Forestry and Land Scotland - South Region
Laurieston
Land Management Plan

Approval date:

Plan Reference No:

Plan Approval Date:

Plan Expiry Date:

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.

FSC
www.fsc.org
FSC® C123223
The mark of responsible forestry

PEFC™
PEFC/16-40-1002
Promoting Sustainable Forest Management
www.pefc.org

CSM 6

Forestry and Land Scotland – Application for Land Management Plan Approvals

Forestry and Land Scotland – Property

FLS Region:	SOUTH REGION
Woodland or property name:	LAURIESTON
Nearest town, village or locality:	LAURIESTON/GATEHOUSE OF FLEET
OS Grid reference:	NX 649 641
Local Authority district/unitary Authority	DUMFRIES AND GALLOWAY

I apply for Land Management Plan approval*/~~amendment approval~~* for the property described above and in the enclosed Land Managment Plan.

I confirm that the scoping, carried out and documented in the Consultation Record attached, incorporated those stakeholders which the FC agreed must be included. Where it has not been possible to resolve specific issues associated with the plan to the satisfaction of consultees, this is highlighted in the Consultation Record.

I confirm that the proposals contained in this plan comply with the UK Forestry Standard.

I undertake to obtain any permissions necessary for the implementation of the approved Plan.

Signed ……..... Signed .....
Planning Manager Conservator

District: South Region Conservancy: South Scotland

Date **……**..... **Date of Approval:** .....

Date approval ends: .....

*delete as appropriate

Laurieston Land Management Plan 2018 - 2028

Contents

1.0 Summary of Proposals

The plan proposes an expansion of continuous cover forestry, along with smaller scale clearfell coupes to facilitate an expansion of cover for the nationally important migratory nightjar population. The methods will retain the productive capacity of the forest, while diversifying species stocked and product produced. While expanding the habitat network for the nightjar, the overall productive character of the forest will be maintained throughout the period of this plan.

The plan area covers 3043ha, and is located between the settlements of Laurieston in the north east and gatehouse in the south. There is limited utilisation of the forest as a recreational resource due to surrounding forest areas having greater facilities and different character.

There is some minor internal water bodies, but adjacent major water bodies in the surrounding areas which gives rise to areas of open space. In addition to the open space for water protection and habitat diversification, there are limited internal viewpoints from inside the forest.

2.0 FCS Regulatory Requirements

Table 1 - Clearfell coupes first 10 years

Coupe No	Operation	Area (ha)
56118	Clearfell	74.7
56169	Clearfell	24.9
56161	Clearfell	3.4
56111	Clearfell	34.2
56123	Clearfell	33.9
56007	Clearfell	5.5
56081	Clearfell	14.2
Total Clear fell		**190.8**

Table 2 - Clearfell coupes as a % of LMP area (3043ha)

Phase No	Coupe	Year	Percentage of Forest
1	56118	2019	74.7ha 2.20%
1	56007	2019	5.5ha 0.18%
1	56081	2019	14.2ha 0.46%
1	56169	2020	24.9ha 0.81%
1	56161	2020	3.4ha 0.11%
2	56123	2026	33.9ha 1.11%
2	56111	2028	34.2ha 1.12%

Table 3 - Restocking coupes, area and species

Felling Phase No	Restock Coupe	Restock Year	Total Coupe size (ha)	1	2	3
1	56118	2022	74.7	SS 74.7		
1	56081	2022	14.2	SS 12.6	OS 1.6	
1	56007	2022	5.5	MB 5.5		
1	56161	2023	3.4	SP 2	MB 1	SS 0.4
1	56169	2023	24.9	DF 20.4	MB 4.5	
2	56123	2029	33.9	OS 33.9		
2	56111	2031	34.2	OS 34.2		

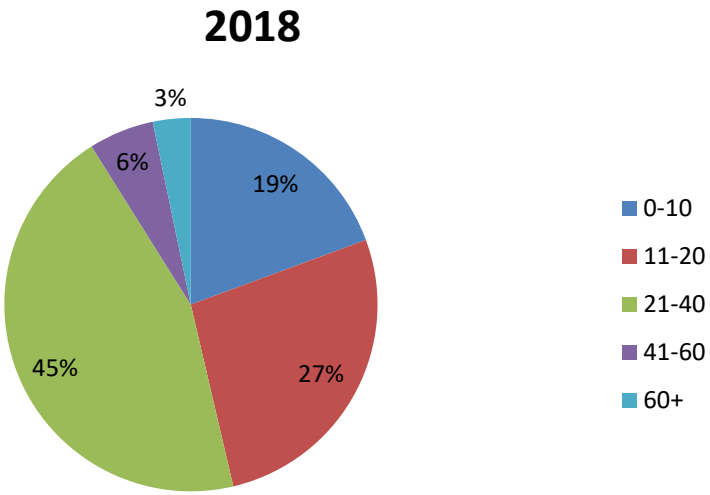


Figure 1 - Age class before plan

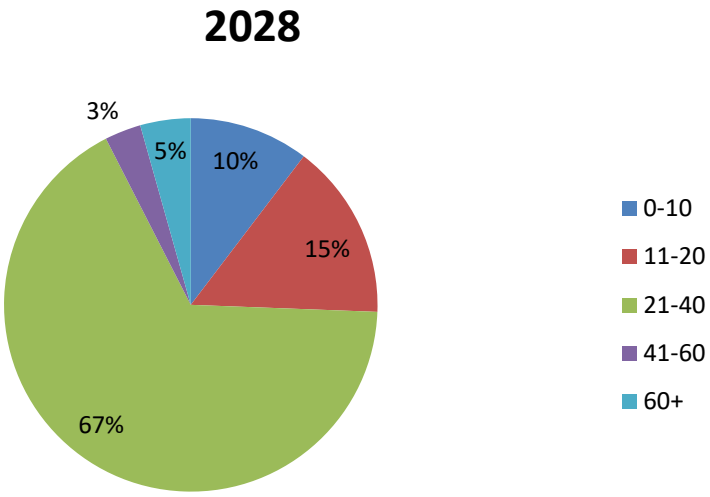


Figure 2 - Age class after first 10 years plan

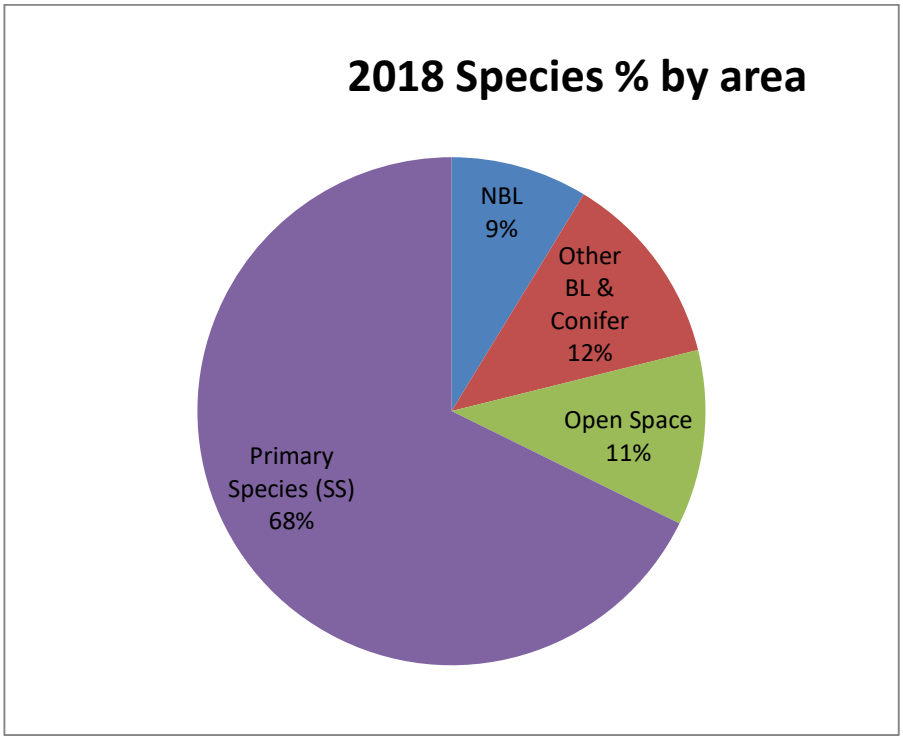


Figure 3 - Species composition at plan start

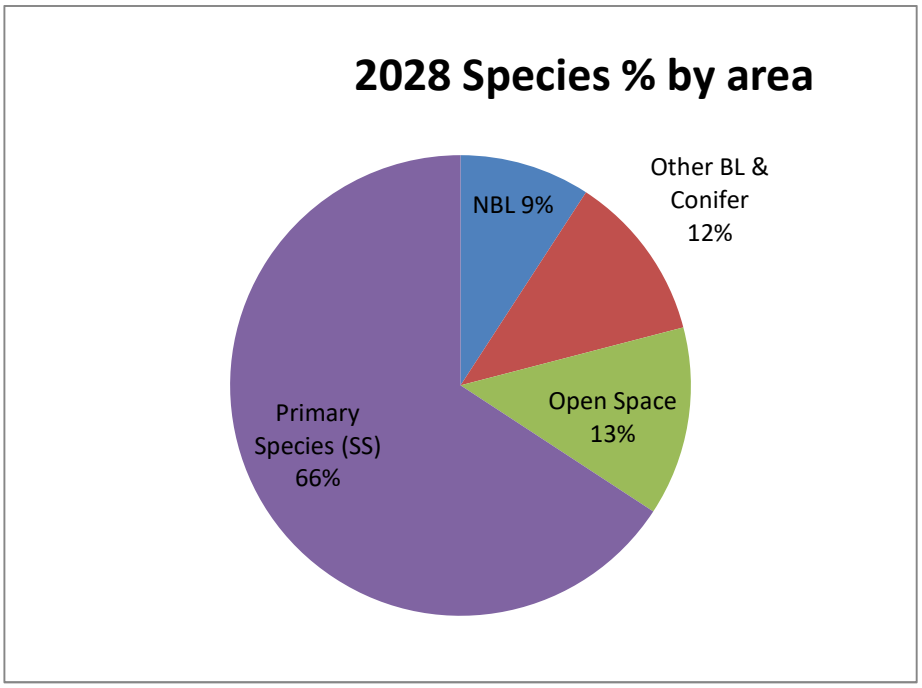


Figure 4 - Species composition after 10 years

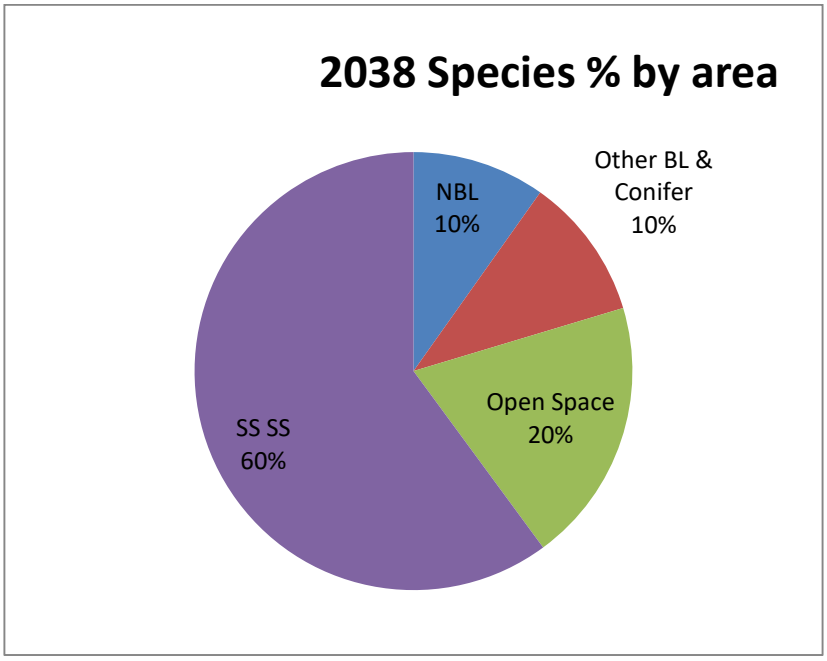


Figure 5 - Species Composition after 20 years

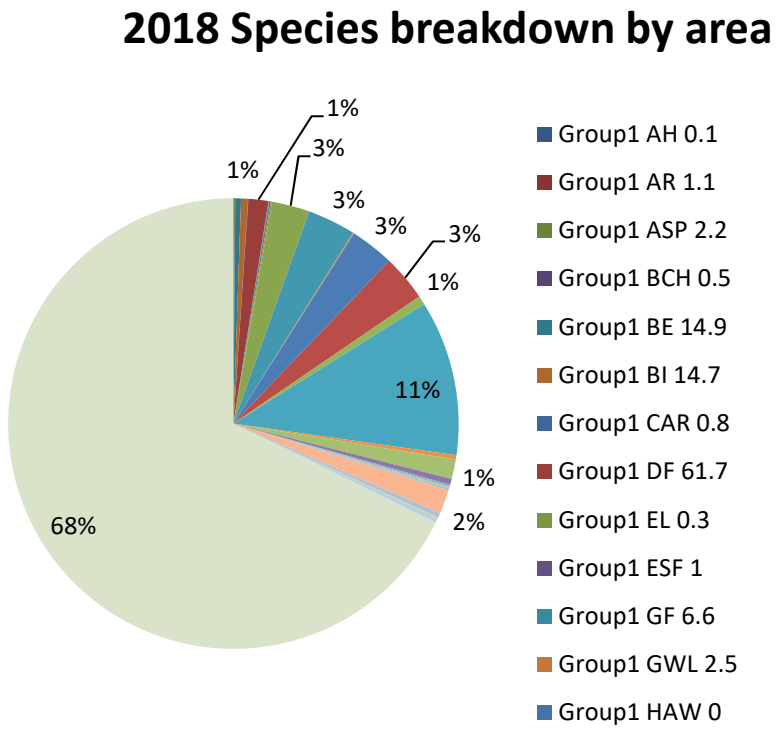


Figure 6 - Species breakdown at plan start, SS is shown at 68%, OS@11%

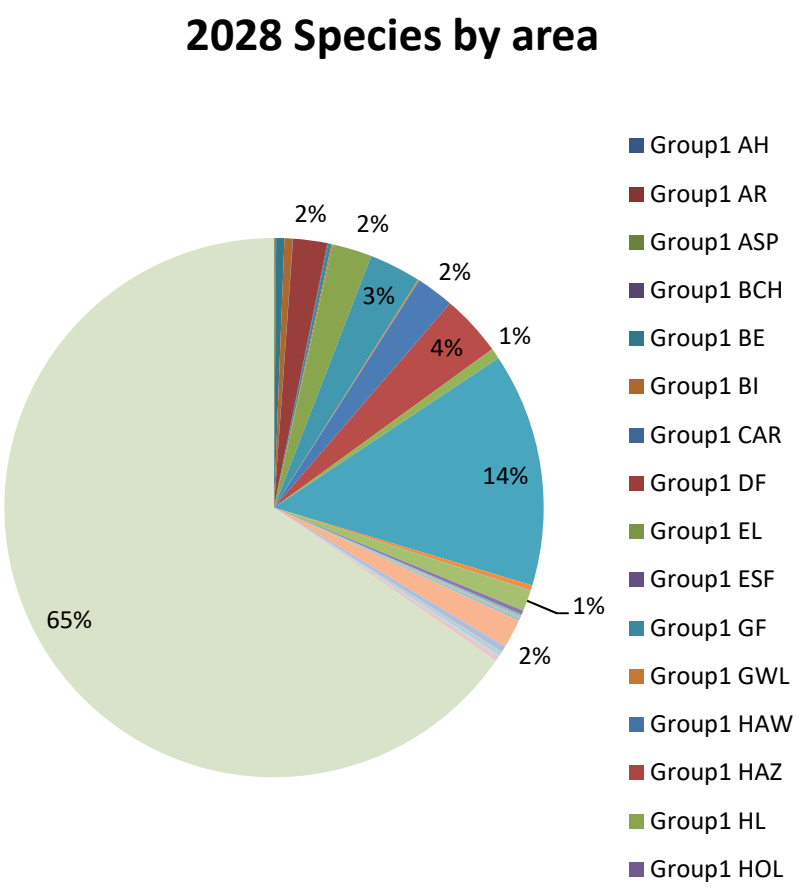


Figure 7 - Species breakdown at year 10 into plan, SS shown at 65%, OS@14%

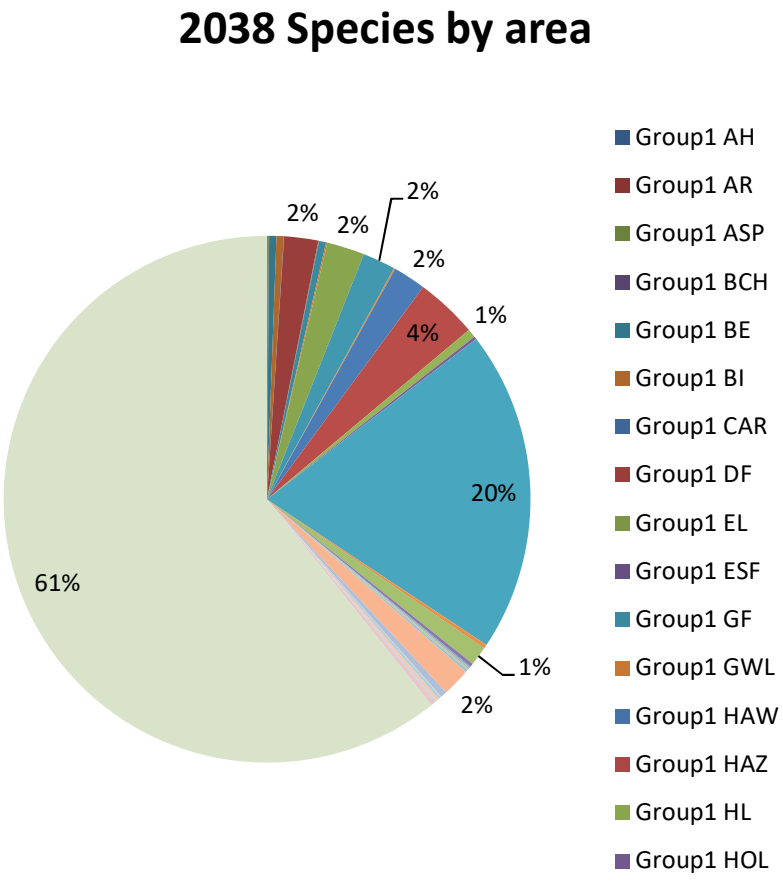


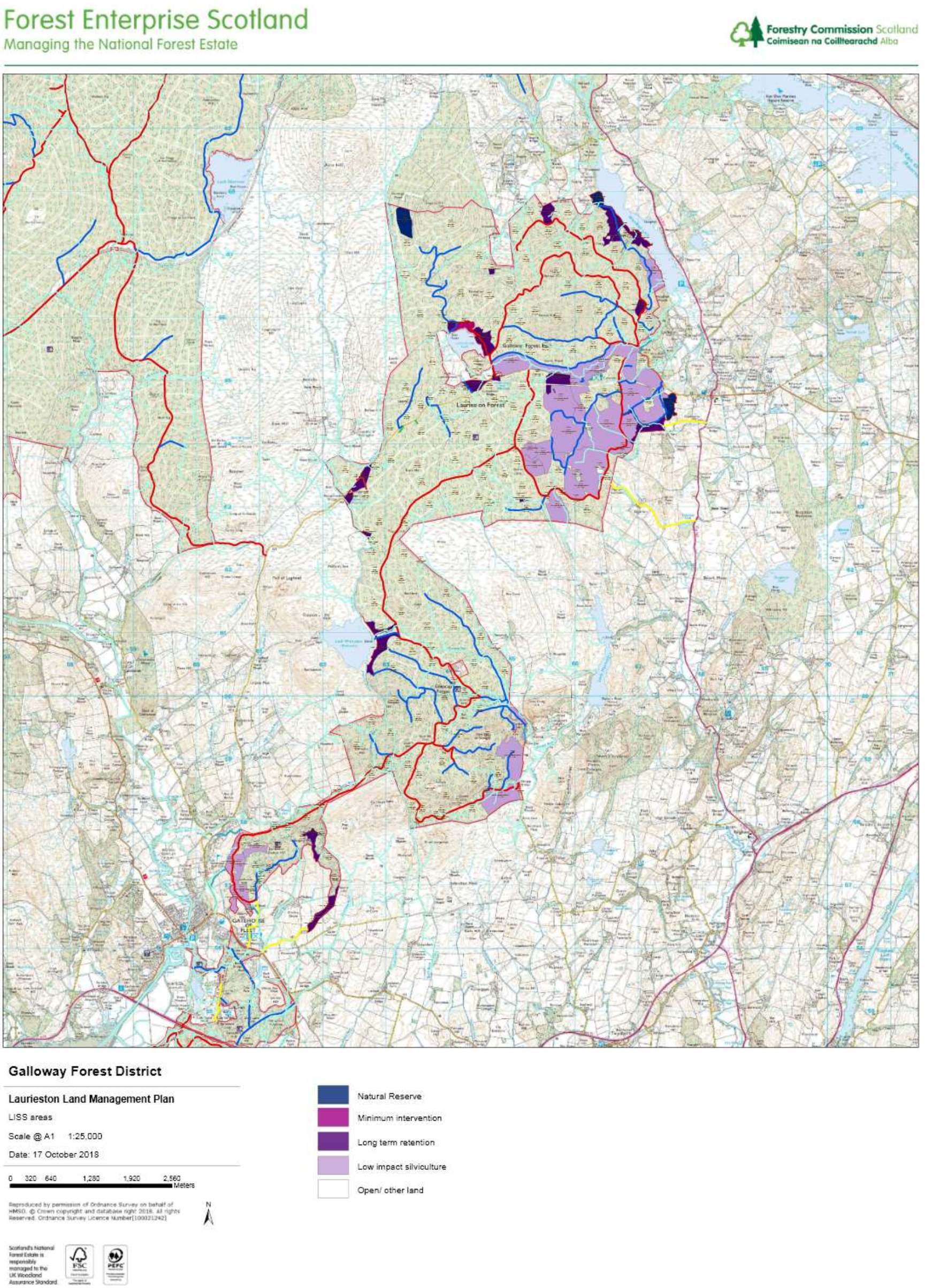
Figure 8- Species breakdown at year 20 of plan, SS shown at 61%, OS@20%

2.1 Summary of additional planned operations

In addition to the planned clearfell and management coupes, shown in table 1-3, table 4 shows the areas which are under LISS management, which may have small scale operations conducted as part of the cwider thinning programme.

Table 4 - LISS coupes

Coupe number	Area (ha)	Type of management
56146	31.29	Strip Shelterwood
56141	9.02	Strip Shelterwood
56037	37.50	Strip Shelterwood
56143	19.23	Strip Shelterwood
56150	12.48	Strip Shelterwood
56055	4.01	Strip Shelterwood
56054	8.44	Strip Shelterwood
56087	45.09	Strip Shelterwood
56544	10.92	Group Shelterwood
56501	5.20	Group Shelterwood
56553	24.08	Group Shelterwood
56547	49.11	Group Shelterwood
56008	17.47	Group Shelterwood
56153	10.81	Group Shelterwood
56526	22.18	Group Shelterwood
56541	3.46	Group Shelterwood
56001	5.35	Group Shelterwood
56505	5.66	Group Shelterwood
56511	24.41	Group Shelterwood
56162	4.88	Group Shelterwood
56555	5.52	Group Shelterwood
56178	4.30	Group Shelterwood
56156	6.31	Group Shelterwood



Map 1 - LISS areas

2.2 Proposed felling in years 2018- 2028

Map 2 shows the proposed felling coupes over the first 10 years of the plan. The proposed felling represents 6.4% of the forest area. This felling will take place utilising harvester-forwarder methodology. Wherever possible motor manual felling will be avoided. For the period of the first 2 phases, there are no areas that will require a specialist felling methodology. There may be brash recovery from felling sites where it is judged not to adversely affect the soil conditions, however, this would be after a fallow period to allow for the foliage to drop from branches and be retained within the site. Both internal and external harvesting operators may be used depending on markets and resource availability.

The main crop felled will be Sitka spruce, producing both logs and small roundwood. This will be sold as either as standing sale, or to satisfy ongoing production contracts from the national estate.

It is important to manage forestry activities in acid sensitive water catchment and there are three catchments within this Land Management Plan area that have been identified as being either "at risk" or "failing", see appendix VII for an evaluation of the catchments with the felling coupes.

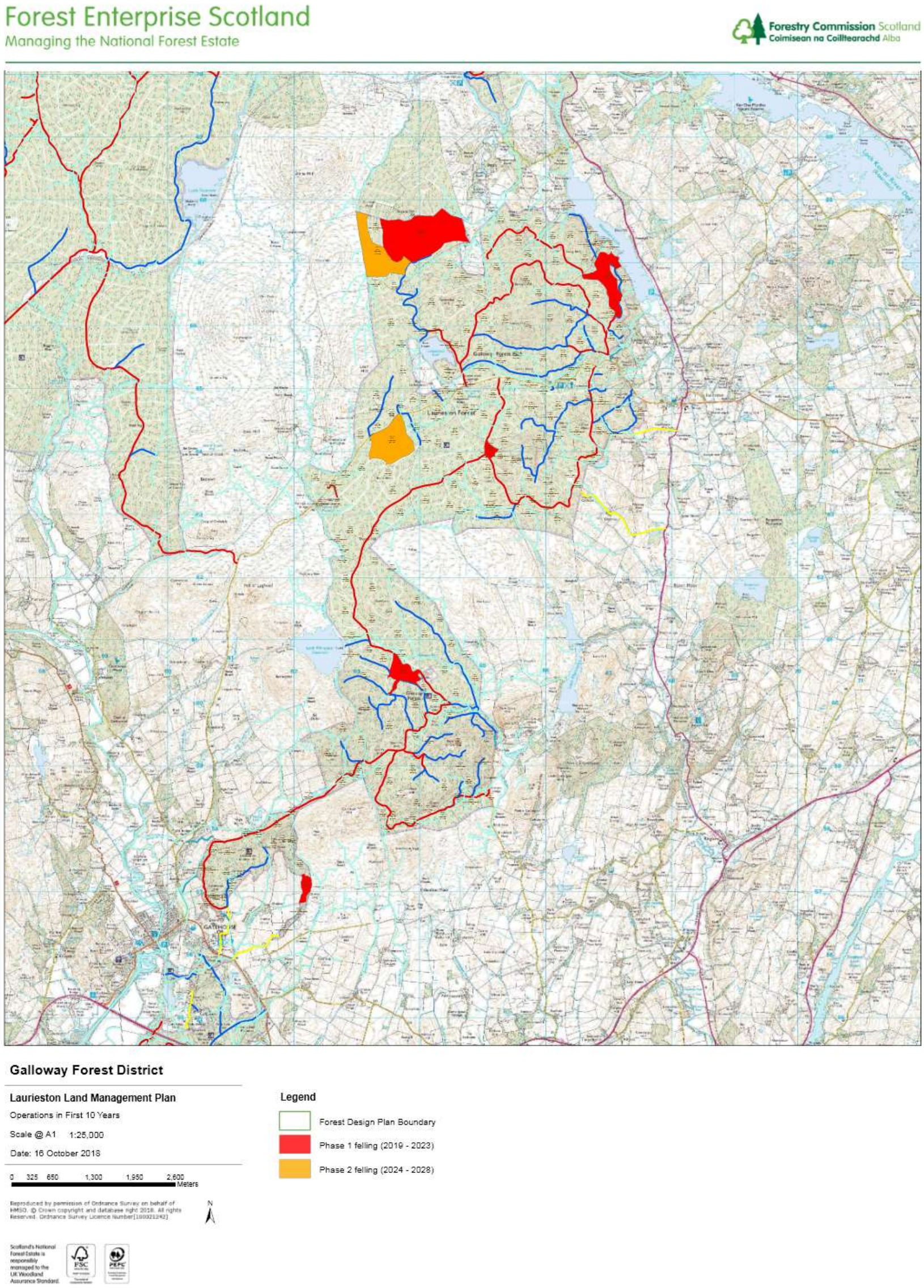
For conservation and biodiversity considerations efforts have been made

- to extend the felling period between coupes
- to remove dense conifer plantations above 300m
- Create habitat which is advantageous to riparian areas

All proposed operations sites will be surveyed prior to work taking place to identify the presence of species such as red squirrel, otter or badger that may require specific management treatments i.e. locating dreys or avoiding breeding seasons. Any resident squirrel populations will not be left in isolated blocks of mature conifer where at all possible, and transportation of any isolated populations will be considered as a mitigating measure.

The Slogarie hill coupe, 56118, has extensive windblow in the coupes immediately to the south west, west and north as shown in 2017 aerial photography. The coupe itself also has two sections of windblow in the coupe, around the peak of the hill. Our senior FLS landscape architect has advised against chasing windblow across the hill by utilising smaller coupes areas, which will probably be unstable due to the nature of the crop which has missed thinnings, has a unfavourable crown to stem ratio, and has been established on plough furrows which has led to asymmetrical root plates developing. The felling coupe has been designed, in collaboration with the senior landscape architect, to

allow for felling from the leeward side (moving east to west) as there is little prospect of being able to hold onto this unstable area for more than one felling phase, especially with DAMS scores ranging from 15-17. The situation is further complicated with a wildlife constraint to operations which would limit the operational window to three months. Furthermore, to allow for operational access to the coupe would necessitate a forest road, bisecting the face of the hill. To avoid this situation in future rotations, the area will be replanted with wide rides, allowing for a smaller coupe size with windfirm edges. The forest gales data requested by South Scotland Conservancy (Scottish Forestry) is given appendix VI. The visual impact of felling the whole hilltop has been assessed as minimal and follows UKFS and landscape guidance in terms of treating the hilltop as one functional unit, and avoids bisecting the horizon with a brown unstable coupe edge. The design also takes into account the proposed coupe structure in the adjacent private plantation (Slogarie) and ties in accordingly. The felling has been modelled in Prospect software and results taken from the Mossdale carpark viewpoint, (the only significant viewpoint where this coupe can be seen from) results are given in Appendix VIII. A second viewpoint was attempted to be modelled, but the hillside is not visible from any southern, eastern or viewpoint being shielded by neighbouring hills and forest.



Map 2 - First 10 years management

2.3 Proposed thinning in years 2018-2028

Thinning will be completed in line with the district thinning plan after an assessment of the coupes against the criteria given. All coupes which are marked for LISS methodology will require thinning and have been assessed as suitable for such.

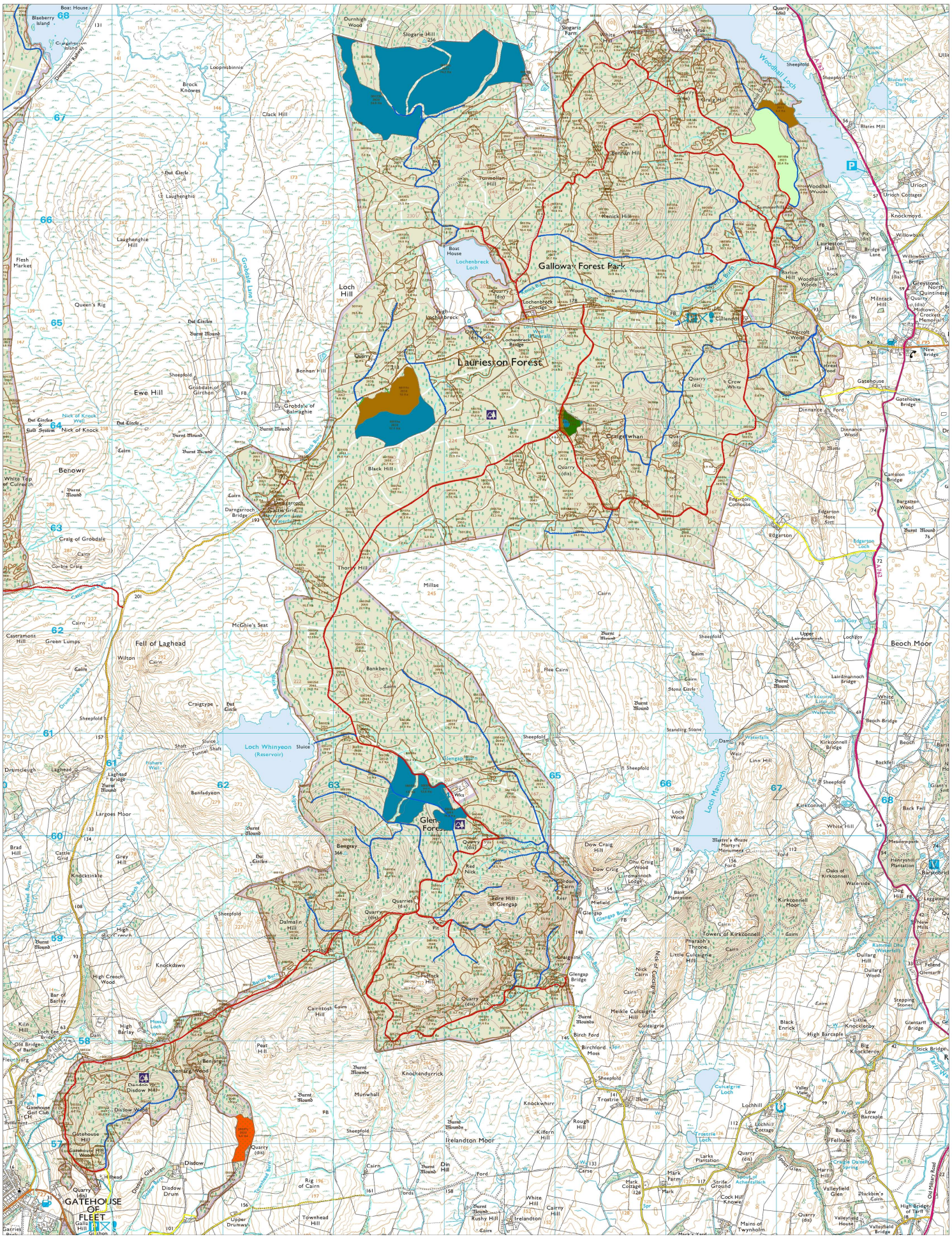
2.4 Proposed restocking in years 2018-2028

The proposed restocking from clearfells have been selected by ESC, on-site observations and the previous rotations. Where it has been suitable to diversify the species utilising both BL and alternative conifers, this had been undertaken. The species choice also meets the criteria for restocking under UKFS, UKWAS and internal FC policy. Inverted mounding will be preferred, but hinge and trench mounding may also be used as site dictates. No ploughing will be undertaken due to the excess carbon release on peaty soils and the development of asymmetrical root plates which will affect stand stability. As with the felling, replanting may occur with the use of internal or external planting operators, utilising trees provided by various nurseries of the correct provenance. Deer control will be managed internally, in line with the deer control strategy for the district.

The national restocking plan for FLS is based on a presumption that restocking will take place as quickly as possible to avoid the loss of productive area for extended periods of time. This plan's restocking period is based on a fallow period of 3 years (see tolerance table) which has been established as the most advantageous timescale through both experimental results within the district and feedback from previous establishment operations. This fallow period has been key to reducing the incidence of loss due to Hylobius abietis and a reduction in chemical usage on the NFE. This fallow period is under constant review, and where we believe we can shorten this period with acceptable losses through increased beat-up, greater ground preparation and/or using treated trees, we will take the opportunity. Any extension to this period will be noted in the mid-term review and any exceptions to the 3 year rule described and amendments will be applied for as per the requirements of the tolerance table. One of the objectives for felling and restocking is to have at least a 7 year or 2m separation between felling and restocking of neighbouring coupes for both visual amenity and overall forest structure. Wherever possible, this plan will resolve adjacency issues by delaying felling, rather than restocking outside the normal 3 year window.

Forest Enterprise Scotland
Managing the National Forest Estate

Forestry Commission Scotland
Coimisean na Coilltearachd Alba



Map 3 - First 10 years restocking

2.5 Access and roading 2018-2028

There will be no new road required for the first 10 years of the plan. The existing road network is well suited to the management operations, however, upgrading of roads will be required within the forest and will be assessed at the time of operations.

ATV tracks are utilised deer control, and their placing, length and direction is assessed at time of restock. Permanent ATV tracks will be retained and upgraded when required.

2.6 Departure from UKFS Guidelines

The UKFS guidance for adjacency has been met wherever possible. Given the reduced coupe size, landscape considerations, hylobius management, and possible stand stability, the adjacency guideline will not always be possible to follow. The adjacency guideline will primarily be addressed by delayed felling, with the secondary option being delayed restocking.

2.7 Tolerance table

See appendix 4

3.0 EIA Screening Determination for forestry projects

3.1 Proposed deforestation

Deforestation within the LMP area will only occur where there has been an identified benefit to the wider environment or community. This will be in the form of the creation of permanent open space. The rationale behind this will be to enhance water quality or the enhancement of viewpoints. At year 20, the amount of open space in the place will account for 20% of the total plan area, an increase of 9% almost entirely from conifer removal from watercourses and catchment areas.

3.2 Proposed forest road works

There is no extension of the forest road network planned for the area during the 10 year approval period, but upgrading of existing roads will be required to facilitate forestry operations. These will be identified once an assessment of the route required prior to operations has taken place. An assessment of the roading network throughout the National Forest Estate has been undertaken to see if a Construction licence from SEPA is required for works, and none of the roading projects within the forest block will be over the threshold requirements.

3.3 Proposed forest quarries

To reduce the impact of transportation of stone, as much suitable stone shall be won from locally available quarries within the forest block. Where this is undertaken all works shall be done in accordance with The Quarries Regulations(1999). To avoid diffuse pollution arising from rainfall derived leaching, appropriate soakaways are in place in the main quarries and all construction work will comply with the general binding rules specified in the Water Environment (Controlled Activities) (Scotland) Regulations 2011.

3.4 Proposed afforestation

There is not proposed afforestation of permanent open space areas. Some naturally regenerated dispersed tree cover, where the canopy cover is less than 20% of the area, will be accepted where this does not significantly impact on other management objectives such as water quality, landscape, and deer control.

4.0 Critical Success Factors

- To maintain the productive capacity of the forest
- To maintain and enhance the habitat available for migratory nightjar species, specifically by introducing a strip shelterwood system where this is appropriate and retain existing group shelterwood systems
- Retain and enhance the broadleaves and remnant designed landscapes (beech avenue)
- To increase the species diversity of the forest utilising the areas cleared for *P. ramorum* and where diversification would not detract from the overall diversity of the forest.

5.0 Introduction

5.1 The existing land holding

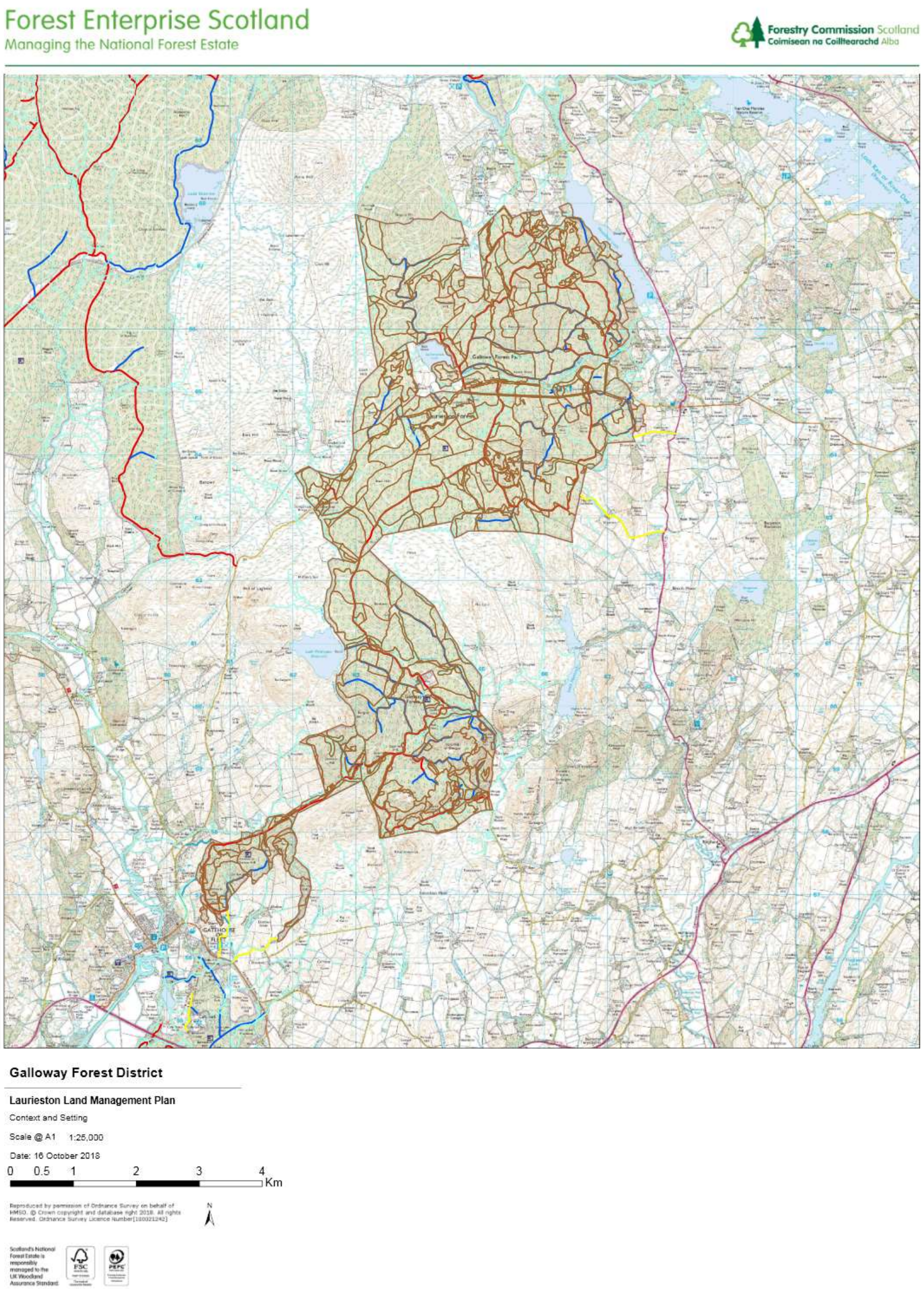
Laurieston forest block includes the areas described on OS mappings as Laurieston Forest, Glengap Forest and Disdow wood, lying between Laurieston village and Gatehouse of Fleet. These contiguous areas cover 3,043ha, with no large areas of open hill ground within the forest block.

The first of the 3 large forest blocks to be acquired by the Forestry Commission was Disdow, immediately north of Gatehouse in 1933. This was followed in 1938 by Laurieston, with Glengap following in 1945. Two smaller blocks were added in 1965 and 1985.

The areas are mostly given to first/second rotation conifer on poor quality former agricultural land. The primary species is Sitka spruce, sometimes grown in a mixture with lodgpole pine on wetter ground. The drier areas have been stocked with Larch, however, this has been affected by *P. ramorum*.

In the North east of the Laurieston area is a PAWS site which will continue to be restored with the removal of a Western Hemlock seed stand. There is also an area above Gatehouse of Fleet (South Disdow) which contains many veteran broadleaf and alternative conifer trees, which has resulted in a LEPO designation. The lower west section of Disdow is part of the Fleet Valley national scenic area. There are also small historic areas of broadleaves in the north along the Laurieston-Gatehouse of Fleet road, known locally as the beeches.

5.2 Setting and context



Map 4- Settings and context

The block is surrounded by a combination of open hills, lochs and agricultural holdings. There is a small private forestry block which abuts the forest boundary on Slogarie hill. There are 2 major water bodies on two of the boundaries of the block; Woodhall loch at the north east boundary and loch Whinyeon in the south east. There is also Lochenbreck Loch, which is internal to the forest block, but not owned by FLS. There is also the water processing works currently operated by Scottish Water. There are limited recreation facilities with the picnic area around the Kennick burn providing the only maintained recreation infrastructure. There is fishing on all of the surrounding and internal water bodies. The Woodhall loch catchment has been found to be at risk from North American Signal Crayfish (NASC), which are an invasive non-native species (INNS). Biosecurity best practice, taken from the districts INNS policy, will be consulted and implemented in operations which are at risk from NASC. There is ongoing consultation on the INNS policy from FLS, SEPA & SNH, which includes updating of the areas considered at risk.

There are two small settlements which surround the forest block; Laurieston to the East of the forest from where the forest draws it name and Gatehouse of Fleet to the immediate south of the forest block.

Timber harvesting must take into account the neighbouring areas road infrastructure and harvesting must abide by the Timber transport Forum guides for excluded and consultation routes, and utilise internal forest road networks wherever possible.

The north west of the plan lies the Laughenghie and Airie Hills SSSI, and the Woodhall loch SSSI lying to the North East.

The internal, and some external viewpoints, have been affected by large amounts of felling associated with sanitation felling of larch killed by P. Ramorum. This felling was in addition to the original felling design set out in the previous plan which largely aimed to retain larch for landscape and biodiversity reasons. This additional felling resulted in some trees being exposed on skylines and hilltops. There has also been extensive windblow in areas which have been converted to LISS at a late stage, mainly focussed around Kenick burn area.

The 1994 Dumfries & Galloway landscape assessment categorises most of the area as 16a, upland fringe with forestry where the key characteristics are elevated rolling terrain, panoramic views over valley lowlands and the contrast between wide open spaces and more intimate landform. Summary guidelines

suggest that forest proposals should achieve informal patterns of forest integrated with open space and valley woods.

The 2000 Galloway local Forestry Framework groups most of the area into ”Dee 8” where guidance suggests that restructuring should pay particular attention to forest edges, riparian zone, enhancements and opening up key viewpoints. There has been some informal clearance of the Fuffock hill viewpoint which affords views out across the surrounding area.

5.3 LMP Presentation

This LMP is presented as a whole, rather than divided into management zones. There are no discrete divisions within the plan as the forest is contiguous over the 3,043ha covering the plan. The management objectives are based on the themes given in the Forest Enterprise Scotland corporate plan 2017-2019 along with the Galloway district forest strategy

6 Plan Objectives

6.1 Issues

- Habitat for nightjar must be maintained and enhanced. The small coupe clearfell size and variety of habitat must be continued to protect this valuable species in the north Glen gap/South Laurieston area
- Recreation area at Kenick burn has suffered from extensive windblow leading to path disruption and a diminished visual amenity. Furthermore extensive infection and death of mature larch around the area will cause further lowering of visual amenity.
- Recent thinning programme has left some unthinned areas which will be subject to windblow before ideal rotation age.
- An area of LMP is used by a schedule 1 raptor with an expansive exclusion zone. Strict timing restrictions hampers the ability to harvest in this area.
- Larch is likely to be lost entirely from the species mix in the forest because of the rapid spread of P. Ramorum causing the subsequent death of this tree.
- Restructuring of age class has been hampered by *P. ramorum* and windblow

6.2 Key Challenges

- The primary species in the area is a mix of first and second rotation spruce crop. Due to windblow the planting age has remained broadly similar in the second rotation and there was little chance for diversification. This has reduced the opportunities for restructuring of forest in this rotation.
- Maintaining mature conifer species, mostly spruce, for red squirrel past optimal rotation and stability. While reducing large seeded broadleaves to reduce the food source available to grey squirrel while maintaining historic character high amenity areas.
- Maintain the management of the local deer population at a low enough level to allow for natural regeneration of broadleaves and protect planting of vulnerable tree species.
- The reduction in coupe size for nightjar, while balancing the guidance of adjacency from the UK forestry standard can lead to a "checkerboard" appearance of coupes.
- Maintaining recreation capacity while removing infected larch from surrounding areas will be a short term challenge

6.3 Management objectives

Maintain the productive capacity of the forest: Galloway Forest District is responsible for contributing the largest amount of timber to the national programme, and as such must maintain the productive character and capacity of many of the forest blocks. This will utilise the more productive species for the site, mainly Sitka spruce, however this will be guided by the Ecological Site Classification (ESC) system and alternatives will be introduced where viable. The productive zones are shown in the concept zone map (map 5)

Maintain and enhance the habitat for migratory nightjar: 92% of Scotland's population of nightjars (RSPB, 2005) live in a handful of sites in Dumfries and Galloway. Laurieston forest block is one of these key sites and management will continue in consultation with RSPB over areas which are believed to be key to the nightjar. The combination of introducing a strip shelterwood system to the east of the forest, maintenance of the existing group shelterwood system and the use of smaller clearfell coupe size should all combine to enhance habitat availability for this species. The shelter wood systems are shown in concept map (map 5) and LISS map (map 1)

Increase the diversity of species at restock in the forest to enhance resilience: While there is a reliance on Sitka spruce to produce the majority of softwood from the forest, there will be an increase in the diversity of productive species, focussing on increasing alternative conifer and productive broadleaf where site conditions allow providing there would not be a large drop in volume from the forest overall. These alternative conifers will be located on the better soil conditions which are concentrated around the north west and southern areas of the block. See map 7 for restocking plans.

Diversify the products from the forest: To increase the diversity of products and to spread the time at which volume is removed from stands, a thinning programme will be used and maintained wherever possible given the constraints for the site type and exposure for the stand. This process is described in more detail in the Galloway Forest District Thinning Strategy.

Maintain the restructuring the forest in age class: Restructuring an even aged forest in one rotation is not possible, and will continue for at

least the next two rotations. The restructuring will take advantage of any disruption to the scheduled felling based on, such as *P. ramorum* felling.

Maintain the ongoing management of Black Grouse: The areas to the North and North West area of the plan are subject to an ongoing wider management of Black Grouse habitat in liaison between our internal environment team, RSBP and the wider Galloway Glens management group.

Maintain the recreation capacity of the forest: Parts of the forest area used by mostly by the local community for informal recreation – mainly walking, dog walking and horse riding.

7.0 Analysis and concept

7.1 Analysis

Table 5 - Analysis of the the concepts and the implentation available

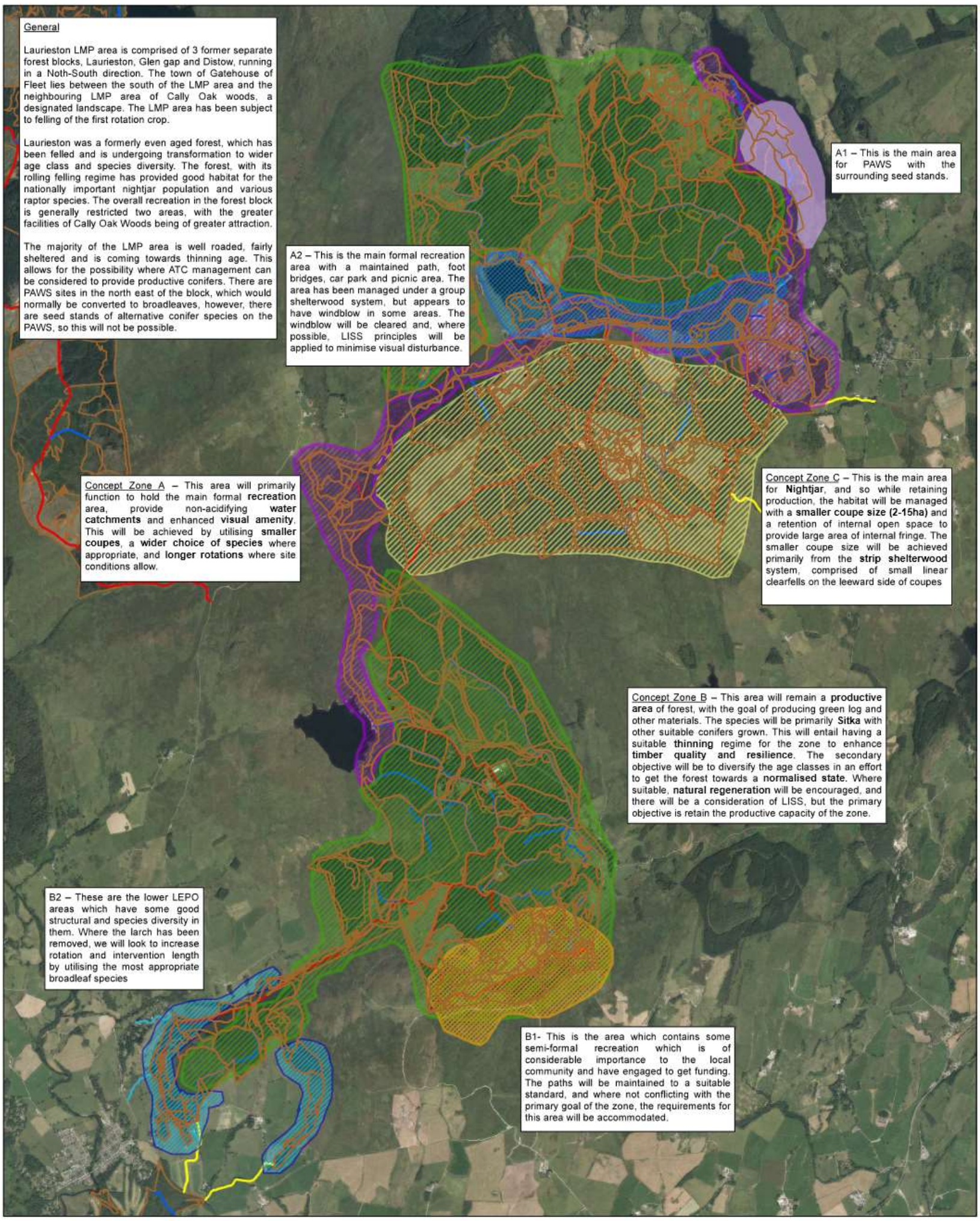
Objective	Opportunities	Constraints	Concept
Maintain the productive capacity of the forest	Capitalise on the areas which have been cleared of larch to diversify the species used for restock to promote sustainable timber supply and increase resilience within the forest. Expand the use of Low Impact Silviculture Systems in concert with increasing habitat for nightjar An increased use of thinning within the block will increase the potential supply of green sawlogs* from the LMP area and give the opportunity to further diversify silvicultural management or extend rotational length thus allowing for a greater age diversity throughout the forest block. Enhance age diversification of the forest through felling of smaller coupes.	Roading for access to allow for smaller, repeated harvesting operations. Full engagement with the thinning programme to allocate an appropriate intensity of harvesting. Adjacency constraints and maintaining felling of trees around MMAI to maximise productivity.	Create an area of strip shelterwood for nightjar and group shelterwood around the key recreation areas. Implement modest scale road building and upgrade programme required to service proposed operations coupes including LISS/CCF Continue restructuring of forest based upon the MMAI
Maintain and enhance the habitat for migratory nightjar	Smaller coupe size can be used to create transient open space, along with boggy areas retained as open space post harvesting Use of strip and group shelterwood will provide transient open space of varying size, with mature trees beside the areas.	Adjacency constraints may lead to the even age forest having a "checkerboard" appearance from a small coupe size, which would not provide interlock with the surrounding landscape	Utilise a reduced coupe size, permanent open space, and CCF methodology to enhance the habitat area and variety to maximise the capacity of the forest block for migratory Nightjars. The CCF approach will focus in the east of the forest, in the leeward side

			of the prevailing SW wind.
Increase the diversity of species at restock in the forest to enhance resilience	Utilising the areas which have been cleared before MMAI or scheduled felling will allow for a wider variety of tree species to be planted. Greater confidence in the growth characteristics of alternative conifers and access to better or improved alternative species will allow for planting in a greater range of site types	Availability of suitable alternative conifers Marketing of alternative conifers to local markets	Maximise the use of alternative conifer in restocking. Give indicative mix of species in restocking plans, confirm suitability with ground-truthing as to suitability of alternative conifer species for the site.
Diversify the products from the forest.	Early interventions are possible within the forest structure to allow for the greater diversity of products produced from initial thinnings (small roundwood/chip) and final thinnings (green sawlogs) The forest block is well roaded and nearly all coupes are accessible for interventions without further road construction	There will be upgrading required to ensure that all coupes can be accessed at the correct time. There will an increased timespan for timber haulage to be taken from the forest	Prioritise first thinning operations within the forest block and ensure that the roads are of suitable condition and sufficient permanent racks are established within coupes for future operations. Work with the council to ensure that timber traffic utilises internal forest roads for as much haulage as possible.
Maintain the restructuring the forest in age class	The existing forest has sufficient stability to tolerate moderate amount of extension beyond MMAI to facilitate restructuring Ability to utilise LISS/CCF areas for multi-age cohorts of trees within the same stand	The larch clearance has created unplanned sequences of felling Unstable stands have necessitated felling of coupes at a similar time which exacerbated the restructuring challenge	Restocking will continue to diversify age structure as far as possible and increased thinning will allow for extension of second rotation stands, allowing for greater scope for restructuring in the future
Maintain the ongoing management of Black Grouse	Continue the work utilising the expertise of the internal FLS environment team while consulting with RSBP and the wider Galloway	Retention of the productive capacity of the forest.	Larger areas of open space in the North and North West of the plan area which will allow for

	Glens management group to allow for habitat maintenance and expansion	Limited felling opportunity.	additional habitat suitable for Black Grouse.
Maintain the recreation capacity of the forest	The path network is in fairly good condition and could be maintained with little upkeep. The area around Fuffock hill has been identified as a viewpoint by the local community and the area has been cleared to provide a hilltop view.	The area around Kenick burn has suffered from extensive windblow and will require restructuring The larch around Kenick burn will require felling due to ramorum and will further detract from the landscape amenity value	Utilise the larch felling to restructure the area, leaving character trees as seed trees. Leave the area for the prescribed fallow period (3 years) to avoid Hylobius and monitor natural regeneration before finalising replanting plans.

* green sawlogs refer to a log classification system using specific criteria defined in "Classification and Presentation of Softwood Sawlogs" Second Edition (Forestry Commission Field Book 9. 1990). Green are of higher quality for sawmilling, with red being of lower quality.

7.2 Concept

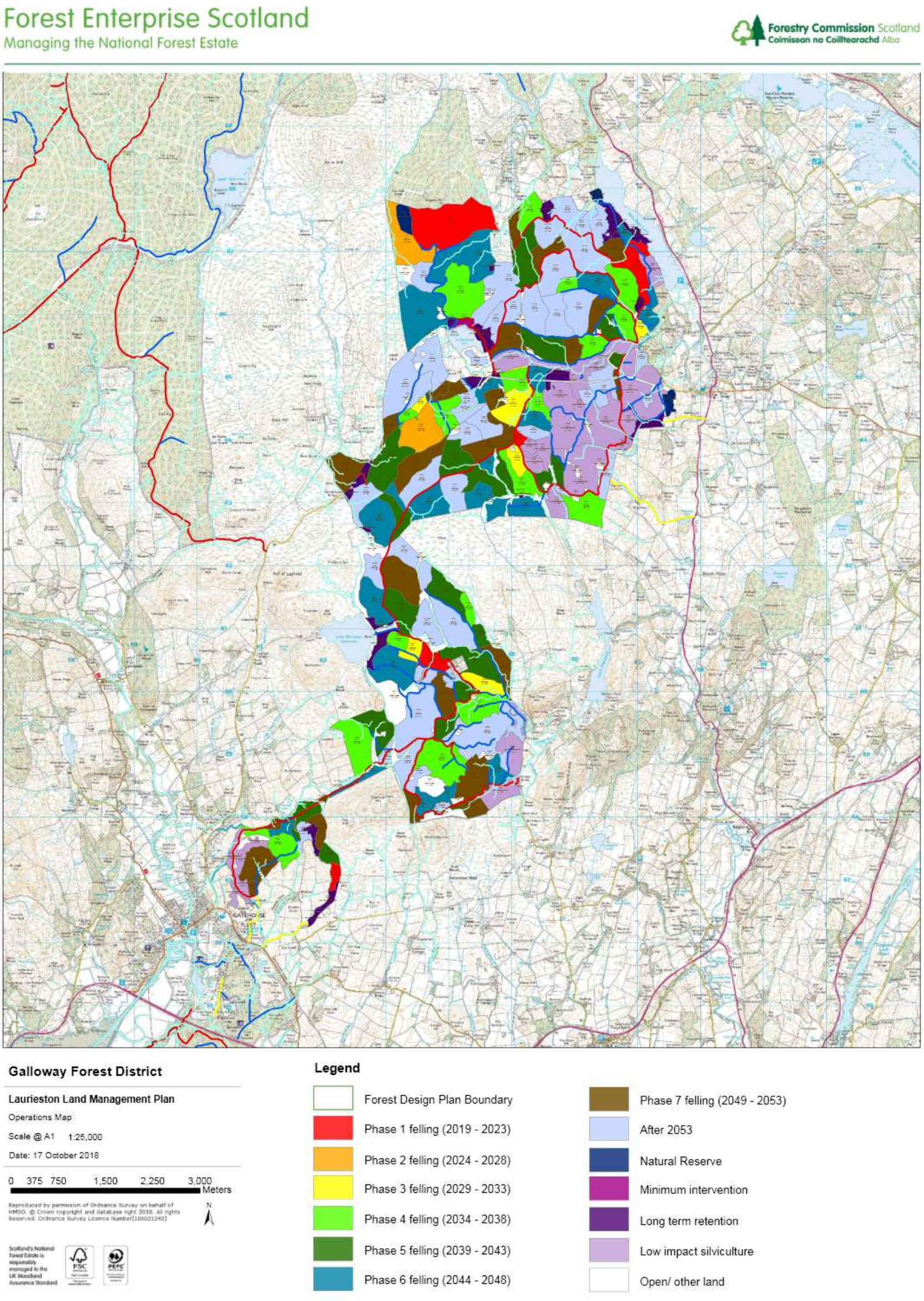


Map 5 - Concept Zone Map

8.0 Long Term Land Management Plan Proposals

The overarching aim for the forest management over the next 20 years is to provide a continuing supply of timber for the national markets, whilst maintaining and enhancing the area for nightjar. This will be achieved by utilising mostly Sitka spruce, with alternative conifers and productive broadleaves utilised where site conditions would allow acceptable growth. The increasing use of CCF, in the form of both group and strip shelterwood will allow for greater habitat for nightjar, when combined with small coupe clearfell. An increase in thinning will provide a wider range of forest products over a longer period, while increasing silvicultural options.

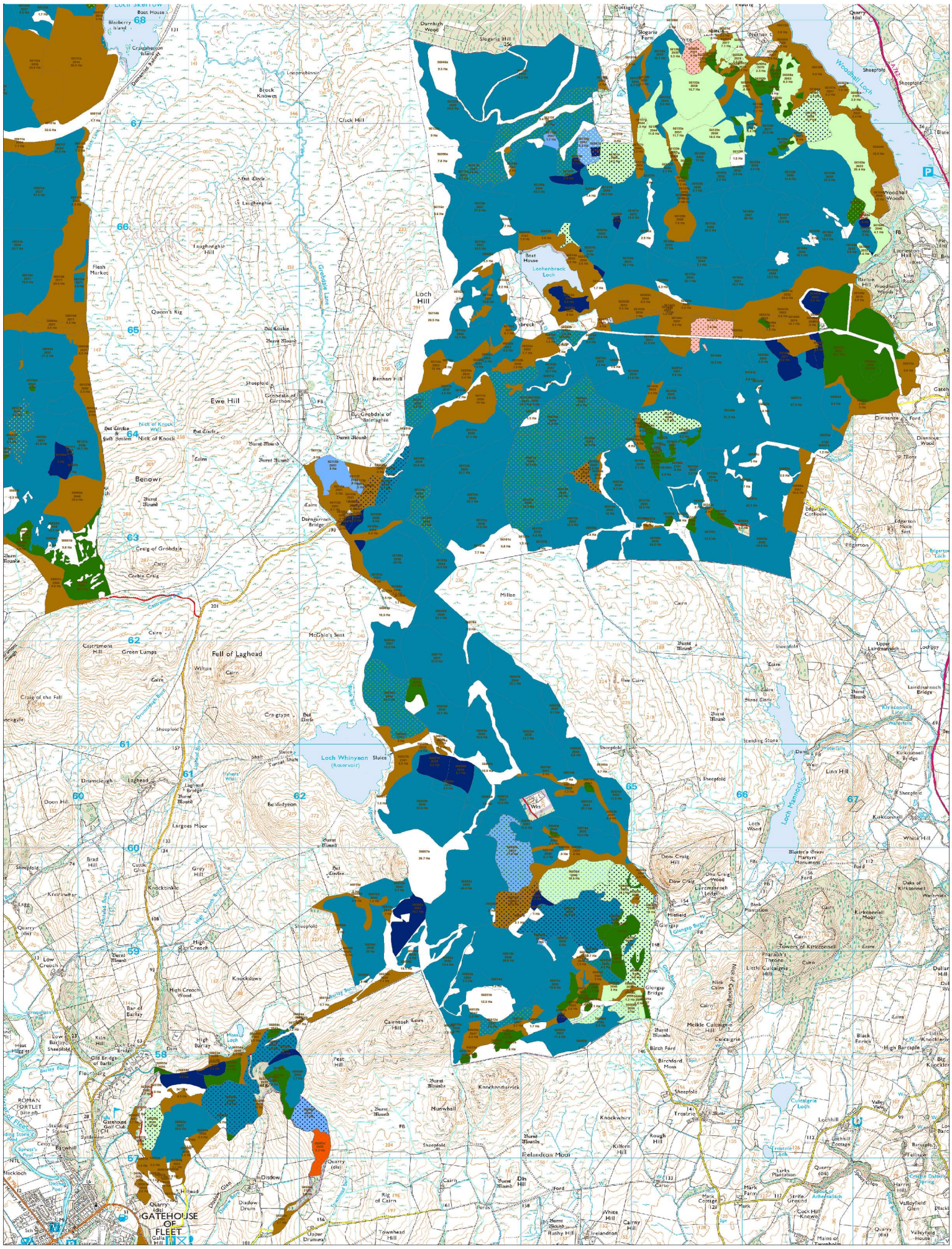
This plan area is in the process of restructuring and diversification which will take more than one rotation given the uniformity of the crop and the moderately successful thinning programme. This restructuring has been severely disrupted, as previously stated, by the *P. ramorum* felling.



Map 6 - Full Plan Area Operations Map

Forest Enterprise Scotland
Managing the National Forest Estate

Forestry Commission Scotland
Coimisean na Coilltearachd Alba



Legend

- Forest Design Plan Boundary
- Sitka spruce (SS)
- Norway spruce (NS)
- Lodgepole pine (LP)
- Scots pine (SP)
- Larch sp (EL/HL/JL)
- Douglas fir (DF)
- Mixed/ other conifers (MC/XC)
- Birch (BI)
- Oak (OK)
- Ash (AH)
- Beech (BE)
- Mixed/ other broadleaves (MB/XB)
- Open land
- Species Mixture:
  Main colour = Dominant species
  Dots = Secondary species
  Sitka spruce with Birch shown here

Galloway Forest District

Laurieston Land Management Plan

Restock Map
1:10,000
Date: 15 January 2019

0 250 500 1,000 1,500 m

N

Scotland's National Forest Estate is responsibly managed to the UK Woodland Assurance Standard.

Map 7 - Full Plan Area Future Habitats and Species

8.1 Management

The existing CCF or LISS areas have not been managed to a high enough standard to prevent losses in the areas due to windblow. This has resulted in a degradation of the areas, and a challenge to maintain the CCF nature of the area. This management plan will seek to enhance these areas which are now a key management objective.

There is a general lack of maturity to the forest, with the first rotation being harvested and the replanted. This means that the felling programme is relatively limited for the next 2-4 phases. The one large scale felling operation will be the felling around Slogarie hill, discussed below. Beyond this there is little clearfelling in the scope of the plan, with a concentration of first thinning operations, CCF/Shelterwood systems and regeneration control.

The felling of Slogarie hill has been designed after plans for the neighbouring forest had been considered. There was a previous intention to clear the hillside coupe, but as the neighbouring forest will restock to the border, the visual disturbance would be high if the restock did not encompass the whole hill side.

8.1.1 Clear Felling

The first three phases of the plan contain little felling, with the area increasing in the fourth phase (Table 6). This reflects the lack of age diversity in the the plan, which will continue to be restructured over the age of the coupes. The 4th phase contains a larger felling area as more of the restocked areas will approach MMAI.

Phase	No of coupes	Area	Percentage of area
1	5	122.70 ha	4.0
2	2	68.11 ha	2.2
3	6	64.52ha	2.1
4	18	343.63 ha	11.3

Table 6 - percentage of forest area felled in each 5 year phase.

8.1.2 Thinning

Thinning will be undertaken in line with the district thinning strategy, utilising the correct machinery and methodology. This programme will cover

more than this single forest block and will continue to rotate in a 5-7 year cycle around the district as opportunities arise. The coupes selected for thinning are based on both the management prescription and the district thinning guide which gives criteria for selection of a coupe. Once the coupe is deemed viable, further assessments are made against wildlife constraints, possible ground damage, coupe location and economic considerations. The economic considerations include the market for the projected products from the thinning and the infrastructure costs which are associated with the operation. Thinning also has to consider the species which is planned to be thinned or the heterogeneity of the stand as an undertaking. Where the stand varies from the dominant Sitka spruce species, there is a lack of experience and knowledge of the effects of thinning in the forestry sector generally, so a cautious approach will be taken with alternative conifer species.

8.1.3 Continuous Cover Forestry (CCF)

The use of continuous cover forestry is key to the success of this management plan in providing a greater diversity of habitat within the forest block while simultaneously providing a diversity of timber product from the required thinning and felling operations. The areas which have been selected for CCF have been assessed against the district thinning guide criteria for DAMS (Detailed Aspect Method of Scoring) for acceptable exposure scores. There will be a pre-commencement assessment of the regeneration potential from the remaining standing crop, targeting mast years for the desired species. For most areas, the regenerative species will be a shade tolerant or semi-shade tolerant conifer. Where the desired species does not regenerate, there will be an assessment made as to whether this species is acceptable or whether there will have to be enrichment planting or clearance of the undesired regeneration.

The use of strip shelterwood will be focused on utilising the standing Sitka spruce crops, with the strips cut 50m (two tree height wide) on the leeward edge of the crop. This will allow for the maximum range of equipment to be used and require the minimum supervision of operations by harvesting foresters and allow the district to build experience and capacity for CCF operations. These 50m strips will be repeated on a 5 year cycle. The areas where this system is proposed are not however at maturity yet and will have to wait until strip shelterwood creation is required. They will have the thinning interventions required for CCF operations.

8.1.3 Restructuring

Age of trees	Growth stage	Percentage of class at given year	
		2018	2038
0 - 10	Establishment	17.21	11.68
11 - 20	Thicket	23.95	3.52
21 - 40	Pole stage	39.76	31.88
41 - 60	Maturing high forest	5.00	20.11
61 +	Old high forest	2.92	5.30
	Open space / felled areas	11.15	27.50
Total		**100.0%**	**100.0%**

Table 7 - Change to age profile over scope of plan

8.2 Restocking proposals, future habitats and species

There is little felling within the first two phases of the forest plan, with five coupes in phase one and two coupes in phase two, therefore the restocking is limited to these sites. However where the opportunity arises areas will be restocked with the correct species for the site and utilise suitable natural regeneration should it occur. Where planting is required, ground preparation and planting of transplanted nursery stock with the correct provenance will occur.

Natural regeneration will play a larger part in the CCF-LISS areas which will attempt to be entirely restocked by natural regeneration and no ground preparation. There is, however, the possibility that the remaining trees will not provide sufficient regeneration of the suitable species and in these instance both a further assessment of the growing conditions will occur. Options for remedial action will include such operations as enrichment planting, increasing light levels and increased ground disturbance.

The restocking has avoided creating isolated pockets of broadleaves which would be impractical to maintain and due to lack of maintenance would fail to meet management objectives. Broadleaves have been collected into larger coherent areas where they can be successfully managed to deliver the maximum benefits to the forest.

8.2 Open lands

The open land in the forest is directed by two primary goals; the enhancement of the riparian zones and watershed protection and the use of this habitat for a number of species within the forest. This has been utilised on the upper west areas for Loch Whinyeon. A secondary goal is to utilise open space for the viewpoint on Fuffock Hill, allowing an uninterrupted panoramic view.

8.3 Visitor Zones

Laurieston is not connected to the core recreation areas for Galloway, and has the more heavily visited Fleet oak woods (Cally woods) immediately to the south. The recreation facilities are mostly utilised by local residents who utilise the forest on a regular basis for dog walking and shorter walks.

There is a formal recreation area around Kenick Burn, which provides shorter walks around the burn, with the some rest areas incorporated. The plan will look to retain these areas and will attempt to restructure the surrounding coupes utilising a CCF approach.

There is an informal, unsignposted, longer walk from the north of the plan at Summerhill – Slogarie which follows forest roads and is also subject to a claimed right of way, which follows the forest roads.

8.4 PAWS Restoration

To facilitate the restoration around the Woodhall Loch area, the existing Western Hemlock seed stand has to be felled and removed. The removal of this alternative conifer seed site requires that Forest research is informed and given the opportunity for a final seed collection prior to felling. Once this area is removed, it is hoped that the area is colonised by the surrounding broadleaves, however, this will be monitored. If there is unsuitable species colonise the site then enrichment planting of native broadleaves will be carried out and conifers cleared.

9.0 Management Prescriptions

Forest Management Types

- Clearfelling

  Clearfelling will be done with harvester and forwarder, with none of the areas scheduled for clearfell necessitating skyline felling. All timber will be processed as cut to length (CTL) and will utilise brash mats and appropriate machinery to reduce ground damage and compaction. Subsequent brash recovery may take place where this will not adversely affect soil quality on the site.

- Thinning

  As determined by the district thinning programme, this will be focused on first thinnings which will predominately be racks cut into the coupe, every 6-8 rows. Where terrain and slope allows, chevron patterns will be utilised and where an area is not possible to thin, a severance rack will be cut to split the thinned and unthinned coupes. Matrix thinning will focus on improving timber quality with suppressed, double stemmed, wolf and co-dominants the focus of removal, where this will not create instability in the stand. The volumes will be assessed pre and post thinning, with inspections to ensure the stand quality is being enhanced.

- CCF/LISS

  Strip shelterwood – 50m (or 2 tree lengths) drifts to be cut in the leeward side of coupes from the previous cut. These will be repeated at 5 year intervals. Regeneration will be monitored to ensure that there is sufficient coverage of the area cut, and if necessary supplemented with additional planting and ground preparation.

  Group shelterwood – Areas which have been subject to windblow will be harvested to a maximum of 50m diameter (2 tree lengths) to ensure that humidity and windspeed levels are at their optimum levels for natural regeneration to occur. The regeneration will be monitored to ensure that the correct species are regenerating at the correct density to maintain forest cover.

- Natural regeneration

  Natural regeneration will be utilised where appropriate and managed under the district guidance and the guidance from the natural

regeneration working group. This may include interventions such as respacing, enrichment planting or ground scarification. This will apply to both clearfell and CCF areas.

- Long Term Retentions
  Long Term Retentions (LTR) are an important area of the forest for biodiversity. Where these are present, it would be expected that they would also contain standing deadwood and large woody debris, especially of native broadleaves in excess of 20cm diameter.

- Natural Reserves
  There are areas of natural reserves identified within the plan which will retain as much deadwood as possible, in excess of the $20m^3$/ha as recommended by the UKFS. This will include a variety of heights and species where available. No trees will be girdled or cut above stump lever to create deadwood habitat

- Operational Access
  The forest block has good operational access within the forested areas, however, additional ATV tracks may need to be created within the forest block to allow for deer control. No additional roads are required, however, road upgrades may be required for the thinning and CCF operations. This will be assessed as part of the operational work planning assessment.

- Biosecurity
  Our local Invasive Non Native Species (INNS) strategy applies across the area. This is a "standalone" document which is updated through ongoing liaison with SEPA & SNH. With particular reference to North American Signal Crayfish (NASC) the aim is to have a coordinated approach to the ongoing management of this potentially invasive species. In catchments identified as being susceptible to NASC this involves more stringent biosecurity guidance that sets out agreed best practice in relation to forestry operations. Within the Laurieston LMP, the Woodhall Loch catchment will be subject to this guidance.

- Deer Management
  Deer management has been maintained in line with the districts deer management strategy. This has allowed a sustainable level of deer to be maintained, allowing for natural regeneration of broadleaves to occur.

- Management of Open Ground
  Post clearfelling, there will be no conifer restocking within 20m (and on occasion up to 50m) within the main watercourse riparian zones. It is expected that some of the riparian zones, designed open ground and broadleaf areas will fill in with natural regeneration of both conifers and broadleaves. Through the delivery of this Land Management Plan (LMP) FLS will manage natural regeneration in such a way as to ensure that, where practicable, it does not significantly impose a negative impact upon the objectives of the plan. Natural regeneration will be managed so that any negative impact upon designated, protected or promoted habitats, species, landscapes and catchments within or adjacent to the LMP area is minimised and where possible mitigated. The advice of the Galloway Fisheries Trust and comments from SEPA will be taken into account when planning management of natural regeneration.
  For areas designated as permanent open space natural colonisation and regeneration will be managed in line with the management objectives for the areas.

- PAWS Restoration
  PAWS restoration will look to remove all non-native conifers, especially where there is mature cone-bearing and shade tolerant conifer existing on site.

Appendix I: Land Management Plan Consultation Record

Statutory Consultee	Date contacted	Date response received	Issue raised	Forest District Response
SNH - Dumfries and Galloway	29.06.2018	None		
Forestry Commission Scotland	29.06.2018	None		
CONFOR	29.06.2018	None		
Dumfries and Galloway Council	29.06.2018	13.07.2018	None	
Historic Scotland	29.06.2018	10.07.2018	None	
SEPA	29.06.2018		Biosecurity for American Signal Crayfish SEPA construction site licences	Met on site to discuss, incorporated biosecurity into plan and ongoing liaison. No construction site licences required
Balmaghie Community Council	29.06.2018	01.07.2018	None	
Gatehouse of Fleet Community Council	29.06.2018	None		
Visit Scotland	29.06.2018	None		

Consultee	Date contacted	Date response received	Issue raised	Forest District Response
IUCN Otter Specialist Group	29.06.2018	None		
Red Squirrels in South Scotland	29.06.2018	None		
RSPB	29.06.2018	23.07.2018	Use of group shelterwood. Increase in O/S	Areas already in use for group shelterwood.

				Expansion possible once these are functioning correctly. OS increased where suitable.
Galloway Fisheries Trust	29.06.2018	None		
Galloway & Southern Ayrshire Biosphere	29.06.2018	None		
Neighbour - PS	29.06.2018		Access and hedgecutting	
Neighbour – EL	29.06.2018		Species diversity and public access	Public access ongoing issue with the community and access layer. Species diversity is looked at for restock, however as little felling in first 10 years, not large opportunity to alter restocking
Neighbour – GM	29.06.2018		Road construction and access	FCS civil engineers responded with details of road construction.
Neighbour – NH	29.06.2018		Species diversity	Species diversity is looked at for restock, however as little felling in first 10 years, not large opportunity to alter restocking

Appendix II: Supporting Information

1.0 Background information

1.1.1 Geology, Soils and landform

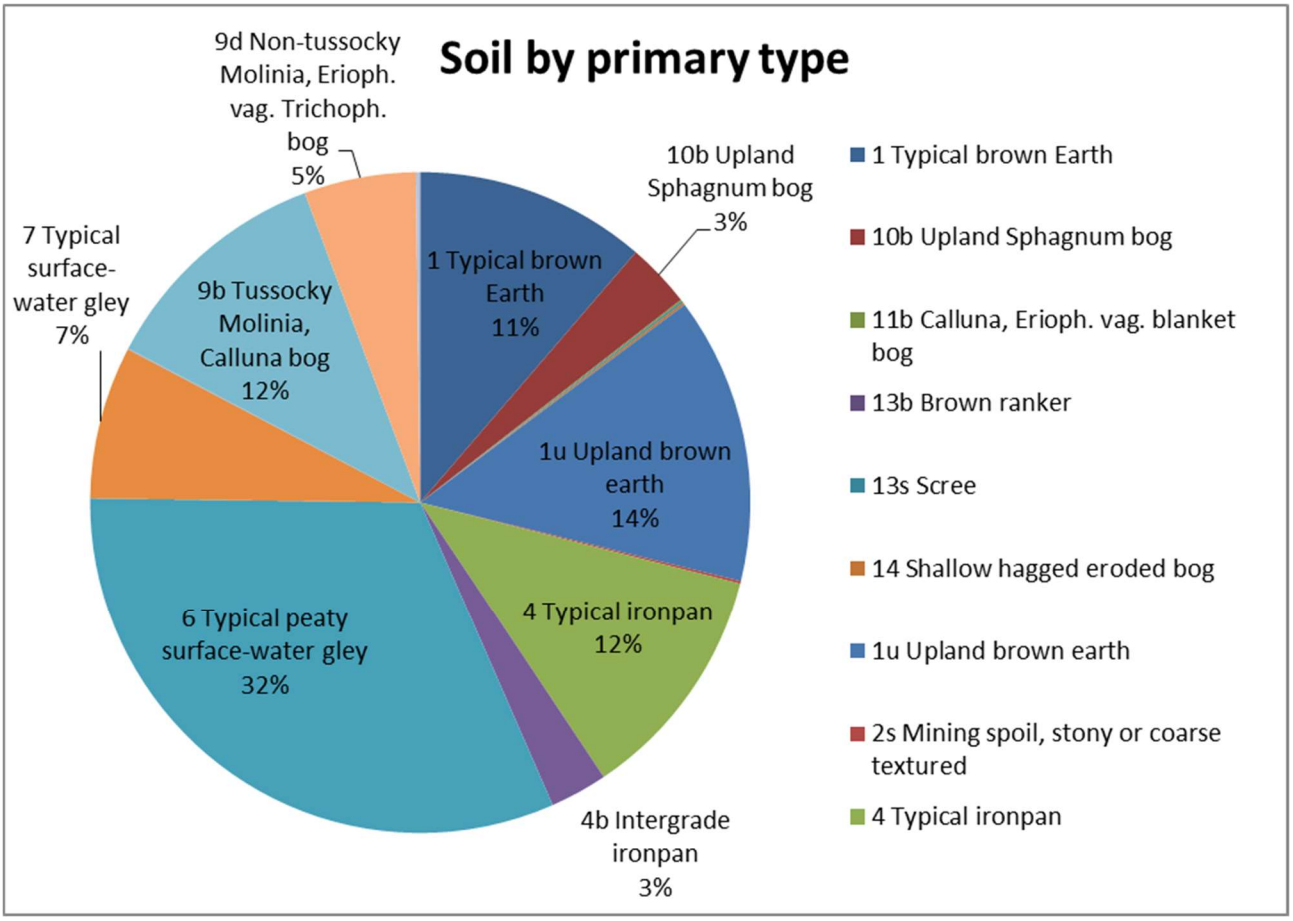
Geology: The block is situated on an extensive area of Silurian Greywackes and Shales.

Geomorphology; Set in an undulating landscape interspersed with a series of minor peaks the most significant being Slogarie Hilt (256m) and Kennick Hill (260m) in the north and Bengray (366m) and Fore Hill of Glengap (300m) to the south.

Elevation: ranges from 50 meters near Gatehouse of Fleet to 366 metres.

Soils: The soil survey coverage within the block is at a fairly detailed scale showing areas of brown earths; upland, podzolic and basic (25%), with some ironpans (15%). The majority of the soils comprise of Gleys and Peaty gleys (39%), with the rest being various classifications of bog. The Macaulay "land capability for Forestry" classification for this area is mostly F5 (limited flexibility for growth and management of tree crops.

Figure 9 - Soil type (FC classification) by primary constituent



1.1.2 Water

The minor hill within the block area create a complex hydrology around them, with the North and West Laurieston draining into the River Dee catchment in many different directions, the main internal watercourse is the Kenick Burn flowing from Lochenbreck Loch to Woodhall Loch. Both lochs have shared boundaries with farming and forestry.

South Laurieston and most of Glengap drain via the Anstool Burn and Glengap burn into the Tarff Water Catchment. Loch Whinyeon, a reservoir, also lies adjacent to the plantations on the western boundary. This creates a key constraint for the planting surrounding the reservoir and tributaries.

Disdow wood and the west of Bengray form part of the Fleet catchment, the Barlay Burn is the most significant watercourse in these areas.

Woodhall loch is designated a SSSI, with a 2014 report by SNH finding the loch in "favourable-maintained" condition, however, the loch is identifies as "Moderate status" due to overall Ecology and Total Phosphorus by SEPA. Feedback from SEPA has indicated that this Loch is subject to American Signal Crayfish (ASC) and decontamination measures will be required where operations will increase the risk of spreading ASC.

Contained within the Glengap forest block, there is a water treatment plant which is responsible for the water supply to Gatehouse and the surrounding communities. This area is leased to a third party with management agreement in place.

Private water supplies have been identified are mapped on the GIS system and are incorporated into operational planning as part of the wider constraints layer. All private water supplies will have appropriate measures for protection when operations are conducted on or near them.

The SEPA flooding maps (http://map.sepa.org.uk/floodmap/map.htm) shows that a small area in the south west corner of the LMP area is a Potentially Vulnerable Area (PVA). Within this area there is mostly continuous cover forestry for the veteran trees above the gatehouse area, and there is no planned felling within the first 10 years of the plan in the area.

1.1.3 Climate

The south west of Scotland has a predominantly mild windy oceanic climate influenced by the Gulf Stream. Annual rainfall in the block is around 1200mm, compared to the district range of 1000 – 2000mm, and falls mainly during the winter months October to February.

Guidance on Climate Change suggests that the District can expect an increased frequency of extreme weather events with the climate remaining wet and mild. Whilst there may be little impact on this DP block with regard to primary species choice (mainly conifer) there may be future threats to wildlife habitats. The development and maintenance of Habitat networks will be important.

1.1.4 Transport

As with all timber transport from the NFE, we will utilise the Agreed Routes Map from the timber transport forum (https://timbertransportforum.org.uk/maps/agreed-routes) to identify where liaison is required for the transport of timber. Timber transport will utilise the internal forest road network as far as possible before coming onto public roads.

2.0 Analysis of previous plan

Objectives	Assessment of Objectives during plan period
Commercial softwood timber production in core of forest.	Clearfelling has continued in the older plantation areas. There has been a reduction in coupes size to accommodate Nightjar, which was subject to a separate amendment. Large areas remain under commercial conifer management.
Target environmental improvements where they will add greatest value	Environmental efforts have been applied in the Glen gap forest block, focussing on reduction in coupe size. The habitats for protected species have been maintained and increased where possible. Where long term retentions do not contain larch, all have been retained as per the plan.
Restructuring of even aged plantation to create a diverse age structure between coupes to benefit habitat & visual diversity	This has continued and will be carried on into the next plan. There has been disruption to this with the *P.ramorum* felling.
Secondary Objectives	
Increase area of broadleaves in selected areas where they will give the greatest environmental & visual benefits	Areas of broadleaves have been achieved by both planting and natural regeneration in areas where they will be of benefit
Improve riparian zoneas along significant watercourses.	Riparian zones have been widened at replanting, with the use of BL where practicable

The 2005 approved plan objectives have generally been met, they have over the interim period become slightly outdated. Key objectives for the plan are now more directly related to the revised brief see section 6.3

Appendix III. Land Management Plan Brief

The main management objectives in this medium scale plan focus on Timber Production, Biodiversity (habitat restoration and the creation of additional transient open space habitat to benefit a range of bird species) and Water quality (for loch Whinyeon and Loch Lochenbreck)

The block lies between Gatehouse of Fleet to the south and Laurieston to the east

Key Strategic Directions from Role of Scotland's National Estate	Local District Strategic Plan Priorities	Actions / Prescriptions
Healthy: good environmental and silvicultural condition in a changing climate	• Commitment to high quality silviculture and increased use of alternatives to clearfell • Stewardship of carbon resources locked up in Estate's trees and soils • Adapt to climate change and make woodlands more resilient to pressure • Deal with invasive species that threaten habitats and biodiversity	• *Increase* the use of alternatives to clear fell, especially strip shelterwood, which will give a heterogeneous structure to the forest. • *Improve* resilience through smaller coupe size and increased use of woodland managed under LISS, alternative to clearfell and other continuous cover systems where appropriate • *Increase* use of natural regeneration in our restocking • *Control* invasive species as per FLS guidelines (specifically *R. ponticum*) • *Continue* with *P. Ramorum* management as per district guidance
Productive: provide sustainable economic benefits from the land	• Contribute to the local economy by maintaining core timber production and providing an appropriate roads infrastructure • Consider species diversity and use of mixtures in forest resilience	• *Meet* production forecast commitment through revised felling plan • *Enhance* the productive yield by selecting the correct species for site type restocking in line with district goals for diversity • *Increase* the area within the forest block which is part of the district thinning programme to enhance timber quality and provide a wider range of products • *Implement* road construction / maintenance programme and quarry development required to service proposed harvesting operations
Treasured: a multi-	• Involve and engage with local people /	• Continue to *consult* with local communities and stakeholders through

purpose resource that sustains livelihoods, improves quality of life and offers involvement and enjoyment	encourage partnership working • Create uniquely special places across the Estate • Recognise the Estate as a place for research and development	Forest panel and Land Management Plan process • *Incorporate* Research and Development into Land Management Plans including monitoring of *P. Ramorum* and *Maintain* existing experimental plots within forest block. • *Maintain and Enhance* views of the forest from Woodhall Loch
Accessible: woodlands that welcome and are open for all	• Improve access and enhance existing facilities • Use for health benefits and outdoor learning	• *Rationalise* the existing paths to allow for a greater variety of paths in conjunction with the neighbouring facilities • *Retain* access and carpark for Kenick Burn path • *Maintain* the accessibility for recreational use in Lochenbreck Loch • *Enhance* the local communities use of Fuffock hill
Cared for: working with landscape and the natural and cultural heritage	• Maintain open habitats in good ecological condition • Landscape • Increase area of broadleaf cover in block focussing on creation of habitat networks • Conserve vulnerable species • Safeguard heritage features	• *Create* additional permanent open habitat between Loch Whinyeon and Kennick burn. • Southern, Eastern and North-Eastern edges block are visually prominent as viewed from surrounding hill tops/open areas; *maintain and enhance* local landscape through additional species diversity, open space integrated management and revised coupe shapes to better suit landform • *Increase* area of native BL throughout plan area for added biodiversity, targeting a permanent BL woodland infrastructure along riparian zones (Fuffock Burn, Kenick Burn, Woodhall Loch, Lochenbrek Loch, Loch Whinyeon) • The block is a key habitat for the European Nightjar (BAP species) and one of the main sites nationally for breeding. *Enhance* the habitat through smaller coupe size and the introduction of strip shelterwood system where possible. • The block is core for Black Grouse (priority species); *maintain* lek and nesting areas for Black Grouse and *enhance* habitat through creation of woodland fringe • The block is relatively adjacent to but not part of the priority area for Red squirrel; *maintain and enhance* area for Red Squirrel (priority species)

		• *Manage* watercourses and private water supplies within DP unit in keeping with UKWAS standards, Water Framework Directive and Forest and Water guidelines to *maintain and improve* water quality. • *Manage* minor heritage features as per FLS guidelines
Good value	• Seek diverse range of income streams • Reduce carbon emissions from business activities	• *Facilitate* energy infrastructure as required by national policy • *Manage* resident deer population with wildlife team and

ACHIEVED BY PLAN

HEALTHY
Y Committed to high quality silviculture and increasingly using alternatives to clearfell (LISS): significant area of LISS/ATC in place throughout the block (Concept area 2 – Craigelwhan, Black Hill & Thorny Hill)
Y Committed to dealing with invasive plants that threaten habitats and biodiversity: active *R.ponticum* control ongoing mainly within policy area around Disdow/Fuffock hill
Y Help the estate to adapt to climate change and become more resilient to pressure: Larch management of *P. Ramorum* as part of the agreed sitrict management strategy and operational Deer management plan throughout block in place. Retain seed stands of diverse conifer and broadleaf within the forest block to provide genetic diversity

PRODUCTIVE
Y Supply three million cubic metre of sustainable softwood: design plan contributes to the overall programme for the district and with changes in management should provide a wider variety of products at different time frames.
Y Work with partners to find new ways to harness our natural and cultural heritage and develop the estate's potential for tourism: Local community groups will be consulted on plan.
N Manage at least one quarter of our expanding broadleaf woodlands to produce quality hardwood and fuelwood: increased BL restock is unlikely to be of a productive nature
N Support Scottish Governments woodland expansion programme: block presents limited opportunities for woodland expansion
N Plan to increase the agricultural use of the estate where this is consistent with environmental objectives: block presents limited opportunities for agricultural land use expansion

TREASURED
Y Committed to more unique special places across the estate and delivering benefits to a more diverse range of Scotland's people: Habitat for nightjar is nationally important. Undertake management of a schedule 1 raptor in agreement with neighbouring properties.
Y Recognise the value of the Estate as a place for research and development of best practice: block has potential for LISS development, enhanced thinning regime and contains research plots

Y Continue to use the Estate as a place for volunteering and gaining employment skills: block has been, and to a degree is still used by community volunteers.

ACCESSIBLE
Y Invest available resources into high quality facilities that encourage and help visitors experience and enjoy the outdoor experience: block presents limited opportunities for facility development, but will focus on retention of trails and facilities which have high utilisation
Y Use estate for health benefits and outdoor learning: block is regularly used by local people for exercise (dog walking, horse riding)

CARED FOR
Y Restore 85%of areas on ASNW to native species: ongoing thinning will contribute towards district restoration targets and plan for PAWS restoration will be agreed
Y Increase BL tree cover from 8% woodland cover to 20%: block will contribute modestly towards district's BL tree cover expansion targets
N Committed to maintaining best open habitats in good ecological condition: Limited open habitats within LMP area, other than the shifting edge habitat as recommended for nightjars
Y Identify particularly vulnerable species for which the NFE is important and take specific conservation action (Black Grouse / Red Squirrel): The main vulnerable species within the block has been identified as Nightjar and the management practices have been adapted where possible to suit. Although not a priority area, our current intention to maintain Laurieston as a largely productive conifer will not disadvantage the local Red Squirrel population
Y Safeguard archaeological sites through planning and management and recognise special places and features with local cultural meaning: area around Dunragit is an important locus for Archaeology, local heritage features and two SAM sites will be managed accordingly

GOOD VALUE
Y Seek a range of income sources to underpin the cost of managing the Estate and look for ways to achieve best value in delivery of public benefits: block presents some opportunity through facilitation of energy infrastructure, but may have greater drawback than benefits to the block.

Appendix IV. Tolerance table

PROCESS TO BE APPLIED IN RESPECT TO ANY ALTERATIONS TO APPROVED FOREST PLANS

1) Adjacency issues will normally be dealt with through delayed felling i.e. a coupe will not be felled until all surrounding crops are at least 2m tall

2) Where this cannot be achieved then adjacency issues may be dealt with through delayed restocking i.e. a coupe will not be restocked until all surrounding crops are at least 2m tall. Where this approach is adopted an assessment must be made and recorded, at the time of the decision being taken, to ensure wider forest and habitat structure is not being significantly compromised. Such evidence must be presented at 5 year review

3) Tolerance Table:

	Maps Required (Y/N)	Adjustment to felling period *	Adjustment to felling coupe boundaries **	Timing of Restocking	Changes to Restocking species	Changes to road lines	Designed open ground ** ***	Windblow Clearance ****
FC Approval normally not required	N	• Fell date can be moved within 5 year period where separation or other constraints are met.	• Up to 10% of coupe area.	• Up to 3 planting seasons after felling.	• Change within species group e.g. evergreen conifers or broadleaves.		• Increase by up to 5% of coupe area	
Approval by exchange of letters and map	Y		• Up to 15% of coupe area	• Between 3 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 > 60m in either direction from centre line of road	• Increase by up to 10% of coupe area • Any reduction in open space of coupe area by planting.	• Up to 5ha

Approval by formal plan amendment may be required	Y	• Felling delayed into second or later 5 year period. • Advance felling (phase 3 or beyond) 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 group.	• As above, depending on sensitivity.	• In excess of 10% of coupe area. • Colonisation of open space agreed as critical.	• More than 5ha.

NOTES:

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

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

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

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

Appendix V. Archaeology

Designation	Grid Reference	Name	Feature ID	Feature Description	Site Description	Importance	Source	NMR Hyperlink	Area (ha)
Undesignated	NX63 8653	FIELD BANKS ; RIG	GD00 2035	FIELD SYSTEM (S)	Located to a 100m square is an area of rig and furrow cultivation and field banks.	Uncategorised	FCS		1
Undesignated	NX66 5644	CROW WHITS	GD00 1235	FARMSTEAD	A farmstead, comprising one L-shaped roofed building, two unroofed structures and two enclosures is depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 38).	Regional Importance	FCS	http://canmore.rcahms.gov.uk/en/site/177409/	0.26
Undesignated	NX66 0670	CRAIG HILL	GD00 1280	SHEEPFOLD, STRUCTURE	One unroofed structure and what may be an enclosure aligned N/S annotated 'Old Sheep Ree' is depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire	Regional Importance	NMR	http://canmore.rcahms.gov.uk/en/site/177437/	0.06

					1852, sheet 31)				
Undesignated	NX645599	GLENGAP QUARRY	GD001766	QUARRY	Site of a quarry.	Local Importance	HER		0.64
Undesignated	NX634614	BANKBEN	GD000244	CAIRN	A cairn measures 10m from N to S by 9m transversely and up to 1m in height. It is grass and moss covered surmounted by a marker cairn 1.5m in diameter and 1m in height which may account for a depression on the N side.	Regional Importance	HER	http://canmore.rcahms.gov.uk/en/site/64192/	0.02
Undesignated	NX638665	SHEEP PEN	GD001909	SHEEPFOLD	A small circular sheepfold.	Local Importance	FCS		0.03
Undesignated	NX645599	SHEEP PEN	GD002036	SHEEPFOLD	A sheepfold of two compartments.	Local Importance	FCS		0.11
Undesignated	NX660634	SHEEP PEN	GD001908	SHEEPFOLD	A sheepfold of five compartments lying on the W side of a boundary wall.	Local Importance	FCS		0.08
Und	NX66	UPPER	GD00	BURNT	A burnt mound,	Regional	HER	http://canmore	0.01

esig nate d	4625	LAIRD MANN OCH	1506	MOUND	measures 4.4m from N to S with a central hollow 2m across. Burnt mound material, revealed by lifting a sod, occupies a semi-circular arc on the E side and is 1.5m thick and up to 0.3m in height.	Importance		.rcahms.gov.uk /en/site/69002 /	
Und esig nate d	NX66 8666	Summ erhill Glenn Field Syste ms		FIELD SYSTEM	Stone dyke field system as depicted on 1st edition OS 6 -inch map (Kirckudbrightshire 1852, sheet 38)	Local Importance	FCS		4.88
Und esig nate d	NX63 4650	LOCH HILL	GD00 1283	ENCLOS URE	An enclosure is depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 38).	Local Importance	NMR	http://canmore .rcahms.gov.uk /en/site/17744 2/	0.07
Und esig nate d	NX65 9675	SHEEP PEN	GD00 2037	SHEEPF OLD	A sheepfold of three compartments.	Local Importance	FCS		0.06
Und esig nate d	NX65 5667	CAIRN	GD00 1907	CAIRN	Location of a cairn, depicted on current OS maps.	Regional Importance	FCS		0.01

Undesignated	NX625594	HLA Relict Area		Later Prehistoric Settlement and Agriculture	SITE IDENTIFIED BY HLA NO FURTHER INFORMATION AVAILABLE.	Uncategorised			2.35
Undesignated	NX645599	SHEEP PEN	GD002036	SHEEPFOLD	A sheepfold of two compartments.	Local Importance	FCS		0.11
Undesignated	NX625632	DARNGARROCH	GD001285	FARMSTEAD	A farmstead, comprising two roofed buildings, one partially roofed building and one small unroofed structure and an enclosure is depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 38).	Regional Importance	NMR	http://canmore.rcahms.gov.uk/en/site/177444/	0.46
Undesignated	NX646667	WALLED ENCLOSURE	GD002038	ENCLOSURE	A square enclosure, probably a plantation enclosure.	Local Importance	FCS		0.83
Undesignate	NX648650	LOCHENBRECK	GD002039	WELL	A well named by the OS as Lochenbreck well.	Regional Importance	FCS		0.01

d		WELL							
Undesignated	NX64 5650	LOCKENBRECK	GD00 1507	BURNT MOUND	A crescentic burnt mound, measures 8.6m from N to S by 7m transversely, opening out to the W, and stands up to 0.75m in height. The S arm of the crescent is the better defined standing 0.3m higher than the rest of the mound.	Regional Importance	NMR	http://canmore.rcahms.gov.uk/en/site/68851/	0.01
Undesignated	NX62 6594	DALMALIN HILL	GD00 0457	CAIRNFIELD	At least 22 small cairns measuring between 2m and 6m in diameter and up to 0.5m in height are situated on a slight NW-facing terrace to the N of Dalmalin Hill. Two thirds of the cairns have been disturbed by forestry ploughing.	Regional Importance	NMR	http://canmore.rcahms.gov.uk/en/site/69085/	2.72
Undesignated	NX62 7591	DALMALIN HILL	GD00 0211	ROAD(S)	Four main tracks were observed north of Barlay Burn: the mapped (1907) road; a hollow way; a terraced cambered road (the	Local Importance	NMR	http://canmore.rcahms.gov.uk/en/site/64029/	10.82

					earliest in the sequence) and a higher, partly-hollowed track.				
Undesignated	NX62 2574	WHINNY HILL	GD00 1508	BURNT MOUND	This crescentic burnt mound is set against a steep slope on the E side of the Townhead Burn. It measures 5.5m from NW to SE by 4.8m transversely, opening to the SW, and 0.3m in height. Its SW side has been eroded by the burn.	Regional Importance	NMR	http://canmore.rcahms.gov.uk/en/site/69103/	0.04
Undesignated	NX63 9604	GLENGAP BURN	GD00 0442	ENCLOSURE(S)	A sheepfold of at least three compartments or maybe five compartments is attached to the N side of a boundary dyke.	Local Importance	HER	http://canmore.rcahms.gov.uk/en/site/68930/	0.05
Undesignated	NX64 3604	GLENGAP BURN	GD00 1286	STRUCTURE(S)	One small unroofed structure annotated 'Old Walls' and one small unroofed structure annotated 'Old Sheep Ree' are depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire	Regional Importance	NMR	http://canmore.rcahms.gov.uk/en/site/177445/	0.07

					1852, sheet 38).				
Undesignated	NX658671	BENNAN HILL	GD001281	FIELD BOUNDARY	A length of field wall annotated 'Old Fence' is depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 31).	Local Importance	NMR	http://canmore.rcahms.gov.uk/en/site/177438/	0.47
Undesignated	NX639640	BLACK HILL	GD001287	BOUNDARY DYKE	A boundary dyke annotated 'Old Fence' is depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 38).	Local Importance	NMR	http://canmore.rcahms.gov.uk/en/site/177450/	1.98
Undesignated	NX620575	WHINNY HILL	GD001509	BURNT MOUND	This crescentic shaped burnt mound is situated towards the N end of the Townhead Burn; it measures 9.8m from NNE to SSW by 7.6m transversely, opening out to the ESE, and up to 0.8m in height.	Regional Importance	NMR	http://canmore.rcahms.gov.uk/en/site/69146/	0.24
Undesignated	NX646638	BLACK HILL	GD001284	ENCLOSURE	A circular enclosure is depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 38).	Local Importance	NMR	http://canmore.rcahms.gov.uk/en/site/177443/	0.03
Und	NX65	SLOGA	GD00	FIELD	One unroofed structure	Local	NMR	http://canmore	5.69

esignated	4675	RIE	1279	SYSTEM, SHEEPFOLD	annotated 'Sheep Ree' and a field-system annotated 'Old Fences' are depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 31).	Importance		.rcahms.gov.uk/en/site/177436/	
Undesignated	NX66 0658	KENWICK HILL	GD00 1236	FARMSTEAD, FIELD SYSTEM	A farmstead annotated 'in ruins', comprising four unroofed buildings and one enclosure, and a field-system annotated 'Old Fences' are depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 38).	Regional Importance	NMR	http://canmore.rcahms.gov.uk/en/site/177413/	5.6
Undesignated	NX66 0658	KENWICK HILL	GD00 1236	FARMSTEAD, FIELD SYSTEM	A farmstead annotated 'in ruins', comprising four unroofed buildings and one enclosure, and a field-system annotated 'Old Fences' are depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 38).	Regional Importance	NMR	http://canmore.rcahms.gov.uk/en/site/177413/	1.93
Und	NX67	CRAIG	GD00	FARMST	A farmstead, comprising	Regional	HER	http://canmore	0.16

esig nate d	3649	CROFT	1576	EAD	one partially roofed building, one unroofed building annotated 'Ruin' and one enclosure is depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 38).	Importance		.rcahms.gov.uk /en/site/17740 8/	
Und esig nate d	NX64 1668	SLOGA RIE BURN	GD00 1282	ENCLOS URE(S)	Two enclosures annotated 'Old Fence' and 'Track of Fence', one of which is adjacent to a later plantation enclosure are depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 31).	Local Importance	FCS	http://canmore .rcahms.gov.uk /en/site/17744 1/	1.67
Und esig nate d	NX66 3662	KENWI CK HILL	GD00 1238	FIELD SYSTEM	A large field annotated 'Old Fence' is depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 38).	Local Importance	NMR	http://canmore .rcahms.gov.uk /en/site/17741 5/	4.56
Und esig nate d	NX67 5645	RETRE AT WOOD	GD00 1575	FARMST EAD	A farmstead, comprising two unroofed buildings and one enclosure is depicted on the 1st edition of the OS 6-inch	Regional Importance	NMR	http://canmore .rcahms.gov.uk /en/site/17740 7/	0.08

					map (Kirkcudbrightshire 1852, sheet 38).				
Undesignated	NX64 5599	RED NICK, FOREHILL OF GLENGAP	GD00 1232	FIELD SYSTEM, HEAD DYKE	Lengths of head-dyke annotated 'Old Fence' and one enclosure or field are depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 44).	Local Importance	NMR	http://canmore.rcahms.gov.uk/en/site/177389/	1.22
Undesignated	NX65 2592	GLENGAP	GD00 1511	CUP MARKED STONE	Three cup-marks are visible on a stone that has been built into the wall immediately on the E side of the front door of Glengap House, and centred 0.9m above the threshold.	Regional Importance	HER	http://canmore.rcahms.gov.uk/en/site/69076/	0.02
Undesignated	NX65 0586	GLENGAP BRIDGE	GD00 1233	BUILDING	A single unroofed building of two compartments annotated 'Ruins' is depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 44).	Regional Importance	NMR	http://canmore.rcahms.gov.uk/en/site/177392/	0.02
Undesig	NX64 8586	FUFFOCK	GD00 1234	STRUCTURE	A single unroofed L-shaped structure of two	Regional Importance	NMR	http://canmore.rcahms.gov.uk	0.02

nated		BURN			compartments annotated 'Hay Ree' is depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 44).			/en/site/177395/	
Undesignated	NX64 4582	FUFFOCK BURN	GD00 1231	STRUCTURE	A single unroofed structure attached to a field wall is depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 44).	Regional Importance	NMR	http://canmore.rcahms.gov.uk/en/site/177388/	0.01
Undesignated	NX64 1582	FUFFOCK HILL	GD00 1230	FARMSTEAD	A farmstead annotated 'in ruins', comprising three unroofed buildings and one enclosure is depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 44).	Regional Importance	FCS	http://canmore.rcahms.gov.uk/en/site/177387/	0.85
Undesignated	NX63 9604	GLENGAP BURN	GD00 0442	ENCLOSURE(S)	A sheepfold of at least three compartments or maybe five compartments is attached to the N side of a boundary dyke.	Local Importance	HER	http://canmore.rcahms.gov.uk/en/site/68930/	0.05
Und	NX64	GLENG	GD00	STRUCT	One small unroofed	Regional	NMR	http://canmore	0.07

esignated	3604	AP BURN	1286	URE(S)	structure annotated 'Old Walls' and one small unroofed structure annotated 'Old Sheep Ree' are depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 38).	Importance		.rcahms.gov.uk/en/site/177445/	
Undesignated	NX633588	FUFFOCK HILL, GLENGAP FOREST	GD001764	COMMEMORATIVE MONUMENT	A memorial stone to a sheepdog was re-discovered by William McMoran of Miefield, Twynholm, on the north-west flank of Fuffock Hill. It was erected by a famous shepherd, G.Caig, to his dog, Meg, on 2/8/1905.	Uncategorised	HER		1
Undesignated	NX656676	Nether Crae Field System		FIELD SYSTEM	Drystone wall field system as depicted on the 1st edition of the OS 6-inch map (Kirkcudbrightshire 1852, sheet 31	Local Importance	FCS		4.24
Undesignate	NX670648	Cullenoch Field		FIELD SYSTEM	Drystone dykes marking field system and woofland boundaries as	Local Importance	FCS		2.52

d		system			depicted in the 1st edition OS 6-inch map (Kirkcudbrightshire 1852, sheet 38)				

Appendix VI. Notes on coupe felling

Notes on coupe work schedule

56118	Large hillside coupe with shared boundary to private productive forestry on the other side. Also shares a boundary with a new natural reserve area containing deadwood. Some areas starting to windblow, however a wildlife constraint may complicate the timing of operations. This is a self-contained coupe which will be replanted and probably subject to a no thin regime due to access and exposure. Replant with SS to maintain high productive capacity in the coupe. There may be natural regeneration of SS, which should be left if non-disruptive to restocking operations and in large enough areas to warrant respacing operations at appropriate junctures.
56007	Small areas of HL allow for replacement with BL. Possible regeneration of the from surrounding BL will be accepted, otherwise utilise a mix of BL, reflecting the surrounding stands. Any standing Bl will be left.
56081	Removal of the remaining unstable coupe. Extensively affected by windblow, the coupe requires removal and redesign. Restock with SS and leave large riparian corridor. Coupe 56081 will not meet the adjacency guideline due to the extensive windblow in the coupe as the result of failed thinning practice. The coupe will be merged and restocked at the same time as the neighbouring coupe 56028.
56169	Removal of SS, JL and WH to facilitate PAWS restoration. Will be restocked with suitable NBL/DF.
56161	Removal of mature, rotation age Sitka. Will be restocked with a mixture of SP, BL and a small area of Sitka. Where there is natural regeneration of SS, this will be retained where it does not adversely affect the growth

	of the SP & BL.
56123	Removal of mature, rotation age SS, to be replaced with a combination of OS and SS. This will allow for greater protection for the surrounding watercourses and provide a better coupe shape for the edge of the forest.
56111	Removal of coupe containing a failed nurse mix of p60 LP/SS & SS/JL. To be replaced by a BL and SS coupe.

South Scotland conservancy requested Forest Gales data for coupe 56118, despite overwhelming visual evidence showing the wind instability for this and surrounding coupes, they remained unconvinced that felling from the leeward side of the prevailing wind would be justified. The requested data is provided below.

Most of the coupe was planted in 1951 and has been thinned, and after running the numbers through ForestGales software the return period varies from 1 to 200 years, with the vast majority of the coupe having a wind damage risk status of 6 and a return period under 10 years.

The soil for coupe 56118 is overwhelmingly 4ps (Peaty-gley surface water), and a peaty gley with deep rooting was used in the report.

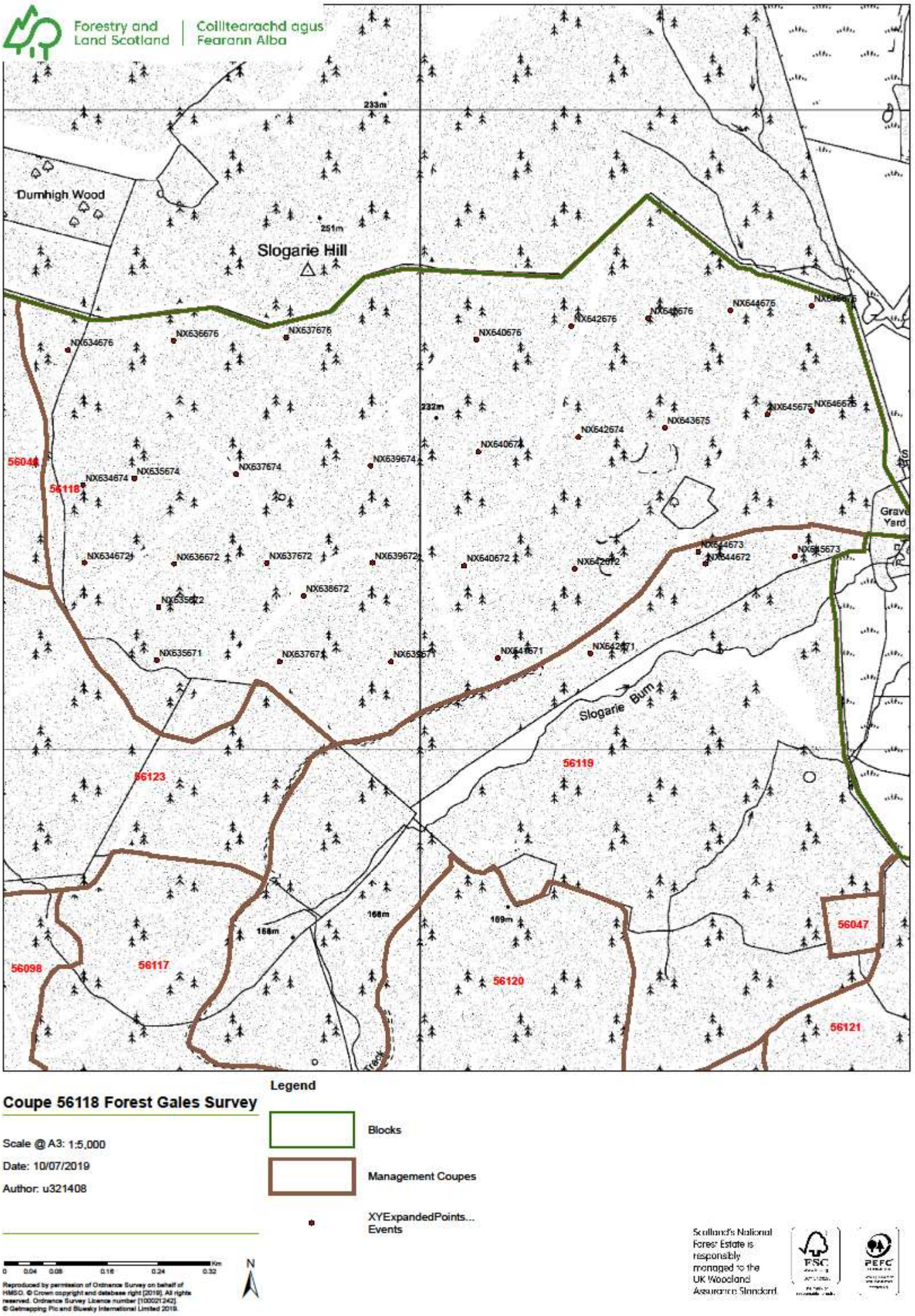
The coupe on the far eastern side is quite well protected from the prevailing wind and has a higher return period, but will be harvested as it would not make sense from a visual or ecological perspective for this small area to be left.
The following inputs were used for the forest gales software:

Species	Top Height(m)	Dbh(cm)	Trees (n/ha)	Gap (m)
Sitka spruce	28	35	303	0

Which gave the following results from the locations. See map 9 – Forest Gales survey for location.

Grid Ref	Return Period (years) Overturn	Return Period (years) Snap	Wind risk Over	Wind risk Snap
NX642671	4	3	6	6
NX634676	10	6	5	6
NX641671	2	1	6	6
NX639671	2	1	6	6
NX637671	2	1	6	6
NX635671	4	3	6	6
NX635672	4	3	6	6
NX638672	2	1	6	6
NX644672	4	3	6	6
NX645673	41	21	3	4
NX644673	4	3	6	6
NX642672	4	3	6	6
NX636676	2	1	6	6
NX640672	2	1	6	6
NX639672	2	1	6	6
NX637672	2	1	6	6
NX636672	2	1	6	6
NX634672	2	1	6	6
NX634674	2	1	6	6
NX635674	2	1	6	6
NX637674	2	1	6	6

NX639674	2	1	6	6
NX640674	2	1	6	6
NX642674	10	5	6	6
NX643675	10	5	6	6
NX645675	200	113	1	1
NX646675	200	113	1	1
NX646676	200	113	1	1
NX644676	10	5	6	6
NX643676	10	5	6	6
NX642676	10	5	6	6
NX640676	1	6	1	6
NX637676	1	6	1	6


Forestry and Land Scotland
Coilltearachd agus Fearann Alba
Dumhigh Wood
Slogarie Hill
233m
251m
NX634674
NX635674
NX636676
NX637676
NX639674
NX640674
NX642676
NX643675
NX644675
NX645675
NX646675
56048
56118
NX634672
NX636672
NX637672
NX639672
NX640672
NX642672
NX644673
NX644672
NX645673
NX638672
NX635672
NX635671
NX637671
NX639671
NX641671
NX642671
Slogarie Burn
56123
56119
56047
56098
56117
56120
56121
168m
169m
232m
Grave Yard
Legend
Coupe 56118 Forest Gales Survey
Scale @ A3: 1:5,000
Date: 10/07/2019
Author: u321408
Blocks
Management Coupes
XYExpandedPoints... Events
0 0.04 0.08 0.16 0.24 0.32 Km
N
Reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database right [2019]. All rights reserved. Ordnance Survey Licence number [100021242].
© Getmapping Plc and Bluesky International Limited 2019.
Scotland's National Forest Estate is responsibly managed to the UK Woodland Assurance Standard
FSC
PEFC

Appendix VII: Assessment of felling and restock proposals within catchments at risk and failing

Aire burn 1652 catchment at risk / failing catchment

See below for base catchment area detail as at 8th January 2019. The total area for the catchment is 2769.25ha, split between the Fleet Basin LMP and Laurieston. To reflect the balance as to the plantation area within the catchment, the areas for this calculation will be 797ha.

Open ground area (including open water)	623.4Ha 9.4ha inside plantation
Plantation area	183.0 ha
Total catchment area (within Laurieston LMP)	797ha*
20% of catchment	159ha
30% of catchment	239ha

The only felling within the catchment area is scheduled for phase 2 and covers 4.5Ha within the catchment. This represents >0.6% of the catchment area.

The area of closed canopy conifer forest (age > 15years) needs to be less than 30% of catchment in 15 years' time i.e.239ha. Due to there being less than 239ha of plantation (183.0ha) within the portion of the catchment that would be assigned to the Laurieston LMP (rather than Fleet Basin LMP) , the area of closed canopy conifer forest >15 years of age will always be less than deemed necessary.

Black Water of Dee and Pullaugh Burn to Loch Ken catchment at risk / failing catchment

See below for base catchment area detail as at 8th January 2019. The total area for this catchment that includes Black Water of Dee and Pullaugh Burn to Loch Ken is 2,156ha. The failing catchment area is proportionally split between the 3 plantation areas, FLS land in Laurieston, Fleet Basin and private plantation area around Slogarie Hill.

Open ground area (including open water)	239.3ha
Plantation area	367.8ha
Total catchment area (within Laurieston LMP)	707ha
20% of catchment	141.4ha
30% of catchment	212.1ha

In line with the UK Forestry Standard the felled area within the catchment in any 3 year period needs to be less than 20% of the catchment. The table below based on the planned coupe felling programme confirms that this entirely the case with no period exceeding 10.4% of the catchment.

3yr Fell period	Currently proposed felled areas (ha)	Proposed fell area as % of catchment area
2019-21	**74.74**	10.4%
2020-22	**74.74**	10.4%
2021-23	**74.74**	10.4%
2022-24	**0**	0%
2023-25	**0**	0%
2024-26	**0**	0%
2025-27	**33.89**	4.8%
2026-28	**33.89**	4.8%
2027-29	**33.89**	4.8%

2028-30	**0**	0%

The area of closed canopy conifer forest (age > 15years) needs to be less than 30% of catchment in 15 years' time i.e. 212 ha. The table below confirms that under the current LMP proposals this is not achievable with the figure around 36.6%.
In the table the proposed fell area for the next 15yrs within the catchment is subtracted from the current plantation area in the catchment to give a notional area of 1684.8ha of plantation within the catchment over 15yrs age (assumes that felled areas will be restocked within 3yrs of felling subject to planned restock and Hylobius Management Support System).

Current plantation area within catchment	367.5ha
Proposed felled area between 2019-2033 (15yrs)	108.6ha
Notional plantation area in 15yrs time > 15yrs age	**258.9ha**

Woodhall Loch and Camelon Lane catchment at risk / failing catchment

See below for base catchment area detail as at 8th January 2019. The total area for this catchment that includes Woodhall Loch and Camelon Lane is 2676ha. The failing catchment area is has small private areas of forest and a large proportion of the northern/north eastern area of Laurieston forest block, therefore the notional catchment size used is 2151.6ha.

Open ground area (including open water)	818.6.3ha
Plantation area	1216.7ha
Total catchment area (within Laurieston LMP)	2151.6ha
20% of catchment	430.2ha

30% of catchment	645.3ha

In line with the UK Forestry Standard the felled area within the catchment in any 3 year period needs to be less than 20% of the catchment. The table below based on the planned coupe felling programme confirms that this entirely the case with no period exceeding 1.2% of the catchment.

3yr Fell period	Currently proposed felled areas (ha)	Proposed fell area as % of catchment area
2019-21	**27.1**	1.2%
2020-22	**27.1**	1.2%
2021-23	**27.1**	1.2%
2022-24	**0**	0%
2023-25	**0**	0%
2024-26	**0**	0%
2025-27	**0**	0%
2026-28	**0**	0%
2027-29	**0**	0%
2028-30	**0**	0%

The area of closed canopy conifer forest (age > 15years) needs to be less than 30% of catchment in 15 years' time i.e. 645.3 ha. The table below confirms that under the current LMP proposals this is not achievable with the figure around 46%.
In the table the proposed fell area for the next 15yrs within the catchment is subtracted from the current conifer plantation area in the catchment, to give a notional area of 998.1ha of plantation within the catchment over 15yrs age (assumes that felled areas will be restocked within 3yrs of felling subject to planned restock and Hylobius Management Support System).

Current plantation area within catchment	1216.7ha

Proposed felled area between 2019-2033 (15yrs)	27.12ha
Non-conifer plantation area and internal open space	190.8ha
Notional conifer plantation area in 15yrs time > 15yrs age	**998.1ha**

Revised Calculations

On instruction from South Scotland conservancy, the NFI dataset, of which the latest version is 2 years old, is to be used to calculate the standing tree cover for the acid sensitive calculations. This disregards the previously agreed calculation above which was applied to the previously approved NFE blocks on a proportional basis. With this data the following categories from the NFI calculations are excluded.

Bare area
Broadleaved
Felled
Grassland
Ground Prep
Mixed Mainly broadleaves
Open Water
Other vegetation
Shrub
Urban
Young trees

The fields included from the NFI data are as follows:

Assumed Woodland
Conifer
Mainly mixed conifer
Windblow

Outside of the NFE, neither FLS or South Scotland conservancy have any stock data for the privately held forest, so the planting year is unknown for

the areas which are included. As instructed, we have been told to assume that ALL the areas given in the fields included above are mature conifer. These numbers will, of course vary as private companies will have access to their own stock data and be able to give a more reflective number for forest cover. As further instructed, the calculation disregards any fallow period, which is used extensively on the NFE for prevention of *hylobius*, assumes like for like restocking, assumes no additional felling for larch, which is felled under a separate management agreement. From the snapshot data, the area of felling will only increase, and there is no point in seeing any replanting numbers for the 30% tree cover, again deviating from the previously agreed methodology. This gives limited utility for the catchment calculation and in the authors opinion does not reflect best practice.

Within the Woodhall Loch Camelon Lane there is 8.66ha if woodland creation in 2017. This will not affect the calculation for the time period 2019-2029 which the LMP covers.

Catchment name	Woodhall Loch, Camelon Lane
Catchment area	2676.8Ha
Estimated conifer coverage over 15 years old	647.8ha
Estimated percentage conifer cover over 15 years old	24.2%

Catchment name	Black Water of Dee Pullaugh Burn to Loch Ken
Catchment area	2156.2ha
Estimated conifer coverage over 15 years old	652.7ha
Estimated percentage conifer cover over 15 years old	30.3%

Catchment name	Aire Burn
Catchment area	2769.2ha
Estimated conifer coverage over 15 years old	568.8ha
Estimated percentage conifer cover over 15 years old	20.5%

Felling over 20% of catchment

Again on instruction from South Scotland conservancy, the data used for the calculation stem from the NFI dataset and the NFE. With this there is little point in separating the NFE data from the private data, so the felling is incorporated into data supplied from South Scotland conservancy. This, again, does not take into account felling under the PR management agreement. As this is an entire catchment calculation, the numbers required for felling without the previous areas being restocked are so large as to be extremely unlikely to ever occur. Therefore, even though the felling dates vary, all felling here is assumed to for the same year and not restocked for the entire 10 year period, which would be the maximum impact for acidification purposes.

Catchment name	Woodhall Loch, Camelon Lane
Catchment area	2676.8Ha
FLS felling areas	59.6Ha
Private sector felling areas	None
Felling percentage in catchment	2.2%

Catchment name	Aire burn
Catchment area	2156.2ha
FLS felling areas	139.9ha
Private sector felling areas	50.7ha
Felling percentage in catchment	8.8%

Catchment name	Black Water of Dee Pullaugh Burn to Loch Ken
Catchment area	2769.2ha
FLS felling areas	311.4ha
Private sector felling areas	149.6ha
Felling percentage in catchment	16.6%

Appendix VIII: Prospect viewpoint images

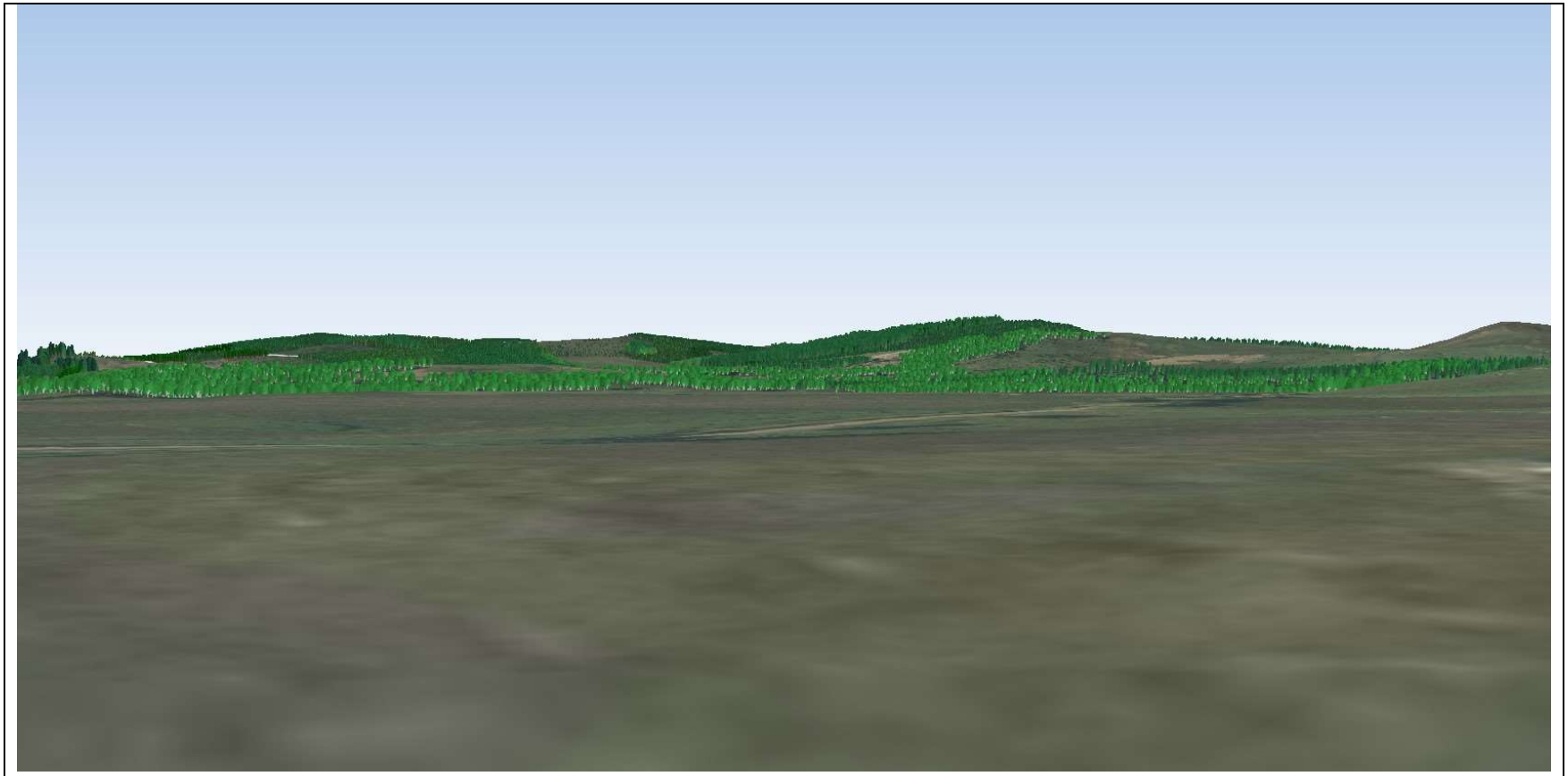


Figure 10 - Viewpoint from Mossdale carpark, as the forest currently stands. This utilises the national forest inventory data to give an idea of the surrounding private forestry.

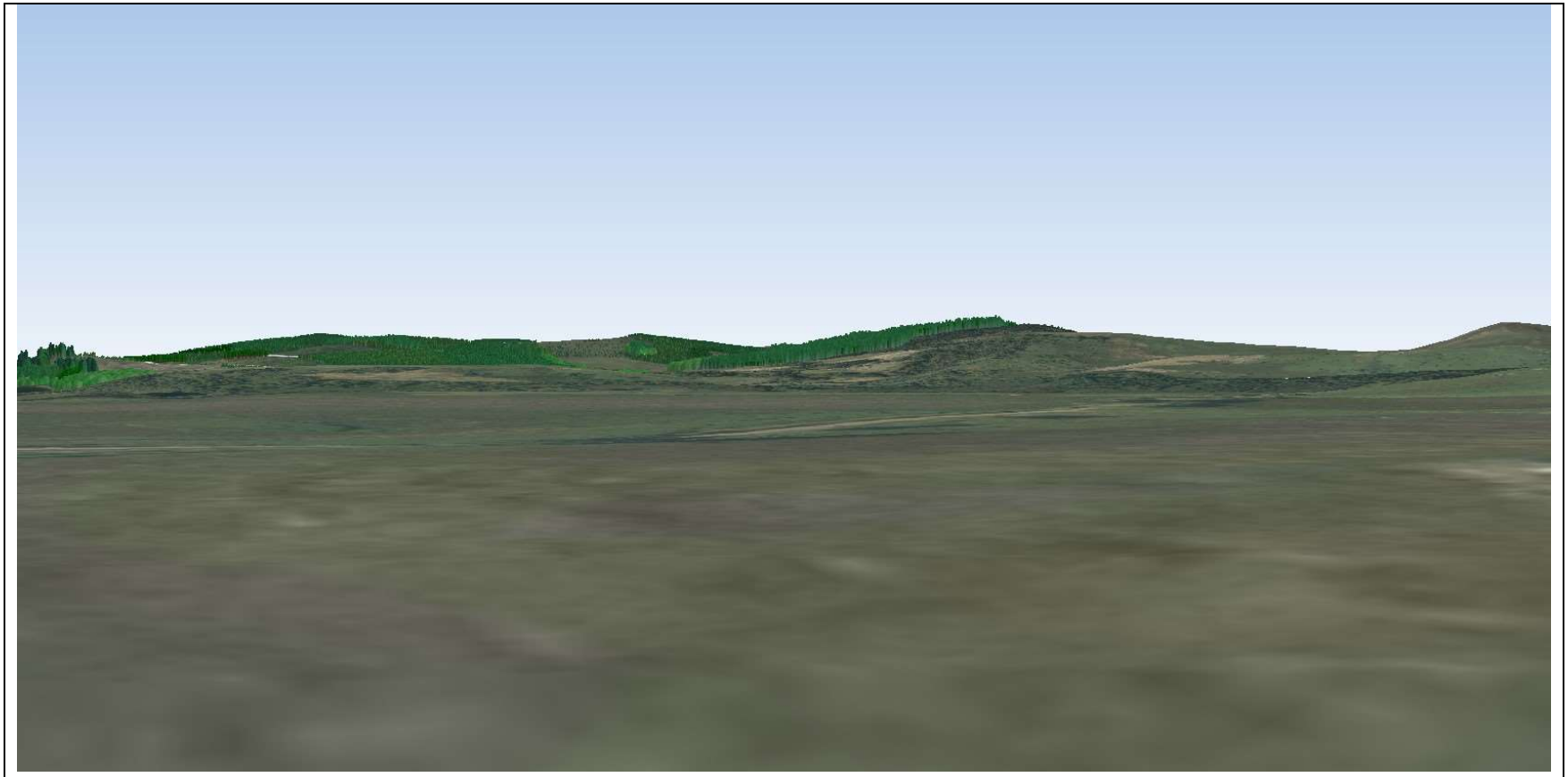


Figure 11 - Private felling - by removing the national forest inventory data, the view now simulates the private felling. Rather than the green edge that is shown across the hilltop, this would be a brown, unstable edge across the skyline

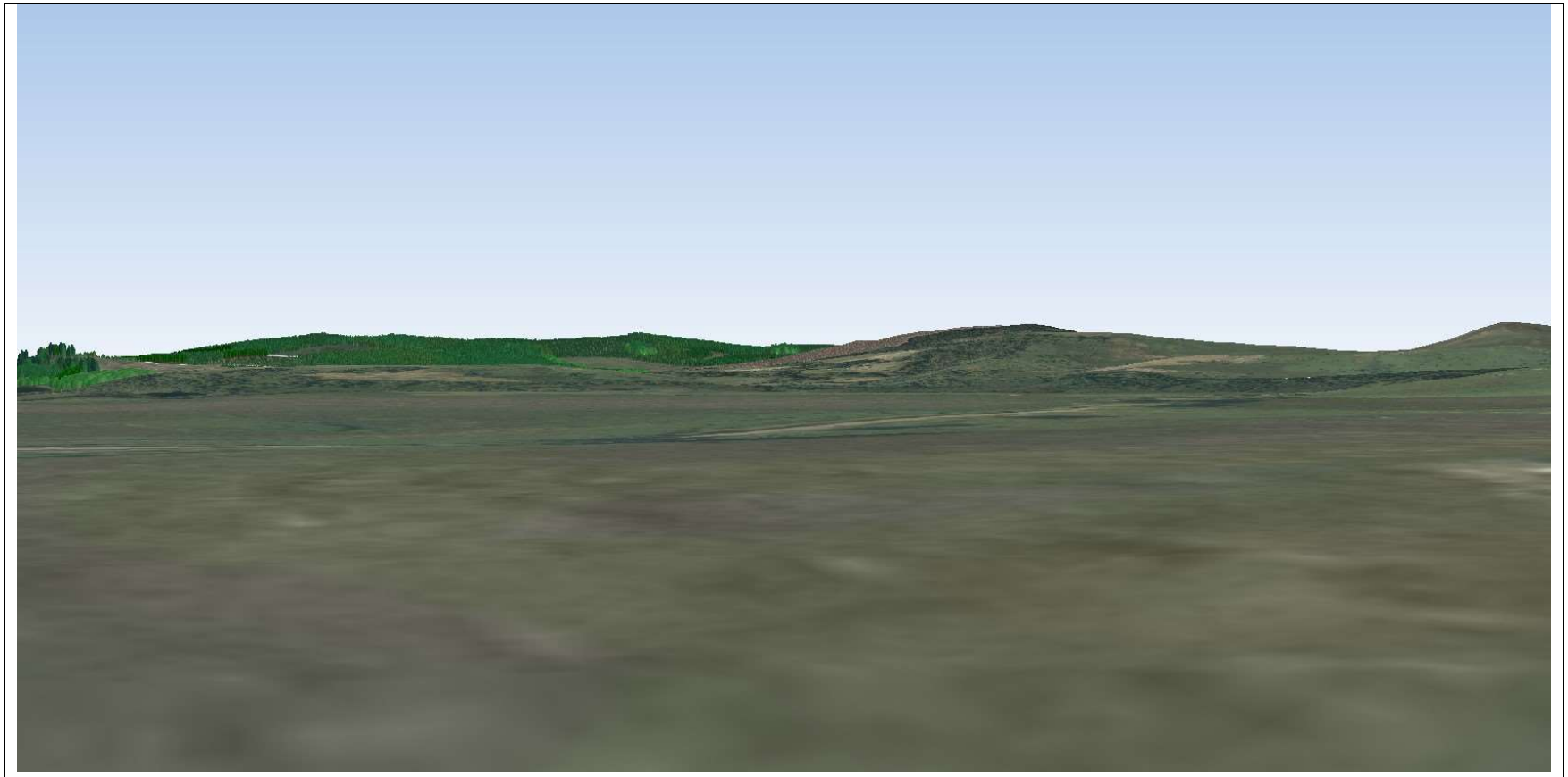


Figure 12 - Showing the complete felling across the hilltop, utilising the hilltop coupe design.