.

A.6 General Site Description

See Context and Key Features Maps 22 & 23.

A.6.1 Topography and Landscape

The **Glen Prosen** forest block and open land lies at the head of the glen, and includes the summits of two Munros, reaching 947m above sea level. Prosen Water flows through the main U-shaped valley, with smaller tributaries such as Burn of Kilbo and Burn of Louie running through steeper V-shaped valleys to the north and east of the site. The southern area of Cormuir is its own miniature glen centered around the Burn of Cormuir and the system of flushes, mires and peatland. At the northern end of the site, the ground rises steeply up away at the head of the glen into rocky crags containing a distinctive mix of montane flora.

Glen Doll forest is located at the head of Glen Clova around the confluence of the River South Esk and the White Water, on the lower slopes of an area of mountain and moorland known as the Mounth. The glen forms a striking feature on the edge of the Cairngorms massif, having been heavily influenced by past glacial activity. This steep-sided and enclosed glen provides a marked contrast to the broad, flowing landscape of Glen Clova. The Red Craig SSSI is located partly within the forest boundary.

A.6.2 Geology and Soils

See Soils maps 14 and 15.

Glen Prosen is predominately underlain by Quartz-mica-schist, grit, slate and phyllite (Upper Dalradian), part of the large group of schists comprising the Dalradian series. Overlying the solid geology there are deposits of fluvioglacial till and shallow drift deposits left by the receding glaciers of the last ice age.

The soils in **Glen Prosen** forest block are predominately Upland brown earth and surface water gleys, in the Southern half of the forest iron pan soils and podzols are more frequent on the higher ground. In the Northern half end of the forest there are more gleys and some areas of flushed bog and iron pan soils on the upper margins. These soils suit a reasonable range of upland tree species, particularly Spruce, Larch and Scots pine. The most suitable broadleaves are birch, rowan, alder and willow.

Outside of the forest block, a comprehensive soil survey conducted by Forestry and Land Scotland (FLS) and the James Hutton Institute revealed a rich and varied soil landscape of:

- Brown Earths: Including typical, basic, upland, and podzolic variants—common in forested and well-drained areas.
- Podzols and Ironpan Soils: Found in upland heath and coniferous zones, often acidic and poorly drained.
- Gleys: Groundwater and surface-water gleys, including peaty variants, dominate wetter low-lying areas.
- Bogs: Extensive bog types such as:
- Sphagnum, Calluna, Eriophorum, Trichophorum, and Molinia dominated blanket bogs.
- Fen and rush-dominated bogs (Juncus, Carex).
- Rankers and Scree: Shallow soils on steep slopes and rocky outcrops.
- Eroded Bog Complexes: Including hagged and pooled bogs, indicating past disturbance.
- Calcareous and Argillic Soils: Present in localized areas, supporting more nutrient-rich vegetation including rare plants.

Glen Doll is geologically complex, shaped by ancient glacial activity and composed primarily of metamorphic rocks such as schists and quartzites. These rocks are part of the Dalradian Supergroup, which dominates much of the Highlands and formed during the Precambrian era. The glen includes features like Corrie Fee, a classic glacial corrie, and is surrounded by peaks such as Driesh and

Mayar, which are accessible via high passes like the Kilbo Path. The terrain reflects a history of intense geological processes including folding, faulting, and erosion.

The soils in **Glen Doll** are diverse and reflect the varied topography and geology. According to detailed mapping, the area includes:

- Brown Earths (e.g., Typical, Basic, Upland, Podzolic): Found on well-drained slopes and forested areas.
- Podzols and Ironpan Soils: Common in upland heath and coniferous forest zones, often with poor drainage and acidic conditions.
- Gleys (Groundwater and Surface-water types): Present in low-lying or poorly drained areas, often supporting wetland vegetation.
- Peaty Soils and Bogs: Extensive in flatter upland areas, including blanket bogs dominated by species like Calluna and Eriophorum.
- Rankers and Scree: Found on steep slopes and rocky outcrops, often shallow and poorly developed.
- Mining Spoil and Eroded Bog: Indicating areas of past disturbance or erosion.

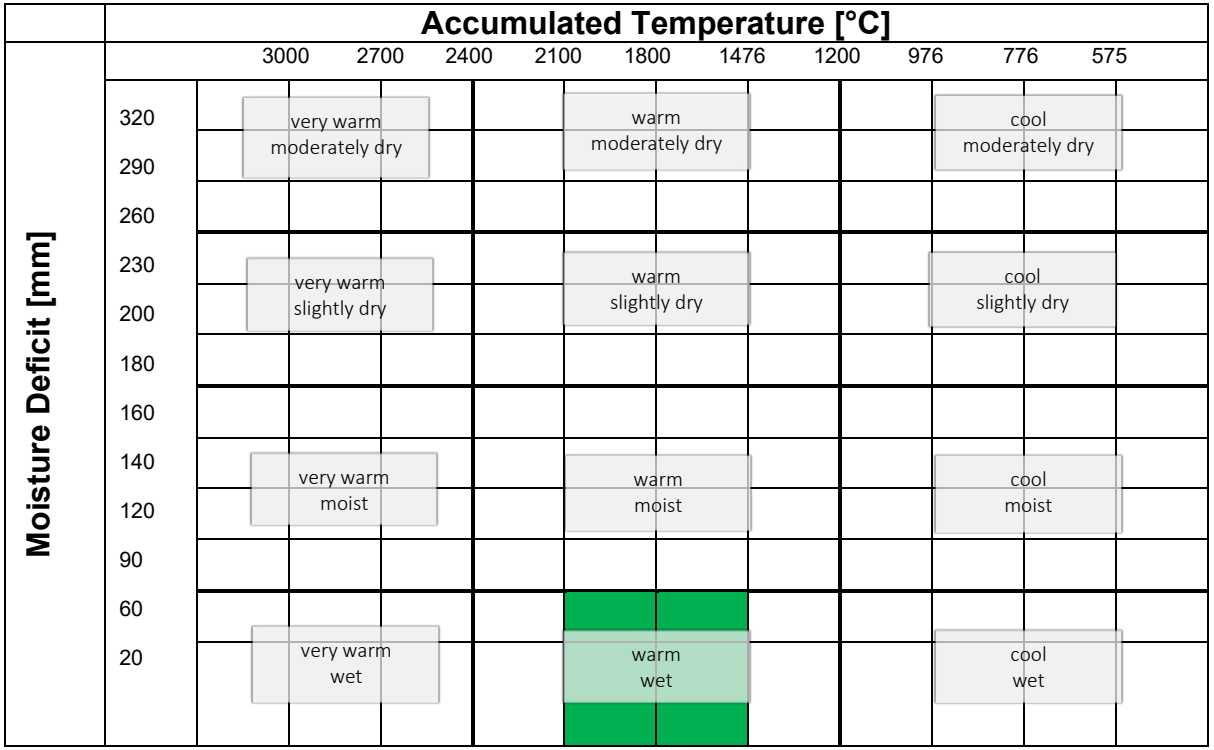
These soil types support a range of habitats, from alpine forests to wetland bogs, and are crucial for biodiversity and land management in the glen.

A.6.3 Climate

Glen Prosen at its highest point is 947 m and approximately 300m its lowest point which makes it relatively high and subject to cooler conditions than further down the glen.

In **Glen Doll,** the climate can be severe, and the changes can be rapid. At the edge of the forest the trees approach the limit of 600 m, and growth is therefore slow. In the past the glen was often blocked by snow; but over the past few years there have been very few days when access was impossible.

The climate data has been obtained from the Ecological Site Classification system (ESC). The results of interrogating this system gave the following data for Angus Glens:



Accumulated Temperature (AT5) is the accumulated total of the day-degrees above the growth threshold temperature of 5º, which provides a convenient measure of summer warmth. The results for AT5 place the entire block in the warm zone. **Moisture Deficit (MD)** reflects the balance between potential evaporation and rainfall and therefore emphasises the dryness of the growing season (rather than the wetness of the winter or entire year). These results place the block in the wet zone.

Each tree species has tolerances for these, and other factors and they can be used to identify species suitable for the site conditions. The results above will be used to help assist in the choice of tree species for restocking in this plan. Further information

on these criteria and the application of ESC can be found in Forestry Commission Bulletin 124 - An Ecological Site Classification for Forestry in Great Britain.

A.6.4 Hydrology

See Concept maps 4 and 5.

Glen Prosen forest is an important component in the local Angus Glen watershed with a number of named burns, Dead Water, Farchal, West, East and Mid Grain joining to form two significant water courses which pass through the forest before entering the Prosen Water which eventually joins the South Esk, all of which are designated as part of the Special Area of Conservation. There are three private waters supplies (PWS) with catchments in the plantation forest, both of which are surface/spring water abstraction.

Outside the forest, the upper reaches of the glen are dominated by Prosen Water, running through the main valley, and its tributaries coming in from the east through steep V-shaped valleys. There are further PWS in the main glen near to Old Craig and the deer larder, as well as a hydro scheme on the Burn of Kilbo.

In Glen Doll the River South Esk and its tributaries are part of the South Esk SAC. There are several burns running down the steep slopes, and the two main watercourse in the valley bottom are a strong feature in the landscape. There is no open water in or near to the forest. There are two PWS abstraction points in the forest block.

Glen Doll and Glen Prosen are within the upper catchment of Brechin, a Scottish Environment Protection Agency (SEPA) Objective Target Area, recently affected by storm flooding in 2023. The catchment is vast, with minimal woodland cover and the FLS landholding covers 8% of the overall catchment.

A.6.5 Windthrow

The wind throw risk is measured by the Detailed Aspect Method of Scoring (DAMS) score for the forest. This represents the amount of physically damaging wind that forest stands experience in the year. The range of DAMS for this area is from 12 – 15 and windiness is a limiting factor to commercial tree growth at higher elevations. **Glen Prosen** is moderately exposed, while **Glen Doll** is slightly more sheltered. The DAMS range indicates that, as you would expect, the areas at the tops of the glens are most exposed and therefore more liable to wind throw. This information will be used when felling coupes are planned and LISS prescriptions are to be implemented to reduce the risk of windthrow. Past storm events in the last five years have significantly impacted the plantations in both **Glen Doll** and **Glen Prosen**, with approximately 89 ha of windblow in **Glen Doll** and 66 ha in **Glen Prosen**.

A.6.6 Landscape and Adjacent Land Use

The open land at **Glen Prosen** was, managed as a grouse moor until the FLS acquisition in November 2022. There is still an agricultural element to the surrounding land use, with upland sheep farming and cattle grazing in the glen. Neighbouring estates comprise a mix of forestry, agriculture, deer stalking and grouse shooting.

The forest block crosses three landscape Character Types (LCT) as described in the NatureScot Landscape Character Assessment comprising of: Mid Upland Glen, Upland Glen and Summits and Plateau. These LCTs are strung along the upper catchment area for the Prosen Water with:

- Mid Upland Glen LCT is located on the southern approach to the forest block,
- Upland Glen LCT covers the central core area of the water course and forest block, and
- Summits and Plateau LCT, in the northwest, encloses the head of **Glen Prosen** valley and the flanking uplands.

Most of the forest block is located within the Cairngorm National Park and the upper reaches of the glen, north of Kilbo Bothy, is a Wild Land Area.

In Glen Doll neighbouring land use is deer stalking, though some farming takes place further along Glen Clova. The transition from farms to forest to hill ground is quite sudden and striking, adding to the interest of the area. The National Nature Reserve in Corrie Fee is managed to preserve biodiversity and rare alpine plant species.

The **Glen Doll** block straddles two landscape Character Types (LCT) as described in the NatureScot Landscape Character Assessment: Upland Glen and Summits and Plateaux. The River South Esk section diverges northwards, extending into the Summits and Plateau LCT, whilst the White-Water section is contained within the Upland Glen LCT (See Appendix VII).

The forest block is located within a National Scenic Area, Cairngorm National Park and is popular location for visitors to access hill tracks and experience the dramatic and rugged landscape.

A.6.7 Access and Recreation

See Visitor Access maps 18 and 19.

Visitor numbers at **Glen Prosen** are much lower and comprise mainly of walkers using the forest road network and tracks to access the Driesh and Mayar mountains. Out with the forest, there is a good network of estate tracks that allow access to the head of the glen and up onto the surrounding high ground.

Glen Doll has several main access routes that traverse the forest, in the form of core paths, Rights of Way and waymarked forest trails publicised by FLS. Around 65,000 people per year visit the forest and land to experience the landscape, wildlife and to access the Munros beyond. Recreation is a significant and important use of the forest. Facilities such as the car park, which has recently been expanded, and a Ranger Centre offering public toilets and information, mean that it will continue to be a core part of the offering at **Glen Doll**. Some of the trails in **Glen Doll** have been blocked by windblown trees since Storm Arwen in 2021, whilst we have been working to clear these, he core path known as ‘Jock’s Road’ remains blocked, with a diversion in place.

A.6.8 Historic Environment

No scheduled monuments are present within either the **Glen Prosen** or **Glen Doll**. There are a wide range of unscheduled sites across the estate, some of which have local or regional significant such as, old grouse butts and remains of past settlements and agriculture in the glens.

A.6.9 Biodiversity

See Environmental Designations maps 20 & 21.

A key factor behind the environmentally focused aims and objectives of this plan is the number of designated sites, protected species and priority habitats found in the plan area. The Table 2 summarises the designations:

Table 2: biodiversity designations in **Glen Prosen** and **Glen Doll**.

Designated Site Name	PA Site code	Site Type	Total Area of designated site (ha)	Area in this LTFP (ha)	% of Designated site on the Nation Forest Estate in this LTFP
Red Craig	1,335	SSSI	105.4	32.5	30.8
Caenlochan	282	SSSI	4,974.7	305.9	6.1
Caenlochan	8,216	SAC	5,200.8	305.9	5.9

Designated Site Name	PA Site code	Site Type	Total Area of designated site (ha)	Area in this LTFP (ha)	% of Designated site on the Nation Forest Estate in this LTFP
Caenlochan	8,474	SPA	5,972.6	305.9	5.1
Cairngorms Massif	10,234	SPA	187,484.8	1,006.2	0.5
Red Craig	1,335	SSSI	105.4	32.5	30.8
River South Esk	8,364	SAC	471.8	22.4	4.7
Corrie Fee	8,670	NNR	164	0	0

A.6.9.1 Priority Open Habitats

See Open Habitats Survey Maps 26 & 27.

As well as the above designated sites there is also a large proportion of Priority Open Habitats - covering 53% of the total LTFP area. In **Glen Prosen** these habitats make up 60% of the LTFP area, and feature to a lesser extent in **Glen Doll** (7% of the site), mainly curtailed to the open woodland fringes. Priority open habitats found in the plan area are:

- Upland heathland – 1,575 ha (31%)
- Blanket bog – 534 ha (10.6%)
- Upland flush, fen & swamp – 257 ha (5%)

- Montane heath – 255 ha (5%)
- Purple moor grass & rush pasture – 19 ha (0.4%)
- Lowland dry acid grassland – 1 ha (0.02%)
- Fen, marsh, and swamp – 7.3 ha (0.15%)
- Upland birch wood – 3.7 ha (0.07%)
- Wet woodland – 3 ha (0.06%)
- Native pine woodland – 5.6 ha (0.1%)

A.6.9.2 Wildlife and ecology

Birds: Populations of ground-nesting birds and raptors - waders, black grouse, golden eagle, hen harrier, goshawk, short eared owl and merlin, as well as a variety of passerines and woodland birds.

Invertebrates: 246 species recorded in **Glen Prosen**, including rare and threatened species; habitat diversity is key to conservation pf these species.

Mammals: the plan area is within a wildcat priority area and both forests are surveyed using camera traps for wildcat activity. Red squirrels are present in both forests, as are pine marten, otters and water voles. Mountain hares are present at low density on the high open ground.

Flora: Areas of **Glen Doll** forest are of high conservation value - much of the floral interest is concentrated along the riparian zones and includes species such as spignel, lesser twayblade, frog orchid and bugle. Twinflower, a nationally rare plant subject to a Species Action Plan, has an established habitat on the upper margins of some north-facing areas of the forest. In **Glen Prosen** there are areas of rich grassland, flushes and heath which have been surveyed.

A.6.9.3 Deer management

See Deer Management maps 16 & 17 and Appendix III.
There is a large Red deer population in the glens and the surrounding area, and Roe deer present also, averaging 15 deer per km^2 according to the 2025 population count by NatureScot. Overgrazing has degraded open habitats and prevented natural regeneration of woodland. Forest plantations have been protected by deer fencing for the most part, though the majority in **Glen Doll** is now porous and in a state of disrepair. A deer cull is set for each site but, even so, the transitory nature of the large herds means that fencing is needed to fully protect new planting.

A.6.9.4 Ancient woodland

Remnants of ancient woodland as identified via the Roy maps can be found in **Glen Doll** covering the south facing slopes below Craig Mellon around Jock's road.

A.6.10 Invasive Species

There are no records of invasive species within **Glen Prosen** or **Glen Doll**.

A.7 Woodland Description

See Current Species maps 2 and 3.

Plantation forest is mature, even-aged conifer for the most part, this is especially prevalent in **Glen Doll**. In **Glen Prosen** there has been more felling and restock in the last 20 years resulting in some younger crops coming through. Maps 2 and 3 show the actual tree cover and species at the present date. The Ordnance Survey base map also shows previously forested areas as conifer plantation, much of this is currently Open Ground with a presumption to restock. There are some instances where the actual forest/crop boundary differs slightly to that of the historic fenced enclosure so the base map shows forest up the historic fenceline but the actual crop boundary is within this due to areas of steeps and rocky ground that were unplantable.

Table 3: Area by species (plantations only).

Tree Species	Current (2026) Area ha	Current (2026) %	Year 10 (2036) Area ha	Year 10 (2036) %	Year 20 (2046) Area ha	Year 20 (2046) %
Norway Spruce	50	3.2%	107	6.7%	132	8.2%
Lodgepole Pine	210	13.2%	76	4.8%	17	1.0%
Mixed Conifers	11	0.8%	20	1.3%	20	1.2%
Native Mixed Broadleaves	30	1.8%	222	13.8%	388	24.3%
Sitka Spruce	401	25.0%	307	19.2%	115	7.2%
Scots Pine	192	12.0%	285	17.8%	397	24.8%
Larch	160	10.0%	101	6.3%	36	2.3%
Open ground	546	34.0%	482	30.1%	495	31.0%
Total	**1600**	**100%**	**1600**	**100%**	**1600**	**100%**

Chart 1: Area by species (plantations only)

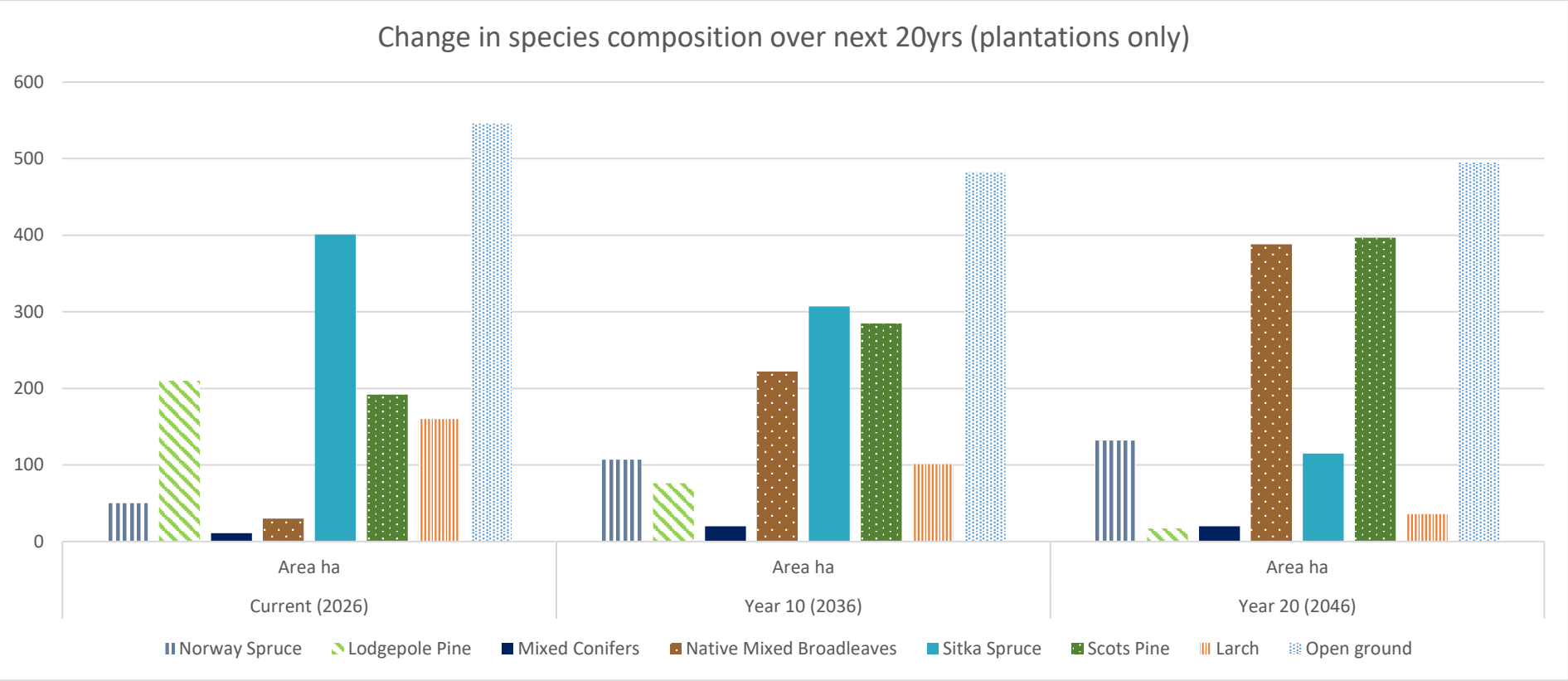
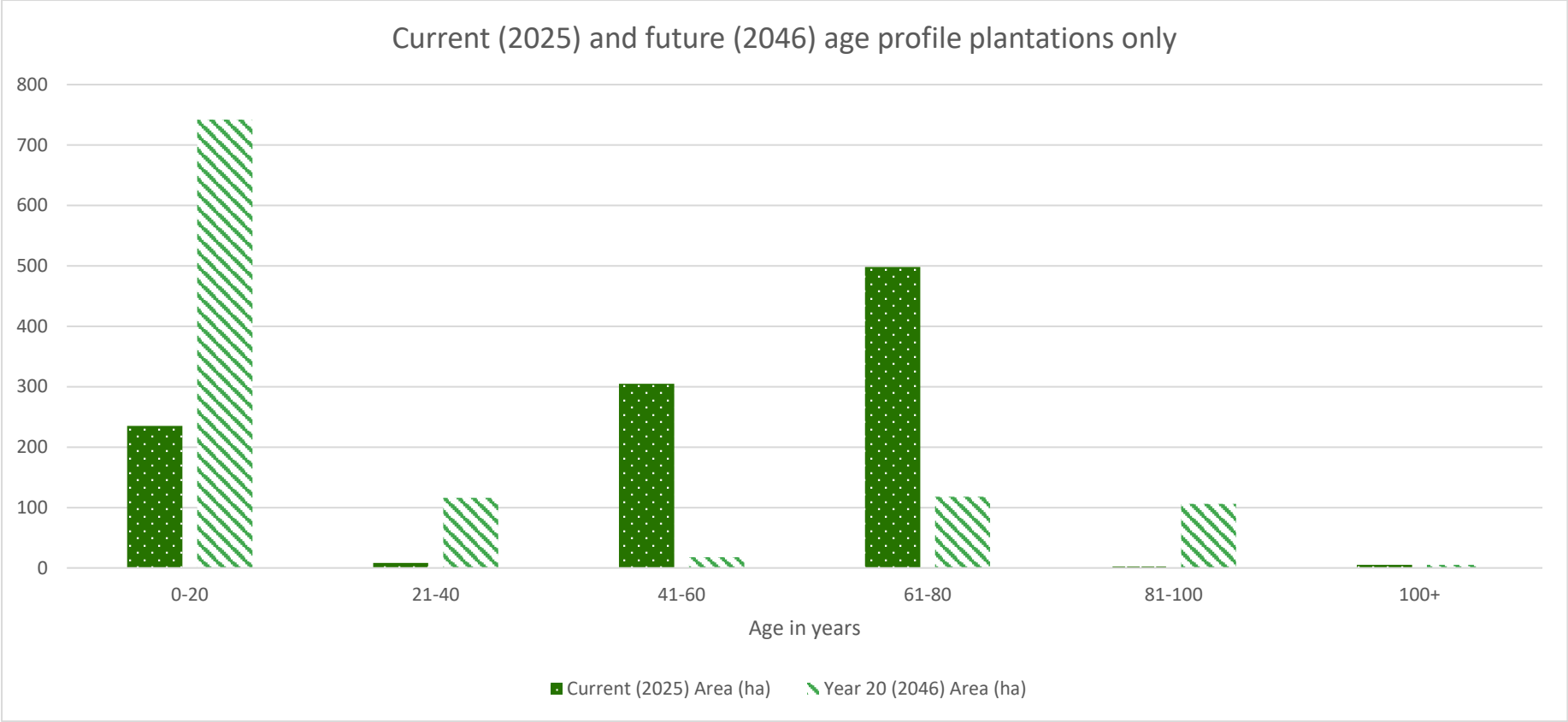

Change in species composition over next 20yrs (plantations only)
600
500
400
300
200
100
0
Area ha
Current (2026)
Area ha
Year 10 (2036)
Area ha
Year 20 (2046)
Norway Spruce
Lodgepole Pine
Mixed Conifers
Native Mixed Broadleaves
Sitka Spruce
Scots Pine
Larch
Open ground

Table 4: Area by age (plantations only).

Age Class (years)	Current (2025) Area ha	Year 10 (2036) Area ha	Year 20 (2046) Area ha
0-20	235	606	742
21-40	8.5	88	116
41-60	305	7	18
61-80	498	373	118
81-100	2.5	48	106
100+	5	3	5
Total	**1,054**	**1,118**	**1,105**

Chart 2: Area by age (plantations only)


Current (2025) and future (2046) age profile plantations only
800
700
600
500
400
300
200
100
0
0-20
21-40
41-60
61-80
81-100
100+
Age in years
Current (2025) Area (ha)
Year 20 (2046) Area (ha)

A.8 Plant Health

A.8.1. *Dothistoroma* Needle Blight (DNB)

DNB, first found in the UK in 1954, is the major threat and damaging agent for pine species. It causes premature needle defoliation, resulting in loss of timber yield and, in severe cases, tree death. It is also known as red band needle blight because of the colourful symptoms it shows on pine trees. Moisture is required for natural dispersal of the fungus, and long-distance dispersal is thought to occur in moist winds and mists.

A.8.2. Large Pine Weevil (*Hylobius abiatis*)

The Large Pine Weevil (*Hylobius abiatis*) can cause extensive feeding damage to young trees used to restock clearfell sites, but damage is often highly variable. This species lays its eggs in deadwood/stumps on clearfell sites and the emerging adults feed on the bark of young trees, often with devastating effect on newly planted conifer crops. The *Hylobius* Management Support System (HMSS) is based on a simple monitoring protocol using billet traps to measure *Hylobius* numbers on individual clearfell sites. The numbers recorded are used, with other information entered into the HMSS software, to determine the best way to manage clear-fall sites for successful, cost effective and environmentally friendly restocking. This Support System will be used along with past results and experience to determine the optimal time to restock while minimising the use of chemicals. Restocking has traditionally taken place within two years of sites being felled. However, many seedlings were damaged or killed by the *H.abiatis*. To reduce the use of insecticides where feasible restocking is planned to take place at the end of year two. Restocking may take place for up to four years following felling if monitoring, using MSS shows that it is expected that there will be an elevated level of *H.abiatis*.

A.8.3 Fungal plant pathogen *Phytophthora ramorum*

Phytophthora ramorum is a fungus-like plant pathogen which attacks a wide range of tree and shrub species. European and hybrid larch are particularly susceptible to *P. ramorum*, but current evidence indicates that the impact of the disease is greatest on Japanese Larch, which can die within one to two seasons, with consequential economic, environmental and amenity impacts.

Therefore, there is currently a moratorium on the planting of larch within FLS woodlands, to try and help slow the spread of the disease. We will try to retain existing larch stands where it is practical to maintain the species diversity within the plan area.

Section B Analysis of Information

B.1 Opportunities and constraint analysis

Objective (what we want to do)	Opportunity	Constraint	Concept (how we are going to do it)
Create new native woodland.	• Improve species diversity and create a varied structural composition, benefitting overall biodiversity and particular species e.g. salmon from riparian woodland restoration, and habitats such as upland heath mosaics. • Restoring ancient woodland on Roy Map in **Glen Doll.** • Carbon sequestration by new woodland. • Small-scale low impact productive forestry under a Low Impact Silvicultural System. • Landscape resilience to impacts of climate change e.g. wildfire, disease, flood mitigation.	• Herbivore impact is main obstacle to establishing new native woodland, primarily deer, but also other small mammals. • Soil types may limit species choice. • Steep ground and access constrain planting operations. • Plant availability may limit species choice. • Need to protect valuable open habitats like species rich Ground Water Dependent Ecosystems (GWDTE), blanket bog etc. • Need to retain some areas of open habitats for species e.g. raptors, black grouse lek sites.	• Riparian corridors of broadleaves, particularly around SAC watercourses. • Gradual transition from productive timber plantation to native Scots Pine and mixed broadleaf woodland in **Glen Doll.** • Mixture of open and wooded habitats, varied density, and shape, becoming more disperse with increased elevation. • Explore opportunities to promote/facilitate natural colonisation, where herbivore pressure is low enough.

Objective (what we want to do)	Opportunity	Constraint	Concept (how we are going to do it)
	• Visual impact on landscape can be positive if scale, shape, pattern etc are considered. • Landscape connectivity – create corridors of woodland linking between glens and further north into Cairngorms plateau.	• Heritage features to be buffered and kept open/within low density planting areas.	• Species selection according to soil and site conditions, considering seed zone and local provenance. • Planting will consider species features e.g. wader areas, grouse leks, open heathland for raptors and leave large areas of open space (e.g. >30 ha). • Fencing – mixture of appropriate scale enclosures and strategic fence-lines to provide protection from herbivore impact. • Utilise cattle grazing in open wood-pasture and other open habitats to drive dynamism in the system, enhance open habitats and facilitate natural regeneration where appropriate.

Objective (what we want to do)	Opportunity	Constraint	Concept (how we are going to do it)
			• Onsite seed orchards for tree species where local provenance is important.
Restore areas of damaged peatland.	• Restore, protect, enhance, connect, and expand areas of peatland to benefit biodiversity, hydrology, and flood mitigation. • Identify peaty soils in current plantations and address restock accordingly. • Identify and understand network of historical drainage and block drains. • Protect against wildfire	• Herbivore impact • Access for machinery • Network of historical drainage • Non-native conifer regen. • Visitor impacts on sensitive areas	• Blocking of artificial drains to allow rewetting of areas • Restore areas of severely damaged peat where access is possible. • Peatland carbon code survey to inform areas for restoration as part of a Peatland Action Fund project. • Identify and plan for controlling conifer regen where necessary – focusing particularly on designated sites as a priority
River and watercourse restoration.	• Improve freshwater and riparian habitats, particularly for protected species i.e. cooling summer water	• Needs expert input and planning. • Needs extensive collaboration with SEPA, Angus Council,	• River restoration is guided by input from South Esk Rivers and Fisheries Trust, through surveys and monitoring.

Objective (what we want to do)	Opportunity	Constraint	Concept (how we are going to do it)
	temperatures for salmon and Freshwater Pearl Mussel (FWPM), reconnecting rivers to flood plains and diversifying the habitat niches in the river channels. • Opportunity to collaborate with other organisations to achieve this as part of River South Esk catchment restoration, make landscape more resilient to climate change impacts	South Esk Rivers & Fisheries Trust.	• Riparian planting and installing large woody debris in river channels where appropriate. • Large, fenced enclosures for riparian woodland creation, using water gates to allow for planting close to the water course. • Remove conifer regen from SAC designated watercourses.
Enhance, protect, and expand montane scrub in high mountain crag zones and surrounding open habitats to create alpine tall herb and montane scrub mosaic.	• Improve biodiversity and landscape resilience by protecting and enhancing a mosaic of open habitats, including alpine and montane scrub, open woody pasture, wetland and flushes, heathland, acid grassland. • Re-introduce rare plant species where appropriate, in	• Herbivore impact – high deer population remains surrounding both sites. • Availability and provenance of rare species. • Conifer regeneration and other Invasive Non-Native Species (INNS).	• Mosaic of all habitats – integrated and complex across the whole landscape. • Expand montane vegetation into surrounding base rich and high elevation area, in partnership with Nature Scot in designated sites. • Explore potential for plug planting and translocation of

Objective (what we want to do)	Opportunity	Constraint	Concept (how we are going to do it)
	agreement with Nature Scot on designated sites. • Research and monitoring opportunities for species and habitats with changing land management over time	• Access for operations/machinery if required. • Visitor impacts on sensitive areas.	rare species in partnership with Nature Scot. • Plant montane willows into crag areas and encourage natural regeneration through new seed source with reduced herbivore impact. • Use deer fencing and electric offset stock fencing to protect vulnerable areas as part of deer management plan.
Restore priority open habitats such as, heathland, grassland, and wet flushes for protected species.	• Improve biodiversity and landscape resilience by protecting and enhancing a mosaic of open habitats, including alpine and montane scrub, open wood-pasture, wetland and flushes, heathland, acid grassland. • Opportunity to improve condition of Caenlochan SSSI at head of **Glen Prosen.**	• Herbivore impact. • Historical drainage. • Non-native conifer regeneration and other INNS. • Access for operations/machinery if required. • Visitor impacts on sensitive areas.	• Mosaic of all habitats – integrated and complex across the whole landscape • Upland heath – cease muirburn, use mechanical control of vegetation to improve structure and reduce risk of wildfire. • Flushes and GWDTE – species rich areas identified and

Objective (what we want to do)	Opportunity	Constraint	Concept (how we are going to do it)
	• Improve habitats for protected species. • Work with organisations such as Royal Society for the Protection of Birds (RSPB) to get specialist advice and join up landscape scale initiatives. • Research and monitoring opportunities for species and habitats with changing land management over time.		appropriately managed to conserve and enhance diversity. • Block artificial drainage where possible to help rewet areas and sustain GWDTE. • Conservation grazing on targeted areas to maintain condition of open habitats. • Habitat improvements, such as scrapes, for ground nesting birds in wet areas. • Natural regeneration of non-native conifers and any other INNS will be removed from designated sites and priority habitats.
Plan to enhance responsible and inclusive access for visitors.	• Improve inclusive and responsible access for visitors to both **Glen Doll** and **Glen Prosen** - trails and paths,	• Visitor impacts on environmentally sensitive areas/habitats. • Windblow blocking access.	• Develop short, new walking loop and viewpoint behind ranger centre at **Glen Doll** to the viewpoint that is currently in windblown area

Objective (what we want to do)	Opportunity	Constraint	Concept (how we are going to do it)
	information and interpretation, visitor facilities. • Opportunity in doing so to improve communities' health and wellbeing, facilitate learning and education and provide a quality public amenity for recreation and tourism.	• Identifying appropriate space for facilities/welcome in **Glen Prosen.** • Forestry operations may limit access to some parts of site. • New fencing and woodland creation may leave less land open to access.	– avoiding restocking with large trees that would obstruct this lookout. • Explore potential for utilising old quarry in **Glen Prosen** as visitor car park and welcome area. • Explore potential for establishing some short walking routes in **Glen Prosen** that allow visitors to see and experience the new native woodland creation and landscape change – with interpretation. • Develop access solutions for areas of fencing and ways through/around woodland creation – self-closing pedestrian and equestrian gates. Provision of accessible information on site and online.

Objective (what we want to do)	Opportunity	Constraint	Concept (how we are going to do it)
Harvest mature crop including removal of windblow	• Harvest timber at optimum time for income and volume. • Harvest windblow before reduction in value. • Open blocked trails in **Glen Doll** for visitors. • Upgraded/new accesses will benefit future operations. • Restock with more diverse native and broadleaf species to improve biodiversity and structure. • Coupe surveys for protected species will provide better understanding of wildlife on site to inform management.	• Access – steep ground working, need new/upgraded forest roads required, timings constrained by environmental features and local climate. • Areas of friable, thin, and/or wet soils are easily damaged by heavy machinery, requires robust site management and may further restrict seasonal timings for operations. • River South Esk SAC – require robust site management to reduce run-off that could cause a problem for flooding and for water quality. • Protected species e.g. wildcats, raptors may mean some areas are unworkable at times. • Visitors – particularly in **Glen Doll** with high numbers of	• Plan sequence of coupes in both **Glen Doll** and **Glen Prosen** plantations that removes windblow and creates new wind firm edges, whilst also harvesting high value marketable timber crop, making efficient use of steep ground working operations and access • Manage rate of change by sequencing coupes to maintain mix of felled and mature areas for protected species. • Plan roads and access infrastructure required for operations, including quarry expansion for road materials. • Include permanent internal open grassy areas for deer glades and wildcat hunting areas.

Objective (what we want to do)	Opportunity	Constraint	Concept (how we are going to do it)
		people walking through the site in particular areas. • Rate of change in forest impacting negatively on biodiversity • Timber transport consultation routes – limitations in some places on amount of timber that can be hauled on public roads, consultation required, and routes needing upgrades.	• Plan harvesting coupes to align with areas that can be fenced/protect for restock establishment. • Timescales – over ten years 437ha – front loaded to the first five years, operational timings to consider visitor access and environmental constraints. • Work with Angus Council, the Timber Transport Forum, and neighbouring landowners to progress upgrades to public road in **Glen Prosen** that will help facilitate timber haulage.
Diversify and restructure existing plantations	• Include more native species and broadleaves to improve biodiversity and habitats for protected species.	• Herbivore impact on establishment. • Feasibility of fencing if required.	• Create opportunities to extend tree cover beyond existing shape of plantation that is sympathetic to and interlocks with surrounding

Objective (what we want to do)	Opportunity	Constraint	Concept (how we are going to do it)
	• Identify any areas that could be open habitats. • Explore opportunities for LISS. • Interlock existing plantations with surrounding landscape and neighbouring woodland creation schemes. • Create a forest more resilient to disease and climate change	• Access for ground prep and planting • Plant availability may impact species choice. • Soils, climate, and site factors may limit species choice. • Conifer regen spreading out into surrounding habitats and within areas of new native broadleaves. • Availability of information on neighbouring woodland creation schemes. • Protected species may impact on timings of operations, species choice.	landscape and habitats – could focus on riparian areas as starting points. • Identify areas of LISS and implement appropriate thinning regimes with new conifer crops where accessible. • Use enclosures and/or strategic boundary fencing to protect new planting in **Glen Doll**. • Upgrade/maintain access for ground prep and planting where necessary, following on from harvesting access. • Plan to control conifer regeneration in riparian and open areas within the plantations. • Use species mixtures for restock, underpinned with native species but including

Objective (what we want to do)	Opportunity	Constraint	Concept (how we are going to do it)
			more diverse conifers for productive areas. • Transition some currently productive areas into long term retention for environmental and public amenity – restocking with varied density native mixed woodland.
Management to enhance plant health and minimise impact of existing diseases.	• Large amount of larch due to be removed due to windblow and harvesting. • Windblown areas open up forest to create more structural and species diversity which will improve resilience. • Re-wetting peatland, moorland and wetlands will reduce fire risk. • Harvesting plan should remove areas at risk of further windblow	• Tall rank vegetation may pose future fire risk if not managed. • Larch not harvested in this plan may become infected with PR – neighbouring Glen Isla has had SPHN recently. • Access requires new/upgraded roads, and steep ground makes operations more complex and costly.	• Implement FLS larch strategy and plan pre-emptive extraction where possible before an SPHN occurs. • Plan access and maintenance that allows for larch to be harvested should an SPHN occur. • Manage open habitats to reduce fire risk

B.2 Concept

Maps 4 and 5 illustrate how the plan concept incorporates the important constraints and opportunities into the management objectives.

Section C Management Proposals

C.1 Silvicultural practice

This plan has been designed in accordance with sound silvicultural and environmental principles within the framework outlined by the UK Forestry Standard and the UK Woodland Assurance Scheme. The plan area has been divided into a system of coupes to reflect the varying management strategies being applied. The precise system of management for each coupe will be tailored to suit the current and subsequent species in the rotation. Details of proposed woodland management prescriptions are detailed below.

C.2 Management Prescriptions

Table 5: Proposed management operations 2026-2036.

	Area (ha)	(%) of plan area (1600ha)
Felling	443.9	27.75
Thinning approval	168	10.5
Restocking	528.8	33
Fell awaiting restock	84.9	5.3
New Fencing	20km	N/A
New Woodland Creation	Planting 150 + 10ha nat regen	10
New Road/Track Construction	1.6	0.1
Quarry expansion	0.7	0.04

C.2.1 Felling

See Management maps 6 and 7.

Sites proposed for clear felling in the plan period are identified as Phase 1 and Phase 2 management coupes. The total LTFP area for **Glen Prosen** and **Glen Doll** is 1,600ha.

Table 4: Felling operations by phase.

Felling Phase and Year	Area (ha)	% of forest area	% of plan area
Phase 1 (2026-2031)	391.9	36.1	24.5
Phase 2 (2032-2036)	51.9	4.8	3.2
Phase 3 (2037-2041)	147	13.6	9.2
Phase 4 (2042-2046)	252	23.3	15.8
Area out with of the 20-year plan period	220	20.3	13.7
Long term retention	21	1.9	1.3
Total	**1083.8**	**100**	**67.7**

Planned felling will facilitate the following outcomes:

- Clearing windblow, incorporating some of the mature standing crop to create new wind firm edges (approximately 30% of felling is windblown).
- Timber production to achieve commercial income.
- Forest restructure to integrate into wider landscape.
- Removal of naturally regenerating non-native conifer from riparian zones - 17% of felling area in Phase 1.

Felling operations will use best practice guidance and follow the UK Forestry Standard when dealing with the variety of environmental features that cut across the sites, such as SAC designated water courses, schedule one species and high levels of recreation in **Glen Doll**. Work Planning is the collaborative process of preparing for an operational activity. All functions contribute so that any constraints or issues are understood and mitigation can be put in place. Operational work planning collates real time information on sensitivities from internal consultation through our 'work plan' process, guiding operations in terms of timings, buffer zones, risk zones and other measures to avoid negative impacts and keep everyone across the site safe – **see Appendix IX** 'Operational Buffers.' The timing of operations will be planned to cause the least possible impact on wildlife and visitors where possible, though winter working conditions are also a consideration, thus the felling programme will need to be flexible and pragmatic. In **Glen Doll**, Scots pine will be retained where it is possible to provide structure and habitat for red squirrels.

Brash mats (or alternative measures) will be used to protect sensitive soils. There will be minimal soil disturbance and machine movement on sites with clayey soils to reduce the risk of compaction or damage to the soil structure. Felling residue will usually be left on site to allow nutrient recycling, with consideration for the practicalities of restocking. Where required, the choice of ground cultivation technique will consider the short-term benefits for establishment against any long-term side effects on tree stability, access for future forest operations and the environment. There will be a preference for the least intensive technique.

In accordance with forestry best practice, UKFS Forest and Water Guidelines, FC Practice Guide – "Managing forest operations to protect the water environment", and Forestry & Water Scotland 'Know the Rules' 2nd Edition, all operations will be planned in advance to consider their effects on watercourses leading to or forming part of the River South Esk SAC.

All works will use competent and qualified operators. To reduce the risk of pollution events, machinery will be selected for its suitability to the site and operation, and must be in good working condition, be well maintained and regularly inspected. Pollution control plans will be in place and machines equipped with spill kits to absorb any spillages. Fuel, oils, lubricants and chemicals will be kept in appropriate storage containers, such as a locked bunded tank stored on level ground, away from drains and watercourses.

Any chemical applications will following best practice and recommended buffers will be applied to reduce the risk of any chemicals entering watercourses. All chemicals will be stored safely and mixed well away from any watercourses or roadside drains. Pre-commencement meetings will clearly set out constraints and sensitivities, alongside a map highlighting sensitive areas and the presence of protected species. Buffers will apply along water courses and operations within these minimised as far as possible. Water crossings will also be minimised, where this unavoidable, log bridges and/or pipes will be used.

Both before operations begin and during works, site conditions will be monitored and contingency plans in place should unforeseen events occur, such as postponing or halting operations during severe rainfall. Opportunities will be taken possible to disconnect existing drains where this will not lead to an increase in the water table and risk instability in the crop.

To further protect watercourses during operations, any new drainage will not connect with watercourses. Silt traps and vegetated areas may be used to allow sediment to settle.

Other tree felling in exceptional circumstances.

FLS will normally seek to map and identify all planned tree felling in advance through the planning process. However, there are some circumstances requiring small scale tree felling where this may not be possible and where it may be impractical to apply for separate felling permission due to the risks or impacts of delaying the felling. Felling permission is sought for the LTFP approval period to cover the following circumstances:

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

  *Infrastructure includes forest roads, footpaths, access (vehicle, cycle, horse walking) routes, buildings, utilities, and services, and drains. The maximum volume of felling in exceptional circumstances covered by this approval is 75 cubic metres per LTFP per calendar year. A record of the volume felled in this way will be maintained and will be considered during the five-year LTFP review.

- Trees may be felled without permission if they are of less than 10 cm diameter at breast height (1.3 m); pose immediate danger to persons or property; are completely dead and are not being retained as dead wood; or are part of Authorised Planning Permission works or wayleave agreements.

C.2.2 Thinning

See Thinning maps 8 and 9.

FLS policy assumes that all productive conifer crops will be thinned except where:

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

In **Glen Doll**, given the steep ground, windblow and poor access we are not proposing to undertake thinning of mature crops for silvicultural purposes. Thinning approval on the selected coupes shown on map 8 will be used to manage those areas of long-term retention and productive crops that fall lower down in the glen and within the visitor zones, that have good access for operations and may require management for visitor access/experience/environmental benefit. High forest on steep slopes, with poor access will not be thinned. In **Glen Prosen**, thinning of mature crops is possible where/when management requires and identified on map 9, the younger conifer crops are not yet ready for first thinning.

All thinning decisions will be guided by Operational guidance Booklet No 9 ‘Managing thinning.’ 168 ha of the crop will be eligible for thinning if deemed necessary between 2026 and 2035. Thinning will normally be conducted at, or below, the level of marginal thinning intensity (i.e., removing no more than 70% of the maximum Mean Annual Increment (MAI), or Yield Class (YC), per year). Higher intensities (no more than 140% of maximum MAI, or YC, per year) may be applied where thinning has been delayed, larger tree sizes are being sought or as part of a LISS prescription. In all cases work plans will define the detailed thinning prescription

before work is conducted and operations will be monitored by checking pre and post thinning basal areas for the key crop components.

Table 5: Thinning in the plan period by species.

Thinning over the first 10 years of the plan	
Total area where thinning may be undertaken during the plan period	168 ha

C.2.3 Low Impact Silvicultural Systems (LISS)

See maps 6 and 7.

Currently none of the plan areas are managed under LISS prescriptions, on account of the clear-fell rotations and recent significant windblow events. There is one management coupe in Glen Prosen (38006) which is intended for LISS management, though the first intervention will be to beat-up the restock. There is less scope to develop LISS in upland environments. However, where crop and site conditions are allowed, areas of productive restock will be identified for future LISS management. Any opportunities to increase the area managed under LISS will be taken as the crops and site conditions allow. LISS prescriptions will be appropriate for the species present, utilizing group selection systems for light demanding species and unform shelterwood for shade tolerant species.

C.2.4 Long Term Retentions (LTR) / Natural Reserves

See Management Maps 6 and 7.

2% of the plan area (6% of the forested area) is currently managed as Long-term Retention. This is where individual, stable stands and clumps of trees are retained for environmental/amenity benefit significantly beyond the age or size adopted by the woodland enterprise. The amount of Long-Term Retention will increase over time as the non-productive restock establishes – in **Glen Doll** the future forest will be 35% LTR in 2046 and in **Glen Prosen** it will transition to 26% by 2046.

There is an area of 12 ha in **Glen Prosen** forest that is a Natural Reserve (minimum intervention), this is where biodiversity is the primary objective, and we are prepared to commit the area of land in question to minimum intervention management in perpetuity.

All LTR areas within the LTFP area fall under the following categories and will be managed as such:

- Broadleaf planting for environmental or amenity value, including riparian zones, visitor zones or where broadleaf species have been planted to increase biodiversity. These areas will manage under the standard thinning cycle where thinning is needed and are unlikely to be clearfelled in the next 50 years.
- Old growth native species which are being retained to increase the range of age classes within the block and therefore increase the resilience and biodiversity value. These areas will be monitored but should require limited management unless there is an unforeseen windthrow or disease event.
- Some areas of windblown crops to be retained as deadwood habitat and provide potential den sites for the resident Scottish wildcat population.
- Some areas of commercial crop to be retained past their MAI recommended felling date to preserve some age diversity within relevant blocks.

C.2.5 Restocking Proposals, Future Habitats and Species

See Future Habitats and Species (Restock) maps 10 and 11.

In both **Glen Doll** and **Glen Prosen** forest this plan marks a transition towards restructuring and diversifying the plantations, with an overall reduction in timber production and an increasing focus on management for nature and people, and other ecosystem services. In areas where the restock is non-productive the percentage of open space has been increased to 10-20% to account for a slightly more open, naturalistic woodland so the total area of restock is less than the total area felled due to this increase in open space which will help produce a more diverse structure.

In **Glen Doll**, there will be a "productive core" of 55 ha restocked with Norway spruce and Scots pine at 2,500 stems/ha to be managed in future as LISS. Out with this area the rest of the high forest that is being clear-felled will be restocked with variable density native mixed broadleaves and Scots pine at 1,600 stems/ha (on average), to achieve a future habitat of mixed native woodland with integral open spaces, that disperses with elevation into montane scrub on the outer edges of the forest near the crags. The forest edge is feathered transitioning from woodland cover to open ground through lower density restock with increasing open space to avoid a harsh tree line in the landscape. At the Corrie Fee National Nature Reserve there will be a 100m buffer between closed canopy woodland, providing a transition zone of low density increasingly open forest edge. In the bottom of the glen the riparian areas around the river South Esk, the White Water and its tributaries, will be enhanced with further broadleaf planting to create wide riparian zones to improve the freshwater habitats. The transition from productive conifer forest to a mixed native woodland will take longer than the timescale of this plan to achieve. It is our intention to remove unwanted non-native conifer regeneration to facilitate native tree species. However, we will accept up to 20% of non-native species within the mix – over the whole restocking plan area, as a pragmatic response.

In **Glen Prosen** plantation forest a "productive core" of 146 ha will be restocked at 2,500 stems/ha of Scots pine, Norway spruce and minor elements of other mixed conifers – **see Appendix X Species List**. It is expected that Sitka spruce and larch will regenerate in these restock areas too from the mature crops that have been clear-felled. Where there are other conifers regenerating in the productive areas these will be accepted and/or thinned out at an appropriate time. 105 ha of the plantation will transition into

mixed native woodland to better integrate the forest into the surrounding landscape, on its outer edges. This will be restocked with native mixed broadleaves and Scots pine at an average of 1,600 stems/ha with integral opens spaces. As in **Glen Doll**, this transition will take time and whilst we wish to facilitate direction of travel away from productive conifer species in these areas, we will accept up to 20% of other species within the mix. The riparian areas in **Glen Prosen** will be planted with native mixed broadleaves at 1,600 stems/ha.

The future structure and purpose of these forests is transitioning away from a clear fell system of management, into more low impact silviculture and long term retention. This transition along with the amount of windblow already affecting structure means that some restock coupes will still be less than 2m high when adjacent coupes are felled/cleared. However, given the future management intended the consideration of adjacency and need adjacent coupes to establish ahead of any further felling is not as important given that the coupes will not be cleared felled in the future and a diverse structure will be allowed to develop over time.

Please see table 10 on page 57 detailing the restock plans for the plan period and Maps 10 and 11.

Remnants of ancient woodland as identified via the Roy maps can be found in **Glen Doll** covering the south facing slopes below Craig Mellon around Jock's road. The intention for the restock and future habitat of this area is to increase the proportion of broadleaves and create a mixed native woodland that becomes a long-term retention and is managed for nature and people.

The species choice for restocking has been guided by the ESC results for this climatic area and soil types (see sections A.6.2 Geology and Soils and A.6.3 Climate). This has shown that the climate and site conditions make a range of species suitable for restocking. This range will be utilised where possible, provided the species will meet the objectives of the plan. One of the aims of restocking will be to increase the species diversity within the plan area while also retaining timber productivity. To achieve this, alternative conifer species such as Norway spruce will be added and there will be in an increase in the use of productive mixtures such as Scots pine and Norway spruce – this will make up the small area of timber production. Out with the core productive area, the forest is transitioning away from commercial stocking to a predominantly native broadleaf amenity woodland with Scots pine.

FLS is following a chemical reduction strategy. Restocking Strategy for Scotland's National Forest Estate explains that we will minimise chemical usage in restocking (insecticides and herbicides) by considering options at the site scale and using tactics such as delayed planting to achieve this. To allow this strategy to be followed the '*Hylobius* management support system' will be applied and the minimum recommended fallow period used prior to restocking. This fallow period will also reduce the potential need for herbicide applications to restocked areas.

Where required, the choice of ground cultivation technique will consider the short-term benefits for establishment against any long-term side effects on tree stability, access for future forest operations, and the environment. There will be a preference for the least intensive technique. Conifer restocking will be established at 2,700 stems per ha to achieve 2,500 stems per ha once established. Broadleaf restocking will be achieved through the following stocking densities, and will be protected by enclosures and planting tubes where appropriate:

- Riparian habitats will be restocked with a mixture of suitable native broadleaved species planted at 1,600 stems per ha, and allowed to regenerate naturally from seed, providing the necessary levels of dappled shade and woody debris to support healthy watercourses.
- Environmental broadleaf planting will be restocked with a mixture of suitable native broadleaved species planted at a low density, 50/50 mix of open ground and native mixed broadleaves at 1,600 stems per ha, to allow for open space that will re-generate naturally providing age and habitat diversity.

The choice of ground preparation for each site will be decided at the operation planning stage by the relevant establishment forester. Ground preparation techniques can vary, even across individual sites, so the most up to date advice will be applied at the time of the operation. This will help ensure that soil structure and water quality are both protected, whilst also providing an optimal environment for establishment, depending on the species and site conditions. Forest and Water Guidelines, UK Forest Standard and UKWAS can all be used to help with the decision making process, along with: FLS Guidance on Ground Cultivation for Forestry and Land staff, and internal FLS guidance related to making decisions related to ground preparation Given the scale of the forest, there are a wide range of soil types. Predominately, these are peaty podzols / podzolic ironpan, surface water gleys, blanket bog and brown earths. Forest Research's Field Guide to Soil Cultivation (Jens Haufe, 2019) and Scottish Forestry's Cultivation for

Upland Productive Woodland Creation sites will be referenced where necessary to help aid in the specific choice applied across any restock sites.

Table 8 below is a good indication of what ground preparation techniques will be applied, with the “Best Practice” option the target if possible. The majority of restock operations within the plan period take place on intergrade soils, with Ironpans, Podzols and Surface-water Gleys all present, best practice options set out below:

- Ironpans: Inverted mounding or no cultivation if site conditions suitable.
- Podzols: Disk scarification or mulching if weed competition is high, no cultivation if site conditions suitable.
- Surface water gleys: Inverted mounding or no cultivation, depending on nutrient availability on individual sites

Table 8: recommended ground preparation techniques based on soil type, Dr Jens Haufe, 2019

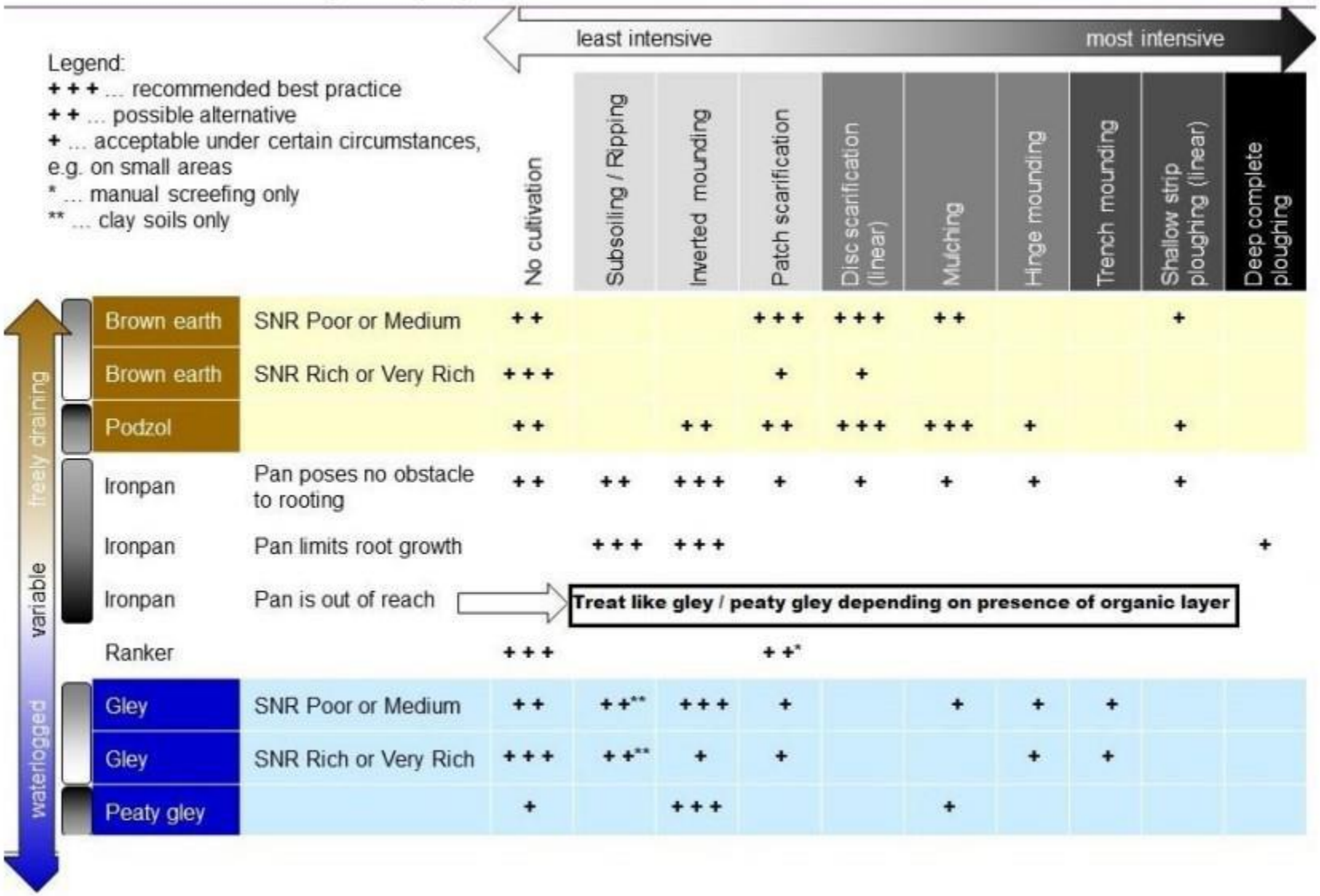

least intensive
most intensive
Legend:
+ + + ... recommended best practice
+ + ... possible alternative
+ ... acceptable under certain circumstances, e.g. on small areas
* ... manual screefing only
** ... clay soils only
No cultivation
Subsoiling / Ripping
Inverted mounding
Patch scarification
Disc scarification (linear)
Mulching
Hinge mounding
Trench mounding
Shallow strip ploughing (linear)
Deep complete ploughing
freely draining
variable
waterlogged
Brown earth
SNR Poor or Medium
Brown earth
SNR Rich or Very Rich
Podzol
Ironpan
Pan poses no obstacle to rooting
Ironpan
Pan limits root growth
Ironpan
Pan is out of reach
Treat like gley / peaty gley depending on presence of organic layer
Ranker
Gley
SNR Poor or Medium
Gley
SNR Rich or Very Rich
Peaty gley

Table 6: detailed restock for 10-year plan period.

Felling Phase	Felling Year	Coupe Reference	Coupe Area	Restock Description	Scots pine	Native Mixed Broadleaves	Norway Spruce	Mixed Conifer	Open space	Total area
Felled awaiting restock	2010/11	39036	1.1	Amenity woodland for environment/people	0.4	0.5	-	-	0.2	1.1
Felled awaiting restock	2010/11	39024	4.7	Amenity woodland for environment/people	1.8	2.3	-	-	0.6	4.7
Felled awaiting restock	2014/15	38084	3.5	Amenity woodland for environment/people	0.8	1.7	-	-	1	3.5
Felled awaiting restock	2014/15	39037	1	Commercial.	0.5	-	0.4	-	0	1.0
Felled awaiting restock	2015/16	38088	0.7	Riparian, managed open.		0.5	-	-	0.2	0.7
Felled awaiting restock	2015/16	39002	8.2	Amenity woodland for environment/people	3.6	4.6	-	-	0	8.2
Felled awaiting restock	2016/17	38094	2.4	Commercial, riparian, managed open	0.2	1.7	0.1	-	0.4	2.4

Felling Phase	Felling Year	Coupe Reference	Coupe Area	Restock Description	Scots pine	Native Mixed Broadleaves	Norway Spruce	Mixed Conifer	Open space	Total area
Felled awaiting restock	2017/18	38096	8.1	Commercial, riparian, environmental, managed open.	1.1	4.1	1.3	-	1.7	8.1
Felled awaiting restock	2017/18	39032	1.9	Amenity woodland for environment/people	0.7	1.0	-	-	0.2	1.9
Felled awaiting restock	2018/19	39006	7	Commercial, riparian	2.6	1.5	1.7	-	0.3	7.0
Felled awaiting restock	2018/19	39038	1.6	Commercial, riparian, managed open.	0.6	0.9	-	-	0.1	1.6
Felled awaiting restock	2022/23	39034	3.8	Amenity woodland for environment/people	0.1	2.9	-	-	0.7	3.8
Felled awaiting restock	2022/23	39040	1	Amenity woodland for environment/people	0.4	0.5	-	-		1.0
Felled awaiting restock	2022/23	39041	0.9	Amenity woodland for environment/people	0.3	0.3	-	-	0.4	0.9

Felling Phase	Felling Year	Coupe Reference	Coupe Area	Restock Description	Scots pine	Native Mixed Broadleaves	Norway Spruce	Mixed Conifer	Open space	Total area
Felled awaiting restock	2023/24	38076	5.3	Commercial	3.2	-	2.1	-	0	5.3
Felled awaiting restock	2023/24	38080	2.2	Commercial, riparian, managed open.	0.9	0.3	0.9	-	0.1	2.2
Felled awaiting restock	2023/24	38077	7.4	Commercial, riparian, managed open.	2.1	2.2	1	-	2.1	7.4
Felled awaiting restock	2024/25	39033	2.6	Commercial, riparian, managed open	1.3	0.6	-	0.6	0.2	2.6
Felled awaiting restock	2024/25	39302	7	Amenity woodland for environment/people	2.5	3.7	-	-	0.8	7.0
Felled awaiting restock	2024/25	39088	14.5	Commercial, riparian, managed open	4.2	3.9	3.7	-	0.9	14.5
Phase 1	26/27	38013	11.1	Commercial	5.5	-	5.5	-	0.1	11.1
Phase 1	26/27	38016	4.1	Riparian, managed open.		3.3	-	-	0.8	4.1
Phase 1	26/27	38376	34.2	Amenity woodland for environment/people	5.4	23.6	-	-	5.2	34.2

Felling Phase	Felling Year	Coupe Reference	Coupe Area	Restock Description	Scots pine	Native Mixed Broadleaves	Norway Spruce	Mixed Conifer	Open space	Total area
Phase 1	26/27	38081	17.4	Amenity woodland for environment/people	1.0	13.2	-	-	3.2	17.4
Phase 1	26/27	38093	0.6	Amenity woodland for environment/people	-	0.4	-	-	0.2	0.6
Phase 1	26/27	38092	2	Amenity woodland for environment/people	0.1	1.5	-	-	0.4	2.0
Phase 1	26/27	38097	7	Commercial, riparian	0.9	4.2	0.3		1.6	7.0
Phase 1	26/27	39035	41	Commercial, riparian	12.8	12.2	4.9		9.9	41.0
Phase 1	26/27	38073	0.6	Amenity woodland for environment/people, managed open	-	0.3	-	-	0.3	0.6
Phase 1	26/27	38074	2	Amenity woodland for environment/people	0.4	1.2	-	-	0.4	2.0

Felling Phase	Felling Year	Coupe Reference	Coupe Area	Restock Description	Scots pine	Native Mixed Broadleaves	Norway Spruce	Mixed Conifer	Open space	Total area
Phase 1	27/28	38105	21.2	Commercial, riparian	8.3	3.8	8.3	-	0.8	21.2
Phase 1	27/28	38027	10.7	Commercial, riparian	2.0	5.4	2	-	1.3	10.7
Phase 1	27/28	38042	10	Commercial, riparian	1.2	4.1	0.8	-	3.9	10.0
Phase 1	27/28	38030	26.4	Amenity woodland for environment/people, managed open	7.6	12.9	-	-	6	26.4
Phase 1	27/28	39058	40.5	Commercial, riparian	15.9	12.7	6.2	-	2.6	40.5
Phase 1	28/29	38015	14.8	Commercial, riparian, managed open	2.5	6.2	1.2	-	4.9	14.8
Phase 1	28/29	38079	15.1	Commercial, riparian	5.7	2.1	5.5	-	1.8	15.1
Phase 1	28/29	38106	23.4	Commercial, riparian	10.7	1.4	10.4	-	0.9	23.4
Phase 1	28/29	38101	15.7	Commercial, riparian	4.9	3.7	4.2	-	2.9	15.7
Phase 1	28/29	38025	14.3	Commercial, riparian	7.0	0.1	7	-	0.2	14.3
Phase 1	28/29	39625	51	Amenity woodland for	20.0	26.2	-	-	4.8	51.0

Felling Phase	Felling Year	Coupe Reference	Coupe Area	Restock Description	Scots pine	Native Mixed Broadleaves	Norway Spruce	Mixed Conifer	Open space	Total area
				environment/people						
Phase 1	30/31	38102	18.8	Commercial, riparian	7.3	3.6	-	7	0.9	18.8
Phase 1	30/31	38036	10	Commercial, riparian	4.7	0.6	-	4.7	0.1	10.0
Phase 2	31/32	38021	14.8	Amenity woodland for environment/people, managed open	2.9	7.5	-	-	4.4	14.8
Phase 2	31/32	38028	4	Amenity woodland for environment/people	0.7	2.1	-	-	1.2	4.0
Phase 2	31/32	38398	7.6	Commercial, riparian	1.6	2.9	0.5	-	2.7	7.6
Phase 2	31/32	38020	5.8	Commercial	3.4	-	2.3	-	0.1	5.8
Phase 2	32/33	39020	19.7	Amenity woodland for environment/people	6.3	11.0	-	-	2.4	19.7
Total restock area in plan period			**528.7**							

C.2.6 Protection and Deer management

See Deer Management Appendix V and Maps 16 & 17

Wild deer on the National Forest Estate (NFE) are managed in accordance with the Scottish Government's strategy "Scotland's Wild Deer: A National Approach" and under the Code of Practice on Deer Management. The strategy and Code of Practice make recognition of the fact that wild deer are an asset, an integral part of Scotland's biodiversity, and provide healthy food and recreational opportunities. The challenge of managing wild deer originates in a need to balance the environmental, economic and deer welfare objectives of the Scottish nation with the objectives of private landowners for forestry, agriculture, sporting and other forms of land use.

The principal legislation governing the management of deer in Scotland and hence on the NFE is the Deer (Scotland) Act 1996. It is therefore FLS deer policy to:

- Prevent adverse deer impacts on commercial tree crops, new native woodland, and other habitats e.g. peatland. In doing so to carry out deer culling in an exemplary and humane way
- Work closely with relevant organisations and neighbours to make sure that there are integrated deer management plans which seek to recognise the interests of all parties.
- Take opportunities to optimise income from venison from sporting activities where this does not conflict with our primary objective of maintaining deer impacts at an acceptable level, in line with the Quality Meat Scotland accreditation in the form of The Scottish Quality Wild Venison (SQWV) Assurance Scheme.
- Take all practicable steps to slow down the expansion of deer species into areas where they are not currently present. All deer management will be carried out in accordance with OGB 5 – Deer Management. The aim is to manage deer density safely and humanely at a level which is consistent with acceptable impacts on forests and other habitats. This is likely to be at a density level of 5 deer per square kilometer or less.

Deer cull plans are prepared for each Deer Management Unit and are the responsibility of the Wildlife Ranger Manager. Deer damage assessments are carried out to evaluate the current density of the deer population and the level of cull required – please see the Deer Management Plen in Appendix 4 for further details.

C.2.7 Fence erection / removal

See Deer Management maps 16 and 17.

To achieve establishment of restock in **Glen Doll**, renewal of fencing will be required to protect from herbivore pressure. The deer population in the area is such that a cull alone will not be sufficient to ensure the success of large areas of restock in the plan.

In **Glen Prosen**, the approach to fencing is to create three large compartments that seal two thirds of the land holding from deer ingress and where possible keep fencing infrastructure away from the busiest areas for visitors in the bottom of the glen. Where fencing does cross paths and trails, self-closing pedestrian gates will be provided for access and along the march boundary where fences go out onto the open hill, gates will be provided to allow access for walkers under Scottish Outdoor Access Code (SOAC) onto and off the hill ground. The highest third of the **Glen Prosen** open ground will remain unenclosed aside from an open-ended 'deflector fence' to reduce ingress from neighbouring estates yet keep the highest areas and Munro summits fence-free. Strategic sections of fencing will be marked with canes to prevent bird strikes, where they are at high elevation and/or cut down across a slope.

Then fence around the plantation forest in **Glen Prosen** will be repaired to ensure that restock is established and additional new fencing is detailed in the EIA SOR for the woodland creation on the open ground.

C.2.8 Road operations

See Timber and Haulage maps 12 and 13.
Maps 12 and 13 shows the existing forest road network and any associated quarries, timber haulage egress points, and any local 'Agreed Timber Transport Routes'. All planned new roads and a quarry expansion in the planned period are also indicated on this map. The lengths of planned new roads are given on the map and are reflected in the EIA SOR submitted with the plan. Most of the Phase 1 and 2 felling coupes can be felled and extracted using the existing internal road network but there will be the requirement for some new roadside access, forwarder tracks, as well as repairing some of the existing road network. A second EIA SOR for civil

engineering works will be submitted during Phase 1, for the Phase 2 harvesting of coupes 39020 and 39022 in Glen Doll which will require access either via a bridge over White Water or via a temporary forest road and forwarder track along Jock's Road on the north side of the White Water.

Table 7: civils operations in plan period.

Grid Reference	Operation
NO 2884 7044	New forest road to access windblow coupe in Glen Prosen
NO 2674 7551	Forwarder track extension Glen Doll
NO 2795 7695	Forwarder track extension Glen Doll
NO 2869 6922	Quarry expansion Glen Prosen

C.2.9 Public access

See Visitor Access maps 18 and 19.

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

Woodland Management in Visitor Zones

Visitor Zones have been identified in areas where FLS encourage and manage access or where the woodland managed by FLS interacts with popular visitor sites or access routes. These are shown on Map 18. In these areas, single trees or small groups of trees will be removed when necessary to protect facilities, infrastructure and trails, or to enhance the setting of features, or to maintain existing views. Woodland in these zones will also be thinned, or trees re-spaced, for safety reasons (including increasing visibility to ensure that sites are welcoming and feel safe) and where it is necessary to enhance the experience of the forest setting, through the development of large trees, or preferential removal of trees to favour a particular species.

In **Glen Doll**, FLS is enhancing the provision of access in the forest. It is our intention within this plan period to create a new waymarked trail to a viewpoint now available thanks to clearing windblown crop, that offer a shorter more accessible view for those visitors not wanting to embark on climbing the nearby munros or the longer walk to Corrie Fee. It is our aim in this plan period to clear the trails which are currently blocked by windblown trees.

Glen Prosen will see new planned forest roads which will improve this access to a potential viewpoint at Garth Head in the forest block. As part of the planned woodland creation in the glen, further informal access will be possible in and around the new native woodland to allow visitors to see and experience the land use change.

C.2.10 Historic environment

See Appendix II and Maps 24 & 25.

The UK Forestry Standard (UKFS) is the reference standard for sustainable forest management in the UK. The updated 5th edition was published in 2023. The standard promotes the role of forest and woodland managers in the recognition and appropriate safeguarding of our historic environment, noting that “it is important that all significant heritage features and designated heritage assets are protected, and that consideration is given to the conservation and enhancement of historic landscapes.” Our strategic land management planning is informed by desk-based assessment, stakeholder consultation and professional archaeological

walkover surveys where required. Details of known heritage features are held within the Forester Web Heritage Data Geographic Information System (GIS) (built using national and regional historic environment records) and included within operational planning to ensure damage is avoided.

Heritage features are assessed against basic categories of importance and the majority retained as found – requiring simple conservation management through identification and protection. Designated historic assets and significant heritage features are considered for active or complex conservation management, although there are no designated features in this plan area. Maps 24 & 25 and Appendix II provide more information about the historic environment features within and adjacent to the plan area.

FLS staff use the Forester Web Heritage Data Geographic Information System (GIS) layer to protect and conserve heritage features within the wider framework of sustainable land management described by the UK Forestry Standard and the UK Woodland Assurance Scheme. The Forester Web Heritage Data has been created using information from (i) Historic Environment Scotland's designation layers, (ii) the National Record of the Historic Environment, (iii) Local Authority Historic Environment Records (SMR / HER) and (iv) the Historic Land-use Assessment (which includes 'relict landscape polygons' detailing areas over 1 ha in size identified using aerial photography and historic maps). Our own environment coupe checks and professional archaeological walkover surveys also continue to contribute data to the layer.

The Forester Web Heritage Data is a dynamic mapping tool. The Regional Environment Team uses the layer to assess the heritage features of any given area and prepare improved and up-to-date mapping for Land Management Plans, Work Plans and Contract Maps. They also check and include online historic environment data sources such as the local Historic Environment Record and Pastmap. They concentrate on recording and mapping significant heritage features using professional judgement and in-house expertise to filter through the wider data – marking relevant sites on the ground is very important, as is checking and excluding sites on record that are no longer extant or are of little to no significance (i.e. are extremely disturbed or fragmentary features of relatively recent date).

Harvesting coupes, access roads and fence lines will be surveyed prior to any work being undertaken to ensure that upstanding historic environment features can be marked and avoided. At establishment and restocking, work prescriptions buffer relevant historic environment features from ground disturbing operations and replanting – see Appendix IX 'Operational Buffers.'

Details of all known historic environment features are held in FLS's Heritage Dataset and included within work plans for specific operations to ensure damage is avoided. Heritage features will be depicted on all relevant operational maps. Areas of historic environment interest will be checked both on FLS's records and with the Council's HER prior to the commencement of forestry activities. Relevant heritage features will be clearly marked, both on the ground and on operational maps. Care will be taken to avoid any damage to surviving structural elements. Toolbox talks take place at the 'Pre-commencement Meeting' on site with contractors before works start to highlight particular considerations / features on the ground that are to be buffered or excluded from works.

During operations, the discovery of any new significant heritage features, human remains or archaeological artefact will be reported to the relevant authority. Under Crimen Violati Sepulchre (Violation of Sepulchre), any accidental discovery of human remains must be reported to the police immediately. If requested subsequently (by the police directly or, with police agreement, by HES, the Local Authority Archaeology Service or the FLS Archaeologist), an investigation by professional archaeologists will be commissioned as a matter of urgency. Under Bona Vacantia (Ownerless Goods), any discovery of an archaeological find or historic object must be reported to the Treasure Trove Unit for assessment.

- New significant heritage features will be reported to the FLS Archaeologist who will inform the Local Authority Archaeology Service.
- The discovery of any human remains will be reported to the police and to the FLS Archaeologist.
- The discovery of any archaeological find or artefact will be reported to the FLS Archaeologist who will inform the Treasure Trove Unit.

Maps 24 & 25 and Appendix II provide more information about the historic environment features within and adjacent to the plan area.

C.2.11 Biodiversity

A key aim of this land management plan is to increase biodiversity and manage the forest and land to help tackle the biodiversity crisis and promote nature recovery. This will happen through the restructuring and restocking of the forest plantations and through the habitat restoration and native woodland creation on the open land.

C.2.11.1 Open land

The intention is that any land identified as "Open" in the plan area will be managed to keep tree cover to <10%. Where the land is described as "Open/Successional", regeneration of native species at low densities will be accepted. At the end of the plan period, the managed open space will total 79% of the plan area, the majority of which is in **Glen Prosen**. There are several areas of priority open habitats such as, upland heath, upland flush, fen and swamp and purple moor grass and rush pasture, these are shown on the habitats maps 26 and 27. An integrated approach to open habitat management and nature restoration will result in a habitat mosaic across **Glen Prosen and Glen Doll** that blends open wooded habitats and more dense groves of new native woodland with the priority open habitats on the sites. See maps 26 and 27 for priority open habitats.

On all the open areas, both inside and outside the forest plantations, there is the potential for the natural regeneration of non-native conifer species, particularly Sitka spruce, which as a prominent species within the plantations, spreads seed out onto the open ground. It is our aim to remove conifer regeneration from areas managed as open, prioritising designated sites and priority habitats.

C.2.11.2 Riparian management

The riparian areas in the plan are important because they are either part of the River South Esk Special Area of Conservation (SAC) or they flow into the River South Esk SAC – designated for Atlantic salmon and freshwater pearl mussel. Riparian areas within the LTFP area will be maintained and/or improved by the introduction of native broadleaf species or management to encourage native

broadleaf regeneration, including the removal of non-native conifers in riparian areas. This will primarily take place as part of the standard felling, thinning and restock program in any coupes containing the relevant habitat. Mature non-native conifer removal will be identified and removed periodically in a separate operation or as part of thinning operations. To ensure the relevant felling permission is in place, riparian areas which are expected to need non-native conifer removal have been added to the management coupes map.

C.2.11.3 Protected Species

There are various red-listed, protected and/ or UKBAP priority species found in the plan area, from birds to mammals, fish, invertebrates and plants. An overarching aim of land management is to improve the habitats of as many species as possible. There are instances where we will be undertaking specific management for some species, such as providing areas of open space for raptors to hunt, retaining and planting Scots pine, Norway spruce and hazel to help red squirrels, and keeping open the black grouse lek sites and areas for ground nesting waders. To benefit invertebrates, wildflowers and birds, we will use conservation grazing with hardy cattle and create scrapes and rewetted areas as part of the drain blocking planned in **Glen Prosen**.

C.2.11.3 Deadwood management

Deadwood will be managed in accordance with the FCS Practice Guide: Managing Deadwood in forests and woodlands (Humphrey & Bailey, 2012) and supplemented by the FLS Guidance note: Deadwood Management – Summary Guidance for FLS Staff (Kortland, 2016). Key principles applied:

- Retain and create as much deadwood as possible and create new deadwood on a continuing basis.
- Retain and create as many kinds of deadwood as possible.
- Favour native tree species when creating and retaining deadwood.
- Favour the retention and creation of large-diameter deadwood.
- Retain and create high stumps and snags (standing deadwood) within woodland and permanent open areas (but not on clear fells that will be restocked).
- Design the distribution of deadwood to maximise connectivity at the woodland management unit and coupe scale.

C2.12 Plant health

The large pine weevil (*Hylobius abiatis*) is likely to be the major tree health issue encountered in this plan. The Hylobius Management Support System (HMSS) will be used to determine the best way to manage clearfell sites for successful, cost effective, and environmentally friendly restocking. This system will be used along with past results and experience to determine the optimal time to restock while minimising the use of chemicals. Restocking will take place as soon after felling as possible (with two years being the usual period) but could be delayed up to five years.

Up to this point, there have been no Statutory Plant Health Notices (SPHN) served within the plan area related to *Phytophthora ramorum*. However, as part of the planning process, areas containing larch have been identified and checked to ensure that there would be no significant issues with access or adjacency should an SPHN be served within the plan period. In particular, the need for new forest roads which may require a long lead time was investigated. It was found that, should the need for emergency felling of larch be required, the felling and extraction of timber is feasible at short notice and should be able to be completed with an acceptable impact on landscape and adjacency.

Dothistroma needle blight (DNB) - The forest manager will decide how DNB will be managed at the forest block and management coupe level through the workplan process, prior to management operations. This includes thinning of pine stands to promote air circulation in the tree crowns. This will reduce humidity levels making conditions less conducive to fungus development. Although this will not prevent infection, it can help to reduce the impact.

C.2.13 Management of invasive species

Currently there are no significant issues with invasive species within the plan area. Should any be identified, suitable measures will be taken to manage and remove them wherever possible.

C.2.14 New Planting

Subject to a separate EIA screening opinion request, new planting will take place in Glen Prosen over the course of the plan period and beyond.

Over the next 5 to 50 years, we are anticipating the open area of **Glen Prosen** to develop gradually, starting with the initial tree planting, drain blocking and peatland restoration which will provide the basis for further habitat recovery through natural processes. We aim to achieve 900 ha of tree planting in the next 10 years which will form the basis of further woodland expansion as a seed source is established. The reduction in herbivore pressure will further aid natural regeneration over the next 25-50 years. As a result, we hope to see an increase in woodland cover to around 1,800-2,000 ha across the site, varying from dense groves of 'birch belt' and Scots pine to scattered trees and woodland scrub cover in the higher reaches of the site.

The woodland creation consists of four different wooded habitats: denser 'valley side woodland,' riparian woodland to create dappled shade, open wooded habitat (including wood pasture), and montane woodland:

- **Valley-side woodland:** variable density (1,200-1,600 stems/ha) creating groves of trees with integral open space to allow for rocky outcrops and to leave space for natural regeneration. Native species such as birch, Scots pine, rowan, aspen, sessile oak, and hazel will be planted in clusters/groups using minimal ground preparation (e.g. vegetation removal, screefing/scarifying, with invert-mounding only where necessary).
- **Riparian woodland:** denser planting (1,600 stems/ha) of native species such as alder, various willows, bird cherry, aspen, downy birch, rowan, and bird cherry, along water courses in clusters/ groups as close to the channel as possible. Ground preparation will be by screefing only, where required.
- **Open wooded habitat:** variable lower density (400 - 800 stems/ha) with large amounts of integral open space to enable existing open habitats such as heath to thrive as woodland understorey, and for a graduated transition from open habitats to tree cover (e.g. around shallow peaty pockets/ bog and fen fringe), and to leave space for natural regeneration. Native species of trees and shrubs such as hawthorn, gorse, wild roses, willows, downy birch, juniper, and bird cherry.

- **Wood pasture:** open grown trees such as Scots pine, oak, and rowan, alongside thorny shrubs with individual tree protection by cactus guards to allow for cattle grazing during establishment.
- **Montane woodland:** high elevation, low density (400-600 stems/ha) trees and shrubs such as dwarf birch, downy birch, rowan, downy willow, least/dwarf willow, woolly willow (base-rich soils), eared willow, Scots pine, goat and grey willows, tea-leaved willow, and dark-leaved willow.

Woodland creation within unplanted areas of the existing **Glen Prosen** plantation will help to better integrate the productive plantation into the surrounding landscape by blending the tree line higher up the hill and protecting vulnerable water courses.

There will be a preference for natural regeneration of future native woodland areas, once framework planting and seed source has been established. With seed source limitations, planting will be necessary across much of the site. All broadleaf planting will be native to the area and local provenance stock (unless unavailable) and will complement existing naturally growing scrub and woodland to give the most ecological value. Enrichment planting will be used to ensure the target stocking density is reached if there is insufficient natural regeneration.

C.2.15 Other

C.2.15.1 Wildfire

See Appendix VI.

FLS continues to work closely with Scottish Fire and Rescue Service (SFRS) to prevent and tackle wildfires that threaten Scotland's National Forests and Land. FLS support SFRS in their lead role for fire prevention and suppression through creating annual fire plans, maintaining a duty rota, and providing additional logistical support. FLS's primary objective is always to protect people's health, safety and wellbeing. A wildfire risk assessment has been undertaken for the plan area, identifying possible mitigations to reduce the risk of wildfire starting, in addition to this an emergency plan has been drawn up, with input from local stakeholders to aid response to any wildfire incidents in the future.

C.2.15.2 Hydrology

The scale of felling of windblown coupes in **Glen Doll** and **Glen Prosen** is a very small proportion of the catchment and therefore will not have a significant impact on peak flow at the flood point. Furthermore, in the existing forest, the restocking will include buffers and riparian areas with broadleaves that will slow the flow of water – see Appendix IX 'Operational Buffers.' FLS mitigate for any site local impacts of felling and operations, through the careful management of water and sediment on site during and after operations. Land management interventions on the open ground in **Glen Prosen**, such as peatland restoration, drain blocking and woodland creation, will bring benefits of holding more water on the land, slowing the flow and reducing peak flows.

The project will adhere to industry working requirements and follow best practice guidance to protect the River South Esk SAC and the private water supply catchments in the vicinity. In accordance with forestry best practice, UKFS Forest and Water Guidelines, FC Practice Guide – "Managing forest operations to protect the water environment", and Forestry & Water Scotland 'Know the Rules' 2nd Edition, all operations will be planned in advance to consider their effects on watercourses leading to or forming part of the River South Esk SAC.

All works will use competent and qualified operators. To reduce the risk of pollution events, machinery will be selected for its suitability to the site and operation, and must be in good working condition, be well maintained and regularly inspected. Pollution control plans will be in place and machines equipped with spill kits to absorb any spillages. Fuel, oils, lubricants and chemicals will be kept in appropriate storage containers, such as a locked bunded tank stored on level ground, away from drains and watercourses.

Any chemical applications will following best practice and recommended buffers will be applied to reduce the risk of any chemicals entering watercourses. All chemicals will be stored safely and mixed well away from any watercourses or roadside drains. Pre-commencement meetings will clearly set out constraints and sensitivities, alongside a map highlighting sensitive areas and the presence of protected species. Buffers will apply along water courses and operations within these minimised as far as possible. Water crossings will also be minimised, where this unavoidable, log bridges and/or pipes will be used.

Both before operations begin and during works, site conditions will be monitored and contingency plans in place should unforeseen events occur, such as postponing or halting operations during severe rainfall. Opportunities will be taken possible to disconnect existing drains where this will not lead to an increase in the water table and risk instability in the crop.

To further protect watercourses during operations, any new drainage will not connect with watercourses. Silt traps and vegetated areas may be used to allow sediment to settle

C.2.15.3 Private water supplies

As part of the design process for this plan, a concerted effort has been made to identify any PWS sources either within the plan area or within approximately 2km of the boundaries. This was done by setting up an indicative "private water supply screening zone" around the forest blocks and within this area checking against all relevant water supply data currently available including:

- FLS local private water supplies data
- Data provided by the local authority
- Drinking Water Protected Area data provided by SEPA.
- Using a database of addresses to identify all residents of rural properties within 2km which are not located near a water main.

Any PWS identified were ground-truthed and added to the FLS local database before the felling and future restock design process took place. This means that all the relevant buffers are robustly designed into our plans from the outset. Any properties which we were unable to contact and have not responded to the consultation have been flagged as potentially having a PWS will be contacted in the future if any operations are planned in the vicinity of their property. With this updated data, future operations within the vicinity of all private water supplies can be adequately planned, including using our drinking water source catchment tool to create catchments for each source, and carrying out any extra consultation necessary, to avoid any adverse effects on the drinking water supplies of neighbouring landowners.

Confidential appendix IV details the PWS catchments in the plan area and how we will avoid negatives impacts on PWS.

When felling and restocking are carried out the Forest and Water Guidelines (3rd Edition) will be strictly adhered to. Timber extraction will normally avoid crossing the burns or main drains but, where necessary, each crossing point will be piped or bridged. Branches will be kept out of watercourses and trees will generally be felled away from the watercourses. When restocking, planting will normally be kept back from the watercourses, although broadleaves may be planted or regenerated to provide dappled shade.

C2.16 Environmental Impact Assessment (EIA) and Permitted Development Notifications

Table 8: EIA projects (in Phase 1)

Total area (hectares) for each project type and details by sensitive or non-sensitive area.					
Type of Project	Sensitive Area		Non-sensitive Area		Total
Afforestation	%Con	%BL	%Con	%BL	0ha
Deforestation	%Con	%BL	%Con	%BL	0ha
Forest Roads	1.5 ha		ha		1.5ha
Quarries	1ha		ha		1ha
Provide further details on your project if required.					

C2.17 Tolerance Table

	Map Required (Y/N)	Adjustment to felling period *	Adjustment to felling coupe boundaries **	Timing of restock	Change to restocking species	Changes to roadline	Designed open ground ***	Windblow clearance ****
SF approval not normally required	N	Felling date can be moved within 5 year period where separation or other constraints are met	Up to 10% of coupe area	Up to 2 planting seasons after felling	Change within species group e.g. evergreen conifers or broadleaves	-	Increase by up to 5% of coupe area	-
SF approval by exchange of email and map	Y	-	Up to 15% of coupe area	Between 2 and 5 planting seasons after felling subject to the wider forest and habitat structure not being significantly compromised	-	Additional felling of trees not agreed in plan. Departures of more than 60m in either direction from centre of road	Increase by up to 10% Any reduction in open ground within coupe area	Up to 5 ha
SF approval by formal plan amendment may be required	Y	Felling delayed into second or later 5 year period Advance felling into current or 2nd 5 year period	More than 15% of coupe area	More than 5 planting seasons after felling subject to the wider forest and habitat structure not being significantly compromised	Change from specified native species Change between species groups	As above, depending on sensitivity	More than 10% of coupe area Colonisation of open areas agreed as critical	More than 5 ha

Tree Felling in Exceptional Circumstances	FLS will normally seek to map and identify all planned tree felling in advance through the planning Process. However there are some circumstances requiring small scale tree felling where this may not be possible and where it may be impractical to apply for separate felling permission due to the risks or impacts of delaying felling. Felling permission is therefore sought for the approval period to cover the following circumstances: Individual, rows or small groups of trees that are impacting on important infrastructure (i.e. Forest roads, footpaths, access routes (vehicular, cycle, equestrian or pedestrian), Buildings, Utilities and services and drains) either because they are now encroaching on or have been destabilised or made unsafe by wind, physical damage or impede drainage. The maximum volume of felling in exceptional circumstances covered by this approval is 75 cubic metres per Land Management Plan per calendar year. A record of the volume felled in this manner will be maintained and will be considered during the five year review.

* Felling sequence must not compromise UKFS in particular felling coupe adjacency. Felling progress and impact will be reviewed against UKFS at 5 year review.

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

*** Tolerance subject to an overriding maximum of 20% designed open ground

**** Where windblow occurs, SF must be informed of extent prior to clearance and consulted on clearance of any standing trees

Appendices

Map 1 – Location
Map 2 – Current tree species **Glen Doll**
Map 3 – Current tree species **Glen Prosen**
Map 4 – Concept **Glen Doll**
Map 5 - Concept **Glen Prosen**
Map 6 – Management Coupes **Glen Doll**
Map 7 - Management Coupes **Glen Prosen**
Map 8 – Thinning **Glen Doll**
Map 9 – Thinning **Glen Prosen**
Map 10 – Future habitats and species (Restock) **Glen Doll**
Map 11 - Future habitats and species (Restock) **Glen Prosen**
Map 12 – Timber haulage & Civils **Glen Doll**
Map 13 - Timber haulage & Civils **Glen Prosen**
Map 14 – Soils **Glen Doll**
Map 15 - Soils **Glen Prosen**
Map 16 – Deer management **Glen Doll**
Map 17 – Deer management **Glen Prosen**
Map 18- Visitor Access **Glen Doll**
Map 19 – Visitor Access **Glen Prosen**
Map 20 – Environmental Designations I
Map 21 – Environmental Designations II
Map 22. Context & Key Features **Glen Doll**
Map 23. Context & Key Features **Glen Prosen**
Map 24. Historic Environment **Glen Doll**

Map 25. Historic Environment **Glen Prosen**
Map 26. **Glen Prosen** Open Habitats
Map 27. **Glen Doll** Open Habitats

Appendix I – Record of Consultation
Detailed summary of stakeholder and public consultation between Sept 2023 and Aug 2025.

Appendix II – Historic environment records
Table of scheduled, significant and relevant heritage features that are in the plan area and plan period.

Appendix III – Deer Management Plan
Context and information on deer population in the area, previous deer management and future culls to enable woodland establishment and restock.

Appendix IV – Private Water Supplies (confidential)
Table of water supply points and catchments in the plan area and relevant information re operational mitigations.

Appendix V – Landscape and visualisations
Suite of visualisations to show felling and restock in plantations over the plan period, and Landscape Character Assessments for both sites.

Appendix VI – Wildfire Management Plan
Maps showing deer management for each site and plan detailing deer culls for the plan period and how these will be managed.

Appendix VII – EIA SORs
EIA SOR for new road, track and quarry expansion in plantation forest blocks

Appendix VIII – Protected Species (confidential)
Details of recorded species with protected/scheduled status in plan area.

Appendix IX – Planting and Operational Buffers
Table identifying buffers to be applied to sensitive features during operations/management

Appendix X – List of tree species
Details of species included in the terms ‘native mixed broadleaves’ and ‘mixed conifers’